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<td>April 2007</td>
<td>Original version</td>
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<td>1.1</td>
<td>August 2008</td>
<td>• Enhancement and restructuring of chapter 4</td>
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<td>1.11</td>
<td>December 2008</td>
<td>• Adjustment of the description of SAP Net Weaver Administrator (section 4.5.2)</td>
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1 Management Summary

Managing complexity, risk, costs as well as skills and resources is at the heart of implementing mission critical support for SAP-centric solutions. The complexity rises even further with the trend of outtasking and outsourcing of process components. To help customers manage their SAP-centric solutions, SAP provides a comprehensive set of standards for solution operations.

Out of this set of standards, the system administration standard describes processes for the administration of SAP-centric solutions. The term "system administration" encompasses all activities that are required to ensure the successful, long-term operation of a solution from a technical perspective. The range of activities that can be included in the broadest sense of system administration is therefore very extensive. As usual in this context, the main areas of system administration are treated separately. The procedures in the main areas of use (such as Data Management, Change Management, and Incident Management) are explained in separate documents. This document provides an overview of the various, regularly occurring standard system administration tasks and associated tools.

Over the course of evolution to enterprise service-oriented architecture (enterprise SOA) solutions, vertical system administration based on a technical system gives way to horizontal system administration based on processes. Consequently, the different subject areas in system landscape administration must be combined and provided in a central location. The platform for this is SAP Solution Manager.
2 SAP Standards for E2E Solution Operations

Mission-critical operations is a challenge. While the flexibility of SAP-centric solutions rises, customers have to manage complexity, risks, costs, as well as skills and resources efficiently. Customers have to run and incrementally improve the IT solution to ensure stable operation of the solution landscape. This includes the management of availability, performance, process and data transparency, data consistency, IT process compliance, and other tasks.

Typically, multiple teams in the customer organization are involved in the fulfillment of these requirements (see figure 1). They belong to the key organizational areas Business Unit and IT. While the names of the organizations may differ from company to company, their function is roughly the same. They run their activities in accordance with the corporate strategy, corporate policies (for example, corporate governance, compliance and security), and the goals of their organizations.

Figure 1: Organizational model for solution operations

The different teams specialize in the execution of certain tasks: On the business side, end users use the implemented functionality to run their daily business. Key users provide first-level support for their colleagues. Business process champions define how business processes are to be executed. A program management office communicates these requirements to the IT organization, decides on the financing of development and operations, and ensures that the requirements are implemented.

On the technical side, the application management team is in direct contact with the business units. It is responsible for implementing the business requirements and providing sup-
Support for end users. **Business process operations** covers the monitoring and support of the business applications, their integration, and the automation of jobs. **Custom development** takes care of adjusting the solution to customer-specific requirements and developments. **SAP technical operations** is responsible for the general administration of systems and detailed system diagnostics. And the **IT infrastructure** organization provides the underlying IT infrastructure (network, databases ...). Further specialization is possible within these organizations as well. For example, there may be individual experts for different applications within SAP technical operations.

Efficient collaboration between these teams is required to optimize the operation of SAP-centric solutions. This becomes even more important if customers engage service providers to execute some of the tasks or even complete processes. Customers have to closely integrate the providers of out-tasking and outsourcing services into the operation of their solutions.

Key prerequisite for efficient collaboration of the involved groups is the clear definition of processes, responsibilities, service level agreements (SLAs), and key performance indicators (KPIs) to measure the fulfillment of the service levels. Based on the experiences gained by SAP Active Global Support while serving more than 36,000 customers, SAP has defined process standards and best practices, which help customers to set up and run End-to-End (E2E) Solution Operations for their SAP-centric solutions. This covers not only applications from SAP but also applications from ISVs, OEMs, and custom code applications integrated into the customer solution.

