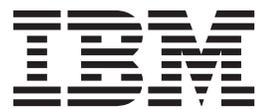


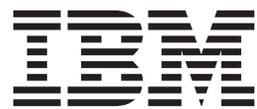
IBM InfoSphere Information Server
Version 11 Release 3

*IBM InfoSphere Information Server
Integration Guide for IBM InfoSphere
DataStage Pack for SAP BW*



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Note

Before using this information and the product that it supports, read the information in “Notices and trademarks” on page 125.

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Chapter 1. IBM InfoSphere Information Server Pack for SAP BW

IBM® InfoSphere® Information Server Pack for SAP BW includes two stages:

- Load stage
Loads data into the SAP Business Information Warehouse.
- Hub Extract stage
Allows the extraction of any type of data supported by the Open Hub architecture and allows for the initiation of data extraction from either SAP BW or InfoSphere DataStage®. It also uses certified APIs to access extracted metadata and data in the SAP BW system. The Open Hub Extract stage is designed for SAP BW installations equal to or greater than version 3.5

The InfoSphere DataStage Pack for SAP BW follows the SAP standard interface protocol, Business Application Programming Interface (BAPI), supporting high-performance loading of the Business Information Warehouse from heterogeneous sources. This Pack lets you maximize your existing investments in large ERP systems. SAP BW is open to different Source Systems and includes a broad range of predefined reporting templates geared to the specific needs of particular industries and users, such as production planners, financial controllers, or human resource directors.

InfoSphere DataStage provides enhanced SAP support with this Pack for Business Information Warehouse (BW).

Upgrading the Pack

IBM InfoSphere DataStage jobs and job designs created using an older version of the Pack are not compatible with Version 4.1. During installation of the Load stage Server components, existing Load jobs are upgraded. No recompiling is necessary.

You should not edit existing jobs with the SAP BW Load client until the server components are installed and the upgrade process runs.

When upgrading the Pack, you must follow one of these migration procedures:

- Maintaining or upgrading InfoSphere DataStage in the same environment
- Migrating to a new InfoSphere DataStage server

Maintaining or upgrading InfoSphere DataStage on the same server

About this task

If the IBM InfoSphere DataStage environment is unchanged or upgraded on the same server, all 2.0 SAP BW Load jobs in all projects configured on the server are automatically upgraded and compiled when you run the Pack server installer. No preinstallation preparation is necessary.

For example, to upgrade your old InfoSphere DataStage installation:

Procedure

1. Upgrade InfoSphere DataStage.
2. Install the IBM InfoSphere Information Server Pack for SAP BW server.

Migrating to a new InfoSphere DataStage server

About this task

To successfully install a new IBM InfoSphere DataStage server, you must do the following:

Procedure

1. Install InfoSphere DataStage.
2. Reinstall the Pack stage using the InfoSphere DataStage Package installer. (We recommend this step since the stage type definitions are read-only by default. As a result, they are not included in the exported .dsx file.)

To confirm this step, use the InfoSphere DataStage Manager to browse Stage Types. You should ensure that a stage type named Load_PACK_for_BW exists in either the ERP or Enterprise Apps category.

3. Import the jobs that contain the old version of the Pack.
4. Restore the *SourceSystems.config* file from the previous installation. It usually resides in the DSBWConnections directory. Restore it to `<DSSAPHOME>/DSBWConnections`.
5. Restore all Source System directory paths. Determine these from the Source System Properties page of your old version of the stage editor.
Alternatively, you can directly view the *SourceSystems.config* file. The Source System directory paths for each Source System are determined from the INFOSOURCEDATAPATH parameter.
You must recreate each path exactly or the new installation cannot locate the necessary files.
6. Install the IBM InfoSphere DataStage Pack for SAP BW server.

SAP BW Load upgrade process

The SAP BW Load upgrade process does the following:

- Adds new properties with default values to each job containing a stage.
- Recompile the jobs if they were previously compiled.
- Creates a new directory structure in the DSSAPHOME directory based on the contents of the *SourceSystems.config* file. The root of the new directory structure is named DSBWConnections.
- No Source System directories or data files are moved.
- No files are deleted.
- The behavior of jobs is not modified.

Configuring the SAP BW stage for IPv6

To use the IPv6 protocol, you must enable the set the environment variable SAP_IPv6_ACTIVE on both client and servers.

About this task

On Linux or UNIX operating systems, the environment variables can be specified in the dsenv script. InfoSphere Information Server installations on Windows

operating system do not include the dsenv script.

Procedure

1. Log in as the DataStage administrator user.
2. On Linux, set the environment variable as follows:
 - a. Open the dsenv script.
 - b. Set the value of environment variable `SAP_IPv6_ACTIVE` to 1.
 - c. Save and close the dsenv script.
3. On Windows, set the environment variable `SAP_IPv6_ACTIVE` in the system environment.
4. Restart InfoSphere DataStage and the RFC Manager service.

Configuring source systems in SAP BW

SAP BW 3.0A and later requires additional information when manually configuring a Source System for use with a third party loader (that is, RFC Server). Previous versions of SAP BW did not require that users explicitly define the system's Gateway Host and Gateway Service. SAP BW 3.0A does require these entries. At minimum, this requires SAP BW version-specific configuration documentation.

Loading data into SAP Business Information Warehouse

This section describes the functionality and architecture of the Load stage, and how to tune Load jobs. The Load stage loads data into SAP Business Information Warehouse and extends the functionality of the stage to comply with the SAP BW certifiable BAPI interface for SAP release levels BW 3.0 and 3.5.

Additional enhancements include various performance-related modifications, and custom integration features, designed in collaboration with SAP development.

The Load stage is a passive stage within IBM InfoSphere DataStage used to load data into an SAP BW Application Server. This stage can have only one input link.

Functionality

The Load stage lets you load data directly into SAP BW systems and integrate it with data from other sources, using the visual design process of IBM InfoSphere DataStage for modeling and deploying source-to-target transformations and loads.

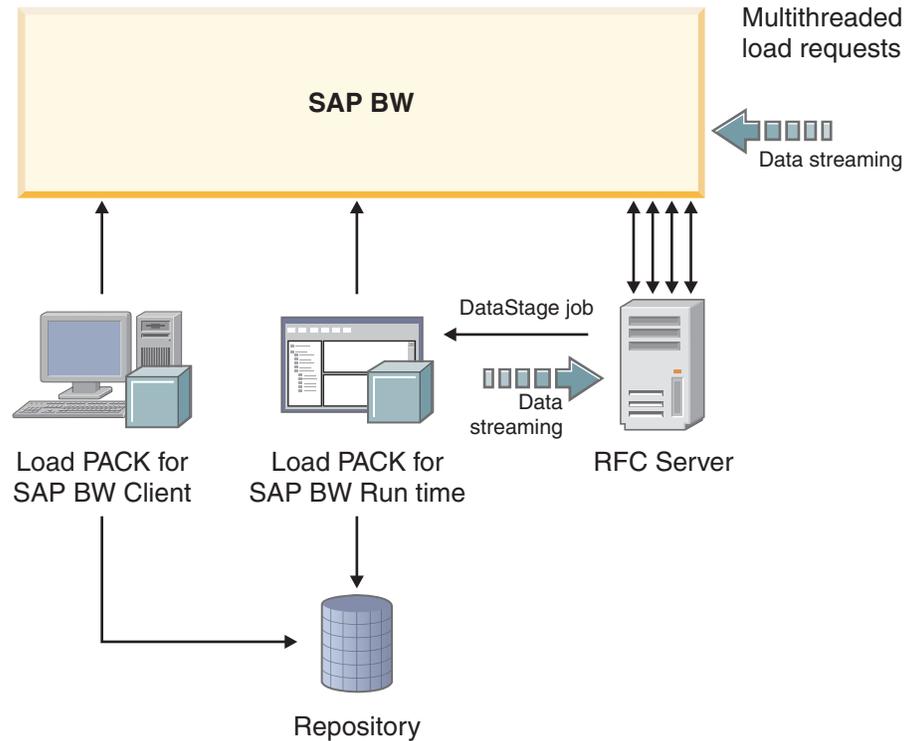
This stage has the following functionality:

- Lets you create and modify SAP BW InfoObjects (Characteristics and Key Figures) based on column level metadata as represented in InfoSphere DataStage Table Definitions, job links, and so forth.
- Lets you create InfoSources that are comprised primarily of InfoObjects generated by the Load stage.
- Lets you create InfoPackages to load data from the Load stage, including load requests initiated by the stage. (You can schedule the load using SAP BW.)
- Supports the use of job parameters for the source system and connection properties of the stage.
- Is integrated with the InfoPackage third party selections for the SAP BW user interface to allow the display of InfoSphere DataStage job parameters and possible values.
- Supports the creation of third party Source Systems.

- Integrates with the SAP BW GUI InfoPackage monitor to display the InfoSphere DataStage job log from within the SAP BW GUI.
- Supports data streaming directly to SAP BW.
- Provides multithreaded RFC Servers to support simultaneous load requests.
- Supports loading of master data hierarchies.
- Supports SAP load-balancing capabilities
- Provides the InfoSphere DataStage Administrator for SAP utility to manage:
 - RFC Servers
 - RFC Server logs
 - SAP BW connection configuration
 - Source System configurations
- Supports NLS (National Language Support). For information, see the IBM InfoSphere DataStage *Administrator Client Guide*.
- Server jobs provide the ability to Reset and Validate a job. The InfoSphere DataStage Director Reset selection might resolve potential problematic job issues.
- RESET:
 - Server: Checks for previously existing intermediary files
 - Deletes previously existing intermediary files
 - InfoSphere DataStage Director log updated by runtime
- The InfoSphere DataStage Director Validate selection confirms job properties and BW connectivity without running the job.
- VALIDATE:
 - Server: Checks Job Open Sequence
 - Checks all job properties
 - Checks BW connections
 - Checks Job Termination Sequence
 - InfoSphere DataStage Director log updated by runtime

Architecture

The functionality for the Load stage is represented by this diagram:



- A GUI client selects a Source System and an InfoSource from the SAP BW system and displays the corresponding transfer structure into which you load data.
- A runtime server stage processes data from an input link, sends its output directly to SAP BW using an RFC Server or to a text file, and generates an associated metadata file.
- An RFC Server loads data into SAP BW. A separate instance of the RFC Server is constantly running for each Source System supported by IBM InfoSphere DataStage.
- An RFC Server Manager starts and stops the individual RFC Server instances, depending on which Source Systems are supported.

Requests from SAP BW to load data from a InfoSphere DataStage source system can be serviced only if a job produces the required data and metadata files. You can accomplish this by running the job independently before SAP BW makes the load request.

Note: You can also request that a SAP BW InfoPackage supply a job name as part of the load request itself. In this case, the RFC Server, upon receiving the request, runs the specified job to completion before loading the resultant data file into SAP BW.

Load stage properties

The Load stage properties include the Stage, NLS, and Input pages.

Defining the Load stage

After creating the Load stage and connecting an input link to it, you need to define the properties for this stage. Double-click the stage to open the **Load PACK for BW Stage** dialog at the Stage page. The Stage dialog has the following pages:

- **Stage.** This page displays the name of the stage you are editing. It also has the **General** tab, which is displayed by default. You can enter text to describe the purpose of the stage in the **Description** field.
- **NLS.** It has the NLS page if you installed NLS. This page defines a character set map to use with the stage, if required.
- **Input.** This page lets you define input properties for connections, transfer structures, column definitions, and InfoPackages.

Link configurations for Load stage: The Load stage allows the user to configure multiple input links into a stage for Server jobs. ALL links must be configured independently in the GUI by the user (one link cannot inherit the properties of another). If any links are not properly configured, the job is likely to fail.

- Links into a single stage configured with the SAME InfoSource and InfoSourceType attempt to share a single request ID, and load the data to BW in parallel. In this case, only one InfoPackage or Process Chain is scheduled in BW, although multiple can be defined between links.
- Links into a single stage configured with DIFFERENT InfoSources or InfoSource Types run as totally independent loads, each using a unique Request ID from BW. In this case, the Director Log shows multiple "BW Load Complete" summary messages.
- Supported, partitioned data flows into a single instance of the BW Load stage.
- Unsupported, unpartitioned data is routed to two or more instances of the BW Load stage.

Defining character set maps:

You can optionally define a character set map for a Load stage using the **NLS** tab.

You can change the default character set map that is defined for the project or the job by selecting a map name from the list. This tab also has the following components:

- **Show all maps.** Lists all the maps supplied with IBM InfoSphere DataStage. Maps cannot be used unless they have been loaded using the InfoSphere DataStage Administrator Client.
- **Loaded maps only.** Displays the maps that are loaded and ready to use.
- **Use Job Parameter...** . Specifies a character set map as a parameter to the job containing the stage. If the parameter has not yet been defined, you are prompted to define it from the Job Properties dialog in the InfoSphere DataStage and QualityStage[®] Designer.

For details about NLS configuration, see *IBM InfoSphere DataStage documentation*.

Tuning load jobs

Change the following environment variables using the IBM InfoSphere DataStage Administrator. The default timeout is 120 seconds.

For BW Load variables (timeout is defined in seconds):

- **ASC_BWLOAD_PCIPAK_TIMEOUT** indicates how long the stage waits for a Process Chain to start an InfoPackage.

- **ASC_BWLOAD_IPAK_TIMEOUT** indicates how long the stage waits for the scheduled InfoPackage to become ready for loading.
- **ASC_PROCESSCHAIN_START_TIMEOUT** indicates how long the stage waits for a Process Chain to respond to the start request.

For BW open hub extract variables (timeout is defined in seconds):

- **ASC_BWOHEXTRACT_PCIS_TIMEOUT** indicates how long the stage waits for a Process Chain to start an InfoSpoke.
- **ASC_BWOHEXTRACT_IS_TIMEOUT** indicates how long the stage waits for an active InfoSpoke to notify that an extraction is ready.
- **ASC_PROCESSCHAIN_START_TIMEOUT** indicates how long the stage waits for a Process Chain to respond to the start request.

Defining Load Input Properties

Input page

To define the input properties, click the Input page.

It has the name of the input link in **Input name**. Click **Columns...** to see a list of column names for the link in **Input name**.

This page also has the **General**, **Transfer Structure**, **Columns**, and **InfoPackage** tabs:

- **General**. Displayed by default. This tab displays your selection of a **IBM InfoSphere DataStage Connection to BW**. Use this tab to select which SAP BW system the stage loads data into. This tab also contains an optional description of the connection. For details, see Input General page.
- **Transfer Structure**. Lets you specify and create the Source System, InfoSource, and optionally, a Hierarchy for the data to be loaded. You can create Source Systems and InfoSources here without using the SAP BW GUI. These selections determine the transfer structure to be used. For details, see Selecting Input Transfer Structures. For information about InfoSource types, see Types of records for InfoSources.
- **Columns**. Contains the column definitions for the data being written to the stage. The synchronization of the columns with the transfer structure takes place automatically whenever the transfer structure changes.
- **InfoPackage**. Lets you determine when and how jobs load data into SAP BW. It contains the PUSH, PULL, and FILE options to invoke jobs from inside or outside SAP BW.

The PUSH option lets the InfoSphere DataStage job invoke an InfoPackage that the job can use to stream the data into SAP BW.

The PULL option lets you create InfoPackages that invoke the InfoSphere DataStage job at the discretion of SAP BW.

The FILE option lets the InfoSphere DataStage job put the data in a file, which is later loaded by an InfoPackage that is scheduled by SAP BW.

The **General** tab opens by default. It displays your selection of a InfoSphere DataStage Connection to BW.

Input General page:

Use the **General** tab of the Input page to select which SAP BW system the stage loads data into. The connection parameters include the following:

- **IBM InfoSphere DataStage Connection to BW.** The InfoSphere DataStage connection to the SAP BW system that is defined on the server machine and shared by all users connected to that machine.
- The fields in this area are read-only and are obtained from the connection that you selected.
- When you create a new stage, it defaults to the connection you most recently selected for another stage of this type. Even if you never created a Load stage previously, a new stage defaults to a connection if there is only one InfoSphere DataStage Connection to BW defined on the server (as is often the case).
- For more information, see *Selecting a DataStage connection to SAP BW*.
 - **Name.** The name of the selected connection to SAP BW, with descriptive text about the connection in **Description**.
 - The menu beside **Name** lists the operations relating to connections. To modify and create connections, choose these options:
 - Properties...** opens the Connection Properties dialog to view the properties of the currently selected connection.
 - Select...** opens the **Select InfoSphere DataStage Connection to BW** dialog. This lets you select a InfoSphere DataStage connection to SAP BW.
 - New...** opens the Connection Properties dialog to define the properties of the new connection.
 - Use job parameter...** opens the Use Job Parameter dialog to define a parameter name for the connection. When the name is defined, (*#parametername#*) appears appended to **Name**.
 - BW Administration** lets you run the SAP BW Administrator Workbench for the selected connection.
 - Clear job parameter** clears the parameter name. This option appears only if a parameter is specified for the connection (**Name** is unaffected).
 - Clear connection.** Clears the name of the connection (*#parametername#* is unaffected).
 - **Application Server.** The SAP BW host name or the IP address where the SAP BW application server is running. The name is determined by the selected connection.
 - **System Number.** The system number of the BW application server. The number is determined by the selected connection.
- **SAP Logon Details.** The SAP logon properties are read-only unless you clear **Use connection defaults**.
 - **User Name.** The user name used by this stage to connect to SAP BW.
 - **Password.** The password for the SAP BW user name.
 - **Client Number.** The SAP BW client number. Identifies which client within SAP BW you want to log on to.
 - **Language.** The language used to connect to SAP BW. Use EN for English.
 - **Use connection defaults.** Selected by default. Clear to remove the default SAP Logon Details settings so you can use different logon information. If selected, the displayed logon details are obtained from the selected connection and are read-only.

Note: Any changes made to connection properties affect all jobs that reference this connection. Clear **Use connection defaults** if you want to modify connection properties for only this job.

Selecting a InfoSphere DataStage connection to SAP BW:

The menu beside **Name** on the **General** tab of the Input page includes the **Select...** option. Choose the **Select...** option to open the Select DataStage Connection to BW dialog.

This dialog lets you choose a IBM InfoSphere DataStage connection to the SAP BW system. The selected connection provides all needed connection and default logon details required to communicate with the corresponding SAP BW system.

The Select DataStage Connection to BW dialog lets you select a connection for the stage and manage the connection definitions. These operations are also available in the InfoSphere DataStage Administrator for SAP utility.

This dialog includes the following buttons that let you manage the list of connections that is maintained on the InfoSphere DataStage server machine:

- Click **New** to open the Connection Properties dialog, where you can create a new connection.
- Click **Properties...** to open the Connection Properties dialog, where you can change the configuration for the selected connection.
- Click **Remove** to delete the selected connection.
- Click **Cancel** to cancel the select connection operation. Any changes to the connection that were made while using the buttons are not undone.
- Click **OK** to use the selected connection in the current stage in the job. (A message is generated if the logon attempt is unsuccessful.)

Selecting input Transfer Structures:

After you select the connection, click the **Transfer Structure** tab on the Input page. The **Transfer Structure** tab specifies the Source System and its description, InfoSource and its description, InfoSource type, components related to hierarchies (if appropriate), and indirectly the transfer structure for the data to be loaded into SAP BW. This tab supports the creation of InfoSources and Source Systems from within the stage editor without requiring your use of the SAP BW GUI.

This **Transfer Structure** tab has the following components:

- **Source System.** The selected Source System and its description are shown in the corresponding text boxes.
- The menu beside **Source System** has a list of operations related to source systems.
- **InfoSource.** The selected InfoSource and its description are shown in the corresponding text boxes.
- The menu beside **InfoSource** has the following options:
 - **InfoSource Properties...** . Displays the properties of the selected InfoSource.
 - **Characteristic Properties...** . This option appears if the selected InfoSource is a Master InfoSource. It gives you direct access (using the Characteristic Properties dialog) to the properties of the characteristic that the Master InfoSource loads data into.
 - **Select from this Source System...** . Lets you select an InfoSource from the set defined within SAP BW. You see only InfoSources assigned to the selected Source System. This loads a set of transfer structure fields into the grid.
 - **Create Master InfoSource from New Characteristic...** .

- **Create Master InfoSource from Existing Characteristic.** Opens another menu with the **Search for Characteristic** and **Select Characteristic from InfoCatalog** options. (The latter option opens another menu with the **Search for InfoCatalog** option.)
- **Create Transaction InfoSource...** .
- **Search for InfoSource...** .
- **Update Type.** Specifies Direct for a Master data InfoSource or Flexible for a Transaction InfoSource.
- **InfoSource Type.** Specifies whether to load an Attributes, Texts, or Hierarchies InfoSource type when loading a Master data InfoSource. This does not display for a Transaction InfoSource.

The grid is read-only, since the metadata is obtained from SAP BW. If an InfoSource previously selected for the stage is not associated in the SAP BW connection with the source system currently selected for the stage, the InfoSource description is shown as "Not found in Source System," and the displayed transfer structure grid is empty.

Types of records for InfoSources:

You identify the InfoSource on the **Transfer Structure** tab of the **Input** page. **InfoSources** can have Master or Transaction types of records.

