
Successfully Leverage ALE and IDocs for New Application Integration

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What We'll Cover

- Understanding the SAP product offering
- Following the evolution of SAP integration technology
- Examining ALE/IDOC interfacing technology
- Reviewing SAP product integration scenarios
- Using ALE/IDocs
 - ▶ Application of technology
 - ▶ Cool tools
- Applying ALE/IDOCs with R/3 and mySAP
- 7 key points to take home
- Questions and answers

Understanding SAP Product Offering – R/3

- ***SAP R/3: enterprise resource planning***

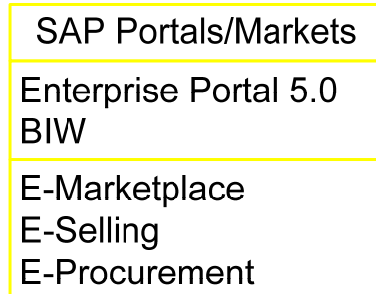
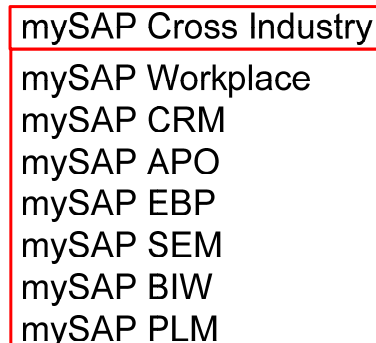
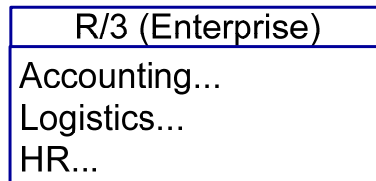
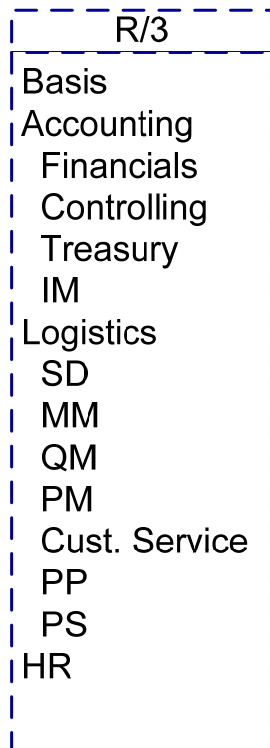
- ▶ *Provides a traditional set of ERP transactional applications*
- ▶ *Applications include finance, controlling, materials management, etc*
- ▶ *OLTP (On line transactional processing) systems*
 - Supports a business' day-to-day activities
 - High update rate
 - Simple queries
 - Typically measured in GB

Understanding SAP Product Offering– mySAP

- ***Re-branding of SAP into a provider of e-business solutions and services.***
 - ▶ ***Collaboration, integration and empowerment***
 - ▶ ***OLAP (on-line analytical processing) systems***
 - Analyzes operational data
 - Low update rate
 - Complex queries
 - Usually measured in GB or TB
 - A strategic business decision (high rewards, but difficult to implement)

Understanding SAP Product Offering- R/3 and mySAP

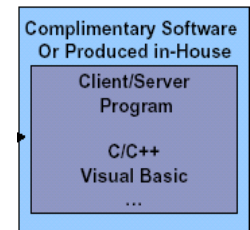
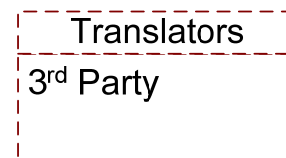
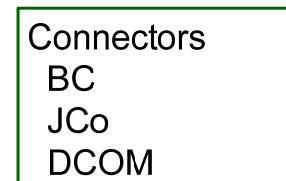
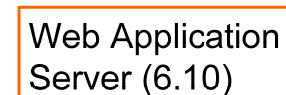
mySAP Applications



mySAP Industry Specific Applications



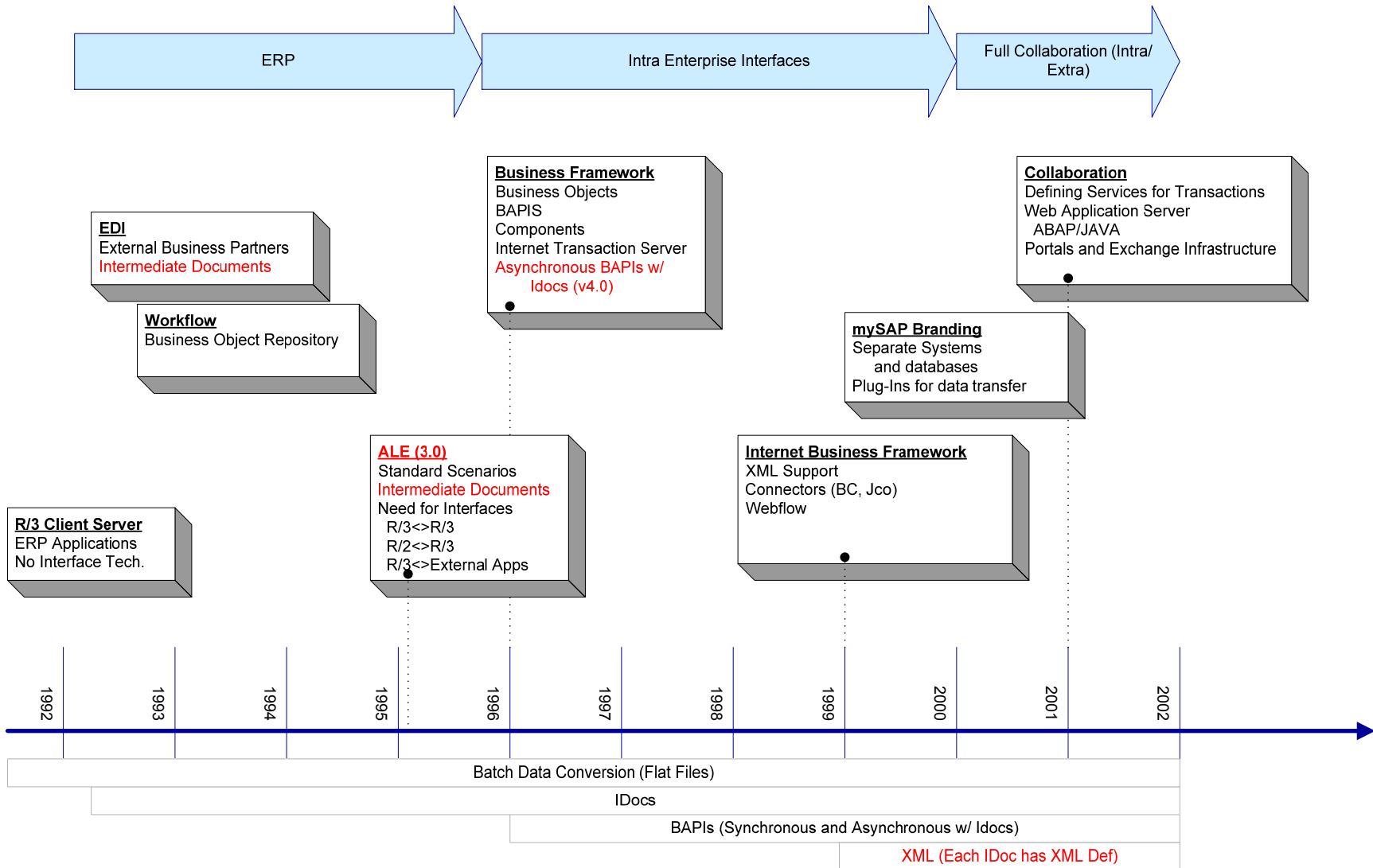
mySAP Technology



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- 👉 ● **Following the Evolution of SAP Integration Technology**
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Following The Evolution of SAP Integration Technology



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Examining ALE/IDOC Interfacing Technology

- Files, IDocs
- ALE, tRFC
- BAPIs
- Plugins, qRFC

ALE/IDOC Interfacing Technology - File / IDOC

Key Features:

- EDI technology originally based on file transfer.
- IDocs can be written to files and transferred via standard file transfer protocols (FTP, HTTP, etc) for processing on other systems.
- Requires some form of job scheduling to implement.
- File interface provides minimal performance overhead when transferring large volumes of data

Common Issues:

- Most issues with file interfaces are related to file permissions, file ownership and character conversions moving between platforms.

