

Opalis JobEngine User's Manual

Version 3.50f

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GETTING STARTED

System Requirements

Service

The Opalis JobEngine automation engine runs as a Service and is generally referred to as an “Opalis JobEngine Service.” The minimum system requirements are:

- Windows 2000
- Windows NT 4.0 Service Pack 3 or later,
- Windows NT 3.51 Service Pack 5
- 5 MB of free disk space

Optional

- TCP/IP for SMTP e-mail functions
- ODBC 3.0 for ODBC database functions
- Remote Access Service for Dial-up Networking functions

ODBC files are available from www.microsoft.com

Client

The Opalis JobEngine graphical user interface (GUI) is used to view or modify an Opalis JobEngine Service configuration. It is generally referred to as “Opalis JobEngine Client.” The minimum system requirements are:

- Windows 95/98
- Windows NT 3.51 Service Pack 5
- Windows NT 4.0 Service Pack 3 or later
- Windows 2000
- 5 MB of free disk space

Windows 95/98: Microsoft Remote Registry Services must be installed. The installation files are located in the following location:

- Windows 95 CD-ROM: “Admin\Nettools\Remotereg”
- Windows 98 CD-ROM: “tools\reskit\netadmin\remotereg”

Differences between Windows 95/98 and Windows NT/2000 for the Client: The executable is the same, but some functions are not available on Windows 95/98 because they are part of the advanced Windows NT API (such as restarting the Service remotely).

License Structure

Server License

Opalis JobEngine is licensed per Windows NT/2000 system. For each Windows NT/2000 system where Opalis JobEngine's functionality is required, a license is also required.

An Opalis JobEngine license is generally referred to as an Opalis JobEngine Server License.

"Server License" does not mean that Opalis JobEngine only runs on a Windows NT Server. It can run on both a Windows NT Workstation and a Server as well as Windows 2000.

For an Opalis JobEngine Server License, a serial number and key must be entered during the software installation or at a later stage.

Five Minute Installation Guide

Installation

Insert the Opalis CD-ROM into the CD-ROM drive. From here, you can install the software.

On the CD-ROM, you install the Opalis products by launching the self-extracting ZIP files.

Refer to the "README.TXT" on the CD-ROM for more information on files and their locations.

If you run the setup program from a Windows 95/98 computer, you can only install the Client program.

From a Windows NT/2000 system, you have three installation choices:

- Client and Service
- Client only
- Remote Installation. Choose this option to install the Opalis JobEngine Service on another Windows NT/2000 computer (if you wish to install just the Service, it will also work locally). You must have administrative rights on the remote computer. Note that the installation does not require a reboot and that you can immediately start to work with Opalis JobEngine after the installation. (See Requirements Section.)

Account Used for the Service: The installation program allows customization of the account used by the Opalis JobEngine Services. It is possible to ignore this feature and run Services under the local system account context. However, if you plan to use ODBC functions, you must modify this account to a well-known administrative account (for example, yours). To do this, from the Services applet in the Control Panel press the Startup button (see also the Online help).

Overview

Description

Opalis JobEngine is an advanced job scheduling and automation tool for Windows NT/2000 environments. The Opalis JobEngine improves productivity by automating routine tasks and multi-step job sequences. It delivers the sophisticated parallel scheduling capabilities necessary to automate complex IT processes, saving administrators time while lowering Total Cost of Ownership.

Job Scheduling

With Opalis JobEngine you can schedule tasks (run a program, SQL executions, ODBC data transfers and queries, file management, connection/disconnection of remote access links, send electronic mail or network message, and so on). Benefit from the right tasks being completed in the right order and on time with full logging capability.

Flexible Automation

Opalis JobEngine offers a single solution to automate virtually any network administrative task. The sophisticated calendar facilities and multiple tasks enable IT professionals to design custom automation solutions that address the specific needs of their organization.

Notification

Advanced notification and alerting features via standard communication channels enable immediate response to system malfunctions. Opalis JobEngine delivers user-defined corrective actions and multiple methods of notification to alert administrators about problems that can result in downtime.

Opalis JobEngine is extremely easy to use because it is built on three intuitive concepts:

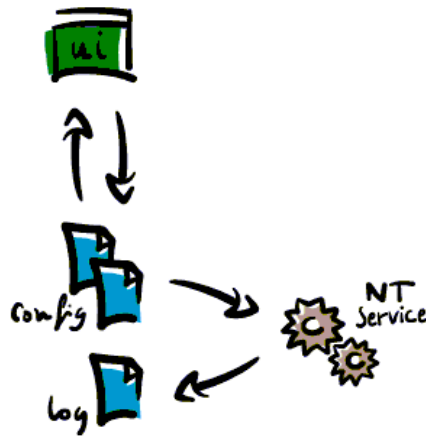
- Tasks
- Events (Date/Time Event only in Opalis JobEngine)
- Links

Opalis JobEngine treats tasks, date/time event, and links as objects. You can create as many objects as needed and combine them to create scheduled processes.

This first section is a crash course through Opalis JobEngine objects. Even if you do not want to read this manual from cover to cover, we urge you to take the time to read this section.

We also urge you to try the Wizards that are available from the New Object window and upon start-up. These will assist you in creating several configurations that many administrators use.

This section assumes you are already familiar with the Windows NT/2000 interface. If any buttons, menus, trees, or mouse functions are new to you, please refer to the MS User's Manual.



Concept



Tasks

A *task* is an action Opalis JobEngine can perform. You can think of tasks as small procedures. Typically, Opalis JobEngine can execute tasks in response to the Date/Time event (to be introduced shortly). *A task is the unit of action in Opalis JobEngine.* You can run any program or system command from Opalis JobEngine.

Opalis JobEngine also offers numerous other built-in tasks:

- File and directory operations (copy, move, and print files from Opalis JobEngine)
- SQL and ODBC queries (send queries to databases or files from Opalis JobEngine)
- Remote access (connect to other computers from Opalis JobEngine)
- Network messaging (send messages such as alerts from Opalis JobEngine)
- Service manipulation (start, stop, or pause NT Services from Opalis JobEngine)

Typical tasks include the ability to:

- Back up hard drive C:
- Transfer data from a flat text file to your relational database
- Process EDI messages
- Query a database
- Move files from a public directory to a protected one

What is an Event?



Events are triggers for tasks. Opalis JobEngine contains only the Date/Time Event.

Note: for more events such as Monitor File System, Windows NT/2000 Service, Windows NT/2000 Event Log, Database, Processes, Computers, Disk Space, please contact Opalis to inquire about OpalisRobot.

You can link this event to tasks (links are introduced shortly). Here is how it works: after you define the conditions, Opalis JobEngine efficiently tests them and when it detects that the date/time condition is met, the associated Task to the Date/Time event is triggered and Opalis JobEngine performs the task.

Here are some typical events:

- It is Friday, it is 9:00 pm
- It is the last Monday of the month
- It is the 15th of the month



What is a Link?

Links associate tasks to events. A link enables Opalis JobEngine to run a task in response to the Date/Time event.

The Data/Time Event and tasks by themselves are not sufficient; it is the combination of the event and tasks that will perform the actual work.

What is a Folder?

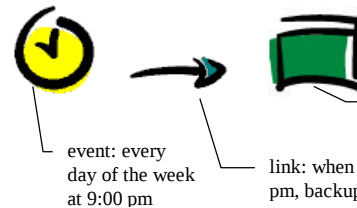
As an added convenience, Opalis JobEngine lets you arrange events, tasks, and links in folders to help you visually organize your configuration. Each folder has an associated log which only tracks messages regarding folder tasks.

The scheduler does not use folders so you are free to organize your configuration to suit your tastes or working habits. Please note that the objects defined in one folder are available to objects in all folders.

A Simple Example

Let's say you want to use Opalis JobEngine to automate your backup of drive C: every day at 9:00 p.m. with Opalis JobEngine.

The first step is to determine the task. In this case, you want to start the backup; that is, run the NTBackup program with "C:" as a parameter.



Opalis JobEngine supports "program execution" tasks that run arbitrary programs – including NTBackup.

The next step is "*When to start the task*" In this example, we want to perform a backup every day at 9:00 p.m.

Opalis JobEngine's built-in "Date/Time" event is ideal for this job.

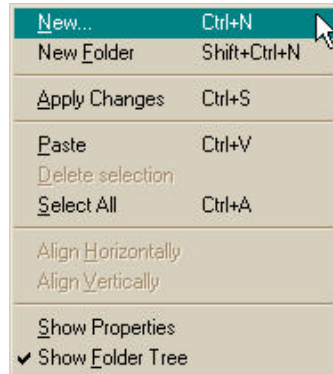
The last step is to associate the event and task with a link. This tells the task (starting the back-up) when to start the event.

Creating Job Processing with Opalis JobEngine

In the previous section we described the concept and objects used to create an automated job. This section explains how to configure the automated job using the Opalis JobEngine interface and menus.

First run the Opalis JobEngine Client program and connect to the Opalis JobEngine server. You can use the Server | Connect To... menu item and enter the server name in the dialog box. This opens a window with a view of the configuration on your server.

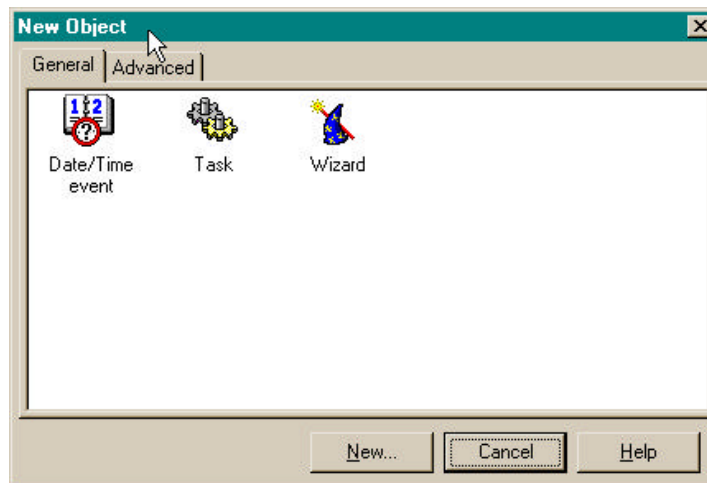
If you want more information on a precise aspect of the Opalis JobEngine client program, please refer to the “Client” section in this manual.



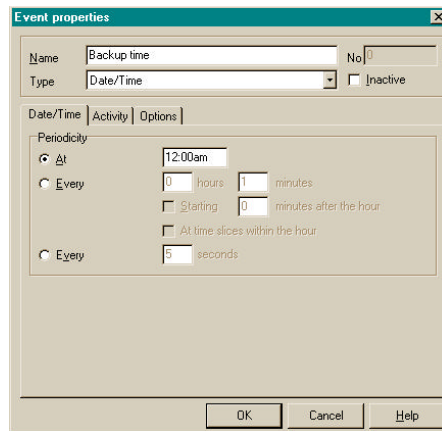
To create an event that is triggered every day at 9:00 p.m.

Right-click on the folder where you want to insert the event, select New (alternatively you can select New in the Edit menu).

This opens the following New Object dialog box as shown in Figure 6. Depending on what is installed on the server, this dialog lists the different objects you can create.



Select Date/Time Event and click New.

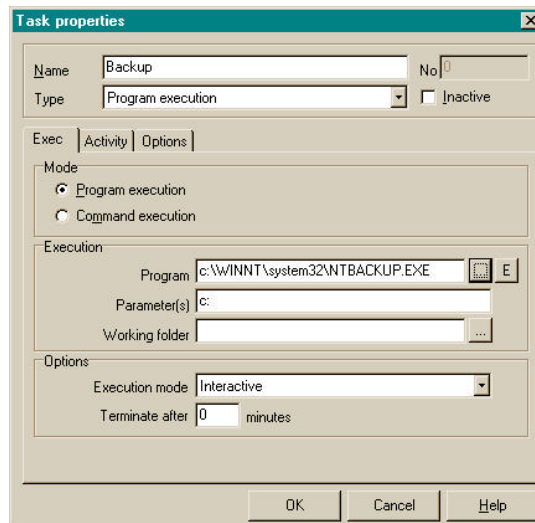


Fill in the event name (such as “Backup time”) and select the type of event (“Date/Time” which is the default value). Enter 9:00 pm in the Periodicity At field as shown below.