- **Master InfoSources.** Represent entities, such as companies and customers. Master InfoSource data is loaded using separate transfer structures for Attributes, Texts, or Hierarchy transfer structures. Choose **Attributes**, **Texts**, or **Hierarchy** transfer structures using the **InfoSource Type** menu on the **Transfer Structure** tab of the Input page, as appropriate:
 - **Attributes.** Contains all the fields for a Master InfoSource except for the SAP standard Short, Medium, and Long text descriptions associated with each master record.
 - **Texts.** Contain the SAP standard short, medium, and long text descriptions. The text fields are passed in a separate transfer structure because several Texts records, in different languages, might be associated with a given master record.
 - **Hierarchy.** Lets you create new hierarchy definitions from within the stage editor. If you select Hierarchy as the InfoSource type, extra hierarchy fields and a menu appear on the Transfer Structure tab of the Input page. Hierarchy is an option only if the characteristic used to load the Master InfoSource supports hierarchies.
- **Transaction InfoSources.** Supply numerical quantities associated with combinations of master entities, such as the dollar value of sales from each store over each period of time. (No InfoSource Type appears for Transaction InfoSources.)
- **Update Type** displays Flexible as the value when you select a Transaction InfoSource. (Transaction records do not include **short**, **medium**, and **long** descriptive text fields). It displays Direct when you select a Master Data InfoSource.

Setting the source system: You select the source system from among the list of source systems configured on IBM InfoSphere DataStage for that connection. These are the source systems for which InfoSphere DataStage is running SAP BW Load RFC Servers for the specified connection to SAP BW. The Select Source System dialog (see Selecting the source system) displays the list of source systems. If only one such source system exists, a new Load stage defaults to that source system.

Otherwise, it defaults to the source system most recently selected for the particular connection. If a source system was never selected for this connection, and if the connection has more than one InfoSphere DataStage source system defined for it, the names of the source system are blank. You must select or create a source system to add it to the InfoSphere DataStage repository.

At creation time, the source system in SAP BW needs to be of Activation Type Registration, with the Program ID the same as the RFC Server Program ID in InfoSphere DataStage. Otherwise this results in error messages.

You need to use a user name and non-blank password for InfoSphere DataStage logon credentials defined in the source system for the process to work correctly when being called from a SAP InfoPackage. This means that you need to clear **Omit** on the Attach to Project dialog in InfoSphere DataStage.

You identify **Source System**, **InfoSource**, and **InfoSource Type** (and indirectly the transfer structure) for the data to be loaded into SAP BW on the **Transfer Structure** tab of the Input page.

Click the menu beside **Source System** on the **Transfer Structure** tab of the Input page. The menu includes the following components that you can choose:

- **Properties...** . Lets you view and modify the properties of the currently selected Source System. This opens the Source System Properties dialog. Any changes made to Source System properties affect all jobs that reference the Source System.
- **Select...** . Selects a Source System other than the default. This opens the **Select Source System** dialog.
- **New...** . Creates a new Source System. Note that errors from SAP BW are generated if the BAPI is unavailable, depending on the version of SAP BW you are using.
- **Clear Source System** clears the name of the source system (*#parametername#* is unaffected if it exists).
- **Use job parameter...** . Opens the Use Job Parameter dialog to define a parameter name for the source system. When the name is defined, (*#parametername#*) appears appended to the name of the Source System.
- **Clear job parameter.** Clears the parameter for the Source System. (This option appears only if a parameter is specified for the Source System. The name of the Source System is unaffected.)

Job parameters: Job parameters are for runtime only. A real Connection Name is needed for Design Time. If a job parameter is used for **Connection Name** or the name of the Source System, a corresponding entry must exist in the SAP BW Load configuration files for the values provided at runtime. This implies that you previously used the IBM InfoSphere DataStage Administrator for SAP utility or the stage editor to configure the connection or Source System that is provided at runtime.

See Input General page for details about using the options from the menu beside **Name** using the GUI property. See Setting the Source System for details about respective options from the menu beside **Source System** on the Input Transfer Structure page.

Source System Properties dialog:

The Source System Properties dialog lets you view and modify the properties of the currently selected source system. It opens automatically after you add a source system to the InfoSphere DataStage source system list.

To open the Source System Properties dialog, for example, choose **Properties** from the menu beside **Source System** on the **Transfer Structure** tab of the Input page.

The connection details default to the values you supply when connecting to SAP BW for the list of available source systems.

This dialog has the RFC Server Configuration and InfoPackage Options or Runtime Options pages (depending on your stage).

Source System Properties RFC Server Configuration page:

Use the RFC Server Configuration page to configure information needed by the SAP BW Load RFC Server. It has the following components, whose names vary slightly depending on your stage:

- Clear **Listen for BW requests** to shut down the RFC Server.
- **BW Load RFC Server Program ID** is an editable control that automatically gets set from the SAP BW Source System definition. It must match the Program ID specified in SAP BW for the Source System on the RFC Destination window. This window displays the program ID that the RFC Server registers with SAP BW when the RFC Server starts up. (If the ID is the same as that for another Source System, a message tells you to make the ID unique before you save changes.)
- You need to configure an RFC Server within SAP BW from the Administrator Workbench. You can also configure the RFC Destination when you create a Source System from the stage (see Setting the Source System).
- **Location of Temporary InfoSource Data Files** shows the directory where extracted data, metadata, and RFC Server logs are stored. You must have read and write permissions on this directory.
- Clear **Use default** to make the **Location of Temporary InfoSource Data Files** control modifiable and enable **Browse**.
- **BW PACK RFC Server SAP Connection Details** shows the connection information that is used by the RFC Server when it starts up. These settings are always read-only since they are actually defined as part of the InfoSphere DataStage connection to SAP, rather than in the Source System configuration itself.

The Router String is the router information for accessing a remote SAP application server. An example of a typical router string is as follows:

/H/router1/H/router2/H/ or

/H/router1/H/xxx.xxx.xxx.xxx/H/

where xxx.xxx.xxx.xxx is a TCP/IP address.

(The Router String is deleted in this sample image.)

Source System Properties InfoPackage Options page:

This page shows the settings needed by the RFC Server when it receives a load request from an InfoPackage. The settings depend on the type of the InfoPackage.

- **IBM InfoSphere DataStage Project Containing the Job.** Only the InfoSphere DataStage project in which the job is invoked by InfoPackages is run for this source system for this project. The project defaults to the one containing your current job.

- **InfoSphere DataStage Logon Details for Running the Job.** These values default to your current logon values.
- **UserName.** The user name to be used when InfoPackages invoke jobs.
- **Password.** The password to be used when InfoPackages invoke jobs.

InfoPackage will set the name of a InfoSphere DataStage job to be run automatically before loading the InfoSource data file. This means that the InfoPackage interface in SAP BW shows an entry labeled InfoSphere DataStage Job on the Third party selections page of its Scheduler (Maintain InfoPackage) dialog (see an example later in this section). Setup in SAP BW is required to schedule and run the InfoPackage.

The parameters can be entered by clicking **refresh** beside **Check** on the Third party selections page in the SAP BW GUI. This results in a call to the RFC Server that retrieves job parameters if the InfoPackage has a job name in third party selections.

When you refresh the parameters, use the help button beside **Input value** to view the list of possible values for list type parameters in InfoSphere DataStage. Or, if a default value exists for a parameter that is not encrypted, you can see this value as a parameter.

Additionally, the tokens <default> and <none> are available for selection. Choosing <default> causes the default value for this parameter to always be used. Choosing <none> causes a blank value to be used for the parameter. Leaving a value blank for a job parameter named on this window also causes the default value to always be used.

The RFC Server builds the *dsjob* command line before invoking the job.

Optionally, you can leave the value for the InfoSphere DataStage Job entry for the InfoPackage in SAP BW blank. In this case, the RFC Server tries to load the data file for the InfoSource, without first running any job. But if the InfoPackage specifies a job name, possibly supplemented with job parameter values, the RFC Server tries to run the job before loading data into SAP BW.

Note that for backward compatibility for a previous version of SAP BW, the format for a job parameter value for is as follows:

```
jobname -param name=value
```

For example,

```
EmployeeMasterData -param Department=Development
```

- *jobname* is EmployeeMasterData. *jobname* is case sensitive, that is, it must match the case of *jobname* in InfoSphere DataStage.
- *name* is Department and *value* is Development.
- If the *name=value* string contains spaces, enclose the entire string with quotation marks (").

The format for multiple parameters is:

```
jobname -param name1=value1 -param name2=value2, and so forth
```

Source System Properties Runtime Options page:

The Runtime Options page that you see when you use the Extract stage specifies the IBM InfoSphere DataStage project, including similar logon details.

The settings and the names of the components for this page depend on the type of the InfoPackage and whether you are using the Extract or Load stage. This page specifies the project, including similar logon details:

- **InfoSphere DataStage Project Containing the Job.** Only the project in which the InfoSphere DataStage job is invoked by InfoPackages is run for this source system for this project. The project defaults to the one containing your current job.
- **Logon Details for Running the Job.** These values default to your current InfoSphere DataStage logon values.
 - **UserName.** The user name to be used when InfoPackages invoke jobs.
 - **Password.** The password to be used when InfoPackages invoke jobs.

InfoPackage will set the name of a InfoSphere DataStage job to be run automatically before loading the InfoSource data file. This means that the InfoPackage interface in SAP BW shows an entry labeled InfoSphere DataStage Job on the third party selections page of its Scheduler (Maintain InfoPackage) dialog. Setup in SAP BW is required to schedule and run the InfoPackage.

The parameters can be entered by clicking refresh beside Check on the third party selections page in the SAP BW GUI. This results in a call to the RFC Server that retrieves job parameters if the InfoPackage has a job name in third party selections.

When you refresh the parameters, use the help button beside Input value to view the list of possible values for list type parameters in InfoSphere DataStage. Or, if a default value exists for a parameter that is not encrypted, you can see this value as a parameter.

Additionally, the tokens <default> and <none> are available for selection. Choosing <default> causes the default value for this parameter to always be used. Choosing <none> causes a blank value to be used for the parameter. Leaving a value blank for a job parameter named on this window also causes the default value to always be used.

The RFC Server builds the dsjob command line before invoking the job.

BW Extract. This page also contains relevant information about Process Chains. It does not support job parameters.

BW Load. This page shows similar information and, for example, the settings needed by the RFC Server when it receives a load request from an InfoPackage.

Saving changes:

You can save your changes to the Source System Properties dialog if the following conditions are met:

- Application Server, System Number, BW Load, RFC Server Program ID (an editable field), User Name, Client Number, and Location of Temporary InfoSource Data Files must be specified.
- You must specify the IBM InfoSphere DataStage **User Name** on the InfoPackage Options page. You must also set **InfoSphere DataStage Project containing the Job** to an existing project.
- The pathname specified for **Location of Temporary InfoSource Data Files** is supplied. If it does not exist on the InfoSphere DataStage server, you are asked whether to create the directory. If you click **No**, or if the directory creation fails, you cannot save your changes to the Source System.

- The stage connects to SAP BW, using the connection and logon values set for the Source System. If the connection fails, you are warned, but you can still save your changes.

If you click **Cancel**, the dialog closes without saving your changes.

You can select a Source System that is different from the default by using the Select Source System dialog (see the following section.)

Selecting the source system:

You can, for example, choose **Select...** from the menu beside **Source System** on the **Transfer Structure** tab of the Input page to open the **Select Source System** dialog. This dialog lets you select a source system that is different from the default.

The **Select Source System** dialog opens. The functionality is similar for the Load and Extract stages.

A IBM InfoSphere DataStage RFC Server for SAP BW loads runs for each source system that is listed (unless disabled). The entries in **InfoSphere DataStage Source Systems for this SAP BW System** represent logical InfoSphere DataStage source systems for SAP BW that are currently defined for the selected SAP BW connection. (You can use only these third party external BAPI Source Systems with InfoSphere DataStage.) This list of available source systems and their properties is stored as a file on the InfoSphere DataStage server machine.

The following components resemble those of the **InfoSphere DataStage Connections** to R/3 page for the InfoSphere DataStage Administrator for SAP utility. They let you manage the Source Systems in the list from this dialog.

- Click **Add...** to open the **Attach Source System** dialog, which lets you make an existing source system that is already defined within SAP BW available for use by InfoSphere DataStage.

The **Attach Source System** dialog opens.

BW Administration lets you run the BW Administrator Workbench for the selected connection. Define a new source system in SAP BW here, for example, before adding it using the Select Source System dialog. (Click **Refresh** to see the newly added Source System in the list.)

- Click **Properties...** to change the configuration for the source system.
- Click **Remove** to make the source system unavailable from InfoSphere DataStage and automatically shut down the corresponding RFC Server. (However, the metadata describing the source system remains intact within SAP BW, and the InfoSphere DataStage structure is retained on the server.)
- Information related to this Source System is removed from the file on the InfoSphere DataStage server, and the corresponding RFC Server is shut down. Any stages referring to the removed source system (and their jobs) become invalid. You can add a Source System with the same name to make the job valid again.
- Click **Cancel** to cancel the selection operation. Any changes to the Source System list are not undone if you click **Cancel**.
- After you select a Source System, click **OK** to use it in the current stage in the job.
- If a Source System with the same name exists in the InfoSphere DataStage list, you can overwrite it. (The RFC Program ID must be uniquely defined, or an error occurs.)

Selecting an existing InfoSource:

After you select the Source System for the **Transfer Structure** tab on the Input page, you select an InfoSource from the source system or create a new one.

Choose **Select from this Source System...** from the menu beside **InfoSource** to open the **Select InfoSource** dialog.

The **Select InfoSource** dialog displays **Source System Name** and its description for the source system you selected, the **Find InfoSource...** and **Properties...** buttons, and the **Master** and **Transaction** pages.

- Click **Find InfoSource...** to search for a specific InfoSource within the list.
- Click **Properties...** to see the definition of an InfoSource before selecting it as the stage InfoSource property.
- Master and Transaction pages. Separate pages exist for Master and Transaction InfoSources where you can select a Master or Transaction InfoSource.

Creating InfoSources:

You can create Master or Transaction InfoSources using the menu beside **InfoSource** on the **Transfer Structure** tab of the Input page.

Creating Master InfoSources:

To create a Master InfoSource, you must first specify the characteristic that the InfoSource uses to load. You can use an existing characteristic, or you can create one as part of the process of creating the InfoSource.

The menu beside **InfoSource** has the following options for creating Master InfoSources:

- Select **Create Master InfoSource from Existing Characteristic** to select an existing characteristic that the InfoSource uses to load data. Use any of the following options:
 - **Search for Characteristic...** . Opens the Search for InfoObject dialog, so you can select the existing characteristic from the results of a search.
 - **Select Characteristic from InfoCatalog.** Opens a submenu, which lets you search for the InfoCatalog or pick from a list of recently-used InfoCatalogs. (The list appears within the submenu.)
 - **A list.** Select the existing characteristic from the list at the bottom of the menu. The list contains characteristics with Master data, that is, their **Exclusively attribute** property is cleared. These are created within IBM InfoSphere DataStage as attributes of another characteristic (or as compounds or after abandoning a Master InfoSource creation) using the Characteristic Properties dialog of the Load stage editor, but they do not yet have a corresponding Master InfoSource defined for them.
After you select the characteristic, the Master InfoSource Properties dialog opens.
- Select **Create Master InfoSource from New Characteristic...** by clicking the menu beside **InfoSource**. The Create Characteristic dialog opens first, where you specify a name and description.

The Characteristic Properties dialog opens next. This dialog lets you select link columns or Repository table definition columns to use as templates for the attributes of the characteristic or lets you create a new characteristic or key figure to use as compounds or attributes.

The Master InfoSource Properties dialog opens.

Creating Transaction InfoSources:

Select **Create Transaction InfoSource...** by clicking the menu beside **InfoSource**. This opens the Create Transaction InfoSource dialog, where you name the InfoSource and add a description.

After you create the new InfoSource, the Transaction InfoSource Properties dialog opens. It lets you define the transfer structure. This dialog lets you select link columns or repository table definition columns to use as templates for the fields of the InfoSource transfer structure. You can also add key figures or new characteristics.

InfoSource Properties dialogs:

Dialogs for InfoSources include the **Master InfoSource Properties** and the **Transaction InfoSource Properties** dialogs.

You can access these dialogs in any of the following ways:

- Clicking **Properties...** when you select an InfoSource in a list.
- Choosing the **InfoSource Properties...** option by clicking the menu beside **InfoSource** on the **Transfer Structure** tab of **Input** page.
- As part of the process of creating a new InfoSource (see Creating Master InfoSources).

Master InfoSource Properties dialog:

The Master InfoSource Properties dialog lets you view the transfer structures for an InfoSource in a format like that of the **Transfer Structure** tab of the Input page. You cannot directly modify transfer structures for a Master InfoSource. You can only modify the transfer structures indirectly by changing the properties of the characteristic that the InfoSource uses to load data.

The Master InfoSource Properties dialog has the following components:

- **InfoSource.** The InfoSource being used from the Source System. The **Short** and **Long Descriptions** for the new InfoSource are copied from the **Short** and **Long Description** values for the characteristic.
- **Source System.** The data repository (and its description) containing the InfoSource.
- **Characteristic.** The name of the characteristic (and its description) into which the InfoSource loads data.
- Click **...** beside **Characteristic** to open the Characteristic Properties dialog for the characteristic.

The Master InfoSource Properties dialog includes separate pages for transfer structures for **Attributes** and **Texts**.

The transfer structures for **Hierarchies** are also shown on a separate **Hierarchies** page if **With hierarchies** is selected on the General page of the Characteristic Properties dialog when you create or select a characteristic.

- **Attributes page.** Displays the fields for the InfoSource in the **Transfer Structure** area. The fields can be modified only when you first create the InfoSource.
Select **Delta update** to update only the data that accumulated since the last update, and add it to the database for loading (disabled in this version).
Select **Time-dependent** to update fields that are valid for a specific time interval (disabled in this version).

- Click **InfoObject...** to open the Characteristic Properties dialog or the Key Figure Properties dialog, depending on the selected object, showing the properties of the InfoObject associated with the selected transfer structure field (disabled in this version).
- **Texts page.** Shows the transfer structure for loading the texts for the InfoSource in the **Transfer Structure** area.
- Select **Delta update** to update only the data that accumulated since the last update, and add it to the database for loading (disabled in this version).
- Select **Time-dependent** to update fields that are valid for a specific time interval (disabled in this version).
- **Hierarchies page.** Shows the list of hierarchies that are loaded using this InfoSource in the **Hierarchies Loaded Using this InfoSource** area.
By selecting one of the hierarchies, you can view the transfer structure for that hierarchy in the **Transfer Structure for the Selected Hierarchy** area.
(Click **New...** from the menu beside Hierarchy Name on the Input Transfer Structure page to open the Create Hierarchy dialog, where a Hierarchy header can be created. The Hierarchy Properties dialog opens next. The new hierarchy is added to the list of hierarchies for the InfoSource. For more information about the Hierarchy Properties dialog, see the following section.)
- Click **Properties...** to open the Hierarchy Properties dialog for the selected hierarchy.

Hierarchy Properties dialog:

Click **Properties...** on the **Hierarchies** page of the Master InfoSource Properties dialog to open the Hierarchy Properties dialog for the selected hierarchy.

(You can access the Master InfoSource Properties dialog by, for example, choosing the **InfoSource Properties...** option from the menu beside **InfoSource** on the **Transfer Structure** tab of **Input** page.)

The Hierarchy Properties dialog opens.

You can specify whether the records in the hierarchy are sorted, the interval to be used, and whether the hierarchy is time-dependent.

(When a hierarchy is already selected on the **Transfer Structure** tab, the menu beside **Hierarchy Name** includes a **Properties** option, which opens the same Hierarchy Properties dialog.)

Transaction InfoSource Properties dialog:

After you create a new Transaction InfoSource, the Transaction InfoSource Properties dialog opens.

(Choose **Create Transaction InfoSource...** from the menu beside **InfoSource** on the **Transfer Structure** tab of the Input page. This opens the Create Transaction InfoSource dialog.)

The Transaction InfoSource Properties dialog lets you modify the transfer structure.

It has the following components:

- **InfoSource.** The InfoSource being used from the Source System. The description for the new InfoSource is supplied at the time the Transaction InfoSource is created.

- **Source System.** The data repository (and its description) containing the InfoSource.
- Click **Add** to open a menu that provides the following ways to specify an InfoObject from which to create a new field for the transfer structure:
See Characteristic Properties dialog for information about the methods for creating and selecting InfoObjects.
- Click **Properties...** to open the Characteristic Properties dialog. This lets you see the properties of the InfoObject for the selected field.
- Click **Remove** to delete the field from the transfer structure after receiving confirmation from the user.

Note: This dialog opens as read-only when you open it for existing InfoSources.

Searching for an InfoSource:

Select **Search for InfoSource...** by clicking the menu beside **InfoSource** on the **Transfer Structure** tab for the Input page. This lets you find any InfoSource that is defined on the SAP BW system, regardless of whether the InfoSource is assigned to the current Source System.

This is a useful alternative to the **Select from this Source System...** menu option, since you might want to use the current Source System to load a characteristic that is already being loaded from another Source System.

Since the full list of InfoSources can be large, the search option:

- Improves performance when you retrieve the list.
- Reduces the size of the list from which you must make a selection.

The **Search for InfoSource...** option opens the Search for InfoSource dialog, where you can supply search criteria.

