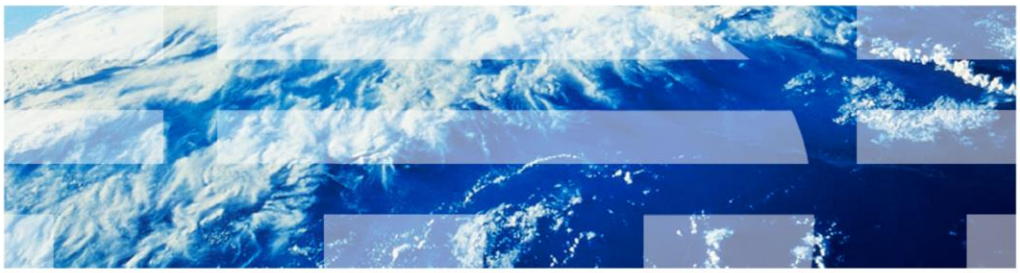
IBM

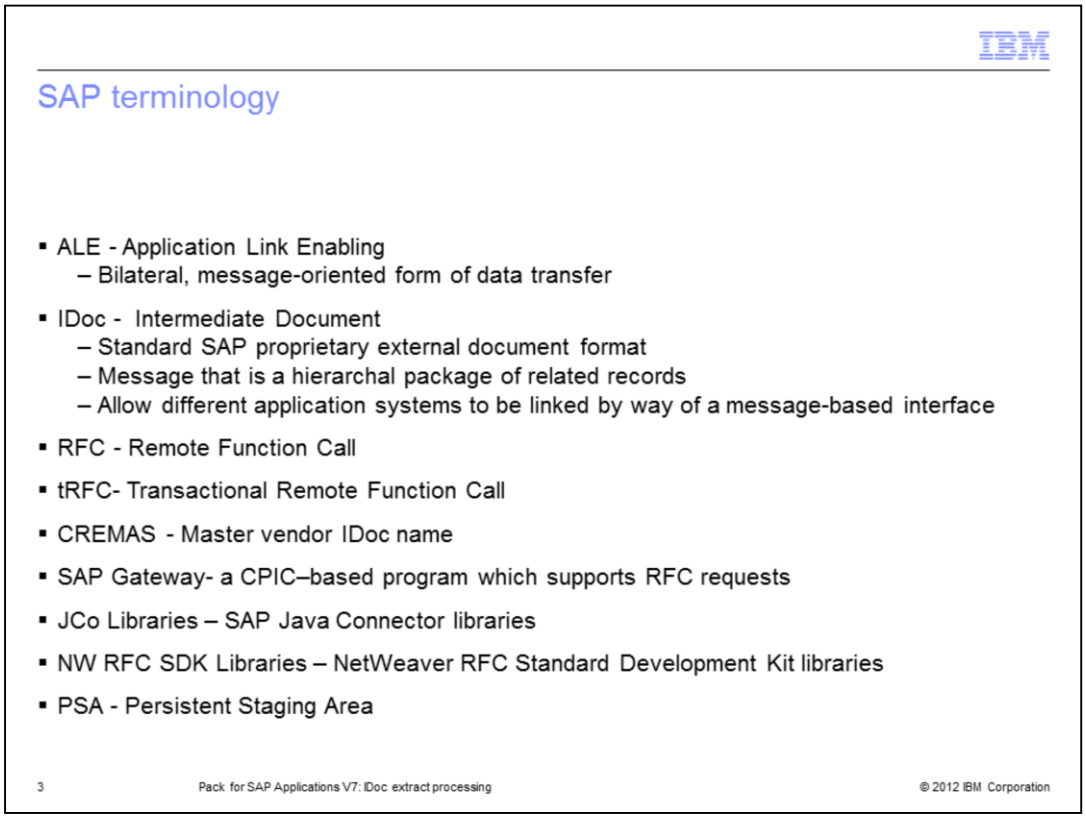
InfoSphere Information Server

Pack for SAP Applications V7: IDoc extract processing



This presentation will discuss the IDoc extract processing and IDoc extract processing changes in version 7 of the Pack for SAP Applications. This presentation uses screen captures from the InfoSphere® Information Server Pack for SAP Applications version 7. This presentation is applicable for Information Server versions 8.5.01 and higher.

The objectives of this presentation are to discuss some basic SAP terminology and IDoc extract processing. The presentation will examine the DataStage® IDoc extract stage and the IDoc Manager service changes. It also provides details and common IDoc extract processes supporting a successful IDocs transport.



There is some basic SAP terminology that is important to understand.

ALE stands for Application Link Enabling. ALE is a bilateral, message-oriented form of data transfer. ALE technology enables integration of business processes between SAP and external systems.

IDoc stands for Intermediate Document. IDoc is a standard SAP proprietary document format. An IDoc is a message that is a hierarchal package of related records, generated by SAP in an SAP exchange format. IDocs allow different application systems to be linked by way of a message-based interface.

RFC stands for Remote Function Call and tRFC stands for transactional Remote Function Call.

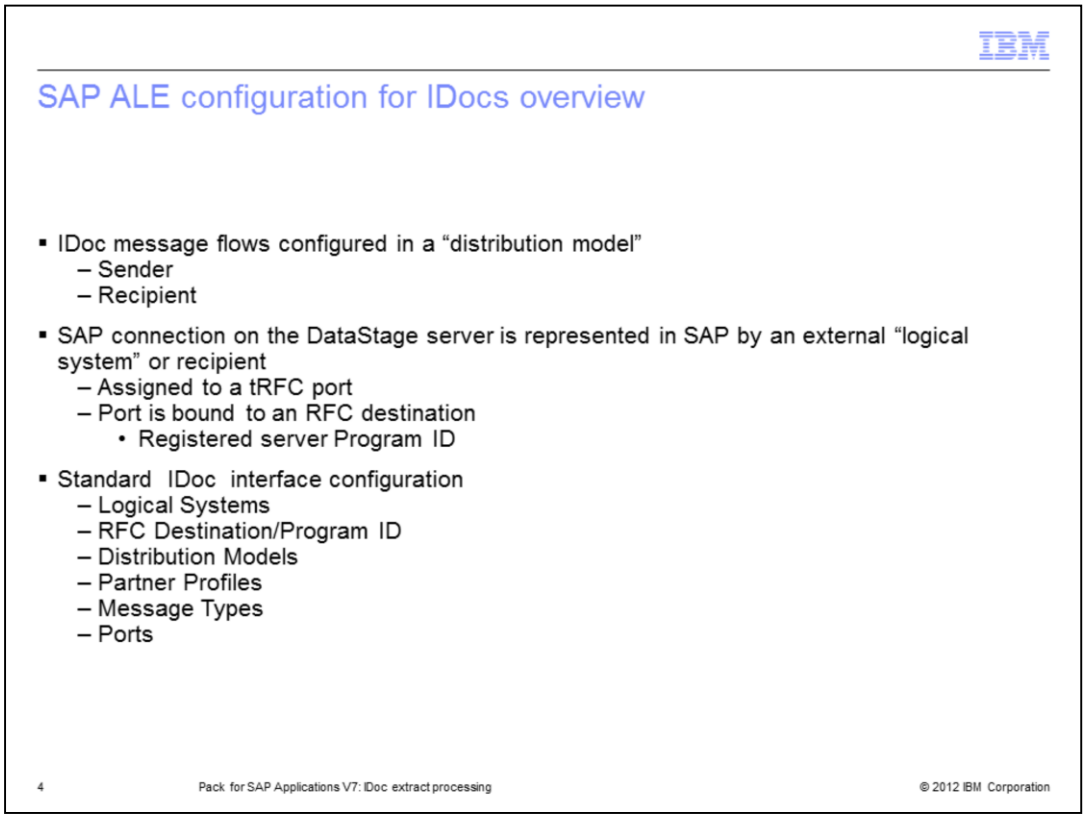
CREMAS is the name of the master vendor IDoc.

Each instance of an SAP System has a gateway. The gateway enables communication between work processes and external programs. It carries services which support RFC requests.

JCo Libraries refers to SAP Java Connector libraries.

NW RFC SDK 7.01 Libraries stands for NetWeaver RFC Standard Development Kit Libraries version 7.01.

Finally, PSA stands for Persistent Staging Area and it is a file system for data storage.

