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WHITE PAPER

SAP integration using IDocs, Monitoring and Error handling in SAP S/4HANA

Contents

Abstract

Application Link Enabling (ALE) is the native integration technology that involves the exchange of hierarchical structures called IDOCs and is one of the proven and acceptable technologies used for data communication between distributed applications.

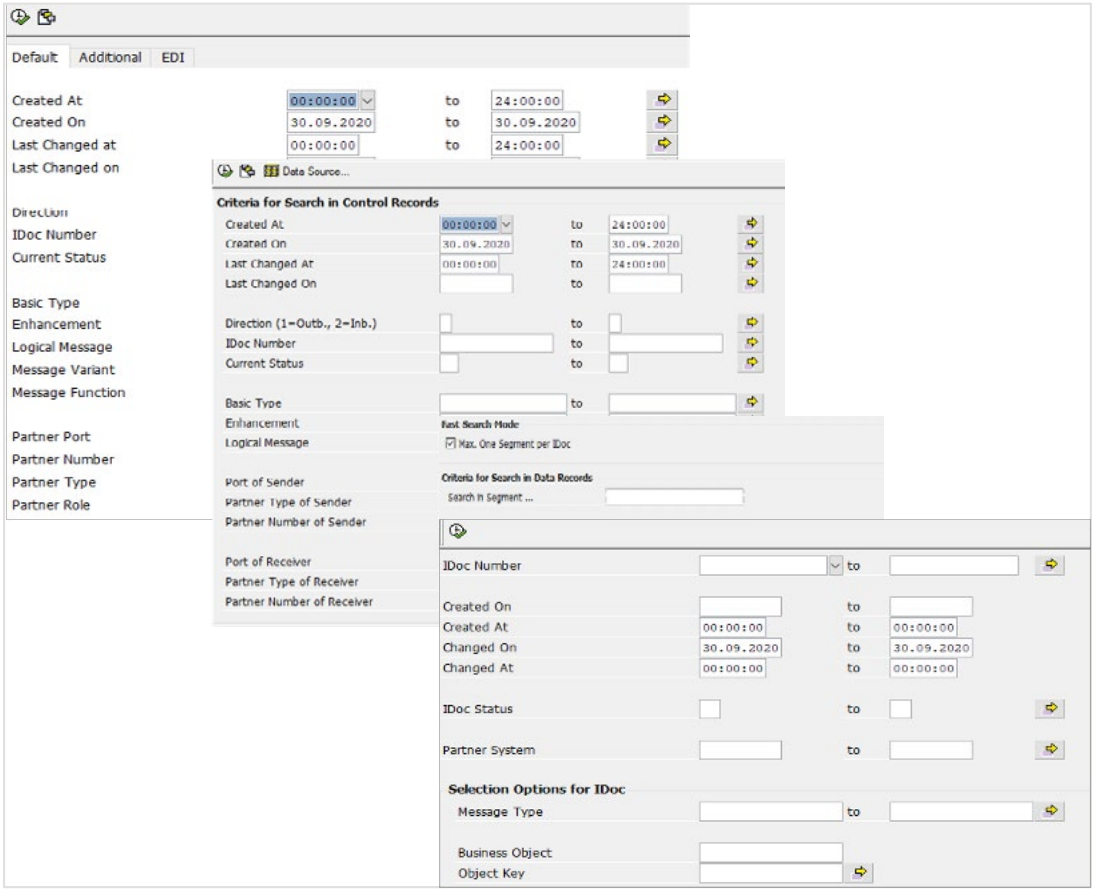
In a complete end-to-end scenario, data synchronization (Outbound – > Inbound to SAP) of Master data, Transactional and Customizing data executes in asynchronous mode leading to a difficult situation in tracking or monitoring errors related to IDOC processing.

Traditionally in SAP ECC6.0, the approach to administer, develop, and monitor IDoc is through WEDI.
From WEDI, approach for IDoc error handling using transactions such as WE02, WE05, WE09, WE19, and BD87. This can be time-consuming and frustrating, navigating between the various transactions for a support analyst trying to identify errors and fix them.

In real-time, challenges lie in the following topics:

- Timely detection of technical and data-related error situations
- Cumbersome navigation, search for IDoc processing
- High coordination effort in the event of data errors between IT, business teams
- Control takes place in the IT department, although the department is responsible for data-related issues

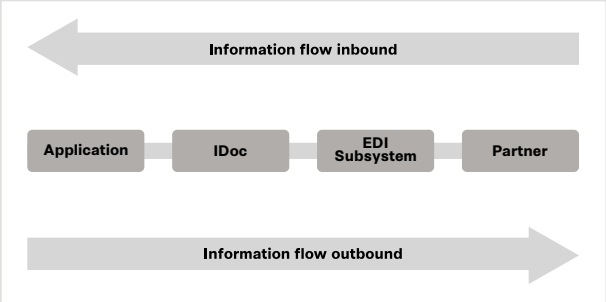
If handled correctly, IDOC management helps integration streamline with SAP and standardize the business processes and avoid a greater degree of manual intervention.



