Know-How Network:
SAP BW - SAP XI Integration
Agenda

SAP NetWeaver

SAP XI Data Load into SAP BW

Distribution of BW Data to other systems using BW’s Open Hub and XI
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Distribution of BW Data to other systems using BW’s Open Hub and XI
Integration on Several Levels, is the Key Challenge

**Business Drivers**
- Extended Value NetWork
- Increased Market Dynamics

Integration costs are high
- Lots of heterogeneous systems
- Long integration projects
- IT environments become increasingly rigid

Pressure on IT increases
- Must leverage existing investments
- Must support new business processes quicker
- Must reduce total cost of ownership (TCO)
How to Address the Integration Challenge

Reduce complexity
- Minimize the number of connections through hubs
- Use only 1 platform to integrate all people, information, and systems

Reduce custom integration
- Deliver .NET and J2EE interoperability
- Deliver adaptors for ISV products
- Deliver products, not projects!

Increase company performance
- Increase ease of use, scalability and adaptability
- Increase business process flexibility by using an Enterprise Services Architecture
SAP NetWeaver™
The comprehensive integration and application platform for lower TCO

Unifies and aligns people, information and business processes
- Integrates across technologies and organizational boundaries
- A safe choice with full .NET and J2EE interoperability

The business foundation for SAP and partners
- Powers business-ready solutions that reduce custom integration
- Its Enterprise Services Architecture increases business process flexibility
Focus of this discussion

Process integration solution extend the reach of information integration solution

- Real time, near real time data updates possible
- Pathway for bringing non-SAP data in BI for analysis: integrated, global view of the business
- Distribution of data from BI to downstream systems: enable Enterprise Data Warehousing potential & maximize value of data
SAP Business Intelligence integrates all your corporate information so you can turn information into insight, insight into action, and action into improved business operations.
SAP XI: Strategic Process & Integration Management

Enterprise Resource Planning

Database Integration
Integration by single centralized data model

Inter-/Intra-Enterprise Co-operation

Direct Connections
Integration challenge quadratically growing complexity

Collaborative Business

Integration Engine & Bus Infrastructure
Shared central knowledge, Small number of peer-to-peer connections
Agenda

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Extended Service Infrastructure

Analysts, Knowledge Workers

Info Consumers

Non-SAP system A

Non-SAP system B

Non-SAP system C

Non-SAP system D

BW

n Persistence
n Presentation
n Analytics

XI

n Open Interfaces
n Routing & Monitoring
n Transformation
BW: Extraction, Transformation and Loading

- Open for any source
- Flexible set of ETL capabilities
- Integration to mySAP.com on application level
- Open to third-party tools
- Support of open standards
Adapters hosted in the XI Adapter Engine

The Adapter Engine hosts a set of adapters:

- **ABAP Proxy Framework**
- **SAP Adapters**
  - File / FTP
  - JDBC (Database)
  - JMS (MQSeries, SonicMQ, ...)
  - RFC
  - SOAP
  - SMTP
  - SAP BC (header extension for support of Quality of Service)
  - SAP Marketplace Adapter
  - RosettaNet (RNIF 2.0) Adapter
  - CDIX (RNIF 1.1) Adapter
- **3rd Party Adapters**
  - iWay: UCCnet, more to come ...
  - Optional: Adapters developed by partners, certificated by SAP
BW-XI-Integration: Possible Quality of Service Levels

# XI categories of Quality of Service

- **BE (Best Effort):** The message is sent synchronously; this means that the sender system waits for a response before it continues processing. Messages are not persisted by the Integration Engine in synchronous message processing. Once a message has been processed in the target system it performs an implicit database commit. No transactional security can be guaranteed. Only one receiver system can be configured.

- **EO (Exactly Once):** The message is sent asynchronously in this case; this means that the sender system does not wait for a response before continuing processing. The Integration Engine guarantees that the message is sent and processed exactly once.

- **EOIO (Exactly Once In Order):** In addition to Exactly Once, messages with the same queue names (supplied by the application) are delivered in the same sequence that they were sent from the sender system. Message processing is asynchronous in this case.
Data Load scenarios via “Push” in BW

In all Push Scenarios the data is transferred into BW via a generated RFC-enabled function module.