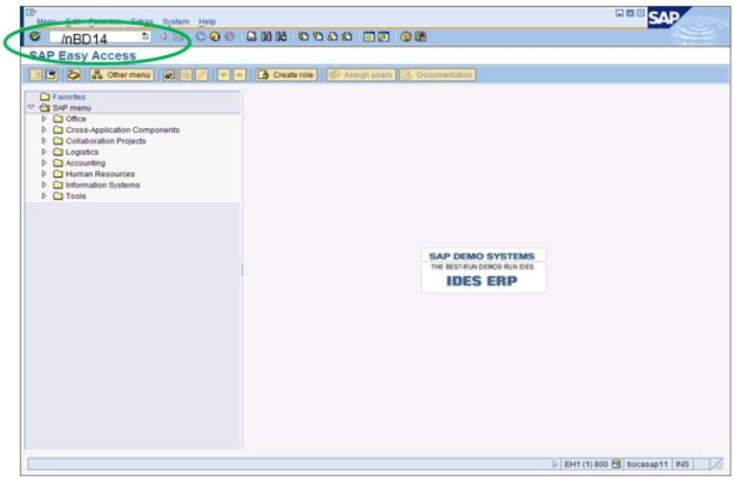


An IDoc can be generated at any point in a transaction process. For example, during a shipping transaction process, an IDoc can be generated that includes the data fields required to print a shipping manifest. After a user performs an SAP transaction, one or more IDocs are generated in the sending database and passed to the SAP Gateway. The Gateway Service performs RFCs using the port definition and the RFC destination specified in the partner profile.

For more details, see the SAP R/3 Pack: ALE Partner Profile configuration for IDoc extract processing IBM Education Assistant presentation.

Outbound IDoc processing: Sending IDocs

- Send vendor Application
- Send vendor master IDoc



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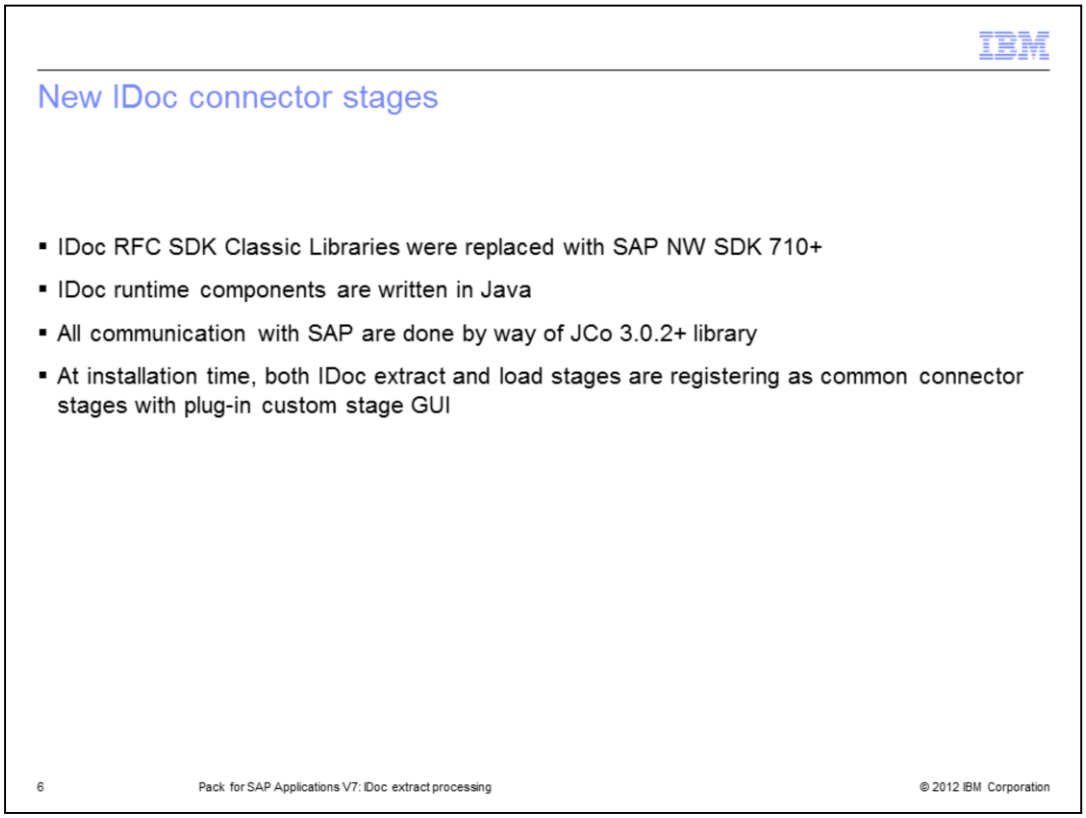
This slide displays the initial SAP applications window after connecting to an SAP client system with a dialog user.

To send a vendor master IDoc to the DataStage server, type the /nBD14 transaction code in the navigation window displayed on this slide, and press Enter.

For the detailed information on how to send IDocs and to view IDoc metadata on the SAP side see SAP R/3 Pack: IDoc extract processing IBM Education Assistant presentation.

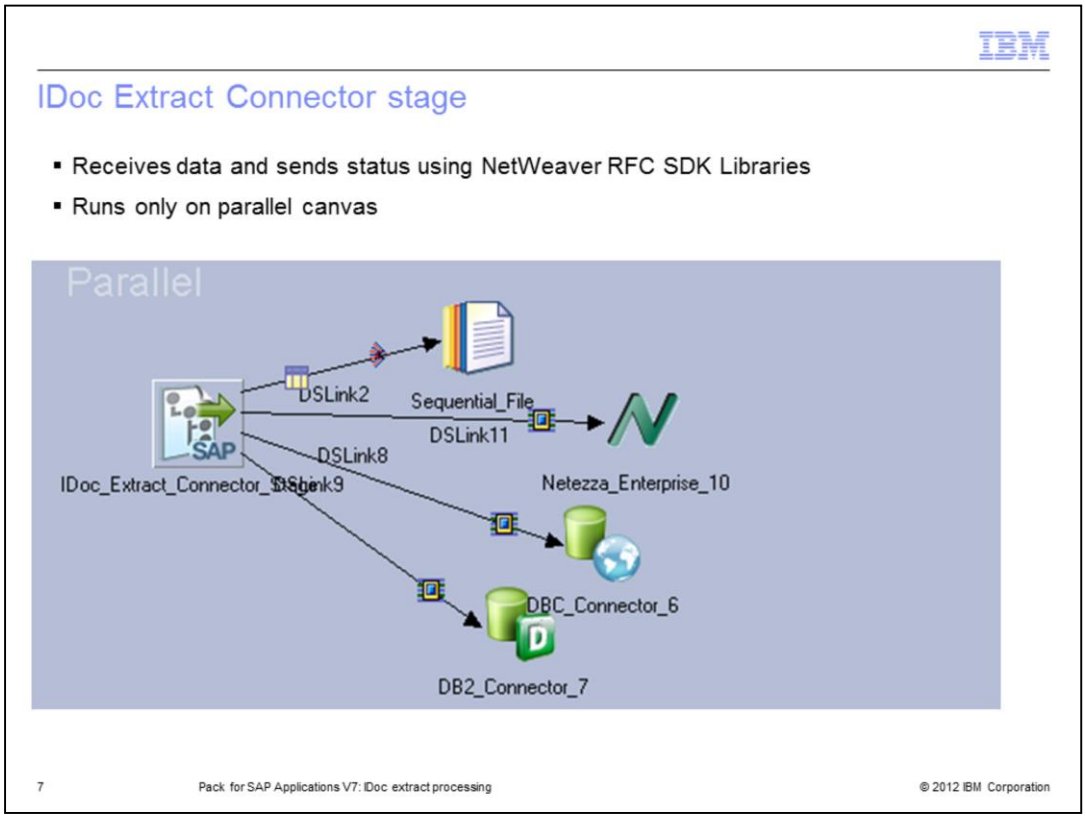


The existing SAP R3 Pack 6.5 depends on obsolete SAP C++ APIs that have not been supported by SAP since SAP Web Application Server 6.1 and is using the classic RFC SDK library that is also obsolete.

In the Pack for SAP Applications version 7 all new development was done using SAP Java Connector library, NetWeaver RFC SDK Library and Java implementation for the IDoc Server.

The SAP Pack installer was adapted to register the IDoc stages as common connector stages. The old version 6.5 IDoc stages remains untouched by the installer.

It is important to note, in the Pack for SAP Applications version 7, all stages user interface, ABAP runtime and BAPI runtime are using the SAP NetWeaver RFC Library. IDoc Listener and IDoc stage runtime require the SAP Java Connector.



This slide displays the example of a DataStage job that is designed to process IDocs to data targets.

