

# SAP NetWeaver Process Integration 7.1 Advanced Adapter Engine



**SAP NetWeaver Regional Implementation Group**  
**SAP NetWeaver Product Management**  
**December 2007**

After reading this presentation you will be able to:

- Explain the architecture of the Advanced Adapter Engine (AAE)
- Describe the benefits, features and configuration of the AAE
- Identify valid integration scenarios empowered by the AAE

# Agenda



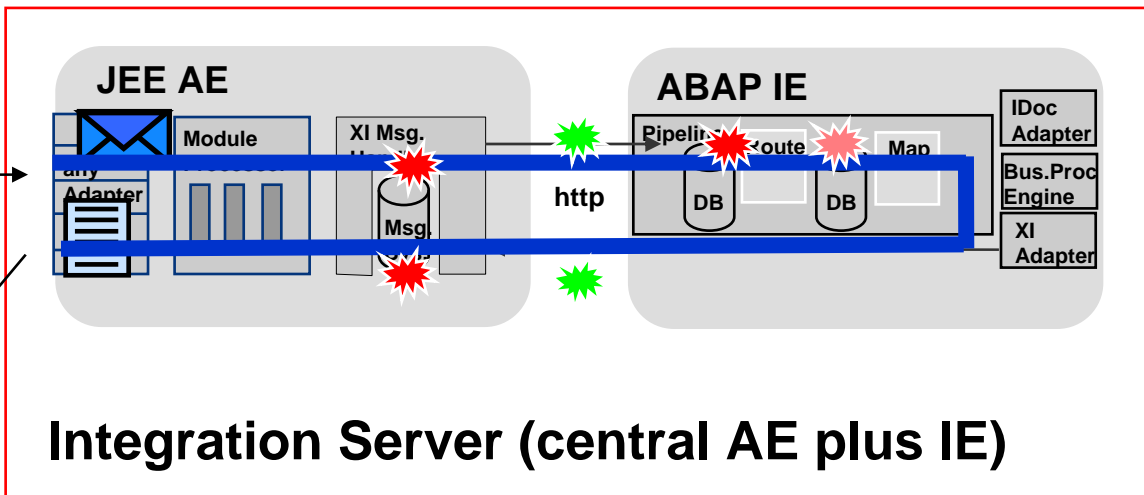
- 1. Introduction and Architecture**
- 2. Features and Configuration**
- 3. Integration Scenarios**
- 4. Summary**

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# From Adapter & Integration Engine to Advanced AE (AAE)



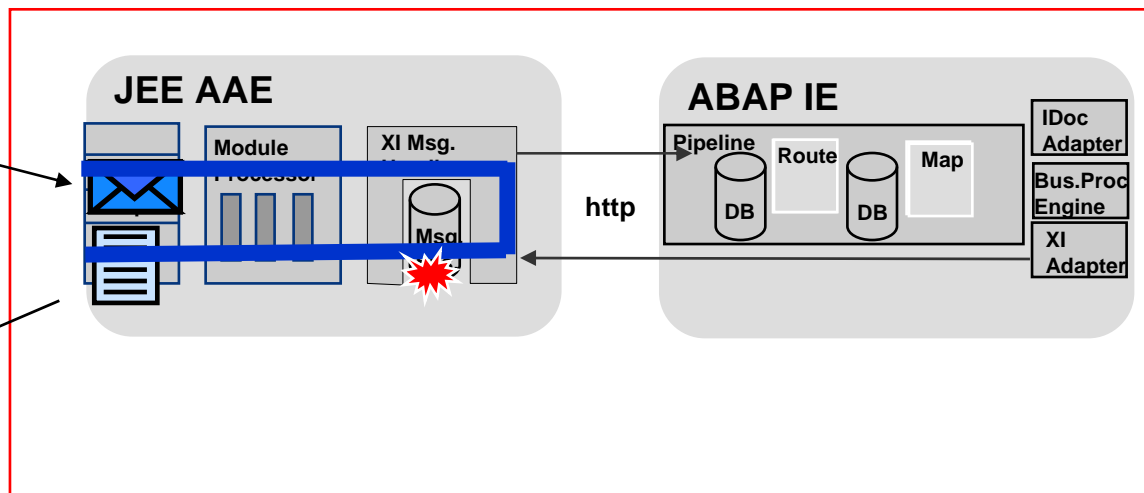
## Runtime Picture: From...



★ 3-4 persistence steps

★ 2 times rendering / parsing for http transport incl. user authentication, process switch

