

IBM i
7.2

*Systems management
Advanced job scheduler*



Note

Before using this information and the product it supports, read the information in [“Notices” on page 31.](#)

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Advanced Job Scheduler

The IBM Advanced Job Scheduler for i (5770-JS1) licensed program is a powerful scheduler that allows unattended job processing 24 hours a day, 7 days a week. This scheduling tool provides more calendar features and offers greater control over scheduled events than the base scheduler. You can also view job completion history and manage notification of a job's status.

If you want to schedule jobs on several systems in your network, the product must be installed on each of your systems.

Note: For ordering information, see the [Job Scheduler for IBM i](#)  Web site.

PDF file for Advanced Job Scheduler

Use this to view and print a PDF version of this information.

To view or download the PDF version of this document, select [Advanced Job Scheduler](#).

Saving PDF files

To save a PDF on your workstation for viewing or printing:

1. Right-click the PDF link in your browser.
2. Click the option that saves the PDF locally.
3. Navigate to the directory in which you want to save the PDF.
4. Click **Save**.

Downloading Adobe Reader

You need Adobe Reader installed on your system to view or print this PDF. You can download a free copy from the [Adobe Web site](#) .

Advanced Job Scheduler on the web

Using a web browser, you can remotely access scheduled jobs, job groups, report distribution, notification features, scheduled job activity, and activity log information for Advanced Job Scheduler.

Advanced Job Scheduler on the web can be accessed through IBM Navigator for i. Advanced Job Scheduler is found under the Work Management task category. All of the features within the Advanced Job Scheduler are added to the Advanced Job Scheduler on the web.

Advanced Job Scheduler properties

The Advanced Job Scheduler Properties page provides you with a place to define the general properties for Advanced Job Scheduler. This page also allows you to work with predefined schedules, scheduling calendars, holiday calendars, fiscal calendars, data libraries, systems and groups, and users.

General Properties

The Advanced Job Scheduler Properties page provides you with a place to define the general properties for Advanced Job Scheduler.

Related tasks

[Assigning the general properties](#)

You can follow these instructions to assign the general properties used by Advanced Job Scheduler. You can specify how long to retain activity and log entries for the Advanced Job Scheduler, as well as the period that jobs are not allowed to run.

Schedules

The Advanced Job Scheduler Properties page provides you with a place to work with predefined schedules.

Related tasks

[Predefined schedules](#)

You can create schedules that contain information needed to schedule a job or calculate exception dates within a holiday calendar.

Job Controls/Applications

The Advanced Job Scheduler Properties page provides you with a place to work with Job Controls/Applications.

Applications are jobs that have been grouped together for processing. Job controls are the defaults assigned to a job as you add it to the job scheduler. Job control defaults include such things as default application, calendar, holiday calendar, and so on. Each application contains job control information. The application specified in the definition of a job is used to determine the job controls used by the job when the job is submitted. If the job does not contain an application the job will use the job controls in the System Default.

Related tasks

[Setting up Job Controls/Applications](#)

Use the Job Controls/Applications page to add an application, add an application that is based on an existing application, or remove an application. You can also select an application and display or modify properties.

Library Lists

The Advanced Job Scheduler Properties page provides you with a place to work with Library Lists.

A library list is a user-defined list of libraries that is used by an Advanced Job Scheduler job when it is processing.

Related tasks

[Setting up Library Lists](#)

The **Library Lists** page allows you to add a library list, add a library list that is based on an existing one, or remove a library list, if it is not being used by a currently scheduled job. You can also select a list and display or modify properties.

Command Variables

The Advanced Job Scheduler Properties page provides you with a place to work with Command Variables.

Command variables are variables that you create in Advanced Job Scheduler and use in the command list of jobs that are submitted through Advanced Job Scheduler. Examples of command variables include the beginning of each month, a division number, or a company number. The value for a command variable is retrieved at the time it is being used when a job is running and replaced in the command string where the command variable is located.

Related tasks

[Setting up Command Variables](#)

The **Command Variables** page allows you to add a command variable, add a command variable that is based on an existing one or remove a command variable, provided it is not currently used by a scheduled job. You can also select an existing command variable and display or modify the properties.

Permissions

The Advanced Job Scheduler Properties page provides you with a place to add or modify permissions for functions within Advanced Job Scheduler.

Job Scheduler functional authority allows you to maintain control of who can perform various job and system related functions. It allows you to specify who can perform any Job Scheduler function ranging from adding a job to ending the monitor.

Related tasks

[Specifying permission levels](#)

This information explains how to specify permission levels for jobs, functions of the product, and provide new job default permissions.

Data libraries

The Advanced Job Scheduler Properties page provides you with a place to work with data libraries.

Related tasks

[Setting up multiple scheduling environments](#)

You can set up multiple scheduling environments on the same system. The original data library can act as the production data library and the copied data library can be used for testing. Thus you have two scheduling environments, one for testing and one for production. In addition, Advanced Job Scheduler product data can be replicated from a production system to a backup system. During a failover to the backup system, the production environment can be started for submitting its scheduled jobs.

Systems and groups

The Systems and Groups page allows you to add, remove, and change IP addresses to remote systems that are used for the communication and running of scheduled jobs on remote systems.

Related concepts

[Setting up systems and groups](#)

The Systems and Groups page allows you to add, remove, and change existing IP addresses and other information for IBM i and non-IBM i systems used by the Advanced Job Scheduler.

Users

The Advanced Job Scheduler Properties page provides you with a place to work with users.

The Users page provides you with a place to display all the users added to the Advanced Job Scheduler and its associated data library. The data library assigned to a user is used when that user accesses the Advanced Job Scheduler. A data library is a library consisting of all the data files and other objects used by the Advanced Job Scheduler. Each data library is a scheduling environment. From this page, you can add a new user to the list, change the data library for a user or remove a user. The user must exist on the system before it can be added to the list. The data library specified for the (Default) user is used for any user accessing the Advanced Job Scheduler that is not found in this list.

Calendars

The Advanced Job Scheduler Properties page provides you with a place to work with scheduling calendars and holiday calendars.

For more information, see [“Setting up a scheduling calendar” on page 10](#), [“Setting up a holiday calendar” on page 10](#), and [“Setting up a fiscal calendar” on page 11](#).

Scheduled jobs

Under Scheduled Jobs you have the option to display a list of all scheduled jobs, create a new scheduled job, define the properties related to scheduling jobs and reset all scheduled jobs. When listing scheduled jobs, job-related processes and job management functions can be performed on the scheduled jobs.

Scheduled job list

Use the scheduled job list to view and change your list of scheduled jobs.

When listing jobs, any column can be used for sorting or filtering. This list is helpful for selecting jobs that begin with certain letters and then sorting by the next scheduled date and time. Not only can you add new jobs and change existing jobs, there are options for managing your scheduled jobs. You can do the following to a scheduled job:

Properties

This option displays the definition of a scheduled job. You can change and update scheduled jobs.

Hold/Release Schedule

Use this option to hold or release a scheduled job.

Reset Scheduled Job

Use this option to reschedule a job into the future based on the current date and time.

Activity

Use this option to display entries for each time the selected job has run.

Activity Log

Use this option to display the activity log for the selected job.

New Based On

Use this option to create a job based on the properties on an existing job.

Add Selected Job to Group.

This option allows you to add the selected job to a Job Group. The confirmation requires you to select a Job Group where the job is to be added. The job is added as the last job in the Job Group.

Permissions

Select this option to update the permissions of a job. If more than one job is selected, each job is updated with the specified authority.

Run Now

This option allows you to run the job immediately, at a specific time in the future or at a specific number of minutes in the future. You have the option whether to check resource dependencies. You can also indicate if the running of this job affects the running of its dependencies.

Skip Next Run

Using this option skips the scheduled run of the job. Using this option multiple times continues to skip the next run. To reset the job back to the original schedule, use the Reset Scheduled Job option.

Rename

Select this option to rename a job.

Status

This option displays the status information of a job while it is running.

Job Dependencies

This option provides a list of the predecessor and successor jobs for the selected job with the option to edit the dependencies. Job dependencies refer to predecessor and successor relationships for jobs. Predecessor jobs are jobs that must run before the successor job runs. A successor job is a job that runs after all the predecessor jobs have been processed. There can be multiple successor jobs for a single predecessor job as well as multiple predecessor jobs for a single successor job. In addition, you can specify to skip a dependent job if its predecessors and successors run on a day that the dependent job is not scheduled to run.

Active Dependencies

This option provides lists of jobs that cannot be active when the selected job is to be submitted. If Advanced Job Scheduler determines that any of the jobs are active, then Advanced Job Scheduler will

not let the specified job run. The specified job will be delayed until all the jobs in the list are inactive or until the wait limit is met in which case the job would be reset.