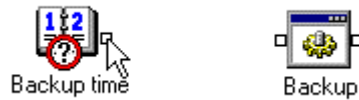
To create a task to backup the hard drive C:

Right-click in the folder where you want to insert the task, and select New (alternatively you can select New in the Edit menu). This opens the New Object dialog box. Select the Opalis JobEngine Task icon and click the New button.

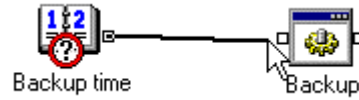
A window similar to the Event Window now appears. Name the task (“Backup” seems appropriate) and select the type of task you want (“Program execution” in this case). *Program* is “NTBackup.exe” and *Parameters* is “C:\.” Select Interactive in the Execution mode list. You may leave the other fields empty.



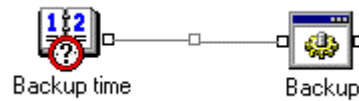
To Create a link between the event and the task.



Click on the square at the right of the originating event or task.



Drag the mouse pointer to the square at the left of the destination task. (Do not release the mouse button.)



When the square at the left of the destination task is highlighted, release the mouse button to complete the link.

The last step is to refresh the Opalis JobEngine configuration. To do this, use the “Apply Changes” icon in the toolbar as shown below.



Opalis JobEngine is now configured to back up the drive C: every day of the week at 9:00 p.m.

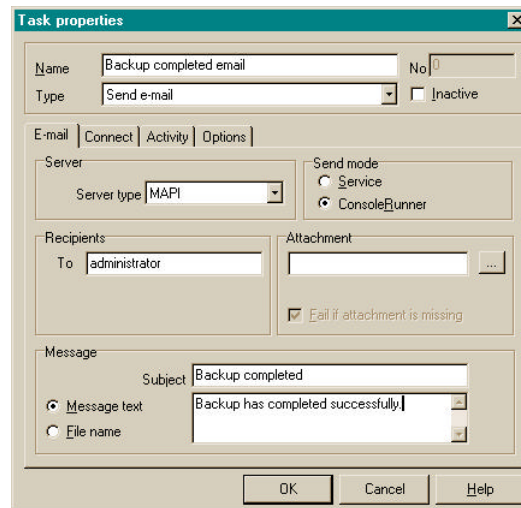
Chaining Tasks

In many cases, you will want to chain together jobs to run consecutively or simultaneously. For example, at the end of the backup procedure, you may want to e-mail the system administrator or restart services or applications that may have been stopped to complete the back up.

This section explains how to modify the configuration we have created so that Opalis JobEngine sends an e-mail message to the system administrator once the backup procedure has finished.

This section assumes you know how to create tasks and links as explained in the previous section. Please refer to the “Opalis JobEngine Client” section if you are unsure.

To create a “Send E-mail” task.



The screenshot shows the 'Task properties' dialog box for a task named 'Backup completed email'. The 'Type' is set to 'Send e-mail'. The 'E-mail' tab is selected, showing the 'Server' type as 'MAPI', 'Send mode' as 'ConsoleRunner', and 'Recipients' as 'administrator'. The 'Attachment' field is empty, and the 'Fail if attachment is missing' checkbox is checked. The 'Message' section shows the 'Subject' as 'Backup completed' and the 'Message text' as 'Backup has completed successfully'.

Create the link between the “Outer” square (at the right of the task icon) of the “Backup” task and the “Backup completed e-mail” task you just created. This result should look like Figure 12.

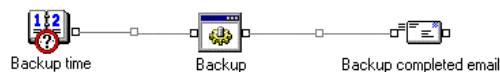


Figure12.

Use the Apply Changes command to have your changes taken into account.

You may want to link this task to a different message if it fails. To do this, you will have to create a new link and then edit that to change its characteristics by double-clicking on it.

The screenshot shows a 'Link properties' dialog box. It is divided into two main sections: 'Properties' and 'Options'. In the 'Properties' section, there are three rows. The first row is labeled 'If' and contains a text box with 'Backup', a dropdown menu with 'Completes' selected, and two input boxes for 'Value' (0) and 'Max' (0). The second row is labeled 'And' and contains a text box with '(None)' and a dropdown menu with 'Occurs' selected, followed by 'Value' (0) and 'Max' (0) input boxes. The third row is labeled 'Then' and contains a text box with 'Backup completed email'. The 'Options' section below has three checkboxes: 'Inactive', 'Timeout (secs.)', and 'Wait before triggering task (secs.)'. All three are unchecked. The 'Timeout' and 'Wait' checkboxes have associated input boxes set to '0'. At the bottom of the dialog are three buttons: 'OK', 'Cancel', and 'Help'.

Figure 13

The Edit Link dialog box, as shown above in Figure 13, allows you to select which condition you want the link to test: an event occurrence, a task completion or failure.

Depending on its type, a task can return a given value when it successfully completes; using this feature, a link can chain to another task if this value meets certain criteria.

The Service

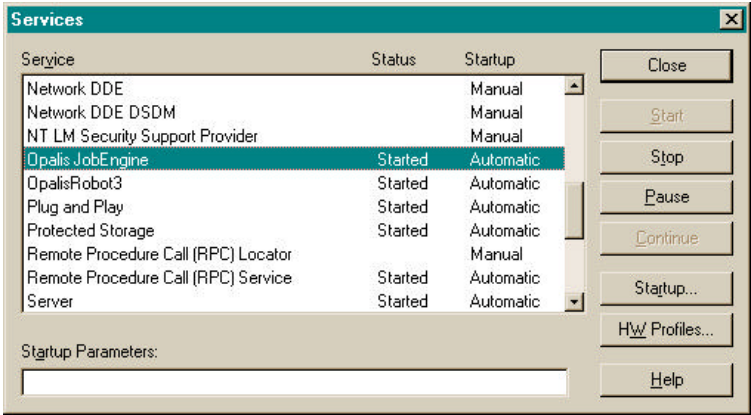
The Opalis JobEngine is a Windows NT/2000 Service. Windows Services are background processes that normally run without a console. Services do not necessarily run under the user logged in the system. In fact, Services can run even when no user is logged into the system. Also, you can configure these Services to automatically start when the system boots (default configuration).

Starting or stopping Windows Services requires administrative privileges.

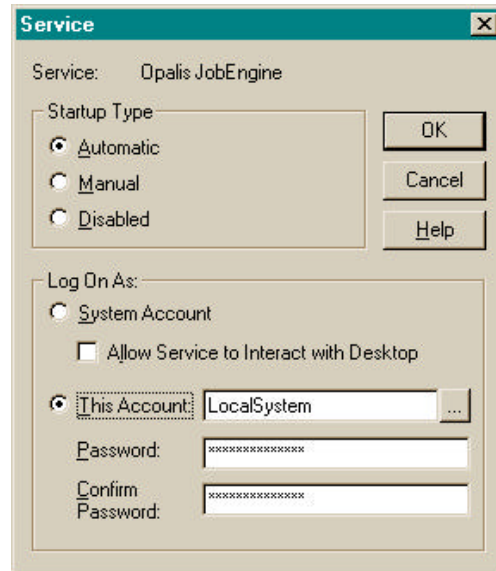
Like all other Windows Services, Opalis JobEngine can be started, stopped, and configured from the Services applet located in the Control Panel as shown below.



Once the Services icon is selected, a screen window appears.



The "Startup..." button displays the Service dialog box.



From the Service dialog box, you can control the behavior of your Service at system startup. A Windows Service can either:

- Automatically start when the system boots
- Wait until you manually start it (“Start” button, “net start” command, or “Action on NT Service” Opalis JobEngine task)

We recommend that you do not run Opalis JobEngine under the system account rather under an administrative account.

You can also change the user account of the Service from the same dialog. This allows you to fine-tune the security of the Service. The Service will never be able to bypass the rights of the user's account.

Remote Administration

One of the most exciting features of Opalis JobEngine is that you can remotely manage the Opalis JobEngine Service. The Opalis JobEngine Client program and the Opalis JobEngine Service work in true client/server fashion.

The Opalis JobEngine consists of two separate programs:

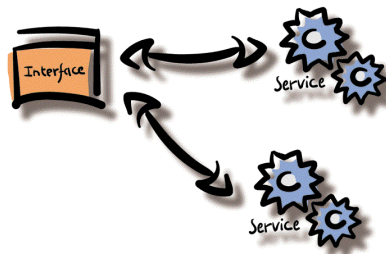
- Opalis JobEngine Service, the core of Opalis JobEngine's functionality
- Opalis JobEngine Client, the program used to view or modify the Opalis JobEngine Service configuration

The Opalis JobEngine Service makes full use of Windows NT/2000 multitasking capabilities. Most objects are implemented in the form of Opalis JobEngine Service threads, thereby allowing it to simultaneously perform many different actions.

The Opalis JobEngine Service consumes practically no system resources for its internal operation. Threads are synchronized by means of special system objects that guarantee security, robustness, and low consumption of resources.

The Opalis JobEngine Service runs whether the Opalis JobEngine Client program is running or not.

An additional benefit of separating the Service from the Client is that the latter can remotely run from another computer. This is especially convenient to manage a pool of Windows NT/2000 systems running the Opalis JobEngine Service.



Of course, the Opalis JobEngine Client and the Opalis JobEngine Service do not have to run on separate computers. You can administer the local computer. In this case, simply enter the local computer name in the "Connect To" dialog box.

THE CLIENT

Architecture

Italics in this section of the manual indicate the name of a field in a dialog box.

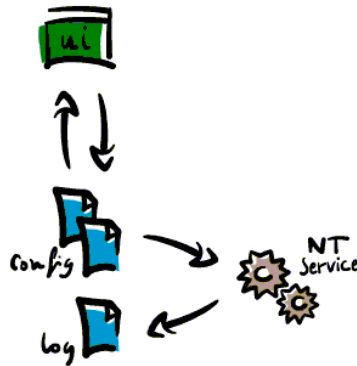
Components

Opalis JobEngine is consists of two distinct programs

- Opalis JobEngine Service, the automation engine
- Opalis JobEngine Client, the graphical user interface

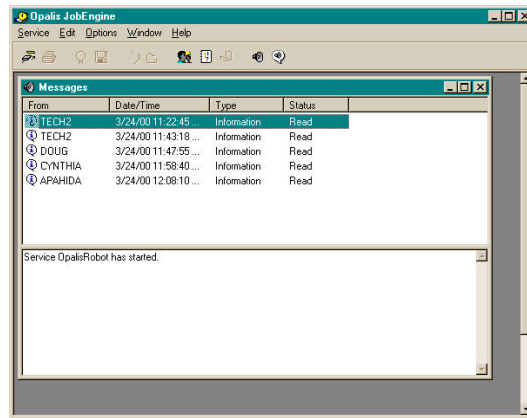
The Opalis JobEngine Service runs whether the Client is running or not.

The user interface is separated from the Service to minimize system load. Additionally, a single Client can remotely administer several Opalis JobEngine Services.



Windows

When you execute the Opalis JobEngine Client for the first time, it is not connected to any Service. After the Wizards windows, the first window should be similar to the window below.



You are not connected to any Service but you can view Opalis JobEngine messages. For more information on Opalis JobEngine messages, see the section "Messages Window"

If you cannot connect to a Service, check that you have sufficient rights on the system where the Opalis JobEngine Service is running.