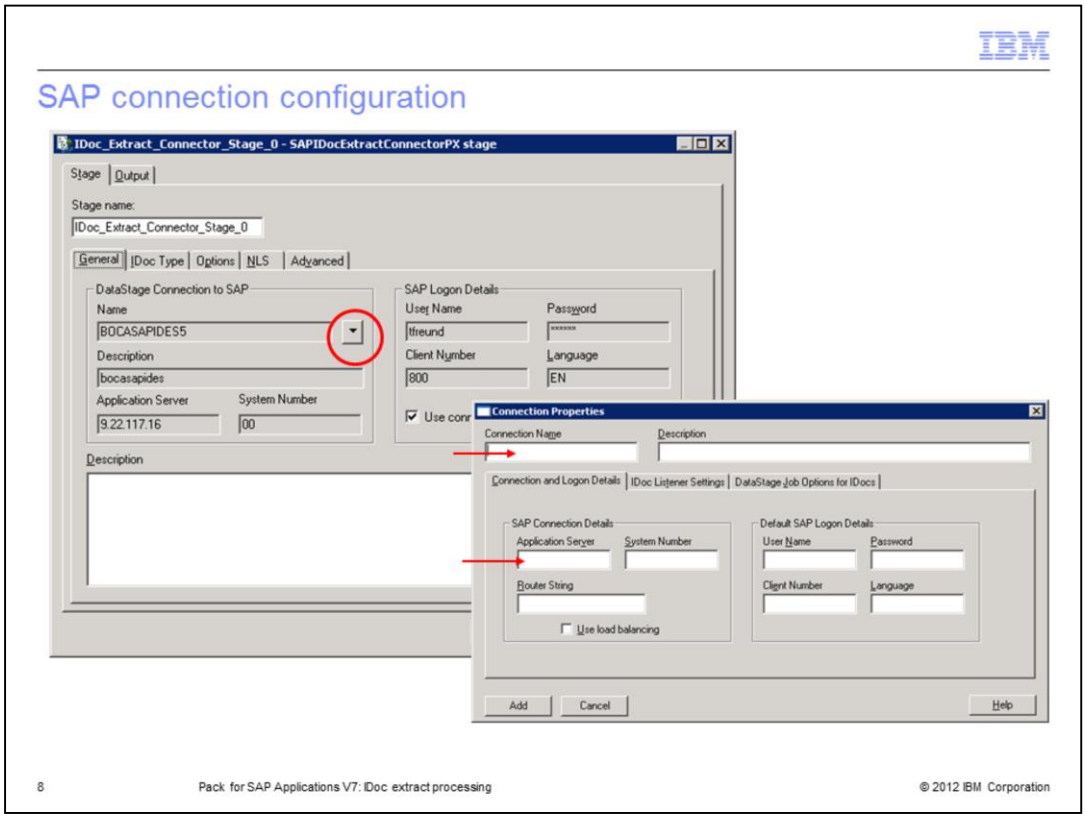
On the left side, there is a new icon of the IDoc Extract Connector stage. IDoc Extract Connector is a stage that can be used with DataStage parallel jobs.

The IDoc Extract Connector stage connects to the SAP system at design- and run-time, and processes IDocs using the NetWeaver RFC SDK Libraries.

It is important to note that there are two parts supporting IDoc processing on the DataStage server: the IDoc Extract Connector stage and the IDoc Manager service.

The IDoc Manager is a separate service outside the DataStage canvas that manages IDoc Servers and does all administrating, processing and controlling work by way of JCo Libraries.

For details on what the IDoc Manager does, see slide 16.

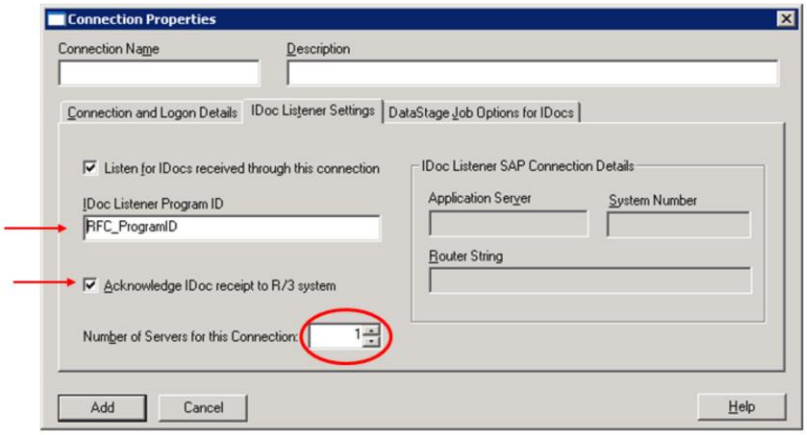


The IDoc Extract Connector should be configured to connect to the SAP system.

To create a new connection, open the IDoc Extract Connector and click the drop down list for the ‘DataStage Connection to SAP‘ property on the General tab. Choose the New option. Type in the logon connection details for the fields in the Connection Properties window.

SAP connection properties – IDoc Listener settings

- IDoc Listener settings
  - Provide IDoc Listener Program ID
  - Set number of processes
  - Uncheck Acknowledge IDocs receipt to R/3 for better performance



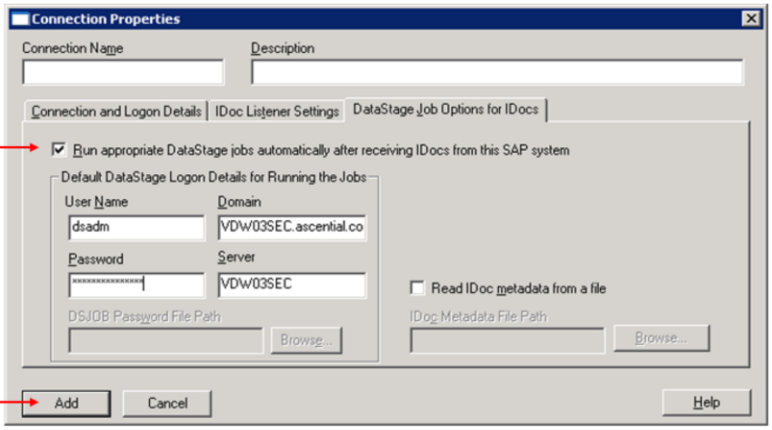
Each SAP connection has its own set of IDoc Server processes. To configure IDoc Servers, also known as the IDoc Listeners, choose the 'IDoc Listener Settings' tab to provide the Program ID value with which the IDoc Servers are listening to at the SAP Gateway.

The default number of IDoc Server processes is one per connection. It can be configured to process more than one by selecting the 'Number of Servers for this Connection', as displayed on this slide in the red oval. This will increase the number of registered IDoc Server processes at the gateway, therefore, enabling multi-threading of requests.

It is important to note that performance is better if the check box "Acknowledge IDoc receipt to R/3 system" is not checked.

SAP connection properties – Online and offline job run options

- DataStage Job Options for IDocs
- Configure jobs to run automatically
  - Enter login information for DataStage server
- Connection information
  - Stored in save format as older versions
  - Stored in directory defined by $DSSAPHOME under directory DSSAPConnections



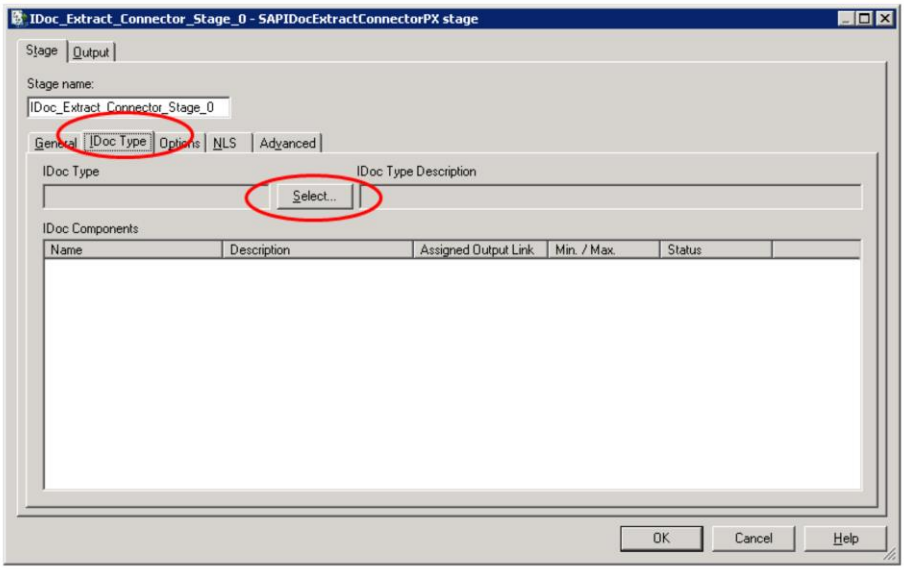
Next, proceed to the ‘DataStage Job Options for IDocs‘ tab.