Resource Dependencies

This option provides a list of resource dependencies for the selected job including a list of dependencies, the requirements needed before continuing to run a job, and the time to wait before resetting the job.

Delete

This option deletes the selected job. A confirmation is required.

Creating a scheduled job

You can schedule a job and specify the commands that are associated with the job.

For information about creating a new scheduled job, see [“Creating and scheduling a job” on page 16.](#)

Scheduled Job Properties

This page allows you to assign the general controls used by Advanced Job Scheduler for scheduling jobs.

- You can specify if an Application is required for each submitted job. This option cannot be selected if there are existing jobs that do not contain an application. For more information, see [“Creating and working with application controls and job controls” on page 26.](#)
- You can specify whether to base periodic frequency on start time of the job. When checked, jobs that are scheduled to run periodically base the next run time on the start time. For instance, a job is to run every 30 minutes, starting at 8:00 am. (For a job to run around the clock, you would also specify 7:59 am as the ending time.) The job runs for a total of 20 minutes. With this field checked, the job would run at 8:00 am, 8:30 am, 9:00 am, and so on. If this field is not checked, the job would run at 8:00 am, 8:50 am, 9:40 am, 10:30 am, and so on.
- You can specify if you want held jobs to be reset. When this option is checked, jobs that are held and have a schedule contain a next scheduled date and time to show when the job would have run if it were not held. There is a possible performance increase for the job monitor if the box is not checked. This consideration is especially true for those jobs that are held and are scheduled to run periodically.
- You can specify if the job scheduled date and time is reset after a change. When checked, jobs are reset any time the properties of a job are displayed and the OK button is used. This behavior occurs true even if nothing was changed. When this box is not checked, the schedule of a job has to change before the job is reset. Resetting a job recalculates the next scheduled date and time for that job.
- You can specify the start time of day. The time of day that you consider starts a new day. All jobs that specify to use this time of day have their job date changed to the previous day if the time the job starts is before the Start Time of Day. For instance, the Start Time of Day is 6:00 AM and a job that uses the Start Time of Day is submitted on November 12, 2013 at 11:00 PM. If the job starts after midnight and before 6:00 AM the job date of the job will be changed to November 12, 2013.

Job groups

Job groups are a basic job dependency of the Advanced Job Scheduler.

Jobs in a job group run in order based on a predefined sequence. If a job in the job group completes abnormally, the subsequent jobs do not run. Under Job Groups, you have the option to display a list of all job groups and to create a job group.

Job group job list

The Job Group list allows you to view and change Job Groups in the list.

When listing Job Groups, any column can be used for sorting or filtering. This list is helpful for selecting Job Groups that begin with certain letters and then sorting by the next scheduled date and time. Not only can you add new job groups and change existing Job Groups, there are options for managing your Job Groups. You can do the following to a Job Group

Open

Use this option to list all the jobs within the Job Group. You can manage the jobs as well as start the Job Group at a specific job.

Properties

This option displays the definition of a Job Group. You can change the description and the schedule.

Hold/Release

Use this option to hold or release a Job Group.

New Based On

Select this option to create a Job Group based on the properties on an existing Job Group. No jobs exist in the created Job Group.

Add New Job to Group

This option allows you to create a job and add it to the Job Group. The job is added as the last job in the Job Group.

Run Now

This option allows you to run the Job Group immediately starting at the first job in the group.

Resequence Jobs in Group

Use this option to change the order of jobs in the Job Group.

Rename

Select this option to rename a Job Group.

Delete

This option allows you to delete the selected Job Group and all the jobs within the Job Group. A confirmation is required.

Creating a job group

You can set up and schedule a series of jobs that run consecutively in a specified order.

Related tasks

[Creating and scheduling a job group](#)

You can set up and schedule a series of jobs that run consecutively in a specified order. Jobs within a job group require completion before the next job is submitted for processing.

Notification

Use notification to specify recipient properties and report distribution list properties.

With the Advanced Job Scheduler, you can send email notifications when: jobs complete normally or abnormally, when jobs do not start within a specific amount of time, and when a job is waiting on an error message. Email messages can escalate to other recipients until escalation is stopped. You can also distribute reports automatically by email or to other output queues. For more information, see [“Working with notification” on page 27](#).

To enable the email capabilities within the Advanced Job Scheduler, see [“Specifying a mail server to use for notification” on page 11](#).

Related tasks

[Working with notification](#)

Within notification, you can perform a series of tasks. Use notification to specify recipient properties and report distribution list properties. In addition, you can send email messages and set up an escalation list in case a recipient does not respond within a specified amount of time.

[Specifying a mail server to use for notification](#)

A mail server is required if you want to send email notification messages.

Scheduled job activity

Each time a job runs a history entry of the job is stored in the Advanced Job Scheduler.

The history entry contains pertinent information such as the last run date, start and end time, elapsed time and completion status. The Schedule Job Activity Properties allows you to change the retention of the history entries.

Scheduled job activity list

When listing scheduled job activity, you can quickly see when a job ran, its completion status and how long it ran. Any column can be used for sorting or filtering.

This list is helpful for selecting jobs that begin with certain letters and then sorting by the last time the job ran. You can display the properties of each Scheduled Job Activity entry to see how the job was defined at the time the job ran.

Scheduled job activity properties

This page allows you to assign the retention for Scheduled Job Activity.

Activity retention specifies how long Advanced Job Scheduler activity records are to be retained. The possible values are 1 - 999 days or occurrences. For instance, select Occurrences per job and 30 if you want to keep the last 30 Scheduled Job Activity entries for each job.

Activity log

The Activity Log lists all messages associated with the Advanced Job Scheduler processing

The Activity Log lists can include messages for when a job was added, changed, removed, and executed. The Activity Log is a great way of knowing the user that added or changed a job. You can also easily see the error messages that caused a job to end abnormally. The Activity Log Properties allows you to change the retention of the log entries

Activity log list

When listing the Activity Log, you can quickly see detailed history of Advanced Job Scheduler activities.

The Activity Log list can include such things as changes to the job schedule, job processing including error messages, starting or ending the Advanced Job Scheduler job monitor, and so on. Any column can be used for sorting or filtering. This list is helpful for selecting specific messages and then sorting by the time issued. You can display the properties of each entry for more information.

Activity log properties

This page allows you to assign the retention for Activity Log entries.

Activity Log retention specifies how long Advanced Job Scheduler activity records are to be retained. The possible values are 1 - 999 days. For instance, enter 30 if you want to keep the last 30 days of Activity Log

Scheduling jobs with Advanced Job Scheduler

To manage the Advanced Job Scheduler, you need to install the licensed program first, and then complete the tasks to customize the Advanced Job Scheduler. Finally, the remainder of the tasks allow you to work with and manage the Advanced Job Scheduler.

Setting up the Advanced Job Scheduler

Before you start scheduling jobs, you need to configure the Advanced Job Scheduler.

Assigning the general properties

You can follow these instructions to assign the general properties used by Advanced Job Scheduler. You can specify how long to retain activity and log entries for the Advanced Job Scheduler, as well as the period that jobs are not allowed to run.

You can specify the working days that jobs processes, and whether an application is required for each scheduled job. If you have a notification product installed, you can also set up the command that is used to send a notification when a job completes or fails or you can use the Send Distribution using Job Scheduler (SNDDSTJS) command to notify a recipient.

You can specify how long to retain activity records for jobs, as well as the period that jobs are not allowed to run. You can specify the working days that jobs are allowed to process, and whether an application is required for each submitted job.

To set up the general properties for the Advanced Job Scheduler, follow these steps on the web :

1. Expand **Work Management** from your IBM Navigator for i window.
2. Expand **Advanced Job Scheduler** and click **Properties**.
3. Specify the **Activity Retention**. The activity retention is how long you want to retain the activity records for jobs. The possible values are 1 to 999 days or occurrences. Click **Days** to specify if you want to keep activity for a certain number of days, or click **Occurrences per job** if you want to keep activity for a certain number of occurrences per job.
4. Specify the **Log retention**. The log retention specifies, in days, how long you want to retain Advanced Job Scheduler log entries.
5. You can specify a **Reserved period**. Jobs do not run during this time.
6. Specify the working days from the list. If a day is selected, it is designated as a working day and can be referenced when scheduling jobs.
7. Click **Application required for scheduled job** to designate whether an application is required for each scheduled job. **Applications** are jobs that have been grouped together for processing. This cannot be selected if existing jobs do not contain an application. If you choose to have an application required for certain jobs, go to working with applications.
8. Specify a **Job monitor user**. This field specifies the name of the user profile to use as the owner of the monitor job. All jobs that have **Current user** specified use the user profile of the monitor job. The monitor job's default user profile is QIJS.
9. In the **Notification command** field, you can specify a command. Use the Send Distribution using Job Scheduler Notification (SNDDSTJS) command supplied with the system or a command specified by your notification software. The SNDDSTJS command uses the Advanced Job Scheduler notification function. The designated recipients can receive messages for normal and abnormal completions of job scheduled entries.