The Search for InfoSource dialog has the following components:

- **InfoSource Type.** Choose one of the following types: **Master**, **Transaction**, **All types**.
- **InfoSource Name.** To limit the list of InfoSources based on the InfoSource Name or the Long Description, the corresponding boxes provide a list of comparison operators, such as between, contains pattern, and so forth.
- If you select **between** or **not between**, both edit controls to the right of the selected operator become enabled. Any other selected operator enables only the first control.
- After you specify the search criteria, and click **OK**, the Select InfoSource dialog opens.

Selecting the InfoSource:

After you specify the search criteria, click **OK** on the Search for InfoSource dialog.

The **Select InfoSource** dialog opens, displaying all the InfoSources on the SAP BW system that satisfy the search conditions.

The dialog that opens depends on how you open it. For example, if you select **Search for InfoSource...** from the menu beside **InfoSource**, the resulting display for this dialog contains **Connection Name** and its description. This is the name of the current connection to the SAP BW system that the stage loads data into. Click **Cancel** to return to the Search for InfoSource dialog to use different search criteria.

(The dialog that opens when you select **Select from this Source System...** from the menu beside **InfoSource** on the **Transfer Structure** tab for the Input page has **Source System Name**, the name of the current Source System, and its description.

If you select an InfoSource from the list and click **OK**, you return to the **Transfer Structure** tab of the Input page, with the selected InfoSource set as the InfoSource for the page. The InfoSource is automatically assigned to the current Source System, if it is not already assigned to it. (The same InfoSource can be assigned to several Source Systems at the same time. The assignments are not mutually exclusive.)

Finding the InfoSource:

After you select an InfoSource from the Search for InfoSource dialog (opened by clicking the menu beside **InfoSource** on the **Transfer Structure** tab of the Input page), the **Select InfoSource** dialog opens.

Click **Find InfoSource** on the **Select InfoSource** dialog to open the Find InfoSource dialog. Use this dialog to search for a specific InfoSource within the list. This dialog has the following components:

- **Find in InfoSource Name.** Enter the complete or partial name of an InfoSource that you want to find.
- **Find in Description.** Enter the text to find in a description for the InfoSource.
- **Find.** Click to find the first InfoSource on the displayed property page that contains the specified values in its name and description. A message appears if no match is found.
- If a match is found, the InfoSource is selected and scrolled into view. If no further matches exist, the dialog closes. Otherwise, **Find** changes to **Find Next**.
- **Find Next.** Click to select the next match, if one exists. If no other matches exist, the dialog closes.
- If you change the search conditions, the **Find Next** reverts to **Find**, and the search starts again at the beginning of the InfoSource list.

More Load Input properties

This section describes how to create and search for InfoObjects, both characteristics and key figures. It discusses adding InfoObjects, selecting loaded characteristics, selecting InfoObjects from an InfoCatalog, and viewing the properties of the selected InfoSource. It describes how to create and search for an InfoCatalog, and how to select and create hierarchies.

Creating InfoObjects

Separate dialogs let you create characteristics and key figures. You can open the dialogs using options from a variety of menus.

Creating characteristics:

The **Create a New Characteristic...** option on various menus opens the Create Characteristic dialog.

For example, you can choose this option from the menu beside **InfoSource** on the **Transfer Structure** tab of the **Input** page.

The Create Characteristic dialog contains the following components:

- **Characteristic.** An SAP BW InfoObject that is specified to create a Master InfoSource, with descriptive text in **Short Description** and **Long Description**.

- **Reference Characteristic.** A characteristic whose value is from an SAP BW object table, which ensures consistent characteristic values. It has descriptive text in Reference Characteristic
- **Description.** If the class and reference is other than the object type, the object loses its status as reference. (Reference Characteristic and the menu beside it are unavailable when you create a new Master InfoSource with a new characteristic.) Menus let you select existing characteristics to use as a **Reference Characteristic**. For example, choose the **Select a Characteristic Loaded from this Source System...** , **Select a Characteristic from an InfoCatalog**, or **Search for Characteristic...** by using the menu beside **Reference Characteristic**.
- If a **Reference Characteristic** that is used for the new characteristic is already specified, the corresponding menu includes a **Clear Selection** option, so you can make the control blank again. It also includes **Characteristic Properties...** .
- You can use a **Reference Characteristic** or a **Template**. If a **Reference Characteristic** is already specified, selecting a template characteristic clears out **Reference Characteristic** and vice versa.
- **Template.** The name of the template that specifies attributes for the new characteristic, with descriptive text in **Template Description**.
- Menus let you select existing characteristics to use as a template for the new characteristic. For example, choose **Select a Characteristic Loaded from this Source System...** , **Select a Characteristic from an InfoCatalog**, or **Search for Characteristic...** by using the menu beside **Template**.
If a template that is used for the new characteristic is already specified, the corresponding menu includes a **Clear Selection** option, so you can make the control blank again. It also includes the **Characteristic Properties...** option.
Menus let you select a characteristic loaded from this Source System, select a characteristic from an InfoCatalog, (which in turn lets you search for the InfoCatalog), and search for a characteristic.
- **InfoCatalog.** The value defaults to the InfoCatalog (of **Characteristic InfoCatalog Type**) most recently used by the current user to create a characteristic, with descriptive text in **InfoCatalog Description**. The characteristic that you are creating is assigned to the specified InfoCatalog. The menu includes the **Search for InfoCatalog...** and **New InfoCatalog...** options.

The Characteristic Properties dialog opens.

Creating Key Figures

The **Create a New Key Figure** option on various menus opens the Create Key Figure dialog.

For example, you can access this option from the **Add** menu on the Transaction InfoSource Properties dialog.

(You can access the Transaction InfoSource Properties dialog after you create the Transaction InfoSource. Do this from the menu beside **InfoSource** on the **Transfer Structure** tab of the Input page)

This dialog has the following components:

- **Key Figure.** The InfoObject unit that is a value or quantity with descriptive text in **Short Description** and **Long Description**.

- **Template, Template, Template Description,** and related menus behave the same as their counterparts in the Create Characteristic dialog. However, only a key figure InfoCatalog can be selected (or be the default) as the template for the new key figure.

The menu lets you select or search for a key figure from an InfoCatalog.

- **InfoCatalog, InfoCatalog Description,** and related menus behave the same as their counterparts in the Create Characteristic dialog. However, only a key figure InfoCatalog can be selected (or be the default) as the InfoCatalog for the new key figure.

The menu lets you search for or create a new InfoCatalog.

The Key Figure Properties dialog opens.

InfoObject Properties dialogs

You can access separate properties dialogs for characteristics and key figures by doing any of the following:

- Clicking the **Properties** (or sometimes **InfoObject**) button when an InfoObject is selected from a list.
- Choosing **Properties** (sometimes labeled as **Characteristic Properties** or **Key Figure Properties**) from a menu.
- As part of the process of creating a new InfoObject.

Characteristic Properties dialog:

You can view and modify the properties of a characteristic from the Characteristic Properties dialog.

You can access the Characteristic Properties dialog, for example, when you create a characteristic from the menu beside InfoSource on the **Transfer Structure** tab of the Input page.

The Characteristic Properties dialog includes the following components with the General, Compounding, and Attributes pages:

- **Characteristic.** The characteristic you want to view, with descriptive text in Short Description and Long Description.
- **Version.** Specifies whether the version is modified.
- **Object Status.** Specifies whether the object is inactive.

General page of the Characteristic Properties dialog:

You can access the Characteristic Properties dialog when you create a characteristic. Do this from the menu beside InfoSource on the **Transfer Structure** tab of the Input page.

The General page opens by default. Use the General page of the Characteristic Properties dialog to view the properties of a characteristic. It includes the following components:

- **Data Type.** Options for the data type include CHAR, NUMC, DATS, and TIMS.
- **Length.** The default Length for a new InfoObject is generally copied from the value for Length for the column, but the data type of the InfoObject can also determine the length of the InfoObject (see an example in Adding Info Objects for Columns).
- **Conv. Rout.** The SAP BW conversion routine to internal SAP format that is performed on source data (ALPHA is the default).

- **Exclusively attribute.** If you select Exclusively attribute, **Allow lowercase** and **Constant** become enabled, and all **Texts** and **Hierarchies** controls become disabled. **Texts are language dependent** and **Texts are time dependent** are generally disabled unless a 'text exists' box is selected.
- **Texts area.** Choose one or more of the following: **Short text exists**, **Medium text exists**, or **Long text exists** (the default). You can also choose **Texts are language dependent**, or **Texts are time dependent**.
- **Hierarchies area.** You can choose one of the following: **With hierarchies**, **Hierarchies are version dependent**, or an option from a list. If you select **With hierarchies**, the other hierarchies controls become enabled. (If you select **Exclusively attribute**, all hierarchies controls become disabled.)
The options for the list are: **Hierarchy is not time dependent**, **Entire hierarchy is time dependent**, and **Hierarchy structure is time dependent**.

Compounding page of the Characteristic Properties dialog:

You can access the Characteristic Properties dialog when you create a characteristic from the menu beside **InfoSource** on the **Transfer Structure** tab of the Input page.

Use the Compounding page of the Characteristic Properties dialog to view and modify Superior InfoObjects.

The controls on the Compounding page are disabled if you select **Exclusively attribute** on the General page.

The **Add** menu and its operations behave the same as that on the Attributes page (see the following section).

Attributes page of the Characteristic Properties dialog:

Use the Attributes page to view and edit the list of attributes for the characteristic. (The controls on the Attributes page are disabled if you select **Exclusively attribute** on the General page).

You can access the Characteristic Properties dialog when you create a characteristic. Do this from the menu beside **InfoSource** on the **Transfer Structure** tab of the Input page.

This page includes the following components:

- **Attributes of the Characteristic.** Includes a list of InfoObjects added as Attributes and corresponding descriptive text in Description.
- **Add.** Opens a menu with options to create or select an InfoObject to add to the list of attributes:

Add InfoObjects for Link Columns... .

Add InfoObjects for Table Definition Columns.

Select a Characteristic Loaded from this Source System... .

Create a New Characteristic... .

Create a New Key Figure... .

Select an InfoObject from an InfoCatalog.

Search for **InfoObject... .**

No matter which method you use to add InfoObjects as attributes, if an InfoObject to be added is compounded, and if its Superior InfoObjects do not already appear in the list of attributes for the characteristic, the Superior InfoObjects are automatically added to the attribute list.

Adding InfoObjects for Table Definition Columns:

If you select the **Add InfoObjects for Table Definition Columns...** option from the **Add** menu on the **Attributes** page of the **Characteristic Properties** dialog, the **Add InfoObjects for Table Definition Columns** dialog opens.

The **Add InfoObjects for Table Definition Columns** dialog, which is resizable, opens directly above the **Attributes of the Characteristic** list.

The **Available Columns** tree list lets you view and select columns from any table definition that is saved to the DataStage Repository. The table definitions are organized in the folder hierarchy of data source type, data source name, and table name.

Additionally, you can select multiple columns from multiple table definitions.

Adding InfoObjects for Columns:

After you select some columns and click **Add InfoObjects** on the **Add InfoObjects for Table Definitions Columns** dialog, the **Add InfoObject for Column** dialog opens.

(You can access the **Add InfoObjects for Table Definitions Columns** dialog from the **Add** menu on the **Transaction InfoSource Properties** dialog. Do this after you create the **Transaction InfoSource** from the menu beside **InfoSource** on the **Transfer Structure** tab of the **Input** page.)

The **Add InfoObject for Column** dialog displays the details of the first selected column and asks you to specify a corresponding InfoObject.

Prefix shows the prefix that is applied to the default InfoObject name. The prefix shown initially is the one that you last entered into the control when you previously used this dialog. As you type into **Prefix**, the displayed value for the **New InfoObject for Column** changes simultaneously to match and lasts for the duration of the InfoObject.

The rest of the default InfoObject name is generated by capitalizing (and, if necessary, truncating) the column name. The default **Short Description** for the new InfoObject is copied from the column name (truncated to twenty characters). The default **Long Description** is copied from the description for the column.

InfoObject Type defaults to **Characteristic** unless the SQL Type for the column is a non-integer number. In this case, the default **InfoObject Type** is **Key Figure**.

Column SQL types and InfoObject default Data Types:

When you add InfoObjects for columns, the default for **Data Type** for new InfoObjects is based on the SQL type of the column. The following table lists the SQL types, the corresponding data types, and the InfoObject types:

Table 1. SQL types and Data Types

Column SQL type	Default InfoObject data type	Default InfoObject type
BigInt	NUMC	Characteristic
Binary	CHAR	Characteristic
Bit	CHAR	Characteristic
Char	CHAR	Characteristic

Table 1. SQL types and Data Types (continued)

Date	DATS	Characteristic
Decimal	DEC	Key Figure (Number)
Double	FLTP	Key Figure (Quantity)
Float	FLTP	Key Figure (Quantity)
Integer	NUMC	Characteristic
LongVarBin	CHAR	Characteristic
LongVarChar	CHAR	Characteristic
Numeric	DEC	Key Figure (Number)
Real	FLTP	Key Figure (Quantity)
SmallInt	NUMC	Characteristic
Time	TIMS	Characteristic
Timestamp	CHAR	Characteristic
TinyInt	NUMC	Characteristic
VarBinary	CHAR	Characteristic

Generally, the default **Length** for the new InfoObject is copied from the value for **Length** for the column, but the data type of the InfoObject can also determine the length of the InfoObject.

For example, a DATS InfoObject always has a length of 8. When the data type of the InfoObject determines the length of the InfoObject, Length becomes read-only. The default InfoCatalog for the InfoObject is the same as the most recent InfoCatalog that you specify when creating an InfoObject of this type. (A given InfoCatalog contains only characteristics or key figures).

When you click **Add**, an InfoObject is created with the specified properties. (The new InfoObject has **Exclusively attribute** cleared.) The created InfoObject then appears in the list of attributes for the characteristic being edited, and the Add InfoObject for Column dialog advances to the next selected column.

Adding attributes for each selected column:

About this task

Click **Add All** on the **Add InfoObjects for Column** dialog to add attributes for the displayed column and all remaining columns that are selected. Defaults are used when creating an InfoObject for each column. Default InfoObjects are created and added as attributes without further user interaction. If a problem exists, the dialog shows the offending column (and InfoObject), with an accompanying message describing the problem.

Click **Next** to advance to the next selected column without creating an InfoObject or adding an attribute for the current column.

After all selected columns are processed, you return to the Add InfoObjects for Table Definition Columns dialog, where you can select additional columns to use as templates for adding further attributes to the characteristic. In this way, you can add attributes for columns in a different sequence from the order in which the columns are listed.

New InfoObject for Column menu:

After you select some columns and click **Add InfoObjects** on the **Add InfoObjects for Table Definitions Columns** dialog, the Add InfoObject for Column dialog opens.

(You can access the **Add InfoObjects for Table Definitions Columns** dialog from the **Add** menu on the Transaction InfoSource Properties dialog. Do this after you create the Transaction InfoSource from the menu beside **InfoSource** on the **Transfer Structure** tab of the Input page.)

Normally, you use the Add InfoObject for Column dialog to create default InfoObjects (to be used as attributes). However, the menu beside **New InfoObject for Column** lists alternative methods for specifying an InfoObject for the column.

You can specify an InfoObject for the column using the menu beside **New InfoObject for Column** on the Add InfoObject for Column dialog.

The menu includes the following options:

- Create a New Characteristic... .
- Create a New Key Figure... . Select a Characteristic Loaded from this Source System... .
- Select an InfoObject from an InfoCatalog.
- Search for InfoObject... .

The **Create a New Characteristic** and **Create a New Key Figure** options let you create new InfoObjects using the **Create Characteristic** and **Create Key Figure** dialogs. These dialogs, which are followed by the corresponding properties dialogs, give you more control over the InfoObject creation process than when you create the new InfoObject directly from the Add InfoObject for Column dialog.

The remaining options let you select an existing InfoObject for the column. After you specify an InfoObject using a menu option, the Add InfoObject for Column dialog shows the properties of the selected (or created) InfoObject as read-only values.

Before displaying the Add InfoObject for Column dialog for a given column, the program checks to see whether a column with the same name, SQL type, and length was assigned an InfoObject in the past by anyone on the IBM InfoSphere DataStage system, that is, a user editing a stage that is set to the same connection and Source System as the stage that is currently being edited. If so, the Add InfoObject for Column dialog shows that InfoObject with read-only controls by default.

Since, in this case, an existing InfoObject is shown in the dialog, the menu includes a **Properties** option to view the details of the InfoObject.

Adding InfoObjects for Link Columns:

The **Add** menu on the Attributes page of the Characteristic Properties dialog also includes an **Add InfoObjects for Link Columns...** option. This option is only available if the stage actually has columns already defined.

(You can access the Characteristic Properties dialog when you create a characteristic. Do this by using the menu beside **InfoSource** on the **Transfer Structure** tab of the Input page.)

Selecting the **Add InfoObjects for Link Columns...** option opens the Add InfoObjects for Link Columns dialog. It shows all columns assigned to the link.

As in the Add InfoObjects for Table Definition Columns dialog, you can select multiple columns. Even after you add InfoObjects for these columns, the dialog remains open so you can select more columns for adding attributes. (This lets you add attributes for the columns in a different order from that in the list control.)

When you click **Add InfoObjects**, the Add InfoObject for Column dialog opens. This dialog behaves the same as it does with the Add InfoObjects for Table Definition Columns dialog.

The General page of the Key Figure Properties page:

This is the General page of the Key Figure properties dialog.

Aggregation page of the Key Figure Properties dialog:

Click **InfoObject...** on the **Master data** page of the **Master InfoSource Properties** dialog to access the Key Figure Properties dialog.

(You can access the **Master InfoSource Properties** dialog, for example, from the **Create Master InfoSource from Existing Characteristic** option on the menu beside **InfoSource** on the **Transfer Structure** tab of the Input page.)

If **Object Status** is Active, the properties are disabled. The **Cumulative/Non-Cumulative Values** area is always disabled.

Options for **Aggregation** include for example, Summation, Minimum, and Maximum.

Options for **Exception Aggregation** include for example, Summation, Minimum, Maximum, and so forth.

Searching for an InfoObject

About this task

Some menus include a **Search for InfoObject** option.

For example, you can access this option using the **Add** menu on the Transaction InfoSource Properties dialog.

(You can access the Transaction InfoSource Properties dialog after you create the Transaction InfoSource. Do this by using the menu beside **InfoSource** on the **Transfer Structure** tab of the Input page.)

Choose the **Search for InfoObject** menu option to open a matching dialog.

Procedure

1. Select the search criteria for the InfoObject from the **InfoObject Type** menu. The choices for the **InfoObject Type** are: **Characteristic**, **Key figure**, **Time characteristic**, **Unit of measurement**, and **All types**.
2. To limit the list of InfoObjects based on **InfoObject Name** or **Long Description**, the corresponding boxes provide a list of comparison operators, such as **between**, **contains pattern**, and so forth.

If you select **between** or **not between**, both edit controls to the right of the selected operator become enabled. Any other selected operator enables only the first control.

3. After you select the search criteria and click **OK**, the Select InfoObject dialog opens.
4. Click **Find InfoObject...** to search within the results.
5. Click **Properties...** to view the properties of the selected InfoObject.

Selecting loaded characteristics

Many menus that let you select or create an InfoObject include the option **Select a Characteristic Loaded by this Source System**. This means that the characteristic is loaded by a Master InfoSource that has this Source System assigned to it.

For example, the Characteristic Properties dialog includes this option from the **Add** menu on the Attributes page.

(You can access the **Characteristic Properties** dialog when you create a characteristic from the menu beside **InfoSource** on the **Transfer Structure** tab of the Input page.)

When you choose this option, the Select Characteristic Loaded from this Source System dialog opens.

This feature is useful since data loaded by the InfoSources to which the same Source System is assigned tends to be interrelated. If the Source System loads a particular characteristic, other characteristics loaded by the Source System often need the characteristic as an attribute. Additionally, Transaction InfoSources for the Source System often need the characteristic for a transfer structure field.

Selecting an InfoObject from an InfoCatalog

Menus that let you select or create an InfoObject generally include an option to select an InfoObject from an InfoCatalog.

For example, the Characteristic Properties dialog includes the **Select an InfoObject from an InfoCatalog** option from the **Add** menu on the Attributes page.

(You can access the **Characteristic Properties** dialog when you create a characteristic. Do this from the menu beside **InfoSource** on the **Transfer Structure** tab of the Input page.)

The **Select an InfoObject from an InfoCatalog** option opens a secondary menu, which lists recently used InfoCatalogs (that is, InfoCatalogs that the current user recently created, selected, or selected an InfoObject from).

Select a listed InfoCatalog to open the Select InfoObject from InfoCatalog dialog or, click **Search for InfoCatalog** from the top of the secondary menu to find one. The Search for InfoCatalog dialog opens.

After you click **OK**, the Select InfoObject from InfoCatalog dialog opens, showing all the InfoCatalogs that satisfy the query, along with their constituent InfoObjects.

Creating an InfoCatalog

About this task

The **New InfoCatalog** option on InfoCatalog-related menus opens the Create InfoCatalog dialog. (You cannot select, create, or display InfoAreas from this dialog.)

For example, you can access this option from the menu beside **InfoCatalog** on the Create Characteristic dialog.

(You can access the Create Characteristic dialog, for example, when you create a characteristic. Do this from the menu beside **InfoSource** on the **Transfer Structure** tab of the Input page.)

Procedure

1. Enter the name of the InfoCatalog you want to create in the **InfoCatalog** field, with descriptive text in the **Description** field. The InfoCatalog is created in a common area within SAP BW named NODESNOTCONNECTED.
2. Choose a type from the **InfoCatalog Type** menu.