Based on that there are the following implementations:
  - SOAP-DataSource (XML-DataSource)
  - Web Service
  - BW-XI-Integration

BW requirements concerning Quality of Service
  - Data consists of “After Images” (AIM) only: IO (In Order) has to be supported from the source of data up to the BW Inbound Layer; otherwise the “wrong” Image could be used for update in the data target!
  - Data contains “New Images”, “Before Images”, “After Images”, “Reverse Images” (ABR): EO (Exactly Once) has to be supported; otherwise multiple operations would create wrong values (in case that deletions are processed before insertions data targets could have inconsistent states. However, this is not considered to be critical, as this will be fixed with the next load).

Conclusion
  - EOIO (Exactly Once In Order) is required to enable the delta load in the most flexible and robust manner.
BW-XI-Integration: Adapters & QoS

- **RFC-Adapter**
  - asynchronous: EO, but not IO (tRFC)
  - synchronous, BE: No transactional security possible; (Drawback: only one receiver system)
  - Result: *Not recommended*, as correct processing of delta loads with "After Images" is not possible; practical however for mass load scenarios with strictly separated updates

- **SOAP-Adapter**
  - asynchronous: "Guaranteed Delivery“ In Order, as the serialization on the queue is maintained (stops until delivery is confirmed); in error cases data has to be transferred repeatedly => multiple deliveries possible
  - Result: *Not recommended*, as EOIO cannot be achieved; extensive configuration effort; However processing of “After Images” possible

- **Proxy**
  - asynchronous: EOIO, data is transferred from queue on Integration Engine to queue in application system
  - Result: **Recommended** without restriction; standard adapter of XI with the highest flexibility concerning error handling
XI Data Load: Components of the Technical Solution

Partner Systems

- HTTP inbound Adapter
- different Infrastructures

WAN

SAP XI
- Mapping
- Routing
- ABAP Adapter

SAP BW
- ABAP Proxy
- Delta Queue Interface
- Delta Queue
- BW Staging: InfoCubes, ODS
- Business Explorer
Architecture: data flow for XI data load into BW

- Data received into XI from non-SAP applications
- Non-SAP application
- HTTP inbound Adapter
- ABAP Adapter
- Mapping
- Routing
- ABAP proxy & RFC function module
- Push XML data
- Delta extraction / load
- Delta queue
- ABAP proxy & RFC function module
- BW DataSource
- BW InfoSource
- BW InfoProviders
- SAP XI
- SAP BW
- DataSource
- InfoSource
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Distribution of BW Data to other systems using BW’s Open Hub and XI
General Scenario: BW Open Hub “push” via XI

Extended Service Infrastructure

- BW / Business Planning
  - Persistence
  - Information Delivery
  - Central Monitoring

- XI
  - Message Routing
  - Interfacing
  - Processing

- Non-SAP system A
- Non-SAP system B
The Corporate Information Factory – SAP BW Open Hub Service

Open Hub Service

Departmental Data Marts
- Marketing
- Acctg
- Finance
- Sales

DSS Applications
- ERP
- ERP
- ERP
- CRM
- eComm.
- Bus. Int.

EDW
- Global ODS
- Local ODS
- ETL
- changed data
- Staging Area

Source: Bill Inmon
Open Hub in the SAP Business Intelligence Architecture
Open Hub Service provides a framework for the scheduled and monitored extraction of consolidated and integrated data from SAP BW to external destinations.

- Controlled distribution of consistent data
- Target: file or DB table
- Central monitoring
- Filtering
- Aggregation
- Scheduling
- Full or Delta Mode
- Process Chains
Data transfer in Open Hub Service 3.x

SAP BW Open Hub: Concept Overview 2

Open Hub terminology – *InfoSpoke*: An SAP BW object, where the specific properties are configured for the dataset to be extracted.
Open Hub

SAP BW’s Open Hub does NOT offer functionality for delivery of the datasets from the BW system (it’s DB or it’s app server OS) to a receiver.

- Open Hub BAPIs have been delivered for tasks such as notification of 3rd-party ETL of new dataset staging readiness, for reading the DB table where the Open Hub has staged the data, etc.