Related concepts

[General Properties](#)

The Advanced Job Scheduler Properties page provides you with a place to define the general properties for Advanced Job Scheduler.

Specifying permission levels

This information explains how to specify permission levels for jobs, functions of the product, and provide new job default permissions.

You can specify permission levels for jobs, functions of the product, and provide new job default permissions to be associated with each Job Control/Application. Use the permissions for a job to grant or deny access to the following actions: submit, manage, permission, display, copy, update, or delete. You can also grant or deny access to individual functions of the product such as Work with Schedule Calendars, Send Reports, and Add Job.

Default permission levels are transferred to new jobs when they are added. In which case, the system transfers the New Job permissions that are based on the application that is specified within the job definition. If no application is used, it transfers the System Default (*SYSTEM) New Job permissions.

Related concepts

[Permissions](#)

The Advanced Job Scheduler Properties page provides you with a place to add or modify permissions for functions within Advanced Job Scheduler.

Specifying permission levels for functions of the product

To specify permission levels for functions of the product, follow these steps:

1. Expand **Work Management**.
2. Expand **Advanced Job Scheduler** and click **Properties**.
3. Click **Permissions**.
4. Select a function and click **Properties**.
5. On the **Function Permissions Properties** window, edit the permission level as necessary. You can grant or deny access to the public or specific users.

Specifying permission levels to jobs

To specify permission levels to jobs, follow these steps:

1. Expand **Work Management**.
2. Expand **Advanced Job Scheduler** and click **Scheduled Jobs** to list jobs.
3. Select the scheduled job and click **Permissions**.
4. On the **Permissions Properties** window, edit the permission level as necessary. You can grant or deny access to the public or specific users. In addition, you can specify submit, manage, permission, display, copy, update, or delete permissions.

Specifying default permission levels

To specify default permission levels for new jobs that are associated with a Job Control/Application, follow these steps:

1. Expand **Work Management**.
2. Expand **Advanced Job Scheduler** and click **Properties**.
3. Click **Job Controls/Applications**.
4. Select a job control or application from the list and click **New Job Permissions**.
5. On the **Function Permissions Properties** window, edit the permission level as necessary. You can grant or deny access to the public or specific users. In addition, you can specify submit, manage, permission, display, copy, update, or delete permissions.

Setting up a scheduling calendar

These instructions show how to set up a calendar of selected days for scheduling a job or job group. This calendar can specify the dates to be used for scheduling a job, or it can be used with other schedules.

A **scheduling calendar** is a calendar of selected days that you can use for scheduling a job or job group. You can display scheduling calendars, add a scheduling calendar, add a scheduling calendar that is based on an existing one, or remove an existing calendar, provided it is not in use by a currently scheduled job.

You can select a calendar and display and change its properties. When you select a calendar, the details of the calendar are displayed under Details.

To set up a scheduling calendar, follow these steps:

1. Expand **Work Management**.
2. Expand **Advanced Job Scheduler** and click **Properties**.
3. Click **Calendars**.
4. On the **Scheduling Calendars** page, click **New**.
5. Specify a **Name**.
6. In the **Description** field, specify text that describes the calendar.
7. Choose a **Reference calendar** if applicable. A reference calendar is a calendar that was previously set up, and its properties are applied to the new calendar as if you merged the two calendars. If this is the first time you used the Advanced Job Scheduler, you do not have reference calendars to select.
8. Select the dates that you want to include on your calendar. You must specify whether each date you select is for the current year or for every year in the **Selected date** field, before you can add another date to the calendar. Otherwise, any date you select is cleared when you click a different date.
9. Specify whether you want certain days of the week to be included on the calendar.

Setting up a holiday calendar

These instructions show how to set up a calendar for days that you do not want to allow processing for a scheduled job. Alternate days can be specified for each exception day, or processing can be skipped completely for that day.

A **holiday calendar** is an exception calendar for days that you do not want to process an Advanced Job Scheduler job. Alternate days can be specified for each exception day that you specify in a holiday calendar. You can display holiday calendars, add a holiday calendar, add a holiday calendar that is based on an existing one, or remove an existing calendar, provided it is not in use by a currently scheduled job.

Predefined schedules can be used in holiday calendars. You can create a schedule THIRDFRI that has a frequency of the third Friday of each month. When you use THIRDFRI in a holiday calendar, you cause all jobs that use this holiday calendar to not run on the third Friday of each month. One or more schedules can be used in a holiday calendar. Dates that are generated by the schedule are shown on the calendar with a black border.

You can select a calendar and display and change its properties. When you select a calendar, the details of the calendar are displayed under Details.

Setting up a holiday calendar

To set up a holiday calendar, follow these steps:

1. Expand **Work Management**.
2. Expand **Advanced Job Scheduler** and select **Properties**.
3. Click **Calendars**.
4. Click **Holiday Calendars**.
5. Click **New** and type a name for the calendar.
6. In the **Description** field, specify text to describe the calendar.

7. Choose a **Reference calendar** if applicable. This is a calendar that was previously set up, and its properties are applied to the new calendar as if you merged the two calendars. You do not have reference calendars to select if this is your first time using the Advanced Job Scheduler.
8. Select the dates that you want to include on your calendar. You must specify whether each date you select is for the current year or for every year in the **Selected date** field, before you can add another date to the calendar. Otherwise, any date you select is cleared when you click a different date.
9. Select an alternate day for the job to run. You can choose the previous working day, next working day, a specific date or not at all. To select a specific date, click **Specific alternate date**, and type the date.
10. Select specific days of the week to be included on the calendar and the Alternate day to run.

Adding a schedule to a holiday calendar

To add a holiday calendar to a scheduled job, follow these steps:

1. Expand **Work Management**.
2. Expand **Advanced Job Scheduler** and click **Properties**.
3. Click **Calendars**.
4. On the Holiday calendar page, select the holiday calendar and click **Properties**.
5. From the lower left corner of the tab, click **Schedules**.
6. Select the appropriate schedule and click **Add**.
7. To change the **Alternate day**, remove the schedule from the **Selected Schedules** list and add the day again with the correct **Alternate Day**.

Setting up a fiscal calendar

If you want to divide the fiscal year into periods other than months, follow these steps to set up a fiscal calendar of selected days for scheduling a job or job group.

A *fiscal calendar* is a calendar of selected days that you can use for scheduling a job or job group. Use a fiscal calendar to define a fiscal calendar that is unique to your business. You can specify the start and end dates for each period in the fiscal year.

To set up a fiscal calendar, follow these steps:

1. Expand **Work Management**.
2. Expand **Advanced Job Scheduler** and click **Properties**.
3. Click **Calendars**.
4. On the **Fiscal Calendars** page, click **New**.
5. Specify a **Name**.
6. In the **Description** field, type in text to describe the calendar.
7. Click **New** on the **Fiscal Calendar Properties** window to create an entry.
8. Click the check box for each period and specify the start and end dates. You can specify up to 13 periods. You can create an entry for each year.
9. Click **OK** to save the fiscal calendar entry.
10. Repeat steps 7 through 9 as necessary.

Specifying a mail server to use for notification

A mail server is required if you want to send email notification messages.

To set up the notification properties, follow these steps:

1. Expand **Work Management**.
2. Expand **Advanced Job Scheduler**.
3. Expand **Notification** and click **Properties**.
4. Specify how many days to store messages. Specify a number in the **Message retention** field.

5. Specify an **Outgoing mail server (SMTP)**. For example, SMTP.yourserver.com.
6. Specify a **Port**. The default port number is 25.
7. Specify an email address in the **Reply address** field. All reply messages are sent to this address.
8. Select **Yes** or **No** in the **Log send activity** field. Send activity is used for problem determination.
9. Specify the **Number of banner pages** allowed. This value is used in Report Distribution.
10. Check the box whether the Report Distribution report is created when the Report Distribution function is used.
11. Click **OK** to save the notification properties.

Related concepts

Notification

Use notification to specify recipient properties and report distribution list properties.

Setting up multiple scheduling environments

You can set up multiple scheduling environments on the same system. The original data library can act as the production data library and the copied data library can be used for testing. Thus you have two scheduling environments, one for testing and one for production. In addition, Advanced Job Scheduler product data can be replicated from a production system to a backup system. During a failover to the backup system, the production environment can be started for submitting its scheduled jobs.