To start the DataStage job online, enable the ‘Run appropriate DataStage jobs automatically after receiving IDocs from this SAP system’s check box. Provide the user name and the password for connection to the DataStage server, otherwise, leave it unchecked to schedule the job run offline.

Finally, click the Add button to complete creation of the SAP connection.

Connection configuration information in version 7 is stored in the same format like in older versions under the location defined by $DSSAPHOME environment variable in the directory named ‘DSSAPConnections’.

Configuring IDoc types (1 of 3)



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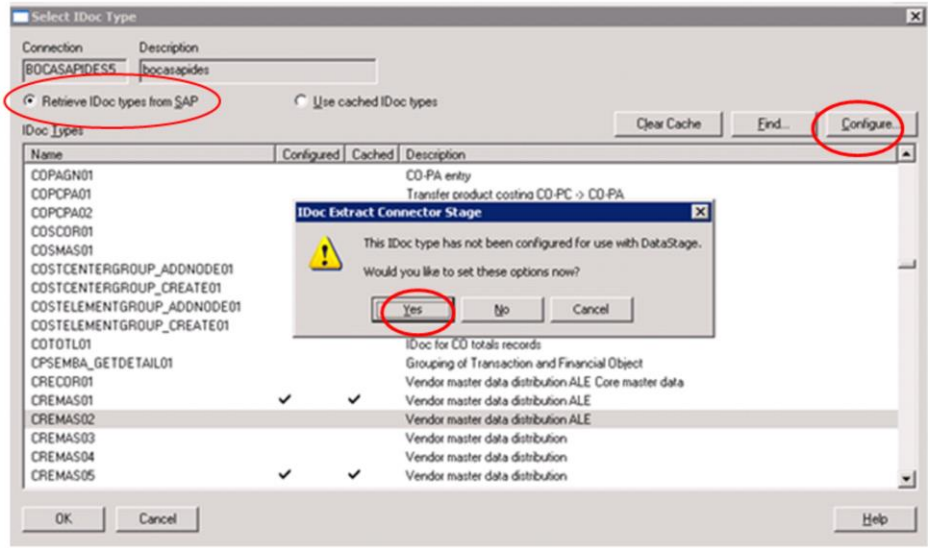
Using the configured SAP connection, you can upload the IDoc metadata directly from the SAP repository or from the previously configured and saved list of IDoc types, also known as the cached list of IDoc types.

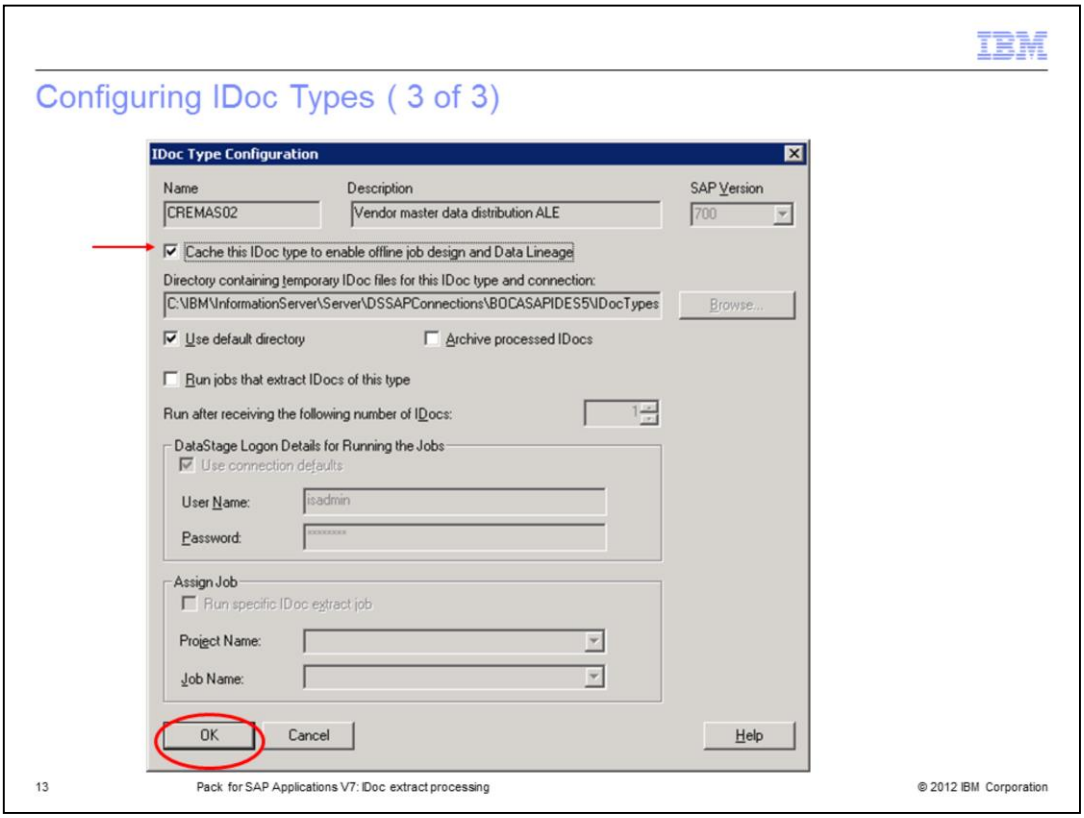
To pull up the IDoc metadata, open the IDoc Extract Connector Stage, choose the IDoc Type tab and click the Select button.

Configuring IDoc Types (2 of 3)



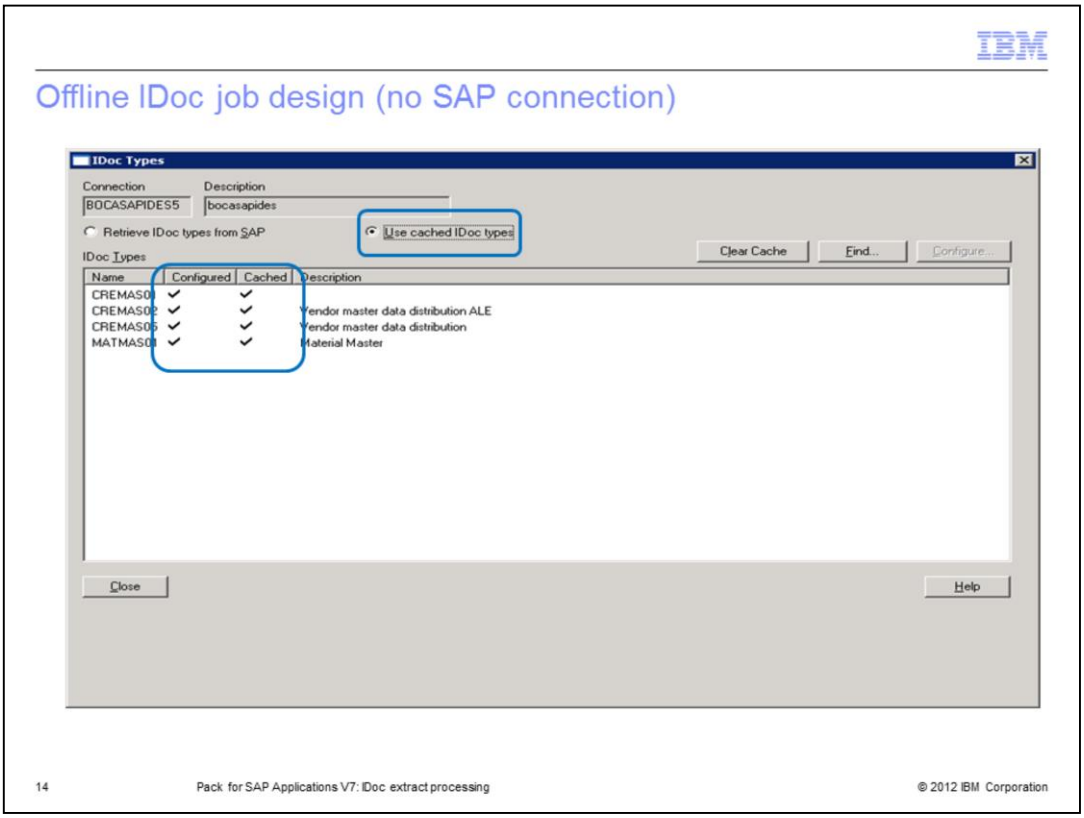
To upload the IDoc metadata directly from the SAP repository, choose ‘Retrieve IDoc types from SAP’. Click the ‘Configure’ button and then select the ‘Yes’ button.

