How to Deploy SAP NetWeaver

Deployment Recommendations for SAP NetWeaver 7.0/7.1
- Service Oriented Architecture: PI, ESR, SR -

Dirk Anthony, SAP NetWeaver Solution Management

February 2009

Approved by SAP System Landscape Governance Board
Disclaimer

This presentation outlines our general product direction and should not be relied on in making a purchase decision. This presentation is not subject to your license agreement or any other agreement with SAP. SAP has no obligation to pursue any course of business outlined in this presentation or to develop or release any functionality mentioned in this presentation. This presentation and SAP's strategy and possible future developments are subject to change and may be changed by SAP at any time for any reason without notice. This document is provided without a warranty of any kind, either express or implied, including but not limited to, the implied warranties of merchantability, fitness for a particular purpose, or non-infringement. SAP assumes no responsibility for errors or omissions in this document, except if such damages were caused by SAP intentionally or grossly negligent.
The following table provides an overview on the most important document changes:

<table>
<thead>
<tr>
<th>Version</th>
<th>Date</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.00</td>
<td>2009-02-27</td>
<td>Initial Version</td>
</tr>
</tbody>
</table>

1. **Baseline**

2. Deployment of SAP Service Oriented Architecture offerings
   2.1. Enterprise Service Repository (ESR) & Services Registry (SR)
   2.2. Process Integration (PI)

3. Deployment of System Landscape Directory (SLD)
Introduction: Evolution Of SAP Architecture

Evolution Of SAP Architecture Technology Application

SAP R/3 up to 4.6C

Industry Sol.

SAP Basis

Application

SAP R/3 Enterprise

Enterprise Solution

SAP Web Application Server 6.20

mySAP ERP 2004

Self-Services

Internet Sales

Composite Applications

Strategic Enterprise Management

and more …

Industry Solutions

Enterprise Extensions

SAP ECC Core (5.0)

SAP NetWeaver 2004

people integration

Multi Channel Access

Portal

Communication

information integration

Bus. Intelligence

Knowledge Mgmt

Master Data Mgmt

process integration

Integration

Broker

Business

Process Mgmt

application server (6.40)

J2EE

ABAP

DB and OS Abstraction

SAP ERP 6.0

Supplier Relationship Management

Self-Services

Internet Sales

Composite Applications

Strategic Enterprise Management

and more …

Industry Solutions

Enterprise Extensions

SAP ECC Core (6.0)

SAP NetWeaver 2004

people integration

Multi Channel Access

Portal

Communication

information integration

Bus. Intelligence

Knowledge Mgmt

Master Data Mgmt

process integration

Integration

Broker

Business

Process Mgmt

application server (6.40)

J2EE

ABAP

DB and OS Abstraction

SAP ERP 6.0 EHP 2

EHP 3

and more …

Industry Solutions

Enterprise Extensions

SAP ECC Core (6.0)

SAP NetWeaver 7.0

people integration

Multi Channel Access

Portal

Communication

information integration

Bus. Intelligence

Knowledge Mgmt

Master Data Mgmt

process integration

Integration

Broker

Business

Process Mgmt

application server (7.00)

J2EE

ABAP

ITS

DB and OS Abstraction

SAP NetWeaver 7.0
The Big Picture: SAP Business Suite 7 and SAP NetWeaver

Accelerated Innovation
Composite Applications
SAP NetWeaver PI 7.1 ... 

Continuous Innovation
SAP NetWeaver 7.0 (foundation for the SAP Business Suite)

Non-SAP
ERP

CRM
SCM
SRM
PLM

How can different innovation cycles be reflected?