Searching for an InfoCatalog

Various menus include the **Search for InfoCatalog** option, for example, the menu beside **InfoCatalog** on the Create Characteristic dialog.

The options for the menu beside **InfoCatalog** also include **New InfoCatalog...** and a list of recently used InfoCatalogs.

When you choose the **Search for InfoCatalog** option from this menu, the **Search for InfoCatalog** dialog opens (for an example of this dialog, see "Searching for an InfoCatalog").

After you select search criteria and click **OK**, the Select InfoCatalog dialog or the Select InfoObject from InfoCatalog dialog opens, depending on which menu you use to open the Search for InfoCatalog dialog.

Both dialogs show the InfoCatalogs that satisfy the search conditions, along with their constituent InfoObjects. However, **OK** on the Select InfoCatalog dialog is enabled only when an InfoCatalog is selected, where **OK** on the Select InfoObject from InfoCatalog dialog is enabled only when an InfoObject is selected.

Viewing the properties of the selected InfoSource

After you select an InfoSource, additional menu options become available on the menu side **InfoSource** on the **Transfer Structure** tab of the Input page. For example, you can view the properties of the selected InfoSource or of the Characteristic that it loads from this menu.

Choose the **InfoSource Properties** option to open the Master InfoSource Properties dialog or the Transaction InfoSource Properties dialog, depending on the type of the selected InfoSource.

If the selected InfoSource is a Master InfoSource, the menu beside **InfoSource** also includes a **Characteristic Properties** option. The option gives you direct access (using the Characteristic Properties dialog) to the properties of the characteristic that the Master InfoSource uses to load data.

Setting a hierarchy to be loaded

The **Transfer Structure** tab on the Input page supports hierarchies.

The **Hierarchy** option is available in the **InfoSource Type** list only if you set the characteristics to support hierarchies initially. (Do this by selecting **With Hierarchies** from the **Characteristic Properties** dialog, when you create a characteristic from the menu beside **InfoSource** on the **Transfer Structure** tab of the Input page.)

If you select **Hierarchy** for **InfoSource Type**, additional hierarchy controls appear.

You can select or create a new hierarchy definition for the hierarchy to be loaded by using the menu beside **Hierarchy Name**. With these controls, you can select or create a hierarchy definition.

Note: The stage only lets you provide master data for hierarchies. You must create nodes and leaves in SAP BW.

To select an existing hierarchy or create a new one, use the menu beside **Hierarchy Name**:

- The **Select** option opens the Select Hierarchy dialog, showing the hierarchies already defined for the InfoSource.
- The **New...** option opens the Create Hierarchy dialog.

Select Hierarchy dialog:

The **Select** option on the menu beside **Hierarchy Name** on the **Transfer Structure** tab of the **Input** page opens the Select Hierarchy dialog.

The Select Hierarchy dialog shows the hierarchies already defined for the InfoSource.

Click **Properties** to open the Hierarchy Properties dialog.

Create Hierarchy dialog:

The **New...** option in the menu beside **Hierarchy Name** on the **Transfer Structure** tab of the **Input** page opens the Create Hierarchy dialog.

Specify the name of the hierarchy and its description. When you click **OK**, the Hierarchy Properties dialog opens.

After you select or create a hierarchy for the **Transfer Structure** tab, the grid is automatically filled with the appropriate transfer structure for the hierarchy.

You can specify that the selected hierarchy be automatically renamed when it get loaded. Do this on the **Transfer Structure** tab by selecting **New Name** (which enables the control below the check box) and entering the new hierarchy name.

Defining Load Columns and InfoPackages

This section discusses the Input Columns page, describing how to synchronize and validate columns. It also describes the Input InfoPackage page, including the PUSH, PULL, and FILE options; along with the Input Process Chain page that will be invoked at runtime.

Defining Input Columns

After you select an InfoSource and establish the transfer structure for the stage, click the **Columns** tab on the Input page.

The **Columns** tab opens.

The synchronization of the columns with the transfer structure takes place automatically whenever the transfer structure changes. However, if the column list is accidentally modified, use **Synchronize Columns** to resynchronize the column list.

The **Columns** tab has the following components:

- **Corresponding Field in Transfer Structure for Column.** Displays the properties of the field in the transfer structure whose ordinal position is the same as that of the current column in the Columns grid.
- **Synchronize Columns.** Fills the grid with columns that match the fields in the transfer structure respectively. The name of each column is based on the corresponding transfer structure field. Mapping occurs as follows:
 - Transfer structure fields whose Decimal property is greater than 0 are mapped to the IBM InfoSphere DataStage Decimal SQL type.
 - The Decimals property of the source field that uses the SAP BW data type is mapped to the Scale of the new column that uses the InfoSphere DataStage SQL type.
 - If the length of the field is greater than 256, the column type is set to VarChar, not Char.
 - DATS fields are mapped to SQL Type Date.
 - TIMS fields are mapped to Time.
 - The SQL Type for synchronized columns is Char (except Decimal, Char, Date, and Time).

If you synchronize columns when columns already exist in the grid, any existing column whose name matches the InfoObject of a transfer structure field is moved to the correct position. Its type, length, and scale are updated, if appropriate. This preserves any other information, such as **Derivation**, that might be related to the column from the other end of the link. Existing columns that do not match any transfer structure field are deleted.

If you synchronize the columns when no transfer structure is defined on the **Transfer Structure** tab, you are notified that the operation is unavailable until a valid transfer structure is specified.

- **Validate Columns.** Verifies the consistency of the columns with the transfer structure.

The validation process first confirms that the number of columns is the same as the number of transfer structure fields. If this number differs, a message opens, and the validation process stops.

If the number matches, each column is checked in sequence to confirm that its SQL type is compatible with the SAP BW data type of the corresponding transfer structure field. The column length must be the same as the transfer field length. The names do not need to match.

The validation process accepts columns using the following types according to these rules:

- The BigInt, Integer, SmallInt, TinyInt, and Char type when the corresponding transfer structure field uses the NUMC type.
- Char regardless of the type used by the corresponding transfer structure field.

- Any type when the corresponding transfer structure field is CHAR.
If there are any discrepancies, the column is automatically selected, and a message like the following appears:
For consistency with the transfer structure, column "EMPLOYEE" is required to have a type "Char" and length 8, but instead it has type "Double" and length 18. Would you like the type and length to be set correctly?
Choose one of these responses:
Yes. Resets the property for the column, and validation continues. (**Yes to All** does the same for all validation errors.)
No. Leaves the property uncorrected for the column, but validation continues.
Cancel. Leaves the property uncorrected, and terminates validation. If all the columns are consistent with the transfer structure, a message stating this appears at the end of the validation.
If you try to validate the columns when no transfer structure is defined on the **Transfer Structure** tab of the Input page, you are told that the operation is unavailable until a valid transfer structure is specified.

Input Process Chain page

The **Process Chain** tab on the **Input** page lets you determine when to use a Process Chain. To use a Process Chain, select a Process Chain from the list. Enable **Use Process Chain**. Click **OK**. The Process Chain will invoke the IBM InfoSphere DataStage option job at runtime.

If a PUSH job schedules a Process Chain, for example, the job must wait for the associated InfoPackage within the Process Chain to run and contact the RFC Server with a Request ID before proceeding with the load. This wait will timeout after 120 seconds but can be modified with the environment variable `ASC_BWLOAD_PCIPAK_TIMEOUT`.

Note: If a Load job runs a Process Chain, the Process Chain **MUST** contain a scheduled InfoPackage for the appropriate InfoSource/IS Type within the job related Source System. If the Process Chain does not contain a schedule InfoPackage for the appropriate InfoSource/IS Type, the job will timeout and fail.

Input InfoPackage page

The **InfoPackage** tab on the Input page lets you determine when and how IBM InfoSphere DataStage jobs load data into SAP BW using the following data load methods. These load methods let you invoke jobs from or outside SAP BW:

- **PUSH** lets the InfoSphere DataStage job invoke InfoPackages to stream data into SAP BW.
- **PULL** lets InfoPackages initiate the load, invoking the InfoSphere DataStage job.
- **FILE** lets the InfoSphere DataStage job put the data in a file, which is later loaded by a scheduled InfoPackage.

Parallel Loads: SAP BW Load architecture is based on the criteria of InfoSource and InfoSource Types. The load runtime knows how to pool simultaneous loads with matching criteria. Stages, Links, and Jobs, that run simultaneously within the same RFC Server control, merge the loads into a single load utilizing the same SAP BW generated InfoPackage Request ID.

For example, when you run a Server PUSH job with multiple, identically configured input links, each link executes in parallel. When the first link (A) reaches a specific spot in the configuration process, it locks a semaphore so that the other links (B) cannot continue until the first is through. At this time, the A link

either starts a Process Chain, or schedules an InfoPackage. Once started, the A link frees the semaphore and waits for BW to contact the appropriate RFC Server with a Load Request ID. When the semaphore is released by the A link, the B links recognize that either a Process Chain or InfoPackage has already been scheduled and waits for the Load Request ID, as link A is doing.

When SAP BW returns to the RFC Server with a Load Request ID, all links (A & B) begin their load process utilizing the same Request ID, thus processing a single load in parallel. Coordination of package numbers and total row counts between links, stages, and jobs, is done via semaphores and intermediary files allowing this parallelism.

For an SAP BW Parallel Load to work, the runtime processes:

- must exist on the same host server. This is required as semaphores cannot be shared between servers and they are vital to coordinating packets to BW.
- must all use a common RFC Server or Source System. Multiple links configured the same except for the Source System will not be treated as a single load, they will work individually, at a slower performance measure due to semaphore locking when not really necessary.

InfoPackage PUSH option: A Load PUSH job can be configured in two ways, first by Scheduling an InfoPackage, second by scheduling a Process Chain.

1. Scheduling an InfoPackage. If a PUSH job schedules an InfoPackage, the job must wait for the InfoPackage to contact the RFC Server with a Request ID before proceeding with the load. The duration the job waits for this call back is hard coded to 120 seconds but can be changed (on the Project Level) with the environment variable ASC_BWLOAD_IPAK_TIMEOUT. When the IBM InfoSphere DataStage job gets the Request ID, the load proceeds. To change the environment variable refer to Tuning load jobs.
2. Scheduling a Process Chain. If a PUSH job schedules a Process Chain, the job must wait for the associated InfoPackage within the Process Chain to run and contact the RFC Server with a Request ID before proceeding with the load. This wait will timeout after 120 seconds but can be modified with the environment variable ASC_BWLOAD_PCIPAK_TIMEOUT. To modify the environment variable refer to Tuning load jobs.

Note: If a Load job runs a Process Chain, the Process Chain MUST contain a schedule InfoPackage for the appropriate InfoSource/IS Type within the job related Source System. If this is not the case, the job will timeout and fail.

Note: When a job is designed, both an InfoPackage and Process Chain can be configured to be scheduled. If the Process Chain is selected, it will be run, with the expectation that the Process Chain will schedule the InfoPackage specified in the job. This is the only supported configuration on BW Load jobs with a Process Chain being selected.

Note: Multiple links configured with the same InfoSource/IS Type schedule only a single InfoPackage or Process Chain, even though multiple packages or chains might be defined in the job. This enables BW Load Parallelism.

The menu beside **InfoPackage to Invoke** includes the **Select...** and **New...** options:

- **Select...** . This option opens the Select InfoPackage dialog. Use this dialog to select from all existing InfoPackages defined on the SAP BW system for the

currently selected Source System, InfoSource, and InfoSource Type. The InfoSphere DataStage job invokes the selected InfoPackage when you use the InfoSphere DataStage Director to run it.

- **New...** . This option opens the **Create InfoPackage** dialog. Use this dialog to define a new InfoPackage for the job to use.

To push data into SAP BW, an InfoPackage must not have any **Select Data**, **Third Party Selections**, or **Schedule** settings defined. Any InfoPackage not meeting these requirements is not displayed in the list.

If you use the **PUSH** option, but the job is invoked by SAP BW, the job aborts.

InfoPackage PULL option: Use the **PULL** option for the Data Load Method on the InfoPackage tab on the Input page to create InfoPackages that starts jobs at the discretion of SAP BW.

The PULL Data Load Method includes the following components for the SAP BW InfoPackages that start this Job.

- **New.** Opens the Create InfoPackage dialog to define a new InfoPackage for the job to use, then the InfoPackage Properties dialog.
- **Properties.** Opens the InfoPackage Properties dialog to specify how the data gets updated, control which objects get loaded, define when data is updated, and which IBM InfoSphere DataStage job parameters to use when the InfoPackage runs the job. For more information about this dialog, see the next section.

When you create an InfoPackage using the PULL Data Load Method, the InfoSphere DataStage Job parameter is automatically set appropriately on the **DataStage Job Parameters** tab.

Note: You must click **OK** on the InfoPackage Properties page, or the runtime will consider this as a PUSH.

Create InfoPackage dialog:

About this task

Use the Create InfoPackage dialog to create an InfoPackage on SAP BW.

Procedure

1. Enter a **Name** for the InfoPackage and click the **OK** button.
The InfoPackage is immediately created in SAP BW.
2. The Edit Properties dialog opens. At this point, the InfoPackage has been created in SAP BW. If from the Edit Properties dialog, you click **Cancel**, the InfoPackage will still exist on SAP BW but will be considered a PUSH as the job name parameter will not have been sent to SAP BW. Click **OK** to send the job name parameter to SAP BW. The InfoPackage is created.

InfoPackage Properties dialog:

Use the InfoPackage Properties dialog to specify how the data gets updated, control which objects get loaded, define when data is updated, and which IBM InfoSphere DataStage job parameters to use when the InfoPackage runs the job.

The InfoPackage Properties dialog contains the **Processing** and Update Parameters pages (the **Hierarchy** page is uneditable), depending on how you create the InfoPackage. (For example, the InfoSphere DataStage **Job Parameters** page opens

only when you use the **PULL** option for the **Data Load Method** on **InfoPackage** tab on the Input page to create InfoPackages.)

It also contains the InfoPackage with its description.

Use the Processing page of the InfoPackage Properties dialog to specify how the data gets transferred.

(Click **Properties...** on the **InfoPackage** tab of the Input page to open the InfoPackage Properties dialog with the Processing page displayed by default.)

Select **Consistency check for characteristic values in the transfer rules** to ensure that the fields for the transfer structure are assigned to the InfoObjects of the communication structure.

The settings for **Update data...** let you determine whether the data is stored only in a persistent staging area before the data goes to Characteristics or InfoCubes.

InfoPackage Properties Update Parameters page:

Use the **Update Parameters** page of the InfoPackage Properties dialog to define when data is updated.

(Click **Properties...** on the **InfoPackage** tab of the Input page to open the InfoPackage Properties dialog.)

The **Update Parameters** page behaves like the corresponding window in the SAP BW GUI. A window opens for master data when you use the **FILE** option for the **Data Load Method** on **InfoPackage** tab on the Input page to create InfoPackages.

Update Mode lets you specify whether to fully update the data.

Data update type in the Data targets lets you specify when to update the data (disabled for this version).

InfoPackage Properties Job Parameters page:

Use the DataStage Job Parameters page of the InfoPackage Properties dialog to define which InfoSphere DataStage job parameters to use when the InfoPackage runs the job. This page opens only when you use the **PULL** option for the **Data Load Method** on the **InfoPackage** tab on the Input page to create InfoPackages (it does not appear when you use the **PUSH** or **FILE** option).

(Click **Properties...** on the **InfoPackage** tab of the Input page to open the InfoPackage Properties dialog.)

InfoPackage FILE option:

About this task

Use the **FILE** option for the **Data Load Method** on the **InfoPackage** tab of the Input page to cause a IBM InfoSphere DataStage job to put the data in a file. The data is loaded at a later time by a scheduled InfoPackage.

- Click **New...** to open the Create InfoPackage dialog.
- Click **Properties...** to view and modify the InfoPackages in the list. This opens the InfoPackage Properties dialog.

To perform a FILE Load:

Procedure

1. When run from InfoSphere DataStage (such as in PUSH mode) the Pack runtime gathers the data to send to SAP BW and places it in a file located in the selected RFC Servers Data directory. This file is named with the convention <InfoSource>_<InfoSource Type>.TXT. An additional file with the naming convention <InfoSource>_<InfoSource Type>.FILE.READY is also created when the job has completed successfully. This FILE.READY file is binary data containing all the information needed to load the created TXT file into SAP BW via the RFC Server. Both of these files should not be manually edited. They are intermediary files which will be deleted after the data is loaded into SAP BW. Any customer interaction with these files is not supported.

During this step, the stage runtime does not connect to SAP BW, it is self-contained.

Legacy intermediate .MET files are no longer used by the stage in processing FILE loads. They are no longer created in the process, unless a specific environment variable is set forcing their creation. For backward compatibility the .MET files can still be generated by setting the environment variable ASC_BWLOAD_CREATE_MET_FILE to an integer value other than 1. If this is set, .MET files will be generated for ALL load jobs. Existing MET files will be overwritten by future job runs. Deleting or editing your MET files will not effect your load jobs. MET files provide no value in the FILE Load methodology. Modifications of these files will have no effect.

When a FILE Load job is run multiple times, the .TXT and .FILE.READY files are overwritten. A InfoSphere DataStage Director Client log entry will indicate this has occurred. Previously generated files will be lost.

2. When the created InfoPackage is scheduled from SAP BW the RFC Server looks for the FILE.READY binary file to determine if a load can be processed. If this file is not found, the load will be treated as a "zero row load" and might be identified as a load error in BW. If the FILE.READY indicator file exists, the RFC Server uses the data it contains to log into SAP BW, and load the associated TXT file via the standard load BAPIs the runtime uses. Once the load is successful, both the TXT file and the FILE.READY file are deleted.

During this step of the FILE Load process, InfoSphere DataStage is not run, thus no load logs or job status will be available in InfoSphere DataStage Director Client.

Load Dynamic Packet Size:

The Dynamic Packet Size can be set in SAP using transaction code **RSCUSTV6**.

Processing SAP BW selection parameters

This section describes the necessary components, coding, and flow of passing selection parameters from SAP BW into IBM InfoSphere DataStage jobs.

Loading data from non-R/3 systems into SAP BW requires extraction of data from many different data sources. Many data sources are relational database systems, requiring queries to be generated that select only parts of the source data. In some cases the selection criteria must be dynamic, based on the information required within SAP BW. The selection parameters defined within SAP BW are available as a single parameter to InfoSphere DataStage. The next section describes how to understand, parse, and utilize this new BWFILTERS parameter within InfoSphere DataStage jobs.

Working with BWFILTERS from SAP BW to InfoSphere DataStage

You can use the BWFILTERS job parameter to pass selection parameters from SAP BW into IBM InfoSphere DataStage.

This parameter is set correctly only if the SAP BW developer identifies the parameter on the Third party selection page within the InfoPackage. The SAP BW developer can make this parameter visible by clicking the **refresh** button on the third party selection page. The **refresh** button then accesses the job parameter information for the defined job in InfoSphere DataStage. You must define this job parameter in the job in InfoSphere DataStage prior to the refresh procedure.

When the InfoPackage is run from within SAP BW, the RFC Server that processes data requests between InfoSphere DataStage and SAP BW populates the BWFILTERS parameter with the information on the selection page. The format of the BWFILTERS is as follows:

```
<techname>:<sign>:<option>:<From>:<To>;<techname>:<sign>:<option>:...
```

where semicolons separate each technical name entry on the selection page.

For each technical name entry, five more parameters identify additional values for the technical name. Colons separate the technical name parameters. Only three parameters are used (the *<sign>* and *<option>* parameters are only being passed).

InfoSphere DataStage job parameters

When a IBM InfoSphere DataStage job starts, all the necessary job parameters must be defined. You cannot add additional parameters to a running job.

Because BWFILTERS contains a series of additional values that are considered additional parameters, a controlling job must be written to parse the BWFILTERS parameter (see the sample InfoSphere DataStage BatchStart job).

The parsed values create additional parameters before running a job that populates SAP BW, which is also defined by a DSJOB job parameter. Three additional parameters are created from each technical name in BWFILTERS. Any job that this controlling job starts can have any of these job parameters defined.

The total number of parameters can be determined by using this simple calculation: (3 * technical names from selection page).

In addition, the BatchStart program reads the GlobalParameters file from the current project directory (DataStage/projects/<ProjectName>) and initializes any parameters required for <DSJOB>.

You can import the BatchStart job using the BWFiltersToDataStage.dsx export file, which resides in the Templates directory of your Load CD.

BatchStart processing

The BatchStart template program provided processes the BWFILTERS parameter by first breaking the parameter into SAP BW technical items. Each value in the technical item is then assigned to a variable. The variable names identify the type of item, such as TechName, From and To.

The BatchStart program handles any special processing that might be required to map SAP BW technical names to column names in the source stage that performs the filtering.

As an example, the BatchStart program maps SAP BW technical names to columns in Oracle Applications (for example, ORA_COMP is changed to GL_BALANCING). The special processing is used for the assignment of "flex" fields in the Oracle Applications source stage.

Created parameters are named as follows:

```
<techname>Name = <TechName>  
<techname>From = <From>  
<techname>To = <To>
```

<techname>Name initially contains the technical name defined on the selection tab within SAP BW. However, this value can be changed with special coding to identify a specific column on the source table (see ORA_COMP as an example).

