24x7 JAL™ Reference 3.6

Job Automation Language (JAL) Reference

24x7 Scheduler Multi-platform Edition 6.1

Table of Contents

Conventions Used in This Document

This section describes the style conventions used in this document.

Italic
An *italic* font is used for filenames, URLs, emphasized text, and the first usage of technical terms.

`Monospace`
A `monospaced` font is used for code fragments and data elements.

Bold
A **bold** font is used for important messages, names of options, names of controls and menu items, and keys.

User Input
Keys are rendered in **bold** to stand out from other text. Key combinations that are meant to be typed simultaneously are rendered with "+" sign between the keys, such as:
Ctrl+F
Keys that are meant to be typed in sequence will be separated with commas, for example:
Alt+S, H
This would mean that the user is expected to type the Alt and S keys simultaneously and then to type the H key.

Graphical marks
 **-** This mark is used to indicate product specific options and issues and to mark useful tips.
 **-** This mark is used to indicate important notes.

Abbreviations and Terms

This guide uses common abbreviations for many widely used technical terms including FTP, HTTP, RAS, SQL, DBMS, SSH and other.

Trademarks

24x7 Job Automation Language

Overview

You can write job automation scripts using Job Automation Language (JAL). JAL includes over 300 statements for a wide variety of operations such as file manipulations, program execution, process handling, database operations, and many others.

You can use macro-parameters in your JAL scripts. Macro-parameter values are substituted in script run-time just before the JAL interpreter starts executing your script.

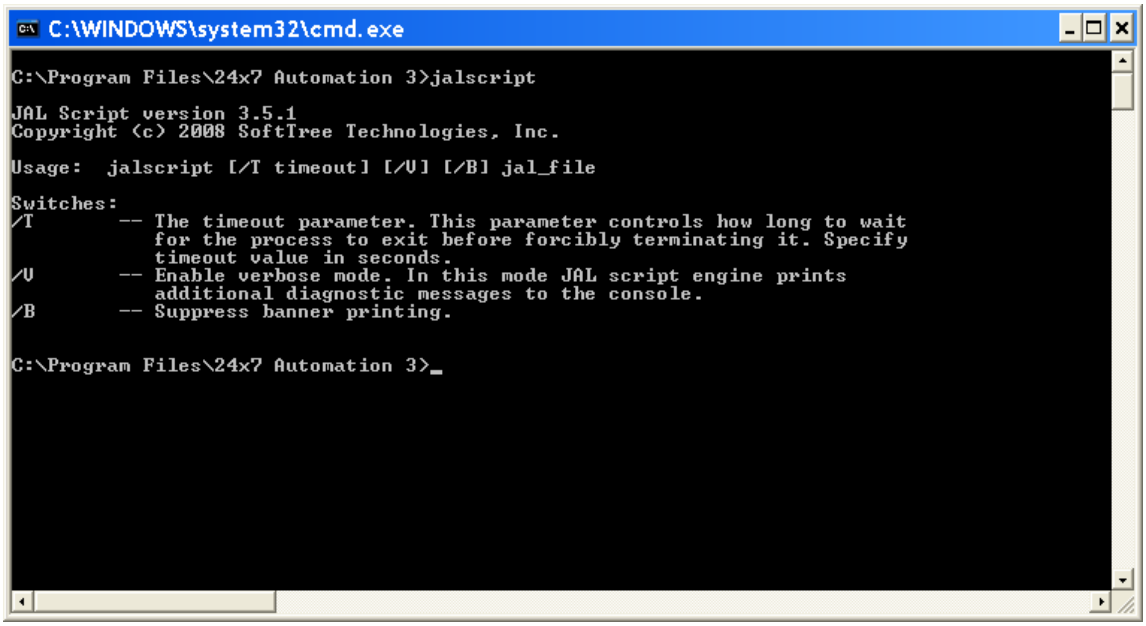
See also:

Syntax

Statements by Category

Running JAL Scripts

Use **jalscript.exe** command to run JAL script files. You can also start .JAL files by entering their names at the DOS command prompt.



See also:

Syntax

Statements by Category

Syntax

The 24x7 Job Automation Language supports the following three programming language elements:

1 Variables

Variables

A JAL variable is a named storage location that contains data that can be modified during program execution. Each variable has a unique name that identifies it within the JAL script. You must declare a variable before you can use it. Use the Dim statement to declare variables and their data types. When you declare a variable, you can accept the default initial value or specify an initial value.

The variable name should begin with an alphabetic character, followed by any combination of alphabetic characters, numbers, or the underscore character, as in this example: ProcessID.

A variable can be declared as one of the following data types:

- NUMBER - A signed floating-point number with 15 digits of precision and a range from 2.2250738585072E-308 to 1.79769313486232E+308. When necessary, the JAL script engine automatically handles conversion between floating-point and integer numbers. Variables of NUMBER data type have 0 (zero) as their default initial value.
- STRING - Any string of ASCII characters with variable length (0 to 2,147483,647). Variables of STRING data type have ""(empty string) as their default initial value.
- DATE - The date, including the full year (1000 to 3000), the number of the month (01 to 12), and the day (01 to 31). Variables of DATE data type have 1900-01-01 (January 1, 1900) as their default initial value.
- TIME - The time in 24-hour format, including the hour (00 to 23), minute (00 to 59), and second (00 to 59), with a range from 00:00:00 to 23:59:59. Variables of TIME data type have 00:00:00 (midnight) as their default initial value.
- DATETIME - The date and time in a single data type. Variables of DATETIME data type have 1900-01-01 00:00:00 (January 1, 1900 midnight) as their default initial value.
- BOOLEAN - Contains TRUE or FALSE. Variables of BOOLEAN data type have FALSE as their default initial value.

A variable can have either local or global scope. A local variable is a temporary variable accessible only from within the script in which you define it. When the script is finished, the variable constant ceases to exist. Global variables are accessible from anywhere in any script of any job. To avoid ambiguity when referring to variables, you must use the GLOBAL prefix when declaring or referring to global variables. The JAL script engine allocates memory and initializes a global variable whenever it executes a JAL script, in which it first time finds the declaration of that variable. JAL script engine ignores the declaration on subsequent runs. You can use the Set statement to change the values of global variables.

Examples:
This statement declares a local variable: Dim(counter, number)
This statement declares a global variable: Dim(global.counter, number)
This statement sets the value of a local variable: Set(count, 5)
This statement sets the value of a global variable: Set(global.count, 5)

Statements

JAL statements have two main components: the statement name and the statement parameters. The statement and variable names are case insensitive. The statement name must be spelled exactly as it is shown in the syntax and the parameters must be used in the order they are given in the syntax. Parameters provide information for the statement. For example, the FileReadLine statement, which reads a line from a text file, has parameters for the name of the file, the line number, and the variable name into which the line will be stored.

All JAL statements use the following syntax:
StatementName(parameter1, parameter2, ...)

The opening parenthesis, closing parenthesis, and commas are optional. You can use spaces and tabs instead. Statement names are not case-sensitive. The JAL script engine automatically removes all unnecessary white space before executing JAL script. This enables you to use spaces and tabs in the script to improve readability.

Parameters can be variable names, text strings or numbers, and are separated by commas, spaces, and/or tabs. Text string parameters must be enclosed in double quotes. The number of white space characters is preserved when they are part of a string literal (parameter).

Some statements have return value. The return value is always passed in the last statement parameter. When coding statements you should declare a variable of the appropriate type in order to store this return value.

Some statements have no parameters at all. For example: Exit
You cannot nest more than one statement in a statement string.

@ sign is used as an escape character that allows you to include **macro-variables** as part of a statement parameter. If you need a literal @ sign (for example, in a string specification) you must double the @ sign.

You can define your own JAL statements. You can use the **Script Library** tool (Tools/Script Library menu) to create, modify, and delete your **user-defined JAL statements**. User-defined JAL statements may call other user-defined statements. You should be very careful when coding your JAL statements and avoid cyclical calls that may lead to infinite loops.

Statement continuation

Although typically you would put one statement on each line, you will occasionally want to continue a statement on to more than one line. The statement continuation character is the ampersand (&).

Syntax:

Start of statement &
more statement &
end of statement

The ampersand must be the last nonwhite character on the line (or the script interpreter will consider it as a part of the statement).

Special ASCII characters

You can include special ASCII characters in strings. For example, you may want to include a tab in a string to ensure proper spacing or a new line character to indicate end of line. The backslash character (\) introduces special characters. To specify the backslash character as string literal, precede it with another backslash.

Syntax:

Symbol	***ASCII character***
\n	*New line*
\r	*Carriage return*
\t	*Tab*
\"	*Double quote*
**	*Backslash*

Off-line scripts

You can develop off-line JAL scripts that are saved in text files as opposed to in-line scripts that are stored in the job database. You use the @SCRIPT tag in in-line scripts to reference off-line scripts. In run-time, JAL script engine inserts the contents of the off-line script file into the body of the main job script.

Syntax:
@SCRIPT:<file name>

For example: @SCRIPT:c:\scripts\check_errors.jal

Comments

A comment is a line that starts with // (double forward slash). You cannot use comments on the line that already has some statement or statement. You can have as many comments as you want.

Important Notes:

- JAL script lines cannot exceed 8K (8192 characters) in size.
- The total script size cannot exceed 32000 characters.
- Nested statements are not currently supported.

See also:

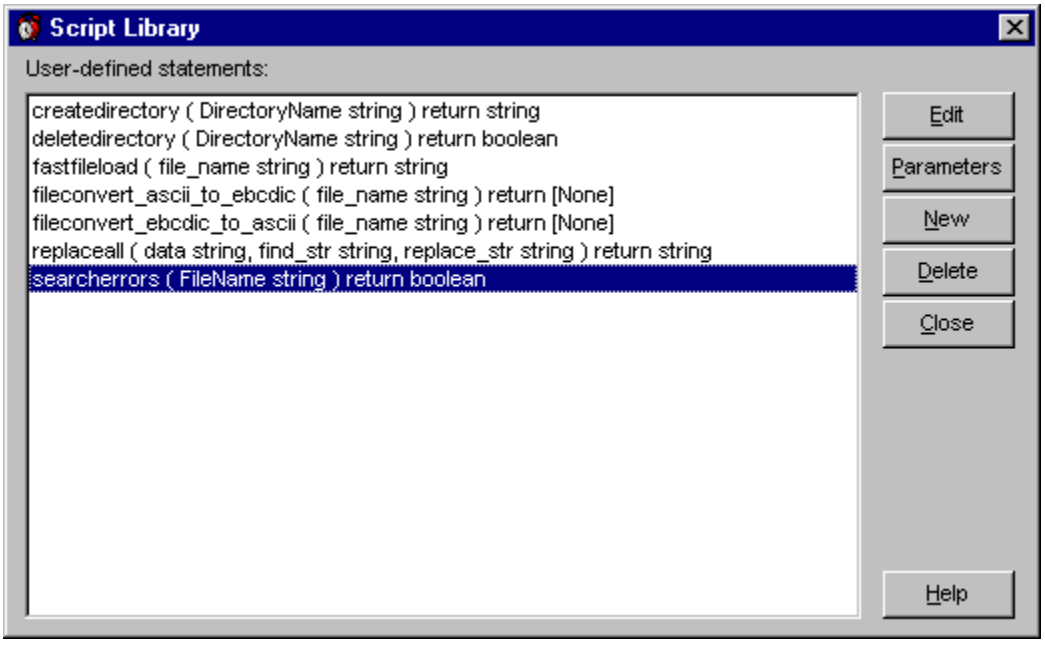
Statements by Category

Functions in Filter and Sort Expressions

Script Library

Script library is available on systems where you have 24x7 Scheduler Windows Edition installed. You can access the Script Library from the **Tools/Script Library** menu or simply by pressing the F7 hot key.

The Script Library is the place where you can create and store user-defined JAL statements. User-defined JAL statements have global scope and can be called from any script type job. You call them from JAL scripts just as you call built-in JAL statement. From a user-defined JAL statement you can also call other user-defined statements and jobs. To simplify and easy job maintenance, implement common business functions as user-defined statements that you can call from multiple jobs.



User-defined statements must follow the same syntax rules that apply to other JAL scripts. Just as script jobs, variables declared in any user-defined JAL statement have local scope unless they are declared as GLOBAL. User-defined statements, just like built-in JAL statements, may have parameters. Parameters are defined at the time when you declare new user-defined statement in the Script Library. Every parameter must have a name. Parameters are

always passed by value and inside the user-defined statement they are treated as local variables. In the statement code, you can refer to them by their names. However, their names are not used when calling the statement from some other script. The position of the parameter in the user-defined statement is important. The order in which you specify parameter is the order you will use when calling the statement.

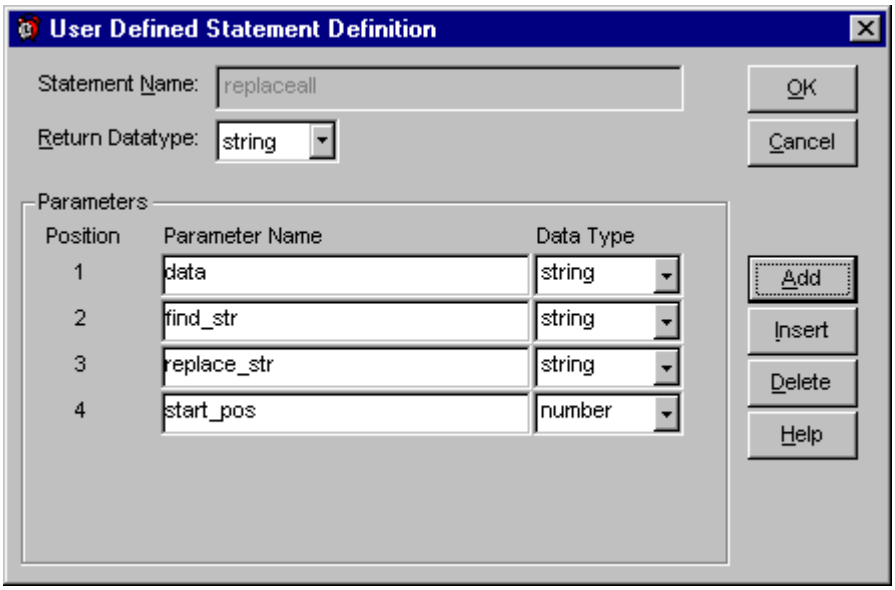
If you declare your user-defined statement with the return value, you must use the Return statement to return some value to the calling script. To call such user-defined statement, specify appropriate variable for the return value as the last parameter in the statement call line.
For example: *MyStatement first_param_as_var, "abc", 123, "third param as string", ret_value_var*.

Caution: User-defined statements can be recursive; that is, they can call themselves to perform a given task. However, recursion can lead to stack overflow. Be very careful when implementing recursive calls.

JAL is not case sensitive, that is, when calling your user-defined statements you can specify their names in lower, upper, or mixed case.

To create a new user-defined statement:

1 Open **Script Library** from the **Tools** menu. The Script Library dialog box will appear.
2 Click the **New** button. The Statement Definition dialog box will appear.
3 Specify the new statement name. The name must follow standard naming convention and must not exceed 50 characters in length. Generally, you should not use names that are the same as the names of the built-in JAL statements. Otherwise, you would shadow the same keywords in the language.
4 Specify the return value type or leave the return value (None) if the new statement has no return value.
5 Specify the statement parameter names and their data types. Parameter names must follow standard naming convention and must not exceed 50 characters in length. You can specify as many parameters as needed. To add more parameters, use the **Add** button.
6 When you are finished defining the parameters, click the **OK** button. The Script Editor window will appear.
7 Code your user-defined statement then click the **Exit** button to close the Script Editor and return to the Script Library.



To modify an existing user-defined statement:

1 Open the **Script Library** from the **Tools** menu. The Script Library dialog box will appear.
2 Find and select the desired statement.
3 To modify statement parameters, click the **Parameter** button. The Statement Definition dialog box will appear.
4 To modify the statement code, click the **Edit** button. The Script Editor window will appear.
5 Code your user-defined statement then click the **Exit** button to close the Script Editor and return to the Script Library.

To delete an existing user-defined statement:

1 Open the **Script Library** from the **Tools** menu. The Script Library dialog box will appear.
2 Find and select the desired statement.
3 Click the **Delete** button.

Macro-parameters

Macro-parameters provide a way to replace specific values at run time. Macro-parameters can be used in the following areas:

- Semaphore file names
- Program names and directories
- SQL commands
- Notification messages
- Job automation scripts

The @ sign is used as an escape character for macro-parameters. If you need a literal @ sign (for example, in a program name specification) you must double it, for example, “@@somename”.

Parameter Substitution
The JAL script engine always applies Macro-parameters before checking the job conditions and executing the job. There are two parameter types: time-dependent parameters and general-purpose V parameters that simplify job design.
Some macro-parameters consist of two parts: The parameter identifier and the format mask. You must use double quotes around masks in order for parameter to be interpreted correctly. See the following tables for supported parameters and masks.

Two types of macro-parameters are supported:

- Time-dependent parameters
- V-parameters

Time-dependent parameters

The following time-dependent macro-parameters are supported in all places:

Identifier	Meaning
@W	An integer (1-7) representing the current day of the week. Sunday is day 1, Monday is day 2, and so on.
@T" <mask>"	Current date and time. The actual representation depends on the mask.
@Q	An integer (1-4) representing the current quarter of the year.
@D<number>"<mask>"	The date of a specified day number of the current week. The actual representation depends on the mask. The number can be anything from 1 to 7, where Sunday is day 1, Monday is day 2, and so on.
@DP" <mask>"	The date for the previous calendar day. The actual representation depends on the mask.
@DN" <mask>"	The date for the next calendar day. The actual representation depends on the mask.
@DL" <mask>"	The date for the last business day. The actual representation depends on the mask.
@DB" <mask>"	The date for the next business day. The actual representation depends on the mask.

@ML" <mask>"	The date for the last calendar day of the month. The actual representation depends on the mask.
@MF" <mask>"	The date of the first calendar day of the month. The actual representation depends on the mask.
@ME" <mask>"	The date for the last (ending) business day of the month. The actual representation depends on the mask.
@MS" <mask>"	The date for the first (starting) business day of the month. The actual representation depends on the mask.

Format Masks

Character	Meaning	Example
d	Day number with no leading zero.	9
dd	Day number with leading zero, if appropriate.	09
ddd	Day name abbreviation.	Mon
dddd	Day name.	Monday
m	Month number with no leading zero.	6
mm	Month number with leading zero, if appropriate.	06
mmm	Month name abbreviation.	Jun
mmmm	Month name.	June
yy	Two-digit year.	97
yyyy	Four-digit year.	1997

Colons, slashes, and spaces appear as they are specified in the mask.

Two-digit years

If you specify a two-digit year in a mask, where the year is greater than or equal to 50, the JAL script engine will assume that the date is in the 20th Century, If the year is less than 50, the JAL script engine will assume it is the 21st Century. For example:

1/1/85 is interpreted as January 1, 1985. 1/1/40 is interpreted as January 1, 2040.

Examples:

The following table shows how the date Friday, Jan. 30, 1998, displays when different format masks are applied:

Format	Displays
mmddyy	013098
mmyyyyy	011998
d-mmm-yy	30-Jan-98
dd-mmmm	30-January
mmm-yy	Jan-98
dddd, mmm d, yyyy	Friday, Jan 30, 1998
dddd	Friday

V-parameters

The **V** macro-parameters are similar to other macro-parameters described above. The scope of each macro-parameter is specified in the parameter description. V-parameters are case-sensitive. You can use the following **V** macro-parameters in your jobs:

Identifier	Meaning
@V"subject"	This parameter can be used in scripts for email-watch jobs. It returns the full subject of the email message that triggered the job.
@V"message"	This parameter can be used in scripts for email-watch jobs. It returns full text of the email message that triggered the job.
@V"x-message"	This parameter can be used in scripts for email-watch jobs. It returns full text of the email message that triggered the job with all carriage return and new line characters replaced with spaces. It also formats escape symbols and double quotes, essentially transforming the text to a single line message whose value can be inserted directly into a job script and do not cause syntax errors typically caused by @V"message" macro-parameter.
@V"datereceived"	This parameter can be used in scripts for email-watch jobs. It returns receiving date-time of the email message that triggered the job. The value is retuned as a string in the format it appears in the message header.
@V"sender"	This parameter can be used in scripts for email-watch jobs. It returns sender ‘s email address from the email message that triggered the job.
@V"attachments"	This parameter can be used in scripts for email-watch jobs. It returns comma-separated list of files attached to the email message that triggered the job. If there is no file attached, it returns empty string
@V"user"	Returns user id of the user currently logged on. This parameter can be used in any script, notification event or job trigger.
@V"computer"	Returns name of computer on which the job is running. This parameter can be used in any script, notification event or job trigger.
@V"domain"	Returns name of the primary logon domain for the user currently logged on. This parameter can be used in any script, notification event or job trigger. This macro-parameter is not supported on Windows 95/98/Me.
@V"job_id"	Returns id of the job whose script is referencing this macro-parameter. This parameter can be used in any script, notification event or job trigger.
@V"job_name"	Returns name of the job whose script is referencing this macro-parameter. This parameter can be used in any script, notification event or job trigger.
@V"24x7_home"	Returns name of the JAL script engine installation directory. This parameter can be used in any script, notification event or job trigger.
@V"files"	This parameter can be used in scripts and notification events of jobs that have "file-watch" triggers. This macro-parameter returns comma-separated list of files that triggered the job.
@V"event"	This parameter can be used in scripts and properties for job notification actions. Depending on the notification event that triggered the action, the returned value can be one of the following: • START • FINISH • ERROR • NOT FOUND • LATE
@V"winver"	Returns Windows version and service pack number. This parameter can be used in any script, notification event or job trigger.
@V"param:[N]"	Returns value of the command line parameter passed to the command line JAL script. [N] represents relative position of the parameter specified on the command line. First parameter specified after JAL file name is counted as 1. See the following examples for more details.

@V"env:[VAR]"	Returns value of the DOS/Windows environment variable whose name is referenced by [VAR]. This parameter can be used in any script, notification event or job trigger.

Examples:

The following statement coded in “Macro-testing” job will display “Hello from job Macro-testing” message
MessageBox “Hello from job @V”job_name””

The following line will add user-defined message to the job log. Note that the job id and name are not hard-coded and in run-time they are be substituted with the actual job id and name.
LogAddMessageEx “INFO”, @V”job_id”, “@V”job_name””, “Some message here”

The following code fragment will delete disk versions of email attachments

```
FileDeleteEx "@V"attachments""
```

The following code fragment will send automatic email confirmation to the email message sender.

```
MailSend "Exchange Settings", "mypassword", "@V"sender"", "RE: @V"subject"", "Thank
you. Your message has been received.\r\n\r\n Truly yours, @V"user""
```

The following code fragment will assign default Java class path (as specified in the %CLASSPATH % environment variable) to the script variable v_classpath.

```
Set v_classpath, "@V"env:CLASSPATH""
```

The following code fragment will assign value of the first command line parameter "test parameter" specified in the following command to the to the script variable v_param1. The last line will assign value of the second command line parameter "test parameter 2" specified in the following command to the to the script variable v_param2

JALScript C:\scripts\some_script.jal "test parameter" "test parameter 2"

```
Set v_param1, "@V"param:1""
Set v_param2, "@V"param:2""
```

Control-of-Flow Statements

24x7 Job Automation Language includes the following statements for controlling script execution logic, declaring variables, and assigning values to variables:

Break

Description: In a LoopWhile, LoopUntil, or a ForNext control structure, passes control out of the current loop. Break takes no arguments.

Syntax: Break

Usage: A Break statement in a loop control structure causes control to pass to the statement following the end of loop label. In a nested loop, a Break statement passes control out of the current loop structure.
For information on how to jump to the end of the loop and continue looping, see Continue statement.

Continue

Description: In a LoopWhile, LoopUntil, or a ForNext control structure, skips statements in the current loop. Continue takes no arguments.

Syntax: Continue

Usage: When JAL script engine encounters a Continue statement in a loop structure, control passes to the loop's end label. The statements between the Continue statement and the loop's end label are skipped in the current iteration of the loop. In a nested loop, a Continue statement bypasses statements in the current loop structure.
For information on how to break out of the loop, see Breakstatement.

Dim

Description: Declares variables and allocates storage space.

Syntax: Dim variable, datatype [, initial_value]

Argument	Description
variable	The name of the variable you want to declare
datatype	The data type of the variable. The following data types are supported:

	• String • Number • Boolean • Date • Time • DateTime
initial_value	The initial value of the variable. The data type of the initial_value must match the declared data type of the variable. This argument is optional.

Usage Notes: To declare a global variable, use *dot notation* with the GLOBAL prefix in front of the variable name.

Exit

Description: Immediately exits the script.

Syntax: Exit

Usage: This statement has no arguments.

RaiseError

Description: Causes an error event at the job level and writes error message to the 24x7 event log.

Syntax: RaiseError error

Argument	Description
error	A string whose value is the error message that you want to write to the 24x7 event log.

Usage: By default, RaiseError statement halts job execution and writes error message to the 24x7 event log. If parallel logging to the Windows NT (NT/2000/XP/2003/VISTA/2008) event log enabled, RaiseError also writes error message to the Windows NT (NT/2000/XP/2003/VISTA/2008) application event log. The exact behavior of the RaiseError statement depends on the error mode set by any of the previously executed OnError statements.

See also:

LogAddMessageEx
Exit
OnErrorStop
OnErrorResumeNext
OnErrorGoTo

ForNext

Description: A control structure that is a numerical iteration, used to execute one or more statements a specified number of times.

Syntax: ForNext variable, start, end, step, label
statement-block
label:

Argument	Description
Variable	The name of the iteration counter variable having number data type.
Start	Starting value of variable. It can be a constant or name of another variable.
End	Ending value of variable. It can be a constant or name of another variable.
Step	The increment value. It can be a constant or name of another variable.
Label	An end loop label is an identifier followed by a colon (such as OK:). This label followed by a colon must be placed on a separate line. Do not use the colon with a label in the LoopWhile statement.

Usage:

- Using the start and end parameters: for a positive increment (step), end must be greater than start; for a negative increment, end must be less than start, otherwise it will lead to an infinite loops. When increment is positive and start is greater than end, *statement-block* does not execute. When increment is negative and start is less than end, *statement-block* does not execute.
- Use Break, GoTo of If statement to jump out of the loop structure. Note that Exit or Reboot statements will also interrupt the loop.
- Use Break statement to interrupt the loop and continue with the first statement that follows the loop end label.
- Use GoTo label inside loop structure (where the label is the same as the label referenced in ForNext) to jump to the end of the loop and continue looping. You can also use Continue statement for this purpose.

The JAL script engine does not perform iteration when program control is transferred into a loop structure from outside of it.
JAL script engine supports nested loops. A nested loop is a loop placed inside another loop.

- The label name must satisfy Universal Naming Convention (UNC).

Note:
When start and end are variables, they are reevaluated on each pass through the loop. So if the variable's value changes, it will affect the number of loops. Consider this example—the body of the loop changes the number of rows in the database buffer, which changes the result of the DatabaseRowCount statement:

```
...
DatabaseRowCount( row_count )
ForNext( n, 1, row_count, 1, END_LOOP )
    DatabaseDelete( 1 )
    Subtract( row_count, 1, row_count )
END_LOOP:
...
```

See also:

LoopUntil
LoopWhile
Break

Continue

GoTo

Description: Transfers control from this statement in a script to another statement or statement that is preceded by a label.

Syntax: GoTo label

Argument	Description
Label	The label associated with the statement or statement to which you want to transfer control. A label is an identifier followed by a colon (such as OK:). This label followed by a colon must be placed on a separate line. Do not use the colon with a label in the GoTo statement.

Usage: The label name must satisfy Universal Naming Convention (UNC).

See also:

IfThen
Exit
OnErrorGoTo
Break

If

Description: Evaluates a conditional Boolean variable and depending on its value transfers control to the statement following the specified labels.

Syntax:
If (boolean, truelabel, falselabel)
    statement-block
truelabel:
    statement-block
falselabel:
    statement-block

Argument	Description
Boolean	The boolean variable that evaluates to TRUE or FALSE. If the boolean variable evaluates to TRUE then control will be transferred to the statement going after truelabel, otherwise control will be transferred to the statement going after falselabel.
statement-block	The block of JAL statements you want JAL script engine to execute.
Truelabel	A truelabel is an identifier followed by a colon (such as

	OK:). This truelabel followed by a colon must be placed on a separate line
Falselabel	A falselabel is an identifier followed by a colon (such as OK:). This falselabel followed by a colon must be placed on a separate line.

Usage:
You can use If statements to branch program logic that depends on some conditions. The truelabel and falselabel names must satisfy Universal Naming Convention (UNC).

Notes:
- Instead of the boolean value you can specify numeric value. In case of numeric value, 0 (zero) always evaluates to FALSE, otherwise it evaluates to TRUE.

After executing block of JAL statements following truelabel JAL script engine executes section following falselabel unless you code some other Control-Of-Flow statement to transfer control beyond falselabel section.

See also:

IfThen

IfThen

Description: Evaluates a conditional Boolean variable and depending on its value transfers control to the next statement in script or the statement following the specified label.

Syntax:
IfThen (boolean, label)
    statement-block
label:

Argument	Description
boolean	The boolean variable that evaluates to TRUE or FALSE. If the boolean variable evaluates to FALSE then control will be transferred to the next statement going after IfThen, otherwise control will be transferred to the statement going after the label.
statement-block	The block of JAL statements you want JAL script engine to execute if the boolean value is False.
label	A label is an identifier followed by a colon (such as OK:). This label followed by a colon must be placed on a separate line.

Usage:
You can use If statements to branch program logic that depends on some conditions. The label name must satisfy Universal Naming Convention (UNC).

Note:
Instead of the boolean value you can specify numeric value. In case of numeric value, 0 (zero) always evaluates to FALSE, otherwise it evaluates to TRUE.

See also:

If

ChooseCase

Description: Evaluates a conditional variable and depending on its value transfers control to the appropriate "Case" section.

Syntax:
ChooseCase testvariable, label
Case valuelist1
    statement-block
[Case valuelist2]
    statement-block
[Case ...]
    statement-block
[CaseElse]
    statement-block
label:

Argument	Description
testvariable	The variable whose value is evaluated in the following Case sections.
Case	The keyword beginning the new Case section. You can define as many Case sections as needed.
valuelist	One of the following: • A single value • A list of values separated by commas (such as 2, 4, 6, 8)· • A single variable • A list of variables separated by commas (such as VAR1, VAR2, VAR5)· • Any combination of the above with an implied OR between items (such as 1, 3, VAR2, 7, 9, VAR5) Data types of values and variables in the list must match data type of the conditional testvariable
statement-block	The block of JAL statements you want JAL script engine to execute if the value of the testvariable matches the value in valuelist of the corresponding Case section.
CaseElse	The keyword beginning the CaseElse section to which control is transferred when the value of the testvariable does not match any of the valuelist
label	A label is an identifier followed by a colon (such as OK:). This label followed by a colon must be placed on a separate line.

Usage:
You can use ChooseCase statements to branch program logic that depends on some conditions. The label name must satisfy Universal Naming Convention (UNC).

At least one Case section is required. You must end the ChooseCase control structure with the label.
If the value of the testvariable at the beginning of the ChooseCase statement matches a value in valuelist for a Case section, the statements immediately following that Case section are executed. Control then passes to the first statement after the label.

If multiple Case section exist, then testvariable is compared to each valuelist until a match is found or the CaseElse section or label is encountered.

CaseElse section is optional. If there is a CaseElse section and the testvariable value does not match any of the valuelist, statemens in the CaseElse Section are executed. If no CaseElse section exists and a match is not found, the first statement after the label is executed.

Note:
Data type of the testvariable can be any of JAL standard data types. Data types of values and variables in the valuelist must match data type of the testvariable

See also:

If

IfThen

LoopWhile

Description: A control structure that is a general-purpose iteration statement used to execute a block of statements while a conditional Boolean variable evaluates to TRUE.

Syntax:
LoopWhile boolean, label
    statement-block
label:

Argument	Description
Boolean	The boolean variable that evaluates to TRUE or FALSE. If the boolean variable evaluates to TRUE then control will be transferred to the statement going after LoopWhile, otherwise control will be transferred to the statement or statement going after label.
Statement-block	The block of statements you want to repeat.
Label	An end loop label is an identifier followed by a colon (such as OK:). This label followed by a colon must be placed on a separate line.

Usage:
- You can use LoopWhile statements to branch program logic that depends on some conditions.
- Avoid infinite loops. Make sure to change the conditional Boolean variable so it evaluates to FALSE or use Break, GoTo of If statement to jump out of the loop structure. Note that Exit or Reboot statements will also interrupt the loop.
- Use Break statement to interrupt an endless loop and continue with the first statement that follows the loop end label.
- Use GoTo label inside loop structure (where the label is the same as the label referenced in LoopWhile) to jump to the end of the loop and continue looping. You can also use Continue statement for this purpose.

The JAL script engine does not perform iteration when program control is transferred into a loop structure from outside of it.
JAL script engine supports nested loops. A nested loop is a loop placed inside another loop.

- The label name must satisfy Universal Naming Convention (UNC).

Note:
Instead of the boolean value you can specify numeric value. In case of numeric value, 0 (zero) always evaluates to FALSE, otherwise it evaluates to TRUE.

See also:

LoopUntil
ForNext
Break
Continue

LoopUntil

Description: A control structure that is a general-purpose iteration statement used to execute a block of statements while a conditional Boolean variable does not evaluate to TRUE.

Syntax:
LoopUntil boolean, label
    statement-block
label:

Argument	Description
Boolean	The boolean variable that evaluates to TRUE or FALSE. If the boolean variable evaluates to FALSE then control will be transferred to the statement going after LoopUntil, otherwise control will be transferred to the statement or statement going after label.
Statement-block	The block of statements you want to repeat.
Label	An end loop label is an identifier followed by a colon (such as OK:). This label followed by a colon must be placed on a separate line.

Usage:

- You can use LoopUntil statements to branch program logic that depends on some conditions.
- Avoid infinite loops. Make sure to change the conditional Boolean variable so it evaluates to TRUE or use Break, GoTo of If statement to jump out of the loop structure. Note that Exit or Reboot statements will also interrupt the loop.
- Use Break statement to interrupt an endless loop and continue with the first statement that follows the loop end label.
- Use GoTo label inside loop structure (where the label is the same as the label referenced in LoopUntil) to jump to the end of the loop and continue looping. You can also use Continue statement for this purpose.

The JAL script engine does not perform iteration when program control is transferred into a loop structure from outside of it.
JAL script engine supports nested loops. A nested loop is a loop placed inside another loop.

Note:
Instead of the boolean value you can specify numeric value. In case of numeric value, 0 (zero) always evaluates to FALSE, otherwise it evaluates to TRUE.

See also:

LoopWhile
ForNext
Break
Continue

OnErrorGoTo

Description: Instructs JAL script engine in case of run-time script error to continue script execution with the statement immediately following the label specified in the OnErrorGoTo statement. This error handling behavior applies only to the portion of the script whose execution follows OnErrorGoTo statement.

Syntax: OnErrorGoTo label

Argument	Description
label	The label associated with the statement or statement to which you want to transfer control in case if a run-time error occurs. A label is an identifier followed by a colon (such as OK:). This label followed by a colon must be placed on a separate line. Do not use the colon with a label in the OnErrorGoTo statement.

Usage: The label name must satisfy Universal Naming Convention (UNC).

OnErrorGoTo statement overrides default error handling specified by the **Ignore Errors** job property. It also overrides error handling mode previously set using OnErrorStop and OnErrorResumeNext statements (if any of them were used).

 **Tip:** Use OnErrorGoTo statements to implement custom job error handling procedures. For example:

```
OnErrorGoTo label_1
    statement-block
OnErrorGoTo label_2
    statement-block
OnErrorGoTo label_3
    statement-block
Exit

label_1:
    statement-block
    Exit
label_2:
    statement-block
    Exit
label_3:
    statement-block
    Exit
```

See also:

RaiseError
OnErrorResumeNext
OnErrorStop
Exit

OnErrorResumeNext

Description: Instructs JAL script engine to ignore run-time script errors and continue script execution whenever a run-time error is detected. This error handling behavior applies only to the portion of the script whose execution follows OnErrorResumeNext statement. The code execution continues with the statement immediately following the statement that caused the run-time error.

Syntax: OnErrorResumeNext

Usage: This statement has no arguments. OnErrorResumeNext overrides default error handling specified by the **Ignore Errors** job property. It also overrides error handling mode previously set using OnErrorStop and OnErrorGoTo statements (if any of them were used).

See also:

RaiseError
OnErrorGoTo
OnErrorStop
Exit

OnErrorStop

Description: Instructs JAL script engine to stop the script and generate an error message whenever a run-time error is detected. This error handling behavior applies only to the portion of the script whose execution follows OnErrorStop statement.

Syntax: OnErrorStop

Usage: This statement has no arguments. OnErrorStop overrides default error handling specified by the **Ignore Errors** job property. It also overrides error handling mode previously set using OnErrorResumeNext and OnErrorGoTo statements (if any of them were used).

If you do not use OnErrorStop and other OnError statements in your code, the error handling is completely controlled by the **Ignore Errors** job property.

See also:

RaiseError
OnErrorGoTo
OnErrorResumeNext
Exit

GetLastError

Description: Returns calling job's last-error message.

Syntax: GetLastError message

Argument	Description
message	A string variable that receives the returned value.

Usage: The last-error is maintained on a per-job basis. Multiple jobs do not overwrite each other's last-error.

See also:

RaiseError
OnErrorGoTo
OnErrorResumeNext
OnErrorStop

Set

Description: Assigns new value to a variable.

Syntax: Set variable, value

Argument	Description
variable	The name of variable you want to change
value	The new value that will be assigned to the variable. The value data type must be the same as variable data type

Usage: The following data types are supported: String, Number, Boolean, Date, Time, DateTime

Bitwise statements

BitwiseAnd

Description: Performs a bitwise AND operation on each bit of two passed values.

Syntax: BitwiseAnd value1, value2, return

Argument	Description
value1	A first number whose value is used in the bitwise AND operation
value2	A second number whose value is used in the bitwise AND operation
return	A numeric variable that receives the returned value

Return value: Number. Returns the result of the AND operation on each of value1's and value2's bits.

Usage: In a bitwise AND operation:
1 AND 0 evaluates to 0
0 AND 0 evaluates to 0
0 AND 1 evaluates to 0
1 AND 1 evaluates to 1

See also:

Bitwise statements

BitwiseClearBit

Description: Clears the specified bit in a number.

Syntax: BitwiseClearBit value, bit, return

Argument	Description
value	A number whose value is used in the bitwise operation
bit	A number whose value is the bit number that you want to clear
return	A numeric variable that receives the returned value

Return value: Number. Returns the result of the bitwise operation.

Usage: If the specified bit is off (0), the returned value equals the original value.

See also:

Bitwise statements

BitwiseFlipBit

Description: Reverses the specified bit in a number.

Syntax: BitwiseFlipBit value, bit, return

Argument	Description
value	A number whose value is used in the bitwise operation
bit	A number whose value is the bit number that you want to flip
return	A numeric variable that receives the returned value

Return value: Number. Returns the result of the bitwise operation.

Usage: If the specified bit is off (0), BitwiseFlipBit sets the bit on (1), otherwise it clears the bit.

See also:

Bitwise statements

BitwiseGetBit

Description: Reports whether the specified bit is on (1) or off (0).

Syntax: BitwiseGetBit value, bit, return

Argument	Description
value	A number whose value is used in the bitwise operation
bit	A number whose value is the bit number that you want to test
return	A boolean variable that receives the returned value

Return value: Boolean. Returns TRUE if the bit is on (1) and FALSE if it is off (0).

See also:

Bitwise statements

BitwiseOr

Description: Performs a bitwise OR operation on each bit of two passed values.

Syntax: BitwiseOr value1, value2, return

Argument	Description
value1	A first number whose value is used in the bitwise OR operation
value2	A second number whose value is used in the bitwise OR operation
return	A numeric variable that receives the returned value

Return value: Number. Returns the result of the OR operation on each of value1's and value2's bits.

Usage: In a bitwise OR operation:
1 OR 0 evaluates to 1
0 OR 0 evaluates to 0
0 OR 1 evaluates to 1
1 OR 1 evaluates to 1

See also:

Bitwise statements

BitwiseNot

Description: Performs a bitwise NOT operation on each bit of a passed value.

Syntax: BitwiseNot value, return

Argument	Description
value	A number whose value is used in the bitwise NOT operation
return	A numeric variable that receives the returned value

Return value: Number. Returns the result of the bitwise NOT operation on each of value's bits.

Usage: In a bitwise NOT operation:
1 evaluates to 0
0 evaluates to 1

See also:

Bitwise statements

BitwiseSetBit

Description: Sets the specified bit on (1) in a number.

Syntax: BitwiseSetBit value, bit, return

Argument	Description
value	A number whose value is used in the bitwise operation
bit	A number whose value is the bit number that you want to set
return	A numeric variable that receives the returned value

Return value: Number. Returns the result of the bitwise operation.

Usage: If the specified bit is on (1), the returned value equals the original value.

See also:

Bitwise statements

BitwiseXor

Description: Performs a bitwise XOR operation on each bit of two passed values.

Syntax: BitwiseXor value1, value2, return

Argument	Description
value1	A first number whose value is used in the bitwise XOR operation
value2	A second number whose value is used in the bitwise XOR operation
return	A numeric variable that receives the returned value

Return value: Number. Returns the result of the XOR operation on each of value1's and value2's bits.

Usage: In a bitwise XOR operation:
1 XOR 0 evaluates to 1
0 XOR 0 evaluates to 0
0 XOR 1 evaluates to 1
1 XOR 1 evaluates to 0

See also:

Bitwise statements

Clipboard statements

ClipboardGet

Description: Obtains a copy of the text stored in the system clipboard.

Syntax: ClipboardGet return

Argument	Description
return	A string variable that receives the Clipboard data

Return value: String. Returns a copy of the text data stored in the system clipboard if it succeeds and the empty string ("") if an error occurs.

See also:

ClipboardSet

ClipboardSet

Description: Replaces a contents of the system clipboard with the specified text.

Syntax: ClipboardSet string

Argument	Description
string	The string you want to copy to the clipboard

Return value: None.

See also:

ClipboardGet

Database statements

DatabaseConnect

Description: Connects to a database using the specified profile.

Syntax: DatabaseConnect profile

Argument	Description
profile	A string whose value is the name of the profile defined in the 24x7 Preferences

Return value: None.

Usage: DatabaseConnect statement obtains from the profile all the required connection information for the database to which you want to connect. This statement must be executed before other database actions can be processed using the same profile. Only one database connection may be opened at a time. All other database statements executed after DatabaseConnect are sent to the database specified in the profile.

See also:

DatabaseDisconnect

Database Profiles

DatabaseConnectEx

Description: Connects to the database using the specified connection parameters.

Syntax: DatabaseConnectEx dbms, server_name, database_name, user_id, password, auto_commit

Argument	Description
DBMS	A string whose value is the type of the database management system that you want to connect to. This name must match any supported DBMS name as they are specified in the Database Profiles dialog (see Tools/Database Profiles menu)
server_name (Optional)	A string whose value is the database server name. The format for the name differs for different database systems. Specify an empty string "" if you connect to a local database and the server name is not required for connection. If you connect using ODBC (DBMS=ODBC) specify name of the desired ODBC profile as the server_name
database_name	A string whose value is name of the database. Specify

(Optional)	an empty string "" if the database name is not required for connection.
user_id	A string whose value is the name of the user to log on to the database
password	A string whose value is the password to use to log on to the database
auto_commit	A boolean whose value controls AutoCommit mode. Some databases support AutoCommit mode. Specify TRUE to turn AutoCommit on or specify FALSE otherwise. If DBMS does not support AutoCommit then this parameter is ignored.

Return value: None.

Usage: DatabaseConnectEx or DatabaseConnect statement must be executed before other database actions can be processed.

One job may have only one database connection open at a time. However, multiple jobs may have multiple database connections opened simultaneously.

All other database statements executed after DatabaseConnectEx are sent to the database connected in the same job.

 **Important Note:** In some databases AutoCommit is required in order to execute DDL statements and create temporary tables. For example, this is required in MS SQL Server and Sybase SQL Server.

See also:

DatabaseDisconnect

Database Profiles
DatabaseConnect

DatabaseCopy

Description: Copies the data from the primary database buffer to the system clipboard.

Syntax: DatabaseCopy return

Argument	Description
return	A numeric variable that receives the returned value

Return value: Number. Returns the number of rows copied to the clipboard.

Usage: DatabaseCopy uses tab characters to separate columns and carriage return (CR), linefeed (LF) pairs to separate rows. The copied data can be easily pasted into a spreadsheet program or into other Windows applications that supports data format described above..
The data you want to copy can be previously retrieved from the database using DatabaseRetrieve statement or pasted from the system clipboard using DatabasePaste statement.

See also:

DatabasePaste
Clipboard statements

DatabaseDelete

Description: Deletes a row from the database buffer.

Syntax: DatabaseDelete row

Argument	Description
row	A number identifying the row you want to delete

Return value: None.

Usage: The row is not deleted from the database table until you call the DatabaseUpdate statement. After the DatabaseUpdate statement has successfully updated the database, then the storage associated with the row is cleared.

See also:

DatabaseRetrieve
DatabaseRowCount
DatabaseSetFilter
DatabaseUpdate

DatabaseDescribe

Description: Describes result set definition in the database buffer.

Syntax: DatabaseDescribe return

Argument	Description
return	A string variable that receives the returned value

Return value: String. Returns current result set description.

Usage: This statement is provided for debugging purposes. The JAL script engine creates result set definition while executing DatabaseSetSQLSelect or DatabaseRetrieve statements. You can use MessageBox statement to display the returned result set definition.

See also:

MessageBox
DatabaseRetrieve
DatabaseSetSQLSelect

DatabaseDisconnect

Description: Disconnects from a database.

Syntax: DatabaseDisconnect

Return value: None.

Usage: DatabaseDisconnect statement has no arguments. This statement disconnects the JAL script engine from the database to which you previously connected using DatabaseConnect statement.

See also:

DatabaseConnect
Database Profiles

DatabaseExecute

Description: Execute a SQL statement that does not produce a result set.

Syntax: DatabaseExecute sql, return

Argument	Description
sql	A string whose value is a valid SQL command that you want to send to the database.
return	A numeric variable that receives the returned value

Return value: Number. Returns the number of rows affected, if applicable.

Usage:
Refer to your database documentation for the correct SQL syntax. DatabaseExecute sends the specified SQL as is. Before you execute a SQL, be sure you have active database connection. You use the DatabaseConnect statement to establish a database connection.

See also:

DatabaseRetrieve
DatabaseUpdate

DatabaseExport

Description: Exports data from the specified database table and in stores it in the specified file.

Syntax: DatabaseExport table, file, return

Argument	Description
table	A string whose value is the name of database table that you want to export
file	A string whose value is the name of the file into which you want to save exported data
return	A numeric variable that receives the returned value

Return value: Number. Returns the number of exported rows.

See also:

DatabaseRetrieve
DatabaseImport
DatabaseSave

DatabaseGet

Description: Obtains the current value of a cell in the primary database buffer.

Syntax: DatabaseGet row, column, return

Argument	Description
row	A number whose value is the row number for the cell whose value you want to get
column	A number whose value is the column number for the cell whose value you want to get
return	A string variable that receives the returned value

Return value: String. Returns the string representation of the data value at the row and column location. If the value is null, DatabaseGet returns the empty string ("").

See also:

DatabaseSet
DatabaseUpdate

DatabaseImport

Description: Imports data from the specified file and inserts it into the specified database table.

Syntax: DatabaseImport table, file, return

Argument	Description
table	A string whose value is the name of database table into which you want to import data
file	A string whose value is the name of the file that you want to import
return	A numeric variable that receives the returned value

Return value: Number. Returns the number of imported rows.

See also:

DatabaseRetrieve
DatabaseExport

DatabaseInsert

Description: Inserts an empty row into the database buffer.

Syntax: DatabaseInsert return

Argument	Description
return	A number identifying the inserted row. The row is always inserted at the end of the dataset.

Return value: Number. Returns the number of the new row.