There are several reasons why you might want to set up multiple scheduling environments. You might want to run a production version and a test version of the product at the same time. This type of environment allows you to test various job schedules before actually using them in the data library on the production system. Or you might have a system that is the backup for one or more other systems in which you can use a data-mirroring product to replicate the Advanced Job Scheduler data library (QUSRIJS) from the source system into a library named differently. In this case, the data library is active until there is a problem with the source system.

A scheduling environment is a duplicate of the QUSRIJS library except with different data. For instance, you can have another data library named QUSRIJSTST with all the objects as QUSRIJS. Each is considered a data library.

To set up a multiple scheduling environment, follow these steps:

1. Add a data library to Advanced Job Scheduler

The Advanced Job Scheduler contains a list of data libraries (scheduling environments). To add a data library to the list, the data library must exist or you can select to create a data library. The following are three more ways that you can obtain a data library:

- Save the data library from a system and restore it onto the production system.
- Duplicate the data library on the current system by using the Copy Library (CPYLIB) command.
- Mirror a data library from another system. These systems should be running the same version release level.

Note: The copied, restored, or mirrored data library must use a different name than the original system.

2. Assign data libraries to users

After you obtain a test data library, add the data library to the Advanced Job Scheduler's properties and assign users to the data library. Therefore, when a user uses the Advanced Job Scheduler, the changes that the user makes are stored in the data library that is assigned to the user.

3. Copy jobs from test data library to actual data library (optional)

If you are using a data library for testing purposes, you might want to copy the jobs from the test data library to the actual data library in use. You must do this only if you restored or copied a data library in step 1 and you have jobs that you want to move to the actual data library in use. You do not need to do this if you mirrored a data library from the actual system to a test system.

To copy jobs from one system's data library to another, use the Copy Job using Job Scheduler (CPYJOBJS) command and specify TOJOB(*DATALIB). For more information about the specific parameters for this command, see the online help.

Related concepts

Data libraries

The Advanced Job Scheduler Properties page provides you with a place to work with data libraries.

Setting up Job Controls/Applications

Use the Job Controls/Applications page to add an application, add an application that is based on an existing application, or remove an application. You can also select an application and display or modify properties.

Job controls are the defaults that are assigned to a job. Job control defaults include such things as default application, calendar, holiday calendar, job description, and job queue. Each application contains job control information. The application that is specified in the definition of a job is used to determine the job controls used by the job when the job is submitted.

To set up Job Controls/Applications, follow these steps:

1. Expand **Work Management**.
2. Expand **Advanced Job Scheduler** and click **Properties**.
3. On the **Job Controls/Application** page, click **New**.
4. Enter a name for the new job control/application. The maximum length for the name is 10 characters.
5. Enter a brief description of the new job control/application. This field is optional.
6. Select a contact name and click **Add** to add the contact to the application. If the contact name you want to use does not exist, enter the name in the edit box. The name is automatically added to the list. To remove a contact, click the name and click **Remove**. The contact is removed from the Application.
7. Any additional information that is associated with the application is displayed in the **Additional information** box.
8. Select **Batch Information** to specify job defaults such as Job Description, Job Queue, Output Queue.
9. Select **Notification** to specify job defaults such as the recipient to notify if the job completes abnormally.
10. Select **Problem Recovery** to specify job defaults such as Reply to inquiry messages, Logging Level.
11. Click **OK** to add the new Job Controls/Application.

Related concepts

Job Controls/Applications

The Advanced Job Scheduler Properties page provides you with a place to work with Job Controls/Applications.

Setting up Library Lists

The **Library Lists** page allows you to add a library list, add a library list that is based on an existing one, or remove a library list, if it is not being used by a currently scheduled job. You can also select a list and display or modify properties.

A *Library List* is a list of libraries that is used by a scheduled job to search for an operating system object name that is specified without a library qualifier.

To set up Library List, follow these steps:

1. Expand **Work Management**.
2. Expand **Advanced Job Scheduler** and click **Properties**.
3. On the **Library Lists** page, click **New**.
4. Enter the name of the library list you want to add. The maximum length is 10 characters.

5. Enter a brief description of the library list. This field is optional.
6. Select a library to add from the list of Available libraries and click **Add**. It is displayed in the **Selected libraries** box. Note: A maximum of 250 libraries can be associated with any single library list. All libraries must be valid.
7. If you want to remove a library from the library list, highlight the library in the **Selected libraries** box and then click **Remove**. The library is automatically removed from the library list.
8. When you are done, click **OK** to add your library list.

Related concepts

[Library Lists](#)

The Advanced Job Scheduler Properties page provides you with a place to work with Library Lists.

Setting up Command Variables

The **Command Variables** page allows you to add a command variable, add a command variable that is based on an existing one or remove a command variable, provided it is not currently used by a scheduled job. You can also select an existing command variable and display or modify the properties.

To set up Command Variables, follow these steps:

1. Expand **Work Management**.
2. Expand **Advanced Job Scheduler** and click **Properties**.
3. On the **Command Variables** page, click **New**.
4. Enter the name of the new command variable. The maximum length of the name is 10 characters.
5. Enter a brief description of the variable. This field is optional.
6. Enter the length of the value that is returned within the command string in the **Length** field. The possible values are 1 through 90.
7. Select how you want the returned value to be supplied. It can be supplied in one of several ways:
 - Click **Data** to enter and store the value in the space provided.
 - Click **Use Formula** to enter a date calculating formula. See the help for more information.
 - Click **Retrieve from program** to call a user-defined program to supply the replacement value. You must enter the program name and library in the fields provided.
 - Click **Retrieve from system operator** to retrieve the replacement value from the system operator at run time.
8. When you are finished entering all the pertinent information, click **OK** to add the command variable to the list of existing variables.

Related concepts

Command Variables

The Advanced Job Scheduler Properties page provides you with a place to work with Command Variables.

Assigning data libraries to users

The data library stores any changes that the user does using the Advanced Job Scheduler. A data library contains all the objects that are found in the QUSRIJS library. You can have an unlimited number of data libraries.

To assign data libraries to users, follow these steps:

1. Expand **Work Management**.
2. Expand **Advanced Job Scheduler** and click **Properties**.
3. On the **Users** page, click **Add** to add new users.
4. Specify a name.
5. Select a data library from the list of data libraries.
6. Click **OK** to add the user.

Setting up systems and groups

The Systems and Groups page allows you to add, remove, and change existing IP addresses and other information for IBM i and non-IBM i systems used by the Advanced Job Scheduler.

There are various system types that can be defined for a system such as IBM i, AIX®, UNIX, and Windows. System groups can be defined with one or more non-IBM i systems. In order for a scheduled job to process commands on a non-IBM i system, you must check the **Run as remote command** box below the list of commands and select the appropriate single system or system group on the **Batch Information** tab of the job. To run a scheduled job on a remote IBM i or LPAR, do not check the **Run as remote command** box and select the appropriate single system on the **Batch Information** tab. Advanced Job Scheduler must be installed on the remote IBM i.

The Run Remote Command (RUNRMTCMD) command is being used to issue the commands on the non-IBM i systems. The RUNRMTCMD command allows server users to run a command on a remote system that is running the target portion of this function. The target portion of this function can be a remote executing daemon (rexecd).



Attention: Commands that are processed on non-IBM i systems might report that the command ended normally even though the command did not complete normally. The main reason is that the rexecd being used does not return the appropriate error code information to the RUNRMTCMD. The process produces a spooled file with information about the process that helps to determine whether the command completed normally. The spooled file cannot be used by the scheduler because of translation issues and inconsistencies.

Related concepts

Systems and groups

The Systems and Groups page allows you to add, remove, and change IP addresses to remote systems that are used for the communication and running of scheduled jobs on remote systems.

Adding a system or system group

Follow this procedure to add a system or system group.

To add a system or system group, follow these steps.

1. Expand **Work Management**.
2. Expand **Advanced Job Scheduler** and select **Properties**.
3. Select the **Systems and Groups** tab.
4. Existing systems and groups for Advanced Job Scheduler are listed. To add an entry, select **New** and select the entry type.
5. Select **Single system** type or **System group** and click **Go**.
6. For a single system that is an IBM i, enter the following information: System name and Network ID, IP address, Description, and select the **Communication** type. The system name and network identifier are used in the definition of a scheduled job to determine the IP address of the remote system the job is to run on. After you define the target system on the source system, define the source on the target system. Use the same Communication type for both. For more information about the Communication type, see [“Communication type” on page 16](#).
7. For a single system that is non-IBM i, enter the following information: System name, IP address, Description, User, and Password. The User and Password are optional and are related to commands that are to be processed on the remote system and to the remote running daemon (rexecd) running on the remote system.
8. For a system group, enter the following information: Group name, Description, and select the systems to be associated with the group.
9. Click **OK** when you are finished.