ALE/IDOC Interfacing Technology – ALE

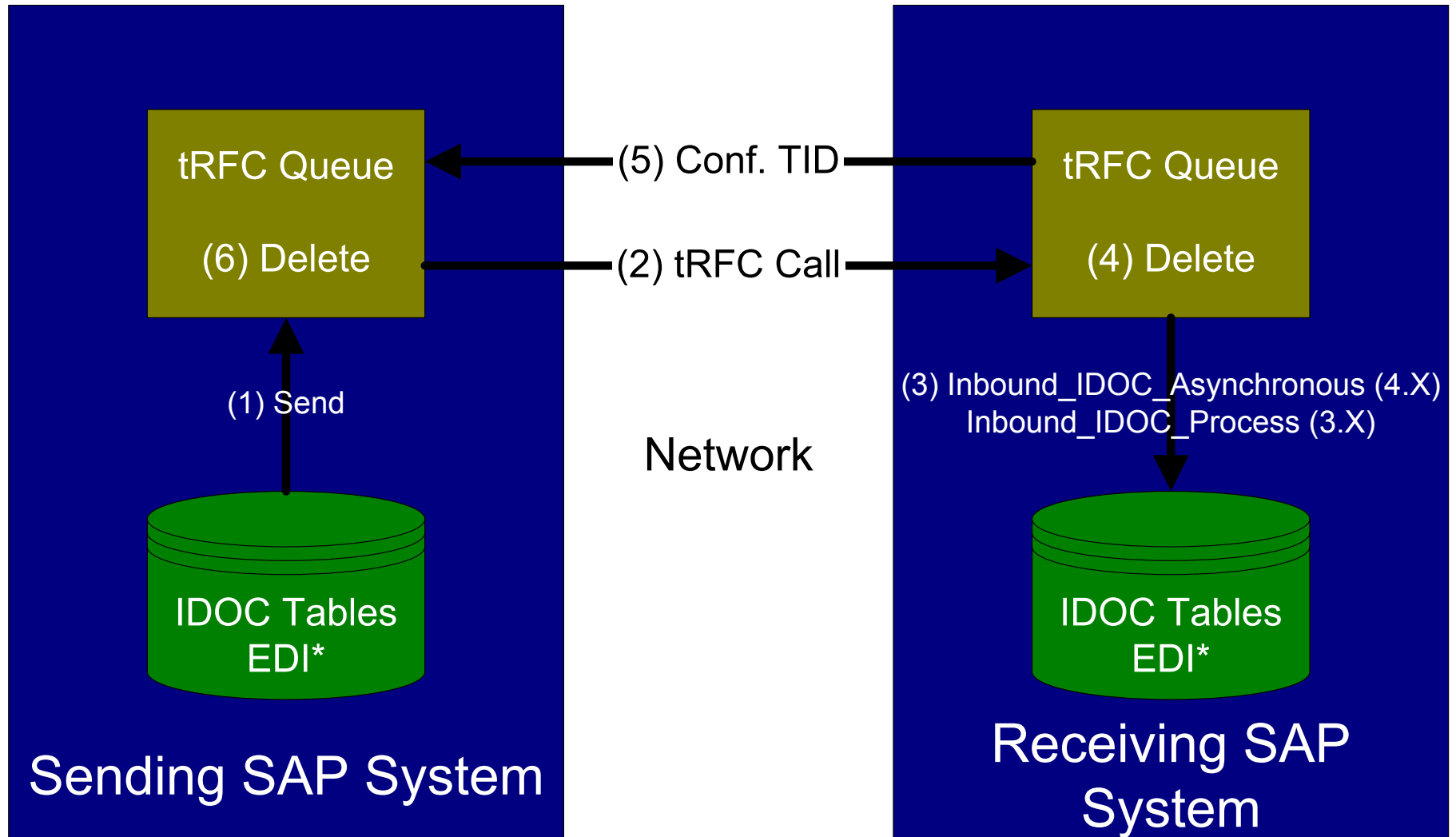
Key Features:

- Asynchronous communication between system via IDocs.
- Message types (Business Function), IDocs (Data Container)
- Leverages a transactional RFC (tRFC) to guarantee message delivery between systems.
- Requires some form of job scheduling: processes controlled via background jobs.
- Content based modeling tools, data transformations and change tracking.

Common Issues:

- Added Overhead of tRFC and Data Format (1000 Byte Data Records)
- Most issues with ALE interfaces are application\configuration related or with RFC user ID permissions.

ALE/IDOC Interfacing Technology tRFC



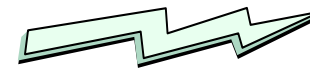
ALE/IDOC Interfacing Technology – BAPIs

Key Features:

- Leverages BOR (Business Object Repository) - methods
- Can be used for synchronous or asynchronous data transfer
- Most BAPIs are direct input methods (i.e. should be faster). Be sure to test!
- Open to non-SAP systems
- Uses content-based data models, transformations and supports a number of change tracking options

Common Issues

- Similar issues to ALE, field conversion routines (screen fields versus table fields)



GOTCHA!

- Note: In 4.X MOST BAPIS require the commit work to be executed by the calling program.

ALE Interfacing Technology – Plugins

Key Features:

- Standard interfaces for tightly coupling SAP R/3 and mySAP products
- Leverages a variety of ALE technologies such as change pointers and tRFC buffers
- Incorporates the use of new BAPIs and BTEs
- Supports content-based routing via Variant configuration during model generation (APO CIF Interface)
- Uses qRFCs to control dependencies of data object and ensure FIFO processing

Common Issues:

- Performance issues with BTE's

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Reviewing SAP Product Integration Scenarios

- R/3 to R/3
- R/3 to APO
- R/3 to BW
- mySAP to mySAP
- R/3 to Non-SAP Systems
 - ▶ ALE/BAPI/IDocs

Reviewing SAP Integration Scenarios R/3 to R/3

- **Master Data**
- **Transactional Data**
 - ▶ Central HR
 - ▶ Central FI
 - ▶ Distributed Logistics
 - ▶ Many more SAP-provided scenarios
- **Newer Scenarios**
 - ▶ Project Systems WBS Elements
 - ▶ Bank Distribution (BAPI)

Transactional scenarios often require enhancements and/or modifications, e.g. reconciliation process



GOTCHA!

Reviewing SAP Integration Scenarios R/3 to APO

- Near Real Time Data Transfer Possible
- Data transfer primarily based on plug-ins, qRFC based

APO	R/3
Product Master	Material Master
Resource Master	Work Center
PPM	Production Versions
Location Masters Plant Locations Supplier Locations Distribution Center Locations Customer Locations	Various objects Plants Vendor Masters Plants set up as distribution centers Customer Masters
Transportation Lanes	No Equivalent
Quota Arrangements	Quota Arrangements

Reviewing SAP Integration Scenarios R/3 to BW

- **Data Warehouse Technology**
- **Original version of BW used IDocs**
- **Current data transfer based on plug-Ins (extractors)**
- **IDoc data transfer is obsolete and replaced by**
 - ▶ **PSA: Persistent Staging Area**
 - ▶ **ODS: Operational Data Store**

Reviewing SAP Integration Scenarios between mySAP Components

- **Data transfer between mySAP components, e.g.**
 - ▶ CRM needs ATP check from APO
 - ▶ APO and BW heavily integrated
 - Data Marts
 - InfoCubes
 - Livecache
- **Most data transfer between mySAP components is based on plug-ins**
- **SAP moving towards XML format for future integration**
- **ALE/IDoc technology used in places where appropriate, i.e. data may be structured in IDoc format and posted via ALE function module but IDoc is never created**

What We'll Cover

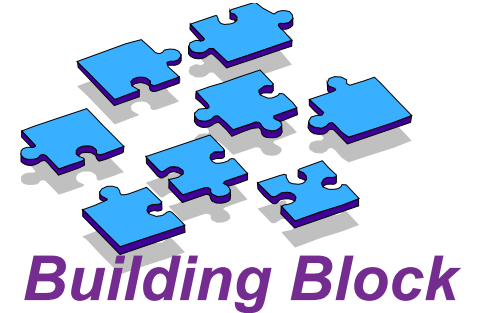
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Using ALE/IDOCs – Application of Technology

- **Master Data Reference Server**
- **Refreshing test and development with ALE**
- **EAI integration using ALE**
 - ▶ Best-of-breed architecture
 - ▶ Hub-and-spoke architecture
- **General ALE (tips and tricks)**

Master Data Reference Server (Concept)

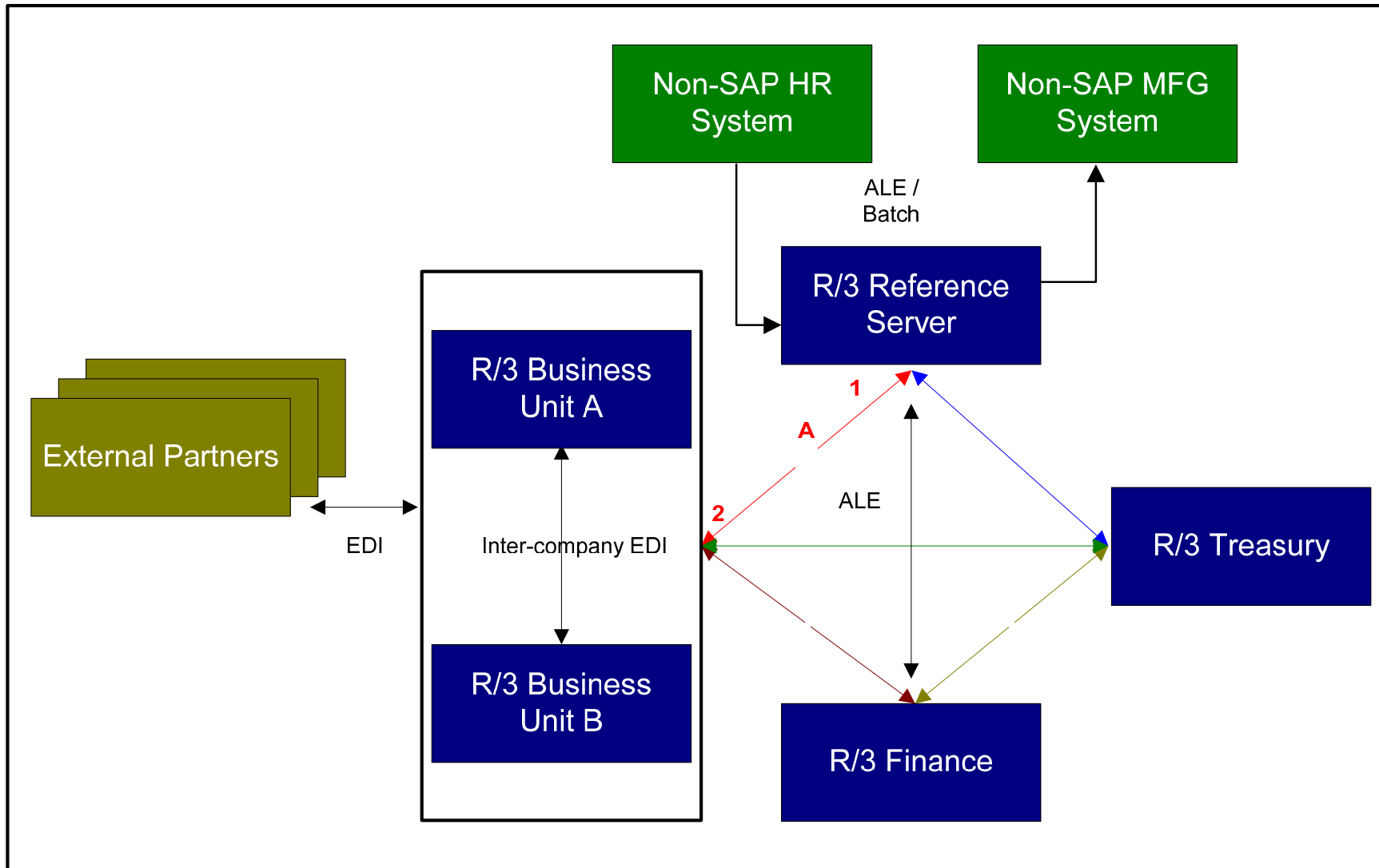
- Using SAP R/3 as a single point for storage and maintenance of master data, common code and configuration for enterprise.