Introduction to SAP IDocs

IDoc (Intermediate document) is an SAP object used for data transmission of a business document from the source system to the target communicating system in an electronic form. Data transfer between SAP and the non-SAP system is done via EDI (Electronic Data Interchange) subsystems, whereas ALE for data integration between two SAP systems.

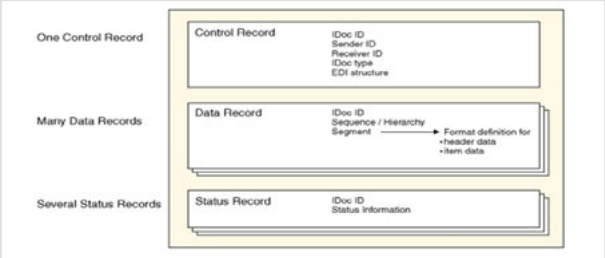
Depending on the source of the document flow and the direction in which the IDoc is sent is called an Inbound/Outbound IDoc. In case IDoc is triggered in SAP for outbound flow, through document message control and then sent to EDI subsystem. EDI then converts the data into XML or equivalent format and further sends it to the partner system through the Internet.



IDoc is a hierarchically structured document containing Control Records, Data Records, and Status Records.

Control record (EDIDC)

The Control Record includes administration information for technical processing and stores the details of the sender, receiver, basic type, message type, direction, IDoc status, date and time of creation/update, and interchange file or ISA number. The Control Record of an IDoc is stored in an EDIDC table. Every IDoc has one Control Record.



Data record (EDIDD)

The data record is a standard SAP cluster table that stores details of a business document arranged in segments for posting in the target application. Each IDoc represented by an IDoc number (DOCNUM) contains one or more data records arranged in sequence and is identified by fields PSGNUM and HLEVEL. SDATA holds the actual data subdivided into individual application fields. Key field SEGNAM helps determine the IDoc segment stored in SDATA specific to the IDoc type used.

Status record (EDIDS)

The Status Record contains the processing status of an IDoc. IDoc statuses represent various processing states in reverse chronological order. Only the current status of the IDoc is present in the Control Record. The status field is of two bytes length (data type CHAR), with a range of values: For outbound - 01–41 and for inbound IDocs - 50–73. It also includes the date and timestamps of the particular state when it was reached.

Solution manager: Central IDoc monitoring

Use transaction code - SOLMAN_SETUP to set up SAP Solution Manager Interface and Connection Monitoring.

SOLMAN_SETUP → Application Operations → Integration Monitoring → Interface and Connections.

The template provides details of both inbound/outbound for error monitoring, monitoring technical errors, and backlog monitoring to:

- Create the interface channel by selecting IDoc as the type
- Maintain the IDoc interfaces to be captured
- Select the metrics and maintain thresholds and schedules for the data collection
- Activate the IDoc monitoring Analysis Template

Monitoring content

IDoc Realtime monitoring template

The IDoc Realtime Monitoring Template provides metrics of errored IDocs and performance with details of erroneous IDocs in both Delta and Total modes in real-time. Delta mode monitors and alerts erroneous IDocs collected after the last collector run; Total Mode provides IDoc details within a specified timeframe.

The template provides the critical and recommended IDoc statuses to be monitored. It provides graphics of both intermediate(backlog) and errors in real-time. IDocs normally pass through different intermediate statuses before in their lifetime; however, if a very high number of IDocs in intermediate statuses indicates an error in the ALE layer and Status Age parameter should be considered for backlog monitoring.

Using Detail Info List, one can easily navigate to the desired errored IDoc directly without having to search in the respective managed system. Similar to display IDocs, reprocess IDocs button helps to reprocess selected IDocs immediately using standard RBDPROCESS.