Communication type

Describes how to communicate with a target system.

When a job is ready to run on a remote IBM i, Advanced Job Scheduler uses the Communication type to determine how to communicate with the target system. The source system issues the job submission information and commands to the target system and the target system issues completion and log information back to the source system.

Choose the communication type that is best for your situation.

Use Distributed Data Management (DDM)

All the communication between the source and target systems uses DDM over TCP/IP. A consideration for using DDM is that the Password required (PWDRQD) parameter on the Change DDM TCP/IP Attributes (CHGDDMTCPA) command must be set to *NO. This consideration might be a security issue that you are not allowed to change. If this type is used, the DDM server must be started manually in the start-up process. The DDM server can be started automatically by setting the Autostart server (AUTOSTART) parameter on the Change DDM TCP/IP Attributes (CHGDDMTCPA) command to *YES.

Use product TCP/IP server

All the communication between the source and target systems uses the TCP/IP server provided by Advanced Job Scheduler. This communication type eliminates the DDM password requirement using DDM. The server job is QIJSSRVZ. It can be found in the QSYSWRK subsystem and is automatically started when the product is started using the Start Job Scheduler (STRJS) command. Job QIJSXRMTT is also used in the remote job process and can be found in the QSYSWRK and QUSRWRK subsystems. The default port used is 8250.

This example shows how an IBM i target system could be defined on system PROD.

System name

TEST

Network ID

APPN

IP address

192.168.200.201

Communication type

Use product TCP/IP server

Source system defined on system TEST.

System name

PROD

Network ID

APPN

IP address

192.168.200.247

Communication type

Use product TCP/IP server

Managing the Advanced Job Scheduler

This information shows how to schedule jobs using the Advanced Job Scheduler.

Creating and scheduling a job

Scheduled jobs can be a single job, a member of a job group or an application. You can schedule a batch job to be submitted every week, every month, at a regular interval, and so on, based on the schedule you

specify. You can schedule jobs with user-defined calendars, holiday exception calendars, and fiscal year calendars.

The scheduled job definition contains all of the information that is needed to submit the job, including the commands to process, the job description, and user profile under which the job is run, the job queue to which the job is submitted, the message queue to which messages are sent, and so on.

To create and schedule a new scheduled job, follow these steps:

1. Expand **Work Management**.
2. Expand **Advanced Job Scheduler**.
3. Select **New Scheduled Job**.

The following pages must be completed.

General Page

1. Enter the Job name in the **Job name** field. The maximum length for the name is 10 characters. All new jobs names must be unique.
2. Enter a brief description of the new job. This field is optional.
3. Select whether you want the job to be a scheduled job, non-scheduled job, or an alternate job.
NOTE: If you decide to create a non-scheduled job, the **Schedule** page is omitted.
4. Add commands to the command list:
 - a. Select **Add** beside the Command box.
 - b. Enter a command string. Select **Prompt** for assistance in entering a command.
 - c. Add message identifiers that are associated with this command. When the job runs and an error message is issued matching one of the messages that are entered for the selected command, the job will log the error but continue processing with the next command in the list.
 - d. Select **OK** to add the command.
5. Enter the application that is associated with the new job in the space provided. You can select an application from a list of existing applications. For more information, see [“Creating and working with application controls and job controls”](#) on page 26.
6. Enter the name of the report distribution list that the job uses when the job distributes spooled files to email addresses and user's output queues. The spooled files to distribute are generated by the scheduled job. You may select a report distribution list from existing lists.

Schedule Page

1. There are two ways to specify the schedule for a scheduled job. You can select a pre-defined schedule to be associated with the job or define the schedule within the job. Even if a pre-defined schedule is used you are required to enter the scheduled times. The job can be defined to run up to 10 times per scheduled day or you can schedule the job to run every so many minutes. To define the schedule within the job, continue with the following steps.
2. To select specific dates for the schedule, select **On selected dates** under the **Frequency** parameter in the **Dates to run** box. To add specific dates, click the dates you want to include on the calendar. Up to 30 dates can be selected. All of the dates that are selected are summarized in the **Details** box. The date range of the calendar is automatically completed for you below the calendar.
3. To select days of the week for the schedule, select **Weekly** under the **Frequency** parameter in the **Dates to run** box. There are two ways to select days of the week.
 - a. You can select the day of the week to select that specific day of the week. For example, if you want all Mondays to be included for that month, select any Monday that is shown and all of the Mondays are then highlighted and added to the calendar.
 - b. Alternatively, under the **Details** box, select the day of the week you want to add to the calendar.

For example, if you want all Fridays to be included on the calendar, select **Friday** under **Details**. All Fridays are highlighted and automatically added to the calendar. If you must remove any dates from the calendar, clear the dates to remove.

4. To select certain days of the month for the schedule, select **Monthly** under the **Frequency** parameter in the **Dates to run** box. Select and highlight the days of the month that you want to include in the calendar. The days are summarized in the **Details** box. For example, if you want the first day of every month to be included in your calendar, select the first of the current month. This day is carried over to every month. Day 1 of every month is displayed in the **Details** box. You can add up to 30 days. You can also specify if you want the first working day, last working day, first, second, third, fourth, fifth or last day of each month to be included on the schedule for the job.
5. To select certain dates of each year for the schedule, select **Yearly** under the **Frequency** parameter in the **Dates to run** box. Select and highlight the specific dates that you want to include in the calendar. The date carries over to every year. The dates are summarized in the **Details** box. For example, if you select September 1, this date will be scheduled for every year. 09/01 every year is displayed in the **Details** box. You can add up to 30 dates.

Batch Information Page

Specify the information that is used when submitting a new scheduled job in batch.

Notification Page

The **Notification** page provides you with a place to specify how to notify your users the status of a job. You can choose to send a completion message to a message queue. You must specify the message queue and library to which you want to send the message. Click **Browse** to select the message queue from a list of existing queues. With the use of email notification, you can send a message regarding the successful or unsuccessful completion of the job, if the job is submitted but does not start within a certain time limit or if the job is waiting on an error message. You must specify both the recipient of the message and the message itself.

Note: Before you can send an email message, you must specify a mail server to use for notification. For more information, see [“Specifying a mail server to use for notification”](#) on page 11.

Problem Recovery Page

1. Enter the maximum time in minutes that the job can run. You can enter a number 1 - 9999. Specify the action that you want to take after the maximum run time expires. The job can be ended or the system operator notified that the maximum run time expires.
2. Select **Use alternate job if job fails** if you decide that you want to use an alternate job if the current one fails. Alternate jobs are used with jobs that do not process successfully. When Advanced Job Scheduler detects an unsuccessful job completion, it checks to see if there is an alternate job that is associated with the unsuccessful job. If there is, Advanced Job Scheduler processes the alternate job. Jobs are not required to have alternate jobs.
3. Enter the recovery action to be taken if the job cannot be submitted at the designated time because the system is powered down or in restricted state. The action that is specified on the parameter occurs at the next IPL or when the Advanced Job Scheduler system becomes active. Jobs that are submitted after an IPL or when the system comes out of restricted state are submitted in the same order that they would be submitted if the jobs are submitted at the times that are specified in the job schedule entries. If multiple occurrences of a recurring job are missed, the job is submitted only once. The first missed occurrence of the job is calculated from the current date.
4. Enter the reply that you want to assign to inquiry messages. You can specify that no change is made in the way that predefined messages are answered, that all inquiry messages require a reply, that a default reply is issued, or that the system reply list is selected for a matching reply as each predefined inquiry message is sent.

Note: The product default when installed is to use the default reply.

5. Advanced Job Scheduler allows for extensive message logging. Enter the message level in the **Level** box, or use the drop-down arrow to open a list of possible values.

6. Enter the message severity in the **Severity** box, or use the drop-down arrow to open a list of possible values.
7. Enter the message text in the **Text** box, or use the drop-down arrow to open a list of possible values.

Local Data Area Page

The Local Data Area (LDA) page allows you to change the stored LDA for this job and assign variables to specific positions of the LDA. The LDA values that are displayed here are the LDA values that the job will use when submitted from Advanced Job Scheduler.

Documentation Page

Specify any text documentation for the scheduled job. For example, specify information for restarting the job, who is responsible, or who to contact during failures.

Related tasks

[Creating and working with application controls and job controls](#)

Applications are jobs that are grouped for processing. They are broader than job groups and do not necessarily process sequentially. Jobs in applications can process simultaneously and one job does not need to wait for another to process. All jobs within the application can be worked with and can have their own set of job defaults. Job controls are the defaults that are assigned to a job as you add it to the job scheduler as well as defaults used when the job is submitted.

