Unisys e-@ction ClearPath Enterprise Servers

Task Attributes
Programming Reference Manual

ClearPath MCP Release 7.0 SSP1

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Section 1
Accessing Task Attributes

This section discusses the purpose and audience of this manual, and provides an overview of some of the notation conventions used within the manual. It also explains task attributes and describes how to access them. For more information on task attributes, see the *Task Management Programming Guide*.

Purpose

Task attributes are used to record or control various aspects of process behavior. All processes possess all the task attributes described in these pages, though the values of the individual attributes vary from one process to another. The operating system uses these attributes in executing a process. Some programming languages also allow you to write applications that query or modify task attributes.

Audience

The audience for this manual consists of programmers who write tasking applications and operators who use task equations.

Before reading this manual, you should have a basic familiarity with the MCP environment. A more detailed introduction to tasking and the use of task attributes is provided in the *Task Management Programming Guide*.

Terminology Conventions

Two different ANSI levels of COBOL are supported on the MCP systems: ANSI-74, and ANSI-85. These implementations are referred to in this guide as COBOL74 and COBOL85, respectively. Statements in this guide about "COBOL" are true of both COBOL implementations, unless otherwise specified.

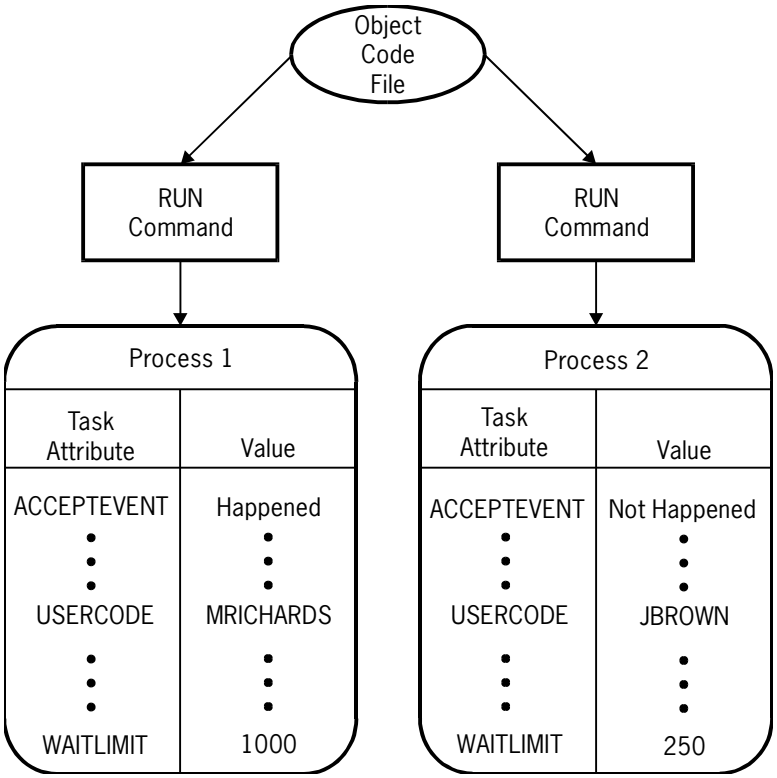
The term *library,* which was used in previous editions of this guide, has been replaced by the term *server library.* The term *user process* (when used in the context of libraries) has been replaced by the term *client process.* The library as it is declared in the client process is now referred to as the *client library.*

These changes resulted from the implementation of a new type of libraries, called *connection libraries.* The term *library* is now used as a general term referring to a server library, a client library, or a connection library. For further information about libraries, refer to the *Task Management Programming Guide.*

What Are Task Attributes?

Each time you initiate a program, the system creates a process that reflects the executing program. If several users initiate the same program, several processes are created for that program.

Each process has attributes associated with it. These are called task attributes, although they could more accurately be called "process" attributes. Task attributes reflect the various properties of a process.



Each process has the entire list of task attributes described in this manual from ACCEPTEVENT through WAITLIMIT. However, the values of the task attributes can vary. For example, each process has a USERCODE task attribute, but the USERCODE value for one process may be MRICHARDS and the USERCODE value for another process may be JBROWN, as shown in the previous figure.

Why Use Task Attributes?

You use task attributes to monitor the status of the process and to assign values for the attribute to pass on to the process. Therefore, you can access a task attribute either to read the attribute or to assign a value to the attribute.

Who Can Access Task Attributes?

The end user, programmer, operator, and system administrator can access the task attributes of a process in various ways. The system software provides default and inherited values, resolves conflicting assignments, and issues errors for invalid attempts to access task attributes.

The rest of this section describes the following ways to access task attributes:

- Operator and end-user access
- Programmer access
- System administrator access
- System access

Performance Considerations

Task information is a global resource. Access to task information for either inquiry or modification must be carefully controlled to ensure data integrity. The MCP provides the required locking protocol to control access. The locking protocol results in serialization of processes accessing task information. In general, higher priority tasks will gain access to task information before lower priority tasks.

Operator and End-User Access to Task Attributes

The operator or end user can affect the task attributes of a process with commands entered in Command and Edit (CANDE) or Menu-Assisted Resource Control (MARC) sessions or at the operator display terminal (ODT).

Using CANDE and MARC Task Equations

You can make task attribute assignments in CANDE or MARC by using *task equations.* Task equations are task attribute assignments that you can append to a process initiation statement. The system applies these assignments before initiating the process.

In CANDE, you can include task equations after most process initiation statements, including RUN and UTILITY. In MARC, you can include task equations after the RUN command. In addition, if you initiate a process from the RUN screen, you can enter task equations on the TASKATTR screen and the FILEEQUATE screen.

The following is a CANDE example:

```
RUN ALGOL/TASK;SW1=TRUE;MAXPROCTIME=20;
                FILE IN=DAILY/DATA;FILE OUT(KIND=DISK,TITLE=OUTPUT);
```

The preceding example shows assignments to several types of task attributes. SW1 is a Boolean attribute, and MAXPROCTIME is a real attribute. The FILE IN and FILE OUT assignments are examples of the syntax for assigning the FILECARDS task attribute.

You can also include task equations after a CANDE *COMPILE* command. Such task equations can make assignments to the compilation or the resulting object code file. For details, refer to "Assigning Task Attributes to an Object Code File" in this section.

Note that a process can change the values of many of its own task attributes while it is running. Thus, a programmer can design a process to override the effects of task equations submitted by operators.

Assigning Task Attributes to a Session

When you initiate a process from a CANDE or MARC session, the process inherits a number of task attributes from the session. You can make assignments to some of the task attributes of the session by using special CANDE and MARC commands such as FAMILY, LANGUAGE, and so on. Thereafter, all the processes you initiate from the session inherit these values, unless you override them with task equations. For details, refer to the discussion of tasking from interactive sources in the *Task Management Programming Guide*.

Using Operator Commands

You can use any of several system commands to make assignments to the task attributes of a running process. You can enter these system commands, or close equivalents to them, at an ODT or in a MARC or CANDE session. These include communication commands, which affect such task attributes as EXCEPTIONEVENT, ACCEPTEVENT, and TASKVALUE. You can use other commands to change the PRIORITY value or to change the STATUS value of the process. For details, refer to the discussion of tasking from interactive sources in the *Task Management Programming Guide*.

Programmer Access to Task Attributes

You can access task attributes in either of two ways:

- Through language constructs in Work Flow Language (WFL), ALGOL, COBOL74, and COBOL85
- Through calls on the WFLSUPPORT library

You can access task attributes from programs by any of several means, including task variables, task equations, the WFL job attribute list, and object code file assignments.

The following subsections discuss the WFL, ALGOL, and COBOL language constructs for reading and assigning task attributes, as well as the WFLSUPPORT interface.

Using Task Variables

Task variables are the main method of accessing task attributes from programs. A task variable is an object that is declared in a program and that accesses the task attributes of a particular process. The task variable becomes associated with a particular process by being specified in the statement that initiates that process. For example, the following COBOL statement initiates a process and associates the task variable TASK-VAR-1 with that process:

```
PROCESS TASK-VAR-1 WITH PROC-EXTERNAL.
```

Certain predeclared task variables are available that are automatically associated with a particular process. The MYSELF task variable allows a process to access its own task attributes. The MYJOB task variable accesses the task attributes of the job of the process. The task attribute PARTNER accesses the task attributes of the partner process and the task attribute EXCEPTIONTASK accesses the task attributes of the exception task.

Additionally, a process can access any task variable within the extended addressing environment of the outer block of the process. For example, if the process is an internal task, it can access task variables declared globally in its parent. The process can access any task variables declared in its own code. The process can also access any task variables that are passed as parameters.

Task attributes can be assigned to a task variable before the task variable is used in a process initiation statement. These task attributes are assigned to the new process when it is initiated. If the same task attribute is assigned more than once, the most recent value assigned is used when the process is initiated. If the task attributes of the task variable are read before initiation, they return their default values or the values they were previously assigned.

If a task variable is associated with a dependent process in the initiation statement, then the task variable remains associated with the process after initiation. The task variable can be used to access the task attributes of the running process. Assignments to the task variable can change the behavior of the process. Interrogations of the task variable can be used to monitor the status of the process.

If a task variable is associated with an independent process in the initiation statement, then any task attributes that were previously assigned to the task variable are applied to the independent process. However, once initiation completes, the task variable ceases to be associated with the independent process. The task attributes of the task variable can be read or written to; however, these operations do not access the task attributes of the independent process.

Once the process has terminated, the task variable can be used to examine the final values of the task attributes of the process. For example, the history-related attributes of the task variable can be examined for information about how the process terminated.

Reusing Task Variables

The same task variable can be specified in more than one task initiation statement in a program. However, the same task variable cannot be associated with two processes at the same time. For example, the following pair of ALGOL statements causes an error:

```
PROCESS PROG1 [T];
PROCESS PROG2 [T];
```

Because the first statement initiates an asynchronous process, task variable T is still in use when the second statement is executed. An ALGOL process that executes the statements in the previous example is discontinued with the run-time error "INITIATE ACTIVE TASK".

Problems can arise from task attributes being carried over from one use of the task variable to another. Consider the following ALGOL statements:

```
CALL PROG1 [T];
CALL PROG2 [T];
```

No error results from these statements, because PROG1 is initiated as a synchronous process. The statement that initiates PROG2 is not executed until PROG1 terminates. However, PROG1 might have used the MYSELF task variable to make an assignment to its FAMILY task attribute. This new FAMILY value is passed on to PROG2, simply because it uses the task variable that was previously associated with PROG1. Other task attribute values can also be passed on in this way.

This problem can be prevented by declaring a different task variable for each process that is to be initiated. The task variable can also be made safe for reuse by reinitializing it. A task variable can be reinitialized by setting the STATUS task attribute to NEVERUSED. This assignment causes all task attributes to be returned to their default values. The following ALGOL statement reinitializes a task variable:

```
TVAR.STATUS := VALUE(NEVERUSED);
```

WFL also provides the INITIALIZE statement for reinitializing task variables. The following is an example of this statement:

```
INITIALIZE (TVAR);
```

These statements reinitialize the task variable only if it is not currently in use. That is, the current value of the STATUS task attribute must be TERMINATED, BADINITIATE, or NEVERUSED. Otherwise, the assignment has no effect.

Using WFL Task Equations

You can use task equations in WFL jobs that are similar to the task equations allowed in CANDE or MARC sessions. You can include task equations after a process initiation statement, such as RUN or PROCESS. Where task equations conflict with previous assignments to the task variable, the task equations take precedence. The following is an example of a WFL job that uses task equations:

```
100 ?BEGIN JOB WFL/TEST;
200  TASK T (TASKVALUE = 3);
300  RUN OBJECT/ALGOL/TASK [T];
400    TASKVALUE = 1;
500 ?END JOB
```

In this example, OBJECT/ALGOL/TASK runs with a TASKVALUE of 1 because the task equation overrides the previous assignment to the task variable.

You can also use task equations with the COMPILE statement to make assignments to the compilation or the resulting object code file. For details, refer to "Assigning Task Attributes to an Object Code File" in this section.

Note that a process can change the values of many of its own task attributes while it is running. Thus, a programmer can design a process to override the effects of task equations submitted through WFL.

Using the WFL Job Attribute List

A WFL job attribute list consists of task attribute assignments in the WFL source program, immediately following the job header. The system applies the assignments in the job attribute list before initiating the job. This feature can be useful because some task attributes can be assigned to a process only before initiation (an example is the CLASS task attribute).

The following is an example of a WFL job with a job attribute list that assigns the CLASS, CHARGE, and JOBSUMMARY task attributes:

```
?BEGIN JOB RUNNER;
   CLASS = 2;
   CHARGE = ORDERS;
   JOBSUMMARY = SUPPRESSED;
 RUN OBJECT/TAU ON PACK;
?END JOB
```

Assigning Task Attributes to an Object Code File

In some cases, you might want certain task attributes to be assigned the same values each time a program is run. For many task attributes, you can achieve this effect by including statements in the source program that assign task attributes to the MYSELF task variable. However, some task attributes can only be assigned before process initiation. For a WFL job, you can assign such task attributes in the job attribute list. For programs written in other languages, you can assign such task attributes to the object code file. The task attributes stored in the object code file are used whenever the object code file is initiated, unless they are overridden by later task attribute assignments.

You can assign task attributes to the object code file at compile time through the use of compiler task equations, which can be included in the WFL or CANDE *COMPILE* statements. You must be careful to distinguish between task equations that affect the compilation itself and task equations that affect the resulting object code file. The following WFL example uses compiler task equations:

```
500 COMPILE OBJECT/X WITH ALGOL LIBRARY;
600    COMPILER FILE CARD (TITLE = X, KIND = DISK);
700    ALGOL PRIORITY = 50;
800    TASKVALUE = 3;
```

In both WFL and CANDE, task equations are applied to the compilation if they are preceded by the word *COMPILER* or the name of a compiler. Otherwise, the task equations are applied to the object code file. In the preceding example, the task equations at lines 600 and 700 are applied to the compilation. The task equation at line 800 is applied to the object code file.

WFL includes a statement that can be used to make task attribute assignments to an existing object code file. This is the MODIFY statement. Task attributes that are stored by a MODIFY statement have the same effect as task attributes assigned at compile time: they serve as default values for every execution of that object code file. They also override any conflicting task attribute assignments that were made at compile time. The following is an example of a MODIFY statement:

```
MODIFY OBJECT/X;
   CHARGE = ADMIN;
   FILE INPUT = (JAS)DOC/103 ON DOCPK;
```

Note: *Task attributes assigned to an object code file do not affect internal tasks of that object code file. For example, suppose you assign TASKVALUE = 1 to an object code file. Someone then initiates the object code file, which in turn uses a CALL or PROCESS statement to initiate an internal procedure as an internal task. That internal task is not directly affected by the TASKVALUE = 1 assignment. Therefore, the internal task runs with the default TASKVALUE of 0 unless a different value is explicitly assigned to the task variable of the internal task.*

Task Attribute Syntax Examples

Different task attributes store different types of values. Most task attributes store values that are of type Boolean, event, integer, mnemonic, real, string, or task. The following pages give examples of how these various types of task attributes can be read or assigned in WFL, ALGOL, COBOL74, and COBOL85. For information about how to access task attributes that are of irregular types, refer to the task attribute descriptions.

Note that task attributes can also be assigned from other task declarations. For example, in ALGOL:

```
TASK PRIORITY := MYSELF.PRIORITY -5;
```

In COBOL74:

```
CHANGE ATTRIBUTE task-attr OF task-id TO ATTRIBUTE task-attr OF task-id.
```

Accessing Boolean Task Attributes

Boolean task attributes have a value of TRUE or FALSE. In WFL, these values can be read or assigned directly, or the task attribute can be used in other Boolean expressions. WFL also allows the use of a null assignment, which assigns a value of TRUE. Thus, the following two statements are equivalent. (In these statements, T is a task variable.)

```
T (DISPLAYONLYTOMCS = TRUE);
T (DISPLAYONLYTOMCS);  % Null assignment; assigns a value of TRUE
```

The following WFL examples show the use of Boolean task attributes as expressions. BOOL is a Boolean variable and T is a task variable.

```
BOOL := T(LOCKED);
IF T(SW1) THEN DISPLAY "NO ERRORS FOUND";
```

The ALGOL syntax is similar, except that task attributes are preceded by periods instead of enclosed in parentheses. In the following examples, BOOL is a Boolean variable and T is a task variable:

```
T.DISPLAYONLYTOMCS := TRUE;
BOOL := T.LOCKED;
IF T.SW1 THEN BOOL := TRUE;
```

In COBOL74 and COBOL85, Boolean task attributes return a value of 0 if FALSE or 1 if TRUE. Boolean attributes must be moved into a numeric receiving field. However, the VALUE function can be used when assigning or reading Boolean values. In the following examples, BOOLVAL was declared as *77 BOOLVAL BINARY PIC 9(11)*.

```
MOVE ATTRIBUTE LOCKED OF MYSELF TO BOOLVAL.
CHANGE ATTRIBUTE LOCKED OF MYSELF TO VALUE FALSE.
IF ATTRIBUTE SW1 OF MYSELF = VALUE FALSE
   DISPLAY "SWITCH ONE IS OFF."
```

Accessing Event Task Attributes

The event task attributes are accessed by the same types of statements that access event variables. For a discussion of statements related to events, refer to the *Task Management Programming Guide*.

The following are ALGOL examples:

```
CAUSE (MYSELF.EXCEPTIONTASK.EXCEPTIONEVENT);
WAITANDRESET (MYSELF.EXCEPTIONEVENT);
```

The following are COBOL74 or COBOL85 examples:

```
CAUSE ATTRIBUTE EXCEPTIONEVENT OF MYSELF.
WAIT AND RESET UNTIL ATTRIBUTE EXCEPTIONEVENT OF MYSELF.
```

WFL jobs cannot reference event task attributes directly. However, the following statements cause the job to implicitly wait on the exception event and the accept event:

```
WAIT; % Causes the job to wait on its own exception event.
STR := ACCEPT("ENTER A COMMAND"); % Waits on its own accept event &
                                  % stores operator AX command
                                  % input in string variable STR.
```

Accessing Integer and Real Task Attributes

In general, integer and real task attributes accept or return a numeric identifier, literal, or arithmetic expression. The system allows you to mix integer and real types: thus, you can assign a real value to an integer task attribute or read a real task attribute value into an integer variable. The system rounds off real numbers to change them into integers where necessary.

In the following WFL example, INT is an integer variable and T is a task variable:

```
CLASS = 2;
INT := T(TASKVALUE);
```

In the following ALGOL example, INT is an integer variable and T is a task variable:

```
T.TASKVALUE := 3;
INT := T.CORE;
```

In the following COBOL74 or COBOL85 examples, INTVAL was declared as *77 INTVAL BINARY PIC 9(11)*.

```
CHANGE ATTRIBUTE TASKVALUE OF MYSELF TO 16.
MOVE ATTRIBUTE TASKVALUE OF MYSELF TO INTVAL.
```

Accessing Mnemonic Task Attributes

In WFL, mnemonic task attributes can be read into string values or compared with string values. Mnemonics can be assigned as keywords, without quotes around them. In the following examples, STR is a string variable and T is a task variable:

```
MYSELF(JOBSUMMARY = SUPPRESSED);
STR := T(HISTORYTYPE);
IF T(HISTORYTYPE) = "NORMALEOTV" THEN DISPLAY "RAN SUCCESSFULLY";
```

In ALGOL, mnemonic task attributes accept or return a numeric value. The VALUE function can be used to translate a mnemonic into a numeric value for assignment to, or comparison with, a mnemonic task attribute. In the following examples, INTVAL is an integer variable and T is a task variable:

```
MYJOB.JOBSUMMARY := VALUE(SUPPRESSED);
INTVAL := T.HISTORYTYPE;
IF T.HISTORYTYPE = VALUE(SUPPRESSED) THEN ...
```

In COBOL74 or COBOL85, mnemonic task attributes also accept or return a numeric value and the VALUE function is available. In the following examples, MNEMVAL was declared as *77 MNEMVAL BINARY PIC 9(11)*:

```
MOVE ATTRIBUTE JOBSUMMARY OF MYSELF TO MNEMVAL. % Returns a number
CHANGE ATTRIBUTE JOBSUMMARY OF MYSELF TO VALUE UNCONDITIONAL.
IF ATTRIBUTE JOBSUMMARY OF MYSELF = VALUE UNCONDITIONAL
   DISPLAY "JOBSUMMARY IS UNCONDITIONAL".
```

Accessing String Task Attributes

In WFL, string task attributes can be read into string variables and assigned string literals, variables, or expressions. WFL also allows some string task attributes to be assigned a nonquoted value. If a string task attribute is assigned a nonquoted value, then the nonquoted value is checked for correct syntax at compile time. If the same task attribute is assigned a string value, the contents of the string are not checked for syntax until run time.

In the following WFL examples, STR is a string variable and T is a task variable:

```
T(FAMILY DISK = DPMAST OTHERWISE DISK); % Nonquoted assignment
T(FAMILY = "DISK = DPMAST OTHERWISE DISK"); % String assignment
T(FAMILY = "GIBBERISH"); % Receives run-time error
STR := T(FAMILY);  % Reading the value into a string variable
```

In ALGOL, string task attributes are treated as one-dimensional EBCDIC arrays. You can use REPLACE statements to assign values or to read string task attribute values into EBCDIC arrays. You must terminate values assigned to string task attributes with a period (.). Values returned by string task attributes are also terminated with a period. In the following examples, T is a task variable and ARR is an EBCDIC array that was declared as *EBCDIC ARRAY ARR[0:79]*:

```
REPLACE T.NAME BY "(JASMITH)OBJECT/THETA ON PACK.";
REPLACE ARR BY T.NAME;
```

Note: *Note that ALGOL syntax does* not *allow you to use string task attributes in the same way as string variables. For example, if STR is a string variable, the statement* STR := T.NAME *results in a syntax error.*

In COBOL74 or COBOL85, string task attributes accept or return an alphanumeric item. The value is terminated with a period, as in ALGOL. In the following example, TASK-VAR-1 is a task variable and STRINGVAL was declared as *77 STRINGVAL PIC X(80)*:

```
CHANGE ATTRIBUTE NAME OF TASK-VAR-1 TO "OBJECT/ALGOL/TASK.".
MOVE ATTRIBUTE FILECARDS OF TASK-VAR-1 TO STRINGVAL.
```

Accessing Task-Valued Task Attributes

Task-valued task attributes can be assigned a task variable or can be used as task variables to access the task attributes of a particular process. In the following ALGOL examples, TVAR is a task variable that was previously declared:

```
MYSELF.PARTNER := TVAR;
MYSELF.EXCEPTIONTASK.TASKVALUE := 33;
```

In the following COBOL74 or COBOL85 examples, TVAR-1 and TVAR-2 were previously declared as 77-level items with a USAGE of TASK:

```
CHANGE ATTRIBUTE EXCEPTIONTASK OF TVAR-1 TO TVAR-2.
CHANGE ATTRIBUTE PRIORITY OF ATTRIBUTE PARTNER OF MYSELF TO 65.
```

Task-valued task attributes cannot be accessed from WFL.

Accessing Task Attributes at the Bit Level

Some Boolean, integer, and real task attributes return values that are divided into bit fields with distinct meanings. Examples are the ERROR, HISTORY, LIBRARYSTATE, ORGUNIT, SOURCESTATION, STOPPOINT, and TASKERROR task attributes.

The following are ALGOL statements that extract the values from various fields of the ERROR task attribute. In these statements, R is a real variable, ERR is a Boolean variable, and ERRNUM and UCERRNUM are real variables:

```
R := TVAR.ERROR;             % Put ERROR value in real variable
ERR := BOOLEAN(R.[46:1]);    % Translate a bit value into a Boolean
ERRNUM := R.[7:8];           % Record the task attribute number
UCERRNUM := R.[27:20];       % Record the USERDATA error number
```

The following are COBOL74 or COBOL85 statements that extract the values from the various fields of the ERROR task attribute. The variables INTVAL, ERR, ERRNUM, and UCERRNUM were all declared as 77-level variables of type *BINARY PIC 9(11)*.

```
MOVE ATTRIBUTE ERROR OF TASK-VAR-1 TO INTVAL.
MOVE INTVAL TO ERR [ 46:00:01 ].
MOVE INTVAL TO ERRNUM [ 07:07:08 ].
MOVE INTVAL TO UCERRNUM [ 27:19:20 ].
```

In WFL, there is no direct way to access task attributes at the bit level. However, the ERROR task attribute can be accessed by mnemonic values in WFL. Further, a WFL job can extract values from selected fields of any real or integer value by calling the following ALGOL program:

```
PROCEDURE WORDANALYZER(FULLWORD, STARTPOINT, LENGTH, FIELDVAL);
  VALUE FULLWORD, STARTPOINT, LENGTH;
  REAL FULLWORD, FIELDVAL;
  INTEGER LENGTH, STARTPOINT;
BEGIN
  FIELDVAL := FULLWORD.[STARTPOINT:LENGTH];
END.
```

In the WORDANALYZER program, the FULLWORD parameter receives the real or integer value to be analyzed. The STARTPOINT parameter receives the left-most bit position of the field being evaluated. The LENGTH parameter receives the length of the field being evaluated. The FIELDVAL parameter returns the value of the specified field. Note that the calling WFL job should pass the FIELDVAL parameter by reference.

WFL does not provide access to the HISTORYREASON task attribute. The following WFL job determines the HISTORYREASON value indirectly by calling the WORDANALYZER program. WORDANALYZER extracts field [23:08] from the HISTORY task attribute value.

```
BEGIN JOB TEST/WFL;
REAL HREASON;
TASK T;
RUN OBJECT/DELTA [T];
RUN OBJECT/WORDANALYZER(T(HISTORY),23,8,HREASON REFERENCE);
IF T(HISTORYTYPE) = "DSEDV" AND T(HISTORYCAUSE) = "OPERATORCAUSEV"
   AND HREASON = 2  % Equivalent to HISTORYREASON mnemonic JUSTDSEDV
THEN ABORT "OBJECT/DELTA WAS DSED BY OPERATOR";
END JOB
```

Note: *Some programmers have attempted to use WFL expressions involving DIV and MOD operators to extract the values of fields in words. This method is not recommended, because the DIV and MOD operators interpret a number of the bits in field [46:08] as sign or exponent values. The value of these high-order bits can therefore affect the results of DIV and MOD operations.*

ALGOL, COBOL, and WFL all provide bit-level access to the OPTION task attribute by way of special mnemonics that specify the bit position. For examples, refer to the description of the OPTION task attribute.

Using WFLSUPPORT to Access Task Attributes

The WFLSUPPORT system library exports two library procedures that assist in assigning attributes to a task variable: the HANDLEATTRIBUTES procedure and the ATTRIBUTEMESSAGE procedure. The HANDLEATTRIBUTES procedure accepts a string of text containing task attribute assignments, and makes the requested assignments to a task variable. The ATTRIBUTEMESSAGE procedure accepts an encoded task attribute assignment error as input and returns a textual error message.

Assigning Task Attributes through HANDLEATTRIBUTES

The HANDLEATTRIBUTES procedure has the following primary uses, which are illustrated by examples later in this section.

- HANDLEATTRIBUTES passes task attributes to a compiler for insertion into an object code file. This procedure replaces the old mechanism of attaching attributes to the compiler SHEET array, which is to be deimplemented on a future release.
- An interactive program using HANDLEATTRIBUTES allows the user to enter task attribute assignments at run time. Because HANDLEATTRIBUTES includes all the logic for checking the task attribute syntax, the interactive program need not be changed as new task attributes are implemented in the future.

The HANDLEATTRIBUTES procedure assumes that the task attribute assignments follow the syntax of a task equation list in WFL, except that local data specifications cannot be included. For the syntax of the WFL task equation list, refer to the *Work Flow Language (WFL) Programming Reference Manual*.

HANDLEATTRIBUTES can handle assignments to all the task attributes that can be specified in WFL. These include assignments to the DATABASE, FILECARDS, and LIBRARY task attributes, which are known in WFL as database equations, file equations, and library equations, respectively. Like WFL, HANDLEATTRIBUTES does not handle assignments to task attributes of type event or task.

If any of the task attribute assignments contains an error, HANDLEATTRIBUTES returns without making the requested assignments. You can specify options to tell HANDLEATTRIBUTES whether to accept assignments that generate warnings.

You can use the AICOMPILEF field of the HOW1 parameter to specify whether HANDLEATTRIBUTES is to accept both compiler task equations and noncompiler task equations. Additionally, you can use the DISPOSITION parameter to specify whether the equations are to be assigned to the target task variable, assigned to the MYPPB task attribute for later use, or simply checked for syntactical correctness.

The following is an ALGOL example of the way the WFLSUPPORT library declaration and the HANDLEATTRIBUTES procedure declaration look in a calling program:

```
LIBRARY WFLSUPPORT (LIBACCESS=BYFUNCTION);

REAL PROCEDURE HANDLEATTRIBUTES
          (TEXT,TEXTOFFSET,TEXTLENGTH,HOW1,DISPOSITION,TARGET,ERRORLOC);
  REAL          TEXTOFFSET,TEXTLENGTH,HOW1,DISPOSITION,       ERRORLOC;
  EBCDIC ARRAY TEXT[*];
  TASK                                                 TARGET;
  LIBRARY WFLSUPPORT;
```

Alternatively, you can use the $INCLUDE compiler option in your program to automatically insert these declarations from the file *SYMBOL/ATTRIBUTE/INTERPRETER/INTERFACE. It is a good idea to do so because this file also contains many defines that can be used with the HANDLEATTRIBUTES procedure.

The HANDLEATTRIBUTES parameters are explained as follows:

TEXT

The calling program must place the text of the task attribute assignments in this parameter. The assignments must follow the syntax of a task equation list in WFL.

TEXTOFFSET

The calling program can use this parameter to specify the offset within the TEXT buffer at which the attribute assignments begin. The offset is zero-relative and expressed in units of bytes.

TEXTLENGTH

The calling program can use this parameter to specify the number of bytes to be parsed starting at the location specified by the TEXTOFFSET parameter. If TEXTLENGTH is 0, then TEXT is scanned until a null character is encountered.

HOW1

The calling program can use this parameter to specify parsing control options. The fields of this parameter have the following meanings:

[47:23] Reserved. The value of this field must be 0.

[24:01] AIWARNINGSFATALF.

If 1, and a warning or error is detected, HANDLEATTRIBUTES returns without making the requested assignments. The procedure result and the ERRLOC parameter store information about the error or warning.

If 0, and a warning is detected, HANDLEATTRIBUTES displays a warning message and then continues normally. If an error is detected, HANDLEATTRIBUTES behaves as it would if the value of this field were 1.

[23:23] Reserved. The value of this field must be 0.

[00:01] AICOMPILEF.

If AICOMPILEF is 1, compiler mode is enabled. This mode makes it possible to assign task attributes to a compilation or to the resulting object code file. Compiler task equations are those that are prefixed by the word COMPILER or the name of a compiler, such as ALGOL, PASCAL, and so on.

If AICOMPILEF is 0, then any task attribute assignments preceded by a compiler prefix result in a syntax error.

For further information, refer to the following discussion of the DISPOSITION parameter.

DISPOSITION

The calling program can use this parameter to specify whether the task attribute assignments are to be applied. The effect of the DISPOSITION parameter varies, depending on whether compiler mode is specified by the AICOMPILEF field of the HOW1 parameter. The values of this parameter have the following meanings:

0 AIATTACHV

If HANDLEATTRIBUTES is invoked in compiler mode, then compiler task equations are assigned to TARGET.MYPPB. The compiler task equations in TARGET.MYPPB are applied to TARGET when TARGET.APPLYLIST is set to TRUE, or when TARGET is used to initiate a process (whether the process is a compiler or not).

Noncompiler task equations are assigned as a nested MYPPB value within TARGET.MYPPB. If TARGET is later used to initiate a compiler process, the compiler process reads the nested task equations from TARGET.MYPPB and assigns them to the resulting object code file.

If HANDLEATTRIBUTES is invoked in noncompiler mode, then any compiler task equations receive an error. Noncompiler task equations are assigned to TARGET.MYPPB. The equations in TARGET.MYPPB are applied when TARGET.APPLYLIST is set to TRUE or when TARGET is used in a process initiation statement.

1 AIAPPLYV

If HANDLEATTRIBUTES is invoked in compiler mode, then compiler task equations are applied directly to TARGET.

Noncompiler task equations are assigned to TARGET.MYPPB. If TARGET is later used to initiate a compiler, the compiler applies the equations in TARGET.MYPPB to the resulting object code file. Note that the system never applies the TARGET.MYPPB equations to TARGET, not even if TARGET.APPLYLIST is set to TRUE or TARGET is used in a process initiation statement.

If HANDLEATTRIBUTES is invoked in noncompiler mode, then any compiler task equations receive an error. Noncompiler task equations are applied directly to TARGET. Nothing is written to TARGET.MYPPB.

2 AISYNTAXONLYV

If HANDLEATTRIBUTES is invoked in compiler mode, then both compiler and noncompiler task equations are checked for syntax. None of the equations are applied and nothing is written to TARGET.MYPPB.

If HANDLEATTRIBUTES is invoked in noncompiler mode, then any compiler task equations receive an error. Noncompiler task equations are checked for syntax. None of the equations are applied and nothing is written to TARGET.MYPPB.

TARGET

The calling program can use this parameter to provide the task variable to which the task attribute assignments are applied. This parameter is ignored if the value of the DISPOSITION parameter is AISYNTAXONLYV.

ERRORLOC

HANDLEATTRIBUTES uses this parameter to return error information to the calling program. If field AIERRORF of the procedure result is 0, meaning that no error occurred, then this parameter stores a 0. If field AIERRORF has a value of 1, then ERRORLOC returns a value divided into the following fields:

[47:20] This field is always 0.

[27:01] AIERROFFSETVALIDF

If 1, then the error is associated with a particular offset in the input TEXT array. This offset is given in field AIERROFFSETF of the ERRORLOC parameter.

If 0, then the error is not associated with a specific offset. In this case, the AIERROFFSETF field does not store any offset.

[26:01] This field is always 0.

[25:18] AIERROFFSETF

This field stores the zero-relative offset of the task attribute error in the TEXT parameter. This field is meaningful only if the AIERROFFSETVALIDF field of the ERRORLOC parameter stores a 1.

[07:08] This field is always 0.

Procedure Result

The HANDLEATTRIBUTES result contains general information about task attribute errors. The value is divided into the following fields:

[47:08] AITYPEF

The type of attribute for which the error was detected. The possible values are as follows:

1 = FILECARDS task attribute

2 = Miscellaneous task attribute

4 = PRINTDEFAULTS task attribute

6 = LIBRARY task attribute

7 = DATABASE task attribute

[39:16] AIATTNUMF

The number of the attribute for which the error was detected. If field [47:08] of the procedure result indicates that FILECARDS had an error, then AIATTNUMF stores the number of the file attribute that caused the error. Otherwise, AIATTNUMF stores the number of the task attribute that caused the error. For file attribute numbers, refer to the *File Attributes Programming Reference Manual*. For task attribute numbers, refer to the description of the ERROR task attribute.

[23:16] AIERRNUMF

The error or exception number. Refer to Table 1–1, "HANDLEATTRIBUTES Error Numbers," for a list of these numbers and their meanings. This information also appears in the file *SYMBOL/ATTRIBUTE/INTERPRETER/INTERFACE.

[07:05] This field is always 0.

[02:01] AIATTNUMVALIDF

If 1, then the error is associated with a particular attribute in the input TEXT. In this case, the AIATTNUMF field and the AITYPEF field are valid. If 0, the error is not associated with a particular attribute and these fields are not valid.

[01:01] AIWARNINGF

If 0, the error is fatal. If 1, it is a warning.

[00:01] AIERRORF

If 1, an error occurred. If 0, no error occurred and none of the other fields in this result are valid.

Table 1–1 explains the values of the numbers returned in field [23:16] of the HANDLEATTRIBUTES procedure result.

Table 1–1. HANDLEATTRIBUTES Error Numbers

Error Number	Meaning
0	No error or warning occurred.
1-1000	If the error number is in this range, the error number is equal to the HISTORYREASON task attribute value. For information about the value, refer to the description of the HISTORYREASON task attribute.
1015	A syntax error was detected.
1017	An attribute mnemonic was expected.
1018	A numeric value was expected.
1019	An end-of-text marker was encountered.
1021	The same attribute has been assigned two values. This is a warning in most cases, but it is an error for the PRINTDEFAULTS attribute. If the warning is ignored, the more recent value overwrites the previous value.
1023	A right parenthesis was expected.
1027	A semicolon was expected (;).
1030	A string over 256 characters long was specified.
1031	An ending quotation mark (") is missing.
1032	The maximum number was exceeded.
1033	An illegal character was used.
1034	An illegal file name was used.
1035	An OPTION task attribute mnemonic was expected.
1036	An attribute mnemonic was expected.
1037	An illegal attribute mnemonic was used.

Table 1–1. HANDLEATTRIBUTES Error Numbers

Error Number	Meaning
1038	A left parenthesis was expected.
1039	A real constant was expected.
1040	The user part of a file title must be 12 names or less.
1041	The end of the statement was expected.
1042	A task attribute was expected.
1043	A compiler name was expected.
1044	An equal sign (=) was expected.
1045	A simple volume name was expected.
1046	A keyword was not recognized.
1047	An attempt was made to assign a value to a read-only attribute.
1048	Too many serial numbers were specified.
1049	The serial number was too long.
1050	A serial number was expected.
1051	The serial number contained an illegal character.
1052	This construct can be used only in a job heading.
1053	An illegal resource value was specified.
1054	A number from 0 to 255 was expected.
1055	This attribute is not valid in this context.
1056	A comma (,) was expected.
1057	The word OTHERWISE or ONLY was expected.
1058	A WFLSUPPORT fault occurred.
1059	String constants are not allowed here.
1060	This construct is not implemented.
1061	There was an error in numeric constant evaluation.
1062	The DATABASE attribute was expected.
1063	An illegal name was specified.
1064	A hyphen (-) or underscore (_) cannot be the first character of an unquoted name.
1065	The family specification was invalid.
1066	A file attribute was expected.
1067	A print attribute or print modifier was expected.
1068	A file equation for this file was previously specified; the previous equation is ignored.

Table 1–1. HANDLEATTRIBUTES Error Numbers

Error Number	Meaning
1072	An invalid type was specified.
1073	An invalid INTNAME file attribute value was specified.
1074	The word UP was expected.
1075	The word FILE was expected.
1076	The version number specified in ParseTaskAttributes, AttributesToTask, or AttributeMessage is too big.
1077	AIERRINFO_AVAILF is not 0.
1078	AIHOW_AVAILF is not 0.
1079	AIHOW1_AVAIL1F or AIHOW1_AVAIL2F is not 0.
1080	AIHOW3_AVAILF is not 0.
1081	AIHOW4_AVAILF is not 0.
1082	HOW5 is not 0.
1083	AIWHATTODO_AVAIL1F or AIWHATTODO_AVAIL2F is not 0.
1084	LIBRARY attribute expected.
1085	Only one node is allowed in a Multi-Vendor Password.
1086	The INTNAME of a file is more than 17 characters.
1087	Language id exceeds 17 characters.
1088	Too many AX values were specified for the task.

Decoding Error Values with ATTRIBUTEMESSAGE

The ATTRIBUTEMESSAGE procedure translates the HANDLEATTRIBUTES procedure result into a textual error message, suitable for display to a user.

ATTRIBUTEMESSAGE also allows you to specify the language in which the error message should be displayed, an array to hold the error message, and the offset in the array where the error message should start. ATTRIBUTEMESSAGE places the error message at the requested location in the array, and updates the offset parameter to point to the end of the error message.

The following is an ALGOL example of the way the WFLSUPPORT library declaration and the ATTRIBUTEMESSAGE procedure declaration look in a calling program:

```
LIBRARY WFLSUPPORT (LIBACCESS=BYFUNCTION);

REAL PROCEDURE ATTRIBUTEMESSAGE
                    (ERRINFO,HOW4,LANGUAGE,LANGLENGTH,MSG,MSGOFFSET);
  REAL               ERRINFO,HOW4,         LANGLENGTH,    MSGOFFSET;
  EBCDIC ARRAY                     LANGUAGE[*],        MSG[*];
  LIBRARY WFLSUPPORT;
```

Alternatively, you can use the $INCLUDE compiler option in your program to automatically insert these declarations from the file *SYMBOL/ATTRIBUTE/INTERPRETER/INTERFACE. It is a good idea to do so because this file also contains many defines that can be used with the ATTRIBUTEMESSAGE procedure.

The ATTRIBUTEMESSAGE parameters are explained as follows:

ERRINFO

The calling program must store the encoded error description in this parameter. The format of this word must be the same as the procedure result returned by HANDLEATTRIBUTES.

HOW4

The calling program can use this parameter to specify some aspects of the ATTRIBUTEMESSAGE interface. This parameter is divided into the following values:

[47:04] AIMESSAGEVERSIONF

This field stores the version number of the ATTRIBUTEMESSAGE interface. For the version supplied with this release, the value should be 0.

[43:43] Reserved. The value of this field must be 0.

[00:01] AIDISPLAYMESSAGEF

If 1, ATTRIBUTEMESSAGE issues a DISPLAY statement that causes the resulting error message to appear in the MSG (Display Messages) system command display. (The DISPLAYONLYTOMCS task attribute can limit the display of the message.)

If 0, the error message does not appear in the MSG display.

LANGUAGE

The calling program can use this parameter to specify the language in which the error message is to be reported. Parsing of the language starts at element 0 of the LANGUAGE value, although leading blanks are ignored. Parsing ceases when a null character is encountered or when the number of characters specified by the LANGLENGTH parameter has been parsed.

If the requested language is not supported on the system, a warning of AILANGNOTAVAILABLEV is reported and the system default language is used.

LANGLENGTH

The calling program can use this parameter to specify the maximum number of characters in the LANGUAGE parameter to be parsed, starting at element 0 of the LANGUAGE value. If LANGLENGTH is 0, the LANGUAGE parameter is ignored and the LANGUAGE task attribute of the calling process is used instead.

MSG

ATTRIBUTEMESSAGE returns the decoded error message in this parameter. You should take care that the array passed to this parameter is at least as long as the sum of the initial MSGOFFSET value and the value of the AIMSGLENGTHV define in *SYMBOL/ATTRIBUTE/INTERPRETER/INTERFACE. (The AIMSGLENGTHV define specifies the maximum length message that can be returned by the current version of ATTRIBUTEMESSAGE.)

MSGOFFSET

The calling program can use this parameter to specify the offset within the MSG array at which the decoded message should begin. ATTRIBUTEMESSAGE updates this parameter to return the offset of the null character that terminates the decoded message.

Procedure Result

ATTRIBUTEMESSAGE uses this parameter to report errors. The procedure result has the same format as the HANDLEATTRIBUTES procedure result, as previously described in this section.

The format of the message returned in MSG, the message parameter, is as follows when the error pertains to a specific attribute (that is, when field AIATTNUMVALIDF of the ERRINFO parameter equals 1):

```
<attribute type> Attribute "<attribute name>": <error description>
```

For example:

```
Task Attribute "DECLAREDPRIORITY":Cannot recognize keyword
```

If the error does not pertain to a specific attribute (that is, the AIATTNUMVALIDF field of the ERRINFO parameter equals 0), the message has the following format:

```
Attribute Error: <error description>
```

Examples

The following are examples of ALGOL programs that use the HANDLEATTRIBUTES and ATTRIBUTEMESSAGE procedures.

Example 1: Setting Multiple Attributes.

The following interactive program asks a user to supply task attribute assignments. The program then calls HANDLEATTRIBUTES to check the assignments for correctness and apply them to a task variable. If there are no errors, the program uses the task variable to initiate a task. If there are errors, the program uses ATTRIBUTEMESSAGE to display an error message.

```
100 BEGIN
110 $INCLUDE ATTINT = "*SYMBOL/ATTRIBUTE/INTERPRETER/INTERFACE"
120 TASK T;
130 FILE TERM(KIND = REMOTE,FILEUSE=IO);
140 EBCDIC ARRAY TEXT[0:419], LANG[0:119], MYPPBVAL[0:599];
150 REAL ERRORLOC, ATTERR, MSGERR, ERROFFSET, HOW1;
160 PROCEDURE UTILRUN;
170    EXTERNAL;
180
190 WRITE(TERM,//,"PLEASE ENTER YOUR TASK EQUATIONS");
200 REPLACE TEXT BY 48"00" FOR 420;
210 READ(TERM,420,TEXT);
220 ATTERR := HANDLEATTRIBUTES(TEXT,0,0,HOW1,AIAPPLYV,T,ERRORLOC);
230 IF ATTERR = 0 THEN
240    CALL UTILRUN [T]
250 ELSE
260    BEGIN
270    DISPLAY(TEXT);
280    IF ERRORLOC.AIERROFFSETVALIDF = 1 THEN
290       BEGIN
300       REPLACE TEXT BY " " FOR ERRORLOC.AIERROFFSETF,
310                       "^", 48"00";
320       DISPLAY(TEXT);
330       END;
340    REPLACE TEXT BY "*" FOR 3;
350    ERROFFSET := 3;
360    REPLACE LANG BY T.LANGUAGE;
370    MSGERR := ATTRIBUTEMESSAGE(ATTERR,1,LANG,0,TEXT,ERROFFSET);
380    END;
390 END.
```

The following is an example of the interaction between a user and this program. The user runs the program from a CANDE session. Because the user misspells the TASKVALUE task attribute, the program returns an error message and does not initiate the requested task.

```
User:     RUN ATTINT/TEST
Response: #RUNNING 9807
Response: #?
Response: PLEASE ENTER YOUR TASK EQUATIONS
User:     NAME=OBJECT/ALGOL/TASK;TASKVALUW=R;PRIORITY=60;
Response: #9807 DISPLAY:NAME=OBJECT/ALGOL/TASK;TASKVALUW=R;PRIORITY=60;
Response:             .
Response: #9807 DISPLAY:                        ^.
Response: #9807 DISPLAY:***Attribute error: Task attribute expected.
Response: #ET=27.6 PT=0.1 IO=0.1
```

Example 2: Inserting Attributes into an Object Code File

Programs that initiate a compiler can cause attributes to be inserted into the resulting object code file. These attributes are applied at task initiation time whenever the object code file is executed. The following example shows how this is done using the HANDLEATTRIBUTES and ATTRIBUTEMESSAGE procedures.

```
100 BEGIN
110 $INCLUDE ATTINT="*SYMBOL/ATTRIBUTE/INTERPRETER/INTERFACE."
120 TASK CTASK;
130 ARRAY SHEET[0:32];
140 EBCDIC ARRAY TEXT[0:299];
150 REAL ERRLOC, ATTERR, MSGERR, MSGOFFSET;
160
170 PROCEDURE ALGOLCOMPILER(SHEET);
180   ARRAY SHEET[*];
190   EXTERNAL;
200
210 REPLACE TEXT BY
220    "ALGOL NAME=*SYSTEM/ALGOL ON DISK;"
230    "ALGOL FILE CARD (KIND=DISK, TITLE=ALGOL/TASK);"
240    "ALGOL FILE CODE (KIND=DISK, TITLE=OBJECT/ALGOL/TASK);"
250    "MAXPROCTIME=20;TASKVALUE=3;"
260    "FILE IN=DAILY/DATA; FILE OUT(KIND=DISK,TITLE=OUTPUT)" 48"00";
270 ATTERR:=HANDLEATTRIBUTES(TEXT,0,0,1,AIAPPLYV,CTASK,ERRLOC);
280
290 REPLACE SHEET BY 0 FOR 33 WORDS;
300 SHEET[8] := VALUE(LIBRARY); % This statement specifies the
310                             % object code file disposition.
320 SHEET[0] := 0 & 1[47:1];
330
340 CALL ALGOLCOMPILER(SHEET) [CTASK];
350
360 END.
```

In this example, the task assignments at lines 220 through 240 are applied to the compilation, because they are preceded by the keyword ALGOL. The task assignments at lines 250 through 260 are assigned to the resulting object code file, because they have no compiler name prefixing them.

System Administrator Access to Task Attributes

The system administrator can establish defaults and limits on the use of various task attributes by various users. These defaults and limits aid in preserving system security and managing workload.

Assigning Task Attributes to Usercodes

The system administrator can create usercode definitions in the USERDATAFILE by running either MAKEUSER or a DCALGOL program that calls the USERDATA function. By creating a usercode definition, the system administrator makes that usercode a legal value for the USERCODE task attribute. By suspending or removing the usercode definition, the system administrator can prevent processes from being initiated with that USERCODE task attribute value.

The usercode definition can include one or more usercode attributes. Several of these usercode attributes provide values that can be inherited by task attributes of processes that run with that usercode. The following task attributes can be affected by the values of usercode attributes: ACCESSCODE, CHARGE, CLASS, CONVENTION, DEPTASKACCOUNTING, DESTNAME, FAMILY, FILEACCOUNTING, LANGUAGE, PRINTDEFAULTS, PRIORITY, SAVEMEMORYLIMIT, and TEMPFILELIMIT. These can be referred to as the usercode-related task attributes of a process.

These task attributes are not always affected by their corresponding usercode attributes. The system administrator might not have included all the possible usercode attributes in the usercode definition. Furthermore, the usercode attributes are inherited only in the following circumstances:

- Usercode attributes can be inherited by a WFL job that includes a USERCODE assignment in the job attribute list. Any usercode-related task attributes that are not assigned values in the job attribute list receive their values from the usercode attributes.
- Usercode attribute values are inherited by CANDE or MARC session attributes at log-on time. These session attributes are inherited by any processes initiated from the session, unless the user takes actions to change the session attributes or uses task equations to assign different task attributes to a process. (Refer to the discussion of tasking from interactive sources in the *Task Management Programming Guide*.)

The usercode-related task attributes are also inherited from a parent by its offspring, unless specifically overridden. In this way, a usercode attribute can be propagated through an entire process family.

For further details about the inheritance rules for usercode-related task attributes, refer to the descriptions of each of these task attributes in this manual.

Assigning Job Queue Attributes

The system administrator can use job queue definitions to affect the task attributes of WFL jobs and their descendants. The job queue definitions are created by way of the MQ (Make or Modify Queue) system command. Each job queue definition can include job queue attributes that specify default or limiting values for task attributes of jobs run from that queue. The job queue attributes correspond mostly to task attributes that impose limits on resource usage, such as MAXPROCTIME and MAXIOTIME. For a summary of the effects of job queue attributes on task attributes, refer to the *Task Management Programming Guide*.

System Access to Task Attributes

The system software plays several roles in the assignment of task attribute values. The system provides values for task attributes in some cases, resolves conflicting assignments from various sources, and issues errors when an attempt is made to access an attribute incorrectly.

The system software provides values for task attributes that have not been specifically assigned values by any of the other methods discussed in this section. The following subsections discuss the types of assignments that the system software makes.

Providing Default Values

The default value for a task attribute is the value it assumes if no other factors influence the task attribute value. For Boolean task attributes, the default is typically FALSE; for integer or real task attributes, 0; for string task attributes, a null string.

The default values for all the task attributes are documented in this manual.

Providing Inherited Values

Inheritance is the transfer of a task attribute value from a process to one of its descendants. Different inheritance rules are applied to different task attributes; some can inherit values, but others cannot. The inheritance rules for each task attribute are included in the task attribute descriptions.

Some of the basic task attributes that can be inherited are USERCODE, ACCESSCODE, CHARGE, and FAMILY. The inheritance properties save the programmer the trouble of having to assign these task attributes for each member of the process family. A single assignment to the job can be propagated to all its descendants.

The term *inheritance* is also loosely applied to the transfer of values from job queue attributes, session attributes, or usercode attributes to a process. These types of inheritance are discussed under "Assigning Job Queue Attributes," "Assigning Task Attributes to a Session," and "Assigning Task Attributes to Usercodes" in this section.

Updating Task Attribute Values

During process execution, the system automatically updates the values of certain task attributes. These task attributes return information about dynamic aspects of process status and history. One example is the STATUS task attribute, whose value is updated when the process becomes scheduled, suspended, resumed, or terminated. Other examples are the task attributes that record resource usage, including ACCUMPROCTIME and ACCUMIOTIME. These automatic updates make it possible to use these task attributes to monitor the current state of a process as it executes.

Resolving Conflicting Values

When a process is initiated, the system software evaluates the task attribute values submitted from the various sources discussed in this section. Where different sources have assigned conflicting values to the same task attribute, the system chooses the value submitted from the most dominant source.

The rules used to determine which assignment is most dominant are called *overwrite rules.* The system applies different overwrite rules to different task attributes. However, most task attributes follow either *standard* overwrite rules or *object code file dominant* overwrite rules. The following subsections describe standard and object code file dominant overwrite rules for various types of processes.

Each task attribute description includes information about the overwrite rules for that task attribute. The description states whether that task attribute follows standard or object code file dominant overwrite rules. For task attributes that follow irregular rules, the exact behavior of the task attributes is explained.

Overwrite Rules for WFL Jobs

The following are the various sources that can contribute to the initial task attribute values of a WFL job. The sources are listed in order from most dominant to least dominant according to standard overwrite rules.

1. Assignments in the job attribute list of the WFL job.
2. Usercode attributes, if a USERCODE assignment is included in the job attribute list of the WFL job.
3. Attributes of the parent process or job, if the WFL job was initiated from a user process or job.
4. Attributes of the CANDE or MARC session, if the WFL job was initiated from a session.
5. Job queue defaults. (By contrast, job queue limits do not affect the initial task attribute values of a WFL job. They simply affect the selection of a queue for the job.)
6. The task attribute default.

Task attributes cannot be assigned to the object code file of a WFL job because a WFL job has no object code file. Object code file dominant task attributes, when applied to a WFL job, follow the standard overwrite rules listed previously.

The following is one illustration of the overwrite rules for WFL jobs. Suppose the job attribute list of a certain WFL job includes a PRINTDEFAULTS assignment, followed by a USERCODE assignment. Further, suppose that the usercode definition in the USERDATAFILE has a PRINTDEFAULTS value associated with it. In this case, only the PRINTDEFAULTS value specified in the job attribute list is used, even though the USERCODE assignment statement occurred last.

Overwrite Rules for Session Tasks

The following are the various sources that can contribute to the initial task attribute values of a task initiated from a CANDE or MARC session. The sources are listed in order from most dominant to least dominant according to standard overwrite rules.

1. Task equations appended to the initiation statement.
2. Inheritance from the attributes of CANDE or MARC sessions.
3. Assignments to the object code file.
4. The task attribute default.