How to deploy SAP NetWeaver and SAP Business Suite within the system landscape?
How To Design the Best Landscape Layout – How SAP Will Support

Determine the strategic direction

Communication of product roadmaps

Consider general recommendations

Categorization of deployment options

Assess the individual situation

Landscape papers in certain areas for detailed aspects

Derive the appropriate landscape layout
Ease Landscape Setups By Stronger Guidance

Clear recommendations by categorization of deployment options

**Possible Exception**
- Only useful for specific use cases
- Supported by SAP, but limitations might occur

**Reasonable Alternative**
- Useful choice for certain use cases or customer scenarios
- Supported and confirmed by SAP’s strategy

**General Recommendation**
- Best choice for majority of typical landscape use cases
- Recommended by SAP’s strategy
- Accepted by a wide base of customers

**Goal**
- Outlining main important aspects to be considered
- Best considered trade-off between flexibility and simplicity
- Applied to main building blocks of SAP products

**Consider**
- Alternative deployment options might have different benefits
- Customer individual assessment not be compensated
Definition for Dual Stack:

SAP system that contains installations of both Application Server ABAP and Application Server Java

A dual-stack system has the following characteristics:
- Common SID for all application servers and the database
- Common startup framework
- Common database (with different schemas for ABAP and Java)

Examples:

**ABAP single stack**
- ERP
- ECC
- ABAP

**JAVA single stack**
- Portal
  - EP
  - EP-C
  - Java

**Mandatory Dual stack**
- Process Integration
- PI

**Optional Dual stack**
- Business Warehouse
  - BI
  - ABAP
- BEx Web
  - BI Java
  - EP
  - Java

**Legende**
- capability based on ABAP
- capability based on JAVA
- capability based on ABAP & JAVA
- Single system (SID)
General Recommendation

- Separated Single Stack Systems

Reasonable Alternative

- Mandatory Dual Stack System

Possible Exception

- Optional Dual Stack System

Generic Use Case
- ABAP and JAVA based capabilities are deployed on single stack systems

Approach
- In general install ABAP + Java stacks in separate systems (where offered by SAP)

Benefit
- Separation of duties
- Independent scalability & performance
- Optimal resource consumption
- Maintenance downtime only for used stack

Considerations
- Additional technical system to be administrated
- Additional <SID> appears in the landscape

Generic Use Cases
- SAP NetWeaver capabilities require explicitly a dual stack installation (like PI today)
- SAP Solution Manager

Approach
- Install a dual stack where this is required by the application or related capability

Benefits
- Direct support by the installation procedure
- Automated connectivity

Considerations
- Deployment layout might be changed to single stack by SAP with the next release

* Starting with SAP NetWeaver Mobile 7.1 a dual stack is no longer required

Generic Use Case
- In individual cases only, dual stack systems might still be a valid solution (e.g. BI and Bex Web scenario)

Approach
- Install ABAP and JAVA stack in the same system

Benefit
- Setup and configuration effort only for one system
- Administration and software maintenance effort only for one system

Considerations
- No need to change existing systems today, dual stack systems will still be supported
- Installation options will be limited
Consistent Deployment Recommendations:
One central activity of the SAP System Landscape Governance Board to reduce complexity for customers

Challenges in Customer Solution Landscapes

- Solution landscapes evolve in different speeds
  - Different release frequency for SAP NetWeaver and SAP Business Suite systems
  - Maintenance of the complete landscape at once not manageable

- Efficient solution landscape layouts
  - Shared service hubs to ease governance
  - Shared technology infrastructure to reduce costs
  - Automated connectivity between systems

- Life-cycle Management of complete business solutions
  - Connect Business and IT
  - E2E view on lifecycle management processes
  - Central administration environment

Landscape Governance

1. Define Reference Landscapes
2. Ensure Interoperability
3. Consistent Recommendations
4. Ease Connectivity
5. Integrated Solution Manager Platform
Scope of Deployment Recommendations

Assumptions

- High-level deployment recommendation to provide an easy and quick overview
- Consistent recommendations for the complete reference landscape approved by SAP System Landscape Governance Board
- Differentiation between development, test and production landscape so far not covered
- No detailed description of concrete configuration steps
- Customer individual assessment will not be compensated, especially individual data volume and sizing still have to be evaluated
Provide Recommendations and Further Details at One Central Place