Master Data Reference Server (Concept)

- **Examples of Master Data elements include:**
 - ▶ Chart of Accounts (GLMAST),
 - ▶ Cost Centers (COSMAS)
 - ▶ Material Master (MATMAS)
 - ▶ Vendor Master (CREMAS)
 - ▶ Search for more messages w/ transaction BALM and WE81
- **Examples of common code – customer reports, system maintenance jobs, custom interfaces, etc.**
- **Examples of common configuration – company codes, sales areas, customer and vendor groups, material types, etc.**
- **Can be implemented in conjunction with other SAP functionality, or independently.**

Master Data Reference Servers (Example)



Master Data Reference Servers (Features)

- **Distribution of data is controlled by customer distribution model. Modeling allows for content-based routing rules and filtering.**
- **Routing and filtering can also be achieved by using characteristic and classification system.**
- **Changes are tracked via change pointers and data can be transformed using conversion rules.**
- **SAP master data is structured in normalized maintenance views based on organizational structure. Therefore, it allows for centralization of certain master data elements and distributed maintenance of other data elements.**

Master Data Reference Servers (Benefits)

- **Creates a central repository for all master data within an organization.**
- **Reduces master data maintenance and conversion activities by eliminating redundant maintenance activities.**
- **Reduces confusion and mistakes when working across inter-organization boundaries and with customers and suppliers.**
- **Facilitates global procurement strategies.**
- **Simplifies integration and conversion of newly acquired businesses.**
- **Reduces cost of overall distributed system architecture by facilitating common code and common configuration processes.**

Master Data Reference Servers (Tips and Tricks)

- Use the reference server as a base platform of code and configuration for rolling additional SAP instances out across organization.
- Utilize SAP Control Data Model to lock configuration steps in target SAP systems. This helps eliminate interface issues related to configuration differences.
- Maintain all interface models on Reference Server(BD64). This helps identify scheduling and load conflicts across the integrated architecture.



Tip

Refreshing Test\Dev With ALE

- **Using ALE technology to refresh production master data to development and test systems.**
- **Leverages standard ALE technology**
 - ▶ It provides for modeling of distributed data, filtering functionality and limited data transformation.
- **Significantly improves master data used in development and testing. Eliminates Master Data setup requirements during testing by using real production data.**
 - ▶ Often less time required in comparison to DB and client refreshes
 - ▶ DB or client copy would wipe out test data, ALE does not
 - ▶ DB or client copy requires manual configuration steps

Refreshing Test\Dev With ALE (Tips and Tricks)

- Setup Dev/Test number ranges to be independent from production number ranges **(Most Important Tip)**.
- Do not setup continuous updates of master data from production to test/dev. Production changes can impact testing results. Development and test system availability can impact production interface performance.



Refreshing Test\Dev With ALE (Tips and Tricks)

- **Create copies of message types and activate change pointers to track deltas only**
 - ▶ Use Reduced Message Types(BD53) to easily create message types
- **Reduce potentially sensitive data(BD53) or use conversion rule to default the value.**
- **Create a separate model for refreshing data. Do not include any production interfaces in this model.**
- **Recommendation – Delete Production to Test/Dev RFC destinations(SM59) when not being used.**
 - ▶ Create the RFC's for Refresh and Remove after Refresh is completed.

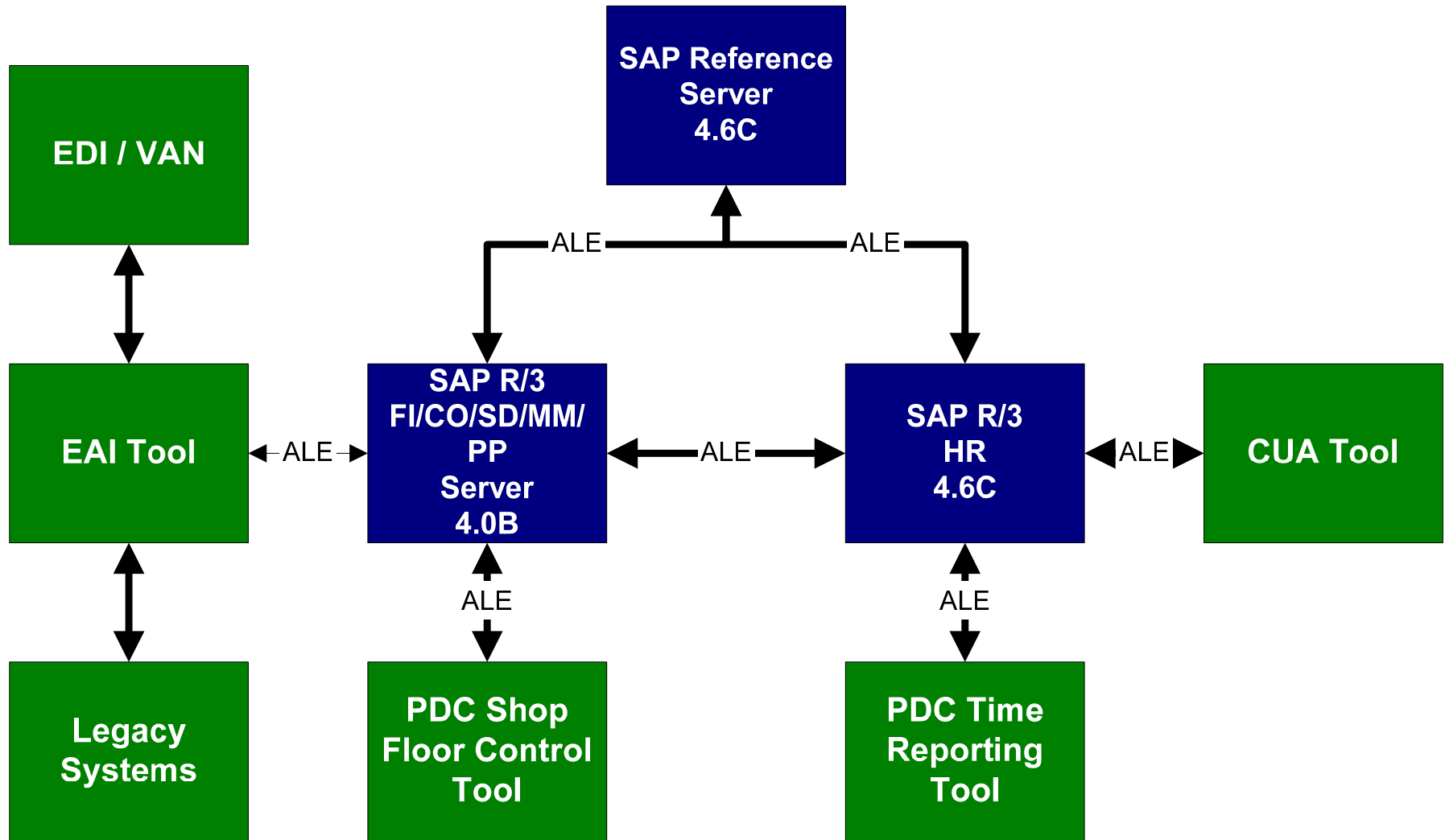
Refreshing Test\Dev with ALE (Example)

- **(SNUM) Number Range Example:**
 - ▶ **Material Master Number Range Example**
 - ▶ **Setup a number range In production**
 - 1 to 10 Million
 - ▶ **Setup a test number range**
 - 10 to 20 Million
 - ▶ **Setup a development number range**
 - 20 to 30 Million
- **Staggered number ranges:**
 - ▶ **Allows you to refresh production master data to Test/Dev without impacting data created in these environments.**
 - ▶ **Eliminates posting issues when refreshing data:**
 - **Example: Material 123 created in Test belongs To Material Group FERT. Material 123 created in Production belongs to Material Group KMAT. When refreshing, it is not possible to change Material Group and the posting will result in error.**

EAI Integration Via ALE (Concept)

- **ALE Is the foundation for enterprise application integration in SAP, by providing standard customizable interfaces for loosely coupling SAP with external products.**
 - ▶ **Examples: Integration to Legacy Systems, Warehouse Management Systems, Security Management Tools, Shop Floor Control Tools, E-Commerce Tools, Etc.**
- **ALE facilitates the implementation of other EAI concepts such as best-of-breed strategies and publish-and-subscribe architectures for the enterprise.**

EAI Integration Via ALE



EAI Integration Via ALE (Features)

- There are many approaches to integrating 3rd party systems with SAP.
 - ▶ Some 3rd party tools have certified standard R/3 interfaces.
 - Examples: Time and Labor Collection, Bar Code Systems (MM-MOB/WM-LSR), Production Optimization Interfaces (POIM/POIT)
 - ▶ Other 3rd party tools require the use of an EAI integration product to perform data transformations.