Usage: A newly inserted row is not marked as modified until data is entered in the row. You can use the DatabaseSet statement to enter data in the newly inserted row. The new modified row is not inserted into the database table until you call the DatabaseUpdate statement. After the DatabaseUpdate statement has successfully updated the database, the row state changes to unmodified.

See also:

DatabaseRetrieve
DatabaseRowCount
DatabaseSet
DatabaseUpdate

DatabasePaste

Description: Pastes the data from the system clipboard to the primary database buffer.

Syntax: DatabasePaste return

Argument	Description
return	A numeric variable that receives the returned value

Return value: Number. Returns the number of rows pasted from the clipboard.

Usage: The clipboard data is expected in ASCII text format with tab characters separating columns and carriage return (CR), linefeed (LF) pairs separating rows. The result set definition must exist in the database buffer before pasting data. Number of columns and their data types defined in the database buffer must match data in the clipboard. You can use either DatabaseSetSQLSelect or DatabaseRetrieve statement to create result set definition in the database buffer. You may want to call DatabaseUpdate statement after pasting data to save new data in the database.

See also:

DatabaseCopy

Clipboard statements

DatabasePipe

Description: Copies data from the source database to the destination database as specified by the SQL query and update method.

Syntax: DatabasePipe source, destination, query, table, method, return

Argument	Description
source	A string whose value is the profile name of the source database
destination	A string whose value is the profile name of the destination database
query	A string whose value a valid SQL SELECT statement that is used to retrieve data from the source database
table	A string whose value is the name of database table in the destination database into which you want to copy data from the source database
method	A string constant whose value specifies how you want to update the destination table. Values are: • "INSERT" — Execute DELETE then INSERT SQL statements for each copied row • "UPDATE" — Execute UPDATE SQL statement for each copied row
return	A numeric variable that receives the returned value

Return value: Number. Returns the number of transferred rows.

Usage: Before the JAL script engine executes the pipeline, it connects to the source and destination databases. This does not affect active database connection if any. When the JAL script engine executes the pipeline, the piped data is committed every 100 rows. The data is also committed when the pipeline finishes. If a database error occurs, last not committed yet data portion is rolled back.

Caution:
Special considerations for the “UPDATE" method:

- For each row to be updated you should have at least one matching row in the destination table. Otherwise a database error will occur. The match is based on the primary key values.
- The primary key must be defined for the destination table. DatabasePipe uses primary key definition when constructing the UPDATE SQL statements.

Special considerations for the “INSERT" method:

- DatabasePipe generates and executes the DELETE SQL statement for each new row. Then it generates the INSERT SQL statements for each new row. This method allows avoiding duplicate records inserted in the destination table. However, if there is a foreign key of type “DELETE CASCADE" defined for the destination table, the database will enforce such referential integrity and will delete all referencing records from the child table(s).
- The primary key must be defined for the destination table. DatabasePipe uses primary key definition when constructing the DELETE SQL statements.

See also:

DatabaseRetrieve
DatabaseExport
DatabaseImport
DatabaseSave

DatabaseRetrieve

Description: Retrieves data from the database using the specified SQL query.

Syntax: DatabaseRetrieve query, return

Argument	Description
query	A string whose value a valid SQL SELECT statement that is used to retrieve data
return	A numeric variable that receives the number of rows retrieved

Return value: Number. Returns the number of retrieved rows.

Usage: After rows are retrieved, the database buffer’s filter and sort options are applied. Therefore, any retrieved rows that don't meet the filter criteria are not included in the returned data and number of rows. The retrieved data remains in the database buffer until new retrieval. A new call to the DatabaseFilter and/or DatabaseSort statements will affect data in the primary database buffer.
Before you retrieve rows, be sure you have active database connection. You use the DatabaseConnect statement to establish a database connection.

See also:

DatabaseExport
DatabaseConnect

DatabaseRowCount

Description: Obtains the number of rows that are currently available in the primary database buffer. If there is a filter set on the database buffer, the DatabaseRowCount statement checks only rows that have been left.

Syntax: DatabaseRowCount return

Argument	Description
return	A numeric variable that receives the number of rows retrieved

Return value: Number. Returns the number of rows that are currently available in the primary database buffer, 0 if no rows are currently available, and -1 if an error occurs.

Usage: The number of currently available rows equals the total number of rows retrieved plus any pasted rows minus any rows that have been filtered out.

See also:

DatabaseSetFilter

DatabaseSave

Description: Saves the contents of the primary database buffer as an external file in the specified format.

Syntax: DatabaseSave file, format, return

Argument	Description
file	A string whose value is the name of the file in which to save the contents. If you specify an empty string (""), the JAL script engine prompts for the file name
format	A string constant specifying the format in which to save the contents of the primary database buffer. Values are: "DBF" — dBASE-III format "DIF" — Data Interchange Format "XLS" — Microsoft Excel 5 format "HTML" or "HTM" — table in HTML format "SQL" — SQL syntax with CREATE TABLE statement following by INSERT statements "TXT" — Text format with tab-separated columns and return at the end of each row "CSV" — Text format with tab-separated columns and return at the end of each row "WKS" — Lotus 1-2-3 format
return	A numeric variable that receives the returned value

Return value: Number. Returns the number of rows saved in the specified file.

Usage: The number of rows currently available for saving equals the total number of rows retrieved plus any pasted rows minus any rows that have been filtered out. If you specify an empty string for the file name, the JAL script engine displays the Save Rows As dialog. Execution of the script will not continue until you either enter missing file name interactively or cancel the dialog.

See also:

DatabaseExport
DatabaseRetrieve
DatabaseSetFilter

DatabaseSet

Description: Changes the value of a cell in the primary database buffer to the specified value.

Syntax: DatabaseSet row, column, value

Argument	Description
row	A number whose value is the row number for the cell whose value you want to change
column	A number whose value is the column number for the cell whose value you want to change
value	A string whose value is the string representation of the new value to which you want to set the data at the row and column location

Return value: None.

Usage: The value is not changed in the database table until you call the DatabaseUpdate statement. DatabaseSet statement automatically converts the specified value to the appropriate data type that matches data type of the database table that you want to update.

See also:

DatabaseGet
DatabaseUpdate

DatabaseSetFilter

Description: Changes filter criteria for the database buffer. Rows that do not meet the filter criteria are moved to the filter buffer.

Syntax: DatabaseSetFilter filter, return

Argument	Description
filter	A string whose value is a boolean expression that you want to use as the filter criteria. The expression includes column names or numbers. A column number must be preceded by a pound sign (#).

Return value: None.

Usage: The database buffer can have filter criteria specified as part of its definition. After data is retrieved, rows that don't meet the criteria are immediately transferred from the primary database buffer to the filter buffer.
The DatabaseSetFilter statement replaces the filter criteria defined for the database buffer, if any, with a new set of criteria. The new filter is applied immediately.

The filter expression consists of columns, functions, operators, and values against which column values are compared. Boolean expressions can be connected with AND and OR logical operators. You can also use NOT, the negation operator. Use parentheses to control the order of evaluation.

Sample expressions are:

```
item_id > 5
NOT item_id = 5
(NOT item_id = 5) AND customer > "Mabson"
item_id > 5 AND customer = "Smith"
left(customer, 5) = "Smith"
#1 > 5 AND #2 = "Smith"
```

The filter expression is a string and does not contain variables. However, you can build the string at during execution using the values of variables in the script. Within the filter string, values that are strings must be enclosed in quotation marks (see the examples).
If the filter expression contains numbers, the database buffer expects the numbers in U.S. format. Be aware that when converting numbers to string the String statement formats numbers using the current system settings. If you use it to build the filter expression, use the Format statement to specify the desired format.

To remove a filter, call DatabaseSetFilter with the empty string (""). The rows in the filter buffer will be restored to the primary database buffer after the rows that were already in the primary buffer.

See also:

- DatabaseSetSort
- Operators in Filter and Sort Expressions
- Functions in Filter and Sort Expressions by Category

DatabaseSetSort

Description: Changes sort criteria for the database buffer.

Syntax: DatabaseSetSort sort, return

Argument	Description
sort	A string whose value is an expression that you want to use as the sort criteria. The expression includes column names or numbers. A column number must be preceded by a pound sign (#).

Return value: None.

Usage: The database buffer can have sort criteria specified as part of its definition. After data is retrieved, the JAL script engine performs immediate sorting according to the current sort criteria.
The DatabaseSetSort statement replaces the sort criteria defined for the database buffer, if any, with a new set of criteria. The new sort is applied immediately.

The sort expression may include columns and functions.

The sort criteria for a column has one of the forms shown in the following table, depending on whether you specify the column by name or number. Order is either A for ascending or D for descending order. You can specify secondary sorting by specifying criteria for additional columns in the format string. Separate each column specification with a comma.

Syntax for sort order	Examples
columnname order	"emp_lname A" "emp_lname A, dept_id D"
# columnnumber order	"#3 A"

In place of a column in the sort criteria you can use an expressions.

Sample expressions are:

"(item_id * 5) A"
if(status = 'A', current_rate, prev_rate * 01) A
left(#1, 5) = D, #3 A

The sort expression is a string and does not contain variables. However, you can build the string at during execution using the values of variables in the script. Within the sort string, values that are strings must be enclosed in quotation marks (see the examples).
If the sort expression contains numbers, the database buffer expects the numbers in U.S. format. Be aware that when converting numbers to string the String statement formats numbers using the current system settings. If you use it to build the filter expression, use the Format statement to specify the desired format.

To remove the database buffer sorting, call DatabaseSetSort with the empty string (""). However the empty string ("") does not restore original sort order made in the database at during retrieval of data.

See also:

DatabaseSetFilter
Operators in Filter and Sort Expressions
Functions in Filter and Sort Expressions by Category

DatabaseSetSQLSelect

Description: Specifies the new SQL SELECT statement for the database buffer. The result set definition in the database buffer is updated to match the new SQL.

Syntax: DatabaseSetSQLSelect sql

Argument	Description
sql	A string whose value is the new SQL SELECT statement that you want to use for the database operations

Return value: None.

Usage: The DatabaseSetSQLSelect statement destroys data in the database buffer, if any, then creates the new result set definition based on supplied SELECT statement. Any existing filter and sort criteria are also reset.

See also:

DatabaseRetrieve

DatabaseUpdate

Description: Updates the database with the changes made.

Syntax: DatabaseUpdate method, return

Argument	Description
method	A string constant whose value specifies how you want to update the destination table. Values are: • "INSERT" — Execute DELETE then INSERT SQL statements for each modified row • "UPDATE" — Execute UPDATE SQL statement for each modified row
return	A numeric variable that receives the returned value

Return value: Number. Returns the number of newly updated/inserted/deleted rows.

Usage: The DatabaseUpdate statement generates UPDATE, INSERT, and DELETE SQL statements for all new or changed rows in the database buffer including rows in the filter buffer, if any. The DatabaseUpdate always generates the INSERT SQL statement for all new rows. Depends on the specified update method, DatabaseUpdate determines for each modified row, whether the row can be updated in place or whether the row has to be deleted and reinserted. The database changes are committed after the last row is updated. If a database error occurs, all database changes are rolled back.

Caution:
Special considerations for the “UPDATE" method:

- When there are multiple rows modified in the database buffer and you have switched keys or rows, updating in place may fail due to DBMS duplicate restrictions.
- The primary key must be defined for the destination table. DatabaseUpdate uses primary key definition when constructing UPDATE SQL statements.

Special considerations for the “INSERT" method:

- DatabaseUpdate generates and executes the DELETE SQL statement for each row that needs to be updated. Then it generates the INSERT SQL statements that reinserts each modified row in the database. This method allows avoiding duplicate records inserted in the destination table. However, if there is a foreign key of type “DELETE CASCADE" defined for the destination table, the database will enforce such referential integrity and will delete all referencing records from the child table(s).
- The primary key must be defined for the destination table. DatabaseUpdate uses primary key definition when constructing DELETE SQL statements.

See also:

DatabaseRetrieve

DatabaseImport

DatabasePipe

DatabasePaste
DatabaseDelete

Date and time statements

AtomicTime

Description: Obtains time from the specified atomic time server and optionally sets the local system time to the obtained value.

Syntax: AtomicTime (server, set_local, result)

Argument	Description
server	A string containing a server name or IP address.
set_local	A boolean value that controls whether AtomicTime statement should automatically update system time on the computer where it is running
Result	A datetime variable that receives the returned value

Return value: DateTime. Returns atomic clock date and time.

Usage: AtomicTime statement utilizes standard time protocol called SNTP with UDP connections (RFC-1305). In theory it returns the exact time value which is accurate to 10ms or so. On practice the network traffic latency can slightly delay and thus affect the returned value.

There are many free atomic time servers connected to the Internet. You can use any server you like. For example you can use the following servers:

tick.usno.navy.mil
tmc.edu
time.nist.gov
utcnist.colorado.edu
time-nw.nist.gov
nist1.aol-ca.truetime.com
nist1.nyc.certifiedtime.com
nist1.sjc.certifiedtime.com
time-a.nist.gov
time-b.nist.gov
time-a.timefreq.bldrdoc.gov
time-b.timefreq.bldrdoc.gov
time-c.timefreq.bldrdoc.gov

You can use the AtomicTime statement to synchronize time on computer systems with precise time on atomic clock servers. You can also use the returned value to synchronize simultaneous jobs running on multiple computers.

Note:
In order to update the local system clock on Windows NT/2000/XP/2003/VISTA/2008 computers the JAL script engine must run under an administrator account.

See also:

HostTime statement
Today statement
Now statement
Timer statement

Date

Description: Converts a string whose value is a valid date to a value of data type date.

Syntax: Date (string, result)

Argument	Description
String	A string containing a valid date (such as Jan 1, 1998, or 12-31-99) that you want returned as a date
Result	A date variable that receives the returned value

Return value: Date. Returns the date in string as a date. If string does not contain a valid date, Date returns 1900-01-01.

Usage: The value of the string must be a valid date.

Note:
Valid dates in strings can include any combination of day (1 to 31), month (1 to 12 or the name or abbreviation of a month), and year (2 or 4 digits). JAL script engine assumes a 4-digit number is a year. Leading zeros are optional for month and day. The month, whether a name, an abbreviation, or a number, must be in the month location specified in the system setting for a date's format. If you do not know the system setting, use the standard data type date format "yyyy-mm-dd" .
A four-digit number is assumed to be a year. If the year is two digits, then JAL script engine chooses the century, as follows: If the year is between 00 and 49, program assumes 20 as the first two digits; if it is between 50 and 99, the JAL script engine assumes 19. If your data includes dates before 1950, such as birth dates, always specify a four-digit year so that the JAL script engine interprets the date as intended.

The JAL script engine handles years from 1000 to 3000 inclusive.

See also:

DateTime statement
MakeDate statement

DateTime

Description: Combines a date and a time value into a DateTime value.

Syntax: DateTime (date, time, result)

Argument	Description
date	A valid date (such as Jan 1, 1998, or 12-31-99) that you want included in the value returned by DateTime
time	A valid time (such as 8AM or 10:25:23) that you want included in the value returned by DateTime. If you include a time, only the hour portion is required. If you omit the minutes, or seconds, they are assumed to be 0s. If you omit AM or PM, the hour is determined according to the 24-hour clock
result	A datetime variable that receives the returned value

Return value: DateTime. Returns a DateTime value based on the values in date and time.

Usage: For information on valid dates, see Date statement.

DateAdd

Description: Obtains the date that occurs a specified number of days after or before another date.

Syntax: DateAdd (date, n, result)

Argument	Description
date	A date value
n	An number indicating the number of days
result	A date variable that receives the returned value

Return value: Date. Returns the date that occurs n days after date if n is greater than 0. Returns the date that occurs n days before date if n is less than 0.

See also:

TimeAdd

DateTimeAdd

DateDiff

Description: Determines the number of days between two specified dates..

Syntax: DateDiff (date1, date2, result)

Argument	Description
date1	A date value that is the start date of the interval being

	measured
date2	A date value that is the end date of the interval
result	A numeric variable that receives the returned value

Return value: Number. Returns the number of days date2 occurs after date1. If date2 occurs before date1, DaysDiff returns a negative number.

See also:

DateTimeDiff
TimeDiff

DateTimeAdd

Description: Obtains the time that occurs a specified number of seconds after or before another time.

Syntax: DateTimeAdd (datetime, n, result)

Argument	Description
datetime	A datetime value
n	A long number of seconds
result	A datetime variable that receives the returned value

Return value: DateTime. Returns the time that occurs n seconds after datetime if n is greater than 0. Returns the time that occurs n seconds before datetime if n is less than 0.

See also:

TimeAdd
DateAdd

DateTimeDiff

Description: Determines the number of seconds one time occurs after another.

Syntax: DateTimeDiff (datetime1, datetime2, result)

Argument	Description
datetime1	A datetime value that is the start time of the interval being measured
datetime2	A datetime value that is the end time of the interval

result	A numeric variable that receives the returned value

Return value: Number. Returns the number of seconds datetime2 occurs after datetime1. If datetime2 occurs before datetime1, TimeDiff returns a negative number.

See also:

DateDiff

TimeDiff

DateTimePart

Description: Extracts the number containing the specified part of a given datetime, date, or string value.

Syntax: DateTimePart (datetime, part, result)

Argument	Description
datetime	A datetime (optionally date or string) value from which you want to extract specified interval of time
part	A string value that specifies the interval of time you want to return
result	A numeric variable that receives the returned value

Return value: Number. Returns the interval of time extracted from datetime value.

Settings: The interval argument has these settings:

Setting	Description
dd	day of month
dw	day of week
mm	Month
yy	Year
hh	Hour
mi	Minute
ss	Second
qq	Quarter

DayName

Description: Determines the day of the week in a date value and returns the weekday's name.

Syntax: DayName (date, result)

Argument	Description
date	The date for which you want the name of the day
result	A string variable that receives the returned value

Return value: String. Returns a string whose value is the name of the weekday (Sunday, Monday, and so on) for date.

See also:
DayName
Macro-parameters

DayNumber

Description: Determines the day of the week of a date value and returns the number of the weekday.

Syntax: DayNumber (date, result)

Argument	Description
date	The date from which you want the number of the day of the week
result	A numeric variable that receives the returned value

Return value: Number. Returns an integer (1-7) representing the day of the week of date. Sunday is day 1, Monday is day 2, and so on.

See also:
DayNumber
Macro-parameters

HostTime

Description: Obtains time from the specified network computer.

Syntax: HostTime (host, result)

Argument	Description
host	A string containing a computer name or IP address.
Result	A datetime variable that receives the returned value

Return value: DateTime. Returns time on the remote computer. The result is returned as it is reported by the remote computer without adjusting to the local time zone.

Usage: HostTime statement utilizes standard TCP time service on port 13. Frequently this service is called as Daytime Protocol (RFC-867). The remote computer must listen on port 13, and respond to requests in either TCP/IP or UDP/IP formats. The standard does not specify an exact format for the Daytime Protocol, but requires that the time is sent using standard ASCII characters. Different computer systems use different time formats for returned values. The HostTime is capable to recognize and properly parse 2 most commonly used formats:

- JJJJJ YY-MM-DD HH:MM:SS TT
- DDD MMM DD HH:MM:SS YYYY

You can use the HostTime statement to synchronize simultaneous processing on multiple computers.
You can also use it to find out local times on remote computers located in different time zones.

Before you use the HostTime statement make sure that the remote computer listens on port 13 and also that it reports time in one of the 2 formats described above. Most UNIX servers by default provide support Daytime Protocol. On Windows 2000 and XP the Daytime service by default is not enabled. You can use the Services applet in the Windows Control Panel to enable and start this service.

See also:

AtomicTime statement
Today statement
Now statement
Timer statement

MakeDate

Description: Combines numbers representing the year, month, and day into a date value.

Syntax: MakeDate (year, month, day, result)

Argument	Description
year	The 4-digit year (1000 to 3000) of the date
month	The 1- or 2-digit number for the month (1 to 12) of the year
day	The 1- or 2-digit number for the day (1 to 31) of the month
result	A date variable that receives the returned value

Return value: Date. Returns the date specified by the numbers for year, month, and day as a date data type. If any value is invalid (out of the range of values for dates), MakeDate returns 1900-01-01.

MakeDateTime

Description: Combines numbers representing the year, month, day, hour, minute, and second into a datetime value.

Syntax: MakeDateTime (year, month, day, hour, minute, second, result)

Argument	Description
year	The 4-digit year (1000 to 3000) of the date
month	The 1- or 2-digit number for the month (1 to 12) of the year
day	The 1- or 2-digit number for the day (1 to 31) of the month
hour	The number for the hour (00 to 23) of the time
minute	The number for the minutes (00 to 59) of the time
second	The number for the seconds (0 to 59) of the time
result	A datetime variable that receives the returned value

Return value: DateTime. Returns the datetime value based on the values in year, month, day, hour, minute, and second arguments.

MakeTime

Description: Combines numbers representing hours, minutes, and seconds into a time value.

Syntax: MakeTime (hour, minute, second, result)

Argument	Description
hour	The number for the hour (00 to 23) of the time
minute	The number for the minutes (00 to 59) of the time
second	The number for the seconds (0 to 59) of the time
result	A time variable that receives the returned value

Return value: Time. Returns the time as a time data type and 00:00:00 if the value in any argument is not valid (out of the specified range of values).

Now

Description: Obtains the system time

Syntax: Now (result)

Argument	Description
result	A time variable that receives the returned value

Return value: Time. Returns the current system time.

See also:
Today
Timer
Macro-parameters

Timer

Description: Reports the amount of CPU time that has elapsed since specified starttime.

Syntax: Timer starttime, result

Argument	Description
starttime	A number whose value is start of the time interval expressed in milliseconds
result	A number variable that receives the returned value.

Return value: Number. Returns number of milliseconds elapsed since starttime. If you specify 0 for starttime the Timer statement returns number of milliseconds elapsed since JAL script engine startup.

See also:
Today
Now
Macro-parameters

Time

Description: Converts a string to a time data type.

Syntax: Time (string, result)

Argument	Description
string	A string containing a valid time (such as 8AM or 10:25) that you want returned as a time data type. Only the hour is required; you do not have to include the minutes, or seconds of the time or AM or PM. The default value for minutes and seconds is 00 . AM or PM is determined automatically
result	A time variable that receives the returned value

Return value: Time. Returns the time in string as a time data type. If string does not contain a valid time, Time returns 00:00:00.

TimeAdd

Description: Obtains the time that occurs a specified number of seconds after or before another time.

Syntax: TimeAdd (time, n, result)

Argument	Description
time	A time value
n	A long number of seconds
result	A time variable that receives the returned value

Return value: Time. Returns the time that occurs n seconds after time if n is greater than 0. Returns the time that occurs n seconds before time if n is less than 0. The maximum return value is 23:59:59.

See also:

DateAdd
DateTimeAdd

TimeDiff

Description: Determines the number of seconds one time occurs after another.

Syntax: TimeDiff (time1, time2, result)

Argument	Description
time1	A time value that is the start time of the interval being measured

time2	A time value that is the end time of the interval
result	A numeric variable that receives the returned value

Return value: Number. Returns the number of seconds time2 occurs after time1. If time2 occurs before time1, TimeDiff returns a negative number.

See also:

DateTimeDiff

DateDiff

Today

Description: Obtains the system date.

Syntax: Today (result)

Argument	Description
result	A date variable that receives the returned value

Return value: Date. Returns the current system date.

See also:

Now

Macro-parameters

DDE statements

DDEClose

Description: Closes a channel to a DDE server application that was opened by calling the DDEOpen statement.

Syntax: DDEClose channel

Argument	Description
channel	A number whose value is the channel number previously returned by the DDEOpen statement that started the DDE conversation

Return value: None.

Usage: Use DDEClose to close a channel to a DDE server application that was opened by calling the DDEOpen statement .

Important notes: DDE statements are not supported in **asynchronous** jobs and **remote** jobs running on the 24x7 Remote Agents. DDE statements are supported in **synchronous** jobs and **asynchronous detached** jobs.

See also:

DDEOpen

DDEExecute

Description: Asks a DDE server application to execute the specified command.

Syntax: DDEExecute channel, command

Argument	Description
channel	A number whose value is the channel number previously returned by the DDEOpen statement that started the DDE conversation
command	A string whose value is the command you want a DDE server application to execute. The format of the command depends on the DDE application you want to execute the command

Return value: None.

Usage: The DDE server application must already be running when you call a DDE statement. Use the Run statement to start the application if necessary. Before using this statement, call DDEOpen to establish a DDE channel.

Important notes: DDE statements are not supported in **asynchronous** jobs and **remote** jobs running on the 24x7 Remote Agents. DDE statements are supported in **synchronous** jobs and **asynchronous detached** jobs.

See also:

DDEOpen

DDEGetData

Description: Asks a DDE server application to provide data and stores that data in the specified variable.

Syntax: DDEGetData channel, location, return

Argument	Description
channel	A number whose value is the channel number previously returned by the DDEOpen statement that started the DDE conversation
location	A string whose value is the location of the data you want returned. The format of the location depends on the DDE application that will receive the request
return	A string variable that receives the returned value

Return value: String.

Usage: The DDE server application must already be running when you call a DDE statement. Use the Run statement to start the application if necessary. Before using this statement, call DDEOpen to establish a DDE channel.

 **Important notes:** DDE statements are not supported in **asynchronous** jobs and **remote** jobs running on the 24x7 Remote Agents. DDE statements are supported in **synchronous** jobs and **asynchronous detached** jobs.

See also:

DDEOpen

DDEOpen

Description: Opens a channel to a DDE server application.

Syntax: DDEOpen application, topic, return

Argument	Description
application	A string specifying the DDE name of the DDE server application
topic	A string identifying the data or the instance of the application you want to use (for example, in Microsoft Excel, the topic name could be System or the name of an open spreadsheet)
return	A numeric variable that receives the returned value

Return value: Number. Returns the handle to the channel if it succeeds. If an error occurs, DDEOpen returns a negative number.

Usage: The DDE server application must already be running when you call a DDE statement. Use the Run statement to start the application if necessary.

 **Important notes:** DDE statements are not supported in **asynchronous** jobs and **remote** jobs running on the 24x7 Remote Agents. DDE statements are supported in **synchronous** jobs and **asynchronous detached** jobs.

See also:

DDEClose

DDESetData

Description: Asks a DDE server application to accept data and store it in the specified location.

Syntax: DDESetData channel, location, data

Argument	Description
channel	A number whose value is the channel number previously returned by the DDEOpen statement that started the DDE conversation
location	A string whose value is the location of the data you want returned. The format of the location depends on the DDE application that will receive the request
data	A string whose value you want to send to the DDE server application

Return value: None.

Usage: The DDE server application must already be running when you call a DDE statement. Use the Run statement to start the application if necessary. Before using this statement, call DDEOpen to establish a DDE channel.

Important notes: DDE statements are not supported in **asynchronous** jobs and **remote** jobs running on the 24x7 Remote Agents. DDE statements are supported in **synchronous** jobs and **asynchronous detached** jobs.

See also:

DDEOpen

Email, Page, and Network statements

MailConfig

Description: Overrides global email settings and setting various parameters for subsequent Mail operations in the current job.

Syntax: MailConfig property, new_value

Argument	Description
Property	A string whose value is the name of the property for the FTP session that you want to change. The following properties are supported:

	• "MAIL INTERFACE" • "PORT" • "SERVER" • "ENCODING" • "FORMAT"
New_value	A string whose value is the new value for the property that you want to change. The following values are supported for the "MAIL INTERFACE" property: • "MAPI" • "SMTP" • "Lotus Notes" The default value is "MAPI". The specified "MAIL INTERFACE" is used for all subsequent Mail commands executed in the same job. The "PORT" parameter is applicable tto SMTP interface only and ignore for all other mail interfaces. Use the "PORT" parameter, to specify which SMTP port your want to use for all subsequent Mail commands executed in the same job. This setting applies to all statements that begin with Mail prefix: **MailSend** and **MailSendWithAttachment** statements. If you do not change this property, the default SMTP port is used for Mail operations. The following values are supported for the "ENCODING" property: • "none" • "mime" • "base64" • "uuencode" The default value is "none". Use this property, to specify SMTP message encoding format for all subsequent Mail commands executed in the same job. This property is used only when using SMTP mail interface. The following values could be specified for the "FORMAT" property: • "text/plain" • "text/html" • "text/xml" • Any other valid message format that the email recipient's program can recognize The default value is "text/plain". Use this property, to specify SMTP message format for all subsequent Mail commands executed in the same job. This property is used only when using SMTP mail interface. command and this feature must not be disabled.

Return value: None.

Usage: This statement should be primarily used in standalone command line JAL scripts. JAL commands executed within script type jobs should use global parameters set for the 24x7 Scheduler.

See also:

MailSend
MailSendWithAttachment

MailSend

Description: Establishes a new mail session and sends the specified mail message. If the message information is incomplete, the mail system displays a dialog box that you use to enter missing information.

Syntax: MailSend profile, password, recipient, subject, message

Argument	Description
profile	The profile value depends on the email system interface that you have selected in the JAL script engine Options. MAPI: a string whose value is the profile name to use when starting a new MAPI session Lotus Notes: a string whose value is the user name to use when logging to Lotus Notes SMTP: a string whose value is the valid sender's email address
password	A string whose value is the user's mail system password
recipient	A string variable whose value is the name of the recipient for the message.
subject	A string variable whose value is the subject line, displayed in the message header
message	A string variable whose value is the content of the message body

Return value: None.

Usage: If one or more message parameters are missing or incorrect, the mail system displays a dialog box. Execution of the script will not continue until you either enter missing information interactively or cancel the dialog. You can specify multiple recipients in one message. Use comma (,) to separate recipient names.

See also:

MailSendWithAttachment
PageSend
NetworkSend

MailSendWithAttachment

Description: Establishes a new mail session and sends a mail message. If no message information is supplied, the mail system provides a dialog box for entering it before sending the message. An additional file can attached to the message.

Syntax: MailSendWithAttachment profile, password, recipient, subject, message, file

Argument	Description
profile	The profile value depends on the email system interface that you have selected in the JAL script engine Options. MAPI: a string whose value is the profile name to use when starting a new MAPI session Lotus Notes: a string whose value is the user name to use when logging to Lotus Notes SMTP: a string whose value is the valid sender's email address
password	A string whose value is the user's mail system password
recipient	A string variable whose value is the name of the recipient for the message.
subject	A string variable whose value is the subject line, displayed in the message header
message	A string variable whose value is the content of the message body
file	A string variable whose value is the full file name of the file you want to attach

Return value: None.

Usage: If one or more message parameters are missing or incorrect, the mail system displays a dialog box. Execution of the script will not continue until you either enter missing information interactively or cancel the dialog.
You can specify multiple recipients in one message. Use comma (,) to separate recipient names.
You can also specify multiple attachments in one message. Use comma (,) to separate attachment file names.

See also:

MailSend

PageSend

Description: Sends pager message using SNPP protocol (RFC 1861).

Syntax: PageSend pager, message

Argument	Description
pager	A string variable whose value is the recipient's pager number in the format required by your carrier.
message	A string variable whose value is the message to be sent

Return value: None.

Usage: PageSend transmits the message using SNPP server specified in **System Options**
You can specify multiple page recipients in one message. Use comma (,) to separate pager numbers.

The maximum size of the message is usually limited to about 100 characters. Contact your carrier to find out the exact limit.

See also:

MailSend
NetworkSend

NetworkSend

Description: Sends network message to a network user or computer.

Syntax: NetworkSend recipient, message

Argument	Description
recipient	A string variable whose value is the name of a network user or network computer in domain\user or domain\computer format, for example, NSNTSVR\Administrator
message	A string variable whose value is the message to be sent

Return value: None.

Usage: You can specify multiple page recipients in one message. Use comma (,) to separate recipient names.

NetworkSend transmits the message just like the Windows NT NET SEND command. However it does not support real message broadcasting. Each message recipient must be specified separately or as part of the recipient list.

In order to receive the message each recipient must be running the Windows NT Messenger service, which is usually installed and enabled by default. No error occurs if the recipient of the message is specified correctly but the messenger service or destination computer is not running.

The message is displayed on the recipient's computer in a modal system message box.

Important Note:
NetworkSend is not supported on Windows 95/98/Me systems

See also:

MailSend
PageSend

File statements

CD

Description: Changes the current directory for the current process.

Syntax: CD dir

Argument	Description
dir	A string that is the directory you want to set as current directory.

Usage: The dir specifies the path to the new current directory. This parameter may be a relative path or a fully qualified path. In either case, the fully qualified path of the specified directory is calculated and stored as the current directory. This new setting will affect all file operations that do not specify full paths to the referenced files.

Notes:
Each process has a single current directory made up of two parts:

- A disk designator that is either a drive letter followed by a colon, or a server name and share name (\\servername\sharename)
- A directory on the disk designator
- **Changing current directory may affect other already running jobs.**

Dir

Description: Returns comma-separated list of files in the specified directory.

Syntax: Dir file_mask, return

Argument	Description
File_mask	A string whose value is the DOS file mask that you want to use to list file. File_mask can contain wildcard characters (* and ?). File_mask can contain full or partial file path.
Return	A string variable that receives the returned value.

Return value: String. Returns comma-separated list of files.

Usage: The Dir statement is equivalent to DOS *dir* command.
To get the list of all files use *.* file mask. If you don't include file path to the file_mask then Dir statement returns files from the current working directory.

See also:
DirEx
CD
FileSearchEx
FileFindFirst
FTPDir
RemoteDir

DirEx

Description: Returns comma-separated list of files in the specified directory.

Syntax: Dir file_mask, return

Argument	Description
File_mask	A string whose value is the DOS file mask that you want to use to list file. File_mask can contain wildcard characters (* and ?). File_mask can contain full or partial file path.
Return	A string variable that receives the returned value.

Return value: String. Returns comma-separated list of full file names.

Usage: The DirEx statement is similar to the Dir statement. The only difference is that it returns list of full file names including file path while the Dir statement returns list of file names without path. For more information see the topic for the Dir statement.
To get the list of all files use *.* file mask. If you don't include file path to the file_mask then DirEx statement returns files from the current working directory.

See also:
Dir
CD
FileSearchEx
FileFindFirst
FTPDir
RemoteDir

SubDir

Description: Returns comma-separated list of subdirectories in the specified directory.

Syntax: SubDir path, return

Argument	Description
path	A string whose value is the file path where you want to search for subdirectories.
Return	A string variable that receives the returned value.

Return value: String. Returns comma-separated list of subdirectory names.

Usage: The SubDir statement is similar to the Dir statement. The only difference is that it returns list of subdirectory names while the Dir statement returns complete list of all file and subdirectory names that match the specified criteria.

See also:

Dir
CD
FileSearchEx
FileFindFirst
FTPDir
RemoteDir

DirCreate

Description: Creates a new directory.

Syntax: DirCreate path

Argument	Description
path	A string whose value is either absolute or relative path of the directory to be created

Return value: None

Usage: DirCreate statement can recursively create all missing subdirectories referenced in the path. For example, if DirCreate is called with *C:\subdir1\subdir2\subdi3* parameter and subdirectories *subdir2* and *subdir3* do not exist DirCreate will create both of them.

See also:

DirDelete
isDir
CD

DirDelete

Description: Deletes an existing directory and all files in it. If that directory contains subdirectories, JAL script engine deletes subdirectories recursively.

Syntax: DirDelete dir

Argument	Description
dir	A string whose value is the name of the directory you want delete

Return value: None

See also:

- isDir
- FileDelete
- FileDeleteEx
- DirCreate

DirEx

Description: Returns comma-separated list of files in the specified directory.

Syntax: DirEx file_mask, return

Argument	Description
File_mask	A string whose value is the DOS file mask that you want to use to list file. File_mask can contain wildcard characters (* and ?). File_mask can contain full or partial file path.
Return	A string variable that receives the returned value.

Return value: String. Returns comma-separated list of full file names.

Usage: The DirEx statement is similar to the Dir statement. The only difference is that it returns list of full file names including file path while the Dir statement returns list of file names without path. For more information see the topic for the Dirstatement.
To get the list of all files use *.* file mask. If you don't include file path to the file_mask then DirEx statement returns files from the DOS current directory.

See also:

- Dir
- CD

FileSearchEx
FileFindFirst
FTPDir
RemoteDir

DirExists

Description: Tests whether the specified directory exists.

Syntax: DirExists dir, status

Argument	Description
Dir	A string whose value is the name of directory that you want to test.
Status	A boolean variable that receives the returned status value.

Return value: Boolean. Returns True if the directory exists directory and False otherwise. DirExists statement also returns False if dir is an invalid name or an empty string.

See also:

DirDelete
Dir
CD
isDir

DirRename

Description: Renames an existing directory.

Syntax: DirRename oldname, newname

Argument	Description
oldname	A string whose value is the name of existing directory that want to rename
newname	A string variable whose value is the new directory name

Return value: None

Usage: If the newname directory already exists, the statement fails. This statement is provided as a synonym for FileRename

See also:

FileRename

FileMove

DirWaitForUpdate

Description: Suspends job execution and then enters an efficient wait state until either a change occurs in the monitored directory or the statement times out.

Syntax: DirWaitForUpdate dir, timeout, return_status

Argument	Description
dir	A string whose value is the full name of the directory that you want to monitor.
timeout	A number whose value is the maximum time interval within which you expect a new change to occur in the specified dir. Use 0 timeout to allow infinite waiting.
return_status	A boolean variable that receives the returned status value.

Return value: Boolean. If the DirWaitForUpdate statement succeeds, the return_status is True, otherwise the return_status value is False. Make sure to specify a valid directory name. Invalid names will cause the statement to return False.

See also:

Dir

Wait

FileTime

FileSize

EOF

Description: Checks whether the end of a file (EOF) opened for read operation has been reached.

Syntax: EOF filenum, return

Argument	Description
Filenum	The file number previously returned by FileOpen statement
return	A boolean variable that receives the returned value

Return value: Boolean. Returns TRUE when the end of a file has been reached. The EOF statement returns FALSE until the end of the file has been reached.

Usage: Use EOF to avoid the error generated by attempting to read past the end of a file. With files opened for write operations, EOF always returns TRUE.

See also:

FileOpen
FileSetPos
FileGetPos
FileSize

FileAppend

Description: Copies an existing file and appends to the end of another file. In other words it concatenates 2 files.

Syntax: FileAppend source, destination

Argument	Description
source	A string whose value is the name of an existing file you want to copy
destination	A string whose value is the name of an existing or a new file to which you want to append the contents of the source file.

Return value: None

Usage: If the destination file already exists, the statement appends contents of the source file to the end of the destination file; otherwise the FileAppend statement creates the new destination file. In the latest case the result is identical to the result that would be produced by the **FileCopy** statement.

See also:

FileCopy
FileMove
FileTransfer

FileExists

Description: Reports whether the specified file exists.

Syntax: FileExists file, return

Argument	Description
file	A string whose value is the name of a file
return	A boolean variable that receives the returned value

Return value: Boolean. Returns TRUE if the file exists, FALSE if it does not exist.

Usage: If file is locked by another application, causing a sharing violation, FileExists also returns FALSE. File name may include wildcard characters (* and ?).

See also:

NotFileExists

FileCreateTemp

Description: Creates an empty temporary file in the default TEMP directory. The name of the file is guaranteed to be unique.

Syntax: FileCreateTemp return

Argument	Description
return	A string variable that receives the returned value

Return value: String. Returns name of the created temporary file.

Usage: Use FileCreateTemp to create and work with temporary files. After you done with the file processing you should delete the created file using **FileDelete** statement. Repeated failure to delete the file will lead to continues wasting of disk space and potentially slowing down overall system performance after a significant number of files get created and not deleted.

See also:

FileOpen
FileWrite
FileSave
FileDelete

FileClose

Description: Closes the file associated with the specified file number. The file number was assigned to the file with the FileOpen statement.

Syntax: FileClose filenum

Argument	Description
filenum	The number assigned to the file you want to close. The FileOpen statements returns the file number when it opens the file

Return value: None

See also:

FileOpen

FileCompare

Description: Compares contents of two text files, writes differences to the specified output file and then returns number of found differences.

Syntax: FileCompare file1, file2, output_file, new_lines1, new_lines2

Argument	Description
file1	A string whose value is the name of the first file
file2	A string whose value is the name of the second file
output_file	A string whose value is the name of the output file which will contain the result of comparision. The output file format is described below.
New_lines1	A numeric variable that receives the returned value for the first file
New_lines2	A numeric variable that receives the returned value for the second file.

Return value: After comparision, the new_lines1 variable containes number of lines that were found in the first file, but not found in the seconf file. The new_lines2 variable containes number of lines that were found in the second file, but not found in the first file. The complete result of file comparion is written to the output_file file.

The output_file file format:
Every line in the output file begins with a 3-character tag following by the original line text.

Tag	Meaning
' ' (3 spaces)	The identical line is found both files
'<! '	The line is found in the first file only
'>! '	The line found in the second file only
'-> ' line1:line2	The line is found in both files, but in different places. The line1 value is the number of the original line in the first file and line2 value is the number of the original line in the second file.
'<- ' line1:line2	The line is found both files, but in different places. The line1 value is the number of the original line in the first file and line2 value is the number of the original line in the second file.

Notes:

- new_lines1 and new_lines2 are for describe only number of new lines. The compared files can be still different even if both new_lines1 and new_lines2 are equal to 0.
- Don't use FileCompare statement if you only want to compare files without finding all differences. Instead use FileReadAll statement to read the entire first file into a string variable, and then read the entire second file into another variable and then use isEqual statement to compare contents of these variables. The isEqual statement will return either TRUE or FALSE to indicate the difference without going to details.
- The main result of work of the FileCompare statement is the output file whose contens is similar to the results of the UNIX diff command. Diifferences can be easily extracted from the output file using available JAL statements.

See also:

FileReadAll
FileSearchEx
FileReplaceEx
isEqual

FileCopy

Description: Copies an existing file to a new file.

Syntax: FileCopy source, destination

Argument	Description
source	A string whose value is the name of an existing file you want to copy
destination	A string whose value is the name of a new file to which you want to copy the source file

Return value: None

Usage: If the destination file already exists, the statement overwrites the existing file.

See also:

FileCopyEx
FileAppend
FileMove
FileTransfer

FileCopyEx

Description: Copies existing files to a new location.

Syntax: FileCopyEx source, destination, return

Argument	Description
source	A string whose value is the file mask describing existing files that you want to copy. Source file mask can contain wildcard characters (* and ?).
destination	A string whose value is the directory name to which you want to copy the source files.
return	A numeric variable that receives the returned value.

Return value: Number of files copied. If no files were found to satisfy source file mask, the return value is 0.

Usage: If any of the source files already exists in the destination, the statement overwrites the existing file.

See also:

- FileCopy
- FileAppend
- FileMoveEx
- FileTransfer

FileTransfer

Description: Copies an existing file from the local drive to a new file on the remote computer.

Syntax: FileTransfer host, source, destination

Argument	Description
host	A string whose value is the name of a Remote Agent that is running on the host computer
source	A string whose value is the name of an existing file you want to transfer to the host computer
destination	A string whose value is the name of a new file which you want to create on the host computer as a copy of the source file

Return value: None

Usage: If the destination file already exists, the statement overwrites the existing file. The host name must match the name of an existing Remote Agent profile on the computer initiating the transfer. The transfer time might be lengthily for large files and slow networks. To reduce network traffic and transmission time JAL script engine compresses source file before sending it to the host. The Remote Agent decompresses received data and stores them in the destination file.

Tips:

- You can transfer multiple files at once. Use comma to separate multiple files in both source and destination parameters. Make sure to specify matching number of files for the source and destination parameters. Sending multiple files in one FileTransfer batch is faster then sending source files one by one using multiple FileTransfer statements.
- You must have sufficient free disk space on both sending and host computers for the temporary files used in compression/decompressions routines.

See also:

FileMove
FileCopy

FileMove

Description: Moves an existing file to a new file.

Syntax: FileMove source, destination

Argument	Description
source	A string whose value is the name of an existing file you want to move
destination	A string whose value is the name of a new file to which you want to move the source file

Return value: None

Usage: If the destination file already exists, the statement overwrites the existing file. FileMove first checks the destination file and deletes it when this file exists. Then FileMove copies the source file to the new file. If the copy operation succeeds, FileMove deletes the source file.

See also:

FileCopy
FileMoveEx

FileMoveEx

Description: Moves existing files to a new location.

Syntax: FileMoveEx source, destination, return

Argument	Description
source	A string whose value is the file mask describing existing files that you want to move. Source file mask can contain wildcard characters (* and ?).
destination	A string whose value is the directory name to which you want to move the source files.
return	A numeric variable that receives the returned value.

Return value: Number of files moved. If no files were found to satisfy source file mask, the return value is 0.

Usage: If any of the source files already exists in the destination, the statement overwrites the existing file.

See also:

FileMove
FileCopyEx
FileTransfer

FileDate

Description: Reports the date that a file was last modified.

Syntax: FileDate file, return

Argument	Description
file	A string whose value is the name of a file
return	A date variable that receives the returned value

Return value: Date. Returns the date that a file was last modified..

See also:

FileTime
MakeDateTime

FileTime

Description: Reports the time that a file was last modified.

Syntax: FileTime file, return

Argument	Description
file	A string whose value is the name of a file
return	A time variable that receives the returned value

Return value: Time. Returns the time that a file was last modified.

See also:

FileDate
MakeDateTime

FileDelete

Description: Deletes the specified file.

Syntax: FileDelete file

Argument	Description
file	A string whose value is the name of a file you want delete

Return value: None

See also:

FileDeleteEx

FileDeleteEx

Description: Deletes existing files from the specified location.

Syntax: FileDeleteEx mask, return

Argument	Description
mask	A string whose value is the file mask describing existing files that you want to delete. File mask can contain can contain wildcard characters (* and ?).
return	A numeric variable that receives the returned value.

Return value: Number of files deleted. If no files were found to satisfy file mask, the return value is 0.

See also:

FileDelete

FileMoveEx

FileFindFirst

Description: Searches a directory for a file whose name matches the specified filename. FileFindFirst examines subdirectory names as well as filenames.

Syntax: FileFindFirst filename, firstfile, return

Argument	Description
filename	A string whose value specifies a valid directory or path and filename, which can contain wildcard characters (* and ?).
firstfile	A string variable that receives the name of a file whose name matches the specified filename
return	A boolean variable that receives the success of the operation. If the search was successful return receives TRUE, otherwise it receives FALSE.

Return value: This statements returns two values: string and boolean. If the statement succeeds, the string variable firstfile receives the name of the first found file.

Usage: If the statement succeeds, you can use the FileFindNext statement to search for other files that match the same pattern. You may wont to call FileFindNext in a loop in order to find all files that match the same pattern.

See also:

- FileFindNext
- Dir
- DirEx
- SubDir
- isDir
- FileExists
- LoopWhile
- LoopUntil

FileFindNext

Description: Searches a directory for a file whose name matches the specified filename. FileFindNext examines subdirectory names as well as filenames.

Syntax: FileFindNext nextfile, return

Argument	Description
nextfile	A string variable that receives the name of a file whose name matches the mask specified in the previous call to the FindFileFirst statement
return	A boolean variable that receives the success of the operation. If the search was successful return receives TRUE, otherwise it receives FALSE.

Return value: This statements returns two values: string and boolean. If the statement succeeds, the string variable nextfile receives the name of the next found file.

Usage: You use the FileFindNext statement to continue a file search from a previous call to the FindFileFirst statement. You may wont to call FileFindNext in a loop in order to find all files that match the same pattern.

See also:

FileFindFirst
Dir
DirEx
SubDir
isDir
FileExists
LoopWhile
LoopUntil

FileSearchEx

Description: Searches for files that contain the specified text.

Syntax: FileSearchEx dir, file_mask, find_string, search_subdir, return

Argument	Description
Dir	A string whose value is the full name of the directory where you want to search for files
File_mask	A string whose value is the file mask describing existing files that you want to search. File_mask can contain wildcard characters (* and ?).
Find_string	A string whose value is the text contained in file(s) to be found
Search_subdir	A boolean that indicates whether you want to search in the subdirectories starting with dir. Specify TRUE to search in the subdirectories, or FALSE to search only in the directory specified by dir.
Return	A string variable that receives the returned value.

Return value: String. Returns comma-separated list of files that contain the specified find_string.

Usage:
FileSearchEx statement should be used for searching in text files only, such as .TXT, .HTM, .LOG, and so on. It may produce incorrect results when searching in binary files.

You may want to use FileSearchEx to quickly scan various log files for common error messages.