You must connect to a Service before you can administer it. You can use the:

- Service | Connect To... menu item
- Connect To button in the toolbar
- Most recently connected servers in the Service menu

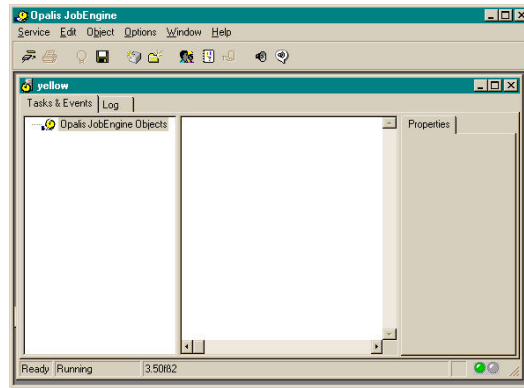
The *Server View* window displays the configuration of the server to where you are connected. Please note that you can connect to several servers at the same time, each with its own server view.

The *Server View* window can be opened in user (low privileges) or administrator (full privileges) mode. For more details, see the security section in the Advanced Topics chapter.

Server View

The Server View is divided into three parts.

- On the left, the Folder Tree
- On the center, the graph-view of objects
- On the right, the Properties panel



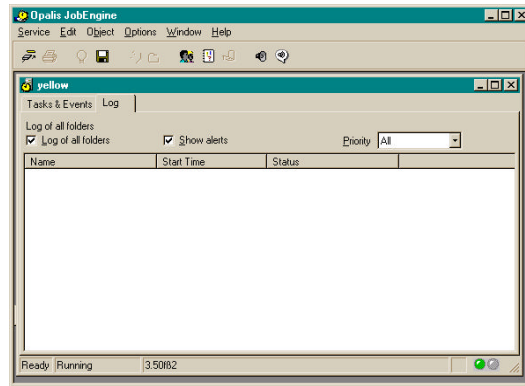
The Folder Tree is used to manage folders. When you click on a folder, the graph-view displays any objects contained in this folder. Using the right-click popup menu or Objects menu, you can create or rename folders. Using Drag'n Drop you can move folders to another location.

You can hide or show this panel using the popup menu.

The graph-view of objects is used to manage objects contained in the selected folder. You can move objects within or outside the folder using Drag'n Drop. You can add or delete objects and folders using menus or shortcuts.

The Properties panel displays a summary of the selected object configuration. You can hide or show this panel using the popup menu.

Log and alerts



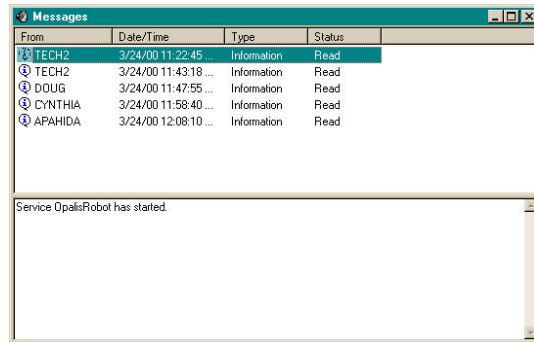
The log contains the history of task execution. Each time a task is launched, with the “No Log” option not set, a new log entry is created. You can sort log entries by clicking on the label of each column. You can view the detail of a log entry by double-clicking on it or pressing Enter when the entry is selected.

If the “Log of all folders” option is selected, the list will contain all the log entries of the server. Otherwise, the list will contain the log entries of each task that is located in the currently selected folder in the Folder Tree.

If the “Show alerts” option is checked, the list will also contain alerts. Alerts keep you aware of general problems or incorrect execution of the date/time event.

In the Priority list, you can select what type of log entries you want to view. By default, all log entries are displayed. To set the log priority of a task, use the Log priority option in the Options tab of the task configuration.

Messages Window



This messaging system is based on mail-slots. Therefore, it will not go through routers unless you use a Virtual Private Network (VPN).

Opalis JobEngine supports a proprietary network messaging system.

The Opalis JobEngine Client must be running to receive Opalis JobEngine messages. In this respect, Opalis JobEngine messages work like Network messages (WinPopup).

Users can send messages using the "Send Message" dialog. Please refer to the "Send Message" dialog section for more information.

Unlike logs, messages are not archived; that is, all messages are deleted when you close the client program.

You can also use Opalis JobEngine messages to exchange information between system administrators working from different sites. You can broadcast messages like: «I'm configuring 'gateway' to process incoming messages» to your colleagues or «Let's go eat.»

Menus

Service Menu

- *Connect To...* connects to an Opalis JobEngine Service. It opens a dialog box where you can type a computer name or choose it from a list box.
- Under the *Reconnect* menu item is listed the name of recently connected Services. Select one of them to quickly connect to the server without using the Connect To... dialog.
- *Apply Changes* applies last modifications or creation of new objects to the running Service.

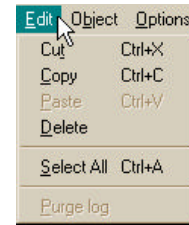


If you stop the Service when tasks are being executed, they will be interrupted (except Program Execution tasks). If you attempt to do so, you will be prompted for confirmation.

- *Start/Stop* starts or stops the Opalis JobEngine Service. The current status is displayed in the status bar. Please note that the status does not immediately change depending on the time the Service needs to start or stop. This function is not available on Windows 95/98.
- *Restart* checks inside the Service that no task is running and that no replacement code is waiting to be used and then, if possible, it stops and restarts the Opalis JobEngine Service. This command can be used to validate changes in Service Options.
- This function is not available on Windows 95/98.
- *Print* prints the contents of the currently selected object. It opens a dialog box where you can choose the printer, the number of copies, the print to a file function, the printing font, and precisely the object or list of objects you want to print.
- *Exit* terminates the Opalis JobEngine Client. Please note that any connected Opalis JobEngine Service, if started, continues to operate. To stop the Service, use the Start/Stop command or the Control Panel.

Edit Menu

- *Paste* copies the object(s) stored in the clipboard to the current configuration.
- *Delete* removes the selected object(s) from the current configuration.
- *Select All* selects all objects and folder of the currently selected folder. *Purge log* erases all entries of the log currently displayed.

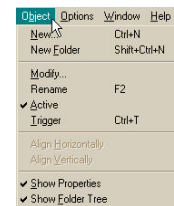


You can use toolbar buttons or shortcuts to create new folders, tasks, and events.

- *Cut* copies the selected object(s) to the clipboard and removes them from the current configuration.
- *Copy* copies the selected object(s) to the clipboard without removing them from the current configuration.

Objects Menu

- *New...* displays the New Object dialog box used to create new objects.
- *New Folder* creates a new folder in the current folder (or the root if no folder is selected in the Folder Tree).
- *Modify...* displays a dialog box to modify the configuration of the selected object.
- *Active* indicates whether the selected object is active or not.
- *Trigger* asks the Service to launch the selected task or to simulate that the selected event has occurred.
- *Show Properties* toggles on and off to display the Properties panel.
- *Show Folder Tree* toggles on and off to display the Folder Tree.



Options Menu

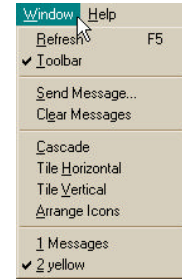
Service... displays a dialog box to edit the Service-side options of installed modules.

- *Log Filter* sets filtering options for the log. Depending on which items are checked, Tasks that are Completed, Failed, Interrupted, Running are displayed in the log.
- *Client...* displays a dialog box to edit the client-side options of installed modules.



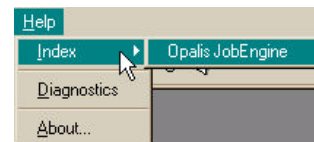
Windows Menu

- The *Refresh* command updates the content of the selected folder or log by requesting new data from the server.
- *Toolbar*: if selected, the Toolbar is visible.
- *Send Message...* displays a dialog to type and send an Opalis JobEngine message.
- *Clear Messages* removes all the Messages in the window.
- *Cascade* cascades windows. *Tile Horizontal* horizontally tiles windows. *Tile Vertical* vertically tiles windows.
- *Arrange Icons* arranges window icons.
- The last items in the menu display all opened windows. Selecting one of these items will bring the corresponding window to the front.



Help Menu

- *About...* displays the version, copyright, and other information about Opalis JobEngine.

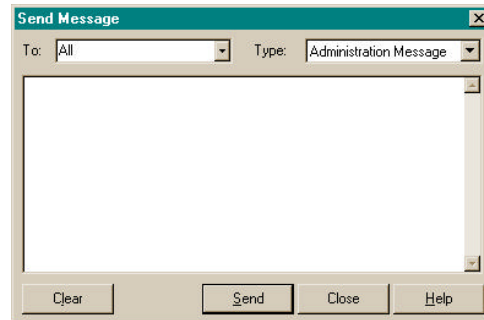


Popup Menus

Context sensitive popup menus are displayed on the Configuration Tree when you click on the right button of the mouse on objects.

Dialog Boxes

Send Message



Messages are only received on those computers that are running the client.

The Send Message dialog box sends messages through Opalis JobEngine's proprietary message protocol. The messages are prompted in the "Messages" window of the Opalis JobEngine client.

You can send *To* a particular computer in the network or to all computers (including yourself).

You can send messages of different *types* (Information, Warning, Error and Administration). The Message type is informative only. Please refer to the "Messages" window section for a more complete discussion of Opalis JobEngine messages. Depending on the Client settings, a sound can be played when Error or Administration messages are received (see the Client Options dialog).

Edit Event/Task

To create/modify tasks and the date/time event, use the "Edit Event/Task" dialog box. The screen is divided into three parts:

- The *Name* field
- The *Type* field
- The *Tab* sections

In the *Name* field, you enter the name of the task/event. Duplicate object names are allowed but not recommended.

The *Type* drop-down list allows you to select an event/task type. All the available types are listed in the "Events and Tasks" chapter with appropriate explanations.

Choose the *Type* of the event or task at creation time. Please note that you cannot change it when modifying an object.

Tabs

The last part of the screen is the configuration tabs. They will dynamically adapt to the object type.

The directory explains how to configure those parameters. The “Properties” tab holds the most common configuration option for the task/event.

The other tabs hold specific or advanced options. These options default to a “safe” value. If you are not sure of the meaning of these options, it is safer to leave the default settings.

You can see the internal number in the “Properties” tab for the object or in the title bar of the “Edit Event/Task” dialog in the modification mode. This number is used in replacement codes,; that is, when you want to share data between tasks. See “Using Replacement Codes” in Tasks.

For files located on network drives file names must be expressed into UNC notation.

UNC is short for “Universal Naming Convention.”

The UNC notation is independent of drive names and used for files located on network drives. UNC file names are expressed in the following format: \\computer_name\share_name\directory\file_name

When you enter a password, you must confirm it in the field at the right.

Edit Link

The screenshot shows the 'Link properties' dialog box. It is divided into two main sections: 'Properties' and 'Options'.
In the 'Properties' section, there are three rows of configuration:
1. 'If' row: A text field containing 'Backup', a dropdown menu set to 'Occurs', and two input fields labeled 'Value' and 'Max', both containing '0'.
2. 'And' row: A text field containing '(None)', a dropdown menu set to 'Occurs', and two input fields labeled 'Value' and 'Max', both containing '0'.
3. 'Then' row: A text field containing 'zztop'.
In the 'Options' section, there are three checkboxes with corresponding input fields:
- 'Inactive' checkbox is unchecked.
- 'Timeout (secs.)' checkbox is unchecked, with an input field containing '0'.
- 'Wait before triggering task (secs.)' checkbox is unchecked, with an input field containing '0'.
At the bottom of the dialog are three buttons: 'OK', 'Cancel', and 'Help'.

You need to create the task(s) and/or the event(s) before creating the link.

To create a link, proceed as described in the Five-Minute Guide chapter. To modify the options of a link, simply double-click on it. This brings up the Edit Link dialog.

If list

- When the initial object of a link is an event, the only choice is that the event *occurred*.
- When the initial object of a link is a task, the *If* list can contain two different sets of items:
- If the task returns a numeric value after completion, the list has the following items:
- **Completes:** select this item if you want to launch the resulting task when the initial task successfully completes.
Fails: select this item if you want to launch the resulting task when the initial task fails.
- **Completes or fails:** select this item if you want to launch the resulting task when the initial task completes or fails.
- **Returns:** the resulting task is launched if the return value of the initial task is the same as the entered value.
- **Returns more than:** the resulting task is launched if the return value of the initial task is greater than the entered value.
Returns less than: the resulting task is launched if the return value of the initial task is lower than the entered value.
Returns a value between: the resulting task is launched if the return value of the initial falls in the entered range values.