... to



★ ■ 1 persistence step

# Local vs. „Classical“ Processing

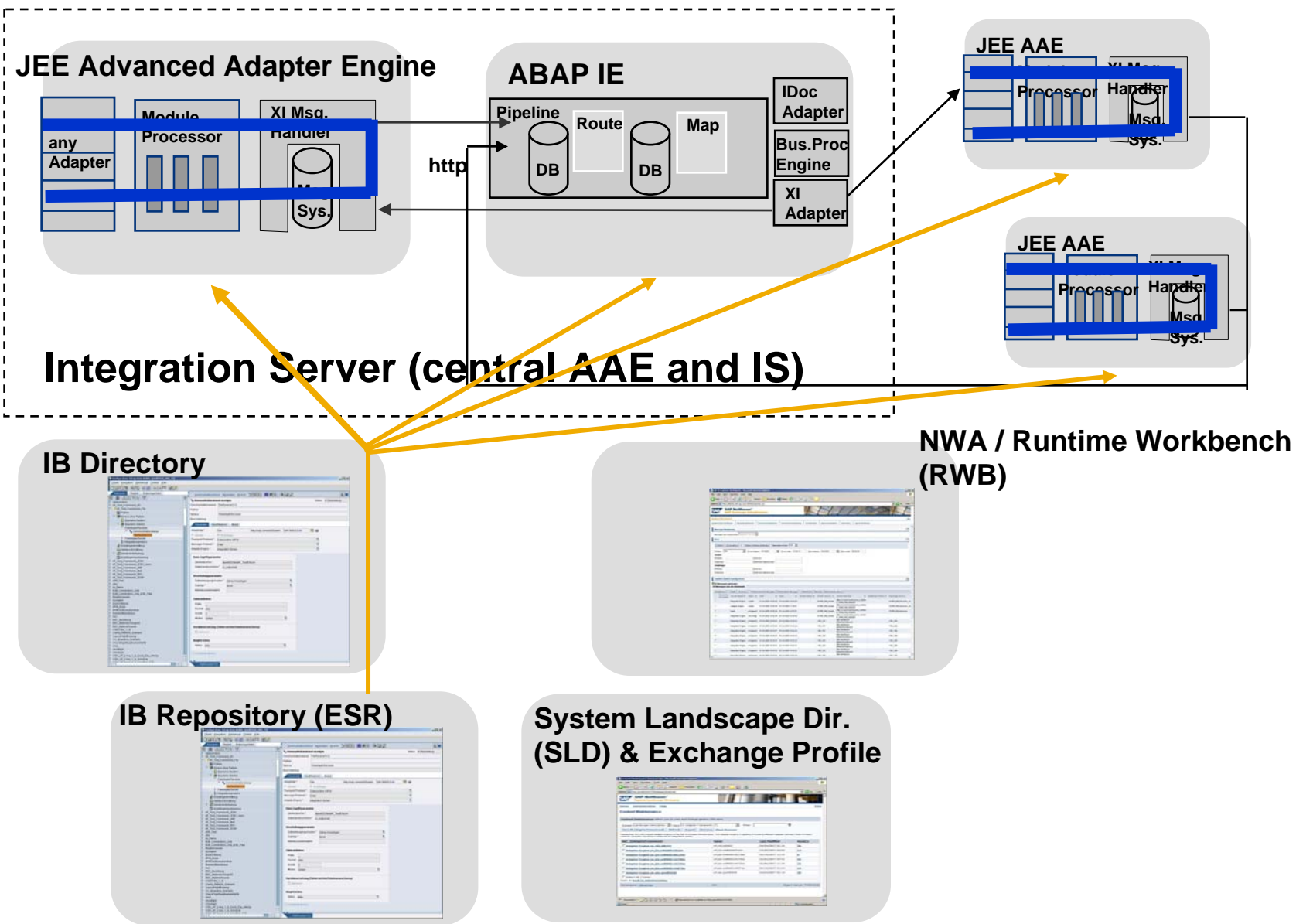


## Classical via IS

Sender Adapter	Parse
Module Processor	
Messaging System	Persist
Integration Server	Transfer, Persist, Parse
Routing	Persist
Mapping	Transfer
XI Adapter	
Messaging System	Transfer, Persist, Parse
Module Processor	
Receiver Adapter	Render

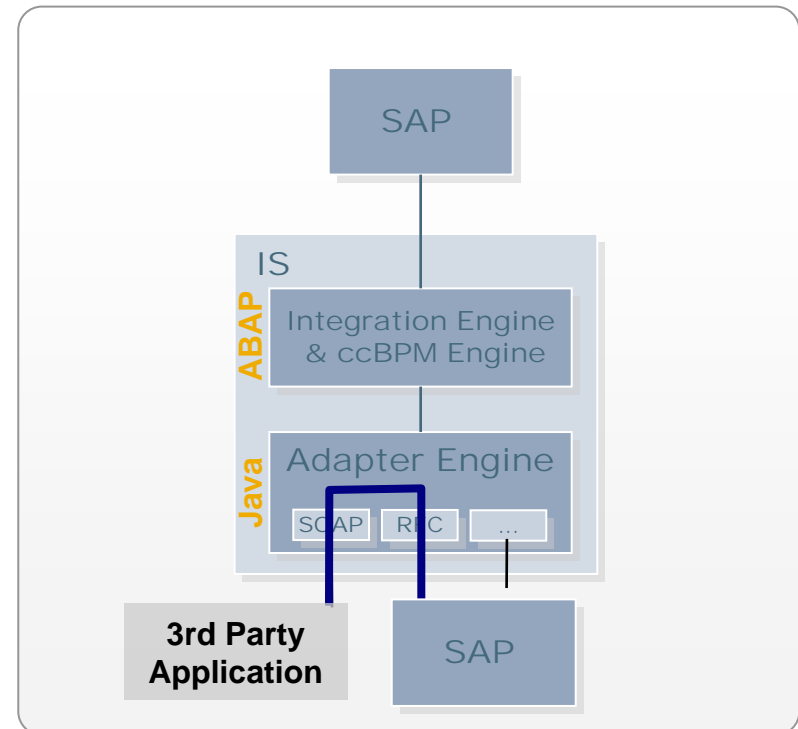
## Local Processing

Sender Adapter	Parse
Module Processor	
Routing	
Messaging System	Persist
Mapping	
Module Processor	
Receiver Adapter	Render



## Local Processing in the Advanced Adapter Engine

- Natural evolution of adapter engine
- Provides mapping, routing to by-pass Integration Server
- Adapter to adapter communication
- For sync and async scenarios





# Agenda



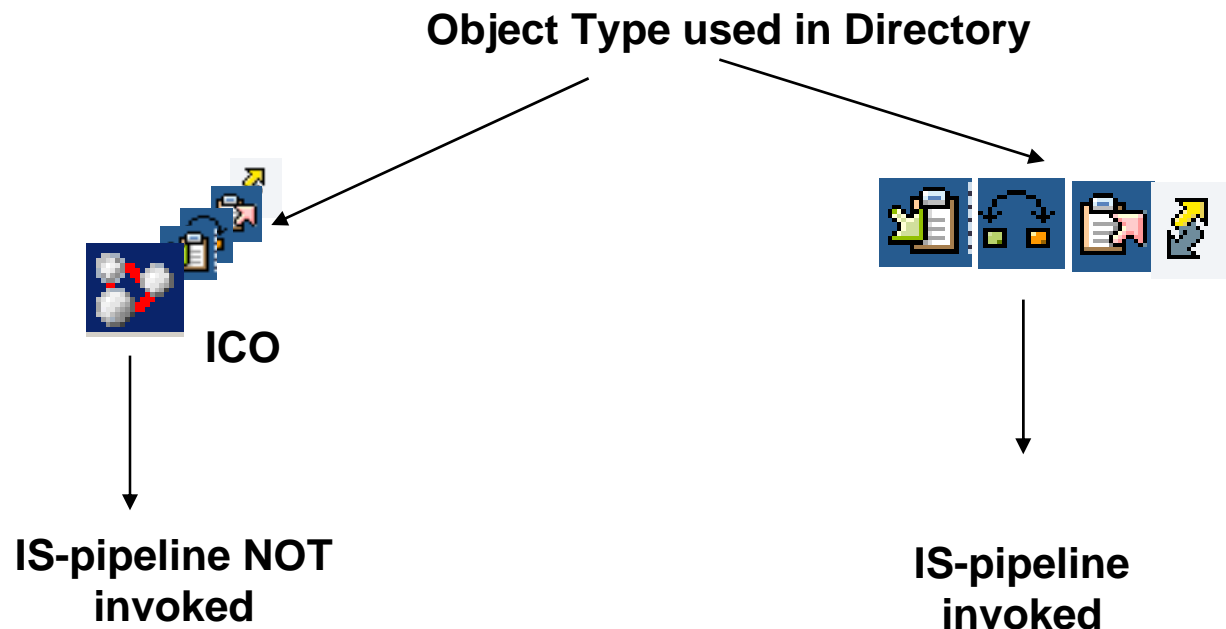
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- **Both synchronous and asynchronous messages**
- **Sender and receiver adapters located on the same Adapter Engine**
- **Support of decentral Adapter Engine with central configuration and monitoring**
- **Available for adapter types hosted on the Adapter Engine (IDoc-, http-, XI-, iSpeak- adapters excluded)**
- **One to one message mapping (no ABAP based mapping types)**
- **Single Static Routing**
  - **(i.e. no content based routing or message split yet)**

- ✓ **ACL's**
- ✓ **Mapping Lookups**
- ✓ **Principal Propagation (if supported by the adapter)**
- ✓ **Value Mapping, Sequence Mapping**
- ✓ **Schema Validation**
- ✓ **Header Mapping (if supported by the adapter)**
- ✓ **Message Prioritization**

## New Directory Object: Integrated Configuration Object

Used for configuring local processing within advanced adapter engine. Therefore the AAE provides routing and mapping services locally.