We are going to provide a central access to relevant information and recommendations regarding deployment options for SAP NetWeaver: https://www.sdn.sap.com/irj/sdn/landscapedesign section Distribution Models
1. Baseline

2. Deployment of SAP Service Oriented Architecture offerings
   2.1. Enterprise Service Repository (ESR) & Services Registry (SR)
   2.2. Process Integration (PI)

3. Deployment of System Landscape Directory (SLD)
Deployment recommendations based on following different use cases

- **Process Integration (PI) only Landscape**
  - Integration Centric Scenarios

- **Composition Environment (CE) only Landscape**
  - Simplified Composition

- **Combined Usage (PI and CE)**
  - Service Enabling Legacy
  - SOA backbone
General Recomendation (integration centric scenarios)

- Shared usage of a central Enterprise Services Repository & Services Registry within the application solution landscape
- When focusing on A2A integration, connection to B2B networks or service provisioning and mediated message based communication use ESR & SR as part of SAP NetWeaver PI 7.1
- Avoid setup of additional ESR systems in the same solution landscape

Use Cases

- A2A integration or connection to B2B networks by packaged integration
- Design governance and service provisioning and mediated message based communications

Benefits

- Central governance for service design & definition and central overview of published services
- Reduced landscape complexity
- Automated deployment of ESR & SR within PI
- Latest features of the Enterprise services repository can directly be leveraged by PI (same release)

Considerations

- Requires SAP NetWeaver PI 7.1 to get complete ESR & SR functionality
- Innovation speed of ESR & SR and PI have to be synchronized
Possible Exception (integration centric scenarios)

- Separation of local business units by multiple PI systems
- When focusing on A2A integration, connection to B2B networks or service provisioning and mediated message based communication use ESR & SR as part of SAP NetWeaver PI 7.1
- Multiple ESR systems triggered by complex PI landscape
- Use only one central SR within the leading PI system

Use Case

- Integration centric scenarios with multiple PI systems for local business units

Benefits

- Separation of PI systems due to organizational responsibilities
- Local development and service design

Considerations

- Design governance becomes more complicated (should be mitigated by determining one organizational leading PI)
- Use one central SR within the leading PI (should also contain the runtime SLD)
- ESR can not be connected to multiple PI systems (only one PI connection can be maintained within ESR)
- No automatic federation between different ESRs, content has to be synchronized manually by transports; no back transports from PI 7.1 to PI 7.0 supported
- Each application system can only be connected to one single PI/ESR

* => SAP NetWeaver PI 7.1

CTS+ helps to support complex transport routes
Deployment recommendations based on following different use cases

- **Process Integration (PI) only Landscape**
  - Integration Centric Scenarios

- **Composition Environment (CE) only Landscape**
  - Simplified Composition

- **Combined Usage (PI and CE)**
  - Service Enabling Legacy
  - SOA backbone
General Deployment of Enterprise Services Repository – CE-only Landscape

**General Recommendation (simplified composition)**

- Shared usage of a central Enterprise Services Repository & Services Registry within the application solution landscape
- When focusing on pure consumption of services provided by SAP’s application system or NON-SAP services use ESR & SR as part of SAP NetWeaver Composition Environment 7.1
- Avoid setup of additional ESR systems in the same solution landscape

**Use Case**

- Service provisioning with focus on pure consumption of SAP or NON-SAP services

**Benefits**

- Central governance for service design & definition and central overview of published services
- Reduced landscape complexity
- Easy deployment of ESR & SR within CE
- Latest features of the Enterprise services repository can directly be leveraged by CE (same release)

**Considerations**

- Innovation speed of ESR and CE have to be synchronized
General Deployment of Enterprise Services Repository – CE-only Landscape