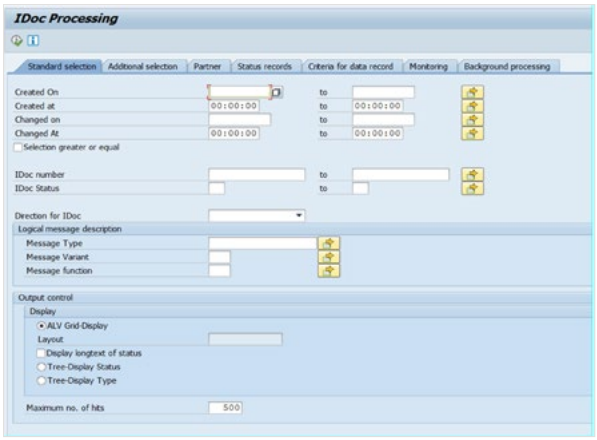
IDoc Analysis template

Provides statistical information of IDoc data to measure throughput and performance. Using the Average Time/ Maximum time metrics, one can easily analyze the time to process IDocs in a specified timeframe. After the scope is defined, make sure to maintain the header information of the managed objects, expert mode provides a list of all available configuration parameters.

- Total number of erroneous IDocs, total number of processed IDocs, current number of erroneous IDocs, and current number of processed IDocs metrics help with a summary of the total and current status of the specified.
- Average Time to Process IDocs, Maximum Time to Process IDocs metrics provides the average/ maximum processing time between initial and final status.
- Percentage of IDocs in total, percentage of current IDocs metrics calculate the percentage of IDocs created with the same header information within a given timeframe.

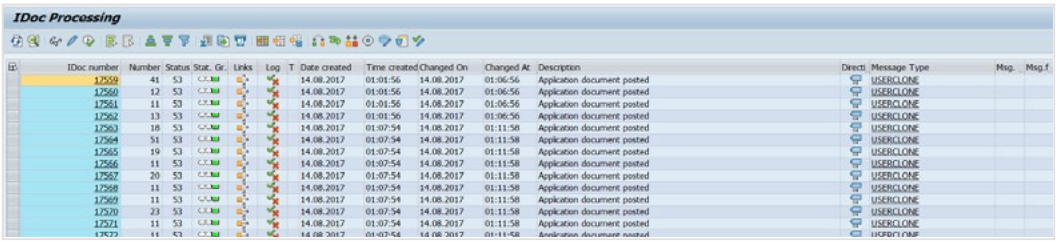
IDoc monitoring locally through a central cockpit

SAP S/4 HANA offers a standard transaction that simplifies and accelerates the IDoc monitoring and error handling process through WLF_IDOC (Fiori app “IDoc processing”):



A central cockpit is where all of the former ECC6.0 transactions and varieties of selections are on various tabs on the selection screen. Criteria for specific data record search can be used to find a specific value within data segments (as is possible in the traditional WE09 approach).

From this cockpit, one can navigate directly to the processed IDocs and execute many new functions.



Available detailed functions

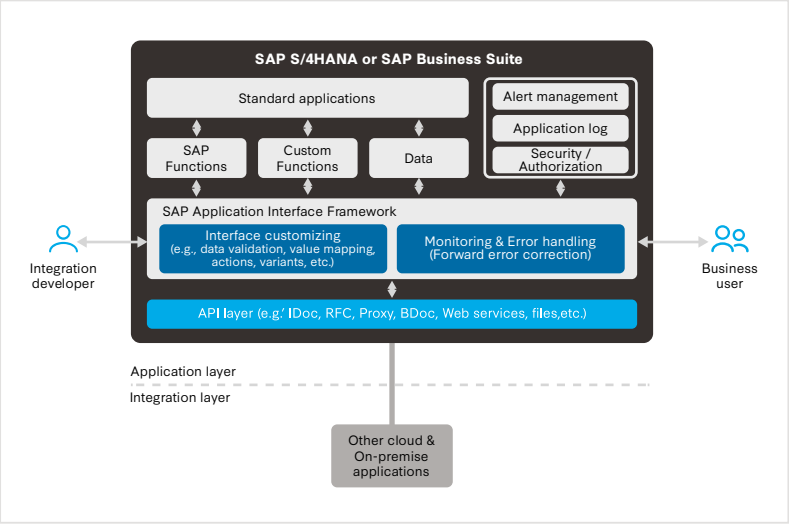
A large variety of functions are available on the output screen are optimized for

- Display IDoc - Display the content of an IDoc by clicking the IDoc number or selecting a line and choosing “Display IDoc.”
- Single IDoc view - All segments of an IDoc are displayed in a hierarchy, and by selecting any specific segment, the content is displayed, giving a complete overview of IDoc content.
- Edit IDoc - Select a line in the displayed IDoc hit list and choose “Edit IDoc.” Caution: Required business justification in place.
- Direct navigation options are provided when clicked on respective columns like message type, partner profiles, IDoc type, current status record, etc. Note: These columns are underlined with hotspot enabled
- (Tip: Use BAdI WLF_PROCESS_EDIDS_EXTERNAL to display status records stored in external tables (not EDIDS) and BAdI WLF_PROCESS_TCODE_CALL to assign application-specific transactions to error messages.)