See also:

FileReplaceEx
FileFindFirst
Pos
InStr

FileReplaceEx

Description: Searches and replaces in files.

Syntax: FileReplaceEx dir, file_mask, find_string, replace_string, search_subdir, return

Argument	Description
Dir	A string whose value is the full name of the directory where you want to search for files
File_mask	A string whose value is the file mask describing existing files that you want to search and replace. File_mask can contain wildcard characters (* and ?).
Find_string	A string whose value is the text contained in file(s) to be found
Replace_string	A string whose value is the text that is used to replace all occurrences of the Find_string
Search_subdir	A boolean that indicates whether you want to search and replace in the subdirectories starting with dir. Specify TRUE to search in the subdirectories, or FALSE to search only in the directory specified by dir.
Return	A numeric variable that receives the returned value.

Return value: Number. Returns total number of replacements made in all files that were found to contain the specified find_string.

Usage: FileReplaceEx statement should be used for searching and replacing in text files only, such as .TXT, .HTM, .LOG, and so on. It may corrupt binary files.

 **Tip:**
FileReplaceEx statement can be used to quickly convert files from UNIX format to DOS/Windows format and vise versa.
Note that UNIX files use NL character (ASCII code 10) as a end of line markers where DOS files use CR/NL pair of characters (ASCII codes 13 and 10) for this purpose. Use FileReplaceEx statement to convert files after FTP downloading from UNIX or before FTP uploading to UNIX hosts.
Examples:

UNIX to DOS: FileReplaceEx "*.htm", "\n", "\r\n", False, count
DOS to UNIX: FileReplaceEx "*.htm", "\r\n", "\n", False, count

See also:

FileSearchEx
FileFindFirst
FileConvert
Replace

FileConvert

Description: Converts the specified file by replacing some symbols.

Syntax: FileConvert file, find_table, replace_table, return

Argument	Description
File	A string whose value is the full name of the file in which you want to replace symbols from Source_list string with matching symbols from the Transform_list string.
Source_list	A comma-separated string containing ASCII codes of symbols to be converted (replaced)
Transform_list	A comma-separated string containing ASCII codes of symbols to be used for conversion.
Return	A numeric variable that receives the returned value.

Return value: Number. Returns number of replacements made in the file.

Usage: Number of symbols in the Transform_list string must match number of symbols in the Source_list sring. The FileConvert statement scans the specified file for symbols included into Source_list. For every found occurrence, the FileConvert statement replaces the found symbol with the corresponding symbol from the Transform_list. This allows you to perform multi-symbol "replace all" operation on a file.

FileConvert statement can process both text and binary files.

Tip:
You may use FileConvert statement to convert mainframe files using EBCDIC code table to files using ASCII code table. Translations between code sets can be tricky. There are a variety of problems that may occur. A problem related to translation is record format. In mainframe world, records exist as fixed-length, variable-length and string. There are no delimiters. All file types may contain text or binary data. When sent via FTP, however, there are no fixed-length records. Also, EBCDIC records are always ended by a new line (NL) character (X'15') and ASCII records are ended with a carriage return, line feed pair (CR LF). These characters cannot be embedded in the records. Binary files are treated as a single string of bytes and such files have no record structure. Thus, choice of translation affects the record format of the file. FileConvert statement provides powerful and yet simple options for translating between ASCII and EBCDIC. JAL script engine is shipped with the Example Jobs database that includes two user-defined JAL statements for performing EBCDIC to ASCII and ASCII to EBCDIC file conversions using common translation tables presented as translation lists.
You can customize translations lists in these example statements to make them fit your unique requirements.

Examples:

This statement replaces ASCII symbols 0 and 7 with a space (ASCII code 32) and a tab (ASCII code 8) symbols
FileConvert "c:\ftp\myfile.txt", "0,7", "32,8", count

This statement replaces ASCII symbol 0 with a space (ASCII code 32)
FileConvert "c:\ftp\myfile.txt", "0", "32", count

Common Translation Tables

EBCDIC to ASCII

```
   0  1  2  3  4  5  6  7  8  9  a  b  c  d  e  f
0 00 01 02 03 DC 09 C3 7F CA B2 D5 0B 0C 0D 0E 0F
```

```
1 10 11 12 13 DB DA 08 C1 18 19 C8 F2 1C 1D 1E 1F
2 C4 B3 C0 D9 BF 0A 17 1B B4 C2 C5 B0 B1 05 06 07
3 CD BA 16 BC BB C9 CC 04 B9 CB CE DF 14 15 FE 1A
4 20 FF 83 84 85 A0 C6 86 87 A4 BD 2E 3C 28 2B 7C
5 26 82 88 89 8A A1 8C 8B 8D E1 21 24 2A 29 3B AA
6 2D 2F B6 8E B7 B5 C7 8F 80 A5 DD 2C 25 5F 3E 3F
7 9B 90 D2 D3 D4 D6 D7 D8 DE 60 3A 23 40 27 3D 22
8 9D 61 62 63 64 65 66 67 68 69 AE AF D0 EC E7 F1
9 F8 6A 6B 6C 6D 6E 6F 70 71 72 A6 A7 91 F7 92 CF
a E6 7E 73 74 75 76 77 78 79 7A AD A8 D1 ED E8 A9
b 5E 9C BE FA B8 F5 F4 AC AB F3 5B 5D EE F9 EF 9E
c 7B 41 42 43 44 45 46 47 48 49 F0 93 94 95 A2 E4
d 7D 4A 4B 4C 4D 4E 4F 50 51 52 FB 96 81 97 A3 98
e 5C F6 53 54 55 56 57 58 59 5A FD E2 99 E3 E0 E5
f 30 31 32 33 34 35 36 37 38 39 FC EA 9A EB E9 9F
```

ASCII to EBCDIC

```
   0  1  2  3  4  5  6  7  8  9  a  b  c  d  e  f
0 00 01 02 03 37 2D 2E 2F 16 05 25 0B 0C 0D 0E 0F
1 10 11 12 13 3C 3D 32 26 18 19 3F 27 1C 1D 1E 1F
2 40 5A 7F 7B 5B 6C 50 7D 4D 5D 5C 4E 6B 60 4B 61
3 F0 F1 F2 F3 F4 F5 F6 F7 F8 F9 7A 5E 4C 7E 6E 6F
4 7C C1 C2 C3 C4 C5 C6 C7 C8 C9 D1 D2 D3 D4 D5 D6
5 D7 D8 D9 E2 E3 E4 E5 E6 E7 E8 E9 BA E0 BB B0 6D
6 79 81 82 83 84 85 86 87 88 89 91 92 93 94 95 96
7 97 98 99 A2 A3 A4 A5 A6 A7 A8 A9 C0 4F D0 A1 07
8 68 DC 51 42 43 44 47 48 52 53 54 57 56 58 63 67
9 71 9C 9E CB CC CD DB DD DF EC FC 70 B1 80 BF FF
a 45 55 CE DE 49 69 9A 9B AB AF 5F B8 B7 AA 8A 8B
b 2B 2C 09 21 28 65 62 64 B4 38 31 34 33 4A B2 24
c 22 17 29 06 20 2A 46 66 1A 35 08 39 36 30 3A 9F
d 8C AC 72 73 74 0A 75 76 77 23 15 14 04 6A 78 3B
e EE 59 EB ED CF EF A0 8E AE FE FB FD 8D AD BC BE
f CA 8F 1B B9 B6 B5 E1 9D 90 BD B3 DA FA EA 3E 41
```

See also:

- FileSearchEx
- FileReplaceEx
- Replace
- FTP statements
- Telnet statements

FileGetAttr

Description: Reports file attributes for the specified file or directory.

Syntax: FileGetAttr file, return

Argument	Description
file	A string variable that is the file or directory name you want to query

return	A numeric variable that receives the returned value

Return value: Number. Returns a number representing the attributes of a file, directory, or folder.

Usage: The value returned by FileGetAttr is the sum of any following attribute values:

Value	Description
0	Normal
1	Read-only
2	Hidden
4	System
16	Directory or folder
32	File has changed since last backup

To determine which attributes are set, use the BitwiseAnd statement to perform a bitwise comparison of the value returned by the FileGetAttr statement and the value of the individual file attribute you want. If the result is not zero, that attribute is set for the named file.

See also:

FileSetAttr

Bitwise statements

FileSetAttr

Description: Sets file attributes for the specified file or directory.

Syntax: FileSetAttr file, attr

Argument	Description
File	A string variable that is the file or directory name you want to update
Attr	A numeric variable that is the new file attributes

Return value: None

Usage: The attr value for the FileSetAttr is the sum of any following attribute values:

Value	Description
0	Normal
1	Read-only
2	Hidden
4	System
16	Directory or folder
32	File has changed since last backup

Note:
A run-time error will occur if you try to change attributes of an open file.

See also:

FileGetAttr

FileSetAttrEx

FileSetAttrEx

Description: Sets file attributes for all files that match the specified file mask.

Syntax: FileSetAttrEx file, attr, count

Argument	Description
file	A string variable that is the file mask you want to use for searching files whose attributes will be updated. You can use standard * and ? wildcard characters for the mask.
attr	A numeric variable that is the new file attributes
count	A numeric variable that receives the returned value

Return value: Number. Returns the number of files whose attributes were changed.

Usage: The attr value for the FileSetAttrEx is the sum of any following attribute values:

Value	Description
0	Normal
1	Read-only
2	Hidden
4	System
16	Directory or folder
32	File has changed since last backup

 **Note:**

- A run-time error occurs if you try to set the attributes of an open file.
- FileSetAttrEx can update multiple files at once but it is not recursive. If you want to update files in subdirectories you need to execute FileSetAttrEx separately for each subdirectory.

See also:

FileGetAttr
FileSetAttr

FileGetPos

Description: Reports current position in the specified file previously opened by FileOpen statement.

Syntax: FileGetPos filenum, pos

Argument	Description
Filenum	The file number previously assigned to the file when it was opened by FileOpen statement
Pos	A numeric variable that receives the returned value

Return value: Number. Returns the file position after the read/write operation or zero if no operation has been performed after file opening.

Note:
FileGetPos always returns position from the beginning of the file.

See also:

FileSetPos
FileOpen

FileSetPos

Description: Moves the file pointer to the specified position in a file previously opened by FileOpen statement. The file pointer is the position in the file at which the next read or write begins.

Syntax: FileSetPos filenum, origin, pos

Argument	Description
Filenum	The file number previously assigned to the file when it was opened by FileOpen statement
Pos	A number whose value is the new position of the file pointer relative to the position specified in origin, in bytes
origin	A string constant whose value specifies from where you want to set then position. Values are: • "START" — At the beginning of the file • "CURRENT" — At the current position • "END" — At the end of the file

Return value: None.

Usage: The file must be opened previously using FileOpen statement.

See also:

FileGetPos
FileOpen

FileOpen

Description: Opens the specified file for reading or writing and assigns it a unique file number. You use this number to identify the file when you read, write, or close the file. The arguments filemode, fileaccess, filelock, and append determine the mode in which the file is opened. If the file doesn't exist, a new file is created.

Syntax: FileOpen filename, filemode, fileaccess, append ,return

Argument	Description
filename	A string whose value is the name of the file you want to open. If filename is not on the operating system's search path, you must enter the fully qualified name
filemode	A string constant whose value specifies how the end of a file read or file write operation is determined. Values are: • "LineMode" — Read or write the file a line at a time • "StreamMode" — Read the file in 32K chunks. For more information, see Usage below
fileaccess	A string constant whose value specifies whether the file is opened for reading or writing. Values are: • "Read" — Read-only access • "Write" — Write-only access
append	A boolean whose value specifies whether existing data in the file is overwritten when file is opened for write operation. Values are: • True — Write data to the end of the file • False — Replace all existing data in the file append is ignored if the fileaccess argument is "Read"
return	A numeric variable that receives the returned file number.

Return value: Number. Returns the file number assigned to filename.

Usage: When a file has been opened in "LineMode" , each call to the FileRead statement reads until it encounters a carriage return (CR), linefeed (LF), or end-of-file mark (EOF). Each call to the FileWrite adds a CR and LF at the end of each string it writes.
When a file has been opened in "StreamMode" , a call to FileRead reads the whole file (until it encounters an EOF) or 32,765 bytes, whichever is less. FileWrite writes a maximum of 32,765 bytes in a single call and does not add CR and LF characters.

Note:
If the JAL script engine doesn't find the file, it creates a new file, giving it the specified name.

See also:

FileClose
FileRead
FileWrite

FilePrint

Description: Sends the specified file to the default printer

Syntax: FilePrint filename

Argument	Description
filename	A string whose value is the name of the file you want to print. If filename is not on the operating system's search path, you must enter the fully qualified name

Return value: None.

See also:

PrinterSetDefault

FileRead

Description: Reads data from the file associated with the specified file number, which was assigned to the file with the FileOpen statement.

Syntax: FileRead filenum, return

Argument	Description
filenum	The file number previously assigned to the file when it was opened by FileOpen statement
return	A string variable into which you want to read the data

Return value: String.
If the file is opened in Line mode, FileRead reads a line of the file (that is, until it encounters a CR, LF, or EOF). It stores the contents of the line in the specified variable, skips the line-end characters, and positions the file pointer at the beginning of the next line.

If the file was opened in Stream mode, FileRead reads to the end of the file or the next 32,765 bytes, whichever is shorter. FileRead begins reading at the file pointer, which is positioned at the beginning of the file when the file is opened for reading. If the file is longer than 32,765 bytes, FileRead automatically positions the pointer after each read operation so that it is ready to read the next chunk of data.

FileRead can read a maximum of 32,765 characters at a time. Therefore, before calling the FileRead function, call the FileSize statement to check the file size. If your system has file sharing or security restrictions, you may need to call FileSize before you call FileOpen.

An end-of-file mark is a NULL character (ASCII value 0). Therefore, if the file being read contains null characters, FileRead will stop reading at the first null character, interpreting it as the end of the file.

Usage: The file must be opened previously using FileOpen statement.

See also:

FileSize
FileOpen

FileReadAll

Description: Loads data from the specified file.

Syntax: FileReadAll file, return

Argument	Description
file	A string whose value is the name of the existing file that you want to read
return	A string variable into which you want to read the data

Return value: String. Loads entire file specified by file into a string variable specified by return.

See also:

FileRead
FileSave
FileCopy

FileReadLine

Description: Reads specified line from a ASCII file.

Syntax: FileReadLine file, line, return

Argument	Description
file	A string whose value is the name of the existing file that you want to read
line	A number whose value is the number of the line that want to read from the file
return	A string variable into which you want to read the data

Return value: String. Reads specified line from file.

Usage: FileReadLine opens file for reading in the Line Mode, reads the file until it reaches the specified line, then closes the file. This statement makes sense only for ASCII (text) files.

See also:

FileRead

FileReadAll

FileRename

Description: Renames an existing file.

Syntax: FileRename oldname, newname

Argument	Description
oldname	A string whose value is the name of existing file or directory that want to rename
newname	A string variable whose value is the new file name

Return value: None

Usage: If the newname file already exists, the statement fails. You can use FileMove to override an existing file. Both oldname and newname can include path to the file.

See also:

FileCopy
FileMove

FileSplitName

Description: Splits up a full file name into two components consisting of path, file name with extension

Syntax: FileSplitName fullname, filepath, filename

Argument	Description
fullname	A string whose value is the full file name that may include file path and file extension
filepath	A string variable whose value is the returned file path including drive letter and directory name
filename	A string variable whose value is the returned file name including file extension

Return value: String and String

Usage: The specified file does not have to exist.

See also:

FileCopy
FileMove

FileSave

Description: Saves data in the specified file.

Syntax: FileSave file, text

Argument	Description
file	A string variable whose value is the name of the file into which you want to save the text
text	A string whose value is the data want to save in the file

Return value: None.

Usage: If the file already exists then FileSave overwrites it.

See also:

FileRead
FileExists
FileCopy

FileSize

Description: Reports the length of a file in bytes.

Syntax: FileSize file, return

Argument	Description
file	A string whose value is the name of the file for which you want to know the length. If filename is not on the current application library search path, you must specify the fully qualified name
return	A numeric variable that receives the returned value

Return value: Number. Returns the length in bytes of the file identified by file.

FileWrite

Description: Write data to the file associated with the specified file number, which was assigned to the file with the FileOpen statement.

Syntax: FileWrite filenum, s

Argument	Description
filenum	The file number previously assigned to the file when it was opened by FileOpen statement
s	A string variable, which you want to save to the file associated with filenum

Return value: None.

Usage:
FileWrite writes its data at the position identified by the file pointer. If the file was opened by FileOpen with the writemode argument set to “Replace" , the file pointer is initially at the beginning of the file. After each call to FileWrite, the pointer is immediately after the last write. If the file was opened with the writemode argument set to “Append" , the file pointer is initially at the end of the file and moves to the end of the file after each write.

FileWrite sets the file pointer following the last character written. If the file was opened in “LineMode" , FileWrite writes a carriage return (CR) and linefeed (LF) after the last character in variable and places the file pointer after the CR and LF.
FileWrite can write only 32,766 bytes at a time, which includes the string terminator character. If the length of variable s exceeds 32,765, FileWrite writes the first 32,765 characters only.

Usage: The file must be opened previously using FileOpen statement.

See also:

FileRead
FileOpen

FileZip

Description: Compresses existing files into a new ZIP file. Produced ZIP files are compatible with PKZIP, Winzip, InfoZip, and most other zipping utilities. PKZIP utility is not required for zipping operations.

Syntax: FileZip destination, source

Argument	Description
destination	A string whose value is the name of a ZIP file into which you want to archive the source file
source	A string whose value is the comma-separated list of existing files you want to zip.

Return value: None

Usage: If the destination file already exists, FileZip overwrites the existing file.

Tips:

- Source file names may include wildcard characters. Multiple files and wildcards can be specified in a single FileZip operation.
- Use FileZipEx statement if you want to recursively zip files in subdirectories.

See also:

FileZipEx
FileUnzip
FileDeleteEx
Dir
CD

FileZipEx

Description: Compresses existing files into a new ZIP file. Produced ZIP files are compatible with PKZIP, Winzip, InfoZip, and most other zipping utilities. PKZIP utility is not required for zipping operations.

Syntax: FileZipEx destination, source, recursive, save_path, base_dir

Argument	Description
destination	A string whose value is the name of a ZIP file into which you want to archive the source file(s)
source	A string whose value is the comma-separated list of existing files you want to zip.
recursive	A boolean whose value controls whether the zip operation should recursively process file in subdirectories.
save_path	A boolean whose value controls whether the path to zipped files should be stored within archive. In WinZip and other popular compression utilities this option is often called "save extra-folder info."
base_dir	A string whose value defines which part of the file path should be stored in archive. This option is ignored if save_path is set to False. For example, if you want to zip all files in c:\dir1\dir2*.* and all subdirectories but save "extra folder info" beginning with dir2 you should specify c:\dir1 as base_dir. If There exist files c:\dir1\dir2\file1, c:\dir1\dir2\file2, c:\dir1\dir2\dir3\file3 then within the resulting archive they would be stored as dir2\file1, dir2\file2, dir2\dir3\file3

Return value: None

Usage: If the destination file already exists, FileZipEx overwrites the existing file. FileZipEx behaves exactly as the **FileZip** statement when both recursive and save_path options are set to False.

 **Tip:** Source file names may include wildcard characters. Multiple files and wildcards can be specified in a single FileZipEx operation. Example:

```
FileZipEx "c:\\backup\\backup.zip", "c:\\dir1\\*.txt, c:\\dir1\\*.htm", True, True, "c:\\"
```

See also:

- FileZip
- FileUnzip
- FileDeleteEx
- Dir
- CD

FileUnzip

Description: Decompresses files from an existing ZIP file. (PKUNZIP utility is not required for unzipping operations)

Syntax: FileUnzip source, destination

Argument	Description
source	A string whose value is the name of existing ZIP file.
destination	A string whose value is the name of existing directory to which all archived files will be extracted from the source file.

Return value: None

Usage: If the destination directory does not exist, the statement fails. Extracted files may overwrite existing files with the same names in the destination directory.

See also:

- FileZip
- Dir
- FileDeleteEX

IniFileGetKey

Description: Obtains the string value of a setting in the profile file or system registry. A profile file usually has .INI extension.

Syntax: IniFileGetKey inifile, section, key, return

Argument	Description
inifile	A string whose value is the name of the profile file. If you do not specify a full path, IniFileGetKey uses the operating system's standard file search order to find the file
section	A string whose value is the name of a group of related values in the profile file. In the file, section names are in square brackets. Do not include the brackets in section. Section is not case-sensitive
key	A string specifying the setting name in section whose value you want. The setting name is followed by an equal sign in the file. Do not include the equal sign in key. Key is not case-sensitive
return	A string variable, which receives the returned value

Return value: String, with a maximum length of 4096 characters. Returns the string from key within section within inifile. If inifile is not found, section is not found in inifile, or key is not found in section, IniFileGetKey returns the empty string (""). If an error occurs, it returns the empty string ("").

Usage: Use IniFileGetKey to get configuration settings from a profile file. You can use IniFileSetKey statement to change configuration of the application that owns this profile file. Before you make changes, you can use IniFileGetKey to obtain the original settings so you can restore them after or during the application run.

IniFileGetKey can also be used to obtain configuration settings from the Windows system registry. To obtain information from the registry instead of from an initialization file:

- On Windows NT (NT/2000/XP/2003/VISTA/2008), create a new folder called INIFILEMAPPING at the following location: hkey_current_user\software\microsoft\windows nt\current version To override the WIN.INI file, create a key in the new folder called WIN.INI with the following value: #usr:software\microsoft\windows nt\current version\extensions
- On Windows 95/98/Me, substitute windows for windows nt in both paths (see above).

This change will tell Windows to override initialization files, so that you can use these initialization files to obtain registry settings.

See also:

IniFileSetKey

RegistryGetKey

RegistrySetKey

IniFileSetKey

Description: Changes the string value of a setting in the profile file or system registry. A profile file usually has .INI extension.

Syntax: IniFileSetKey inifile, section, key, newvalue

Argument	Description
inifile	A string whose value is the name of the profile file. If you do not specify a full path, IniFileSetKey uses the operating system's standard file search order to find the file
section	A string whose value is the name of a group of related values in the profile file. In the file, section names are in square brackets. Do not include the brackets in section. Section is not case-sensitive
key	A string specifying the setting name in section whose value you want to change. The setting name is followed by an equal sign in the file. Do not include the equal sign in key. Key is not case-sensitive
newvalue	A string whose value is the value you want to specify for key. The value can be up to 4096 characters long.

Return value: None.

Usage: IniFileSetKey changes the value for key within section within inifile. If inifile is not found, section is not found in inifile, or key is not found in section, an error occurs.

Use IniFileSetKey to change configuration settings stored within profile file. You can use IniFileSetKey statement to change configuration of the application that owns this profile file. Before you make changes, you can use IniFileGetKey to obtain the original settings so you can restore them after or during the application run.

IniFileSetKey can also be used to change configuration settings in the Windows system registry. To change information in the registry instead of changing an initialization file:

- On Windows NT (NT/2000/XP/2003/VISTA/2008), create a new folder called INIFILEMAPPING at the following location: hkey_current_user\software\microsoft\windows nt\current version To override the WIN.INI file, create a key in the new folder called WIN.INI with the following value: #usr:software\microsoft\windows nt\current version\extensions
- On Windows 95/98/Me, substitute windows for windows nt in both paths (see above).

This change will tell Windows to override initialization files, so that you can use these initialization files to obtain registry settings.

See also:

IniFileGetKey

RegistryGetKey

RegistrySetKey

isDir

Description: Tests whether the specified path is a name of a valid existing directory.

Syntax: isDir dir, status

Argument	Description
Dir	A string whose value is the name of directory that you want to test.
Status	A boolean variable that receives the returned status value.

Return value: Boolean. Returns True if the name points to an existing directory and False otherwise.

See also:

DirDelete
Dir
CD

NotFileExists

Description: Reports whether the specified file does not exist.

Syntax: NotFileExists file, return

Argument	Description
file	A string whose value is the name of a file
Return	A boolean variable that receives the returned value

Return value: Boolean. Returns TRUE if the file does not exist, FALSE if it exists.

Usage: If file is locked by another application, causing a sharing violation, NotFileExists also returns TRUE. File name may include wildcard characters (* and ?).

See also:

FileExists

RemoteDir

Description: Returns comma-separated list of files in the specified directory on the specified remote computer running 24x7 Remote Agent

Syntax: RemoteDir agent, file_mask, return

Argument	Description
Agent	A string whose value is the name of the Remote Agent as it is specified in the Remote Agent profile.
File_mask	A string whose value is the file mask that you want to use to list file. File_mask can contain wildcard characters (* and ?). File_mask can contain full or partial file path.
Return	A string variable that receives the returned value.

Return value: String. Returns comma-separated list of files.

Usage: The RemoteDir statement is equivalent to DOS *dir* command executed on the remote computer hosting 24x7 Remote Agent specified by Agent.
If you don't include file path to the file_mask then RemoteDir statement returns files from the Agent's computer current directory.

See also:
FileTransfer
Dir
FTPDir

File replication and synhronization statements

CompareFTPDir

Description: Compares files in two directories residing on local and remote computers using FTP protocol.

Syntax: CompareFTPDir server, user, password, local_dir, remote_dir, name_comparison, local_list, remote_list

Argument	Description
Server	A string whose value is host name of an FTP server (for example, ftp.microsoft.com) or the IP number of the site in ASCII dotted-decimal format (for example, 11.0.1.45)

User	A string whose value is the name of the user to log on
Password	A string whose value is the password to use to log on
Local_dir	A string whose value is the name of the local directory containing files that you want to compare
Remote_dir	A string whose value is the name of the remote directory on FTP server containing files that you want to compare.
Name_comparison	A boolean whose value should be TRUE if you want to compare files by name only, and FALSE if you want to compare them by name and date of the last modification.
Local_list	A string variable that receives the list of files from the Local_dir directory. This list contains only files that are different from files in the Remote_dir directory.
Remote_list	A string variable that receives the list of files from the Target_dir directory. This list contains only files that are different from files in the Remote_dir directory.

Return value: Two String values are returned.

Usage: Use CompareFTPDir statement to automate various file comparison and synchronization processes.

By default JAL script engine uses standard non-secure FTP protocol for all FTP operations. If you are working with a secure FTP server (SFTP server) use **FTPConfig** statement to switch FTP protocol.

By default JAL script engine performs all FTP operations using default port for FTP servers. To specify a different port number use **FTPConfig** statement.

File names are case-sensitive on all FTP server platforms.

See also:

SyncFTPDir
CompareLocalDir
CompareRemoteDir
FTPGetFile
FTPPutFile

CompareLocalDir

Description: Compares files in two local or shared network directories.

Syntax: CompareLocalDir source_dir, target_dir, name_comparison, source_list, target_list

Argument	Description
Source_dir	A string whose value is the name of the source directory containing files that you want to compare
Target_dir	A string whose value is the name of the target

	directory
Name_comparison	A boolean whose value should be TRUE if you want to compare files by name only, and FALSE if you want to compare them by name and date of the last modification.
Source_list	A string variable that receives the list of files from the Source_dir directory. This list contains only files that are different from files in the Target_dir directory.
Remote_dir	A string whose value is the name of the remote directory on FTP server containing files that you want to compare.

Return value: Two String values are returned.

Usage: Use CompareLocalDir statement to automate various file comparison and synchronization processes.

See also:
SyncLocalDir
CompareFTPDir
CompareRemoteDir
FileCopyEx
FileMoveEx

CompareRemoteDir

Description: Compares files in two directories residing on local and remote computers provided 24x7 Remote Agent is running at a given remote computer.

Syntax: CompareRemoteDir agent, local_dir, remote_dir, name_comparison, local_list, remote_list

Argument	Description
Agent	A string whose value is the name of 24x7 Remote Agent or 24x7 Master Scheduler as it is specified in the Remote Agent profile.
Local_dir	A string whose value is the full name of the local directory containing files that you want to compare
Remote_dir	A string whose value is the full name of the remote directory containing files that you want to compare.
Name_comparison	A boolean whose value should be TRUE if you want to compare files by name only, and FALSE if you want to compare them by name and date of the last modification.
Local_list	A string variable that receives the list of files from the Local_dir directory. This list contains only files that are different from files in the Remote_dir directory.
Remote_list	A string variable that receives the list of files from the Target_dir directory. This list contains only files that are different from files in the Remote_dir

	directory.

Return value: Two String values are returned.

Usage: Use CompareRemoteDir statement to automate various file comparison and synchronization processes.

See also:
SyncRemoteDir
CompareLocalDir
CompareFTPDir
FileTransferEx

SyncFTPDir

Description: Synchronizes and replicates files across two directories residing on local and remote computers using FTP protocol.

Syntax: SyncFTPDir master, server, user, password, source_dir, target_dir, add_new, delete_missing, update_old, subdir

Argument	Description
Master	A string whose value instructs 24x7 Schedule which computer is the "master" computer containing files and subdirectories that you want to replicate. The following values are supported: • "REMOTE" - the remote FTP server is "master" • "LOCAL" the local computer is "master"
Server	A string whose value is host name of an FTP server (for example, ftp.microsoft.com) or the IP number of the site in ASCII dotted-decimal format (for example, 11.0.1.45)
User	A string whose value is the name of the user to log on
Password	A string whose value is the password to use to log on
Source_dir	A string whose value is the name of the "master" directory containing files and subdirectories that you want to replicate
Target_dir	A string whose value is the name of the target directory to which .files and subdirectories are replicated
Add_new	A boolean whose value should be TRUE if you want to replicate files that exist in the source_dir, and FALSE otherwise
Delete_missing	A boolean whose value should be TRUE if you want to delete from the target_dir directory these files that target_dir but do not exist in the source_dir, and FALSE otherwise
Update_old	A boolean whose value should be TRUE if you want to update older versions of files in the target_dir directory, and FALSE otherwise. If file is considered as old if it

	exists in both target_dir and source_dir directories and target_dir version of that files has a time older than the version from the source_dir directory.
Subdir	A boolean whose value should be TRUE if you want to update recursive subdirectories. Note that if you enable recursion then all other replication options described above apply to all subdirectories of all nesting levels starting with the Source_dir.

Return value: None.

Usage: Use SyncFTPDir statement to automate synchronization and replication for a group of files residing on different computers.
The directory you are copying files from is also known as the **master directory** or **primary site**-replication

JAL script engine logs all file synchronization and replication details to the SYNC.LOG file in the JAL script engine's installation directory.

By default JAL script engine uses standard non-secure FTP protocol for all FTP operations. If you are working with a secure FTP server (SFTP server) use **FTPConfig** statement to switch FTP protocol.

By default JAL script engine performs all FTP operations using default port for FTP servers. To specify a different port number use **FTPConfig** statement.

File names are case-sensitive on all FTP server platforms.

 **Important Notes:**

- Because the standard FTP protocol lacks file date/time manipulations, all files uploaded to a FTP server always have system date/time on the FTP server computer (date/time when they were uploaded).
- Read **File Caching Internet Options** topic if you experience various "cannot create file/directory because it already exists" errors or files do not get updated during FTP downloads.

 **Tips:**

- To update only outdated files set Update_old to TRUE and set both Add_new and Delete_missing to FALSE.
- To perform full 2 way file synchronization between directory <one> residing on the remote computer and directory <two> residing on the local computer:
  First run SyncFTPDir using "REMOTE" for the Master with Delete_missing set to FALSE and everything else set to TRUE. Repeat SyncFTPDir using "LOCAL" for the Master with Delete_missing set to FALSE and everything else set to TRUE.

See also:
SyncRemoteDir
SyncLocalDir
Other FTP statements

SyncLocalDir

Description: Synchronizes and replicates files across two local or shared network directories.

Syntax: SyncLocalDir source_dir, target_dir, add_new, delete_missing, update_old, subdir

Argument	Description
Source_dir	A string whose value is the name of the "master" directory containing files and subdirectories that you want to replicate
Target_dir	A string whose value is the name of the target directory to which .files and subdirectories are replicated
Add_new	A boolean whose value should be TRUE if you want to replicate files that exist in the source_dir, and FALSE otherwise
Delete_missing	A boolean whose value should be TRUE if you want to delete from the target_dir directory these files that target_dir but do not exist in the source_dir, and FALSE otherwise
Update_old	A boolean whose value should be TRUE if you want to update older versions of files in the target_dir directory, and FALSE otherwise. If file is considered as old if it exists in both target_dir and source_dir directories and target_dir version of that files has a time older than the version from the source_dir directory.
Subdir	A boolean whose value should be TRUE if you want to update recursive subdirectories. Note that if you enable recursion then all other replication options described above apply to all subdirectories of all nesting levels starting with the Source_dir.

Return value: None.

Usage: Use SyncLocalDir statement to automate synchronization and replication for a group of files.
The directory you are copying files from is also known as the **master directory** or **primary site**-replication

JAL script engine logs all file synchronization and replication details to the SYNC.LOG file in the JAL script engine's installation directory.

Tip:

- To update only outdated files set Update_old to TRUE and set both Add_new and Delete_missing to FALSE.
- To perform full 2 way file synchronization between directory <one> and another directory <two>:
  First run SyncLocalDir using <one> as the "master" with Delete_missing set to FALSE and everything else set to TRUE. Repeat SyncLocalDir using <two> as the "master" with Delete_missing set to FALSE and everything else set to TRUE.

See also:

SyncFTPDir
SyncRemoteDir
FileCopyEx
FileMoveEx

SyncRemoteDir

Description: Synchronizes and replicates files across two directories residing on local and remote computers provided 24x7 Remote Agent is running at a given remote computer.

Syntax: SyncRemoteDir master, agent, source_dir, target_dir, add_new, delete_missing, update_old, subdir

Argument	Description
Master	A string whose value instructs 24x7 Schedule which computer is the "master" computer containing files and subdirectories that you want to replicate. The following values are supported: • "REMOTE" - the remote computer is "master" • "LOCAL" the local computer is "master"
Agent	A string whose value is the name of 24x7 Remote Agent or 24x7 Master Scheduler as it is specified in the Remote Agent profile.
Source_dir	A string whose value is the name of the "master" directory containing files and subdirectories that you want to replicate
Target_dir	A string whose value is the name of the target directory to which .files and subdirectories are replicated
Add_new	A boolean whose value should be TRUE if you want to replicate files that exist in the source_dir, and FALSE otherwise
Delete_missing	A boolean whose value should be TRUE if you want to delete from the target_dir directory these files that target_dir but do not exist in the source_dir, and FALSE otherwise
Update_old	A boolean whose value should be TRUE if you want to update older versions of files in the target_dir directory, and FALSE otherwise. If file is considered as old if it exists in both target_dir and source_dir directories and target_dir version of that files has a time older than the version from the source_dir directory.
Subdir	A boolean whose value should be TRUE if you want to update recursive subdirectories. Note that if you enable recursion then all other replication options described above apply to all subdirectories of all nesting levels starting with the Source_dir.

Return value: None.

Usage: Use SyncRemoteDir statement to automate synchronization and replication for a group of files residing on different computers.
The directory you are copying files from is also known as the **master directory** or **primary site**-replication

JAL script engine logs all file synchronization and replication details to the SYNC.LOG file in the JAL script engine's installation directory.

Tip:

- To update only outdated files set Update_old to TRUE and set both Add_new and Delete_missing to FALSE.
- To perform full 2 way file synchronization between directory <one> residing on the remote computer and directory <two> residing on the local computer:
  First run SyncRemoteDir using "REMOTE" for the Master with Delete_missing set to FALSE and everything else set to TRUE. Repeat SyncRemoteDir using "LOCAL" for the Master with Delete_missing set to FALSE and everything else set to TRUE.

See also:

SyncFTPDir
SyncLocalDir
FileTransfer

Dir

Description: Returns comma-separated list of files in the specified directory.

Syntax: Dir file_mask, return

Argument	Description
File_mask	A string whose value is the DOS file mask that you want to use to list file. File_mask can contain wildcard characters (* and ?). File_mask can contain full or partial file path.
Return	A string variable that receives the returned value.

Return value: String. Returns comma-separated list of files.

Usage: The Dir statement is equivalent to DOS *dir* command.
To get the list of all files use *.* file mask. If you don't include file path to the file_mask then Dir statement returns files from the DOS current directory.

See also:

CD
FileSearchEx
FileFindFirst
FTPDir
RemoteDir

FTPDir

Description: Returns comma-separated list of files in the specified directory on the specified FTP server

Syntax: FTPDir server, user, password, file_mask, return

Argument	Description
Server	A string whose value is host name of an FTP server (for example, ftp.microsoft.com) or the IP number of the site in ASCII dotted-decimal format (for example, 11.0.1.45)
User	A string whose value is the name of the user to log on
Password	A string whose value is the password to use to log on
File_mask	A string whose value is the file mask that you want to use to list file. File_mask can contain wildcard characters (* and ?). File_mask can contain full or partial file path. File_mask must be a valid FTP host Operation System file mask.
Return	A string variable that receives the returned value.

Return value: String. Returns comma-separated list of files.

Usage: On DOS/Windows based FTP hosts the FTPDir statement is equivalent to DOS *dir* command. For most UNIX flavors, the FTPDir statement is equivalent to UNIX *ls* command.
If you don't include file path to the file_mask then FTPDir statement returns files from the FTP server current directory.

See also:
FTPFileExists
Dir
RemoteDir

RemoteDir

Description: Returns comma-separated list of files in the specified directory on the specified remote computer running 24x7 Remote Agent

Syntax: RemoteDir agent, file_mask, return

Argument	Description
Agent	A string whose value is the name of the Remote Agent as it is specified in the Remote Agent profile.
File_mask	A string whose value is the file mask that you want to use to list file. File_mask can contain wildcard characters (* and ?). File_mask can contain full or partial file path.
Return	A string variable that receives the returned value.

Return value: String. Returns comma-separated list of files.

Usage: The RemoteDir statement is equivalent to DOS *dir* command executed on the remote computer hosting 24x7 Remote Agent specified by Agent.
If you don't include file path to the file_mask then RemoteDir statement returns files from the Agent's computer current directory.

See also:
FileTransfer
Dir
FTPDir

FTP statements

The same statements can be used for both regular FTP and Secure FTP automation. Call the FTPConfig statement in the beginning of a job to specify which protocol to use.

FTPConfig

Description: Set various parameters for the subsequent FTP operations.

Syntax: FTPConfig property, new_value

Argument	Description
Property	A string whose value is the name of the property for the FTP session that you want to change. The following properties are supported: • "TRANSFER MODE" • "LIST SEPARATOR" • "PORT" • "CONNECTION TYPE" • "FTP PROTOCOL" • "PRESERVE FILE TIMES" • "SET TIME COMMAND" • "TIME FORMAT" • "TIME OFFSET" • "FTP YEAR BUG"
New_value	A string whose value is the new value for the property that you want to change. The following values are supported for the "TRANSFER MODE" property: • "ASCII" • "BINARY" The default value is "BINARY". The specified "TRANSFER MODE" is used for all subsequent FTP

	commands executed in the same job. For the "LIST SEPARATOR" property, you can specify any desired symbol that you will use to separate multiple files when performing various multi-file FTP operations. The default value for the "LIST SEPARATOR" is comma. For more information, see **FTPAppendFile, FTPGetFile**, **FTPPutFile**, **FTPREsumeFile** and **FTPDeleteFile** statements. This parameter is used for all subsequent FTP commands executed in the same job. Use the "PORT" property, to specify which port your want to use for all subsequent FTP commands executed in the same job. This setting applies to all statements that begin with FTP prefix and to the **SyncFTPDir** and **CompareFTPDir** statements. If you do not change this property, the default FTP port 21 is used for FTP operations. The following values are supported for the "CONNECTION TYPE " property: • "PASSIVE" • "ACTIVE" The default value is "ACTIVE". Use this property, to specify whether your want to use active or passive FTP connection mode for all subsequent FTP commands executed in the same job. This setting applies to all statements that begin with FTP prefix and to the **SyncFTPDir** and **CompareFTPDir** statements. If you do not change this property, the default active mode is used for FTP operations. The following values are supported for the "FTP PROTOCOL " property: • "SECURE" • "NON SECURE" The default value is "NON SECURE". Use this property, to specify whether your want to use secure or non-secure FTP protocol for all subsequent FTP commands executed in the same job. This setting applies to all statements that begin with FTP prefix and to the **SyncFTPDir** and **CompareFTPDir** statements. If you do not change this property, the default non-secure FTP protocol is used for FTP operations. Properties "PRESERVE FILE TIMES", "SET TIME COMMAND", "TIME FORMAT", "TIME OFFSET" are used together as a group of properties that control when and how to set date/time of transferred files. These properties are not used with secure FTP protocol. The following values are supported for the "PRESERVE FILE TIMES" property:

	• "TRUE" • "FALSE" The default value is "FALSE". For more information see the following **Usage** section. Use this property, to specify whether your want to preserve times of uploaded and downloaded files. This property is not used by the secure FTP protocol. The following values are supported for the "SET TIME COMMAND" property: • "" (an empty string) • "[user specified host Operation System command]" The default value is "" which instructs the script engine to use the extended version of the MDTM command supported by modern FTP protocols. For more information see the following **Usage** section. If you specify some other non-empty value for "SET TIME COMMAND" property the script engine attempts to execute that command as a FTP host operation system command. For this purpose it executes FTP SITE EXEC command following by the specified host command. In order for the host command to be successfully executed your FTP server must support SITE EXEC command and this feature must not be disabled. The "TIME FORMAT" property controls time format used with the user-defined command specified in the "SET TIME COMMAND" property. For more information see the following **Usage** section. The default value for "TIME FORMAT" property is YYYYMMDDHHMM.SS. The "TIME OFFSET" property can be used to specify the difference in time between the host and the target computer. In other words if the processing computer and the FTP server computer run in different time zones you can use this property to specify the time difference. Generally speaking you can use this property to affect how the file time is set when the value of "PRESERVE FILE TIMES" property is set to TRUE. Specify offset value in seconds. The default value of the "TIME OFFSET" property is 0. You can specify both positive and negative values. A positive value causes the target file time to be adjusted forward; a negative value causes the target file time to be adjusted backward. For more information see the following **Usage** section. The "FTP YEAR BUG" parameter can be used to correct incorrect behavior on Windows systems running Internet Explorer 5.0, 5.01, and 5.5. On such systems, **FTPFileDateTime**, **SyncFTPDir** and **CompareFTPDir** statements can incorrectly determine file date information for files that are stored on a UNIX-based File Transfer Protocol (FTP) server (or an FTP server that is running Internet Information Services [IIS] that is running in UNIX folder listing style mode), the year information may appear

	as one year later or one year earlier than the correct year. This bug is documented in Microsoft Knowledge Base Article – 284455. For more information please visit Microsoft Product Support Services site. This bug can cause **SyncFTPDir** to synchronize wrong files. It is recommended that in order to correct the problem you upgrade to Microsoft Internet Explorer 6.0 or later. As a temporary workaround you can use the "FTP YEAR BUG" parameter, which will force FTP statements to automatically adjust file date. The default value for the "FTP YEAR BUG" parameter in JAL script engine version 3.4.3 and earlier was –1. Starting with version 3.4.4 the default value is 0 meaning that no adjustment is needed. You can set this parameter to the following values • "-1" • "1" • "0" If a non-zero value is set for this parameter, FTP statements will automatically adjust year portion of file dates by the specified value.

Return value: None.

Usage: Use FTPConfig statement with the "TRANSFER MODE" property to configure transfer mode when downloading or uploading files using FTPGetFile and FTPPutFile statements. Both parameter name and new value are case insensitive. Use FTPConfig statement with the "LIST SEPARATOR" property to configure multi-file FTP operations.

"TRANSFER MODE" setting determines which transfer mode will be set when you initiate a file transfer. It can be one of the following:

ASCII: This mode is used for transferring text files between sites running different operating systems. It will take care of all the necessary translation to make text readable. However, use it with caution since binary files will be corrupted if transferred in this mode. Text files with non-English characters in it will also be corrupted.

Binary: This is the most frequently used transfer mode. It transfers raw data without any translation.

"LIST SEPARATOR" setting overrides the default comma symbol used to separate names of files in other FTP statements. Specify some other symbol if a file you need to process contains comma as a part of the file name.

"PORT" setting overrides the default FTP port number.

"CONNECTION TYPE" setting overrides the default FTP connection mode.

"FTP PROTOCOL" setting overrides the default FTP protocol used for FTP operations. For more information on secure FTP protocols read RFC-2228 specification.

Important Note:

Secure FTP protocol does not currently support ASCII transfer mode, that's why all file transfers are always performed using Binary transfer mode regardless of the "TRANSFER MODE" setting.

Properties "PRESERVE FILE TIMES", "SET TIME COMMAND", "TIME FORMAT", "TIME OFFSET" are used together as a group of properties that control when and how to set date/time of transferred files. These properties are not used with secure FTP protocol.

Use these properties, to specify whether your want to preserve times of uploaded and downloaded files. By default all transferred files receive system date/time on the destination computer at the time of the transfer. When the "PRESERVE FILE TIMES" property is set to "TRUE", job engine automatically executes additional commands required to change the times of transferred files to match times of the original files.

Important note:

Not all FTP servers support methods for changing times of uploaded files. See description of the "SET TIME COMMAND" property for more information about supported methods.

If an empty string is specified for "SET TIME COMMAND" property the script engine attempts to use the extended version of the FTP MDTM command supported by modern FTP protocols. Please note that the FTP MDTM command is not understood by all FTP servers. The command is executed internally as

MDTM [TIME] [FILE]

In job run-time the [TIME] parameter is substituted with the time of the source file in YYYYMMDDhhmmss format and [FILE] is substituted with the name of the target file.

For example if file time is 16-June-2001 2:00:05 PM, time format is YYYYMMDDHHMM.SS and file name is test.txt the final command text will be sent to FTP server as

```
MDTM 20010616140005 test.txt
```

If you specify some other non-empty value for "SET TIME COMMAND" property the script engine attempts to execute that command as a FTP host operation system command. For this purpose it executes FTP SITE EXEC command following by the specified host command. In order for the host command to be successfully executed your FTP server must support SITE EXEC command and this feature must not be disabled. The user specified operation system command may include [TIME] and [FILE] macros that will be automatically replaced in the run-time with the source file time and target file name. The format of the file time value is driven by the "TIME FORMAT" property.

For example many UNIX systems support the touch command that can be used to change file times.

Example of the complete command:

```
touch -mct [TIME] [FILE]
```

This example command will be executed as

```
SITE EXEC touch -mct [TIME] [FILE]
```

For example if file time is 16-June-2001 2:00:05 PM, time format is YYYYMMDDHHMM.SS and file name is test.txt the final command text will be sent to the FTP server as

```
SITE EXEC touch –mct 200106161400.05 test.txt
```

Use the "TIME FORMAT" property to specify time format to be used with the user-defined command specified in the "SET TIME COMMAND" property. See previous 4 paragraphs for more information.

Important note:
The default value for the "FTP YEAR BUG" parameter in JAL script engine version 3.4.3 and earlier was –1. Starting with version 3.4.4 the default value is 0 meaning that no adjustment is needed.

See also:

- FTPGetFile
- FTPPutFile
- FTPResumeFile
- FTPAppendFile
- SyncFTPDir

FTPDir

Description: Returns comma-separated list of files in the specified directory on the specified FTP server

Syntax: FTPDir server, user, password, file_mask, return

Argument	Description
Server	A string whose value is host name of an FTP server (for example, ftp.microsoft.com) or the IP number of the site in ASCII dotted-decimal format (for example, 11.0.1.45)
User	A string whose value is the name of the user to log on
Password	A string whose value is the password to use to log on
File_mask	A string whose value is the file mask that you want to use to list file. File_mask can contain wildcard characters (* and ?). File_mask can contain full or partial file path. File_mask must be a valid FTP host Operation System file mask.
Return	A string variable that receives the returned value.

Return value: String. Returns comma-separated list of files.

Usage: On DOS/Windows based FTP hosts the FTPDir statement is equivalent to DOS *dir* command. For most UNIX flavors, the FTPDir statement is equivalent to UNIX *ls* command.
If you don't include file path to the file_mask then FTPDir statement returns files from the FTP server current directory.

By default JAL script engine uses standard non-secure FTP protocol for all FTP operations. If you are working with a secure FTP server (SFTP server) use **FTPConfig** statement to switch FTP protocol.

By default JAL script engine performs all FTP operations using default port for FTP servers. To specify a different port number use **FTPConfig** statement.