**Reasonable Alternative (simplified composition)**

- Shared usage of a central Enterprise Services Repository & Services Registry within the application solution landscape
- When focusing on pure consumption of services provided by SAP’s application system or NON-SAP services use ESR & SR as part of SAP NetWeaver Composition Environment 7.1
- Use only one central SR to provide consumption of services across business units

**Use Case**

- Consumption of SAP or NON-SAP services within local business units
- Central service governance

**Benefits**

- Local composition for different business units
- Central service design and governance
- Central overview of published services*
- Services can be consumed across business units

**Considerations**

- Application systems can only publish services to one SR
- Application systems can only be connected to one ESR

* security improvements planned for upcoming releases to provide different usage profiles within central SR
Deployment of Enterprise Services Repository and Services Registry

Deployment recommendations based on following different use cases

- **Process Integration (PI) only Landscape**
  - Integration Centric Scenarios

- **Composition Environment (CE) only Landscape**
  - Simplified Composition

- **Combined Usage (PI and CE)**
  - Service Enabling Legacy
  - SOA backbone
**General Recommendation (service enabling legacy)**

- Shared usage of a central Enterprise Services Repository & Services Registry within the application solution landscape
- When focusing on service consumption including non-service enabled legacy systems, use ESR & SR as part of SAP NetWeaver PI 7.1
- Avoid setup of additional ESR and SR systems in the same solution landscape

**Use Cases**

- Consumption of SAP or NON-SAP services
- Service enabling of legacy applications

**Benefits**

- Easy integration of non-WS based legacy systems
- Pre-delivered adapters to expose legacy systems as web services
- Central definition of service interfaces by using Global Data Types in the Enterprise Services Repository
- Easy future scale-out to SOA backbone use cases

**Considerations**

- Requires SAP NetWeaver PI 7.1 to get complete ESR functionality
- Innovation speed of ESR and PI have to be synchronized
- Avoid using SR in CE

© SAP 2008 / Deployment Recommendations for SOA (PI, ESR) / Page 22
Possible Exception (service enabling legacy)

- Shared usage of a central Enterprise Services Repository & Services Registry within the application solution landscape
- When focusing on service consumption including non-service enabled legacy systems use ESR & SR as part of SAP NetWeaver CE 7.1 since PI 7.0 does not cover ESR functionality
- Avoid setup of additional ESR and SR systems in the same solution landscape

Use Cases

- Consumption of SAP or NON-SAP services
- Service enabling of legacy applications with existing PI 7.0

Benefits

- First step into service consumption without upgrade to PI 7.1
- Integration of non-WS based legacy systems
- Pre-delivered adapters to expose legacy systems as web services

Considerations

- Reduced ESR capabilities for PI scenarios (no use of GDTs, only one operation defined for interfaces)
- No direct integration of PI (containing the integration directory) with central ESR
- Upgrade to PI 7.1 might require a transition of ESR&SR from CE to PI
- Innovation speed of ESR and CE have to be synchronized
**Reasonable Alternative (SOA backbone)**

- Shared usage of a central Enterprise Services Repository & Services Registry within the application solution landscape
- Support a company wide SOA backbone with local business unit driven composition by using ESR & SR as part of SAP NetWeaver PI 7.1
- Avoid setup of additional ESR and SR systems in the same solution landscape

**Use Case**

- Central definition & mediation with local composition (SOA backbone)

**Benefits**

- Separation of local compositions based on different business units
- Central service design and governance
- Central overview of published services
- Central A2A or B2B integration and mediated communication

**Considerations**

- Application systems can only be connected to one ESR and publish service to one SR
- Automatic federation of local SRs in the CE systems to a central SR not supported today
1. Baseline

2. Deployment of SAP Service Oriented Architecture offerings
   2.1. Enterprise Service Repository (ESR) & Services Registry (SR)
   2.2. Process Integration (PI)