For an object code file dominant task attribute, the order of dominance is the same, except that item 3, assignments to the object code file, is moved to the head of the list.

Overwrite Rules for Other Processes

The following are the various sources that can contribute to the initial task attribute values of a process initiated from a WFL, ALGOL, or COBOL process. The sources are listed in order from the most dominant to the least dominant according to standard overwrite rules.

1. Task equations appended to the initiation statement.
2. Task attribute assignments to the task variable outside the task variable declaration.
3. Task attribute assignments in the task variable declaration. (This feature is supported only by WFL.)
4. Assignments to the object code file.
5. Inheritance from the parent.
6. The task attribute default.

For an object code file dominant task attribute, the order of dominance is the same, except that item 4, assignments to the object code file, is moved to the head of the list.

Task Attribute Errors

Task attribute errors result from an attempt to access a task attribute in an improper manner. The most basic errors are caught at compile time. These include type mismatches that occur, for example, from assigning a string to an integer-valued task attribute.

Other task attribute errors are caught only at run time. For example, a run-time error can result from assigning a task attribute a value that is

- Outside the allowed range. For example, if a particular attribute has a range of 1 to 9999, then an assignment of 10500 might cause an error.
- Assigned at the wrong time. Some attributes can be assigned only before initiation; after initiation, assignment causes a run-time error.
- Referring to a nonexistent entity. For example, an error results from assigning a DESTSTATION value that does not correspond to a valid Logical Station Number (LSN).
- Inconsistent with a related attribute. For example, the USERCODE and CHARGE task attributes must be compatible.

An attempt to read a task attribute can also result in an error in some cases. For example, if the private process bit of the OPTION task attribute is set, then other processes are prevented from reading (or assigning) the task attributes of this process.

Some task attributes can cause a delayed error if assigned an invalid value. For example, the STATION task attribute can be assigned a value that refers to a nonexistent station. No error occurs until the process attempts to open a remote file.

The process that attempted to access the task attribute can be referred to as the *accessing process.* The process whose task attribute was accessed can be referred to as the *receiving process.* The accessing process and the receiving process can be the same, for example, if the MYSELF task variable is used.

If the attempted access is illegal, the accessing process incurs the error. If the accessing process is nonprivileged, almost all task attribute errors are fatal. If the accessing process is privileged or a message control system (MCS), then errors in accessing event-valued or file-valued task attributes are generally fatal, but most other task attribute errors are not fatal.

The ERROR task attribute of the receiving process stores the attribute number of the task attribute that was being accessed when the error occurred. The accessing process can read the ERROR task attribute of the receiving process to determine whether the last task attribute access was successful. The system erases the ERROR value each time it is read. TASKERROR is another task attribute that provides error information. Unlike ERROR, the TASKERROR value is not erased when it is read.

For further details about these task attributes, refer to the ERROR and TASKERROR task attribute descriptions.

The operator or the user is notified of task attribute errors by the display of error messages for the process. Many task attribute error messages are documented in this manual in the "Run-Time Errors" part of the task attribute descriptions. All the errors documented in this manual are also included in the index for easy reference.

The error messages that are displayed for a process are somewhat more informative if the object code file of the process was compiled with the LINEINFO compiler option set. This option causes the sequence number of each record in the source program to be stored in the object code file. When an error occurs, the sequence number of the statement that incurred the error is included at the end of the error message.

If LINEINFO was not set, then error messages display the code address instead of the sequence number of the statement that incurred the error. You can interpret the code address by referring to the printout produced by the compiler if the LIST compiler option was set. For an example of this printout, refer to the discussion of process history in the *Task Management Programming Guide*.

Section 2
Task Attribute Descriptions

Task attributes provide a wide variety of options for process monitoring and control. Using task attributes, you can control various aspects of file usage, memory usage, resource usage, and communication with other processes or with operators. You can also use task attributes to determine the status of a process or discover how it terminated.

The following sections include complete descriptions of all the task attributes that are supported for customer use as of the current ClearPath MCP release. Note that the file SYMBOL/ATTABLEGEN, which lists all the task attributes, includes several that are not documented in this manual. These undocumented task attributes are intended only for internal use. Attempts by customers to use these task attributes result in compile-time errors, run-time errors, or other undefined results.

Choosing the Right Task Attribute

At this time, about a hundred task attributes have been implemented. Each task attribute is designed to assume reasonable default or inherited values. Therefore, it is not necessary for you to learn the functions of all the task attributes. However, by studying the task attributes related to a particular area of process control, you can learn how to take advantage of the abilities the system provides in that area.

Table 2–1, "Task Attribute Functional Groupings," helps you find the task attributes relevant to each aspect of process control. For details about any of these task attributes, refer to the individual descriptions in this manual.

Table 2–1. Task Attribute Functional Groupings

Category	Attribute
Billing	ACCESSCODE CHARGE USERCODE
COMS direct window programs	DCIINPUTEVENT DCITASKEVENT
Databases	DATABASE MAXWAIT

Table 2–1. Task Attribute Functional Groupings

Category	Attribute
Data comm	AUTOSWITCHTOMARC
	DCIINPUTEVENT
	DCITASKEVENT
	DESTNAME
	DESTSTATION
	DISPLAYONLYTOMCS
	INHERITMCSSTATUS
	LANGUAGE
	MCSNAME
	ORGUNIT
	SOURCEKIND
	SOURCENAME
	SOURCESTATION
	STATION
	STATIONNAME
	SUPPRESSWARNING
	TANKING
Debugging	OPTION
	PDUMPTITLE
	TADS
	TASKFILE
Files	AUTORESTORE
	BACKUPFAMILY
	CURRENTDIRECTORY
	DEFAULTFILEGROUP
	FAMILY
	FILEACCESSRULE
	FILECARDS
	FILEGROUP
	FILEMASK
	LABELFORMAT
	OPTION (the AUTORM, BACKUP, TODISK and TOPRINTER options)

Table 2–1. Task Attribute Functional Groupings

Category	Attribute
History	DEPTASKACCOUNTING
	ERROR
	FILEACCOUNTING
	HISTORY
	HISTORYCAUSE
	HISTORYREASON
	HISTORYTYPE
	OPTION
	PRIORHISTORY
	PRIORHISTORYCAUSE
	PRIORHISTORYREASON
	PRIORHISTORYTYPE
	STACKHISTORY
	STATUS
	STOPPOINT
	TASKERROR
	TASKFILE
	TASKWARNINGS
Identification	BOTTIMESTAMP
	JOBNUMBER
	MIXNUMBER
	MPID
	NAME

Table 2–1. Task Attribute Functional Groupings

Category	Attribute
Interprocess Communication	ACCEPTEVENT AX EXCEPTIONEVENT EXCEPTIONTASK LOCKED MAXCARDS NETPATH OPTION (the "private process" option) OPTIONAL PARTNER PARTNEREXISTS REPORTBADINITIATE STATUS SW1 through SW8 TARGET TASKLIMIT TASKSTRING TASKVALUE TYPE
Job Summaries	JOBSUMMARY JOBSUMMARYTITLE NOJOBSUMMARYIO OPTION (the NOSUMMARY option)
Libraries	LIBRARY LIBRARYSTATE LIBRARYUSERS STATUS
Localization	CONVENTION COUNTRY LANGUAGE
Logging	DEPTASKACCOUNTING FILEACCOUNTING

Table 2–1. Task Attribute Functional Groupings

Category	Attribute
Memory Management	CORE
	SAVEMEMORYLIMIT
	STACKLIMIT
	STACKSIZE
Messages	DISPLAYONLYTOMCS
	LANGUAGE
	SUPPRESSWARNING
	TASKWARNINGS
Printer Output	BACKUPFAMILY
	BDNAME
	DESTNAME
	DESTSTATION
	OPTION (the BACKUP, BDBASE, and NOSUMMARY options)
	PRINTDEFAULTS
	TASKFILE
Remote Tasking	HOSTNAME
	ITINERARY
Resource Usage Data	ACCUMIOTIME
	ACCUMPROCTIME
	ELAPSEDTIME
	INITPBITCOUNT
	INITPBITTIME
	OTHERPBITCOUNT
	OTHERPBITTIME
	TEMPFILEMBYTES

Table 2–1. Task Attribute Functional Groupings

Category	Attribute
Resource Usage Limits	ELAPSEDLIMIT
	MAXIOTIME
	MAXLINES
	MAXPROCTIME
	MAXWAIT
	PRIORITY
	RESOURCE
	SAVEMEMORYLIMIT
	STACKLIMIT
	TASKLIMIT
	TEMPFILELIMIT
	WAITLIMIT
Restarting Processes	BRCLASS
	CHECKPOINTABLE
	RESTART
	RESTARTED
Security	ACCESSCODE
	BLOCKCREDENTIALS
	CREDENTIALS
	CREDENTIALSBASE
	FILEACCESSRULE
	FILEMASK
	GROUPCODE
	INHERITCREDENTIALS
	INHERITMCSSTATUS
	REALGROUPCODE
	REALUSERCODE
	SAVEDGROUPCODE
	SAVEDUSERCODE
	SUPPLEMENTARYGRPS
	USERCODE

Table 2–1. Task Attribute Functional Groupings

Category	Attribute
Task Attribute Usage	APPLYLIST MYPPB ERROR TASKERROR
Tape Usage	LABELFORMAT RESOURCE
WFL Jobs	CLASS DECKGROUPNO FETCH STARTTIME

Format of the Descriptions

Each task attribute description includes information about certain characteristics of task attributes. The following subsections explain how these characteristics are presented in the task attribute descriptions.

Name

Each task attribute description begins with a heading that gives the name of the task attribute. An attribute is generally referred to by the same name from all the sources accessing it. The only exception to this rule occurs when several task attributes have synonyms and some sources recognize only the synonym. Refer to the "Synonym" discussion in this section.

Type

This part of the description indicates the type of data stored in the task attribute. Almost all task attributes fall into one of the following types: Boolean, event, file, integer, mnemonic, real, string, or task. A few other attributes, such as OPTION and RESOURCE, are of irregular types. For details about how to access these types from various languages, refer to "Programmer Access to Task Attributes" in Section 1, "Accessing Task Attributes."

Units

This part of the description specifies, for either a real or an integer task attribute, the units measured by the attribute value: seconds, microseconds, words, and so on.

Range

This part of the description defines the legal values for the attribute. For example, a mnemonic attribute's range consists of all the valid mnemonic values for the attribute. An integer attribute's range defines the upper and lower limits of the integers allowed (for example, 1 through 256).

In some cases, the range is defined by a metatoken, which is a word or phrase enclosed within angle brackets, as in the following example: <simple name>. For such items, a railroad diagram is used to describe the exact range of the task attribute values. If a metatoken is referred to by only one task attribute description, then the railroad diagram for that metatoken is given in the description of that task attribute. Metatokens that are referred to by more than one task attribute description are defined in the following syntax discussion. For information about how to read these diagrams, refer to Appendix A, "Understanding Railroad Diagrams."

Syntax

<digit>

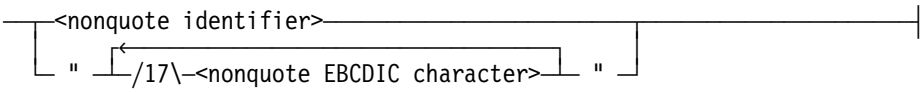
Any one of the 10 Arabic numerals 0 through 9

<family name>

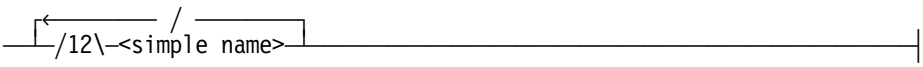
<hyphen>

The hyphen character (-)

<identifier>



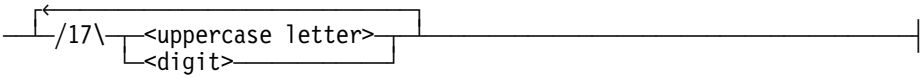
<name>



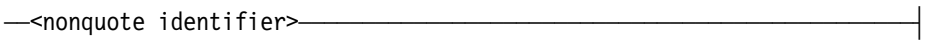
<nonquote EBCDIC character>

Any uppercase or lowercase letter, number, or special character that is not a quotation mark (") and that has a hexadecimal code greater than or equal to 4"40".

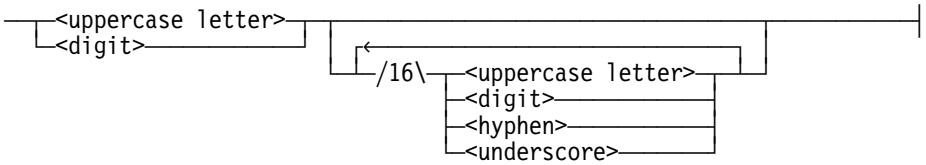
<nonquote identifier>



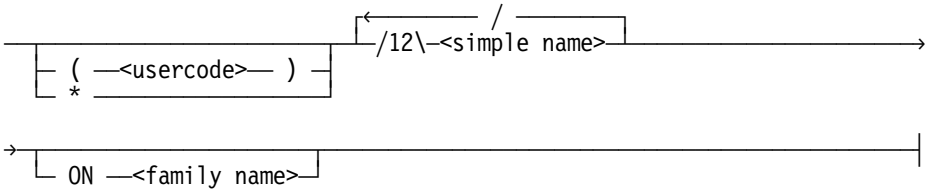
<password>



<simple name>



<title>



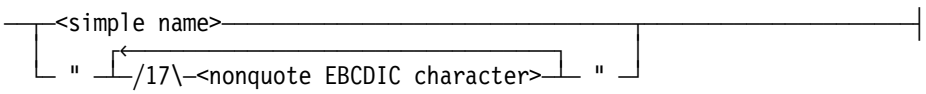
<underscore>

The underscore character (_)

<uppercase letter>

Any one of the 26 uppercase characters A through Z.

<usercode>



Default

This part of the description lists the value that the task attribute assumes if the attribute does not inherit its value and is not assigned a value. For a read-only task attribute, this is the value the task attribute returns if interrogated before initiation.

For many string task attributes, the default listed is *null string*. If this default value is read from Work Flow Language (WFL), a string of 0 length ("") is returned. However, if this default value is read from ALGOL or COBOL, a string that contains a single period (".") is returned.

Read Time

This part of the description defines whether and when the task attribute value can be interrogated by a program. The following are the possible read time values:

- Anytime. The task attribute of the task variable can be read before the process is initiated, while it is running, or after termination.
- Anytime; accurate after initiation. The task attribute can be read at any time, but does not receive its actual value until the process is initiated.
- Anytime; accurate while in use. The task attribute can be read at any time, but is reset to its default when the process terminates.
- Never. The task attribute cannot be read. Such an attribute is called write-only.
- Only while in use. The task attribute can be read only for an in-use process. That is, the task attribute cannot be read before the process is initiated or after it is terminated.

Note that inheritance, object code file assignments, and run-time assignments can cause the values of many attributes to change at initiation time. Therefore, any value that is read before initiation might not reflect the value that the process actually receives.

Write Time

This part of the description defines whether and when the task attribute can be assigned a value by a program. The following are the possible write time values:

- Anytime. The task attribute of the task variable can be assigned before the process is initiated, while it is running, or after termination.
- Anytime, effective before initiation. The task attribute value can be assigned at any time without incurring an error; however, assignments made after initiation are ignored.
- Before initiation. The task attribute must be assigned as one of the following:
  - An assignment to the task variable before the process is initiated.
  - A task equation appended to the statement that initiates the process.
  - An assignment in the job attribute list of a WFL job. The job attribute list immediately follows the job heading at the start of the job. These assignments are applied before the job begins execution.
  - An assignment to the object code file of the process. Such assignments can be appended to the WFL or CANDE *COMPILE* statements or can be made to an existing object code file by way of the WFL *MODIFY* statement.
- Never. The task attribute cannot be assigned. Such an attribute is called read-only.

Inheritance

This part of the description explains whether the task attribute inherits its value from the equivalent task attribute of an ancestor process or from a job queue attribute, session attribute, or usercode attribute.

If a task attribute inherits from the parent, then both dependent processes and independent processes inherit that attribute, unless otherwise stated.

Although inheritance rules are described definitively, inherited values can be overridden by several other types of explicit and implicit assignments. Refer to "Resolving Conflicting Values" in Section 1, "Accessing Task Attributes," for more information.

Fork() Inheritance

This part of the description explains whether the task attribute inherits a value when the POSIX fork() statement initiates a process. For information about the fork() statement and the POSIX tasking model, refer to the *POSIX User's Guide*.

Overwrite Rules

This part of the description specifies which of the possible sources for task attribute values takes precedence at initiation time if there is a conflict. For each attribute, the overwrite rules are listed as *standard* or as *object code file dominant* or else described in detail. The standard overwrite rules and object code file dominant overwrite rules are discussed under "Resolving Conflicting Values" in Section 1, "Accessing Task Attributes."

Host Services

This part of the description states whether the task attribute is supported by Host Services. If it is supported, then a process running on one host system may access this attribute of a process running on another host system. If the task attribute is not supported, then it is not possible to use the task attribute across hosts.

For a centralized list of the task attributes supported by Host Services, refer to the discussion of tasking across multihost networks in the *Task Management Programming Guide*.

Attribute Number

This part of the description specifies the number used to identify the task attribute if an error occurs when a process accesses that attribute. If such an error occurs, the ERROR task attribute stores the attribute number of the task attribute that was accessed when the error occurred. A list of task attributes, in numeric order, is given in the discussion of the ERROR task attribute.

Synonym

This part of the description lists an alternate name for the task attribute, if there is one. Synonyms were implemented primarily because a more concise or more descriptive name was invented after the task attribute was originally implemented. While the "Name" part of the task attribute description gives the preferred name for the attribute, the "Synonym" part lists the nonpreferred name. Most languages allow you to use either name for the task attribute.

Table 2–2 summarizes the preferred and nonpreferred names for the benefit of these users.

Table 2–2. Task Attribute Synonyms

Nonpreferred Name	Preferred Name
BACKUPDESTINATION	DESTNAME
BACKUPPREFIX	BDNAME
BLOCKCREDS	BLOCKCREDENTIALS
CHARGECODE	CHARGE
COREESTIMATE	CORE
DECLAREDPRIORITY	PRIORITY
FILE	FILECARDS
INHERITCREDS	INHERITCREDENTIALS
INITIATOR	STATION
IOTIME	MAXIOTIME
OPTIONS	OPTION
ORGHOSTNAME	Deimplemented; use the leftmost part of the ITINERARY attribute value instead.
PRINTLIMIT	MAXLINES
PROCESSIOTIME	ACCUMIOTIME
PROCESSTIME	ACCUMPROCTIME
QUEUE	CLASS
STACK	STACKSIZE
STACKNO	MIXNUMBER
TARGETTIME	TARGET
TASKATTERR	ERROR
VALUE	TASKVALUE

Restrictions

Most task attributes can be accessed by ALGOL, COBOL74, COBOL85, and WFL. However, a few of the attributes are not available from one or more of these sources. For example, WFL cannot access event-valued task attributes. ALGOL and the COBOL languages cannot use the STARTTIME and FETCH task attributes, which are specific to WFL. These language restrictions are discussed in the "Restrictions" part of the attribute description.

CANDE or Menu-Assisted Resource Control (MARC) commands can access a limited subset of the task attributes, although such restrictions are not documented in the attribute descriptions. For lists of the task attributes accessible from CANDE and MARC sessions, refer to the discussion of tasking from interactive sources in the *Task Management Programming Guide.*

Explanation

This part of the description summarizes the function of the task attribute. In many cases, relevant background information, helpful hints, or cautions are also provided.

Examples

Some of the task attribute descriptions include an "Examples" part, usually because they are unusual in some way. For examples of how to access most types of task attributes from programs, refer to "Programmer Access to Task Attributes" in Section 1, "Accessing Task Attributes."

Run-Time Errors

This part of the description discusses task attribute access errors that occur when the program is executed rather than when it is compiled. In addition, some errors closely related to the task attribute are discussed. For example, the errors for exceeding resource limits are documented.

Run-time errors are usually fatal for nonprivileged processes. However, they are not fatal for privileged processes, message control systems (MCSs), or tasking programs, unless specifically stated in the text.

The index at the end of this manual includes page references for all the error messages that are discussed in this manual.

Section 3
Task Attributes A through E

This section contains task attributes starting with the letters A through E.

ACCEPTEVENT

Type	Event
Units	Not applicable
Range	HAPPENED, NOT HAPPENED
Default	NOT HAPPENED
Read Time	Anytime
Write Time	Never
Inheritance	None
Fork() Inheritance	NOT HAPPENED
Overwrite Rules	None (read-only)
Host Services	Not supported
Attribute Number	100
Synonym	None
Restrictions	Not available in WFL

Explanation

The ACCEPTEVENT task attribute accesses a predeclared event called the *accept event* that is associated with each process. The accept event is caused by the system whenever an operator enters an AX (Accept) system command for the process. A program can conveniently use this attribute in a statement that waits on several events, one of which is the ACCEPTEVENT task attribute, as in the following ALGOL example:

```
WAITANDRESET(EVNT1,EVNT2,MYSELF.ACCEPTEVENT);
```

A process can also attach its ACCEPTEVENT to an interrupt, in which case the interrupt is executed whenever an operator enters an AX command for the process.

A process can access only its own accept event. For example, a process cannot interrogate or wait on the value of the accept event of its parent. A process that attempts to do so receives a run-time error and terminates abnormally.

Note: *Assignments to the AX task attribute do not cause the ACCEPTEVENT task attribute. Only AX system commands cause the ACCEPTEVENT task attribute.*

For more information about the AX command and about events, refer to the *Task Management Programming Guide*.

Run-Time Errors

NON-LOCAL ACCEPTEVENT

A process attempted to access the ACCEPTEVENT task attribute of another process. The accessing process is discontinued with HISTORYCAUSE = 2 (PROGRAMCAUSEV) and HISTORYREASON = 137 (NONLOCALACCEPTEVENTV).

ACCEPTEVENT ATTRIBUTE IS READONLY

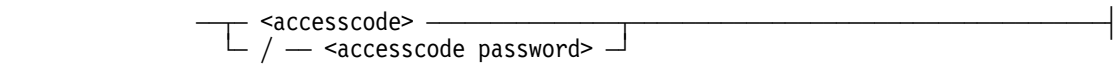
A process attempted to assign an event variable to the ACCEPTEVENT task attribute. The process, if nonprivileged, is discontinued with HISTORYCAUSE = 2 (PROGRAMCAUSEV) and HISTORYREASON = 9 (ATTREADONLYV).

ACCESSCODE

Type	String
Units	Not applicable
Range	<accesscode assignment>
Default	Null string
Read Time	Anytime
Write Time	Anytime
Inheritance	From parent
Fork() Inheritance	From parent
Overwrite Rules	Object code file dominant
Host Services	Supported
Attribute Number	61
Synonym	None
Restrictions	None

Range

<accesscode assignment>



<accesscode>
<accesscode password>

These are both identifiers.

Explanation

The ACCESSCODE task attribute affects the ability of a nonprivileged process to access files that have associated guard files. A guard file can specify that only processes with a certain accesscode are allowed to access the file. For information about guard files, refer to the *MCP/AS Security Features Operations and Programming Guide*.

You must include an accesscode password in your assigned value for ACCESSCODE if the accesscode in your accesscode list has an associated password. However, you do not need to include an accesscode password in your assigned value for ACCESSCODE if the program you are accessing is either a tasking or an MCS program.

The accesscode password is not usually included in the value returned when ACCESSCODE is read. However, if the ACCESSCODE value is read for a task variable that has not yet been initiated, then the ACCESSCODE value returned includes the password in an encoded form.

The system performs validation to determine whether the ACCESSCODE value for a process is compatible with the USERCODE task attribute value. When you assign ACCESSCODE to a task variable that is not in use, the system does not perform this validation until the task variable is used in a process initiation statement. When you assign an ACCESSCODE value to an in-use process, the system performs the validation immediately. The following is an outline of this validation:

1. If the process has a nonnull ACCESSCODE value, the system compares this value with the ACCESSCODELIST usercode attribute. If the ACCESSCODE value does not correspond to any of the accesscode/accesscode-password pairs in the ACCESSCODELIST, the system discontinues the process and displays a "SECURITY VIOLATION" message.
2. For a WFL job, the WFL compiler checks the usercode of the job to see if the ACCESSCODENEEDED usercode attribute is set. If it is, the WFL compiler gives a syntax error if the ACCESSCODE value of the job is null or does not correspond to any of the values in the ACCESSCODELIST usercode attribute. (A WFL job can receive an ACCESSCODE value at compile time either through inheritance or through an assignment in the job attribute list.)

When you change the USERCODE value of an in-use process, the system changes the ACCESSCODE value to a null string. Therefore, when changing the USERCODE and ACCESSCODE values of an in-use process, you should make the USERCODE assignment first and the ACCESSCODE assignment second. Refer to "USERCODE" for details.

The ACCESSCODE task attribute cannot be transferred using task-to-task transfer if the source task has been protected from modification, except by a tasking program. A task is protected from modification when it is passed as a parameter to a library change or approval procedure. While the change or approval procedure is active, access to the MYSELF intrinsic generates a protected task.

Examples

The following are examples of ACCESSCODE assignment and interrogation in WFL. The string variable STRVAR receives the value *TDOT/<encoded password>*.

```
TVAR (ACCESSCODE = TDOT / ALTO);
STRVAR := TVAR (ACCESSCODE);
```

The following is an example of ACCESSCODE assignment in ALGOL:

```
REPLACE TVAR.ACCESSCODE BY "TDOT/ALTO.";
```

The following is an example of ACCESSCODE assignment in COBOL74 or COBOL85:

```
CHANGE ACCESSCODE OF MYSELF TO "TDOT/ALTO.".
```

Run-Time Errors

ACCESSCODE ATTRIBUTE INCORRECT SYNTAX

An attempt was made to assign ACCESSCODE a value that did not follow the proper format of *<nonquote identifier> / <nonquote identifier>*. The process, if nonprivileged, is discontinued with HISTORYCAUSE = 2 (PROGRAMCAUSEV) and HISTORYREASON = 131 (INCORRECTSYNTAXV).

SECURITY VIOLATION

An attempt was made to assign an accesscode that does not exist, does not match the accesscode password, or is not allowed for this usercode. The process, if nonprivileged, is discontinued with HISTORYCAUSE = 2 (PROGRAMCAUSEV) and HISTORYREASON = 29 (SECURITYERRORV). The following entry is made in the system log: "INVALID TASK ATTRIBUTE: ACCESSCODE".

ACCUMIOTIME

Type	Real
Units	See below
Range	0 to about 4.31E+68
Default	0
Read Time	Anytime
Write Time	Never
Inheritance	None
Fork() Inheritance	0
Overwrite Rules	None (read-only)
Host Services	Supported
Attribute Number	14
Synonym	PROCESSIOTIME
Restrictions	None

Explanation

The ACCUMIOTIME task attribute records the accumulated I/O time for the process.

The process is discontinued if the value of the ACCUMIOTIME task attribute reaches the same value as the MAXIOTIME task attribute. Refer to the MAXIOTIME description for details.

If ACCUMIOTIME is accessed through Host Services, bit 47 will always be 0 (zero).

Units

When accessed from WFL, the ACCUMIOTIME value is expressed in units of seconds. When accessed from other languages, the value is expressed in units of 2.4 microseconds.

ACCUMPROCTIME

Type	Real
Units	See below
Range	0 to about 4.31E+68
Default	0
Read Time	Anytime
Write Time	Never
Inheritance	None
Fork() Inheritance	None
Overwrite Rules	None (read-only)
Host Services	Supported
Attribute Number	13
Synonym	PROCESSTIME
Restrictions	None

Explanation

The ACCUMPROCTIME task attribute records the accumulated processor time for the task.

The process is discontinued if the value of the ACCUMPROCTIME task attribute reaches the same value as the MAXPROCTIME task attribute. Refer to the MAXPROCTIME description for details.

If ACCUMPROCTIME is accessed through Host Services, bit 47 will always be 0 (zero).

Units

When accessed from WFL, the ACCUMPROCTIME value is expressed in units of seconds. When accessed from other languages, the value is expressed in units of 2.4 microseconds.

APPLYLIST

Type	Boolean
Units	Not applicable
Range	TRUE, FALSE
Default	None
Read Time	Anytime
Write Time	Before initiation
Inheritance	None
Fork() Inheritance	From parent
Overwrite Rules	None
Host Services	Not supported
Attribute Number	116
Synonym	None
Restrictions	None

Explanation

The APPLYLIST task attribute, if set, causes the system to apply task equations that were previously placed in the MYPPB task attribute of the process for temporary storage.

The MYPPB value can store task equations applied to a process, or task equations intended to be applied to an object code file. Setting APPLYLIST to TRUE causes the system to apply only those equations in MYPPB that are intended for a process. For further information, refer to the discussion of the MYPPB task attribute.

Run-Time Errors

MYPPB IS EMPTY, NOTHING TO APPLY

An attempt was made to set the APPLYLIST attribute to TRUE while there were no attribute assignments stored in the MYPPB task attribute. The assignment is ignored, but the assigning process continues executing normally.

CANNOT APPLY : PPB IS FOR CODEFILE

This warning occurs if the APPLYLIST attribute is set to TRUE when the MYPPB task attribute of the compiler process stores only attributes intended for the resulting object code file. The assignment is ignored, but the assigning process continues executing normally.

AUTORESTORE

Type	Boolean
Units	Not applicable
Range	TRUE, FALSE
Default	See below
Read Time	Anytime
Write Time	Anytime
Inheritance	From parent
Fork() Inheritance	From parent
Overwrite Rules	Standard
Host Services	Not supported
Attribute Number	123
Synonym	None
Restrictions	None

Explanation

The AUTORESTORE task attribute specifies how the system should respond if the process attempts to open a disk file that is not present on the requested family.

If AUTORESTORE is TRUE when a process encounters a NO FILE condition for a disk file, then the system might initiate a dependent process called ARCHIVE/AUTORESTORE to copy the missing file from backup tape to disk. The system starts ARCHIVE/AUTORESTORE if all of the following conditions are true:

- The AUTORESTORE system option has a value of either YES or DONTCARE. An operator can use the AUTORESTORE (Archiving Autorestore Option) system command to assign this option.
- The reference to the file would normally produce a "NO FILE" RSVP message if the file is not resident. Thus, for example, interrogating the RESIDENT file attribute does not cause an automatic restore to take place.
- The archive directory references a backup tape that contains a backup copy of the requested file. The archive directory records the location of files backed up through the WFL *ARCHIVE* command.
- The FILENAME file attribute of the requested file specifies the same usercode as the USERCODE attribute of the requesting process.
- If the file is a cataloged file, then the generation of the file being requested matches the file listed in the archive directory.
- The process is not attempting to open a logical file that has the file attribute DUPLICATED = TRUE.

If the system does initiate an ARCHIVE/AUTORESTORE, the process requesting the file remains in an active state. On the other hand, ARCHIVE/AUTORESTORE becomes suspended and appears in the W (Waiting Mix Entries) system command display. The RSVP message identifies the backup tape that the operator should mount. When the operator mounts the requested tape, ARCHIVE/AUTORESTORE copies the missing file back to disk. The process that originally tried to use the file then resumes execution.

If the AUTORESTORE task attribute is FALSE, the system does not initiate ARCHIVE/AUTORESTORE. Instead, the system suspends the process and displays a "NO FILE <file name>" or a "NO FILE <file name> FIND ON <backup description>" RSVP message.

For an overview of the system archiving and AUTORESTORE features, refer to the *System Administration Guide*.

Default

If the AUTORESTORE system option is set to NEVER or DONTCARE, then the default value of the AUTORESTORE task attribute is FALSE. If the AUTORESTORE system option is set to YES, then the default value of the AUTORESTORE task attribute is TRUE.

If the value of the AUTORESTORE system option is changed while the process is running, the change has no effect on the value of the task attribute AUTORESTORE.

AUTOSWITCHTOMARC

Type	Boolean
Units	Not applicable
Range	TRUE, FALSE
Default	FALSE
Read Time	Anytime
Write Time	Anytime
Inheritance	None
Fork() Inheritance	From parent
Overwrite Rules	Object code file dominant
Host Services	Not supported
Attribute Number	102
Synonym	None
Restrictions	None

Explanation

The AUTOSWITCHTOMARC task attribute affects only processes initiated by a MARC session and that open a remote file. For these processes, AUTOSWITCHTOMARC specifies whether the originating screen is automatically displayed when the process terminates.

If AUTOSWITCHTOMARC is TRUE, the originating screen is displayed immediately upon termination of the process. If AUTOSWITCHTOMARC is FALSE, the remote file screen continues to be displayed after process termination, until the user presses the XMIT or SPCFY key.

If this task attribute is assigned more than once, only the last assignment before process termination has effect.

For more information about MARC tasking and remote files, refer to the discussion of tasking from interactive sources in the *Task Management Programming Guide*.

AX

Type	String
Units	Not applicable
Range	<ACCEPT string>
Default	Null string
Read Time	Never
Write Time	Anytime
Inheritance	None
Fork() Inheritance	None
Overwrite Rules	See below
Host Services	Not supported
Attribute Number	129
Synonym	None
Restrictions	None

Range

<ACCEPT string>

A string of up to 255 EBCDIC characters.

Explanation and Overwrite Rules

The AX task attribute passes a string of text to a process. The receiving process can read the AX string by executing an ACCEPT statement. The ACCEPT statement returns an *AX string*, which is a string specified for a process by either an AX (Accept) system command or an AX task attribute assignment.

If more than one AX string is submitted for a process before the process performs its next ACCEPT statement, then the system must either queue the extra AX strings or discard them. You can use the QUEUEDAX option of the SYSOPS (System Option) system command to enable or disable queuing of AX strings. If QUEUEDAX is set, then the system queues up to 250 AX strings for a process. If QUEUEDAX is reset, then each AX command overwrites any pending AX string for a process.

QUEUEDAX is set TRUE by default on ClearPath systems.

When multiple AX strings are queued for a process, the system stores the strings in chronological order. Each ACCEPT statement reads the oldest AX string queued for the process.

The system passes each AX string to the next ACCEPT statement performed by the process stack, regardless of whether the process stack is executing library program code or user program code. Therefore, when you write ACCEPT statements in exported library procedures, remember that the ACCEPT statement might receive an AX string that was previously queued for the user process.

Examples

The AX task attribute can assign a string value on a WFL RUN statement:

```
RUN OBJECT/PROGA;AX="1"
```

This causes an AX string with a length of one character to be queued for the process.

In WFL, a RUN statement can include multiple AX task equations. If the QUEUEDAX system option is set, then the system queues all the AX assignments for later use by the program as in the following example:

```
RUN OBJECT/PROGA;
    AX = "DELTA";
    AX = "EPSILON";
    AX = "GAMMA";
```

If QUEUEDAX is not set, then the system passes only the last AX assignment to the program.

The following statement shows the ALGOL syntax for AX assignments:

```
REPLACE T.AX BY "DELTA";
```

In COBOL74 and COBOL85, the equivalent statement has the following form:

```
CHANGE ATTRIBUTE AX OF T TO "DELTA".
```

Because AX assignments do not cause the ACCEPTEVENT, a program cannot use an interrupt to detect the presence of AX strings supplied through task equation. Instead, a program can include conditional ACCEPT statements to process the AX task equations, as in the following ALGOL example:

```
100 BEGIN
110   ARRAY A[0:14];
120   INTERRUPT INT;
130     BEGIN
140       ACCEPT (A);
150       DISPLAY (A);
160       REPLACE POINTER(A) BY 0 FOR 15 WORDS;
170     END;
180 ATTACH INT TO MYSELF.ACCEPTEVENT;
190 WHILE ACCEPT(A) DO DISPLAY(A);
200 ENABLE INT;
```

```
210 WAITANDRESET (MYSELF.EXCEPTIONEVENT);
220 END.
```

In this example, the statement at line 190 detects AX strings submitted through task equations. The interrupt attached at line 180 detects AX system commands. Note that this example does not detect any assignments to the AX task attribute made after the program is initiated.

Run-Time Errors

AX ATTRIBUTE INCORRECT SYNTAX

An attempt was made to assign an AX string value that was more than 255 characters long or that was not terminated by a null character. The assigning process is discontinued with HISTORYCAUSE = 2 (PROGRAMCAUSEV) and HISTORYREASON = 131 (INCORRECTSYNTAXV).

AX ATTRIBUTE IS WRITEONLY

A process attempted to read an AX message. AX messages can only be read through the ACCEPT mechanism. The process is discontinued with HISTORYCAUSE = 2 (PROGRAMCAUSEV) and HISTORYREASON = 129 (ATTWRITEONLYV).

BACKUPFAMILY

Type	String
Units	Not applicable
Range	See below
Default	See below
Read Time	Anytime
Write Time	Before initiation
Inheritance	See below
Fork() Inheritance	From parent
Overwrite Rules	Object code file dominant
Host Services	Not supported
Attribute Number	63
Synonym	None
Restrictions	None

Explanation

The BACKUPFAMILY task attribute specifies the disk family where the system should place print and punch backup files created by the process.

The BACKUPFAMILY task attribute affects only backup files with a BACKUPKIND file attribute value that is equated to DLBACKUP by the SB (Substitute Backup) system command. For an illustration of this restriction, refer to the examples at the end of this subsection.

The effect of the BACKUPFAMILY task attribute can be overridden for individual backup files by the FAMILYNAME print attribute. For an introduction to printing issues, refer to the discussion of controlling process I/O usage in the *Task Management Programming Guide*.

Default

The BACKUPFAMILY value defaults to the current DL BACKUP family defined by the DL (Disk Location) system command.

Range

The BACKUPFAMILY value typically must conform to the syntax for <simple name> as defined under "Format of the Descriptions" in this section.

However, when BACKUPFAMILY is assigned by an MCS or tasking program, the value can optionally be in standard form. For an explanation of standard form, refer to the description of the DISPLAYTOSTANDARD function in the *Unisys e-@ction ClearPath*

Enterprise Servers DCALGOL Programming Reference Manual. The system extracts the first identifier from the standard form value and uses this as the BACKUPFAMILY.

Inheritance

A process inherits its parent's BACKUPFAMILY value if the parent has a non-null value and the process is running on the same host as its parent.

If you explicitly assign a null string to the BACKUPFAMILY attribute, the attribute receives the DL BACKUP value in effect at process initiation. The DL BACKUP setting is specified by the DL (Disk Location) system command.

A process initiated from a MARC session receives the BACKUPFAMILY value associated with that session.

Examples

Suppose an operator has used the SB (Substitute Backup) system command to create the following SB settings for the system:

```
SB
DISK = DLBACKUP
PACK  = PACK
TAPE  = TAPE
```

Suppose also that an operator has used the DL (Disk Location) system command to create the following DL BACKUP setting for the system:

```
DISK LOCATION:
 BACKUP     ON DBFAM
```

The following WFL job creates a backup file:

```
100 ?BEGIN JOB;
110   BACKUPFAMILY = SYSPK;
120   FILE F(KIND=PRINTER,BACKUPKIND=DISK);
130   OPEN(F);
140   LOCK(F);
150 ?END JOB
```

Line 120 of the WFL job specifies a BACKUPKIND value of DISK; but the SB setting equates DISK to DLBACKUP. The DL BACKUP setting in turn is DBFAM. Thus, by default the printer backup file would have been created on DBFAM. However, the BACKUPFAMILY statement at line 110 overrides the DL BACKUP family and causes the backup file to be created on SYSPK instead.

Now suppose that line 120 of the WFL job is changed to specify a BACKUPKIND of PACK for the backup file. The following is the modified WFL job:

```
100 ?BEGIN JOB;
110   BACKUPFAMILY = SYSPK;
120   FILE F(KIND=PRINTER,BACKUPKIND=PACK);
130   OPEN(F);
140   LOCK(F);
150 ?END JOB
```

This version of the job specifies a BACKUPKIND value of PACK. The SB setting equates PACK to PACK, and the backup file is created on the family called PACK. The system ignores the BACKUPFAMILY assignment in the WFL job because BACKUPFAMILY affects only backup files that are redirected to the DL BACKUP family by an SB substitution.

Run-Time Error

BACKUPFAMILY ATTRIBUTE MAY ONLY BE SET BY AN MCS OR TASKING PROGRAM

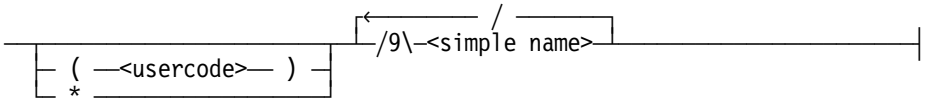
A process that was not an MCS or tasking program attempted to assign a value to BACKUPFAMILY. The assigning process, if nonprivileged, is discontinued with HISTORYCAUSE = 2 (PROGRAMCAUSEV) and HISTORYREASON = 54 (ONLYMCSTASKINGV).

BDNAME

Type	String
Units	Not applicable
Range	<backup prefix>
Default	Null string
Read Time	Anytime
Write Time	Anytime
Inheritance	From parent
Fork() Inheritance	From parent
Overwrite Rules	Standard
Host Services	Supported
Attribute Number	29
Synonym	BACKUPPREFIX
Restrictions	None

Range

<backup prefix>



Explanation

The BDNAME task attribute causes backup files declared by the process to be permanently saved under the file name prefix specified by the BDNAME value and prevents the backup files from being automatically queued for printing. The user can print out the backup files later by using a WFL *PRINT* statement.

If BDNAME is used by a nonprivileged process, backup files are saved under the usercode of the process that declares the file. An error results if a nonprivileged process attempts to assign a BDNAME value that includes a usercode different from the process usercode, or an asterisk (*) in place of a usercode.

A privileged process can include a different usercode or an asterisk (*) at the start of the BDNAME value and thus create backup files that do not have the same usercode as the process.

The titles of the backup files follow the normal backup file titling conventions, except that a usercode or asterisk (*) and the BDNAME value replaces the usual prefix of *BD or *BP. For a discussion of backup file titling conventions, refer to the discussion of controlling process I/O usage in the *Task Management Programming Guide*.

File names can be a maximum of 12 nodes long, not counting the usercode. However, the BDNAME value should not be that long because the system adds two or more nodes to the BDNAME value when constructing the file title. In most cases, the system adds three nodes to the title.

If the BDNAME value is changed after initiation, only backup files opened after the change are affected.

Note that the BDNAME task attribute affects only backup files declared by the process. Any backup files written to by the process, but declared by another process, are not affected.

When originally implemented, the BDNAME task attribute had effect only if the BDBASE option of the OPTION task attribute was set. This is no longer the case; whether the BDBASE option is set or not set has no effect on the BDNAME task attribute.

The BDNAME task attribute has no effect on the job summary. For information about saving a copy of the job summary on disk, refer to the description of the JOBSUMMARYTITLE task attribute.

The effects of the BDNAME task attribute can also be achieved using several print attributes. For information about the interaction of BDNAME and these print attributes, refer to the discussion of controlling process I/O usage in the *Task Management Programming Guide*.

Run-Time Errors

BDNAME ATTRIBUTE IS READONLY ON ACTIVE TASK

A process attempted to change the BDNAME value of another in-use process. The assigning process, if nonprivileged, is discontinued with HISTORYCAUSE = 2 (PROGRAMCAUSEV) and HISTORYREASON = 33 (READONLYONACTIVEV).

BDNAME ATTRIBUTE INCORRECT SYNTAX

BDNAME was assigned a value that does not conform to the backup prefix format. The assigning process is discontinued with HISTORYCAUSE = 2 (PROGRAMCAUSEV) and HISTORYREASON = 131 (INCORRECTSYNTAXV).

FILE <internal name> OPEN ERROR: TOO MANY NAMES

This error occurs when the backup file is opened if the BDNAME value caused the backup file title to have more than the allowed number of nodes. The process is discontinued with HISTORYCAUSE = 8 (SOFTIOERRCAUSEV) and HISTORYREASON = 18 (GTR14ERR).

BLOCKCREDENTIALS

Type	Boolean
Units	Not applicable
Range	TRUE, FALSE
Default	FALSE
Read Time	Anytime
Write Time	See below
Inheritance	From parent
Overwrite Rules	Standard
Host Services	Not supported
Attribute Number	146
Synonym	BLOCKCREDS
Restrictions	None

Explanation

The BLOCKCREDENTIALS attribute is used by a task to temporarily inhibit use of its credentials. This is useful, for example, during the execution of external or library functions. Any procedure called while BLOCKCREDENTIALS is TRUE does not have access to the stack's credentials. Such procedure is also unable to set BLOCKCREDENTIALS to FALSE, because the stack level from which BLOCKCREDENTIALS was set to TRUE is recorded.

All processes initiated while credentials of the task owner are blocked do not inherit credentials. All processes initiated with their own BLOCKCREDENTIALS set to TRUE inherit credentials but cannot use them until the task's parent sets the value to FALSE.

For information about credential management and Generic Security Service Application Program Interface (GSS-API), see Appendix G in the *Security Administration Guide*.

Write Time

BLOCKCREDENTIALS may be updated before initiation by the parent of the task or, after initiation, by the task itself. If BLOCKCREDENTIALS is updated by the task itself, it may be set to

- TRUE only if the current value is FALSE.
- FALSE only if it was previously set to TRUE from an equal or higher stack offset (deeper nested program code location).

Example

```
LIBRARY LIB;

PROCEDURE PROC;
     LIBRARY LIB;

MYSELF.BLOCKCREDENTIALS := TRUE;
PROC;  %% Ensure that PROC cannot use my client credentials
MYSELF.BLOCKCREDENTIALS := FALSE;
```

BOTTIMESTAMP

Type	Real
Units	Not applicable
Range	See "Explanation" below
Default	0
Read Time	Anytime
Write Time	Never
Inheritance	None
Fork() Inheritance	None
Overwrite Rules	None
Host Services	Supported
Attribute Number	159
Synonym	None
Restrictions	None

Explanation

The BOTTIMESTAMP task attribute is a read-only attribute that returns the date and time the task began execution in the following format:

```
0 & (JULIANDATE-70000) [47:16] & (TIME(11) DIV 16) [31:32]
```

For a task that has not been initiated or that has terminated, this attribute returns 0 (zero).

Note: *This Julian date is in YYYDDD format where the value changes from 099365 to 100001 at midnight on December 31, 1999.*

BRCLASS

Type	Mnemonic
Units	Not applicable
Range	See "Explanation" below
Default	NOBR
Read Time	Anytime
Write Time	Anytime
Inheritance	From parent
Fork() Inheritance	None
Overwrite Rules	Object code file dominant
Host Services	Not supported
Attribute Number	83
Synonym	None
Restrictions	None

Explanation

The BRCLASS task attribute controls how the process responds to a BR (Breakout) system command. The operator can use the BR command to initiate a checkpoint for an in-use process. For a general discussion of checkpointing, refer to the discussion of restarting jobs and tasks in the *Task Management Programming Guide*.

This attribute is meaningful only if the CHECKPOINTABLE attribute is TRUE. Refer to the CHECKPOINTABLE description for details.

The following are the possible values and their meanings:

Mnemonic Value	Integer Value	Meaning
NOBR	0	The operator is not allowed to initiate a checkpoint for this process.
ONCEONLY	1	The operator can initiate a checkpoint for this process. The process is not allowed to continue after the checkpoint. The recovery files created by an operator BR (Breakpoint) system command are removed as soon as the RERUN statement has completed. This restriction prevents a process from being restarted more than once from this checkpoint.

Mnemonic Value	Integer Value	Meaning
MULTIPLE	2	The operator can initiate a checkpoint for this process. The process is allowed to continue execution after the checkpoint. ***Note:*** *The MULTIPLE value has effect only if it is set for the parent WFL job as well as for the checkpointed process.*

The BRCLASS attribute is reset to NOBR when the process terminates.

Example

In the following WFL job, the job attribute list assigns the job a BRCLASS value of MULTIPLE. This value is inherited by OBJECT/PROGDATA, which becomes eligible for multiple operator checkpoints.

```
?BEGIN JOB;
  BRCLASS = MULTIPLE;

  RUN OBJECT/PROGDATA;
?END JOB
```

Run-Time Error

BRCLASS ATTRIBUTE INCORRECT SYNTAX

An attempt was made to assign BRCLASS either an invalid mnemonic or a value less than 0 or greater than 2. The assigning process, if nonprivileged, is discontinued with HISTORYCAUSE = 2 (PROGRAMCAUSEV) and HISTORYREASON = 131 (INCORRECTSYNTAXV).

CHARGE

Type	String
Units	Not applicable
Range	<charge code>
Default	Null string
Read Time	Anytime
Write Time	See below
Inheritance	See below
Fork() Inheritance	From parent
Overwrite Rules	Standard
Host Services	Supported
Attribute Number	42
Synonym	CHARGECODE
Restrictions	None

Range

<charge code>

Explanation

The CHARGE task attribute contains the charge code of the process. The system logs the charge code information for each process. This information can be used by a log analysis program that computes billing charges at a site. For further information about billing, refer to the *System Administration Guide*.

When a process is initiated, the system examines the USERCODE task attribute of the process and examines the usercode definition in the USERDATAFILE to determine whether the CHARGEREQ usercode attribute is set. If not, any CHARGE task attribute is accepted. If CHARGEREQ is set, the system performs the following steps to determine whether the CHARGE task attribute value is legal for the process. Remember when reading these steps that the system applies any inherited value to the process before making the following checks:

- If the CHARGE value of the process is null, the system discontinues the process.
- If the CHARGE value of the process is not null, the system compares the value with the CHARGECODE usercode attribute. If the CHARGE value does not correspond to any of the values stored in the CHARGECODE usercode attribute, the system discontinues the process.

- For a WFL job, the WFL compiler checks the usercode of the job to see if the CHARGEREQ usercode attribute is set. If it is, the WFL compiler gives a syntax error if the CHARGE value of the job is null. The WFL compiler also gives a syntax error if the CHARGE value of the job is not null and does not correspond to any of the values in the CHARGECODE usercode attribute. (A WFL job can receive a CHARGE value at compile time either through inheritance or through an assignment in the job attribute list.)

Write Time

In general, CHARGE can be assigned only before a process is initiated.

However, processes with MCS or tasking privileges can change the CHARGE value at any time. Note that the system validates the CHARGE value only when a process is initiated. Therefore, an MCS or tasking process should check the validity of a new CHARGE value before assigning it to any running process. If an MCS or tasking process assigns an invalid CHARGE value to a running process, the operating system allows that process to run with a CHARGE that would not normally be permitted.

Inheritance

A process inherits the CHARGE value of its parent.

For library processes initiated by the library linkage mechanism, the USERCODE attribute inherits the USERCODE value of the process that is linking to the library.

The system administrator can assign one or more charge codes to the CHARGECODE attribute of a usercode. If the system administrator also sets the USEDEFAULTCHARGE attribute of the usercode, then MARC or CANDE sessions receive the first charge code from the CHARGECODE usercode attribute at log-on time. Otherwise, MARC or CANDE requests the user to enter a charge code. Processes initiated from a MARC or CANDE session inherit the CHARGE value of the session.

A WFL job inherits a charge code from the usercode definition if all the following conditions are true:

- The job attribute list includes a USERCODE assignment or inherits the usercode of the initiating source (such as an ODT that has a terminal usercode).
- The job attribute list did not include a CHARGE assignment and the job was submitted from a source that had no CHARGE value associated with it. (An ODT is an example of such a source.)
- The system administrator has assigned CHARGECODE and USEDEFAULTCHARGE attributes to the usercode.

Run-Time Errors

CHARGECODE ATTRIBUTE INCORRECT SYNTAX

An attempt was made to assign CHARGE a value that was not in simple name format. If the assigning process is nonprivileged, it is discontinued with HISTORYCAUSE = 2 (PROGRAMCAUSEV) and HISTORYREASON = 131 (INCORRECTSYNTAXV).

CHARGECODE READONLY ON ACTIVE TASK, NOT CHANGED

An attempt was made to change the CHARGE value after initiation. This is a warning message rather than an error message. The process continues normally, but the requested change is not made.

INVALID CHARGECODE

The charge code assigned at initiation is not allowed for this usercode. The new process (not the assigning process) is discontinued with HISTORYCAUSE = 2 (PROGRAMCAUSEV) and HISTORYREASON = 14 (INVALIDCHARGECODEV).

CHECKPOINTABLE

Type	Boolean
Units	Not applicable
Range	TRUE, FALSE
Default	FALSE
Read Time	Anytime
Write Time	Never
Inheritance	None
Fork() Inheritance	None
Overwrite Rules	None (read-only)
Host Services	Not supported
Attribute Number	82
Synonym	None
Restrictions	None

Explanation

The CHECKPOINTABLE task attribute specifies whether a checkpoint can be initiated for this process.

A value of TRUE indicates that a checkpoint can be initiated for this process. This value does not guarantee that the checkpoint will be executed successfully. The checkpoint can fail because of factors that are not reflected by the CHECKPOINTABLE value.

A value of FALSE indicates that the task is not allowed to execute a checkpoint.

The value of this attribute is computed at the time it is accessed.

The system evaluates the following conditions once. If any are true, the system sets the CHECKPOINTABLE attribute to FALSE for the life of the process:

- The process is an MCS or a process initiated by an MCS. This category includes processes initiated from sessions.
- The process is a frozen library. (For information about libraries, refer to the *Task Management Programming Guide*.)
- The process was not initiated by a RUN statement in a WFL job.
- The code was not compiled by one of the following compilers:
  - ALGOL, DCALGOL, DMALGOL, or BDMSALGOL
  - COBOL74 or BDMSCOBOL

In addition, at every access of the attribute the system checks to see whether the process has any offspring. If so, CHECKPOINTABLE returns a value of FALSE.

Another task attribute related to checkpointing, called BRCLASS, is discussed elsewhere in this manual. For more information about checkpointing, refer to the discussion of restarting jobs and tasks in the *Task Management Programming Guide*.

CLASS

Type	Integer
Units	Not applicable
Range	0 through 1023
Default	See below
Read Time	Anytime
Write Time	See below
Inheritance	See below
Fork() Inheritance	0
Overwrite Rules	See below
Host Services	Supported
Attribute Number	34
Synonym	QUEUE
Restrictions	None

Explanation

For WFL jobs or descendants of WFL jobs, the CLASS task attribute specifies the number of the job queue from which the WFL job is initiated. For processes not descended from WFL jobs, CLASS stores a value of 0.

The CLASS task attribute is only one of many factors affecting the job queue chosen for a WFL job. The system compares any user-specified CLASS value with the job queue definitions and terminates the WFL job if the specified CLASS is not appropriate. The system also terminates the WFL job if its CLASS value is not allowed by the CLASSLIST, ANYOTHERCLASSOK and CLASS attributes of the WFL job's usercode.