EAI Integration Via ALE (Tips and Tricks)

- When integrating SAP R/3 with other tools, make sure that the constraints created when integrating the systems do not reduce or eliminate the benefit of the tool.
 - ▶ Example: When a 3rd party purchasing optimizer tool needs detailed pricing information, make sure it is capable of supporting SAP pricing procedures.
- Use a job scheduler to coordinate jobs between R/3 and 3rd party tools. This can eliminate integration issues by adding controls and notifications that are system independent.



Tip

General ALE (Tips and Tricks)

- Always protect production customer distribution models(BD64) by setting ownership of the model to a dummy logical system. This eliminates the possibility of production models being changed accidentally.
- Do a sufficient job communicating integration points when integrating systems via ALE. It is important that developers and end users understand integration points and dependencies of the integrated architecture (Visio Diagrams).



Tip

General ALE (Tips and Tricks)

- When integrating R/3 systems, never transport tRFC Ports(WE21), always generate tRFC ports locally (BD82). If a port is improperly maintained centrally or changed locally on a target system, it is possible to send data to an incorrect system.
- Never create RFC destinations (SM59) from Test\Dev to Production. It is a security risk and small mistakes in development could impact production.
- Never use Dialog User ID's in RFC destinations (SM59). It is a major security risk.
 - ▶ Contrary to OSS – consider creating RFC user w/ restricted security roles
- Review OSS Notes!



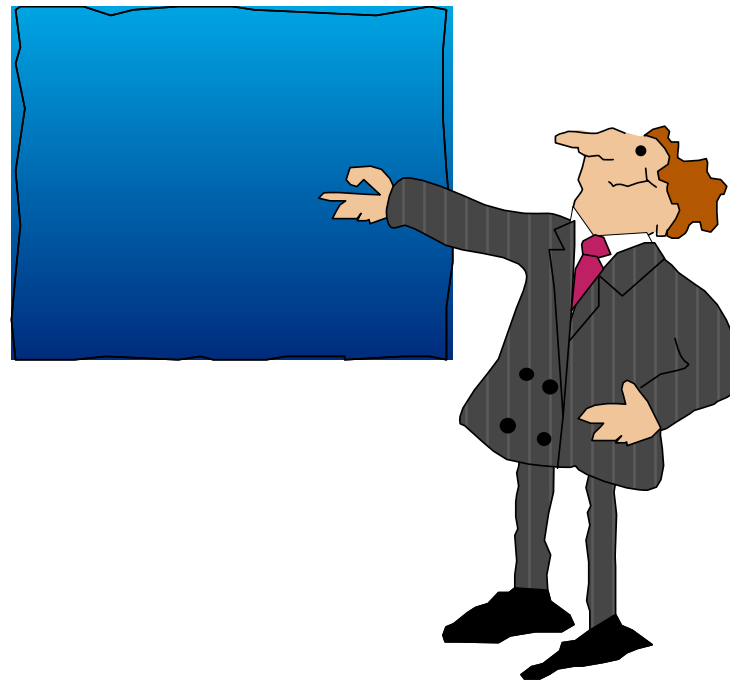
Using ALE/IDocs – Cool Tools

- **Generating asynchronous interfaces from BAPIs.**
- **ALE interfaces to Web and email**
- **Using XML ports**
- **ALE interfaces and workflow integration**

ALE Interfaces using Asynchronous BAPIs

- BAPI's can be used for both synchronous and asynchronous communication.
- Some BAPI's come with pre-generated asynchronous ALE scenarios and others can be generated via transaction (BDBG).
- Examples of pre-generated ALE BAPI scenarios are:
 - ▶ Work Breakdown Structure
 - BAPI_PROJECT_SAVEREPLICA – IDOC: PROJECT
 - ▶ Purchase Order
 - BAPI_PO_CREATE – IDOC: PORDCR
- This functionality extends SAP ALE significantly past the already 500+ pre-delivered ALE \EDI message types.

ALE Interfaces Using Asynchronous BAPIs



Asynchronous BAPI Demo

- **Post an inbound bank record order via a BAPI IDoc**
 - ▶ **BAPI – BUS1011 BAPI_BANK_SAVEREPLICA**
 - ▶ **Message Type – BANK_SAVEREPLICA**

ALE Interfaces Using Asynchronous BAPIs

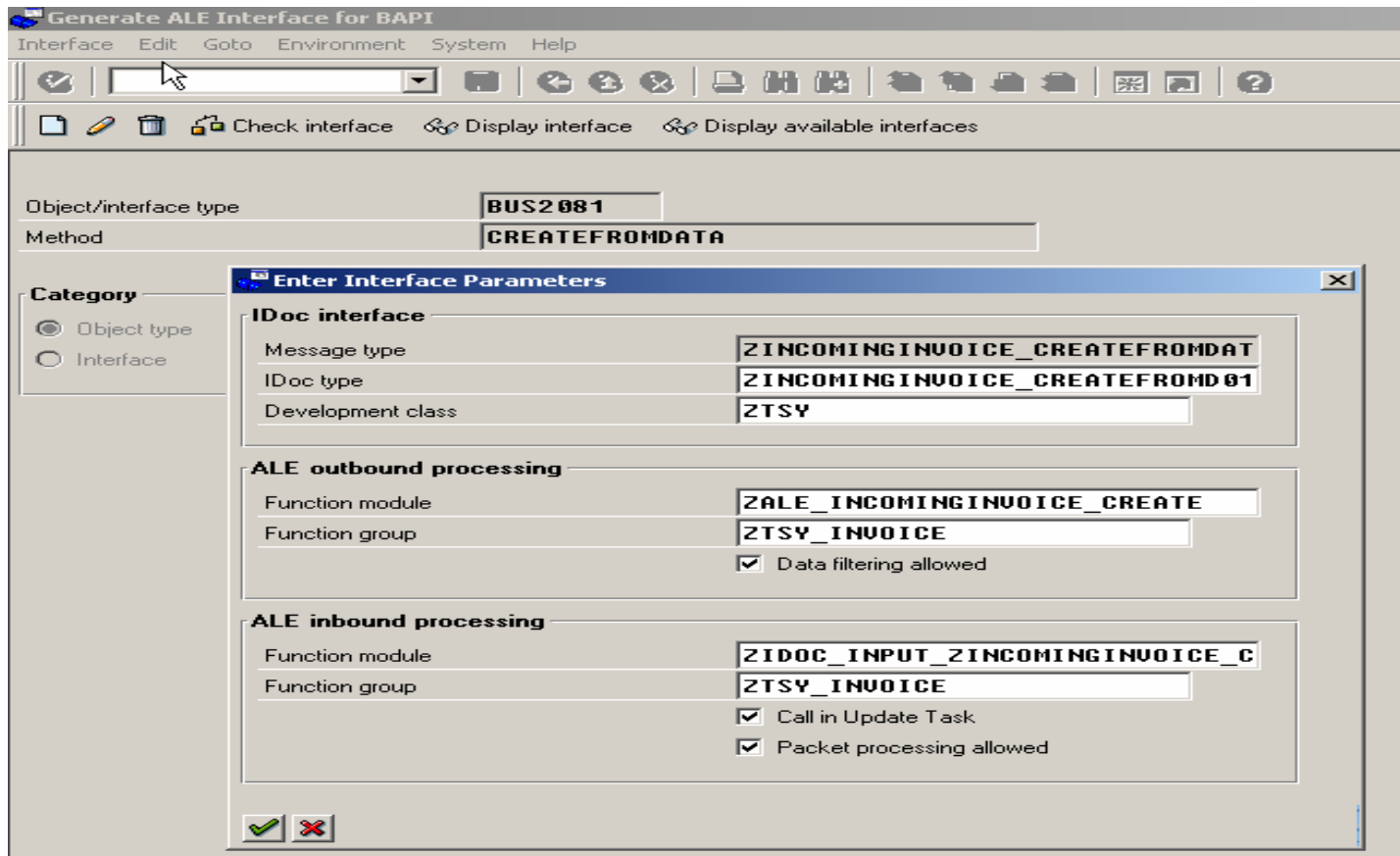
- **Before you run the transaction (BDBG) you need:**
 - ▶ Client independent configuration access.
 - ▶ Developers key in same client
 - ▶ Need a user defined development class and function group



Note

When designing new ALE interfaces, check your options. Often there are traditional ALE interfaces that overlap with BAPI ALE interfaces. Make sure you understand the benefits and constraints associated with both methods.