<techname>From contains the starting value when a range of values is specified on the selection tab. If no *To* value exists, the *From* value is placed into the *To* parameter, making a transformation filter possible.

<techname>To contains the ending value when a range of values is specified. If the value in SAP BW is not set, the value contains the *From* value.

The parameters are written with their assignments to a sequential file, defined as <DSJOB>.pf. The parameter file is then processed to assign parameters to the job defined by <DSJOB> after all the new parameter names are created. DSJOB is an additional parameter that is defined in the BatchStart sample program.

Using new parameters from BWFILTERS

The following example illustrates the use of BWFILTERS values from the BW InfoPackage. The example assumes only one value is defined on the selection page within the InfoPackage:

1. SAP BW requests data from a InfoSphere DataStage job defined on the InfoPackage.
2. The RFC Server receives the request and sees the BWFILTERS parameter.
 - a. A call is then directed back to the SAP BW to get the selection page information.
 - b. The BWFILTERS values are replaced with the contents from the selection page.
3. The RFC Server starts the InfoSphere DataStage job, for example, StartBatch, which is defined on the Third party page. The third party page in SAP BW also defines the DSJOB parameter to contain the value of a subsequent InfoSphere DataStage job, called GLDATA in this example, to run. The job defined by <DSJOB>(GLDATA) is run only after the BWFILTERS values are parsed into additional InfoSphere DataStage parameters.
4. The resulting job returns data to SAP BW using the RFC Server.

Global parameters file

After setting the job parameters from the BWFILTERS parameter, the code reads the GlobalParameters file that is defined in your current project directory. Each line in this file contains additional parameters and values that can be set for the called job.

The ParamFile utility is provided in the Templates directory to facilitate the creation of the GlobalParameters file. If the GlobalParameters file is not found, no additional properties are set, and the defaults are used.

Parameters are set only if the job defined by <DSJOB> has the parameter defined. Parameter names that contain an asterisk (*) in the last position have the value decrypted using the SAPChgChar routine that is provided in the .dsx file.

The ParamFile utility performs the encryption and writes the encrypted value to the GlobalParameters file.

Summary

You can import the BatchStart job using the BWFiltersToDataStage.dsx export file, which resides in the Templates directory of your Load CD. See sample code in this file for examples of how to set and use parameters from the SAP BW selection page to filter rows from the source system.

You cannot set these parameters in a IBM InfoSphere DataStage job, but you can code a job sequence to:

- Process the filters from SAP BW
- Change column name values
- Run the sourcing job

The minimum number of InfoSphere DataStage jobs required to perform this operation is two.

Scenario: Loading SAP BW from an Oracle database

The following scenario describes coordinating delta processing between the Load stage and a source stage.

In addition to using the BWFILTERS job parameter to extract data from non SAP R/3 sources into SAP BW, delta processing further enhances the extraction capabilities of the Load stage.

The Oracle Applications stage lets you capture incremental changes to increase the efficiency of data extraction. To do this, you use the **Delta** tab on the Output page of the Oracle Applications Direct Access stage.

Example of delta processing

The following example describes how to coordinate delta processing between the Load stage and the Oracle Applications stage.

1. Start the processing from the Scheduler (Maintain InfoPackage) dialog in SAP BW. To do this, select **Initialize Delta Process** as the **Update Mode** on the Update page.
2. Make your selection from the Data Selection page of the Scheduler (Maintain InfoPackage) dialog. Use the JJJJ/MM/DD date format.
3. In DataStage, open the Oracle Applications Direct Access stage and select the **Delta** tab on the Outputs page to enable delta processing:
4. Select a table from the **Available delta tables** list and move it to the **Selected Delta tables** list, then specify the appropriate path and filename in the **Path to delta file** field:
5. From the **Scheduler** menu in SAP BW, select **Initialization Options for Source System**, then select Start Data Load immediately from the Schedule page:
6. Mark and delete the entry on the Initialization for this Source window.
7. An informational message appears, verifying the deletion.
8. Ensure the delta file is deleted on the server. You can view log information in Notepad.

Extracting Open Hub data by using InfoSpokes

This section describes how to define the Open Hub Extract stage properties, define the communication between SAP BW and IBM InfoSphere DataStage, define an Open Hub Extract job, perform an extraction, and verify an extraction.

The Open Hub Extract stage can perform the following by using the InfoSphere DataStage Designer client:

- Extract data and metadata from the SAP BW system.
- Allow for the initiation of data extraction from either SAP BW or InfoSphere DataStage.
- Use certified APIs to access extracted metadata and data in the SAP BW system.
- Allow the extraction of any type of data supported by the Open Hub architecture.
- Provide checking of SAP BW Process Chain status and logging of unsuccessful operations.

The IBM InfoSphere Information Server Pack for SAP BW supports the extraction of 3rd party Open Hub Destinations (OHD) of type External System. The correct data transfer between a data source and the OHD is not guaranteed because this transfer is implemented completely within SAP BW. For the data sources supported by 3rd party OHD please consult the documentation of your SAP BW system. For more information, see Support for SAP BW Open Hub data sources.

The stage has a custom GUI that lets you specify a Source System, an InfoSpoke, and a Process Chain from the SAP BW system, and to display the corresponding Transfer Structure for the InfoSpoke.

The Open Hub stage also has a runtime stage and an RFC Server to extract data from SAP BW. (A separate instance of the RFC Server is constantly running for each Source System supported on a InfoSphere DataStage system.) Additionally, it has an RFC Server Manager that starts and stops the individual RFC Server instances, depending on which Source Systems are supported.

Important prerequisite

To use the Open Hub Extract Stage you must first install SAP BW's Open Hub service. The Open Hub Extract stage can only be used with SAP BW installations equal to or greater than version 3.5.

IMPORTANT! To upgrade from the Extract stage to the Open Hub Extract stage you will need to update the InfoSphere DataStage Connection parameters to point to your 3.5 server (see in step 4 on page 9-20), and configure your server with IDENTICAL InfoSpokes and Process Chains that were used on your legacy server.

Defining communication between SAP BW and InfoSphere DataStage

Before an extraction can be run in InfoSphere DataStage, in SAP BW you will need to:

- Create an InfoSpoke
- Create a Process Chain

Creating a new InfoSpoke

About this task

The following steps summarize the process of creating an InfoSpoke in SAP BW and configuring it for data extraction from IBM InfoSphere DataStage:

- Create a new InfoSpoke
- Define the InfoSpoke
- Define the destination
- Specify the InfoObjects to extract
- Activate the InfoSpoke

Follow the steps below to create an InfoSpoke:

Procedure

1. Enter transaction code **/nrsboh2** in SAP BW.
The Edit InfoSpoke: Initial window opens.
2. Enter a unique name for the InfoSpoke in the **InfoSpoke** field. Click the **Create InfoSpoke** button.
The Create InfoSpoke DSBWEXTR window opens.
3. Enter a short description of the InfoSpoke. Under the **General** tab select the Data Source type and Data Source you want to extract data from. Specify the InfoObject to extract. The following example selects *InfoObject (Attributes)* as the Data Source. To view all available InfoObjects click the icon to the right of the second line of the **Data Source** field. By default, *Full* is the Extraction Mode with *10,000* Lines per Data Package. It is recommended you use the default package size. Using an InfoSpoke packet size greater than the default would impact SAP BW server's performance and exhausts its resources.
The Selection of InfoObjects window opens.
Choose from the available options in the selection window.
4. Click the **Destination** tab. Enter a description. There are two possible destinations: DB table or File. The **DB table** is selected by default. Note: The Open Hub API's do not support File destination at this time. Select the **Delete Table Before Extraction (Recommended)**, **Technical Key**, and **Message to Third Party Tool** options. Define the **RFC Destination** as the InfoSphere DataStage server source system. Later, the Pack will set the **Parameters** of the destination. Initially, the parameters table will be empty.
Only the extraction to a database table option is supported for Third Party extractions.
5. Click the **InfoObjects** tab. Select the appropriate InfoObjects, moving them from the right column to the left column using the arrow keys.
6. Click the **Key Fields at Beginning of Table** button. The key fields must be at the beginning of the table for database extraction.
7. You can use the **Selection** tab to filter your extraction.
8. Click **Activate the InfoSpoke** icon (Ctrl + F3). The **InfoSpoke was activated** message appears in the bottom left of the window.

Creating a Process Chain

About this task

The following steps summarize the process of creating a Process Chain in SAP BW. A typical Process Chain contains two Process steps: Start Process and an InfoSpoke Process.

- Create a new Process Chain
- Define the Start Process
- Create a new Process Variant
- Define the Start Process Variant
- Define the start time
- Add an InfoSpoke
- Select an InfoSpoke
- Create a link between the Start Process and the Data Export
- Save and Activate the Process Chain

In SAP BW to create a Process Chain:

Procedure

1. Enter transaction code `/nrspc`.
The **Process Chain Maintenance Planning View** window opens.
2. Click the Create icon (or F5).
The New Process Chain dialog opens.
3. Enter a **Process Chain** name and a **Long Description**. Click the **Enter** icon.
After you specify the name of the new Process Chain, the Insert Start Process dialog opens. It lets you insert a Start Process for the Process Chain.
4. Define the **Start Process**. The **Start Process** must be unique for each Process Chain.
5. Create the Start Process Variant. A variant is a collection of predefined criteria, similar to a group of values used as parameters.
Variants are attached to various processes that are defined for Process Chains. Certain variants are used by InfoSphere DataStage for data extraction. These Variants are used by InfoSphere DataStage for data extraction, for example, the Start process, the Data Export into External Systems process, and the ABAP Program process. The ABAP Program process itself has a variant attached to it.
Click the **New** icon on the Insert Start Process dialog to create a new Process Variant.
The Start Process dialog opens.
6. Define the Start Process Variant. When the Maintain Process Variant dialog opens, create a variant for the start process by selecting **Direct Scheduling**. This allows you to customize the **Start Time** options. Click **Change Selections**.
The Start Time dialog opens.
7. Enter a Start Time value by clicking the **Immediate** button, which enables **Immediate start**. Click the **Check** button and Save.
8. Add an InfoSpoke as the next Process in the Process Chain.
To create this Process, expand the selections on the **Process Chain Maintenance** canvas.

9. Drag **Data Export into External** to the canvas. The Insert Data Export to External Systems dialog opens.
10. Select an InfoSpoke or create a new one that is configured for data extraction from InfoSphere DataStage.
The Insert Data Export into External Systems dialog opens. It lets you specify an InfoSpoke as a Process Variant.
Select the InfoSpoke desired. Click the **Check** button and save.
11. Create a link between the Start Process and the Data Export into External Systems Process.
Position your cursor at the bottom left of the **Start Process** on the canvas and drag it to the **Data Export...** Process.
This creates a unidirectional link in the Process Chain between the two existing processes.
12. Save and Activate the Process Chain, using the **Activate** icon.

Results

Next, define your job in InfoSphere DataStage.

Defining an Open Hub Extract job in InfoSphere DataStage

In IBM InfoSphere DataStage after creating the Open Hub Extract job and connecting an output link to it, you need to define the following parameters in a job including:

- Defining the Connection Parameters to a SAP BW System
- Selecting a Process Chain that is configured to perform the extraction in SAP BW, along with the Source System used to communicate with SAP BW.
- Selecting an InfoSpoke. The InfoSpoke specifies the data to be extracted and the manner in which it will be extracted (this includes filtering criteria, selection of InfoObjects, Delta vs. Full extraction, deletion of data before extraction).
- Metadata. The metadata describes the data that will be retrieved by the Pack. The metadata is retrieved from SAP BW and is transformed into corresponding InfoSphere DataStage columns. This metadata is used again to validate the data retrieved from SAP BW. This insures that the definition of the extraction data has not been modified in SAP BW since the job was designed.

IMPORTANT! An extraction that does not define all these parameters will fail.

Before beginning save your Open Hub Extract job.

Open Hub Extract properties

Double-click on the Open Hub Extract stage in your IBM InfoSphere DataStage job to open the Open Hub Extract stage dialog.

The Open Hub Extract Stage dialog has two pages:

- **Stage.** This page displays the name of the stage you are editing. It also has the **General** tab, which is displayed by default. You can enter text to describe the purpose of the stage in the Description field. The **NLS** tab opens only if you have installed NLS. This page defines a character set map to use with the stage, if required. For details, see NLS tab - Defining character set maps.
- **Output.** This page lets you define output properties and includes the:
 - **General tab** opens by default and includes connection and login information.

- **Process Chain** tab allows the user to define the properties of the selected Source System
- **InfoSpoke** tab allows the user to select the InfoSpoke to use in the extraction, update SAP BW, and define the properties of the InfoSpoke and data.
- **Columns** tab contains the column definitions for the data being written to the stage.

NLS tab - Defining Character Set Maps:

You can optionally define a character set map for Open Hub Extract stage using the **NLS** tab.

You can change the default character set map that is defined for the project or the job by selecting a map name from the list. This tab also has the following components:

- **Show all maps.** Lists all the maps supplied with InfoSphere DataStage. Maps cannot be used unless they have been loaded using the InfoSphere DataStage Administrator.
- **Loaded maps only.** Displays the maps that are loaded and ready to use.
- **Use Job Parameter...** . Specifies a character set map as a parameter to the job containing the stage. If the parameter has not yet been defined, you are prompted to define it from the Job Properties dialog in the Designer client.

For details about NLS configuration, see *IBM InfoSphere DataStage documentation*.

Unicode statement: The IBM InfoSphere DataStage Pack for SAP BW is currently designed to communicate with SAP BW Unicode systems with respect to both inbound and outbound calls for non-Unicode data. Communication involving Unicode data with SAP BW Unicode systems is not currently supported, and potential data incompatibilities resulting from restricted character sets can result from any usage, involving Unicode data, of the IBM InfoSphere DataStage Pack for SAP BW with SAP BW Unicode systems.

Defining the connection parameters to a SAP BW system

About this task

To define the connection parameters to an SAP BW system:

Procedure

1. Open the Open Hub Extract Stage dialog.
2. Select the Output page. The **General** tab opens by default and includes the connection and login information.
3. To change the IBM InfoSphere DataStage connection parameters to SAP BW click the button to the right of the Name field.
4. Define or change the InfoSphere DataStage connection parameters to SAP BW by selecting one of the following:
 - **Properties** opens the Connection Properties dialog displaying the properties of the currently selected connection. From this dialog you can edit the current Connection and Logon Details along with the SAP BW RFC Server Settings.
 - **Select** opens the **InfoSphere DataStage Select DataStage Connection to BW** dialog. This dialog lets you select a connection for the stage and manage the connection definitions. These operations are also available in the InfoSphere DataStage Administrator for SAP utility.

This dialog includes the following buttons that let you manage the list of connections that is maintained on the InfoSphere DataStage server machine:

New. Opens an empty Connection Properties dialog, where you can create a new connection.

Properties. Opens the Connection Properties dialog, where you can change the configuration for the selected connection.

Remove. Deletes the selected connection.

Cancel. Cancels the selected connection operation. Any changes to the connection that were made while using the buttons are not undone.

OK. Uses the selected connection in the current stage in the InfoSphere DataStage job. (A message is generated if the logon attempt is unsuccessful.)

- **New** opens an empty **Connection Properties** dialog. From this dialog you can define a new connection to SAP BW including a Connection Name, Description, Connection and Logon Details, and SAP BW RFC Server Settings.
- Use **Job Parameter** opens the Use Job Parameter dialog to define a parameter name for the connection. When the name is defined, (#parametername#) appears appended to the Name.
- **BW Administrator** lets you run the SAP BW Administrator Workbench for the selected connection.
- **Clear Connection** clears the current connection to SAP BW (#parametername# is unaffected).

Selecting a source system and a Process Chain

About this task

To select a Process Chain in IBM InfoSphere DataStage:

Procedure

1. Open the Open Hub Extract Stage dialog, if it is not already open.
2. Select the **Output** page.
3. Select the **Process Chain** tab.
4. Select the **Source System** used to connect to SAP BW from the drop-down list. The user can select an existing Source System, connect to one already defined in SAP BW or create a new Source System.

The Source System is also referred to as the "Third Party System" and "RFC Destination" in SAP BW.

5. Select an existing **Process Chain** from the list that the InfoSphere DataStage job will start in order to trigger an extraction in SAP BW. The list of Available Process Chains includes those unrelated to extractions. For this reason, use a naming convention when creating Process Chains, such as a name containing the string **DS_**.

The Process Chain has the capability of triggering the InfoSphere DataStage job.

Selecting an InfoSpoke

About this task

Before selecting an InfoSpoke, verify you have saved your Open Hub Extract job in IBM InfoSphere DataStage. To select an InfoSpoke in InfoSphere DataStage:

Procedure

1. Open the Open Hub Extract Stage dialog, if it is not already open.
2. Select the **Output** page.
3. Select the **InfoSpoke** tab.
4. Select the button to the right of the InfoSpoke field. Choose **Select...**
The Select InfoSpoke dialog opens.
5. Choose the InfoSpoke from the list of available InfoSpokes. You must select the InfoSpoke used in the Process Chain you created in SAP BW.
6. Click the **OK** button. The properties of the InfoSpoke are retrieved from SAP BW and appear in the dialog.
7. **IMPORTANT!** To enable communication between SAP BW and a third party tool, SAP BW allows the setting of parameters in the destination object. The **Update BW** button sets these parameters in SAP BW.

The parameters passed by the Open Hub Extract consist of the following attribute-value pairs:

- <DataStage Job> InfoSphere DataStage job name
- <Process Chain> Process Chain name
- <InfoSpoke> InfoSpoke name
- <Third Party System> Third party (source system) name.

It is important that all these parameters be defined in the stage before passing the parameters to SAP BW.

The extraction will not complete successfully if these parameters are not set in the SAP BW system. Also, SAP BW must be updated whenever any of the parameters described above are modified.

8. Click the **OK** button.

The contents of **Columns** tab on the Output page is automatically generated from the fields retrieved from the InfoSpoke selected.

Verifying destination parameters in SAP BW

About this task

To verify the parameters are correctly transferred to SAP BW, edit the InfoSpoke selected and click the **Parameters** button in the **Destination** tab.

Summary of runtime Open Hub Extract

Detailed below is an overview of the extraction process.

1. An extraction can be started in two ways:
 - Start a Process Chain from SAP BW - Starting a Process Chain configured with a third party InfoSpoke will start an extraction in SAP BW and run a compiled job.
 - Start a IBM InfoSphere DataStage job containing an Open Hub Extract - The Open Hub Extract starts a SAP BW Process Chain and waits for the extraction to finish. In this case, the Open Hub Extract will receive a log ID from SAP BW. This log-ID is associated with the current instance of the Process Chain run. The Open Hub Extract might use this log ID to check on the Process Chain's status and to retrieve associated logs.
2. After an extraction successfully completes in SAP BW, it triggers a message signifying the availability of the data to the "Third Party System". The InfoSphere DataStage RFC server corresponding to the "Third Party System" intercepts the message.

3. The RFC server starts the appropriate InfoSphere DataStage job designed to retrieve the extracted information from SAP BW.
4. The Open Hub Extract stage obtains the metadata associated with the execution and compares it with the metadata saved during the job definition. The job aborts if there is any discrepancy in the metadata.
5. If the metadata is identical, the Open Hub Extract stage retrieves the data from the SAP BW system.
6. At the conclusion of the extraction, the Open Hub Extract updates the third-party extraction status in SAP BW, using the Request ID stored by the RFC server. The extraction status conveys to SAP BW the success or failure of the data retrieval operation in DataStage.

Logging

Messages are logged in the InfoSphere DataStage Director at various points in the Extraction to track the progress of a job.

Extracting Open Hub data by using Open Hub Destinations

You can also extract Open Hub data by using Open Hub Destinations.

For more information see the developerWorks article.

Defining connections to SAP BW with InfoSphere DataStage Administrator for SAP utility

The IBM InfoSphere DataStage Administrator for SAP utility is a dialog-based application program that runs on the InfoSphere DataStage client. The utility also contains the InfoSphere DataStage Connections to BW, InfoSphere DataStage Connections to R/3 and the IDoc Cleanup and Archiving pages. The pages you see depend on which stages you install.

The InfoSphere DataStage Connections to BW page is described in the following sections. For details about the DataStage Connections to R/3 page and the IDoc Cleanup and Archiving page, see the section InfoSphere DataStage Administrator for SAP Utility.

This utility is shared by other stages that work with SAP databases. The user interface for the utility automatically adjusts itself to accommodate whatever SAP-related stages are installed. (For example, the windows show the controls as if the SAP BW and IDoc Extract stages are installed.)

The utility is useful because of the GUI feature to view logs generated by the SAP BW Load RFC Servers.

You might need to view an RFC log while selecting a source system for a new stage. For the new log-viewing feature to be useful, it needs to be accessible from outside the stage editor. You can use the RFC Server Monitor dialog, or the utility to manage configurations of SAP BW connections and source systems outside the context of editing a job. The utility lets you see the activity of any configured RFC Server. This can include load statistics and any errors generated by the server.

InfoSphere DataStage Connections to SAP BW page

The DataStage Connections to BW page opens by default. This page displays the list of systems that the IBM InfoSphere DataStage jobs can access. This list is stored

as a flat file on the InfoSphere DataStage Server machine, and the individual connections contain SAP connection and logon details, and configuration information needed by particular stages.

The InfoSphere DataStage Connections to BW page includes the following buttons that let you manage the list of connections that is maintained on the InfoSphere DataStage server machine. Most of these operations are also available in the Select DataStage Connection to BW dialog.

