

SAP NetWeaver Know-How Network Conference Call

Backup & Restore of Web AS 6.40 Java

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Introduction and Overview

B&R of SAP NetWeaver 04 Java Components

B&R of SAP NetWeaver 04 Landscape

Restore of SAP NetWeaver 04 Java Components

Backup of Oracle 9.2i: Using the BR-Tools

Additional Information Resources

Q & A

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Introduction: Focus of this KHNC Webinar

This presentation will describe the general ideas of Backup & Restore concepts for a distributed system environment.

It provides the information needed to set up a Backup & Restore strategy for an implementation of the Enterprise Portal 6.0 and KMC on Web AS 6.40 Java.

Out of scope:

- **Backup applications running on the ABAP-Stack of SAP NetWeaver 04**
- **Backup of Java based components like XI, BI or other applications running of WebAS 6.40 Java**
- **Backup of TREX: For additional information on how to perform online backup of TREX, see SAP Note number 666279. For information on how to perform an offline backup of TREX, see SAP Note number 639053.**
- **Backup of systems, integrated into the Enterprise Portal**
- **Backup of customer specific components**

Preface to Backup & Restore (1)

Backup refers to the activity of copying files and data with the intention of preserving them for later use (e.g. in case of hardware failure or other disaster).

When you retrieve files that have been backed up earlier, you are restoring them.

Preface to Backup & Restore (2)

Criteria to evaluate the quality of a Backup & Restore strategy:

- **Minimize Data Loss and Data Inconsistencies: A system backup must ensure a system recovery to a certain point in time, e.g. a crash.**
 - ◆ Is data loss acceptable? To which degree? Can data be recovered from data in other systems?
 - ◆ Which kind of data can be inconsistent? Can operation continue with partly inconsistent data?
- **Backup Runtime And Speed Of The Restore: A fast backup can reduce the impact on production.**
 - ◆ According to Service Level Agreements (SLA), the implementation of special solutions, e.g. mirror disks, might be required.
 - ◆ The restore process must usually meet some kind of agreement that regulates system availability.

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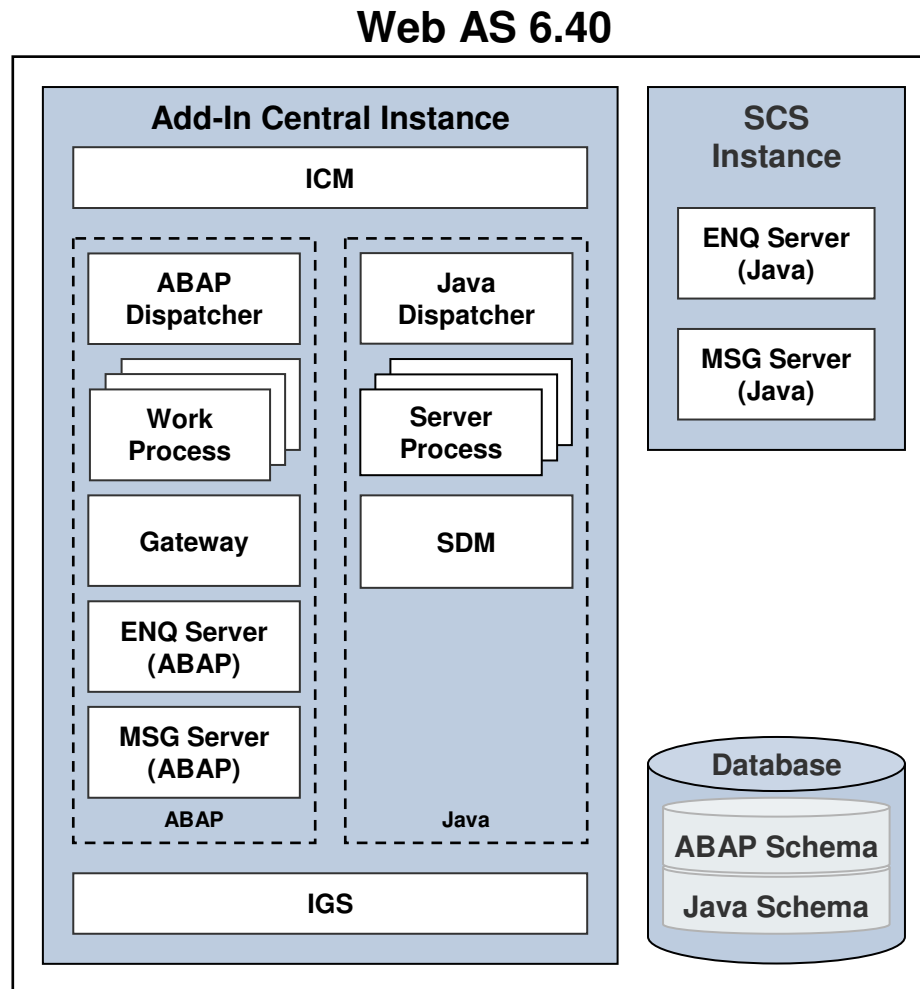
Q & A

Necessary considerations for SAP NetWeaver 04 Java components for design of a backup & restore strategy are:

- **Which system components and which data need to be backed up?**
- **Which backup methods shall be used (online/offline) depending on the data storage type (file system, database)?**
- **Is a consistent system landscape backup necessary? In which situations is a system landscape backup necessary?**

Architectural Overview Web AS 6.40 (Add-In Installation)

Which system components and which data need to be backed up?