If a CLASS value is not explicitly assigned, the system selects a queue for the WFL job. The job queue selection depends on such factors as the system default queue specification, the usercode definition, and any resource limits set for the job queue.

For a detailed explanation of job queues, refer to the *System Administration Guide*.

Write Time

The CLASS task attribute can be assigned only in WFL jobs. Within a WFL job, CLASS can be assigned only in the job attribute list.

Overwrite Rules

This attribute can be assigned only in the job attribute list of a WFL job. For information about job attribute lists, refer to the *Work Flow Language (WFL) Programming Reference Manual*.

Inheritance

A WFL job inherits a CLASS value from the usercode definition if all the following conditions are true:

- The job attribute list includes a USERCODE assignment or the job has inherited the usercode of the initiating source (such as an ODT that has a terminal usercode).
- The job attribute list did not include a CLASS assignment, and the job was submitted from a source that had no CLASS value associated with it. An example of such a source is an ODT that has no UQ (Unit Queue) assignment and no terminal usercode.
- The system administrator has assigned a CLASS value to the usercode.

Descendants of WFL jobs inherit the CLASS value of the job. However, because only WFL jobs go through the job queue mechanism, the CLASS value has no effect on the descendants.

Example

The following is an example of a CLASS assignment in the job attribute list of a WFL job:

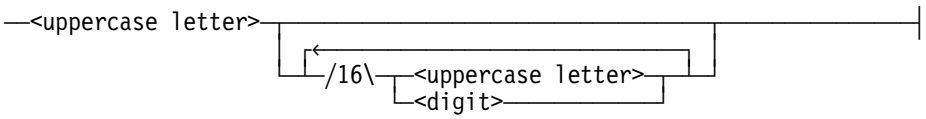
```
?BEGIN JOB;
  CLASS = 2;

  RUN OBJECT/X;

?END JOB
```

CONVENTION

Type	String
Units	Not applicable
Range	<convention identifier>
Default	See below
Read Time	Anytime
Write Time	Anytime
Inheritance	See below
Fork() Inheritance	From parent
Overwrite Rules	Standard
Host Services	Supported
Attribute Number	120
Synonym	None
Restrictions	None

Range

<convention identifier>



Explanation

The CONVENTION task attribute specifies the date, time, and currency conventions used by a process.

This task attribute affects only processes that use the CENTRALSUPPORT library to handle conventions for localization. When a process invokes a conventions procedure in the CENTRALSUPPORT library, the process can optionally use parameters to specify the convention that is desired. If the process does not request a convention in the procedure parameters, the CONVENTION task attribute of the user process determines the convention that is used.

Changes made to the value of this attribute take effect immediately. That is, subsequent calls to the conventions procedures in CENTRALSUPPORT use the new value of CONVENTION.

However, if the job attribute list also contains a PRINTDEFAULTS assignment, the PRINTDEFAULTS attribute of the usercode is ignored.

For further information about the CENTRALSUPPORT library, refer to the *Unisys e-@ction ClearPath Enterprise Servers MultiLingual System Administration, Operations, and Programming Guide*.

Default and Inheritance

A process inherits the CONVENTION value of its parent.

The default convention is ASERIESNATIVE. If you purchase your system through an international subsidiary, they may have already altered the CENTRALSUPPORT library to provide a different default convention. The system administrator can establish a different default convention value for the whole system by using the SYSOPS (System Options) system command.

The system administrator can selectively override the system default convention by including a CONVENTION attribute in usercode definitions in the USERDATAFILE. This CONVENTION value does not directly affect processes, but it is inherited by MARC and CANDE sessions with that usercode. The user can also use the MARC or CANDE *CONVENTION* command to change the convention of a session. Processes initiated from the session inherit the current convention of the session.

The CONVENTION attribute of a usercode also is inherited by WFL jobs that are assigned that usercode in the job attribute list.

Example

Processes that differ only in the conventions they use can benefit from this task attribute.

For example, a company might have a program that needs to print invoices for customers in several different countries. The invoices have to be printed using the conventions of each country. The following ALGOL statements run the program three times, assigning a different CONVENTION value to each run:

```
REPLACE T1.CONVENTION BY "UNITEDKINGDOM1.";
CALL DONOTHING [T1];
REPLACE T2.CONVENTION BY "FRANCELISTING.";
CALL DONOTHING [T2];
REPLACE T3.CONVENTION BY "EUROPEANSTANDARD.";
CALL DONOTHING [T3];
```

Each of these processes calls the appropriate CENTRALSUPPORT library procedures to format date, time, and currency information while generating invoices appropriate for each country.

CORE

Type	Integer
Units	Words
Range	0 to 1048575
Default	See below
Read Time	Anytime (except in WFL)
Write Time	See below
Inheritance	None
Fork() Inheritance	From parent
Overwrite Rules	Standard
Host Services	Not supported
Attribute Number	2
Synonym	COREESTIMATE
Restrictions	See below

Explanation

The CORE task attribute provides an estimate of the amount of main memory that a process needs for code and data areas in order to execute efficiently. The system schedules a new process if the CORE value exceeds the amount of available memory. You can override the default core estimate by assigning a different value to this task attribute.

For more information, refer to the discussion of controlling process memory usage in the *Task Management Programming Guide*.

Default

The default value of CORE is taken from compiler and operating system core estimates that are stored in the object code file. For information about these estimates, refer to the discussion of process memory usage in the *Task Management Programming Guide*.

Write Time

The CORE task attribute can be written at any time. However, the CORE value is used only at initiation time. Assignments made to CORE after initiation have no effect on the process.

Restrictions

In WFL, CORE can be assigned separate data core and code core values or a single total core value. Other sources can assign CORE only a single value, which is a data core estimate.

The CORE task attribute cannot be read in WFL.

Examples

The following WFL statement initiates the program OBJECT/PROG and assigns CORE a data estimate of 3000 and a code estimate of 1300:

```
RUN OBJECT/PROG;
    CORE = (3000,1300);
```

The following WFL statement initiates the program OBJECT/PROG and assigns CORE a total memory estimate of 4300:

```
RUN OBJECT/PROG;
    CORE = 4300;
```

Run-Time Error

CORE ATTRIBUTE INCORRECT SYNTAX

An attempt was made to assign CORE a value outside the allowed range. The assigning process, if nonprivileged, is discontinued with HISTORYCAUSE = 2 (PROGRAMCAUSEV) and HISTORYREASON = 131 (INCORRECTSYNTAXV).

COUNTRY

Type	String
Units	Not applicable
Range	<identifier>
Default	See below
Read Time	Anytime
Write Time	Anytime
Inheritance	See below
Fork() Inheritance	From parent
Overwrite Rules	Standard
Host Services	Not supported
Attribute Number	157
Synonym	None
Restrictions	None

Explanation

The COUNTRY task attribute specifies the country identifier associated with the process.

Be careful when you enter a value for the COUNTRY task attribute because no checks are made against locally defined values. Instead, the system accepts any combination of letters and numbers that conforms to the <identifier> syntax. For more information about the syntax, refer to the *System Commands Operations Reference Manual*.

Default and Inheritance

The COUNTRY task attribute is inherited from the parent. The default value for the COUNTRY task attribute is UNITEDSTATES. The system administrator can establish a different default COUNTRY value by using the SYSOPS (System Options) system command.

CREDENTIALS

Type	Integer
Units	Not applicable
Range	See below
Default	0
Read Time	Anytime
Write Time	See below
Inheritance	See below
Overwrite Rules	Not applicable
Host Services	Not supported
Attribute Number	147
Synonym	None
Restrictions	None

Explanation

The CREDENTIALS task attribute identifies the mix number of the entity that authenticated the task's identity. This attribute is used for security verification purposes.

For information about credential management and Generic Security Service Application Program Interface (GSS-API), see Appendix G in the *Security Administration Guide*.

Range

A valid mix number.

Write Time

Only stacks with PP:TASKING privilege are allowed to assign a value to CREDENTIALS.

Inheritance

If INHERITCREDENTIALS is set to TRUE, a non-zero value is inherited. If CREDENTIALSBASE is set to FALSE, CREDENTIALS is set to the task parent's mix number. If CREDENTIALSBASE is set to TRUE, or the task is an independent task, CREDENTIALS is set to the mix number of the task and credentials are copied to that mix number.

Example

```
%%  Tasking Program Dependent Process Initiation:
REPLACE CLIENT_TASK.USERCODE BY CLIENT_USERDATA;
REPLACE CLIENT_TASK.ACCESSCODE BY CLIENT_ACCESSCODE;
REPLACE CLIENT_TASK.CHARGECODE BY CLIENT_CHARGECODE;
CLIENT_TASK.CREDENTIALS := CLIENT_CREDENTIALS;
PROCESS PROC [CLIENT_TASK];
%%  Proc can perform actions on behalf of Client.

%%  Tasking Program Worker Process:
%%  Assume Client USERCODE (call USERCODE)
%%  Assume Client ACCESSCODEASSESSCODE (call USERDATA)
REPLACE MYSELF.CHARGECODE BY CLIENT_CHARGECODE;
MYSELF.CREDENTIALS := CLIENT_CREDENTIALS;
%%  Perform actions on behalf of client
%%  All client's credentials are usable at this point
MYSELF.CREDENTIALS := 0;
%%  Even though USERCODE, ACCESSCODE, and CHARGECODE are still in effect,
%%  the client's credentials can no longer be used.
```

CREDENTIALSBASE

Type	Boolean
Units	Not applicable
Range	TRUE, FALSE
Default	FALSE
Read Time	Anytime
Write Time	Before initiation
Inheritance	None
Overwrite Rules	Standard
Host Services	Supported
Attribute Number	148
Synonym	None
Restrictions	None

Explanation

The CREDENTIALSBASE task attribute controls whether the task is to be regarded as a new base for acquiring credentials.

CREDENTIALSBASE is evaluated only when a dependent task is initiated with INHERITCREDENTIALS set to TRUE. In these circumstances, if CREDENTIALSBASE is set to TRUE, all credentials are copied from the parent task. Otherwise, they are shared with the parent task. This is required if a task initiated from a session needs to use server credentials. If the task were to share credentials with the session that initiated it, any new credentials acquired by the task would also be shared by the parent session. This is not permitted: a session is explicitly limited to a single set of credentials.

For information about credential management and Generic Security Service Application Program Interface (GSS-API), see Appendix G in the *Security Administration Guide*.

Examples

The following examples show the syntax used to run a program that needs to use server credentials:

- To run a program, from MARC or CANDE, that needs to use server credentials, enter the following command:

```
RUN SYSTEM/SPECIAL/SERVICE; CREDENTIALSBASE
```

- To run a program, from MARC or CANDE, that needs to use server credentials but is not allowed to use the credentials of a particular user's session, enter the following command:

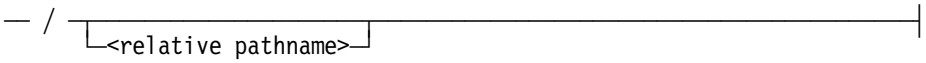
```
RUN SYSTEM/SPECIAL/SERVICE; CREDENTIALSBASE; INHERITCREDENTIALS = FALSE
```

CURRENTDIRECTORY

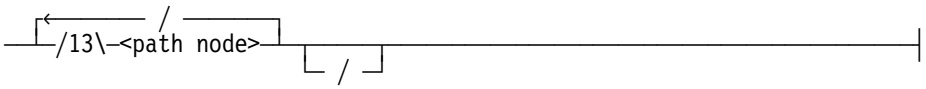
Type	String
Units	Not applicable
Range	<absolute pathname> or <relative pathname>
Default	Null string, which is interpreted as "/"
Read Time	Anytime
Write Time	Anytime
Inheritance	See below
Fork() Inheritance	From parent
Overwrite Rules	Standard
Host Services	Not supported
Attribute Number	137
Synonym	None
Restrictions	None

Range

<absolute pathname>



<relative pathname>



<path node>

A sequence of 1 to 17 EBCDIC characters whose values are greater than or equal to 4'40', except for the slash [/], double quote ["], and left parenthesis [(]. This set includes uppercase and lowercase letters, digits, and most special characters.

Note: *Blank spaces are treated as significant when included in the CURRENTDIRECTORY value. For example, a CURRENTDIRECTORY value of "/A / B" does not match a directory path named "/A/B".*

Explanation

The CURRENTDIRECTORY task attribute specifies a directory to be used as the prefix for relative pathnames referenced by this process.

A pathname is a file title that is encoded in a way defined by the POSIX standard. Pathnames are stored in the PATHNAME file attribute. The TITLE file attribute and the PATHNAME file attribute store the same value, but in a different format. Changes to the

PATHNAME file attribute are immediately reflected by the TITLE file attribute, and vice versa. For example, the following two WFL statements are equivalent:

```
F(TITLE = (JASMITH)DATA/TEST/ONE ON MYFAM);

F(PATHNAME = "/-/MYFAM/USERCODE/JASMITH/DATA/TEST/ONE");
```

There are two types of pathnames:

- *Absolute* pathnames, which begin with the root directory, end with the file name, and include all the subdirectories leading from the root directory to the file name. Absolute pathnames always begin with a slash, signifying the root directory. For example, the following is an absolute pathname:

  ```
  "/-/MYFAM/USERCODE/JASMITH/DATA/TEST/ONE"
  ```

- *Relative* pathnames, which are a short cut method you can use for specifying file names that are nested under a common directory. Relative pathnames omit the root directory and one or more of the leftmost subdirectories, which are supplied by the CURRENTDIRECTORY task attribute instead. The following are relative pathnames that could refer to the same file as the previous example, if used together with appropriate CURRENTDIRECTORY values:

  ```
  "-/MYFAM/USERCODE/JASMITH/DATA/TEST/ONE"

  "MYFAM/USERCODE/JASMITH/DATA/TEST/ONE"

  "USERCODE/JASMITH/DATA/TEST/ONE"

  "DATA/TEST/ONE"

  "TEST/ONE"

  "ONE"
  ```

TITLE file attribute assignments result in an absolute PATHNAME value if the TITLE assignment contains a usercode or a family name. Otherwise, TITLE assignments result in a relative PATHNAME value. The following table shows TITLE assignments and the resulting PATHNAME values:

TITLE Assignment	Resulting PATHNAME	Absolute or Relative
(JASMITH)A/B	/USERCODE/JASMITH/A/B	Absolute
A/B ON MYFAM	/-/MYFAM/A/B	Absolute
A/B	A/B	Relative

When POSIX search rules are used, the system combines relative pathnames with the CURRENTDIRECTORY value to create *resolved pathnames* at file open time. If you want to use POSIX search rules for relative pathnames in your program, you need to do the following:

- Ensure that a root family has been defined for your system by the DL ROOT form of the DL (Disk Location) system command.
- Ensure that the CURRENTDIRECTORY task attribute has a value corresponding to the left part of the pathname.
- Assign the SEARCHRULE file attribute of each file a value of POSIX.
- Assign relative pathnames by way of the PATHNAME or TITLE file attributes.

For example, consider the following WFL statements:

```
MYSELF (CURRENTDIRECTORY = "/-/MYFAM/USERCODE/JASMITH/DATA");
FILE F1(SEARCHRULE = POSIX, PATHNAME = "TEST/ONE");
FILE F2(SEARCHRULE = POSIX, PATHNAME = "REPORT/BRIEF");
```

The preceding statements have the same effect as the following statements:

```
FILE F1(SEARCHRULE = POSIX,
        PATHNAME = "/-/MYFAM/USERCODE/JASMITH/DATA/TEST/ONE");
FILE F2(SEARCHRULE = POSIX,
        PATHNAME = "/-/MYFAM/USERCODE/JASMITH/DATA/REPORT/BRIEF");
```

The SEARCHRULE = POSIX assignment has two side effects that you should be aware of:

- The FAMILY task attribute is ignored. The family, if not specified in the resolved pathname, defaults to the DL ROOT family.
- If the resolved pathname does not include a usercode, the system searches for or creates the file only as a nonusercoded (*) file. By contrast, when SEARCHRULE = NATIVE, the system searches for the file under the usercode of the process first.

If the SEARCHRULE value is NATIVE, rather than POSIX, then the system conducts the file search based on native rules, and the CURRENTDIRECTORY value is ignored.

For further information about the PATHNAME and SEARCHRULE file attributes, refer to the *File Attributes Programming Reference Manual*.

Write Time

The following restrictions vary, depending on the time when CURRENTDIRECTORY is assigned:

- For an in-use process, the CURRENTDIRECTORY value can be changed only by the process itself.
- For an in-use process, CURRENTDIRECTORY can be assigned either an absolute or a relative pathname. If CURRENTDIRECTORY is assigned a relative pathname, the system adds the relative pathname to the end of the existing CURRENTDIRECTORY value, and sets CURRENTDIRECTORY to this combined value.
- If the process is not in-use, then only absolute pathnames can be assigned to CURRENTDIRECTORY.

You can assign the CURRENTDIRECTORY value either through conventional task attribute assignments or through one of the following methods:

- The C language chdir function. For information about the chdir function, refer to the *MCP/AS C Programming Reference Manual, Volume 2: Headers and Functions*.
- The POSIX_CHANGEDIR procedure of the MCPSUPPORT library. For information about this procedure, refer to the *MCP/AS ALGOL and MCP Interfaces to POSIX Features Programming Reference Manual*.

Default and Inheritance

The default value for CURRENTDIRECTORY is the null string. At file open time, this default is treated as equivalent to a single slash, indicating the root directory.

System administrators can define a default CURRENTDIRECTORY value for each usercode with the POSIXINITDIR usercode attribute.

A task inherits the CURRENTDIRECTORY value of its parent, unless this value is overridden by explicit assignments.

Examples

In ALGOL, you must explicitly terminate CURRENTDIRECTORY assignments with a null character, as shown in the following example:

```
REPLACE T1.CURRENTDIRECTORY BY
   "/-/DBFAM/USERCODE/JANEDOE/TESTCASE/ONE" 48"00";
```

In COBOL74 and COBOL85, you must first define a group item that ends with a null character, as in the following example:

```
WORKING-STORAGE SECTION.
01 X.
   03 Y PIC X(6) VALUE "aa/bbb".
   03 Z PIC X(1) VALUE @00@.
```

You can use a statement such as the following to assign the group item to CURRENTDIRECTORY:

```
CHANGE ATTRIBUTE CURRENTDIRECTORY OF MYSELF TO X.
```

Run-Time Errors

CURRENTDIRECTORY NOT CHANGED: INVALID SYNTAX

An attempt was made to assign CURRENTDIRECTORY a value that does not conform to pathname syntax. The assigning process continues to run normally, but the CURRENTDIRECTORY value remains unchanged.

CURRENTDIRECTORY NOT CHANGED: ACCESS ERROR

An attempt was made to assign CURRENTDIRECTORY a directory that does not exist, or a directory to which this process does not have access rights. The assigning process continues running normally, but the CURRENTDIRECTORY value remains unchanged.

CURRENTDIRECTORY WRITABLE ONLY BY OWNER STACK ON ACTIVE TASK

A process attempted to modify the CURRENTDIRECTORY value of another, in-use process. The assigning process, if nonprivileged, is discontinued with HISTORYCAUSE = 2 (PROGRAMCAUSEV) and HISTORYREASON = 56 (NONOWNERACCESSV).

CURRENTDIRECTORY MUST BE ABSOLUTE ON INACTIVE TASK

An attempt was made to assign a relative pathname to the CURRENTDIRECTORY of a task variable that is not in-use. The assigning process, if nonprivileged, is discontinued with HISTORYCAUSE = 2 (PROGRAMCAUSEV) and HISTORYREASON = 131 (INCORRECTSYNTAXV).

<partial file name> REQUIRES ROOT FAMILY TO BE SET WITH DL COMMAND

An attempt was made to assign CURRENTDIRECTORY, and no DL ROOT family has been defined for this system. The <partial file name> is the value being assigned to CURRENTDIRECTORY, expressed in TITLE form rather than pathname form. The assigning process is suspended with the above RSVP message. The operator can respond in either of the following ways:

- With a DS (Discontinue) command to terminate the suspended process.
- With the *DL ROOT ON <family name>* form of the DL (Disk Location) system command. The suspended process resumes execution when the DL ROOT family is defined.

DATABASE

Type	String
Units	Not applicable
Range	<database equation>
Default	Null string
Read Time	See below
Write Time	See below
Inheritance	From parent
Fork() Inheritance	From parent
Overwrite Rules	Standard
Host Services	Not supported
Attribute Number	73
Synonym	None
Restrictions	None

Range

<database equation>

```
–– DATABASE ––<simple name>–– ( –– TITLE –– = ––<title>–– ) ––––––––––┤
```

Explanation

The DATABASE task attribute causes a process to use a different database than it otherwise would.

In the DATABASE value, the simple name is the internal name by which the process refers to the original database. The title is the title of the database that is to be used instead. Your title should be the title of an Enterprise Database Server control file.

Read Time

The DATABASE task attribute can be read at any time from an ALGOL program. However, the value returned is encoded in an internal form that does not resemble the original DATABASE assignment.

The DATABASE task attribute returns a null value if read from COBOL and cannot be read from WFL at all.

Write Time

The DATABASE task attribute can only be assigned by a DATABASE equation statement in a WFL program. For information about database equation, refer to the *Work Flow Language (WFL) Programming Reference Manual.*

Assigning the DATABASE task attribute from an ALGOL or COBOL program causes a run-time error.

Examples

The following example shows this attribute being used in a WFL job:

```
RUN USERPROG;
  DATABASE TESTDB(TITLE=<database name>/CONTROL);
```

The database internal name or the database title can be replaced by string variables, which must be prefixed with a pound sign (#). The following example uses the string variables STRINT and STRTITLE:

```
RUN USERPROG;
  DATABASE #STRINT(TITLE=#STRTITLE);
```

Run-Time Error

DATABASE ATTRIBUTE - RESTRICTED ACCESS

A non-WFL process attempted to assign a value to the DATABASE attribute, or a WFL process attempted to assign a value to the DATABASE attribute of an in-use task variable. An attempt was made to assign a value to the DATABASE attribute of an in-use process. The assigning process, if nonprivileged, is discontinued with HISTORYCAUSE = 2 (PROGRAMCAUSEV) and HISTORYREASON = 128 (RESTRICTEDACCESSV).

DATEOFFSET

Type	Integer
Units	Days
Range	0 to 4095
Default	0
Read Time	Anytime
Write Time	Anytime
Inheritance	From parent
Fork() Inheritance	From parent
Overwrite Rules	Standard
Host Services	Supported
Attribute Number	154
Synonym	None
Restrictions	None

Explanation

The DATEOFFSET task attribute provides a means for a task to adjust the date returned to the task when calling the TIME intrinsic.

All TIME functions that return a date are adjusted by DATEOFFSET days, except for functions 36 and 136, which return the halt/load time in TIME(6) format.

Notes:

- *In a library environment the attribute value for a client program is used if the TIME intrinsic is invoked in a library entrypoint. If the result from the TIME intrinsic is stored globally and compared with values obtained from different calls from different clients, the results are unpredictable. It is recommended that in such an environment the library and all clients are assigned the same value for the DATEOFFSET attribute.*
- *If the system option NODATEOFFSET is set, the value of the DATEOFFSET attribute can only be set to 0 (zero). Attempts to set the attribute to any other value within the range of 1 to 4095 results in a warning message, and the attribute value is not changed.*

DCIINPUTEVENT

Type	Event
Units	Not applicable
Range	HAPPENED, NOT HAPPENED
Default	None
Read Time	See below
Write Time	Never
Inheritance	None
Fork() Inheritance	None
Overwrite Rules	None (read-only)
Host Services	Not supported
Attribute Number	127
Synonym	None
Restrictions	Not available in WFL

Explanation

The DCIINPUTEVENT task attribute can be used by the Transaction Server direct window programs to detect the presence of user input.

Direct window programs should use DCIINPUTEVENT together with the DCITASKEVENT task attribute. When input is available, the system causes one or the other of these attributes, but not both. For input that is available to any of the copies of a program, the system causes the DCIINPUTEVENT of all the program copies. For input that is available only to a particular copy of the program, the system causes the DCITASKEVENT of that program copy.

Before attempting to wait on the DCIINPUTEVENT task attribute, the direct window program must successfully execute an ENABLE statement with the ONLINE option. If the program attempts to execute the WAIT statement before executing the ENABLE statement, the system discontinues the program.

A program awakened by the DCIINPUTEVENT might find that no input is available because one of the other copies of the program executed a RECEIVE statement first. Therefore, the program should always use the DONTWAIT option of the RECEIVE statement to prevent the risk of hanging indefinitely.

The system automatically resets DCIINPUTEVENT after a direct program executes the RECEIVE statement.

The program should use only WAIT statements or IF HAPPENED expressions with DCIINPUTEVENT. The program should not use statements that cause the event or reset the event, because such statements overwrite the effects of cause actions and reset actions issued by the system. Examples of such statements include the ALGOL language, WAITANDRESET, CAUSE, and CAUSEANDRESET. The system does not issue any error for the programs that cause or reset DCIINPUTEVENT, but the program is likely to not work as intended.

Run-Time Errors

Transaction Process is DSED because task is empty or TP is not under COMS control

An attempt was made to wait on or interrogate the DCIINPUTEVENT or DCITASKEVENT attribute, and one of the following conditions is true:

- The task variable is not currently in use, because the task has not been initiated or has already terminated.
- The task variable refers to a process that is not a Transaction Server direct window program. The system recognizes a process as a Transaction Server direct window program when the process executes an ENABLE statement with the ONLINE option.

The process that waited on or interrogated the task attribute is discontinued with HISTORYCAUSE = 2 (PROGRAMCAUSEV) and HISTORYREASON = 128 (RESTRICTEDACCESSV).

Note that the same HISTORYCAUSE and HISTORYREASON values are associated with the following messages.

Transaction Processor is DSED because DS or BADGOTO was encountered during linking
Transaction Process is DSED because unable to link to the Transaction Processor
Transaction Process is DSED because during linkage to TP an error was encountered
Transaction Process is DSED because link error occurred during DCIWAIT linkage

The preceding four messages each indicate that a system software error occurred when a process attempted to wait on or interrogate the DCIINPUTEVENT or DCITASKEVENT task attribute. The process that waited on or interrogated the task attribute is discontinued with HISTORYCAUSE = 2 (PROGRAMCAUSEV) and HISTORYREASON = 128 (RESTRICTEDACCESSV). These diagnostic messages should not normally occur, but if they do occur, you should notify system support personnel.

DCITASKEVENT

Type	Event
Units	Not applicable
Range	HAPPENED, NOT HAPPENED
Default	None
Read Time	See below
Write Time	Never
Inheritance	None
Fork() Inheritance	None
Overwrite Rules	None (read-only)
Host Services	Not supported
Attribute Number	128
Synonym	None
Restrictions	Not available in WFL

Explanation

The DCITASKEVENT task attribute can be used by Transaction Server direct window programs to detect the presence of user input.

Direct window programs should use DCITASKEVENT together with the DCIINPUTEVENT task attribute. When input is available, the system causes one or the other of these attributes, but not both. For input that is available to any of the copies of a direct window program, the system causes the DCIINPUTEVENT of all the program copies. For input that is available only to a particular copy of the program, the system causes the DCITASKEVENT of that program copy.

Before attempting to wait on the DCITASKEVENT task attribute, the direct window program must successfully execute an ENABLE statement with the ONLINE option. If the program attempts to execute the WAIT statement before executing the ENABLE statement, the system discontinues the program.

If a program is awakened by DCITASKEVENT, then there is no possibility that another copy of the program might read the input before this copy does. However, it is still a good idea to use the DONTWAIT option of the RECEIVE statement in case the input becomes unavailable for some reason.

The system automatically resets DCITASKEVENT after a program executes the RECEIVE statement.

The program should use only WAIT statements or IF HAPPENED expressions with DCITASKEVENT. The program should not use statements that cause the event or reset the event, because such statements overwrite the effects of cause actions and reset actions issued by the system. Examples of such statements include the ALGOL language, WAITANDRESET, CAUSE, and CAUSEANDRESET. Although, the system does not issue errors for the direct window programs that cause or reset DCITASKEVENT, the direct window program might not work as intended.

Run-Time Errors

Refer to the discussion of run-time errors for the DCIINPUTEVENT task attribute.

DECKGROUPNO

Type	Integer
Units	Not applicable
Range	0 to 549755813887
Default	0
Read Time	Anytime; accurate while in use
Write Time	Never
Inheritance	None
Fork() Inheritance	None
Overwrite Rules	None (read-only)
Host Services	Not supported
Attribute Number	33
Synonym	None
Restrictions	None

Explanation

The DECKGROUPNO task attribute stores an index that is assigned by WFL to each task initiated by a WFL job. The first task that appears in a WFL job is assigned a DECKGROUPNO of 1, the second task a DECKGROUPNO of 2, and so on. WFL uses this information internally to determine which local data specifications are associated with which tasks.

A process initiated from any source but WFL has a DECKGROUPNO of 0.

For information about local data specifications, refer to the *Work Flow Language (WFL) Programming Reference Manual*.

Example

The following WFL example includes a number of statements that display the value of DECKGROUPNO at different points during job execution. The comments at the right of the example show the values displayed by these statements.

```
?BEGIN JOB WFL/TEST;
  TASK T1, T2, T3;
  DISPLAY STRING(T1(DECKGROUPNO),*);     % Displays 0
  PROCESS RUN OBJECT/ALGOL/ERROR [T1];
     DISPLAY STRING(T1(DECKGROUPNO),*);  % Displays 1
  PROCESS RUN OBJECT/ALGOL/ERROR [T2];
     DISPLAY STRING(T2(DECKGROUPNO),*);  % Displays 2
  PROCESS RUN OBJECT/ALGOL/ERROR [T3];
     DISPLAY STRING(T3(DECKGROUPNO),*);  % Displays 3
?END JOB
```

DEFAULTFILEGROUP

Type	String
Units	Not applicable
Range	<Simple Name>
Default	Null String
Read Time	Anytime
Write Time	Never
Inheritance	See below
Overwrite Rules	See below
Host Services	Not supported
Attribute Number	153
Synonym	None
Restrictions	None

Explanation

The DEFAULTFILEGROUP task attribute is a read-only attribute that is used to interrogate the effective FILEGROUP value used by the task when creating disk files. The value returned by this task attribute specifies the group name that is assigned to any newly created disk files that are owned by the task.

If the FILEGROUP attribute for the task is set, then the task's FILEGROUP value is returned. Otherwise, if the FILEGROUP value associated with the user is set on the task, the user's FILEGROUP value is returned. Otherwise, interrogating the DEFAULTFILEGROUP attribute returns ".".

Refer to the FILEGROUP task attribute for more information.

DEPTASKACCOUNTING

Type	Mnemonic
Units	Not applicable
Range	See "Explanation" below
Default	See below
Read Time	Anytime
Write Time	Before initiation
Inheritance	See below
Fork() Inheritance	Set to IDENTIFIED if IDENTIFIED is specified for the parent, the usercode, or the system; otherwise, set to ANONYMOUS
Overwrite Rules	Standard
Host Services	Not supported
Attribute Number	124
Synonym	None
Restrictions	None

Explanation

The DEPTASKACCOUNTING task attribute specifies whether the system should generate log entries and system messages when the process is initiated and when the process terminates. You can use DEPTASKACCOUNTING to improve overall system performance by reducing the number of log entries the system generates. The best way to achieve this effect is by establishing a system-wide DEPTASKACCOUNTING default, as described later under "Default and Inheritance."

The DEPTASKACCOUNTING task attribute can be assigned to any process. However, the system enforces the value of this task attribute only for processes that meet all the following criteria:

- The process is a task (that is, a dependent process).
- The process has the same usercode as its parent.
- The process is not initiated directly from a CANDE or MARC session or from a WFL job.

The following are the possible values of DEPTASKACCOUNTING:

Mnemonic Value	Integer Value	Meaning
UNSPECIFIED	0	This value has no effect on logging or message displays.
ANONYMOUS	1	The system does not generate Major Type 1, Minor Type 2 (BOT Entry) or Major Type 1, Minor Type 4 (EOT Entry) log entries for this process. If the system generates any other log entries for this process, the system places a Major Type 0, Minor Type 1 (Establish Identity) log entry before the first of these other entries and generates a Major Type 0, Minor Type 1 (Empty Establish Identity) log entry when the process terminates. These logging effects apply equally to the system log and the job log. When the process terminates, the resource usage statistics of the process are added to those of the parent and are reflected in the Major Type 1, Minor Type 2 (EOJ Entry) or Minor Type 4 (EOT Entry) log entry that the system issues for the parent. For details about which fields in the parent's log entry can reflect statistics from an ANONYMOUS offspring, refer to the *Unisys e-@ction ClearPath Enterprise Servers System Log Programming Reference Manual*. Further, no BOT or EOT messages are sent to the originating station, and the process does not appear in the C (Completed Mix Entries) system command display. This value also affects enforcement of the FILEACCOUNTING task attribute. Refer to the FILEACCOUNTING task attribute description.
IDENTIFIED	2	The system generates BOT and EOT log entries for the process. The system sends BOT and EOT messages to the originating terminal, and the process termination is recorded in the C (Completed Mix Entries) display. Note that an operator can use the LOGGING (Logging Options) system command to prevent logging of any BOT and EOT log entries. In this case, even processes with DEPTASKACCOUNTING = IDENTIFIED do not receive BOT or EOT log entries.

Default and Inheritance

A process inherits the DEPTASKACCOUNTING value of its parent.

The system administrator can use the ACCOUNTING (Resource Accounting) system command to specify a system-wide default for DEPTASKACCOUNTING. The system administrator can also associate a default value with a usercode by including a DEPTASKACCOUNTING usercode attribute in the usercode definition in the USERDATAFILE.

When a process is initiated, the system assigns the DEPTASKACCOUNTING task attribute the maximum of its current value (whether assigned or inherited), the system default value, and the usercode value. The integer values for each DEPTASKACCOUNTING mnemonic were previously listed under the "Explanation" subheading.

For example, suppose that DEPTASKACCOUNTING has a value of ANONYMOUS in the task variable, a value of IDENTIFIED at the system level, and a value of UNSPECIFIED at the usercode level. At initiation time, the process is assigned a DEPTASKACCOUNTING value of IDENTIFIED by the system, because IDENTIFIED has a higher numeric value (2) than ANONYMOUS or UNSPECIFIED.

On a system running Security Services for ClearPath MCP with a security class of S2, or with the security option ANONACCOUNTING set to the value NOTOK, the system sets DEPTASKACCOUNTING to IDENTIFIED for all processes when they are initiated. This rule overrides all of the other factors affecting the DEPTASKACCOUNTING value.

DESTNAME

Type	String
Units	Not applicable
Range	<name>
Default	SITE
Read Time	Anytime
Write Time	Before initiation
Inheritance	See below
Fork() Inheritance	From parent
Overwrite Rules	Standard
Host Services	Supported
Attribute Number	44
Synonym	BACKUPDESTINATION
Restrictions	None

Explanation

The DESTNAME task attribute specifies a destination station for printer or punch output created by the process. This attribute is useful at sites where some of the printers are connected to data comm lines.

This attribute can be set to any of the following values:

- Any station name in the DATACOMINFO file data comm definition for the system.
- SITE. This value specifies that there is no destination station for the process. Other factors, such as the default destination, determine the routing of printer and punch files.

Setting this attribute to something other than SITE causes printer files to be built under the directory **REMLPnn/=* , and punch files to be created under the directory **REMCPnn/=* . The *nn* in the titles is the MCS number defined by the data comm subsystem for the MCS that controls the destination station. The remainder of the file name includes the job number, mix number, and so on, as described in the process I/O usage discussion in the *Task Management Programming Guide*.

An alternate method of specifying the destination station for a process is the DESTSTATION task attribute. DESTSTATION specifies the logical station number (LSN) of the destination station. Assigning a valid station name to DESTNAME causes DESTSTATION to receive the corresponding LSN. Similarly, assigning a valid LSN to DESTSTATION causes DESTNAME to be updated with the corresponding station name.

The MCS, which controls the destination station, might print the files automatically, depending on which MCS is involved. Otherwise, the files remain on disk until removed or printed by application software supplied by the site.

If the Transaction Server controls the destination station, the files will not be printed automatically. If you want the output to be printed at a Transaction Server station, you must assign the DESTINATION file attribute to the desired station. You can assign this file attribute for a particular file, or you can assign a default DESTINATION value as a part of the PRINTDEFAULTS task attribute.

For information about remote printing, refer to the *Print System and Remote Print System Administration, Operations, and Programming Guide*.

Using DESTNAME with JOBSUMMARY and JOBSUMMARYTITLE

The DESTNAME task attribute exists only to support legacy printing applications through message control systems (MCSs). DESTNAME cannot be used to generate print requests. However, if DESTNAME is specified to deliver job summaries, the following rules apply:

- The JOBSUMMARY task attribute determines whether a job summary is printed by the Print System and whether one is created for an MCS to print.
- A job summary file is created for each service (Print System or MCS) for which printed output is generated. You can control the name of the job summary file created for the Print System with the JOBSUMMARYTITLE task attribute.
- If no printed output is created and the JOBSUMMARY task attribute is specified, a job summary is created for the Print System. If no printed output is created and the DESTNAME task attribute is specified, a job summary is created for an MCS. If both the DESTNAME and JOBSUMMARYTITLE attributes are set, two files are created. Whether the Print System job summary is printed depends on the setting of the JOBSUMMARY attribute.

For information on the JOBSUMMARY and JOBSUMMARYTITLE task attributes, refer to Section 4 in this manual.

Inheritance

A process inherits the DESTNAME value of its parent.

A process initiated from a MARC or CANDE session inherits the DESTNAME value of the session. If the CANDEDESTNAME usercode attribute is set for a usercode, then MARC and CANDE use this value as the DESTNAME for sessions with that usercode. (For information about setting CANDEDESTNAME, refer to the *Security Administration Guide*.) The DESTNAME value for the current session can be changed using the MARC or CANDE *DESTNAME* command.

Run-Time Errors

BACKUPDESTINATION ATTRIBUTE INCORRECT SYNTAX

An attempt was made to assign DESTNAME a value that was not in title format. (Note that BACKUPDESTINATION is a synonym for DESTNAME.) The current values of DESTNAME and DESTSTATION remain unchanged. The assigning process, unless privileged, is discontinued with HISTORYCAUSE = 2 (PROGRAMCAUSEV) and HISTORYREASON = 131 (INCORRECTSYNTAXV).

DESTNAME ATTRIBUTE IS READ ONLY ON ACTIVE TASK

An attempt was made to assign DESTNAME for an in-use process. The assigning process, if it is nonprivileged, is discontinued with HISTORYCAUSE = 2 (PROGRAMCAUSEV) and HISTORYREASON = 33 (READONLYONACTIVEV).

INVALID DESTINATION

The process was initiated with a DESTNAME value that does not correspond to any existing station or pseudostation. Note that no error is given for assigning such a DESTNAME value to a task variable. When the assignment is first made, DESTNAME is changed to the requested value and DESTSTATION is changed to zero. When the task variable is later used to initiate a process, the new process suffers the error. The process is discontinued with HISTORYCAUSE = 2 (PROGRAMCAUSEV) and HISTORYREASON = 46 (BADTASKATTRIBUTEV). The INVALIDDESTINATION error message can also be displayed for a bad DESTSTATION task attribute assignment; refer to the description of the DESTSTATION task attribute.

UNABLE TO OBTAIN STATION NAME

An attempt was made to read DESTNAME when DESTNAME was set to the name of a nonexistent station. This error is not fatal.

DESTSTATION

Type	Integer
Units	Not applicable
Range	Valid LSNs
Default	0
Read Time	Anytime
Write Time	Before initiation
Inheritance	See below
Fork() Inheritance	From parent
Overwrite Rules	Standard
Host Services	Supported
Attribute Number	46
Synonym	None
Restrictions	None

Explanation

The DESTSTATION task attribute specifies a destination station for printer or punch output created by the process. This attribute is useful at sites where some of the printers are connected to data comm lines.

DESTSTATION serves the same purpose as the DESTNAME task attribute. The difference is that DESTSTATION specifies the logical station number (LSN) of the destination station rather than the station name. Assigning a valid LSN to DESTSTATION causes DESTNAME to be updated with the corresponding station name. Similarly, assigning a valid station name to DESTNAME causes DESTSTATION to receive the corresponding LSN.

DESTSTATION can be set to the LSN of any station on the system or to 0. If DESTSTATION is 0, there is no destination station for the process. In that case, other factors, such as the default printer pool definition, determine the routing of printer and punch files.

Inheritance

A process inherits its parent's DESTSTATION value. A process initiated from a MARC or CANDE session inherits the DESTNAME value of the session, and this DESTNAME, in turn, determines the DESTSTATION value.

Run-Time Errors

DATACOMM MUST BE ACTIVE TO SET DESTSTATION

An attempt was made to set DESTSTATION to a nonzero value while the number of data comm users was zero. The assigning process, if nonprivileged, is discontinued with HISTORYCAUSE = 2 (PROGRAMCAUSEV) and HISTORYREASON = 134 (DATACOMMNOTACTIVEV).

DESTSTATION ATTRIBUTE IS READ ONLY ON ACTIVE TASK

An attempt was made to assign DESTSTATION for an in-use process. The assigning process, if nonprivileged, is discontinued with HISTORYCAUSE = 2 (PROGRAMCAUSEV) and HISTORYREASON = 33 (READONLYONACTIVEV).

INVALID DESTINATION

An attempt was made to set DESTSTATION to a value that is not a valid LSN. The DESTSTATION value is set to zero, and the DESTNAME value remains unchanged. The assigning process, if nonprivileged, is discontinued with HISTORYCAUSE = 2 (PROGRAMCAUSEV) and HISTORYREASON = 133 (INVALIDLSNV). The INVALID DESTINATION error message can also result indirectly from a bad DESTNAME task attribute assignment; refer to the description of the DESTNAME task attribute.

DISPLAYONLYTOMCS

Type	Boolean
Units	Not applicable
Range	TRUE, FALSE
Default	FALSE
Read Time	Anytime
Write Time	Anytime
Inheritance	See below
Fork() Inheritance	From parent
Overwrite Rules	Object code file dominant
Host Services	Not supported
Attribute Number	103
Synonym	None
Restrictions	None

Explanation

The DISPLAYONLYTOMCS task attribute specifies whether any DISPLAY messages created by the process are included in the system messages. The operator can use the MSG (Display Messages) system command to list recent system messages.

If a process was not created from an MCS session, DISPLAY messages appear in the MSG command output, regardless of the setting of DISPLAYONLYTOMCS.

If a process was initiated from an MCS session and DISPLAYONLYTOMCS is FALSE, then DISPLAY messages appear in the MSG command output, as well as at the session that initiated the process. If a process was initiated from an MCS session and DISPLAYONLYTOMCS is TRUE, then DISPLAY messages appear only at the session that initiated the process. A DISPLAYONLYTOMCS value of TRUE allows a process to communicate with an end user without distracting the operator.

The ?MSG command in CANDE displays messages regardless of the value of DISPLAYONLYTOMCS. Further, the MSG ALL and MSG FULL forms of the MSG (Display Messages) system command display messages regardless of the value of DISPLAYONLYTOMCS.

The DISPLAYONLYTOMCS task attribute does not affect the logging of DISPLAY messages in either the job log or the system log. DISPLAY messages will be included in these logs unless the operator has used selective logging features to suppress the logging of DISPLAY messages. (For a description of selective logging features, refer to the *Security Administration Guide*.)

For information about DISPLAY messages, refer to the discussion of tasking from interactive sources in the *Task Management Programming Guide.*

The system also provides methods for suppressing other types of messages. These methods include

- The SUPPRESSWARNING task attribute (discussed in this manual) and SUPPRESSWARNING system command (discussed in the *System Commands Operations Reference Manual).*
- The MSC SUPPRESS form of the MSC command, which is discussed in the *MCP/AS Menu-Assisted Resource Control (MARC) Operations Guide*.

Inheritance

The value of DISPLAYONLYTOMCS is not inherited from the parent process.

CANDE supports several methods of providing default values for the DISPLAYONLYTOMCS task attribute. The ?OP DISPLAYONLYTOMCS control option provides a default setting for the DISPLAYONLYTOMCS session option, for example:

To cause DISPLAYONLYTOMCS to default to . . .	**Enter . . .**
TRUE	?OP + DISPLAYONLYTOMCS
FALSE	?OP – DISPLAYONLYTOMCS

The ?SO and ?RO user commands override the previous setting and establish a default DISPLAYONLYTOMCS value for all processes initiated from the current CANDE session, for example:

To establish a default of . . .	**Enter . . .**
TRUE	?SO DISPLAYONLYTOMCS
FALSE	?RO DISPLAYONLYTOMCS

ELAPSEDLIMIT

Type	Real
Units	Seconds
Range	0 to about 4.31E+68 = 4.31*10 exp 68
Default	0 (no limit)
Read Time	Anytime
Write Time	Anytime
Inheritance	See below
Fork() Inheritance	From parent
Overwrite Rules	Standard
Host Services	Supported
Attribute Number	57
Synonym	None
Restrictions	None

Explanation

The ELAPSEDLIMIT task attribute specifies the maximum elapsed time for a process. If the ELAPSEDTIME task attribute value reaches the same value as ELAPSEDLIMIT, the process is discontinued. Refer to the ELAPSEDTIME task attribute description for details.

Inheritance

Although ELAPSEDLIMIT is not inherited from the parent, the ELAPSEDLIMIT value of a process indirectly limits the elapsed time for all its descendants. This is true because when a process terminates, any in-use descendants of that process are discontinued with a "PARENT PROCESS TERMINATED" error.

If the operator defines a default value for the ELAPSEDLIMIT attribute of a job queue, the value is inherited by WFL jobs run from that job queue. If the operator defines a limit value for the ELAPSEDLIMIT attribute of a job queue, then WFL jobs that specify a greater ELAPSEDLIMIT in the job attribute list are not allowed in that job queue. For an introduction to job queue defaults and limits, refer to the discussion of tasking from programming languages in the *Task Management Programming Guide*.

Run-Time Error

ELAPSED TIME LIMIT EXCEEDED

The process ran for longer than the time specified by ELAPSEDLIMIT. The process is discontinued with HISTORYCAUSE = 3 (RESOURCECAUSEV) and HISTORYREASON = 10 (ELAPSEDEXCEEDEDV).

ELAPSEDTIME

Type	Real
Units	See below
Range	0 to about 4.31E+68 = 4.31*10 exp 68
Default	None
Read Time	Anytime
Write Time	Never
Inheritance	None
Fork() Inheritance	None
Overwrite Rules	None (read-only)
Host Services	Supported
Attribute Number	15
Synonym	None
Restrictions	None

Explanation

The ELAPSEDTIME task attribute records the total amount of time that has passed since the initiation of the process. The process is discontinued if the value of the ELAPSEDTIME task attribute reaches the same value as the ELAPSEDLIMIT task attribute. Refer to the ELAPSEDLIMIT description for details.

The ELAPSEDTIME value is unaffected by any DR (Date Reset) or TR (Time Reset) system commands entered while the process is in use. However, the ELAPSEDTIME value of a WFL job is set to zero when the job is restarted after a halt/load.

If ELAPSEDTIME is accessed through Host Services, bit 47 will always be 0 (zero).

Units

When accessed from WFL, the ELAPSEDTIME value is expressed in units of seconds. When accessed from other languages, the value is expressed in units of 2.4 microseconds.

ERROR

Type	Real (string in WFL)
Units	Not applicable
Range	See "Explanation" below
Default	0
Read Time	Anytime
Write Time	Never
Inheritance	None
Fork() Inheritance	From parent
Overwrite Rules	None (read only)
Host Services	Not supported
Attribute Number	25
Synonym	TASKATTERR
Restrictions	None

Explanation

The ERROR task attribute indicates whether an error resulted from the most recent attempt to access a task attribute of this process. If an error did result, the ERROR value also indicates which task attribute was being accessed.

If read in WFL, the ERROR task attribute returns a string value. If the most recent task attribute access had an error, then the string is the name of the task attribute that was being accessed. If the most recent task attribute access did not cause an error, the ERROR task attribute returns a null string.

If read in other languages, the ERROR task attribute returns a real value. If the most recent task attribute access caused an error, the ERROR value is the negative of the attribute number of the attribute in error. (The USERCODE task attribute is an exception, as discussed in the following table.) If the most recent task attribute access did not cause an error, the ERROR value is 0 (zero).

The ERROR value has the following fields, which can be accessed at the bit level:

Field	Meaning
[46:01]	If set, the last task attribute access caused an error, and the remaining fields of the word are used. Otherwise, the last task attribute access did not cause an error, and the remaining fields of the word are *not* used.
[27:20]	If the last attribute to be assigned was the USERCODE attribute, then this field contains a USERDATA error code. For a list of the most common USERDATA errors that can be stored in this field, refer to Table 3–1, "USERDATA Errors." For a complete list, and general information about USERDATA errors, refer to the *Security Administration Guide*. If the last attribute to be assigned was *not* the USERCODE attribute, then this field stores an error code in one of the following ranges of numbers: 1 through 999. Such an error code corresponds to the HISTORYREASON task attribute value. For an explanation of values in this range, refer to the HISTORYREASON task attribute description. 1000 or greater. Such an error code corresponds to the HANDLEATTRIBUTES error number. For an explanation of values in this range, refer to Table 1–1, "HANDLEATTRIBUTES Error Numbers."
[07:08]	If the task attribute most recently assigned was FILECARDS, then this field stores the number of the file attribute that was assigned incorrectly. For a list of file attributes ordered by number, refer to the relevant appendix of the *File Attributes Programming Reference Manual*. If the task attribute most recently assigned was LIBRARY, then this field stores the number of the library attribute that was assigned incorrectly. For a list of the possible values and the corresponding LIBRARY attributes, refer to Table 3–2, "Library Attributes by Number." If the task attribute most recently accessed was neither FILECARDS nor LIBRARY, then this field stores the number of the task attribute that was most recently accessed. The task attributes are listed by number in Table 3–3, "Task Attributes by Number."

For details about how to access these fields, refer to "Accessing Task Attributes at the Bit Level" in Section 1, "Accessing Task Attributes."

The value of the ERROR task attribute is automatically erased when the task attribute is read by any process. Most MCSs read this task attribute for processes initiated from sessions. Therefore, if you initiate a process from a session, you can expect the ERROR task attribute to be blank even if a task attribute error has occurred.

In a memory dump or a program dump, you might see an ERROR value even though no task attribute error occurred. This occurs because the ERROR task attribute contains the attribute number of the task attribute most recently assigned, even if no error occurred. In addition, the ERROR value is used by the system software as scratch storage while a job is being restarted. Both these types of values are visible only in dumps; a program that reads the task attribute finds a value of 0.

For more information about task attribute errors, refer to "Task Attribute Errors" in Section 1, "Accessing Task Attributes."

Table 3–1 lists and defines the USERDATA error numbers that can occur in field [27:20] of the ERROR task attribute value.

Table 3–1. USERDATA Errors

Error Code	Definition
8	No *SYSTEM/USERDATA file present.
9	No entry exists with the requested usercode.
10	The password supplied was invalid, or none was supplied when one was required.
16	This usercode is not a viable usercode; its entry has no system node.
17	This usercode has been marked SUSPENDED.
35	The usercode/password syntax was incorrect.
36	No usercode was specified.
45	The password has expired.
51	The password associated with the usercode has expired, and ENFORCEEXPIREDPW is true for the usercode.

Table 3–2 lists the library attribute numbers that can occur in field [07:08] of the ERROR task attribute value.

Table 3–2. Library Attributes by Number

Number	Name
0	INTNAME
1	TITLE
2	LIBPARAMETER
3	FUNCTIONNAME
4	LIBACCESS
13	CONNECTIONS
14	CHANGE

Table 3–2. Library Attributes by Number

Number	Name
15	APPROVAL
16	SINGLE
17	STATE
18	AUTOLINK
20	DELINKEVENT
21	CLUSAGE

Table 3–3 lists the numbers that can be returned in field [07:08] of the ERROR task attribute value, and the names of the corresponding task attributes. Note that some numbers are intentionally omitted because no task attributes correspond to those numbers.

Table 3–3. Task Attributes by Number

Number	Name
0	NAME
1	MIXNUMBER
2	CORE
3	PRIORITY
4	MAXPROCTIME
5	MAXIOTIME
6	TARGET
7	STACKSIZE
8	USERCODE
9	TASKVALUE
10	HISTORY
11	TYPE
12	STATUS
13	ACCUMPROCTIME
14	ACCUMIOTIME
15	ELAPSEDTIME
16	EXCEPTIONTASK
17	LOCKED
18	STOPPOINT

Table 3–3. Task Attributes by Number

Number	Name
19	PARTNER
20	STATION
21	EXCEPTIONEVENT
22	OPTION
23	VALIDITYBITS
24	FILECARDS
25	ERROR
27	PARTNEREXISTS
28	RESTART
29	BDNAME
30	STACKHISTORY
32	TASKFILE
33	DECKGROUPNO
34	CLASS
37	MYPPB
38	ORGUNIT
39	MAXCARDS
40	MAXLINES
41	JOBNUMBER
42	CHARGE
44	DESTNAME
45	SOURCESTATION
46	DESTSTATION
47	SOURCEKIND
48	RESTARTED
49	MAXWAIT
50	STACKLIMIT
52	FETCH
53	RESOURCE
55	FAMILY
56	WAITLIMIT
57	ELAPSEDLIMIT

Table 3–3. Task Attributes by Number

Number	Name
58	TASKLIMIT
60	TANKING
61	ACCESSCODE
63	BACKUPFAMILY
64	HOSTNAME
66	HISTORYTYPE
67	HISTORYCAUSE
68	HISTORYREASON
70	HSPARAMSIZE
72	ITINERARY
73	DATABASE
74	LIBRARY
78	TIMESTARTED
79	STARTTIME
81	JOBSUMMARY
82	CHECKPOINTABLE
83	BRCLASS
84	SW1
85	SW2
86	SW3
87	SW4
88	SW5
89	SW6
90	SW7
91	SW8
92	INHERITMCSSTATUS
94	TADS
95	LANGUAGE
97	JOBSUMMARYTITLE
98	NOJOBSUMMARYIO
99	PRINTDEFAULTS
100	ACCEPTEVENT

Table 3–3. Task Attributes by Number

Number	Name
101	LIBRARYUSERS
102	AUTOSWITCHTOMARC
103	DISPLAYONLYTOMCS
104	INITPBITCOUNT
105	INITPBITTIME
106	OTHERPBITCOUNT
107	OTHERPBITTIME
108	LIBRARYSTATE
109	TASKWARNINGS
110	SUPPRESSWARNING
111	FILEACCESSRULE
112	SAVEMEMORYLIMIT
113	TASKSTRING
116	APPLYLIST
117	TASKERROR
118	TEMPFILELIMIT
119	TEMPFILEMBYTES
120	CONVENTION
121	SOURCENAME
122	MCSNAME
123	AUTORESTORE
124	DEPTASKACCOUNTING
125	FILEACCOUNTING
126	LABELFORMAT
127	DCIINPUTEVENT
128	DCITASKEVENT
129	AX
130	REALUSERCODE
131	SAVEDUSERCODE
132	GROUPCODE
133	REALGROUPCODE
134	SAVEDGROUPCODE

Table 3–3. Task Attributes by Number

Number	Name
136	NETPATH
137	CURRENTDIRECTORY
138	PRIORHISTORY
139	PRIORHISTORYTYPE
140	PRIORHISTORYCAUSE
141	PRIORHISTORYREASON
142	SUPPLEMENTARYGRPS
143	FILEMASK
144	STATIONNAME
145	PUMPTITLE
146	BLOCKCREDENTIALS
147	CREDENTIALS
148	CREDENTIALSBASE
149	INHERITCREDENTIALS
152	FILEGROUP
153	DEFAULTGROUP
154	DATEOFFSET
155	OPTIONAL
156	REPORTBADINITIATE
157	COUNTRY
158	MPID
159	BOTTIMESTAMP

Run-Time Error

ERROR ATTRIBUTE IS READONLY

An attempt was made to assign a value to the ERROR task attribute. The assigning process, if nonprivileged, is discontinued with HISTORYCAUSE = 2 (PROGRAMCAUSEV) and HISTORYREASON = 9 (ATTREADONLYV).