Task type	Return value
Program execution	Return value of the program
File management	See File Management Task in the Events and Tasks chapter
Database execution	First row of the first line returned by the query (if a numeric value)

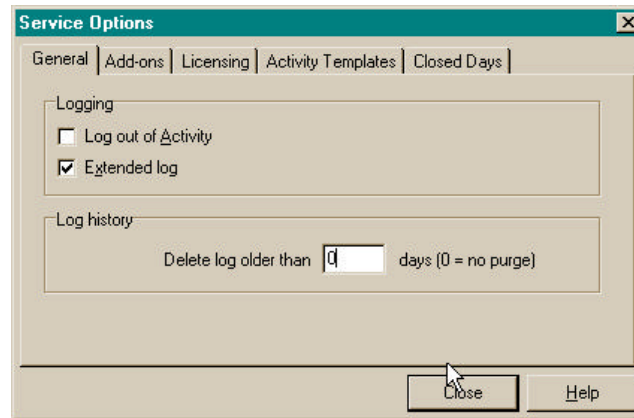
Return values are not taken into account when a task fails.

- If the task does not return a numeric value, the list has the following items:
- **Completes:** select this item if you want to launch the resulting task when the initial task successfully completes.
- **Fails:** select this item if you want to launch the resulting task when the origin task failed.
- **Completes or fails:** select this item if you want to launch the resulting task when the initial task completes or fails.

Options for a link are:

- *Inactive*: if selected, the link is inactive and will not be evaluated at run-time. This means that the task selected in the Then field will not be launched if the event or task selected occurs or completes.
- *Timeout*: see Multiple Links in the Advanced Topics chapter.
- *Wait before triggering task* is a period of time (in seconds) that will elapse by the link before launching the resulting task.

Service Options



General Options

Log out of activity: when selected, Opalis JobEngine sends a message to the Event Viewer when a task is triggered and is outside of its activity range. See Activity Templates section later in this chapter.

Extended log: when selected, Opalis JobEngine records extended information about its operation in a file named op_joben.log. This file may be required for Technical Services.

Log History: Opalis JobEngine deletes log entries (and their associated detail file) older than the number specified. 0 means no purge.

Add-on Options

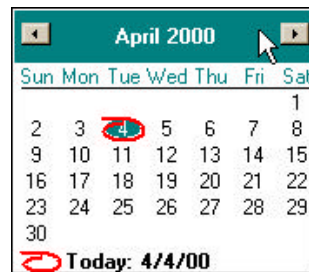
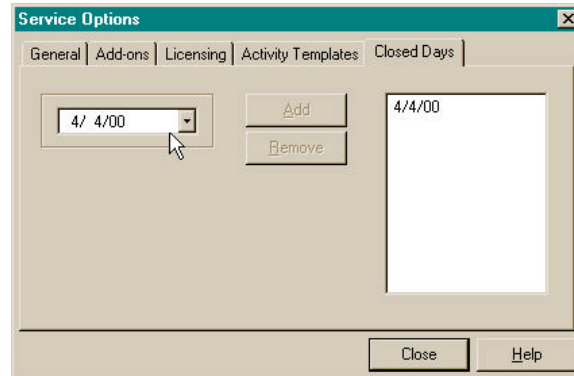
This tab lists the installed Service Add-ons and their respective version.

If the selected Add-on has Service-side options, the Configure button is enabled and you can use it to access the configuration dialog of the Add-on.

Note that Opalis JobEngine does not support purchased add-ons such as the Call Add-on, E-mail Add-on, SNMP Add-on, and Script Studio Add-on. These are only available with OpalisRobot. See www.opalis.com for details.

Closed Days

The Closed Days tab lets you enter a list of calendar dates that can be used as activity templates to enter numerous days in one operation.



To add a day on the list, select it using the calendar window that appears when you click on the drop-down arrow for the date field at the left, then click Add.

To remove a day from the list, select it and click on the Remove button.

Activity Templates

Activity templates describe date and time settings to which you want to assign one or more events/tasks.

To create a template, click on the Create button then fill the template settings as desired.

Activity

Identification

Template Name: Schedule Auto Download

Regular days | Exceptional days | Hours

Type

Every Week(s)

Active days

Days of the week	Mon	Tue	Wed	Thu	Fri	Sat	Sun
	x	x	x	x	x		

OK Cancel Help

The Activity dialog is composed of three tabs. The Regular days tab allows you to enter a pattern describing when the regular days of the template should occur. Possibilities are:

- Every week on specific days of the week. For example, Monday and Tuesday.
- Every month, on days selected by week. For example, the first and second Monday of the month.
- Every month, on days selected by number. For example, every 1st, 2nd, 11th, 12th, 21st and 22nd of the month.
- Exceptional days (for example, the user can select not to run on December 24th but to run on January 1st).
- To add a day on the Exceptional days list, select it using the calendar window that appears when you click on the drop-down arrow of the date field at the left. Next, select Active or Inactive and then click on the Add button. An icon representing a red cross will appear at the left of an inactive day and a green check mark will appear at the left of an active day.
- To add to the list of closed days in the Exceptional days tab section, click on the Add closed button.
- To toggle a day from Active to Inactive, select it from the list and click the Invert button.
- Hour range (for example, from 8 am to 10 am and from 2 p.m. to 6 p.m. or from 8 p.m. to 6 am).

How it works:

Depending on what you have entered, there is a possible conflict between Regular and Exceptional days.

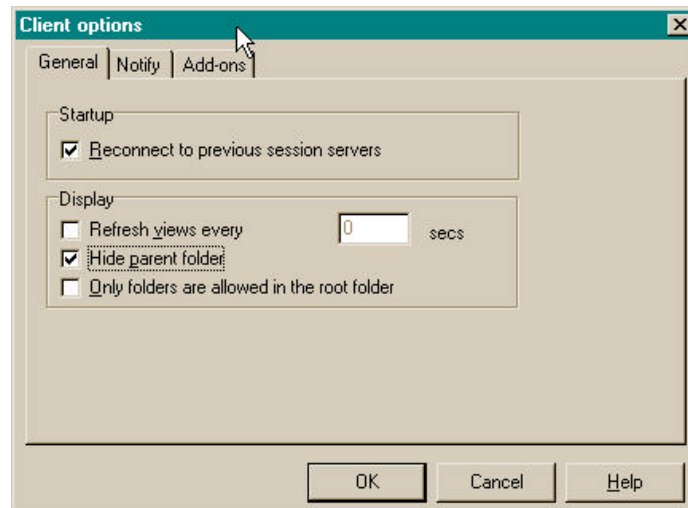
Exceptional days will always be evaluated before the regular days.

If the day should be active (set by the Regular days options), but is marked as Inactive in the Exceptional days list, then this day will be ignored. For example, a job that should run every Monday on December 1st, 1997 (a Monday) and is marked as Inactive, the job will not run during this day.

If the day should not be Active (set by the Regular days settings) but is marked as Active in the Exceptional days list, then the job will run during this day. For example, a job that should run every Monday on December 2nd, 1997 (a Tuesday) and is marked as Active, the job will run during this day.

The hour range is evaluated at the end. No matter what time it is, a job will not run if the day is not activated by the Days settings.

Client Options



General

Check *"Reconnect to Previous Session Servers"* if you want the client, at startup, to automatically reconnect to the servers that were opened at the end of the previous session.

If *"Refresh views every"* is checked, the current folder or log is refreshed at the specified interval (in seconds).

If *"Hide parent folder"* is checked, the "Parent" folder icon (that displays the parent folder when you double-click on it) is not displayed in the folders.

If *"Only folders are allowed in the root folder"* is checked, only new folders can be created in the root folder. You cannot add any new event, tasks, or links in the root folder (only in other folders).

Notify

Confirmation Messages: When checked, Opalis JobEngine asks for a confirmation before executing major commands. You should leave it to Checked until you become familiar with Opalis JobEngine.

The *Play Sound* options control whether a sound is emitted or not when the Messages window does receive Error or Administration messages.

Sound allows you to change the sound from the default system beep to any WAV file.

Options & Parameters

The *Inactive* option is common to all tasks and the Date/Time Event. It is used to deactivate the object without deleting it. When it is turned on, the object will not be used:

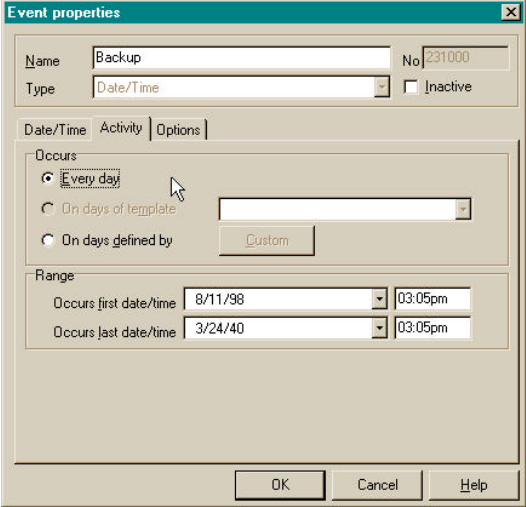
- Date/Time Event: the event will not be triggered (in fact, the condition is not tested at all). When inactive, the event will not start any task
- Task: the task will not start even if an event triggers it

A simple “date/time event-link-task” chain will not work unless all three objects are active.

The length of *names* is limited to 60 characters. You should use explicit names. For example, choose “cheap rate” and “connection” over “ev1” and “tk1.”

Duplicate object names are allowed but not recommended. Object names are not case sensitive; that is, “Test” and “test” are the same objects.

Activity tab



The screenshot shows the 'Event properties' dialog box with the 'Activity' tab selected. The 'Name' field contains 'Backup' and the 'No.' field contains '231000'. The 'Type' is set to 'Date/Time'. The 'Inactive' checkbox is unchecked. The 'Occurs' section has three options: 'Every day' (selected), 'On days of template' (with a dropdown menu), and 'On days defined by' (with a 'Custom' button). The 'Range' section has two rows: 'Occurs first date/time' with '8/11/98' and '03:05pm', and 'Occurs last date/time' with '3/24/40' and '03:05pm'. The 'OK', 'Cancel', and 'Help' buttons are at the bottom.

The Activity tab lets you assign an activity template to a task or event. This template can be one of the existing global templates (the ones listed in the Activity Templates tab of the Service Options dialog) or a custom one that will be attached to the current event or task.

If you need to apply the same activity template to several objects, it is better to create a global template. For more details about activity templates, refer to the Activity Templates section.

A *first* and *last date/time* can be set. The object will never run before the *first date/time* and never after the *last date/time*.

Parameters for Tasks

The screenshot shows the 'Task properties' dialog box with the following settings:

- Name:** Backup
- No:** 101000
- Type:** Program execution
- Inactive:** ☐
- After:**
 - If task succeeds:** (none)
 - If task fails:** Send a message to the Event Log
- Log:**
 - Log Priority:** Medium
- Execution mode:**
 - Multitask:** Parallel execution

In the *After* block, you can set the task to send a message after it completes and/or fails.

The message can be sent to the Event Log, to the screen (Popup message), or to the Opalis JobEngine client. The two latter options require a destination. Enter a computer or a user name (Popup), or a computer name (Opalis JobEngine message). If you enter "*" the message will be sent to all computers in the domain.

The *Log Priority* option controls the level of importance given to the task in the log. For more details about how to view the Opalis JobEngine log, please refer to the "Log and alerts" section. If "No log" is selected, the execution of the task will not generate any trace in the Opalis JobEngine log.