Components

- Internet Communication Manager
- ABAP Instance
- Database Instance
- SCS Instance
- SAP J2EE Engine 6.40
- IGS (Internet Graphics Server)
- Monitoring Tools (SAPCCMSR and SAPOsCol)

Architectural Overview Web AS 6.40 (Java only Installation)

Which system components and which data need to be backed up?

Central Java Instance:

- **Java Dispatcher**
 - ◆ Receives client requests and forwards them to the server processes accordingly
- **Java Server Processes**
 - ◆ Actually process the requests
 - ◆ Server processes hold the session data

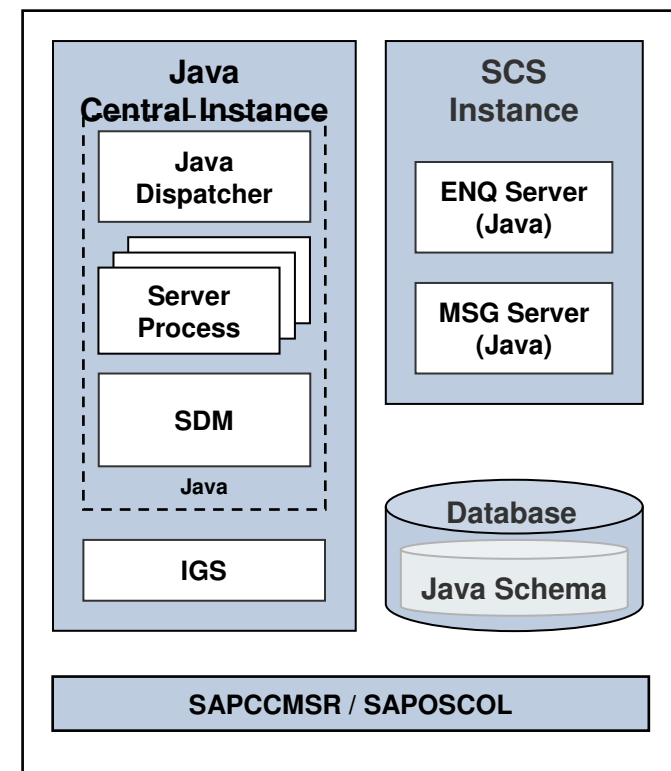
Central Services Instance:

- **Java Enqueue Service**
 - ◆ Manages logical locks
 - ◆ Ensure server synchronization
- **Java Message Service**
 - ◆ Central service for cluster internal communication, like event notifications, broadcasts, exchange of cache content, etc.
 - ◆ Provides cluster state information to SAP Web Dispatcher

Database Instance

Monitoring Tools (SAPCCMSR and SAPOsCol)

Web AS 6.40 Java



System Components to be backed up (1)

Which system components and which data need to be backed up?

System Component	Type of data	Storage of data
Web AS 6.40 Java Cluster (Startup Framework, SCS instance, Central Instance and any Dialog Instance)	Configuration Data & Software	Filesystem and Database
Software Deployment Manager (SDM)	Application Data	Filesystem
Internet Graphics Server (IGS)	Configuration Data	Filesystem
SAPCCMSR Agent SAPOSCol Agent	Configuration Data	Filesystem and Database
RDBMS Instance	Configuration Data & Software	Filesystem and Database

System Components to be backed up (2)

Which system components and which data need to be backed up?

System Component	Type of data	Storage of data
Enterprise Portal 6.0 (as application deployed on Web AS 6.40 Java cluster)	Configuration Data Software Application Data	Database and Filesystem
Content Management & Collaboration (as application deployed on Web AS 6.40 Java cluster)	Configuration Data Software Application Data	Database and Filesystem Depending on configuration: external systems (filesystem, database)
User Management Persistence	Application Data	Database Depending on configuration: external systems (LDAP servers, database)
TREX (as standalone application)	Configuration Data Software Application Data	

Supported Backup Methods by SAP NetWeaver 04

Which backup methods shall be used (online/offline) depending on the data storage type (File system, Database)?

Starting with SAP NetWeaver `04 SP Stack 10, online backup & restore is officially supported for all SAP NetWeaver components.

If you keep data outside the WebAS database, you must back up this data separately. This is for instance the case for repositories connected to KM, for TREN indices, for LDAP data, etc.