3. Deployment of System Landscape Directory (SLD)
**General Deployment of SAP NetWeaver Process Integration**

**General Recommendation (Single PI)**
- Shared usage of SAP NetWeaver Process Integration for A2A or B2B scenarios as well as service enabling of the SAP Business Suite application systems
- SAP NetWeaver Process Integration is deployed as a central, separate system to support different innovation speed and simplified landscape setups
- Avoid embedded deployment of SAP NetWeaver Process Integration within the application system

**Use Cases**
- Integration of A2A or B2B processes between SAP and Non-SAP systems
- Service enablement of SAP and Non-SAP systems

**Benefits**
- Less complexity of system landscape
- Central governance for meta data
- Less effort by central maintaining of data for routing, mapping, connectivity, ccBPM, etc.
- Central responsibility for monitoring of services and processes
- Support of high volume scenarios, simplified modeling and configuration, enhanced standard support with SAP NetWeaver PI 7.1
**Possible Exception (Multiple PI)**

- Separation of local business units by multiple PI systems
- SAP NetWeaver Process Integration is deployed separately from the application systems for different innovation speed
- Avoid embedded deployment of SAP NetWeaver Process Integration within the application system

**Use Cases**

- Local integration of A2A or B2B processes between SAP and Non-SAP systems
- Service enablement of SAP and Non-SAP systems

**Benefits**

- Separation of PI systems due to organizational responsibilities
- Local development and service design

**Considerations**

- Governance for meta data becomes more complicated
- No automatic federation between different PI systems (content has to be synchronized manually by transports*)
- Each application system can only be connected to one single PI
- More complex landscape

*CTS+ helps to support complex transport routes
1. Baseline

2. Deployment of SAP Service Oriented Architecture offerings
   2.1. Enterprise Service Repository (ESR) & Services Registry (SR)
   2.2. Process Integration (PI)

3. Deployment of System Landscape Directory (SLD)
General Deployment of **System Landscape Directory** and the SAP Business Suite

**General Recommendation**
- Shared usage of System Landscape Directory (SLD) to provide a central access for all SLD clients
- Data suppliers (ABAP and JAVA based systems) report to central SLD
- SLD is deployed in the central SAP Solution Manager system to simplify landscape setups

**Use Cases**
- Central storage of information about all systems belonging to the solution landscape

**Benefits**
- Easy setup (one SLD setup for all systems)
- Low operation effort
- No redundancy
- Consistent foundation for all systems belonging to the landscape

**Considerations**
- Higher demand on SLD regarding availability and stability
- Not applicable, if runtime dependencies to SLD for certain applications exist (e.g. SAP NetWeaver PI, ESS scenario)
- Data of all systems visible/accessible
General Recommendation (addition)

- Extension of generic approach – setup of additional local SLDs to improve availability of SLD data for certain use cases
- If customer uses SAP NetWeaver PI or Web Dynpro Java, a local runtime SLD is required in addition to the central SLD in SAP Solution Manager system

Use Cases

- Central storage of information about all systems belonging to the solution landscape
- Setup of additional SLDs to compensate SLD runtime dependencies (such as for Web Dynpro Java applications using aRFC or for PI)

Benefits

- Increased availability for critical use case at low expense for additional operation effort + cost
- Clear separation between management system + managed systems possible with central SLD in SAP Solution Manager

Considerations

- Data consistency has to be ensured (data synchronization between different SLDs have to be configured)
- SLD runtime dependency for PI is planned to be removed with SAP NetWeaver 7.20
- Web Dynpro dependency is planned to be removed after complete migration from aRFC to aRFC2
Feedback

Dirk Anthony
Product Strategist
SAP NetWeaver Solution Management

SAP AG
Dietmar-Hopp-Allee 16
69190 Walldorf
Germany

Phone  +49/6227/765224
Fax    +49/6227/78-19164
E-Mail dirk.anthony@sap.com