The *Multitask mode* option controls the multitasking behavior of multiple instances of a task; that is, how a started task behaves if another task of the same name is running:

- When the option is set to “Parallel execution” (default), several tasks with the same name can concurrently run.
- When the option is set to “Queued execution,” only one instance of a given task can run at any time. If more than one instance of a given task is started, they are serialized. A task must wait for the completion of the running task before executing.
- When the option is set to “Single execution,” only one instance of a given task can run at any time and if more than one instance of a given task is started, newer tasks are simply not executed (they terminate **without** executing any work). This choice may conflict with the use of dynamic data.

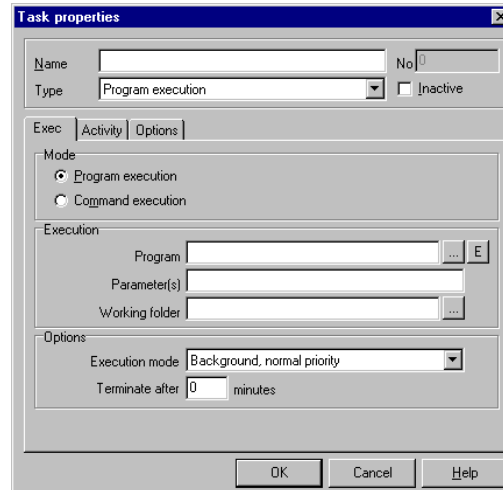
Parameters for the Date/Time Event

The screenshot shows the 'Event properties' dialog box. It has a title bar with a close button. Inside, there are fields for 'Name' (Backup), 'No' (231000), and 'Type' (Date/Time). There is an 'Inactive' checkbox which is unchecked. Below these is a tabbed interface with 'Date/Time', 'Activity', and 'Options' tabs. The 'Date/Time' tab is active, showing a section labeled 'After' with a dropdown menu for 'When event is triggered' set to '(none)' and a text field for 'Message recipient'. At the bottom are 'OK', 'Cancel', and 'Help' buttons.

In the *After* block, you can set the event to send a message when it occurs. The message can be sent to the Event Log, to the screen (Popup message), or to the Opalis JobEngine client. The two latter options require a destination. Enter a computer or a user name (Popup) or a computer name (Opalis JobEngine message). If you enter “*” the message will be sent to all computers in the domain.

TASKS

Program Execution Task



Executes the *Program* with optional *Parameter(s)* on the command-line.

The program can be a batch file or any executable that Windows NT/2000 can launch (DOS, Windows 16-bit, Windows 32-bit, etc.) If the file is a batch or command file, you can edit it by clicking on the "E" button at the right of the field.

You can use the Command mode to run programs. However, it is not recommended since it uses more system resources.

If the *Command execution* mode is chosen, the command-line is passed to the command interpreter (CMD.EXE). We recommend using this option for executing .bat or .cmd files.

Working directory starts the program in a different working directory. By default, the working directory is the program directory.

After *Terminate after* minutes, the program is terminated. In this case, the task is considered as Failed.

We recommend that you use this option carefully because a clean exit is not performed and DLLs loaded by the program are not unloaded, which can lead graphical programs to hazardous graphical behavior on the console.

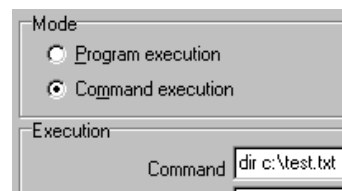
Program execution mode:

- Background, normal priority: when the program does not need any user input or when the program runs in character mode.
- Background, low priority: when the program does not need any user input or when the program runs in character mode.
- Interactive (only if the program interacts with the user): this option is not recommended because it can interfere with the execution of the program on the system console.
- Launched by ConsoleRunner: this option is designed for programs that cannot be launched by a Service (such as some applications in MS Office, VB programs, or 16-bit applications that require shared memory). When the task has been triggered, Opalis JobEngine passes information about it to the ConsoleRunner utility and then launches the program. In order to launch the task, it is mandatory for ConsoleRunner to be running on the system console when the task is triggered. ConsoleRunner must be launched manually or at logon time using the Startup folder.

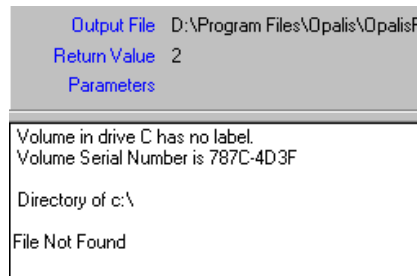
Example: Return Values

When the Program Execution task completes, it produces a return value. Return values can be used to make decisions. To find out if a file is available or not, you can use the return values of the “dir” command.

Create a Program Execution task, set “Mode” to “Command execution” and type “dir c:\test.txt” as the command (You can change “c:\test.txt” to something else of course).



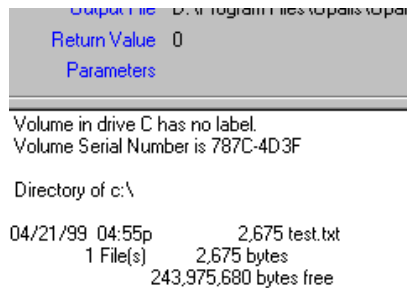
Trigger this task and switch to the “Log view.” The log entry detail (double click the log entry) for this task will look similar to this:



Note that the “Return Value” is 2, which means the file does not exist.

Create the file “test.txt” (or rename an existing file) and trigger the task again.

The log entry detail will show you:



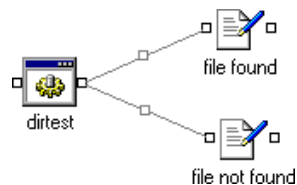
Now the “Return Value” is 0, which means the file exists.

Opalis JobEngine can make decisions based on these return values by evaluating the links originating from a task.

Create two Send Message tasks, which send a message to your computer or user name.

One task should have a message that reads, “file found”; the other should have a message that reads, “file not found.”

Link the Program Execution task to both Send Message tasks:



Double-click the link between the Program Execution task and the Send Message task that sends the “file found” message. The “Link properties” window will open:

Link properties

Properties

If Value Max

And Value Max

Then

Options

☐ Inactive

☐ Timeout (secs.)

☐ Wait before triggering task (secs.)

OK Cancel Help

Select "Returns" from the drop-down list:

Link properties

Properties

If Value Max

And Value Max

Then

Options

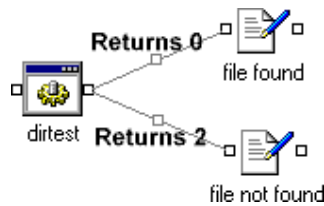
☐ Inactive

☐ Timeout (secs.)

☐ Wait before triggering task (secs.)

OK Cancel Help

The "Link properties" window now reads, "If dirtest returns 0, then file found." Modify the link between the Program Execution task and the Send Message task that sends the "file not found" message. This time select "Returns" and change the value from 0 (default) to 2.



Apply changes. If the Program Execution task is triggered and the file is available, you will get a message that reads, "file found." If not, a message "file not found" will be displayed. To automate this process, we can add a Date/Time event, which is triggered every 5 seconds:

Type

Date/Time Activity Options

Periodicity

☐ At

☐ Every hours minute

☐ Starting minute

☐ At time slices within the hour

☒ Every seconds

If we link the Date/Time event to the program execution task we have automated this process:



Every 5 seconds the Program Execution task will be triggered. Depending on the result, a Send Message task will be triggered.

Use of mapped drives is not recommended, as they cannot be guaranteed to be available to the Opalis JobEngine Service.

A process like this could be used to determine the existence of a specific file on a remote computer connected to the Windows network (in this case a path in UNC format would be entered instead of a local path).

Hints and tips

Not all programs or commands produce return values. You can test for return values by creating a situation where you know the result will be “good.” Using the Program Execution task, launch the program or command and check the return value in the Opalis JobEngine log. Then create a situation where you know the result is “bad.” Again, using the Program Execution task, launch the program or command and check the return value in the Opalis JobEngine log. If the return values are different, then Opalis JobEngine can use them to make decisions. If a task fails, return values are not taken into account. However, you can make decisions if a task fails.

A batch file will only produce a return value for the last program or command executed. Split your batch file into different Program Execution tasks to evaluate other return values.

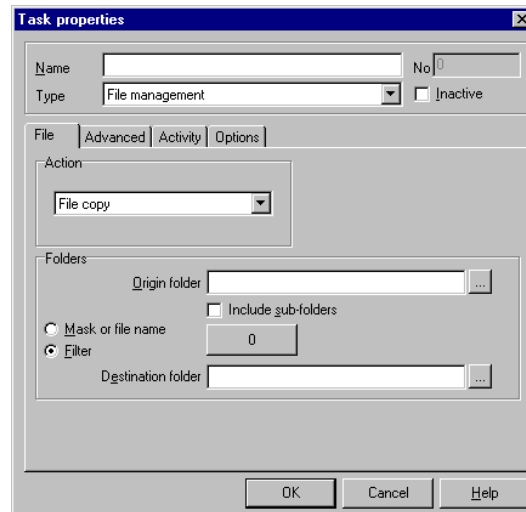
Some programs or commands wait for user input. If such programs or commands are launched by Opalis JobEngine, they will never terminate. Some commands have optional “switches” to override the waiting for user input. Be aware of the fact that Opalis JobEngine cannot directly simulate keystrokes. However, it could “drive” a 3rd party application to do so.

NTBackup and automatic mode.

Make sure that a cartridge is loaded in the tape drive before running the program. Otherwise NTBACKUP may be blocked, and you may have to reboot the system.

We recommend that you set the *Execution mode* to *Interactive* for NTBACKUP tasks.

File Management Task



Copy, move, delete, rename, or print the files in the *Origin folder* that correspond to the *Mask or file name* or *Filter*. The *Origin folder* and *Destination folder* entry fields accept local paths or path in UNC format. Use of mapped drives is not recommended, as they cannot be guaranteed to be available to the Opalis JobEngine Service.

For the *Print* option, the printer name must be entered in UNC format ("\\server_name\\printer_name"). Otherwise, the UNC format is required only when the destination folder resides on a remote computer.

Printing sends the file to the printer. Therefore, the file must be pre-formatted for the printer, or must be in ASCII format.

ASCII files

- The font name and font size can be selected
- A line wrapping value can be set. After specifying the number of characters, a new line is created for the remaining characters of the line

Filters

- Filters can include wildcards (the "*" or "?" character) but not folder names.
- Order of filters is important. The filters are evaluated from the top to the bottom. As soon as a matching filter is encountered, the file may be accepted depending on the *Include/Exclude* value.

When the file already exists in the destination directory, Opalis JobEngine can:

- Overwrite it and delete the old file
- Create a new file with a different file name (Opalis JobEngine appends date/time at the end of the file to create new unique file names)
- Fail.

Destination file date can be modified to the transfer date or keep its original date (default).

You can add a global filter based on the *file age* expressed in days.

Since Opalis JobEngine appends date/time at the end of the file name to create new and unique file names, the file system on the target machine must support long file names.

This task has the following return values:

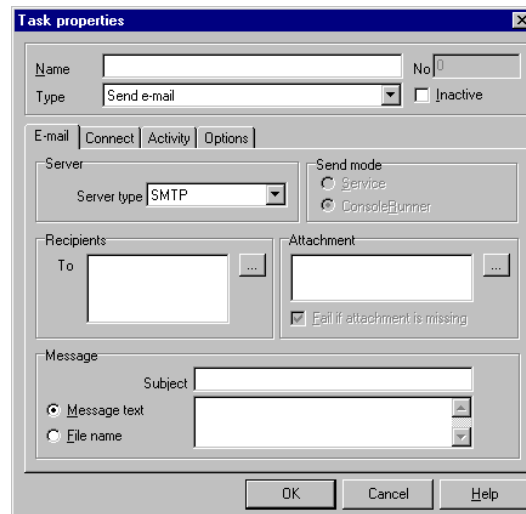
Situation	Status in Log	Return value
File(s) successfully copied, moved, deleted, renamed, or printed	✓ (completed)	Number of file(s) successfully copied, moved, deleted, renamed or printed; that is, a value greater than 0.
No file(s) to copy, move, delete, rename or print	✓ (completed)	0
Unable to copy, move, delete, rename, or print file(s)	✗ (failed)	The task will fail if destination folder is not accessible; that is, network problem, insufficient rights, or share not available. <i>Please note that the return values are not taken into account when a task fails.</i>

Hints and Tips

Every task that is executed by the Opalis JobEngine Service is executed under the user account where the Opalis JobEngine Service runs. The File management task is no exception: if a File management task keeps failing with "Access Denied" messages, determine if the user account used by the Opalis JobEngine Service has sufficient rights at the destination.