Please refer to <http://help.sap.com> > Documentation > SAP NetWeaver 04 > SAP NetWeaver Technical Operations Manual > SAP NetWeaver Administration (Java) > Backup and Restore.



Online Backup means: All components, which need to be backed up, are up and running. No downtime is required!

Offline Backup means: All components, which need to be backup, are shut down. Downtime necessary – availability of components is reduced!

ONLINE Backup of EP 6.0 – 6.20 vs. 6.40

Web AS 6.20 and EP 6.0 on 6.20

SAP NetWeaver 04 Java



Problem: J2EE engine of Web AS 6.20 writes data into various locations: FS and DB.

Restriction: For the consistent restore, Database and File system must be at the same state



Solved with Web AS 6.30/
6.40

SP Stack 3+



Problem: Not all complex write operations to the persistence (like DB) of some web applications have top level 'enclosing transactions'.

Restriction: A short period of inactivity of end users should be scheduled to reduce the probability of inconsistencies



Solved with EP 6.0 on 6.40

SP Stack 10+

Starting with the SPS 10 of SAP NetWeaver 04
ONLINE Backup is supported by SAP **without restrictions!**

Backup Methods - data storage in SAP NW 04 Java

Which backup methods shall be used (online/offline) depending on the data storage type (File system, Database)?

Data of Web AS 6.40 Java Cluster and deployed applications (EP, KMC) is stored in DB.

Essential data to start, stop, run and monitor the Web AS 6.40 Java cluster is stored on the file system.



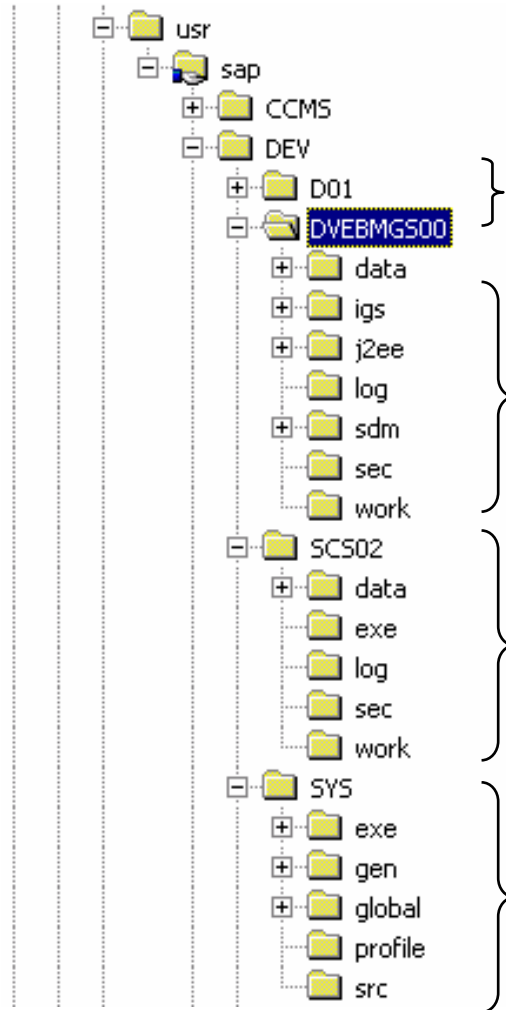
Online backup of the Web AS 6.40 database and file system is possible.

The database is the primary persistence for data storage.

Parts of the file system are synchronized with the DB upon any Java system restart.

Web AS 6.40 AddIn Installation - J2EE Instance on FS

Web AS 6.40 Java AddIn - Which directories need to be backed up?



Additional Instance: ABAP & Java instance

Central Instance: ABAP & Java instance;

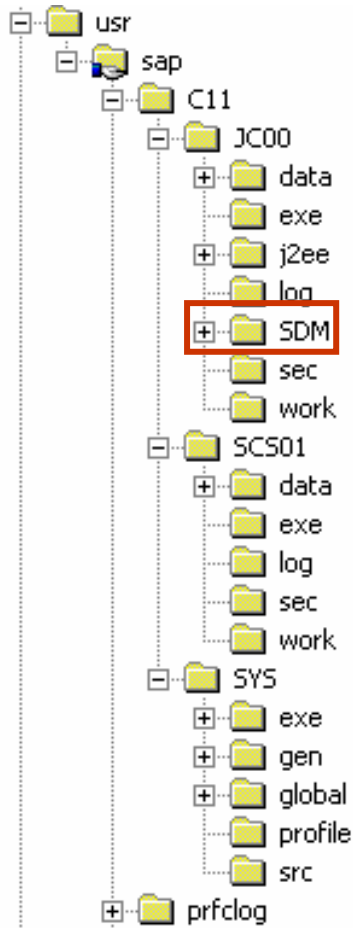
Central Services Instance

/usr/sap/<sid>/SYS:

Storage of executables, profiles, configuration files of the Web AS 6.40 system

Web AS 6.40 Java Only - J2EE Instance on FS

Web AS 6.40 Java Only - Which directories need to be backed up?