Note that all types of released IDocs are supported, including custom created IDocs. IDoc types that are not released cannot be selected in the IDoc stage.

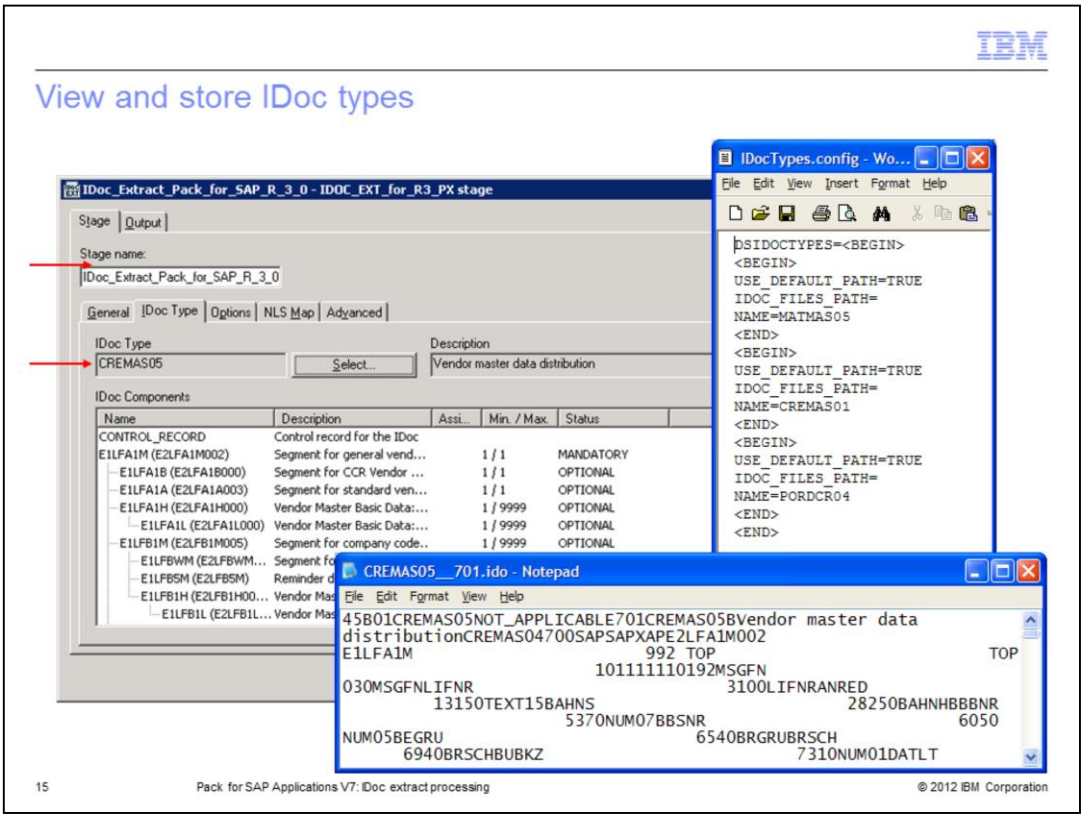


The IDoc Type Properties window will appear. Review the settings and click the OK button to confirm. As a result, it will save the IDoc type in a form of a .ido text file.

The new ‘Cache this IDoc type to enable offline job design and Data Lineage’ feature is available and will allow you to continue designing the job offline. If enabled, the IDoc metadata is stored in the DataStage repository, so the job will not require a live SAP connection during the design time.



To design the job using previously configured and saved IDoc type metadata, choose ‘Use Cached IDoc types’. Select the IDoc type and click the ‘Configure’ button.

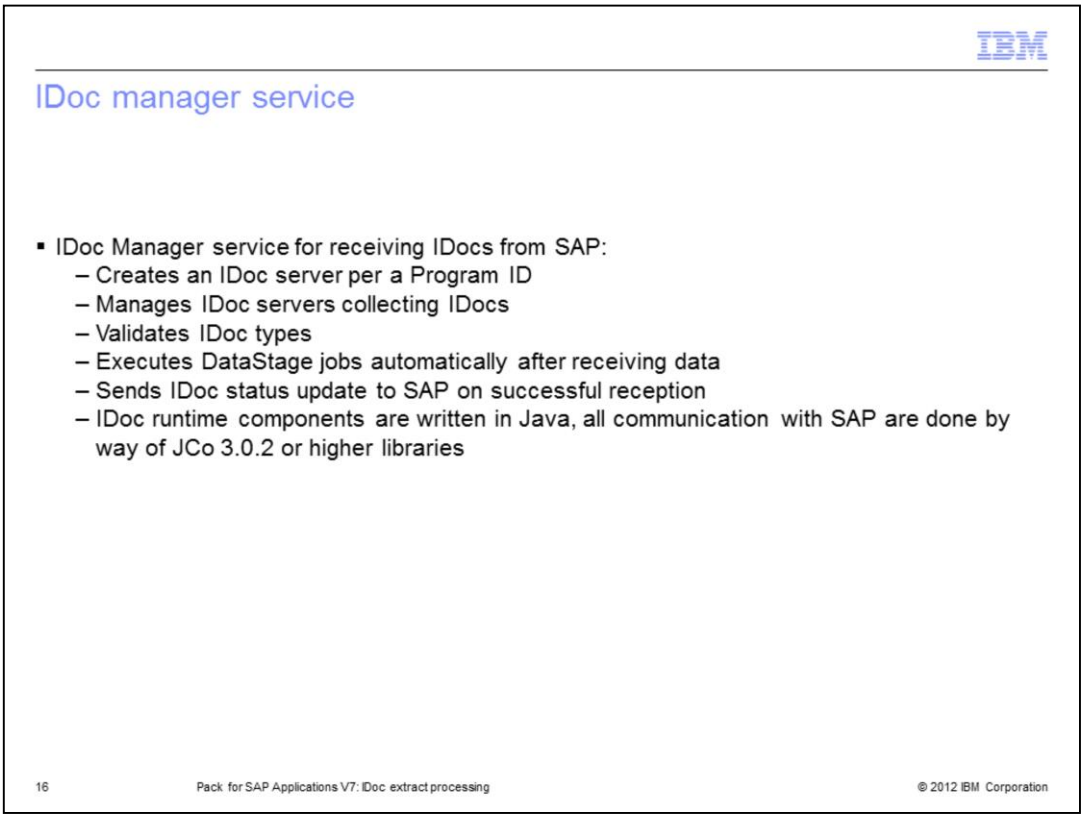


The IDoc Connector stage saves the IDoc type in a form of a .ido text file. For example, CREMAS05_701.ido. It also creates an entry into the IDocTypes.config file.

The .ido files are stored on the server file system in the ‘DSSAPConnections’ directory.

The IDocTypes.config is also stored in ‘DSSAPConnections’ under the ‘SAP connection name’ directory.

It is important to note that all Unicode metadata related information is gathered by way of NW RFC SDK. The format of the file .ido stays unchanged compared to version 6.5.



The IDoc Manager service is the second important part of the IDoc extract processing. The IDoc Manager is a separate service outside the DataStage canvas. The IDoc Manager manages different IDoc servers collecting IDocs. It creates an IDoc Server per a Program ID, it validates IDoc types, it executes DataStage jobs automatically after receiving data, and it sends a status update to SAP on successful reception.