SAP provides the following standards for solution operations:

- **Incident Management** describes the process of incident resolution
- **Exception Handling** explains how to define a model and procedures to manage exceptions and error situations during daily business operations
- **Data Integrity** avoids data inconsistencies in end-to-end solution landscapes
- **Change Request Management** enables efficient and punctual implementation of changes with minimal risks
- **Upgrade** guides customers and technology partners through upgrade projects
- **eSOA Readiness** covers both technical and organizational readiness for enterprise service-oriented architectures (Enterprise SOA)
- **Root Cause Analysis** defines how to perform root cause analysis end-to-end across different support levels and different technologies
- **Change Control Management** covers the deployment and the analysis of changes
- **Solution Documentation** and **Solution Documentation for Custom Code** define the required documentation and reporting regarding the customer solution
- **Remote Supportability** contains five basic requirements that have to be met to optimize the supportability of customer solutions
- **Business Process and Interface Monitoring** describes the monitoring and supervision of the mission critical business processes
SAP® Standard for System Administration

- **Data Volume Management** defines how to manage data growth
- **Job Scheduling Management** explains how to manage the planning, scheduling, and monitoring of background jobs
- **Transactional Consistency** safeguards data synchronization across applications in distributed system landscapes
- **System Administration** describes how to administer SAP technology in order to run a customer solution efficiently
- **System Monitoring** covers monitoring and reporting of the technical status of IT solutions
- **Test Management** describes the test management methodology and approach for functional, scenario, integration and technical system tests of SAP-centric Solutions

Out of this list, this white paper describes the system administration standard.
3 The System Administration Standard at a Glance

The topic System Administration describes how all SAP technology must be administered to run a customer solution efficiently. Administration tasks are mainly executed locally, but can be accessed and triggered from a central administration system. This allows a unified access to all SAP technologies. System Administration is owned and executed by SAP technical operations. Possible results are smoother business execution and optimized total cost of operations.

The typical tasks of system administration include starting and stopping systems, applying changes to technical configuration, performing imports, and/or applying patches and Support Packages based on the change control workflow, creating or changing users based on a compliance workflow, performing system copies and installing systems, running system diagnostics, managing jobs, and performing backups and recovery.
4 What is the Basic Concept of the System Administration Standard?

4.1 Architecture and Process Flow

SAP NetWeaver is the foundation of SAP xApps and SAP Business Suite solutions, and also powers partner solutions and custom-built applications.

Its core component, the SAP NetWeaver Application Server, is the central foundation for the entire SAP software stack. It also provides a platform for other NetWeaver components (Portal, XI etc.), as well as for ABAP and Java applications.

An SAP system consists of several application server instances and a database. A dialog instance consists of the following components:

- The Internet Communication Manager (ICM) sets up the connection to the Internet. It can process both server and client Web requests. It supports the protocols HTTP, HTTPS, and SMTP. The SAP Web AS may be a Web server or a client (see SAP Web Application Server: Web Server or Web Client).
- The Dispatcher distributes the requests to the work processes. If all the processes are occupied the requests are stored in the dispatcher queue.
- The Work Processes execute ABAP or Java programs.
- The SAP Gateway makes the RFC interface between the SAP instances available (within an SAP System and beyond system boundaries).
- The Message Server exchanges messages and balances the load in the system.
- In the J2EE component of the SAP NetWeaver AS, there are also components Java Dispatcher, Server Process and Software Deployment Manager.

For more details, follow this link to find a description of the Architecture.

System administration must be done on the ABAP and the Java stack of a NetWeaver installation, both locally and landscape-wide, using the appropriate tools provided by SAP Solution Manager, CCMS and, in the case of Java components, in NetWeaver Administrator, among others. The most important administration functionalities available on both stacks are listed below:

- CCMS Data and Alerts: The CCMS monitoring infrastructure provides central access to all important monitoring information. For example, an aborted database backup triggers an CCMS alert. The operator in charge is notified. The operator enters the central operations hub, opens the corresponding CCMS monitor and starts the analysis function, which is attached to the backup alert. The analysis function guides the operator to the corresponding backend system, and displays the database backup log for further analysis.
• Workload Statistics: The workload statistics provide a central overview of the overall performance of the landscape components.

• Database Administration: SAP offers a database cockpit, which centrally offers key administrative functionality like analyzing missing database objects, backup planning, health checks. This cockpit is currently available for MAXDB and DB2. It is planned to be expanded for other databases with the next major NetWeaver release.

• Central User Administration offers central user maintenance and distribution to the backend landscape.

• Transport Management Service controls the distribution of coding and customizing between landscape components (mainly from development to quality assurance to production system) to safeguard productive system availability.

• The User Management Engine maintains users and roles for AS Java.

• A central log viewer provides access to all key administrative logs of the backend systems.