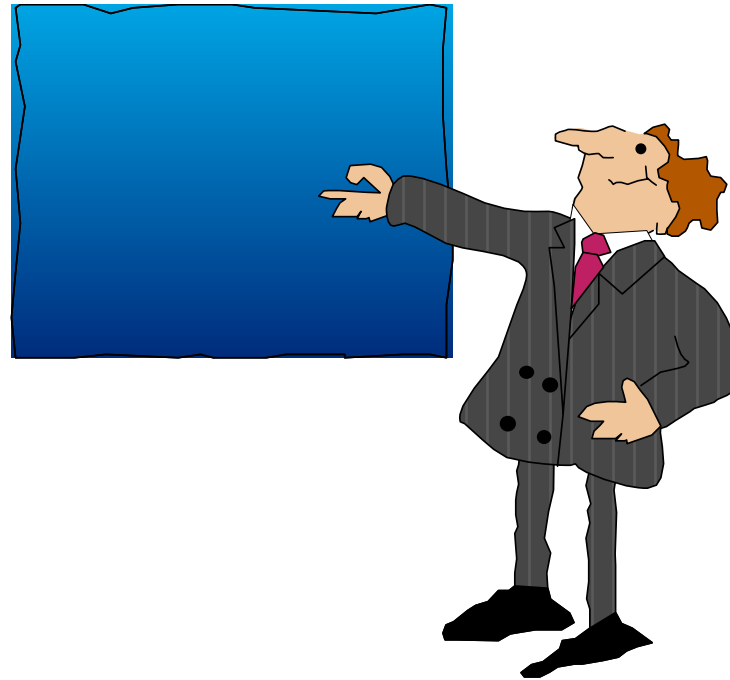
ALE Interfaces Using Asynchronous BAPIs



Enabling IDoc transmission via Email - Options

- **Business Connector**
- **Define an XML port and custom script (SENDMAIL) to write to SMTP email address**
- **IDoc Connector for XML Component (DCOM)**
- **Internet Ports**
 - ▶ No longer supported (See OSS Note 315083)
 - ▶ Certain characters are not converted correctly and IDocs are not readable
 - ▶ SAP Enhancements (ABAP) required for conversions
- **SAPConnect and Workflow**
 - ▶ RSCONN01/RSWUWFML programs
 - ▶ SAP enhancements (ABAP required for conversions)
- **Third Party Tools**
- **MAPI's/WAPI's**

Enabling IDoc Transmission via Email Business Connector



Enabling IDoc Transmission via Email

- **ALE and Business Connector configuration will be reviewed**
 - ▶ Business Connector is the recommended tool because of enhanced functionality, e.g. http/ftp post, routing rules, integrator mapping tool, SSL security, etc.
- **An outbound ORDERS message/IDoc will be created in SAP and sent to Business Connector**
- **The IDoc will be converted into XML format**
 - ▶ Segment names become tags
- **The IDoc will be attached to an email and sent via SMTP**

Sending/Receiving ORDERS IDocs via Email

● ALE Configuration

- ▶ **BD54: Create Logical System**
- ▶ **BD64: Create ALE Model (outbound and inbound orders flow)**
- ▶ **SM59: RFC connections**
- ▶ **WE20: Create partner profiles**
- ▶ **WE19: Send something out via master data distribution screens (e.g. BD10 for Material Master) or by test tool (WE19)**

SM59 – Create RFC Destination

The screenshot shows the SAP SM59 configuration interface for an RFC destination named 'SAPBC'. The window title is 'RFC Destination SAPBC'. The 'Test connection' button is visible at the top left. The 'RFC destination' field contains 'SAPBC'. Under 'Technical settings', the 'Connection type' is 'TCP/IP connection'. The 'Activation Type' section has 'Start' and 'Registration' buttons, and a 'Trace' checkbox which is unchecked. The 'Registration' section shows a table with one entry: 'Rommel' in the 'Program ID' column. Under 'Security Options', the 'SNC' section has 'Activ' and 'Inactv.' radio buttons, with 'Inactv.' selected. The 'Description' section contains the text 'Business Connector 4.0.1 on Rommel'. The 'Attributes' section shows 'Created by' as 'CSTASILA' and a date '02/01/2002'. The status bar at the bottom right shows 'TJN (1) (100) ROMMEL INS'.

Destination System information Test System Help

RFC destination SAPBC

Test connection

Technical settings

Connection type TCP/IP connection

Activation Type Start Registration Trace

Registration

Program ID
Rommel

Security Options

SNC Activ Inactv.

Description

Business Connector 4.0.1 on Rommel

Attributes

Created by CSTASILA 02/01/2002

TJN (1) (100) ROMMEL INS

BC Connection to SAP

The screenshot shows a Microsoft Internet Explorer browser window displaying the SAP Business Connector configuration page. The address bar shows the URL: `http://205.245.2.112:5555/WmRoot/adapter-index.dsp?url=/SAP/sapServers_listServers.dsp&adapter=SAP&help=true`. The page title is "ROMMEL.e-interfaces.com :: SAP Business Connector :: SAP". The main content area is titled "SAP > SAP Servers > Add SAP Server" and contains a form for configuring a new SAP server. The form is organized into several sections:

- System:** Name: Rommel_100, SAP Router String: (empty)
- Login Defaults:** User: BCUser, Password: (masked with asterisks), Client: 100, Language: en
- Server Logon:** Application Server: (empty), System Number: (empty)
- Load Balancing:** Load Balancing: Off, Group Name: (empty), Message Server: (empty), System ID: (empty)
- External Rfc Server:** Rfc Server: No, Program ID: (empty), Gateway Host: (empty), Gateway Service: (empty)
- Advanced Settings:** ABAP Debug: Off, RFC Trace: Off, Use SAPGUI: Off
- Security options:** (empty)

The left sidebar contains a navigation menu with the following items: SAP, SAP Servers, Lookup, DDIC-Cache, Settings, Routing, and Monitoring. The status bar at the bottom of the browser window shows "Done" and "Internet".

BC RFC Listener

The screenshot shows a Microsoft Internet Explorer browser window displaying the SAP Business Connector configuration page. The address bar shows the URL: `http://205.245.2.112:5555/WmRoot/adapter-index.dsp?url=/SAP/sapServers_listServers.dsp&adapter=SAP&help=true`. The page title is "ROMMEL.e-interfaces.com :: SAP Business Connector :: SAP".

The main content area is titled "SAP > SAP Servers > SAP Listeners for ROMMEL_100 > Edit Rommel". It contains a list of navigation links:

- Return to SAP Servers
- Return to SAP Listeners for ROMMEL_100

The "SAP Listener Definition" dialog box is open, showing the following configuration:

Program ID	Rommel	Number of Threads	1
Gateway Host	127.0.0.1	Gateway Service	sapgw01
Autostart	<input checked="" type="radio"/> Yes <input type="radio"/> No	RFC Trace	<input type="radio"/> On <input checked="" type="radio"/> Off
Repository Server	ROMMEL_100		

Buttons for "Save" and "Cancel" are visible at the bottom of the dialog box.

BC Routing Rules

The screenshot shows a web browser window titled "Routing - ROMMEL.e-interfaces.com - SAP Business Connector - Microsoft Internet Explorer". The address bar contains the URL: `http://205.245.2.112:5555/WmRoot/adaptor-index.dsp?url=/WmPartners/listRoutingRules.dsp&adapter=Routing&help=true`. The browser window displays the SAP Business Connector interface for Routing Rules. The main content area is titled "Routing > Routing Rules" and contains a "Routing Rule List" table. The table has columns for Edit, Enabled?, Status, Sender, Receiver, Msg Type, Transport, Service, and Delete. Two rows are visible: one with Status "No" and Sender "D00_100", and another with Status "Yes" and Sender "SAPMF02D". Below the table is an "Add Routing Rule" form with input fields for Sender, Receiver, and Msg Type, and an "Add Rule" button. The browser's status bar at the bottom shows "Done" and "Internet".

Edit	Enabled?	Status	Sender	Receiver	Msg Type	Transport	Service	Delete
	No		D00_100	SAPBC	MATMAS	ALE (R/3 IDOC)		
	Yes		SAPMF02D	0000010000	ORDERS	Email Outbound Service	wm.PartnerMgr.flows.SAPMF02D.0000010000:ORDERS	

Add Routing Rule

Sender: Receiver: Msg Type:

BC Modifying Service Configuration

The screenshot shows a web browser window titled "Routing - ROMMEL.e-interfaces.com - SAP Business Connector - Microsoft Internet Explorer". The address bar contains the URL: `http://205.245.2.112:5555/WmRoot/adaptor-index.dsp?url=/WmPartners/listRoutingRules.dsp&adapter=Routing&help=true`. The browser window displays the SAP Business Connector interface for editing a routing rule.

The interface includes a navigation menu on the left with "Routing Rules" selected. The main content area is titled "Routing > Routing Rules > Edit Routing Rule" and contains the following configuration sections:

- Return to Routing Rules**
- Routing Rule Flow**
 - Sender: D00_100
 - Receiver: SAPBC
 - Message Type: MATMAS
 - ACL Group: <None>
 - Package: Default
 - Pre-Processing Service: (empty)
 - Main flow service: `wm.PartnerMgr.flows.D00_100.SAPf`
 - Post-Processing Service: (empty)
- Transport**
 - Transport: FTP Outbound Service
- Configure FTP Outbound Service**
 - Name of Outbound Service: `wm.PartnerMgr.gateway.transport.FTPTransport:OutboundProcess`
 - Host Name: `68.15.141.135`
 - Port Number: `21`
 - User Name: `BCUser`
 - Password: `*****`
 - File Path: (empty)

At the bottom of the configuration area are "Save" and "Cancel" buttons. The browser status bar at the bottom shows "Done" and "Internet".