The IDoc Manager is a Windows service or a UNIX daemon that is also responsible for starting and stopping individual IDoc servers. To stop the service on UNIX, navigate to the /opt/IBM/InformationServer/Server/DSSAPbin directory and type

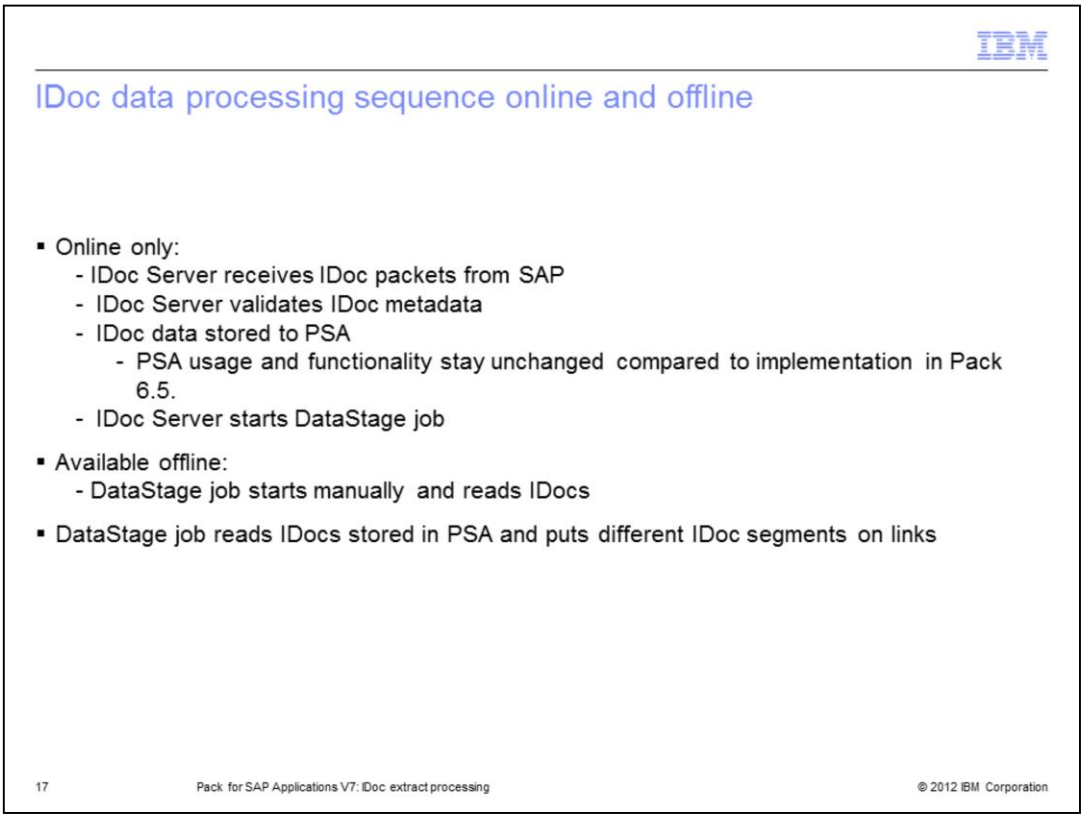
./dsidocd.rc stop

To start the service, type

./dsidocd.rc start

To restart the service on Windows, from the Start menu navigate to Settings, Control Panel, Administrative Tools and then Services. Locate the DataStage IDoc Manager service. Right-click the DataStage IDoc Manager service and select Restart.

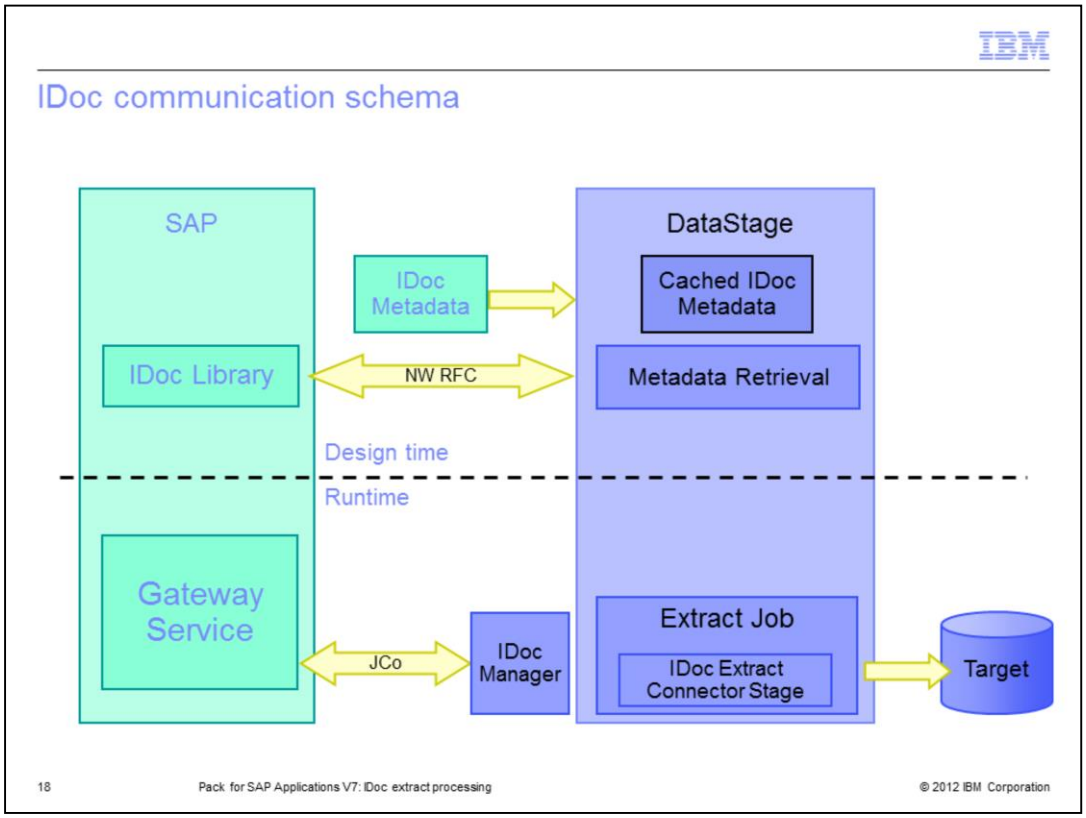
It is important to note that with the Pack for SAP Applications version 7, the IDoc Listener implementation has been changed from C/C++ to Java. All functionality stays the same. For example, the IDoc Manager starts and stops the IDoc Listeners. The name of the OS processes dsidocmgr, dsidocd, and dsidocsvr are the same.



Next, this presentation discusses the processing sequence for IDoc Extract data packets. When the IDoc Extract Connector is configured to connect to the SAP system and the IDoc Manager is running multiple IDoc Server threads to speed up data transfer, the IDoc Server will process IDocs in this sequence:

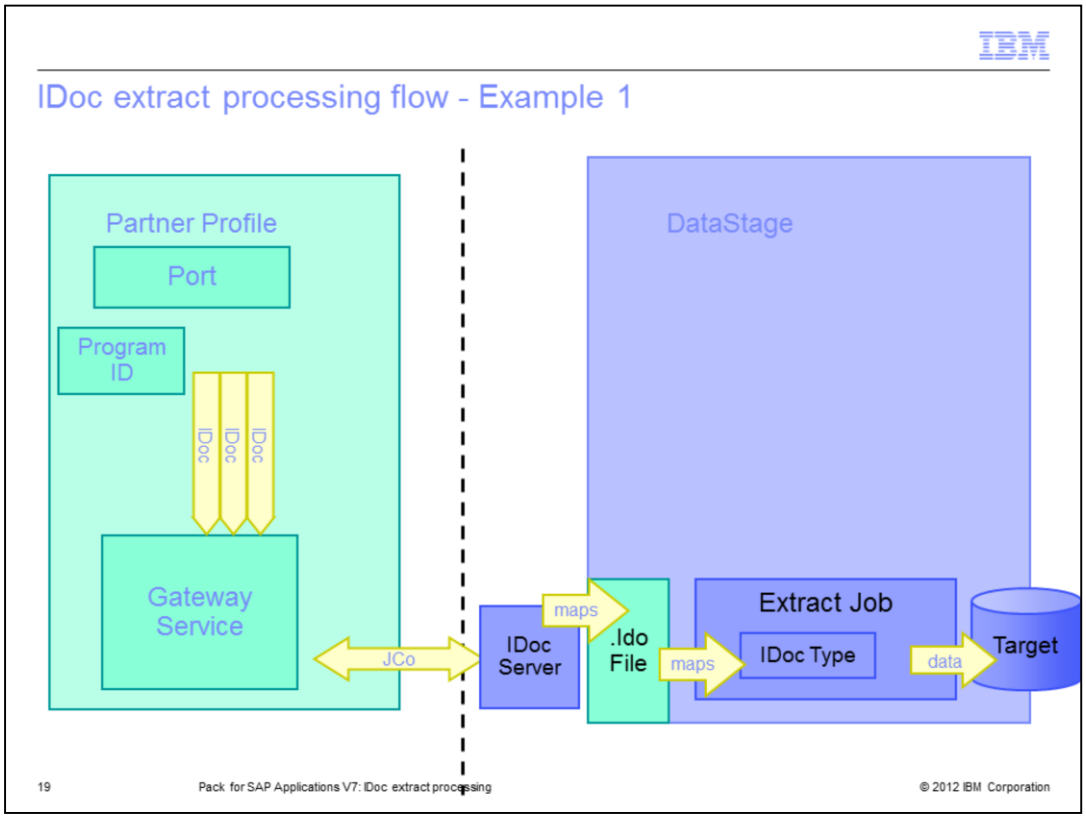
First, the IDoc Server receives an IDoc packet from SAP on the gateway. Before processing it, the IDoc Server validates the IDoc type that appeared at the gateway against available .ido files. If a .ido file exists, IDocs are transferred and stored in the DataStage server file system. If a .ido file does not exist, no IDocs are processed.