EXCEPTIONEVENT

Type	Event
Units	Not applicable
Range	HAPPENED, NOT HAPPENED
Default	NOT HAPPENED
Read Time	Anytime
Write Time	See below
Inheritance	None
Fork() Inheritance	Indeterminate; software interrupts remain attached
Overwrite Rules	See below
Host Services	Not supported
Attribute Number	21
Synonym	None
Restrictions	Not available in WFL

Explanation

The EXCEPTIONEVENT task attribute accesses a predeclared event called the *exception event* that is associated with each process. When the STATUS task attribute of a process changes value, the system causes the exception event of the exception task of that process. By default, the parent is the exception task of a dependent process. Therefore, the exception event of the parent is a convenient means of informing the parent when one of its offspring has terminated or otherwise changed status.

The system also causes the exception event of a permanent library or control library whenever the value of the LIBRARYUSERS task attribute changes to zero.

The operator can also cause the exception event of a process by using the HI (Cause EXCEPTIONEVENT) system command.

The EXCEPTIONEVENT task attribute can be used in any ALGOL or COBOL statement that operates on an event. For example, a process can wait on the EXCEPTIONEVENT task attribute or can cause it.

A process can access the exception event of itself or of an ancestor process. The process cannot access the exception event of a descendant, sibling, or cousin process.

For a discussion of exception tasks, ancestors, siblings, cousins, local-parent/remote-task logic and descendants, refer to the *Task Management Programming Guide*.

Write Time

A process can cause or reset the EXCEPTIONEVENT at any time. However, a process can never assign an event variable to EXCEPTIONEVENT. For example, the following ALGOL statement compiles successfully, but produces a run-time error:

```
T.EXCEPTIONEVENT := EVNT;
```

Overwrite Rules

The statements that access EXCEPTIONEVENT can be applied only to an in-use process.

Run-Time Errors

EXCEPTIONEVENT ATTRIBUTE IS READONLY

A process attempted to assign an event variable to the EXCEPTIONEVENT task attribute. The assigning process, if nonprivileged, is discontinued with HISTORYCAUSE = 2 (PROGRAMCAUSEV) and HISTORYREASON = 9 (ATTREADONLYV).

NON-ANCESTRAL TASK REFERENCE

A process attempted to access the exception event of a descendant, sibling, or cousin process. The process, if nonprivileged, is discontinued with HISTORYCAUSE = 2 (PROGRAMCAUSEV) and HISTORYREASON = 130 (NONANCESTRALEXCEPTEVENTV).

EXCEPTIONTASK

Type	Task
Units	Not applicable
Range	See below
Default	See below
Read Time	Anytime
Write Time	Anytime
Inheritance	None
Fork() Inheritance	MYSELF
Overwrite Rules	Standard
Host Services	Not supported
Attribute Number	16
Synonym	None
Restrictions	Not available in WFL

Explanation

The EXCEPTIONTASK task attribute specifies the exception task for a process. When the STATUS task attribute of a process changes value, the system causes the exception event of the exception task for that process. (Note that the "exception task" is not necessarily a task; it could be a job.) A program can use the EXCEPTIONTASK task attribute to assign the process that is to be used as the exception task, or to access task attributes of the exception task.

For further information, refer to the discussion of interprocess relationships in the *Task Management Programming Guide*.

Range

A process can assign any ancestral, sibling, or cousin process as the exception task. Descendant processes cannot be assigned as the exception task. (For a discussion of ancestral, sibling, cousin, and descendant processes, refer to the discussion of interprocess relationships in the *Task Management Programming Guide*.)

An independent process has no exception task. When any process attempts to access the exception task of an independent process, the attempt is treated as a reference to the MYSELF task variable of the accessing process.

For remote tasks, the exception task is always the parent process. No other process can be assigned as the exception task. For information about remote tasks, refer to the discussion of tasking across multihost networks in the *Task Management Programming Guide*.

Default

For a task, the parent is the default exception task. For a job, the job is its own default exception task. For a task initiated by a session, the controlling MCS is the default exception task.

Run-Time Errors

UP LEVEL TASK ASSIGNMENT

An attempt was made to assign a descendant process as the exception task. The assigning process, if nonprivileged, is discontinued with HISTORYCAUSE = 2 and HISTORYREASON = 113.

NON-ANCESTRAL TASK REFERENCE

A sibling or cousin process is assigned as the exception task, and an attempt was made to access the exception event of the exception task using a statement such as "CAUSE (MYSELF.EXCEPTIONTASK.EXCEPTIONEVENT)". The accessing process is discontinued, even if it is privileged, with HISTORYCAUSE= 2 (PROGRAMCAUSEV) and HISTORYREASON = 130 (NONANCESTRALEXCEPTEVENTV).

Section 4
Task Attributes F through K

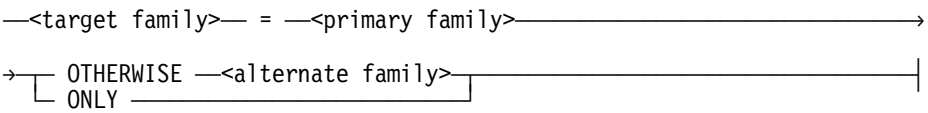
This section contains task attributes starting with the letters F through K.

FAMILY

Type	String
Units	Not applicable
Range	<family specification>
Default	See below
Read Time	Anytime
Write Time	Anytime
Inheritance	See below
Fork() Inheritance	From parent
Overwrite Rules	Object code file dominant
Host Services	Supported
Attribute Number	55
Synonym	None
Restrictions	None

Range

<family specification>



<target family>
<primary family>
<alternate family>

These are each nonquote identifiers.

Explanation

The FAMILY task attribute can assign one or two substitute disk families to be used whenever the process references the target disk family. The substitute families are called the *primary family* and the *alternate family.* The alternate family is optional.

The process searches for and creates files on the substitute families whenever it would have used the target family. The following rules determine whether both substitute families, or only the primary family, are searched:

- When an existing file is being opened or executed, if the file cannot be found on the primary family, the alternate family is searched. If the TITLE file attribute does not include a usercode, then the file is searched for first under the usercode of the process and then as a nonusercoded file on each of the substitute families.

- When a file is being created, or when the file is the subject of a CHANGE, REMOVE, ARCHIVE, SECURITY, or CATALOG statement, only the primary family is searched. The alternate family is not used.
- In the ALTER, MOVE, RESTORE, RESTOREADD, COPY and ADD statements, only the primary family is used for both sources and destinations; the alternate family is not used.

The most typical use of this task attribute is to establish a default family for files that do not have a family specified. Such files default to DISK if the FAMILY task attribute is not used. However, if the FAMILY task attribute is used, and the target family specified is DISK, then such files default to the substitute family in the FAMILY value. The following is an example of a FAMILY value that establishes ORDSPACK as the default family for a process:

```
DISK = ORDSPACK OTHERWISE DISK
```

The target family, primary family, and alternate family must be disk families. TAPE cannot be specified as the name of the target family, primary family, or alternate family.

During process initiation, when the system searches for an object code file to initiate, the system does *not* consult the FAMILY attribute of the new process. Instead, the system consults the NAME attribute of the new process and the FAMILY attribute of the initiator, and applies family substitution if appropriate. This applies mainly if you are writing programs that process external code files.

Note: *The FAMILY attribute has no effect on files that have the SEARCHRULE file attribute set to POSIX. For further information, refer to the descriptions of the SEARCHRULE and PATHNAME file attributes in the* File Attributes Programming Reference Manual. *Refer also to the description of the CURRENTDIRECTORY task attribute later in this section.*

Default

The default FAMILY setting is null, which means that no substitution takes place. The family specified by the TITLE or FAMILYNAME file attribute is used. If no family name is assigned to either of these file attributes, then DISK is used by default.

Inheritance

A process inherits the FAMILY value of its parent.

A process initiated from a MARC or CANDE session inherits the FAMILY value associated with the session. At log-on time, the session receives the FAMILY usercode attribute associated with the usercode in the USERDATAFILE. The session FAMILY can be changed using a MARC or CANDE *FAMILY* command.

If the job attribute list of a WFL job includes a USERCODE assignment, but no FAMILY assignment, then the job inherits any FAMILY usercode attribute that is defined for the usercode in the USERDATAFILE.

If a FAMILY value is assigned to a job queue, that value is inherited by WFL jobs run from that queue. A WFL job is not allowed in a job queue if the job attribute list specifies a FAMILY value different from that of the job queue. However, the job can assign a different FAMILY value after initiation.

Examples

Consider the following ALGOL program, which declares and opens two different disk files:

```
BEGIN
  FILE F(KIND=DISK,DEPENDENTSPECS=TRUE,TITLE="F ON TOOLS.");
  FILE G(KIND=DISK,DEPENDENTSPECS=TRUE);
  OPEN (F);
  OPEN (G);
END.
```

The following WFL statement would run the program and cause it to search for file F on ORDSPACK and then on DISK if necessary, and to search for file G on DISK:

```
RUN OBJECT/FILEOPEN;FAMILY TOOLS = ORDSPACK OTHERWISE DISK;
```

The following WFL statement would run the program and cause it to search for file F on TOOLS and for file G on ORDSPACK, and then on DISK if necessary:

```
RUN OBJECT/FILEOPEN;FAMILY DISK = ORDSPACK OTHERWISE DISK;
```

WFL supports several different syntax forms for assigning the FAMILY task attribute. The syntax using unquoted literals is shown in the preceding two examples. In addition, WFL supports the use of string primaries to specify the family names, and the use of a single string expression to specify the entire FAMILY value. The following are examples of these forms of the FAMILY syntax:

```
STR1 := "DISK";
STR2 := "USERPACK";
STR3 := "SYS41";
RUN OBJECT/PROG;
   FAMILY #STR1 = #STR2 OTHERWISE #STR3;

STR4 := "USERPACK OTHERWISE SYS41";
RUN OBJECT/PROG;
   FAMILY = STR1 & " = " & STR4;
```

Run-Time Errors

FAMILY ATTRIBUTE INCORRECT SYNTAX

An attempt was made to assign FAMILY a value that does not follow the syntax for family specification. The assigning process, if nonprivileged, is discontinued with HISTORYCAUSE = 2 (PROGRAMCAUSEV) and HISTORYREASON = 131 (INCORRECTSYNTAXV).

REQUIRES *PK <family name> <file name

This error occurs if the FAMILY value causes the process to search for a nonexistent family. In this message, <family name> is the name of the family being searched for, and <file name> is the value of the FILENAME attribute of the requested file. > The process waits until an operator takes action. Refer to the *System Operations Guide* for information on how to respond to waiting processes.

FETCH

Type	String
Units	Not applicable
Range	<fetch specification>
Default	Null string
Read Time	Never
Write Time	Before initiation
Inheritance	None
Fork() Inheritance	None
Overwrite Rules	See below
Host Services	Not supported
Attribute Number	52
Synonym	None
Restrictions	Available only in WFL

Range

<fetch specification>

A string of up to 256 EBCDIC characters.

Explanation

The FETCH task attribute stores instructions for the operator. The programmer can assign a string of text to FETCH. The operator can use the PF (Print Fetch) system command to display the FETCH value.

If a WFL job contains a FETCH specification, and the system option NOFETCH is reset, then the job cannot be initiated until the operator enters an OK (Reactivate) system command. The operator can set or reset the NOFETCH system option with the OP (Options) system command.

Overwrite Rules

The FETCH task attribute can be assigned only in the job attribute list in a WFL job. For the syntax of this assignment, refer to the *Work Flow Language (WFL) Programming Reference Manual*.

Example

The following is an example of a WFL job that contains a FETCH specification. This specification asks the operator to mount several tapes before allowing the job to proceed.

```
BEGIN JOB FILEIT;
  FETCH = "THIS JOB NEEDS THREE TAPE DRIVES";
  RUN NIGHTLY/UPDATE;
END JOB
```

FILEACCESSRULE

Type	Mnemonic
Units	Not applicable
Range	See "Explanation" below
Default	DEFAULT
Read Time	Anytime
Write Time	See below
Inheritance	See below
Fork() Inheritance	From parent
Overwrite Rules	Standard
Host Services	Supported
Attribute Number	111
Synonym	None
Restrictions	None

Explanation

The FILEACCESSRULE task attribute specifies whether file access security checking is based on the identity of the process that declares the file or the process that opens the file. This task attribute is relevant only in cases where the declaring process and the opening process are different because a logical file is being shared among processes. For these cases, the value of the FILEACCESSRULE task attribute of the accessing process determines which type of security checking is used.

The following are the possible values and their meanings:

Mnemonic Value	Integer Value	Meaning
DEFAULT	0	This value is synonymous with DECLARER.
ACTOR	1	File access security checking is based on the identity of the process that accesses the file. Only an MCS or a process with privileged status or tasking status can assign this value to FILEACCESSRULE.
DECLARER	2	File access security checking is based on the identity of the process that declares the file.

For a further discussion of file access security, refer to the discussion of shared files in the *Task Management Programming Guide*.

Write Time

The ACTOR value can be assigned only after the process is initiated. The DEFAULT and DECLARER values can be assigned at any time.

Inheritance

A process inherits the FILEACCESSRULE value of its parent.

Run-Time Errors

FILEACCESSRULE ATTRIBUTE INCORRECT SYNTAX

A process attempted to assign FILEACCESSRULE a value not in the possible range of values. The assigning process, if nonprivileged, is discontinued with HISTORYCAUSE = 2 (PROGRAMCAUSEV) and HISTORYREASON = 131 (INCORRECTSYNTAXV).

PRIVILEGED REQUIRED TO SET FILEACCESSRULE = ACTOR

A process that was not an MCS and did not have privileged status or tasking status attempted to assign the FILEACCESSRULE attribute the value ACTOR. The assigning process is discontinued with HISTORYCAUSE = 2 (PROGRAMCAUSEV) and HISTORYREASON = 136 (PRIVILEGEREQUIREDV).

SETTING FILEACCESSRULE TO ACTOR IS RESTRICTED TO ACTIVE TASKS

A process attempted to assign a value of ACTOR to the FILEACCESSRULE task attribute of a task variable that is not in use. This message can also occur if the ACTOR value is assigned through run-time task equation or is inherited from a FILEACCESSRULE assignment in the object code file. This error is nonfatal, but the requested assignment is ignored.

FILEACCOUNTING

Type	Mnemonic
Units	Not applicable
Range	See "Explanation" below
Default	See below
Read Time	Anytime
Write Time	Before initiation
Inheritance	See below
Fork() Inheritance	Set to IDENTIFIED if IDENTIFIED is specified for the parent, the usercode, or the system; otherwise, set to ANONYMOUS
Overwrite Rules	Standard
Host Services	Not supported
Attribute Number	125
Synonym	None
Restrictions	None

Explanation

The FILEACCOUNTING task attribute specifies whether the system should generate log entries when the process opens or closes a file. You can use FILEACCOUNTING to improve overall system performance by reducing the number of log entries the system generates. The best way to achieve this effect is by establishing a system-wide FILEACCOUNTING default, as described later under "Default and Inheritance."

The following are the possible values of FILEACCOUNTING:

Mnemonic Value	Integer Value	Meaning
UNSPECIFIED	0	This value has no effect on logging.
ANONYMOUS	1	The system does not generate Major Type 1, Minor Type 5 (File Open) or Major Type 1, Minor Type 6 (File Close) log entries for this process. The system keeps general statistics on the file usage of the process, and issues a summary of these statistics as the Major Type 1, Minor Type 25 (File Statistics) log entry when the process terminates. However, if the system is enforcing a DEPTASKACCOUNTING value of ANONYMOUS for the process, then at termination time the system does not generate this log entry. Instead, the system adds the file usage statistics of the process to the file usage statistics of the parent. (Refer to the discussion of the DEPTASKACCOUNTING task attribute.)

Mnemonic Value	Integer Value	Meaning
IDENTIFIED	2	The system generates File Open and File Close log entries for this process. The system does not create any File Statistics log entry for the process, nor does it add file statistics for the process to the parent's statistics. Note that an operator can use the LOGGING (Logging Options) system command to prevent logging of any File Open and File Close log entries. In this case, even processes with FILEACCOUNTING = IDENTIFIED do not receive File Open or File Close log entries.

Default and Inheritance

A process inherits the FILEACCOUNTING value of its parent.

The system administrator can use the ACCOUNTING (Resource Accounting) system command to specify a system-wide default for FILEACCOUNTING. The system administrator can also associate a default value with a usercode by including a FILEACCOUNTING usercode attribute in the usercode definition in the USERDATAFILE.

When a process is initiated, the system assigns the FILEACCOUNTING task attribute the maximum of its current value (whether assigned or inherited), the system default value, and the usercode value. The integer values for each FILEACCOUNTING mnemonic were previously listed under the "Explanation" subheading.

For example, suppose that FILEACCOUNTING has a value of ANONYMOUS in the task variable, a value of IDENTIFIED at the system level, and a value of UNSPECIFIED at the usercode level. At initiation time, the process is assigned a FILEACCOUNTING value of IDENTIFIED by the system, because IDENTIFIED has a higher numeric value (2) than ANONYMOUS or UNSPECIFIED.

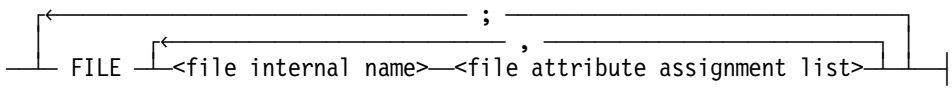
On a system running InfoGuard software with a security class of S2, or with the security option ANONACCOUNTING set to the value NOTOK, the system sets FILEACCOUNTING to IDENTIFIED for all processes when they are initiated. This rule overrides all of the other factors affecting the FILEACCOUNTING value.

FILECARDS

Type	String
Units	Not applicable
Range	<file equation list>
Default	Null string
Read Time	See below
Write Time	Anytime
Inheritance	See below
Fork() Inheritance	From parent
Overwrite Rules	See below
Host Services	Supported
Attribute Number	24
Synonym	FILE
Restrictions	None

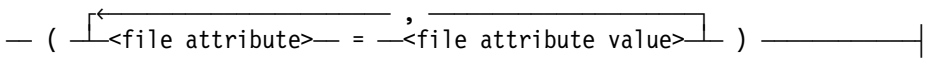
Range

<file equation list>



<file internal name>

<file attribute assignment list>



<file attribute>
<file attribute value>

For descriptions of all the file attributes and the values they can be assigned, refer to the *File Attributes Programming Reference Manual*.

Explanation

The FILECARDS task attribute can be used to assign file attributes to one or more of the files declared by the process. Assignments to the FILECARDS task attribute are sometimes referred to as *file equations*. This task attribute is most frequently assigned by the parent in order to cause a task to use a file different from the one it otherwise would use.

The <file internal name> variable corresponds to the internal name of the file as it is declared in the process. The internal name is the value of the INTNAME file attribute. If INTNAME is not assigned for the file, then it receives the file identifier as its value. The FILENAME file attribute has no effect on the internal name.

Thus, the following ALGOL file declarations both declare files with an internal name of CARD:

```
FILE CARD(FILENAME="INPUT/DATA.");
FILE LINE(INTNAME="CARD.",FILENAME="INPUT/DATA.");
```

If the FILECARDS value assigns attributes to a file that is not declared in the process, no error results, but the file attribute assignments are never used.

The file attributes assigned by FILECARDS are assigned to the logical file the first time the process references the file. A process is said to reference a file whenever it accesses a file attribute or opens a file. The FILECARDS file attribute assignments are merged with those in the file declaration. Where there is a conflict, the values assigned through FILECARDS override those assigned in the declaration. The file attributes assigned by FILECARDS, in turn, can be overridden by file attribute assignment statements later in the process.

FILECARDS can be assigned either before or during process execution. A given FILECARDS assignment has no affect on files that the process has already referenced at the time the FILECARDS assignment is made.

Note that, for a file declared within a procedure, the system creates a new logical file each time the process enters that procedure, and deallocates the logical file each time the process exits the procedure. The system applies the FILECARDS values to the logical file the first time the process references the file after each time the process enters the procedure.

Read Time

The FILECARDS task attribute can be read at any time from ALGOL. However, the value returned is encoded in an internal form that does not resemble the original FILECARDS assignments. The FILECARDS task attribute returns a null value if read from COBOL and cannot be read from WFL at all.

Inheritance

Internal processes inherit the FILECARDS value of the parent.

Overwrite Rules

In ALGOL or COBOL, if the FILECARDS attribute of a task variable is assigned more than once, each assignment is merged with the previous value of the FILECARDS attribute. A file attribute assignment in the existing value is overwritten only in the following cases:

- If the new assignment specifies a different value for the same attribute of the same file.
- If a null string is assigned to FILECARDS. In this case, the FILECARDS value is restored to null.

In WFL, a FILECARDS assignment is generally merged with the existing FILECARDS value for the same task. However, if the same file is affected by two FILECARDS assignments in the same statement, then the file might be affected only by the later FILECARDS assignment. The two sets of FILECARDS assignments to that file are merged only if at least one of the following conditions is true:

- The later FILECARDS assignment includes an asterisk (*)
- The <file internal name> construct in the later FILECARDS assignment is a string primary.

If neither of the preceding conditions is true, then the first of the two FILECARDS assignments in the statement is discarded. Refer to the WFL examples later under this heading.

When a process is initiated, the FILECARDS values given through assignments to the task variable, object code file assignments, and inheritance from the parent are merged into a single FILECARDS value. If these sources assign conflicting values to the same file attribute of the same file, then standard overwrite rules determine which file attribute assignment takes precedence.

Examples

In WFL, the syntax for assigning FILECARDS is distinguished by several special features, which are illustrated in the following example:

```
500 RUN OBJECT/DELTA ON PACK;
600     FILE OUT(KIND=DISK,TITLE=(BARNES)ACCUM/DATA ON ORDSPACK);
700     FILE IN=(JACOB)INPUT/DATA ON ORDSPACK;
800     FILECARDS CARD(KIND=READER);
```

The RUN statement at line 500 initiates a task. The statements at lines 600, 700, and 800 are all assignments to the FILECARDS attribute of that task. Although FILECARDS is a string-valued task attribute, in WFL the FILECARDS value is not enclosed in quotation marks ("). The assignment at line 600 shows how multiple file attributes can be assigned to the same file. The assignment at line 700 shows an abbreviated syntax that can be used if TITLE is the only attribute being assigned to a file. Line 800 shows the same syntax as line 600, except that FILECARDS is used instead of its synonym FILE.

The following example demonstrates how repeated FILECARDS assignments are handled in WFL. The comments within the example explain the effects of each assignment.

```
TASK T(FILE OUTFILE(KIND=READER,NEWFILE=TRUE,PROTECTION=SAVE));
% File OUTFILE receives all three file attribute assignments because
% they are all part of a single FILECARDS assignment

T(FILE OUTFILE(TITLE=A/B), FILE OUTFILE(KIND=DISK),
       FILE SOURCE(KIND=TAPE), FILE SOURCE(*,TITLE=A/B));
% The second OUTFILE assignment overrides the first one, while the
% second SOURCE assignment is merged with the first one because of
% the asterisk.  The resulting task assignment is equivalent to:
% (FILE OUTFILE(KIND=DISK), FILE SOURCE(KIND=TAPE,TITLE=A/B))
% However, this task assignment is merged with the FILECARDS
% assignment in the TASK T declaration, with the following result:
% (FILE OUTFILE(KIND=DISK,NEWFILE=TRUE,PROTECTION=SAVE),
%  FILE SOURCE(KIND=TAPE,TITLE=A/B));

RUN OBJECT/TEST [T];
   FILE OUTFILE(TITLE=OTHERDATA);
   FILE OUTFILE(*,SECURITYTYPE=PUBLIC);
% The second OUTFILE assignment is merged with the first, because of
% the *.  Then the result is merged with the previous assignments to
% the task variable, for the following combined effect:
% (FILE OUTFILE(KIND=DISK,NEWFILE=TRUE,PROTECTION=SAVE,TITLE=OTHERDATA,
%  SECURITYTYPE=PUBLIC), FILE SOURCE(KIND=TAPE,TITLE=A/B);
```

The CANDE and MARC syntaxes for assigning FILECARDS are the same as the WFL syntax, except that FILECARDS must be referred to by its synonym, FILE.

The ALGOL syntax for assigning FILECARDS also differs from that used to assign other string-valued task attributes. The value is terminated by 48"00" instead of by a period (.). The following is an example:

```
REPLACE CTASK.FILECARDS BY
   "FILE CARD (KIND=DISK, TITLE=ALGOL/TASK);"
   "FILE CODE (KIND=DISK, TITLE=OBJECT/ALGOL/TASK);" 48"00";
```

The following ALGOL statement resets the FILECARDS value to a null string:

```
REPLACE T.FILECARDS BY 48"00" ;
```

The following COBOL74 or COBOL85 statements assign attributes to two files. The second assignment does not overwrite the first assignment, but rather is merged with it:

```
CHANGE ATTRIBUTE FILECARDS OF TASK-VAR-1 TO
   "FILE CARD(KIND=DISK,TITLE=JUNK/JUNK);".
CHANGE ATTRIBUTE FILECARDS OF TASK-VAR-1 TO
   "FILE LINE(KIND=DISK,TITLE=JUNK/JUNK3);".
```

Run-Time Errors

FILECARDS ATTRIBUTE IS READONLY ON ACTIVE TASK

An attempt was made to assign the FILECARDS value of an in-use process. The assigning process, if nonprivileged, is discontinued with HISTORYCAUSE = 2 (PROGRAMCAUSEV) and HISTORYREASON = 33 (READONLYONACTIVEV).

FILECARDS ATTRIBUTE INCORRECT SYNTAX

There were one or more syntax errors in the file attribute assignments in the FILECARDS value. The assigning process, if nonprivileged, is discontinued with HISTORYCAUSE = 2 (PROGRAMCAUSEV) and HISTORYREASON = 131 (INCORRECTSYNTAXV).

FILEGROUP

Type	String
Units	Not applicable
Range	<Simple Name>
Default	Null string
Read Time	Anytime
Write Time	Anytime
Inheritance	See below
Overwrite Rules	See below
Host Services	Supported
Attribute Number	152
Synonym	None
Restrictions	None

Explanation

The FILEGROUP task attribute specifies the default group name to be assigned to the GROUP file attribute of any newly created disk files that are owned by the task. The FILEGROUP attribute can be set on the task or in the USERDATAFILE entry for a user. The value set on the task always takes precedence over any value set in the USERDATAFILE for the USERCODE associated with the task. Explicit assignment on the file always takes precedence over any default value set on the task or assigned from the USERDATAFILE.

Setting the FILEGROUP attribute to "." deletes the value set on the task and restores the default setting from the USERDATAFILE (if set).

Interrogating the FILEGROUP attribute only returns the value set on the task. The FILEGROUP attribute set for the user is not returned by this task attribute. Use the DEFAULTGROUP task attribute to determine the "effective" FILEGROUP value associated with the task. Refer to the DEFAULTFILEGROUP task attribute description for more information.

Setting the FILEGROUP attribute to 48"00" causes both the FILEGROUP value assigned to the task and the task's FILEGROUP value assigned from the USERDATAFILE to be deleted. This can be used to disable any default group assignment by the task.

Inheritance

The FILEGROUP attribute set on the task is inherited from the parent if not set on the child task.

The FILEGROUP attribute associated with the USERCODE follows inheritance of the USERCODE attribute. That is, if the USERCODE attribute of a task is inherited from the

parent, then the task also inherits the user's setting for the FILEGROUP attribute if it is set in the parent task. If the user's FILEGROUP value is not set on the parent task, then any user FILEGROUP value for the child task is deleted.

When the USERCODE attribute of a task is changed, the task's FILEGROUP value associated with the user is changed to the value associated with the new usercode. For task-to-task assignment of the USERCODE attribute, the value is assigned from the source task variable. For string assignment of the USERCODE attribute, the value is assigned from the USERDATAFILE. In either case, if the value is not set for the new USERCODE, the user FILEGROUP value for the task is deleted. If the USERCODE attribute of the task is set to ".", then the user FILEGROUP value for the task is deleted. The FILEGROUP value assigned to the task is unaffected by changes to the USERCODE attribute.

FILEMASK

Type	Real
Units	Not applicable
Range	0 to (2**9) - 1
Default	0
Read Time	Anytime
Write Time	Anytime
Inheritance	From parent
Fork() Inheritance	From parent
Overwrite Rules	Standard
Host Services	Supported
Attribute Number	143
Synonym	None
Restrictions	None

Explanation

The FILEMASK task attribute is used in conjunction with the SECURITYMODE file attribute to control the security of newly created disk files. FILEMASK and SECURITYMODE are related as follows:

- Any bits that are set to 1 in the FILEMASK task attribute cause the corresponding bits to be set to 0 in the SECURITYMODE attribute when a disk file is created by the process. Note that this effect is stronger than establishing a default. Bits that are set in the FILEMASK value override even SECURITYMODE bits that were previously set by file attribute assignments in effect when creating the file.
- Any bits that are set to 0 in the FILEMASK task attribute have no effect on the corresponding bits of the SECURITYMODE attribute.

The following are the effects of the individual bits in the FILEMASK value:

Field	Meaning if Set to 1
[47:39]	Field reserved for future use.
[08:01]	Prevents the owner from reading the file.
[07:01]	Prevents the owner from writing to the file.
[06:01]	Prevents the owner from executing the file.
[05:01]	Prevents group members from reading the file.
[04:01]	Prevents group members from writing to the file.
[03:01]	Prevents group members from executing the file.
[02:01]	Prevents other users from reading the file.
[01:01]	Prevents other users from writing to the file.
[00:01]	Prevents other users from executing the file.

This task attribute has no effect on the security of existing files.

For details about the SECURITYMODE file attribute, refer to the *I/O Subsystem Programming Guide* and the *File Attributes Programming Reference Manual*.

Example

The following ALGOL statement sets all of the bits in the task's FILEMASK attribute.

```
MYSELF.FILEMASK := REAL (NOT FALSE);
```

The preceding statement causes all the file permission bits of the SECURITYMODE file attribute to be set to 0 when the file is created.

GROUPCODE

Type	String
Units	Not applicable
Range	<usercode assignment>
Default	Null string
Read Time	Anytime
Write Time	Never
Inheritance	See below
Fork() Inheritance	From parent
Overwrite Rules	None (read-only)
Host Services	Supported
Attribute Number	132
Synonym	None
Restrictions	None

Explanation and Inheritance

The GROUPCODE task attribute is a read-only attribute that specifies the group code of the process. Group codes play the following roles in system security:

- Group codes affect the file access rights accorded to processes. The SECURITYMODE file attribute specifies file access rights for processes whose GROUPCODE or SUPPLEMENTARYGRPS values match the GROUP attribute of a file.
- Group codes help control access rights for signals and semaphores, which are described in the *POSIX User's Guide.*

When a process is initiated from a CANDE or MARC session, the GROUPCODE task attribute inherits the value of the GROUPCODE usercode attribute associated with the usercode of the process.

Similarly, whenever a WFL job is initiated, the GROUPCODE task attribute inherits the value of the GROUPCODE usercode attribute associated with the usercode of the job.

For library processes initiated by the library linkage mechanism, GROUPCODE inherits the GROUPCODE value of the process that is linking to the library.

Any process that inherits the USERCODE attribute from the parent also inherits the GROUPCODE attribute from the parent.

If the SETGROUPCODE subattribute of the SECURITYMODE attribute of the code file was set, then

- The initial GROUPCODE value is taken from the GROUP attribute of the code file. A copy of the initial GROUPCODE value is stored in the SAVEDGROUPCODE task attribute. A copy of the GROUPCODE value the process would have received from the initiating process is stored in the REALGROUPCODE task attribute. A process can use various functions to toggle the GROUPCODE attribute value between the values stored in the REALGROUPCODE and SAVEDGROUPCODE task attributes. For further information about toggling between the real and saved group codes, refer to the discussion of process identities in the *Task Management Programming Guide*.
- The system nulls the GROUPCODE value in the task variable when the process terminates.

If a process is initiated with a different USERCODE value than the parent, or if the process is assigned a different USERCODE value after being initiated, then the system automatically updates the GROUPCODE task attribute value in one of the following ways:

- If USERCODE is assigned the USERCODE value of another task variable, the system updates the GROUPCODE value with the GROUPCODE of the other task variable.

  For example, suppose the following statement is used:

  ```
  REPLACE MYSELF.USERCODE BY TVAR.USERCODE;
  ```

  In this case, the system copies the value from TVAR.GROUPCODE to MYSELF.GROUPCODE.

- If USERCODE is assigned in any other way, the system updates the GROUPCODE task attribute with the value of the GROUPCODE usercode attribute for the new usercode. For example, suppose the following statement is used:

  ```
  REPLACE MYSELF.USERCODE BY "REXP/MYPASS.";
  ```

  In this case, the system examines the REXP usercode definition in the USERDATAFILE, and copies the value of the GROUPCODE usercode attribute to MYSELF.GROUPCODE.

HISTORY

Type	Real
Units	Not applicable
Range	See "Explanation" below
Default	0
Read Time	Anytime
Write Time	Never
Inheritance	None
Fork() Inheritance	None
Overwrite Rules	None (read-only)
Host Services	Not supported
Attribute Number	10
Synonym	None
Restrictions	None

Explanation

The HISTORY task attribute records the type of termination a process had, and if termination were abnormal, it stores information about why the abnormal termination occurred. The HISTORY value is divided into the following fields:

Field	Meaning
[47:01]	The operating system sometimes sets this bit for internal purposes.
[46:01]	If this bit is set, and field [07:08] stores a value of 4, then process initiation failed.
[45:01]	If this bit is set, the process cannot be discontinued.
[44:01]	This bit indicates a DS not trappable by TRY error-handling code unless the PROTECTED option is set. For more information about the TRY statement, refer to the *Task Management Programming Guide*.
[43:20]	The operating system sometimes stores information in this field for internal purposes.
[23:08]	If the process was discontinued or is suspended, this field stores the specific reason. This field corresponds to the value of the HISTORYREASON task attribute. Refer to the HISTORYREASON description for details.
[15:08]	If this process was discontinued or is suspended, this field stores the general reason. This field corresponds to the value of the HISTORYCAUSE task attribute. Refer to the HISTORYCAUSE description for details.
[07:08]	This field stores information about the process state. If the process has terminated, this field also records the general type of termination. This field corresponds to the value of the HISTORYTYPE task attribute. Refer to the HISTORYTYPE description for details.

For details about how to access these fields, refer to "Accessing Task Attributes at the Bit Level" in Section 1.

HISTORYCAUSE

Type	Mnemonic
Units	Not applicable
Range	See "Explanation" below
Default	0
Read Time	Anytime
Write Time	Never
Inheritance	None
Fork() Inheritance	None
Overwrite Rules	None (read-only)
Host Services	Supported
Attribute Number	67
Synonym	None
Restrictions	None

Explanation

The HISTORYCAUSE task attribute specifies what general type of condition caused the process to terminate abnormally or to suspend. The HISTORYCAUSE value is the same as field [15:08] of the HISTORY task attribute.

If the process did not terminate abnormally and is not suspended, the HISTORYCAUSE value is 0. No mnemonic is associated with this value.

If the process terminated abnormally, then the HISTORYTYPE value is DSEDV, and the following are the possible HISTORYCAUSE values and their meanings:

Mnemonic Value	Integer Value	Meaning
(none)	0	The process has not been initiated, is still in use, or terminated normally.
OPERATORCAUSEV	1	The process was discontinued by a system command such as DS (Discontinue).
PROGRAMCAUSEV	2	The process was deliberately terminated for one of the following reasons: • A value of TERMINATED was programmatically assigned to the STATUS task attribute. • The process attempted an action that is not allowed by the operating system.
RESOURCECAUSEV	3	The process was terminated for exceeding a resource limit, such as MAXPROCTIME or MAXIOTIME.

Mnemonic Value	Integer Value	Meaning
FAULTCAUSEV	4	The process was terminated because it requested a machine operation that could not be executed, such as dividing by zero or reading past the end of an array.
SYSTEMCAUSEV	5	The process was terminated because it violated a system parameter, such as overlay row size or the amount of memory allowed.
DCERRCAUSEV or DCERRV	6	The process was terminated because of a data comm error.
IOERRCAUSEV or IOERRV	7	The process was terminated because of a physical I/O error.
SOFTIOERRCAUSEV or SOFTIOERRV	8	The process was terminated because of a logical I/O error.
NEWIOERRCAUSEV or NEWIOERRV	9	The process was terminated because of an error in opening a file.
UNIMPLEMENTEDCAUSEV or UNIMPLEMENTEDV	10	The process was terminated because it attempted to use a feature that has not been implemented.
UNSPECIFIEDCAUSEV	11	The process was terminated because of an error of an unknown type.
EBDMSERRCAUSEV or EBDMSERRV	12	The process was terminated because of a Data Management System II (DMSII) error.
NETWORKCAUSEV	13	The process was terminated because of a BNA-related error. For example, the process might have failed initiation because of a missing host or a missing object code file on a remote host.
SOFTIOERR2CAUSEV or SOFTIOERR2V	14	The process was terminated because of a logical I/O error.

If the process is suspended, then the HISTORYTYPE value is STEDV, and the following are the possible HISTORYCAUSE values and their meanings:

Mnemonic Value	Integer Value	Meaning
OPERATORCAUSEV	1	The process was suspended by the ST (Stop) system command.
PROGRAMCAUSEV	2	The process was suspended for one of the following reasons: • A resource needed by the process is missing. • The STATUS task attribute was programmatically assigned a value of SUSPENDED.

Mnemonic Value	Integer Value	Meaning
SYSTEMCAUSEV	5	The process was suspended because of a shortage of available memory.
NETWORKCAUSEV	13	The process was suspended because of a BNA condition.

For a list of process termination messages and their relationship to HISTORYCAUSE values, refer to the discussion of process history in the *Task Management Programming Guide*.

HISTORYREASON

Type	Mnemonic
Units	Not applicable
Range	See "Explanation" below
Default	0
Read Time	Anytime
Write Time	Never
Inheritance	None
Fork() Inheritance	None
Overwrite Rules	None (read-only)
Host Services	Supported
Attribute Number	68
Synonym	None
Restrictions	Not available in WFL; however, for a description of how to extract the same information from the HISTORY task attribute, refer to "Accessing Task Attributes at the Bit Level" in Section 1.

Explanation

The HISTORYREASON task attribute indicates the specific reason why a process terminated abnormally, failed to initiate or was suspended. The HISTORYREASON value corresponds to field [23:08] of the HISTORY task attribute.

Most HISTORYREASON integer values have mnemonics associated with them. Each mnemonic briefly describes one reason this HISTORYREASON integer value could have occurred. You can determine which mnemonic applies in a particular case by using the HISTORYREASON integer value with the HISTORYTYPE and HISTORYCAUSE values.

If the process did not terminate abnormally and is not suspended, the HISTORYREASON value is 0. No mnemonic is associated with this value.

One standard method of reading mnemonic-valued task attributes might yield confusing results if applied to HISTORYREASON. The following is an ALGOL example of this method:

```
IF T.HISTORYREASON = VALUE(DIVIDEBYZEROV) THEN ...
```

The mnemonic DIVIDEBYZERO is associated with a HISTORYREASON value of 1. The expression shown in the example evaluates to TRUE whenever HISTORYREASON has a value of 1. However, a HISTORYREASON value of 1 indicates a DIVIDEBYZERO error only if HISTORYTYPE = DSEDV and HISTORYCAUSE = FAULTCAUSEV.

The following is a better method of reading HISTORYREASON. This example evaluates to TRUE only if a DIVIDEBYZERO error occurred:

```
IF T.HISTORYTYPE = VALUE(DSEDV)
   AND T.HISTORYCAUSE = VALUE(FAULTCAUSEV)
   AND T.HISTORYREASON = VALUE(DIVIDEBYZEROV) THEN ...
```

The following pages list the possible HISTORYREASON values for each combination of HISTORYTYPE and HISTORYCAUSE values. For HISTORYREASON values that have mnemonics, the mnemonics are listed under the column heading "Mnemonic Value." For HISTORYREASON values that do not have mnemonics, a short explanatory phrase is listed under the column heading "History Reason (No Mnemonic)."

HISTORYTYPE = 3 (STEDV), HISTORYCAUSE = 1 (OPERATORCAUSEV)

Integer Value	Mnemonic Value
0	(No mnemonic. This value means the ST (Stop) system command was entered from an ODT.)
1	REMOTELYCAUSEDV

HISTORYTYPE = 3 (STEDV), HISTORYCAUSE = 2 (PROGRAMCAUSEV)

Integer Value	Mnemonic Value
1	RESPONSEREQUIRED

HISTORYTYPE = 3 (STEDV), HISTORYCAUSE = 13 (NETWORKCAUSEV)

Integer Value	Mnemonic Value
3	SUSPENDEDV

HISTORYTYPE = 4 (DSEDV), HISTORYCAUSE = 1 (OPERATORCAUSEV)

Integer Value	Mnemonic Value
0	RSVPV
1	CLEARUNITV
2	JUSTDSEDV

HISTORYTYPE = 4 (DSEDV), HISTORYCAUSE = 2 (PROGRAMCAUSEV)

Integer Value	Mnemonic Value
0	MISSINGCODEFILENAMEV
1	MISSINGCODEFILEV
2	ALREADYRUNNINGV
3	INITACTIVETASKV
4	NOEXTERNALRUNV
5	VISITNONACTIVEV
6	ILLEGALVISITV
7	DYNCODEEOFV
8	BADD1STRETCHV
9	ATTREADONLYV
11	NOTSESSIONNUMBERV
12	NONANCESTRALTASKFILEV
13	NOTIMPLEMENTEDV
14	INVALIDCHARGECODEV
15	INCOMPATIBLEBOXESV
18	DEATHINFAMILYV
19	CRITICALBLOCKV
20	BADGOTOV
23	INVALIDPARAMETERV
25	INCOMPATIBLECODEV
26	NOTEXECUTABLEV
27	UNMATCHEDPARAMSV
28	INVCOMPILERVV
29	SECURITYERRORV
30	LIBMAINTV
31	ILLEGALTASKXFERV
32	BADRESIZEDEALLOCV
33	READONLYONACTIVEV
37	MISSINGINTRINSICV
38	INCOMPATIBLELEVELV
39	INFANTICIDEV
40	NOTBOUNDV
41	ILLEGALOWNARRAYV

HISTORYTYPE = 4 (DSEDV), HISTORYCAUSE = 2 (PROGRAMCAUSEV)

Integer Value	Mnemonic Value
42	DIMSIZERRORV
43	UPLEVELATTACHV
44	ILLEGALSWAPV
46	BADTASKATTRIBUTEV
47	MISSINGCARDDECKV
48	BADRESTARTV
49	BADEVENTUSAGEV
50	BADGIVELOCKV
51	BADGETLOCKV
52	ONLYMCSMAYSETV
53	DCKEYINSIZEV
54	ONLYMCSTASKINGV
56	NONOWNERACCESSV
57	COMPILERSONLYV
58	TASKLIMITEXCEEDEDV
59	AXBADARRAYV
60	RUNTIMEWFLV
61	COMPILERERRORV
62	XSPARAMSV
63	SORTKILLV
66	LIBMISSINGNAMEV
68	LIBNOTINITIATEDV
69	CYCLICPROVISIONV
70	PREVIOUSLYFROZENLIBV
71	LIBIMPLEMENTATIONERRORV
73	NONUNIQLIBV
74	SAVELIBTASKNEVERCALLEDV
75	LIBNEVERFROZEV
77	BADLIBTASKV
78	LIBFEATURENOTIMPLEMENTEDV
79	BADCOMPILERINDEXV
80	LIBNOTPROCESSEDORRUNV
82	INVALIDPARAMV

HISTORYTYPE = 4 (DSEDV), HISTORYCAUSE = 2 (PROGRAMCAUSEV)

Integer Value	Mnemonic Value
83	FORTRANERRV
84	PLIRUNTIMEERRV
85	INTRINSICSERRV
86	MATHERRV
87	FORMATERRV
88	LIBDEIMPLEMENTATIONERRORV
89	LIBLEVELINCOMPATIBLEV
90	BADLIBTITLEV
91	CANTLINKTOASYSTEMLIBV
92	NOTASYSTEMLIBV
93	NOTLIBRARYCAPABLEV
94	LISTSERRORV
95	LIBPARENTNOTALIBV
96	HOLDNOTALLOWEDV
97	INVALIDATTVALUEV
98	UNAUTHORIZEDLIBUSEV
99	FOREIGNTASKINITFAILV
100	PORTSERRORV
101	LIBCANCELERRV
102	INVALIDSAVECORELIMITV
103	NONVISTASKFILEV
104	BADINSCRIBEV
105	BADERASEV
106	CLIENTDIEDINACRV
107	BADPOBOXUSAGEV
108	INVALIDSTKNOV
109	BADTCPREQV
110	BYRESTRICTIONV
111	LIBWRONGMARKLEVELV
112	NOINITIATORV
113	UPLEVELTASKASSIGNV
114	FRAMEEXCEEDEDV
115	CODEFILEINCOMPATIBLEWITHMCPV

HISTORYTYPE = 4 (DSEDV), HISTORYCAUSE = 2 (PROGRAMCAUSEV)

Integer Value	Mnemonic Value
116	CODEFILENOTACTIVEV
117	BADPPBV
123	STACKHASFAMILYV
124	FASTTASKFAULTEDV
125	DATABASEDIEDV
126	LIBRARYDIEDV
127	STACKHASUNITATTACHEDV
128	RESTRICTEDACCESSV
129	ATTWRITEONLYV
130	NONANCESTRALEXCEPTEVENTV
131	INCORRECTSYNTAXV
132	ATTACCESSFAULTV
133	INVALIDLSNV
134	DATACOMMNOTACTIVEV
135	VALUETOOLARGEV
136	PRIVILEGEREQUIREDV
137	NONLOCALACCEPTEVENTV
138	INVSCHEDACTV
139	INVTIMESTATV
140	INVREACTIVATEV
141	INVSOURCEV
142	INVDUMPPARAMV
143	INVCPMACTIONV
144	INVPREFACTIONV
145	INVDISCONNECTV
146	INVDESTINATIONV
147	BLOCKHASNOSCWV
148	PRPROVIDERGONEV
149	LIBWRONGCODEFILEV
150	STEPPARENTDIEDV
151	CRITICALSBDESTROYDV
152	BADCLINDEXV
153	BADAPPROVALRSLTV

HISTORYTYPE = 4 (DSEDV), HISTORYCAUSE = 2 (PROGRAMCAUSEV)

Integer Value	Mnemonic Value
154	CHANGEFAULTV
155	APPROVALFAULTV
156	LINKFAILEDV
157	LINKNOTALLOWEDV
158	AUTOLINKERRV
159	CIAINCORRECTSTATEV
160	CIABADPARAMETERV
161	CIABADLEVELSV
162	CIADSEDV
163	CIAUNSUPPORTEDV
164	BADFPBV

HISTORYTYPE = 4 (DSEDV), HISTORYCAUSE = 3 (RESOURCECAUSEV)

Integer Value	Mnemonic Value
0	PROCESSEXCEEDEDV
1	IOEXCEEDEDV
2	STACKEXCEEDEDV
3	PRINTEXCEEDEDV
6	MEMORYEXCEEDEDV
8	TAPEEXCEEDEDV
9	WAITEXCEEDEDV
10	ELAPSEDEXCEEDEDV
12	STRINGPOOLEXCEEDEDV
13	FAMILYSIZEEXCEEDEDV
14	SAVECORELIMITEXCEEDEDV
15	CAUEXCEEDEDV
16	SEGLIMITEXCEEDEDV

HISTORYTYPE = 4 (DSEDV), HISTORYCAUSE = 4 (FAULTCAUSEV)

Integer Value	Mnemonic Value
1	DIVIDEBYZEROV
2	EXPOVERFLOWV
3	EXPUNDERFLOWV
4	INVALIDINDEXV
5	INTEGEROVERFLOWV
6	INACTIVEQV
7	MEMORYPROTECTV
8	INVALIDOPV
9	LOOPV
10	MEMORYPARITYV
11	SCANPARITYV
12	INVALIDADDRESSV
13	STACKOVERFLOWV
14	STRINGPROTECTV
16	FALSEASSERTV
17	SEQUENCEERRORV
18	INVALIDPCWV
19	STACKUNDERFLOWV
21	LIBLINKERRORV
22	INVALIDINTV
23	MEMFAIL1V
26	MEMORYFAIL2V
30	PROCINTERNALV
35	PROCDIEDV
37	BCLPOINTERV
40	DISKPARITYV
41	EMODEVIOLATIONV
42	NOACTIVELINKV
43	PROCLINKPARITYV
45	BOTTOMOFSTACKV
46	RUNLIGHTOUTV
47	STACKSTRUCTUREV
48	BADMSCWV

HISTORYTYPE = 4 (DSEDV), HISTORYCAUSE = 5 (SYSTEMCAUSEV)

Integer Value	Mnemonic Value
1	NOMEMV
2	PARITYONPBITV
3	ARRAYTOOLARGEV
4	INCOMPATIBLEWFLJOBFILEV
8	FORCIBLECLOSEV
	The process was using an object code file or a data file on a disk unit that was closed by the *CLOSE PK <unit number> :DS* form of the CLOSE (Close Pack) system command.
9	SOFTINTERRORV
	The MCP encountered an error while handling software interrupts.
10	APPLICATIONTIMEOUTV
	A registered application failed to check in.