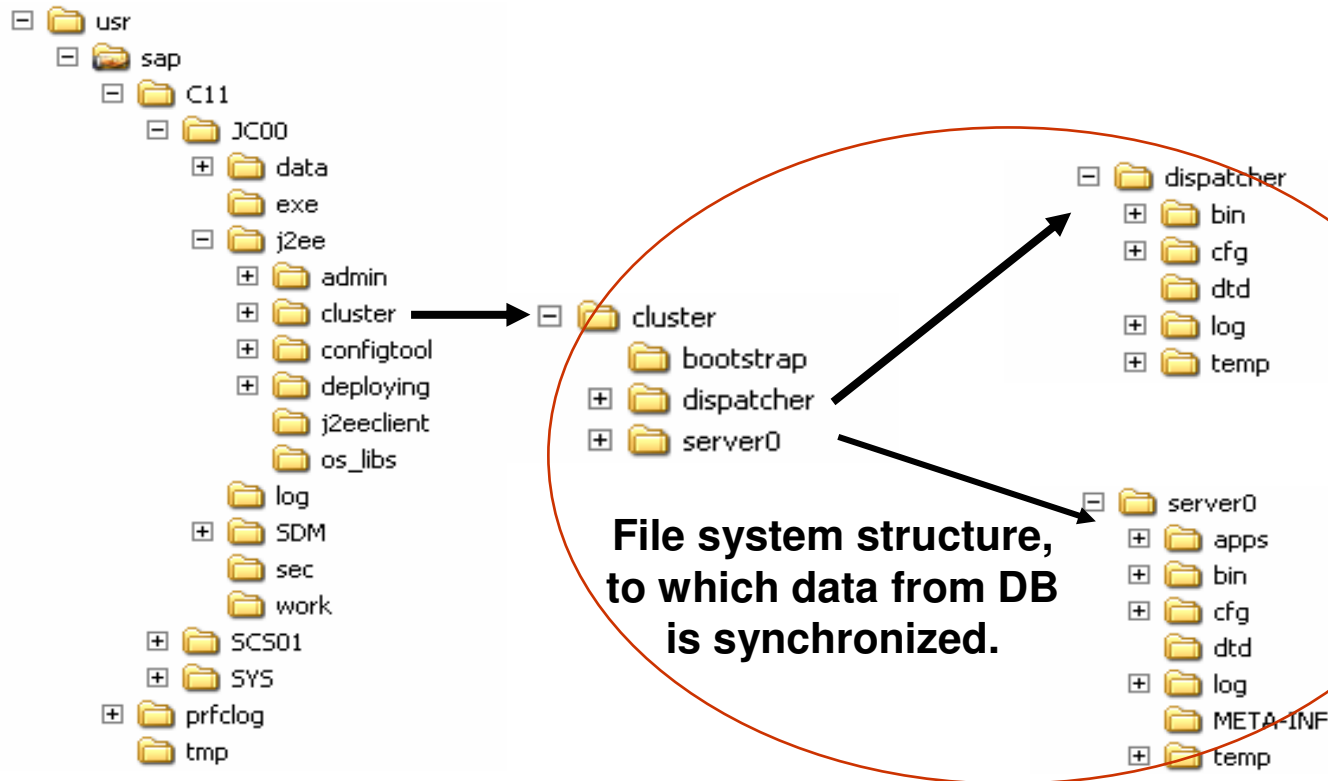
**Java Central Instance including SDM directories:
Solution Deployment Manager keeps information
about deployments in the filesystem**

System Central Services Instance

**/usr/sap/<sid>/SYS:
Storage of executables, profiles,
configuration files for the J2EE engine**

Web AS 6.40 - Directory Structure of J2EE Instance

Which directories need to be backed up (2)?



The Bootstrap JAVA program synchronizes the binary data from the Java database with the local file system and creates a property file, which describes the processes of the Java instance.

Data consistency between DB and FS is guaranteed by the bootstrapping!

Backup Methods - data storage in SAP NW 04 Java

Which backup methods shall be used (online/offline) depending on the data storage type (File system, Database)?

The SDM (Software Deployment Manager) writes information about deployments into the file system.

In your backup routine, include a backup of SDM directories, stored on FS

- `/usr/sap/<sid>/<instance_00>/SDM`

This data changes upon any software deployment done via SDM and SAPInst.

During any software deployment via SDM and SAPInst, files can be opened. Thus, it is recommended to backup `/usr/sap/<sid>/<instance_00>/SDM`, while no deployments are proceeded (e.g. when SDM is stopped).

Backup Methods - data storage in SAP NW 04 Java

Which backup methods shall be used (online/offline) depending on the data storage type (File system, Database)?