BC Inbound Set-up

The screenshot shows a web browser window titled "205.245.2.112:5555 - SAP Business Connector Server - Microsoft Internet Explorer". The address bar shows "http://205.245.2.112:5555". The page header includes "Shut Down and Restart Log Off About Help" and the SAP logo. The main content area is titled "ROMMEL.e-interfaces.com :: SAP Business Connector" and "Security > Ports > Edit Email Client Configuration".

The interface features a left-hand navigation menu with sections: Server (Statistics, Service Usage, Scheduler), Logs (Audit, Error, Server, Session, Guaranteed Delivery), Packages (Management, Publishing, Subscribing), Adapters (Database..., Routing..., SAP...), Security (Ports, Users and Groups, ACLs, Certificates), and Settings (Resources, Logging, Clustering, Remote Servers, Proxy Servers, Repository, Licensing, Extended).

The main configuration area is titled "Email Client Listener Configuration" and includes the following fields and options:

- Package:** Package Name: Default
- Server Information:** Host Name: mail.dataxstream.com; Type: POP3 (selected), IMAP; User Name: BCUser; Password: *****; Time Interval (seconds): 300; Port (optional): ; Log out after each mail check: Yes (selected), No.
- Security:** Run services as user: ; Require authorization within message: Yes (selected), No.
- Message Processing:** Global Service (optional): ; Default Service (optional): ; Send reply email with service output: Yes, No (selected); Send reply email on error: Yes, No (selected); Delete valid messages (IMAP only): Yes (selected), No; Delete invalid messages (IMAP only): Yes (selected), No; Multithreaded processing (IMAP only): Yes, No (selected); Number of threads if multithreading turned on: 0.

A "Save Changes" button is located at the bottom of the configuration area.

Sample of IDoc/XML Document

```
<?xml version="1.0" encoding="iso-8859-1" ?>
- <ORDERS05>
- <IDOC BEGIN="1">
- <EDI_DC40 SEGMENT="1">
  <TABNAM>EDI_DC40</TABNAM>
  <MANDT>100</MANDT>
  <DOCNUM>0000000000002010</DOCNUM>
  <DOCREL>46C</DOCREL>
  <STATUS>30</STATUS>
  <DIRECT>1</DIRECT>
  <OUTMOD>2</OUTMOD>
  <EXPRS />
  <TEST />
  <IDOCTYP>ORDERS05</IDOCTYP>
  <CIMTYP />
  <MESTYP>ORDERS</MESTYP>
  <MESCOD />
  <MESFCT />
  <STD>X</STD>
  <STDVRS />
  <STDMES>ORDERS</STDMES>
  <SNDPOR>SAPTJN</SNDPOR>
  <SNDPRT>KU</SNDPRT>
  <SNDPFC />
  <SN DPRN>SAPMF02D</SN DPRN>
  <SNDSAD />
  <SNDLAD />
  <RCVPOR>A000000016</RCVPOR>
  <RCVPRT>LS</RCVPRT>
  <RCVPFC />
  <RCVPRN>SAPBC</RCVPRN>
  <RCVSAD />
  <RCVLAD />
  <CREDAT>20020202</CREDAT>
  <CRETIM>152356</CRETIM>
  <REFINT />
  <REFGRP />
  <REFMES />
  <ARCKEY />
  <SERIAL>20010317211732</SERIAL>
</EDI_DC40>
- <E1EDK01 SEGMENT="1">
  <CURCY>USD</CURCY>
  <WKURS>1.00000</WKURS>
  <ZTERM>2-10</ZTERM>
  <BSART>NB</BSART>
  <BELNR>0000000001</BELNR>
  <RECIPT_NO>0000010000</RECIPT_NO>
</E1EDK01>
- <E1EDK14 SEGMENT="1">
```

ALE Interfaces and Workflow Integration

- In the past, IDocs were processed exclusively through ‘Workflow Process Technology’ (2.1/2.2)
 - ▶ ‘Process Technology’ is obsolete and IDocs are passed directly to posting function modules
 - ▶ Current IDoc scenarios use Workflow for error processing
- Workflow may be used to enhance IDoc processing
 - ▶ Display IDoc in in-box
 - ▶ Change/Add data to IDoc
 - ▶ Use workflow as custom trigger mechanisms
 - ▶ Automate a sequence of events, e.g. serial number creation, production order confirmation, goods receipt, etc.
 - ▶ Route IDocs for approval

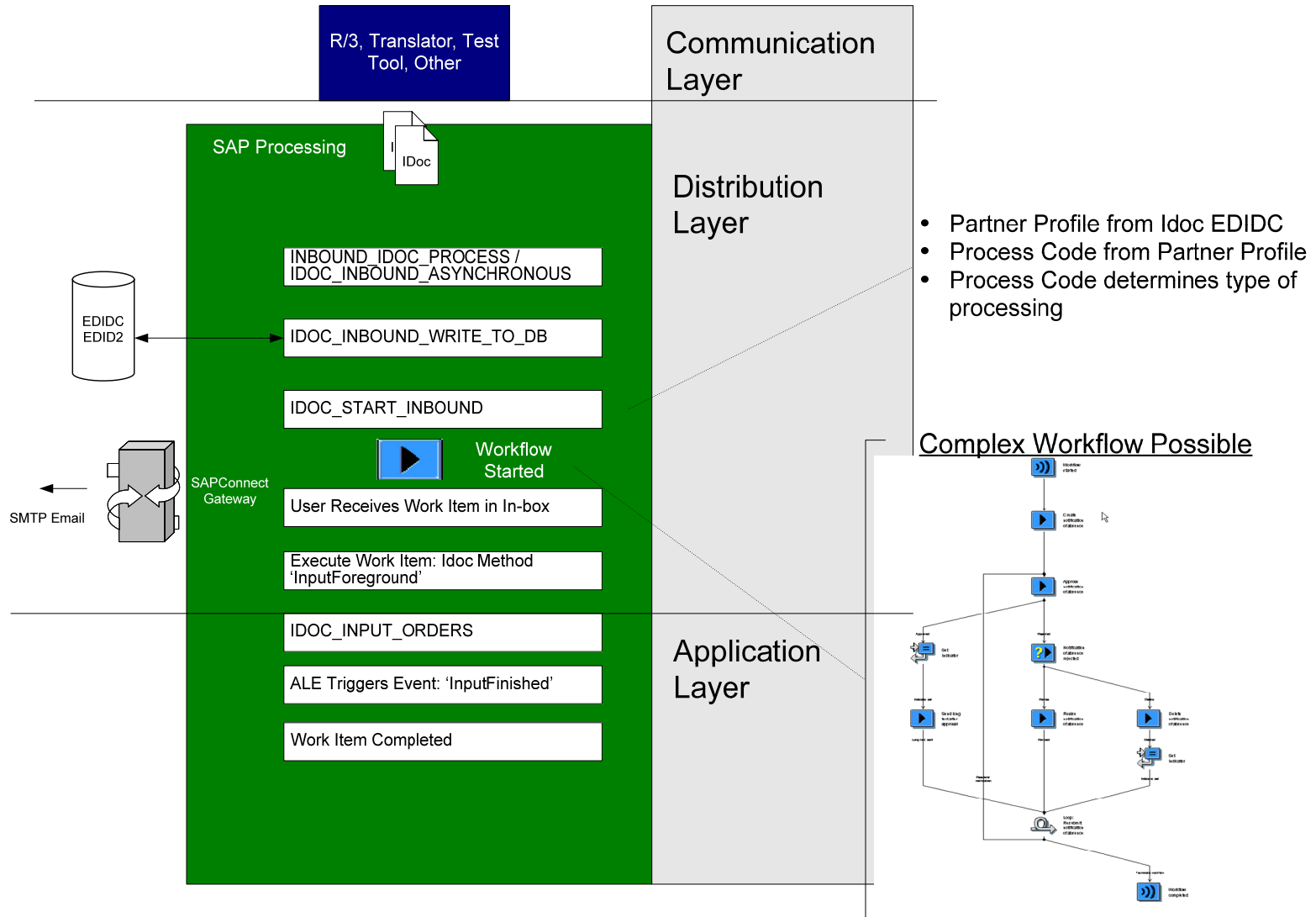
Workflow Benefits

- Automation
- Deadline monitoring
 - ▶ Ensure IDoc is reviewed
- Notify users external to SAP system via email
- EAI integration via WF-XML tasks, i.e. notify non-SAP systems of IDocs to be processed
- Distribution of workload, i.e. identification of exclusive agents (or groups) to process IDocs