HISTORYTYPE = 4 (DSEDV), HISTORYCAUSE = 6 (DCERRCAUSEV)

Integer Value	History Reason (No Mnemonic)
10	Message size error
12	Unknown file or station
13	File subtraction error

HISTORYTYPE = 4 (DSEDV), HISTORYCAUSE = 7 (IOERRCAUSEV)

Integer Value	History Reason (No Mnemonic)
0	Either a train printer I/O error occurred and could not be resolved, or else the MCP procedure PATHRES did not successfully complete. PATHRES performs functions such as loading disk controller firmware.
6	Direct I/O attribute error

HISTORYTYPE = 4 (DSEDV), HISTORYCAUSE = 8 (SOFTIOERRCAUSEV)

Integer Value	History Reason (No Mnemonic)
0	No error
1	Label parity error
2	Parity error on position

HISTORYTYPE = 4 (DSEDV), HISTORYCAUSE = 8 (SOFTIOERRCAUSEV)

Integer Value	History Reason (No Mnemonic)
3	Invalid translation
4	Incompatible blocking
5	Illegal output reverse
6	Illegal input reverse
7	Short tape blocking
8	Illegal output file
9	No buffer space
10	No space in header
11	Duplicated file
12	Illegal direct I/O
14	Exceeded resources
15	No unit
16	Illegal optional file
17	Illegal final reel
18	Too many names
19	Failed entry
20	Illegal MYUSE value
21	Illegal NEWFILE value
22	DCOPEN failed
23	No write ring
24	Failed volume entry
25	Illegal unlabeled volume
26	Illegal BLOCKSTRUCTURE or FILETYPE
27	Illegal reel number
28	Find routines failed
29	Illegal backward seek
30	Illegal read reverse
31	Illegal seek
32	Parity error on seek
33	Read on output file
34	Read on unopened file
35	Read reverse on unopened file
36	Seek on unopened file

HISTORYTYPE = 4 (DSEDV), HISTORYCAUSE = 8 (SOFTIOERRCAUSEV)

Integer Value	History Reason (No Mnemonic)
37	Space forward on output file
38	Write on code file
39	Write on input file
40	Write on unopened file
41	Buffer in use
42	Up-level event
43	Security error
44	No room for buffer
45	Unknown error
46	Logic error
47	Already closed
48	No read before rewrite
49	No read before delete
50	Delete on non-I/O file
51	Illegal update file
52	Incompatible file organization
53	Close not called
54	File information block (FIB) stack transition error
55	Locking error
56	Kind list not allowed
57	Dialog communication failure with other host
59	File not removed on disk
60	File not cataloged
61	Checkpoint file title not changed
62	Write user label error
63	RELEASEHEADER error
64	Tried to write beyond end of file (EOF)
65	Rewrite on non-I/O file
66	Logical/physical file mismatch
67	Seek on output file
68	Tape position error
69	Distributed systems service (DSS) cannot handle this file
70	Access restricted to APL

HISTORYTYPE = 4 (DSEDV), HISTORYCAUSE = 8 (SOFTIOERRCAUSEV)

Integer Value	History Reason (No Mnemonic)
71	Open after close with lock
72	Illegal write random
73	Illegal read random
74	Not closed
75	Unexpected I/O error
76	Exception in IOHANDLER
77	Cannot link to IOHANDLER
78	Data error
79	Deleted/duplicate record
80	Parity error
81	I/O not done
82	Invalid subfile
83	Broadcast read error
84	Subfile is closed
85	No available buffer
86	No available message
87	Port not connected
88	End of file (EOF)
89	Illegal short block read
90	Break on output
91	Unit in rewind
92	Time limit exceeded
93	File not available
94	No file
95	Mismatched genealogy
96	Mismatched serial number
97	File not resident
98	Pack not present
99	Invalid access code
100	Foreign file open error
101	Port offer error
102	Illegal hostname for foreign file
103	Data might have been lost

HISTORYTYPE = 4 (DSEDV), HISTORYCAUSE = 8 (SOFTIOERRCAUSEV)

Integer Value	History Reason (No Mnemonic)
104	Record count error
105	Block count error
106	Host not reachable
107	Write lockout
108	FRAMESIZE and INTMODE values incompatible
109	Binary I/O not allowed
110	End of page
111	BCL not allowed on this machine
112	No continuation pack for audited file
113	Cannot be audit file
114	I/O error occurred during flushing of buffers
115	Too many backup files
116	Maximum audit length exceeded
117	Unable to position file at end
118	Unsupported function
119	Bad use of use routines
120	Must have usercode to use DSS
121	Invalid port name
122	Requires direct I/O
123	SB must contain a disk/pack unit
124	EIO logic error
125	Invalid array index
126	Incompatible I/O length
127	SIZEVISIBLE/FRAMESIZE/INTMODE value conflict
128	I/O error occurred during closing of file
129	I/O support library error
130	I/O error
131	INQ_LIST allocation failed
132	End file not allowed
133	I/O error changing host control (HC) unit access mask register (AMR)
134	Unsupported protocol type
135	Protocol error
136	No resource to open port

HISTORYTYPE = 4 (DSEDV), HISTORYCAUSE = 8 (SOFTIOERRCAUSEV)

Integer Value	History Reason (No Mnemonic)
137	YOURHOST is not in YOURHOSTGROUP
138	User is not an authorized user of the application group
139	Support library unavailable
140	Error in one or more port-subfiles open operations
141	Error in one or more port-subfiles close operations
142	Incompatible attribute value or values
143	Function not available
144	Unacceptable character set
145	Networking not supported
146	TRANSLATE=FORCESOFT not allowed with binary I/O
147	I/O error clearing adapter or unit
148	Access restrictions not met
149	Cannot create restricted file
150	Security error on output tape open
151	Cannot write on guard file
152	Logical I/O not supported for this type of unit
153	Attribute already set in physical file
154	FAMILYOWNER conflicts with task usercode
155	Illegal I/O to coactive disk
156	Coactive unit not in output mode
157	Incompatible with this MCP version
158	DSS dialogue number too large for logical I/O
159	I/O error occurred during closing of file
160	Tape drive mode change operation failed
161	BYTES is not supported by this unit
162	Random add not allowed unless delete-capable
163	Not delete-capable
164	Record has not been read
165	Beyond extend area
166	Record not locked
167	Record position occupied
168	Sequential write not permitted to EFS direct file
170	Attempt to exceed family limit

HISTORYTYPE = 4 (DSEDV), HISTORYCAUSE = 8 (SOFTIOERRCAUSEV)

Integer Value	History Reason (No Mnemonic)
171	Family integral limit exceeded
172	Attempt to exceed temporary file limit
174	Illegal write option specified
175	Invalid specification of ANYSIZEIO
176	Area length exceeds maximum allowed
177	Logical file INTMODE incompatible with permanent file FRAMESIZE
178	Incompatible FILESTRUCTURE
179	Permanent file FILESTRUCTURE must be STREAM
180	Logical file MAXRECSIZE inconsistent with permanent file MAXRECSIZE
181	Logical file BLOCKSIZE inconsistent with permanent file BLOCKSIZE
182	MAXRECSIZE exceeds AREALENGTH
183	Logical file FRAMESIZE incompatible with permanent file area length
184	Unsupported parameter for this service
185	Local interprocess communication (IPC) not supported for this service
186	Unsupported translation for this service
187	DIOFILESTRUCTURE value requires FILESTRUCTURE to be set
188	Not in proper state for direct I/O to unit EIO
189	Cannot access a file of this FILEKIND
190	Open rejected by correspondent
191	Close rejected by correspondent
192	Endpoint not registered
193	Invalid respond option
194	Service invalid for provider
195	Provider restricted
196	Connect time limit exceeded
197	Correspondent does not support APPLICATIONCONTEXT value
198	Correspondent rejected DEFAULTPCONTEXT value
199	Invalid value or values for DEFINEDPCONTEXTSET
200	Warning—DEFINEDPCONTEXTSET values have changed
201	Warning—port attribute ignored

HISTORYTYPE = 4 (DSEDV), HISTORYCAUSE = 8 (SOFTIOERRCAUSEV)

Integer Value	History Reason (No Mnemonic)
202	Invalid associated data
203	Associated data too long
204	Invalid attribute values for respond
205	Invalid attribute values for AWAITOPEN
206	DEPENDENTSPECS must be TRUE when DIOFILESTRUCTURE=SECTORSTREAM
207	Warning—initiator close collision
208	Warning—responder close collision
209	Endpoint incompatible with service
210	Unsupported primitive
211	Open failure in KEYEDIO library
212	Read reverse is not supported by this unit
213	Specified MAXRECSIZE is not supported by this unit
214	MAXRECSIZE must equal BLOCKSIZE for this unit
215	MCP does not support Enterprise Database Server use of this FILESTRUCTURE
216	Insufficient disk space
217	Operator entered OF (Optional File) system command
218	KEYEDIOII write error occurred
219	Unmatched DIOFILESTRUCTURE value
220	Invalid connect TIMELIMIT value
221	Error encoding data
222	No data available to be read
223	Error on broadcast write
224	No buffer available for write
226	Open data was received
227	Open response data was received
228	Close request data was received
229	Close abort data was received
230	Close response data was received
231	More data to come
232	Fault in use routine
233	Logical file MINRECSIZE inconsistent with permanent file MINRECSIZE

HISTORYTYPE = 4 (DSEDV), HISTORYCAUSE = 8 (SOFTIOERRCAUSEV)

Integer Value	History Reason (No Mnemonic)
233	Logical file MINRECSIZE inconsistent with permanent file MINRECSIZE
234	BASICSERVICE violation
235	Action not valid in this FILESTATE
236	Transparent LOCALSYNTAX cannot be supported for this subfile
237	Open aborted by correspondent
238	Open rejected—transient
241	Requested PROVIDERGROUP not defined
244	Write on read-only file
245	During a file open, either the CENTRALSUPPORT library could not be accessed, or CENTRALSUPPORT reported an error related to CCSVERSION validation, INTMODE/EXTMODE validation, or translation tables availability
248	Operation requires ownership of all available tokens
249	Tape was changed while assigned
250	Word oriented access not supported for KIND=CD
251	NETBIOS name in use
252	Warning: switching between read and write might result in program being discontinued
253	Print System error during backup file open

HISTORYTYPE = 4 (DSEDV), HISTORYCAUSE = 9 (NEWIOERRV)

Integer Value	Mnemonic Value (No Mnemonic)
20	Data error—no label
37	Remote backup disk error
38	Unknown station
39	Invalid set of attributes

HISTORYTYPE = 4 (DSEDV), HISTORYCAUSE = 10 (UNIMPLEMENTEDCAUSEV)

Integer Value	Mnemonic Value
1	DYNAMICOWNARRAYV

HISTORYTYPE = 4 (DSEDV), HISTORYCAUSE = 12 (EBDMSERRCAUSEV)

There are no mnemonics. The possible numeric values correspond to the category numbers for major categories of Enterprise Database Server exceptions and errors. For a list of the major category numbers and their meanings, refer to the *MCP/AS DMSII Application Program Interfaces Programming Guide* or the *MCP/AS DMSII Interpretive Interface Programming Reference Manual*. (Both manuals include the same list of exception and error values.)

HISTORYTYPE = 4 (DSEDV), HISTORYCAUSE = 13 (NETWORKCAUSEV)

Integer Value	Mnemonic Value
1	DISCONNECTEDV
5	HOSTNOTREACHABLEV
12	TASKPROTOCOLERRORV

HISTORYTYPE = 4 (DSEDV), HISTORYCAUSE = 14 (SOFTIOERR2CAUSEV)

Integer Value	History Reason (No Mnemonic)
12	Reopen stopped by TAPEMANAGER
13	Creation stopped by TAPESERVER
14	Library cannot open this file
15	Assignment stopped by TAPEMANAGER
16	X400: All segments of data were not sent
17	Warning: Attempt to purge LOCKEDFILE tape
18	Warning: Attempt to purge write-protected tape
19	Domain name error: Resolver not available
20	Domain name error: Name service not available
21	Domain name error: Name service unreachable
22	TCP: Connection in use
23	KEYEDIOII: Deadlock, deadly embrace
24	KEYEDIOII: Deadlock, timeout
25	Disk address out of range
26	Destination unreachable
27	An open or close error was reported by the IOHANDLER library
28	Invalid specification of BUFFERSHARING
29	File open with exclusive BUFFERSHARING
30	File open without BUFFERSHARING
31	Last I/O before REWRITE or DELETE must be a READ

HISTORYTYPE = 4 (DSEDV), HISTORYCAUSE = 14 (SOFTIOERR2CAUSEV)

Integer Value	History Reason (No Mnemonic)
32	Different length record
33	Port file read failed: Buffer less than a segment
34	Port file read failed: Data length specified exceeds the buffer size
35	Port file read failed: Data length exceeds 63000
36	Port file read failed: All segments were not sent
37	Port file read failed: Segment I/O attribute was not set
38	Open error: UNIQUETOKEN expansion exceeds node size
39	Blocks of both logical and permanent file must be integral number of sectors
40	My application process title not recognized
41	My application process invocation ID not recognized
42	My application entity invocation ID not recognized
43	My application entity qualifier not recognized
44	Your application process title not recognized
45	Your application process invocation ID not recognized
46	Your application entity invocation ID not recognized
47	Your application entity qualifier not recognized
48	Invalid specification of APPEND
49	Random write with APPEND set
50	Attempt to purge unlabelled tape
51	Illegal SEEK option specified
52	Illegal READ option specified
53	Incompatible attributes on OPEN where FILEKIND=FIFO
54	FIFO currently has no readers
55	FIFO in use from this logical file
56	Write to FIFO which has no readers
59	Invalid control value for laser beam printer file
60	File already exists
63	Invalid use of TRUNCATE option
64	Open type incompatible with retained file
65	Open type incompatible with duplicated file
67	EXTMODEs of logical file and physical file incompatible
68	Cannot use file, 'AREAS', 'AREASIZE', or file too large
69	Incompatible FILEUSE specified

HISTORYTYPE = 4 (DSEDV), HISTORYCAUSE = 14 (SOFTIOERR2CAUSEV)

Integer Value	History Reason (No Mnemonic)
70	Incompatible attributes on OPEN where FILEKIND indicates a special file
71	The permanent directory already exists
72	The permanent directory is not empty
73	Name contains too many nodes
74	Name contains invalid character
78	Read/write interrupted by signal
79	Read/write interrupted by signal, process group is orphaned
85	Sequential I/O after reaching EOF
86	Sequential I/O after unsuccessful seek
87	Interrupted by signal during OPEN
89	Incompatible attributes on OPEN where FILEKIND indicates a permanent directory
90	File IDs longer than 17 characters are not allowed for this kind of file
91	The complex translation failed because the array was too small to hold the translated data
92	The complex translation failed because it ran out of source data prematurely
93	The complex input translation (EXTMODE to INTMODE) failed because it is not supported by the CENTRALSUPPORT library
94	The complex output translation (INTMODE to EXTMODE) failed because it is not supported by the CENTRALSUPPORT library
95	An error occurred in the CENTRALSUPPORT library
96	A fault occurred in the CENTRALSUPPORT library
97	The SYSTEM/CCSFILE is not accessible or is missing
98	User-supplied translate tables cannot be used when complex translation is required
99	Complex translation is not allowed or supported for this file
100	Complex characters are not allowed or supported for this file
101	The CENTRALSUPPORT library does not support complex translation for the INTMODE/EXTMODE values provided
102	The target family for the new permanent directory is not present or is not a volumed disk
103	Cannot open a new file on a shared disk family with this share level
104	The file must be input only or output only
106	A value of the EXTDELIMITER attribute was specified that is incompatible with the other attributes of the file

HISTORYTYPE = 4 (DSEDV), HISTORYCAUSE = 14 (SOFTIOERR2CAUSEV)

Integer Value	History Reason (No Mnemonic)
107	An IOHANDLER library did not recognize the version of the INFO array passed to the open routine, and rejected the open
108	The IOHANDLER detected an error in the IOHSTRING parameter set in the virtual file and passed to the IOHANDLER library open procedure
109	The REDIRECTOR IOHANDLER library encountered a protocol error communicating with the server
110	The REDIRECTOR IOHANDLER library could not establish the required NETBIOS session with the server. The address or name of the server is incorrectly specified, the server is offline, or the underlying network software is not working
111	The server responded to the REDIRECTOR negotiate protocol request indicating that it did not support any of the protocols the REDIRECTOR supported
112	The server rejected the credentials supplied during the session setup phase of file open
113	The server rejected the open for capacity reasons
114	The server rejected the share connection requested
115	The file name supplied during the OPEN of a redirected file was invalid for REDIRECTOR
116	The file name supplied during the OPEN of a redirected file indicated that it was formatted as a UNC (Uniform Naming Convention) file name, but was incorrectly formatted
117	The BLOCKSTRUCTURE value for the logical file is incompatible with the BLOCKSTRUCTURE value for the permanent file
119	Library cannot close this file

Examples

Suppose that the following task attributes have the values shown:

```
HISTORYTYPE = 4 (DSEDV)
HISTORYCAUSE = 4 (FAULTCAUSEV)
HISTORYREASON = 1
```

In this context, a HISTORYREASON of 1 means DIVIDEBYZEROV. In other words, the process was discontinued because it attempted to divide by zero.

Now suppose that these task attributes have the following values:

```
HISTORYTYPE = 4 (DSEDV)
HISTORYCAUSE = 3 (RESOURCECAUSEV)
HISTORYREASON = 1
```

In this context, a HISTORYREASON of 1 means IOEXCEEDEDV. In other words, the process was discontinued because it used more I/O time than was allowed by its MAXIOTIME task attribute value.

HISTORYTYPE

Type	Mnemonic
Units	Not applicable
Range	See "Explanation" below
Default	NORMALV
Read Time	Anytime
Write Time	Never
Inheritance	None
Fork() Inheritance	None
Overwrite Rules	None (read-only)
Host Services	Supported
Attribute Number	66
Synonym	None
Restrictions	None

Explanation

The HISTORYTYPE indicates the type of termination that occurred for a process. The HISTORYTYPE value is identical to field [07:08] of the HISTORY task attribute. Possible values are as follows:

Mnemonic Value	Integer Value	Meaning
NORMALV	0	The process is still in-use or has not yet been initiated.
DUMPINGV	1	The process is performing a program dump.
QTEDV	2	The QT system command was used against the process.
STEDV	3	The process is suspended.
DSEDV	4	The process was discontinued (terminated abnormally).
NORMALEOTV	5	The process terminated normally.
SYNTAXERRORV	6	The process was a compilation that failed because of syntax errors in the source program.
UNKNOWNEOTV	7	The process was terminated by an unknown cause or by a cause related to job queues.
DSEDINEPILOGV	8	The process was a WFL job whose initiation failed because the job attribute list included an invalid task attribute assignment; or, the process is executing an EPILOG procedure after having been discontinued.

HOSTNAME

Type	String
Units	Not applicable
Range	<hostname>
Default	None
Read Time	Anytime
Write Time	Before initiation
Inheritance	From parent
Fork() Inheritance	From parent
Overwrite Rules	See below
Host Services	Supported
Attribute Number	64
Synonym	None
Restrictions	None

Range

<hostname>

A valid HOSTNAME contains from 1 to 17 alphanumeric characters that include the uppercase letters A through Z and the numerals 0 through 9 only.

Explanation

The HOSTNAME task attribute specifies the host system on which the process runs.

If HOSTNAME is specified before initiation, the object code file is searched for and initiated on the requested host. If HOSTNAME is read after initiation, it returns the name of the host where the process is running.

For general information about initiating and controlling tasks on remote host systems, refer to the discussion of tasking across multihost networks in the *Task Management Programming Guide*.

Overwrite Rules

Standard overwrite rules apply, except that HOSTNAME task attribute assignments should not be made to an object code file. If HOSTNAME is assigned to an object code file, the process is immediately discontinued as soon as it is initiated.

Run-Time Errors

HOSTNAME ATTRIBUTE INCORRECT SYNTAX

An attempt was made to assign HOSTNAME a value that did not follow the simple name syntax. The assigning process, if nonprivileged, is discontinued with HISTORYCAUSE = 2 (PROGRAMCAUSEV) and HISTORYREASON = 131 (INCORRECTSYNTAXV).

HOSTNAME ATTRIBUTE IS READONLY ON ACTIVE TASK

An attempt was made to assign a HOSTNAME value to an in-use process. The assigning process, if nonprivileged, is discontinued with HISTORYCAUSE = 2 (PROGRAMCAUSEV) and HISTORYREASON = 33 (READONLYONACTIVEV).

ILLEGAL HOST-TO-HOST TRANSFER OF TASK

An attempt was made to initiate a process with a compiled-in HOSTNAME task attribute value. The initiating process is discontinued with HISTORYCAUSE = 2 (PROGRAMCAUSEV) and HISTORYREASON = 31 (ILLEGALTASKXFERV).

HSPARAMSIZE

Type	Integer
Units	See below
Range	–65535 to +65535
Default	0
Read	Anytime
Write Time	Never
Inheritance	None
Fork() Inheritance	None
Overwrite Rules	None (read-only)
Host Services	Not supported
Attribute Number	70
Synonym	None
Restrictions	None

Explanation

The HSPARAMSIZE task attribute records the total length of the parameters passed to this process. This attribute is mainly intended for use by the system software, but can also be read by application programs.

Units

If the value of HSPARAMSIZE is less than 0, the length is expressed in words. If the value of HSPARAMSIZE is greater than 0, the length is expressed in bytes.

INHERITCREDENTIALS

Type	Boolean
Units	Not applicable
Range	TRUE, FALSE
Default	TRUE
Read Time	Anytime
Write Time	Before initiation
Inheritance	None
Overwrite Rules	Standard
Host Services	Not supported
Attribute Number	149
Synonym	INHERITCREDS
Restrictions	None

Explanation

The INHERITCREDENTIALS attribute controls the inheritance of credentials.

By default, credentials are inherited unless the parent task's credentials are blocked. Credentials are copied if the initiation is for an independent task or if CREDENTIALSBASE is set to TRUE. In all other cases, credentials are shared with the parent task.

For information about credential management and Generic Security Service Application Program Interface (GSS-API), see Appendix G in the *Security Administration Guide*.

Examples

The following examples show the syntax used to run a program that needs to use server credentials:

- To run a program, from MARC or CANDE, that needs to use server credentials, enter the following command:

```
RUN SYSTEM/SPECIAL/SERVICE; CREDENTIALSBASE
```

- To run a program, from MARC or CANDE, that needs to use server credentials but is not allowed to use the credentials of a particular user's session, enter the following command:

```
RUN SYSTEM/SPECIAL/SERVICE; CREDENTIALSBASE; INHERITCREDENTIALS = FALSE
```

INHERITMCSSTATUS

Type	Boolean
Units	Not applicable
Range	TRUE, FALSE
Default	See below
Read Time	See below
Write Time	See below
Inheritance	None
Fork() Inheritance	FALSE
Overwrite Rules	See below
Host Services	Not supported
Attribute Number	92
Synonym	None
Restrictions	Not available in WFL

Explanation

The INHERITMCSSTATUS task attribute controls whether a process inherits MCS status, TASKING status and/or locked program status.

MCS status confers special privileges and priority, which are discussed in the *Task Management Programming Guide.*

The INHERITMCSSTATUS task attribute, if TRUE, enables a process to inherit the privileges and priority category of an MCS. If the initiating process is not an MCS, then the INHERITMCSSTATUS task attribute can only be used to remove TASKING and/or locked program status from the process.

Use INHERITMCSSTATUS to control TASKING status and locked program status of an internal offspring. If set to FALSE, TASKING status and locked program status are not inherited. Refer to the *Task Management Programming Guide* for more information about tasking status. For information about locked program status, refer to the LOCKED option of the MP command in the *System Commands Operations Reference Manual*.

Note: *Although tasking programs have many of the same privileges as an MCS, the INHERITMCSSTATUS task attribute cannot be used to cause tasking status to be inherited.*

Range

When the INHERITMCSSTATUS attribute is written, the value range is TRUE or FALSE. Other bits in the value are ignored. When the INHERITMCSSTATUS attribute is read, the value returned contains the following additional information:

Field	Name	Value	Meaning
[47:01]	MCS Status	0	Task does not have MCS status.
		1	Task has MCS status.
[46:07]	MCS Number		The MCS number of the task if the task has MCS status.
[39:39]	Not used		
[00:01]	InheritMCSStatus	0	Task does not inherit MCS status, Tasking Status, or Locked Program status from parent process.
		1	Task inherits MCS status from parent process.

Default

INHERITMCSSTATUS defaults to FALSE for most processes. However, the INHERITMCSSTATUS task attribute defaults to TRUE for internal processes initiated by an MCS.

Read Time, Write Time, and Overwrite Rules

The INHERITMCSSTATUS of a task variable can be read or written at any time, but only by the following types of programs:

- Host Services system software
- Libraries with a nonzero linkage class
- Programs marked with one or more of the following types of security status: compiler status, MCS status, privileged status, or tasking status. (Note that it is the object code file, rather than the process usercode, that must have the special security status.)

For information about linkage classes and about the various types of security status, refer to the *Task Management Programming Guide*.

Although you can assign INHERITMCSSTATUS to object code files, such assignments are ignored when the program is initiated.

Similarly, although you can assign INHERITMCSSTATUS through task equations in CANDE and MARC, such assignments have no effect. INHERITMCSSTATUS task equations in WFL result in the run-time error or warning "INHERITMCSSTATUS ATTRIBUTE –RESTRICTED ACCESS", which is described later under this heading.

Run-Time Error

INHERITMCSSTATUS ATTRIBUTE – RESTRICTED ACCESS

A program lacking the necessary code file privileges attempted to access the INHERITMCSSTATUS task attribute. The accessing process, if nonprivileged, is discontinued with HISTORYCAUSE = 2 (PROGRAMCAUSEV) and HISTORYREASON = 128 (RESTRICTEDACCESSV).

INITPBITCOUNT

Type	Real
Units	Presence-bit operations
Range	0 to about 4.31E+68
Default	0
Read Time	Anytime
Write Time	Never
Inheritance	None
Fork() Inheritance	None
Overwrite Rules	None (read-only)
Host Services	Not supported
Attribute Number	104
Synonym	None
Restrictions	None

Explanation

The INITPBITCOUNT task attribute returns the number of initial presence-bit interrupts that have been performed for the process since its initiation.

For information about initial presence-bit operations, refer to the discussion of controlling process memory usage in the *Task Management Programming Guide*.

INITPBITTIME

Type	Real
Units	See below
Range	0 to about 4.31E+68
Default	0
Read Time	Anytime
Write Time	Never
Inheritance	None
Fork() Inheritance	None
Overwrite Rules	None (read-only)
Host Services	Not supported
Attribute Number	105
Synonym	None
Restrictions	None

Explanation

The INITPBITTIME task attribute returns the total time spent processing initial presence-bit interrupts for this process.

For information about initial presence-bit operations, refer to the discussion of controlling process memory usage in the *Task Management Programming Guide*.

Units

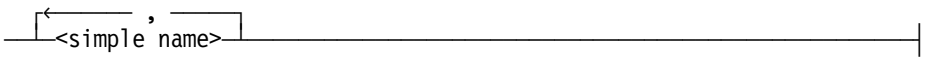
In WFL, this value is returned in units of seconds. In all other languages, this value is returned in units of 2.4 microseconds.

ITINERARY

Type	String
Units	Not applicable
Range	<hostname list>
Default	Null string
Read Time	Anytime
Write Time	Never
Inheritance	See below
Fork() Inheritance	From parent
Overwrite Rules	None (read-only)
Host Services	Supported
Attribute Number	72
Synonym	None
Restrictions	None

Range

<hostname list>



Explanation

The ITINERARY task attribute contains a record of the remote hosts where ancestors of this process were initiated. The leftmost entry in the string is the hostname of the most recent remote ancestor of the process. The next entry in the string is the hostname of the host where the next most recent remote ancestor was initiated, and so forth.

The default value of null indicates that the process has no remote ancestors.

Inheritance

This attribute is inherited verbatim from parent to offspring when the parent and offspring are running on the same host. When the parent and offspring are on different hosts, the offspring inherits the parent's ITINERARY value with an added entry at the left that records the host where the parent is running.

Examples

The contents of the ITINERARY attribute for four related processes are shown in the following table:

Process	ITINERARY Value of Process
A	"."
B	"BLUE."
C	"BLUE."
D	"YELLOW, BLUE."

The relationship of the processes is as follows:

- Job A starts on host BLUE.
- Job A initiates task B on host YELLOW.
- Task B initiates task C on host YELLOW.
- Task C initiates task D on host RED. Note that RED does not appear in the ITINERARY value for D because the ITINERARY reflects only the ancestors of D.

JOBNUMBER

Type	Integer
Units	Not applicable
Range	100 to 65,535
Default	See below
Read Time	Anytime
Write Time	See below
Inheritance	See below
Fork() Inheritance	Value of MIXNUMBER
Overwrite rules	See "Write Time" below
Host Services	Supported
Attribute Number	41
Synonym	None
Restrictions	None

Explanation

For a task, the JOBNUMBER task attribute records the mix number of the job that owns the task. For a job, the JOBNUMBER task attribute value records the job's own mix number. The mix number is a number that uniquely identifies a process and which the system assigns to the process at initiation. A process can read the mix number by using the MIXNUMBER task attribute.

For further information about mix numbers and relationships between jobs and tasks, refer to the *Task Management Programming Guide*.

Default and Inheritance

The JOBNUMBER value is 0 before initiation. At initiation, a job is automatically assigned a JOBNUMBER value by the system. When you initiate a task from a MARC or CANDE session, the task receives a JOBNUMBER value equal to the session number. All other tasks inherit the JOBNUMBER value of their parents, unless the BDBASE bit is set in the process's OPTION task attribute. In this case, the JOBNUMBER of the process is set to the process's mix number.

Range

For tasks initiated from a MARC or CANDE session, the JOBNUMBER value equals the session number and can range from 100 up to 65,535.

Tasks not initiated from MARC or CANDE inherit the JOBNUMBER value of their parents, unless the BDBASE bit is set in the OPTION task attribute of the process. In this case, the JOBNUMBER of the process is set to the mix number of the process. For

these processes, the JOBNUMBER value equals the MIXNUMBER value of MYJOB and is in the range from 100 up to 65,535.

Write Time

Only a tasking program, MCS, or other system software can effectively assign the JOBNUMBER value.

WFL MODIFY statements can assign a JOBNUMBER value to an object code file, but the JOBNUMBER is overridden by the system at initiation time. Similarly, CANDE permits you to specify JOBNUMBER in task equations, but the system overrides the JOBNUMBER value at task initiation time.

Run-Time Errors

The following errors are fatal unless the accessing process is privileged.

JOBNUMBER ATTRIBUTE INCORRECT SYNTAX

An attempt was made to assign JOBNUMBER a value less than 0 or greater than 65,535. The assigning process, if nonprivileged, is discontinued with HISTORYCAUSE = 2 (PROGRAMCAUSEV) and HISTORYREASON = 131 (INCORRECTSYNTAXV).

JOBNUMBER ATTRIBUTE IS READONLY ON ACTIVE TASK

An attempt was made to assign a JOBNUMBER value to an in-use process. The accessing process, if nonprivileged, is discontinued with HISTORYCAUSE = 2 (PROGRAMCAUSEV) and HISTORYREASON = 33 (READONLYONACTIVEV).

JOBNUMBER ATTRIBUTE MAY ONLY BE SET BY AN MCS OR TASKING PROGRAM

A process that was not an MCS or tasking program attempted to assign a value to JOBNUMBER. The assigning process, if nonprivileged, is discontinued with HISTORYCAUSE = 2 (PROGRAMCAUSEV) and HISTORYREASON = 54 (ONLYMCSTASKINGV).

JOBNUMBER ATTRIBUTE – RESTRICTED ACCESS

A WFL job attempted to task-equate the JOBNUMBER attribute of a task. The WFL job, if nonprivileged, is discontinued with HISTORYCAUSE = 2 (PROGRAMCAUSEV) and HISTORYREASON = 128 (RESTRICTEDACCESSV).

JOBNUMBER IS NOT A SESSIONNUMBER

An attempt was made to assign JOBNUMBER a value that was not a session number. The assigning process, if nonprivileged, is discontinued with HISTORYCAUSE = 2 (PROGRAMCAUSEV) and HISTORYREASON = 11 (NOTSESSIONNUMBERV).

JOBSUMMARY

Type	Mnemonic
Units	Not applicable
Range	See "Explanation" below
Default	DEFAULT
Read Time	Anytime
Write Time	Anytime
Inheritance	None
Fork() Inheritance	Inherited from parent if DEPTASKACCOUNTING = IDENTIFIED; otherwise, no job file is created.
Overwrite Rules	Standard
Host Services	Supported
Attribute Number	81
Synonym	None
Restrictions	None

Explanation

The JOBSUMMARY task attribute of a job determines whether the job produces a job summary printout. The following are the possible values and their meanings:

Mnemonic Value	Integer Value	Meaning
DEFAULT	0	If the NOSUMMARY option of the OPTION task attribute is set, then the effects are the same as if JOBSUMMARY had a value of CONDITIONAL. If NOSUMMARY is not set, job summary printing is controlled by the JOBSUMMARY option of the PS DEFAULT system command. This PS DEFAULT JOBSUMMARY option can specify a value of CONDITIONAL, SUPPRESSED, UNCONDITIONAL, or ABORTONLY. These values have the same effects as the corresponding JOBSUMMARY task attribute values.
CONDITIONAL	1	The job summary is printed only if one of the following conditions occurs: backup files are produced, the job terminates abnormally, or a descendant compilation encounters a syntax error.

Mnemonic Value	Integer Value	Meaning
SUPPRESSED	2	The job summary is suppressed, except in the following circumstances: • The job is submitted from an ODT and has WFL syntax errors. • The job is discontinued because of a job queue conflict, such as requesting a nonexistent job queue, or specifying job attributes that conflict with job queue attributes. Any backup files associated with the job are printed, regardless of whether the job summary prints or not.
UNCONDITIONAL	3	The job summary is printed, regardless of how the job terminates or whether there are backup files.
ABORTONLY	4	The job summary is printed only if the job or one of its descendants terminates abnormally.

The JOBSUMMARY value is not used until the job terminates. If JOBSUMMARY is assigned more than once for an in-use job, only the last assignment before job termination has effect.

When a task initiated through a CANDE or MARC *RUN* command attempts to access its own JOBSUMMARY value, the system actually accesses the JOBSUMMARY value for the session. In other words, for a task initiated by the RUN command from a session, MYSELF.JOBSUMMARY is interpreted as MYJOB.JOBSUMMARY. Any assignments made by the offspring actually affect the job summary for the session.

Similarly, for WFL statements submitted through a CANDE or MARC *WFL* command, MYJOB(JOBSUMMARY) affects the job summary of the session. However, in such WFL statements, MYSELF(JOBSUMMARY) has no effect on the job summary of the session.

In MARC, you can also assign the JOBSUMMARY value for a session by using the MARC *JOBSUMMARY* command.

A task initiated from a job can read or modify its own JOBSUMMARY value. However, for a task, the JOBSUMMARY value has no effect, because a task has no job summary. The JOBSUMMARY value of the task's job determines whether a job summary is produced.

Using DESTNAME with JOBSUMMARY

The DESTNAME task attribute exists only to support legacy printing applications through message control systems (MCSs). DESTNAME cannot be used to generate print requests. However, if DESTNAME is specified to deliver job summaries, the following rules apply:

- The JOBSUMMARY task attribute determines whether a job summary is printed by the Print System and whether one is created for an MCS to print.
- A job summary file is created for each service (Print System or MCS) for which printed output is generated. You can control the name of the job summary file created for the Print System with the JOBSUMMARYTITLE task attribute.
- If no printed output is created and the JOBSUMMARY task attribute is specified, a job summary is created for the Print System. If no printed output is created and the DESTNAME task attribute is specified, a job summary is created for an MCS. If both the DESTNAME and JOBSUMMARYTITLE attributes are set, two files are created. Whether the Print System job summary is printed depends on the setting of the JOBSUMMARY task attribute.

For information on the DESTNAME task attribute, refer to Section 3 in this manual.

Run-Time Error

JOBSUMMARY ATTRIBUTE INCORRECT SYNTAX

An attempt was made to set JOBSUMMARY to a value less than 0 or greater than 3. The assigning process, if nonprivileged, is discontinued with HISTORYCAUSE = 2 (PROGRAMCAUSEV) and HISTORYREASON = 131 (INCORRECTSYNTAXV).

JOBSUMMARYTITLE

Type	String
Units	Not applicable
Range	<title>
Default	Null string
Read Time	Anytime
Write Time	Anytime
Inheritance	None
Fork() Inheritance	Inherited from parent if DEPTASKACCOUNTING = IDENTIFIED; otherwise, set to null string
Overwrite Rules	Standard
Host Services	Not supported
Attribute Number	97
Synonym	None
Restrictions	None

Explanation

The JOBSUMMARYTITLE task attribute specifies a title under which the job summary file should be saved.

If JOBSUMMARYTITLE is null when the job terminates, then a job summary file is created only if a job summary is to be printed. The job summary file is titled according to default conventions and is removed immediately after printing.

If the JOBSUMMARYTITLE value has a nonnull value when the job terminates, then the system creates a permanent job summary file with the value of JOBSUMMARYTITLE as its title. The job summary file is created even if no job summary is to be printed. However, even if a job summary is printed, the job summary file is preserved for possible later use.

If the JOBSUMMARYTITLE value includes an *ON <family name>* part, then the file is created on the specified family. Otherwise, the location of the job summary file is determined by the rules discussed for printer backup file media in the *Task Management Programming Guide*.

If a statement assigns JOBSUMMARYTITLE a value that does not include a usercode, then the system automatically prefixes the new JOBSUMMARYTITLE value with the usercode under which the job was initiated.

Note: *If the usercode of the job changes after initiation, and the job then assigns JOBSUMMARYTITLE a value that does not include a usercode, the system prefixes JOBSUMMARYTITLE with the original usercode of the job. If you want the job summary file to be created under the new usercode of the job, you must explicitly specify the desired usercode in the JOBSUMMARYTITLE assignment.*

Only a privileged process can assign JOBSUMMARYTITLE a usercode different from the usercode of the process. If a nonprivileged process assigns a usercode to JOBSUMMARYTITLE, the usercode must match the usercode of the process and the usercode of the job of the process. A nonprivileged process running without a usercode cannot assign a usercode to JOBSUMMARYTITLE.

The JOBSUMMARYTITLE attribute has meaning only for jobs and BDBASE tasks. Whenever a task reads its own JOBSUMMARYTITLE value, a null value is returned. If a task assigns a value to its JOBSUMMARYTITLE value, then no error results but the value remains null. The JOBSUMMARYTITLE for a job is accessed with the MYJOB task variable. The JOBSUMMARYTITLE attribute for a BDBASE task is accessed with the MYSELF task variable.

When a task initiated from a CANDE or MARC session attempts to access its own JOBSUMMARYTITLE value, the system actually accesses the JOBSUMMARYTITLE value for the session. In other words, for a task initiated from a session, MYSELF.JOBSUMMARYTITLE is interpreted as MYJOB.JOBSUMMARYTITLE. Any assignments made by the offspring actually affect the job summary for the session. In MARC, you can also assign the JOBSUMMARYTITLE for a session by using the MARC *JOBSUMMARYTITLE* command.

The JOBSUMMARYTITLE value has no effect on the printing of the job summary. For information about controlling job summary printing, and general information about job summaries, refer to the *Task Management Programming Guide.*

Using DESTNAME with JOBSUMMARYTITLE

The DESTNAME task attribute exists only to support legacy printing applications through message control systems (MCSs). DESTNAME cannot be used to generate print requests. However, if DESTNAME is specified to deliver job summaries, the following rules apply:

- The JOBSUMMARY task attribute determines whether a job summary is printed by the Print System and whether one is created for an MCS to print.
- A job summary file is created for each service (Print System or MCS) for which printed output is generated. You can control the name of the job summary file created for the Print System with the JOBSUMMARYTITLE task attribute.
- If no printed output is created and the JOBSUMMARY task attribute is specified, a job summary is created for the Print System. If no printed output is created and the DESTNAME task attribute is specified, a job summary is created for an MCS. If both the DESTNAME and JOBSUMMARYTITLE attributes are set, two files are created. Whether the Print System job summary is printed depends on the setting of the JOBSUMMARY task attribute.

For information on the DESTNAME task attribute, refer to Section 3 in this manual.

Run-Time Errors

JOBSUMMARYTITLE TASK ATTRIBUTE INCORRECT SYNTAX

A process attempted to assign JOBSUMMARYTITLE a value that does not conform to the syntax of a title. The assigning process, if nonprivileged, is discontinued with HISTORYCAUSE = 2 (PROGRAMCAUSEV) and HISTORYREASON = 131 (INCORRECTSYNTAXV).

SECURITY VIOLATION

A nonprivileged process attempted to assign JOBSUMMARYTITLE a usercode that is not allowed for that process. The assigning process is discontinued with HISTORYCAUSE = 2 (PROGRAMCAUSEV) and HISTORYREASON = 29 (SECURITYERRORV). The message "INVALID TASK ATTRIBUTE: JOBSUMMARYTITLE" is written in the log.

TASK ATTRIBUTE ACCESS FAULT

A disk error resulted from an attempt to read or assign the JOBSUMMARYTITLE of a process. The reading or assigning process, if nonprivileged, is discontinued with HISTORYCAUSE = 2 (PROGRAMCAUSEV) and HISTORYREASON = 132 (ATTACCESSFAULTV).

Section 5
Task Attributes L through R

This section contains task attributes starting with the letters L through R.

LABELFORMAT

Type	Mnemonic
Units	Not applicable
Range	UNSPECIFIED, ANSI69, ANSI87
Default	UNSPECIFIED
Read Time	Anytime
Write Time	Anytime
Inheritance	From parent
Fork() Inheritance	From parent
Overwrite Rules	Code file dominant
Host Services	Supported
Attribute Number	126
Synonym	None
Restrictions	None

Explanation

The LABELFORMAT task attribute defines the format of the tape label for the first file created on a tape

Once the first file on a multifile tape is created, the label format for that tape never changes. The same label format is used for all later files added to a multifile tape, even if the LABELFORMAT value changes before the later files are opened. If a reel switch is performed, all subsequent reels use the same label format as the first file on the first reel.

The LABELFORMAT task attribute has three possible values, as follows:

Mnemonic Value	Integer Value	Meaning
UNSPECIFIED	0	Generally defaults to the value of the LABELFORMAT system option. The LABELFORMAT system option is controlled through the SYSOPS (System Options) system command; the default value is ANSI69DEFAULT. The system ignores the LABELFORMAT system option and automatically enforces ANSI87 format if the tape drive is compression-capable and either of the following conditions is true: • The COMPRESSIONCONTROL file attribute has a value of SYSTEM and the tape has been purged with the COMPRESSION option. • The COMPRESSIONCONTROL file attribute has a value of USER and the COMPRESSIONREQUESTED file attribute is TRUE.
ANSI69	1	Complies with ANSI X3.27 1969 standard. This value overrides the LABELFORMAT system option.
ANSI87	2	Complies with ANSI X3.27 1987 standard. This value overrides the LABELFORMAT system option.

Note: *The system ignores the LABELFORMAT task attribute and automatically enforces the ANSI87 format for the first file on the tape if* all *the following conditions are true:*

- *The Secure Accountability Facility is activated.*
- *The TAPECHECK security option is set to AUTOMATIC. This option is controlled by the SECOPT (Security Options) system command.*
- *The SECURITYLABELS volume attribute for the tape has a value of TRUE. If the LABELFORMAT value is ANSI69 and the system enforces a value of ANSI87, the system issues the warning message "SECURITYLABELS REQUIRE ANSI87 LABELS BUT OPTION ISN'T SET".*

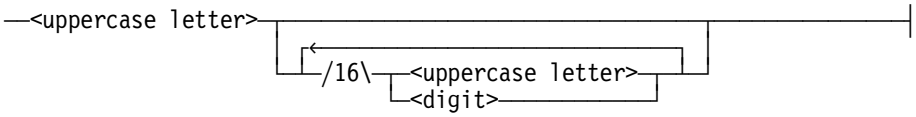
For illustrations of the standard tape label formats supplied by the system software, refer to the *I/O Subsystem Programming Guide.*

LANGUAGE

Type	String
Units	Not applicable
Range	<language identifier>
Default	See below
Read Time	Anytime
Write Time	Anytime
Inheritance	See below
Fork() Inheritance	From parent
Overwrite Rules	Standard
Host Services	Supported
Attribute Number	95
Synonym	None
Restrictions	None

Range

<language identifier>



Explanation

The LANGUAGE task attribute is used by the MultiLingual System (MLS) to determine the language of output messages displayed by a process. The LANGUAGE value affects all messages displayed for the process by the system, including BOT, EOT, and RSVP messages. The LANGUAGE value also establishes a default language to be applied to any MESSAGESEARCHER statements executed by ALGOL programs.

You should be especially careful not to misspell the LANGUAGE value, because the system does not notify you of any spelling errors. The system accepts any combination of letters and digits that conforms to the language identifier syntax. If the LANGUAGE value does not correspond to any language that is available on the system, the process messages are displayed in the system default language.

Refer to the *Unisys e-@ction ClearPath Enterprise Servers MultiLingual System Administration, Operations, and Programming Guide* for information about MLS.

Default and Inheritance

A process inherits the LANGUAGE value of its parent.

The default value of LANGUAGE is ENGLISH. A different default can be established for the whole system by using the LANGUAGE option of the SYSOPS (System Options) system command.

The system administrator can associate a language with a usercode by including a LANGUAGE usercode attribute in the usercode definition in the USERDATAFILE. This language value does not directly affect processes, but it is inherited by MARC or CANDE sessions with that usercode. You can also change the language of a session after log-on by using the MARC or CANDE *LANGUAGE* command. Processes initiated from the session inherit the current language of the session.

The LANGUAGE attribute of a usercode is also inherited by WFL jobs that are assigned that usercode in the job attribute list. However, if the job attribute list also contains a PRINTDEFAULTS assignment, the PRINTDEFAULTS attribute of the usercode is ignored.

Run-Time Errors

LANGUAGE ATTRIBUTE INCORRECT SYNTAX

An attempt was made to assign a LANGUAGE value that did not conform to the language identifier syntax. The assigning process, if nonprivileged, is discontinued with HISTORYCAUSE = 2 (PROGRAMCAUSEV) and HISTORYREASON = 131 (INCORRECTSYNTAXV).

TOO MANY LANGUAGES IN USE BY SYSTEM

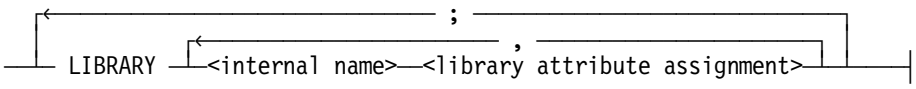
An attempt was made to assign a language value that would bring the total number of languages in use on the system to greater than 256. The assigning process, if nonprivileged, is discontinued with HISTORYCAUSE = 2 (PROGRAMCAUSEV) and HISTORYREASON = 99 (FOREIGNTASKINITFAILV).

LIBRARY

Type	String
Units	Not applicable
Range	<library equation>
Default	Null string
Read Time	See below
Write Time	Anytime
Inheritance	See below
Fork() Inheritance	From parent
Overwrite Rules	See below
Host Services	Not supported
Attribute Number	74
Synonym	None
Restrictions	None

Range

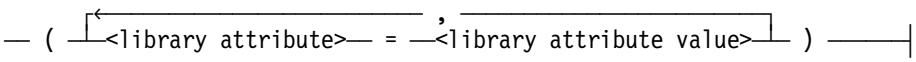
<library equation>



<internal name>

<simple name>

<library attribute assignment>



<library attribute>
<library attribute value>

For a list of possible library attributes and their values, refer to the *Task Management Programming Guide*

Explanation

The LIBRARY task attribute assigns library attributes to a client library or connection library declared by the process. The LIBRARY task attribute overrides any conflicting assignments in the library declaration.

One typical use of this attribute is to cause a client library to link to a different server library than it otherwise would. The server library to be used can be specified through assignments to the client library attributes LIBACCESS, FUNCTIONNAME, and TITLE.

Another use of the LIBRARY task attribute is to pass a parameter to a library through the LIBPARAMETER library attribute.

You can also use the LIBRARY task attribute to cause a connection library to link to a different matching connection library than it otherwise would.

The internal name specified in the LIBRARY value should equal the value of the INTNAME library attribute. If the INTNAME attribute was not explicitly assigned a value, then the INTNAME value defaults to the name of the identifier used in the library declaration.

LIBRARY can be assigned either before or during process execution. A given LIBRARY assignment has no affect on libraries that the process has already referenced at the time the LIBRARY assignment is made.

Read Time

The LIBRARY task attribute can be read at any time from ALGOL. However, the value returned is encoded in an internal form that does not resemble the original LIBRARY assignments. The LIBRARY task attribute returns a null value if read from COBOL and cannot be read from WFL at all.

Inheritance

Internal processes inherit the LIBRARY value of the parent.

Overwrite Rules

In ALGOL or COBOL, if the LIBRARY attribute of a task variable is assigned more than once, each assignment is merged with the previous value of the LIBRARY attribute. A library attribute assignment in the existing value is overwritten only in the following cases:

- If the new assignment specifies a different value for the same attribute of the same library.
- If a null string is assigned to LIBRARY. In this case, the LIBRARY value is restored to null.

In WFL, a LIBRARY assignment is merged with the existing LIBRARY value if the assignment includes an asterisk or if the library internal name is a string primary. If no asterisk is included, and the library internal name is a name constant, then the previous LIBRARY value is discarded.

When a process is initiated, the LIBRARY values assigned through assignments to the task variable, object code file assignments, and inheritance from the parent are merged into a single LIBRARY value. If these sources assign conflicting values to the same library attribute of the same library, then standard overwrite rules determine which library attribute assignment takes precedence.

Examples

The following is an example of a LIBRARY assignment in CANDE and in WFL:

```
RUN OBJECT/DAILY/UPDATE;
    LIBRARY UPDATER (LIBACCESS=BYTITLE, TITLE=OBJECT/UPDATE/MODS);
    LIBRARY GENROUTINES (TITLE=OBJECT/GENROUTINES/TESTVERSION);
```

The following is an example of a LIBRARY assignment in ALGOL:

```
REPLACE T.LIBRARY BY
 "LIBRARY L (LIBACCESS = BYFUNCTION,FUNCTIONNAME=MYSUPPORT);"
 "LIBRARY GENROUTINES (TITLE=OBJECT/GENROUTINES/TEST);" 48"00";
```

The following ALGOL statement resets the LIBRARY value to a null string:

```
REPLACE T.LIBRARY BY 48"00";
```

The following COBOL74 or COBOL85 statements assign attributes to two libraries. Both assignments are made to the same task variable, TASK-VAR-1. The second assignment does not overwrite the first assignment, but rather is merged with it:

```
CHANGE ATTRIBUTE LIBRARY OF TASK-VAR-1 TO
  "LIBRARY L (LIBACCESS=BYFUNCTION,FUNCTIONNAME=""MYSUPPORT"");".
CHANGE ATTRIBUTE LIBRARY OF TASK-VAR-1 TO
  "LIBRARY UPDATER (LIBACCESS = BYFUNCTION);".
```

Run-Time Error

LIBRARY ATTRIBUTE INCORRECT SYNTAX

There were one or more syntax errors in the library attribute assignments in the LIBRARY value. The assigning process, if nonprivileged, is discontinued with HISTORYCAUSE = 2 (PROGRAMCAUSEV) and HISTORYREASON = 131 (INCORRECTSYNTAXV).

LIBRARYSTATE

Type	Real
Units	Not applicable
Range	See "Explanation" below
Default	0
Read Time	Anytime
Write Time	Never
Inheritance	None
Fork() Inheritance	From parent
Overwrite Rules	None (read-only)
Host Services	Not supported
Attribute Number	108
Synonym	None
Restrictions	None

Explanation

The LIBRARYSTATE task attribute records several types of information about the properties of a library process. The LIBRARYSTATE value is divided into the following fields:

Field	Name	Value	
[35:01]	CL Call	0	Not initiated by connection library linkage
		1	Initiated by connection library linkage
[30:03]	Sharing	0	Private
		1	Shared by run unit
		4	Shared by all
[27:01]	Permanent	0	Temporary (The library goes away after the last client delinks.)
		1	Permanent (The library remains until thawed and the last client is delinked or the library is DSed.)
		Note: *If a permanent or freeze control library is being thawed or DSed, the exception event for the task will be caused on a transition from permanent to temporary with no users.*	
[26:01]	Trusted	0	LINKCLASS is applied to all exported objects
		1	Exported objects can each have a LINKCLASS different from the overall process LINKCLASS

Field	Name	Value
[25:02]	Access	0 Initiated by title 1 Initiated by function **Note:** *Values for this field can be monitored by a parent task or used while in a freeze control procedure. (For example, this could be done to determine the method used by the initiator of the library where initiation by title is not acceptable and the library could then be discontinued.) In addition, the value can change from 0 to 1 if a library was originally initiated by title, but is later accessed by function.*
[19:04]	Security	Contains the value of LINKCLASS. See the description of security considerations for libraries in the *Task Management Programming Guide* for a description of these values.
[02:01]	Nonresumable	1 Library is not resumable
[01:01]	Frozen	1 Frozen library
[00:01]	Library Call	0 Not initiated as a library (for example, a program that was run) 1 Frozen server library process or initiated by the library linkage mechanism. The library linkage mechanism initiates a library program if a process attempts to import an object from a server library or connection library and an instance of the library does not already exist. ***Note:*** *This field is useful for programs designed to run in either of two ways, as an ordinary process or a frozen server library process. The process reads this field value to determine if it was initiated by the library mechanism; if so, the process executes a FREEZE statement and becomes a frozen server library process. If the process was not initiated by the library linkage mechanism, it can skip the FREEZE statement and take other actions.*

Example

An ALGOL program can use a statement such as the following to determine if it was invoked as a library and take appropriate action:

```
IF BOOLEAN(MYSELF.LIBRARYSTATE)
   THEN FREEZE(TEMPORARY)
   ELSE NONLIBACTOR;
```

This IF statement freezes the process as a server library if the process was invoked as a library. Otherwise, it calls a procedure named NONLIBACTOR, which is declared elsewhere in the program.

LIBRARYUSERS

Type	Integer
Units	Linked processes
Range	See below
Default	0
Read Time	Anytime
Write Time	Never
Inheritance	None
Fork() Inheritance	None
Overwrite Rules	None (read-only)
Host Services	Not supported
Attribute Number	101
Synonym	None
Restrictions	None

Explanation

For server library processes, the LIBRARYUSERS task attribute returns the number of client processes or connection libraries that are currently linked to this server library.

If the same process links to the server library through two or more library declarations, the LIBRARYUSERS value counts each declaration as a separate client.

If the process is a server library with a permanent or control freeze, then when the LIBRARYUSERS value changes to zero, the system causes the exception event of the process.

If LIBRARYUSERS is read for a process that is not a server library, it returns a zero.

The LIBRARYUSERS value does not reflect the users of any connection libraries declared by the process.

Range

The value of LIBRARYUSERS is roughly limited to the number of stacks that a given system is capable of running. This number is anywhere from about 1000 to more than 32000, depending on the model you are using.

LOCKED

Type	Boolean
Units	Not applicable
Range	TRUE, FALSE
Default	FALSE
Read Time	Anytime
Write Time	Anytime
Inheritance	None
Fork() Inheritance	None
Host Services	Not supported
Attribute Number	17
Synonym	None

Explanation

The LOCKED task attribute provides a means to regulate the timing of two or more processes that access a shared object.

If LOCKED has a value of FALSE, then any process can change the value to TRUE and continue normally. However, if LOCKED has a value of TRUE, then any process that attempts to set LOCKED to TRUE stops executing until some other process sets the value of LOCKED to FALSE. If more than one process is waiting to set LOCKED to TRUE, then when another process sets LOCKED to FALSE, one of the waiting processes sets LOCKED back to TRUE and resumes execution. The programmer cannot predict which of the waiting processes resumes execution first. However, the highest priority process has the best chance. The other waiting processes continue to wait until the next time a process sets LOCKED to FALSE.

Implicitly, the LOCKED attribute functions by accessing the available state of a predeclared event. This attribute is used mainly in WFL jobs because they cannot access events directly. For a detailed discussion of events, refer to the *Task Management Programming Guide*.

MAXCARDS

Type	Integer
Units	Punch cards
Range	0 to 549755813887
Default	0 (unlimited)
Read Time	Anytime
Write Time	Anytime
Inheritance	See below
Fork() Inheritance	From parent
Overwrite Rules	Standard
Host Services	Supported
Attribute Number	39
Synonym	None
Restrictions	None

Explanation

The MAXCARDS task attribute was previously used to limit the number of cards punched by a process. This task attribute is no longer used for that purpose.

MAXCARDS stores any integer value assigned to it by a user. The value of this attribute has no effect on the process nor does it report any information. Rather, the value is used for communicating information between processes. Any value stored into a program is inherited in the program's offspring.

Range

If a value less than 0 is assigned, the value is changed to 0. If a value greater than the maximum value is assigned, the value is changed to the maximum value, 549755813887.

Inheritance

A process inherits the MAXCARDS value of its parent.

MAXIOTIME

Type	Real
Units	Seconds
Range	0 through about 1319400 (15 days, 6 hours, 30 minutes)
Default	See below
Read Time	Anytime
Write Time	Anytime
Inheritance	See below
Fork() Inheritance	From parent
Overwrite Rules	See below
Host Services	Supported
Attribute Number	5
Synonym	IOTIME
Restrictions	None

Explanation

The MAXIOTIME task attribute specifies the maximum amount of I/O time that a process can use. When the ACCUMIOTIME task attribute reaches the same value as the MAXIOTIME task attribute, the process is discontinued.