 **Important Notes:**

- Read **File Caching Internet Options** topic if you experience various "cannot create file/directory because it already exists" errors or files do not get updated during FTP downloads.

See also:

FTPFileExists
Dir
RemoteDir

FTPDirCreate

Description: Creates a new directory on remote FTP server.

Syntax: FTPDirCreate server, user, password, dir

Argument	Description
server	A string whose value is host name of an FTP server (for example, ftp.microsoft.com) or the IP number of the site in ASCII dotted-decimal format (for example, 11.0.1.45)
User	A string whose value is the name of the user to log on
password	A string whose value is the password to use to log on
dir	A string whose value is the full name of the directory to be created

Return value: None

Usage: By default JAL script engine uses standard non-secure FTP protocol for all FTP operations. If you are working with a secure FTP server (SFTP server) use **FTPConfig** statement to switch FTP protocol.

By default JAL script engine performs all FTP operations using default port for FTP servers. To specify a different port number use **FTPConfig** statement.

Important Notes:

- Directory and file names are case-sensitive on all FTP server platforms.
- Read **File Caching Internet Options** topic if you experience various "cannot create file/directory because it already exists" errors or files do not get updated during FTP downloads.

See also:

FTPDirDelete
FTPDir

FTPDirDelete

Description: Delete an existing directory on remote FTP server. If that directory contains files or subdirectories, JAL script engine deletes them recursively.

Syntax: FTPDirDelete server, user, password, dir

Argument	Description
server	A string whose value is host name of an FTP server (for example, ftp.microsoft.com) or the IP number of the site in ASCII dotted-decimal format (for example, 11.0.1.45)
user	A string whose value is the name of the user to log on
password	A string whose value is the password to use to log on
dir	A string whose value is the full name of the directory to be deleted

Return value: None

Usage: By default JAL script engine uses standard non-secure FTP protocol for all FTP operations. If you are working with a secure FTP server (SFTP server) use **FTPConfig** statement to switch FTP protocol.

By default JAL script engine performs all FTP operations using default port for FTP servers. To specify a different port number use **FTPConfig** statement.

By default JAL script engine uses standard non-secure FTP protocol for all FTP operations. If you are working with a secure FTP server (SFTP server) use **FTPConfig** statement to switch FTP protocol.

By default JAL script engine performs all FTP operations using default port for FTP servers. To specify a different port number use **FTPConfig** statement.

Important Notes:

- Directory and file names are case-sensitive on all FTP server platforms.
- Read **File Caching Internet Options** topic if you experience various "cannot create file/directory because it already exists" errors or files do not get updated during FTP downloads.

See also:

FTPDirCreate

FTPDeleteFile

FTPDir

FTPDeleteFile

Description: Deletes the specified file on the specified remote FTP server.

Syntax: FTPDeleteFile server, user, password, file

Argument	Description
Server	A string whose value is host name of an FTP server (for example, ftp.microsoft.com) or the IP number of the site in ASCII dotted-decimal format (for example, 11.0.1.45)
User	A string whose value is the name of the user to log on
password	A string whose value is the password to use to log on
file	A string whose value is the name of the file that you want to delete

Return value: None.

Usage: file can be either partially or fully qualified file name relative to the current directory. A backslash (\) or forward slash (/) can be used as the directory separator for the name. The FTPDeleteFile statement translates the directory name separators to the appropriate character before they are used.

By default JAL script engine uses standard non-secure FTP protocol for all FTP operations. If you are working with a secure FTP server (SFTP server) use **FTPConfig** statement to switch FTP protocol.

By default JAL script engine performs all FTP operations using default port for FTP servers. To specify a different port number use **FTPConfig** statement.

Tip:
FTPDeleteFile statement can delete multiple files in one pass. This is more efficient than calling FTPDeleteFile for each file separately, which requires a separate FTP connection for every file. To delete multiple files in one pass, specify multiple files names in the file parameter as a comma separated list.

Important Notes:

- Read **File Caching Internet Options** topic if you experience various "cannot create file/directory because it already exists" errors or files do not get updated during FTP downloads.

See also:

FTPGetFile

FTPFileDateTime

Description: Reports date and time of the specified file on the specified FTP server.

Syntax: FTPFileDateTime server, user, password, file, return

Argument	Description
server	A string whose value is host name of an FTP server (for example, ftp.microsoft.com) or the IP number of the site in ASCII dotted-decimal format (for example, 11.0.1.45)
user	A string whose value is the name of the user to log on
password	A string whose value is the password to use to log on
file	A string whose value is the name of the file that you want to check
return	A datetime variable that receives the returned value

Return value: Datetime. Returns date/time of the specified file.

Usage: file can be either partially or fully qualified file name relative to the current directory. A backslash (\) or forward slash (/) can be used as the directory separator for the name. The FTPFileDateTime statement translates the directory name separators to the appropriate character before they are used.

By default JAL script engine uses standard non-secure FTP protocol for all FTP operations. If you are working with a secure FTP server (SFTP server) use **FTPConfig** statement to switch FTP protocol.

By default JAL script engine performs all FTP operations using default port for FTP servers. To specify a different port number use **FTPConfig** statement.

Important Notes:

- File names are case-sensitive on all FTP server platforms.
- Read **File Caching Internet Options** topic if you experience various "cannot create file/directory because it already exists" errors or files do not get updated during FTP downloads.

See also:

FTPFileSize

FTPFileExists

FTPFileSize

Description: Reports size of the specified file on the specified FTP server.

Syntax: FTPFileSize server, user, password, file, return

Argument	Description
server	A string whose value is host name of an FTP server (for example, ftp.microsoft.com) or the IP number of the site in ASCII dotted-decimal format (for example, 11.0.1.45)
user	A string whose value is the name of the user to log on
password	A string whose value is the password to use to log on
file	A string whose value is the name of the file that you want to check
return	A numeric variable that receives the returned value

Return value: Number. Returns size of the specified file.

Usage: file can be either partially or fully qualified file name relative to the current directory. A backslash (\) or forward slash (/) can be used as the directory separator for the name. The FTPFileSize statement translates the directory name separators to the appropriate character before they are used.

By default JAL script engine uses standard non-secure FTP protocol for all FTP operations. If you are working with a secure FTP server (SFTP server) use **FTPConfig** statement to switch FTP protocol.

By default JAL script engine performs all FTP operations using default port for FTP servers. To specify a different port number use **FTPConfig** statement.

File names are case-sensitive on all FTP server platforms.

See also:

FTPFileDateTime
FTPFileExists

FTPFileExists

Description: Reports whether the specified file exists on the specified remote FTP server.

Syntax: FTPFileExists server, user, password, file, return

Argument	Description
server	A string whose value is host name of an FTP server (for example, ftp.microsoft.com) or the IP number of the site in ASCII dotted-decimal format (for example, 11.0.1.45)
user	A string whose value is the name of the user to log on
password	A string whose value is the password to use to log on
file	A string whose value is the name of the file that you want to check
return	A boolean variable that receives the returned value

Return value: Boolean. Returns TRUE if the file exists, FALSE if it does not exist.

Usage: file can be either partially or fully qualified file name relative to the current directory. A backslash (\) or forward slash (/) can be used as the directory separator for the name. The FTPFileExists statement translates the directory name separators to the appropriate character before they are used.

By default JAL script engine uses standard non-secure FTP protocol for all FTP operations. If you are working with a secure FTP server (SFTP server) use **FTPConfig** statement to switch FTP protocol.

By default JAL script engine performs all FTP operations using default port for FTP servers. To specify a different port number use **FTPConfig** statement.

Important Notes:

- File names are case-sensitive on all FTP server platforms.
- Read **File Caching Internet Options** topic if you experience various "cannot create file/directory because it already exists" errors or files do not get updated during FTP downloads.

See also:

FTPGetFile

FTPDir

FTPGetFile

Description: Retrieves a file from the specified FTP server and stores it under the specified file name, creating a new local file in the process.

Syntax: FTPGetFile server, user, password, source, target

Argument	Description
server	A string whose value is host name of an FTP server (for example, ftp.microsoft.com) or the IP number of the site in ASCII dotted-decimal format (for example, 11.0.1.45)
user	A string whose value is the name of the user to log on

password	A string whose value is the password to use to log on
source	A string whose value is the name of the file to retrieve from the remote system
target	A string whose value is the name of the file to create on the local system

Return value: None.

Usage: Both source and target file can be either partially or fully qualified file names relative to the current directory. A backslash (\) or forward slash (/) can be used as the directory separator for either name. The FTPGetFile statement translates the directory name separators to the appropriate character before they are used. By default FTPGetFile statement uses binary transfer mode. To change transfer mode to ASCII, use **FTPConfig** statement to modify the "TRANSFER MODE" setting.

By default JAL script engine uses standard non-secure FTP protocol for all FTP operations. If you are working with a secure FTP server (SFTP server) use **FTPConfig** statement to switch FTP protocol.

By default JAL script engine performs all FTP operations using default port for FTP servers. To specify a different port number use **FTPConfig** statement.

File names are case-sensitive on all FTP server platforms.

 **Tip:**
FTPGetFile statement can transfer multiple files in one pass. This is more efficient than calling FTPGetFile for each file separately, which requires a separate FTP connection for every file. To transfer multiple files in one pass, specify the source files as a comma separated list. The target files must be also specified as a comma separated list. Make sure to specify the same number of file names in the source and target file lists.

 **Important Notes:**

- Secure FTP protocol does not currently support ASCII transfer mode, that's why all file transfers are always performed using Binary transfer mode regardless of the "TRANSFER MODE" setting.
- Read **File Caching Internet Options** topic if you experience various "cannot create file/directory because it already exists" errors or files do not get updated during FTP downloads.

See also:

FTPPutFile
FTPConfig
SyncFTPDir

FTPResumeFile

Description: Retrieves a file from the specified FTP server and stores it under the specified file name, creating a new local file in the process or appending to local file if it already exists.

Syntax: FTPResumeFile server, user, password, source, target

Argument	Description
server	A string whose value is host name of an FTP server (for example, ftp.microsoft.com) or the IP number of the site in ASCII dotted-decimal format (for example, 11.0.1.45)
user	A string whose value is the name of the user to log on
password	A string whose value is the password to use to log on
source	A string whose value is the name of the file to retrieve from the remote system
target	A string whose value is the name of the file to create on the local system

Return value: None.

Usage: Both source and target file can be either partially or fully qualified file names relative to the current directory. A backslash (\) or forward slash (/) can be used as the directory separator for either name. The FTPResumeFile statement translates the directory name separators to the appropriate character before they are used. By default FTPResumeFile statement uses binary transfer mode. To change transfer mode to ASCII, use **FTPConfig** statement to modify the "TRANSFER MODE" setting.

FTPResumeFile statement is identical to **FTPGetFile** statement except that it attempts to resume broken downloads or perform incremental downloads of files whose size have increased since the last download.

By default JAL script engine performs all FTP operations using default port for FTP servers. To specify a different port number use **FTPConfig** statement.

File names are case-sensitive on all FTP server platforms.

Tip:
FTPResumeFile statement can transfer multiple files in one pass. This is more efficient than calling FTPResumeFile for each file separately, which requires a separate FTP connection for every file. To transfer multiple files in one pass, specify the source files as a comma separated list. The target files must be also specified as a comma separated list. Make sure to specify the same number of file names in the source and target file lists.

Important Note:

- Not all FTP servers support RESUME operations. An error will occur if you attempt to run FTPResumeFile statement for a server that does not support this feature.
- FTPResumeFile statement is supported only in standard FTP mode. It is not supported in Secure FTP mode (SFTP), because Secure FTP protocol does not currently provide support for RESUME operations.
- Read **File Caching Internet Options** topic if you experience various "cannot create file/directory because it already exists" errors or files do not get updated during FTP downloads.
- You must have Microsoft ® Internet Explorer version 5.0 or better installed on the computer in order to use FTPCommand, FTPResumeFile and FTPAppendFile statements.

See also:

FTPGetFile
FTPPutFile
FTPConfig
SyncFTPDir

FTPPutFile

Description: Transfers a file from the local system to specified remote FTP server and stores it under the specified file name, creating a new remote file in the process.

Syntax: FTPPutFile server, user, password, source, target

Argument	Description
server	A string whose value is host name of an FTP server (for example, ftp.microsoft.com) or the IP number of the site in ASCII dotted-decimal format (for example, 11.0.1.45)
user	A string whose value is the name of the user to log on
password	A string whose value is the password to use to log on
source	A string whose value is the name of the file to transfer from the local system
target	A string whose value is the name of the file to create on the remote system

Return value: None.

Usage: Both source and target file can be either partially or fully qualified file names relative to the current directory. A backslash (\) or forward slash (/) can be used as the directory separator for either name. The FTPPutFile statement translates the directory name separators to the appropriate character before they are used. By default FTPPutFile statement uses binary transfer mode. To change transfer mode to ASCII, use **FTPConfig** statement to modify the "TRANSFER MODE" setting.

By default JAL script engine uses standard non-secure FTP protocol for all FTP operations. If you are working with a secure FTP server (SFTP server) use **FTPConfig** statement to switch FTP protocol.

By default JAL script engine performs all FTP operations using default port for FTP servers. To specify a different port number use **FTPConfig** statement.

File names are case-sensitive on all FTP server platforms.

 **Tip:**
FTPPutFile statement can transfer multiple files in one pass. This is more efficient than calling FTPPutFile for each file separately, which requires a separate FTP connection for every file. To transfer multiple files in one pass, specify the source files as a comma separated list. The target files must be also specified as a comma separated list. Make sure to specify the same number of file names in the source and target file lists.

 **Important Notes:**

- Secure FTP protocol does not currently support ASCII transfer mode, that's why all file transfers are always performed using Binary transfer mode regardless of the "TRANSFER MODE" setting.
- Read **File Caching Internet Options** topic if you experience various "cannot create file/directory because it already exists" errors or files do not get updated during FTP downloads.

See also:

FTPGetFile
FTPConfig
SyncFTPDir

FTPAppendFile

Description: Transfers a file from the local system to specified remote FTP server and stores it under the specified file name, creating a new remote file in the process or appending data to an existing remote file.

Syntax: FTPAppendFile server, user, password, source, target

Argument	Description
server	A string whose value is host name of an FTP server (for example, ftp.microsoft.com) or the IP number of the site in ASCII dotted-decimal format (for example, 11.0.1.45)
user	A string whose value is the name of the user to log on
password	A string whose value is the password to use to log on
source	A string whose value is the name of the file to transfer from the local system
target	A string whose value is the name of the file to create on the remote system

Return value: None.

Usage: Both source and target file can be either partially or fully qualified file names relative to the current directory. A backslash (\) or forward slash (/) can be used as the directory separator for either name. The FTPAppendFile statement translates the directory name separators to the appropriate character before they are used. By default FTPappendFile statement uses binary transfer mode. To change transfer mode to ASCII, use **FTPConfig** statement to modify the "TRANSFER MODE" setting.

FTPAppendFile statement is identical to **FTPPutFile** statement except that it attempts to append to an existing file on the FTP server rather than overwrite it.

By default JAL script engine performs all FTP operations using default port for FTP servers. To specify a different port number use **FTPConfig** statement.

File names are case-sensitive on all FTP server platforms.

 **Tip:**
FTPAppendFile statement can transfer multiple files in one pass. This is more efficient than calling FTPAppendFile for each file separately, which requires a separate FTP connection for every file. To transfer multiple files in one pass, specify the source files as a comma separated list. The target files must be also specified as a comma separated list. Make sure to specify the same number of file names in the source and target file lists.

 **Important Note:**

- Not all FTP servers support APPEND operations. An error will occur if you attempt to run FTPAppendFile statement for a server that does not support this feature.
- FTPAppendFile statement is supported only in standard FTP mode. It is not supported in Secure FTP mode (SFTP), because Secure FTP protocol does not currently provide support for APPEND operations.
- Read **File Caching Internet Options** topic if you experience various "cannot create file/directory because it already exists" errors or files do not get updated during FTP downloads.

- You must have Microsoft ® Internet Explorer version 5.0 or better installed on the computer in order to use FTPCommand, FTPResumeFile and FTPAppendFile statements.

See also:

FTPPutFile
FTPGetFile
FTPConfig
SyncFTPDir

FTPRenameFile

Description: Renames the specified remote file on the specified FTP server.

Syntax: FTPRenameFile server, user, password, oldname, newname

Argument	Description
Server	A string whose value is host name of an FTP server (for example, ftp.microsoft.com) or the IP number of the site in ASCII dotted-decimal format (for example, 11.0.1.45)
User	A string whose value is the name of the user to log on
Password	A string whose value is the password to use to log on
Oldname	A string whose value is the name of the file to rename
Newname	A string whose value is the new name of the file

Return value: None.

Usage: Both oldname and newname file can be either partially or fully qualified file names relative to the current directory. A backslash (\) or forward slash (/) can be used as the directory separator for either name. The FTPRenameFile statement translates the directory name separators to the appropriate character before they are used.

By default JAL script engine uses standard non-secure FTP protocol for all FTP operations. If you are working with a secure FTP server (SFTP server) use **FTPConfig** statement to switch FTP protocol.

By default JAL script engine performs all FTP operations using default port for FTP servers. To specify a different port number use **FTPConfig** statement.

File names are case-sensitive on all FTP server platforms.

See also:

FTPPutFile
FTPGetFile
FTPDeleteFile

FTPCommand

Description: Executes arbitrary commands directly on the specified FTP server.

Syntax: FTPCommand server, user, password, command

Argument	Description
server	A string whose value is host name of an FTP server (for example, ftp.microsoft.com) or the IP number of the site in ASCII dotted-decimal format (for example, 11.0.1.45)
user	A string whose value is the name of the user to log on
password	A string whose value is the password to use to log on
command	A string whose value is the command that you want to execute on the server

Return value: None

Usage: The FTPCommand statement allows you to enter commands directly to the FTP server. The available commands vary depending on the type of server, and can usually be determined by logging on to the server with the command line FTP client and using the "remotehelp" command. A typical output of "remotehelp" command looks like the following:

```
ftp> remotehelp
  The following commands are recognized (* =>'s unimplemented).

   USER    PORT    STOR    MSAM*   RNTO    NLST    MKD     CDUP
   PASS    PASV    APPE    MRSQ*   ABOR    SITE    XMKD    XCUP
   ACCT*   TYPE    MLFL*   MRCP*   DELE    SYST    RMD     STOU
   SMNT*   STRU    MAIL*   ALLO    CWD     STAT    XRMD    SIZE
   REIN*   MODE    MSND*   REST    XCWD    HELP    PWD     MDTM
   QUIT    RETR    MSOM*   RNFR    LIST    NOOP    XPWD
```

By default JAL script engine performs all FTP operations using default port for FTP servers. To specify a different port number use **FTPConfig** statement.

Important Notes:

- Read **File Caching Internet Options** topic if you experience various "cannot create file/directory because it already exists" errors or files do not get updated during FTP downloads.
- Not all FTP servers support QUOTE operation which is used to execute remote commands. An error will occur if you attempt to run FTPCommand statement for a server that does not support this feature.
- FTPCommand statement is supported only in standard FTP mode. It is not supported in Secure FTP mode (SFTP), because Secure FTP protocol does not currently provide support for QUOTE operations.
- The SITE command can be used to execute operation system commands on the remote FTP server computer.

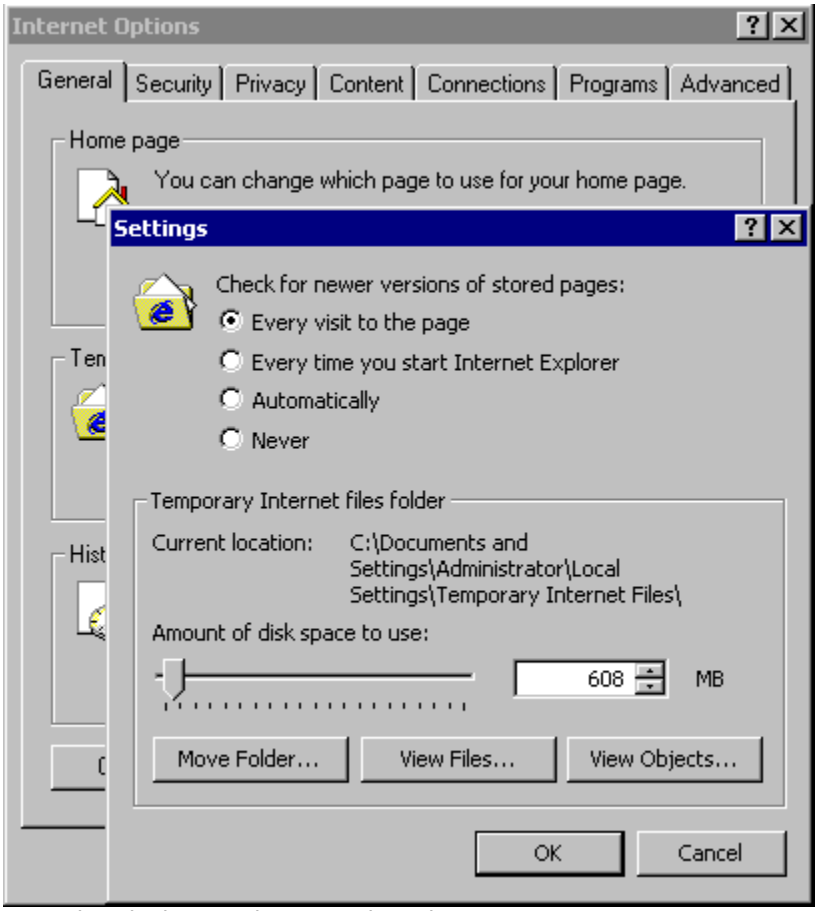
  For example to set read permissions for file *myfile.txt* you can execute the following command (this example is given for a UNIX based FTP server):

  ```
  FTPCommand "myserver", "user", "password", "SITE chmod +r /home/myfile.txt"
  ```

- Executing FTPCommand statement has no effect on subsequent FTP operations because each FTP operation is executed in a separate session.
- You must have Microsoft ® Internet Explorer version 5.0 or better installed on the computer in order to use FTPCommand, FTPResumeFile and FTPAppendFile statements.

File Caching Internet Options

JAL script engine utilizes a number of Windows API functions for FTP and Internet file operations. As a result of that certain Windows settings can affect job processing within 24x7. If you experience various "cannot create file/directory because it already exists" errors or files do not get updated during FTP downloads the problem may be with your Windows settings (local file cache). In the Windows Control Panel select " Internet Options " applet and then under " Temporary Internet Files " select " settings " and pick the "Every Visit to the page " option rather than the default "



Every time the browser is restarted " option.

The problem may be also with your Internet Service Provider (ISP). If your ISP uses some caching techniques, you may be working with your old files for certain period of time (regardless of whether you have updated the files using one of the supported FTP methods or not. But this problem should not exist for more than a few hours. If you are seeing the old file for more than one day, then the problem may not be related to the ISP. If you believe your problem is ISP related contact your ISP support and request to turn off the caching options.

Job management statements

JobCreate

Description: Creates a new job.

Syntax: JobCreate return

Argument	Description
Return	Number

Return value: Number. Returns job ID for the new job. The new job inherites default job properties.

Usage: Use JobCreate in your scripts to programmatically create new jobs. Use JobModify statement to setup properties of the created job . Use JobEnable statement with the TRUE status to enable the job after you done with setting job properties.

 **Important note:**

- The JobCreate statement is not supported in remote jobs executed on 24x7 Remote Agents. An error “Job not found” will occur if you use this statement. However, it can be used if the remote job is executed on the 24x7 Master Scheduler.

See also:

JobDelete
JobEnable
JobModify

JobDelete

Description: Deletes the specified job.

Syntax: JobDelete job

Argument	Description
Job	A string whose value is ether job ID or job name

Return value: None

Usage: Use JobDelete in your scripts to programmatically delete jobs. JobDelete permanently deletes the specified job from the active job pool. The deleted job cannot be recovered at a later time. Use JobEnable statement with the FALSE state to temporary disable jobs. If the specified job is not found, an error occurs.

Important note:

- The JobDelete statement is not supported in remote jobs executed on 24x7 Remote Agents. An error “Job not found” will occur if you use this statement. However, it can be used if the remote job is executed on the 24x7 Master Scheduler.

See also:

JobEnable
JobGetStatus

JobDescribe

Description: Describes properties of the specified job.

Syntax: JobDescribe job, property, value

Argument	Description
job	A string whose value is ether job ID or job name
property	A string whose value is the property that you want to modify. See Job Properties topic for list and description of available properties
value	A string variable that receives the returned value.

Return value: A string whose value matches the value for the property. The returned value is always converted to a string.

Usage: Use this statement to retrieve job definitions, job schedules and triggers programmatically. For example, you can use JobDescribe to create customizable job monitors.

Notes:

- The JobDescribe statement is not supported in remote jobs executed on 24x7 Remote Agents. An error “Job not found” will occur if you use this statement. However, it can be used if the remote job is executed on the 24x7 Master Scheduler.

See also:

JobModify
JobEnable
Job Properties

JobList

Description: Returns comma-separated list of job IDs in the active job database.

Syntax: JobList folder, return

Argument	Description
folder	A string whose value is the name of the folder in which you want to list jobs. Specify an empty string ("") for the folder to obtain a list of all job IDs in the job database.
return	A string variable that receives the returned value.

Return value: A string containing comma-separated list of job IDs.

Tip:
- You can use the GetToken and LoopWhile statements to parse the returned job list.

Notes:
- The JobList statement is not supported in remote jobs executed on 24x7 Remote Agents. However, it can be used in remote jobs executed on 24x7 Master Schedulers.

See also:

JobModify
JobEnable
JobDescribe
Job Properties

JobEnable

Description: Enables or disables the specified job.

Syntax: JobEnable job, state

Argument	Description
job	A string whose value is ether job ID or job name
state	A boolean whose value is the new job state. Specify TRUE to enable the job or FALSE to disable the job

Return value: None

Usage: Use this statement to enable/disable jobs in the active job pool. If the specified job is not found, an error occurs.

Notes:
- Jobs disabled by using JobEnable statement remain in the active job pool until job database "save" is invoked via 24x7 GUI or via external interface. On "save" all disabled jobs are purged from the active job pool. Jobs disabled via 24x7 GUI are purged from the active job pool right away. However, disabled jobs are not removed from the job database. To physically remove a job from the job database use JobDelete statement, 24x7 GUI or one of the supported external interfaces.
- The JobEnable statement is not supported in remote jobs executed on 24x7 Remote Agents. An error "Job not found" will occur if you use this statement. However, it can be used if the remote job is executed on the 24x7 Master Scheduler.

See also:

JobRun

JobModify

JobGetStatus

Description: Reports current status of the specified job.

Syntax: JobGetStatus job, return

Argument	Description
job	A string whose value is ether job ID or job name
return	A numeric whose value is the job status.

Return value: Number. Returned job status can be one of the following:

-1	Error job. Job may have this status as a result of incomplete job definition or if a run-time error occurred during last job run.
-2	Job is executing job notification action such as sending email message, executing database command, etc.
-3	Job is running.
-5	First job run is pending. This job hasn't run since the last scheduler restart.
-6	Unknown job status. Status of asynchronous job of “Program” type might be unknown after job start. This status can be also reported in case multiple job instances found in job queues.
0	Job successfully completed. Note: an asynchronous job of “Program” type also may have this status after it successfully started but before the program actually finished running. That's the nature of asynchronous jobs.
Any other number	Successfully completed (applicable to asynchronous jobs of “Program” type only). A job may have this status after it successfully started and is still running.

Usage: Use this statement to retrieve job status programmatically from the script. This statement can be useful in building various job monitors.

Notes:

- Use JobDescribe statement to found out job Enabled/Disabled state.

You cannot change job status directly. Job status is the internal job state maintained by the JAL script engine.

- The JobGetStatus statement is not supported in remote jobs executed on 24x7 Remote Agents. An error “Job not found” will occur if you use this statement. However, it can be used if the remote job is executed on the 24x7 Master Scheduler.
- An asynchronous job of “Program” type may have 0 status even if the started “program” (process) is still running in any of the following cases: started program spawned one or more child processes after which the main entry point process has terminated; started program is not responding or has security attributes that do not allow querying status of the process.

See also:

JobRun
JobDescribe

JobModify

Description: Modifies properties of the specified job.

Syntax: JobModify job, property, new_value

Argument	Description
job	A string whose value is ether job ID or job name
property	A string whose value is the property that you want to modify. See Job Properties topic for list and description of available properties
new_value	A string whose value is the new value for the property

Return value: None

Usage: Use this statement to modify job definitions, job schedules and triggers programmatically. For example, you can use JobModify to reschedule jobs for a later run when the exact start time is unknown in design-time.

 **Notes:**
Modified jobs are updated immediately in both places: the active job pool and the job database. JAL script engine internally triggers “save" command after every change.

- Side effect: On “save,"all disabled jobs are purged from the active job pool. However, disabled jobs are not removed from the job database. To physically remove a job from the job database use JobDelete statement, 24x7 GUI or one of supported external interfaces.
- The JobModify statement is not supported in remote jobs executed on 24x7 Remote Agents. An error “Job not found” will occur if you use this statement. However, it can be used if the remote job is executed on the 24x7 Master Scheduler.

See also:

JobModify
JobDescribe
JobEnable
Job Properties

JobHold

Description: Places the specified job on hold.

Syntax: JobHold job_runtime_id

Argument	Description
job_runtime_id	A number whose value is job runtime ID in job queue. Job runtime ID uniquely identifies job instance in job queues.

Return value: None

Usage: Use JobHold in your scripts to programmatically delay queued jobs. Job run-time ID is returned by JobSendToQueue statement and can be also obtained using QueueJobList statement. JobHold can delay queued jobs only. A held job cannot start until it is released. the queue manager ignores held jobs. An error occurs if the specified job_runtime_id cannot be found

Important note:

- This statement is not supported in remote jobs executed on 24x7 Remote Agents. An error “Job not found” will occur if you use this statement.
- Do not confuse JobHold and JobDisable statements. The last one can be used to disable job definition and remove if from the active job pool.
- This statement is not supported in standalone JAL scripts executed from command line.

See also:

QueueJobList
JobSendToQueue
JobEnable
JobRelease
JobRun

JobRelease

Description: Releases the specified job from held state and allows the queue to process this job.

Syntax: JobRelease job_runtime_id

Argument	Description
job_runtime_id	A number whose value is job runtime ID in job queue. Job runtime ID uniquely identifies job instance in job queues.

Return value: None

Usage: Use JobRelease in your scripts to programmatically releases held jobs. Job run-time ID is returned by JobSendToQueue statement and can be also obtained using QueueJobList statement. When a job is released it goes to the end of the queue. If the queue manager is not busy, it picks the released job and starts running it immediately. If the queue manager is busy running other jobs, the released job will remain in the queue until the queue manager is free to run it. An error occurs if the specified job_runtime_id cannot be found

Important note:

- This statement is not supported in remote jobs executed on 24x7 Remote Agents. An error “Job not found” will occur if you use this statement.
- Do not confuse JobRelease and JobEnable statements. The last one can be used to enable previous disabled job definition and place them back into active job pool.
- This statement is not supported in standalone JAL scripts executed from command line.

See also:

QueueJobList
JobSendToQueue

JobEnable
JobHold
JobRun

JobKill

Description: Kills specified job if it is already running and removes it from the job queue.

Syntax: JobKill job_runtime_id

Argument	Description
job_runtime_id	A number whose value is job runtime ID in job queue. Job runtime ID uniquely identifies job instance in job queues.

Return value: None

Usage: Use JobKill in your scripts to programmatically terminate running jobs and/or delete jobs instances from job queues. Job run-time ID is returned by JobSendToQueue statement and can be also obtained using QueueJobList statement. An error occurs if the specified job_runtime_id cannot be found

 **Important note:**

- This statement is not supported in remote jobs executed on 24x7 Remote Agents. An error “Job not found” will occur if you use this statement.
- Do not confuse JobKill, JobDelete and JobDisable statements. See descriptions of these statements for more details.
- This statement is not supported in standalone JAL scripts executed from command line.

See also:

QueueJobList
JobSendToQueue
JobDelete
JobHold
JobRun

JobRun

Description: Runs the specified job.

Syntax: JobRun job

Argument	Description
Job	A string whose value is ether job ID or job name

Return value: None

Usage: Use JobRun in your scripts to programmatically start other jobs. This allows creation of simple and complex batch jobs.
JobRun can start jobs from the active job pool only. If the specified job is not found, an error occurs.

Important note:
- The JobRun statement is not supported in remote jobs executed on 24x7 Remote Agents. An error “Job not found” will occur if you use this statement. However, it can be used if the remote job is executed on the 24x7 Master Scheduler.

See also:
JobEnable
JobGetStatus
JobRemoteRun

JobRemoteRun

Description: Runs the specified job using the specified remote agent.

Syntax: JobRemoteRun job, agent

Argument	Description
Job	A string whose value is ether job ID or job name
Agent	A string whose value is the name of 24x7 Remote Agent or 24x7 Master Scheduler as it is specified in the Remote Agent profile.

Return value: None

Usage:
Use JobRemoteRun in your scripts to programmatically start other jobs. This allows creation of simple and complex batch jobs.

JobRemoteRun allows dynamic selection for the Remote Agent that will execute the specified job. JobRemoteRun ignores name of the default Remote Agent that may be assigned to the job in the job properties, where JobRun statement instead uses the default Remote Agent if there is any.

JobRemoteRun can start jobs from the active job pool only. If the specified job is not found, an error occurs.

Important note:
- The JobRemoteRun statement is not supported in remote jobs executed on 24x7 Remote Agents. An error “Job not found” will occur if you use this statement. However, it can be used if the remote job is executed on the 24x7 Master Scheduler.

See also:
JobEnable
JobGetStatus
JobRun
GetRemoteVariable
SetRemoteVariable

JobSendToQueue

Description: Queues the specified job for later execution. The job goes to the queue specified in job properties.

Syntax: JobSendToQueue job, return

Argument	Description
Job	A string whose value is ether job ID or job name
return	A numeric variable receiving the value of the job run-time ID

Return value: None

Usage: Use JobSendToQueue in your scripts to programmatically start other jobs. This allows creation of simple and complex batch jobs. JobSendToQueues can start jobs from the active job pool only. If the specified job is not found, an error occurs.

Use JobSendToQueue statement to add jobs to queues and allow calling jobs to continue running not waiting for their completion.

Important note:

- This statement is not supported in remote jobs executed on 24x7 Remote Agents. An error “Job not found” will occur if you use this statement. However, it can be used if a remote job is executed within 24x7 Master Scheduler.
- This statement is not supported in standalone JAL scripts executed from command line.

See also:

QueueJobList
JobRun
JobRemoteRun

QueueJobList

Description: Reports jobs being executed and waiting in job queues.

Syntax: QueueJobList queue_name, return

Argument	Description
queue_name	A string whose value job queue name
return	A string variable receiving the output list

Return value: None

Usage: QueueJobList returns tab-separated multi-line value describing jobs waiting and running in the specified queue. The returned value is reported in the following format

job 1 run time ID	job 1 status	job 1 ID	job 1 process identifier
job 2 run time ID	job 2 status	job 2 ID	job 2 process identifier
job 3 run time ID	job 3 status	job 3 ID	job 3 process identifier

…
job N run time ID job N status job N ID job N process identifier

The number of returned lines matches the number of jobs currently running and waiting in the specified queue. Individual values within each line are tab separated. The returned value can be parsed and split into individual elements using GetToken statement.

Important note:
- This statement is not supported in remote jobs executed on 24x7 Remote Agents. However, it can be used if a remote job is executed within 24x7 Master Scheduler.
- This statement is not supported in standalone JAL scripts executed from command line.

See also:
JobList
JobRun
JobSendToQueue

GetRemoteVariable

Description: Obtains value of the specified global variable on the specified 24x7 Remote Agent or 24x7 Master Scheduler.

Syntax: GetRemoteVariable agent, variable, return

Argument	Description
Agent	A string whose value is the name of 24x7 Remote Agent or 24x7 Master Scheduler as it is specified in the Remote Agent profile.
Variable	A string whose value is the name of the global variable that must exists in the run-time environment of the Agent.
Return	A string variable that receives the returned value.

Return value: Returns value of a global variable stored in the run-time environment of the Agent. The value is returned in the string format regardless of the data type of the remote variable.

Usage:
Use GetRemoteVariable and SetRemoteVariable statements to pass data between networked JAL script engine components. This can be used to build complex distributed jobs. This can be also used for synchronization of jobs running simultaneously on different computers.

See also:
Dim
Set
SetRemoteVariable
JobGetStatus
JobRemoteRun

SetRemoteVariable

Description: Sets value of the specified global variable on the specified 24x7 Remote Agent or 24x7 Master Scheduler.

Syntax: SetRemoteVariable agent, variable, new_value

Argument	Description
Agent	A string whose value is the name of 24x7 Remote Agent or 24x7 Master Scheduler as it is specified in the Remote Agent profile.
Variable	A string whose value is the name of the global variable that must exists in the run-time environment of the Agent.
New_Value	A constant or a variable whose value you want to store in the remote variable. The data type of the new_value must match the data type of the remote global variable.

Return value: None.

Usage:
Use GetRemoteVariable and SetRemoteVariable statements to pass data between networked JAL script engine components. This can be used to build complex distributed jobs. This can be also used for synchronization of jobs running simultaneously on different computers.

See also:

Dim
Set
JobRemoteRun
GetRemoteVariable

RemoteCopyJob

Description: Copies an existing job to the specified remote JAL script engine.

Syntax: RemoteCopyJob host, job, append

Argument	Description
host	A string whose value is the name 24x7 Master Scheduler as it is specified in the Remote Agent profile.
job	A string whose value is ether source job ID or job name.
append	A boolean whose value indicates how you want to copy the job. Use TRUE value for "always **append**" mode and FALSE for "**replace** if exists, otherwise **append**" mode.

	If a TRUE is specified, a new job is created and appended to the remote job database. The properties of the newly created job are exactly the same as properties of the source job. The only exception is the new job ID, which must be unique and because of that it can differ from ID of the source job. If the remote database does not have a folder whose name matches the name of the folder containing the source job, then RemoteCopyJob creates a new folder in the target job database. If a FALSE is specified, a new job is created only if there is no job with the same name and folder exists in the target job database. If either job or folder do not exist in the target job database, then the RemoteCopyJob operation proceeds just as if a TRUE value was specified. If the same job is found in the target job database, then its definition is updated to match the definition of the source job.

Return value: None

Usage: Use this statement to programmatically replicate jobs from the JAL script engine executing the RemoteCopyJob statement to the remote 24x7 Master Scheduler.

Important note:

- The RemoteCopyJob statement cannot be used for copying jobs from/to 24x7 Remote Agents. It can be only used to append or replace jobs on remote 24x7 Master Schedulers.

See also:

RemoteJobCreate
RemoteJobModify
RemoteCopyJobFolder
RemoteCopyJobDatabase

RemoteCopyJobFolder

Description: Copies job folder and all jobs contained in that folder to the specified remote JAL script engine.

Syntax: RemoteCopyJobFolder host, folder, append

Argument	Description
host	A string whose value is the name 24x7 Master Scheduler as it is specified in the Remote Agent profile.
folder	A string whose value is source folder name.
append	A boolean whose value indicates how you want to copy jobs from the source folder. Use TRUE value for "always **append**" mode and FALSE for "**replace** if exists, otherwise **append**" mode. JAL script engine recursively copies jobs from the source folder as if the RemoteCopyJob statement was executed for each of them.

	If the target folder does not exists, RemoteCopyJobFolder creates it. If the target folder exists and a FALSE is specified, the target folder is cleaned before the job copy operation begins.

Return value: None

Usage: Use this statement to programmatically replicate folders and jobs from the JAL script engine executing the RemoteCopyJobFolder statement to the remote 24x7 Master Scheduler.

Important note:

- The RemoteCopyJobFolder statement cannot be used for copying jobs from/to 24x7 Remote Agents. It can be only used to append or replace jobs on remote 24x7 Master Schedulers.

See also:

RemoteJobCreate
RemoteJobModify
RemoteCopyJob
RemoteCopyJobDatabase

RemoteCopyJobDatabase

Description: Copies alls job folders and jobs to the specified remote JAL script engine.

Syntax: RemoteCopyJobDatabase host, append

Argument	Description
host	A string whose value is the name 24x7 Master Scheduler as it is specified in the Remote Agent profile.
append	A boolean whose value indicates how you want to copy folders and jobs from the source job database. Use TRUE value for "always **append**" mode and FALSE for "**replace** if exists, otherwise **append**" mode. JAL script engine recursively copies folders and jobs from the source database as if the RemoteCopyJobFolder statement was executed for each folder. RemoteCopyJobDatabase creates folders that do not exist in the target database. If a FALSE value is specified, RemoteCopyJobDatabase cleans target folders that already exist; it also deletes folders that exist in the target job database but not in the source job database.

Return value: None

Usage: Use this statement to programmatically replicate job database from the JAL script engine executing the RemoteCopyJobDatabase statement to the remote 24x7 Master Scheduler.

Important note:

- The RemoteCopyJobDatabase statement cannot be used for copying jobs from/to 24x7 Remote Agents. It can be only used to append or replace jobs and folders on remote 24x7 Master Schedulers.

See also:

RemoteJobCreate
RemoteJobDelete
RemoteCopyJob
RemoteCopyJobFolder
RemoteCopySettings

RemoteCopySettings

Description: Copies 24x7 system settings to the specified remote JAL script engine or 24x7 Remote Agent.

Syntax: RemoteCopySettings host, settings_group

Argument	Description
host	A string whose value is the name 24x7 Master Scheduler as it is specified in the Remote Agent profile.
settings_group	A string whose value indicates which settings you want to copy. The following values are supported: • "AGENT PROFILES" – use this value to copy Remote Agent profiles • "DB PROFILES" – use this value to copy Database Profiles • "QUEUES" – use this value to copy Queues settings • "HOLIDAYS" – use this value to copy holidays table • "SCRIPT LIBRARY" – use this value to copy the Script Library • "SECURITY" – use this value to copy Security settings, including users and permissions • "" – Use an empty string to copy all of the above

Return value: None

Usage: Use this statement to programmatically replicate 24x7 configuration profiles and data from the JAL script engine (or 24x7 Remote Agent) executing the RemoteCopyJobSettings statement to the remote 24x7 Master Scheduler (or 24x7 Remote Agent).

See also:

Script Library
Job Queues
Remote agent Profiles
Database Profiles
Security
Holiday List

RemoteCopyJobDatabase

RemoteJobCreate

Description: Creates a new job on the specified remote JAL script engine

Syntax: RemoteJobCreate host, job_data, return

Argument	Description
host	A string whose value is the name 24x7 Master Scheduler as it is specified in the Remote Agent profile.
job_data	A string whose value is the job definition in **JDL format**. For examples on how to specify job definition please see available Job Templates that can be found in the Template directory.
return	A numeric variable that receives the returned value.

Return value: Number. Returns job ID for the new job.

Usage: Use RemoteJobCreate in your scripts to programmatically create new remote jobs. Use RemoteJobModify statement to modify properties of the created job.

 **Important note:**

- The RemoteJobCreate statement cannot be used to create jobs on 24x7 Remote Agents. It can be only used to create jobs on remote 24x7 Master Schedulers.

See also:

RemoteJobDelete
RemoteJobEnable
RemoteJobModify
JobCreate

RemoteJobDelete

Description: Delete an existing job on the specified remote JAL script engine

Syntax: RemoteJobDelete host, job

Argument	Description
host	A string whose value is the name 24x7 Master Scheduler as it is specified in the Remote Agent profile.

job	A string whose value is ether job ID or job name.

Return value: None.

Usage: Use RemoteJobDelete in your scripts to programmatically delete remote jobs. Use RemoteJobEnable statement to programmatically enable or disable remote jobs.

Important note:

- The RemoteJobDelete statement cannot be used to delete jobs on 24x7 Remote Agents. It can be only used to delete jobs on remote 24x7 Master Schedulers.

See also:

RemoteJobCreate
RemoteJobEnable
RemoteJobModify
JobDelete

RemoteJobDescribe

Description: Describes properties of an existing job on the specified remote JAL script engine.

Syntax: RemoteJobDescribe host, job, property, value

Argument	Description
host	A string whose value is the name 24x7 Master Scheduler as it is specified in the Remote Agent profile.
job	A string whose value is ether job ID or job name.
property	A string whose value is the property that you want to describe. See Job Properties topic for list and description of available properties
value	A string variable that receives the returned value.

Return value: A string whose value matches the value for the property. The returned value is always converted to a string.

Usage: Use this statement to retrieve job definitions, job schedules and triggers programmatically. For example, you can use RemoteJobDescribe to create customizable job monitors.

Note:

- The RemoteJobDescribe statement cannot be used with 24x7 Remote Agents. It can be only used to obtain properties of jobs setup on remote 24x7 Master Schedulers.

See also:

RemoteJobCreate
RemoteJobDelete
RemoteJobModify

JobDescribe

RemoteJobEnable

Description: Enables or disables an existing job on the specified remote JAL script engine

Syntax: RemoteJobEnable host, job, state

Argument	Description
host	A string whose value is the name 24x7 Master Scheduler as it is specified in the Remote Agent profile.
job	A string whose value is ether job ID or job name.
state	A boolean whose value is the new job state. Specify TRUE to enable the job or FALSE to disable it.

Return value: None.

Usage: Use RemoteJobEnable in your scripts to programmatically enable or disable remote jobs. If the specified job is not found, an error occurs.

Important Notes:

- The RemoteJobEnable statement cannot be used to enable/disable jobs on 24x7 Remote Agents. It can be only used to change state of jobs on remote 24x7 Master Schedulers.
- To physically remove a job from the job database use RemoteJobDelete, JobDelete, 24x7 GUI or one of the supported external interfaces.

See also:

RemoteJobCreate
RemoteJobDelete
RemoteJobModify
JobEnable

RemoteJobList

Description: Returns comma-separated list of job IDs in the active job database on the specified remote host.

Syntax: RemoteJobList host, folder, return

Argument	Description
host	A string whose value is the name 24x7 Master Scheduler as it is specified in the Remote Agent profile.

folder	A string whose value is the name of the folder in which you want to list jobs. Specify an empty string ("") for the folder to obtain a list of all job IDs in the job database.
return	A string variable that receives the returned value.

Return value: A string containing comma-separated list of job IDs.

Usage: The RemoteJobList statement can be used to obtain a list of jobs setup on a remote 24x7 Master Scheduler.

Tip:
- You can use GetToken and LoopWhile statements to parse the returned job list.

See also:

JobRemoteRun
RemoteCopyJob
RemoteJobDescribe
JobList
Job Properties

RemoteJobModify

Description: Modifies properties of an existing job on the specified remote JAL script engine.

Syntax: RemoteJobModify host, job, property, new_value

Argument	Description
host	A string whose value is the name 24x7 Master Scheduler as it is specified in the Remote Agent profile.
job	A string whose value is ether job ID or job name.
property	A string whose value is the property that you want to modify. See **Job Properties** topic for list and description of available properties
new_value	A string whose value is the new value for the property

Return value: None

Usage: Use this statement to modify job definitions, job schedules and triggers programmatically. For example, you can use RemoteJobModify to reschedule jobs for a later run when the exact start time is unknown in design-time.

Important Notes:
- The RemoteJobModify statement cannot be used with 24x7 Remote Agents. It can be only used to change properties of jobs setup on remote 24x7 Master Schedulers.

Modified jobs are updated immediately in both places: the active job pool and the job database. JAL script engine internally triggers "save" command after every change.
- Side effect: On "save," all disabled jobs are purged from the active job pool. However, disabled jobs are not removed from the job database. To physically remove a job from the job database use RemoteJobDelete statement or JobDelete statement or 24x7 GUI or one of supported external interfaces.

See also:

RemoteJobCreate
RemoteJobDelete
RemoteJobDescribe
JobModify

Web statements

Ping

Description: Checks whether the specified remote computer is online. It simulates PING utility that used to test and debug a network by sending out a data packet and waiting for a response.

Syntax: Ping computer, return

Argument	Description
Computer	A string whose value is either name of the remote computer as specified in your DNS Server (for example, www.softtreetech.com, ftp.softtreetech.com) or the IP number of the remote computer in ASCII dotted-decimal format (for example, 11.0.1.45)
Return	A boolean variable that receives the returned value

Return value: Boolean. Returns TRUE if the remote computer can be found (alive), and FALSE otherwise.