Bottom Line: SAP customers working with SAP BW’s Open Hub must otherwise utilize 3rd-party ETL solutions, or write scripting solutions, to deliver the staged datasets to their receiving applications. Thus, building these interfaces are a project solution, with general issues relevant when developing and managing interfaces. The Open Hub push scenario leverages the capabilities of SAP BW Open Hub, process chains and SAP XI’s messaging functionality to offer an improved, effective and robust architecture for meeting this integration challenge.
Open Hub Service provides a framework for the scheduled and monitored extraction of consolidated and integrated data from SAP BW to external destinations. XI extends the reach of the Open Hub by delivering the datasets to receivers.
Receiver Systems Examples in Current “How to” Paper

A. XML doc/ async. send (proxy)
B. async. send (JDBC adapter)
C. async send (file adapter)
D. async msg return (proxy)

note: different interface than send for return msg
Sequence: Open Hub push to MS-SQL DB via XI (1)

1. **START** process chain (e.g. daily job)

2. Open hub staging to flat DB table

3. Custom process type runs (async.), execute ABAP code to read DB table & send data (XML format) via proxy; also sends log id for running process; process then goes into suspend mode (RSPC monitor shows *yellow* status)
Sequence: Open Hub push to MS-SQL DB via XI (2)

1. **START** process chain (e.g. daily job)

2. Open hub staging to flat DB table

3. Custom process type runs (async.), execute ABAP code to read DB table & send data (XML format) via proxy; also sends log id for running process; process then goes into suspend mode (RSPC monitor shows yellow status)

4. XML message received via proxy; mapping routes message to receiver

5. XI queues message; async framework sends message to JDBC adapter
Sequence: Open Hub push to MS-SQL DB via XI (3)

1. **START** process chain (e.g. daily job)

2. Open hub staging to flat DB table

3. Custom process type runs (async.), execute ABAP code to read DB table & send data (XML format) via proxy; also sends log id for running process; process then goes into suspend mode (RSPC monitor shows *yellow* status)

4. XML message received via proxy; mapping routes message to receiver

5. XI queues message; async framework sends message to JDBC adapter

6. JDBC adapter service receives incoming message. Java class within config specifies DB update commands. MS-SQL RDBMS completes insert of dataset into DB table.
Sequence: Open Hub push to MS-SQL DB via XI (4)

1. **START** process chain (e.g. daily job)

2. Open hub staging to flat DB table

3. Custom process type runs (async.), execute ABAP code to read DB table & send data (XML format) via proxy; also sends log id for running process; process then goes into suspend mode (RSPC monitor shows *yellow* status)

4. XML message received via proxy; mapping routes message to receiver

5. XI queues message; async framework sends message to JDBC adapter

6. JDBC adapter service receives incoming message. Java class within config specifies DB update commands. MS-SQL RDBMS completes insert of dataset into DB table.

7. queue for JDBC adapter holds delivery status (note: if delivery fails, queue agent will retry x # of times)

8. Message carrying successful delivery status routed back to original sender (process chain) via proxy

9. Proxy methods send success msg back to suspended process. Upon success, update process status to *green*. If no success msg is received in x hours, process timeout changes status to *red*. **END**
SAP BW Open Hub “push” possibilities: SAP XI Extended Scenario

A. XML doc/ async. send (proxy)
B1. update async. BAPI (proxy)
B2. acknowledgement (proxy)
C1. update async. BAPI (RFC)
C2. async. return msg. (RFC)
D. async. update (JDBC adapter)
E. async send (file adapter)
F. async msg return (proxy)

note: different interface than send for return msg

SAP BW 3.5
SAP XI 3.0
mySAP ERP
SAP R/3 4.x
MS-SQL DB table
XML file

Future
Future
Important! Locations of “How to” Guides & Further Info

SAP Service Marketplace:

http://service.sap.com/bw
- How to Guides > BW 3.5 > “How to Integrate XI and BW”
- How to Guides > BW 3.0 > “How to Load XML Data into BW”

http://service.sap.com/netweaver
- Media Library > Cross Application > “How to Push Data from BI to XI (including receiver examples)”

SAP Developer Network

http://www.sdn.sap.com > Business information Warehouse; > NetWeaver