Creating and scheduling a job group

You can set up and schedule a series of jobs that run consecutively in a specified order. Jobs within a job group require completion before the next job is submitted for processing.

Job groups are jobs that are grouped to run consecutively in the order specified. A normal completion is required for each job in the group before the next job in the group is submitted for processing. If any job in the group does not complete normally, the processing stops for that group.

To create and schedule a new job group, follow these steps:

1. Expand **Work Management**.
2. Expand **Advanced Job Scheduler**
3. Expand **Job Groups** and click **New Job Group**.

For more information about details for the new job group, refer to the online help.

Related concepts

[Creating a job group](#)

You can set up and schedule a series of jobs that run consecutively in a specified order.

Predefined schedules

You can create schedules that contain information needed to schedule a job or calculate exception dates within a holiday calendar.

For instance, you can create an ENDOFWEEK schedule that contains the day of the week to run, along with any additional calendars. The ENDOFWEEK schedule can then be used by all the jobs that match that scheduling frequency. You can access this feature only through IBM Navigator for i.

You can also use predefined schedules that are used in a job with your holiday calendars. You can create a schedule THIRDFRI that has a frequency of the third Friday of each month. When you use THIRDFRI in a holiday calendar, you cause all jobs that use this holiday calendar to not run on the third Friday of each month. You can use one or more schedules in a holiday calendar. Dates that are generated by the schedule is shown on the calendar with a black border.

Related concepts

[Schedules](#)

The Advanced Job Scheduler Properties page provides you with a place to work with predefined schedules.

Setting up a predefined schedule

To set up a predefined schedule, follow these steps.

1. Expand **Work Management**.
2. Expand **Advanced Job Scheduler** and click **Properties**.
3. Click the **Schedules** tab.
4. Click **New** and type a name for the schedule.
5. Type a description for the schedule.
6. Select the frequency and dates that you want to include in your schedule, and any additional calendars.

For more information as you complete details for the new schedule, refer to the online help.

Adding a schedule to a scheduled job

To add a schedule to a scheduled job, follow these steps:

1. Expand **Work Management**
2. Expand **Advanced Job Scheduler**.
3. Expand **Scheduled Jobs** and select **Scheduled Jobs** to list jobs.
4. Select the scheduled job and click **Properties**.
5. Click the **Schedule** tab.
6. From the upper right corner of the tab, select the appropriate Schedule option.

Adding a schedule to a holiday calendar

A holiday calendar is an exception calendar for days that you do not want to process an Advanced Job Scheduler job. Alternate days can be specified for each exception day that you specify in a holiday calendar.

To add a schedule to a holiday calendar, follow these steps:

1. Expand **Work Management**.
2. Expand **Advanced Job Scheduler** and click **Properties**.
3. Select **Calendars** and click **Holiday Calendars**.
4. On the **Holiday Calendars** page, select the holiday calendar and click **Properties**.
5. From the lower left corner of the tab, click **Schedules**.
6. Select the appropriate schedule and click **Add**.
7. To change the **Alternate day**, remove the schedule from the list and add the schedule again with the correct **Alternate Day**.

For more information about adding schedules to a holiday calendar, refer to the online help.

Creating a temporary scheduled job

At times it might be necessary to run a scheduled job now or in the future in addition to its normal schedule. Use the Submit Job using Job Scheduler (SBMJOBJS) command, option 7 from Work with Jobs display, or the **Run** option from IBM Navigator for i. It might also be necessary to process only a portion of the commands in the command list to set up this special run.

The SBJJOBJS command allows you to specify the Starting and Ending command sequences. For instance, JOBA has five commands, sequences 10 through 50. You can specify on the SBJJOBJS command to start with sequence 20 and end with sequence 40. This bypasses sequence 10 and 50.

IBM Navigator for i allows you to select a starting command within the command list and an ending command.

To run a special version of a scheduled job with IBM Navigator for i, follow these steps:

1. Expand **Work Management**.
2. Expand **Advanced Job Scheduler**.
3. Expand **Scheduled Jobs** and select **Scheduled Jobs** to list jobs.
4. Select the scheduled job and click **Run**.
5. Specify whether to run the job now or in the future.
6. Select the starting and ending commands.

For more information about creating a temporary scheduled job, refer to the online help.

Scheduling job dependencies

The Advanced Job Scheduler allows you to set up dependencies that reflect how jobs are processed in your environment. Dependencies determine when a job or group of jobs can run. You can select to require all dependencies to be met before a job can run, or you can require at least one dependency to be met before the job can run.

Dependencies include the following items:

Job dependencies

Job dependencies refer to predecessor and successor relationships for jobs. Predecessor jobs are those that must run before the successor job runs. A successor job is a job that runs after all the predecessor jobs have been processed. There can be multiple successor jobs for a single predecessor job as well as multiple predecessor jobs for a single successor job. In addition, you can specify that a dependent job is skipped if its predecessors and successors run on a day that the dependent job is not scheduled to run.

Active dependencies

Active dependencies are lists of jobs that cannot be active when the selected job is to be submitted. If any of the jobs are active, the Advanced Job Scheduler will not allow the specified job to run. The selected job is delayed until all the jobs in the list are inactive.

Resource dependencies

Resource dependencies are based on several things. Each type that follows describes the areas that are checked. Following are the types of resource dependencies:

File

The job is dependent on the existence or non-existence of a file and whether it meets the specified allocation level to be processed. It can also check whether records are present before the job is processed. For instance, JOBA can be set up so that it only runs when file ABC exists, and the file can be allocated exclusively and if records are present in the file.

Object

The job is dependent on the existence or non-existence of a QSYS type object and whether it meets the specified allocation level to be processed. For instance, JOBA can be set up so that it runs only when data area XYZ exists. The job can also be dependent on the existence or non-existence of an object found in the integrated file system. If the dependency is based on any object in the path, end the integrated file system path with a forward slash '/'.

Hardware configuration

The job is dependent on the existence or non-existence of a hardware configuration and its status to be processed. For instance, JOBA can be set up so that it runs only when device TAP01 exists and has a status of Available.

Network file

The job is dependent on the status of a network file to be processed.

Subsystem

The job is dependent on the status of a subsystem to be processed.

To work with job dependencies, follow these steps:

1. Expand **Work Management**.

2. Expand **Advanced Job Scheduler**.
3. Expand **Scheduled Jobs** and select **Scheduled Jobs** to list the jobs.
4. Select the **Job** whose dependencies you want to work with.
5. Select one of the following: **Job Dependencies**, **Active Dependencies** or **Resource Dependencies**. Refer to the online help for more information.

The Work Flow Manager

Using the Work Flow Manager, you can define units of work that consist of automated or manual steps. These units of work can then be scheduled or run interactively. The Work Flow Manager is in the Advanced Job Scheduler in the IBM Navigator for i interface.

Each step within the work flow can have one or more predecessor Advanced Job Scheduler jobs and one or more successor Advanced Job Scheduler jobs. When a work flow starts, the first step is flagged to run. When it completes, the next step is flagged to run.

The following are more considerations when you use the Work Flow Manager:

- You can manually start a work flow at any step. When you do so, you bypass all previous steps in the work flow.
- Automatic steps complete after all prior steps complete. This includes all predecessor Advanced Job Scheduler jobs.
- After a step completes, the successor Advanced Job Scheduler jobs are flagged to run.
- Manual steps can complete in any sequence after the step's predecessor jobs complete.
- You can mark completed manual steps as not complete and run them again after there are no subsequent incomplete automatic steps.
- You can cause a step to wait until the job completes before notifying of the step's completion by specifying predecessor jobs that are the same as the successor jobs of the previous step.
- You can notify other users when a particular step starts, stops, did not start by a specific time, or is taking too long. For example, you can notify a user who is responsible for a particular manual step that the previous automated steps complete.

When you use work flows, the activity log displays when the work flow started, the steps that were run, the status of automated steps (success or fail), when the work flow ended, and the final status of the work flow.

Table 1. Work Flow Example	
Work Flow	PAYROLL
Scheduled	Every Friday at 1 p.m.
Notification	Clerk - Payroll work flow starts
Step 1	Automatic - Specifies a successor job to initialize payroll files
Step 2	Automatic: • Specifies the successor job from step 1 as a predecessor job for this step • Notifies Clerk that timecards can be entered
Step 3	Manual: • Clerk completes after timecards are entered • Specifies a successor job to process timecard files and print timecard report • Notifies Supervisor if step is not completed within 120 minutes

<i>Table 1. Work Flow Example (continued)</i>	
Work Flow	PAYROLL
Step 4	Automatic: • Specifies successor job from previous step as a predecessor job • No Successor jobs • Notifies Clerk to check timecard report
Step 5	Manual: • Clerk completes after checking reports • Specifies a successor job to process payroll
Step 6	Automatic: • Specifies the successor job from previous step as a predecessor job • No Successor jobs • Notifies Clerk and Supervisor that payroll is complete

In this example the work flow PAYROLL starts every Friday at 1:00 p.m. A notification is sent to the Clerk when the work flow starts.