# Directory Configuration: Integrated Configuration



## Integrated Configuration Object (ICO)

**Contains sender- & receiver agreement and interface determination**

**Is transferred to the CPA-Cache of the individual AAE with a reference to the mapping maintained within the interface determination section**

**For each operation in interface determination a separate entry is created in CPA (receiver interface determination)**

**The integrated configuration object is transferred as one single object to the AAE.**

### Create Object

- Configuration
- Collaboration Profile
- Collaboration Agreement
  - Sender Agreement
  - Receiver Agreement
  - Direct Connection
  - Integrierte Konfiguration**
- Configuration Objects
- Administration

**Integrierte Konfiguration**

**Sender**

Communication Party:

Communication Component:

Interface:

Namespace:

Sender Uses Virtual Receiver

Description:

Add to Scenario:

Add to Folder:

# Details – Directory Configuration



From four configuration entities to one single entity

The screenshot shows the SAP Integration Builder interface with multiple overlapping windows. The main window is titled 'Empfängerermittlung bearbeiten' (Receiver Agreement Edit) and shows a 'Receiver Agreement' configuration. The 'Sender' section is expanded, showing 'Interface-Ermittlung' (Interface Identification) and 'Empfänger' (Receiver) details. The 'Receiver' section is also expanded, showing 'Interface' and 'Namensraum' (Namespace) details. The 'Adapter' section is expanded, showing 'Inhalt' (Content) and 'Software-K' (Software Component) details. The 'Adapter-Specific Attributes' section is expanded, showing 'Authentication' and 'Settings for Reliable Messaging Web Service Client' details. The status is 'In Bearbeitung' (In Progress).

The screenshot shows the SAP Integration Builder interface with a single configuration entity. The main window is titled 'All in One' and shows a 'Receiver Agreement' configuration. The 'Sender' section is expanded, showing 'Kommunikationspartner' (Communication Partner), 'Kommunikationskomponente' (Communication Component), 'Interface', and 'Namensraum' (Namespace) details. The 'Adapter' section is expanded, showing 'Kommunikationskanal des Senders' (Sender Communication Channel), 'Adaptertyp' (Adapter Type), 'Adapter-Engine', and 'Schemavalidierung' (Schema Validation) details. The 'Adapter-Specific Attributes' section is expanded, showing 'Reliable Messaging Settings of Web Service Client', 'Message ID Transport Settings', and 'Settings HTTP Proxy' details. The status is 'aktiv' (Active).

# Integrated Configuration Objects, Mapping & Cache



## Delta Cache Refresh:

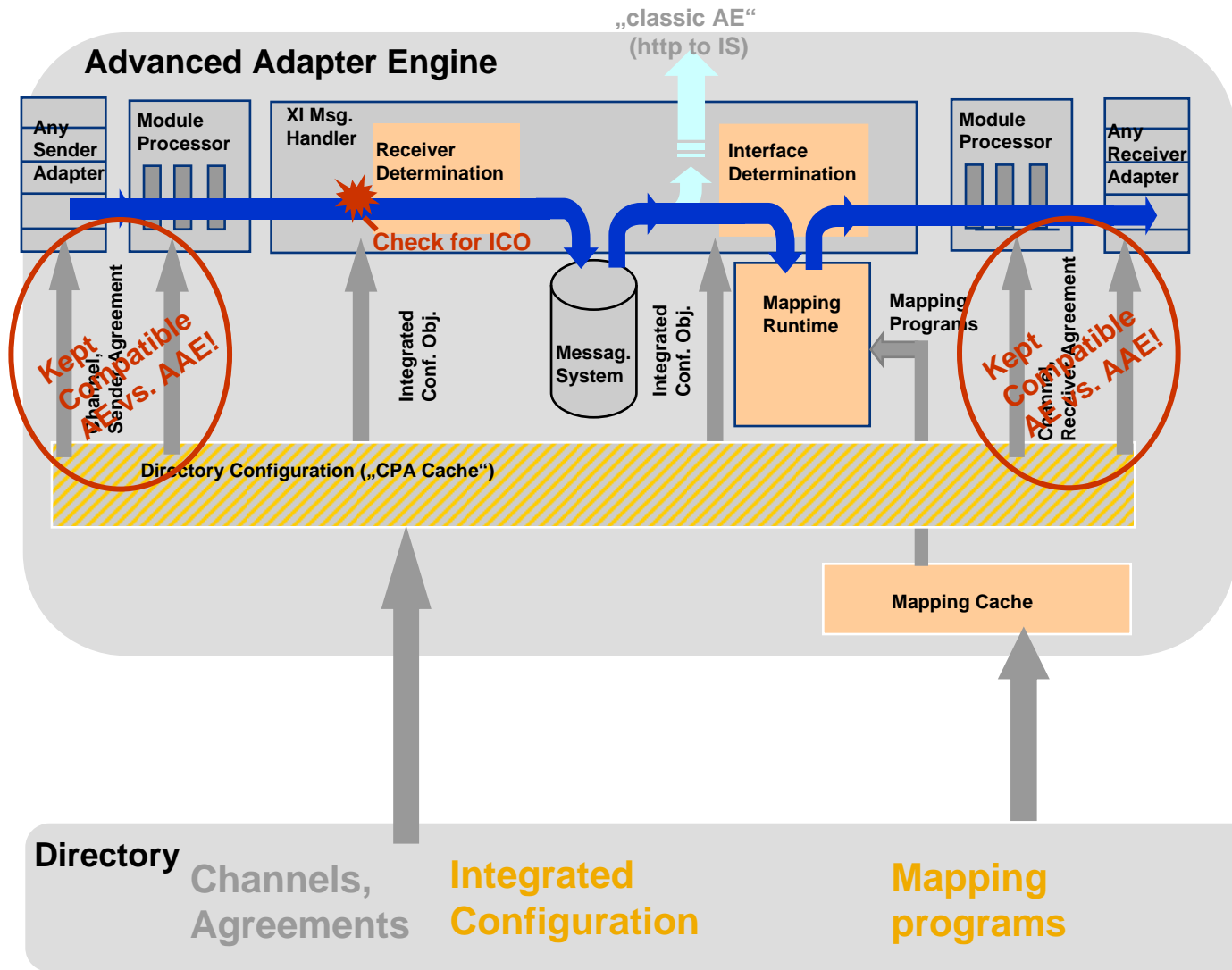
**CPA-Cache and Mapping Runtime Cache are updated independently, i.e.**

- 1. Mappings objects per activation/change are transferred to ALL Mapping Runtime Caches of all Advanced Adapter Engines**
- 2. CPA-Cache-Refresh is usually carried out after activation/change of directory objects. Objects are just transferred to the Advanced Adapter Engine where configured to be used**

**Can be viewed in the Cache Monitoring of the RWB. (other monitoring is reused; no SXMB\_MONI)**

The screenshot displays the SAP NetWeaver SAP Exchange Infrastructure Runtime Workbench interface. The main content area is titled 'Cache Monitoring' and shows a table of cache objects. The table has the following columns: Cache Instance, Cache Object, URL, Class Name, Version, and Last Update Time. The data rows are as follows:

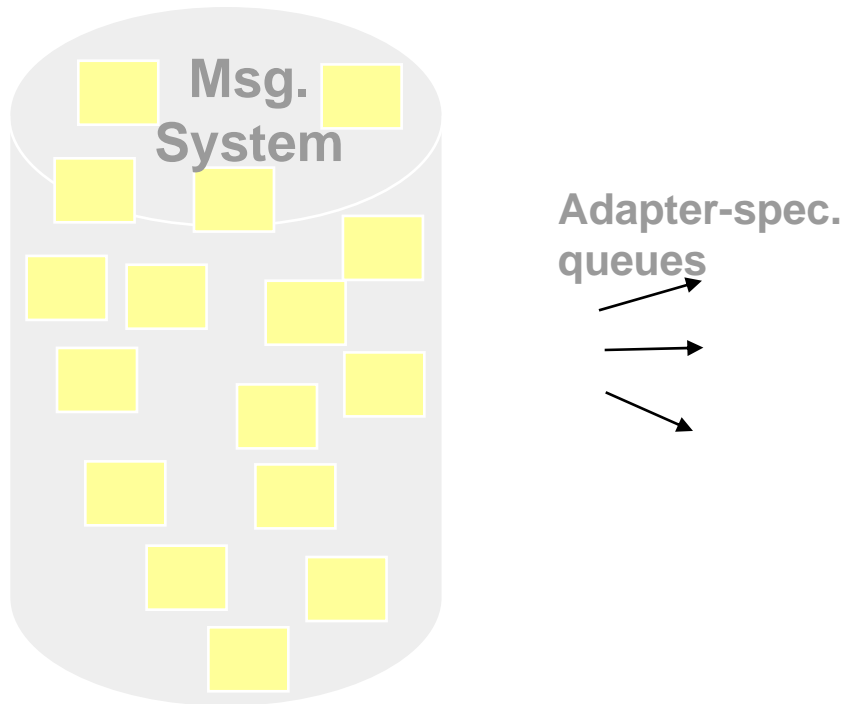
Cache Instance	Cache Object	URL	Class Name	Version	Last Update Time
ds10a4212e2	Mapping Program	http://FileToFile	com.sap.xi.tf_arithmeticFunctionsTest_SMT\$InnerParamsList.class	-1	2007-07-13 13:25:33.957
ds10a4212e2	Mapping Program	http://FileToFile	com.sap.xi.tf_arithmeticFunctionsTest_SMT\$InnerList.class	-1	2007-07-13 13:25:33.957
ds10a4212e2	Mapping Program	http://FileToFile	com.sap.xi.tf_arithmeticFunctionsTest_\$1.class	-1	2007-07-13 13:25:33.957
ds10a4212e2	Mapping Program	http://FileToFile	com.sap.xi.tf_arithmeticFunctionsTest.class	-1	2007-07-13 13:25:33.957
s1c0a114c15	BookingOrder_Agency2Airline	http://sap.com/xi/DemoAgency	com.sap.xi.tf_BookingOrder_Agency2Airline.class	-1	2007-07-17 11:25:46.809
s1c0a114c15	BookingOrder_Agency2AirlineDoc	http://sap.com/xi/DemoAgency	com.sap.xi.tf_BookingOrder_Agency2AirlineDoc.class	-1	2007-07-17 11:25:38.709
s1c0a114c15	BookingOrder_BPM2AirlineDoc	http://sap.com/xi/DemoAgency	com.sap.xi.tf_BookingOrder_BPM2AirlineDoc.class	-1	2007-07-17 11:25:46.274



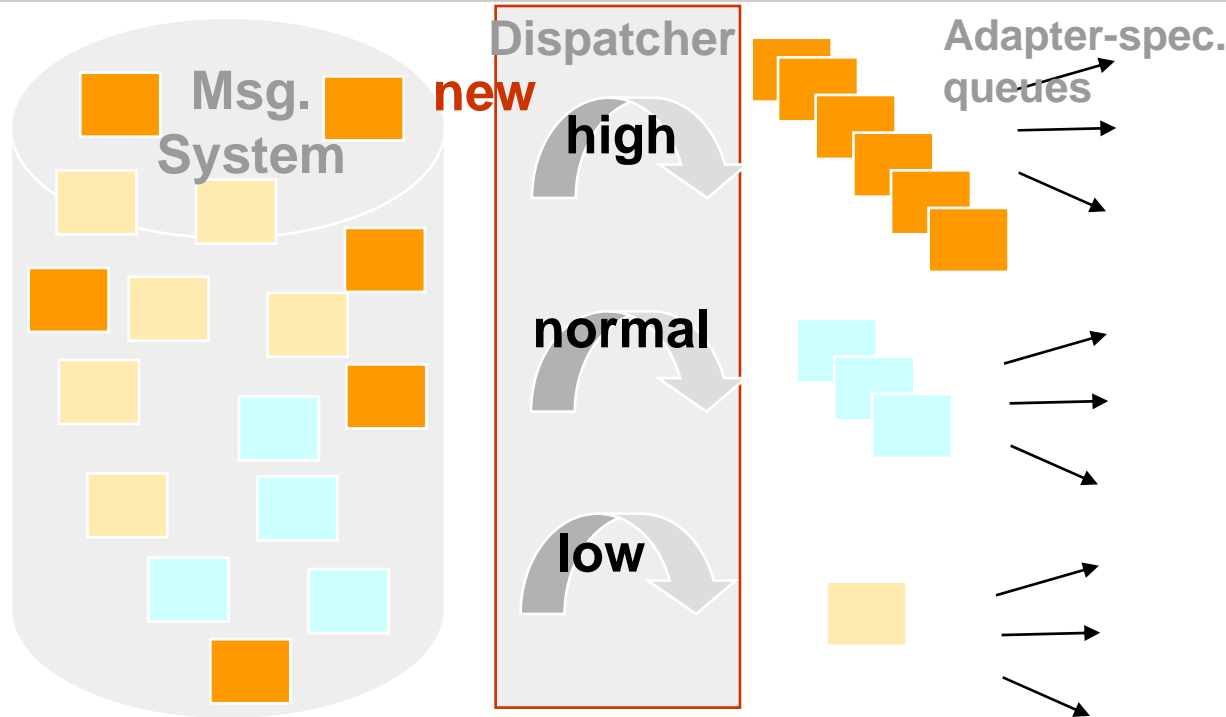
**Legend:**

- New dev. In AAE
- Enhanced For AAE
- Flow of Runtime Data (messages)
- Flow of Configuration Data





**6.40 / 7.00 Message Processing  
without prioritization**



- Outline: „Works as in ABAP IS“

- Weighted msg. Delivery for async. Messages

- Probability high / normal / low: 75:20:5

- Configuration in RWB:

## 7.10 Message Processing with prioritization

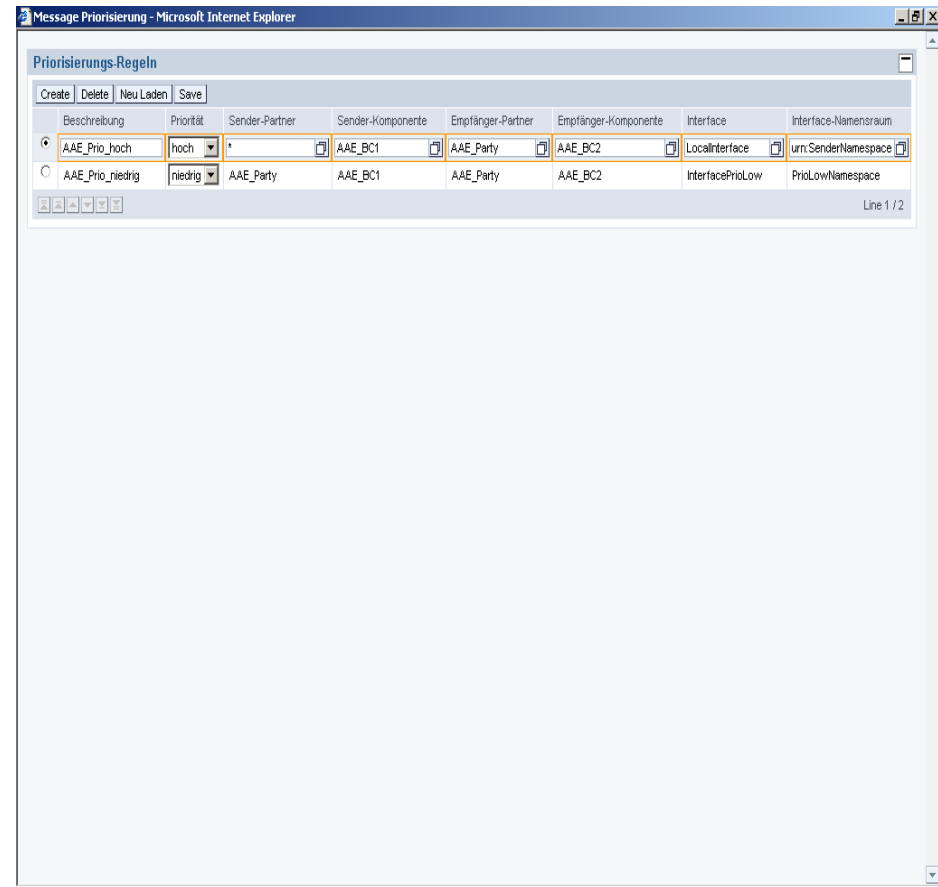
### Remarks:

- Message Prioritization is designed to avoid that ,prio high' messages get stuck due to a backlog of other messages on the same node
- To ,see it working' at all you need a backlog in the messaging system
- To see the expected ratio in message delivery you need in addition comparable fast backends

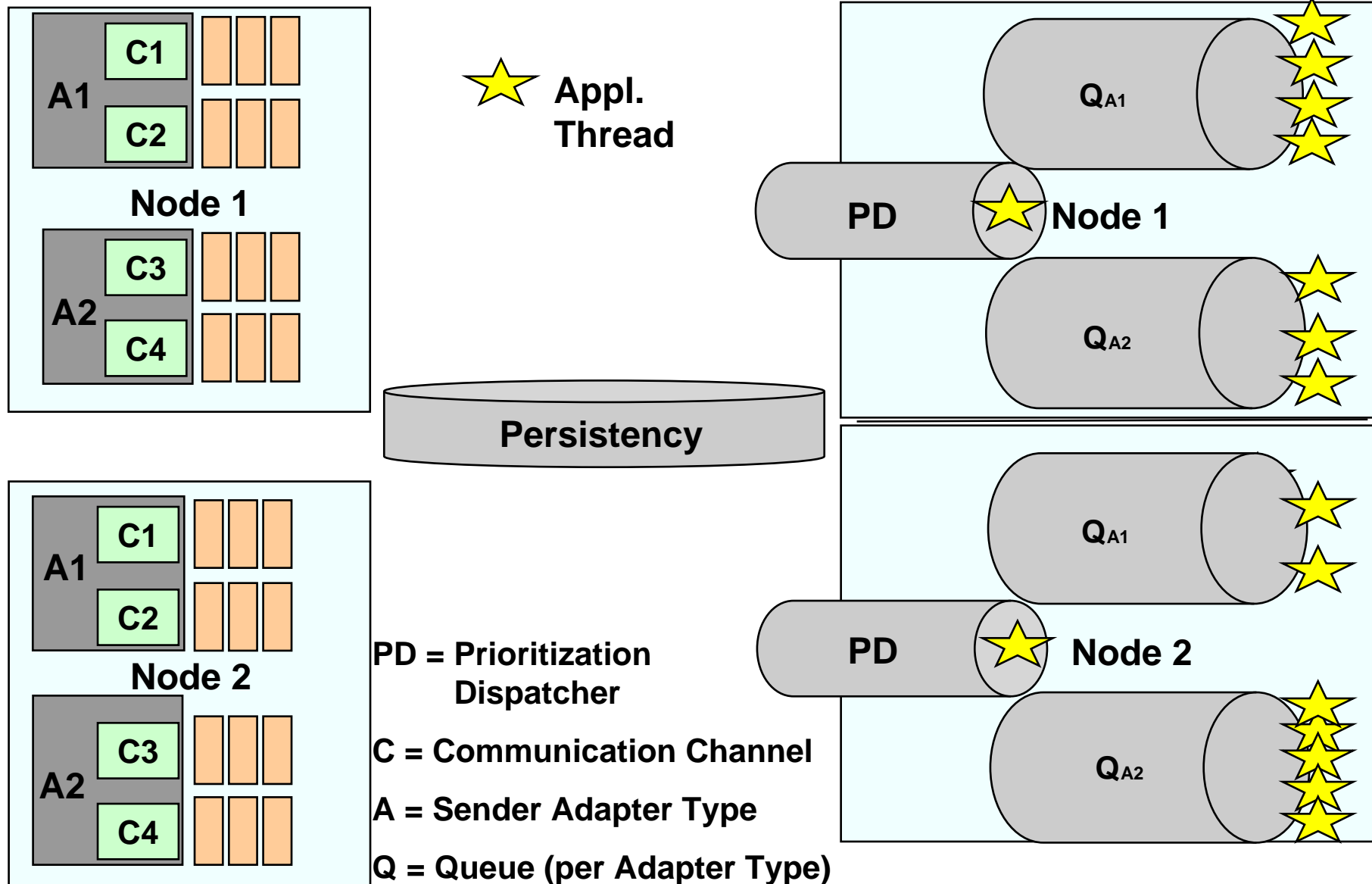
# Message Prioritization in AAE – Configuration