You should always use the UNC format when specifying a shared drive or folder. Mapped drives cannot be guaranteed to be available to the Opalis JobEngine Service.

Send E-mail Task



Sends e-mail using:

- SMTP (any SMTP compliant mail server: UNIX based, Lotus cc:Mail, Novell GroupWise, Microsoft Exchange, and so on)
- MAPI (Microsoft Mail)
- Exchange (Microsoft Exchange servers)

The message can be text that you type in the *Message text* box (limited to 256 characters) or a text file.

Use the *File name* option to specify a (plain) text file. The benefit of having a text file as message text is that the message can be formatted.

Entering text in *Subject* field is not mandatory but recommended.

SMTP

The Connect tab is an area where you enter the *SMTP relay address* (the name or IP address of your SMTP mail server) and the *Sender address* (the name that will identify you as the sender of the mail and at which you will receive the reply).

Use the “...” button to set up the list of recipients. To add a recipient, enter an e-mail address, select a recipient type: To:, Cc: and Bcc: (blind carbon copy, addresses in this field are not seen by the recipients), then click Add. At least one recipient must be entered.

You can attach as many files as you want to the mail by adding them on the *Attachment* list.

SMTP (simple)

The configuration is the same as SMTP, except that only one recipient can be set and one file can be attached. This allows you to use dynamic data in these fields (For more information on dynamic data, see Advanced Topics, Dynamic Data).

MAPI

You can send messages to one destination that can be a user or a group. You can attach one file using the *Attachment* field.

The Connect tab is an area where you enter the *user name* for the user's mail account. If the account is password-protected, enter the password in the *Password/confirm* field.

The screenshot shows a configuration window with two main sections. The left section, titled 'Server', contains a 'Server type' dropdown menu with 'MAPI' selected. The right section, titled 'Send mode', contains two radio buttons: 'Service' and 'ConsoleRunner'. The 'ConsoleRunner' radio button is selected, indicated by a filled circle.

Send mode:

- ConsoleRunner (default). This is used when messages cannot be sent from the Service (especially when MS Mail tasks fail from logon errors). When the task has been triggered, Opalis JobEngine informs the ConsoleRunner utility, which then sends the message. In order to launch the task, it is mandatory for ConsoleRunner to be running on the system console.
- Service. In general, sending messages through a Service is not supported by MAPI. However, in some situations it can work. We recommend using the default option.

Note: to send MS Mail messages when MS Exchange is installed, you must create a special profile for MS Mail connection and enter this profile name in the *user/profile name* field. **When used with ConsoleRunner, this profile must exist in the configuration of the currently logged-on account.**

Destination can only include one MS Mail User name or a group name.

Exchange

To directly send messages via Microsoft Exchange use this option. Make sure the *user/profile name* field on the Connect tab contains a valid profile name. **This profile must exist in the account configuration of the assigned to the Opalis JobEngine Service.**

Send Message Task

The screenshot shows the 'Task properties' dialog box for the 'Send Message' task. The 'Name' field is empty, and the 'Type' is set to 'Send Message'. There is an 'Inactive' checkbox which is unchecked. Below this, there are three tabs: 'Message', 'Activity', and 'Options'. The 'Message' tab is selected. Inside the 'Message' tab, there are two sections: 'Type' and 'Severity'. The 'Type' section has three radio buttons: 'On screen popup' (selected), 'OpalisRobot Client', and 'Windows NT Event Log'. The 'Severity' section has three radio buttons: 'Information' (selected), 'Warning', and 'Error'. Below these sections, there are two text input fields: 'User or computer name' and 'Message'. At the bottom of the dialog box, there are three buttons: 'OK', 'Cancel', and 'Help'.

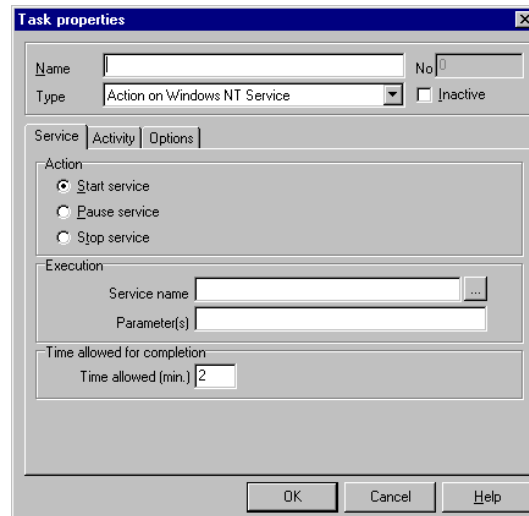
Send a message to a user, computer, or the Event Log.

Message type:

- *On screen popup*: The transport type is WinPopup. The WinPopup program (for Windows computers) or the Messenger Service (for Windows NT/2000) must be running in order to receive messages. Type "*" in the *User/Computer name* field to send the message to all users in the work group. You can enter a computer or a user name.
- *Opalis JobEngine*: Sends Message as an Opalis JobEngine message to all or one computer on the network. The message is displayed on the Messages window of the Opalis JobEngine Client. You can choose the Message type on the list. Error and Administration messages can generate a sound on the Opalis JobEngine Client. The message type is for information only. Type "*" in the User field to send the message to all computers in the work group.
- *Windows NT Event Log*: Sends Message to the Windows NT/2000 Application Log.
- You can choose the severity of the message (Information, Warning, or Error).

Note: depending on the application, it can be easier to use the *After* option of the previous task in the job instead of this task.

Action on Windows NT Service Task



This function is also compatible with Windows 2000.

Starts, stops, or pauses the Service identified by *Service name*. Use the “...” button to display the list of installed Services and select the required Service name (not supported on Windows 95/98).

Parameters that are passed to the program are sent to the Service when it starts. (Unlike the Windows NT/2000 Service manager, the parameters are retained after execution of the task.)

If the action is not performed during the *Time allowed*, then the task is considered as failed.

Hints and Tips

If a Service cannot start within 2 minutes (default value), Opalis JobEngine considers the Service not started. If a Service has many dependencies (it needs to start other Services before it can be started), the *Time allowed* should be incremented. Of course, the same rule applies to stopping a Service as well.

Starting or stopping a Service requires Administrative privileges. Make sure the Opalis JobEngine Service runs under an Administrative account.

RAS Action Task

The screenshot shows the 'Task properties' dialog box with the 'RAS' tab selected. The 'Name' field is empty, and the 'Type' is set to 'RAS action'. The 'Inactive' checkbox is unchecked. Under the 'RAS' tab, the 'Type' section has 'Connection' selected. The 'Connection' section has a 'Phonebook Entry Name' field. The 'If connection busy or failed' section has 'Number of retries' set to 1 and 'Interval between retries' set to 60. The 'OK', 'Cancel', and 'Help' buttons are at the bottom.

Establishes or releases a connection with a remote site using the Remote Access Service. (This Service must have been configured beforehand.)

Connect to the Phonebook entry name (as it appears in the Remote Access Service or Dial-up Networking program). The *Domain* is used for user authentication. You can enter the *User name* and *Password/Confirm* in the connect information if they are required by the phonebook entry.

You can specify what happens if the line is busy (or the modem is not available):

- Fail
- Retry: Number of tries

Using the Remote Access Service program, you can test your connection parameters.

Opalis JobEngine checks the state of the connections before attempting to establish a new connection or disconnect. If the connection is already set up when the task is started the task will immediately and successfully terminate.

We recommend that you always link the failure of a Connection task with a Disconnection task. Otherwise if the connection is unexpectedly interrupted, it may temporarily leave the port in an unusable state.

Database Execution Task

The 'Task properties' dialog box has a title bar with a close button. It contains several sections: 'Name' with a text field and a 'No' checkbox; 'Type' with a dropdown menu set to 'Database execution' and an 'Inactive' checkbox; 'Database' with tabs for 'Connect', 'Activity', and 'Options'; 'Mode' with radio buttons for 'Query' (selected) and 'File', and a 'Database type' dropdown set to 'ODBC'; 'Execution' with 'Query' and 'Database name' text fields; and 'Options' with an 'If error' dropdown set to 'Continue'. At the bottom are 'OK', 'Cancel', and 'Help' buttons.

Executes a query or a file containing queries (SQL Server only) in an ODBC or SQL Server database.

The Database type can be any ODBC-compliant source or SQL Server.

When using ODBC sources it is the Opalis JobEngine Service account that is actually making the ODBC connection. In other words if you define a User Data Source Name then the user is in fact the user account you have defined to run the Service.

The best way to check the connectivity in this situation is to log on to the local system (where the Opalis JobEngine Service is running) as the account you assigned to the Service and define the DSN from here.

Using a System or File DSN does not require a user specific context for the connection. In other words, any user or Service can access the DSN even if you created it from your own logon account.

Enter a SQL statement directly in the Query field or you can select a file if the database you are connecting to is a SQL Server.

This close-up shows the 'Execution' section of the dialog. It has two text fields: 'Query' containing the SQL statement 'SELECT CustomerName FROM tblSales WH' and 'Database name' containing the text 'SALES'.

When using the query field, be aware this is limited to 255 characters. The use of Dynamic Data is supported in this field so you can substitute values from other Opalis objects such as date and file names. As Dynamic Data is substituted, when the task is running, it is possible to run out of space in this field as the Dynamic Data expands the query over the 255-character limit.

With a data source that supports stored procedures, use parameterized queries instead of full SQL statements so that the query uses as few characters as possible.

Execution

Query: Exec CountSales @Var1={299000.param}

Database name: SALES

An example of a Stored Procedure is:

```
CREATE PROCEDURE CountSales @Var1 INT AS
Select Count(*) From tblSales Where SaleType = @Var1
```

On the Connect tab section, enter the server name or DSN for the database to be connected to. With SQL Server, leaving the User Name field blank causes the connection to run in integrated security mode.

Task properties

Name: GetSalesQuantity No []

Type: Database execution [] Inactive

Database Connect Activity Options

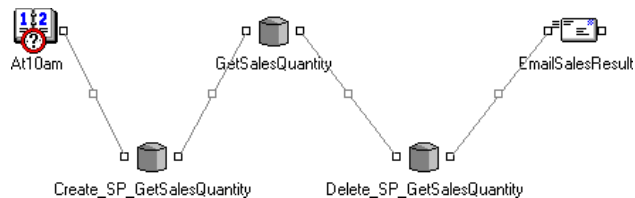
Connect information:

Source name: SQLSRVR1

User name:

Password/Confirm:

By using multiple Database Execution tasks it is possible to link the creation and deletion of stored queries/procedures together in the design.

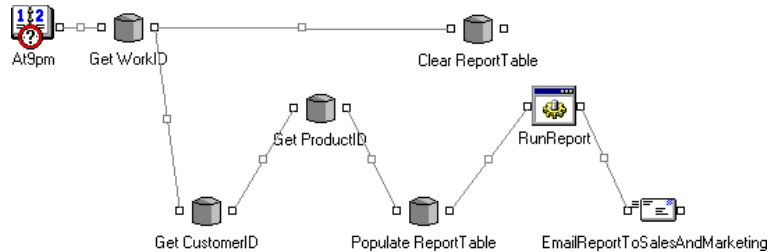


With the combination of Database Execution tasks running SQL scripts from files and parameterized queries it is possible to extend the functionality of the Dynamic Data in this task.

Opalis JobEngine does not check the syntax of the query at the time the query is entered; it simply passes it onto the SQL database or ODBC driver. On execution of the query the status from the server or driver is passed back to the Opalis JobEngine log.