4.2 Solution Landscape in SLD and SAP Solution Manager

The system landscape provides a technical description of all components within a customer solution. This is the basis for using the SAP Solution Manager. You capture and manage the system landscape centrally in SAP Solution Manager, and use it in your implementation and template projects, in change management, customizing synchronization (customizing scout, customizing distribution), and in operational processing (solution monitoring, services, service desk).

SAP Solution Manager has its own repository (transaction code SMSY) with landscape component information. In case of homogeneous ABAP based solution landscapes, SMSY is the central place to connect your systems to (how to maintain solution landscapes in SAP Solution Manager see unit System and Solution Maintenance (SMSY) at the SAP Solution Manager 7.0 learning maps for technology consultants).

To create an overall concept that facilitates the implementation, upgrade and maintenance of system landscapes with Java components, the System Landscape Directory (SLD) of SAP NetWeaver comes into play.

System Landscape Directory contains two kinds of content: the component information and the landscape description:

• The landscape description provides an exact picture of installed landscape elements including the connections between the systems. The content of the landscape description is created during the landscape implementation and automatically maintained through the whole software life-cycle.

• The component information describes the building blocks of solutions and their possible combinations and dependencies. It describes the world of installable landscape elements. The various types of dependencies between building blocks play an important role in landscape implementation, change management and solution validation.
System Landscape Directory is an SAP NetWeaver component. It is completely implemented with Java technology and deployed as a Java component on the Application Server Java. As System Landscape Directory is already part of every AS Java system (as of SAP Web Application Server Java 6.40 or higher), no further installation is required – you only have to perform the easy and quick configuration to activate it.

In case of a large environment with non-ABAP systems and components, all landscape component information is initially sent to SLD. The SMSY repository is regularly updated with information from the SLD. The system data retrieved from the SLD will be automatically classified and stored under the corresponding products in SMSY. After the system data import, you have to maintain information that cannot be retrieved and maintain the RFC connections to the corresponding satellite systems in order to access the systems for various SAP Solution Manager usage scenarios.

The following data can be automatically retrieved from the SLD:

- For ABAP systems:
  - System name and number
  - Message server
  - Clients
  - Installed software components, releases and patch levels
  - Instances of the system
  - Servers assigned to the instances
  - Server data
  - Databases of a system
  - Server of a database

- For Java systems:
  - Instances of a system
  - Servers assigned to the instances
  - Server roles (types)
  - Installed software components, releases and patch levels

### 4.3 Administrative Tasks

Managing a system landscape is a complex task of significant importance for every company that operates one or more SAP systems. The complexity increases with every additional system, component, or extension.

With the monitoring infrastructure of CCMS (Computing Center Management System), SAP provides a flexible and universally-usable basic infrastructure with which you can manage your entire IT landscape centrally. CCMS offers an integrated suite of tools for monitoring and
Managing SAP components, for automating such operations as resource distribution, and for managing SAP-supported databases.

The System Administration Work Center in SAP Solution Manager provides the CCMS administration features. Besides monitoring functionality, this work center bundles all main administrative functionality, being used on a daily operational basis.

For security-relevant information, such as roles and authorizations, see the SAP NetWeaver Security Guide. It contains an overall overview of security with SAP NetWeaver as well as links to the individual guides for each of the usage types, standalone engines, connectivity and interoperability technologies, database and operating system platforms, and the various scenarios.

Administrative tasks are release and usage-type specific. A good overview of all standard administration tasks to be processed is available in the Technical Operations Manual for SAP NetWeaver, which describes SAP NetWeaver 7.0 (2004s). SAPs Online Help page http://help.sap.com offers such a manual for SAP NetWeaver 04 as well.

The typical administrative scope includes tasks such as starting and stopping systems and components, user administration, optimizing load distribution and process automation (job scheduling):

- **Configuring SAP NetWeaver**
  The ABAP and the Java stack each require a set of configuration steps. Some cross-NetWeaver configuration is also required.

  **Configuring SAP NetWeaver ABAP**
  Most configuration steps for the various components of SAP NetWeaver ABAP are contained in the SAP Customizing Implementation Guide (IMG). To call the IMG, choose Tools ➔ Customizing ➔ IMG ➔ Execute Project from the SAP menu to display the SAP Reference IMG. In the SAP Reference IMG, choose the relevant section under SAP NetWeaver. Apart from the NetWeaver section, there are sections on cross-application components and the integration of other SAP components in the top IMG structure.