When a task terminates, the system decrements the MAXIOTIME value of the task's parent by the amount of I/O time recorded by the ACCUMIOTIME attribute of the task. Refer to the ACCUMIOTIME description for details.

Default

If the MAXIOTIME task attribute is not inherited and the value is not explicitly set, then its value is 0 (zero) and it is treated as unlimited. However, if the value is explicitly set to 0 (zero), it is treated as a limit.

If an attempt is made to assign a negative value to the MAXIOTIME attribute, the default value of 0 (zero) is assigned.

If MAXIOTIME is accessed through Host Services, bit 47 will always be 0 (zero).

Inheritance

A process inherits the MAXIOTIME value of its parent.

If a job queue has a default value for the IOTIME queue attribute, then that value is inherited by the MAXIOTIME task attribute of WFL jobs run from that queue.

If a job queue has a limit value for the IOTIME queue attribute, then WFL jobs that specify a higher MAXIOTIME value in the job attribute list cannot be accepted into that job queue.

Overwrite Rules

Standard overwrite rules apply, with the following exceptions:

- When a task is initiated, the MAXIOTIME value is the minimum of the value inherited from the parent and any value resulting from standard overwrite rules.
- For MAXIOTIME assignments to an in-use process, the maximum value that can result is the job's current MAXIOTIME value, minus the amount of I/O time the process has already used. Attempts to assign a higher value result in this maximum value being assigned. No error or warning is issued.

Run-Time Errors

EXC I/O TIME

The process used more I/O time than is allowed by the MAXIOTIME task attribute. The process is discontinued with HISTORYCAUSE = 3 (RESOURCECAUSEV) and HISTORYREASON = 1 (IOEXCEEDEDV).

MAXIOTIME ILLEGAL ATTRIBUTE VALUE - TOO LARGE

A process attempted to assign MAXIOTIME a value greater than the maximum. The assigning process, if nonprivileged, is discontinued with HISTORYCAUSE = 2 (PROGRAMCAUSEV) and HISTORYREASON = 135 (VALUETOOLARGEV).

MAXLINES

Type	Integer
Units	Lines printed
Range	0 to 274877906943
Default	0 (unlimited)
Read Time	Anytime
Write Time	Anytime
Inheritance	See below
Fork() Inheritance	From parent
Overwrite Rules	See below
Host Services	Supported
Attribute Number	40
Synonym	PRINTLIMIT
Restrictions	None

Explanation

The MAXLINES task attribute specifies the maximum number of lines that can be printed by a process and its descendants. If a process and its descendants attempt to print more lines than are allowed by this attribute, the process is discontinued.

The PRINTCOPIES and DESTINATION file attributes are not considered when determining the number of print lines a process has created. The system uses two different, complementary methods to keep track of the number of lines that have been printed by a parent process and its descendants.

1. For each process, the system maintains a print count that records the total number of lines that have been printed for all the printer files declared by that process. (This print count is stored internally and is not visible to the user.) The system updates this print count whenever the process or any of its descendants writes to a print file declared by the process. The system discontinues the process if the print count reaches a value greater than MAXLINES.
2. If a task declares a print file and then writes to it, the system does not update the print count for the parent of the task. However, when the task terminates, the system subtracts the task's print count from the parent's MAXLINES value and updates the parent's MAXLINES value accordingly. The system discontinues the parent if the new MAXLINES value is lower than the parent's print count.

Range

If a value less than 0 is assigned, the value is changed to 0. If a value greater than 274877906943 is assigned, the value is changed to 274877906943.

Inheritance

A process inherits its parent's MAXLINES value if the parent's MAXLINES value is not unlimited.

If a job queue has a default value for the LINES queue attribute, then that value is inherited by the MAXLINES task attribute of WFL jobs run from that queue.

If a job queue has a limit value for the LINES queue attribute, then WFL jobs that specify a higher MAXLINES value in the job attribute list cannot be accepted into that job queue.

Overwrite Rules

Standard overwrite rules apply, with the following exceptions:

- When a task is initiated, the MAXLINES value is the minimum of the value inherited from the parent and any value resulting from standard overwrite rules.
- For MAXLINES assignments to an in-use process, the maximum value that can result is the job's current MAXLINES value, minus the number of lines the in-use process has already written. Attempts to assign a higher value result in this maximum value being assigned. No error or warning is issued.

Run-Time Error

PRINT LIMIT EXCEEDED

The process attempted to print more lines than were allowed by the MAXLINES value. The process is discontinued with HISTORYCAUSE = 3 (RESOURCECAUSEV) and HISTORYREASON = 3 (PRINTEXCEEDEDV).

MAXPROCTIME

Type	Real
Units	Seconds
Range	0 through about 1319400 (15 days, 6 hours, 30 minutes)
Default	See below
Read Time	Anytime
Write Time	Anytime
Inheritance	See below
Fork() Inheritance	From parent
Overwrite Rules	See below
Host Services	Supported
Attribute Number	4
Synonym	None
Restrictions	None

Explanation

The MAXPROCTIME task attribute specifies the maximum amount of processor time that can be used by a process. If the ACCUMPROCTIME task attribute value reaches the same value as MAXPROCTIME, the process is discontinued.

When a task terminates, the system decrements the MAXPROCTIME value of the task's parent by the amount of processor time recorded by the ACCUMPROCTIME attribute of the task. Refer to the ACCUMPROCTIME description for details.

Default

If the MAXPROCTIME attribute is not inherited and the value is not explicitly set, then its value is zero and it is treated as unlimited. However, if the value is explicitly set to zero, it is treated as a limit.

If an attempt is made to assign a negative value to the MAXPROCTIME attribute, the default value of zero is assigned.

If MAXPROCTIME is accessed through Host Services, bit 47 will always be zero.

Inheritance

A process inherits its parent's MAXPROCTIME value if the parent's MAXPROCTIME value is not unlimited.

If a job queue has a default value for the PROCESSTIME queue attribute, then that value is inherited by the MAXPROCTIME task attribute of WFL jobs run from that queue.

If a job queue has a limit value for the PROCESSTIME queue attribute, then WFL jobs that specify a higher MAXPROCTIME value in the job attribute list cannot be accepted into that job queue.

Overwrite Rules

Standard overwrite rules apply, with the following exceptions:

- When a task is initiated, the MAXPROCTIME value is the minimum of the value inherited from the parent and any value resulting from standard overwrite rules.
- For MAXPROCTIME assignments to an in-use process, the maximum value that can result is the job's current MAXPROCTIME value, minus the amount of processor time the process has already used. Attempts to assign a higher value result in this maximum value being assigned. No error or warning is issued.

Run-Time Errors

EXC PROC TIME

The process used more processor time than is allowed by the MAXPROCTIME task attribute. The process is discontinued with HISTORYCAUSE = 3 (RESOURCECAUSEV) and HISTORYREASON = 0 (PROCESSEXCEEDEDV).

MAXPROCTIME ILLEGAL ATTRIBUTE VALUE - TOO LARGE

A process attempted to assign MAXPROCTIME a value greater than the maximum. The assigning process, if nonprivileged, is discontinued with HISTORYCAUSE = 2 (PROGRAMCAUSEV) and HISTORYREASON = 135 (VALUETOOLARGEV).

MAXWAIT

Type	Real
Units	Seconds
Range	0 to about 1319400 (15 days, 6 hours, 30 minutes)
Default	0 (Unlimited)
Read Time	Anytime
Write Time	Anytime; effective only during Enterprise Database Server operations
Inheritance	See below
Fork() Inheritance	From parent
Overwrite Rules	Standard
Host Services	Supported
Attribute Number	49
Synonym	None
Restrictions	None

Explanation

The MAXWAIT task attribute specifies the maximum number of seconds a process can wait on a BDMS *LOCK* or *SECURE* statement in a program. Each of these BDMS statements finds and locks a record in an Enterprise Database Server data set or KEYEDIOII file. These statements cause a process to wait if the requested record is currently locked by another process.

The MAXWAIT task attribute also specifies the maximum number of seconds a process can wait on a BDMS *BEGIN TRANSACTION* or *END TRANSACTION* statement in a program. In an Enterprise Database Server database, BEGIN TRANSACTION is used to enter transaction state and END TRANSACTION is used to leave transaction state. These statements cause a process to wait if a syncpoint is due and the program in the transaction state that is holding up the syncpoint is not executing any BDMS verbs.

If an attempt is made to assign a negative value to the MAXWAIT attribute, the default value of zero is assigned.

Note: *By default, there is no MAXWAIT value, and the Enterprise Database Server performs an unlimited wait. Once an explicit assignment is made to MAXWAIT, the only means to revert to an unlimited wait is to specify a very large value for the MAXWAIT attribute. An explicit assignment of 0 (or an assignment of a negative value) to MAXWAIT specifies that the process is not to wait at all.*

If the time limit specified by MAXWAIT is exceeded, the LOCK, BEGIN TRANSACTION, and END TRANSACTION operations fail and the database status word stores a DMERROR of DEADLOCK and a DMERRORTYPE of 2.

For information about the BDMS *LOCK*, *SECURE*, *BEGIN TRANSACTION*, and *END TRANSACTION* statements, refer to the *MCP/AS ALGOL Programming Reference Manual*, *Volume 2: Product Interfaces*, the *MCP/AS COBOL ANSI-85 Programming Reference Manual*, *Volume 2: Product Interfaces*, and the *MCP/AS DMSII Application Program Interfaces Programming Guide*.

If MAXWAIT is accessed through Host Services, bit 47 will always be zero.

This attribute should not be confused with the WAITLIMIT task attribute, which specifies the number of seconds a process can wait on an event. Refer to the WAITLIMIT description for details.

Inheritance

A task inherits the MAXWAIT value of its parent if the parent's MAXWAIT value is not unlimited.

Example

The following is a BDMSALGOL example:

```
MYSELF.MAXWAIT := 60;
LOCK FIRST STUDENT: RSLT;
IF BOOLEAN(RSLT) THEN
   IF RSLT.DMERROR = DEADLOCK THEN
      IF RSLT.DMERRORTYPE = 2 THEN
         DISPLAY("RECORD NOT UPDATED - LOCKED BY ANOTHER PROCESS");
```

In this example, STUDENT is the name of a data set and RSLT is a real variable.

Run-Time Error

MAXWAIT ILLEGAL ATTRIBUTE VALUE - TOO LARGE

A process attempted to assign MAXWAIT a value greater than the maximum. The assigning process, if nonprivileged, is discontinued with HISTORYCAUSE = 2 (PROGRAMCAUSEV) and HISTORYREASON = 135 (VALUETOOLARGEV).

MCSNAME

Type	String
Units	Not applicable
Range	<title>
Default	See below
Read Time	Anytime
Write Time	Never
Inheritance	See below
Fork() Inheritance	From parent
Overwrite Rules	None (read-only)
Host Services	Supported
Attribute Number	122
Synonym	None
Restrictions	None

Explanation

The MCSNAME task attribute records the name of the message control system (MCS) that initiated this process family, if it was initiated by an MCS. For example, processes initiated from a MARC session have an MCSNAME that refers to COMS. Processes initiated from a CANDE session, even if that session is in a COMS window, have an MCSNAME that refers to CANDE.

The exact spelling of the MCSNAME corresponds to the file name of the MCS object code file. No *ON <family>* part is included. An asterisk (*) might or might not appear at the start of the MCSNAME. For example, the MCSNAME for COMS might be **SYSTEM/COMS*. The MCSNAME for CANDE might be *SYSTEM/CANDE*.

Default

Before a process is initiated, the default MCSNAME value is a null string. When an MCS sets the SOURCESTATION task attribute of a process, the operating system sets the MCSNAME attribute to the name of the setting MCS.

Inheritance

A process inherits the MCSNAME value of its parent.

If a WFL job is initiated from a CANDE or MARC session or from a task descended from such a session, the WFL job inherits the MCSNAME of the session.

MIXNUMBER

Type	Integer
Units	Not applicable
Range	-65535 to 65535
Default	See below
Read Time	Anytime
Write Time	Never
Inheritance	None
Fork() Inheritance	None
Overwrite Rules	None (read-only)
Host Services	Supported
Attribute Number	1
Synonym	STACKNO
Restrictions	None

Explanation

The MIXNUMBER task attribute returns the mix number of a process. The mix number uniquely identifies the process in system messages, log entries, and system commands that affect the process.

A positive MIXNUMBER value indicates an in-use process or a suspended process. A negative value indicates a terminated process. A zero indicates that the process has not yet been initiated.

For a further discussion of mix numbers, refer to the *Task Management Programming Guide*.

Default

The system assigns the MIXNUMBER task attribute of a new process the next available mix number that is not in use.

MPID

Type	String
Units	Not applicable
Range	<identifier>
Default	Null string
Read Time	Anytime
Write Time	Before task initiation
Inheritance	From parent
Fork() Inheritance	From parent
Overwrite Rules	Standard
Host Services	Not supported
Attribute Number	158
Synonym	None
Restrictions	None

Explanation

The MPID task attribute specifies another identity, in addition to the task name, for a process. This attribute is useful at sites where multiple copies of the same code file are used simultaneously because the attribute value is shown in response to mix-related system commands.

Run-Time Errors

MPID ATTRIBUTE INCORRECT SYNTAX

A process attempted to assign MPID a value that did not conform to the MPID identifier syntax. The assigning process, if nonprivileged, is discontinued with HISTORYCAUSE = 2 (PROGRAMCAUSEV) and HISTORYREASON = 131 (INCORRECTSYNTAXV).

MPID ATTRIBUTE IS READONLY ON ACTIVE TASK

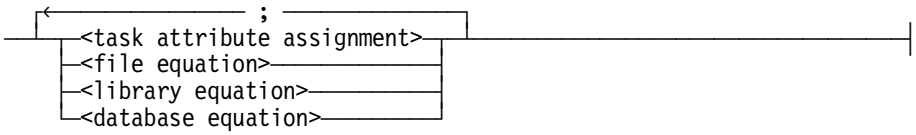
A process attempted to assign a value to the MPID task attribute of an in-use process. The assigning process, if nonprivileged, is discontinued with HISTORYCAUSE = 2 (PROGRAMCAUSEV) and HISTORYREASON = 33 (READONLYACTIVEV).

MYPPB

Type	String
Units	Not applicable
Range	<task equation list>
Default	Null
Read Time	See below
Write Time	Before initiation
Inheritance	None
Fork() Inheritance	From parent
Overwrite Rules	Standard
Host Services	Not supported
Attribute Number	37
Synonym	TASK
Restrictions	Not available in WFL

Range

<task equation list>



<task attribute assignment>
<file equation>
<database equation>
<library equation>

For the syntax of these assignments, refer to the *Work Flow Language (WFL) Programming Reference Manual*.

Explanation

The MYPPB task attribute provides temporary storage for task equations that are not meant to take effect immediately.

The MYPPB task attribute can be assigned only through calls on the HANDLEATTRIBUTES procedure of the WFLSUPPORT system library. The user program can control the behavior of HANDLEATTRIBUTES through several parameters, including one that enables or disables compiler mode and another that specifies a DISPOSITION.

HANDLEATTRIBUTES can assign task equations intended for application to a process, task equations intended for application to an object code file, or both. The task equations intended for a process include

- Compiler task equations assigned in compiler mode with a DISPOSITION of AIATTACHV.
- Noncompiler task equations assigned in noncompiler mode with a DISPOSITION of AIATTACHV.

The MYPPB task equations intended for a process are applied when one of the following happens:

- The task variable is used in a process initiation statement.
- The APPLYLIST task attribute of the task variable is assigned a value of TRUE.

The task equations intended for an object code file include all noncompiler task equations assigned in compiler mode with a DISPOSITION of AIATTACHV or AIAPPLYV. The system does not apply these task equations, even when APPLYLIST is set to TRUE or the task variable is used in a process initiation statement. However, if the task variable is used to initiate a compiler, the compiler applies these task equations to the object code file it creates.

The HANDLEATTRIBUTES procedure can be invoked repeatedly to make assignments to the MYPPB attribute of the same task variable. In this case, the system merges the task equations provided by each HANDLEATTRIBUTES call with the task equations already stored in MYPPB. If a particular task equation conflicts with an existing task equation, the new task equation overwrites the old one.

For a description of the HANDLEATTRIBUTES procedure, refer to "Using WFLSUPPORT to Access Task Attributes" in Section 1, "Accessing Task Attributes."

Read Time

The MYPPB task attribute can be read at any time from ALGOL or COBOL. However, the value returned is encoded in an internal form that does not resemble the original MYPPB assignments.

Run-Time Error

MYPPB ATTRIBUTE IS READONLY ON ACTIVE TASK

An attempt was made to assign the MYPPB attribute of an in-use process. The assigning process, if nonprivileged, is discontinued with HISTORYCAUSE = 2 (PROGRAMCAUSEV) and HISTORYREASON = 33 (READONLYONACTIVEV).

NAME

Type	String
Units	Not applicable
Range	<title>
Default	See below
Read Time	Anytime
Write Time	See below
Inheritance	See below
Fork() Inheritance	From parent
Overwrite Rules	See below
Host Services	Supported
Attribute Number	0
Synonym	None
Restrictions	None

Explanation

The NAME task attribute specifies the name of the process. The name of the process is used in the following ways:

- Before initiating an external process, the initiating process typically assigns the NAME task attribute of the task variable of the external process. The NAME value specifies the title of the object code file that is to be initiated.
- The NAME value appears in messages and log entries generated for the process.
- Guard files can specify that only processes with a given NAME are allowed to access a particular file.

Note that the FAMILY attribute used during process initiation is the FAMILY attribute of the initiator, not the FAMILY attribute of the new process. To determine the family to search for the object code file of a process, the system consults the NAME attribute of the new process and the FAMILY attribute of the initiator, and applies family substitution if appropriate. Refer to the FAMILY description for an explanation of family substitution.

Default and Inheritance

An internal process inherits the NAME value of its parent. For an external process, the NAME value defaults to the name of the declared external procedure specified in the initiation statement. For example, in ALGOL the following statements initiate a process whose NAME task attribute is DATADC:

```
TASK T;
PROCEDURE DATADC;
  EXTERNAL;
PROCESS DATADC [T];
```

For an internal process, the NAME value is automatically prefixed with the USERCODE task attribute value of the initiating process at initiation time. If an internal process is initiated with a different USERCODE than the initiator, the NAME value is nevertheless prefixed with the USERCODE of the initiator rather than the USERCODE of the internal process. If NAME is explicitly assigned a value that includes a different usercode at the start, this usercode is overwritten with the usercode of the initiating process.

For an external process, NAME can specify an object code file with a different usercode than the process or a nonusercoded object code file. If NAME does not explicitly specify a usercode or asterisk (*), then the system searches for the object code file first under the USERCODE of the initiating process, and then as a nonusercoded file. Note that the system uses the USERCODE of the initiating process for this search, not the USERCODE of the new process.

Write Time

Processes with MCS status or tasking status can modify the NAME task attribute at any time. Processes that lack MCS and tasking status can modify the NAME task attribute only before initiation.

Overwrite Rules

Standard overwrite rules are applied. However, you should be aware that the WFL *RUN <object code file title>* statement implicitly assigns the specified object code file title to the NAME task attribute. In the same way, a *PROCESS <subroutine identifier>* statement implicitly assigns the subroutine identifier to the NAME task attribute. Any NAME value previously assigned to the task variable is overridden by these implicit assignments. These implicit assignments can, in turn, be overridden by task equations included in the RUN or PROCESS statement. For example, the following WFL job initiates the program (STEVENS)OBJECT/TESTB ON DCOM:

```
?BEGIN JOB JOBBIT;
 TASK T(NAME=(WALLACE)OBJECT/OUTPUT ON DCOM);
 RUN (THELMA)OBJECT/NEWDATA ON DCOM [T];
   NAME = (STEVENS)OBJECT/TESTB ON DCOM;
?END JOB
```

The NAME task attribute is also implicitly assigned an object code file title by a MARC or CANDE *RUN* statement.

Run-Time Errors

NAME ATTRIBUTE INCORRECT SYNTAX

A process attempted to assign NAME a value that did not conform to the syntax of a title. The assigning process, if nonprivileged, is discontinued with HISTORYCAUSE = 2 (PROGRAMCAUSEV) and HISTORYREASON = 131 (INCORRECTSYNTAXV).

NAME ATTRIBUTE IS READONLY ON ACTIVE TASK

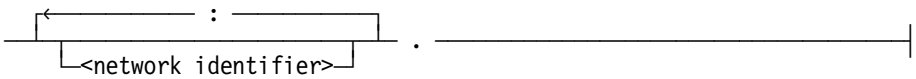
An attempt was made to assign a value to the NAME attribute of an in-use process. The assigning process, if nonprivileged, is discontinued with HISTORYCAUSE = 2 (PROGRAMCAUSEV) and HISTORYREASON = 33 (READONLYONACTIVEV).

NETPATH

Type	String
Units	Not applicable
Range	<netpath string>
Default	"."
Read Time	Anytime
Write Time	Anytime
Inheritance	See below
Fork() Inheritance	From parent
Overwrite Rules	Standard
Host Services	Not supported
Attribute Number	136
Synonym	None
Restrictions	None

Range

<netpath string>



A network identifier is any sequence of characters, except the space, colon, or period. The maximum length of the netpath string is 253 characters. The string data is not case sensitive.

Explanation

The NETPATH task attribute is a string value that is an ordered list of network identifiers separated by colons. By setting NETPATH, you can specify the order in which an application should try various networks (in the context of ONC+ Remote Procedure Call).

Here are some examples of netpath strings:

Sample Input	Explanation
"NET1: NET2: NET3"	The application will try these three networks (NET1, NET2, and NET3) in that order.
"."	There are no networks specified.
"NET8."	The application will try the network called NET8.

Inheritance

A process inherits the NETPATH value of its parent.

If the system administrator has assigned a NETPATH attribute to a usercode, then MARC or CANDE sessions with that usercode receive that NETPATH value at log-on time. You can use the CANDE *NETP* command to change the NETPATH value of a CANDE session. Any processes initiated from a MARC or CANDE session inherit the NETPATH value of the session.

The NETPATH attribute of a usercode is also inherited by WFL jobs that are assigned that usercode in the job attribute list. However, if the job attribute list also contains a NETPATH assignment, the NETPATH attribute of the usercode is ignored.

Examples

The following is an example of a NETPATH assignment in WFL:

```
BEGIN JOB J;
      USER = X/Y;
      NETPATH = "N : M";
END JOB.
```

The following is an example of a NETPATH assignment in COBOL74 or COBOL85:

```
CHANGE ATTRIBUTE NETPATH OF TASK-VAR-1 TO
   "N : M."
```

The following is an example of a NETPATH assignment in ALGOL:

```
REPLACE T.NETPATH BY "N : M."
```

Run-Time Error

NETPATH ATTRIBUTE INCORRECT SYNTAX

A process attempted to assign NETPATH a value that did not conform to the NETPATH syntax. The assigning process, if nonprivileged, is discontinued with HISTORYCAUSE = 2 (PROGRAMCAUSEV) and HISTORYREASON = 131 (INCORRECTSYNTAXV).

NOJOBSUMMARYIO

Type	Boolean
Units	Not applicable
Range	TRUE, FALSE
Default	FALSE
Read Time	Anytime
Write Time	Anytime
Inheritance	None
Fork() Inheritance	TRUE if DEPTASKACCOUNTING = ANONYMOUS; otherwise, inherited from parent.
Overwrite Rules	Standard
Host Services	Not supported
Attribute Number	98
Synonym	None
Restrictions	None

Explanation

The NOJOBSUMMARYIO task attribute specifies whether any information is to be written to the job log. When NOJOBSUMMARYIO is FALSE, log entries recording activities of the job and its tasks are written to the job log. When NOJOBSUMMARYIO is TRUE, no log entries are written to the job log. This setting conserves disk space and I/O time.

A job can change its NOJOBSUMMARYIO value repeatedly during job execution to prevent job logging of selected areas of the job. Whenever the value of NOJOBSUMMARYIO changes from TRUE to FALSE, an entry is made in the job log to indicate that job log information was not written for part of the job.

If NOJOBSUMMARYIO has a value of TRUE at job initiation and is never reset, the job log contains only the BOJ entry or log-on entry.

The job summary information in the job file is used as the source for job summaries that are printed or saved on disk. Thus, any job summary information suppressed by the NOJOBSUMMARYIO attribute does not appear in printouts produced by the JOBSUMMARY attribute or in job summary files created by the JOBSUMMARYTITLE attribute.

NOJOBSUMMARYIO does not prevent information from being written to the system log.

When a task initiated from a CANDE or MARC session attempts to access its own NOJOBSUMMARYIO value, the system actually accesses the NOJOBSUMMARYIO value for the session. In other words, for a task initiated from a session, *MYSELF.NOJOBSUMMARYIO* is interpreted as *MYJOB.NOJOBSUMMARYIO*. Any assignments made by the offspring actually affect the job summary for the session. In MARC, you can also assign the NOJOBSUMMARYIO value for a session by using the MARC *NOJOBSUMMARYIO* command.

A task initiated from a job can read or modify its own NOJOBSUMMARYIO value. However, for a task the NOJOBSUMMARYIO value has no effect, because a task has no job summary. The NOJOBSUMMARYIO value of the task's job determines whether information from that task is written to the job log.

OPTION

Type	Option list
Units	Not applicable
Range	See "Explanation" below
Default	All options reset
Read Time	Anytime
Write Time	Anytime
Inheritance	See below
Fork() Inheritance	From parent
Overwrite Rules	Standard
Host Services	Supported
Attribute Number	22
Synonym	OPTIONS
Restrictions	None

Explanation

The OPTION task attribute assigns or returns the values of various options for the process. The options affect program dump contents, job summary printing, handling of backup files, and other areas.

The option value is a single word in which selected bits are associated with particular options. Most of the options have associated mnemonics that can be used to assign that bit. Any combination of options can be set at the same time. The following are the option mnemonics and the effects they have when set:

Option	Meaning
ARRAYS	All arrays of the stack are dumped if a program dump occurs. The ARRAYS option can be abbreviated as ARRAY.
AUTORM	If this option and/or the system option AUTORM is set, then any duplicate library conditions created by the process cause the removal of the old file. For details, refer to the discussion of shared files in the *Task Management Programming Guide*.

Option	Meaning
BACKUP	For printer files, this option has the following effects: • If BACKUP is set or the system option LPBDONLY is set, the PRINTDISPOSITION file attribute defaults to the value of the PS DEFAULT PRINTDISPOSITION option. • If neither BACKUP nor LPBDONLY is set, the PRINTDISPOSITION file attribute defaults to DIRECT. For punch files, this option has the following effects: • If BACKUP is set or the system option CPBDONLY is set, the PRINTDISPOSITION file attribute defaults to DONTPRINT. • If neither BACKUP nor CPBDONLY is set, the PRINTDISPOSITION file attribute defaults to DIRECT. The LPBDONLY and CPBDONLY system options are controlled by the OP (Options) system command. The BACKUP option interacts with a number of other factors to determine the creation of backup files. For further information, refer to the discussion of printer output in the *Task Management Programming Guide*.
BASE	The base of the process stack, the process information block (PIB), and the task attribute block (TAB) are dumped if a program dump occurs.
BDBASE	The process assumes some of the characteristics of a job, including the default printing of backup files at termination time. For details, refer to the discussion of interprocess relationships in the *Task Management Programming Guide*.
CODE	The segment dictionary of the task is dumped if a program dump occurs.
CRITICALBLOCK	If this option is set, the stack that contains the critical block of the dumping stack is dumped by PROGRAMDUMP (whether TODISK or TOPRINTER). The dump also includes the appropriate stacks that are in the PROGRAMDUMPGRAPH of the additionally selected stack (dependent on the other options such as LIBRARIES and CODE). JOB stacks are not dumped. Stacks are dumped from the top of the environment that contains the critical block (or from the base of the frozen environment of a library or database stack, whichever is higher in the process).
DBS	The database stack is dumped if a program dump occurs.
DEBUG	If the process is a COBOL74 process, it executes special compiled-in debugging code. For details, refer to the *COBOL ANSI-74 Programming Reference Manual, Volume 1: Basic Implementation*.
DSED	A program dump occurs if the process is terminated by an external cause. For a definition of *external cause*, refer to the *Task Management Programming Guide*.

Option	Meaning
FAULT	A program dump occurs if the process terminates abnormally from an internal cause. For a definition of *internal cause* refer to the *Task Management Programming Guide*.
FILES	Information about the files in the stack is dumped if a program dump occurs. The contents of disk file headers are included in the hex information output by this option. The FILES option can be abbreviated as FILE.
LIBRARIES	All libraries associated with the stack are dumped if a program dump occurs. The output from this option includes an analysis of all library-related information, including library templates and directories. The output now also includes connection libraries.
LONG	No arrays are segmented. This option affects only programs written in ALGOL, FORTRAN, or FORTRAN77.
NOSUMMARY	If the JOBSUMMARY task attribute has a value of DEFAULT, then the NOSUMMARY option causes the process to behave as if the JOBSUMMARY task attribute had a value of CONDITIONAL. Refer to the description of the JOBSUMMARY task attribute.
PRESENTARRAYS	Only those arrays that are present in memory are dumped if a program dump occurs. This option reduces the size of a program dump as well as the time the system takes to generate the program dump. Note that if the ARRAYS option is also set, it overrides PRESENTARRAYS and causes all arrays to be dumped. The PRESENTARRAYS option can be abbreviated as PRESENTARRAY.
PRIVATELIBRARIES	Any private libraries used by the process are dumped if a program dump occurs. This option causes an analysis of all library-related information, including library templates and directories.
(private process)	The descendants of the process are prevented from altering the task attributes of the process. Any descendant that attempts to assign an attribute of this process is discontinued. This option is typically assigned to message control systems (MCSs) to prevent tasks initiated by sessions from accessing the task attributes of the MCS. There is no mnemonic for this option, which must be assigned by bit number (see the following discussion of bits and their mnemonics).
SORTLIMITS	Setting this option protects a process that has invoked the SORT facility from being terminated if SORT runs out of memory or disk space. Before performing the actual sort, the SORT facility will determine whether adequate memory and disk space has been allocated to perform the sort. If the allocation is insufficient, the process is suspended and the system displays an RSVP message asking the operator to enter an OK (Reactivate) system command to allow SORT to allocate more memory or disk space. For information about the SORT facility, refer to the *Unisys e-@ction ClearPath Enterprise Servers System Software Utilities Operations Reference Manual*.

Option	Meaning
TODISK	Causes any program dumps generated by the process to be directed to a disk file. This is also the default behavior if the operating system option PDTODISK is set. When the program dump goes to a disk file, a brief summary of the program dump is also written to the program's TASKFILE. This summary describes the name of the disk file and its location. For details about the effects of this option, refer to the *Task Management Programming Guide*.
TOPRINTER	Causes any program dumps generated by the process to be directed to the task file. This is also the default behavior if the operating system option PDTODISK is not set. For details about the effects of this option, refer to the *Task Management Programming Guide* .

The following are the meanings of the various bits in the OPTION value:

Bit	Corresponding OPTION Mnemonic
[47:01]	This bit is set by an OPTION assignment statement in WFL that uses an asterisk (*) to retain the previous option values. (See "Examples" following.)
[25:01]	CRITICALBLOCK
[24:01]	TOPRINTER
[23:01]	TODISK
[22:01]	SORTLIMITS
[21:01]	DEBUG
[20:01]	PRIVATELIBRARIES
[19:01]	LIBRARIES
[15:01]	DBS
[14:01]	private process
[12:01]	NOSUMMARY
[11:01]	PRESENTARRAYS
[10:01]	FILES
[09:01]	CODE
[08:01]	ARRAYS
[07:01]	BASE
[06:01]	BDBASE
[05:01]	AUTORM
[04:01]	BACKUP
[02:01]	DSED
[01:01]	FAULT
[00:01]	LONG

The operator can change the value of the OPTION task attribute with the DUMP (Dump Memory) system command or the DS (Discontinue) system command. Both these commands can include option lists that set program dump options of the OPTION task attribute.

On the other hand, program dump statements in programs do not modify the value of the OPTION task attribute, even if these statements specify dump options. Any dump options specified in a program dump statement thus do not affect later program dumps generated by the process. For information about program dump statements, refer to the *Task Management Programming Guide*.

Inheritance

An internal process inherits the OPTION value of its parent. External processes do not inherit OPTION values.

Examples

The following are ALGOL examples of several methods of setting the OPTION value:

```
200 TVAR.OPTION := 2**VALUE(ARRAYS) + 2**VALUE(FILES);
300 TVAR.OPTION := 1"10100000000";
400 TVAR.OPTION := 1280;
500 TVAR.OPTION := * & 1[VALUE(ARRAYS):1] & 1[VALUE(FILES):1];
600 TVAR.OPTION := * & 0[VALUE(FILES):1];
```

In this example, the statement at line 100 resets all the options. The statement at line 200 sets the ARRAYS and FILES options and resets all the other options. The statements at lines 300 and 400 have the same effect. The statement at line 500 has a similar effect, except that it does not reset any options that were set previously. The statement at line 600 resets a single option (FILES) while leaving the other options unchanged. Where the VALUE function is used in these examples, it returns the bit position of the specified mnemonic.

The following COBOL74 example assigns the FAULT option to the OPTION task attribute and leaves any other options unchanged. Note that if line 600 were omitted, the example would reset all options except FAULT:

```
100 WORKING-STORAGE SECTION.
200 01  OPTION-WORD  PIC 9(11)  BINARY.
300 01  VALUE-ONE    PIC 9(11)  BINARY  VALUE 1.
400 PROCEDURE DIVISION.
500 P-1.
600     MOVE ATTRIBUTE OPTION OF MYSELF TO OPTION-WORD.
700     MOVE VALUE-ONE TO OPTION-WORD [0:VALUE FAULT:1].
800     CHANGE ATTRIBUTE OPTION OF MYSELF TO OPTION-WORD.
```

COBOL85 does not permit mnemonics to be used to specify OPTION bits. To make the preceding example work in COBOL85, you would need to eliminate the FAULT mnemonic from line 700. The revised example would work in both COBOL85 and COBOL74. Line 700 would appear as follows:

```
700     MOVE VALUE-ONE TO OPTION-WORD [0:1:1].
```

The following is an example of an OPTION task attribute assignment in WFL:

```
OPTION = (*,ARRAYS,FILES);
```

This example assigns the ARRAYS and FILES options and leaves unchanged any options that were already set. If the asterisk (*) is not included, then all options are reset except the ones specifically assigned by the statement. By default all options are reset unless the inheritance rules apply.

Run-Time Error

NON-OWNER WRITE ACCESS OF A PRIVATE TASK

A descendant of a private process has attempted to make an assignment to a task attribute of the private process. (A private process is one whose OPTION task attribute has the "private process" option set.) The descendant process, if nonprivileged, is discontinued with HISTORYCAUSE = 2 (PROGRAMCAUSEV) and HISTORYREASON = 56 (NONOWNERACCESSV).

OPTIONAL

Type	Boolean
Units	Not applicable
Range	TRUE, FALSE
Default	FALSE
Read Time	Anytime
Write Time	Anytime
Inheritance	None
Fork() Inheritance	From parent
Overwrite Rules	Not applicable
Host Services	Not supported
Attribute Number	155
Synonym	None
Restrictions	None

Explanation

The OPTIONAL task attribute, when set to TRUE for a task before it is initiated, specifies that the initiating task does not wait on a "NO FILE" RSVP if the code file is not present or if the task cannot be initiated for security reasons. For the noninitiated task, HISTORYCAUSE = 2 (PROGRAMCAUSEV), HISTORYREASON = 1 (MISSINGCODEFILEV), and its STATUS attribute = –2 (BADINITIATE).

The value of the OPTIONAL task attribute has no effect if the initiating task is an MCS.

ORGUNIT

Type	Integer
Units	Not applicable
Range	See "Explanation" below
Default	See below
Read Time	Anytime; accurate after initiation
Write Time	Never
Inheritance	See below
Fork() Inheritance	From parent
Overwrite Rules	None (read-only)
Host Services	Not supported
Attribute Number	38
Synonym	None
Restrictions	None

Explanation

The ORGUNIT task attribute records the Logical Station Number (LSN) or physical unit number of the unit that initiated this process. For example, for a process initiated by a CANDE *RUN* command, this task attribute records the LSN of the terminal where the RUN command was entered. The offspring of a process also inherit the ORGUNIT value of that process.

The following fields are defined in the ORGUNIT value:

Field	Meaning
[15:01]	If set, the job was started from a remote terminal. If reset, the job was started from another source, such as an ODT, a card reader, or the operating system.
[14:15]	If [15:01] is set, this field contains the LSN of the originating terminal. If [15:01] is reset, this field contains the physical unit number of the originating device. The ORGUNIT value is 0 for processes initiated by the ??RUN (Run Code File) primitive system command, for processes initiated by independent runners, and for remote processes.

For details about how to access these fields, refer to "Accessing Task Attributes at the Bit Level" in Section 1, "Accessing Task Attributes."

One typical use of ORGUNIT is to examine bit 15 to determine whether a process was initiated from a remote terminal. The process can use this information to decide whether to open a remote file to communicate with the user. A process can more precisely determine the type of source from which it was initiated by reading the SOURCEKIND task attribute.

If the process was initiated from a remote terminal, it might be useful for the process to read ORGUNIT to extract the LSN. By assigning field [14:15] of the ORGUNIT value to the STATION task attribute, the process can make it possible to open a remote file at the originating station. (An alternate method of learning the LSN is to read the SOURCESTATION task attribute.)

Note: *The LSN associated with any particular station can change over time. The ORGUNIT value is not updated to reflect such changes. An alternative to ORGUNIT is the SOURCENAME task attribute. SOURCENAME stores the originating station name, which is less volatile than the LSN.*

The physical unit returned by ORGUNIT can be a useful aid to assigning an ODT file, as shown under "Example" in this description.

Default

Before a process is initiated, the default ORGUNIT value is 0. At initiation time, ORGUNIT is automatically assigned the correct value.

Inheritance

A process inherits the ORGUNIT value of its parent.

If a WFL job is initiated from a CANDE or MARC session or from a task descended from such a session, the WFL job inherits the ORGUNIT of the session.

Example

The following ALGOL example shows two uses of ORGUNIT:

```
100 BEGIN
110 FILE TERM (MYUSE=IO,DEPENDENTSPECS=TRUE);
120
130 IF MYSELF.SOURCEKIND = VALUE(REMOTE) THEN
140    BEGIN
150      TERM.KIND := VALUE(REMOTE);
160      MYSELF.STATION :=MYSELF.ORGUNIT.[14:15];
170    END;
180 IF MYSELF.SOURCEKIND = VALUE(ODT) THEN
190    BEGIN
200      TERM.KIND := VALUE(ODT);
210      TERM.UNITNO := MYSELF.ORGUNIT.[14:15];
220    END;
230
240 OPEN (TERM);
250 WRITE (TERM, //, "HI, HOW ARE YOU");
260 END.
```

This program examines the SOURCEKIND value to determine whether it was initiated from a remote terminal or an ODT. The statement at line 160 is equivalent to

```
MYSELF.STATION := MYSELF.SOURCESTATION;
```

For more information, refer to the description of the STATION task attribute.

If the program was initiated at an ODT, the statement at line 210 assigns the physical unit number of the ODT to the UNITNO file attribute. This assignment allows the file to be automatically opened at the ODT, and saves the operator from having to enter a LABEL (Label ODT) system command. Note that this statement is not necessary if the MYUSE file attribute value is OUT instead of IO or IN. For further information about ODT files, refer to the *I/O Subsystem Programming Guide*.

Note also that use of the UNITNO file attribute is restricted on systems running Security Services for ClearPath MCP at the S2 level or with the security option NONPRIVUNITNO set to the value NOTOK. Refer to the *Security Administration Guide* for details.

OTHERPBITCOUNT

Type	Real
Units	Presence-bit operations
Range	0 to about 4.31E+68
Default	0
Read Time	Anytime
Write Time	Never
Inheritance	None
Fork() Inheritance	None
Overwrite Rules	None (read-only)
Host Services	Not supported
Attribute Number	106
Synonym	None
Restrictions	None

Explanation

The OTHERPBITCOUNT task attribute returns the count of noninitial presence-bit interrupts for the process since its initiation.

For information about noninitial presence-bit operations, refer to the *Task Management Programming Guide*.

OTHERPBITTIME

Type	Real
Units	See below
Range	0 to about 4.31E+68
Default	0
Read Time	Anytime
Write Time	Never
Inheritance	None
Fork() Inheritance	None
Overwrite Rules	None (read-only)
Host Services	Not supported
Attribute Number	107
Synonym	None
Restrictions	None

Explanation

The OTHERPBITTIME task attribute returns the total time spent processing noninitial presence-bit interrupts for this process.

For information about noninitial presence-bit operations, refer to the *Task Management Programming Guide*.

Units

In most languages, this value is returned in units of 2.4 microseconds. However, in WFL this value is returned in units of seconds.

PARTNER

Type	Task
Units	Not applicable
Range	Any task variable
Default	See below
Read Time	Anytime
Write Time	Anytime
Inheritance	None
Fork() Inheritance	Reset to default
Overwrite Rules	Standard
Host Services	Supported
Attribute Number	19
Synonym	None
Restrictions	Not available in WFL

Explanation

The PARTNER task attribute accesses the task variable of the partner process. The partner process is the one to which control is passed when an ALGOL process executes a simple CONTINUE statement or a COBOL process executes an EXIT PROGRAM statement. Also, the system automatically continues the partner process of a synchronous task when the synchronous task terminates.

A process can use the PARTNER task attribute as a means to read or write the task attributes of the partner process. For example, a process can determine the identity of the partner process by reading the NAME task attribute of the PARTNER task attribute. The following is an ALGOL example of such a statement:

```
REPLACE NAMEARR BY MYSELF.PARTNER.NAME;
```

A process can also use the PARTNER task attribute to assign a particular process to be the partner process. However, setting the PARTNER task attribute to a process other than the parent is not recommended. Such a practice causes each CONTINUE statement to use more processor time and also leads to source code that is difficult to understand and maintain.

If the PARTNER value is a WFL job, then a simple CONTINUE statement has no effect. Execution simply continues to the next statement in the same process.

Similarly, if the PARTNER value defaults to MYSELF, then a simple CONTINUE statement has no effect and execution continues to the next statement. However, if you explicitly assign MYSELF.PARTNER := MYSELF, then a simple CONTINUE statement causes an ILLEGAL VISIT error.

An ILLEGAL VISIT error also occurs if a process performs a simple CONTINUE statement and the PARTNER attribute points to a process that is not in the stack state TO BE CONTINUED. Note that stack states are different from STATUS task attribute values; stack states can be displayed with the Y (Status Interrogate) system command.

To determine whether a partner process exists that can be continued by a simple CONTINUE statement, a process can interrogate the PARTNEREXISTS task attribute.

For more information about partner processes, refer to the *Task Management Programming Guide*. Also, see the description of the PARTNEREXISTS task attribute.

Default

For an independent process or an asynchronous dependent process, the default value of PARTNER is a reference to MYSELF. However, if the process initiates a synchronous dependent offspring, PARTNER changes to a reference to that offspring.

For a dependent process with no offspring, the default value of PARTNER is usually a reference to the initiator of the process. However, PARTNER defaults to MYSELF for such a process if either of the following conditions is true:

- The process was initiated from a MARC or CANDE session.
- The process is a remote process. That is, it was initiated from one BNA host system and runs on a different host system.

When a dependent process *A* initiates a dependent offspring *B*, the PARTNER task attribute of dependent process *A* remains unchanged. It does not become a reference to dependent offspring *B* unless explicitly assigned.

Run-Time Errors

ILLEGAL VISIT

A process executed a simple CONTINUE statement and the PARTNER task attribute had been explicitly assigned a task variable that is not in the TO BE CONTINUED state. The process is discontinued with HISTORYCAUSE = 2 (PROGRAMCAUSEV) and HISTORYREASON = 6 (ILLEGALVISITV).

VISIT NONACTIVE TASK

A process attempted to use a CONTINUE statement to transfer control to a process that is not in use (that is, a process that has terminated or has not yet been initiated). The process that executed the CONTINUE statement is discontinued with HISTORYCAUSE = 2 (PROGRAMCAUSEV) and HISTORYREASON = 5 (VISITNONACTIVEV).

PARTNEREXISTS

Type	Boolean
Units	Not applicable
Range	TRUE, FALSE
Default	FALSE
Read Time	Anytime
Write Time	Never
Inheritance	None
Fork() Inheritance	None
Overwrite Rules	None (read-only)
Host Services	Not supported
Attribute Number	27
Synonym	None
Restrictions	None

Explanation

The PARTNEREXISTS task attribute indicates whether the partner process is a continuable coroutine. The partner process is the process indicated by the PARTNER task attribute. PARTNEREXISTS returns a value of TRUE only if all the following conditions are true:

- The process is a synchronous process.
- The partner process is a separate process whose state is TO BE CONTINUED.
- The partner process is not a WFL job.

For more information about partner processes, refer to the *Task Management Programming Guide.* Also, see the description of the PARTNER task attribute.

PDUMPTITLE

Type	Name
Units	Not applicable
Range	<Name>
Default	Null string
Read Time	Anytime
Write Time	Never
Inheritance	Never
Overwrite Rules	See below
Host Services	Supported
Attribute Number	145
Synonym	None
Restrictions	None

Explanation

The PDUMPTITLE attribute is a read-only attribute that specifies the title of the last programdump TODISK file generated by the task. This attribute cannot be modified by the task and is not inherited by dependent tasks.

PDUMPTITLE is initialized to null (".") when the task is initiated. The attribute is set to the title of the programdump file when the task successfully generates a programdump TODISK file. Any previous value for this attribute is discarded. The value of the PDUMPTITLE attribute remains valid after the task terminates.

PDUMPTITLE is not altered when the task generates a programdump TOPRINTER file.

Interrogating PDUMPTITLE for a task variable returns

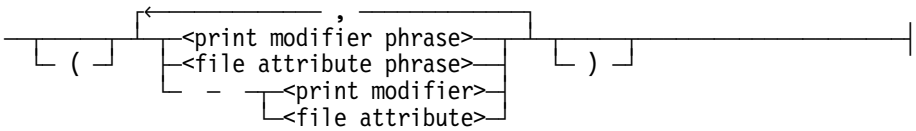
- A null value "." if no programdump file is generated
- The display form title, terminated with a period, of the last programdump TODISK file generated by the task

PRINTDEFAULTS

Type	String
Units	Not applicable
Range	<print specification>
Default	Null string
Read Time	Anytime
Write Time	Anytime
Inheritance	See below
Fork() Inheritance	From parent
Overwrite Rules	Standard
Host Services	Not supported
Attribute Number	99
Synonym	None
Restrictions	Not readable in WFL

Range

<print specification>



The outer parentheses are required in WFL, but optional in ALGOL and COBOL.

<print modifier phrase>
<file attribute phrase>
<print modifier>
<file attribute>

For a discussion of file attributes and print modifiers, refer to the *Print System Guide*.

Explanation

The PRINTDEFAULTS task attribute specifies default values for file attributes and print modifiers. These default values are applied to any file attributes or print modifiers that are not explicitly assigned values by the process.

When you assign print modifier phrases or file attribute phrases to PRINTDEFAULTS, the system merges these assignments with the existing PRINTDEFAULTS value.

You can clear the PRINTDEFAULTS value by assigning "." in ALGOL or COBOL. (There is no equivalent statement in WFL.)

You can use the – <print modifier> or – <file attribute> constructs to remove a single modifier or attribute from the PRINTDEFAULTS value. These constructs also prevent the inheritance of that modifier or attribute from the parent. If you read the PRINTDEFAULTS value later, the deleted modifier or attribute appears preceded by a minus sign (-).

For an overview of all task attributes related to printing, refer to the *Task Management Programming Guide*.

The PAGECOMP specification in a job PRINTDEFAULTS attribute, or in the PRINTDEFAULTS value inherited by a job, might be used when the job summary file is printed. This determination is made by the PS DEFAULT JOBSUMMARY PAGECOMP system command. For details, refer to the *Print System Guide*.

Inheritance

A process inherits the PRINTDEFAULTS value of its parent.

If the system administrator has assigned a PRINTDEFAULTS attribute to a usercode, then MARC or CANDE sessions with that usercode receive that PRINTDEFAULTS value at log-on time. You can use the MARC *PRINTDEFAULTS* command to change the PRINTDEFAULTS value of a MARC session. You can use the CANDE *PDEF* command to change the PRINTDEFAULTS value of a CANDE session. Any processes initiated from a MARC or CANDE session inherit the PRINTDEFAULTS value of the session.

The PRINTDEFAULTS attribute of a usercode is also inherited by WFL jobs that are assigned that usercode in the job attribute list. However, if the job attribute list also contains a PRINTDEFAULTS assignment, the PRINTDEFAULTS attribute of the usercode is ignored.

Examples

The following is an example of a PRINTDEFAULTS assignment in WFL:

```
TVAR (PRINTDEFAULTS = (DESTINATION = "LP4", USERBACKUPNAME = TRUE,
                       SAVEPRINTFILE = TRUE));
```

The following is an example of a PRINTDEFAULTS assignment in COBOL74 or COBOL85:

```
CHANGE ATTRIBUTE PRINTDEFAULTS OF TASK-VAR-1 TO
   "DESTINATION = ""LP4"", USERBACKUPNAME = TRUE.".
```

The following is an example of a PRINTDEFAULTS assignment in ALGOL:

```
REPLACE T.PRINTDEFAULTS BY
  "DESTINATION = """LP4""", USERBACKUPNAME = TRUE,"
  " SAVEPRINTFILE = TRUE.";
```

The following ALGOL example is identical to the previous one, except that outer parentheses are used around the value. The effect of the assignment is the same.

```
REPLACE T.PRINTDEFAULTS BY
  "(DESTINATION = """LP4""", USERBACKUPNAME = TRUE,"
  " SAVEPRINTFILE = TRUE).";
```

Run-Time Errors

PRINTDEFAULTS ATTRIBUTE INCORRECT SYNTAX

A process attempted to assign PRINTDEFAULTS a value that did not conform to the print specification syntax. The assigning process, if nonprivileged, is discontinued with HISTORYCAUSE = 2 (PROGRAMCAUSEV) and HISTORYREASON = 131 (INCORRECTSYNTAXV).

WAITING FOR PRINTSUPPORT TO INITIALIZE

A process attempted to read or assign PRINTDEFAULTS, and the print support library is not available. The process is suspended until the print support library initializes. For information about initializing the print support library, refer to the *Print System and Remote Print System Administration, Operations, and Programming Guide*.

PRIORHISTORY

Type	Real
Units	Not applicable
Range	See "Explanation" below
Default	0
Read Time	Anytime
Write Time	Never
Inheritance	None
Fork() Inheritance	From parent
Overwrite Rules	None (read-only)
Host Services	Not supported
Attribute Number	138
Synonym	None
Restrictions	None

Explanation

The PRIORHISTORY task attribute is valid when a program uses TRY error-handling code to prevent accidental termination. The PRIORHISTORY attribute returns information that would be in the HISTORY attribute if the process had terminated. Because the TRY error-handling code prevented the process from terminating, fields [23:08], [15:08], and [07:08] of HISTORY are reset to zero, and PRIORHISTORY contains the nature of the (prevented) termination condition.

The PRIORHISTORY task attribute is identical to the HISTORY task attribute except that PRIORHISTORY is valid only when the TRY error-handling code has been invoked. The values in PRIORHISTORY change only when subsequent TRY error-handling code is invoked.

For more information about the PRIORHISTORY task attribute, see the HISTORY task attribute description. For more information about TRY error-handling, see the *Task Management Programming Guide* or the *ALGOL Programming Reference Manual, Volume 1: Basic Implementation.*

PRIORHISTORYCAUSE

Type	Mnemonic
Units	Not applicable
Range	See "Explanation" below
Default	0
Read Time	Anytime
Write Time	Never
Inheritance	None
Fork() Inheritance	From parent
Overwrite Rules	None (read-only)
Host Services	Supported
Attribute Number	140
Synonym	None
Restrictions	None

Explanation

The PRIORHISTORYCAUSE task attribute is valid when a program uses TRY error-handling code to prevent accidental termination. The PRIORHISTORYCAUSE attribute returns information that would be in the HISTORYCAUSE attribute if the task had terminated. Because the TRY error-handling code prevented the task from terminating, HISTORYCAUSE is reset to zero, and PRIORHISTORYCAUSE contains the nature of the (prevented) termination condition.

The PRIORHISTORYCAUSE task attribute specifies what general type of condition would have caused the process to terminate abnormally or be suspended. The PRIORHISTORYCAUSE value is the same as field [15:08] of the PRIORHISTORY task attribute.

The PRIORHISTORYCAUSE task attribute is identical to the HISTORYCAUSE task attribute except in the following respects:

- PRIORHISTORYCAUSE is valid only when the TRY error-handling code has been invoked. The values in PRIORHISTORYCAUSE change only when subsequent TRY error-handling code is invoked.
- For TRY statements with the PROTECTED clause, a PRIORHISTORY value of zero has a special meaning. A zero value indicates that the process attempted to execute a GO TO statement that exits to outside the TRY statement.

For more information about the PRIORHISTORYCAUSE task attribute, see the HISTORYCAUSE task attribute description. For more information about TRY error-handling, see the *Task Management Programming Guide* or the *ALGOL Programming Reference Manual, Volume 1: Basic Implementation.*

PRIORHISTORYREASON

Type	Mnemonic
Units	Not applicable
Range	See "Explanation" below
Default	0
Read Time	Anytime
Write Time	Never
Inheritance	None
Fork() Inheritance	From parent
Overwrite Rules	None (read-only)
Host Services	Supported
Attribute Number	141
Synonym	None
Restrictions	Not available in WFL; however, for a description of how to extract the same information from the HISTORY task attribute, refer to "Accessing Task Attributes at the Bit Level" in Section 1.

Explanation

The PRIORHISTORYREASON task attribute is valid when a program uses TRY error-handling code to prevent accidental termination. The PRIORHISTORYREASON attribute returns information that would be in the HISTORYREASON attribute if the task had terminated. Because the TRY error-handling code prevented the task from terminating, HISTORYREASON is reset to zero, and PRIORHISTORYREASON contains the nature of the (prevented) termination condition.

The PRIORHISTORYREASON task attribute indicates the specific reason why a process would have terminated abnormally or be suspended. The PRIORHISTORYREASON value corresponds to field [23:08] of the PRIORHISTORY task attribute.

The PRIORHISTORYREASON task attribute is identical to the HISTORYREASON task attribute except that PRIORHISTORYREASON is valid only when the TRY error-handling code has been invoked. The values in PRIORHISTORYREASON change only when subsequent TRY error-handling code is invoked.