It is helpful to check your queries with a tool from your data provider before you execute them from within Opalis JobEngine, such as the Access query builder (the Queries tab) for Access tables or the SQL Query Window/Analyzer for SQL Server. Just copy and paste the query into a file or the query text box.

The Database Execution task generates Dynamic Data of its own that can be used within other objects in your design. A common technique is to cascade tasks that can be configured to derive lookup values. These values can then be inserted into later queries using Dynamic Data codes.



The “Populate ReportTable” task, in this example, refers to Dynamic Data supplied by the preceding two Database Execution tasks.

Using the Opalis JobEngine Counter objects or by designing loops, all rows of a table can be processed in this way.

Hints and Tips

SQL Server: If *database* is left empty, queries will be executed in the default database for the SQL user.

“Go” is not a Transact-SQL order. It is a query separator used in many interrogation programs (such as ISQL).

Warning: stopping due to an error will not rollback previously executed transactions in the same file.

SQL Server | File: the queries contained in the query file must be separated by the “go” order (which must be located at the beginning of a new line, do not put “go” in comments). In the *If an error occurs in query* field, choose the required behavior, either stop or continue.

A SQL execution error or a RAISERROR call may stop a query. If you choose “Continue,” the number of failed queries will be written into the task execution log. Furthermore, SQL errors that occur during execution are written into the Windows NT/2000 Event Viewer.

Note: If you would like the output to be returned, use ISQL with a “Program execution” type task. The output file created by Opalis JobEngine will contain all the lines returned by file queries.

System Restart Task

The screenshot shows the 'Task properties' dialog box with the 'Restart' tab selected. The 'Name' field is empty, and the 'Type' is set to 'System restart'. There is an 'Inactive' checkbox which is unchecked. The 'Display' section has a 'Message text' field. The 'Options' section has two radio buttons: 'With delay, force applications to close' (selected) and 'With delay, do not force applications to close'. A 'Delay (sec.)' field is set to '30'. At the bottom are 'OK', 'Cancel', and 'Help' buttons.

Shuts down the system with automatic reboot.

Message to be displayed will be displayed on the system's screen when the system shuts down.

After the delay, Restart options are:

- Delay, force applications to close
- Delay, do not force application to close

Delay is expressed in seconds, with a minimum of 30 seconds.

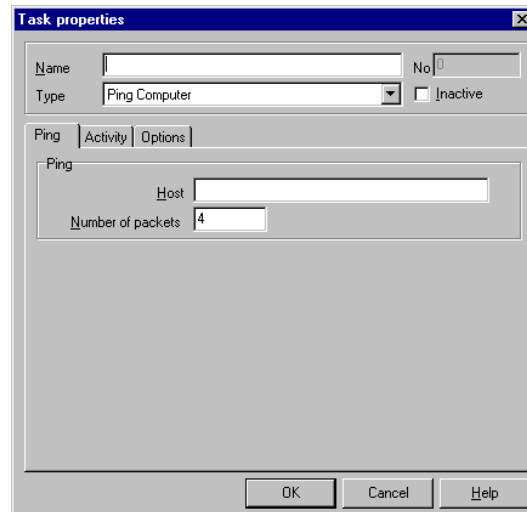
You can send a general message to inform users that a system shutdown is imminent with a "Send Message" type task.

For safety reasons, if the task is started less than ten minutes after a reboot, it will wait one additional minute before initiating the system shutdown.

Hints and Tips

You can abort the system shutdown by running the StopShut.exe utility, which can be found in the folder where Opalis JobEngine was installed.

Ping Computer Task



The image shows a 'Task properties' dialog box with a blue title bar. It contains a 'Name' text field, a 'Type' dropdown menu set to 'Ping Computer', and an 'Inactive' checkbox. Below these are tabs for 'Ping', 'Activity', and 'Options'. The 'Ping' tab is active, showing a 'Host' text field and a 'Number of packets' spinner set to 4. At the bottom are 'OK', 'Cancel', and 'Help' buttons.

Sends Ping packets to a remote TCP/IP host to check its availability.

Enter in the *Number of packets* field the number of times you want the task to send a Ping packet.

Note that the task completes as soon as an incoming packet is received from the remote computer and after sending the packets, the task fails if no incoming packets were received.

Trigger Opalis Object Task

The screenshot shows the 'Task properties' dialog box. At the top, there is a 'Name' field and a 'No.' field. Below these is the 'Type' dropdown menu, which is currently set to 'Trigger Opalis object'. To the right of the dropdown is an 'Inactive' checkbox. Below the 'Type' field are three tabs: 'Opalis', 'Activity', and 'Options'. The 'Opalis' tab is selected. Inside the 'Opalis' tab, there is a 'Server' section with four radio button options: 'OpalisRobot v2', 'OpalisRobot v3' (which is selected), 'OpalisRobot v3 on same server', and 'OpalisRendezVous'. Below the 'Server' section is a 'Trigger' section with three text input fields: 'Server name' (with a browse button '...'), 'Event/Task', and 'Parameter'. At the bottom of the dialog are 'OK', 'Cancel', and 'Help' buttons.

Triggers events, tasks, or flows on local or remote OpalisRobot, or OpalisRendezVous Services.

In the *Server name* field, enter (or use the “...” button to browse the network and select) the Windows NT/2000 computer that runs the OpalisRobot Service.

Type the name of the Event or Task you wish to trigger.

If the *OpalisRobot v3 on same server* option is selected you can use a drop down list to select the event or task.

Hints and Tips

The Trigger Opalis Object task is ideal for cascading jobs on multiple Windows NT/2000 systems running the complete suite of Opalis products. See www.opalis.com

THE DATE/TIME EVENT

Date/Time Event

The screenshot shows the 'Event properties' dialog box with the 'Date/Time' tab selected. The 'Name' field is empty, and the 'Type' is set to 'Date/Time'. The 'No.' field is set to 0, and the 'Inactive' checkbox is unchecked. The 'Date/Time' tab is active, showing the 'Periodicity' section. The 'At' radio button is selected, with the time set to 12:00am. The 'Every' radio button is also selected, with the interval set to 0 hours and 1 minute. The 'Starting' checkbox is checked, with the time set to 0 minutes after the hour. The 'At time slices within the hour' checkbox is unchecked. The 'Every' radio button is also selected, with the interval set to 5 seconds. The 'OK', 'Cancel', and 'Help' buttons are at the bottom.

Triggers the event depending on time or interval.

Select *At* to trigger the event at a specific time of the day or *Every* to enter a time interval expressed in hours, minutes, or seconds.

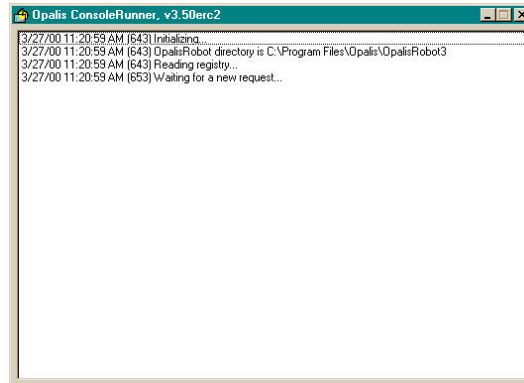
Trigger Options (for interval expressed in minutes or hours):

At time slices within the hour (interval expressed in minutes only) allows the event to be triggered regularly within the hour. For example, if the interval is 5 minutes, the event will trigger at 0, 5, 10, 15, 20, etc. (instead of immediately after the Service startup and then every 5 minutes).

Starting x Minutes after the hour (interval expressed in hours only) allows triggering of the first event using the *minutes* entered. For example, if the interval is 2 hours, the *Minutes* field is "45" and the Service is started at 8:20 am, the event will trigger at 8:45 am, 10:45 am, and so on (instead of immediately after the Service startup and then every two hours).

UTILITIES

ConsoleRunner



ConsoleRunner is a graphical application that communicates with the Opalis JobEngine Service and launches tasks from the system console when the Service requests it.

It is useful for programs that do not run properly when launched by a Windows NT/2000 Service (such as some VB programs, MS Office or 16-bit applications that need to access shared memory).

When the task has been triggered, the Opalis JobEngine Service informs the ConsoleRunner utility, which then executes the task. In order to launch the task, it is mandatory for ConsoleRunner to be running on the system console when the task is triggered.

To be sure that ConsoleRunner is always running, you may want to add its shortcut in the Startup group of the user usually logged on the system console.

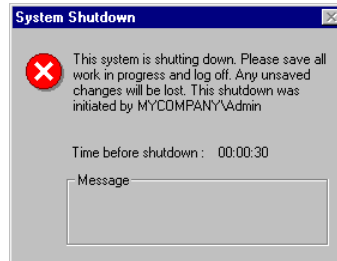
You can also use the Auto Logon function of Windows NT/2000.

For more details about the Auto Logon feature, consult Microsoft Knowledge Base, article No Q97597 ("How to Enable Automatic Logon in Windows NT") and Q114615 ("Bypassing Automatic Logon in Windows NT").

To protect the logged session against unwanted manipulation, it is possible to lock the console (pressing Ctrl-Alt-Del then Enter) or to use a password protected screen saver.

StopShut

StopShut is a utility that interrupts the system shutdown during the countdown preceding it. A minimum countdown of 30 seconds always occurs when the System Restart is used.



To stop the current system shutdown, run StopShut.exe from the folder where Opalis JobEngine was installed.

This can be done only on the computer that is performing the shutdown.

Wait

Wait is a command line utility that simply waits during a given time. It can be found in the folder where Opalis JobEngine was installed.

Syntax of the wait utility is:

Wait <number of seconds to wait>

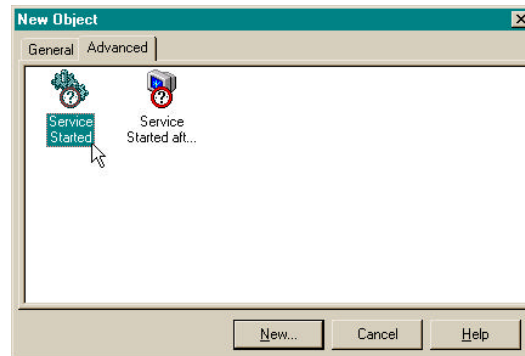
Example: "Wait 30" will wait for 30 seconds.

The wait utility can be used to delay the execution of commands within batch files.

ADVANCED OPTIONS

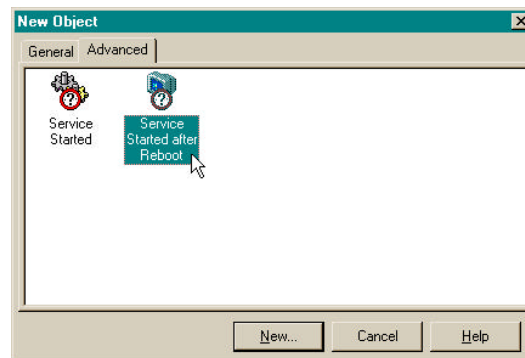
The “Advanced” tab from the “New Object” window contains advanced objects that can be helpful during the creation of automation flows.

Service Started Event



The “Service Started” event is triggered when the Opalis JobEngine Service is started. You can use this event to start or continue an automation sequence as soon as the Opalis JobEngine Service starts.

Service Started After Reboot Event



The “Service Started after Reboot” event is triggered when the Opalis JobEngine Service is started within 10 minutes after a system reboot. You can use this event to continue or start an automation sequence after a system reboot.

Dynamic Data

Dynamic data allows you to create dynamic jobs; that is, jobs that have a generic configuration and can adapt to the context dynamically.

Let's take an example. Say you have a file-processing program that requires the name of the file to process as a parameter in its command-line and you want to launch it each time a file is new or modified in a monitored folder.

Unless the file name is always the same (which is a big limitation in functionality in today's powerful platforms), you would need to create a job for each possible file name. This is fine if there are only three different possibilities but what if the file name changes ten times a day?

Fortunately with the dynamic data feature, you do not need to know the name of the files when you create the job. You just have to insert a special code (using the Insert dynamic data dialog) and the code will be replaced at run-time by the actual name of the new or modified file.