Because Step 1 is automatic and does not have any predecessor jobs, it flags the successor job that initializes the payroll files to run and then complete. Step 2 has the successor job for Step 1 as its predecessor. Step 2 waits for the job that initializes the payroll files to complete. After it completes, Step 2 notifies the Clerk that he can enter timecards. There are no successor jobs to flag to run.

The Clerk manually completes Step 3 after all of the timecards are entered. The successor job that processes the timecard file and prints a timecard report is flagged to run. As a precaution, the Supervisor is notified if the step is not completed within 120 minutes. Because the predecessor job for Step 4 is the successor for Step 3, Step 4 waits until the job that processes the timecard file and prints a timecard report completes.

After the job completes the Clerk is notified that the timecard report can be checked. There are no successor jobs to flag to run. After the timecard report is checked, the Clerk manually completes Step 5. The successor job that processes the payroll and produces the checks is flagged to run.

Because the predecessor job for Step 6 is the successor for Step 5, Step 6 waits until the job that processes the payroll and produces the checks completes. After the job completes, it notifies the Clerk and Supervisor that Payroll is complete. The checks can now be printed and distributed.

For more detailed information about the Work Flow Manager, see the online help.

Creating a work flow

When you create a work flow, you must specify how the work flow is started, its maximum process time, the task steps and their run sequence, scheduling, notification, and documentation details.

To create a work flow, you must complete the following steps:

1. Expand **Work Management**.
2. Expand **Advanced Job Scheduler**.
3. Expand **Work Flow Manager** and select **New Work Flow**.

For more information about how to complete the New Work Flow window, see the online help.

After a work flow is created, you can manage the work flow by selecting the work flow name and clicking **Work Flow Status**.

Starting a work flow

When you start a work flow, you can choose whether you want the work flow to start on the first sequence or on a specific sequence.

To start a work flow, do the following steps:

1. Expand **Work Management**.
2. Expand **Advanced Job Scheduler**.
3. Expand **Work Flow Manager** and select **Work Flow Manager** to list the Work Flows.
4. Select the Work Flow and click **Start**. The **Start Work Flow** page is displayed.
5. Select if you want the work flow to start on the first sequence or on a specific sequence. If you select to start at a sequence other than the first, all of the prior steps are marked as completed.

For more information about the **Start Work Flow** window, see the online help.

Working with work flows

You can control and monitor the work flow as it runs by using the **Work Flow Status** window.

You can access the **Work Flow Status** page by selecting a work flow and clicking **Status**.

- The **General** window shows you the status of the work flow.
- The **Steps** window provides you with a list of all steps that are currently defined to the work flow.
 - You can see whether a step is defined as automated or manual and when the step is started and ended.
 - To mark a manual step as complete, select the correct step and check the **Complete** box.
 - Manual steps can be marked completed in any order if all of the predecessor Advanced Job Scheduler jobs for the step are complete.
 - Manual steps can be marked as not completed if there are no Automatic steps that are complete further in the list.
 - A work flow can be started manually at any step. This bypasses all previous steps.

To refresh the list, click **Refresh**.

- The **Documentation** window shows you the documentation text for the work flow.

Monitoring job activity for the Advanced Job Scheduler

You can use the Advanced Job Scheduler to view the history or status of a job or a job group. You can also set up the activity retention, which is how long you want to retain the activity records for a job.

Scheduled job activity

The scheduled job activity allows you to specify how long the Advanced Job Scheduler activity records are to be retained. The possible values are 1 to 999 days or occurrences. You can specify to keep activity for a certain number of days, or for a certain number of occurrences per job.

The following details about a scheduled job are displayed:

- Name The name of the scheduled job.
- Group The name of the job group for the job.
- Sequence The sequence number of the job within the group, if the job is in a job group.
- Completion Status The status of the job.
- Started When the job started running.
- Ended When the job ended.
- Elapsed Time The amount of time in hours and minutes the job took to process.

Specifying the activity retention

These steps show how to specify the activity retention.

1. Expand **Work Management**.
2. Expand **Advanced Job Scheduler**.
3. Expand **Scheduled Job Activity** and click **Properties**.

Viewing the scheduled job activity details

These steps show how to view the scheduled job activity details.

1. Expand **Work Management**.
2. Expand **Advanced Job Scheduler**.
3. Expand **Scheduled Job Activity** and select **Scheduled Job Activity**.

Viewing the scheduled job activity for a specific job

These steps show how to view the scheduled job activity for a specific job.

1. Expand **Work Management**.
2. Expand **Advanced Job Scheduler**.
3. Expand **Scheduled jobs** and select **Scheduled Jobs**.
4. Select the **Job Name** whose activity you want to display and click **Activity**.

Viewing the activity log details

The activity log displays activity within the scheduler such as a job added, changed, or submitted. Security violations, sequences processed by a scheduled job, and any errors received are displayed. The dates and times for the previous activities are also displayed.

To view detailed message information, double-click a date and time. To view the activity log details, follow these steps:

1. Expand **Work Management**.
2. Expand **Advanced Job Scheduler**.
3. Expand **Activity Log** and select **Activity Log**. The entries are shown in reverse order.

Viewing the activity log for a specific job

These steps show how to view the activity log for a specific job.

1. Expand **Work Management**.
2. Expand **Advanced Job Scheduler**.
3. Expand **Scheduled jobs** and select **Scheduled Jobs**.
4. Select the **Job Name** whose activity log you want to display and click **Activity log**.

You can also use the **Last Run** page of a job's properties to view the progress of a job. Specify the Set Step using Job Scheduler (SETSTPJS) command before or after a step in the CL program along with a description that states the progress of the job. When the job reaches the SETSTPJS command in the program, the associated description is displayed in the **Last Run** page.

Monitoring for messages with Advanced Job Scheduler

Each command in the command list of a job can have message identifiers that are used for monitoring. When the job runs and an error message is issued that matches one of the messages entered for the selected command, the job logs the error but continues processing with the next command in the list.

If zeros are specified in either two or all four of the rightmost positions, such as ppmmm00, a generic message identifier is specified. For example, if CPF0000 is specified, all the CPF messages are monitored.

To add message identifiers to a command, follow these steps:

1. Expand **Work Management**.

2. Expand **Advanced Job Scheduler**.
3. Expand **Scheduled Jobs** and select **Scheduled Jobs** to list jobs.
4. Select the scheduled job and click **Properties**.
5. Select the command from the list and click **Properties**.
6. Click **Messages**.
7. Enter the message identifiers to monitor and click **Add**.

Creating and working with local data area

A local data area is a portion of space that is allocated for a job. Not all jobs use their local data area but some do. Each command within a job has access to the job's local data area. You might want to use a local data area if you are scheduling a job that previously required you to manually specify additional parameters. Use the local data area to specify the additional parameters so you are not required to manually specify them each time the job starts.

To specify local data area information for a scheduled job, follow these steps:

1. Expand **Work Management**.
2. Expand **Advanced Job Scheduler > Scheduled Jobs**.
3. Select a job and click **Properties**.
4. Edit the **Local Data Area** window as necessary.

Refer to the online help for more information as you fill in details for the local data area.

Creating and working with application controls and job controls

Applications are jobs that are grouped for processing. They are broader than job groups and do not necessarily process sequentially. Jobs in applications can process simultaneously and one job does not need to wait for another to process. All jobs within the application can be worked with and can have their own set of job defaults. Job controls are the defaults that are assigned to a job as you add it to the job scheduler as well as defaults used when the job is submitted.

Applications are jobs that are grouped for processing. For example, you might have a series of jobs that you use for payroll that you want to group for an accounting process.

Job Controls are the defaults that are assigned to a job as you add it to the job scheduler as well as defaults used when the job is submitted. Job control defaults include such things as calendar, holiday calendar, job queue, job description.

You can display all the existing applications or job controls on your system. You can add an application control or a job control, add application controls or job controls that are based on an existing one, or remove an application control or a job control. You can also select an application or job control and display or change its properties.

To create an application/job control, follow these steps:

1. Expand **Work Management**.
2. Expand **Advanced Job Scheduler** and click **Properties**.
3. Click the **Job Controls/Applications** tab.
4. Click **New** and type a name for the application.
5. Type a description for the application.
6. Choose the contacts for the application. Contacts are the names of users who are contacted if you have a problem with a job within the application. You can specify up to 5 contacts per application. You can also choose to add or remove contacts from the contact list.
7. You can type information to help you identify the application. The information is associated with the new application. This information might be useful if any problems occur.
8. Select **Batch Information** to specify job defaults such as Job Description, Job Queue, Output Queue.