Usage: Use Ping to test TCP/IP connectivity and check for availability of a remote computer before making connection to that computer. You can also use Ping in various monitoring jobs of “Server Alive” kind.

Important Notes:

- Ping statement is available only if you have Winsock 2 installed on your system. To verify that check if you have WS2_32.DLL in your WINDONS\SYSTEM of WINNT/SYSTEM32 directory. Most Windows 98/Me/NT/2000/XP/2003/VISTA/2008 systems should have Winsock 2 files installed by default. If you are running Windows 95 and don’t have Winsock 2 installed on your system you can freely obtain it at the following location http://www.microsoft.com/windows/downloads/bin/W95ws2setup.exe.
- Ping statement is available only if the TCP/IP protocol has been installed.

Tips:

- Turn of **Tracing** feature to see additional status messages returned by the Ping statement.
- If you see "Request timed out" message in the trace, verify that the host IP address is correct, that the host is operational, and that all the gateways (routers) between this computer and the host are operational.
- To test host name resolution by using the Ping statement, Ping the desired host using its host name. If the Ping fails with an "Unknown host" message in the trace, verify that the host name is correct and that the host name can be resolved by your DNS server.

See also:

PingPort

FTP Statements
Web statements

PingPort

Description: Checks whether the specified port (e.g. network service) is responsive on the specified remote computer.

Syntax: PingPort computer, port, return

Argument	Description
Computer	A string whose value is either name of the remote computer as specified in your DNS Server (for example, www.softtreetech.com, ftp.softtreetech.com) or the IP number of the remote computer in ASCII dotted-decimal format (for example, 11.0.1.45)
Port	A number whose value is the port number that you want to check.
Return	A boolean variable that receives the returned value

Return value: Boolean. Returns TRUE if the Port on remote computer is responding (alive), and FALSE otherwise.

Usage: Use PingPort to test various network services (for example, FTP) before using them. You can also use PingPort in various monitoring jobs of "Service Alive" kind.

The following table lists default port numbers for most commonly used network services.

Service Name	Port
daytime	13
netstat	15
FTP	21
telnet	23
SMTP	25
DNS	53
finger	79
HTTP	80
rlogin	513
rsh	514
UUCP	540
klogin	543
krcmd, kshell	544

Important Notes:

- PingPort statement is available only if you have Winsock 2 installed on your system. To verify that check if you have WS2_32.DLL in your WINDONS\SYSTEM of WINNT/SYSTEM32 directory. Most Windows 98/Me/NT/2000/XP/2003/VISTA/2008 systems should have Winsock 2 files installed by default. If you are running Windows 95 and don't have Winsock 2 installed on your system you can freely obtain it at the following location http://www.microsoft.com/windows/downloads/bin/W95ws2setup.exe.
- PingPort statement is available only if the TCP/IP protocol has been installed.

Tips:

- Turn of **Tracing** feature to see additional status messages returned by the Ping statement.
- If you see "Request timed out" message in the trace, verify that the host IP address is correct, that the host is operational, and that all the gateways (routers) between this computer and the host are operational.
- To test host name resolution by using the Ping statement, Ping the desired host using its host name. If the Ping fails with an "Unknown host" message in the trace, verify that the host name is correct and that the host name can be resolved by your DNS server.

See also:

Ping

FTP Statements

Web statements

WebConfig

Description: Set various parameters for the subsequent Internet operations.

Syntax: WebConfig property, new_value

Argument	Description
Property	A string whose value is the name of the property for the Internet session that you want to change. The following properties are supported: • "PROXY"
New_value	• A string whose value is the new value for the property that you want to change.

Return value: None.

Usage: Use WebConfig statement to configure your Internet connection before accessing file on the Internet using WebGetFile and WebPostData statements. Both parameter name and new value are case insensitive.

"PROXY" setting consists of 4 parts separated by commas: proxy server name (or IP address), proxy server port, your user ID and password required for proxy authentication. If your proxy server does not require authentication, do not specify user ID and password. If you use different proxies for different protocols such as HTTP and FTP, call WebConfig with different parameters before using WebGetFile, WebPostData and other Web statements for a different protocol.

Example:
WebConfig "PROXY", "127.01.01.3,8080,myname,mypassword"

See also:

WebPostData
WebPostDataWithLogin
WebGetFile
WebGetDatawithLogin

WebGetDataWithLogin

Description: Performs HTTP POST and then immediately HTTP GET, allowing a job to submit a request through CGI, NSAPI, or ISAPI call to a login form on a remote web site, and then, in the same authenticated user session download data from the same or a different location through second CGI, NSAPI, or ISAPI call.

Syntax: WebGetDataWithLogin login_url, login_data, error_tokens, data_url, output_format, file, logout_url

Argument	Description
Login_URL	A string whose value is the URL (Internet standard Uniform Resource Locator, e.g. Web address) of the login form which can be used to login to the web site.
Login_Data	A string whose value is the data to be posted to the specified Login_URL
Error_Tokens	A string containing comma-separated substrings that you want to check in the results returned by the login form in to verify whether the login succeeded or not. If you do not want to check the login form output, specify an empty string for this argument. Note that the search for substrings is case-insensitive.
Data_URL	A string whose value is the URL (Internet standard Uniform Resource Locator, e.g. Web address) to get data from
Output_format	A string whose value describes the expected data format for the data returned by your web server after successful GET request. The value is optional. For most results, you can specify an empty string for Output_format argument and let the script engine to handle data using default rules. If you need to specify a value for the output format, use MIME content-type names described in RFC 2387 standard. See common content-type names in the following Usage section.
File	A string whose value is the name of the local file in which you want to save the returned web server response and data
Logout_URL	A string whose value is the URL (Internet standard Uniform Resource Locator, e.g. Web address) of the logout page which can be used to logout from the web site. The Logout_URL argument value is optional. In case logout is not required, specify an empty string as value for this argument.

Return value: None.

Usage: Use this statement to download data from a remote web site that requires prior from-based user authentication. You can also use the **Web Automation Wizard** to quickly build HTTP GET automation scripts

A typical web login form contains several fields such as user name and password, and in case of an invalid login, it outputs some errors. The Error_Tokens argument can be used to automate error checking for the login. Basically, after posting the data to the the login form, WebPostDataWithLogin searches the login form output for substrings specified in the Error_Tokens argument. If any specified substring is found, the statement raises run-time error, and the GET operation aborts. The search for substrings is not case sensitive.

The results returned after the GET operation can be of any downloadable type, including HTML files, ASCII files, image files, and other types of text and binary files. The returned data is saved in the specified target File. The target file is overwritten on every run.

Here is a list of popular content-type values that can be specified for the Output_format argument:
An empty string – this allows the script engine to recognize and automatically handle the output format.
text/plain – any plain text result. Typically, this format should be handled automatically.
text/html – HTML formatted data. Typically, this format should be handled automatically.
text/xml – XML formatted data. Typically, this format should be handled automatically.
image/jpeg- JPG image files.
image/png – PNG image files.
image/bmp – BMP image files.
image/gif – GIF image files.
audio/mpeg – MPEG audio files.
audio/mpeg3 – MPEG 3 audio files.
video/avi – AVI video files.
video/mpeg – MPEG video files.
application/zip – Zip compressed files.
application/x-zip – Zip compressed files.
application/x-gzip - Gzip compressed files.
application/pdf – Adobe Acrobat files.
application/excel – Microsoft Excel files.
application/msword – Microsoft Word files.
… many other – refer to your web application documentation for details on the supported data formats.

If the target web site does not require form-based user authentication, use WebGetFile statement.

If you connect to the Internet via proxy server, use WebConfig statement to specify connection parameters required by your proxy server.

See also:

- WebConfig
- WebGetFile
- WebGetDataWithLogin
- WebPostData
- WebHTMLEncode
- WebURLEncode
- FTPPutFile
- WebOpenPage

WebGetFile

Description: Downloads data from the specified URL and saves it to the specified file. The downloaded file can be of any type, including but not limited to static HTML pages, dynamic HTML pages generated by web server scripts, image files, PDF files, files of any other type sent by the web server.

Syntax: WebGetFile url, file

Argument	Description
URL	A string whose value is the URL (Internet standard Uniform Resource Locator, e.g. Web address) that points to the file that you want to download
File	A string whose value is the name of the local file in which you want to save returned data

Return value: None.

Usage: The specified URL can point to the file of any downloadable type, including HTML files, ASCII files, image files, and other binary files. If the specified URL points to a Internet server executable file such as CGI, ASP, DLL, and other, WebGetFile returns the data source that is created as a result of processing on the Internet server. You can use WebGetFile statement for downloading various Internet files.

If the web site specified by URL requires user authentication, use the following URL syntax:
<username>:<password>@<protocol>://<server name>/<...path and file name>
Example: *myname:mypassword@http://www.mycompany.com/webstats/access.log*

If you connect to the Internet via proxy server, use WebConfig statement to specify connection parameters required by your proxy server.

Note:

- WebGetFile statement can use HTTP and FTP protocols when accessing files on the Web. If you omit protocol name in the URL specification then HTTP protocol is used by default.

See also:

WebConfig
WebGetDataWithLogin
WebPostData
WebPostDataWithLogin
WebStripHTMLTags
FTPGetFile
WebOpenPage

WebGetPageHTML

Description: Retrieves page source for the specified URL. Page source can be HTML file or a file of other type. This statement is provided for compatibility with previous versions of JAL script engine. New JAL script engine jobs should use the more powerful **WebGetFile** statement and **WebGetDataWithLogin.**

Syntax: WebGetPageHTML url, file

Argument	Description
url	A string whose value is the URL whose source data you want to retrieve
file	A string whose value is the name of the local file in which you want to save returned data

Return value: None.

Usage: The specified URL can point to a file of any downloadable type, including HTML files, ASCII files, image files, and other binary files. If the specified URL points to a Internet server executable file such as CGI, ASP, DLL, and other, WebGetPageHTML returns the data source that is created as a result of processing on the Internet server. You can use WebGetPageHTML statement for downloading various Internet files.

Note:

- WebGetPageHTML statement uses HTTP protocol for any type of file transfer.

WebGetPageHTML statement does not support proxy connections. It is provided only for compatibility with previous versions of JAL script engine. New JAL script engine jobs should use the more powerful **WebGetFile** statement.

See also:

FTPGetFile

WebOpenPage

WebOpenPage

Description: Opens default Web browser, displaying the specified URL.

Syntax: WebOpenPage url

Argument	Description
url	A string whose value is the URL you want to open in the default browser

Return value: None.

See also:

WebGetPageHTML

WebGetDataWithLogin

Description: Performs HTTP POST and then immediately HTTP GET, allowing a job to submit a request through CGI, NSAPI, or ISAPI call to a login form on a remote web site, and then, in the same authenticated user session download data from the same or a different location through second CGI, NSAPI, or ISAPI call.

Syntax: WebGetDataWithLogin login_url, login_data, error_tokens, data_url, output_format, file, logout_url

Argument	Description
Login_URL	A string whose value is the URL (Internet standard Uniform Resource Locator, e.g. Web address) of the login form which can be used to login to the web site.
Login_Data	A string whose value is the data to be posted to the specified Login_URL
Error_Tokens	A string containing comma-separated substrings that you want to check in the results returned by the login form in to verify whether the login succeeded or not. If you do not want to check the login form output, specify an empty string for this argument. Note that the search for substrings is case-insensitive.
Data_URL	A string whose value is the URL (Internet standard Uniform Resource Locator, e.g. Web address) to get data from
Output_format	A string whose value describes the expected data format for the data returned by your web server after successful GET request. The value is optional. For most results, you can specify an empty string for Output_format argument and let the script engine to handle data using default rules. If you need to specify a value for the output format, use MIME content-type names described in RFC 2387 standard. See common content-type names in the following Usage section.
File	A string whose value is the name of the local file in which you want to save the returned web server response and data
Logout_URL	A string whose value is the URL (Internet standard Uniform Resource Locator, e.g. Web address) of the logout page which can be used to logout from the web site. The Logout_URL argument value is optional. In case logout is not required, specify an empty string as value for this argument.

Return value: None.

Usage: Use this statement to download data from a remote web site that requires prior from-based user authentication. You can also use the **Web Automation Wizard** to quickly build HTTP GET automation scripts

A typical web login form contains several fields such as user name and password, and in case of an invalid login, it outputs some errors. The Error_Tokens argument can be used to automate error checking for the login. Basically, after posting login data to the login form, WebPostDataWithLogin searches text of the web server response for substrings specified in the Error_Tokens argument. If any specified substring is found, the statement raises run-time error, and the GET operation aborts. The search for substrings is not case sensitive.

The results returned after the GET operation can be of any downloadable type, including HTML files, ASCII files, image files, and other types of text and binary files. The returned data is saved in the specified target File. The target file is overwritten on every run.

Here is a list of popular content-type values that can be specified for the Output_format argument:
An empty string – this allows the script engine to recognize and automatically handle the output format.
text/plain – any plain text result. Typically, this format should be handled automatically.
text/html – HTML formatted data. Typically, this format should be handled automatically.
text/xml – XML formatted data. Typically, this format should be handled automatically.
image/jpeg- JPG image files.
image/png – PNG image files.
image/bmp – BMP image files.
image/gif – GIF image files.
audio/mpeg – MPEG audio files.
audio/mpeg3 – MPEG 3 audio files.
video/avi – AVI video files.
video/mpeg – MPEG video files.
application/zip – Zip compressed files.
application/x-zip – Zip compressed files.
application/x-gzip - Gzip compressed files.
application/pdf – Adobe Acrobat files.
application/excel – Microsoft Excel files.
application/msword – Microsoft Word files.
… many other – refer to your web application documentation for details on the supported data formats.

If the target web site does not require form-based user authentication, use WebGetFile statement.

If you connect to the Internet via proxy server, use WebConfig statement to specify connection parameters required by your proxy server.

See also:

- WebConfig
- WebGetFile
- WebGetDataWithLogin
- WebPostData
- WebHTMLEncode
- WebURLEncode
- FTPPutFile
- WebOpenPage

WebPostData

Description: Performs an HTTP POST, allowing a job to upload data to a remote web site through CGI, NSAPI, or ISAPI call.

Syntax: WebPostData url, data, file

Argument	Description
URL	A string whose value is the URL (Internet standard Uniform Resource Locator, e.g. Web address) to post data to

Data	A string whose value is the data to be posted to the specified URL
File	A string whose value is the name of the local file in which you want to save the returned web server response

Return value: None.

Usage: Use this statement to invoke a CGI, NSAPI, or ISAPI function on a web server, in other words, to post data to a remote web site. The data should be sent in URL-encoded format as specified in RFC1738 standard http://www.ietf.org/rfc/rfc1738.txt. Use WebURLEncode statement to encode the data before uploading it to the target site using WebPostData or WebPostDataWithLogin statements. You can also use the **Web Automation Wizard** to quickly build HTTP POST automation scripts.

The results returned after the POST operation can be of any downloadable type, including HTML files, ASCII files, image files, and other types of text and binary files. This data is saved in the specified target File. The target file is overwritten on every run.

If the target web site specified by URL requires basic type of user authentication, use the following URL syntax:
<username>:<password>@<protocol>://<server name>/<...path and file name>
Example: *myname:mypassword@http://www.mycompany.com/folder/input-form.php*

Use WebPostDataWithLogin statement in case the target site requires form-based authentication before any data can be posted to the site.

If you connect to the Internet via proxy server, use WebConfig statement to specify connection parameters required by your proxy server.

See also:

- WebConfig
- WebGetDataWithLogin
- WebGetFile
- WebPostDataWithLogin
- WebHTMLEncode
- WebURLEncode
- FTPPutFile
- WebOpenPage

WebPostDataWithLogin

Description: Performs double HTTP POST, allowing a job to submit a request through CGI, NSAPI, or ISAPI call to a login form on a remote web site, and then, in the same authenticated user session upload data to the same or a different location through second CGI, NSAPI, or ISAPI call.

Syntax: WebPostDataWithLogin login_url, login_data, error_tokens, data_url, data, output_format, file, logout_url

Argument	Description
Login_URL	A string whose value is the URL (Internet standard Uniform Resource Locator, e.g. Web address) of the login form which can be used to login to the web site.

Login_Data	A string whose value is the data to be posted to the specified Login_URL
Error_Tokens	A string containing comma-separated substrings that you want to check in the results returned by the login form in to verify whether the login succeeded or not. If you do not want to check the login form output, specify an empty string for this argument. Note that the search for substrings is case-insensitive.
Data_URL	A string whose value is the URL (Internet standard Uniform Resource Locator, e.g. Web address) to post data to
Data	A string whose value is the data to be posted to the specified Data_URL
Output_format	A string whose value describes the expected data format for the data returned by your web server after successful POST request. The value is optional. For most results, you can specify an empty string for Output_format argument and let the script engine to handle data using default rules. If you need to specify a value for the output format, use MIME content-type names described in RFC 2387 standard. See common content-type names in the following Usage section.
File	A string whose value is the name of the local file in which you want to save the returned web server response and data
Logout_URL	A string whose value is the URL (Internet standard Uniform Resource Locator, e.g. Web address) of the logout page, which can be used to logout from the web site. The Logout_URL argument value is optional. In case logout is not required, specify an empty string as value for this argument.

Return value: None.

Usage: Use this statement to invoke a CGI, NSAPI, or ISAPI function on a web server, in other words, to post data to a remote web site that requires prior from-based user authentication. The data should be sent in URL-encoded format as specified in RFC1738 standard http://www.ietf.org/rfc/rfc1738.txt. Use WebURLEncode statement to encode the data before uploading it to the target site using WebPostData or WebPostDataWithLogin statements. You can also use the **Web Automation Wizard** to quickly build HTTP POST automation scripts

A typical web login form contains several fields such as user name and password, and in case of an invalid login, it outputs some errors. The Error_Tokens argument can be used to automate error checking for the login. Basically, after posting login data to the login form, WebPostDataWithLogin searches text of the web server response for substrings specified in the Error_Tokens argument. If any specified substring is found, the statement raises run-time error, and the GET operation aborts. The search for substrings is not case sensitive.

The results returned after the POST operation can be of any downloadable type, including HTML files, ASCII files, image files, and other types of text and binary files. The returned data is saved in the specified target File. The target file is overwritten on every run.

Here is a list of popular content-type values that can be specified for the Output_format argument:
An empty string – this allows script engine to recognize and automatically handle the output format.
text/plain – any plain text result. Typically, this format should be handled automatically.
text/html – HTML formatted data. Typically, this format should be handled automatically.
text/xml – XML formatted data. Typically, this format should be handled automatically.
image/jpeg- JPG image files.
image/png – PNG image files.
image/bmp – BMP image files.
image/gif – GIF image files.
audio/mpeg – MPEG audio files.

audio/mpeg3 – MPEG 3 audio files.
video/avi – AVI video files.
video/mpeg – MPEG video files.
application/zip – Zip compressed files.
application/x-zip – Zip compressed files.
application/x-gzip - Gzip compressed files.
application/pdf – Adobe Acrobat files.
application/excel – Microsoft Excel files.
application/msword – Microsoft Word files.
… many other – refer to your web application documentation for details on the supported data formats.

If the target web site does not require form-based user authentication, use WebPostData statement.

If you connect to the Internet via proxy server, use WebConfigstatement to specify connection parameters required by your proxy server.

See also:

- WebConfig
- WebGetFile
- WebGetDataWithLogin
- WebPostData
- WebHTMLEncode
- WebURLEncode
- FTPPutFile
- WebOpenPage

WebHTMLEncode

Description: Applies HTML-encoding to the specified text string. This statement provides convenient means for encoding data to be used in HTML and XML files

Syntax: WebHTMLEncode data, return

Argument	Description
Data	A string value that you want to encode.
Return	A string variable that receives the returned value

Return value: HTML encoded string.

Usage: The encoding replaces characters that cannot be used in HTML/XML data with their encoded values. For more details see "Hypertext Markup Language - 2.0" specification described in RFC 1866 standard.

Here is a partial list of characters that are encoded by WebHTMLEncode statement.

CHARACTER	ENCODED	REF	CHARACTER DESCRIPTION
&	&amp;	&#38;	Ampersand
<	&lt;	&#60;	Less than
>	&gt;	&#62;	Greater than
Other special characters…			

See also:
WebURLEncode
WebGetDataWithLogin
WebPostData
WebPostDataWithLogin

WebURLEncode

Description: Applies URL-encoding to the specified text string. This statement provides convenient means for encoding strings to be used in a data for posting to web form.

Syntax: WebURLEncode data, return

Argument	Description
Data	A string value that you want to encode.
Return	A string variable that receives the returned value

Return value: URL encoded string.

Usage: The encoding is performed according to RFC 1738 standard.

See also:
WebHTMLEncode
WebGetDataWithLogin
WebPostData
WebPostDataWithLogin

WebStripHTMLTags

Description: Removes HTML and XML tags from the specified string. This statement provides convenient means for parsing HTML and XML data.

Syntax: WebStripHTMLTags data, return

Argument	Description
Data	An HTML or XML string value that you want to parse.
Return	A string variable that receives the returned value

Return value: [lain text string.

Usage: This statement removes matching pairs of HTML and XML tags, for example, <td> </td>, as well as singular HTML tags such as <hr>, </br>, <br> and other. Specified data must be a well formed HTML or XML string. Malformed data may lead to incorrect results.

Note:

- HTML comments in <!-- .. --> format are removed along with HTML tags, including all text between start and end comment tags.

See also:

WebURLEncode
WebHTTPEncode
WebGetDataWithLogin

Logical statements

And

Description: Obtains the result of logical operation AND.

Syntax: And boolean1, boolean2, return

Argument	Description
boolean1	A boolean value you want to compare with value in boolean2
boolean2	A boolean value you want to compare with value in boolean1
return	A boolean variable that receives the returned value

Return value: Boolean. Returns result of logical AND operation. boolean1 AND boolean2 is true if both are true. boolean1 AND boolean2 is false if either is false. See the table below for returned values.

Boolean1	Boolean2	Result
TRUE	TRUE	TRUE
FALSE	FALSE	FALSE
TRUE	FALSE	FALSE
FALSE	TRUE	FALSE

IsDate

Description: Tests whether a string value is a valid date.

Syntax: IsDate (string, result)

Argument	Description
String	A string whose value you want to test to determine whether it is a valid date
result	A boolean variable that receives the returned value

Return value: Boolean. Returns TRUE if string is a valid date and FALSE if it is not.

Note:
Valid dates in strings can include any combination of day (1 to 31), month (1 to 12 or the name or abbreviation of a month), and year (2 or 4 digits). JAL script engine assumes a 4-digit number is a year. Leading zeros are optional for month and day. The month, whether a name, an abbreviation, or a number, must be in the month location specified in the system setting for a date's format. If you do not know the system setting, use the standard data type date format yyyy-mm-dd.

IsDateBetween

Description: Tests whether a date value is between specified start and end dates.

Syntax: IsDateBetween (testdate, startdate, enddate, result)

Argument	Description
testdate	A date whose value you want to test to determine whether it is between startdate and enddate
startdate	A date whose value is lower limit of the specified time interval
enddate	A date whose value is upper limit of the specified time interval
result	A boolean variable that receives the returned value

Return value: Boolean. Returns TRUE if testdate is equal or later than startdate and equal or erlier than enddate, and returns FALSE if it is not.

IsEqual

Description: Compares two values and returns True if the first value is equal the second one.

Syntax: IsEqual a, b, return

Argument	Description
a	A value that you want to compare with b
b	A value against which you want compare value a

return	A boolean variable that receives the returned value

Return value: Boolean. Returns TRUE when a = b, and FALSE otherwise

Usage: The data types of value a and b must match each other.

See also:

IsEqual
IsGreater
IsGreaterOrEqual
IsLess
IsLessOrEqual

IsGreater

Description: Compares two values and returns True if the first value is greater then the second one.

Syntax: IsGreater a, b, return

Argument	Description
a	A value that you want to compare with b
b	A value against which you want compare value a
return	A boolean variable that receives the returned value

Return value: Boolean. Returns TRUE when a > b, and FALSE otherwise

Usage: The data types of value a and b must match each other. All data types supported except boolean.

See also:

IsEqual
IsGreater
IsGreaterOrEqual
IsLess
IsLessOrEqual

IsGreaterOrEqual

Description: Compares two values and returns True if the first values is greater or equal the second one.

Syntax: IsGreaterOrEqual a, b, return

Argument	Description
a	A value that you want to compare with b
b	A value against which you want compare value a
return	A boolean variable that receives the returned value

Return value: Boolean. Returns TRUE when a >= b, and FALSE otherwise

Usage: The data types of value a and b must match each other. All data types supported except boolean.

See also:

IsEqual
IsGreater
IsGreaterOrEqual
IsLess
IsLessOrEqual

IsHoliday

Description: Tests whether the specified date falls on a holiday.

Syntax: IsHoliday (testdate, result)

Argument	Description
testdate	A date whose value you want to test to determine whether it is a holiday
result	A boolean variable that receives the returned value

Return value: Boolean. Returns TRUE if testdate is a holiday and FALSE if it is not.

Note:
You use Tools/Holidays menu command to maintain list of holidays and other exception dates for the JAL script engine.

IsLess

Description: Compares two values and returns True if the first value is less then the second one.

Syntax: IsLess a, b, return

Argument	Description
a	A value that you want to compare with b
b	A value against which you want compare value a
return	A boolean variable that receives the returned value

Return value: Boolean. Returns TRUE when a < b, and FALSE otherwise

Usage: The data types of value a and b must match each other. All data types supported except boolean.

See also:

IsEqual
IsGreater
IsGreaterOrEqual
IsLess
IsLessOrEqual

IsLessOrEqual

Description: Compares two values and returns True if the first value is less or equal the second one.

Syntax: IsLessOrEqual a, b, return

Argument	Description
a	A value that you want to compare with b
b	A value against which you want compare value a
return	A boolean variable that receives the returned value

Return value: Boolean. Returns TRUE when a <= b, and FALSE otherwise

Usage: The data types of value a and b must match each other. All data types supported except boolean.

See also:

IsEqual
IsGreater
IsGreaterOrEqual
IsLess
IsLessOrEqual

IsNumber

Description: Reports whether the value of a string is a number.

Syntax: IsNumber (string, result)

Argument	Description
string	A string whose value you want to test to determine whether it is a valid number
result	A boolean variable that receives the returned value

Return value: Boolean. Returns TRUE if string is a valid number and FALSE if it is not.

IsTime

Description: Reports whether the value of a string is a valid time value.

Syntax: IsTime (timevalue, result)

Argument	Description
timevalue	A string whose value you want to test to determine whether it is a valid time
result	A boolean variable that receives the returned value

Return value: Boolean. Returns TRUE if timevalue is a valid time and FALSE if it is not.

IsTimeBetween

Description: Tests whether a time value is between specified start and end times.

Syntax: IsTimeBetween (testtime, starttime, endtime, result)

Argument	Description
testdate	A time whose value you want to test to determine whether it is between starttime and endtime
starttime	A time whose value is lower limit of the specified time interval
endtime	A time whose value is upper limit of the specified time

	interval
result	A boolean variable that receives the returned value

Return value: Boolean. Returns TRUE if testtime is equal or later than starttime and equal or earlier than endtime, and returns FALSE if it is not.

IsWeekday

Description: Tests whether the specified date falls on a weekday.

Syntax: IsWeekday (testdate, result)

Argument	Description
Testdate	A date whose value you want to test to determine whether it is a weekday
result	A boolean variable that receives the returned value

Return value: Boolean. Returns TRUE if testdate is a weekday and FALSE if it is not.

 **Note:**
Weekdays are days from Monday through Friday.

IsWeekend

Description: Tests whether the specified date falls on a weekend.

Syntax: IsWeekend (testdate, result)

Argument	Description
Testdate	A date whose value you want to test to determine whether it is a weekend
result	A boolean variable that receives the returned value

Return value: Boolean. Returns TRUE if testdate is a weekend and FALSE if it is not.

 **Note:**
Weekends include the 2 following days: Saturday and Monday.

Not

Description: Obtains the result of logical operation NOT.

Syntax: Not boolean, return

Argument	Description
boolean	The boolean value you want to negate
return	A boolean variable that receives the returned value

Return value: Boolean. Returns result of logical negation operation. See the table below for returned values.

Boolean	Result
TRUE	FALSE
FALSE	TRUE

NotEqual

Description: Compares two values and returns True if the first value is not equal the second one.

Syntax: NotEqual a, b, return

Argument	Description
a	A value that you want to compare with b
b	A value against which you want compare value a
return	A boolean variable that receives the returned value

Return value: Boolean. Returns TRUE when a <> b, and FALSE otherwise

Usage: The data types of value a and b must match each other.

See also:

IsEqual
IsGreater
IsGreaterOrEqual
IsLess
IsLessOrEqual

Or

Description: Obtains the result of logical operation OR.

Syntax: Or boolean1, boolean2, return

Argument	Description
boolean1	A boolean value you want to compare with value in boolean2
boolean2	A boolean value you want to compare with value in boolean1
return	A boolean variable that receives the returned value

Return value: Boolean. Returns result of logical OR operation. boolean1 OR boolean2 is true if either is true or both are true. boolean1 OR boolean2 is false only if both are false. See the table below for returned values.

Boolean1	Boolean2	Result
TRUE	TRUE	TRUE
FALSE	FALSE	FALSE
TRUE	FALSE	TRUE
FALSE	TRUE	TRUE

Log statements

LogAddMessage

Description: Writes an entry at the end of the Windows NT (NT/2000/XP/2003/VISTA/2008) application event log..

Syntax: LogAddMessage severity, message

Argument	Description
severity	A string that is the severity of the message you want to add to the system application event log. It can be one of the following: • “ERROR" • “WARNING" • “INFO"
message	A string that is the message you want to add to the system application event log.

Usage: This statement can be used on Windows NT (NT/2000/XP/2003/VISTA/2008) systems only. You can use the Windows NT System Event Viewer to read event log messages.

Note:
The JAL script engine maintains its own event log that is different from the system event log. LogAddMessage does not affect JAL script engine event log.

See also:
LogAddMessageEx
LogSearch

LogAddMessageEx

Description: Adds new record to the JAL script engine event log.

Syntax: LogAddMessageEx severity, job_id, job_name, message

Argument	Description
severity	A string that is the severity of the message you want to add to the JAL script engine event log. It can be one of the following: • "ERROR" • "WARNING" • "INFO"
job_id	A number whose value should be ether ID of the job to which this message belongs or 0 to indicate that the message has global scope.
job_name	A string whose value should be ether name of the job to which this message belongs or some generic name like "JAL script engine" to indicate that the message has global scope.
message	A string that is the message you want to add to the JAL script engine event log.

Usage: LogAddMessageEx. writtes new record to the JAL script engine event log. If parallel logging to the Windows NT (NT/2000/XP/2003/VISTA/2008) event log enabled, LogAddMessageEx. also writes an entry at the end of the Windows NT application event log.

Note:
JAL script engine does not verify job_id and job_name values. This is your responsibility to specify the correct values.

See also:
LogAddMessage
LogSearch

LogBackup

Description: Saves the specified Windows NT (NT/2000/XP/2003/VISTA/2008) event log to a file.

Syntax: LogBackup log_name, file_name

Argument	Description
log_name	A string that is the name of the Windows NT (NT/2000/XP/2003/VISTA/2008) event log that you want to backup. For example, it can be one of the following: • “Application" • "Security" • "System”
file_name	A string that is the name of the backup file.

Usage: This statement can be used on Windows NT (NT/2000/XP/2003/VISTA/2008) systems only. Use it to periodically backup Windows NT (NT/2000/XP/2003/VISTA/2008) event logs for historical auditing purposes.

 **Note:**
The JAL script engine maintains its own event log that is different from the system event log. LogBackup does not affect JAL script engine event log. To backup JAL script engine's event log, use FileCopy statement to backup SCHEDULE.LOG file.

See also:
LogAddMessageEx
LogClear
LogSearch

LogClear

Description: Clears the specified Windows NT (NT/2000/XP/2003/VISTA/2008) event log.

Syntax: LogClear log_name

Argument	Description
log_name	A string that is the name of Windows NT (NT/2000/XP/2003/VISTA/2008) event log that you want to truncate. For example, it can be one of the following: • “Application" • "Security" • "System”

Usage: This statement can be used on Windows NT (NT/2000/XP/2003/VISTA/2008) systems only. You normally use this statement after your backup the event log using LogBackup.statement.

Note:
The JAL script engine maintains its own event log that is different from the system event log. LogClear does not affect JAL script engine event log. To clear JAL script engine's event log use FileDelete statement to delete SCHEDULE.LOG file.

See also:
LogAddMessageEx
LogBackup
LogSearch

LogFileSize

Description: Retrieves current size of the specified Windows NT (NT/2000/XP/2003/VISTA/2008) event log and percent of free space left in that file.

Syntax: LogFileSize log_name, size, pct_free

Argument	Description
log_name	A string that is the name of the Windows NT (NT/2000/XP/2003/VISTA/2008) event log that you want to query. For example, it can be one of the following: • “Application" • "Security" • "System”
Size	A numeric variable that receives the returned value for the file size (in bytes).
pct_free	A numeric variable that receives the returned value for the percent of free space left in the log file (as compared to the maximum log file size)

Usage: This statement can be used on Windows NT (NT/2000/XP/2003/VISTA/2008) systems only. Use it to monitor Windows NT (NT/2000/XP/2003/VISTA/2008) event logs and then use LogClear and LogBackup statements to backup and truncate these logs before they reach their maximum allowed size and start overwriting old event log data.

Note:
The JAL script engine maintains its own event log that is different from the system event log. To get the size of JAL script engine's event log, use FileSize statement to retrieve the size of SCHEDULE.LOG file.

See also:
LogAddMessageEx
LogClear
LogBackup
FileSize

LogRecordCount

Description: Retrieves current number of records in the specified Windows NT (NT/2000/XP/2003/VISTA/2008) event log.

Syntax: LogRecordCount log_name, count

Argument	Description
log_name	A string that is the name of the Windows NT (NT/2000/XP/2003/VISTA/2008) event log that you want to query. For example, it can be one of the following: • “Application" • "Security" • "System”
count	A numeric variable that receives the returned value

Usage: This statement can be used on Windows NT (NT/2000/XP/2003/VISTA/2008) systems only. Use it to monitor Windows NT (NT/2000/XP/2003/VISTA/2008) event logs and then use LogClear and LogBackup statements to backup and truncate these logs before they reach their maximum allowed size and start overwriting old event log data.

Note:
The JAL script engine maintains its own event log that is different from the system event log.

See also:
LogFileSize
LogClear
LogBackup
FileSize

LogSearch

Description: Search entries in the Windows NT (NT/2000/XP/2003/VISTA/2008) event log.

Syntax: LogSearch search_system, search_warnings, start_time, return

Argument	Description
search_system	A boolean that indicates whether you want to search the system event log or the application event log. Specify TRUE for the system log or FALSE for the application event log.
search_warnings	A boolean that indicates whether you want to search for messages having severity either ERROR or WARNING. Specify TRUE to search for both types or FALSE to search ERRORS only.
start_time	A date-time value that is the earliest time of the messages

	that you want to search. Use this parameter as a “filter" for the event log. JAL script engine will search only messages that were logged since the start_time.
Return	A string variable that receives the returned value.

Return value: String. Returns all found messages as a tab-separated multi-line string. Each line consists of message time, message ID, message severity (either ERROR or WARNING), message source, user name, and message text separated by the tab character.

Usage: This statement can be used on Windows NT (NT/2000/XP/2003/VISTA/2008) systems only. You can also use the Windows NT System Event Log Viewer to read event log messages. You may want to use this statement to search Windows NT event logs for reported errors and this way effectively monitor other application that write to the event logs.

Note:
The JAL script engine maintains its own event log that is different from the system event log. LogSearch does not search JAL script engine event log. However, if you configured JAL script engine to simultaneously log all messages to the Windows NT (NT/2000/XP/2003/VISTA/2008) System Event Log then LogSearch statement will also automatically search JAL script engine generated messages.

See also:
LogAddMessage

LogSearchEx

Description: Search entries in the Windows NT (NT/2000/XP/2003/VISTA/2008) event log written by the specified application.

Syntax: LogSearchEx search_system, start_time, event_source, return

Argument	Description
search_system	A boolean that indicates whether you want to search the system event log or the application event log. Specify TRUE for the system log or FALSE for the application event log.
start_time	A date-time value that is the earliest time of the messages that you want to search. Use this parameter as a “filter” for the event log. JAL script engine will search only messages that were logged since the start_time.
event_source	A string whose value is the name of the event source (e.g. name of the application that wrote the message).
Return	A string variable that receives the returned value.

Return value: String. Returns all found messages as a tab-separated multi-line string. Each line consists of message time, message ID, message severity (either INFO, ERROR or WARNING), message source, user name, and message text separated by the tab character.

Usage: This statement can be used on Windows NT (NT/2000/XP/2003/VISTA/2008) systems only. You can also use the Windows NT System Event Log Viewer to read event log messages. You may want to use this statement to search Windows NT event logs for reported errors and this way effectively monitor other application that write to the event logs.

Note:
The JAL script engine maintains its own event log that is different from the system event log. LogSearchEx does not search JAL script engine event log. However, if you configured JAL script engine to simultaneously log all messages to the Windows NT System Event Log then LogSearchEx statement will also automatically search JAL script engine generated messages.

See also:
LogAddMessage
LogSearch
LogWaitForUpdate

LogWaitForUpdate

Description: Suspends job execution and then enters an efficient wait state until either new event is written to the Windows NT (NT/2000/XP/2003/VISTA/2008) event log or the statement times out.

Syntax: LogWaitForUpdate wait_system, event_source, timeout, return_data, return_status

Argument	Description
wait_system	A boolean that indicates whether you want to wait for the system event log or the application event log. Specify TRUE for the system log or FALSE for the application event log.
event_source	A string whose value is the name of the event source (e.g. name of the application that wrote the message). If you specify an empty string "", JAL script engine will resume after any new event record is added to the event log, otherwise it will resume only after a record is added by the specified event_source.
timeout	A number whose value is the maximum time interval within which you expect a new event record to be written to the specified event log. Use 0 timeout to allow infinite waiting.
return_data	A string variable that receives the returned event record data.
return_status	A boolean variable that receives the returned status value.

Return value: String and Boolean. If the LogWaitForUpdate statement succeeds, the return_status is True and the return_data value contains new event log record as a tab-separated string, which consists of message time, message ID, message severity (either INFO, ERROR or WARNING), message source, user name, and message text. If the LogWaitForUpdate statement fails, the return_status value is False and return_data is empty string "".

Usage: This statement can be used on Windows NT (NT/2000/XP/2003/VISTA/2008) systems only. You can also use the Windows NT System Event Log Viewer to read event log messages. You may want to use this statement to monitor Windows NT event logs for new messages.

Note:
The JAL script engine maintains its own event log that is different from the system event log. LogWaitForUpdate does not monitor JAL script engine event log. However, if you configured JAL script engine to simultaneously log all messages to the Windows NT (NT/2000/XP/2003/VISTA/2008) System Event Log then LogWaitForUpdate statement will also automatically monitor JAL script engine generated messages.

See also:

LogAddMessage
LogSearch
LogSearchEx

Miscellanious statements

AgentTest

Description: Tests availability of the specified 24x7 Remote Agent.

Syntax: AgentTest agent, return

Argument	Description
Agent	A string whose value is the name of the Remote Agent as it is specified in the Remote Agent profile.
Return	A boolean variable that receives the returned value

Return value: Boolean. Returns TRUE if the specified Agent is running and successful connection can be established between the main scheduler and this Remote Agent, otherwise returns FALSE.

Usage: Use this statement to check availability of the Remote Agent before executing JobRemoteRun statement or JobRun statement for a job that should be executed remotely by that Agent. You can also use that statement to check whether the remote computer hosting 24x7 Remote Agent is running.

See also:

JobRun
JobRemoteRun
Remote Agents

Call

Description: Calls a function within a dynamic-link library or an executable file.

Syntax: Call (module, function, parameter-specification, has-result, [arguments], [result])

Argument	Description
Module	A string whose value is the filename of the DLL or EXE.

Function	A string whose value is the name of the function to run in the designated module.
Parameter-specification	A string whose value is indicating the formats of parameters passed to the function. Characters in the string represent C parameter types: Characters in upper case indicate that the corresponding parameters must be passed by reference, characters in lower case indicate that the corresponding parameters must be passed by value. Parameters of string and double data types are always passed by reference. **Character Description** U or u unsigned integer L or L long N or n short C or c byte or char F or f float D or d double (always by ref) S or s string (always by ref)
Has-result	A boolean whose value is indicating whether the calling function returns a result.
Parameters (optional)	A list of parameters that must be passed to the function. Order, number, and data types of parameters must match parameter-specification
result (optional)	A variable that receives the returned value. You must specify data type of the result value as the last character in the parameter-specification.

Return value: See parameter description above.

Usage: It is recommended that you include the .DLL filename extension when specifying the name of the DLL. Without the extension, JAL script engine first looks through all the system search paths directories trying to find the file exactly as specified. Only after this fails does it add the .DLL extension and look through all the search paths again.

JAL script engine supports only functions and subroutines in 32-bit DLLs and EXEs that use the _stdcall calling convention.
See examples for more information on usage.

See also:

String
Format

ConsoleRead

Description: This statement can be used in standalone JAL scripts only to read user input from the command console.

Syntax: ConsoleRead(result)

Argument	Description
Result	A string variable that receives the returned value.

Return value: See parameter description above.

Usage: Use this statement in interactive processes to read data from the command console input buffer and remove it from the buffer. Note that this statement is blocking and will not return until user enters a value and presses Enter key.

See also:
ConsoleWrite
FileRead

ConsoleWrite

Description: This statement can be used in standalone JAL scripts only, It can be used to write messages to the command console.

Syntax: ConsoleWrite(message)

Argument	Description
Message	A string value that is output to the command console.

Return value: See parameter description above.

Usage: Use this statement in standalone JAL scripts to write messages to the command console. For example, it can be used to write input prompts before calling ConsoleRead statement.

See also:
ConsoleRead
FileWrite

DiskGetFreeSpace

Description: Retrieves the amount of free space on the specified disk.

Syntax: DiskGetFreeSpace path, freespace

Argument	Description
Path	A string that is the disk letter you want to query or a file name or file path. In last two cases DiskGetFreeSpace uses the first character only.
Freespace	A numeric variable that receives the returned value

Usage: The freespace receives the amount of free space in bytes.

Important notes:

- **Windows 95 OSR 1:** The DiskGetFreeSpace statement returns incorrect value for volumes that are larger than 2 gigabytes. That is because the operating system manipulates the disk properties so that computations with them yield the incorrect volume size.
- **Windows 95 OSR 2, Windows 98, Windows Me, Windows NT, Windows 2000 and Windows XP**: The DiskGetFreeSpaceEx statement is available on Windows 95 systems beginning with OEM Service Release 2 (OSR 2), Windows 98/Me/NT/2000/XP/2003/VISTA/2008. The GetDiskFreeSpaceEx statement returns correct values for all volumes, including those that are greater than 2 gigabytes.

See also:

DiskGetFreeSpaceEx

MemoryGetFree

DiskGetFreeSpaceEx

Description: Retrieves the amount of free space on the specified disk.

Syntax: DiskGetFreeSpaceEx path, freespace

Argument	Description
path	A string that is the disk letter you want to query or a file name or file path. In last two cases DiskGetFreeSpaceex uses the first character only.
freespace	A numeric variable that receives the returned value

Usage: The freespace receives the amount of free space in bytes.

Important notes:

- **Windows 95 OSR1:** The DiskGetFreeSpaceEx statement is available on Windows 95 systems beginning with OEM Service Release 2 (OSR 2) only.
  The DiskGetFreeSpace statement returns incorrect value for volumes that are larger than 2 gigabytes. That is because the operating system manipulates the disk properties so that computations with them yield the incorrect volume size.
- **Windows 95 OSR 2, Windows 98/Me/NT/2000/XP/2003/VISTA/2008**: The DiskGetFreeSpaceEx statement is available on Windows 95 systems beginning with OEM Service Release 2 (OSR 2), Windows 98/Me/NT/2000/XP/2003/VISTA/2008. The GetDiskFreeSpaceEx statement returns correct value for all volumes, including those that are greater than 2 gigabytes.

See also:

DiskGetFreeSpace

MemoryGetFree

InputBox

Description: Displays prompts in a dialog box, waits for the user to input values, and returns a string containing the contents of the dialog box.

Syntax: InputBox prompt_list, edit_style_list, return_values_list

Argument	Description
prompt_list	A string whose value is the comma-separated list of prompts. Each prompt is displayed on a separate row. Each row containing a prompt can display one or more lines of text. Lines are automatically wrapped to fit the prompt area of the input box. To force line breaks in a prompt, separate the lines using carriage return character (Char(13)), or carriage return–linefeed character combination (Char(13) & Char(10)) between each line. You can use **special ASCII characters** for this purpose
edit_style_list	A string whose value is the comma-separated list of required edit styles, one item for each prompt. Number of items in this value list must match number of items in the promt_list. The following edit styles are supported: • EDIT • YES/NO • FILE BROWSE • DIR BROWSE • PROCESS BROWSE • FTP BROWSE • SFTP BROWSE • MAIL PROFILE LIST • REMOTE FILE BROWSE • REMOTE DIR BROWSE • REMOTE AGENT LIST • DB PROFILE LIST • QUEUE LIST • JOB BROWSE • JOB FOLDER LIST Multiple edit styles can be selected for a single InputBox dialog. Edit styles are the same as these used by the **job templates** and the **Job Wizard**
return_values_list	A string variable that receives the returned comma-separated list of user-entered values.

Return value: A comma-separated string containing user-entered values. If only one prompt is specified, the returned string will contain only one value.

Usage: Use InputBox statement to display input dialogs that look and feel like input dialogs displayed by the job templates that you use for creating new jobs.

The names of edit styles are self-explaining.
Here is a brief description of what each style does:

EDIT	Allows input of any text up-to 32000 characters long
YES/NO	Allows input of YES or NO values only
FILE BROWSE	Displays the standard file browse dialog box and allows selecting name of an existing file, the complete file name including path is returned
DIR BROWSE	Displays the standard folder browse dialog box and allows selecting name of an existing folder, the complete folder name including path is returned
PROCESS BROWSE	Displays process browse dialog and allows selecting name of the currently running process
FTP BROWSE	Displays FTP file browse dialog that looks and feels like the standard file browse dialog box, but allows selecting name of an existing file or directory on the remote FTP server, the complete file name including path is returned
SFTP BROWSE	Displays Secure FTP file browse dialog that looks and feels like the standard file browse dialog box, but allows selecting name of an existing file or directory on the remote Secure FTP server, the complete file name including path is returned
MAIL PROFILE LIST	Displays MAPI Profile dialog and allows selecting name of an existing mail profile
REMOTE FILE BROWSE	Displays file browse dialog that looks and feels like the standard file browse dialog box, but allows selecting name of an existing file on the remote computer running 24x7 Remote Agent or 24x7 Master Scheduler, the complete file name including path is returned
REMOTE DIR BROWSE	Displays folder browse dialog that looks and feels like the standard folder browse dialog box, but allows selecting name of an existing folder on the remote computer running 24x7 Remote Agent or 24x7 Master Scheduler, the complete folder name including path is returned
REMOTE AGENT LIST	Displays Remote Agent dialog and allows selecting name of an existing 24x7 Remote Agent profile
DB PROFILE LIST	Displays Database Profile dialog and allows selecting name of an existing database profile
QUEUE LIST	Displays Job Queue dialog and allows selecting name of an existing job queue
JOB BROWSE	Displays Job Tree dialog and allows selecting name of an existing job
JOB FOLDER BROWSE	Displays Job Folder dialog and allows selecting name of an existing job folder

With the exception of YES/NO and EDIT styles, to enter the required values you can either use the input assistant or directly type or paste them from the clipboard. To paste a value from the Clipboard, use CTRL+V shortcut. To use the assistant, click the Build  button. The assistant will display a dialog with the specified edit style.

Tips:

- If the user input contains commas as a part of the returned value, you will not be able to properly parse the returned values from a multi-prompt dialog. The workaround is calling InputBox for each input value separately, in other words, for every input value you should display one dialog with one prompt only.
- It is a good idea to use GetToken statement to parse values returned from a multi-prompt InputBox

MacroPlayBack

Description: Plays back GUI automation macros. GUI automation macros can be recorded using **MacroRecorder** - the GUI Automation utility, or be built dynamically in a JAL script job.