- Click **New** to open the Connection Properties dialog, where you can create a new connection.
- Click **Properties** to open the Connection Properties dialog, where you can change the configuration for the selected connection.
- Click **Remove** to make the selected connection unavailable for use by InfoSphere DataStage.
- Click **Source Systems** to open the Select Source System dialog, where you can select a source system that is different from the default.

The dialog box has the following buttons:

- Click **Attach** to open the Attach Source System dialog, where you can make an existing Source System that is already defined within SAP BW available for use by InfoSphere DataStage. The attach operation is similar to the Add Source System operation in the stage GUI.
- Click **New...** to open the Source System Properties dialog, where you can view and modify the properties of the currently selected Source System (For an example, see the section for the GUI.)
- Click **Monitor RFC** to open the BW Load PACK Log dialog. See the following section for details.

SAP BW Load PACK Log dialog

Click **Monitor RFC...** on the Select Source System dialog to open the BW Load PACK Log dialog.

You might need to examine logs generated by the SAP BW Load RFC Servers or view an RFC log while selecting a Source System for a new stage. It lets you view the current and recent activity, including success and failure status information, for the RFC Server that loads InfoSources associated with a particular Source System and connection (namely, the Source System that you selected before opening this dialog). You can see the activity of any configured RFC Server. This can include relevant load events, statistics, and any errors generated by the server.

Note: The Pack has removed load responsibility from the server, putting it with the runtime. Most load information is in the DataStage Director Log as opposed to the RFC Server Log. Job status information, prior to release 4.2 of this PACK, will not appear in the **BW Load and Extract Events**.

The **RFC Server Status** changes from red to green when you click **Start RFC Server** or **Stop RFC Server** and vice versa. Allow adequate time for the stop operation. (Also see the configuration file, which resides in the DSBWConnections folder on the server, for RFC Server status information.)

Connection Properties dialog

The Connection Properties dialog has the Connection and Logon Details and RFC Server Options pages, depending on your stage. The BW RFC Server Settings page opens for the Extract stage.

Use the dialog to create a new SAP BW connection, or to view the properties of the currently selected connection, depending on whether you open it using **New...** or **Properties...** respectively.

Information such as **Connection Name** and **Description** is automatically added if upgrading job from previous version of SAP BW.

Connection Properties Connection and Logon Details page:

This page lets you view SAP connection and default SAP logon details. The information displayed defaults to the most recently specified details if you have already opened the dialog during this InfoSphere DataStage session or a previous one.

You can select **Use load balancing** to set the connection to use load balancing since an RFC Server cannot itself make a load-balancing connection.

If the connection is not configured to use load balancing, the connection details shown on the RFC Server Options page are identical to those shown on this page of this dialog, and the controls are read-only.

When the connection uses load balancing, the controls change to **Message Server**, **System ID**, and **Group**, and the controls on the RFC Server Options page are modifiable and required.

Click **OK** to connect to the specified SAP BW system. If the attempt fails, an error occurs and the dialog stays open. If the connection succeeds, the dialog closes, and the Select Source System dialog opens listing the Source Systems defined on the SAP BW system to which you can connect. Only the third party external BAPI Source Systems are included in the list, because only these Source Systems can be used with InfoSphere DataStage.

Connection Properties RFC Server Options page:

The RFC Server Options page of the Connection Properties dialog shows the connection details used by SAP BW Load RFC Servers for this connection. The BW RFC Server Options page opens for the Extract stage. (The name of the page depends on your stage and your load balancing setting.)

This information is needed when you set the connection to use load balancing, since an RFC Server cannot itself make a load-balanced connection. In this case, the controls on the RFC Server Options page are modifiable, and are required.

If the connection is not configured to use load balancing, the connection details shown here are identical to those shown on the Connection and Logon Details page of the Connection Properties dialog, and the controls are read-only.

The value for **Application Server** must match the value for **Gateway Host** when you view the properties for the Source System using the SAP BW GUI. Also, the value for **System Number** must match the numeric portion of the value for **Gateway Service** seen for the Source System using the SAP BW GUI. For example, if the value for **System Number** is 28, the value for **Gateway Service** must be SAPGW28.

Select Source System dialog

The Select Source System dialog lets you select a source system other than the default, if any exists.

You can click **Source Systems** on the DataStage Connections to BW page, for example, to open the Select Source System dialog.

The entries in **InfoSphere DataStage Source Systems for this SAP BW System** represent logical InfoSphere DataStage source systems for SAP BW that are currently defined for the selected SAP BW connection. (You can use only these third party external BAPI source systems with InfoSphere DataStage.)

The dialog contains the following buttons:

- Click **Attach** to open the Attach Source System dialog, where you can make an existing Source System that is already defined within SAP BW available for use by InfoSphere DataStage. The attach operation is similar to the Add Source System operation in the stage GUI.
- Click **New** to create a new Source System within SAP BW for use by InfoSphere DataStage.
- Click **Monitor RFC** to open the BW Load PACK Log dialog.

Managing RFC connections and authorization

The IBM InfoSphere DataStage RFC Server Manager configures, starts, and stops the individual RFC Servers, one for each InfoSphere DataStage Source System.

Generating the SourceSystems.config file

The IBM InfoSphere DataStage server generates the configuration file named SourceSystems.config whenever you save changes to the list of InfoSphere DataStage source systems on a InfoSphere DataStage client machine. This file tells the RFC Server Manager which RFC Servers should run with what configuration information. For an example of this file, see Example of the SourceSystems.config file.

Periodically, the RFC Server Manager inspects the content of this file and compares it to the in-memory list of the RFC Servers currently running. The actions taken by the RFC Server Manager depend on the content of this file as follows:

- **New Source Systems.** If new Source Systems are listed in the catalog file, the RFC Server Manager launches a new RFC Server instance for each. It configures these according to the Source System that they represent.
- **No Corresponding Source System.** If RFC Servers that are already running no longer have a corresponding Source System listed in the catalog file, the RFC Server Manager shuts down those RFC Servers. An RFC Server always completes any data loading that is in progress before termination.
- **Changed Properties.** If the properties of a Source System change, the RFC Server Manager shuts down the corresponding RFC Server and restarts it with the new configuration information.

An RFC Server establishes a connection with a specific SAP BW host machine at the time of invocation. This connection is maintained until the RFC Server Manager determines that the SAP BW host machine is no longer available. The Server Manager attempts to reestablish the connection for one minute. If unsuccessful, the Server Manager disables the Server. Once the SAP BW system is available, the SAP Administrator can be used to re-enable the RFC Server.

Starting the RFC Server Manager: Windows

About this task

To stop or start the RFC Server Manager on Windows, you follow similar steps.

Windows NT

About this task

The IBM InfoSphere DataStage RFC Server Manager is a Windows NT service that starts up automatically by default when the operating system is started.

To stop or start the RFC Server Manager on Windows NT, we recommend that you use the Windows NT Service Manager dialog as follows:

Procedure

1. Choose **Start > Settings > Control Panel** to display the Windows NT Control Panel.
2. Double-click **Services** to display the Services dialog.
3. Select the InfoSphere DataStage (RFC Manager) service.
4. Click **start/stop** to start or stop the RFC Server Manager.
5. Click **Close** to exit the Services dialog.

Results

If you shut down the RFC Server Manager, the RFC Server Manager shuts down all individual RFC Servers.

For details about using the Windows NT Services dialog, see the Windows NT documentation and online help.

Windows 2000

About this task

To stop or start the RFC Server Manager on Windows 2000 (the procedure is similar to that for Windows NT):

Procedure

1. Choose **Start > Settings > Control Panel > Administrator Tools > Services**.
2. Click **start/stop** on the **General** tab to start or stop the RFC Server Manager.
3. Click **OK** to exit the dialog.

Starting the RFC Server Manager: UNIX

About this task

The IBM InfoSphere DataStage RFC Server Manager is a UNIX daemon that starts up automatically by default when the operating system is started.

If you need to stop or start the RFC Server Manager on UNIX, we recommend that you run the *dsrfcd.rc* script for your platform with the stop or start command options. The exact script name varies by platform. The following table lists the names for the various platforms:

Platform	Script
----------	--------

Solaris
/etc/rc2.d/S99dsrfcd.rc

HP-UX
/sbin/init.d/dsrfcd.rc

AIX® /etc/dsrfcd.rc

Compaq Tru64 UNIX
/sbin/rc2.d/S99dsrfcd.rc

LINUX
/etc/rc2.d/S999dsrfcd.rc

Example. AIX platforms:

To start the InfoSphere DataStage RFC Server Manager (<DSSAPHOME>/DSBWbin/dsrfcsvr.exe):
/etc/dsrfcd.rc start

To stop the InfoSphere DataStage RFC Server Manager:
/etc/dsrfcd.rc stop

If you shut down the RFC Server Manager, the RFC Server Manager shuts down all individual RFC Servers (<DSSAPHOME>/DSBWbin/dsrfcsvr.exe).

Loading InfoSources

The RFC Server runs in a perpetual wait state. Load requests can be initiated by SAP BW or by IBM InfoSphere DataStage. When initiated by SAP BW, the user schedules an InfoPackage to run immediately or at a designated time. When initiated, InfoSphere DataStage asks SAP BW to run the InfoPackage immediately. Once this occurs, the mechanism for loading is the same in either case.

1. A load request can include the name and possibly parameters of a InfoSphere DataStage job to be run before beginning the data load. If a job name is provided, the RFC Server tries to run the job using the InfoSphere DataStage DSJob command. Job parameters are passed through to DSJob according to the rules specified in the Source System Properties dialog.

The job is run from the InfoSphere DataStage project specified in the Source System properties using the InfoSphere DataStage logon information stored with the Source System.

If the job fails, the load is terminated, and an error message is returned to SAP BW. (See the configuration file, which resides in the DSBWConnections folder on the server, for RFC Server status information.)

2. If the InfoSphere DataStage job completes successfully, or if no job is specified in the request, the RFC Server checks the directory specified for the Source System to locate the data and metadata files for the requested InfoSource.

If the InfoPackage detects that it has been invoked by a PUSH data load method for a Load stage, or that it has invoked a stage designated as a PULL data load method (directly or indirectly), this step streams the data from the stage directly to SAP BW. PUSH and PULL stages only produce the metadata file for the requested InfoSource. They do not produce the data file.

3. The RFC Server establishes a user connection for each InfoSource it tries to load. A user connection requires the SAP BW **User Name**, **Password**, **Language** and **Client** as specified in InfoSphere DataStage. Once logged on to SAP BW as

a client, the data loading begins. If logon details are not specified in the metadata file, the logon details that were passed to the RFC Server at the time it was instantiated are used.

Validating metadata and RFC servers

Data loading requires validation of the metadata for each data file with the current configuration of the transfer structure for the InfoSource. The RFC Server does this as follows:

1. Each row in the metadata file is compared with the relevant row in the transfer structure to ensure parity of the metadata.
2. Metadata anomalies are reported on the status bar in the SAP BW InfoPackage scheduler, and the process aborts. The RFC Server returns to a wait-state.
3. If the metadata passes the validation test, and the data load completes successfully, a "Data requested" message appears on the status bar of the SAP BW InfoPackage scheduler, indicating that the data is loaded successfully.

Extracting data and RFC servers

The following information summarizes the behavior of the RFC Server for an extraction.

The RFC Server listens for a message from SAP BW that an extraction is ready for the Extract stage. When it receives the message, one of the following occurs:

- If the job corresponding to the data extract request is not running, it is started using the DSJob interface.
- If the job is already running, the RFC Server notifies the job to get the extracted data. The RFC Server identifies the job by matching the parameters of the calls with the parameters of the job.

The BAPI that provides IBM InfoSphere DataStage with SAP BW notification that the available extract data has associated parameters. They contain the names of the InfoSphere DataStage job, Process Chain, InfoSpoke, and source system.

When the RFC Server receives the SAP BW notification, the runtime starts the Process Chain or gets the data into InfoSphere DataStage. If the job is already started, it retrieves the data.

Runtime data extraction

Before data transfer begins, IBM InfoSphere DataStage retrieves the InfoSpoke metadata and compares it to the metadata that the Designer client stores in the InfoSphere DataStage repository. If a change exists, the job aborts.

An InfoSpoke supports extraction modes for a database table and a file:

- **File.** SAP BW generates a .csv text file. The runtime acts as a modified FTP stage, using the design time credentials to get the text file from the SAP BW server.
- **Database table.** The extraction results are stored in a SAP BW database table. The runtime uses the design time parameters to retrieve the extracted data from SAP BW.

Example of the SourceSystems.config file

The IBM InfoSphere DataStage SAP BW RFC Server Manager is installed as a service named dsrfcmgr.exe in <DSSAPHOME>\DSBWbin on Windows (or UNIX). It runs automatically when the machine reboots. The program configures, starts,

and stops the individual RFC Servers, named dsrfcsvr.exe, also located on these platforms in <DSSAPHOME>\DSBWbin. These servers run for each InfoSphere DataStage source system for SAP BW.

The InfoSphere DataStage server generates a text file named SourceSystems.config whenever you modify the list of source systems on a InfoSphere DataStage client machine. The control file tells the RFC Server Manager which RFC Servers should run with what configuration information.

An example of the content of the file follows:

```
SOURCESYSTEMS=<BEGIN>
<BEGIN>
DSPASSWORD=^L[^
INFOSOURCEDATAPATH=D:\Ascential\DataStage\SourceSystems\JDSRCSYS\Data
DSPROJECTNAME=test
SRCNAME=JDSRCSYS
RFCENABLED=FALSE
USEDEFAULTDATAPATH=TRUE
DSUSERNAME=AS
SRCDESCRIPTION=Test Source System
REFSERVERPROGID=wb-jdoe.JDSRCSYS
<END>
<BEGIN>
DSPASSWORD=LY[Y
INFOSOURCEDATAPATH=D:\Ascential\DataStage\SourceSystems\JDTEST\Data
DSPROJECTNAME=test
SRCNAME=JDTEST
RFCENABLED=FALSE
USEDEFAULTDATAPATH=TRUE
DSUSERNAME=FF
SRCDESCRIPTION=John Doe testing source system
REFSERVERPROGID=wb-jdoe.JDTEST
<END>
<END>
```

Note: Passwords appearing in the file are encrypted.

When the Manager launches an RFC Server instance, the Manager passes configuration information (Source System properties) to the RFC Server as command line parameters. The following Source System properties are passed to the RFC Server:

- BW Application Server
- BW System Number
- BW SAP Router String
- Default BW Logon User Name
- Default BW Logon Password
- Default BW Logon Client Number
- Default BW Logon Language
- RFC Server Program ID
- Location of InfoSource data files
- InfoSphere DataStage Project containing jobs that can be run using the DataStage Job parameter
- InfoSphere DataStage Logon User Name and Password for running jobs

An RFC Server establishes a perpetual connection with the specified SAP BW application server machine and database system at the time of invocation. If the connection is broken on the SAP BW side, the RFC Server tries to reestablish the connection for one minute.

The RFC Server runs in a perpetual wait-state. SAP BW calls the RFC Server with requests.

If the job fails to run successfully, the extract is terminated.

Establishing user connections

The RFC Server establishes a user connection for each Source System. A user connection requires the SAP BW **User Name**, **Password**, **Language**, and **Client Number** (as specified in the GUI).

If **Use connection defaults** on the Output General page, for example, is selected, the default logon details that the Server Manager passes to the RFC Server on the command line are used.

Managing RFC connections and authorizations

This section discusses the RFC Authorization requirements and how to run the Load stage. It documents how to manually create an **Z_DS_RFC_PROFILE** authorization profile. It also describes the configuration of the SAP Dispatch/Gateway service.

RFC authorization requirements

When third party products need to communicate with SAP BW systems using Remote Function Calls (RFC), system administrators and project managers must enforce security for user access to the business information.

The Pack addresses this concern and provides a comprehensive and flexible way to communicate with SAP BW systems without compromising the security aspects that already exist.

Depending on the level of security desired and the type of system (DEV, QAS, or PRD) into which the data is loaded, you can create a **Z_DS_RFC_PROFILE** profile (or another user-defined name) and add authorizations to it that are required for RFC access to a SAP BW system.

This profile can then be assigned with other SAP BW Workbench administration authorizations, roles, and profiles to IBM InfoSphere DataStage users accessing a SAP BW system. These limited authorizations ensure that Load users can run only those transactions to which they have permissions and are denied access to other transactions.

This profile contains only the RFC authorizations that are required by third party products to communicate with a SAP BW system. Other SAP BW Workbench administration authorizations are required in addition to RFC authorizations, depending upon individual user roles in organizations to use the Load stage. The extent of workbench access that Administrators want to provide to individual users varies from one organization to another. The Administrators should decide how to control access to various objects under SAP BW Workbench Administrator. Administrators can use existing roles and profiles provided by SAP to give access to specific activities for different objects under Workbench Administration or create their own roles or profiles using SAP transaction SU02.

Creating an RFC authorization profile:

About this task

The following sections describe how to create an **Z_DS_PROFILE** authorization profile for load PACK.

The SAP Administrator should do the following:

Procedure

Create a **Z_DS_RFC_PROFILE** profile (SAP Transaction **SU02**) containing the following authorization objects required for RFC authorization for IBM InfoSphere DataStage users. Define the authorizations, which are described in the following section, before the profile is created.

Authorization Object	Text	Authorization
Authorization Object	Text	Authorization
S_BI-WX_RFC	Business Information Warehouse, RFC User Extraction	
S_TABU_DIS	Table Maintenance (via standard tools such as SM30)	S_TABU_SHOW S_TABU_UPD

Creating the RFC authorization for InfoSphere DataStage:

About this task

Define the following authorization for RFC access to a SAP BW system (SAP transaction SU03).

- **Authorization.** Z:DS_RFC - no standard authorization available
- **Text.** RFC authorization required for RFC access
- **Class.** AAAB - cross-application authorization objects
- **Object.** S_RFC - authorization check for RFC access

Field	Description	Value
Field	Description	Value
ACTVT	Activity	16
RFC_NAME	Name of RFC to be protected	RFC1, RSAB, SYST
RFC_TYPE	Type of RFC object to be protected	FUGR

Assign the RFC profile to Load users with SAP BW Workbench administration roles, profiles, and authorizations.

Configuring the SAP/Dispatch/Gateway Service

About this task

In order to use the Pack, you must add entries for the SAP Dispatch/Gateway service to the services file for your IBM InfoSphere DataStage client and server

systems. If SAP is already configured on the InfoSphere DataStage client and server systems, these entries might already be added.