- Display of linked objects - Navigate to the linked application documents on the output screen. (Current links are displayed)
- Send IDocs - Send IDocs to another logical systewm; IDoc is copied to the target system with no content reviews. The control record can be adjusted so that the information corresponds to the partner profiles in the target system.
- Compare IDocs - Compare two IDocs, locally or remote comparison through RFC destination and the result as an application log.
- Reprocess - Process selected IDocs in the event of IDocs not processed or in error state either Online (process the IDoc in the foreground) or process the IDoc using BD87 route (background).
- Change Control Record - In a non-live system, you can adjust the fields of the Control Record.
- Change IDoc Status – Change the IDoc status directly instead of the old method of executing report 'RC1_ IDOC_SET_STATUS' separately to avoid IDoc from ever being processed again. Note: Proper authorization should be in place, and changes are logged in Status Records.
- Call transaction via RFC - Use this functionality to execute the current transaction in a remote system. You have to log on to the remote system.
- Copy IDoc and delete segments - An individual segment of a selected IDoc can be deleted using the segment number. No change will be made to original IDoc

SAP AIF - IDoc monitoring and error handling

SAP Application Interface Framework enables the user to build, analyze, deploy, and manage business critical application interfaces in one centralized location residing in the SAP backend. One of the biggest advantages of AIF is it provides different perspectives for Business/IT users to perform various operations. Business users get an overview dashboard with the current status of all interfaces configured in the interface to monitor and take actions to correct, restart or cancel. For IT administrators, AIF provides various options for the implementation of interfaces through customizing menus and enabling reusability of interface building blocks across multiple interfaces. Clearly decouple the technical and business aspects of interfaces, thus enabling business users to perform functional monitoring by efficiently correcting errors within related applications and enhancing data quality across communicating systems.



The following engines support various aspects of the IDoc interface in SAP AIF

- Application Engine for IDocs – To display IDocs in SAP AIF and supports restart/cancel IDoc messages
- Persistence Engine for IDocs – Stores IDoc's data records and processes corrections
- Logging Engine for IDoc status records – Status tracking and monitoring
- Selection Engine for IDoc control records – IDoc selection by control information

1. Start the Interface Monitor and see the summary of the interface statistics assigned:
    - In SAP GUI - Use t-code /AIF/IFMON or SAP Easy Access menu, choose ▶ Cross Application Components ▶ SAP Application Interface Framework ▶ Interface Monitor.
    - In Web-based UI - Use t-code /AIF/ERR_WEB or SAP Easy Access menu, choose ▶ Cross Application Components ▶ SAP Application Interface Framework ▶ Monitoring and Error Handling (Web).
2. Within the Interface Monitor, select the error icon for the relevant interface that the new alert is raised and go on to Monitoring and Error Handling for the message.
3. Confirm the receipt of the alert check the error, and do one of the following:
    - Cancel - If no action is required and also the document has already been processed by other means, the user may cancel it by choosing Cancel in the Data Messages view.
    - Reprocess - Either by changing the data or by correcting the value mapping, reprocess the message by choosing Restart (SAP GUI) or Reprocess (Web-based UI) within the Data Messages view.

Conclusion

In summary, IDocs are containers for data exchange between two enterprise applications. The IDoc interface is feature-rich and provides a robust environment for interfacing with SAP from external applications. The SAP IDoc interface offers several benefits, such as being a thoroughly documented interface independent of the application product, numerous testings' and troubleshooting techniques and tools, and proven end-to-end error handling.

So, choosing a solution that best suits your landscape between the local central cockpit, solution manager, and AIF will be based on your use of ALE, EDI, and integration technology in the landscape. Below are the factors that will influence the strategy of addressing IDoc errors:

- A dedicated team within the organization with proper authorizations to view, change, and update the status and reprocess IDocs comprised of "business users."
- Errors that cannot be resolved should be passed to the IT team for resolution or follow other defined stringent error handling techniques to automatically identify and fix data errors using mapping rules.
- The overall aim should be to keep the count of errored IDocs at zero. If the errors cannot be resolved automatically, they should be manually addressed in the business documents or when the IDoc is marked to final status.

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About Virtusa

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Virtusa helps clients grow their business with innovative products and services that create operational efficiency using digital labor, future-proof operational and IT platforms, and rationalization and modernization of IT applications infrastructure. This is achieved through a unique approach blending deep contextual expertise, empowered agile teams, and measurably better engineering to create holistic solutions that drive business forward at unparalleled velocity enabled by a culture of cooperative disruption.