Syntax: MacroPlayBack macro, timeout, speed_ratio, show_control

Argument	Description
macro	A string whose value is the macro-script that you want play.
timeout	A number whose value is playback timeout specified in seconds. If the playback does not finish in the specified time interval (e.g. timeout occurs) the JAL script engine aborts the playback. A 0 value disables timeout and allows JAL script engine to playback the macro to infinity.
speed_ratio	A number whose value is playback speed ratio as compared to the original speed of recorded events. Number 0 or 1 for the speed_ratio indicate that playback will run with the original speed. Number 2 indicates that playback will be twice as fast as compared to original speed, Number 3 indicates triple speed, and so on.
show_control	A boolean whose value indicates whether you want to see the playback control displayed in the top-right corner of the screen while the playback is in progress. The playback control might be helpful in job debugging and troubleshooting. Specify TRUE value if you wan the control to be displayed, and FALSE otherwise.

Return value: None.

Usage: Use MacroPlayBack statement to automate various GUI applications that cannot be automated using conventional methods.

The macro for playback can be loaded from a file or created in a script.

See also:
MacroRecorder - GUI Automation utility

MemoryGetFree

Description: Retrieves the amount of available free virtual memory.

Syntax: MemoryGetFree freebytes

Argument	Description
freebytes	A numeric variable that receives the returned value

Usage: The freebytes receives the amount of free virtual memory. This value includes amount of free space in the Windows swap file plus the amount of available free physical memory. As opposite to the MemoryGetFree statement the MemoryGetFreeEx statement returns the amount of free space in the Windows swap file only.

Divide the returned value by 1024 to calculate free memory in Kbytes. Divide the returned value by 1048576 to calculate free memory in Mbytes.

 **Note:**
JAL script engine allocates some additional memory while executing JAL script. After execution, this memory is released back to the Operation System. Therefore, amount of free memory reported by the MemoryGetFree statement is usually less than amount of free memory available after the script run.

See also:
DiskGetFreeSpace
MemoryGetFreeEx

MemoryGetFreeEx

Description: Retrieves the amount of available free virtual memory.

Syntax: MemoryGetFreeEx freebytes

Argument	Description
freebytes	A numeric variable that receives the returned value

Usage: The freebytes receives the amount of free virtual memory. This value includes amount of free space in the Windows swap file. As opposite to the MemoryGetFreeEx statement the MemoryGetFree statement returns the amount of free space in the Windows swap plus the amount of available free physical memory.

Divide the returned value by 1024 to calculate free memory in Kbytes. Divide the returned value by 1048576 to calculate free memory in Mbytes.

 **Note:**
JAL script engine allocates some additional memory while executing JAL script. After execution, this memory is released back to the Operation System. Therefore, amount of free memory reported by the MemoryGetFree statement is usually less than amount of free memory available after the script run.

See also:
DiskGetFreeSpace
MemoryGetFree

MessageBox

Description: Displays a system Message Box with the text you specified, and YES/NO buttons.

Syntax: MessageBox message

Argument	Description
message	A string that is the message you want to display

Usage: The MessageBox displays standard Windows message box with the user-defined text and the prompt to press YES button to continue or press NO to stop the script. Pressing the NO button interrupts the script execution.

You should use this statement for Debugging purposes only. For instance, you can use it to display the value stored in a variable.

Reboot

Description: Immediately logs off, shuts down, and restarts the system ("cold" reboot.).

Syntax: Reboot

Usage: This statement has no arguments.

 **Note:**
During a shutdown operation, applications that are shut down are allowed a specific amount of time to respond to the shutdown request. If the time expires, Windows forces applications to close.

ScreenCapture

Description: Captures screen shot and saves it in a file.

Syntax: ScreenCapture file

Argument	Description
file	A string whose value is the name of the destination bitmap file.

Return value: None.

Usage: Use ScreenCapture statement to automate screen-capturing functions. ScreenCapture can be used together with the FileTransfer statement to automatically capturing screen shots on remote computers and then transferring saved bitmap files to the administrator's computer.

The size of the destination files depends on your screen resolution and number of colors selected for the display.

 **Important Note:** ScreenCapture fails if it is called when a screen saver is running.

See also:
WindowCapture

VBScriptExecute

Description: Executes specified Visual Basic Script

Syntax: VBScriptExecute script

Argument	Description
Script	A string whose value is the Visual Basic Script that you want to execute from your JAL script.

Return value: None.

Usage: Use VBScriptExecute statement to execute methods available in VBScript and not available in JAL. For example, you can use it to add COM automation to your existing JAL jobs.

See also:
VBScript Language Reference
Scripting Conventions

WindowCapture

Description: Captures part of the screen allocated by the specified window and saves it in a file.

Syntax: WindowCapture handle, file

Argument	Description
handle	A number whose value is the handle of the window that you want to capture.
file	A string whose value is the name of the destination bitmap file.

Return value: None.

Usage: Use WindowCapture statement to automate screen-capturing functions. WindowCapture can be used together with the other windows statements that can return the handle of the window.

The size of the destination files depends on your screen resolution and number of colors selected for the display.

 **Important Note:** WindowCapture fails if it is called when a screen saver is running.

See also:
ScreenCapture
WindowFind

Yield

Description: Yields execution so that the operating system can process other events.

Syntax: Yield

Usage: This statement has no arguments.

Numeric statements

Add

Description: Obtains the result of an addition operation.

Syntax: Add n1, n2, sum

Argument	Description
n1	The number to which you want to add n2.
n2	The number you want to add to n1
sum	A numeric variable that receives the returned value

Return value: Returns the sum of n1 and n2 so that sum **=** n1 + n2

Usage: You can also use keyword Plus instead of Add.

See also:

Subtract
Multiply
Divide
Mod

Ceiling

Description: Determines the smallest whole number that is greater than or equal to a specified limit.

Syntax: Ceiling n, return

Argument	Description
n	The number for which you want the smallest whole number that is greater than or equal to it
return	A numeric variable that receives the returned value

Return value: Returns the smallest whole number that is greater than or equal to n.

See also:

Floor

Divide

Description: Obtains the result of a division operation.

Syntax: Divide n1, n2, div

Argument	Description
n1	The number you want to divide by n2
n2	The number you want to divide into n1
div	A numeric variable that receives the returned value

Return value: Returns the result of division n1 by n2 so that div = n1 / n2

See also:

Subtract
Multiply
Add
Mod

Floor

Description: Determines the largest whole number less than or equal to a number.

Syntax: Floor n, return

Argument	Description
n	The number for which you want the largest whole number that is less than or equal to it
return	A numeric variable that receives the returned value

Return value: Returns the largest whole number less than or equal to n.

See also:

Ceiling

Max

Description: Determines the larger of two numbers.

Syntax: Max n1, n2, return

Argument	Description
n1	The number to which you want to compare n2
n2	The number to which you want to compare n1
return	A numeric variable that receives the returned value

See also:

Min

Min

Description: Determines the smaller of two numbers.

Syntax: Min n1, n2, return

Argument	Description
n1	The number to which you want to compare n2

n2	The number to which you want to compare n1
return	A numeric variable that receives the returned value

See also:

Max

Mod

Description: Obtains the remainder (modulus) of a division operation.

Syntax: Mod n1, n2, return

Argument	Description
n1	The number you want to divide by n2
n2	The number you want to divide into n1
return	A numeric variable that receives the returned value

Return value: Returns the reminder of a division using the following formula: return = n2 - (floor(n2 / n1) * n1)

See also:

Subtract
Multiply
Divide
Add

Multiply

Description: Obtains the result of a multiplication operation.

Syntax: Multiply n1, n2, return

Argument	Description
n1	The number you want to multiply by n2
n2	The number you want to be a multiplier for n1
return	A numeric variable that receives the returned value

Return value: Returns the result of multiplication n1 by n2 so that return **=** n1 * n2.

See also:

Subtract

Add
Divide
Mod

Power

Description: Obtains the result of an exponentiation operation.

Syntax: Power n1, n2, return

Argument	Description
n1	The number you want to be a base for n2
n2	The number you want to be a exponent for n1
return	A numeric variable that receives the returned value

Return value: Returns the result of exponentiation n1 by n2 so that return = $n1^{n2}$.

See also:
Subtract
Multiply
Divide
Mod
Add

Round

Description: Rounds a number to the specified number of decimal places.

Syntax: Round n1, n2, return

Argument	Description
n1	The number you want to round
n2	The number of decimal places to which you want to round n1. Valid values are 0 through 18
return	A numeric variable that receives the returned value

Usage: Returns the result of rounding n1 to n2 decimal places.

See also:
Floor

Ceiling
Divide

Subtract

Description: Obtains the result of a subtraction operation.

Syntax: Subtract n1, n2, sub

Argument	Description
n1	The number to which you want to add n2.
n2	The number you want to add to n1
sub	A numeric variable that receives the returned value

Return value: Returns the subtraction of n1 and n2 so that sub **=** n1 - n2

Usage: You can also use keyword Minus instead of Subtract.

See also:

Add
Multiply
Divide
Mod

Print statements

FilePrint

Description: Sends the specified file to the default printer

Syntax: FilePrint filename

Argument	Description
filename	A string whose value is the name of the file you want to print. If filename is not on the operating system's search path, you must enter the fully qualified name

Return value: None.

See also:

PrinterSetDefault

Print

Description: Prints the specified string.

Syntax: Print s

Argument	Description
s	The string you want to print. If the string includes carriage return / new line character pairs (CR/NL), the string will be printed on multiple lines

Return value: None.

See also:

FilePrint

PrinterSetDefault

PrinterGetDefault

Description: Reports name of the default printer.

Syntax: PrinterGetDefault s

Argument	Description
s	A string variable that receives the name of the default printer

Return value: None.

Usage: You can use PrinterGetDefault to retrieve name of the default printer before you change it using PrinterSetDefault so that you can restore the default printer after some processing done.

See also:

FilePrint

PrinterSetDefault

PrinterPurgeAllJobs

Description: Discards all pending print jobs from the specified print queue.

Syntax: PrinterPuregAllJobs s

Argument	Description
s	A string variable whose value is the name of a printer for which you want to discard all pending print jobs

Return value: None.

See also:

PrinterGetDefault
PrinterSetDefault

PrinterSetDefault

Description: Changes the default printer.

Syntax: PrinterSetDefault s

Argument	Description
S	A string whose value is the name of the printer that you want to be a default printer

Return value: None.

See also:

FilePrint
PrinterGetDefault

Process statements

IsTaskRunning

Description: Reports whether the specified task is running.

Syntax: IsTaskRunning module, return

Argument	Description
module	A string whose value is the name of the main program module. Usually the module name matches name of the main program executable file. If the module extension is omitted, the default library extension (.DLL) is appended. The module string can include a trailing point character (.) to indicate that the module name has no extension. The string does not have to specify a path. The name is compared (case independently) to the names of modules currently running
return	A boolean variable that receives the returned value

Return value: Boolean. Returns TRUE when the specified module is running, and FALSE otherwise.

Usage: You can use the Windows Task Manager to find out the module name. For example the module name for MS Word is WINWORD.EXE. When you know the module name you can use IsTaskRunning statement to check state of the required application. For instance, in order to fax something, you may want to check presence of Delrina WinFax instance in a memory before establishing a DDE connection to the Delrina DDE server. If IsTaskRunning returns FALSE then you can call Run statement to open an instance of Delrina WinFax .
Alternatively, you can use ProcessList statement to get a string listing all processes and their process IDs.

See also:

Run
ProcessGetID
ProcessList
ProcessKill
ServiceGetStatus

JobProcessID

Description: Obtains Windows process identifier for the current 24x7 job process. If the job is running attached, this is the ID of the main 24x7 process; otherwise it is the ID of the detached job process.

Syntax: JobProcessID pid

Return value: Number. System process ID for the process running the job in which the JobProcessID statement is being executed

Usage: Use JobProcessID in job control scripts. For example, detached jobs can use this ID to abort job execution using ProcessKill statement.

Important note:

- Process ID is assigned by the operation system. Process ID is only unique at the time of the job run. If the job is not setup to run detached, process ID is the same as ID of the main 24x7.exe process.

See also:

JobThreadID
ProcessGetID
ProcessKill

JobThreadID

Description: Obtains Windows thread identifier for the current 24x7 job. If the job is running attached, this is the thread ID of the job process within 24x7 job queue; otherwise it is the main thread ID of the detached job process.

Syntax: JobThreadID tid

Return value: Number. System thread ID for the thread running the job in which the JobThreadID statement is being executed

Usage: Use JobThreadID in asynchronous and/or detached jobs to obtain unique job instance identifier. You can also use in advanced job control scenarios. For example, an asynchronous background job can return this ID to an external process management application. That application can use the obtained thread ID to suspend the job and put it to sleep. Later it can wake up the job and resume the execution from the point when the job execution has been previously suspended.

Important note:
Thread ID is assigned by the operation system. Thread ID is unique in the system. Yet if the job is run synchronous and non-detached, the thread ID will be always the same for all job instances run by the same JAL script engine instance and will match thread ID of the associated job queue manager process.

See also:

JobProcessID
ProcessGetID
ProcessKill

ProcessGetID

Description: Reports process ID for the specified module.

Syntax: ProcessGetID filename, return

Argument	Description
filename	A string whose value is the full name of the process main program module. Usually the module name matches name of the main program executable file. If the module extension is omitted, the default library extension (.DLL) is appended. The module string can include a trailing point character (.) to indicate that the module name has no extension. The string has to include a file path to the desired module. The name is compared (case independently) to the names of modules currently running
return	A numeric variable that receives the returned value

Return value: Number. Returns Windows process identifier for the specified module. A process identifier can change for each run of the program for which you want to find process ID.

See also:

ProcessGetHandle
ProcessGetWindow
JobProcessID
ProcessKill
WindowGetProcess

ProcessGetHandle

Description: Reports process handle for the specified module.

Syntax: ProcessGetHandle module, return

Argument	Description
module	A string whose value is the full name of the process main program module. Usually the module name matches name of the main program executable file. If the module extension is omitted, the default library extension (.DLL) is appended. The module string can include a trailing point character (.) to indicate that the module name has no extension. The string has to include a file path to the desired module. The name is compared (case independently) to the names of modules currently running
return	A numeric variable that receives the returned value

Return value: Number. Returns process handle for the specified module. A process handle can change for each run of the program for which you want to find out process handle.

Usage: The returned handle is not global and should not be passed as a parameter to other Windows applications.

See also:

ProcessGetID

ProcessGetWindow
ProcessKill
WindowGetProcess

ProcessKill

Description: Terminates the specified process and all of its threads.

Syntax: ProcessKill processid

Argument	Description
processid	A number whose value is the id of the process which you want to terminate

Return value: None.

Usage: The ProcessKill statement can be used to unconditionally cause a process to exit. Use it only in extreme circumstances. You can use ProcessGetID statement to find the process ID for the desired module (program). You can also use WindowGetProcess statement to get process ID for the desired window.

 **Note:**
Termination of a process does not always forces termination of all its child processes!

See also:

ProcessGetID
WindowGetProcess
JobProcessID

ProcessList

Description: Reports all running processes and their process IDs.

Syntax: ProcessList return

Argument	Description
return	A string variable that receives the returned value

Return value: String. Returns Ids and names of all running process as multi-line string. Each line consists of process ID following by the tab character and process name.

Usage: Use the returned value to find out process name for the desired application. The application must be running at the when you call ProcessList statement.

Note: Because of security restrictions in Windows NT (NT/2000/XP/2003/VISTA/2008) the returned string may include not all running processes.

See also:

ProcessGetID
ProcessGetWindow
ProcessKill
WindowGetProcess

ProcessGetWindow

Description: Finds and reports the handle of a first window whose process ID matches the specified process ID.

Syntax: ProcessGetWindow processID, return

Argument	Description
processID	A number whose value is the ID of the process for which you want to find first window
return	A numeric variable that receives the returned value

Return value: Number. Returns the handle of the first window that Window's finds for the specified processID. A process ID can change for each run of the program for which you want to find the first window.

Usage: The returned handle is global and uniquely identifies the window instance. You can use ProcessGetID statement to find out the ID of desired module.

See also:

ProcessGetHandle
ProcessGetID
ProcessKill
WindowGetProcess

Run

Description: Runs the specified program or document.

Syntax: Run command, dir, return

Argument	Description
command	A string whose value is the full or partial path and filename of the module to execute.

	The module may be a .COM, .BAT, .EXE, or associated file type. If a partial name is specified, the current drive and current directory are used by default. The module name must be the first white space-delimited token in the Program name field. The specified module can be a Win32-based application, or it can be some other type of module (for example, MS-DOS or OS/2) if the appropriate subsystem is available on the local computer. If the filename does not contain an extension, .EXE is assumed. If the filename ends in a "." with no extension, or the filename contains a path, .EXE is not appended. If the filename does not contain a directory path, Windows searches for the executable file in the following sequence: The directory from which the JAL script engine loaded. 1 The current directory. 2 The 32-bit Windows system directory. The name of this directory is SYSTEM32. 3 The 16-bit Windows system directory. The name of this directory is SYSTEM. 4 The Windows directory. The name of this directory is WINDOWS or WINNT. 5 The directories that are listed in the PATH environment variable. You should always include the full path - don't rely on the PATH environment variable, because this may be different at the time the program runs, depending on what account the program is being run under. Also, keep in minds that other programs can modify the PATH environment variable as well. Program name can be followed by **command line parameters**. You can use **macro-parameters** and **system environment variables** within program name and command line parameters string to pass dynamic information (such as the current month) to the scheduled program.
dir	A string whose value is the directory where the program executable finds associated files that are required to run the program. Most programs do not require an entry in this field so that you can specify the empty string (""). Occasionally however, a program will refuse to run properly unless it is specifically told where to find other program files. The JAL script engine will change to this directory when running the program or document. You can use **macro-parameters** and **system environment variables** within directory name.
return	A numeric variable that receives the ID of the created process.

Return value: Number. Returns the ID of the created process. You can use that ID to control and manipulate further process execution.

Usage: You can use Run for any application that you can run from the operating system. If you specify command line parameters, the application determines the meaning of those parameters. A typical use for command line parameters is to identify a data file to be opened when the program is executed.
In order to run a document, its extension must be registered. For example, if you want to start a MDB file that has AutoExec macro, you must have MDB file extension registered as a MS Access database application.

See also:

- RunConfig
- RunAndWait
- RunAsUser
- RunWithInput
- SendKeys
- Wait

RunAsUser

Description: Runs the specified program or document using different Windows NT (NT/2000/XP/2003/VISTA/2008) user logon.

Syntax: RunAsUser command, dir, user, password, domain, return

Argument	Description
command	A string whose value is the full or partial path and filename of the module to execute. The module may be a .COM, .BAT, .EXE, or associated file type. If a partial name is specified, the current drive and current directory are used by default. The module name must be the first white space-delimited token in the Program name field. The specified module can be a Win32-based application, or it can be some other type of module (for example, MS-DOS or OS/2) if the appropriate subsystem is available on the local computer. If the filename does not contain an extension, .EXE is assumed. If the filename ends in a "." with no extension, or the filename contains a path, .EXE is not appended. If the filename does not contain a directory path, Windows searches for the executable file in the following sequence: The directory from which the JAL script engine loaded. 6 The current directory. 7 The 32-bit Windows system directory. The name of this directory is SYSTEM32. 8 The 16-bit Windows system directory. The name of this directory is SYSTEM. 9 The Windows directory. The name of this directory is WINDOWS or WINNT. 10 The directories that are listed in the PATH environment variable. You should always include the full path - don't rely on the PATH environment variable, because this may be different at the time the program runs, depending on what account the program is being run under. Also, keep in minds that other programs can modify the PATH environment variable as well. Program name can be followed by **command line parameters**. You can use **macro-parameters** and **system environment variables** within program name

	and command line parameters string to pass dynamic information (such as the current month) to the scheduled program.
dir	A string whose value is the directory where the program executable finds associated files that are required to run the program. Most programs do not require an entry in this field so that you can specify the empty string (""). Occasionally however, a program will refuse to run properly unless it is specifically told where to find other program files. The JAL script engine will change to this directory when running the program or document. You can use **macro-parameters** and **system environment variables** within directory name.
user	A string variable that specifies the user name. This is the name of the user account to log on to.
password	A string variable that specifies the password for the user account specified by user.
domain	A string variable that specifies the domain or server to log on to. If this parameter is ".", Windows NT (NT/2000/XP/2003/VISTA/2008) searches only the local account database for the account specified in user.
return	A numeric variable that receives the ID of the created process.

Return value: Number. Returns the ID of the created process. You can use that ID to control and manipulate further process execution.

Usage: You can use RunAsUser for any application that you can run from the operating system. If you specify command line parameters, the application determines the meaning of those parameters. A typical use for command line parameters is to identify a data file to be opened when the program is executed.
In order to run a document, its extension must be registered. For example, if you want to start a MDB file that has AutoExec macro, you must have MDB file extension registered as a MS Access database application.

Important Notes:

- RunAsUser statement is **not supported on Windows 95/98/Me** systems.
- Windows NT (NT/2000/XP/2003/VISTA/2008) considers the user as logged on until the process (and all child processes) have ended.

The process created by the RunAsUser statement is non-interactive, that is, it runs on a desktop that is not visible and cannot receive user input. Also, the process inherits the environment of the JAL script engine, rather than the environment associated with the specified user.

See also:

Run
RunAsUserAndWait
RunConfig
ProcessKill

RunAndWait

Description: Starts specified program or document and enters an efficient wait state until this process finishes or until the timeout interval elapses. In the last case the JAL script engine forcedly terminates the process.

Syntax: RunAndWait command, dir, timeout, return

Argument	Description
Command	A string whose value is the full or partial path and filename of the module to execute. The module may be a .COM, .BAT, .EXE, or associated file type. If a partial name is specified, the current drive and current directory are used by default. The module name must be the first white space-delimited token in the Program name field. The specified module can be a Win32-based application, or it can be some other type of module (for example, MS-DOS or OS/2) if the appropriate subsystem is available on the local computer. If the filename does not contain an extension, .EXE is assumed. If the filename ends in a "." with no extension, or the filename contains a path, .EXE is not appended. If the filename does not contain a directory path, Windows searches for the executable file in the following sequence: The directory from which the JAL script engine loaded. 1 The current directory. 2 The 32-bit Windows system directory. The name of this directory is SYSTEM32. 3 The 16-bit Windows system directory. The name of this directory is SYSTEM. 4 The Windows directory. The name of this directory is WINDOWS or WINNT. 5 The directories that are listed in the PATH environment variable. You should always include the full path - don't rely on the PATH environment variable, because this may be different at the time the program runs, depending on what account the program is being run under. Also, keep in minds that other programs can modify the PATH environment variable as well. Program name can be followed by **command line parameters**. . You can use **macro-parameters** and **system environment variables** within program name and command line parameters string to pass dynamic information (such as the current month) to the scheduled program.
Dir	A string whose value is the directory where the program executable finds associated files that are required to run the program. Most programs do not require an entry in this field so that you can specify the empty string (""). Occasionally however, a program will refuse to run properly unless it is specifically told where to find other program files. The JAL script engine will change to this directory when running the program or document. . You

	can use **macro-parameters** and **system environment variables** within directory name.
Timeout	A number whose value is the maximum time interval within which you allow the specified program to run. Use 0 timeout to allow infinite waiting.
Return	A numeric that receives the ID of the created process.

Return value: Number. Returns the ID of the created process.

Usage: You can use RunAndWait for any application that you can run from the operating system. If you specify command line parameters, the application determines the meaning of those parameters. A typical use for command line parameters is to identify a data file to be opened when the program is executed.
In order to run a document, its extension must be registered. So that if you want to start MDB files that has AutoExec macro you must have MDB file extension registered as a MS Access database application.
Use RunAndWait when you have a complex job with one or more program dependencies so the next program starts upon completion of the process specified by command. For example, you can call RunAndWait first to execute a program that creates huge data file. Then you call FileZip statement that compresses the produced data file. After that, you can use MailSendWithAttachment statement to email the archive created by the FileZip.

See also:

Run
RunAsUserAndWait
RunWithInput
RunConfig
ProcessGetExitCode
SendKeys
Wait

RunAsUserAndWait

Description: Starts specified program or document and enters an efficient wait state until this process finishes or the timeout interval elapses. In the latter case, the JAL script engine forcedly terminates the process. The process is started using different Windows NT (NT/2000/XP/2003/VISTA/2008) user logon.

Syntax: RunAsUserAndWait command, dir, timeout, user, password, domain, return

Argument	Description
command	A string whose value is the full or partial path and filename of the module to execute. The module may be a .COM, .BAT, .EXE, or associated file type. If a partial name is specified, the current drive and current directory are used by default. The module name must be the first white space-delimited token in the Program name field. The specified module can be a Win32-based application, or it can be some other type of module (for example, MS-DOS or OS/2) if the appropriate subsystem is available on the local computer. If the filename does not contain an extension, .EXE is assumed. If the filename ends in a "." with no extension, or the filename contains a path, .EXE is not appended. If

	the filename does not contain a directory path, Windows searches for the executable file in the following sequence: The directory from which the JAL script engine loaded. 1 The current directory. 2 The 32-bit Windows system directory. The name of this directory is SYSTEM32. 3 The 16-bit Windows system directory. The name of this directory is SYSTEM. 4 The Windows directory. The name of this directory is WINDOWS or WINNT. 5 The directories that are listed in the PATH environment variable. You should always include the full path - don't rely on the PATH environment variable, because this may be different at the time the program runs, depending on what account the program is being run under. Also, keep in minds that other programs can modify the PATH environment variable as well. Program name can be followed by **command line parameters**. . You can use **macro-parameters** and **system environment variables** within program name and command line parameters string to pass dynamic information (such as the current month) to the scheduled program.
dir	A string whose value is the directory where the program executable finds associated files that are required to run the program. Most programs do not require an entry in this field so that you can specify the empty string (""). Occasionally however, a program will refuse to run properly unless it is specifically told where to find other program files. The JAL script engine will change to this directory when running the program or document. . You can use **macro-parameters** and **system environment variables** within directory name.
timeout	A number whose value is the maximum time interval within which you allow the specified program to run. Use 0 timeout to allow infinite waiting.
user	A string variable that specifies the user name. This is the name of the user account to log on to.
password	A string variable that specifies the password for the user account specified by user.
domain	A string variable that specifies the domain or server to log on to. If this parameter is ".", Windows NT (NT/2000/XP/2003/VISTA/2008) searches only the local account database for the account specified in user.
return	A numeric variable that receives the ID of the created process.

Return value: Number. Returns the ID of the created process.

Usage: You can use RunAsUserAndWait for any application that you can run from the operating system. If you specify command line parameters, the application determines the meaning of those parameters. A typical use for command line parameters is to identify a data file to be opened when the program is executed.
In order to run a document, its extension must be registered. So that if you want to start MDB files that has AutoExec macro you must have MDB file extension registered as a MS Access database application.
Use RunAsUserAndWait when you have a complex job with one or more program dependencies so the next program starts upon completion of the process specified by command. For example, you can call RunAsUserAndWait first to

execute a program that creates huge data file. Then you call FileZip statement that compresses the produced data file. After that, you can use MailSendWithAttachment statement to email the archive created by the FileZip.

Important Notes:

- RunAsUserAndWait statement is **not supported on Windows 95/98/Me** systems.
- Windows NT (NT/2000/XP/2003/VISTA/2008) considers the user as logged on until the process (and all child processes) have ended.

The process created by the RunAsUserAndWait statement is non-interactive, that is, it runs on a desktop that is not visible and cannot receive user input. Also, the process inherits the environment of the JAL script engine, rather than the environment associated with the specified user.

See also:

Run
RunAsUser
RunAndWait
RunConfig
ProcessGetExitCode
Wait

RunWithInput

Description: Starts the specified program or document, sends one or more keystrokes to the active window as if typed at the keyboard, and then enters an efficient wait state until the started process finishes or until the timeout interval elapses. In the last case, the JAL script engine forcedly terminates the process.

Syntax: RunWithInput command, dir, init_time, keystroke, timeout, return

Argument	Description
command	A string whose value is the full or partial path and filename of the module to execute. The module may be a .COM, .BAT, .EXE, or associated file type. If a partial name is specified, the current drive and current directory are used by default. The module name must be the first white space-delimited token in the Program name field. The specified module can be a Win32-based application, or it can be some other type of module (for example, MS-DOS or OS/2) if the appropriate subsystem is available on the local computer. If the filename does not contain an extension, .EXE is assumed. If the filename ends in a "."with no extension, or the filename contains a path, .EXE is not appended. If the filename does not contain a directory path, Windows searches for the executable file in the following sequence: The directory from which the JAL script engine loaded. 1 The current directory. 2 The 32-bit Windows system directory. The name of this directory is SYSTEM32. 3 The 16-bit Windows system directory. The name of

	this directory is SYSTEM. 4 The Windows directory. The name of this directory is WINDOWS or WINNT. 5 The directories that are listed in the PATH environment variable. You should always include the full path - don't rely on the PATH environment variable, because this may be different at the time the program runs, depending on what account the program is being run under. Also, keep in minds that other programs can modify the PATH environment variable as well. Program name can be followed by **command line parameters**. . You can use **macro-parameters** and **system environment variables** within program name and command line parameters string to pass dynamic information (such as the current month) to the scheduled program.
dir	A string whose value is the directory where the program executable finds associated files that are required to run the program. Most programs do not require an entry in this field so that you can specify the empty string (""). Occasionally however, a program will refuse to run properly unless it is specifically told where to find other program files. The JAL script engine will change to this directory when running the program or document. You can use **macro-parameters** and **system environment variables** within directory name.
init_time	A number whose value is the time in seconds that you want the 24x7 to wait before sending a keystroke to the spawned program, allowing the program to start and initialize.
keystroke	A string whose value is the keystroke you want to send to the started program.
timeout	A number whose value is the maximum time interval within which you want the specified program to finish. Use 0 timeout to allow infinite waiting.
return	A numeric that receives the ID of the created process.

Return value: Number.

Usage: You can emulate any keystrokes that you might need to further automate the actions of this program. You can use RunWithInput for any application that you can run from the operating system. If you specify command line parameters, the application determines the meaning of those parameters. A typical use for command line parameters is to identify a data file to be opened when the program is executed.
In order to run a document, its extension must be registered. So that if you want to start MDB files that has AutoExec macro you must have MDB file extension registered as a MS Access database application.

Use RunWithInput when you have a complex job with one or more program dependencies so the next program starts upon completion of the process specified by command. For instance, you can call RunWithInput first to execute a program that downloads data from database. You send a keystroke to emulate an operator login to database and the command to save some data in an external file. Then you can call RunAndWait statement to execute a program that compresses the produced data file. After that, you can use MailSendWithAttachment statement to email the archive created before.

See also:

Run
RunAndWait

RunConfig
ProcessGetExitCode
SendKeys
Wait

RunConfig

Description: Configures run-time options for subsequent Run… statements. The new options affect only the job in which the RunConfig statement is executed.

Syntax: RunConfig option, new_value

Argument	Description
option	A string whose value is the option name. The following options are supported: • WINDOW • DESKTOP • TITLE • CPU
new_value	A string or number whose value is the new option value.

Return value: None.

Usage: You can use RunConfig statement to configure run-time options for the following **Run**, **RunAndWait** and all other Run… statements.

- The WINDOW option controls size and state of the graphical windows that will be allocated by the system for started processes. For the new_value you can specify either of the following values: "HIDE", "MINIMIZE", "MAXIMIZE", "NORMAL".

The DESKTOP option is supported only on Windows NT based systems (Windows NT 4, Windows 2000, Windows XP, Windows NET and better). You can use this option to specify on which virtual Desktop you want to start the processes. Using this option in JAL script engine NT service you can for example start a graphical process running on the user Desktop from. In fact the default graphical user desktop name is winsta0\default. For more information about Desktops and their names see Microsoft Windows SDK documentation.
Example:

```
RunConfig( "DESKTOP", "winsta0\default" )
// run process
Dim( process_id, number )
Run( "myprocess.exe", "", process_id )
```

- The TITLE option can be used to assign custom title to DOS console process windows. This can be used for user convinience so the user can easily identify different processes. It can be also with the **WindowFind** statement, which can be called later to find the previously created console window. You can use the following code as a template:

```
// set unique title
Dim( unique_tittle, string )
Timer( 0, unique_tittle )
RunConfig( "TITLE", unique_title )
// run process
Dim( process_id, number )
```

```
Run( "myprocess.exe", "", process_id )
... some other processing is performed here ...
// Find and close the created process window
Dim( window_handle, number )
WindowFind( unique_title, window_handle )
WindowClose( window_handle )
```

The CPU option is supported only on Windows NT based systems (Windows NT 4, Windows 2000, Windows XP, Windows NET and better). You can use this option to bind different processes to different CPUs. Obviously this option is useful only on multi-processor systems. By distributing load across multiple CPUs you can achieve better system performance and allow run of more concurrent jobs. Please keep in mind the JAL script engine job engine always runs on the first CPU. For new_value parameter you should specify the desired CPU number such as 1, 2, 3 and so on. Specify 0 value resets the CPU option and allows the system to decide which CPU to use for the processes.

See also:

Run
RunAndWait
RunAsUser
RunAsUserAndWait
RunWithInput

ProcessGetExitCode

Description: Obtains exit code of the last process that was ran from the script using RunAndWait or RunWithInput statements.

Syntax: ProcessGetExitCode return

Argument	Description
return	A numeric variable that receives the exit code of the last process.

Return value: Number. Returns the exit code the last process.

Usage: ProcessGetExitCode returns either of the following values:
-1 -- if an error occurs (such as program not found or cannot be started)
or
-100 -- if the process was terminated by JAL script engine because it timed out
or
process exit code.

See also:

RunAndWait
RunWithInput
WindowFind
ProcessGetWindow

SendKeys

Description: Sends one or more keystrokes to the active window as if typed at the keyboard.

Syntax: SendKeys keystroke

Argument	Description
keystroke	A string whose value is the keystrokes you want to send

Return value: None.

Usage: Each key is represented by one or more characters. To specify a single keyboard character, use the character itself. For example, to represent the letter A, use "A" for string. To represent more than one character, append each additional character to the one preceding it. To represent the letters A, B, and C, use "ABC" for string. The left and right parentheses ( ) have special meanings to SendKeys. To specify one of these characters, enclose it within braces ({}). For example, to specify the plus sign, use {{}. To specify brace characters, use {{} and {}}.

To specify characters that aren't displayed when you press a key, such as ENTER or TAB, and keys that represent actions rather than characters, use the codes shown below:

Key	Code
BACKSPACE	{BACKSPACE}, {BS}, or {BKSP}
BREAK	{BREAK}
CAPS LOCK	{CAPSLOCK}, {CAPSLOCK}, or {CAP}
DEL or DELETE	{DELETE} or {DEL}
DOWN ARROW	{DOWN}
END	{END}
ENTER	{ENTER} or {CR}, {RETURN}
ESC	{ESC} or {ESCAPE}
HOME	{HOME}
INS or INSERT	{INSERT} or {INS}
LEFT ARROW	{LEFT}
NUM LOCK	{NUMLOCK} or {NUM LOCK}
PAGE DOWN	{PGDN}, {PAGE DOWN}, {PAGEDOWN}
PAGE UP	{PGUP}, {PAGE UP}, or {PAGE UP}
PRINT SCREEN	{PRTSC}, {PRINT}, or {PRINT SCREEN}
RIGHT ARROW	{RIGHT}
SCROLL LOCK	{SCROLLLOCK} or {SCROLL LOCK}
TAB	{TAB}
UP ARROW	{UP}
F1	{F1}
F2	{F2}

F3	{F3}
F4	{F4}
F5	{F5}
F6	{F6}
F7	{F7}
F8	{F8}
F9	{F9}
F10	{F10}
F11	{F11}
F12	{F12}
Numpad 0	{NUMPAD0} or {NUMPAD 0}
Numpad 1	{NUMPAD1} or {NUMPAD 1}
Numpad 2	{NUMPAD2} or {NUMPAD 2}
Numpad 3	{NUMPAD3} or {NUMPAD 3}
Numpad 4	{NUMPAD4} or {NUMPAD 4}
Numpad 5	{NUMPAD5} or {NUMPAD 5}
Numpad 6	{NUMPAD6} or {NUMPAD 6}
Numpad 7	{NUMPAD7} or {NUMPAD 7}
Numpad 8	{NUMPAD8} or {NUMPAD 8}
Numpad 9	{NUMPAD9} or {NUMPAD 9}
Numpad *	{NUMPAD*} or {NUMPAD *}
Numpad +	{NUMPAD+} or {NUMPAD +}
Numpad -	{NUMPAD-} or {NUMPAD -}
Numpad /	{NUMPAD/} or {NUMPAD /}
Numpad .	{NUMPAD.} or {NUMPAD .}
Numpad ENTER	{NUMPADENTER}, {NUMPAD ENTER}, {NUMPAD CR}, or {NUMPAD RETURN}

To specify keys combined with any combination of the SHIFT, CTRL, and ALT keys, precede the key code with one or more of the following codes:

Key	Code
SHIFT	{SHIFT}
CTRL	{CTRL}
ALT	{ALT}

To specify that any combination of SHIFT, CTRL, and ALT should be held down while several other keys are pressed, enclose the code for those keys in parentheses. For example, to specify to hold down SHIFT while E and C are pressed, use "{SHIFT}(EC)". To specify to hold down SHIFT while E is pressed, followed by C without SHIFT, use "{SHIFT}EC" .
To specify that a delay is needed between sending several keys, use the {WAIT} code. This will put the JAL script engine in a 1 second sleep mode. To specify longer delay, use the form {WAIT number}. You must put a space between WAIT and number. For example, {WAIT 5} means sleep for 5 seconds.

Note:
You can't use SendKeys to send keystrokes to an application that is not designed to run in Microsoft Windows.

See also:

RunWithInput
WindowActivate
Wait

Wait

Description: Enters an efficient wait state until the waitinterval elapses.

Syntax: Wait waitinterval

Argument	Description
Waitinterval	A number whose value is the time interval expressed in seconds during which you want the JAL script engine to “sleep".

Return value: None.

Usage: You can use Wait to temporarily pause script execution. For example you may want to pause the script for a few second to allow other processing to finish before continuing the script.

See also:

Run
RunAndWait

WindowGetProcess

Description: Obtains process ID for the specified window.

Syntax: WindowGetProcess handle, return

Argument	Description
handle	A number whose value is the handle of the window for which you want to find its process ID
return	A numeric variable that receives the returned value

Return value: Number. Return process ID for the specified window.

Usage: Use WindowGetProcess to pass returned value to the ProcessKill statement when you cannot gracefully close that process and want to terminate the process anyway.

See also:

ProcessGetWindow
ProcessKill
ProcessGetID
WindowClose
WindowFind
WindowGetActive

RAS statements (RAS for Windows platforms)

RASDial

Description: Establishes a RAS (remote access service) connection between a RAS client and a RAS server.

Syntax: RASDial phonebook_entry, user_name, password, return

Argument	Description
Phonebook_entry	A string whose value is the phonebook entry to use to establish the connection.
user_name	A string whose value is the user's user name. This string is used to authenticate the user's access to the remote access server.
Password	A string whose value is the user's password. This string is used to authenticate the user's access to the remote access server.
Return	A numeric variable that receives the returned value.

Return value: Number. The returned value is the RAS connection handle. Use the returned value as a parameter for other RAS statements.

Usage: JAL script engine executes RASDial statement synchronously meaning that the control is not returned and the next statement is not executed until RASDail has completed successfully or failed.

See also:

RASHangUp
RASGetStatus

RASGetStatus

Description: Retrieves information on the current status of the specified RAS (remote access service) connection.

Syntax: RASGetStatus connection, return

Argument	Description
Connection	A number whose value is the connection handle returned by RASDial statement.
Return	A string variable that receives the returned value.

Return value: String. Returns information on the current status of the specified remote access connection. You can use this statement to determine the connection status before starting or closing other applications that use RAS connections. The returned status can be one of the following:

- Open Port
- Port Opened
- Connect Device
- Device Connected
- All Devices Connected
- Authenticate
- Auth. Notify
- Auth. Retry
- Auth. Callback
- Auth. Change Password
- Auth. Project
- Auth. Link Speed
- Auth. Ack
- ReAuthenticate
- Authenticated
- Prepare For Callback
- Wait For Modem Reset
- Wait For Callback
- Connected

See also:

RASDial

RASHangUp

RASHangUp

Description: Terminates a RAS (remote access service) connection previously established using RASDial statement.

Syntax: RASHangUp connection

Argument	Description
Connection	A number whose value is the connection handle returned by RASDial statement.

Return value: None.

See also:

RASDial
RASGetStatus

Remote Automation statements (RA for UNIX and Linux)

The following methods are supported for automating remote UNIX jobs

- **RAConnect**
- **RADisconnect**
- **RAGetWorkDir**
- **RADir**
- **RASetWorkDir**
- **RAFileDateTime**
- **RAFileSize**
- **RAFileTransfer**
- **RAFileReadAll**
- **RAFileSave**
- **RAFileOpen**
- **RAFileRead**
- **RAFileWrite**
- **RAFileClose**
- **RARun**
- **RARunAndWait**
- **RAProcessKill**
- **RAProcessList**

 **Note:** For more information on these methods see manual for **24x7 Remote Automation Server for Linux and UNIX**

Registry statements

RegistryGetKey

Description: Gets a value from the Windows system registry.

Syntax: RegistryGetKey key, valuename, valuetype, return

Argument	Description
key	A string whose value names the key in the system registry whose value you want to retrieve. To uniquely identify a key, specify the list of parent keys above it in the hierarchy, starting with the root key. The keys in the list are separated by backslashes
valuename	A string containing the name of a value in the registry. Each key can have one unnamed value and several named values. For the unnamed value, specify an empty string
valuetype	A string specifying the type of a value in the registry. The following types are supported: • "STRING" — A null-terminated string • "NUMBER" — A 32-bit number
return	A variable corresponding to the data type of valuetype that receives the returned value

Return value: String or Number. The result type corresponds to the data type of valuetype.

Usage: A key is part of a tree of keys, descending from one of the predefined root keys. Each key is a subkey or child of the parent key above it in the hierarchy. There are four root strings:

- HKEY_CLASSES_ROOT
- HKEY_LOCAL_MACHINE
- HKEY_USERS
- HKEY_CURRENT_USER

A key is uniquely identified by the list of parent keys above it. The keys in the list are separated by slashes, as shown in these examples.
HKEY_LOCAL_MACHINE\Software\Microsoft\Access\7.0\Options
HKEY_CURRENT_USER\Control Panel\International

See also:

IniFileGetKey
IniFileSetKey
RegistrySetKey

RegistrySetKey

Description: Sets the value for a key and value name in the system registry. If the key or value name does not exist, RegistrySetKey creates a new key or name and sets its value.

Syntax: RegistrySetKey key, valuename, valuetype, value

Argument	Description
key	A string whose value names the key in the system registry whose value you want to set. To uniquely identify a key, specify the list of parent keys above it in the hierarchy, starting with the root key. The keys in the list are separated by backslashes. If key does not exist in the registry, RegistrySetKey creates a new key
valuename	A string containing the name of a value in the registry. Each key can have one unnamed value and several named values. For the unnamed value, specify an empty string
valuetype	A string specifying the type of a value in the registry. The following types are supported: • "STRING" — A null-terminated string • "NUMBER" — A 32-bit number
value	A constant or a variable corresponding to the data type of valuetype containing a value to be set in the registry

Return value: None.

Usage: A key is part of a tree of keys, descending from one of the predefined root keys. Each key is a subkey or child of the parent key above it in the hierarchy. There are four root strings:

- HKEY_CLASSES_ROOT
- HKEY_LOCAL_MACHINE
- HKEY_USERS
- HKEY_CURRENT_USER

A key is uniquely identified by the list of parent keys above it. The keys in the list are separated by slashes, as shown in these examples.
HKEY_LOCAL_MACHINE\Software\Microsoft\Access\7.0\Options
HKEY_CURRENT_USER\Control Panel\International

See also:

IniFileGetKey
IniFileSetKey
RegistryGetKey

RegistryDelete

Description: Deletes the specified registry key or value from the system registry. If the key contains values or other subkeys, RegistryDelete recursively deletes all of them.

Syntax: RegistryDelete key_or_value_name

Argument	Description
key_or_value_name	A string whose value names the key or named value in the system registry that you want to delete. To uniquely identify a key, specify the list of parent keys above it in the hierarchy, starting with the root key. The keys in the list are separated by backslashes.

Return value: None.

Usage: A key is part of a tree of keys, descending from one of the predefined root keys. Each key is a subkey or child of the parent key above it in the hierarchy. There are four root strings:

- HKEY_CLASSES_ROOT
- HKEY_LOCAL_MACHINE
- HKEY_USERS
- HKEY_CURRENT_USER

A key is uniquely identified by the list of parent keys above it. The keys in the list are separated by slashes, as shown in these examples.
HKEY_LOCAL_MACHINE\Software\Microsoft\Access\7.0\Options
HKEY_CURRENT_USER\Control Panel\International

See also:

RegistryList
RegistrySetKey
RegistryGetKey

RegistryList

Description: Lists sub-keys or named values for the specified registry key

Syntax: RegistryList key, enumerator, return

Argument	Description
key	A string whose value names the key in the system registry whose sub-keys or values you want to retrieve. To uniquely identify a key, specify the list of parent keys above it in the hierarchy, starting with the root key. The keys in the list are separated by backslashes.
enumerator	A string whose value must be one of the following: • SUBKEYS

	• VALUES Specify "SUBKEYS" value to enumerate sub-keys for the key, or specify VALUES to enumerate named values.
return	A string variable that receives the returned value.

Return value: String. RegistryList returns comma-separated list of sub-keys or values.

Usage: A key is part of a tree of keys, descending from one of the predefined root keys. Each key is a subkey or child of the parent key above it in the hierarchy. There are four root strings:

- HKEY_CLASSES_ROOT
- HKEY_LOCAL_MACHINE
- HKEY_USERS
- HKEY_CURRENT_USER

A key is uniquely identified by the list of parent keys above it. The keys in the list are separated by slashes, as shown in these examples.
HKEY_LOCAL_MACHINE\Software\Microsoft\Access\7.0\Options
HKEY_CURRENT_USER\Control Panel\International

See also:

RegistryDelete
RegistrySetKey
RegistryGetKey

Service statements

ServiceContinue

Description: Resume the execution of a paused Windows NT (NT/2000/XP/2003/VISTA/2008) service

Syntax: ServicePause service

Argument	Description
service	A string whose value is the name of the paused service that you want to resume. Service name is case insensitive.

Return value: None.

Usage: This statement can be used on Windows NT (NT/2000/XP/2003/VISTA/2008) platform only. You must have sufficient authority to resume the specified service. You may want to check the service status before trying to stop it. An error occurs if the specified service has not been started. The ServiceGetStatus statement can be used to retrieve the status of a service.

See also:

ServicePause
ServiceStart
ServiceGetStatus

ServiceGetStatus

Description: Retrieves the status of a Windows NT (NT/2000/XP/2003/VISTA/2008) service

Syntax: ServiceGetStatus service, return

Argument	Description
service	A string whose value is the name of the service whose status you want to retrieve. Service name is case insensitive.
return	A string variable that receives the returned value

Return value: String. The returned value can be one of the following:

Value	Meaning
"STOP PENDING"	The service is stopping.
"STOPPED"	The service is not running.
"START PENDING"	The service is starting.
"RUNNING"	The service is running.
"CONTINUE PENDING"	The service continue is pending.
"PAUSE PENDING"	The service pause is pending.
"PAUSED"	The service is paused.
"ERROR"	An error occurred while querying service status.

Usage: This statement can be used on Windows NT (NT/2000/XP/2003/VISTA/2008) platform only. You must have sufficient authority to query status of the specified service.

ServicePause

Description: Pause the execution of a Windows NT (NT/2000/XP/2003/VISTA/2008) service

Syntax: ServicePause service

Argument	Description
service	A string whose value is the name of the service that you want to suspend. Service name is case insensitive.

Return value: None.

Usage: This statement can be used on Windows NT (NT/2000/XP/2003/VISTA/2008) platform only. You must have sufficient authority to pause the specified service. You may want to check the service status before trying to stop it. An error occurs if the specified service has not been started. The ServiceGetStatus statement can be used to retrieve the status of a service.