Next, if the ‘start job automatically’ feature is enabled, the IDoc Server will start the DataStage job. The job reads the IDocs stored in the file system and puts the different IDoc segments on the links to process IDoc data to targets.



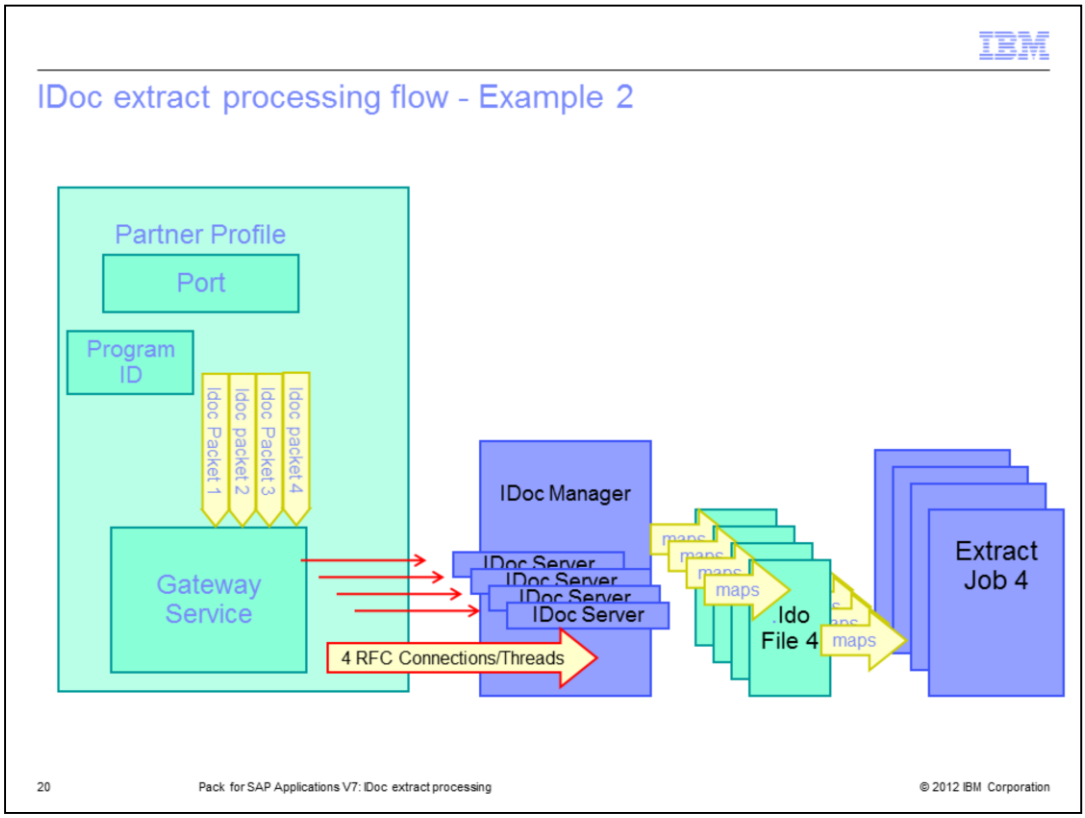
This slide demonstrates the IDoc communication schema for version 7 of the Pack. At the design time, the IDoc Extract Connector stage connects to the SAP system and retrieves metadata using RFC protocol. Alternatively, it retrieves cached IDoc metadata offline.

At the runtime, the IDoc Server receives IDoc packets from SAP and stores them in a file system. The Extract job reads IDocs and processes data to a target.



This slide displays a standard IDoc processing flow. In a standard configuration, the IDoc Server registers itself with the SAP Gateway. It processes requests one after another. If the IDoc Server is currently processing a request and then receives further requests, it collects them in a queue.

This schema illustrates processing of many IDocs of the same type by the IDoc Server utilizing the same port and the same Program ID, packet by packet, in a single-threaded scenario.



The example displayed on this slide shows a multi-threaded scenario. When the job is configured to use more than one IDoc Server process, the requests are then distributed among several threads and can be processed more quickly. See slide 9 for instructions on how to increase the number of IDoc Server processes.

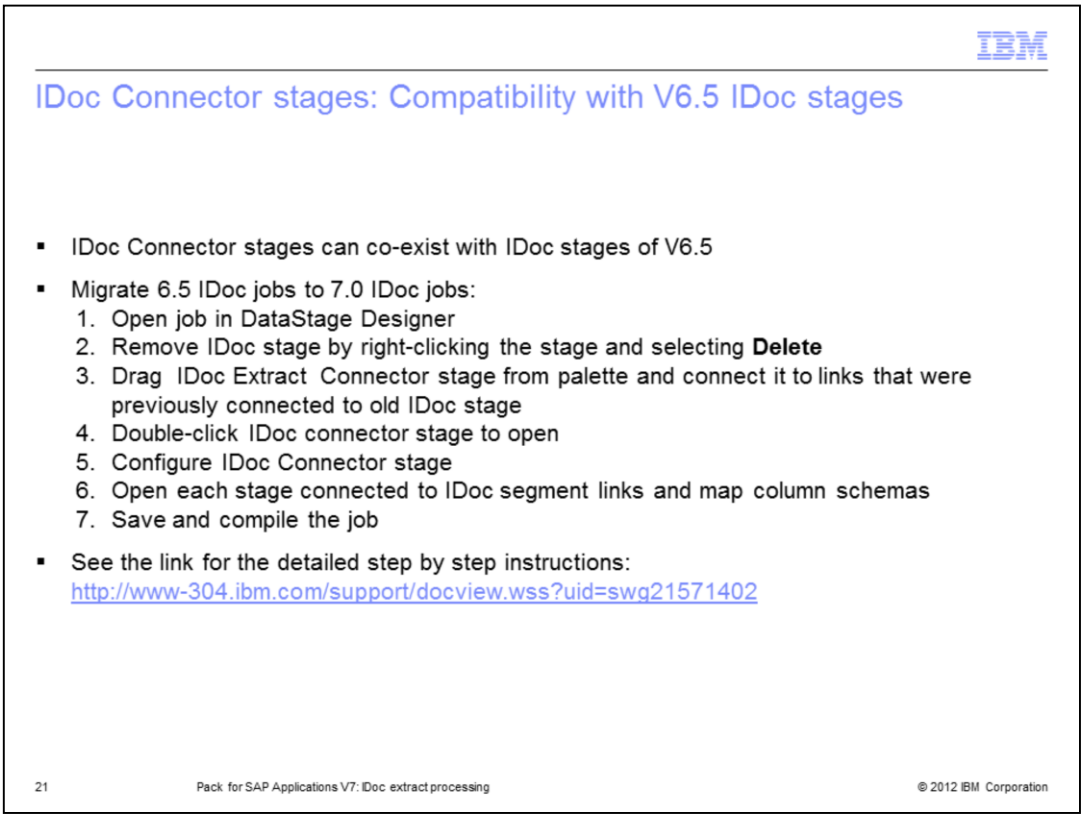
Sometimes the role of the RFC destination in the IDoc Extract processing can be confusing. You may try to configure one RFC destination per IDoc extract job, but it is not necessary. As a communication thread, the same RFC destination or the Program ID can be used by many DataStage jobs that are using the same SAP connection. To avoid a bottleneck, do not run them simultaneously.

Each SAP connection on the DataStage server is represented in SAP by an external logical system, which is assigned to a tRFC port. The port is bound to an RFC destination. The IDoc Server listens on a tRFC port. Therefore, an IDoc Server listening with a unique Program ID is created by the IDoc Manager for each SAP connection, not for each job.

When a communication IDoc packet is collected and ready to be transferred by the SAP Gateway to the DataStage server, an IDoc Listener will check if the Program ID it is listening with is matching the Program ID carried by the IDoc packet. Then, the IDoc Server will match the configured IDoc types with the IDoc type in the packet and only then the packet is transferred and ready for further processing by a DataStage job.