For more information about the PRIORHISTORYREASON task attribute, see the HISTORYREASON task attribute description. For more information about TRY error-handling, see the *Task Management Programming Guide* or the *ALGOL Programming Reference Manual, Volume 1: Basic Implementation.*

PRIORHISTORYTYPE

Type	Mnemonic
Units	Not applicable
Range	See "Explanation" below
Default	NORMALV
Read Time	Anytime
Write Time	Never
Inheritance	None
Fork() Inheritance	From parent
Overwrite Rules	None (read-only)
Host Services	Supported
Attribute Number	139
Synonym	None
Restrictions	None

Explanation

The PRIORHISTORYTYPE task attribute is valid when a program uses TRY error-handling code to prevent accidental termination. The PRIORHISTORYTYPE attribute returns information that would be in the HISTORYTYPE attribute if the task had terminated. Because the TRY error-handling code prevented the task from terminating, HISTORYTYPE is reset to zero, and PRIORHISTORYTYPE contains the nature of the (prevented) termination condition.

The PRIORHISTORYTYPE indicates the type of termination that would have occurred for a process. The PRIORHISTORYTYPE value is identical to field [07:08] of the PRIORHISTORY task attribute.

The PRIORHISTORYTYPE task attribute is identical to the HISTORYTYPE task attribute except that PRIORHISTORYTYPE is valid only when the TRY error-handling code has been invoked. The values in PRIORHISTORYTYPE change only when subsequent TRY error-handling code is invoked.

For more information about the PRIORHISTORYTYPE task attribute, see the HISTORYTYPE task attribute description. For more information about TRY error-handling, see the *Task Management Programming Guide* or the *ALGOL Programming Reference Manual, Volume 1: Basic Implementation.*

PRIORITY

Type	Integer
Units	Not applicable
Range	0 to 99
Default	50
Read Time	Anytime
Write Time	See below
Inheritance	See below
Fork() Inheritance	From parent
Overwrite Rules	See below
Host Services	Supported
Attribute Number	3
Synonym	DECLAREDPRIORITY
Restrictions	None

Explanation

The PRIORITY task attribute specifies the degree of precedence this process has when competing with other processes for system resources. In general, the higher the number assigned to PRIORITY, the faster the process runs.

The priority of a process is affected by other factors in addition to the PRIORITY task attribute. For details, refer to the discussion of priority in the *Task Management Programming Guide*.

If a limit value is set for the PRIORITY attribute of a job queue, then WFL jobs that specify a higher PRIORITY value in the job attribute list cannot be accepted into that job queue.

For PRIORITY assignments made before initiation, for example, in the job attribute list of a WFL job, only values 1 through 99 are effective. A PRIORITY assignment of zero is converted to the default of 50 at process initiation, unless inheritance or overwrite rules result in a different value.

Write Time

The PRIORITY task attribute can be assigned a value at any time. The PRIORITY value reflects assignments made after initiation; however, such assignments do not change the actual priority of the process. Only a PR (Priority) system command can effectively change the PRIORITY task attribute value after initiation.

Inheritance and Overwrite Rules

A process inherits the PRIORITY value of its parent.

At the start of any CANDE or MARC session, CANDE or MARC reads the USERDATAFILE to determine if the usercode of the session has a PRIORITY attribute defined for it. If so, CANDE or MARC stores this PRIORITY value as the priority of the session. If no PRIORITY attribute is defined for the usercode, the session receives no session priority.

If the PRIORITY usercode attribute value is changed after the start of the session, the session priority remains unchanged.

For tasks initiated from CANDE or MARC sessions, the PRIORITY value is determined by the following factors (listed in order from highest to lowest precedence):

- Any PRIORITY task equation appended to the task initiation statement. However, the task equation is ignored if it assigns a PRIORITY value higher than the session PRIORITY.
- The PRIORITY value of the session, if any.
- Any PRIORITY value assigned to the object code file of the task.
- The default PRIORITY value of 50.

For tasks initiated from WFL, the PRIORITY value is determined by the following factors (listed in order from highest to lowest precedence):

- Any PRIORITY task equation appended to the task initiation statement.
- Any PRIORITY value assigned to the object code file of the task.
- The PRIORITY value of the session, if any.
- The PRIORITY value of the WFL job, if any.
- The default PRIORITY value of 50.

The PRIORITY attribute of a usercode is also inherited by WFL jobs that are assigned that usercode in the job attribute list, or that inherit the terminal usercode of an ODT. However, if the job attribute list also contains a PRINTDEFAULTS assignment, the PRINTDEFAULTS attribute of the usercode is ignored.

If a default value is set for the PRIORITY job queue attribute, then that value is inherited by the PRIORITY task attribute of WFL jobs run from that queue. A Q-DS occurs if the value of an inherited PRIORITY attribute of a usercode is greater than the value of the PRIORITY job queue attribute.

In general, tasks can be assigned a higher priority than their parents. However, descendants of WFL jobs cannot be assigned a higher PRIORITY value than the PRIORITY job queue limit (if there is one). When the descendant task is initiated, it receives a PRIORITY value equal to the lower of the following values: the requested PRIORITY value and the job queue PRIORITY limit.

REALGROUPCODE

Type	String
Units	Not applicable
Range	<usercode assignment>
Default	Null string
Read Time	Anytime
Write Time	Never
Inheritance	See below
Fork() Inheritance	From parent
Overwrite Rules	None (read-only)
Host Services	Supported
Attribute Number	133
Synonym	None
Restrictions	None

Explanation

The REALGROUPCODE task attribute stores a copy of the GROUPCODE value the process received from its initiator. This value might have been inherited or assigned through task equation.

The REALGROUPCODE value can differ from the values of the GROUPCODE and SAVEDGROUPCODE task attributes. For an explanation of how these group code values are related, refer to the discussion of process identities in the *Task Management Programming Guide*.

REALUSERCODE

Type	String
Units	Not applicable
Range	<usercode assignment>
Default	Null string
Read Time	Anytime
Write Time	Never
Inheritance	See below
Fork() Inheritance	From parent
Overwrite Rules	None (read-only)
Host Services	Supported
Attribute Number	130
Synonym	None
Restrictions	None

Explanation

The REALUSERCODE task attribute stores a copy of the USERCODE value the process received from its initiator. This value might have been inherited or assigned through task equation.

The REALUSERCODE value can differ from the values of the USERCODE and SAVEDUSERCODE task attributes. For an explanation of how these usercode values are related, refer to the discussion of process identities in the *Task Management Programming Guide*.

REPORTBADINITIATE

Type	Boolean
Units	Not applicable
Range	TRUE, FALSE
Default	FALSE
Read Time	Anytime
Write Time	Anytime
Inheritance	None
Fork() Inheritance	From parent
Overwrite Rules	Not applicable
Host Services	Not supported
Attribute Number	156
Synonym	None
Restrictions	None

Explanation

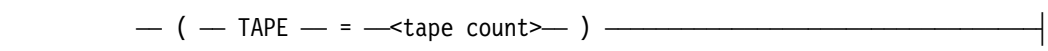
The REPORTBADINITIATE task attribute, when set to TRUE for a task before it is initiated, notifies the initiating task when the new task initiation fails, regardless of the reason for that failure. The initiating task continues even though a new task cannot be initiated. For the noninitiated task, HISTORYTYPE = 4 (DSEDV), and HISTORYCAUSE and HISTORYREASON are set to specify the reason the new task did not begin. Its STATUS attribute is –2 (BADINITIATE).

RESOURCE

Type	Resource
Units	Not applicable
Range	<resource list>
Default	Unlimited
Read Time	Never
Write Time	Before initiation
Inheritance	See below
Fork() Inheritance	0
Overwrite Rules	Standard
Host Services	Supported
Attribute Number	53
Synonym	None
Restrictions	Available only in WFL

Range

<resource list>



<tape count>

An integer in the range 0 to 255

Explanation

The RESOURCE task attribute allows the programmer to specify the maximum number of tape units that a WFL job, and its descendants, will have open at the same time. The RESOURCE value includes all kinds of magnetic tapes.

If the RESOURCE value of a process requests more tape units than are in the overall tape pool, then process initiation is interrupted and the process appears in the W (Waiting Entries) system command display with a "WAITING FOR RESOURCE" RSVP message. The overall tape pool consists of tape units that have been acquired by the system and have not been opened by any process.

If a RESOURCE value is assigned to a task, then the RESOURCE value is compared with the local tape pool as well as the overall tape pool. The local tape pool is defined by the most immediate ancestor process for which RESOURCE was explicitly set. The local tape pool is the number of tapes that can be opened by that ancestor process and all its descendants at any given time. The local tape pool is decremented by one when any of these processes opens a tape file and incremented by one when any of them closes a tape file. If a task is initiated with a RESOURCE value that specifies more tape units than are available in the local tape pool, the task appears in the W display with a "WAITING FOR RESOURCE" RSVP message.

However, RESOURCE does not actually impose a limit on the number of tape files a process can attempt to open. A process can have a RESOURCE value of (TAPE=0) and still open a TAPE file. The only effect of RESOURCE is to interrupt initiation of a process whose RESOURCE value requests more tapes than are available.

A process in this condition is neither scheduled nor suspended. Initiation is halted at a later stage than it is for a scheduled process, which has only a mix number and a PIB. A process whose initiation was suspended because of a missing tape resource has a mix number, a PIB, and also a process stack. However, the code segment dictionary does not yet exist and execution of the process has not begun.

The RESOURCE task attribute is useful for preventing deadlock conditions. For example, there could be four tape units and two processes, each of which needs to use three tape units. If these processes run simultaneously, and RESOURCE is not set for either one, then the processes might succeed in opening two tape units each. Once this has happened, neither process can proceed until the other one is terminated by an operator action, such as a DS (Discontinue) system command.

The RESOURCE task attribute has effect only if the system option RESOURCECHECK is set. This option can be set using the OP (Options) system command. If RESOURCECHECK is reset, then processes are initiated normally regardless of their RESOURCE value.

The RESOURCE task attribute can be accessed only from WFL. It can be assigned to a WFL job in the job attribute list or to tasks by assignments to the task variable or task equations. If RESOURCE is assigned in the job attribute list of a WFL job, then the job cannot be accepted into a job queue with a tape specification that specifies fewer tapes.

Inheritance

A process inherits the RESOURCE value of the closest ancestor that has a RESOURCE value set (if any).

A task cannot be assigned a RESOURCE value higher than what it would inherit from an ancestor. An attempt to assign the task a higher value causes task initiation to fail with the error "TAPE LIMIT EXCEEDED". However, the initiating process continues normally.

Example

The following WFL job includes a RESOURCE assignment for the job as a whole, as well as a RESOURCE assignment for each task. The example is based on the assumption that the first task needs a maximum of three tapes during its execution, and the second task needs a maximum of two.

```
?BEGIN JOB TAPEUSER;
   RESOURCE=(TAPE=5);
PROCESS RUN PROG/ONE;
   RESOURCE=(TAPE=3);
PROCESS RUN PROG/TWO;
   RESOURCE=(TAPE=2);
?END JOB
```

Run-Time Error

RESOURCE ATTRIBUTE IS WRITE ONLY

An attempt was made to read the RESOURCE attribute of a process. The inquiring process, if nonprivileged, is discontinued with HISTORYCAUSE = 2 (PROGRAMCAUSEV) and HISTORYREASON = 129 (ATTWRITEONLYV).

RESTART

Type	Integer
Units	Process restarts
Range	0 to 131071; also see "Range" below
Default	0
Read Time	Anytime; actual after initiation
Write Time	Anytime
Inheritance	None
Fork() Inheritance	0
Overwrite Rules	Standard
Host Services	Not supported
Attribute Number	28
Synonym	None
Restrictions	None

Range

If an attempt is made to assign a value greater than 131071, RESTART is set to 131071. If an attempt is made to assign a value less than 0, RESTART is set to 1.

Explanation

The RESTART task attribute causes a process to be automatically reexecuted following an abnormal termination. The process is reexecuted if RESTART has a nonzero value at the time of the termination and the termination is due to an internal cause. For a definition of *internal cause,* refer to the *Task Management Programming Guide*.

Reexecution begins with the first statement in the outer block of the process. The value assigned to RESTART determines how many times the process can be reexecuted. The value of RESTART is automatically decreased by 1 after each reexecution of the process. If the task has not executed any user code, the RESTART count is ignored. For example, this occurs if the codefile is too old to run on the current release.

For related information, refer to the discussion of restarting jobs and tasks in the *Task Management Programming Guide*.

RESTARTED

Type	Boolean
Units	Not applicable
Range	TRUE, FALSE
Default	FALSE
Read Time	Anytime
Write Time	Anytime
Inheritance	None
Fork() Inheritance	None
Overwrite Rules	Standard
Host Services	Not supported
Attribute Number	48
Synonym	None
Restrictions	None

Explanation

The RESTARTED task attribute records whether the process has been restarted.

For a WFL job, RESTARTED is set to TRUE when the job automatically restarts after a halt/load or when the job is restarted by a RESTART (Restart Jobs) system command. For a checkpoint process, RESTARTED is set to TRUE when the process is restarted by way of a WFL *RERUN* statement.

The value of RESTARTED is not affected by automatic retries that are caused by the RESTART task attribute. These two task attributes are completely unrelated.

Assigning a value to this attribute has no effect on the process. However, the new value is returned if the RESTARTED value is read later.

For further information, refer to the discussion of restarting jobs and tasks in the *Task Management Programming Guide.*

Section 6
Task Attributes S through Z

This section contains task attributes starting with the letters S through Z.

SAVEDGROUPCODE

Type	String
Units	Not applicable
Range	<usercode assignment>
Default	Null string
Read Time	Anytime
Write Time	Never
Inheritance	See below
Fork() Inheritance	Inherited from parent
Overwrite Rules	None (read-only)
Host Services	Supported
Attribute Number	134
Synonym	None
Restrictions	None

Explanation

The SAVEDGROUPCODE task attribute stores a copy of the value the GROUPCODE task attribute had when the process was first initiated. If the SETGROUPCODE subattribute of the SECURITYMODE attribute of the code file was set, then the initial GROUPCODE value is taken from the GROUP attribute of the code file. Otherwise, this value is inherited from the parent or assigned through task equation.

The SAVEDGROUPCODE value can differ from the values of the GROUPCODE and REALGROUPCODE task attributes. For an explanation of how these group code values are related, refer to the discussion of process identities in the *Task Management Programming Guide*.

SAVEDUSERCODE

Type	String
Units	Not applicable
Range	<usercode assignment>
Default	Null string
Read Time	Anytime
Write Time	Never
Inheritance	See below
Fork() Inheritance	From parent
Overwrite Rules	None (read-only)
Host Services	Supported
Attribute Number	131
Synonym	None
Restrictions	None

Explanation

The SAVEDUSERCODE task attribute stores a copy of the value the USERCODE task attribute had when the process was first initiated. If the SETUSERCODE subattribute of the SECURITYMODE attribute of the code file was set, then the initial USERCODE value is taken from the usercode of the code file. Otherwise, this value is inherited from the parent or assigned through task equation.

The SAVEDUSERCODE value can differ from the values of the USERCODE and REALUSERCODE task attributes. For an explanation of how these usercode values are related, refer to the discussion of process identities in the *Task Management Programming Guide*.

SAVEMEMORYLIMIT

Type	Real
Units	Words
Range	0 to 274877906943
Default	0 (Unlimited)
Read Time	Anytime
Write Time	Anytime
Inheritance	See below
Fork() Inheritance	From parent
Overwrite Rules	See below
Host Services	Supported
Attribute Number	112
Synonym	SAVECORELIMIT
Restrictions	None

Explanation

The SAVEMEMORYLIMIT task attribute specifies the maximum amount of save memory that a process can use. When the amount of save memory in use by a process exceeds the value of the SAVEMEMORYLIMIT task attribute, the process is discontinued.

The reason for setting a limit on save memory usage by a process is that save memory cannot be overlaid. As the proportion of total memory set aside as save memory increases, it becomes increasingly more difficult for the system to manage memory efficiently. A process that uses abnormally large amounts of save memory can therefore have an adverse effect on the performance of all other processes running on the system. By setting a SAVEMEMORYLIMIT for a process, you can prevent this from happening.

If SAVEMEMORYLIMIT is accessed through Host Services, bit 47 will always be zero (0).

Inheritance and Overwrite Rules

At initiation, a process receives a SAVEMEMORYLIMIT value that is the minimum value received from the following sources:

- The parent's SAVEMEMORYLIMIT value
- The SAVEMEMORYLIMIT usercode attribute value, if one is defined for the usercode of this process
- The limit value for the SAVEMEMORYLIMIT job queue attribute, if the process is a WFL job submitted through a job queue that has such a limit defined

- Any SAVEMEMORYLIMIT value that was assigned to the task variable of the process before initiation
- Any SAVEMEMORYLIMIT value that was assigned to the object code file of the process before initiation

Note that a SAVEMEMORYLIMIT value of 0 (zero) means there is no limit on save memory usage. Thus, when determining the minimum, the system ignores any of these sources that has a zero value.

If none of these sources provides a nonzero value, and the process is a WFL job submitted through a job queue with a default SAVEMEMORYLIMIT value, then the job queue default value is inherited by the process.

Once a process is running, any assignment statements that increase the current SAVEMEMORYLIMIT value are ignored. No error is issued, but the requested change is not made.

Run-Time Error

USER SAVE MEMORY LIMIT EXCEEDED

The process attempted to use more save memory than was allowed by the SAVEMEMORYLIMIT value. The process is discontinued with HISTORYCAUSE = 3 (RESOURCECAUSEV) and HISTORYREASON = 14 (SAVECORELIMITEXCEEDEDV).

SOURCEKIND

Type	Real
Units	Not applicable
Range	See "Explanation" below
Default	See below
Read Time	Anytime; actual after initiation
Write Time	Never
Inheritance	See below
Fork() Inheritance	From parent
Overwrite Rules	None (read-only)
Host Services	Supported
Attribute Number	47
Synonym	None
Restrictions	See below

Explanation and Restrictions

The SOURCEKIND task attribute records the type of device that initiated this process family.

One typical use of this attribute is to help decide what value to assign the KIND file attribute of input files used by a process: REMOTE, ODT, READER, and so on. The SOURCEKIND values, and their associated mnemonics, correspond to several of the possible values of the KIND file attribute.

The following are the possible values and their meanings:

Mnemonic Value	Integer Value	Meaning
(None)	0	There is no device type. For example, the process might have been initiated by a ??RUN (Run Code File) primitive system command, an independent runner, or a device on a remote BNA host system.
ODT	2	Operator display terminal (ODT).
REMOTE	3	Remote terminal.
READER	9	Card reader.

Note: *COBOL85 does not support the use of mnemonics for SOURCEKIND. When assigning SOURCEKIND in COBOL85, you must use integer values instead.*

If SOURCEKIND is accessed through Host Services, bit 47 will always be zero (0).

Default

Before a process is initiated, the default SOURCEKIND value is 0.

At initiation time, the system assigns SOURCEKIND the appropriate value. For example, processes initiated from CANDE or MARC sessions receive a SOURCEKIND of 3 (remote terminal).

Inheritance

A process inherits the SOURCEKIND value of its parent.

For libraries initiated by the library linkage mechanism, the SOURCEKIND attribute inherits the SOURCEKIND of the process that is linking to the library.

Example

The following ALGOL statement uses SOURCEKIND to determine what value to assign to the KIND attribute of a file:

```
IF MYSELF.SOURCEKIND = VALUE(REMOTE)
   THEN TERM.KIND := VALUE(REMOTE)
   ELSE TERM.KIND := VALUE(ODT);
```

SOURCENAME

Type	String
Units	Not applicable
Range	<name>
Default	See below
Read Time	Anytime
Write Time	Never
Inheritance	See below
Fork() Inheritance	From parent
Overwrite Rules	None (read-only)
Host Services	Supported
Attribute Number	121
Synonym	None
Restrictions	None

Explanation

The SOURCENAME task attribute records the name of the unit that initiated this process family. It corresponds to the name of the unit stored in the SOURCESTATION task attribute.

A process originating from a unit is assigned a SOURCENAME applicable to that unit. For example, a process initiated from SC 2 is assigned a SOURCENAME of SC2. A process originating from a remote station is assigned a SOURCENAME of the station designated by the SOURCESTATION task attribute. If the SOURCESTATION task attribute designates an invalid logical station number (LSN), then the system assigns SOURCENAME the value *STATION/LSNnnnn*, where *nnnn* represents the LSN.

If the process family was initiated from a pseudostation, the SOURCENAME returns the name of the pseudostation rather than the physical station. For example, if the process family originated from the COMS window CANDE/3 at physical station ST143, the SOURCENAME is *ST143/CANDE/3*.

Default

Before a process is initiated, the default SOURCENAME value is a null string. At initiation time, the system assigns the appropriate SOURCENAME value to the process. Processes initiated from a MARC or CANDE session receive a SOURCENAME value that records the name associated with the LSN from which the process originated. This SOURCENAME is applied when the MCS sets the SOURCESTATION task attribute.

If the process was initiated by a ??RUN (Run Program) system command, the system assigns a null string to SOURCENAME.

Inheritance

A process inherits the SOURCENAME value of its parent.

If a WFL job is initiated from a CANDE or MARC session or from a task descended from such a session, the WFL job inherits the SOURCENAME of the session.

Example

The following WFL job runs a program that opens a remote file. The remote file has an internal name of REM. WFL equates the title of REM to the SOURCENAME value. The result is that the remote file is opened at the station where the WFL job originated.

```
?BEGIN JOB;
  RUN OBJECT/PROG;
    FILE REM(TITLE = #MYSELF(SOURCENAME));
?END JOB
```

SOURCESTATION

Type	Real
Units	Not applicable
Range	See "Explanation" below
Default	See below
Read Time	Anytime; actual after initiation
Write Time	See "Explanation" below
Inheritance	See below
Fork() Inheritance	From parent
Overwrite Rules	Object code file dominant
Host Services	Supported
Attribute Number	45
Synonym	None
Restrictions	None

Explanation

The SOURCESTATION task attribute records the unit that initiated this process family. The SOURCESTATION value is divided into the following fields:

Field	Meaning
[47:01]	This field affects the printing of job summaries by any WFL jobs that are initiated by this process. If the value is 0 (zero), the WFL job summary file is saved under a special title for later printing by a message control system (MCS). The title is built under the **REMLPnn/=* directory, where *nn* is the MCS number of the MCS that controls the LSN specified in field [14:15]. On the other hand, if [47:01] has a value of 1, then the WFL job summary is printed in the normal manner. ***Note:*** *The system ignores a 0 value in this field if the rest of the SOURCESTATION value is also 0. If you wish to save job summaries, but you do not wish to set fields [46:01] or [14:15], you can make this field valid by setting another bit such as [45:01].* An MCS can write to this field, but cannot read it. Other processes cannot read from or write to this field. The DESTNAME and DESTSTATION task attributes completely override the effect of this field if they are assigned values. For further information, refer to the descriptions of these attributes.

Field	Meaning
[46:01]	If the value is 0 (zero), the system forwards copies of all process messages to the MCS that controls the LSN specified infield [14:15]. Forwarded messages include DISPLAY messages, "BOT" and "EOT" messages, and so on. ***Note:*** *The system ignores a 0 value in this field if the rest of the SOURCESTATION value is also 0. If you wish to forward process messages, but you do not wish to set fields [47:01] or [14:15], you can make this field valid by setting another bit such as [45:01].* *An MCS can write to this field, but cannot read it. Other processes cannot read from or write to this field.*
[14:15]	The system stores the physical unit number of the originating unit in this field. If the originating unit is a remote terminal, the controlling MCS typically overwrites this field with the LSN of the originating terminal. This field determines the MCS to which process messages are forwarded (refer to the description of field [46:01]). This field contains 0 (zero) for processes initiated by the ??RUN (Run Code File) primitive system command, by system software, or by a device on a remote BNA host system. An MCS can read from or write to this field. Other processes can read from this field, but cannot write to it.

For details about how to access these fields, refer to "Accessing Task Attributes at the Bit Level" in Section 1, "Accessing Task Attributes."

Note: *The LSN associated with any particular station can change over time. The SOURCESTATION value is not updated to reflect such changes. An alternative to SOURCESTATION is the SOURCENAME task attribute. SOURCENAME stores the originating station name, which is less volatile than the LSN.*

Only an MCS can make assignments to this task attribute. The MCS can assign this attribute to a process only before the process is initiated.

Though the SOURCESTATION value is divided into fields, the first two fields are not readable. Therefore, a process can read SOURCESTATION in the same way as it reads a simple real-valued task attribute, without attempting to read the individual fields.

A process can only indirectly determine whether the SOURCESTATION value is an LSN or a physical unit number. One method of determining this is for the process to read the SOURCEKIND task attribute value. If SOURCEKIND = 3, then SOURCESTATION is an LSN. Refer to the SOURCEKIND description for details.

Alternatively, the process can read the ORGUNIT value. Field [14:15] of the ORGUNIT value is identical to field [14:15] of the SOURCESTATION value. However, one difference between ORGUNIT and SOURCESTATION is that ORGUNIT has an extra field, [15:01], that indicates whether the originating unit was a remote terminal. Refer to the ORGUNIT description for details.

One use for the SOURCESTATION task attribute is to enable tasks of WFL jobs to open remote files. For an example, refer to the description of the STATION task attribute.

If SOURCESTATION is accessed through Host Services, bit 47 will always be zero (0).

Default

Before a process is initiated, the default SOURCESTATION value is 0. At initiation time, the system assigns the appropriate SOURCESTATION value to the process. Processes initiated from a MARC or CANDE session receive a SOURCESTATION value that records the LSN associated with the session.

Inheritance

A process inherits the SOURCESTATION value of its parent.

If a WFL job is initiated from a CANDE or MARC session or from a task descended from such a session, the WFL job inherits the SOURCESTATION of the session.

Run-Time Errors

SOURCESTATION ATTRIBUTE IS READ ONLY ON ACTIVE TASK

An MCS attempted to change the SOURCESTATION value of an in-use process. This error is not fatal, but the requested change is not made.

SOURCESTATION ATTRIBUTE MAY ONLY BE SET BY AN MCS

A process that was not an MCS attempted to assign a value to SOURCESTATION. The process, if nonprivileged, is discontinued with HISTORYCAUSE = 2 (PROGRAMCAUSEV) and HISTORYREASON = 52 (ONLYMCSMAYSETV).

STACKHISTORY

Type	String
Units	Not applicable
Range	See "Explanation" below
Default	Null string
Read Time	Anytime
Write Time	Never
Inheritance	None
Fork() Inheritance	Set to null string
Overwrite Rules	None (read-only)
Host Services	Supported
Attribute Number	30
Synonym	None
Restrictions	None

Explanation

The STACKHISTORY task attribute stores information about the structure of a process that terminated abnormally. The STACKHISTORY value is stored regardless of whether the termination was caused by a fault or by an operator command.

If the process terminates normally, the STACKHISTORY value is a null string. If the process terminates abnormally, STACKHISTORY stores the address of the statement that was being executed when the process terminated. STACKHISTORY also indicates which procedures and blocks had been entered, but had not yet been exited, by storing the addresses of the statements that invoked these procedures.

The STACKHISTORY value has the following format if the program was compiled with the compiler control option LINEINFO set:

```
#SSS:AAAA:Y#(DDDDDDDD),....,#SSS:AAAA:Y#(DDDDDDDD).
```

The value has the following format if LINEINFO was not set:

```
#SSS:AAAA:Y,#SSS:AAAA:Y,....,#SSS:AAAA:Y.
```

The elements shown in the preceding examples have the following meanings:

Element	Meaning
SSS	The code segment number in hexadecimal form. This field is expanded to four characters, SSSS, for segment numbers greater than 4095.
Colon (:)	A colon, which appears between the code segment number and the code word address, and between the code word address and the code syllable number.
AAAA	The address, in hexadecimal, of the code word within that code segment.
Y	The number, in hexadecimal, of the syllable within that code word.
Comma (,)	A comma, which appears after each code address except the rightmost address.
Number sign (#)	A blank space, in most cases. However, the blank space is replaced by an asterisk (*) if the code address refers to MCP code.
Ellipsis (....)	Signifies that the same format is repeated for each address.
DDDDDDDD	The line number where the statement occurs in the source file. This number appears only if the LINEINFO control option was set when the program was compiled. If NEWP INLINE procedures are referenced, the DDDDDDDD element can consist of multiple line numbers, separated by slashes (/). The leftmost line number indicates the most recently invoked procedure. For example, the following address indicates that the most recently invoked INLINE procedure is at line 23638000: `003:0580:1 (23638000/23638500/23639023)`
Period (.)	A period terminates the last address in the STACKHISTORY value.

The addresses are listed in reverse historical order. The first address is of the statement that was being executed when the process terminated. The second address, if any, is of the most recent procedure invocation. Subsequent addresses are of previous procedure invocations.

In some cases, one or more of the code addresses in the STACKHISTORY value might refer to MCP code rather than code in the application program. These references are possible because system functions and I/O operations invoked by an application process implicitly result in calls on MCP procedures, which are executed on the application process stack.

For compilations initiated from CANDE, the LINEINFO option is set by default. The DDDDDDDD parts of the STACKHISTORY value can be compared with the sequence numbers in the source program to determine what statements are referred to.

For compilations initiated from WFL, LINEINFO is reset by default, but the LIST option is set. The source code printout that results includes addresses of the form SSS:AAAA:Y after each statement. The STACKHISTORY value can be compared with these addresses to determine what statements are referred to. Alternatively, the programmer could explicitly set LINEINFO and use the sequence numbers instead.

No value is stored for STACKHISTORY if the process incurs a fault but continues executing normally. For an example of using STACKHISTORY, refer to the *Task Management Programming Guide*.

The length of the STACKHISTORY value varies greatly, depending on the number of procedure invocations that were active when the process terminated and whether the program was compiled with the LINEINFO option set. To avoid task attribute errors, you must be careful to read the STACKHISTORY value into an array large enough to hold that value. The largest possible STACKHISTORY value is 400 words (that is, 2400 characters) long.

Examples

In ALGOL, the following declaration creates an EBCDIC array large enough to hold any STACKHISTORY value:

```
EBCDIC ARRAY STACKH[0:2399];
```

The following ALGOL statement reads the STACKHISTORY value into the array:

```
REPLACE STACKH BY T.STACKHISTORY;
```

Run-Time Error

TASK ATTRIBUTE ACCESS FAULT

An attempt was made to read the STACKHISTORY value into an array that is too short. The reading process is discontinued with HISTORYCAUSE = 2 (PROGRAMCAUSEV) and HISTORYREASON = 39 (INFANTICIDEV).

STACKLIMIT

Type	Integer
Units	Words
Range	0 to 64032
Defaults	See below
Read Time	Anytime; actual after initiation
Write Time	Anytime; effective before termination
Inheritance	None
Fork() Inheritance	From parent
Overwrite Rules	Standard
Host Services	Supported
Attribute Number	50
Synonym	None
Restrictions	None

Explanation

The STACKLIMIT task attribute specifies the maximum size to which the process stack can grow. If the process stack exceeds this limit, the system discontinues the process. The system checks the STACKLIMIT value only when performing stack stretches; the system does not consider STACKLIMIT when initiating a process.

For further information about STACKLIMIT, refer to the *Task Management Programming Guide*.

Defaults

The defaults are as follows:

6,000 words for most programs
10,000 words for C programs
16,000 words for C programs with the TADS option
12,000 words for COBOL 85 programs with the TADS option
12,000 words for PASCAL83 programs with the TADS option

Run-Time Errors

ILLEGAL ATTRIBUTE VALUE - TOO LARGE

An attempt was made to assign STACKLIMIT a value larger than 64032. The process, if nonprivileged, is discontinued with HISTORYCAUSE = 2 (PROGRAMCAUSEV) and HISTORYREASON = 135 (VALUETOOLARGEV).

STACK OVERFLOW

The process stack exceeded the size specified by the STACKLIMIT task attribute. The process is discontinued with HISTORYCAUSE = 3 (RESOURCECAUSEV) and HISTORYREASON = 2 (STACKEXCEEDEDV).

STACKNUMBER

Type	Integer
Units	Not applicable
Range	0 to 4095
Default	Not applicable
Read Time	Anytime
Write Time	Never
Inheritance	None
Overwrite Rules	None
Host Services	Not supported
Attribute Number	77
Synonym	None
Restrictions	None

Explanation

The STACKNUMBER task attribute returns the stack number of a process. The stack number uniquely identifies the process while it is executing and is used internally by the system software.

A positive STACKNUMBER value indicates that a process is currently associated with the task. A zero value indicates that the task is not currently associated with a process.

For more information about stack numbers, refer to the *Task Management Programming Guide*.

STACKSIZE

Type	Integer
Units	Words
Range	See below
Default	See below
Read Time	Anytime
Write Time	Before initiation
Inheritance	See below
Fork() Inheritance	From parent
Overwrite Rules	Standard
Host Services	Supported
Attribute Number	7
Synonym	STACK
Restrictions	None

Explanation

The STACKSIZE task attribute provides an estimate of the amount of memory that is required for the process stack. The system inspects this value at initiation to determine the amount of memory to be allocated for the process stack at initiation.

Note that STACKSIZE is not intended to return the current process stack size. This task attribute returns only the stack estimate that was used when the process was initiated.

The programmer can affect process scheduling, or prevent stack stretches, by modifying the STACKSIZE before initiating a process. For more information, refer to the *Task Management Programming Guide*.

Range

STACKSIZE accepts values in the range 0 to 16384. If a higher value is assigned, no error results, but the value is converted to 16384.

Default

STACKSIZE defaults to the value of the revised stack estimate, if there is one. If not, STACKSIZE defaults to the value of the compiler stack estimate. For details, refer to the *Task Management Programming Guide*.

Inheritance

An internal process inherits the STACKSIZE value of its parent. Other processes do not inherit the parent's STACKSIZE.

Run-Time Error

STACKSIZE ATTRIBUTE IS READONLY ON ACTIVE TASK

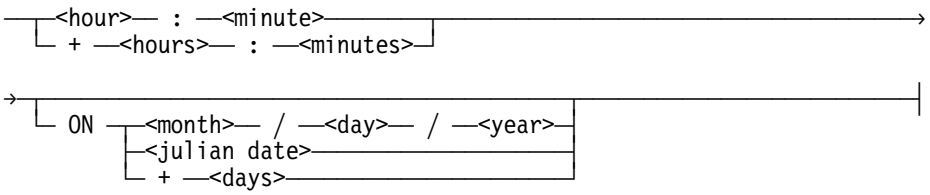
An attempt was made to assign the STACKSIZE task attribute of an in-use process. The assigning process, if nonprivileged, is discontinued with HISTORYCAUSE = 2 (PROGRAMCAUSEV) and HISTORYREASON = 33 (READONLYONACTIVEV).

STARTTIME

Type	String
Units	Not applicable
Range	<starttime specification>
Default	Null string
Read Time	Never
Write Time	Before initiation
Fork() Inheritance	Set to actual time started
Inheritance	None
Overwrite Rules	See below
Host Services	Not supported
Attribute Number	79
Synonym	None
Restrictions	Available only in WFL

Range

<starttime specification>



The <day>, <days>, <hour>, <hours>, and <month> values are each a 1-digit or 2-digit number.

The <minute> and <minutes> values must be 2-digit numbers.

The <year> value can be a 2-digit or 4-digit number.

The <Julian date> value can be a 5-digit or 7-digit number.

Explanation

The STARTTIME task attribute delays initiation of a WFL job until the specified time and date. The job is compiled immediately, but remains in the job queue until the specified start time. The job is then eligible for initiation the next time the system selects a job from that job queue. The STARTTIME task attribute can be assigned only to WFL jobs.

A relative start time can be specified by preceding the time or date with a plus sign (+). Thus, a start time of *+ 2:00* means that the job should be initiated in two hours.

If no date or relative date is included in the STARTTIME value, today's date is assumed.

If a Julian date is used as the STARTTIME value, the last three digits signify the day of the year. The preceding two or four digits signify the year. Thus, *94293* or *1994293* both mean day 293 of 1994.

Overwrite Rules

STARTTIME can be assigned only in the following ways, which are listed in order from most dominant to least dominant:

1. The STARTTIME of a job in a queue can be assigned or changed by the STARTTIME system command or the CANDE *?STARTTIME* command.
2. A STARTTIME assignment can be appended to the MARC, CANDE, or WFL *START* statement that submits a WFL job.
3. A STARTTIME specification can be included in the job attribute list of a WFL job.

Examples

The following example shows a STARTTIME assignment in a WFL job:

```
?BEGIN JOB;
   STARTTIME = 11:00;
   RUN PROG;
?END JOB
```

The following is an example of a STARTTIME assignment appended to a CANDE, MARC, or WFL *START* statement:

```
START WFL/TEST;STARTTIME = 19:00
```

The following is an example of a *STARTTIME* system command:

```
4698 STARTTIME = 21:00
```

The following examples show some of the possible formats for the STARTTIME value:

```
STARTTIME = 14:33;
STARTTIME = + 2:30;
STARTTIME = 23:15 ON + 1;
STARTTIME = 10:00 ON 94014;
STARTTIME = 10:00 ON 1994014;
STARTTIME = 10:00 ON 01/14/94;
STARTTIME = 10:00 ON 01/14/1994;
```

STATION

Type	Integer
Units	Not applicable
Range	–65535 to 0
Default	0
Read Time	Anytime
Write Time	Anytime
Inheritance	See below
Fork() Inheritance	From parent
Overwrite Rules	Standard
Host Services	Supported
Attribute Number	20
Synonym	INITIATOR
Restrictions	None

Explanation

The STATION task attribute stores the negative of the logical station number (LSN) of the station to be assigned any remote files used by this process.

You can also specify a station by using the STATIONNAME task attribute or the TITLE or FILENAME file attribute. Of these attributes, STATIONNAME is the most dominant, and STATION is the next most dominant. The TITLE or FILE attribute affects station selection only if STATIONNAME is null and STATION is 0.

Note: *The LSN associated with any particular station can change over time. The STATION value is not updated to reflect such changes. Use the STATIONNAME task attribute instead of STATION, because the STATIONNAME attribute specifies a station name, which is less volatile than an LSN.*

A process can change the STATION value after initiation. Only remote files opened after the change to the STATION value are affected by the new value.

If the STATION value specifies an LSN that does not exist, no error occurs until an attempt is made to open a remote file.

For further information about remote file assignment, refer to the *I/O Subsystem Programming Guide*.

Inheritance

A process inherits the STATION value of its parent.

The STATION attribute of a task initiated from a MARC or CANDE session inherits the negative of the LSN associated with the session. The fact that the value is negative is not a problem; when the process opens the remote file, it is opened at the originating session.

On the other hand, the STATION attribute of a WFL job submitted from a MARC or CANDE session does not inherit the LSN associated with the session. If tasks of the WFL job open remote files, and those tasks do not use the FILENAME file attribute to specify a station, then the STATION task attribute should first be explicitly assigned. The simplest way to do this is to assign STATION the value of the SOURCESTATION task attribute. SOURCESTATION is a read-only task attribute that stores the originating station number. Refer to the SOURCESTATION description for details.

Example

The following task equation can be used to allow a task initiated from a WFL job to open a remote file:

```
RUN TASK/READIT;
  STATION = MYSELF(SOURCESTATION);
```

For a related example, refer to the description of the SOURCENAME task attribute.

Run-Time Error

UNKNOWN STATION: <file name>

This error message results if a process attempts to open a remote file, the STATIONNAME attribute is null, and the STATION attribute specifies a station that doesn't really exist. The process is discontinued with HISTORYCAUSE = 9 (NEWIOERRCAUSEV) and HISTORYREASON = or 38 (UNKNOWNSTA_EV).

This error can also occur as the result of an invalid STATIONNAME value; refer to "STATIONNAME" later in this section.

STATIONNAME

Type	String
Units	Not applicable
Range	<name>
Default	Null
Read Time	Anytime
Write Time	Anytime
Inheritance	See below
Fork() Inheritance	From parent
Overwrite Rules	Standard
Host Services	Supported
Attribute Number	144
Synonym	None
Restrictions	None

Explanation and Example

The STATIONNAME task attribute specifies the name of the station to be assigned any remote files used by this process.

You can use this attribute in WFL jobs to enable tasks to successfully open remote files. Following is an example:

```
MYJOB (STATIONNAME = #MYSELF(SOURCENAME));
RUN TASK/READIT;
```

The preceding statements assign a STATIONNAME value to the job, and this value is then inherited by any tasks such as TASK/READIT.

You can also specify the station for remote files by using the STATION task attribute or the TITLE or FILENAME file attribute. Of these attributes, STATIONNAME is the most dominant, and STATION is the next most dominant. The TITLE or FILE attribute affects station selection only if STATIONNAME is null and STATION is 0.

Assignments to the STATIONNAME value do not change the STATION value, and assignments to the STATION value do not change the STATIONNAME value.

A process can change the STATIONNAME value after initiation. Only remote files opened *after* the change to the STATIONNAME value are affected by the new value.

If the STATIONNAME value specifies a station name that does not exist, no error occurs until an attempt is made to open a remote file.

The HOSTNAME task attribute and the HOSTNAME file attribute have the following effects on the STATIONNAME:

- If you initiate a process with the HOSTNAME task attribute, then the process is initiated at a remote host by way of Host Services remote tasking. By default, any remote files opened by that process are opened at the remote host. The STATIONNAME value should either be null or should specify a station name that exists on the remote host.
- If a process opens a remote file using the HOSTNAME file attribute, then the remote file is opened at a remote host by way of Host Services logical I/O. The system ignores the STATIONNAME value when the remote file is opened. The process must use the STATION task attribute or the TITLE or FILENAME attribute to specify the station for the remote file.

For further information about remote file assignment, refer to the *I/O Subsystem Programming Guide*.

Inheritance

A process inherits the STATIONNAME value of its parent.

However, a WFL job submitted from a MARC or CANDE session does not inherit the STATIONNAME associated with the session. Therefore, you might wish to assign the STATIONNAME value as described previously.

Run-Time Error

UNKNOWN STATION: <file name>

This error message results if a process attempts to open a remote file and the STATIONNAME task attribute specifies an invalid station. The process is discontinued with HISTORYCAUSE = 9 (NEWIOERRCAUSEV) and HISTORYREASON = 38 (UNKNOWNSTA_EV).

The UNKNOWN STATION error can also occur if the STATIONNAME value is null and the STATION value specifies an invalid LSN; refer to "STATION" earlier in this section.

STATUS

Type	Mnemonic
Units	Not applicable
Range	See "Explanation" below
Default	NEVERUSED
Read Time	Anytime
Write Time	Anytime
Inheritance	None
Fork() Inheritance	None
Overwrite Rules	See below
Host Services	Supported
Attribute Number	12
Synonym	None
Restrictions	None

Explanation

A process can use the STATUS task attribute to read or assign the process state of another process or of itself. Some of the STATUS values can be assigned only at certain times; these limitations are noted in the following table:

Mnemonic Value	Integer Value	Meaning
BADINITIATE	–2	Initiation of the process failed. Setting this attribute to BADINITIATE has no effect. If the current value is BADINITIATE, the only assignment that has an effect is an assignment of NEVERUSED.
TERMINATED	–1	The process completed execution normally or was discontinued. Setting the attribute to TERMINATED discontinues the process with HISTORYCAUSE = 2 (PROGRAMCAUSEV) and HISTORYREASON = 39 (INFANTICIDEV). If the current value is TERMINATED, the only assignment that has an effect is an assignment of NEVERUSED.
NEVERUSED	0	No attempt has yet been made to initiate the process. Assigning this value reinitializes the task variable, restoring all task attribute values to their defaults. Assigning this attribute also releases the save memory for the task variable (100 to 200 words). This value can be set only when the current value is NEVERUSED, TERMINATED, or BADINITIATE. If the current value is NEVERUSED, assignments of any other STATUS values have no effect.

Mnemonic Value	Integer Value	Meaning
SCHEDULED	1	The process is scheduled. Setting this value has no effect.
ACTIVE	2	The process is active. Setting the attribute to ACTIVE has no effect unless the current STATUS value is SUSPENDED or FROZEN. If the STATUS is SUSPENDED, then assigning a value of ACTIVE resumes execution of the process. If the STATUS is FROZEN, then the process is a frozen server library. If the server library is a permanent library, then assigning a value of ACTIVE changes the library to a temporary library. New user processes can continue to link to the library instance. The STATUS attribute continues to return a value of FROZEN until the last user delinks, when the library unfreezes and resumes execution. Refer to the description of the GOINGAWAY value later under this heading. Assigning ACTIVE has no effect on connection libraries declared by the process. If you have quit the task, assignment to ACTIVE resets the HISTORYTYPE to 0.
SUSPENDED	3	The process is suspended. Setting the attribute to SUSPENDED suspends the process.
FROZEN	5	The process is a frozen server library. Setting this value has no effect. This value is not related to connection libraries. A connection library process never enters the FROZEN state unless the process is also a server library process.
GOINGAWAY	6	This value is meaningful only when assigned to a frozen permanent server library process. Assigning a STATUS of GOINGAWAY to such a process changes the library to a temporary library, prevents any new user processes from linking to the library, and leaves a value of ACTIVE in the STATUS attribute. Assigning GOINGAWAY to other types of processes has no effect. Assigning GOINGAWAY has no effect on connection libraries declared by the process. The GOINGAWAY value is never returned when the STATUS attribute is read. Refer to the description of the ACTIVE value earlier under this heading.

Note that assignments to the STATUS task attribute might not affect the process immediately. For example, a critical block exit error can occur if the STATUS attribute is used to terminate a task and the critical block is exited before that STATUS change has taken effect. The only assignment that has immediate effect is an assignment of NEVERUSED.

Whenever the value of the STATUS task attribute changes, the system causes the EXCEPTIONEVENT of the EXCEPTIONTASK of the process. For further information, refer to the descriptions of these attributes.

Overwrite Rules

The STATUS task attribute is not inherited, and syntax errors result from any attempt to assign the STATUS task attribute to an object code file or to assign STATUS in a task equation. The STATUS task attribute of a task variable that is not in use is either NEVERUSED, TERMINATED, or BADINITIATE. When the system initiates a process, the system automatically overwrites the previous STATUS value and assigns a value that reflects the success or failure of the initiation: ACTIVE, SCHEDULED, or BADINITIATE.

Run-Time Error

INITIATE ACTIVE TASK

An attempt was made to set the STATUS attribute of an in-use process to NEVERUSED. The assigning process, if nonprivileged, is discontinued with HISTORYCAUSE = 2 (PROGRAMCAUSEV) and HISTORYREASON = 3 (INITACTIVETASKV).

STOPPOINT

Type	Real
Units	Not applicable
Range	See "Explanation" below
Default	0
Read Time	Anytime
Write Time	Never
Inheritance	None
Fork() Inheritance	Set to 0
Overwrite Rules	None (read-only)
Host Services	Supported
Attribute Number	18
Synonym	None
Restrictions	None

Explanation

The STOPPOINT task attribute reports the point at which the process terminated abnormally. If the abnormal termination was due to a fault, the type of fault is also reported. If the process terminates normally, the STOPPOINT value is zero.

The STOPPOINT value is divided into the following fields:

Field	Meaning
[47:08]	If the process encountered a fault, this field stores the type of fault. The value is the same as that of the HISTORYREASON task attribute when the value of the HISTORYCAUSE attribute is 4 (FAULTCAUSEV). Refer to the description of the HISTORYREASON attribute for a list of these values.
[38:03]	This field, when the code segment index exceeds 8191, contains the most significant bits of the index. See the description of field [12:13].
[35:03]	This field stores the index of the syllable in the code word where process execution terminated.
[32:13]	This field stores the index of the word in the code segment where process execution terminated.
[13:01]	If reset, this bit indicates that the process was executing MCP code when it terminated. If set, the process was not executing MCP code at termination.
[12:13]	This field stores the index of the code segment where process execution ended. If the index exceeds 8191, the most significant bits are in field [38:03].

For details about how to access these fields, refer to "Accessing Task Attributes at the Bit Level" in Section 1, "Accessing Task Attributes."

If STOPPOINT is accessed through Host Services, bit 47 will always be zero.

The code segment, code word, and code syllable indexes appear in source program listings created by the $SET LIST compiler option. For an example of such a listing, refer to the discussion of process history in the *Task Management Programming Guide*.

Other information about a process that terminates abnormally is recorded in the STACKHISTORY task attribute. In addition, the HISTORY task attribute records the type of termination a process had. For further information, refer to the description of the HISTORY task attribute.

SUPPLEMENTARYGRPS

Type	String
Units	Not applicable
Range	<usercode assignment>
Default	Null string
Read Time	Anytime
Write Time	Never
Inheritance	See below
Fork() Inheritance	From parent
Overwrite Rules	None (read-only)
Host Services	Supported
Attribute Number	142
Synonym	None
Restrictions	None

Explanation

The SUPPLEMENTARYGRPS task attribute is a read-only attribute that specifies the list of alternate groups of which the task is a member. Each group code in the list follows the same syntax as the USERCODE task attribute.

For further information about group codes, refer to the discussion of the GROUPCODE task attribute in Section 4.

Inheritance

When the USERCODE task attribute is inherited from the parent task or session, the SUPPLEMENTARYGRPS attribute is inherited also.

When the USERCODE task attribute is modified, the system updates the SUPPLEMENTARYGRPS attribute in one of the following ways:

- For a string assignment or USERCODE task variable equation, the supplementary group setting is retrieved from the USERDATAFILE entry for the new USERCODE.
- For a task variable assignment from another task variable, the SUPPLEMENTARYGRPS task attribute of the destination task variable is assigned the value of the SUPPLEMENTARYGRPS attribute from the source task variable.

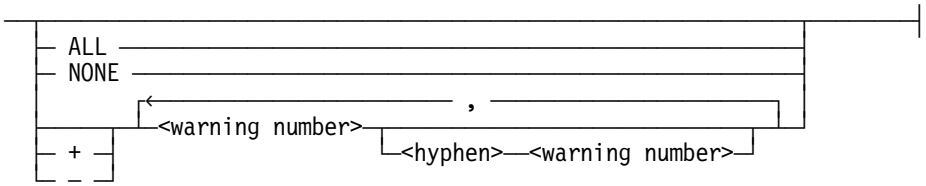
When the USERCODE attribute is set to the null string, the SUPPLEMENTARYGRPS attribute is set to the null string also.

SUPPRESSWARNING

Type	String
Units	Not applicable
Range	<suppresswarning list>
Default	Null string
Read Time	Anytime
Write Time	Anytime
Inheritance	See below
Fork() Inheritance	From parent
Overwrite Rules	See below
Host Services	Not supported
Attribute Number	110
Synonym	None
Restrictions	None

Range

<suppresswarning list>



<warning number>

An unsigned integer in the range 1 through 29999.

Explanation

The SUPPRESSWARNING task attribute can be used to suppress run-time warning messages for a process. Most of these messages are warnings that the process has just used a feature that is scheduled for deimplementation on a future release. These messages might not be of interest to a typical user or system operator, and it might be desirable to suppress their display. A suppressed warning does not appear at the ODT or in CANDE or MARC sessions. However, it does appear in the system log.

The programmer can suppress particular types of run-time warning messages by assigning SUPPRESSWARNING a set of warning numbers or warning number ranges. Each warning number corresponds to a particular run-time warning message. The warning number for each warning message is included in the text of that message. Thus, the following message corresponds to warning number 112:

```
WARNING 112: TIME calls that return the date in BCL will be
deimplemented on SSR <number> (Scheduled for <date>).
```

For a list of warning messages and the warning numbers corresponding to them, refer to the *Unisys e-@ction ClearPath Enterprise Servers System Messages Support Reference Manual*.

Warning messages can also be suppressed by the system warning suppression value. An operator can use the SUPPRESSWARNING (Suppress Warning) system command to define this value, which affects all processes on the system. A particular warning is suppressed for a process if either the system warning suppression value or the SUPPRESSWARNING task attribute indicates that the warning should be suppressed. However, the system warning suppression value and the SUPPRESSWARNING task attribute value are maintained independently and can be completely different.

Note: *The SUPPRESSWARNING option of the CO (Controller Options) system command affects messages warning of system command deimplementation. This option does not affect run-time warning messages for processes and is not related to the SUPPRESSWARNING task attribute.*

SUPPRESSWARNING can be assigned a list of numbers or number ranges. A number range consists of two numbers separated by a hyphen. For example, assigning a value of *1,3-5* causes warning messages 1, 3, 4, and 5 to be suppressed for the process. If a SUPPRESSWARNING assignment begins with a hyphen, it is interpreted as a minus sign and deletes warning types from the SUPPRESSWARNING list. Thus, if SUPPRESSWARNING has a value of *1,4,8-10*, then an assignment of *-1,9* results in a SUPPRESSWARNING value of *4,8,10*.

The programmer can suppress the display of all run-time warning messages for a process by assigning SUPPRESSWARNING a value of *ALL*. The system translates this into the value *1-29999*, which is returned if a statement reads the attribute thereafter.

The programmer can clear the SUPPRESSWARNING value by assigning a value of *NONE*. If a process reads SUPPRESSWARNING after this assignment, SUPPRESSWARNING returns a null string. In this case, the only warnings suppressed are those specified by the system warning suppression value.

The SUPPRESSWARNING value does not prevent warnings from being recorded by the TASKWARNINGS task attribute. For details, refer to the TASKWARNINGS description.

The SUPPRESSWARNING task attribute value of a library process also affects any user processes while they are executing procedures from that library.

Overwrite Rules

When an ALGOL or COBOL program assigns a set of warning numbers to SUPPRESSWARNING, the numbers are added to the current SUPPRESSWARNING value. The system incorporates the warning numbers in ascending order and combines them into ranges where possible. For example, suppose SUPPRESSWARNING has a value of *1,4,8-10*. If a statement assigns a new value of *7,3*, the resulting value is *1,3-4,7-10*. A program can remove warning numbers by assigning SUPPRESSWARNING a value that begins with a hyphen or a value of *NONE*.

However, when SUPPRESSWARNING is assigned from CANDE, MARC, or WFL, the current SUPPRESSWARNING value is discarded and changed to exactly the value assigned. This is true regardless of whether the assignment is made by a task equation, a task attribute assignment to a task variable, or a MODIFY statement that assigns task attributes to an object code file.

Inheritance

The value of SUPPRESSWARNING is inherited from the parent when the code file for the initiating parent is identical to the initiated offspring task. This behavior assumes there is no previously defined SUPPRESSWARNING value for the offspring task and there is a SUPPRESSWARNING value for the parent task.