Data of the EP 6.0 and KMC is partially stored on the file system:

- Configuration and Software Data in `/usr/sap/<sid>/SYS/global/*`
 - ◆ Configuration files like PCD and CM property files
 - ◆ Libraries, jar-files,
- Application Data in `/usr/sap/<sid>/SYS/global/*`
 - ◆ Transport Packages of EP Content in `/usr/sap/<sid>/SYS/global`
 - ◆ Data of XML Forms Builder in `/usr/sap/<sid>/SYS/global/config/cm/etc`



Configuration/ Software Data of EP 6.0 and KMC is stored on FS.
Online Backup is possible as files are only read by the applications!

Creating transport packages and defining XML forms builder projects will perform write operations to FS. During online backup, loss of data might therefore be possible! But:

- This is administrator activity only!
- Transport packages are reproducible!

Backup Methods - data storage in SAP NW 04 Java

Include a regular DB backup into your backup routine!

Include a regular FS backup into your backup routine, e.g. after applying hotfixes, patches or service packs!

- **UNIX: /usr/sap/<sid>/***
- **UNIX: /sapmnt/<sid>/***
- **Windows: \usr\sap\<sid>***

Online and offline backup is supported for both: DB and FS!



To guarantee consistency of an online backup of the filesystem, stop SDM to prevent any write activity during the backup.

In addition: Define procedures to stop administration of EP transport packages and XML forms builder projects during online FS backup!

Don't forget to include components like Java Runtime Environment and DB files (Logfiles, binaries, ...) on FS into your backup concept.

Summary: Required Backup Tasks and Methods

A backup concept of SAP NetWeaver 04 Java must include the following tasks:

Task	Backup Type	Frequency (Proposal)
Regular backup of the Web AS 6.40 database	Online AND/ OR Offline	daily
Regular backup of the Web AS 6.40 file system: /usr/sap/<sid>/ /sapmnt/<sid>/* (UNIX only)	Online AND/ OR Offline	after any deployment
Regular backup of the operating system to include additional software like jdk or DB files	Offline	No SAP Recommendation available