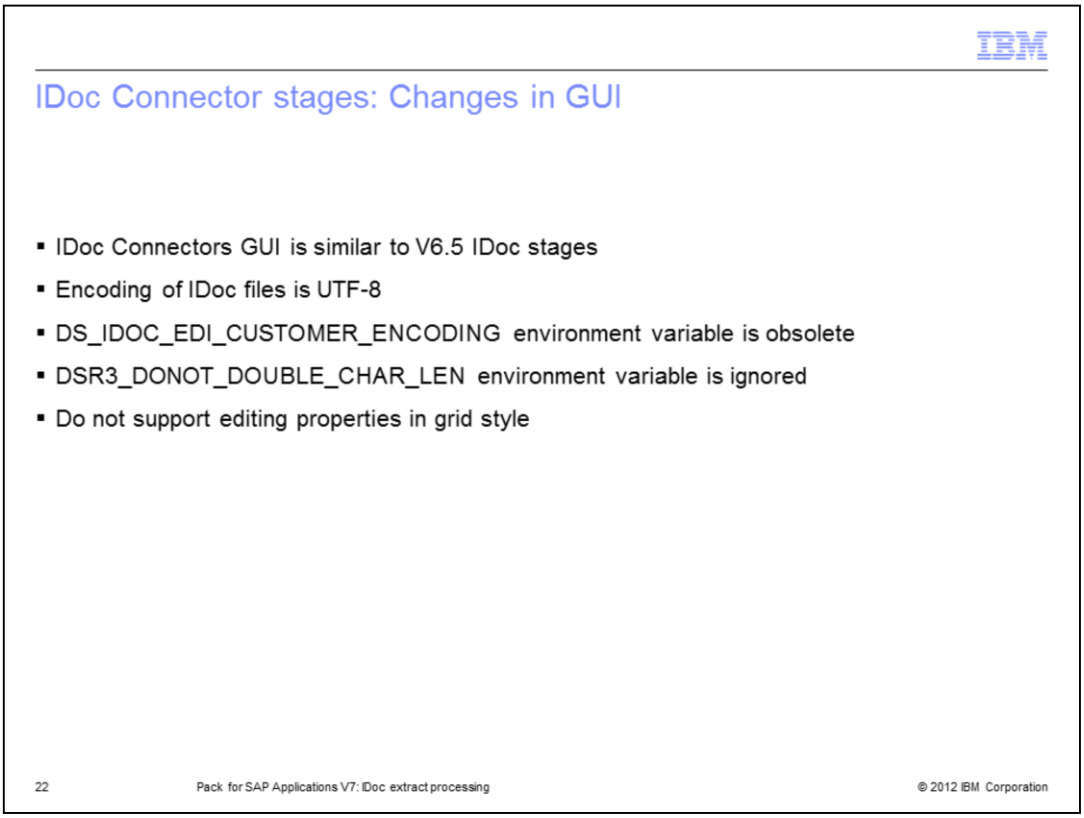
For IDoc extract troubleshooting details, see the SAP R/3 Pack: Troubleshooting IDoc Extract Processing IBM Education Assistant presentation.

For the IDoc Extract Configuration details on the SAP side, see the SAP R/3 Pack: ALE Partner Profile configuration for IDoc extract processing IBM Education Assistant presentation.



The IDoc Connector stages in version 7 are completely new stages that are not downward compatible. You will have to redesign old IDoc jobs by hand if you want to move to the IDoc Connector stage.

It is important to note that the old version 6.5.0.1 IDoc stages remain untouched by the installer. The IDoc stages of version 6.5 can coexist with version 7.



With Pack version 7, the IDoc connector Extract and Load stages are no longer the plug-in stages. They are the common connector stages. Common connector stages do not support editing properties in grid style.

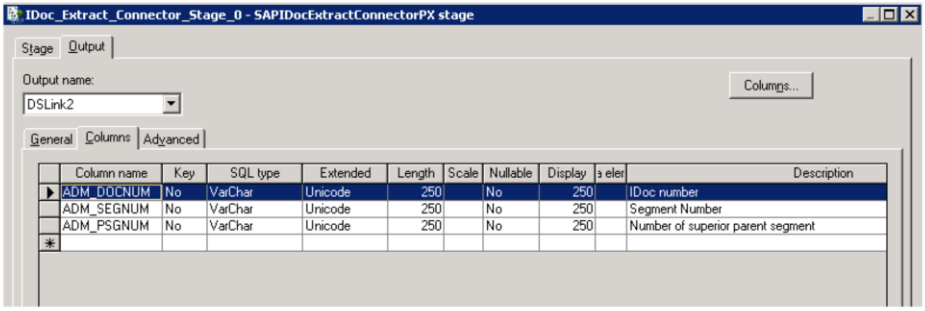
Encoding of IDoc files supports UTF-8 only.

In the 6.5 IDoc stage, the GUI receives IDoc metadata description from the Unicode enabled SAP system in UTF-16 format and translates to local encoding format defined by DataStage Designer.

In the 7.0 IDoc stage, the GUI receives IDoc metadata description from the Unicode enabled SAP Systems in UTF-8 format, like it is currently implemented in BAPI and ABAP Stage GUI.

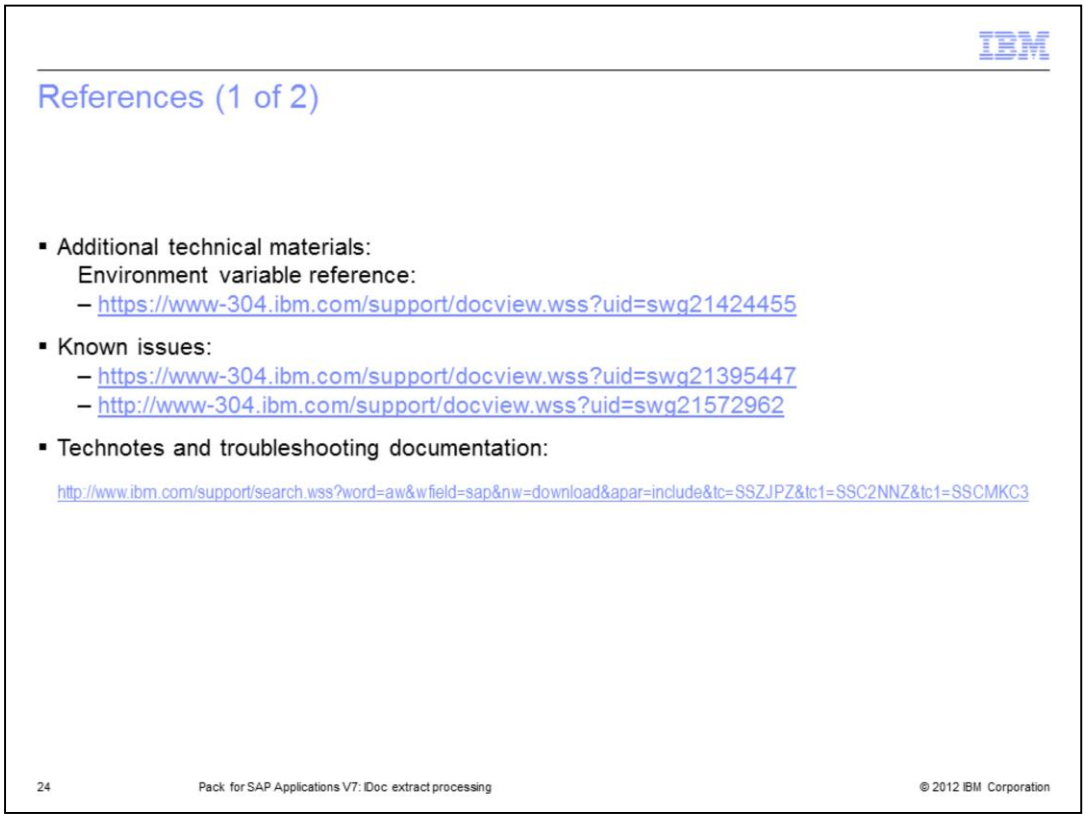
IDoc Connector stages: Uniform column schema

- Consistent column schema for IDoc load and IDoc extract
- Field length for key columns is increased to 250.
- Additional IDoc column fields
  - ADM_DOCNUM
  - ADM_SEGNUM
  - ADM_PSGNUM



In addition to the IDoc native column fields, there is also the ADM_DOCNUM, ADM_SEGNUM and ADM_PSGNUM columns that are added for each IDoc type.

Field length for key columns is increased to 250. A field length of 250 allows for easier construction of those field values for load through concatenation, however, migration from old IDoc jobs requires manual work.



This slide displays links to technical materials including Technotes and troubleshooting documentation.

References (2 of 2)

- Migrating from 6.5 IDoc stages to 7.0 IDoc connector stages

http://www-304.ibm.com/support/docview.wss?uid=swg21571402

- List of documents regarding compatibility issues that might occur when migrating from Pack for SAP Applications Version 6.5 to 7.0:

http://www-304.ibm.com/support/docview.wss?uid=swg21517072

This slide displays links to additional Technotes and troubleshooting documentation.

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