Examples

The following syntax suppresses a range of warnings for a task run from a WFL job:

```
RUN OBJECT/TEST;
SUPPRESSWARNING = "138-139, 145-146";
```

The following ALGOL syntax suppresses the same range of warnings:

```
REPLACE MYSELF.SUPPRESSWARNING BY "138-139, 145-146";
```

Run-Time Error

SUPPRESSWARNING ATTRIBUTE INCORRECT SYNTAX

A process attempted to assign SUPPRESSWARNING a value that did not follow the suppresswarning list syntax. The assigning process, if nonprivileged, is discontinued with HISTORYCAUSE = 2 (PROGRAMCAUSEV) and HISTORYREASON = 131 (INCORRECTSYNTAXV).

SW1 through SW8

Type	Boolean
Units	Not applicable
Range	TRUE, FALSE
Default	FALSE
Read Time	Anytime
Write Time	Anytime
Inheritance	From parent
Fork() Inheritance	From parent
Overwrite Rules	Standard
Host Services	Supported
Attribute Numbers	84 through 91
Synonym	None
Restrictions	None

Explanation

The eight task attributes named SW1, SW2, SW3, SW4, SW5, SW6, SW7, and SW8 can each be used to store a Boolean value. These task attributes serve simply as holders for any Boolean values the user wishes to store. These attributes have no other effect on the process.

You can design processes to communicate with each other by setting and reading these task attributes. For an overview of the use of task attributes in interprocess communication, refer to the *Task Management Programming Guide*.

You can also design processes to receive input from an operator by reading these task attributes. The operator can assign these attributes through task equation, or can modify these attributes for a running process with the SW (Switches) system command.

COBOL provides a special syntax for accessing these task attributes. A statement in the SPECIAL-NAMES paragraph can assign special condition names, which can be used later to access the task attribute value.

In RPG, the SW1 through SW8 task attributes can be accessed by way of the external indicators U1 through U8. These external indicators can be used to condition various operations so that they are only performed when the corresponding task attribute is TRUE. For details, refer to the *MCP/AS Report Program Generator (RPG) Programming Reference Manual, Volume 1: Basic Implementation*.

Example

The following COBOL74 or COBOL85 program accesses the SW1 task attribute in two ways:

```
100 IDENTIFICATION DIVISION.
110 ENVIRONMENT DIVISION.
120 CONFIGURATION SECTION.
130 SPECIAL-NAMES.
140     SW1 ON STATUS IS SWITCH-ONE-ON,
150         OFF STATUS IS SWITCH-ONE-OFF.
160 DATA DIVISION.
170 WORKING-STORAGE SECTION.
180 PROCEDURE DIVISION.
190 START-HERE SECTION.
200 P1.
210     IF SWITCH-ONE-OFF DISPLAY "SWITCH ONE IS OFF".
220     IF ATTRIBUTE SW1 OF MYSELF = VALUE FALSE
230        DISPLAY "SWITCH ONE IS OFF".
240     STOP RUN.
```

First, SW1 is assigned condition names at lines 140 and 150. The statement at line 210 interrogates the SW1 value by condition name. The statement at line 220 interrogates SW1 by way of the normal task attribute syntax.

TADS

Type	Boolean
Units	Not applicable
Range	TRUE, FALSE
Default	FALSE
Read Time	Anytime
Write Time	Before initiation
Inheritance	See below
Fork() Inheritance	From parent
Overwrite Rules	Standard
Host Services	Not supported
Attribute Number	94
Synonym	None
Restrictions	None

Explanation

The TADS task attribute invokes the Test and Debug System (TADS) to cause a program to run in test mode. The program must be written in ALGOL, C, COBOL74, COBOL85, or FORTRAN77. The TADS task attribute is ignored unless the program was compiled with the TADS compiler control option set to TRUE.

For directions about how to use TADS, refer to the following manuals:

- *MCP/AS ALGOL Test and Debug System (TADS) Programming Guide*
- *MCP/AS C Test and Debug System (TADS) Programming Reference Manual*
- *MCP/AS COBOL ANSI-74 Test and Debug System (TADS) Programming Guide*
- *Unisys e-@ction Application Development Solutions COBOL ANSI-85 Test and Debug System (TADS) Programming Reference Manual*
- *MCP/AS FORTRAN77 Test and Debug System (TADS) Programming Guide*
- *MCP/AS NEWP Programming Reference Manual*

Inheritance

An internal process inherits the TADS value of its parent. This inheritance overrides any TADS value explicitly assigned to the internal process. An external process does not inherit the TADS value of its parent.

Run-Time Error

TADS ATTRIBUTE IS READONLY ON ACTIVE TASK

An attempt was made to assign the TADS attribute of an in-use process. The assigning process, if nonprivileged, is discontinued with HISTORYCAUSE = 2 (PROGRAMCAUSEV) and HISTORYREASON = 33 (READONLYONACTIVEV).

TANKING

Type	Mnemonic
Units	Not applicable
Range	See "Explanation" below
Default	UNSPECIFIED
Read Time	Anytime
Write Time	Anytime
Inheritance	None
Fork() Inheritance	From parent
Overwrite Rules	Object code file dominant
Host Services	Not supported
Attribute Number	60
Synonym	None
Restrictions	None

Explanation

The TANKING task attribute specifies the default tanking mode for remote files used by the process. The system uses this default tanking mode for any remote files whose TANKING file attribute has a value of UNSPECIFIED.

The TANKING task attribute values are as follows:

Mnemonic Value	Integer Value	Meaning
UNSPECIFIED	0	The remote file is not tanked unless the MCS overrides this value when assigning the file.
NONE	1	The remote file is not tanked. The MCS cannot override this value.
SYNC	2	The remote file is tanked. When the remote file is closed, the process does not continue until all tanked output has been completed. The MCS cannot override the SYNC value.
ASYNC	3	The remote file is tanked. The process can continue past the file close, and even terminate, without waiting for the tanked output to be completed. The system continues to transfer messages from the tank file to the output queue until the tank file is empty. The MCS cannot override the ASYNC value.

Some of the above values are ignored or interpreted differently for processes writing to Transaction Server stations. For further information, refer to the discussion of tanking in the *Task Management Programming Guide*.

Run-Time Error

TANKING ATTRIBUTE INCORRECT SYNTAX

An attempt was made to assign TANKING a value less than 0 or greater than 3. The assigning process, if nonprivileged, is discontinued with HISTORYCAUSE = 2 (PROGRAMCAUSEV) and HISTORYREASON = 131 (INCORRECTSYNTAXV).

TARGET

Type	Integer
Units	Not applicable
Range	0 through 549755813887
Default	0
Read Time	Anytime
Write Time	Anytime
Inheritance	None
Fork() Inheritance	From parent
Overwrite Rules	Standard
Host Services	Not supported
Attribute Number	6
Synonym	TARGETTIME
Restrictions	None

Explanation

The TARGET task attribute stores any integer value that is assigned to it by a user. The value of this attribute has no effect on the process, nor does it report any information about the process. Rather, it is provided for use in communicating information between processes. For an overview of the use of task attributes in interprocess communication, refer to the *Task Management Programming Guide*.

The value of TARGET formerly had some effect on process scheduling. The operating system no longer uses this attribute for that purpose.

Run-Time Error

TARGET ILLEGAL ATTRIBUTE VALUE - TOO LARGE

An attempt was made to assign TARGET a value greater than its maximum. The assigning process, if nonprivileged, is discontinued with HISTORYCAUSE = 2 (PROGRAMCAUSEV) and HISTORYREASON = 135 (VALUETOOLARGEV).

TASKERROR

Type	Real
Units	Not applicable
Range	See "Explanation" below
Default	0
Read Time	Any time
Write Time	Never
Inheritance	None
Fork() Inheritance	From parent
Overwrite Rules	None (read-only)
Host Services	Not supported
Attribute Number	117
Synonym	None
Restrictions	None

Explanation

The TASKERROR task attribute indicates whether an error resulted from the most recent attempt to access a task attribute of this process. If an error did result, the TASKERROR value also indicates which task attribute was being accessed, and the type of error that occurred.

The TASKERROR task attribute serves a purpose similar to the ERROR task attribute. However, TASKERROR has the advantage of providing more information about the error that occurred. Another advantage of using TASKERROR is that the value can be read repeatedly, whereas the ERROR value is erased each time it is read.

Further, a program can use the TASKERROR value as input to the ATTRIBUTEMESSAGE procedure, which translates the value into a textual error message. For information about ATTRIBUTEMESSAGE, refer to "Using WFLSUPPORT to Access Task Attributes" in Section 1, "Accessing Task Attributes."

The TASKERROR value is divided into the following fields:

Field	Value	Meaning
[47:08]	0	If field [00:01] is 1, then an error occurred in accessing a task attribute other than FILECARDS or LIBRARY. Field [39:16] stores the number of the task attribute that was used incorrectly. For a list of task attributes in numerical order, refer to Table 3–3, "Task Attributes by Number." If field [00:01] is 0 (zero), then there was no task attribute error.
	1	An error occurred in accessing the FILECARDS task attribute. Field [39:16] stores the number of the file attribute that was assigned incorrectly in FILECARDS. For a list of file attributes in numerical order, refer to the description of the ATTYPE file attribute in the *File Attributes Programming Reference Manual*.
	6	An error occurred in assigning the LIBRARY task attribute. Field [39:16] stores the number of the library attribute that was assigned incorrectly in the LIBRARY task attribute. For a list of library attributes in numerical order, refer to Table 3–2, "Library Attributes by Number."
[39:16]	(Various)	The number of the task attribute, file attribute, or library attribute that was assigned incorrectly. For details about the meaning of this field, refer to the discussion of field [47:08].
[23:16]	(Various)	If the last attribute to be assigned was the USERCODE attribute, then this field contains a USERDATA error code. For a list of the most common USERDATA errors that can be stored in this field, refer to Table 3–1, "USERDATA Errors." For a complete list, and general information about USERDATA errors, refer to the *Security Administration Guide*. If field [00:01] is set, and the last attribute to be assigned was *not* the USERCODE attribute, then this field stores an error code in one of the following ranges of numbers: 1 through 999. Such an error code corresponds to the HISTORYREASON task attribute value. For an explanation of values in this range, refer to the HISTORYREASON task attribute description. 1000 or greater. Such an error code corresponds to the HANDLEATTRIBUTES error number. For an explanation of values in this range, refer to Table 1–1, "HANDLEATTRIBUTES Error Numbers."
[07:05]	0	An unused field. Its value is always 0 (zero).

Field	Value	Meaning
[02:01]	0	The validity bit. This value indicates that fields [47:08] and [39:16] do not contain valid values.
	1	Fields [47:08] and [39:16] contain valid values.
[01:01]	0	An unused field. Its value is always 0 (zero).
[00:01]	0	No error or warning occurred, and none of the previously defined fields are used.
	1	An error or warning occurred, and the fields defined previously are used.

For details about how to access these fields, refer to "Accessing Task Attributes at the Bit Level" in Section 1, "Accessing Task Attributes."

Examples

The following are examples of ALGOL statements that read the values of individual fields of the TASKERROR task attribute. The assignments are all made to real variables (named BUF, GENERAL_TYPE, ATTRIBUTE_NUMBER, and so on).

```
BUF := T.TASKERROR;
GENERAL_TYPE := BUF.[47:8];
ATTRIBUTE_NUMBER := BUF.[39:16];
ERROR_NUMBER := BUF.[23:16];
VALIDITY_BIT :=BUF.[2:1];
WARNING_BIT := BUF.[1:1];
EXCEPTION_BIT := BUF.[0:1];
```

The following are examples of COBOL74 or COBOL85 statements that read the values of individual fields of the TASKERROR task attribute. The assignments are all made to 77-level variables of type REAL (named BUF, GENERAL-TYPE, ATTRIBUTE-NUMBER, and so on).

```
MOVE ATTRIBUTE TASKERROR OF TASK-VAR-1 TO BUF.
MOVE BUF TO GENERAL-TYPE [ 47:07:08 ].
MOVE BUF TO ATTRIBUTE-NUMBER [ 39:15:16 ].
MOVE BUF TO ERROR-NUMBER     [ 23:15:16 ].
MOVE BUF TO VALIDITY-BIT     [ 02:00:01 ].
MOVE BUF TO WARNING-BIT      [ 01:00:01 ].
MOVE BUF TO EXCEPTION-BIT    [ 00:00:01 ].
```

WFL allows TASKERROR to be read as a real value, but does not provide any syntax for reading the individual fields within the TASKERROR value.

Run-Time Error

TASKERROR ATTRIBUTE IS READONLY

An attempt was made to assign a value to the TASKERROR attribute. The assigning process is discontinued with HISTORYCAUSE = 2 (PROGRAMCAUSEV) and HISTORYREASON = 9 (ATTREADONLYV).

TASKFILE

Type	File
Units	Not applicable
Range	See "Explanation" below
Default	See below
Read Time	Before termination; accurate only while process is in use
Write Time	Never
Inheritance	None; new for process
Fork() Inheritance	None; new for process
Overwrite Rules	WFL file equations only
Host Services	Not supported
Attribute Number	32
Synonym	None
Restrictions	None

Explanation

The TASKFILE task attribute is used to access the task file associated with a process. The task file is a printer backup file that stores program dumps generated by the process. The task file includes only those program dumps directed to printer rather than to disk. For more information about program dumps, refer to the *Task Management Programming Guide*.

The main use of the TASKFILE task attribute is to allow a process to write comments to the task file before the process generates a dump. TASKFILE can also be used in statements that close the task file or interrogate the file attributes of the task file. TASKFILE cannot be used to assign file attributes to the task file, although the FILECARDS task attribute can be used for this purpose. For information about assigning file attributes to the task file, refer to the discussion of process history in the *Task Management Programming Guide*.

A process can access its own task file or the task file of any of its ancestors. For example, a task can access its job's task file by way of the MYJOB task variable and the TASKFILE task attribute.

A process cannot access the task file of any descendant, sibling, or cousin process or of any process outside its own process family.

Default

By default, the TASKFILE attribute defines a file with the following attributes:

```
BACKUPKIND = DISK
BUFFERS = 1
INTMODE = EBCDIC
INTNAME = TASKFILE
KIND = PRINTER
LABELTYPE = OMITTED
MAXRECSIZE = 22
MYUSE = OUT
```

When the task file is opened, the system titles it according to the standard printer backup file titling convention discussed in the *Task Management Programming Guide*.

Examples

The following ALGOL statements cause two program dumps and write a different comment to each program dump. The CLOSE statement causes the program dumps to be stored in two separate backup files:

```
WRITE (MYSELF.TASKFILE,//,"HI THERE, DUMP 1");
PROGRAMDUMP;
CLOSE (MYSELF.TASKFILE);
WRITE (MYSELF.TASKFILE,//,"HI THERE, DUMP 2");
PROGRAMDUMP;
```

The following ALGOL statements interrogate file attributes of the task file:

```
R := MYSELF.TASKFILE.KIND;
IF MYSELF.TASKFILE.OPEN THEN ...
```

Run-Time Errors

The following errors are always fatal, even if the accessing process is privileged, an MCS, a tasking program, or BNA Host Services.

NON ANCESTRAL TASKFILE

A process attempted to access the task file of another process that is not an ancestor of the accessing process. The accessing process is discontinued with HISTORYCAUSE = 2 (PROGRAMCAUSEV) and HISTORYREASON = 12 (NONANCESTRALTASKFILEV).

TASKFILE ATTRIBUTE IS READONLY

An attempt was made to assign a value to TASKFILE. The assigning process is discontinued with HISTORYCAUSE = 2 (PROGRAMCAUSEV) and HISTORYREASON = 9 (ATTREADONLYV).

TASKLIMIT

Type	Integer
Units	Descendant tasks
Range	0 to 31
Default	0 (unlimited)
Read Time	Anytime
Write Time	Anytime
Inheritance	See below
Fork() Inheritance	From parent
Overwrite Rules	Standard
Host Services	Not supported
Attribute Number	58
Synonym	None
Restrictions	None

Explanation

The TASKLIMIT task attribute limits the number of descendants a job can have. The value of the job's TASKLIMIT is automatically decremented by 1 each time a descendant task is initiated. When TASKLIMIT has been decremented to 0, the initiation of any further descendants causes the initiating process to be discontinued.

The job's TASKLIMIT is also decremented by 1 when an independent process is initiated by the job or one of the job's descendants. However, descendants of the independent process do not affect the original job's TASKLIMIT.

The limit applied by TASKLIMIT is cumulative. That is, it limits the total number of descendants a job can have during its history, not only the number of descendants a job can have at the same time.

If TASKLIMIT has not been set, there is no limit on the number of descendants a job can have, and reading TASKLIMIT returns a value of 0. However, explicitly assigning 0 to TASKLIMIT sets a limit of 0 on the number of descendants.

TASKLIMIT has no effect when assigned to a task. It does not limit the number of descendants the task can have.

Inheritance

If the TASKLIMIT attribute is set for a job queue, it is inherited by all WFL jobs run out of that job queue. This is true even if the WFL job attribute list specifies a different TASKLIMIT value. However, after initiation the WFL job can assign TASKLIMIT a different value.

Run-Time Error

TASKLIMIT EXCEEDED

The process attempted to initiate a task when the TASKLIMIT value of MYJOB was already decremented to 0 (zero). The process is discontinued with HISTORYCAUSE = 2 (PROGRAMCAUSEV) and HISTORYREASON = 58 (TASKLIMITEXCEEDEDV).

TASKSTRING

Type	String
Units	Not applicable
Range	<taskstring specification>
Default	Null
Read Time	Anytime
Write Time	Anytime
Inheritance	None
Fork() Inheritance	From parent
Overwrite Rules	Standard
Host Services	Not supported
Attribute Number	113
Synonym	None
Restrictions	None

Range

<taskstring specification>

A string of up to 255 EBCDIC characters of which the last must be a null character.

Explanation

The TASKSTRING task attribute stores any string value that is assigned to it by a user. The value of this attribute has no effect on the process nor does it report any information about the process. Rather, it communicates information between processes, such as communicating information to a controlling job at task termination. It is not a recommended practice to change the attribute value and have the job continually check whether the attribute has changed. Instead, use an existing event (such as task termination) to determine when to read the attribute.

For an overview of the use of task attributes such as TASKSTRING in interprocess communication, refer to the *Task Management Programming Guide*.

Examples

In ALGOL, the following statement could be used to assign TASKSTRING a value of *$SET LIST*:

```
REPLACE T1.TASKSTRING BY "$SET LIST" 48"00";
```

In COBOL74 and COBOL85, the equivalent statement has the following form:

```
CHANGE ATTRIBUTE TASKSTRING OF T1 TO "$SET LIST".
```

In WFL, the assignment appears as follows:

```
T1(TASKSTRING = "$SET LIST");
```

Run-Time Error

TASKSTRING ATTRIBUTE INCORRECT SYNTAX

An attempt was made to assign a TASKSTRING value that was more than 255 characters long or that was not terminated by a null character. The assigning process is discontinued with HISTORYCAUSE = 2 (PROGRAMCAUSEV) and HISTORYREASON = 131 (INCORRECTSYNTAXV).

TASKVALUE

Type	Real
Units	Not applicable
Range	–4.31E+68 to +4.31E+68
Default	0
Read Time	Anytime
Write Time	Anytime
Inheritance	None
Fork() Inheritance	From parent
Overwrite Rules	Standard
Host Services	Supported
Attribute Number	9
Synonym	VALUE
Restrictions	None

Explanation

The TASKVALUE task attribute stores any real value that is assigned to it by a user. The value of this attribute has no effect on the process nor does it report any information about the process. Rather, it is provided for use in communicating information between processes.

If TASKVALUE is accessed through Host Services, bit 47 will always be zero (0).

An operator can change the TASKVALUE of an in-use process with the *<mix number> HI <integer>* form of the HI (Cause EXCEPTIONEVENT) system command.

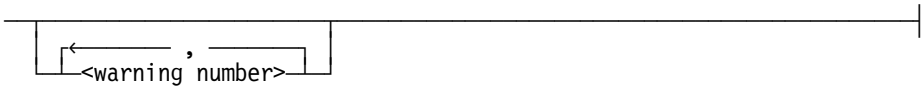
For an overview of the use of task attributes in interprocess communication, refer to the *Task Management Programming Guide*.

TASKWARNINGS

Type	String
Units	Not applicable
Range	<task warnings list>
Default	Null string
Read Time	Only while in-use
Write Time	Never
Inheritance	None
Fork() Inheritance	From parent
Overwrite Rules	None (read-only)
Host Services	Not supported
Attribute Number	109
Synonym	None
Restrictions	None

Range

<task warnings list>



Explanation

The TASKWARNINGS task attribute records what run-time warning messages have been issued for the object code file used by the process. Most run-time warning messages notify the programmer that the process uses a feature that has been scheduled for deimplementation on a future release. A programmer can use these messages to determine what changes need to be made to a program so it can be run on a new release.

The TASKWARNINGS value is the same as the value of the WARNINGS file attribute of the object code file. The value consists of either a null string or a series of warning numbers. Each warning number represents a particular run-time warning message. The warning number for each warning message is included in the text of that message. Thus, the following message corresponds to warning number 112:

```
WARNING 112: TIME calls that return the date in BCL will be
deimplemented on SSR <number> (Scheduled for <date>).
```

For a list of warning messages and the warning numbers corresponding to them, refer to the *Unisys e-@ction ClearPath Enterprise Servers System Messages Support Reference Manual*.

In the TASKWARNINGS value, warning numbers are separated by commas and listed in ascending order.

The TASKWARNINGS value includes warnings that were issued for other processes that were instances of this same object code file, or that were executing a procedure from this object code file when the warning occurred. For example, the TASKWARNINGS attribute of a library process reflects any warnings that were issued for user processes while they were executing procedures exported by the library.

If the TASKWARNINGS attribute of the MYSELF task variable is read within a library program, it returns either the warnings stored in the library object code file or those stored in the user process object code file, depending on the context. If TASKWARNINGS is read in an exported library procedure, it returns warnings stored in the user process object code file. If TASKWARNINGS is read elsewhere in the library, such as by a statement executed before the library freezes, then TASKWARNINGS returns warnings stored in the library object code file.

The TASKWARNINGS value includes all warnings that were issued for this object code file, including any that were suppressed by the SUPPRESSWARNING task attribute or the system warning suppression value. For details, refer to the description of the SUPPRESSWARNING task attribute.

Run-Time Error

CODE FILE MUST BE ACTIVE

An attempt was made to read the TASKWARNINGS task attribute of a process that is not in use. The accessing process, if nonprivileged, is discontinued with HISTORYCAUSE = 2 (PROGRAMCAUSEV) and HISTORYREASON = 116 (CODEFILENOTACTIVEV).

TEMPFILELIMIT

Type	Real
Units	Disk Megabytes
Range	–1 to about 4.31E+68
Default	–1 (Unlimited)
Read Time	Anytime
Write Time	Anytime
Inheritance	From parent
Fork() Inheritance	From parent
Overwrite Rules	See below
Host Services	Supported
Attribute Number	118
Synonym	None
Restrictions	None

Explanation

The TEMPFILELIMIT task attribute specifies the maximum amount of disk space that can be allocated at one time to temporary disk files owned by the process. For an introduction to temporary files, refer to the *Task Management Programming Guide*.

The amount of disk space used for temporary files increases when a process creates a new temporary disk file or increases the size of an existing temporary disk file. If one of these operations causes the process to exceed the TEMPFILELIMIT value, the system issues an I/O error for the process, and the I/O operation is not performed.

The TEMPFILELIMIT value is enforced only when the disk resource control system is active, and is never enforced for library maintenance processes.

If TEMPFILELIMIT is accessed through Host Services, bit 47 will always be zero (0).

TEMPFILELIMIT returns a value of –1 if it is read and no value was previously assigned to it. A value of –1 means that there is no limit on temporary file usage.

For more information about the disk resource control system, refer to the *System Administration Guide* and the *System Operations Guide*. A related task attribute, TEMPFILEMBYTES, is discussed later in this section.

Overwrite Rules

When a process is initiated, the system assigns a TEMPFILELIMIT value that is the minimum of the following values:

- The value of the TEMPFILELIMIT usercode attribute, if this attribute has been defined for the usercode of this process
- The TEMPFILELIMIT value inherited from the parent, as long as it is not unlimited (–1)
- Any TEMPFILELIMIT value that would result from standard overwrite rules, for example, because of a previous TEMPFILELIMIT assignment to the task variable or the object code file

Once a process is running, the current value of TEMPFILELIMIT can never be increased. An assignment that attempts to increase the TEMPFILELIMIT value is ignored and the TEMPFILELIMIT value remains unchanged. On the other hand, TEMPFILELIMIT can be assigned a lower value at any time.

Run-Time Error

FILE <file name> I/O ERROR: ATTEMPT TO EXCEED TEMPORARY FILE LIMIT

The process requested more space for temporary disk files than was allowed by the TEMPFILELIMIT attribute. The I/O operation fails. If the process has specified error handling for the I/O statement that caused the error, then the process can proceed normally. Otherwise, the process is discontinued.

TEMPFILEMBYTES

Type	Real
Units	Disk megabytes
Range	0 to about 4.31E+68
Default	0
Read Time	Anytime
Write Time	Never
Inheritance	None
Fork() Inheritance	Set to 0
Overwrite Rules	None (read-only)
Host Services	Supported
Attribute Number	119
Synonym	None
Restrictions	None

Explanation

The TEMPFILEMBYTES task attribute records the amount of disk space currently allocated to temporary files owned by the process. For an introduction to temporary files, refer to the *Task Management Programming Guide*.

The information returned by TEMPFILEMBYTES is valid only when the disk resource control system is active and is continuously active during the entire life of the process. Temporary files created by library maintenance processes and certain other system functions are not included in the value returned by this attribute.

For more information about the disk resource control system, refer to the *System Administration Guide* and the *System Operations Guide*.

If TEMPFILEMBYTES is accessed through Host Services, bit 47 will always be 0 (zero).

Run-Time Error

TEMPFILEMBYTES IS READONLY

A process attempted to assign a value to the TEMPFILEMBYTES attribute. The assigning process, if nonprivileged, is discontinued with HISTORYCAUSE = 2 (PROGRAMCAUSEV) and HISTORYREASON = 9 (ATTREADONLYV).

TYPE

Type	Mnemonic
Units	Not applicable
Range	See "Explanation" below
Default	PROCESS
Read Time	Anytime; accurate while in use
Write Time	Never
Fork() Inheritance	Set to 5 (FORK)
Inheritance	None
Overwrite Rules	None (read-only)
Host Services	Supported
Attribute Number	11
Synonym	None
Restrictions	None

Explanation

The TYPE task attribute returns information about whether the process is synchronous or asynchronous, and dependent or independent. The following are the possible values and their meanings:

Mnemonic Value	Integer Value	Meaning
PROCESS	0	Asynchronous dependent process
CALL	1	Synchronous dependent process
RUN	2	Non-WFL independent process
JOBSTACK	3	WFL job
FORK	5	Process initiated by fork() function.
EXEC	6	Process initiated by exec() function.

For information about the fork() and exec() functions, refer to the *POSIX User's Guide*.

Read Time

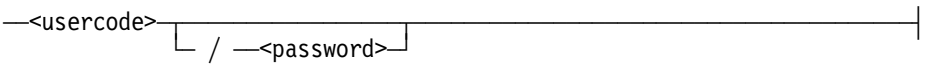
The TYPE attribute can be read at any time. However, the value is reset to PROCESS when the process terminates, regardless of what the value was when the process was in use.

USERCODE

Type	String
Units	Not applicable
Range	<usercode assignment>
Default	Null string
Read Time	Anytime
Write Time	Anytime
Inheritance	See below
Fork() Inheritance	From parent
Overwrite Rules	Object code file dominant
Host Services	Supported
Attribute Number	8
Synonym	None
Restrictions	None

Range

<usercode assignment>



Explanation

The USERCODE task attribute specifies the usercode under which the process is run. The usercode is a major factor in determining the privilege status of the process and what files can be accessed by the process. For information about usercodes and privilege, refer to the *Task Management Programming Guide*.

A USERCODE assignment must include a password unless the usercode does not have a password defined in the USERDATAFILE. However, when a process reads the USERCODE task attribute, the password is omitted from the value returned.

When a process is initiated, the system performs validation to determine whether the USERCODE value for a process is compatible with the ACCESSCODE task attribute value and the CHARGE task attribute value. The following is an outline of this validation:

1. The system checks to see that a USER entry exists for the usercode in the USERDATA file and that the password included in the USERCODE assignment is valid. Otherwise, the system discontinues the process.
2. The system performs the accesscode validation that is explained in the ACCESSCODE task attribute description.

3. The system performs the charge code validation that is explained in the CHARGE task attribute description.
4. For a WFL job, the WFL compiler performs both the accesscode and charge code validation at compile time. The WFL compiler issues a syntax error if either of these validations fails. (A WFL job can receive an ACCESSCODE or CHARGE value at compile time either through inheritance or through an assignment in the job attribute list).

If the USERCODE value of an in-use process is changed, the system performs only the first of the above types of validation. The following are the effects on the CHARGE and ACCESSCODE values:

CHARGE
: The process retains its current CHARGE value, even if it is one that would not normally be permitted for the new usercode. The process continues running normally.

ACCESSCODE
: The system always changes the ACCESSCODE task attribute to a null string, even if the accesscode is one that is permitted for the new usercode. The process continues running normally.

  If you do not want the ACCESSCODE to change, use USERDATA Function 3 to perform the USERCODE validation and assignment. USERDATA Function 3 causes the process to retain its current ACCESSCODE, even if that ACCESSCODE is one that would not normally be permitted for the new usercode.

If USERCODE is assigned a null string before initiation, the null value is overridden by inheritance from the parent at initiation time. A nonusercoded process receives a special security status, as described in the *Task Management Programming Guide*.

Only a privileged process, an MCS, a tasking program, or a compiler can assign a null string to the USERCODE of an in-use process. If a nonprivileged process attempts to assign a null string to the usercode of an in-use process, the nonprivileged process is discontinued with a security violation.

If the USERCODE of an in-use process is assigned a null string, the process becomes a nonusercoded process and the following effects also occur:

- The value of the ACCESSCODE task attribute is cleared.
- If a process was running under a privileged usercode, the process remains privileged.
- If the process is an MCS that was temporarily running under a usercode without MCS privileges, the process resumes its MCS privileges.

For processes initiated from a session, changing the usercode has the side effect of preventing process messages from being displayed at the originating terminal. The messages resume if the original usercode is restored.

During process initiation, if the NAME task attribute does not specify the usercode of the object code file, the system uses the USERCODE attribute of the initiator to search for the object code file to initiate. The system does *not* use the USERCODE attribute of the task variable being initiated for this purpose.

The system prevents the USERCODE attribute of a process from being copied if the SETUSERCODE or SETGROUPCODE subattribute is set for the process code file. (For information about these subattributes, refer to the SECURITYMODE file attribute description in the *File Attributes Programming Reference Manual*.) For such a process,

- When the process terminates, the system nulls the USERCODE value in the task variable.
- While the process is running, any attempt to copy the USERCODE value from one task variable to another results in a security violation.

The USERCODE attribute cannot be transferred using task-to-task transfer if the source task has been protected from modification, except by a tasking program. A task is protected from modification when it is passed as a parameter to a library change or approval procedure. While the change or approval procedure is active, access to the MYSELF intrinsic generates a protected task.

Inheritance

A process typically inherits the usercode of its parent. Processes initiated from CANDE or MARC sessions inherit the usercode of the session.

For library processes initiated by the library linkage mechanism with LIBACCESS = BYTITLE, the USERCODE task attribute inherits the USERCODE value of the process that is linking to the library.

If the SETUSERCODE subattribute of the SECURITYMODE attribute of the code file was set, then the initial USERCODE value is taken from the usercode of the code file. A copy of the initial USERCODE value is stored in the SAVEDUSERCODE task attribute. A copy of the USERCODE value the process would have received from the initiating process is stored in the REALUSERCODE task attribute. A process can use various functions to toggle the USERCODE attribute value between the values stored in the REALUSERCODE and SAVEDUSERCODE task attributes. For further information, refer to the discussion of process identities in the *Task Management Programming Guide*.

Examples

This ALGOL statement assigns a usercode:

```
REPLACE TVAR.USERCODE BY "SMITH/DAVID.";
```

This ALGOL statement assigns a null usercode:

```
REPLACE TSK.USERCODE BY ".";
```

Run-Time Errors

When an error occurs in assigning the USERCODE task attribute, field [27:20] of the ERROR task attribute of the receiving process stores the USERDATA error code. In addition, any of the following messages can be displayed.

SECURITY VIOLATION

An attempt was made to assign an illegal usercode value. The assigning process is discontinued with HISTORYCAUSE = 2 (PROGRAMCAUSEV) and HISTORYREASON = 29 (SECURITYERRORV). The system adds one of the following explanatory messages:

- If an attempt was made to assign a USERCODE value that failed security validation, the following additional message appears.

```
INVALID TASK ATTRIBUTE: USERCODE
```

- If a nonprivileged process attempted to set the USERCODE of an in-use process to a null value, the following additional message appears:

```
INVALID TASK ATTRIBUTE: USERCODE IS A DOT
```

- If an attempt was made to assign an invalid USERCODE to an object code file at compile time, the following additional message appears:

```
INVALID USERCODE WHEN INITIATING A TASK
```

USERCODE ATTRIBUTE INCORRECT SYNTAX

An attempt was made to assign a USERCODE a value that did not follow the usercode assignment syntax. The assigning process, if nonprivileged, is discontinued with HISTORYCAUSE = 2 (PROGRAMCAUSEV) and HISTORYREASON = 131 (INCORRECTSYNTAXV).

VALIDITYBITS

Note: *The VALIDITYBITS task attribute is intended for use by the system software only. The meanings of the various fields in the VALIDITYBITS value are subject to change without notice. It is therefore not possible for application programs to receive reliable information from VALIDITYBITS. For this reason, application programs should not use this attribute.*

WAITLIMIT

Type	Real
Units	Seconds
Range	0 to 164925
Default	0 (maximum wait time allowed)
Read Time	Anytime
Write Time	Anytime
Inheritance	See below
Fork() Inheritance	From parent
Overwrite Rules	Standard
Host Services	Supported
Attribute Number	56
Synonym	None
Restrictions	None

Explanation

The WAITLIMIT task attribute specifies the number of seconds that the process is allowed to spend in a user-requested wait state. If the process waits longer than its WAITLIMIT, it is discontinued.

The WAITLIMIT task attribute applies only to program statements that explicitly wait on one or more events. In particular, it does not apply to suspended processes that issue RSVP messages, such as processes suspended with a NO FILE condition. This attribute is intended to catch otherwise undetected application program errors.

WAITLIMIT is not cumulative; it applies to each WAIT statement separately.

You can assign WAITLIMIT a value greater than 164925 without incurring a compile-time or run-time error. However, the system actually enforces a WAITLIMIT of 164925 in these cases.

The default value of 0 also allows the process to wait for a maximum of 164925 seconds. The effect is the same, regardless of whether the 0 value is assigned explicitly or received as a default.

Note: *The maximum effective value of WAITLIMIT is subject to change in future releases.*

Some forms of the WAIT statement are not affected by WAITLIMIT. These forms can cause the process to wait any amount of time without being discontinued. The following are WAIT statement forms unaffected by WAITLIMIT:

WFL	ALGOL	COBOL
WAIT	WAIT	WAIT UNTIL INTERRUPT
WAIT (OK)		
WAIT (<real expression>)		

In the last of the three WFL statements shown, the real expression follows the syntax described in the *Work Flow Language (WFL) Programming Reference Manual*.

If WAITLIMIT is accessed through Host Services, bit 47 will always be zero (0).

Inheritance

A task inherits the WAITLIMIT value of its job.

If a default value is assigned for the WAITLIMIT attribute of a job queue, that value is inherited by WFL jobs run from that job queue. However, a WFL job can change its WAITLIMIT value after initiation or assign a different WAITLIMIT value to a task.

If a limit value is set for the WAITLIMIT attribute of a job queue, then WFL jobs that specify a higher WAITLIMIT value in the job attribute list cannot be accepted into that job queue. However, after initiation a WFL job can assign a WAITLIMIT value higher than the job queue WAITLIMIT.

Run-Time Error

WAIT TIME LIMIT EXCEEDED

The process remained in a user-requested wait state for longer than the time specified by WAITLIMIT. The process is discontinued with HISTORYCAUSE = 3 (RESOURCECAUSEV) and HISTORYREASON = 9 (WAITEXCEEDEDV).

Appendix A
Understanding Railroad Diagrams

This appendix explains railroad diagrams, including the following concepts:

- Paths of a railroad diagram
- Constants and variables
- Constraints

The text describes the elements of the diagrams and provides examples.

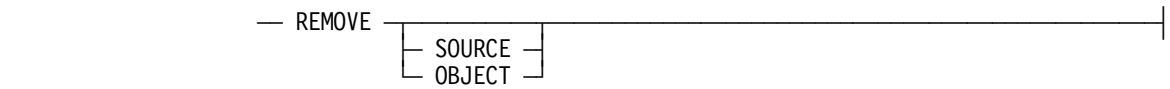
Railroad Diagram Concepts

Railroad diagrams are diagrams that show you the standards for combining words and symbols into commands and statements. These diagrams consist of a series of paths that show the allowable structures of the command or statement.

Paths

Paths show the order in which the command or statement is constructed and are represented by horizontal and vertical lines. Many commands and statements have a number of options so the railroad diagram has a number of different paths you can take.

The following example has three paths:



The three paths in the previous example show the following three possible commands:

- REMOVE
- REMOVE SOURCE
- REMOVE OBJECT

A railroad diagram is as complex as a command or statement requires. Regardless of the level of complexity, all railroad diagrams are visual representations of commands and statements.

Railroad diagrams are intended to show

- Mandatory items
- User-selected items
- Order in which the items must appear
- Number of times an item can be repeated
- Necessary punctuation

Follow the railroad diagrams to understand the correct syntax for commands and statements. The diagrams serve as quick references to the commands and statements.

The following table introduces the elements of a railroad diagram:

Table A–1. Elements of a Railroad Diagram

The diagram element . . .	Indicates an item that . . .
Constant	Must be entered in full or as a specific abbreviation
Variable	Represents data
Constraint	Controls progression through the diagram path

Constants and Variables

A constant is an item that must be entered as it appears in the diagram, either in full or as an allowable abbreviation. If part of a constant appears in boldface, you can abbreviate the constant by

- Entering only the boldfaced letters
- Entering the boldfaced letters plus any of the remaining letters

If no part of the constant appears in boldface, the constant cannot be abbreviated.

Constants are never enclosed in angle brackets (< >) and are in uppercase letters.

A variable is an item that represents data. You can replace the variable with data that meets the requirements of the particular command or statement. When replacing a variable with data, you must follow the rules defined for the particular command or statement.

In railroad diagrams, variables are enclosed in angle brackets.

In the following example, BEGIN and END are constants, whereas <statement list> is a variable. The constant BEGIN can be abbreviated, since part of it appears in boldface.

Valid abbreviations for BEGIN are

- BE
- BEG
- BEGI

Constraints

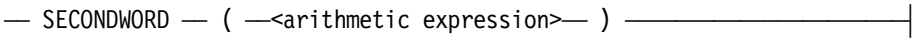
Constraints are used in a railroad diagram to control progression through the diagram. Constraints consist of symbols and unique railroad diagram line paths. They include

- Vertical bars
- Percent signs
- Right arrows
- Required items
- User-selected items
- Loops
- Bridges

A description of each item follows.

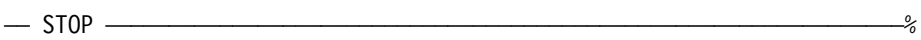
Vertical Bar

The vertical bar symbol (|) represents the end of a railroad diagram and indicates the command or statement can be followed by another command or statement.



Percent Sign

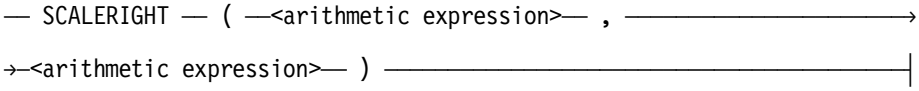
The percent sign (%) represents the end of a railroad diagram and indicates the command or statement must be on a line by itself.



Right Arrow

The right arrow symbol (>)

- Is used when the railroad diagram is too long to fit on one line and must continue on the next
- Appears at the end of the first line, and again at the beginning of the next line



Required Item

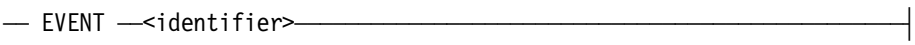
A required item can be

- A constant
- A variable
- Punctuation

If the path you are following contains a required item, you must enter the item in the command or statement; the required item cannot be omitted.

A required item appears on a horizontal line as a single entry or with other items. Required items can also exist on horizontal lines within alternate paths, or nested (lower-level) diagrams.

In the following example, the word EVENT is a required constant and <identifier> is a required variable:



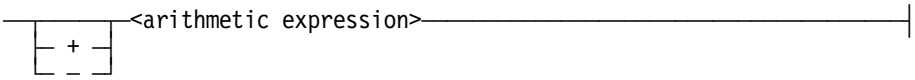
User-Selected Item

A user-selected item can be

- A constant
- A variable
- Punctuation

User-selected items appear one below the other in a vertical list. You can choose any one of the items from the list. If the list also contains an empty path (solid line) above the other items, none of the choices are required.

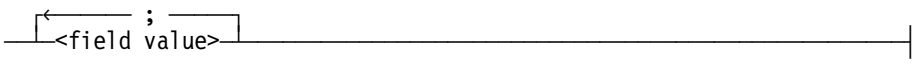
In the following railroad diagram, either the plus sign (+) or the minus sign (–) can be entered before the required variable <arithmetic expression>, or the symbols can be disregarded because the diagram also contains an empty path.



Loop

A loop represents an item or a group of items that you can repeat. A loop can span all or part of a railroad diagram. It always consists of at least two horizontal lines, one below the other, connected on both sides by vertical lines. The top line is a right-to-left path that contains information about repeating the loop.

Some loops include a return character. A return character is a character—often a comma (,) or semicolon (;)—that is required before each repetition of a loop. If no return character is included, the items must be separated by one or more spaces.



Bridge

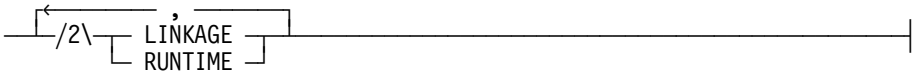
A loop can also include a bridge. A bridge is an integer enclosed in sloping lines (/ \) that

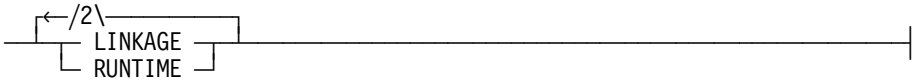
- Shows the maximum number of times the loop can be repeated
- Indicates the number of times you can cross that point in the diagram

The bridge can precede both the contents of the loop and the return character (if any) on the upper line of the loop.

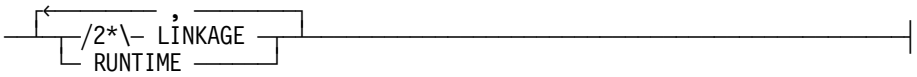
Not all loops have bridges. Those that do not can be repeated any number of times until all valid entries have been used.

In the first bridge example, you can enter LINKAGE or RUNTIME no more than two times. In the second bridge example, you can enter LINKAGE or RUNTIME no more than three times.





In some bridges an asterisk (*) follows the number. The asterisk means that you must cross that point in the diagram at least once. The maximum number of times that you can cross that point is indicated by the number in the bridge.

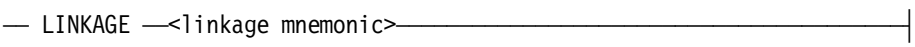


In the previous bridge example, you must enter LINKAGE at least once but no more than twice, and you can enter RUNTIME any number of times.

Following the Paths of a Railroad Diagram

The paths of a railroad diagram lead you through the command or statement from beginning to end. Some railroad diagrams have only one path; others have several alternate paths that provide choices in the commands or statements.

The following railroad diagram indicates only one path that requires the constant LINKAGE and the variable <linkage mnemonic>:



Alternate paths are provided by

- Loops
- User-selected items
- A combination of loops and user-selected items

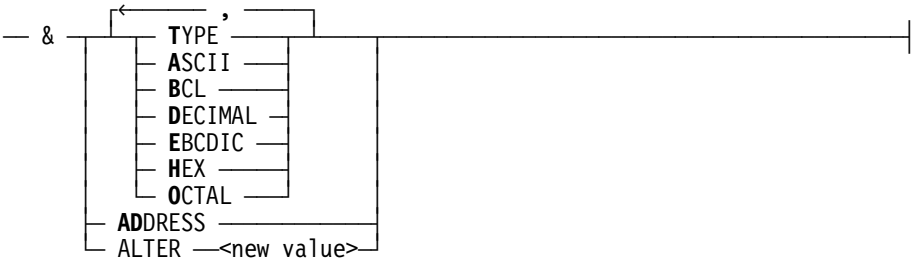
More complex railroad diagrams can consist of many alternate paths, or nested (lower-level) diagrams, that show a further level of detail.

For example, the following railroad diagram consists of a top path and two alternate paths. The top path includes

- An ampersand (&)
- Constants that are user-selected items

  These constants are within a loop that can be repeated any number of times until all options have been selected.

The first alternative path requires the ampersand and the required constant ADDRESS. The second alternative path requires the ampersand followed by the required constant ALTER and the required variable <new value>.

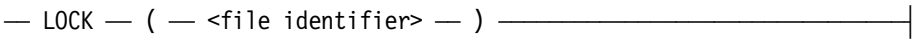


Railroad Diagram Examples with Sample Input

The following examples show five railroad diagrams and possible command and statement constructions based on the paths of these diagrams.

Example 1

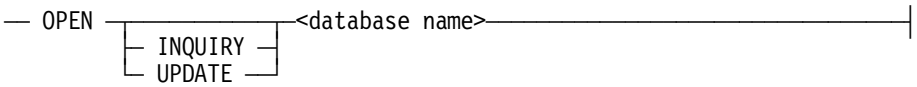
<lock statement>



Sample Input	Explanation
LOCK (FILE4)	LOCK is a constant and cannot be altered. Because no part of the word appears in boldface, the entire word must be entered. The parentheses are required punctuation, and FILE4 is a sample file identifier.

Example 2

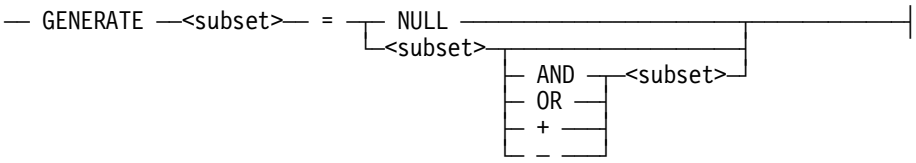
<open statement>



Sample Input	Explanation
OPEN DATABASE1	The constant OPEN is followed by the variable DATABASE1, which is a database name. The railroad diagram shows two user-selected items, INQUIRY and UPDATE. However, because an empty path (solid line) is included, these entries are not required.
OPEN INQUIRY DATABASE1	The constant OPEN is followed by the user-selected constant INQUIRY and the variable DATABASE1.
OPEN UPDATE DATABASE1	The constant OPEN is followed by the user-selected constant UPDATE and the variable DATABASE1.

Example 3

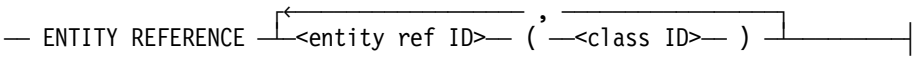
<generate statement>



Sample Input	Explanation
GENERATE Z = NULL	The GENERATE constant is followed by the variable Z, an equal sign (=), and the user-selected constant NULL.
GENERATE Z = X	The GENERATE constant is followed by the variable Z, an equal sign, and the user-selected variable X.
GENERATE Z = X AND B	The GENERATE constant is followed by the variable Z, an equal sign, the user-selected variable X, the AND command (from the list of user-selected items in the nested path), and a third variable, B.
GENERATE Z = X + B	The GENERATE constant is followed by the variable Z, an equal sign, the user-selected variable X, the plus sign (from the list of user-selected items in the nested path), and a third variable, B.

Example 4

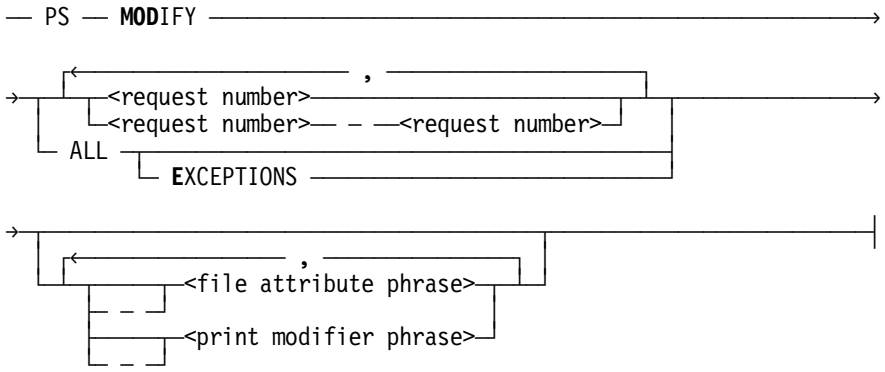
<entity reference declaration>



Sample Input	Explanation
ENTITY REFERENCE ADVISOR1 (INSTRUCTOR)	The required item ENTITY REFERENCE is followed by the variable ADVISOR1 and the variable INSTRUCTOR. The parentheses are required.
ENTITY REFERENCE ADVISOR1 (INSTRUCTOR), ADVISOR2 (ASST_INSTRUCTOR)	Because the diagram contains a loop, the pair of variables can be repeated any number of times.

Example 5

<PS MODIFY command>



Sample Input	Explanation
PS MODIFY 11159	The constants PS and MODIFY are followed by the variable 11159, which is a request number.
PS MODIFY 11159,11160,11163	Because the diagram contains a loop, the variable 11159 can be followed by a comma, the variable 11160, another comma, and the final variable 11163.
PS MOD 11159–11161 DESTINATION = "LP7"	The constants PS and MODIFY are followed by the user-selected variables 11159–11161, which are request numbers, and the user-selected variable DESTINATION = “LP7”, which is a file attribute phrase. Note that the constant MODIFY has been abbreviated to its minimum allowable form.
PS MOD ALL EXCEPTIONS	The constants PS and MODIFY are followed by the user-selected constants ALL and EXCEPTIONS.

Appendix B
Related Product Information

The following documents provide information directly related to the subject of this manual.

***MCP/AS POSIX User's Guide* (7011 8328)**

This guide describes the basic concepts of the POSIX interface, including process control and file management. It also describes specifically how the POSIX.1 interface is implemented and used on the enterprise server. This guide is written for programmers and any user who wants to understand the POSIX interface.

***MCP/AS System Administration Guide* (8600 0437)**

This guide provides the reader with information required to make decisions about system configuration, peripheral configuration, file management, resource use, and other matters related to system administration. This guide is written for users with some, little, or no experience who are responsible for making decisions about system administration.

***Unisys e-@ction Application Development Solutions ALGOL Programming Reference Manual, Volume 1: Basic Implementation* (8600 0098)**

This manual describes the basic features of the Extended ALGOL programming language. This manual is written for the applications programmer or systems analyst who is experienced in developing, maintaining, and reading ALGOL programs.

***Unisys e-@ction Application Development Solutions COBOL ANSI-74 Programming Reference Manual, Volume 1: Basic Implementation* (8600 0296)**

This manual describes the basic features of the standard COBOL ANSI-74 programming language, which is fully compatible with the American National Standard, X3.23-1974. This manual is written for programmers who are familiar with programming concepts.

***Unisys e-@ction Application Development Solutions COBOL ANSI-85 Programming Reference Manual, Volume 1: Basic Implementation* (8600 1518)**

This manual, written for programmers familiar with programming concepts, describes the basic features of the COBOL ANSI-85 programming language.

Unisys e-@ction ClearPath Enterprise Servers File Attributes Programming Reference Manual (8600 0064)

This manual contains information about each file attribute and each direct I/O buffer attribute. The manual is written for programmers and operations personnel who need to understand the functionality of a given attribute. The *I/O Subsystem Programming Guide* is a companion manual.

Unisys e-@ction ClearPath Enterprise Servers I/O Subsystem Programming Guide (8600 0056)

This guide contains information about how to program for various types of peripheral files and how to program for interprocess communication, using port files. This guide is written for programmers who need to understand how to describe the characteristics of a file in a program. The *File Attributes Programming Reference Manual* is a companion manual.

Unisys e-@ction ClearPath Enterprise Servers Print System and Remote Print System Administration, Operations, and Programming Guide (8600 1039)

This guide describes the features of the Print System and provides a complete description of its command syntax. This guide is written for programmers, operators, system administrators, and other interactive users of Menu-Assisted Resource Control (MARC) and CANDE.

Unisys e-@ction ClearPath Enterprise Servers Security Administration Guide (8600 0973)

This guide describes system-level security features and suggests how to use them. It provides administrators with the information necessary to set and implement effective security policy. This guide is written for system administrators, security administrators, and those responsible for establishing and implementing security policy.

Unisys e-@ction ClearPath Enterprise Servers System Commands Operations Reference Manual (8600 0395)

This manual, written for systems operators and administrators, gives a complete description of the system commands used to control system resources and work flow.

Unisys e-@ction ClearPath Enterprise Servers System Operations Guide (8600 0387)

This guide describes concepts and procedures required to operate most Unisys systems. Sections 1 and 2 contain information and procedures that can be done by novice operators. Section 3 contains operations and procedures that require more advanced operations experience. This guide is written for operators responsible for operating the enterprise server, especially operators with little or no experience.

Unisys e-@ction ClearPath Enterprise Servers Task Management Programming Guide (8600 0494)

This guide explains how to initiate, monitor, and control processes on an enterprise server. It describes process structures and process family relationships, introduces the uses of many task attributes, and gives an overview of interprocess communication techniques.

Unisys e-@ction ClearPath Enterprise Servers Work Flow Language (WFL) Programming Reference Manual (8600 1047)

This manual presents the complete syntax and semantics of WFL. WFL is used to construct jobs that compile or run programs written in other languages and that perform library maintenance such as copying files. This manual is written for individuals with some experience in programming in a block-structured language such as ALGOL and who know how to create and edit files using CANDE or the Editor.

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