9. Select **Notification** to specify job defaults such as the recipient to notify if the job completes abnormally.
10. Select **Problem Recovery** to specify job defaults such as Reply to inquiry messages, Logging Level.

Related tasks

Creating and scheduling a job

Scheduled jobs can be a single job, a member of a job group or an application. You can schedule a batch job to be submitted every week, every month, at a regular interval, and so on, based on the schedule you specify. You can schedule jobs with user-defined calendars, holiday exception calendars, and fiscal year calendars.

Working with notification

Within notification, you can perform a series of tasks. Use notification to specify recipient properties and report distribution list properties. In addition, you can send email messages and set up an escalation list in case a recipient does not respond within a specified amount of time.

Before you can send an email message, you must specify a mail server to use for notification.

The following are highlights of the notification function of Advanced Job Scheduler:

Recipient

When you schedule a job, you can specify whether to send notification messages to specified recipients. You can send a notification message if a job fails, completes successfully, or does not start within a specified time limit. For each specified recipient, you must define the recipient's properties. You can access the recipient's properties by expanding **Advanced Job Scheduler > Notification > Recipients**, and then select a recipient from the list of recipients.

Report distribution list

Use a report distribution list to specify a list of spooled files that are eligible for distribution. Each spooled file that is produced by a job is checked to see if a match exists within the spooled file list. If so, the recipients that are associated with that spooled file receive a copy of the spooled file by email, a duplicate of the spooled file in their output queue, or both. You can access report distribution lists by expanding **Advanced Job Scheduler > Notification > Report distribution list**.

Output Queue Monitor

An Output Queue Monitor monitors for any spooled file that is created in its selected output queue. Once a spooled file is created, the spooled file is checked against the spooled file entries within the Report distribution list that is assigned to the Output Queue Monitor. If a match is found, the spooled file is distributed to one or more output queues, one or more email addresses, or both. The distribution is based on the definition of the list.

Output queue monitor considerations:

1. Data queue QIJSOQM in library QUSRIJS is associated with the output queue. When you add a monitor, an error occurs if a different data queue is already associated with the output queue.
2. For an Output Queue Monitor to distribute spooled files, the main job monitor for the data library that contains the Output Queue Monitor must be active.
3. The spooled file must be created with a Ready status in order for the monitor to attempt distribution.
4. Releasing a held spooled file triggers the data queue and possibly cause the spooled file to be distributed.
5. It is possible to monitor the same output queue multiple times. It is also possible for one monitor to remove the spooled file before the other monitor can distribute it.
6. Spooled files with graphics cannot be distributed.

Email

You can send an email message to any recipient that is defined in the list of recipients as well as specific email addresses. The recipient's properties must specify an email address to send the message to. When you send an email message, you can attach a spooled file. The spooled file can be

sent in PDF format. In addition, you can specify an escalation list to use if the intended recipient does not respond within a specified time.

Escalation list

An escalation list specifies a list of recipients in descending order. The recipients are notified in the order that they are listed. If the first recipient does not respond to the message, the message is sent to the next recipient. This process continues until a response is made. To define an escalation list, expand **Advanced Job Scheduler > Notification > Escalation Lists**.

Related concepts

Notification

Use notification to specify recipient properties and report distribution list properties.

Stopping a message from escalating

To stop a message from escalating, complete these steps:

1. Expand **Work Management**.
2. Expand **Advanced Job Scheduler > Notification > Sent**.
3. Select the escalating message and click **Stop**.

Working with library lists

Library lists are user-defined lists of libraries that are used by the Advanced Job Scheduler when a job is processing.

A **library list** is a user-defined list of libraries that is used by the Advanced Job Scheduler job to search for information it needs while processing. You can display library lists, add a new library list, add a new library list based on an existing one, or remove a library list, provided that it is not being used by a currently scheduled job.

You can select a list and display its properties to make changes. You can place up to 250 libraries on the library list.

To add a new library list, follow these steps:

1. Expand **Work Management**.
2. Expand **Advanced Job Scheduler** and click **Properties**.
3. Click the **Library Lists** tab.
4. Click **New** and type a name for the library list.
5. Type a description for the library list.
6. Select the libraries from the list of existing libraries, and click a library.
7. Click **Add** to add the list of selected libraries.

Working with command variables

A command variable (previously known as a parameter) is a variable you can store and use in jobs that are submitted through the Advanced Job Scheduler. Examples of command variables include the beginning of each month, a division number, a company number, and so on.

Command variables (previously known as parameters) are variables that you store in the Advanced Job Scheduler and use in jobs that are submitted through the Advanced Job Scheduler. Command variables contain information that is replaced inside the command string of a scheduled job. Examples of command variables include the beginning of each month, a company division number, a company number and so on. You can display command variables, add a command variable, add a command variable that is based on an existing one, or remove a command variable, provided it is not currently in use by a scheduled job.

You can select an existing command variable and display or change its properties.

To add a command variable, follow these steps:

1. Expand **Work Management**.

2. Expand **Advanced Job Scheduler** and click **Properties**.
3. Click the **Command Variables** tab.
4. Click **New** and type a name for the command variable.
5. Type a description for the command variable.
6. Type the length of the command variable. The length can range from 1 to 90.
7. Choose how you want to supply the replacement value:
 - a) Specify the data to use for the command variable. You use any character in this field. The number of characters in the data cannot be greater than the length specified in the Length field.
 - b) Type a formula to calculate the date. (For examples, see the online Help.)
 - c) Type the program name that you use to retrieve the replacement value.
 - d) Type the library that you use to retrieve the replacement value.
 - e) Choose whether you want the replacement value that is retrieved from the system operator at run time.

Troubleshooting the Advanced Job Scheduler

When a job does not run at the scheduled time, these troubleshooting methods can help you find out what you can do.

To troubleshoot the Advanced Job Scheduler, first view the Frequently Asked Questions page at [IBM Advanced Job Scheduler for i Web site](#). See the commonly asked questions that identify how to do certain functions with Advanced Job Scheduler.

Also, here are a list of items that you can review when a job does not run at the scheduled time:

Current fix level

The first thing you should verify is that your fixes are current. When you request fixes, be sure to request a list of all fixes. Not all fixes are included in the [Cumulative PTF packages](#).

Check job monitor

- Job QIJSSCD should be active in the QSYSWRK subsystem. If it is not, process the Start Job Scheduler (STRJS) command.
- The job monitor can be in a loop if the status of the job is RUN for over ten minutes. If it is in a loop, end the job with *IMMED, and start the job monitor again (STRJS).
- If there is a message to answer, reply with a C (Cancel). The job monitor goes into a 90-second delay and then start monitoring again. Print the job log for the monitor job. This contains the error messages.

Check the Advanced Job Scheduler log

Process the Display Log for Job Scheduler (DSPLOGJS) command for the job. Press F18 to go to the end of the list. Entries exist to explain why the job did not run. Examples of the entries include a resource failure, active or job dependency situation, or submission error.

Dependency on another job

If the job is dependent on another job, take option 10 from the Work with Jobs display to display job dependencies. Press F8 to list all predecessor jobs. A dependent job cannot run unless all the predecessor jobs show *YES in the **Complete** column.

Track a job's progress

If a job is not functioning properly, you can use the Set Step using Job Scheduler (SETSTPJS) command before or after a step in your CL program to help determine what the problem is. Specify the command along with description text in your CL program. Use this command as many times as necessary. The text description that is associated with the current command is displayed in the Command step field on the Last Run page of the scheduled job properties. In addition, you can view the Command step field on the Status window of an active job. The Command step field is automatically updated every time the job encounters the SETSTPJS command. Use this command to help determine the progress of a job.

Collecting these data samples can help in your problem analysis:

Error message conditions

Print the job log for the interactive session, monitor job or scheduled job, depending where the error occurred.

Job schedule date is not correct

Process the DSPJOBJS command for the job with OUTPUT(*PRINT). Print a calendar report if a calendar is used within the job. Print a holiday calendar report if a holiday calendar is used within the job. Press the Print key to print the display of each fiscal calendar entry for the fiscal calendar used within the job.

Advanced Job Scheduler log

Always print the Advanced Job Scheduler log for the time period in question.

Files QAIJSMST and QAIJSHST

Files QAIJSMST and QAIJSHST in library QUSRIJS might need to be journaled before trying to reproduce the problem. Also, the QUSRIJS library may be needed by IBM support.

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