The location of the services file depends on your platform:

Windows NT: \winnt\system32\drivers\etc\services

Unix: */etc/services*

Add the following entries to the services file:

#

SAP Port

#

```
sapdp00 3200/tcp
sapdp01 3201/tcp
sapdp02 3202/tcp
sapdp03 3203/tcp
sapdp04 3204/tcp
sapdp05 3205/tcp
sapdp06 3206/tcp
sapdp07 3207/tcp
sapdp08 3208/tcp
sapdp09 3209/tcp
sapdp10 3210/tcp
sapdp11 3211/tcp
sapdp12 3212/tcp
sapdp13 3213/tcp
sapdp14 3214/tcp
sapdp15 3215/tcp
sapdp16 3216/tcp
sapdp17 3217/tcp
sapdp18 3218/tcp
sapdp19 3219/tcp
sapdp20 3220/tcp
sapdp21 3221/tcp
sapdp22 3222/tcp
sapdp23 3223/tcp
sapdp24 3224/tcp
sapdp25 3225/tcp
sapdp26 3226/tcp
sapdp27 3227/tcp
sapdp28 3228/tcp
sapdp29 3229/tcp
sapdp30 3230/tcp
sapdp31 3231/tcp
sapdp32 3232/tcp
sapdp33 3233/tcp
sapdp34 3234/tcp
sapdp35 3235/tcp
sapdp36 3236/tcp
sapdp37 3237/tcp
sapdp38 3238/tcp
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sapdp39 3239/tcp
sapdp40 3240/tcp
sapdp41 3241/tcp
sapdp42 3242/tcp
sapdp43 3243/tcp
sapdp44 3244/tcp
sapdp45 3245/tcp
sapdp46 3246/tcp
sapdp47 3247/tcp
sapdp48 3248/tcp
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sapdp67 3267/tcp
sapdp68 3268/tcp
sapdp69 3269/tcp
sapdp70 3270/tcp
sapdp71 3271/tcp
sapdp72 3272/tcp
sapdp73 3273/tcp
sapdp74 3274/tcp
sapdp75 3275/tcp
sapdp76 3276/tcp
sapdp77 3277/tcp
sapdp78 3278/tcp
sapdp79 3279/tcp
sapdp80 3280/tcp
sapdp81 3281/tcp
sapdp82 3282/tcp
sapdp83 3283/tcp
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sapdp98 3298/tcp
sapdp99 3299/tcp
sapgw00 3300/tcp
sapgw01 3301/tcp
sapgw02 3302/tcp
sapgw03 3303/tcp
sapgw04 3304/tcp
sapgw05 3305/tcp
sapgw06 3306/tcp
sapgw07 3307/tcp
sapgw08 3308/tcp
sapgw09 3309/tcp
sapgw10 3310/tcp
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sapgw21 3321/tcp
sapgw22 3322/tcp
sapgw23 3323/tcp
sapgw24 3324/tcp
sapgw25 3325/tcp
sapgw26 3326/tcp
sapgw27 3327/tcp
sapgw28 3328/tcp
sapgw29 3329/tcp
sapgw30 3330/tcp
sapgw31 3331/tcp
sapgw32 3332/tcp
sapgw33 3333/tcp
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sapgw35 3335/tcp
sapgw36 3336/tcp
sapgw37 3337/tcp
sapgw38 3338/tcp
sapgw39 3339/tcp
sapgw40 3340/tcp
sapgw41 3341/tcp
sapgw42 3342/tcp
sapgw43 3343/tcp
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sapgw70 3370/tcp
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sapgw72 3372/tcp
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sapgw91 3391/tcp
sapgw92 3392/tcp
sapgw93 3393/tcp
sapgw94 3394/tcp
sapgw95 3395/tcp
sapgw96 3396/tcp
sapgw97 3397/tcp
sapgw98 3398/tcp
sapgw99 3399/tcp

Glossary

The following table lists the terms used in this guide. These terms apply to the SAP BW Load and Extract stages

Table 2. Terminology

Term	Description
Business Application Programming Interface (BAPI)	A precisely defined interface providing access to processes and data in business application systems such as SAP BW. BAPIs are defined as API methods of SAP objects. These objects and their methods are stored in the BOR.
Business Object Repository (BOR)	The object-oriented Repository in the SAP BW system. It contains, among other objects, SAP Business Objects and their methods.
Business Objects	The persistent data objects of central importance in the SAP BW system. They are the organizational units, Master data, and other documents that can be transferred to SAP BW.
BW	Business Information Warehouse.
ERP	Enterprise Resource Planning.
Hierarchy	A summarization and grouping for a characteristic according to individual evaluation criteria. Hierarchies can only be created for those characteristics that do not reference other characteristics, meaning only those characteristics for which Master data exists.
InfoCube	A central data container for queries and evaluations. InfoCubes contain two types of data: key figures and characteristics.
InfoObject	A generic term for the Business Information Warehouse characteristics, key figures, and so forth. InfoObjects are used in InfoCubes.
InfoPackage	A description of which data in an InfoSource should be requested from the Source System. An InfoPackage can specify a InfoSphere DataStage job to produce the data to be loaded.
InfoSource	A DataSource, that is, a representation of a provider structure, which is data that logically belongs together from a business point of view. This data can be transported from one Source System into SAP BW. Each InfoSource can be concurrently assigned to multiple Source Systems (that is, R/3 application components or external systems).
InfoSpoke	SAP BW extraction object that specifies the data to be extracted to a database table or file.

Table 2. Terminology (continued)

Term	Description
Key Figure	Key figures refer to InfoObject units, along with Characteristics. These units are values or quantities, for example, currency, quantity, or numeric fields, such as sales revenue or number of employees.
Master InfoSource	A Master InfoSource represents entities, such as companies and customers. Master InfoSource data contains Master data, texts, or Hierarchy transfer structures.
Open Hub	A SAP BW distribution channel, which can extract, transform, and load data on a schedule.
Process Chain	<p>A series of processes that are scheduled in the background waiting for an event. Some processes trigger an event that, in turn, can start other processes.</p> <p>This workflow functionality in SAP BW reduces the amount of manual work required to load and extract data and deliver information.</p>
RFC	Remote Function Call. The SAP implementation of RPC (Remote Procedure Call) in ABAP. It is a call to a function module that runs on a different system from the calling function. The Remote Function Call can also be called from within the same system, but usually the caller and callee are dispersed.
RFC Server	A InfoSphere DataStage Server component that conforms to an SAP BW specified standard as a certified third party data loading and extraction solution. The server connects to the SAP BW Application server when invoked. The server listens for all SAP BW initiated data loading or extraction directives and triggers InfoSphere DataStage to run specific load and extract jobs.
Source System	The data repository or database containing the InfoSources. It is the logical Source System that the output for the stage represents. The data sources that are loaded into SAP BW using InfoSphere DataStage jobs can be represented as one or more Source Systems.
Transaction InfoSource	Transaction InfoSources supply numerical quantities associated with combinations of master entities, such as the dollar value of sales from each store over each period of time.

Table 2. Terminology (continued)

Term	Description
Transfer Structure	A set of field metadata describing the format of data to be loaded into SAP BW from an InfoSource. A Master InfoSource has separate transfer structures for attribute data, text data, and Hierarchies.
Variant	<p data-bbox="967 417 1450 506">A variant is a collection of predefined criteria, similar to a group of values used as parameters.</p> <p data-bbox="967 531 1450 762">Variants are attached to various processes that are defined for Process Chains used by InfoSphere DataStage for data extraction, such as the Start process, the Data Export into External Systems process, and the ABAP Program process. (The ABAP Program referenced by the ABAP Program process itself has a variant attached to it.)</p>

Chapter 2. Attach Source System dialog

Click **Attach** on the Select Source System dialog to open this dialog, where you can make an existing Source System that is already defined within BW available for use by the IBM InfoSphere DataStage. The attach operation is similar to the Add Source System operation in the plug-in GUI. BW Administration lets you run the BW Administrator Workbench for the selected connection.

Chapter 3. BW Load Pack Detailed Log dialog

Click **View Log** from the BW Load Pack Log dialog to open the BW Detailed Log dialog for more information. You can also clear the log from this dialog.

Chapter 4. BW Load Pack Log dialog

Click **Monitor RFC** on the Select Source System dialog to open the BW Load PACK Log dialog.

You might need to examine logs generated by the BW Load RFC servers or view an RFC log while selecting a Source System for a new stage. It lets you view the current and recent activity, including success and failure status information, for the RFC server that loads InfoSources associated with a particular Source System and connection (namely, the Source System that you selected before opening this dialog). You can see the activity of any configured RFC Server. This can include relevant load events, statistics, and any errors generated by the server.

To examine the logs:

- The **RFC Server Status** changes from a red X to a green check mark when you click **Start RFC Server** or **Stop RFC Server** and vice versa. Allow adequate time for the stop operation. (Also see the configuration file, which resides in the DSBWConnections folder on the server, for RFC Server status information.)
- Click **View Log** to open the BW Detailed Log dialog.
- Click **Find** (beside BW Loads) for more options in searching for InfoSources. This resembles the GUI Find InfoSource dialog. You can also use Find (beside Additional Events) to search for a job name, for example.
- Click **Log Setup** to specify how often to delete the logs on the system. Use an integer between 1 and 100.

Chapter 5. Connection for Source System dialog

This page lets you view SAP connection and default SAP logon details:

- Select **Use load balancing** to set the connection to use load balancing since an RFC server cannot itself make a load balancing connection. If the connection is not configured to use load balancing, the connection details shown on the RFC Server Options page are identical to those shown on this page of this dialog, and the controls are read-only. When the connection uses load-balancing, the controls change to Message Server, System ID, and Group.
- However, when the connection uses load-balancing, the controls on the RFC Server Options page are modifiable and required.

Chapter 6. Connection Properties RFC Server Options page

This page shows the connection details used by BW Load RFC servers for this connection.

This information is needed when you configure the connection to use load balancing.

- When the connection is not configured to use load balancing, the connection details in this page are identical to those shown on the Connection and Logon Details page, and the fields are read-only.
- When the connection uses load balancing, you must configure the controls on the RFC Server Options page. This page lets you view SAP connection and default SAP logon details.

Chapter 7. IBM InfoSphere DataStage connections to BW page

IBM InfoSphere DataStage and QualityStage Administrator for SAP is a utility that contains the InfoSphere DataStage Connections to BW page, the InfoSphere DataStage Connections to R/3 page, and the IDoc Cleanup and Archiving page. The InfoSphere DataStage Connections to BW page appears by default. It displays the list of systems that the InfoSphere DataStage jobs can access. This list is stored as a flat file on the InfoSphere DataStage server machine, and the individual connections contain SAP connection and logon details, as well as some configuration information needed by particular plug-ins. The InfoSphere DataStage Connections to BW page includes the following buttons that let you manage the list of connections. These are maintained on the InfoSphere DataStage server machine. Most of these operations are also available in the Select the InfoSphere DataStage Connection to BW dialog in the GUI.

- Click **New** to open the Connection Properties dialog, where you can create a new connection.
- Click **Properties...** to open the Connection Properties dialog, where you can change the configuration for the selected connection.
- Click **Remove** to make the selected connection unavailable for use by the InfoSphere DataStage.
- Click **Source Systems...** to open the Select Source System dialog. It resembles the dialog for the plug-in GUI for the one you selected with the following additions: Click **Attach...** to open the Attach Source System dialog, where you can make an existing Source System that is already defined within BW available for use by the InfoSphere DataStage. The attach operation is similar to the Add Source System operation in the plug-in GUI. Click **New...** to open the Source System Properties dialog, where you can view and modify the properties of the currently selected Source System (This resembles the Source System Properties dialog for the GUI.) Click **Monitor RFC...** to open the BW Load PACK Log dialog.

Chapter 8. Advanced settings for IDoc cleanup and archiving

Click **Advanced Settings** on the IDoc Cleanup and Archiving page of the IBM InfoSphere DataStage and QualityStage Administrator for SAP utility to open the Advanced Settings for IDoc Cleanup and Archiving dialog. This dialog explains the purpose of the **Job Inactivity Timeout** setting, and lets you modify it.

If you select **No Timeout**, jobs are always assumed to be active, regardless of how much time has passed since the jobs last ran.

Selecting this check box disables **Job Inactivity Timeout**.

Note: Setting a timeout of 0 days is not equivalent to selecting **No timeout**. Setting the timeout to 0 days causes the cleanup process to treat jobs as inactive no matter how recently they have run.

Chapter 9. Select Source System dialog

Click **Source Systems** on the IBM InfoSphere DataStage Connections to BW page to open the Select Source System dialog. It resembles the Select Source System dialog for the plug-in GUI with the following additions:

- Click **Properties** to change the configuration for the Source System.
- Click **Remove** to make the Source System unavailable from the InfoSphere DataStage and automatically shut down the corresponding RFC Server. (However, the meta data describing the Source System remains intact within BW.)
- Click **Cancel** to cancel the selection operation. Any changes to the Source System list are not undone if you click Cancel.
- After you select a Source System, click **OK** to use it in the current stage in the InfoSphere DataStage job.

To examine the logs:

- Click **Attach** to open the Attach Source System dialog, where you can make an existing Source System that is already defined within BW available for use by the InfoSphere DataStage. The attach operation is similar to the Add Source System operation for the GUI.
- Click **New** to open the Source System Properties dialog, where you can view and modify the properties of the currently selected Source System (This resembles the dialog for the GUI.)
- Click **Monitor RFC** to open the BW Load PACK Log dialog.

The following options function the same as those for the Select Source System dialog for the GUI:

- Click **Properties** to change the configuration for the Source System.
- Click **Remove** to make the Source System unavailable from the InfoSphere DataStage and automatically shut down the corresponding RFC Server. (However, the meta data describing the Source System remains intact within BW.)
- Click **Cancel** to cancel the selection operation. Any changes to the Source System list are not undone if you click Cancel.
- After you select a Source System, click **OK** to use it in the current stage in the InfoSphere DataStage job.

Chapter 10. Source System Properties InfoSphere DataStage Job Options page

This page shows the settings needed by the RFC Server when it receives a load request from an InfoPackage. The settings depend on the type of the InfoPackage. It functions like the InfoPackage Options page in the GUI.

- IBM InfoSphere DataStage Project Containing the Job. Only the InfoSphere DataStage project in which the job invoked by InfoPackages will be run for this Source System for this project. The project is defaulted to the one containing your current job.
- InfoSphere DataStage Logon Details for Running the Job. These values default to your current InfoSphere DataStage logon values. User Name - enter the InfoSphere DataStage user name to be used when InfoPackages invoke InfoSphere DataStage jobs. Password - enter the InfoSphere DataStage password to be used when InfoPackages invoke InfoSphere DataStage jobs.

InfoPackage will set the name of an InfoSphere DataStage job to be run automatically before loading the InfoSource data file. This means that the InfoPackage interface in BW shows an entry labeled InfoSphere DataStage Job on the third party selections page of its Scheduler (Maintain InfoPackage) dialog. Setup in BW is required to schedule and run the InfoPackage. The parameters can be entered by clicking the refresh button beside Check on the 3rd party selections page. This results in a callback to the RFC Server that retrieves job parameters as long as the InfoPackage has a job name in 3rd party selections. When you refresh the parameters, use the help button beside Input value to view the list of types in the InfoSphere DataStage. Or, if a default value exists, you can see this value as a parameter. The RFC server builds the dsjob command line before invoking the job.

Chapter 11. Source System Properties dialog

Click **New** on the DataStage Connections to BW page to open the Source System Properties dialog, where you can view and modify the properties of the currently selected Source System. This dialog has the RFC Server Configuration and InfoPackage Options pages.

Chapter 12. Source System Properties RFC Server Configuration page

Use the RFC Server Configuration page, which opens by default, to configure information needed by the BW Load RFC Server:

- Clear Listen for BW Load requests to shut down the RFC Server.
- BW Load RFC Server Program ID is an editable control that shows the program ID that the RFC Server registers with BW when the RFC Server starts up.
- Location of Temporary InfoSource Data Files shows the directory where extracted data, meta data, and RFC Server logs are stored.
- Clear Use default to make the Location of Temporary InfoSource Data Files control modifiable and enable the Browse button.
- BW Load RFC Server SAP Connection Details shows the connection information that is used by the RFC Server when it starts up. The controls are always read-only since these settings are actually defined as part of the DataStage connection to SAP, rather than in the Source System configuration itself. The Router String is the router information for accessing a remote SAP application server. An example of a typical router string is as follows:

`/H/router1/H/router2/H/` or `/H/router1/H/xxx.xxx.xxx.xxx/H/` where `xxx.xxx.xxx.xxx` is a TCP/IP address.

Chapter 13. IDoc Cleanup and Archiving page

About this task

This page lets you indicate the frequency and timing of automatic cleanup (and archiving, depending on the setting of a particular IDoc type configuration) of the files that temporarily store IDocs awaiting processing by the IBM InfoSphere DataStage jobs.

Use this administrative utility as you set **Archive processed IDoc** files on the IDoc Type Properties dialog to archive IDoc files

To run the cleanup executable manually from the command line on the InfoSphere DataStage server machine, specify the `dsidoccln` command in the bin directory of the InfoSphere DataStage home directory (`<ds_home>`).

Open the IDoc Cleanup and Archiving page from the IBM InfoSphere DataStage and QualityStage Administrator for SAP.

Procedure

1. Specify the **Frequency** to indicate whether cleanup should be done daily, weekly (on a particular day of the week), or not at all (that is, never). The default is weekly every Saturday.
2. Specify **Time** to indicate the specific time of the day to perform cleanup. If **Frequency** is set to Never, then the **Time** field is disabled.
3. Click **Advanced Settings** to open the Advanced Settings for IDoc Cleanup and Archiving dialog.
4. Changes to the settings on this page are applied as soon as you close the application or switch to the InfoSphere DataStage Connections to SAP page.

Chapter 14. InfoPackage Options page

This page shows the settings needed by the RFC Server when it receives a load request from an InfoPackage. The settings depend on the type of the InfoPackage:

- **DataStage Project Containing the Job.** Only the DataStage project in which the DataStage job invoked by InfoPackages will be run for this Source System for this project. The project is defaulted to the one containing your current job.
- **DataStage Logon Details for Running the Job.** These values default to your current DataStage logon values. For user name enter the DataStage user name to be used when InfoPackages invoke DataStage jobs. For password enter the DataStage password to be used when InfoPackages invoke DataStage jobs.

InfoPackage will set the name of a DataStage job to be run automatically before loading the InfoSource data file. This means that the InfoPackage interface in BW shows an entry labeled DataStage Job on the 3rd party selections page of its Scheduler (Maintain InfoPackage) dialog. Setup in BW is required to schedule and run the InfoPackage.

The parameters can be entered by clicking the refresh button beside Check on the 3rd party selections page. This results in a callback to the RFC Server that retrieves job parameters as long as the InfoPackage has a job name in 3rd party selections.

When you refresh the parameters, use the help button beside Input value to view the list of types in DataStage. Or, if a default value exists, you can see this value as a parameter.

The RFC server builds the dsjob command line before invoking the job.

Chapter 15. Connection Properties Connection and Logon Details

This page lets you view SAP connection and default SAP logon details:

- Select **Use load balancing** to set the connection to use load balancing since an RFC server cannot itself make a load balancing connection. If the connection is not configured to use load balancing, the connection details shown on the RFC Server Options page are identical to those shown on this page of this dialog, and the controls are read-only. When the connection uses load-balancing, the controls change to Message Server, System ID, and Group.
- However, when the connection uses load-balancing, the controls on the RFC Server Options page are modifiable and required.

Chapter 16. Defining connection properties

Click **Properties** on the Select DataStage Connection to SAP dialog to open the Connection Properties dialog. The Connection Properties dialog has the Connection and Logon Details and RFC Server Options pages. Use the dialog to create a new connection or to view the properties of the currently selected connection, depending on whether you open it using **New** or **Properties** respectively. Information such as Connection Name and Description is automatically added if upgrading job from previous version of BW.

The DataStage Connections to SAP page of the **IBM InfoSphere DataStage and QualityStage Administrator for SAP** utility lets you specify a non-load balancing connection even if load balancing is specified in the connection configuration.

This page has the following components:

- **Application Server.** The name of the R/3 server.
- **System Number.** The system number of the R/3 instance.
- **Router String.** Optional. The string used to connect to the remote SAP server. If you use a SAP router to access your system, you must include a fully-qualified node name for your RFC server machine in the SAP router table.
- **Use load balancing.** Select to use load balancing when connecting to R/3. Client connections are made through a message server rather than an application server.

The **Application Server** and the **System Number** controls are replaced by **Message Server**, **System ID**, and **Group** controls so that connection details specific to load balancing can be entered.

Chapter 17. IBM InfoSphere DataStage Job Options for IDocs page

About this task

This page contains information used to run InfoSphere DataStage jobs automatically when a specified number of IDocs of a given type are received from the SAP application system specified for the connection. (This feature also depends on properties that are defined elsewhere for each IDoc Type.) The properties default to the current InfoSphere DataStage logon details for the user.

Click **DataStage Job Options** to open the page:

To specify job options and add the new connection:

Procedure

1. Select **Run appropriate DataStage jobs automatically after receiving IDocs from this SAP system** to run jobs automatically after the specified number of IDocs of a given type are received from the SAP application system specified for the connection.
2. Specify the user name and password for the InfoSphere DataStage user.

Chapter 18. IDoc Listener Settings page

About this task

Click IDoc Listener Settings to open the page.

This page lets you make an additional load balancing test connection as follows:

Procedure

1. Select **Listen for incoming IDocs on this connection** so that a listener server runs continuously on the IBM InfoSphere DataStage server machine. If selected, this option indicates that the connection is enabled for use with IDoc Extract or IDoc Load stages.

If **Listen for incoming IDocs on this connection** is cleared, the other controls on the IDoc Listener Settings page and DataStage Job Options for IDocs page are disabled. Also if cleared, the **Import Into**, **IDoc Types**, and **IDoc Log** buttons on the DataStage Connections to SAP page of the **IBM InfoSphere DataStage and QualityStage Administrator for SAP** utility are disabled when you select that connection.

2. Specify **IDoc Listener Program ID**. The listener registers this program ID with the SAP system. Use the same program ID for the tRFC port on the SAP system to be invoked when the SAP system sends an IDoc to the InfoSphere DataStage.
3. Clear **Acknowledge IDoc reception to the SAP system** to prevent the listener from sending status messages to the SAP system when IDocs are received. Do this to reduce the load incurred by the SAP system when it sends IDocs to the InfoSphere DataStage.
4. If you select **Use load balancing** on the Connection and Logon Details page, and the load balancing test connection succeeds, an additional test connection is made using the **IDoc Listener SAP Connection Details** that you specify.
If this test connection fails, the following warning appears:

Results

Currently unable to connect to SAP using the IDoc Listener connection information specified for this connection. Do you want to save your changes anyway?

Separate connection details must be provided for the listener, since the Listener cannot make a load-balancing connection. If load balancing is indicated on the Connection and Logon Details page, you can modify the **Gateway Host**, **System Number**, and **Router String** controls shown on the IDoc Listener Settings page.

The **Gateway Host**, **System Number**, and **Router String** information is used by the listener when it connects to the SAP system.

Chapter 19. IDoc Log dialog

About this task

To view log messages about the IDoc listener associated with a connection:

Procedure

1. Open the IDoc Log dialog by clicking **IDoc Log** on the DataStage Connections to SAP page.
The **Connection** field specifies the connection whose IDoc log messages are displayed. Descriptive text is included in the **Description** field.
2. The **IDoc Log Messages** field lists log messages about the activities of the IDoc listener that is associated with the connection. When the dialog first opens, this list is automatically scrolled to the end so that the most recent messages are visible.
3. Click **Refresh** to reload the log messages, including any that were generated since you first opened the dialog.
4. Click **Clear Log** to delete the messages currently in the log (after you provide confirmation) and refresh the display.

Chapter 20. IDoc Types dialog

About this task

After you export connections, saving configuration information into a file, continue on the InfoSphere DataStage Connections to SAP page.

To set the properties of the IDoc types for the selected connection:

Procedure

1. Click **IDoc Types** to open the IDoc Types dialog on the InfoSphere DataStage Connections to SAP page.

The **Connection** field specifies the connection whose IDoc types are displayed in the list with descriptive text in the **Description** field.

2. Click **Find** to open a Find IDoc Type dialog to search for IDoc types that contain user-specified substrings in their name or description as in the Select IDoc Type dialog.
3. Click **Properties** to examine and change the IBM InfoSphere DataStage configuration for the selected IDoc type by using the IDoc Type Properties dialog. (You can also do this by double-clicking an IDoc type in the list.)

Chapter 21. Connection and Logon Details page

About this task

Use this page to specify a name, description, and SAP connection and default SAP logon details for the new connection.

The **Connection and Logon Details** page opens by default. **Group** appears for this window when **Use load balancing** is set.

To define the IBM InfoSphere DataStage connection to SAP:

Procedure

1. Specify the SAP connection details:
 - **Application Server.** The name of the SAP Application server.
 - **System Number.** The system number of the SAP Application instance.
 - **Router String.** Optional. The string used to connect to the remote SAP server. If you use a SAP router to access your system, you must include a fully-qualified node name for your RFC server machine in the SAP router table.
2. Select **Use load balancing** to use load balancing when connecting to an SAP system. The **Application Server** and the **System Number** controls are replaced by **Message Server**, **System ID**, and **Group** controls so that connection details specific to load balancing can be entered (see Load Balancing).
3. Specify the default SAP logon details:
 - **User Name.** The name of the user for connecting to SAP.
 - **Password.** The password for User Name.
 - **Client Number.** The SAP client number.
 - **Language.** The language used for connecting to SAP.

Chapter 22. Defining IDoc type properties

About this task

When you confirm the default values after selecting an IDoc type, the **IDoc Type Properties** dialog opens.

The IDoc Type Properties dialog contains various parameters set to default values. The default settings are usually appropriate.

Procedure

1. **Name** is the name of the selected IDoc type (read-only) with its description in the **Description** field.
2. **Directory containing temporary IDoc files for this IDoc type and connection** is the path name for storing IDoc files for this IDoc type and connection. Initially, the directory is set to a default location, and the edit box is read-only. To enter your own directory, clear the **Use default directory** box.
If **Use default directory** is selected, the default path name is displayed, and the control is read-only.
3. Click **Browse** to browse for an alternate directory to store IDoc files for this IDoc type and connection. If **Use default directory** is cleared, this button is enabled.
4. Click **Use default directory** to browse for an alternate directory for storing IDoc files for this IDoc type and connection. If cleared, **Directory containing temporary IDoc files for this IDoc type and connection** and **Browse** are enabled, and you can specify an alternate directory. Otherwise, the IBM InfoSphere DataStage uses a default location.

If the directory does not exist, and you save changes to the IDoc type configuration, the system tries to create the directory. If it cannot, you must choose another directory.

If the directory has already been configured for this IDoc type by using a different InfoSphere DataStage connection to SAP, you are warned that stages that read IDocs of this type process IDocs arriving from all connections that share this directory for the type.

After you acknowledge this message, the values displayed in the dialog for the other configuration details are refreshed to match those already defined for the type through the other connections. Any changes you make to the configuration details for an IDoc type whose PSA is shared between two or more connections affect all connections processing this type from this PSA.

5. Click **Archive processed IDoc files** to archive processed IDocs rather than permanently remove them. The archive location is at the same level as the PSA for the IDoc.
It is the responsibility of the Administrator to oversee the permanent storage of archived IDocs, for example, moving them to an alternate disk location or removable storage media. You cannot restore processed IDocs.
6. If **Run jobs that extract IDocs of this type after receiving *n* IDocs** is selected, jobs are automatically run that read IDocs of this type each time another *n* IDocs of this type are received by the IDoc listener server. (The default is one.)

If the number of IDocs of this type is expected to be small and to arrive frequently, increase the number of IDocs that must arrive before jobs are automatically run.

Alternately, you can disable automatic jobs invocation for this IDoc type by clearing the check box. In this case, use the InfoSphere DataStage and QualityStage Director client to schedule jobs.

Note: See Chapter 23, “Setting batch size for manual IDoc extraction,” on page 107 for additional information.

7. The **InfoSphere DataStage Logon Details for Running the Jobs** area specifies the InfoSphere DataStage logon user name and password, and whether to use the defaults for the connection.
8. Specify a specific job to run automatically in the **Assign job** section:
 - Select **Run specific job** to specify the project name and job name that is to run automatically when the stage receives the number of IDocs in the **Run jobs that extract IDocs of this type after receiving** field. In the **Project Name** field, choose the name of the project that is to run automatically. The **Project Name** field includes up to two project names:
 - The most recent, saved project associated with this IDoc type
 - The current project
 - Clear **Run specific job** to automatically run *all* jobs that extract this IDoc type when the stage receives the specified number of IDocs.
9. After you select an IDoc type and optionally define IDoc Type configuration properties, the Select IDoc Type dialog closes, and you return to the **IDoc Type** tab of the Stage page, with the properties of the selected IDoc type now visible. The **IDoc Components** area shows the control record and all the segments defined for the IDoc type with their descriptions. (The control record, one for each IDoc, is an administrative record that contains a standard set of fields describing the IDoc as a whole.) This area contains the following information:
 - **Name.** Shows the hierarchical relationship among the segments using a tree structure with their descriptions.

(A segment type can appear only once within an IDoc type. The names for the segments are the segment definition names, not the segment type names. You can infer the segment type name from the segment definition name.)
 - **Assigned Output Link.** After particular segments in the IDoc Type are assigned to the output links of the stage, the **IDoc Components** control shows the names of the links in the **Assigned Output Link** column of the control. This gives you an overview of which segments are being extracted by the stage.

Results

The **General** tab of the Output page shows the segment type or control record for each output link as described in subsequent sections.

Chapter 23. Setting batch size for manual IDoc extraction

You can configure the batch size for IDoc extraction jobs that are to be run in manual mode.

About this task

To set the batch size:

Procedure

1. Create an IDoc extraction job.
2. Set manual job processing in the Stage properties IDoc Type tab by clearing the field **Run jobs that extract IDocs of this type after receiving *n* IDocs**.
3. Right-click the **IDoc Extract Stage** in the IBM InfoSphere DataStage and QualityStage Designer client canvas and click **Grid Style**.
4. In the **Stage** tab, click the **Properties** tab.
5. In the **MANUAL_BATCH_SIZE** field, specify the number of IDocs to be processed when the job is run manually.
6. Click **OK**.

What to do next

Use the InfoSphere DataStage and QualityStage Designer or the InfoSphere DataStage and QualityStage Director to run the IDoc extraction job manually.

Chapter 24. Exporting connections

About this task

To export connections by saving configuration information into a file:

Procedure

1. Click **Export** from the **InfoSphere DataStage Connections to SAP** page to open the Export Connection dialog. This dialog lets you save the following configuration information for the selected connection and all its associated IDoc types into a file:
 - **Connection.** The connection whose configuration you want to export.
 - **Description.** A description of the connection.
2. The **Export configurations for these IDoc Types** control lists all IDocs types that are configured for the connection. You can export only a subset of these configurations by clearing the check boxes next to the IDoc types whose configurations you do not want.
3. Click **Exported Properties** to modify the connection properties to be exported.
4. Click **Exported Configuration** to modify the IDoc type configuration details to be exported for a selected IDoc type.
5. After you click **OK**, a Save As dialog opens so you can specify the name and location of the export file. The file is given a .cxp extension.

Chapter 25. Importing IDoc type configurations

About this task

To import IDoc type configurations into existing connections:

Procedure

1. Click **Import into** from the **InfoSphere DataStage Connections to SAP** page. This lets you select a file to import.
2. The Import IDoc Type Configurations dialog opens. This dialog displays the IDoc types selected for import. These types are imported into an existing connection whose name and description are displayed in the dialog.
The capability to export SAP connection definitions with their associated IDoc types lets you easily migrate your configurations from one of the IBM InfoSphere DataStage server system to another.
3. The following information is displayed:
 - Import into Connection. The existing connection receiving imported IDoc types.
 - Description. A description of the connection.
 - Import configurations for these IDoc Types. A list of the IDoc types whose configurations are imported.
4. Click **Configuration** to view and modify the configuration for the selected IDoc type. The list control has check boxes for each item, so you can import configurations for a subset of the IDoc types shown in the list.
5. When you click **OK**, the configurations are imported. As each checked IDoc type configuration is imported, the IDoc type disappears from the list control.
6. If any errors occur while importing a configuration, the import process stops, the IDoc type with the problem is highlighted, and the problem is reported in a message box. You can resolve the problem by changing the properties or skip the import for this particular IDoc type by clearing its check mark and clicking **OK** again so any remaining configurations are imported.

Appendix A. Product accessibility

You can get information about the accessibility status of IBM products.

The IBM InfoSphere Information Server product modules and user interfaces are not fully accessible.

For information about the accessibility status of IBM products, see the IBM product accessibility information at http://www.ibm.com/able/product_accessibility/index.html.

Accessible documentation

Accessible documentation for products is provided in IBM Knowledge Center. IBM Knowledge Center presents the documentation in XHTML 1.0 format, which is viewable in most web browsers. Because IBM Knowledge Center uses XHTML, you can set display preferences in your browser. This also allows you to use screen readers and other assistive technologies to access the documentation.

The documentation that is in IBM Knowledge Center is also provided in PDF files, which are not fully accessible.

IBM and accessibility

See the IBM Human Ability and Accessibility Center for more information about the commitment that IBM has to accessibility.

Appendix B. Reading command-line syntax

This documentation uses special characters to define the command-line syntax.

The following special characters define the command-line syntax:

- [] Identifies an optional argument. Arguments that are not enclosed in brackets are required.
- ... Indicates that you can specify multiple values for the previous argument.
- | Indicates mutually exclusive information. You can use the argument to the left of the separator or the argument to the right of the separator. You cannot use both arguments in a single use of the command.
- { } Delimits a set of mutually exclusive arguments when one of the arguments is required. If the arguments are optional, they are enclosed in brackets ([]).

Note:

- The maximum number of characters in an argument is 256.
- Enclose argument values that have embedded spaces with either single or double quotation marks.

For example:

```
wsetsrc[-S server] [-l label] [-n name] source
```

The *source* argument is the only required argument for the **wsetsrc** command. The brackets around the other arguments indicate that these arguments are optional.

```
wlsac [-l | -f format] [key... ] profile
```

In this example, the **-l** and **-f** format arguments are mutually exclusive and optional. The *profile* argument is required. The *key* argument is optional. The ellipsis (...) that follows the *key* argument indicates that you can specify multiple key names.

```
wrb -import {rule_pack | rule_set}...
```

In this example, the *rule_pack* and *rule_set* arguments are mutually exclusive, but one of the arguments must be specified. Also, the ellipsis marks (...) indicate that you can specify multiple rule packs or rule sets.

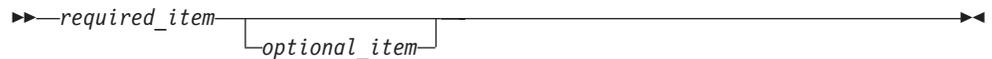
Appendix C. How to read syntax diagrams

The following rules apply to the syntax diagrams that are used in this information:

- Read the syntax diagrams from left to right, from top to bottom, following the path of the line. The following conventions are used:
 - The >>--- symbol indicates the beginning of a syntax diagram.
 - The ---> symbol indicates that the syntax diagram is continued on the next line.
 - The >--- symbol indicates that a syntax diagram is continued from the previous line.
 - The --->< symbol indicates the end of a syntax diagram.
- Required items appear on the horizontal line (the main path).



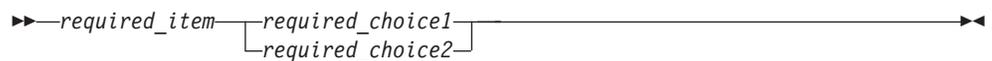
- Optional items appear below the main path.



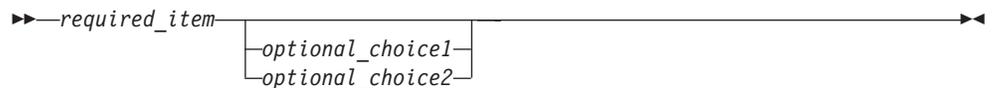
If an optional item appears above the main path, that item has no effect on the execution of the syntax element and is used only for readability.



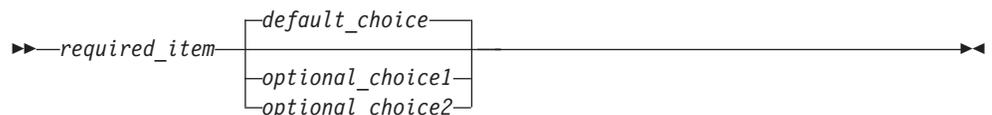
- If you can choose from two or more items, they appear vertically, in a stack. If you must choose one of the items, one item of the stack appears on the main path.



If choosing one of the items is optional, the entire stack appears below the main path.



If one of the items is the default, it appears above the main path, and the remaining choices are shown below.



- An arrow returning to the left, above the main line, indicates an item that can be repeated.

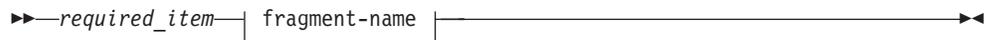


If the repeat arrow contains a comma, you must separate repeated items with a comma.



A repeat arrow above a stack indicates that you can repeat the items in the stack.

- Sometimes a diagram must be split into fragments. The syntax fragment is shown separately from the main syntax diagram, but the contents of the fragment should be read as if they are on the main path of the diagram.



Fragment-name:



- Keywords, and their minimum abbreviations if applicable, appear in uppercase. They must be spelled exactly as shown.
- Variables appear in all lowercase italic letters (for example, *column-name*). They represent user-supplied names or values.
- Separate keywords and parameters by at least one space if no intervening punctuation is shown in the diagram.
- Enter punctuation marks, parentheses, arithmetic operators, and other symbols, exactly as shown in the diagram.
- Footnotes are shown by a number in parentheses, for example (1).

Appendix D. Contacting IBM

You can contact IBM for customer support, software services, product information, and general information. You also can provide feedback to IBM about products and documentation.

The following table lists resources for customer support, software services, training, and product and solutions information.

Table 3. IBM resources

Resource	Description and location
IBM Support Portal	You can customize support information by choosing the products and the topics that interest you at www.ibm.com/support/entry/portal/Software/Information_Management/InfoSphere_Information_Server
Software services	You can find information about software, IT, and business consulting services, on the solutions site at www.ibm.com/businesssolutions/
My IBM	You can manage links to IBM Web sites and information that meet your specific technical support needs by creating an account on the My IBM site at www.ibm.com/account/
Training and certification	You can learn about technical training and education services designed for individuals, companies, and public organizations to acquire, maintain, and optimize their IT skills at http://www.ibm.com/training
IBM representatives	You can contact an IBM representative to learn about solutions at www.ibm.com/connect/ibm/us/en/

Appendix E. Accessing the product documentation

Documentation is provided in a variety of formats: in the online IBM Knowledge Center, in an optional locally installed information center, and as PDF books. You can access the online or locally installed help directly from the product client interfaces.

IBM Knowledge Center is the best place to find the most up-to-date information for InfoSphere Information Server. IBM Knowledge Center contains help for most of the product interfaces, as well as complete documentation for all the product modules in the suite. You can open IBM Knowledge Center from the installed product or from a web browser.

Accessing IBM Knowledge Center

There are various ways to access the online documentation:

- Click the **Help** link in the upper right of the client interface.
- Press the F1 key. The F1 key typically opens the topic that describes the current context of the client interface.

Note: The F1 key does not work in web clients.

- Type the address in a web browser, for example, when you are not logged in to the product.

Enter the following address to access all versions of InfoSphere Information Server documentation:

```
http://www.ibm.com/support/knowledgecenter/SSZJPZ/
```

If you want to access a particular topic, specify the version number with the product identifier, the documentation plug-in name, and the topic path in the URL. For example, the URL for the 11.3 version of this topic is as follows. (The ⇒ symbol indicates a line continuation):

```
http://www.ibm.com/support/knowledgecenter/SSZJPZ_11.3.0/⇒  
com.ibm.swg.im.iis.common.doc/common/accessingiidoc.html
```

Tip:

The knowledge center has a short URL as well:

```
http://ibm.biz/knowctr
```

To specify a short URL to a specific product page, version, or topic, use a hash character (#) between the short URL and the product identifier. For example, the short URL to all the InfoSphere Information Server documentation is the following URL:

```
http://ibm.biz/knowctr#SSZJPZ/
```

And, the short URL to the topic above to create a slightly shorter URL is the following URL (The ⇒ symbol indicates a line continuation):

```
http://ibm.biz/knowctr#SSZJPZ_11.3.0/com.ibm.swg.im.iis.common.doc/⇒  
common/accessingiidoc.html
```

Setting up a locally installed information center

IBM Knowledge Center contains the most up-to-date version of the documentation. However, you can install a local version of the documentation as an information center and configure your help links to point to it. A local information center is useful if your enterprise does not provide access to the internet.

Set up a locally installed information center on the computer of your choice by completing one of the following actions:

- Use the installation instructions that come with the information center installation package
- Use the installation instructions in the following technote: <http://www-01.ibm.com/support/docview.wss?uid=swg27042237>

Changing help links to refer to locally installed documentation

After you install and start your locally installed information center, you can use the **iisAdmin** command on the services tier computer to change the documentation location that the product help links refer to. (The `⇒` symbol indicates a line continuation):

Windows

```
IS_install_path\ASBServer\bin\iisAdmin.bat -set -key ⇒  
com.ibm.iis.infocenter.url -value http://<host>:<port>/help/topic/
```

AIX Linux

```
IS_install_path/ASBServer/bin/iisAdmin.sh -set -key ⇒  
com.ibm.iis.infocenter.url -value http://<host>:<port>/help/topic/
```

Where `<host>` is the name of the computer where the information center is installed and `<port>` is the port number for the information center. The default port number is 8888. For example, on a computer named `server1.example.com` that uses the default port, the URL value would be `http://server1.example.com:8888/help/topic/`.

Obtaining PDF documentation

The PDF file books are available online and can be accessed from this support document: <https://www.ibm.com/support/docview.wss?uid=swg27008803&wv=1>.

Appendix F. Providing feedback on the product documentation

You can provide helpful feedback regarding IBM documentation.

Your feedback helps IBM to provide quality information. You can use any of the following methods to provide comments:

- To provide a comment about a topic in IBM Knowledge Center that is hosted on the IBM website, sign in and add a comment by clicking **Add Comment** button at the bottom of the topic. Comments submitted this way are viewable by the public.
- To send a comment about the topic in IBM Knowledge Center to IBM that is not viewable by anyone else, sign in and click the **Feedback** link at the bottom of IBM Knowledge Center.
- Send your comments by using the online readers' comment form at www.ibm.com/software/awdtools/rcf/.
- Send your comments by e-mail to comments@us.ibm.com. Include the name of the product, the version number of the product, and the name and part number of the information (if applicable). If you are commenting on specific text, include the location of the text (for example, a title, a table number, or a page number).

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Product module	Component or feature	Type of cookie that is used	Collect this data	Purpose of data	Disabling the cookies
Any (part of InfoSphere Information Server installation)	InfoSphere Information Server web console	<ul style="list-style-type: none"> • Session • Persistent 	User name	<ul style="list-style-type: none"> • Session management • Authentication 	Cannot be disabled
Any (part of InfoSphere Information Server installation)	InfoSphere Metadata Asset Manager	<ul style="list-style-type: none"> • Session • Persistent 	No personally identifiable information	<ul style="list-style-type: none"> • Session management • Authentication • Enhanced user usability • Single sign-on configuration 	Cannot be disabled

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Product module	Component or feature	Type of cookie that is used	Collect this data	Purpose of data	Disabling the cookies
InfoSphere DataStage	Big Data File stage	<ul style="list-style-type: none"> • Session • Persistent 	<ul style="list-style-type: none"> • User name • Digital signature • Session ID 	<ul style="list-style-type: none"> • Session management • Authentication • Single sign-on configuration 	Cannot be disabled
InfoSphere DataStage	XML stage	Session	Internal identifiers	<ul style="list-style-type: none"> • Session management • Authentication 	Cannot be disabled
InfoSphere DataStage	IBM InfoSphere DataStage and QualityStage Operations Console	Session	No personally identifiable information	<ul style="list-style-type: none"> • Session management • Authentication 	Cannot be disabled
InfoSphere Data Click	InfoSphere Information Server web console	<ul style="list-style-type: none"> • Session • Persistent 	User name	<ul style="list-style-type: none"> • Session management • Authentication 	Cannot be disabled
InfoSphere Data Quality Console		Session	No personally identifiable information	<ul style="list-style-type: none"> • Session management • Authentication • Single sign-on configuration 	Cannot be disabled
InfoSphere QualityStage Standardization Rules Designer	InfoSphere Information Server web console	<ul style="list-style-type: none"> • Session • Persistent 	User name	<ul style="list-style-type: none"> • Session management • Authentication 	Cannot be disabled
InfoSphere Information Governance Catalog		<ul style="list-style-type: none"> • Session • Persistent 	<ul style="list-style-type: none"> • User name • Internal identifiers • State of the tree 	<ul style="list-style-type: none"> • Session management • Authentication • Single sign-on configuration 	Cannot be disabled
InfoSphere Information Analyzer	Data Rules stage in the InfoSphere DataStage and QualityStage Designer client	Session	Session ID	Session management	Cannot be disabled

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