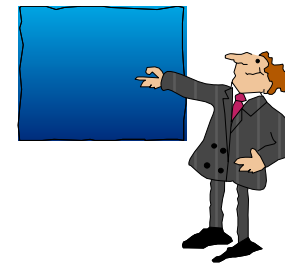
Performance Overhead

IDoc Processing w/ Workflow



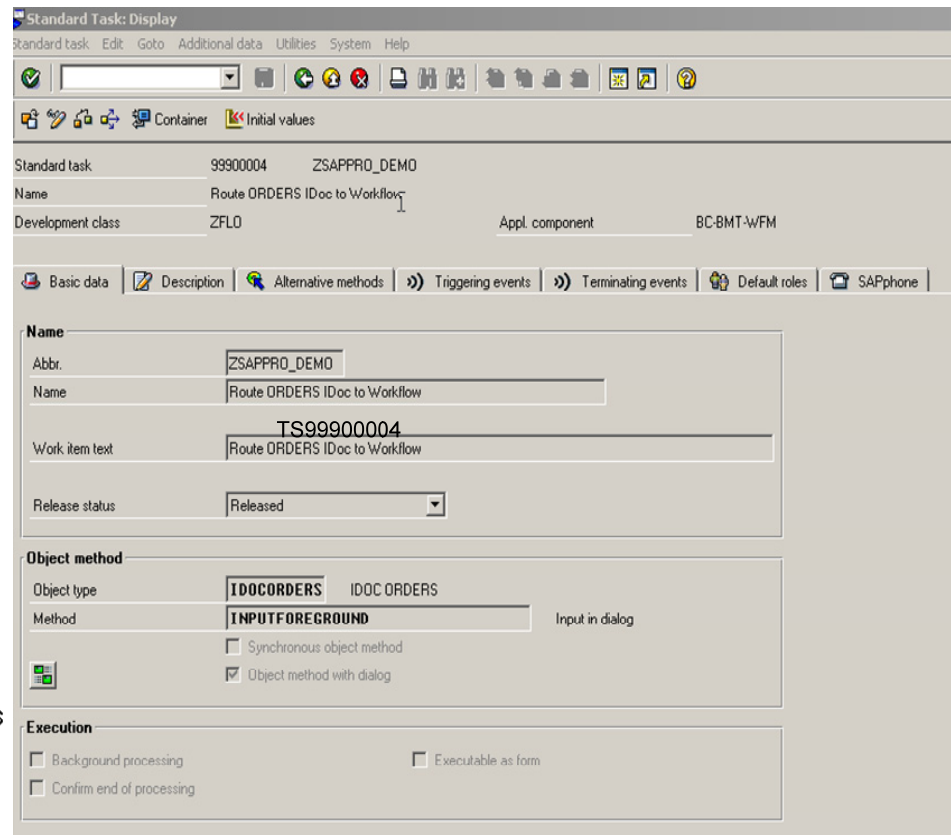
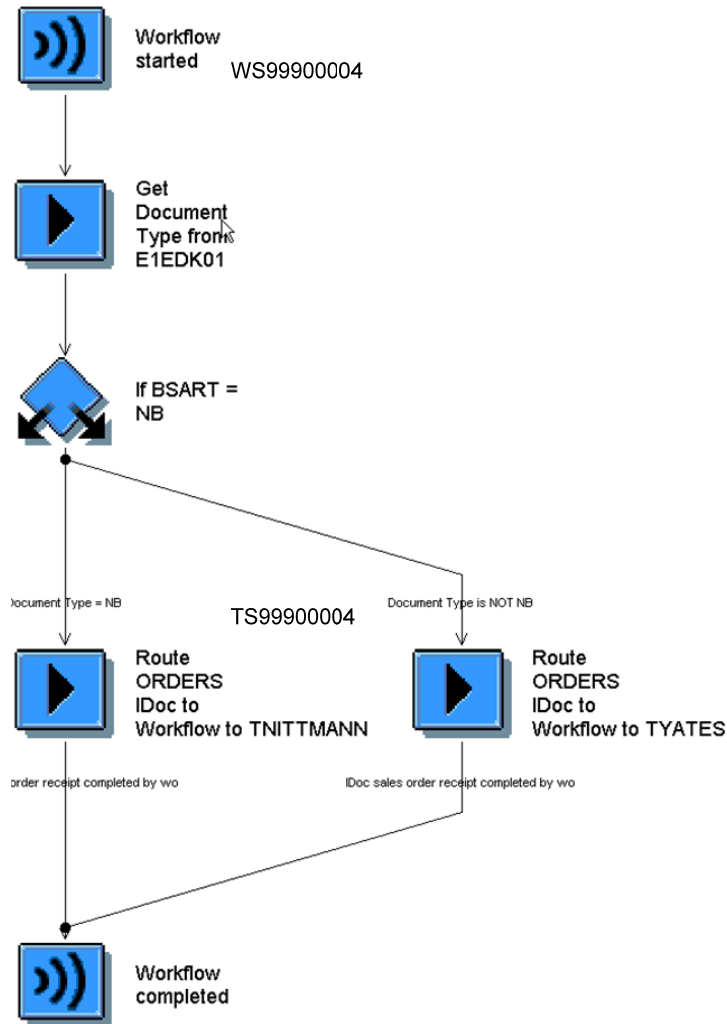
IDoc Processing w/ Workflow Demo

- Change the standard inbound posting routine from Function Module to Workflow
- Test an inbound ORDERS message and have it process through Workflow
- Demonstrate advanced role resolution, foreground processing and changing data



IDoc Processing w/ Workflow Config

PFTC: Create Tasks



IDoc Processing w/ Workflow Config

WE42: Process Code

Dialog Structure

- Inbound process code
- Logical message

Process code: ZPRO

Description: Route ORDERS IDoc to Workflow

Identification: WS99900004

Option ALE

- Processing with ALE service
- Processing w/o ALE service

Processing type

- Processing by task
- Processing by function module
- Processing by process

IDoc Processing w/ Workflow Config

BD67: Assign FM to PC

Change View "Function modules for inbound ALE-EDI": Details

Table view Edit Goto Selection criteria Utilities System Help

Process code: ZPRO

Module (inbound)

Function module: IDOC_INPUT_ORDERS

Maximum number of repeats:

IDoc packet

Object type: IDPKORDERS

End event: MASSINPUTFINISHED

IDoc

Object type: IDOCORDERS

Start event: INPUTERROROCCURRED

End event: INPUTFINISHED

Application object

Object type: BUS2032

Start event:

IDoc Processing w/ Workflow Config

WE20: Partner Profile Change

The screenshot shows the SAP WE20 configuration screen for 'Partner profiles: Inbound parameters'. The window title is 'Partner profiles: Inbound parameters' and the menu bar includes 'Inbound parameters', 'Edit', 'Goto', 'System', and 'Help'. The toolbar contains various icons for navigation and actions. The main data area is as follows:

Partn.number	1000003	Acme Supplies (TJN Manual CATT)
Partn.type	KU	Customer
Partn.funct.	SP	Sold-to party
Message type	ORDERS	Purchase order / order
Message code		
Message function		<input type="checkbox"/> Test

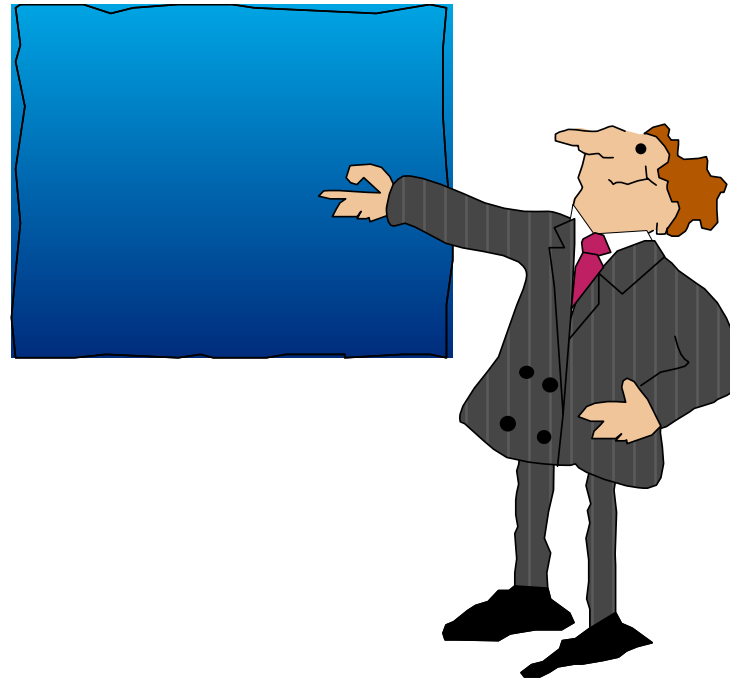
Below the data area, there are tabs for 'Inbound options', 'Post processing: permitted agent', and 'Telephony'. The 'Post processing: permitted agent' tab is active, showing:

Process code	ZPRO	Route ORDERS IDoc to Workflow
--------------	------	-------------------------------

There is a checked checkbox for 'Syntax check'. At the bottom, the 'Processing by function module' section has two radio buttons: 'Trigger by background program' (unselected) and 'Trigger immediately' (selected).

IDoc Processing w/ Workflow DEMO

Inbound ORDERS w/ Workflow



What We'll Cover

- Understanding the SAP Product Offering
- Following the Evolution of SAP Integration Technology
- Examining ALE/IDOC Interfacing Technology
- Reviewing SAP Product Integration Scenarios
- Using ALE/IDocs
 - ▶ Application of Technology
 - ▶ Cool Tools
-  **Applying ALE/IDOCs with R/3 and mySAP**
 - 7 Key Points to Take Home
 - Questions and Answers

Using ALE/IDOCs with R/3 and mySAP (Tips and Tricks)

- Quiz – What's a plug-In?
- R/3 and APO integration
- R/3 and CRM integration
- R/3 and EBP

Transferring Data Between mySAP and R/3

- **SAP developed standard 'Plug-Ins' for TIGHTLY COUPLING mySAP and R/3 systems**
 - ▶ APO-CIF
 - ▶ CRM-R3A
 - ▶ SEM-PI
 - ▶ B2B-PRO-PI
 - ▶ BW-BCT
 - ▶ XIF Adapter: XML/IDoc Adapter for External Interfaces
- **Connection to non-SAP and Legacy OLTP systems via ALE, BAPI's and/or IDocs**
 - ▶ Synchronous and/or Asynchronous (IDocs)

What's a Plug In?