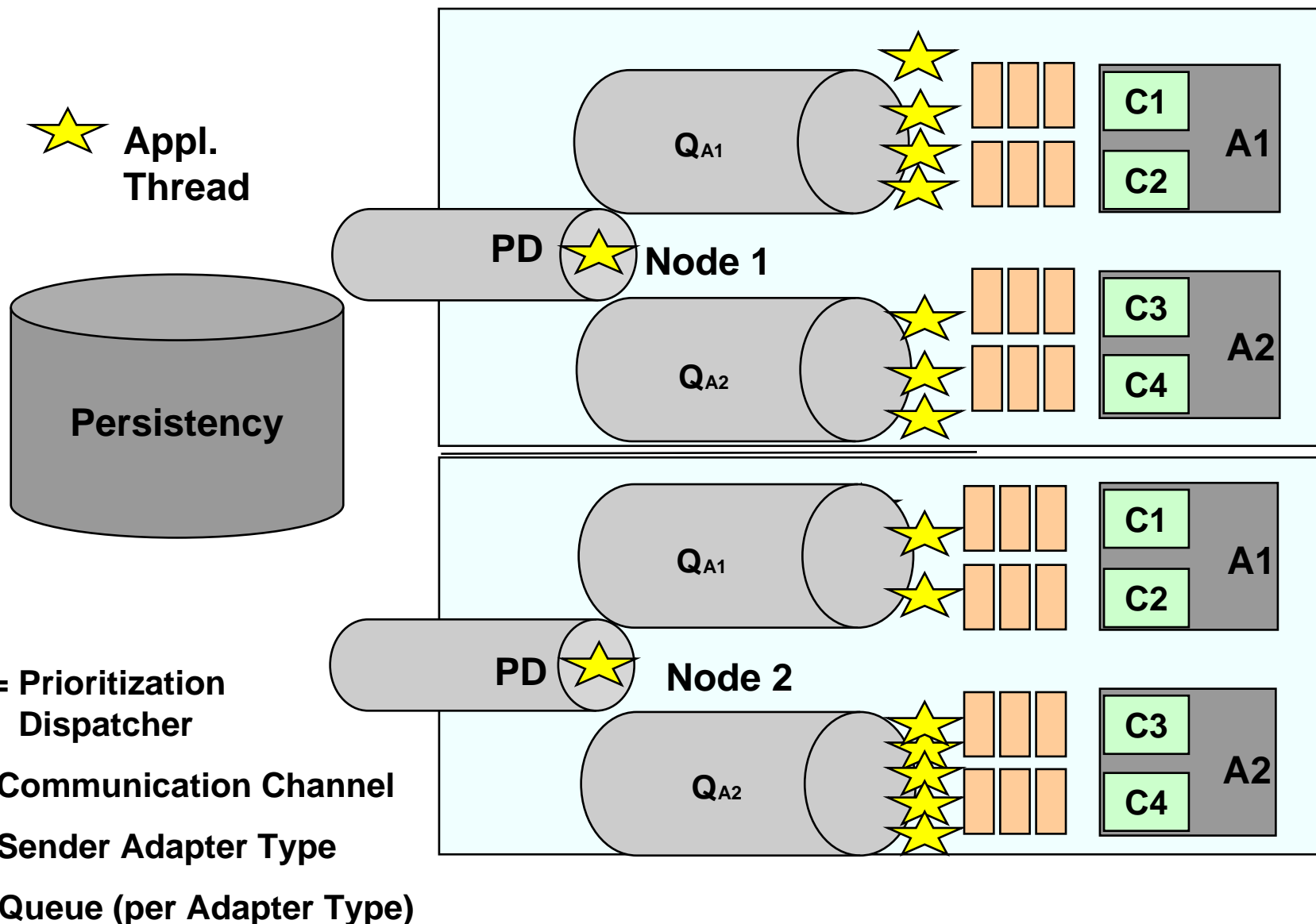
- Rules within Component Monitoring with 3 different categories (high, low, normal) per Sender/Receiver Party/Component, Interface, Namespace
- Corresponding to properties „messaging.prioritization.high“, „messaging.prioritization.low“ and „messaging.prioritization.normal“ of „XPI Service Messaging System“ that can be set per server node (online modifiable)
- All QoS supported (EOIO serial per scenario)
- Prioritization during runtime takes place in principle whenever for a given adapter type and at a given moment of time all worker threads are occupied
- View Dispatcher Queue: RWB -> Component Monitoring -> Adapter Engine -> Status



# Message Prioritization – Sender via IS



# Message Prioritization – Receiver Local Processing or via IS



- 3 Modes: DB, Cache&DB (2000 entries per node), non
- Audit Log Memory Cache (stores audit log data in memory; in case of errors the log will be written to database)
- Configuration: Service „XPI Service: Messaging System“  
component name „com.sap.aii.af.ms.svc“

Property : messaging.auditLog.memoryCache    default true

Property:    messaging.auditLogEnabled                    default true

**Q1: Which adapters are supported?**

- A1:**
- All technical adapters running in the Adapter Framework
  - No iSpeak-Adapters (RNIF/CIDX), no IDoc/http-Adapter, XI-Adapter
  - Third party upon release (no Adapters that require ccBPM)

**Q2: Which mapping types are supported within the AAE?**

- A2:**
- Message Mapping, Java, XSLT (no ABAP)

**Q3: Now, since mapping and routing is carried out on the AAE, can we change the sequence of individual pipeline steps?**

- A3:**
- No

**Q4: Can the locally processed messages be seen within SXMB\_MONI?**

- A4:**
- No

**Q5: Is there any change/case distinction in developing and testing adapters between a classic configuration via IS and integrated object configuration within the Advanced Adapter Engine?**

- A5:**
- No. Even there does not exist an official/released API that e.g. modules can detect if they run in a classical or Integrated Object mode.

- **Performance Monitoring**
- **Integrated Configuration Objects via Directory API**
- **Message persistence after mapping (optional)**
- **Content Based Routing**
- **Condition in interface determination**
- **Split of any kind (Split-Mapping, multiple receivers)**
- **Multimessage-Mapping/Enhanced Interface Determination**
- **Extended Receiver Determination**
- **IDoc-Adapter/WS-RM Adapter**
- **Improvements of cache mechanism for full cache refresh and mapping cache**
- **Adjustment of Sizing Guide/Quicksizer (planned for URS PI 7.1)**

Important Remark: Subject to change at any time without prior and further notice!!!