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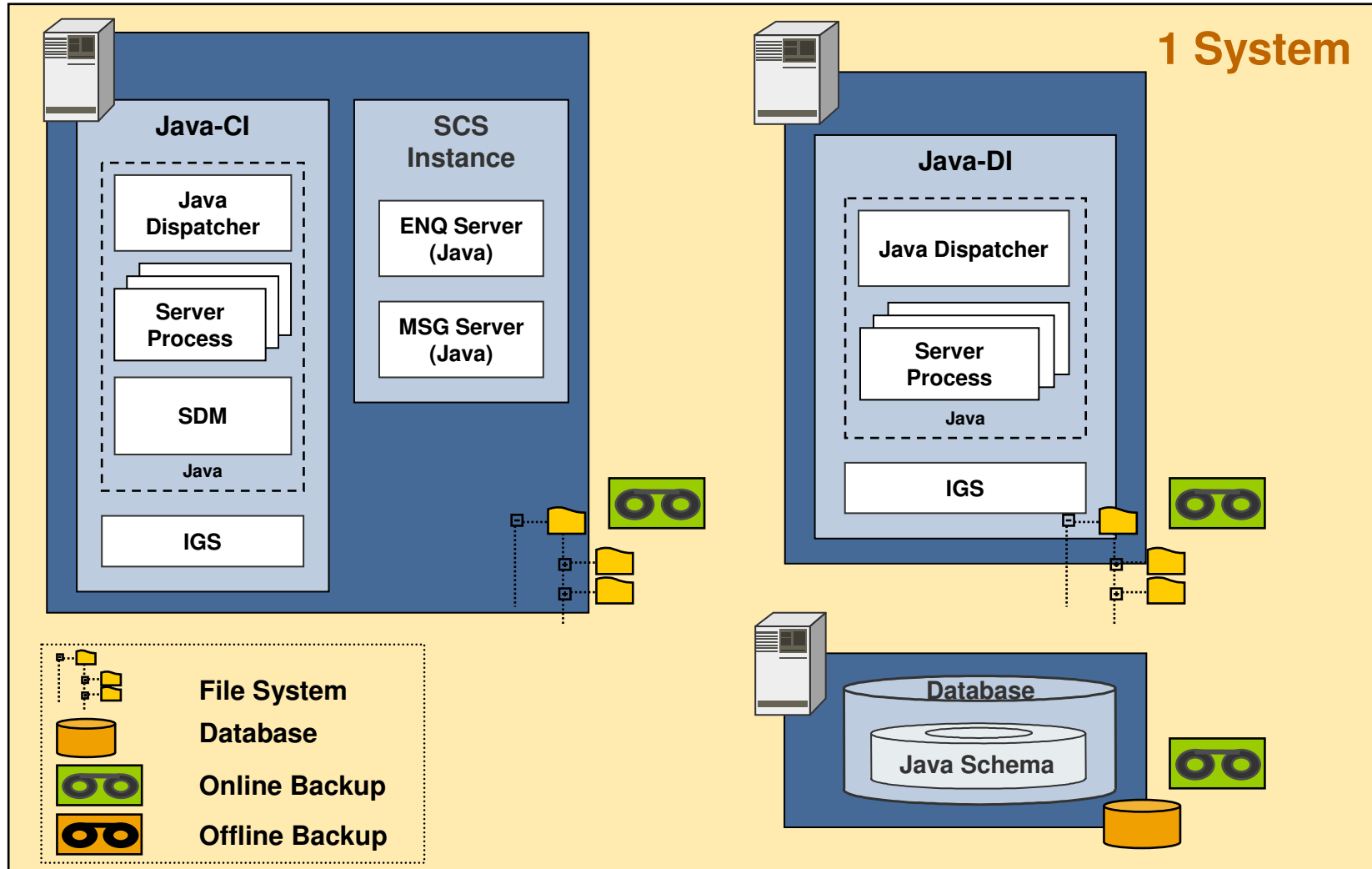
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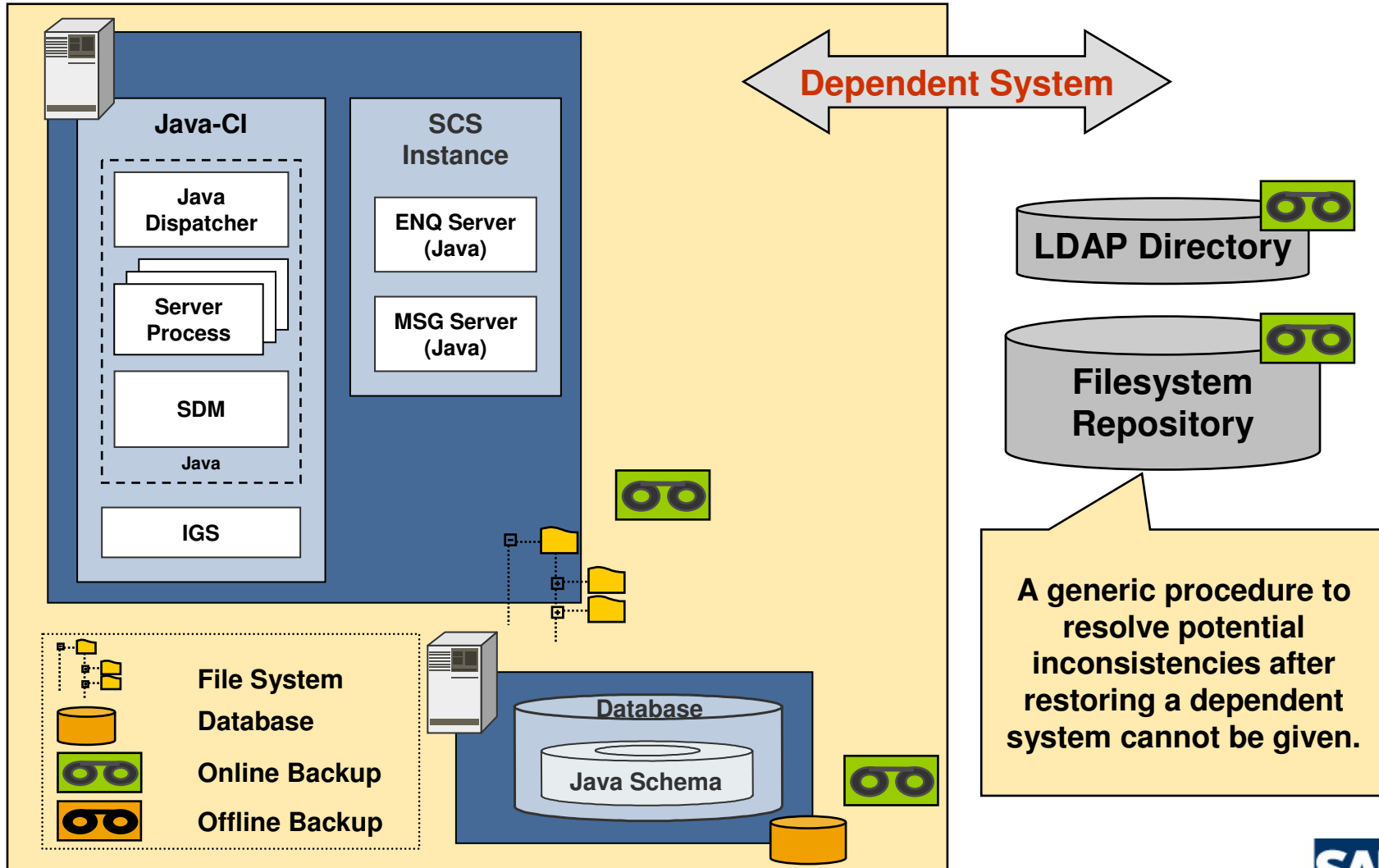
Example: Typical Web AS 6.40 Java Setup

Is a consistent landscape backup necessary?
In which situations is a landscape backup necessary?