See also:

ServiceContinue
ServiceStart
ServiceGetStatus

ServiceStart

Description: Starts the execution of a Windows NT (NT/2000/XP/2003/VISTA/2008) service

Syntax: ServiceStart service

Argument	Description
service	A string whose value is the name of the service that you want to start. Service name is case insensitive.

Return value: None.

Usage: This statement can be used on Windows NT (NT/2000/XP/2003/VISTA/2008) platform only. You must have sufficient authority to start the specified service. You may want to check the service status before trying to start it. An error occurs if the specified service is already running. The ServiceGetStatus statement can be used to retrieve the status of a service.

See also:

ServicePause
ServiceStop
ServiceGetStatus

ServiceStop

Description: Stops the execution of a Windows NT (NT/2000/XP/2003/VISTA/2008) service

Syntax: ServiceStop service

Argument	Description
service	A string whose value is the name of the service that you want to stop. Service name is case insensitive.

Return value: None.

Usage: This statement can be used on Windows NT (NT/2000/XP/2003/VISTA/2008) platform only. You must have sufficient authority to stop the specified service. You may want to check the service status before trying to stop it. An error occurs if the specified service has not been started. The ServiceGetStatus statement can be used to retrieve the status of a service.

See also:

ServicePause
ServiceStart
ServiceGetStatus

String statements

Asc

Description: Converts the first character of a string to its ASCII number value.

Syntax: Asc (string, result)

Argument	Description
string	A string for which you want the ASCII value of the first character
result	A numeric variable that receives the returned value

Return value: Number. Returns the ASCII value of the first character in string.

Usage: Use Asc to test the case of a character or manipulate text and letters. To find out the case of a character, you can check whether its ASCII value is within the appropriate range.

See also:

Char

Char

Description: Converts a number to a string character.

Syntax: Char (number, result)

Argument	Description
number	A number you want to convert to a character
result	A string variable that receives the returned value

Return value: String. Returns the string that consists of a single character whose ASCII value is number.

See also:

Asc

Concat

Description: Appends one string to the end of another strings, in other words concatenates two strings.

Syntax: Concat s1, s2, return

Argument	Description
s1	The string to which you want to append the string s2
s2	The string you want to append to the end of the string s1
return	A string variable that receives the returned value

Return value: String. The concatenation operation returns the string that is union of s1 and s2.

See also:

ConcatEx

ConcatEx

Description: Appends one or more strings to the end of each other, in other words concatenates them.

Syntax: ConcatEx s1, s2, s3, ..., return

Argument	Description
s1	The string to which you want to append the string s2
s2	The string you want to append to the end of the string s1
s3	The string you want to append to the end of the string s1 after s2
return	A string variable that receives the returned value

Return value: String. The concatenation operation returns the string that is union of s1 and s2 and so on.

Usage: Use ConcatEx instead of multiple Concat statement to concatenate multiple strings into a large one. Note that the JAL script engine automatically handles all datatype conversions so that if any of ConcatEx components is not a string it will be automatically converted to it. The number of components in one ConcatEx statement cannot exceed 32765.

See also:

Concat

Fill

Description: Builds a string of the specified length by repeating the specified characters until the result string is long enough.

Syntax: Fill chars, n, return

Argument	Description
chars	A string whose value will be repeated to fill the return string
n	A long whose value is the length of the string you want returned
return	A string variable that receives the returned value

Return value: String. Returns a string n characters long filled with repetitions of the characters in the argument chars. If the argument chars has more than n characters, the first n characters of chars are used to fill the return string. If the argument chars has fewer than n characters, the characters in chars are repeated until the return string has n characters.

See also:

Space

Format

Description: Formats data as a string according to a specified format mask. You can convert and format date, datetime, numeric, and time data. You can also apply a format to a string.

Syntax: Format (data, format , result)

Argument	Description
data	The data you want returned as a string with the specified formatting. Data can have a date, datetime, numeric, time, or string data type
format	A string of the masks you want to use to format the data. The masks consist of formatting information specific to the data type of data. The format string can consist of more than one mask, depending on the data type of data. Each mask is separated by a semicolon.
result	A string variable that receives the returned value

Return value: String. Returns data in the specified format if it succeeds and the empty string ("") if the data type of data does not match the type of mask specified or format is not a valid mask.

Usage:
Formats for date, datetime, string, and time data can include one mask only. Formats for numeric data can have up to three masks. A format with a single mask handles both positive and negative data. If there are additional masks, the first mask is for positive values, and the additional masks are for negative, and zero values. If the format doesn't match the data type, the JAL script engine will try to apply the mask, which can produce unpredictable results.

See also:

Format symbols

String statement

GetToken

Description: Obtains first token from the specified string.

Syntax: GetToken s1, s2, return

Argument	Description
s1	A string that is token separator in the string s1. This could be a single-character string such as space or a multi-character string.
s2	A string from which you want to extract the first available token
return	A string variable that receives the returned value

Return value: String. The first token from string s2 separated by s1. If no separator is found in the string s2 then GetToken returns the entire string s2.

Usage: When the first argument s2 is a variable then GetToken also removes the first found token and the following separator from the string s2 so that it begins with the next token. When there is no more tokens available then GetToken returns the empty string (""). You can call GetToken in a loop to extract all tokens from the string s2.

InStr

Description: Finds one string within another string.

Syntax: InStr string1, string2, start, return

Argument	Description
string1	The string in which you want to find string2
string2	The string you want to find in string1
start	The number indicating starting position where the search will begin in string1.
return	A numeric variable that receives the returned value

Return value: Number. Returns a number whose value is the starting position of the first occurrence of string2 in string1 after the position specified in start. If string2 is not found in string1 or if start is not within string1, InStr returns 0.

Usage: The InStr function is case sensitive. Alternatively, you can use Pos statements which syntax and function is the same.

See also:

Pos

Left

Description: Obtains a specified number of characters from the beginning of a string.

Syntax: Left string, n, return

Argument	Description
string	The string containing the characters you want
n	The number of characters you want
return	A string variable that receives the returned value

Return value: String. Returns the leftmost n characters in string if it succeeds and the empty string ("") if an error occurs. If n is greater than or equal to the length of the string, Left returns the entire string. It does not add spaces to make the return value's length equal to n.

See also:

Right

Mid

Length

Description: Reports the length of a string.

Syntax: Len string, return

Argument	Description
String	The string for which you want the length
Return	A numeric variable that receives the returned value

Return value: Number. Returns a long containing the length of string if it succeeds and -1 if an error occurs.

Lower

Description: Converts all the characters in a string to lowercase.

Syntax: Lower string, return

Argument	Description
string	The string you want to convert to lowercase letters
return	A string variable that receives the returned value

Return value: String. Returns string with uppercase letters changed to lowercase if it succeeds and the empty string ("") if an error occurs.

See also:

Upper

LTrim

Description: Removes leading spaces from the beginning of a string.

Syntax: LTrim string, return

Argument	Description
string	The string you want returned with leading blanks deleted
return	A string variable that receives the returned value

Return value: String. Returns a copy of string with leading blanks deleted if it succeeds and the empty string ("") if an error occurs.

See also:

RTrim
Trim

Match

Description: Determines whether a string's value contains a particular pattern of characters.

Syntax: Match string, textpattern, return

Argument	Description
string	The string in which you want to look for a pattern of characters
textpattern	A string whose value is the text pattern
return	A boolean variable that receives the returned value

Return value: Boolean. Returns TRUE if string matches textpattern and FALSE if it does not. Match also returns FALSE if either argument has not been assigned a value or the pattern is invalid.

Usage: Match enables you to evaluate whether a string contains a general pattern of characters. To find out whether a string contains a specific substring, use the Pos statement.
Textpattern is similar to a regular expression. It consists of **metacharacters**, which have special meaning, and ordinary characters, which match themselves. You can specify that the string begin or end with one or more characters from a set, or that it contains any characters except those in a set.

A text pattern consists of **metacharacters**, which have special meaning in the match string, and **non-metacharacters**, which match the characters themselves.

See also:

metacharacters and sample patterns

Mid

Description: Obtains a specified number of characters from a specified position in a string.

Syntax: Mid string, start, length, return

Argument	Description
string	The string from which you want characters returned
start	A number specifying the position of the first character you want returned. (The position of the first character of the string is 1)
length	A number whose value is the number of characters you want returned. If length is greater than the number of characters to the right of start, Mid returns the remaining characters in the string
return	A string variable that receives the returned value

Return value: String. Returns characters specified in length of string starting at character start. If start is greater than the number of characters in string, the Mid function returns the empty string (""). If length is greater than the number of characters remaining after the start character, Mid returns the remaining characters. The return string is not filled with spaces to make it the specified length.

See also:

Left
Right

Number

Description: Converts a string to a number.

Syntax: Number (string, result)

Argument	Description
string	A string you want returned as a number
result	A numeric variable that receives the returned value

Return value: Number. Returns the contents of string as a number. If string is not a valid number, Number returns 0.

See also:

String
Format

Pos

Description: Finds one string within another string.

Syntax: Pos string1, string2, start, return

Argument	Description
string1	The string in which you want to find string2
string2	The string you want to find in string1
start	The number indicating starting position where the search will begin in string1.
return	A numeric variable that receives the returned value

Return value: Number. Returns a number whose value is the starting position of the first occurrence of string2 in string1 after the position specified in start. If string2 is not found in string1 or if start is not within string1, Pos returns 0.

Usage: The Pos function is case sensitive. Alternatively, you can use InStr statements which syntax and function is the same.

See also:

InStr

Replace

Description: Replaces a portion of one string with another.

Syntax: Replace string1, start, n, string2, return

Argument	Description
string1	The string in which you want to replace characters with string2
start	A long whose value is the number of the first character you want replaced. (The first character in the string is number 1)
N	A number whose value is the number of characters you want to replace
string2	The string that will replace characters in string1. The number of characters in string2 can be greater than, equal to, or fewer than the number of characters you are

	replacing
return	A string variable that receives the returned value

Return value: String. Returns the string with the characters replaced if it succeeds and the empty string ("") if it fails.

Usage:
If the start position is beyond the end of the string1, Replace appends string2 to string1. If there are fewer characters after the start position than specified in n, Replace replaces all the characters to the right of character start. If n is zero, then in effect Replace inserts string2 into string1.

See also:

Concat

Reverse

Description: Reverses the order or characters in a string.

Syntax: Reverse string, return

Argument	Description
string	A string whose characters you want to reorder so that the last character is first and the first character is last
return	A string variable that receives the returned value

Return value: String. Returns a string with the characters of string in reversed order if it succeeds and the empty string ("") if an error occurs.

Right

Description: Obtains a specified number of characters from the end of a string.

Syntax: Right string, n, return

Argument	Description
string	The string containing the characters you want
n	A number specifying the number of characters you want
return	A string variable that receives the returned value

Return value: String. Returns the rightmost n characters in string if it succeeds and the empty string ("") if an error occurs. If n is greater than or equal to the length of the string, Right returns the entire string. It does not add spaces to make the return value's length equal to n.

See also:

Left
Mid

RTrim

Description: Removes spaces from the end of a string.

Syntax: RTrim string, return

Argument	Description
string	The string you want returned with trailing blanks deleted
return	A string variable that receives the returned value

Return value: String. Returns a copy of string with trailing blanks deleted if it succeeds and the empty string ("") if an error occurs.

See also:

LTrim
Trim

Space

Description: Builds a string of the specified length whose value consists of spaces.

Syntax: Space n, return

Argument	Description
N	A number whose value is the length of the string you want filled with spaces
Return	A string variable that receives the returned value

Return value: String. Returns a string filled with n spaces if it succeeds and the empty string ("") if an error occurs.

See also:

Fill

String

Description: Converts data to a string. You can convert and format date, datetime, numeric, and time data.

Syntax: String (data, result)

Argument	Description
data	The data you want returned as a string with the specified formatting. Data can have a date, datetime, numeric, time, or string data type
result	A string variable that receives the returned value

Return value: String. Returns the string based on the data value.

Usage:
For date, datetime, numeric, and time data, the JAL script engine uses the system's default format for the returned string. You can use the Format statement to converting data to a string using user-defined format mask.

See also:

Format

Trim

Description: Removes leading and trailing spaces from a string.

Syntax: Trim string, return

Argument	Description
string	The string you want returned with leading and trailing spaces deleted
return	A string variable that receives the returned value

Return value: String. Returns a copy of string with all leading and trailing spaces deleted if it succeeds and the empty string ("") if an error occurs.

See also:

RTrim
Ltrim

Upper

Description: Converts all the characters in a string to uppercase.

Syntax: Upper string, return

Argument	Description
string	The string you want to convert to uppercase letters
return	A string variable that receives the returned value

Return value: String. Returns string with lowercase letters changed to uppercase if it succeeds and the empty string ("") if an error occurs.

See also:

Lower

Telnet and Secure Shell statements

The same statements can be used for both Telnet and Secure Shell automation. Call the TelnetConfig statement in the beginning of a job to specify which protocol to use.

TelnetClose

Description: Closes active Telnet, Rlogin or Secure Shell session.

Syntax: TelnetClose

Usage: This statement has no arguments. TelnetClose closes session that you previously opened using TelnetOpen statement.

See also:

TelnetOpen

TelnetOpen

Description: Opens new Telnet, Rlogin or Secure Shell session.

Syntax: TelnetOpen host, user, password

Argument	Description
Host	A string whose value is the host name of the remote computer (for example, mycompany.com) or the IP number of the site in ASCII dotted-decimal format (for example, 11.0.1.45)
User	A string whose value is the name of the user to log on
Password	A string whose value is the password to use to log on

Return value: none.

Usage: One job may have only one Telnet session open at a time. However, multiple jobs may have multiple Telnet sessions opened simultaneously.

To execute commands using Secure Shell protocol call TelnetConfig "TELNET PROTOCOL", "SECURE" before calling TelnetOpen statement.

TelnetOpen statement opens new connection to the remote host then attempts to intercept the prompts for user name and password. By default it expects the host to prompt for the user name in the form of "**login:**". After the prompt for user is received and the name is provided, it expects the host to prompt for the password in the form of "**password:**"

If the host uses different prompts, call TelnetConfig statement to change the default prompts before you call TelnetOpen statement.

Host can be any computer using any Operation System that supports standard Telnet protocol. Telnet protocol is supported by most popular Operation Systems including UNIX, Windows NT, Windows 2000, Windows XP, mainframe computers, etc. **In order to connect to the host and execute any valid host commands you do not need JAL script engine or 24x7 Remote Agent running on the host computer.**

 **Tip:** To troubleshoot connection problems use TelnetConfig statement to unhide the hidden Telnet terminal window, which displays all communication messages and errors. After you are done with setup and debugging of your script, comment out or remove the line with TelnetConfig statement un-hiding the terminal.

See also:

- TelnetConfig
- TelnetClose
- TelnetSend
- TelnetReceive

TelnetSend

Description: Sends a command or a data to the remote host using active Telnet, Rlogin or Secure Shell session.

Syntax: TelnetSend text

Argument	Description
Text	A string whose value you want to send as a command or data to the remote host

Return value: none.

Usage: TelnetSend statement simulates a user manually typing some text in the standard Telnet terminal window then pressing the Enter key to submit the entered command or data. TelnetSend statement automatically adds carriage return (CR) character (ASCII code 13). If the text is sent as a command and it contains one or more CR characters then every part of the text separated by the CR will be considered by host as a separate command.

 **Tips:**

- To troubleshoot various Telnet problems use TelnetConfig statement to unhide the hidden Telnet terminal window, which displays all communication messages and errors. After you are done with setup and debugging of your script, comment out or remove the line with TelnetConfig statement un-hiding the terminal.
- To execute commands using Secure Shell protocol call TelnetConfig "TELNET PROTOCOL", "SECURE" before calling TelnetOpen statement.

See also:

TelnetConfig
TelnetOpen
TelnetReceive

TelnetReceive

Description: Returns buffered data received from the remote host using active Telnet, Rlogin or Secure Shell session.

Syntax: TelnetReceive return

Argument	Description
return	A string variable that receives the returned value.

Return value: String. Returns all data received from the host computer since last TelnetSend ot TelnetReceive operation.

Usage: JAL script engine stores all text data it receives from the host computer in an internal buffer. Every call to TelnetReceive statement simply returns data from the buffer. It is up to you how you interpret or use this data. If there is no data available in the buffer, TelnetReceive will pause the script execution until new data is received from the server or timeout occurs. You can use TelnetConfig statement to change the value of the default timeout period.

Important Note: Every call to TelnetSend or TelnetReceive statements causes the internal buffer to be reset (cleared).

See also:
TelnetConfig
TelnetOpen
TelnetSend

TelnetConfig

Description: Changes various settings for the active or pending Telnet, Rlogin and Secure Shell sessions.

Syntax: TelnetConfig property, new_value

Argument	Description
Property	A string whose value is the name of the property for the Telnet session that you want to change. The following properties are supported: • "PROTOCOL" – controls which communication protocol to use. Supported protocols are "TELNET" or "RLOGIN". To use Secure Telnet communication mode (also called **Secure Shell** or simply SSH protocol) use "TELNET PROTOCOL" property. The default value is *"TELNET."* "LOGIN PROMPT" – controls the login prompt that **JAL script engine** should recognize during the authentication process while connecting with your Telnet server. The default value is *"login:"* This option is used only with the telnet protocol. "PASSWORD PROMPT" – controls the password prompt that **JAL script engine** should recognize during the authentication process while connecting with your Telnet server. The default value is *"password:"* This option is used only with the telnet protocol. • "TIMEOUT" – controls communication timeout settings. Specify new_value in seconds. The default value is 10 seconds. • "TERMINAL" – controls whether to show or hide the Telnet terminal, which can be used for debugging of Telnet operations. Specify either "SHOW" or "HIDE" for the new_value • "TELNET PROTOCOL" – controls which kind of Telnet protocol to use. Specify either "SECURE" or "NON SECURE". The default value is "NON SECURE".

	• "PORT" – controls which port to use for communications. Default values are different for different protocols: telnet – 23 rlogin – 513 secure shell (SSH) – 22 "AUTHENTICATE" – controls whether **JAL script engine** should perform user authentication on the connected server. Specify either "TRUE" or "FALSE". The default value is "TRUE". This option is used only with the telnet protocol. • "EOL" – controls which symbol or symbols to use for end-of-line when sending commands to server. The default value is carriage return (CR) character (ASCII code 13).
New_value	A string whose value is the new value for the property that you want to change.

Return value: None.

Usage: Use TelnetConfig statement to configure and troubleshoot Telnet sessions. Both parameter names and their values are case insensitive.

Do not mistake secure telnet protocol (also called secure shell or SSH) and telnet type communications over SSL channel.

JAL script engine supports both old and new versions of the secure shell protocols: SSH1 and SSH2

If you want to use communication protocol other than "TELNET" always call TelnetConfig with the "PROTOCOL" parameter before changing setting for communication port and secure mode.

 **Tips:**

- To unhide the full featured Telnet terminal window use TelnetConfig "TERMINAL", "SHOW".
- To change the default logon prompt to "user name:" use TelnetConfig "LOGIN PROMPT", "user name:" before you call TelnetOpen statement.
- If you are using slow connection to the remote host, increase the timeout value, for example TelnetConfig "TIMEOUT", "30".
- To execute commands using secure shell protocol first call TelnetConfig "TELNET PROTOCOL", "SECURE" and then call other Telnet commands TelnetOpen, TelnetSend, TelnetRead and TelnetClose as needed for the processing. These commands will be executed using secure shell SSH protocol.

See also:

TelnetOpen
TelnetSend

Window statements

WindowActivate

Description: Puts the process that created the specified window into the foreground and activates the window. Keyboard input is directed to the window, and various visual cues are changed for the user.

Syntax: WindowActivate handle

Argument	Description
handle	A number whose value is the handle of the window that you want to send in front of other windows and make activate.

Return value: None.

Usage: Use WindowActivate statement before sending keystrokes to desired window.

See also:

WindowFind
WindowGetActive
SendKeys

WindowClickButton

Description: Searches the specified window for a control having the specified caption and simulates mouse click on the found control.

Syntax: WindowClickButton handle, caption

Argument	Description
handle	A number whose value is the handle of the window that owns the control with the specified caption. Controls are buttons, pictures, radio-buttons, check-boxes, etc…
caption	A string whose value is the caption of the control that you want to “click" .

Return value: None.

Usage: If the specified window is a parent of other windows, WindowClickButton automatically searches all child windows. It “clicks" the first control that has the specified caption. Use WindowFind or any other appropriate Window statement to retrieve handle of the desired parent window.

See also:

WindowGetActive
WindowFind
SendKeys

WindowClose

Description: Closes the specified window.

Syntax: WindowClose handle

Argument	Description
handle	A number whose value is the handle of the window that you want to close

Return value: None.

Usage: If the specified window is a parent of other windows, WindowClose automatically closes children before parent. However, there is no guarantee that the specified window will be closed. In some situations when there are some changes pending, the application that owns the specified window may invoke a dialog box, which prompts the user to save changes before exiting. Any processing that the application does on exit will be carried out as usual.

 **Notes:**

- Often closing of the main window causes that process to finish. It is highly recommended to use such method instead of using ProcessKill statement.
- Sending the ALT+F4 keystroke to the active window in most cases causes window closing as well as WindowClose. The CTRL+F4 keystroke closes sheets in multi-document interface systems such as MS Excel.

See also:

WindowWaitClose
WindowFind
SendKeys

WindowFind

Description: Retrieves the handle of the window whose title matches the specified strings. The specified strings may include the percent (%) sign to indicate a wildcard.

Syntax: WindowFind title, return

Argument	Description
title	A string whose value is the full or partial title of the window that you want to find
return	A numeric variable that receives the returned value

Return value: Number. Return a handle of the first found window whose title matches the specified string.

Usage: Use search with a percent (%) sign appended to the end of the search string when the window title varies. The percent sign is used as a wildcard that matches any group of characters. It solves problems with applications that change their titles depending on the loaded document. For example a search for "Microsoft Word %" will find an instance of Microsoft Word with any document loaded.

 **Note:**
WindowFind searches all windows including invisible windows. Search can be performed only for windows that run on the same Desktop.

See also:

- WindowGetActive
- WindowGetChild
- WindowGetParent
- WindowGetProcess
- WindowGetTitle
- SendKeys

WindowGetActive

Description: Obtains the handle of the active window. An active window is the window that receives keyboard input.

Syntax: WindowGetActive return

Argument	Description
return	A numeric variable that receives the returned value

Return value: Number. Return a handle of the active window.

See also:

- WindowFind
- WindowGetProcess
- WindowGetTitle

WindowGetChild

Description: Obtains the handle of the first child window for the specified parent window.

Syntax: WindowGetChild handle, return

Argument	Description
handle	A number whose value is the handle of a parent window which owns the window that you want to obtain
return	A numeric variable that receives the returned value

Return value: Number. Return a handle of the child window.

Usage: WindowGetChild returns a handle of the first child window reported by Windows. You can use WindowGetNext and WindowGetPrevious statements to obtains handles of other child windows for the same parent window. If the statement succeeds, the return value is a window handle. If no child window exists for the specified window, the return value is 0.

See also:

WindowFind
WindowGetTitle
WindowGetFirst
WindowGetLast
WindowGetNext
WindowGetParent
WindowGetPrevious

WindowGetFirst

Description: Obtains the handle of the first window that has the same type as the specified window.

Syntax: WindowGetFirst handle, return

Argument	Description
handle	A number whose value is the handle of the window for which you want to obtain the first window of the same type
return	A numeric variable that receives the returned value

Return value: Number. The retrieved handle identifies the window of the same type that is highest in the Z order. If the specified window is a topmost window, the handle identifies the topmost window that is highest in the Z order. If the specified window is a top-level window, the handle identifies the top-level window that is highest in the Z order. If the specified window is a child window, the handle identifies the sibling window that is highest in the Z order. If the statement succeeds, the return value is a window handle. If no window exists with the specified relationship to the specified window, the return value is 0.

See also:

- WindowFind
- WindowGetTitle
- WindowGetChild
- WindowGetLast
- WindowGetNext
- WindowGetParent
- WindowGetPrevious

WindowGetLast

Description: Obtains the handle of the last window that has the same type as the specified window.

Syntax: WindowGetLast handle, return

Argument	Description
handle	A number whose value is the handle of the window for which you want to obtain the last window of the same type
return	A numeric variable that receives the returned value

Return value: Number. The retrieved handle identifies the window of the same type that is lowest in the Z order. If the specified window is a topmost window, the handle identifies the topmost window that is lowest in the Z order. If the specified window is a top-level window, the handle identifies the top-level window that is lowest in the Z order. If the specified window is a child window, the handle identifies the sibling window that is lowest in the Z order. If the statement succeeds, the return value is a window handle. If no window exists with the specified relationship to the specified window, the return value is 0.

See also:

- WindowFind
- WindowGetTitle
- WindowGetFirst
- WindowGetChild
- WindowGetNext
- WindowGetParent
- WindowGetPrevious

WindowGetNext

Description: Obtains the handle of the next window that has the same type as the specified window.

Syntax: WindowGetNext handle, return

Argument	Description
handle	A number whose value is the handle of the window for which you want to obtain the next window of the same type
return	A numeric variable that receives the returned value

Return value: Number. The retrieved handle identifies the window of the same type that is next in the Z order. If the specified window is a topmost window, the handle identifies the topmost window that is next in the Z order. If the specified window is a top-level window, the handle identifies the top-level window that is next in the Z order. If the specified window is a child window, the handle identifies the sibling window that is next in the Z order. If the statement succeeds, the return value is a window handle. If no window exists with the specified relationship to the specified window, the return value is 0.

See also:

WindowFind
WindowGetTitle
WindowGetFirst
WindowGetLast
WindowGetChild
WindowGetParent
WindowGetPrevious

WindowGetParent

Description: Obtains the handle of the parent window for the specified child window.

Syntax: WindowGetParent handle, return

Argument	Description
handle	A number whose value is the handle of a child window for which you want to obtain it's parent window
return	A numeric variable that receives the returned value

Return value: Number. The retrieved handle identifies the specified window's owner window. If no parent window for the specified window, the return value is 0.

See also:

WindowFind
WindowGetTitle
WindowGetFirst
WindowGetLast
WindowGetNext
WindowGetPrevious
WindowGetChild

WindowGetPrevious

Description: Obtains the handle of the previous window that has the same type as the specified window.

Syntax: WindowGetPrevious handle, return

Argument	Description
handle	A number whose value is the handle of the window for which you want to obtain the previous window of the same type
return	A numeric variable that receives the returned value

Return value: Number. The retrieved handle identifies the window of the same type that is previous in the Z order. If the specified window is a topmost window, the handle identifies the topmost window that is previous in the Z order. If the specified window is a top-level window, the handle identifies the top-level window that is previous in the Z order. If the specified window is a child window, the handle identifies the sibling window that is previous in the Z order. If the statement succeeds, the return value is a window handle. If no window exists with the specified relationship to the specified window, the return value is 0.

See also:

- WindowFind
- WindowGetTitle
- WindowGetFirst
- WindowGetLast
- WindowGetNext
- WindowGetParent
- WindowGetChild

WindowGetProcess

Description: Obtains process ID for the specified window.

Syntax: WindowGetProcess handle, return

Argument	Description
handle	A number whose value is the handle of the window for which you want to find its process ID
return	A numeric variable that receives the returned value

Return value: Number. Return process ID for the specified window.

Usage: Use WindowGetProcess to pass returned value to the ProcessKill statement when you cannot gracefully close that process and want to terminate the process anyway.

See also:

- ProcessGetWindow
- ProcessKill
- ProcessGetID
- WindowClose
- WindowFind
- WindowGetActive

WindowGetTitle

Description: Obtains the title of the specified window.

Syntax: WindowGetTitle handle, return

Argument	Description
handle	A number whose value is the handle of the window whose title you want to obtain
return	A string variable that receives the returned value

Return value: String. Returns window title for the specified window. If the specified window handle is invalid, the return value is empty string (“”).

See also:

- WindowFind
- WindowGetActive

WindowWaitClose

Description: Waits for the specified window to disappear (close). The specified window title may include the percent (%) sign to indicate a wildcard.

Syntax: WindowWaitClose title, timeout

Argument	Description
title	A string whose value is the full or partial title of the window that you want to find
timeout	A number whose value is the maximum time interval within which you allow the specified window to close. Use 0 timeout to allow infinite waiting.

Return value: None.

Usage: Execution of the script will not continue until the window with the specified title text is no longer present or timeout occurs. The window title may contain the percent (%) symbol at the end to indicate a wildcard. Use it when the desired window title varies. This solves the problem with applications that change their titles depending on the document loaded. The percent sign matches any group of characters. For example a search for "Microsoft Word %"will find an instance of Microsoft Word with any document loaded.

Note:
WindowWaitClose checks both visible and invisible windows

See also:

WindowWaitOpen
WindowFind
WindowClose

WindowWaitOpen

Description: Waits for the specified window to appear (open). The specified window title may include the percent (%) sign to indicate a wildcard.

Syntax: WindowWaitOpen title, timeout

Argument	Description
title	A string whose value is the full or partial title of the window that you want to find
timeout	A number whose value is the maximum time interval within which you allow the specified window to open. Use 0 timeout to allow infinite waiting.

Return value: None.

Usage: Execution of the script will not continue until the window with the specified title text is found or timeout occurs. The window title may contain the percent (%) symbol at the end to indicate a wildcard. Use it when the desired window title varies. This solves the problem with applications that change their titles depending on the document loaded. The percent sign matches any group of characters. For example a search for "Microsoft Word %"will find an instance of Microsoft Word with any document loaded.

Note:
WindowWaitOpen checks both visible and invisible windows.

See also:

WindowWaitClose
WindowFind

WindowPostMessage

Description: Adds the specified Windows message to the message queue for the specified window.

Syntax: WindowPostMessage handle, message, word, long

Argument	Description
handle	A number whose value is the system handle of a window to which you want to post a message
message	A number whose value is the system message number of the message you want to send
word	A number whose value is the word value of the message. If this argument is not used by the message, use 0
long	A number whose value is the long value of the message. If this argument is not used by the message, use 0

Return value: None.

Usage: WindowPostMessage statement posts the message identified by message and optionally, word and long, to the window identified by handle using Windows SDK function PostMessage. The message is added to the end of the object's message queue. Opposite to WindowSendMessage statement, WindowPostMessage is asynchronous; it does not stop execution of the script until the message is processed.

Note:
See Windows Software Development Kit (SDK) documentation for complete information on supported messages and parameters

See also:

WindowSendMessage

Call

WindowSendMessage

Description: Sends the specified Windows message to the specified window so that it is executed immediately.

Syntax: WindowSendMessage handle, message, word, long

Argument	Description
handle	A number whose value is the system handle of a window to which you want to send a message
message	A number whose value is the system message number of the message you want to send
word	A number whose value is the word value of the message. If this argument is not used by the message, use 0

long	A number whose value is the long value of the message. If this argument is not used by the message, use 0

Return value: None.

Usage: WindowSendMessage statement sends the message identified by message and optionally, word and long, to the window identified by handle using Windows SDK function SendMessage. The message is sent directly to the object, bypassing the object's message queue. Execution of the script will not continue until the message is processed.

Note:
See Windows Software Development Kit (SDK) documentation for complete information on supported messages and parameters

See also:

WindowPostMessage

Call

Functions in database filter and sort expressions

You can use the following functions in sort and filter expressions. The functions are organized in the following categories.

- Data type checking and conversion functions
- Day, date, and time functions
- Miscellaneous functions
- Numeric functions
- String functions

See also:

Operators

JAL Control-of-Flow Statements

JAL Statements by Category

Data type checking fnctions

Asc
Char
Date
DateTime
Integer
IsDate
IsNull
IsNumber
IsTime
Long
Number
String
Time

See also:

Functions by category

IsDate

Description: Tests whether a string value is a valid date.

Syntax: IsDate (string)

Argument	Description
string	A string whose value you want to test to determine whether it is a valid date

Return value: Boolean. Returns TRUE if datevalue is a valid date and FALSE if it is not.

IsNull

Description: Reports whether the value of a column or expression is NULL.

Syntax: IsNull (any)

Argument	Description
any	A column or expression that you want to test to determine whether its value is NULL

Return value: Boolean. Returns TRUE if any is NULL and FALSE if it is not.

Usage: Use IsNull to test whether a user-entered value or a value retrieved from the database is NULL.

IsNumber

Description: Reports whether the value of a string is a number.

Syntax: IsNumber (string)

Argument	Description
string	A string whose value you want to test to determine whether it is a valid number

Return value: Boolean. Returns TRUE if string is a valid number and FALSE if it is not.

IsTime

Description: Reports whether the value of a string is a valid time value.

Syntax: IsTime (timevalue)

Argument	Description
timevalue	A string whose value you want to test to determine whether it is a valid time

Return value: Boolean. Returns TRUE if timevalue is a valid time and FALSE if it is not.

Date and time functions

Date

Description: Converts a string whose value is a valid date to a value of data type date.

Syntax: Date (string)

Argument	Description
string	A string containing a valid date (such as Jan 1, 1998, or 12-31-99) that you want returned as a date

Return value: Date. Returns the date in string as a date. If string does not contain a valid date, Date returns NULL.

Usage: The value of the string must be a valid date.
Valid dates can include any combination of day (1-31), month (1-12 or the name or abbreviation of a month), and year (two or four digits). Leading zeros are optional for month and day. If the month is a name or an abbreviation, it can come before or after the day; if it is a number, it must be in the month location specified in the Windows control panel. A four-digit number is assumed to be a year.
If the year is two digits, then program chooses the century, as follows. If the year is between 00 and 49, program assumes 20 as the first two digits; if it is between 50 and 99, **JAL script engine** assumes 19. If your data includes dates before 1950, such as birth dates, always specify a four-digit year so that **JAL script engine** interprets the date as intended.

JAL script engine handles years from 1000 to 3000 inclusive.

An expression has a more limited set of data types than the functions that can be part of the expression. Although the Date function returns a date value, the whole expression is promoted to a DateTime value. Therefore, if your expression consists of a single Date function, it will appear that Date returns the wrong data type. To convert the date without the time, choose an appropriate convert format.

DateTime

Description: Combines a date and a time value into a DateTime value.

Syntax: DateTime (date {, time })

Argument	Description
date	A valid date (such as Jan 1, 1998, or 12-31-99) or a blob variable whose first value is a date that you want included in the value returned by DateTime
Time (optional)	(optional) A valid time (such as 8AM or 10:25:23:456799) or a blob variable whose first value is a time that you want included in the value returned by DateTime. If you include a time, only the hour portion is required. If you omit the minutes, seconds, or microseconds, they are assumed to be 0s. If you omit AM or PM, the hour is determined according to the 24-hour clock

Return value: DateTime. Returns a DateTime value based on the values in date and optionally time. If time is omitted, DateTime uses 00:00:00.000000 (midnight).

Usage: For information on valid dates, see Date function.

Day

Description: Obtains the day of the month in a date value.

Syntax: Day (date)

Argument	Description
date	The date from which you want the day

Return value: Integer. Returns an integer (1-31) representing the day of the month in date.

DayName

Description: Determines the day of the week in a date value and returns the weekday's name.

Syntax: DayName (date)

Argument	Description
date	The date for which you want the name of the day

Return value: String. Returns a string whose value is the name of the weekday (Sunday, Monday, and so on) for date.

DayNumber

Description: Determines the day of the week of a date value and returns the number of the weekday.

Syntax: DayNumber (date)

Argument	Description
date	The date from which you want the number of the day of the week

Return value: Integer. Returns an integer (1-7) representing the day of the week of date. Sunday is day 1, Monday is day 2, and so on.

DaysAfter

Description: Determines the day of the week of a date value and returns the number of the weekday.

Syntax: DaysAfter (date1, date2)

Argument	Description
date1	A date value that is the start date of the interval being measured
date2e	A date value that is the end date of the interval

Return value: Long. Returns a long containing the number of days date2 occurs after date1. If date2 occurs before date1, DaysAfter returns a negative number.

Hour

Description: Obtains the hour in a time value. The hour is based on a 24-hour clock.

Syntax: Hour (time)

Argument	Description
Time	The time value from which you want the hour

Return value: Integer. Returns an integer (00-23) containing the hour portion of time.

Minute

Description: Obtains the number of minutes in the minutes portion of a time value.

Syntax: Minute (time)

Argument	Description
Time	The time value from which you want the minutes

Return value: Integer. Returns the minutes portion of time (00 to 59).

Month

Description: Determines the month of a date value.

Syntax: Month (date)

Argument	Description
date	The date from which you want the month

Return value: Integer. Returns an integer (1 to 12) whose value is the month portion of date.

Now

Description: Obtains the current time based on the system time of the client machine.

Syntax: Now ( )

Return value: Time. Returns the current time based on the system time of the client machine.

RelativeDate

Description: Obtains the date that occurs a specified number of days after or before another date.

Syntax: RelativeDate (date, n)

Argument	Description
date	A date value
n	An integer indicating the number of days

Return value: Date. Returns the date that occurs n days after date if n is greater than 0. Returns the date that occurs n days before date if n is less than 0.

RelativeTime

Description: Obtains the time that occurs a specified number of seconds after or before another time.

Syntax: RelativeTime (time, n)

Argument	Description
Time	A time value
n	A long number of seconds

Return value: Time. Returns the time that occurs n seconds after time if n is greater than 0. Returns the time that occurs n seconds before time if n is less than 0. The maximum return value is 23:59:59.

Second

Description: Obtains the number of seconds in the seconds portion of a time value.

Syntax: Second (time)

Argument	Description
Time	The time value from which you want the seconds

Return value: Integer. Returns the seconds portion of time (00 to 59).

SecondsAfter

Description: Determines the number of seconds one time occurs after another.

Syntax: SecondsAfter (time1, time2)

Argument	Description
Time1	A time value that is the start time of the interval being measured
Time2	A time value that is the end time of the interval

Return value: Long. Returns the number of seconds time2 occurs after time1. If time2 occurs before time1, SecondsAfter returns a negative number.

Time

Description: Converts a string to a time data type.

Syntax: Time (string)

Argument	Description
string	A string containing a valid time (such as 8AM or 10:25) that you want returned as a time data type. Only the hour is required; you do not have to include the minutes,

	seconds, or microseconds of the time or AM or PM. The default value for minutes and seconds is 00 and for microseconds is 000000. AM or PM is determined automatically

Return value: Time. Returns the time in string as a time data type. If string does not contain a valid time, Time returns 00:00:00.

Today

Description: Obtains the system date and time.

Syntax: Today ( )

Return value: DateTime. Returns the current system date and time.

Year

Description: Determines the year of a date value.

Syntax: Year (date)

Argument	Description
date	The date from which you want the year

Return value: Integer. Returns an integer whose value is a four-digit year adapted from the year portion of date if it succeeds and 1900 if an error occurs.
If the year is two digits, then program chooses the century, as follows. If the year is between 00 to 49, program assumes 20 as the first two digits; if it is between 50 and 99, program assumes 19.

Usage: Obtains the year portion of date. **JAL script engine** handles years from 1000 to 3000 inclusive. If your data includes dates before 1950, such as birth dates, always specify a 4-digit year so that Year function (and other functions) interprets the date as intended.

Miscellanious functions

Case
If

ProfileInt
ProfileString
RGB

Case

Description: Tests the values of a column or expression and returns values based on the results of the test.

Syntax:
Case (column WHEN value1 THEN result1 { WHEN value2 THEN result2 { ...} } { ELSE resultelse })

Argument	Description
Column	The column or expression whose values you want to test. Column can be the column name or the column number preceded by a pound sign (#). Column can also be an expression that includes a reference to the column. Column is compared to each valuen
WHEN	Introduces a value-result pair. At least one WHEN is required
Valuen	One or more values that you want to compare to values of column. A value can be: • A single value • A list of values separated by commas (for example, 2, 4, 6, 8) • A TO clause (for example, 1 TO 20) • IS followed by a relational operator and comparison value (for example, IS>5) • Any combination of the above with an implied OR between expressions (for example, 1,3,5,7,9,27 TO 33, IS>42)
THEN	Introduces the result to be returned when column matches the corresponding valuen
Resultn	An expression whose value is returned by Case for the corresponding valuen. All resultn must have the same data type
ELSE (optional)	(optional) Specifies that for any values of column that don't match the values of valuen already specified, Case returns resultelse
Resultelse	An expression whose value is returned by Case when the value of column doesn't match any WHEN valuen expression

Return value: The data type of resultn. Returns the result you specify in resultn.

Usage: If more than one WHEN clause matches column, Case returns the result of the first matching one.

Note:
Function Case is similar to the ORACLE's Decode function.

GetRow

Description: Reports the number of a row in which processing is performed.

Syntax: GetRow ( )

Return value: Long. Returns the number of a row if it succeeds, 0 if no data has been retrieved or added, and -1 if an error occurs.

If

Description: Evaluates a condition and returns a value based on that condition.

Syntax: If (boolean, truevalue, falsevalue)

Argument	Description
boolean	A boolean expression that evaluates to TRUE or FALSE
Truevalue	A string containing the value you want returned if the boolean expression is TRUE
Falsevalue	A string containing the value you want returned if the boolean expression is FALSE

Return value: The data type of truevalue or falsevalue. Returns truevalue if boolean is TRUE and falsevalue if it is FALSE. Returns NULL if an error occurs.

IsRowModified

Description: Reports whether the row has been modified.

Syntax: IsRowModified ( )

Return value: Boolean. Returns TRUE if the row has been modified and FALSE if it has not.

Example: To filter out only modified rows, set filter expression as following:
IsRowModified ( )

IsRowNew

Description: Reports whether the row has been newly inserted after last save or retrieve.

Syntax: IsRowNew ( )

Return value: Returns TRUE if the row is new and FALSE if it was retrieved from the database.

Example: To filter out only newly inserted rows, set filter expression as following:
IsRowNew ( )

See also:

Functions by category

ProfileInt

Description: Obtains the integer value of a setting in the specified profile file.

Syntax: ProfileInt (filename, section, key, default)

Argument	Description
Filename	A string whose value is the name of the profile file. If you do not specify a full path, ProfileInt uses the operating system's standard file search order to find the file
section	A string whose value is the name of a group of related values in the profile file. In the file, section names are in square brackets. Do not include the brackets in section. Section is not case-sensitive
Key	A string whose value is the name of a group of related values in the profile file. In the file, section names are in square brackets. Do not include the brackets in section. Section is not case-sensitive
default	An integer value that ProfileInt will return if filename is not found, if section or key does not exist in filename, or if the value of key cannot be converted to an integer

Return value: Integer. Returns default if filename is not found, section is not found in filename, or key is not found in section, or the value of key is not an integer. Returns -1 if an error occurs.

Usage: Use ProfileInt or ProfileString to get configuration settings from a profile file.

ProfileString

Description: Obtains the string value of a setting in the specified profile file.

Syntax: ProfileInt (filename, section, key, default)

Argument	Description
Filename	A string whose value is the name of the profile file. If you do not specify a full path, ProfileString uses the operating system's standard file search order to find the file
Section	A string whose value is the name of a group of related values in the profile file. In the file, section names are in square brackets. Do not include the brackets in section. Section is not case-sensitive
Key	A string whose value is the name of a group of related values in the profile file. In the file, section names are in square brackets. Do not include the brackets in section. Section is not case-sensitive
default	An string value that ProfileString will return if filename is not found, if section or key does not exist in filename

Return value: String, with a maximum length of 4096 characters. Returns the string from key within section within filename. If filename is not found, section is not found in filename, or key is not found in section, ProfileString returns default. If an error occurs, it returns the empty string ("").

Usage: Use ProfileInt or ProfileString to get configuration settings from a profile file.

RGB

Description: Calculates the long value that represents the color specified by numeric values for the red, green, and blue components of the color.

Syntax: RGB (red, green, blue)

Argument	Description
Red	The integer value of the red component of the desired color
green	The integer value of the green component of the desired color
blue	The integer value of the blue component of the desired color

Return value: Long. Returns the long that represents the color created by combining the values specified in red, green, and blue. If an error occurs, RGB returns NULL.

Usage: The formula for combining the colors is:

Red + (256 * Green) + (65536 * Blue)

Use RGB to obtain the long value required to set the color for text and drawing objects. You can also set an object's color to the long value that represents the color. The RGB function provides an easy way to calculate that value. The value of a component color is an integer between 0 and 255

Numeric functions

Abs
Ceiling
Cos
Exp
Fact
Int
Log
LogTen
Mod
Pi
Rand
Round
Sign
Sin
Sqrt
Tan
Truncate

Abs

Description: Calculates the absolute value of a number.

Syntax: Abs (n)

Argument	Description
n	The number for which you want the absolute value

Return value: The data type of n. Returns the absolute value of n.

Ceiling

Description: Determines the smallest whole number that is greater than or equal to a specified limit.

Syntax: Ceiling (n)

Argument	Description
N	The number for which you want the smallest whole number that is greater than or equal to it

Return value: The data type of n. Returns the smallest whole number that is greater than or equal to n.

Cos

Description: Calculates the cosine of an angle.

Syntax: Cos (n)

Argument	Description
n	The angle (in radians) for which you want the cosine

Return value: Double. Returns the cosine of n.

Exp

Description: Raises e to the specified power.

Syntax: Exp (n)

Argument	Description
n	The power to which you want to raise e (2.71828)

Return value: Double. Returns e raised to the power n.

Fact

Description: Determines the factorial of a number.

Syntax: Fact (n)

Argument	Description
n	The number for which you want the factorial

Return value: Double. Returns the factorial of n.

Int

Description: Determines the largest whole number less than or equal to a number.

Syntax: Int (n)

Argument	Description
n	The number for which you want the largest whole number that is less than or equal to it

Return value: The data type of n. Returns the largest whole number less than or equal to n.

Integer

Description: Converts the value of a string to an integer.

Syntax: Integer (string)

Argument	Description
string	The string you want returned as an integer

Return value: Integer. Returns the contents of string as an integer if it succeeds and 0 if string is not a number.

Log

Description: Determines the natural logarithm of a number.

Syntax: Log (n)

Argument	Description
n	The number for which you want the natural logarithm (base e). The value of n must be greater than 0

Return value: Double. Returns the natural logarithm of n. An execution error occurs if n is negative or zero.

Inverse: The inverse of the Log function is the Exp function.

LogTen

Description: Determines the base 10 logarithm of a number.

Syntax: LogTen (n)

Argument	Description
n	The number for which you want the base 10 logarithm. The value of n must not be negative

Return value: Double. Returns the decimal log of n.

Obtaining a number: The expression 10^n is the inverse for LogTen(n). To obtain n given number (nbr = LogTen(n)), use n = 10^r.

Long

Description: Converts the value of a string to a long.

Syntax: Long (string)

Argument	Description
string	The string you want returned as a long

Return value: Long. Returns the contents of string as a long if it succeeds and 0 if string is not a valid number.

Mod

Description: Obtains the remainder (modulus) of a division operation.

Syntax: Mod (x, y)

Argument	Description
X	The number you want to divide by y
Y	The number you want to divide into x

Return value: The data type of x or y, whichever data type is more precise.

Number

Description: Converts a string to a number.

Syntax: Number (string)

Argument	Description
string	The string you want returned as a number

Return value: A numeric data type. Returns the contents of string as a number. If string is not a valid number, Number returns 0.

Pi

Description: Multiplies pi by a specified number.

Syntax: Pi (n)

Argument	Description
n	The number you want to multiply by pi (3.14159265358979323...)

Return value: Double. Returns the result of multiplying n by pi if it succeeds and -1 if an error occurs.

Usage: Use Pi to convert angles to and from radians.

Rand

Description: Obtains a random whole number between 1 and a specified upper limit.

Syntax: Rand (n)

Argument	Description
n	The upper limit of the range of random numbers you want returned. The lower limit is always 1. The upper limit cannot exceed 32,767

Return value: A numeric data type, the data type of n. Returns a random whole number between 1 and n.

Usage: The sequence of numbers generated by repeated calls to the Rand function is a computer-generated pseudo-random sequence.

Round

Description: Rounds a number to the specified number of decimal places.

Syntax: Round (x, n)

Argument	Description
X	The number you want to round
n	The number of decimal places to which you want to round x

Return value: Decimal. If n is positive, returns x rounded to the specified number of decimal places. If n is negative, returns x rounded to (-n+1) places before the decimal point. Returns -1 if it fails.