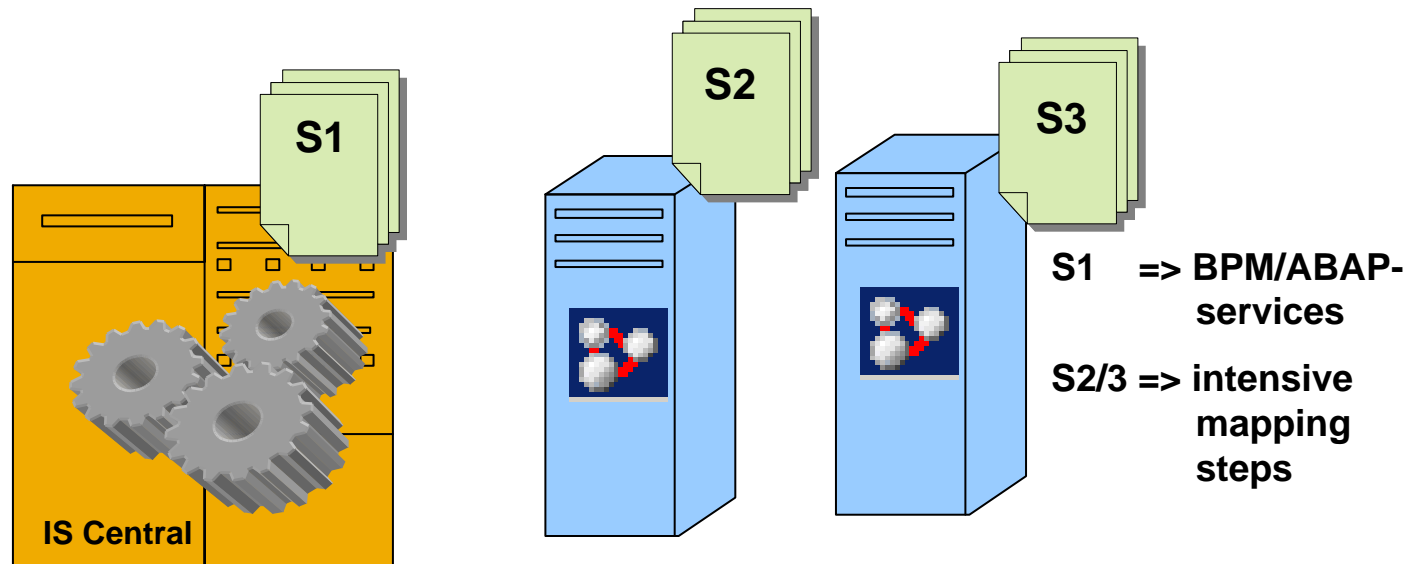


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# Scenario 1 – Performance and Resource Consumption

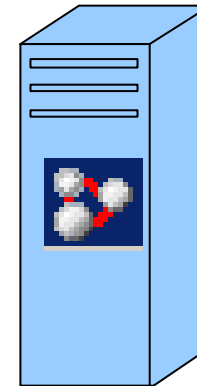
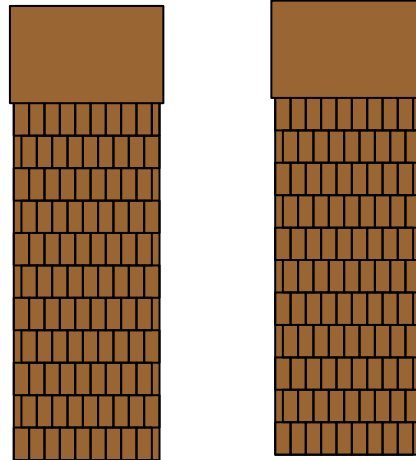
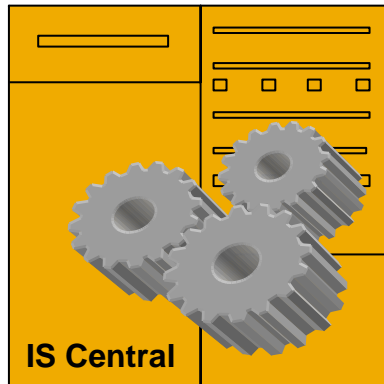


- + Lower processing times, Speed (improved response times), less latency, increased throughput
- + Better support for synchronous scenarios
- + Flexibility in distributing pipeline resources (scenario outsourcing)
- + Dedicated AAE for scenarios with high throughput requirements

**S = Scenario**



**Need for decentral Adapter Engine and limited network capacities or firewall restrictions**



**S1 => BPM/ABAP-services**

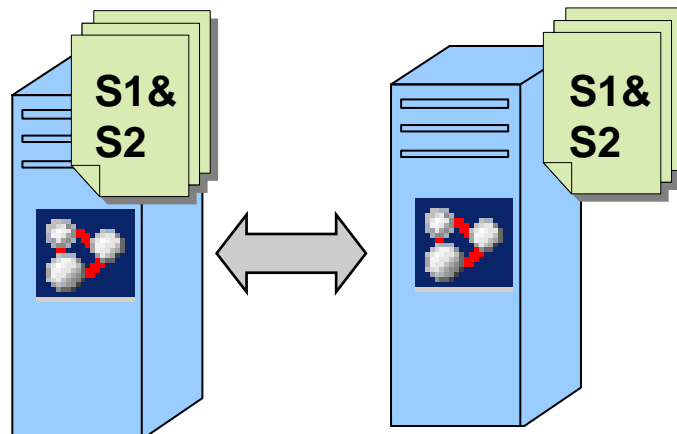
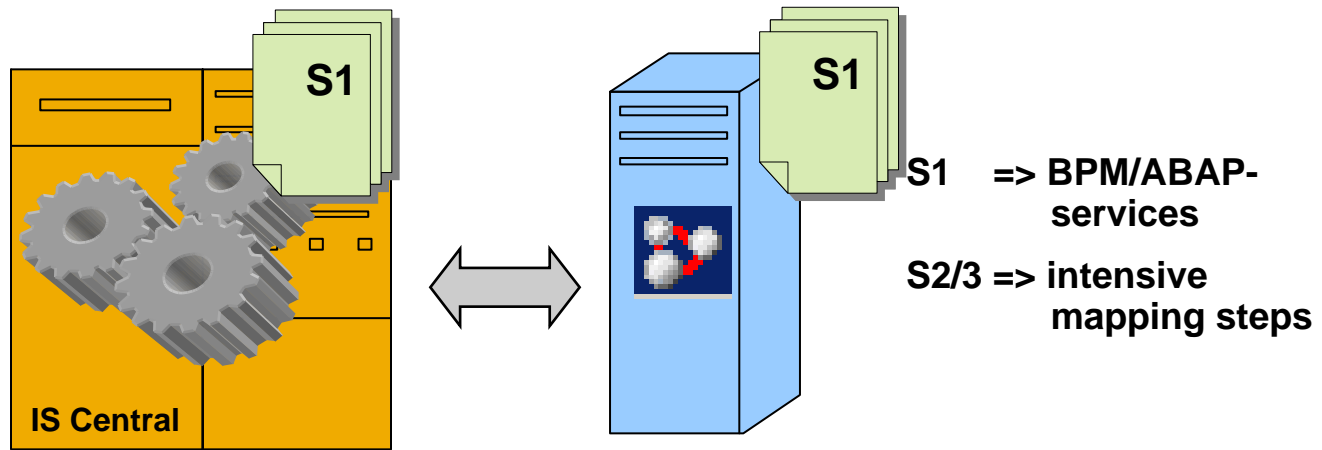
**S2/3 => intensive mapping steps**