Example: B&R of a SAP NW04 Landscape (1)

Is a consistent landscape backup necessary?
In which situations is a landscape backup necessary?



Consistency Check Tools (1)

UME consistency check tool

- Component `com.sap.security.ume.securitycheck.default`
- Available for EP 6.0 SPS10
- SAP Note 818947 for details

The screenshot shows the SAP Enterprise Portal 6.0 interface in Microsoft Internet Explorer. The browser title is "SAP Enterprise Portal 6.0 - Microsoft Internet Explorer provided by SAP IT". The address bar shows the URL: `http://localhost:50000/irj/servlet/prt/portal/prteventname/HtmlbEvent/prtroot/com.sap.security.ume.consistencycheck.default`. The main content area is titled "UME Consistency Check".

Under the heading "Users Without Accounts: 1", there is a table with the following content:

Principal ID
<input type="checkbox"/> USER.PRIVATE_DATASOURCE.un.testuser

Below the table, there is a checkbox labeled "Send Delete-Notifications to Components Outside UME" which is checked. A warning message states: "Ensure that the database has been backed up. It will not be possible to undo afterwards due to delete-notifications that are processed by components outside UME. Any references to principals that have been deleted are deleted as well to avoid inconsistencies caused by repair operations." At the bottom, there are two buttons: "Back" and "Start Interactive Repair".

Consistency Check Tools (2)

KMC Reports

- Examples: Link Consistency, User Validity, CM Repository File Check, CM Repository Database Check...
- http://help.sap.com/saphelp_nw04/helpdata/en/07/dad131443b314988eeece94506f861/frameset.htm

View Report Result

Reporting > Reports > Link Consist... > v1 - 2004-02-24 19:54:18 -

Report	Link Consistency
ID	20040224T185500389.report-result.xml
Name	v1 - 2004-02-24 19:54:18
Description	This report checks the links in KM repositories and determines to have the report delete such broken links as they are found.

Schedule Scope **Commands**

Select command(s) for execution on selected resources.

Delete Deletes link resources where the target resource no longer exists.

Found Items

Item	Description	displayname	link-target	modified	modifiedby
<input type="checkbox"/> /documents/Roland/Links/dummy1		dummy1	/etc/dummy1	2/24/04 7:52:10 PM	roland
<input type="checkbox"/> /documents/Roland/Links/dummy2		dummy2	/etc/dummy2	2/24/04 7:52:29 PM	roland

User Validity

This report checks whether user information referenced by items in KM repositories still exists in user management. For each item, the report checks the validity of the users who created and last changed the item as well as those who have permissions for it. It also checks any user who may have the item locked. If a user, group, or role no longer exists in user management, the item in question appears in the results list.

[Start](#) | [Schedule](#) | [More](#)

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Restoring SAP NetWeaver 04 Java Components

Restore Procedure of WebAS 6.40 Java and deployed applications:

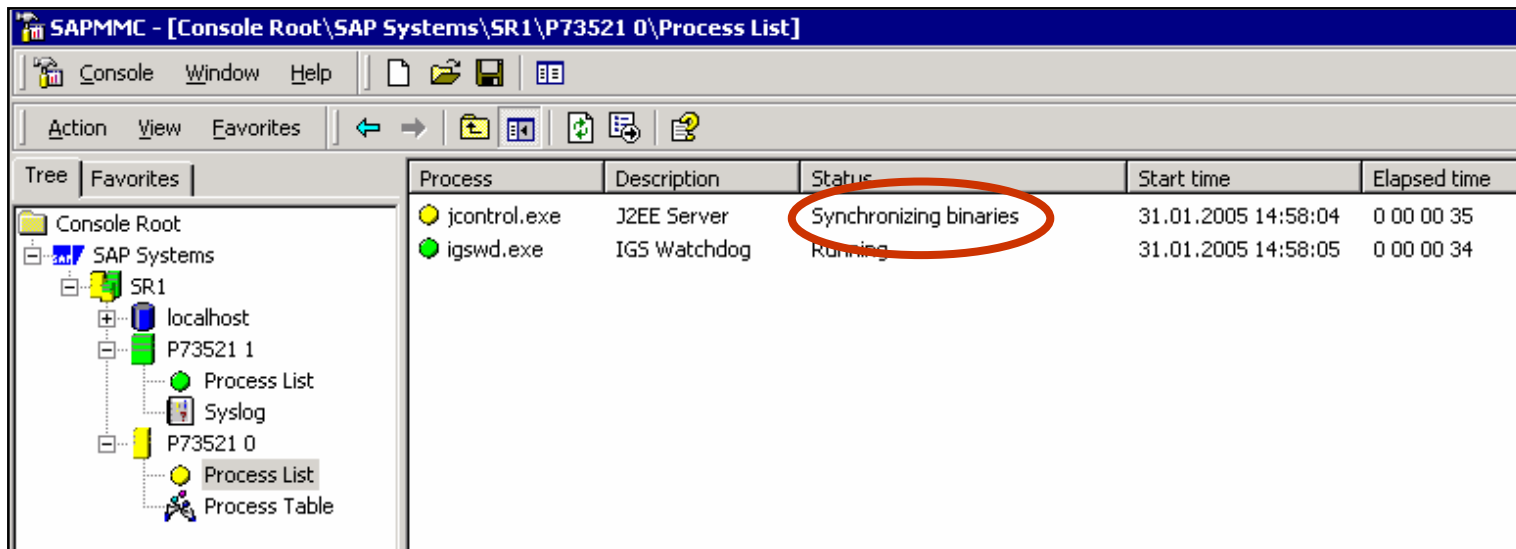
1. Delete the following directories of the file system backup:
 - ◆ /usr/sap/<sid>/<Java_instance_##>/j2ee/cluster/dispatcher/
 - ◆ /usr/sap/<sid>/<Java_instance_##>/j2ee/cluster/server0/
2. Restore the following paths of the file system
 - ◆ on UNIX: /sapmnt/<sid>/*
 - ◆ /usr/sap/<sid>/*
3. Restore DB
4. Restart Web AS 6.40 Java!