Sign

Description: Determines the sign of a number. Sign reports whether a number is negative, zero, or positive.

Syntax: Sign (n)

Argument	Description
n	The number for which you want to determine the sign

Return value: Integer. Returns a number (-1, 0, or 1) indicating the sign of n.

Sin

Description: Calculates the sine of an angle.

Syntax: Sin (n)

Argument	Description
n	The angle (in radians) for which you want the sine

Return value: Double. Returns the sine of n.

Sqrt

Description: Calculates the square root of a number.

Syntax: Sqrt (n)

Argument	Description
n	The number for which you want the square root

Return value: Double. Returns the square root of n.

Usage: Sqrt(n) is the same as n^.5.
Taking the square root of a negative number causes an execution error.

Tan

Description: Calculates the tangent of an angle.

Syntax: Tan (n)

Argument	Description
n	The angle (in radians) for which you want the tangent

Return value: Double. Returns the tangent of n if it succeeds and -1 if an error occurs.

Truncate

Description: Truncates a number to the specified number of decimal places.

Syntax: Truncate (x, n)

Argument	Description
X	The number you want to truncate
n	The number of decimal places to which you want to truncate x

Return value: The data type of n. If n is positive, returns x truncated to the specified number of decimal places. If n is negative, returns x truncated to (-n+1) places before the decimal point. Returns -1 if it fails.

String functions

Fill
Left
LeftTrim
Len
Lower
Match
Mid
Pos
Replace
Right
RightTrim
Space

String
Trim
Upper
WordCap

Asc

Description: Converts the first character of a string to its ASCII integer value.

Syntax: Asc (string)

Argument	Description
String	The string for which you want the ASCII value of the first character

Return value: Integer. Returns the ASCII value of the first character in string.

Usage: Use Asc to test the case of a character or manipulate text and letters.To find out the case of a character, you can check whether its ASCII value is within the appropriate range.

Char

Description: Converts an integer to a character.

Syntax: Char (n)

Argument	Description
n	The integer you want to convert to a character

Return value: String. Returns the character whose ASCII value is n.

Fill

Description: Builds a string of the specified length by repeating the specified characters until the result string is long enough.

Syntax: Fill (chars, n)

Argument	Description
Chars	A string whose value will be repeated to fill the return string
n	A long whose value is the length of the string you want returned (from 0 to 60000)

Return value: String. Returns a string n characters long filled with repetitions of the characters in the argument chars. If the argument chars has more than n characters, the first n characters of chars are used to fill the return string. If the argument chars has fewer than n characters, the characters in chars are repeated until the return string has n characters.

Left

Description: Obtains a specified number of characters from the beginning of a string.

Syntax: Left (string, n)

Argument	Description
string	The string containing the characters you want
n	A long specifying the number of characters you want

Return value: String. Returns the leftmost n characters in string if it succeeds and the empty string ("") if an error occurs. If n is greater than or equal to the length of the string, Left returns the entire string. It does not add spaces to make the return value's length equal to n.

LeftTrim

Description: Removes leading spaces from the beginning of a string.

Syntax: LeftTrim (string)

Argument	Description
string	The string you want returned with leading blanks deleted

Return value: String. Returns a copy of string with leading blanks deleted if it succeeds and the empty string ("") if an error occurs.

Len

Description: Reports the length of a string.

Syntax: Len (string)

Argument	Description
string	The string for which you want the length

Return value: Long. Returns a long containing the length of string if it succeeds and -1 if an error occurs.

Lower

Description: Converts all the characters in a string to lowercase.

Syntax: Lower (string)

Argument	Description
string	The string you want to convert to lowercase letters

Return value: String. Returns string with uppercase letters changed to lowercase if it succeeds and the empty string ("") if an error occurs.

Match

Description: Determines whether a string's value contains a particular pattern of characters.

Syntax: Match (string, textpattern)

Argument	Description
string	The string in which you want to look for a pattern of characters
Textpattern	A string whose value is the text pattern

Return value: Boolean. Returns TRUE if string matches textpattern and FALSE if it does not. Match also returns FALSE if either argument has not been assigned a value or the pattern is invalid.

Usage: Match enables you to evaluate whether a string contains a general pattern of characters. To find out whether a string contains a specific substring, use the Pos function.
Textpattern is similar to a regular expression. It consists of metacharacters, which have special meaning, and ordinary characters, which match themselves. You can specify that the string begin or end with one or more characters from a set, or that it contains any characters except those in a set.

A text pattern consists of **metacharacters**, which have special meaning in the match string, and **non-metacharacters**, which match the characters themselves.

See also:

Metacharacters and sample patterns

Metacharacters

The following tables explain the meaning and use of the metacharacters:

Metacharacter	Meaning	Example
Caret (^)	Matches the beginning of a string	^C matches C at the beginning of a string
Dollar sign ($)	Matches the end of a string	s$ matches s at the end of a string
Period (.)	Matches any character	. . . matches three consecutive characters
Backslash (\)	Removes the following metacharacter's special characteristics so that it matches itself	\$ matches $
Character class (a group of characters enclosed in square brackets ([ ]))	Matches any of the enclosed characters	[AEIOU] matches A, E, I, O, or Uyou can use hyphens to abbreviate ranges of characters in a character class. For example, [A-Za-z] matches any letter
Complemented character class (first character inside the brackets is a caret)	Matches any character not in the group following the caret	[^0-9] matches any character except a digit, and [^A-Za-z] matches any character except a letter

The metacharacters asterisk (*), plus (+), and question mark (?) are unary operators that are used to specify repetitions in a regular expression:

Metacharacter	Meaning	Example
* (asterisk)	Indicates zero or more occurrences	A* matches zero or more As (no As, A, AA, AAA, and so on)
+ (plus)	Indicates one or more occurrences	A+ matches one A or more than one A (A, AAA, and so on)
? (question mark)	Indicates zero or one occurrence	A? matches an empty string ("") or A

Sample patterns

The following table shows various text patterns and sample text that matches each pattern:

This pattern	Matches
AB	Any string that contains AB; for example, ABA, DEABC, graphAB_one
B*	Any string that contains 0 or more Bs; for example, AC, B, BB, BBB, ABBBC, and so on
AB*C	Any string containing the pattern AC or ABC or ABBC, and so on (0 or more Bs)
AB+C	Any string containing the pattern ABC or ABBC or ABBBC, and so on (1 or more Bs)
ABB*C	Any string containing the pattern ABC or ABBC or ABBBC, and so on (1 B plus 0 or more Bs)
^AB	Any string starting with AB
AB?C	Any string containing the pattern AC or ABC (0 or 1 B)
^[ABC]	Any string starting with A, B, or C
[^ABC]	A string containing any characters other than A, B, or C
^[^abc]	A string that begins with any character except a, b, or c
^[^a-z]$	Any single-character string that is not a lowercase letter (^ and $ indicate the beginning and end of the string)
[A-Z]+	Any string with one or more uppercase letters
^[0-9]+$	Any string consisting only of digits
^[0-9][0-9][0-9]$	Any string consisting of exactly three digits
^([0-9][0-9][0-9])$	Any consisting of exactly three digits enclosed in parentheses

See also:

Match function

Mid

Description: Obtains a specified number of characters from a specified position in a string.

Syntax: Mid (string, start {, length })

Argument	Description
string	The string from which you want characters returned
start	A long specifying the position of the first character you

	want returned. (The position of the first character of the string is 1)
Length (optional)	A long whose value is the number of characters you want returned. If you do not enter length or if length is greater than the number of characters to the right of start, Mid returns the remaining characters in the string

Return value: String. Returns characters specified in length of string starting at character start. If start is greater than the number of characters in string, the Mid function returns the empty string (""). If length is greater than the number of characters remaining after the start character, Mid returns the remaining characters. The return string is not filled with spaces to make it the specified length.

Pos

Description: Finds one string within another string.

Syntax: Pos (string1, string2 {, start })

Argument	Description
string1	The string in which you want to find string2
string2	The string you want to find in string1
start (optional)	A long indicating where the search will begin in string1. The default is 1

Return value: Long. Returns a long whose value is the starting position of the first occurrence of string2 in string1 after the position specified in start. If string2 is not found in string1 or if start is not within string1, Pos returns 0.

Usage: The Pos function is case sensitive.

Replace

Description: Replaces a portion of one string with another.

Syntax: Replace (string1, start, n, string2)

Argument	Description
string1	The string in which you want to replace characters with string2
start	A long whose value is the number of the first character you want replaced. (The first character in the string is number 1)

n	A long whose value is the number of characters you want to replace
string2	The string that will replace characters in string1. The number of characters in string2 can be greater than, equal to, or fewer than the number of characters you are replacing

Return value: String. Returns the string with the characters replaced if it succeeds and the empty string ("") if it fails.

Usage: If the start position is beyond the end of the string1, Replace appends string2 to string1. If there are fewer characters after the start position than specified in n, Replace replaces all the characters to the right of character start.
If n is zero, then in effect Replace inserts string2 into string1.

Right

Description: Obtains a specified number of characters from the end of a string.

Syntax: Right (string, n)

Argument	Description
string	The string containing the characters you want
n	A long specifying the number of characters you want

Return value: String. Returns the rightmost n characters in string if it succeeds and the empty string ("") if an error occurs. If n is greater than or equal to the length of the string, Right returns the entire string. It does not add spaces to make the return value's length equal to n.

RightTrim

Description: Removes spaces from the end of a string.

Syntax: RightTrim (string)

Argument	Description
string	The string you want returned with trailing blanks deleted

Return value: String. Returns a copy of string with trailing blanks deleted if it succeeds and the empty string ("") if an error occurs.

Space

Description: Builds a string of the specified length whose value consists of spaces.

Syntax: Space (n)

Argument	Description
n	A long whose value is the length of the string you want filled with spaces

Return value: String. Returns a string filled with n spaces if it succeeds and the empty string ("") if an error occurs.

String

Description: Formats data as a string according to a specified format mask. You can convert and format date, DateTime, numeric, and time data. You can also apply a format to a string.

Syntax: String (data {, format })

Argument	Description
Data	The data you want returned as a string with the specified formatting. Data can have a date, DateTime, numeric, time, or string data type
Format (optional)	A string of the masks you want to use to format the data. The masks consist of formatting information specific to the data type of data. If data is type string, format is required. The format string can consist of more than one mask, depending on the data type of data. Each mask is separated by a semicolon. See Usage for details on each data type

Return value: String. Returns data in the specified format if it succeeds and the empty string ("") if the data type of data does not match the type of mask specified or format is not a valid mask.

Usage: For date, DateTime, numeric, and time data, program uses the system's default format for the returned string if you don't specify a format. For numeric data, the default format is the [General] format. For string data, a format mask is required. (Otherwise, the function would have nothing to do.) The format can consist of one or more masks:

- Formats for date, DateTime, string, and time data can include one or two masks. The first mask is the format for the data; the second mask is the format for a null value.
- Formats for numeric data can have up to four masks. A format with a single mask handles both positive and negative data. If there are additional masks, the first mask is for positive values, and the additional masks are for negative, zero, and NULL values.

If the format doesn't match the data type, JAL script engine will try to apply the mask, which can produce unpredictable results.

See also:

Format symbols

Format Symbols

The following table lists the format symbols that can be used in a format string:

Format Symbol	Description
[General]	Outputs the number in General format.
0	Digit placeholder. If the number contains fewer digits than the format contains placeholders, the number is padded with 0's. If there are more digits to the right of the decimal than there are placeholders, the decimal portion is rounded to the number of places specified by the placeholders. If there are more digits to the left of the decimal than there are placeholders, the extra digits are retained.
#	Digit placeholder. This placeholder functions the same as the 0 placeholder except the number is not padded with 0's if the number contains fewer digits than the format contains placeholders.
?	Digit placeholder. This placeholder functions the same as the 0 placeholder except that spaces are used to pad the digits.
. (period)	Decimal point. Determines how many digits (0's or #'s) are output on either side of the decimal point. If the format contains only #'s left of the decimal point, numbers less than 1 begin with a decimal point. If the format contains 0's left of the decimal point, numbers less than 1 begin with a 0 left of the decimal point.
%	Outputs the number as a percentage. The number is multiplied by 100 and the % character is appended.
, (comma)	Thousands separator. If the format contains commas separated by #'s or 0's, the number is output with commas separating thousands. A comma following a placeholder scales the number by a thousand. For Example, the format 0, scales the number by 1000 (e.g., 10,000 would be converted as 10).
E- E+ e- e+	Outputs the number as scientific notation. If the format contains a scientific notation symbol to the left of a 0 or # placeholder, the number is output in scientific notation and an E or an e is added. The number of 0 and # placeholders to the right of the decimal determines the number of digits in the exponent. E- and e- place a minus sign by negative exponents. E+ and e+ place a minus sign by negative exponents and a plus sign by positive exponents.
$ - + / ( ) : space	Outputs that character. To output a character other than those listed, precede the character with a back slash (\) or enclose the character in double quotation marks (""). You can also use the slash (/) for fraction formats.
\	Outputs the next character. The backslash is not output. You can also output a character or string of characters by surrounding the characters with double quotation marks ("").
* (asterisk)	Repeats the next character until the width of the column is filled. You cannot have more than one asterisk in each format section.
[ ]	Outputs hours greater than 24, or minutes or seconds greater than 60. Place the brackets around the leftmost part of the time code; for Example, [h]:mm:ss would allow the output of hours greater than 24.
"text"	Outputs the text inside the quotation marks.

@	Text placeholder. Text replaces the @ format character.
m	Month number. Outputs the month as digits without leading zeros (e.g., 1-12). Can also represent minutes when used with h or hh formats.
mm	Month number. Outputs the month as digits with leading zeros (e.g., 01-12). Can also represent minutes when used with the h or hh formats.
mmm	Month abbreviation. Outputs the month as an abbreviation (e.g., Jan-Dec).
mmmm	Month name. Outputs the month as a full name (e.g., January-December).
d	Day number. Outputs the day as digits with no leading zero (e.g., 1-9).
dd	Day number. Outputs the day as digits with leading zeros (e.g., 01-31).
ddd	Day abbreviation. Outputs the day as an abbreviation (e.g., Sun-Sat).
dddd	Day name. Outputs the day as a full name (e.g., Sunday-Saturday).
yy	Year number. Outputs the year as a two-digit number (e.g., 00-99).
yyyy	Year number. Outputs the year as a four-digit number (e.g., 1900-2078).
h	Hour number. Outputs the hour as a number without leading zeros (1-23). If the format contains one of the AM or PM formats, the hour is based on a 12-hour clock. Otherwise, it is based on a 24-hour clock.
hh	Hour number. Outputs the hour as a number with leading zeros (01-23). If the format contains one of the AM or PM formats, the hour is based on a 12-hour clock. Otherwise, it is based on a 24-hour clock.
m	Minute number. Outputs the minute as a number without leading zeros (0-59). The m format must appear immediately after the h or hh symbol. Otherwise, it is interpreted as a month number.
mm	Minute number. Outputs the minute as a number with leading zeros (00-59). The mm format must appear immediately after the h or hh symbol. Otherwise, it is interpreted as a month number.
s	Second number. Outputs the second as a number without leading zeros (0-59).
ss	Second number. Outputs the second as a number with leading zeros (00-59).
AM/PM am/pm A/P a/p	12-hour time. Outputs time using a 12-hour clock. Outputs AM, am, A, or a for times between midnight and noon; outputs PM, pm, P, or p for times from noon until midnight.

Trim

Description: Removes leading and trailing spaces from a string.

Syntax: Trim (string)

Argument	Description
string	The string you want returned with leading and trailing

	spaces deleted

Return value: String. Returns a copy of string with all leading and trailing spaces deleted if it succeeds and the empty string ("") if an error occurs.

Upper

Description: Converts all the characters in a string to uppercase.

Syntax: Upper (string)

Argument	Description
String	The string you want to convert to uppercase letters

Return value: String. Returns string with lowercase letters changed to uppercase if it succeeds and the empty string ("") if an error occurs.

WordCap

Description: Sets the first letter of each word in a string to a capital letter and all other letters to lowercase (for example, ROBERT E. LEE would be Robert E. Lee).

Syntax: WordCap (string)

Argument	Description
string	A string or expression that evaluates to a string with initial capital letters (for example, Monday Morning)

Return value: String. Returns string with the first letter of each word set to uppercase and the remaining letters lowercase if it succeeds and NULL if an error occurs.

Operators

An operator is a symbol or word in an expression that performs an arithmetic calculation or logical operation; compares numbers, text, or values; or manipulates text strings.

The database buffer supports the following types of operators:

- Arithmetic for numeric data types
- Relational for all data types
- Logical for all data types
- Concatenation for string data types

Arithmetic operators

These are the arithmetic operators:

Operator	Meaning	Example
+	Addition	SubTotal + Tax
-	Subtraction	Price - Discount
*	Multiplication	Quantity * Price
/	Division	Discount / Price
^	Exponentiation	Rating ^ 2.5

Relational and logical operators

Logical operators can join relational expressions to form more complex boolean expressions.
The result of evaluating a boolean expression is always TRUE or FALSE.
These are the relational and logical operators:

Operator	Meaning	Example
=	Equals	Price = 100
>	Greater than	Price > 100
<	Less than	Price < 100
<>	Not equal	Price <> 100
>=	Greater than or equal	Price >= 100
<=	Less than or equal	Price <= 100
NOT	Logical negation	NOT Price = 100
AND	Logical and	Tax > 3 AND Ship < 5
OR	Logical or	Tax >3 OR Ship < 5
IN	SQL SELECT IN condition	Status IN ('A', 'S', 'R')
BETWEEN	SQL SELECT BETWEEN condition	Ship BETWEEN 3 AND 5
LIKE	SQL SELECT LIKE condition	Brand LIKE 'Micro%'

Concatenation operator

The concatenation operator joins the contents of two string expressions to form a longer value. You can concatenate strings only.

Operator	Meaning	Example
+	Concatenate	"cat "+ "dog"

Operator precedence in expressions

To ensure predictable results, all operators in an expression are evaluated in a specific order of precedence. When the operators have the same precedence, the database buffer evaluates them left to right.

The following table lists the operators in descending order of precedence:

Operator	**Purpose**
( )	Grouping
^	Exponentiation
*, /	Multiplication and division
+, -	Addition and subtraction; string concatenation
IN, LIKE, BETWEEN	SQL SELECT statement conditions
NOT	Logical negation
=, >, <, <=, >=, <>	Relational operators
AND, OR	Logical AND and logical OR

Script Debugger

JAL Script graphical debugger is available in 24x7 Scheduler Windows Edition.

Debugging is a process you use to find and resolve errors, or bugs, in your JAL scripts. There are three types of errors you may encounter as your script runs:

- Syntax errors as a result of incorrectly constructed code. You may have forgotten to balance pairs of statements (such as end labels for LoopWhile, LoopUntil, ForNext loops), or you may have a programming mistake that violates the rules of JAL (such as a misspelled word, missing separator, or argument type mismatch error, mismatched parentheses or an incorrect number of arguments passed to a JAL statement).
- Run-time specific errors after the job starts to run. Examples of run-time errors include attempting an illegal operation, such as dividing by zero or writing to a file that does not exist.
- Logic errors when the script does not perform as intended and produces incorrect results.

To help you isolate all three types of errors and to monitor how your code runs, 24x7 Scheduler provides debugging tools that let you step through your code one line at a time, examine or monitor the values of variables, and trace statement calls.

Using the Debugger

To use the debugger, set breakpoints in the scripts that you want to examine and click the Start button (or press the F5 key). When the script stops at a breakpoint, you can examine the values of variables and view the call stack. The debugger lets you set breakpoints as well as view and change local script and global variables. You can single-step through the code, continue to the next breakpoint, or skip a few lines and continue running from the cursor location.

Breakpoints

Breakpoint is a line of code in a job script or user-defined JAL statement at which the debugger automatically suspends execution.

To make the Debugger pause in its execution of your code, you can set a breakpoint:
- In the script text pane, double-click on the desired line of code that is not already a breakpoint.
  Or
- Move the caret to the desired line then either press the F8 key or select the **Toggle Breakpoint** command from the Debug menu.

To remove a breakpoint:
- Double-click the line of code on which the breakpoint has been set.
  Or
- Move the caret to the breakpoint line then either press the F8 key or select the **Toggle Breakpoint** command from the Debug menu.

A breakpoint can be set on a line that contains an executable statement

Views in the Debugger window

The debugger has two panes. You can resize these at any time.

The top pane shows the full text of a currently executed script. In that pane you can go to a specific line in a script, find a string, print the displayed script, and manage the breakpoints.

The bottom pane contains four tab pages:

Variables Watch -	An expandable list of all the variables in scope. The values in the Variables Watch tab page are updated each time they are changed from a script or Immediate window. You can double-click on any variable to manually change the value of a variable whenever script execution is suspended.
Call Stack -	The sequence of JAL statement calls leading up to the script that was executing at the time of the breakpoint.
Breakpoints -	A list of breakpoints in the current script.
Immediate -	A part of the Debugger window in which you can run individual lines of JAL code,

	usually for the purpose of debugging. The Immediate pane is a kind of scratch pad window in which statements and variables are evaluated immediately. In the Immediate page you can type a statement then press F6 to execute this statement.

Step through code

Stepping through your script can help you identify where an error is occurring. You can see whether each line of code produces the results you expected. To step through the code after you have it opened in the Debugger, do one of the following:

- To step through each line of job script and into the code in a user-defined statement called by the main script or by another statement, select the **Debug/Step** command from the Debug menu, or alternatively you can press the CTRL+F5 keys
- To run the code that precedes the desired line of code, and then break so you can step through each line of code, set a breakpoint on that line then select the **Start** or **Continue** command from the Debug menu. The Debugger will suspend execution at the breakpoint line. Use the **Debug/Step** command to continue line by line (see previous paragraph for details).
- To run the rest of the current script, select the **Continue** command from the Debug menu. The Debugger will continue executing script until it reaches a breakpoint or an end of script, whichever is first.
- To skip undesired lines, move the caret to the desired line, select the **Set Next Statement** command from the Debug menu. Select the **Step** or **Continue** command from the Debug window.

The type of stepping you do depends on which portions of code you want to analyze.

JAL Examples

The default installation of 24x7 Scheduler provides sample job database that includes examples of 24x7 script type jobs that you can use while you are learning Job Automation Language (JAL). This sample job database is distributed as part of the standard 24x7 installation package.

To see the JAL script for a job:
1 Double-click the job icon in the Job Explorer. The Job Wizard dialog box will appear.
2 Click the **Next** button, then click the **Edit** button. The JAL Editor window opens with the script in it.
3 After reviewing the script, close the Editor, then click the **Next** button again to see the actual job schedule. This is an important part of any scripting job.

Look at the following job examples:

1.	Running job between 9:00 AM and 5:00 PM every workday.
2.	Scheduling job to not to run on particular days (job exception days).
3.	Converting dates to filenames.
4.	Converting comma-separated data file to tab-separated file.
5.	Scanning program log file for errors.
6.	Processing files using file mask.
7.	Collecting Web server performance statistics.
8.	Monitoring database server free space.
9.	Monitoring file server free space.
10.	Establishing dial-up connection, avoiding line drops.
11.	Loading data into database.
12.	Starting NT service, executing job, stopping service.
13.	Paging/notifying system administrators.
14.	Restoring network connection.
15.	Unattended server reboot on demand.
16.	Using FTP commands.
17.	Redirecting program output to a file.
18.	Verifying overnight data feed.
19.	Using Windows messages.
20.	Watching for file changes.

Running job between 9:00 AM and 5:00 PM every workday

```
Dim today, date
Dim time_now, time
Dim is_work_time, boolean
Dim is_holiday, boolean


CHECK_WEEKDAY:
Today( today )
isWeekday( today, is_work_time )
If( is_work_time, CHECK_HOLIDAY, DONE )

CHECK_HOLIDAY:
isHoliday( today, is_holiday )
If( is_holiday, DONE, CHECK_TIME )

CHECK_TIME:
Now( time_now )
isTimeBetween( time_now, 9:00, 17:00, is_work_time )
If( is_work_time, SOMETHING, DONE )

DO_SOMETHING:
// Perform the actual job here
```

```
// ...

DONE:
```

See also:
Other JAL script examples

Redirecting program output to a file

```
Dim process_id, number
Dim command, string
Dim output, string
Dim position, number
Dim err_found, boolean

// For this example dynamically create batch file that includes just one command
FileSave( "redir.bat" , "ver" )

// Run the batch and terminate it after 30 seconds, in case
// if it does not stop. Batch output is redirected from the
// console to the out.txt file
RunAndWait  ("redir.bat >> out.txt" , "", 30, process_id)

// Read the output file for error checking
FileReadAll ("out.txt" , output)
Lower (output, output)
Pos (output, "error" , 1, position)
IsGreater (position, 0, err_found)
If (err_found, NOTIFY, END)

NOTIFY:
// Send e-mail message
MailSend("Exchange Settings" , "syspassword" , "admin@mycompany.com" , "Error occurred
while running DOSTEST.BAT" )

END:
// Done
```

See also:
Other JAL script examples

Converting comma-separated data file to tab-separated file

```
Dim pointer, number
Dim buffer, string
Dim found, boolean

// Read comma separated file
FileReadAll( "sometext.txt" , buffer )

// Replace commas with tabs
Pos( buffer, ",", 1, pointer)
isGreater( pointer, 0, found)

LoopWhile( found, ENDLOOP )
   Replace( buffer, pointer, 1, "    ", buffer )
   Pos( buffer, ",", pointer, pointer)
```

```
   isGreater( pointer, 0, found)
ENDLOOP:

// Write tab separated file
FileSave( "tabtext.txt" , buffer )
```

See also:
Other JAL script examples

Using FTP commands

```
Dim process_id, number
Dim found, boolean

// Watch for file on remote FTP site.
FTPFileExists( "ftp.microsoft.com" , "", "", "disclaimer.txt" , found )

// If the file found,
// continue processing, otherwise exit and wait for the next cycle
if (found, DOWNLOAD, END )

DOWNLOAD:
// Download the file from Microsoft FTP site
FTPGetFile( "ftp.microsoft.com" , "", "", "disclaimer.txt" , "c:\\temp\disclaimer.txt"
)
// Do something with the downloaded file, for example you can display
// it in the Notepad
Run( "notepad c:\\temp\disclaimer.txt" , "", process_id )

// Delete the file - in a real-world you most likely will do this
// FTPDeleteFile( "ftp.microsoft.com" , "", "", "disclaimer.txt" )

END:
// Done
```

See also:
Other JAL script examples

Scheduling a job not to run on particular days (exception days)

One of the solutions is to create a text file of exception days so that every time the job runs it compares the current date with days in the exception file. For example, create the “ex_dates.txt" file using the text that follows:

03/01/98
03/08/98
04/01/98
04/08/98

Now create the new job with 24x7 script type and schedule this job to run daily. The following script can be used to check dates:

```
Dim buffer, string
Dim found, boolean
Dim today, date
Dim st_today, string
Dim pointer, number
```

```
// Read comma separated file
FileReadAll( "ex_dates.txt" , buffer )

// Get today’s date and convert it to a string
// Replace commas with tabs
Today( today )
Format( today, "mm/dd/yy" , st_today)

Pos( buffer, st_today, 1, pointer)
isGreater( pointer, 0, found)

if( found, END, DO_SOMETHING )

DO_SOMETHING:
// Do something here
// ...

END:
```

See also:

Other JAL script examples

Converting dates to file names

Sometimes you may need to calculate file name as a function of date. You can use the following example as a template:

```
Dim today, date
Dim yesterday, date
Dim file_name, string

// Get today's date
Today( today )
// Calculate yesterday's date
DateAdd( today, -1, yesterday )
// Convert to string in mmddyyyy format
Format( yesterday, "mmddyyyy" , file_name )
// Append file extension
Concat( file_name, ".dat" , file_name )

// Do something with this file,
// for example FTP, Copy, Load into database, etc.
// ...
```

In some cases, you may use available macro-parameters to simplify date calculations. For example, the following script produces the same end-result as the script above:

```
Dim file_name, string

// Build file name
Concat( @DP" mmddyyyy" , ".dat" , file_name )

// Do something with this file,
// for example FTP, Copy, Load into database, etc.
// ...
```

See also:
Other JAL script examples

Scanning program log file for errors

```
Dim buffer, string
Dim position, number
Dim err_found, boolean

// Load the log file into memory
FileReadAll ("program.log" , buffer)
// Convert to lower case to find all sorts of errors
Lower (buffer, buffer)
// Search for word "error"
Pos (buffer, "error" , 1, position)
// If error found, notify system administrator
IsGreater (position, 0, err_found)
If (err_found, NOTIFY, END)

NOTIFY:
// Send e-mail message
MailSend( "Exchange Settings" , "syspassword" , "admin@mycompany.com" , "Error
occurred while running PROGRAM.EXE. See program log file for details." )

END:
// Done
```

See also:
Other JAL script examples

Processing files using file mask

```
Dim file_name, string
Dim found, boolean
Dim attr, number
Dim read_only, boolean
Dim hidden, boolean
Dim system, boolean
Dim directory, boolean
Dim archived, boolean
Dim message, string

// Start file search
FileFindFirst( "*.txt" , file_name, found )

LoopWhile( found, ENDLOOP )
   // File found, do something with the file here
   // ...
   // For example we can get file attributes then display them
   FileGetAttr( file_name, attr )
   BitwiseGetBit( attr, 1, read_only )
   BitwiseGetBit( attr, 2, hidden )
   BitwiseGetBit( attr, 3, system )
   BitwiseGetBit( attr, 5, directory )
   BitwiseGetBit( attr, 6, archived )

   // skip directories
   IfThen( directory, FIND_NEXT )
```

```
   // Show nice message
   Char( 13, new_line )
   Concat( "File: ", file_name, message )
   Concat( message, "\n\tRead Only: ", message )
   Concat( message, read_only, message )
   Concat( message, "\n\tHidden: ", message )
   Concat( message, hidden, message )
   Concat( message, "\n\tSystem: ", message )
   Concat( message, system, message )
   Concat( message, "\n\tDirectory: ", message )
   Concat( message, directory, message )
   Concat( message, "\n\tArchived: ", message )
   Concat( message, archived, message )
   MessageBox( message )

   FIND_NEXT:
   // Find next file
   FileFindNext( file_name, found )
ENDLOOP:
```

See also:

Other JAL script examples

Collecting Web server performance statistics

```
// This script allows checking Web server response time.
// The number is saved in a file, which can be helpful
// in analyzing Web server performance such as estimating
// average response time and building busy rate graph as
// a dependency of time of day.

Dim current_time, time
Dim current_date, date
Dim start_time, datetime
Dim end_time, datetime
Dim duration, number
Dim file_number, number
Dim line, string


// Get start time
Today( current_date )
Now( current_time )
DateTime( current_date, current_time, start_time )

// Download index page from a Web server
// For example use popular Microsoft Web site
WebGetPageHTML( "http://home.microsoft.com/", "c:\\temp\msweb.tmp" )

// Get end time
Today( current_date )
Now( current_time )
DateTime( current_date, current_time, end_time )

// Calculate response time
DateTimeDiff( start_time, end_time, duration )

// Build text line
Concat( "Start: ", start_time, line )
Concat( line, "  End: ", line )
Concat( line, end_time, line )
Concat( line, "  Duration: ", line )
Concat( line, duration, line )
```

```
// Append built line to the statistics file
FileOpen( "webstat.txt" , "LineMode" , "Write" , TRUE, file_number )
FileWrite( file_number, line )
FileClose( file_number )

// Uncomment next line to open statistics file in Notepad
// Run( "notepad webstat.txt" , "", file_number )
```

See also:
Other JAL script examples

Monitoring file-server free space

```
// Before trying this script, correct the
// network drive letter specified below, if necessary

Dim drive, string
Dim free_space, number
Dim low_space, boolean

Set( drive, "K" )
// Get free space
// Windows95 OSR-1 users use DiskGetFreeSpace instead of DiskGetFreeSpaceEx
DiskGetFreeSpaceEx( drive, free_space )
// Check threshold - 50 Mbytes = 50 * 2^20
isLess( free_space, 52428800, low_space )

if( low_space, PROBLEM, END )
PROBLEM:
// Page network administrator
MailSend( "Exchange Settings" , "system" , "12345678@pagenet.com" , "Low space" ,
"Free space on drive K has fallen below 50 Mbytes" )

END:
```

See also:
Other JAL script examples

Using Windows messages

```
// This example was developed to demonstrate how to send
// Windows messages from a script.
Dim process_id, number
Dim window_handle, number
Dim edit_handle, number

// Use Notepad for demonstration
// Run Notepad
Run( "notepad" , "", process_id )
// Wait 2 seconds for the Notepad to open
Wait( 2 )
// Get handle of the Notepad window
ProcessGetWindow( process_id, window_handle )
// Get handle of the edit box
WindowGetChild( window_handle, edit_handle )
// Send EM_SETREADONLY message to the edit box
// to make it read only
WindowSendMessage( edit_handle, 207, 1, 0 )
```

```
// Open schedule log file in the Notepad
WindowActivate( window_handle )
SendKeys( "{ALT}FOschedule.log{ENTER}" )
```

See also:
Other JAL script examples

Unattended server reboot on demand

```
// In this example, we assume that the 24x7 Scheduler is running on the server
// and that this job is setup as an "e-mail watch." On receiving the specified // e-
mail message, 24x7 Scheduler will reboot the computer. This script has
// just one line:

Reboot

// That's all, folks! Now imagine how easy it is to reboot your database and
// Web servers without leaving your home. You can also setup this job to run
// every day so that it will restart the server every morning at 7:00 AM before
// people come to the office.
```

See also:
Other JAL script examples

Restoring network connection

```
// Use Windows Explorer to restore a disconnected network drive before
// running a program that accesses data files on the disconnected drive.

Dim process_id, number
Dim window_handle, number
Dim running, boolean

Run( "explorer k:\data" , "", process_id )
// Wait 10 seconds to allow the Explorer to restore connection
Wait( 10 )

// First let’s try to close Explorer gracefully (this is always better than killing
the process.)
// However, using the ProcessKill statement guarantees that the process termination. A
keystroke, on the other hand,
// is sent to an active window, which can change at anytime.
SendKeys( "{ALT}{F4}" )

// Wait 2 more seconds
Wait( 2 )
// Check whether Explorer is still running or not
ProcessGetWindow( process_id, window_handle )
isGreater( window_handle, 0, running)

if( running, KILL, DO_MAIN_JOB )
KILL:
ProcessKill( process_id )

DO_MAIN_JOB:
// Do the main job here
// Run ...
```

See also:
Other JAL script examples

Watching for file changes

```
// This is an example of a "file change watch" job. A regular "file watch" job checks
// file presence only. In some situations, you may need to run a job only when
// a change occurs.

// This script uses the "change.txt" file to store "watch file" attributes between
runs.

Dim buffer, string
Dim file_time, string
Dim file_date, string
Dim date_time, datetime
Dim buffer2, string
Dim no_change, boolean

// Read parameter file into buffer
FileReadAll( "change.txt" , buffer )

// Get watch file date/time
FileTime( "k:\data\account.dat" , file_time )
FileDate( "k:\data\account.dat" , file_date )
DateTime( file_date, file_time, date_time )
// Convert to string
Format( date_time, "mm/dd/yyyy hh:mm:ss" , buffer2 )
// Compare file times
isEqual( buffer, buffer2, no_change )

// If the file date/time is the same, then nothing to do, otherwise
// update the parameter file and perform the main job.
If( no_change, END, UPDATE )
END:
Exit

UPDATE:
FileSave( "change.txt" , buffer2 )
// do main job here
// ...
```

See also:
Other JAL script examples

Paging/notifying system administrators

The 24x7 Scheduler allows you to setup a job that can send a page or an e-mail message to one recipient at a time. Sometimes, if a job fails, it is necessary to notify more than one person. You can use JAL to add this function to virtually any job. One way to do this is to setup the “file type" notification action for the main “program" or “database" type job.. In the event of a failure, a semaphore file will be created (for example: job.err). Another job of 24x7 script type instantly checks presence of the specified semaphore file. As soon as the file is detected, the job deletes the file and sends pages or e-mail messages to the specified recipients. Note that the second job will need to be scheduled as a “file watch". The following example shows how to send multiple messages by using JAL e-mail statements.

```
// Note: The list of recipients can be hard-coded to simplify scripting.
// This list of recipients can be read from file. This was done in order to make the
script reusable.
// Thus recipients can be changed without changing the job definition.

Dim file_number, number
Dim recipient, string
Dim end_of_file, boolean

// Open recipients file for reading line by line
FileOpen( "mail.lst" , "LineMode" , "Read" , "", file_number )

// Read the file line by line until the end of file.
// Each recipient must be on a separate line.
EOF( file_number, end_of_file )
LoopUntil end_of_file, ENDLOOP
   FileRead( file_number, recipient )
   // Send e-mail
      MailSend( "Exchange Settings" , "syspassword" , recipient, "any subject" , "any
message" )

      EOF( file_number, end_of_file )
ENDLOOP:

// Done
FileClose( file_number )
```

Notes:

- There are many companies that provide reliable “e-mail to pager" services. For example: CompuServe, SkyTel, PageNet, MobileComm, and PageMart. There is no major difference between sending e-mail messages and sending messages to a pager. The only real difference is that when you send a message to a pager you must use a special addressing format. For example, the address format for the CompuServe is: CompuServe_ID@mobile.compuserve.com. If the account number (CompuServe ID) is 79999,9999, the recipient could receive wireless e-mail by using the address 79999.9999@mobile.compuserve.com. Note that a period must be used in place of a comma.
- In the case of an alphanumeric message, the number of characters received by the recipients depends on how they setup their pager preferences. Keeping your message short and concise helps to ensure that the recipient gets the most out of your message.

See also:

Other JAL script examples

Monitoring database free space

This example shows how easily you can perform various database operations in 24x7 Scheduler. To simplify the script we saved the SQL part in a separate file called free_space.sql. The script will load this file and dynamically execute the loaded SQL. This SQL was designed for Oracle 7 databases. You may need to customize it for your database.

```
// Load and execute SQL script from "free_space.sql" file
// If the result is positive (at least one segment found),
// notify the database administrator about potential problems.

Dim SQL, string
Dim rows, number
Dim problem, boolean
Dim message, string
```

```
// Load file
FileReadAll( "free_space.sql" , SQL )
// Connect to database and retrieve "bad" segments,
// see "free_space.sql" file for details
DatabaseConnect( "Sales DB" )
DatabaseRetrieve( SQL, rows )
DatabaseDisconnect

isGreater( rows, 0, problem )

// If problem detected, notify DBA
If( problem, NOTIFY, END )

NOTIFY:
// Save retrieved data in the temporary file
DatabaseSave( "c:\\temp\message.tmp" , "TXT" , rows )
// Read temp. file contents and then e-mail to DBA
FileReadAll( "c:\\temp\message.tmp" , message )
MailSend( "Exchange Settings" , "pwrd" , "ora_dba@my_company.com" , "Database Problem"
, message )
// Delete temp. file
FileDelete( "c:\\temp\message.tmp" )

END:
```

FREE_SPACE.SQL

```
SELECT 'Owner: ' || seg.owner || chr(13) || chr(10) ||
   'Name: ' || seg.segment_name || chr(13) || chr(10) ||
   'Type: ' || seg.segment_type|| chr(13) || chr(10) ||
   'Tablespace: ' || seg.tablespace_name || chr(13) || chr(10) ||
   'Next extent size: ' || to_char(seg.max_extents, '999,999,999') || chr(13) ||
chr(10) ||
   'Problem: Max extent reached'
FROM sys.dba_segments seg
WHERE seg.extents = seg.max_extents

UNION ALL

SELECT 'Owner: ' || seg.owner || chr(13) || chr(10) ||
   'Name: ' || seg.segment_name || chr(13) || chr(10) ||
   'Type: ' || seg.segment_type|| chr(13) || chr(10) ||
   'Tablespace: ' || seg.tablespace_name || chr(13) || chr(10) ||
   'Next extent size: ' || to_char(t.next_extent, '999,999,999') || chr(13) || chr(10)
||
   'Problem: Not enough space for next extent'
FROM sys.dba_segments seg,
   sys.dba_tables t
WHERE seg.segment_type = 'TABLE'
   AND seg.segment_name = t.table_name
   AND seg.owner = t.owner
   AND NOT EXISTS (SELECT tablespace_name
   FROM dba_free_space free
   WHERE free.tablespace_name = t.tablespace_name
   AND free.bytes >= t.next_extent
   )
UNION ALL

SELECT 'Owner: ' || seg.owner || chr(13) || chr(10) ||
   'Name: ' || seg.segment_name || chr(13) || chr(10) ||
   'Type: ' || seg.segment_type|| chr(13) || chr(10) ||
   'Tablespace: ' || seg.tablespace_name || chr(13) || chr(10) ||
```

```
    'Next extent size: ' || to_char(i.next_extent, '999,999,999') || chr(13) || chr(10)
||
    'Problem: Not enough space for next extent'
FROM sys.dba_segments seg,
    sys.dba_indexes i
WHERE seg.segment_type = 'INDEX'
    AND seg.segment_name = i.index_name
    AND seg.owner = i.owner
    AND NOT EXISTS (SELECT tablespace_name
    FROM dba_free_space free
    WHERE free.tablespace_name = i.tablespace_name
    AND free.bytes >= i.next_extent
    )
UNION ALL

SELECT 'Owner: ' || seg.owner || chr(13) || chr(10) ||
    'Name: ' || seg.segment_name || chr(13) || chr(10) ||
    'Type: ' || seg.segment_type|| chr(13) || chr(10) ||
    'Tablespace: ' || seg.tablespace_name || chr(13) || chr(10) ||
    'Next extent size: ' || to_char(c.next_extent, '999,999,999') || chr(13) || chr(10)
||
    'Problem: Not enough space for next extent'
FROM sys.dba_segments seg,
    sys.dba_clusters c
WHERE seg.segment_type = 'CLUSTER'
    AND seg.segment_name = c.cluster_name
    AND seg.owner = c.owner
    AND NOT EXISTS (SELECT tablespace_name
    FROM dba_free_space free
    WHERE free.tablespace_name = c.tablespace_name
    AND free.bytes >= c.next_extent
    )
UNION ALL

SELECT 'Owner: ' || seg.owner || chr(13) || chr(10) ||
    'Name: ' || seg.segment_name || chr(13) || chr(10) ||
    'Type: ' || seg.segment_type|| chr(13) || chr(10) ||
    'Tablespace: ' || seg.tablespace_name || chr(13) || chr(10) ||
    'Next extent size: ' || to_char(r.next_extent, '999,999,999') || chr(13) || chr(10)
||
    'Problem: Not enough space for next extent'
FROM sys.dba_segments seg,
    sys.dba_rollback_segs r
WHERE seg.segment_type = 'ROLLBACK'
    AND seg.segment_name = r.segment_name
    AND seg.owner = r.owner
    AND NOT EXISTS (SELECT tablespace_name
    FROM dba_free_space free
    WHERE free.tablespace_name = r.tablespace_name
    AND free.bytes >= r.next_extent
    )
```

See also:

Other JAL script examples

Starting Windows service, executing job, stopping Windows service

```
// This script starts Oracle service, runs a program
// that loads information into the database, then the script
// shutdowns the database.
```

```
// Start Oracle database. Note that service OracleStartORCL automatically
// starts another service OracleService.
ServiceStart "OracleStartORCL"
ServiceStart "OracleTNSListener80"
ServiceStart "OracleClientCache80"

// Do main job here
// ... Run ...

// Shutdown database
ServiceStop "OracleClientCache80"
ServiceStop "OracleTNSListener80"
ServiceStop "OracleStartORCL"
ServiceStop "OracleService"
```

See also:

Other JAL script examples

Loading data into database

```
// This script imports data into a temporary table called TEMP_SALES_ORDER,
// then populates the main SALES_ORDER table from the temporary table.
Dim imported_rows, number
Dim old_rows, number
Dim new_rows, number
Dim message, string

// Connect to database
DatabaseConnect( "Sales DB (Oracle 7.2)" )
// Prepare temp.table
DatabaseExecute( "TRUNCATE TABLE scott.temp_sales_order" , old_rows )
// Populate temp. table
DatabaseImport( "scott.temp_sales_order" , "order.txt" , imported_rows )
// Delete from main table matching order to avoid duplicate key problem
DatabaseExecute( "DELETE FROM scott.sales_order WHERE id IN (SELECT id FROM
scott.temp_sales_order)", old_rows )
// Populate main table
DatabaseExecute( "INSERT INTO scott.sales_order SELECT * FROM scott.temp_sales_order"
, imported_rows )
// Disconnect from database and commit transaction
DatabaseDisconnect


// Notify job owner about results
Subtract( imported_rows, old_rows, new_rows )
Concat( "Updated orders: ", old_rows, message)
Concat( message, ", New orders: ", message)
Concat( message, new_rows, message)

MailSend( "Exchange Settings" , "pswrd" , "sctott@mycompany.com" , "Sales Order
Update" , message )
```

See also:

Other JAL script examples

Establishing dial-up connection, avoiding line drops

```
// This script demonstrates how to initiate a dial-up connection from JAL
// script. To use a different connection name, replace CompuServe with
// the name of your dial-up connection. RnaDial and your connection name
// are case-sensitive, so match the text exactly. Make sure to setup your
// dial-up connection so that it remembers the password and does not have to prompt
for it.

Dim process_id, number
Dim window_handle, number

// Connect to CompuServe
Run( "rundll rnaui.dll,RnaDial CompuServe" , "", process_id )
// Wait 60 seconds to allow dial-up networking to initiate the connection
Wait( 60 )
// do something here
// ...
// done

// To disconnect from CompuServe, close the dial-up window.
// To leave the connection online, comment the following two lines
WindowFind( "Connect To%", window_handle )
WindowClose( window_handle )

// If you do not want to close the connection, but keep this
// connection online, even with long periods of inactivity, you can use
// the ping command. setup a new job that will run All Day every minute.
// Select the "program" type for this job and specify the ping command in the
// program name field. This will help avoid line drops.
// For example: ping www.ibm.com
```

See also:

Other JAL script examples

Verifying overnight data feed

```
// Check data files that arrived earlier.
Dim file_date, date
Dim file_time, time
Dim today, date
Dim now, time
Dim not_found, boolean
Dim file_OK, boolean
Dim date_OK, boolean
Dim time_OK, boolean
Dim file_name, string

Today( today )
Now( now )

CHECK_ACCOUNTS:
// Get date/time for Accounts
Set( file_name, "j:\data\account.dat" )
NotFileExists( file_name, not_found )
IfThen( not_found, BAD_FILE )
FileDate( file_name, file_date )
FileTime( file_name, file_time )

// Check if it is file_OK
IsEqual( file_date, today, date_OK )
```

```
IsTimeBetween( file_time, 00:00:00, now, time_OK )
And( date_OK, time_OK, file_OK )
if( file_OK, CHECK_HOLDINGS, BAD_FILE )


CHECK_HOLDINGS:
// Get date/time for Holdings
Set( file_name, "j:\data\holding.dat" )
NotFileExists( file_name, not_found )
IfThen( not_found, BAD_FILE )
FileDate( file_name, file_date )
FileTime( file_name, file_time )

// Check if it is file_OK
IsEqual( file_date, today, date_OK )
IsTimeBetween( file_time, 00:00:00, now, time_OK )
And( date_OK, time_OK, file_OK )
if( file_OK, CHECK_SECURITIES, BAD_FILE )


CHECK_SECURITIES:
// Get date/time for securities
Set( file_name, "j:\data\secirity.dat" )
NotFileExists( file_name, not_found )
IfThen( not_found, BAD_FILE )
FileDate( file_name, file_date )
FileTime( file_name, file_time )

// Check if it is file_OK
IsEqual( file_date, today, date_OK )
IsTimeBetween( file_time, 00:00:00, now, time_OK )
And( date_OK, time_OK, file_OK )
if( file_OK, DONE, BAD_FILE )

BAD_FILE:
// Inform operation personal about bad file
MailSend( "Exchange Settings" , "pswrd" , "david@mycompany.com" , file_name,
"Overnight feed failed. File specified in the subject was not updated!" )
MailSend( "Exchange Settings" , "pswrd" , "joe@mycompany.com" , file_name, "Overnight
feed failed. File specified in the subject was not updated!" )

DONE:
```

Index

F

G

H

I

J

L

M

N

O

P

Q

R

S

T

U

V

W

Y