How it works:

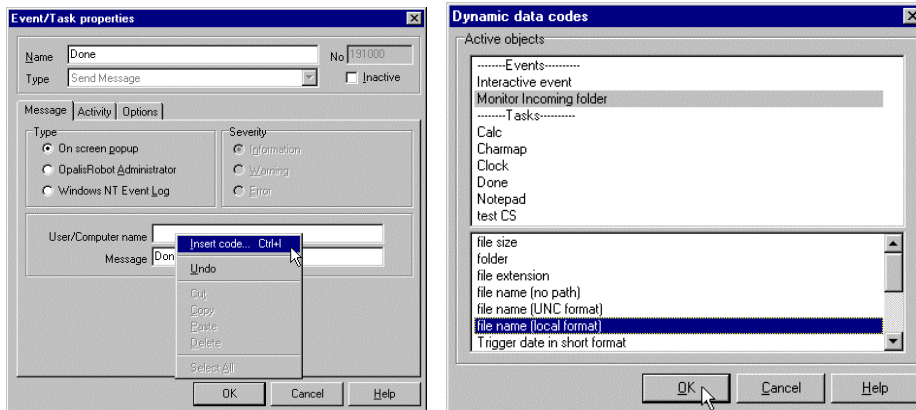
Don't worry. There is no waste. The dynamic data information is saved internally only if a task is using it.

Each event or task publishes data that can be used for the following tasks.

For example, the date/time event and tasks publish information about the time at which they were triggered. File management tasks publish information about the file they manage (name, folder, size). Service management tasks publish information about the Service they manage (name, status), and so on.

You can only use dynamic data codes in tasks.

To insert a dynamic data code, use the right button of the mouse when the cursor is in a character field of the configuration of a task and select "Insert code":



This opens the Insert code dialog:

Unless you are familiar with Opalis JobEngine, it is better to use the Insert code dialog to add a code to a field.

In the above Dynamic data code dialog box, select the event or task from which you want to use dynamic data. Then, select in the lower list of the dialog, the type of dynamic data that you want to use and click the OK button

A special code is then inserted in the configuration field of the task. This code will be replaced where it is by the run-time value of the given data.

The code is composed of the event or task number and a variable-length code that identifies the type of data.

You can use dynamic data codes in all character fields of the configuration of tasks.

If there are several instances of the same code (say several new files), the given task will be launched once for each instance of the data.

If a task uses several dynamic data codes from different tasks and if any one particular piece of information is missing, the task is not launched.

Viewing the result of the "Process files automatically" Wizard is a good way to learn how to use dynamic data.

String Manipulation Functions

Opalis JobEngine's string manipulation functions can be used to extract parts of a dynamic data code.

You can use these functions in all character fields.

Instr

Instr() function and arguments are replaced by the position of the first occurrence of one string within another.

Syntax: Instr(string1, string2)

String1	String expression being searched.
String2	String expression sought. If string2 is not found, the function and arguments are replaced by 0. If string2 is found within string1, the function and arguments are replaced by the position at which match is found.

Right

Right() function and arguments are replaced by a specified number of characters from the right side of a string.

Syntax: Right(string, length)

String	String expression from which the rightmost characters are returned. If string is empty, the function and arguments are replaced by an empty string.
Length	Numeric expression indicating how many characters to return. If 0, function and arguments are replaced by an empty string. If greater than or equal to the number of characters in string, the function and arguments are replaced by the entire string.

Left

The Left() function and arguments are replaced by a specified number of characters from the left side of a string.

Syntax: Left(string, length)

String	String expression from which the leftmost characters are returned. If string is empty, the function and arguments are replaced by an empty string.
Length	Numeric expression indicating how many characters to return. If 0, function and arguments are replaced by an empty string. If greater than or equal to the number of characters in string, the function and arguments are replaced by the entire string.

Trim functions

The trim functions and arguments are replaced by a copy of a string without leading spaces (LTrim), trailing spaces (RTrim), or both leading and trailing spaces (Trim).

Syntax:

LTrim(string)
RTrim(string)
Trim(string)

The string argument is any valid string expression. If string is empty, the trim function and arguments are replaced by an empty string.

Mid

The Mid() function and arguments are replaced by a specified number of characters from a string.

Syntax: Mid(string, start, length)

String	String expression from which characters are returned. If string is empty, the function and arguments are replaced by an empty string.
Start	Character position in string at which the part to be taken begins. If start is greater than the number of characters in string, the function and arguments are replaced by an empty string.
Length	Number of characters to return. If there are fewer than length characters in the text, the function and arguments are replaced by all characters from the start position to the end of the string.

Len

The Len() function return the number of characters in a supplied string.

Syntax: Len(string)

String	String expression for which the length is sought. If string is empty, the function returns zero.
--------	--

Security

Service Security

Windows NT/2000 provides the security for actions performed by the Opalis JobEngine automation engine. File access rights and other permissions (system shutdown, etc.) depend on the account assigned to the Opalis JobEngine Service.

If you do not enter a valid user name or press Cancel in the Service account dialog at install-time, the account assigned to the Service is the "System" account. It is recommended that you change this user because it has rights only on the local machine.

Client Security

By default, the security is not activated and anyone running the Opalis JobEngine Client will have administrator access to a freshly installed Opalis JobEngine Service.

By creating a registry key on the server (called "Opalis JobEngine Security key") and managing security of this key, the system administrator manages accesses allowed to the Opalis JobEngine Clients. The access can be denied, in user mode or in administrator mode.

To create and modify the rights of the Opalis JobEngine Security key, use the REGEDT32.EXE program (warning: be cautious when editing the registry) and create a key (not a value) called "Security" under HKEY_LOCAL_MACHINE\Software\Opalis\Robot3.

To manage security once the key is created, select the key and use the Security | Permissions command.

How it works:

When the key does not exist, the user has access in administrator mode.

If the key exists, the access depends on how the user can open the key. If the access assigned to the user account is:

- Full control, the server window of the Opalis JobEngine Client is opened in administrator mode
- Read, the server window of the Opalis JobEngine Client is opened in user mode.

If the user is not listed or not a member of any authorized Windows NT/2000 group, the access is denied.

Summary

To access Opalis JobEngine in administrator mode, a user must have:

- Access to the Opalis JobEngine Security key with Full control access (if it exists).
- Either a Read/Write access to the hidden "\$" share of the drive on which the Opalis JobEngine Service is installed or to the Opalis JobEngine3 folder using a share named "Opalis JobEngine."

To access Opalis JobEngine in user mode, a user must have:

- Access to the Security registry key (the key MUST exist).
- Either a Read access to the hidden "\$" share of the drive on which the Opalis JobEngine Service is installed or to the Opalis JobEngine3 folder using a share named "Opalis JobEngine."

External configuration

Remote Access Service

To install Remote Access Service, use the Network icon in the Control Panel (Add Software command, select "Remote Access Service"). For more information on installing Remote Access Service, see Windows NT/2000 documentation.

Input names used in the configuration of RAS tasks are the names that you enter in the Windows NT/2000 "Remote Access Service" (also called Dial-up Networking) program.

ODBC

The latest ODBC drivers can be obtained from <http://www.microsoft.com/data/odbc/>

SQL Server

An SQL Server for Windows NT/2000 client must be installed before you can use Opalis JobEngine "SQL Server" functions. The Microsoft Windows NT/2000 SQL Client can connect to Microsoft or Sybase databases.

The purchase of Opalis JobEngine does not include any SQL Server client licenses.

If you use TCP/IP sockets to connect to the SQL Server, the name to input in the "Server" field in the "Edit event/task" screen is the name set up in the "SQL Client configuration utility" program in the "SQL Server for Windows NT/2000 " group.

MS Mail

The MS Mail user's input in the task configuration must exist when the task is executed. The "Opalis JobEngine Interface" program does not check that this user exists at the time of the input. Since MS Mail for Windows NT's development kit is available, the "Simple MAPI" interface is used to send MS Mail letters. Experience shows that sending several mails simultaneously can cause errors.

The use of ConsoleRunner is recommended when you want to send E-mails using MAPI. When setting up a MS Exchange task, enter the profile name in the user name field. The profile must exist in the configuration of the account assigned to the Service.

The SQL Server pack contains a client kit. Please call your Microsoft or Sybase dealer if you would like more information about SQL Server licenses.

Troubleshooting

If Opalis JobEngine Fails to Start

Please check the following points:

- Check recent error messages on the Windows NT/2000 Event Viewer.
- The server is running Windows NT version 3.5 or later.
- Contact us. See the Technical Services section.

If Opalis JobEngine Runs in Evaluation Mode instead of Retail

To be sure that the Opalis JobEngine license information is properly entered:

- In the Client program, connect to the server (in administrator mode). Select Options | Service | Licensing, click on the Opalis JobEngine field and enter the serial number and key. If the key is correct, there is no message when you click the OK button. If the key is incorrect, you get an error message.
- Restart the Service.

If You Cannot Connect to a Server

Please check the following points:

- If you are using Windows 95, check that the Microsoft Remote Registry Services is installed on the system. It is available on the Windows 95 CD-ROM under the folder Admin\Nettools\Remotereg."
- If you are using Windows 98, check that the Microsoft Remote Registry Services is installed on the system. It is available on the Windows 98 CD-ROM under the folder "tools\reskit\netadmin\remotereg."
- If you have sufficient rights to connect, see the Security section.

If a Task Does Not Start or Fails

Please check the following points:

- Opalis JobEngine Services can be configured to execute under the LocalSystem account. This account is not a regular one and has limitations (for example, it cannot connect to a remote computer).

Change the account used by the Service with an Administrator's account or one of your accounts. To do so, use the Services applet of the Control Panel (Startup button, select Log On As, This Account

- Check that the required software for this task is installed on the server (RAS for RAS functions, TCP/IP for SMTP e-mail and ODBC for ODBC functions). If the required software is not installed, the log will display an alert log entry for each object that failed to start.
- The "Active/Inactive" option for objects in the automation sequence.
- Incorrect dynamic data codes can prevent the task from being started when they are not replaced. Make sure that the codes used in the task configuration actually correspond to the date/time event or tasks that triggers it.

If You Cannot Obtain the Results You Want

Please contact us!

We will be pleased to assist you whether you are a novice, an experienced user, or in the process of evaluating Opalis JobEngine.

See Technical Services at the end of this manual.

Messages

The messages described in this section may occur in the Opalis JobEngine Client or in the Event Viewer.

Opalis JobEngine Client Messages

The message number is located in the title of the message window.

Opalis JobEngine Service Messages

Opalis JobEngine Service messages are sent to the Application section of the Windows NT/2000 Event Viewer.

The message number is displayed between square brackets at the beginning of the text message, for example: [173].

The Event Viewer is located in the "Administrative Tools" group. You can also click n its toolbar button.

Task Log Messages

When a task fails to execute, an explanation of the failure is added in parenthesis in the task execution status.

Messages Beginning with INT

Messages that have a name beginning with INT should not occur during normal use of Opalis JobEngine.

If you see such a message, please write down all the steps that preceded it and then contact Technical Services.

Messages From SQL Server

Messages from SQL Server are identified by the "SQL_error" code. These messages contain a severity number and a message explaining the error.

For more information about SQL Server error messages, please refer to the Microsoft SQL Server for Windows NT documentation, and especially the "SQL Server Troubleshooting Guide."

Messages From ODBC

Messages from ODBC are displayed on the Task Log. The message is usually preceded by the ODBC driver name.

TECHNICAL SERVICES

Contact Information

The Opalis JobEngine free Technical Assistance Service is available in several ways. In all cases, we will strive to quickly and thoroughly answer your questions. Please note that Technical Services is also available to users who are evaluating Opalis JobEngine. We will be happy to assist you during the evaluation period.

Electronic Mail

Contact Opalis engineers by sending electronic mail to:
support@opalis.com

World Wide Web

Browse through the technical information; and obtain the latest files from our Web site at: www.opalis.com

Phone

Our Technical Services department can be reached at:

Tel: (416) 253-1750

Fax: (416) 253-7646

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