To enable the startup of the Web AS 6.40, you need to restore configuration files and executables of

- Web AS 6.40 startup & control framework
- SCS instance
- bootstrapping configuration files: Application Data will be resynchronized to the file system by bootstrapping the database.

Bootstrapping – Synchronization of Binaries into FS



Process	Description	Status	Start time	Elapsed time
jcontrol.exe	J2EE Server	Synchronizing binaries	31.01.2005 14:58:04	0 00 00 35
igswd.exe	IGS Watchdog	Running	31.01.2005 14:58:05	0 00 00 34

[Screenshot – SAPMMC after system startup]



Excluded from bootstrapping:

- FS structure of Web AS 6.40 Java Installation, e.g JC00/*
- Log Files
- Data in ../cluster/server0/temp
- Applications, which need to be available on a server node upon request

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Support of BR* Tools for Web AS 6.40 Java Standalone

Since Service Release 1 for SAP NetWeaver 04, BR*Tools are automatically installed in

- /usr/sap/<sid>/SYS/exe/run

Before Service Release 1 for Web AS 6.40 Java Only:

SAP Note 320457: Installing BR tools on a non-R3 database

- „[...] To install BR*Tools on EP systems, see Note 668604, Post-Installation: „Install dba tools manually“.

SAP Note 668604: SAP Web AS 6.40 ABAP/Java Installation on UNIX: Oracle

- Post-Installations: J2EE standalone: Install dba tools manually
 - ◆ Script based installation of dba-tools for java standalone

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Information Resources (1)

Documentation on <http://help.sap.com>

- > Documentation
- > SAP NetWeaver
- > **Technical Operations Manual**
- > Management of SAP Web Application Server (Java)
- > Backup & Recovery of SAP Web Application Server Java

Note:

General considerations for Backup and Restore Concepts are explained for the Web AS 6.40, but apply to all other SAP NetWeaver Java components.

Specific information for EP 6.0 and KMC need to be checked in chapter „Additional Administration of SAP NetWeaver Components“.



Information Resources (2)

SAP Note 779708: EP6 on Web AS 6.40 Online Backup and Restore Strategy

- Starting with SP Stack 10, online backup is officially supported.

SAP Note 711093: Release Restriction Note for Web AS 6.40

- HA-Setups for SAP NetWeaver 04 are currently released on project base only
- Official SAP Consultations are necessary (→ 803018)

SAP Note 709354: Release Restrictions for SAP EP 6.0 on Web AS 6.40

- DB switch-over solutions on project base only (→ 803018)

SAP Note 803018: Central note for NetWeaver04 High Availability capabilities

- HA-Setups for SAP NetWeaver 04 are currently released on project base only (→ 711093 and 709354)

SAP Note 785848: Hom./Het. System Copy SAP Web AS 6.40 SR1 Java

Related Information

Recent TechED lectures

- Java104: SAP Web Application Server - An Overview, Lecture (1h)
- PRTL256: Technical Infrastructures of SAP EP 6.0 on Web AS 6.40

Downloadable on

- SAP Marketplace <http://service.sap.com/TechED04> > Presentations > Lectures
- SAP Developer Network
https://www.sdn.sap.com/sdn/events.sdn?page=teched04_sessions.htm

Other KHNC Webinars:

- HA-Setups for SAP NetWeaver 04
https://www.sdn.sap.com/sdn/events.sdn?page=sdn_webinars.htm
- Starting & Stopping SAP Web AS 6.40 Java
https://www.sdn.sap.com/sdn/events.sdn?page=sdn_webinars.htm

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Questions & Answers

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