- **SAP provided a standard data migration tool used to integrate R/3 with mySAP**
- **Plug ins are primarily a collection qRFC function modules used to distribute data**
- **Plug-Ins share ALE technology**
 - ▶ Logical systems
 - ▶ Triggering via change documents
 - ▶ RFC destinations
 - ▶ Integration models (similar to ALE Models but specific to mySAP component)
 - ▶ Plug ins use qRFC's to distribute data and Do NOT create physical IDocs
 - ▶ May use IDoc structures and ALE/BAPI routines to post data
- **Data may be transmitted near real time and/or at request**
 - ▶ Business transaction events trigger data distribution (alternatively change pointers can be used)

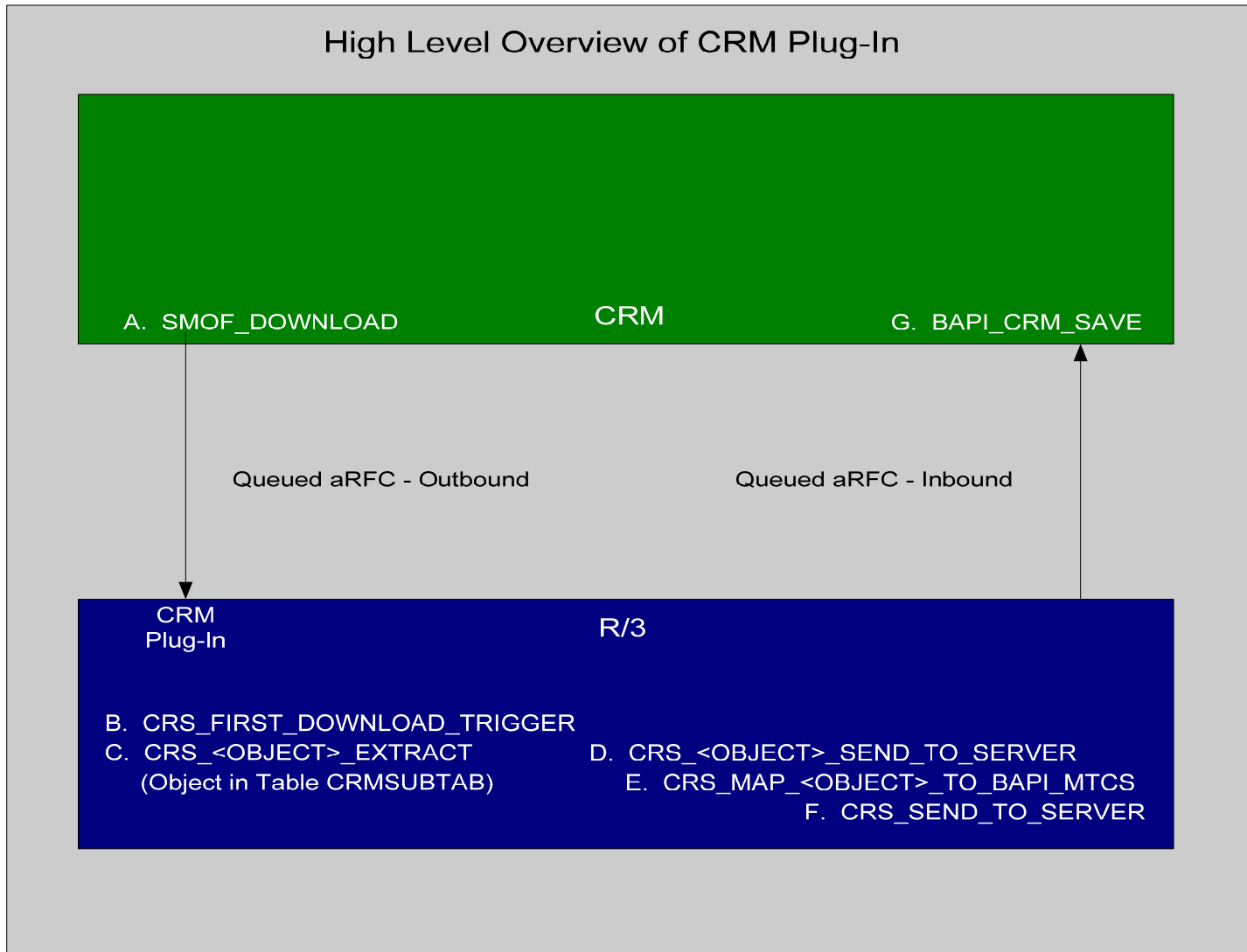
R/3 and APO Integration (CIF Interfaces)

- **Integration Models (different process than ALE models)**
- **Communication process is qRFC (Plug In and CIF)**
 - ▶ qRFC is similar to tRFC
- **Business Transaction Events for near real time transfer**
 - ▶ Tables TBE*
- **Change Pointers**
 - ▶ If near-real time transfer is not required use batch change pointer processing
- **IDocs used in an EDI application or External Interfaces**
 - ▶ E.g. VMI: Vendor Managed Inventory

R/3 and CRM Integration

- R/3 may require CRM data for procurement, inventory Management, Billing, FI and/or CO
- Plug-In Data Transfer
 - ▶ Initial Data Transfer initiated by CRM
 - ▶ Delta changes initiated by R/3
- For Material and Article Master Data physical IDocs are NOT created BUT the data is passed to R/3 in IDoc format and processed via ALE inbound function modules, e.g. inbound routines for MATMAS and ARTMAS (Article Master)
 - ▶ sRFC validation checks made before material is processed in R/3
 - ▶ mapping Table is created in CRM with Material Type, Material Nr, CRM Product Nr, etc
- CRM Business Partner data is created from Data Transfer of Customer Master from R/3
 - ▶ Classification and Account Group determine number range assignment
 - ▶ HRMD_A Messages used if you want to link the employees responsible for the Business Partner

R/3 and CRM Integration Overview



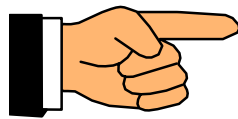
R/3 and Enterprise Buyer Professional

● Purchase Orders

- ▶ Created in R/3 and transmitted by EDI/IDoc
- ▶ Or created in EBP and transmitted by XML

● Procurement Card Interface

- ▶ Settlement data sent by the bank or card company in the Enterprise Buyer database and IDoc 'BBP_PCSTAT01' is used to post data into R/3.
- ▶ Transactional Figures are updated with:
 - Messages ACLPAY, ACC_GOODS_MOVEMENT create invoices in R/3
 - Message ACPJMM (Or BAPI's) posts debit to Cost Object in R/3



Note

Catalog Functions are enabled via XML and
ITS technology

Transferring Data - Summary

- **mySAP<>mySAP<>R3 Integration**
 - ▶ SAP provides standard plug-ins for data integration
 - ▶ Data integration can be near real-time and uses qRFC
 - ▶ Components of ALE/IDocs are used for integration but merged with newer technology
- **R/3<>R/3 distributed landscape is based on ALE/IDocs and BAPIs**
- **Non-SAP system integration**
 - ▶ Asynchronous BAPI and/or ALE/IDocs are the standard
 - ▶ XML technology beginning to replace IDocs
- **Electronic Data Interchange**
 - ▶ IDocs are used for EDI data transfer
 - ▶ XML technology beginning to replace IDocs

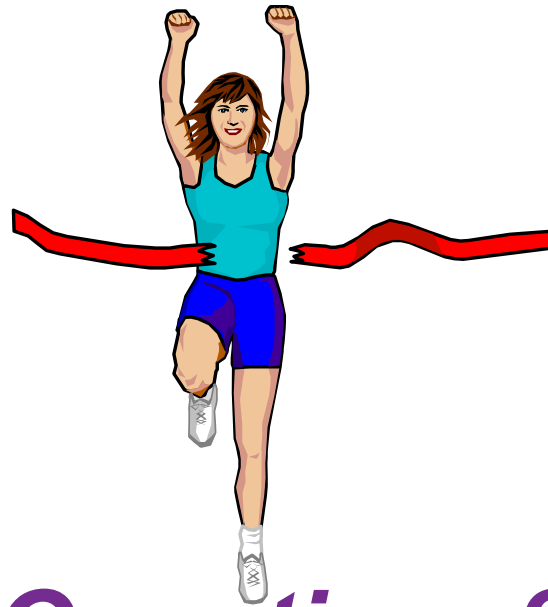
7 Key Points to Take Home

- **mySAP integration is a tighter coupling of data as opposed to ALE loosely coupled systems**
 - ▶ Plug-Ins and qRFC technology
- **Pick the right communication technology for the application.**
 - ▶ File, tRFC, XML, qRFC
- **When using ALE BAPIs watch out for field conversion rules.**
- **When integrating SAP and APO use change pointers when possible instead of BTE's.**
- **Use ALE for refreshing Master Data to Development and Test systems**

7 Key Points to Take Home (continued)

- Know your integration constraints when interfacing to 3rd party tools.
- Always protect your production ALE model and RFC destinations.

Questions and Answers



Questions?