**+ Less communication overhead**

**+ Large payloads are not transferred across different network domains**

**S = Scenario**

# Scenario 3 – Connect to IS, PCK, Proxy, AAE Natively



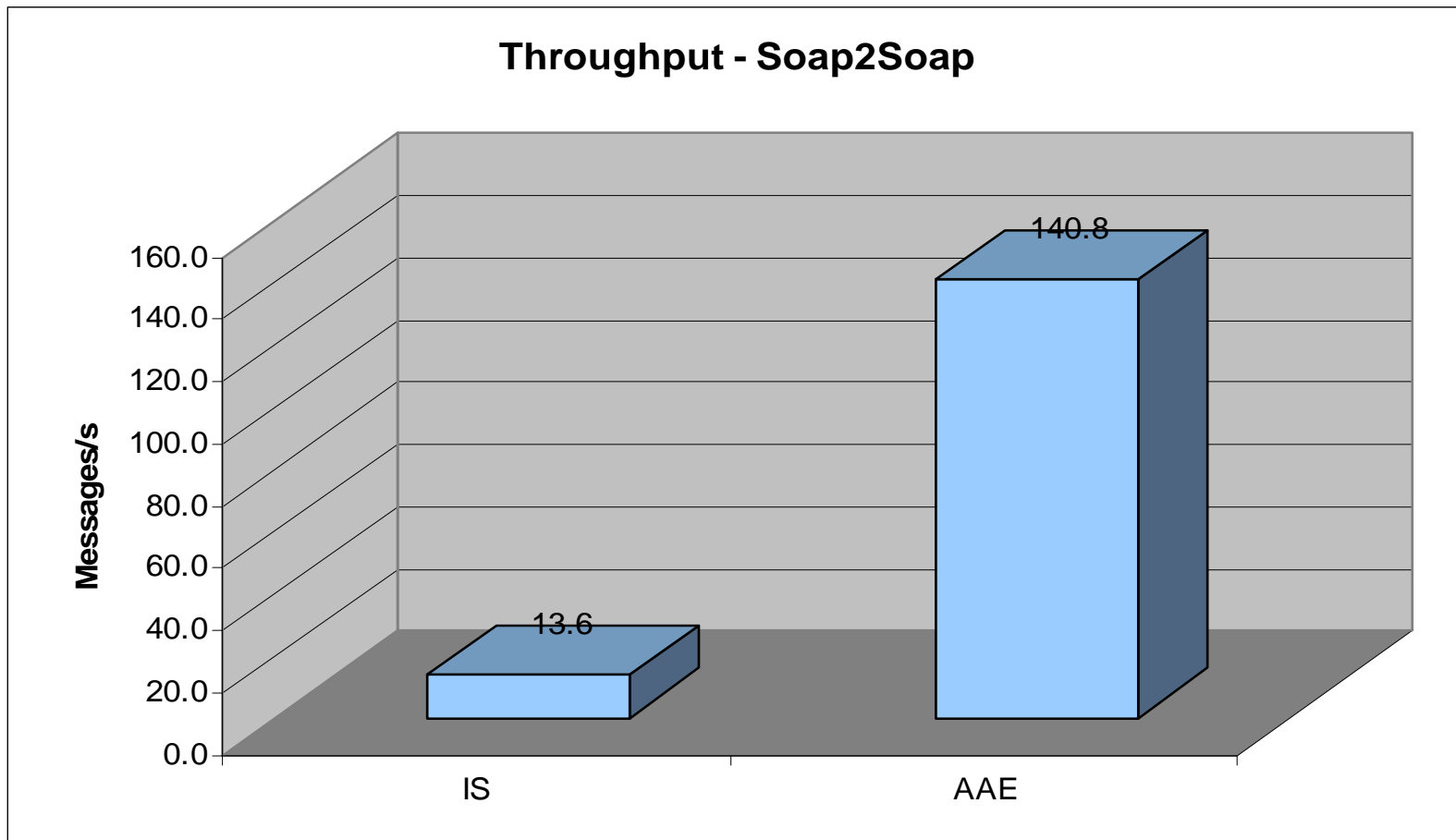
- No XI-Protocol or WS-RM
- No PCK-replacement

S = Scenario

# Agenda



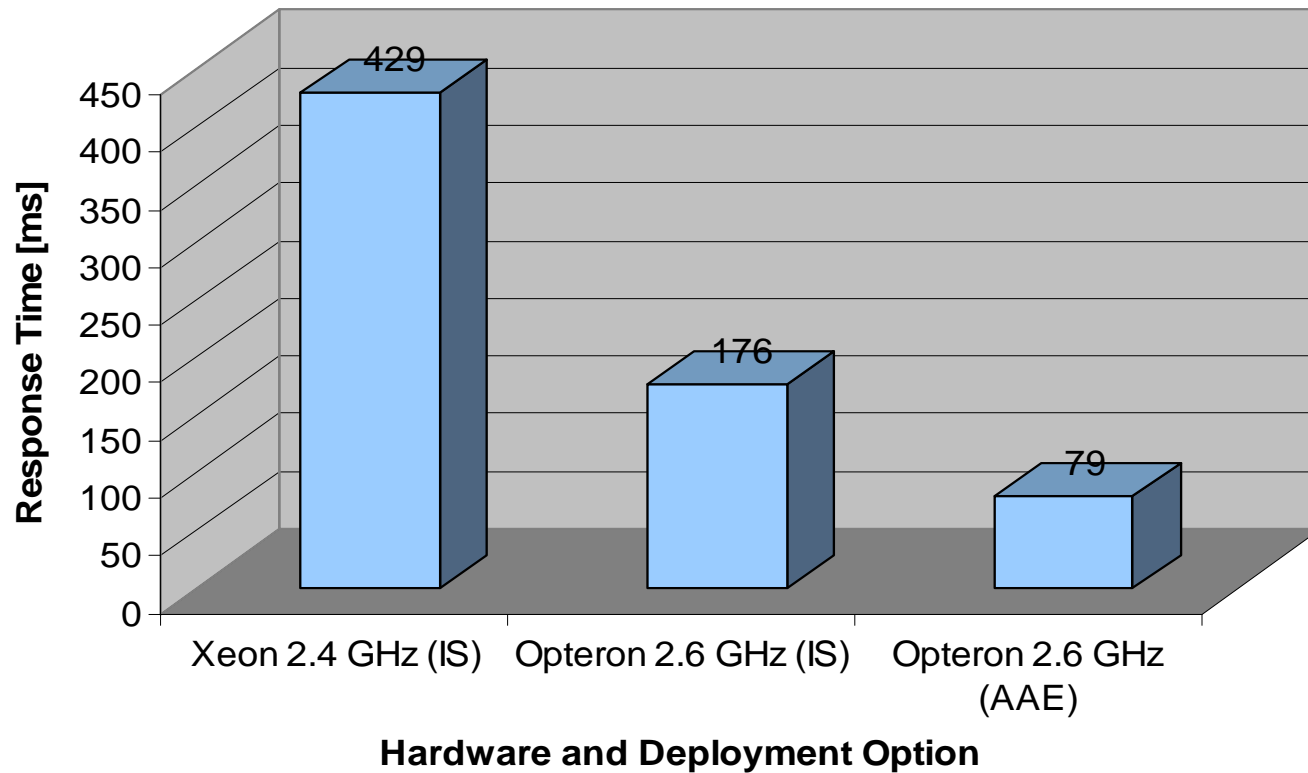
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- System: 4 x Opteron 2.6 GHz
- Scenario without Mapping and without Packaging for IS; Mapping reduces comparison factor from 10 to 7-8
- Audit Log Memory Cache enabled for AAE processing

# Synchronous Processing Response Times - Examples

## Response Time Comparison - Soap2Soap



- Response times depend on backend service performance, additional used PI services (e.g. content-based routing, mapping) and underlying hardware
- Advanced Adapter Engine local processing can reduce response times to <100 ms

- The Advanced Adapter Engine also allows for end-to-end message processing **without invoking the central ABAP-based pipeline of the Integration Server**
- If local processing is configured, several communication calls and persistency steps can be eliminated
- **Reduces resource consumption and latency and increases message throughput**
- **Flexibility** to deploy and run complete message broker scenarios on individual instances (decentral AAE); therefore improved scalability for large volumes by using autonomous processing units





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