  You can create and delete group entries, remove instances from groups, and delete entire logon groups. For details, see the section Configuring Logon Groups in the Technical Operations Manual.

  For other configuration task on ABAP Systems, such as configuring instances, instance profiles and operation modes, see the Configuration documentation in the SAP Help Portal.

  **Configuring SAP NetWeaver Java**
  The J2EE Engine installation procedure provides a system that is ready to be run and used. However, you may need to configure the J2EE Engine additionally to adapt the system to the needs and requirements of a particular business scenario.

  For configuration details, see the documentation on the J2EE Engine Configuration in the SAP Help Portal.
Cross-NetWeaver Configurations

Additional configuration options may be relevant to your NetWeaver implementation although they don’t apply to a specific IT scenario.

- Adobe Document Services - Configuration
  Adobe document services allow SAP applications (either Java or ABAP) to take advantage of the full range of capabilities in Adobe Acrobat® Professional, Adobe Acrobat Standard, and Adobe Reader®.

- SAP License Key
  After you have installed the components, the system is equipped with a temporary license, which is valid for four weeks. During this time you have to apply for a permanent license from SAP and install it. Note that with a J2EE+ABAP installation (SAP NetWeaver Application Server with ABAP and Java), you have to import the ABAP license (see SAP License).

Starting and Stopping SAP Systems and Instances

When you start the SAP System, you simultaneously start the system database, the application server and the respective processes of which the system consists. In the simplest case, an SAP System consists of only a database and a single application server.

There are different processes, depending on the type of SAP system and operating system platform.

Note that you can start and stop systems and instances centrally using the SAP Management Console for all platforms (as of SAP NetWeaver 7.0 (2004s)), the System Administration work center in SAP Solution Manager, or using the Microsoft Management Console under Windows.

For details, see the section Starting and Stopping SAP NetWeaver ABAP and Java in the Technical Operations Manual for SAP NetWeaver.

User Administration

With the user administration, you create the prerequisites for your employees being able to work in the SAP system. Create a user master record for every employee. The record contains all of the information about this user (both technical administration data and authorizations included in roles and profiles that allow the user to execute an action in the SAP system). Note that you can administer users centrally.

For details regarding user administration on the ABAP and Java stacks, see the section User Administration and Identity Management in the Technical Operations Manual for SAP NetWeaver.

Database Administration

Using the following links, you can find more information on routine administration for the following databases that are supported by SAP:

- Oracle
- MS SQL Server
- IBM DB2 Universal Database for UNIX and Windows
SAP® Standard for System Administration

- MaxDB
- IBM DB2 Universal Database for z/OS
- IBM DB2 Universal Database for iSeries

The key administrative database task is to perform a database backup on a daily basis. SAP recommends storing multiple database backups. This 'backup cycle' is described in great detail in the links mentioned above, together with the database specific administration tools.

- **Printer Administration**
  Printer administration consists mainly of:
  - Creating printer definitions in SAP, so that they can be used in an SAP application;
  - Spool maintenance and troubleshooting: Scheduling spool housekeeping jobs, look for aborted spool requests, and so on.

SPAD is the main printer administration transaction. SAP offers a lot of options to connect to your existing printer landscape. For small personal print requests, administrators can configure front-end printers. Productive printing (like an address label printer in production) should always being connected via server hosted printing.

The [SAP Printing Guide](http://service.sap.com/output) provides a detailed overview of the SAP print and spool system. All options how to connect your printers to SAP are described in great detail. For general information about printing in an SAP environment, see [http://service.sap.com/output](http://service.sap.com/output) in the SAP Service Marketplace.

- **Data Archiving**
  SAP Data Archiving allows you to remove business data, according to business rules and legal compliance, from the database and store it in a consistent and secure manner. The archived data is stored in a file system and can be moved from there to other, more cost efficient storage media. This reduces the size of your database, the database backup size and time, and leads to an overall database performance increase.

If there is need for accessing the archived data, SAP offers an infrastructure for read access.

The data archiving technology, which comes with SAP NetWeaver, provides the technical basis for every data archiving solution that SAP delivers. For more information about archiving in an SAP environment, see the section [Data Archiving](#) in the Technical Operations Manual.

Further information regarding data archiving is available in the solution operations standard [Data Volume Management](#).

- **Process Scheduling**
  SAP NetWeaver's background processing is used for running large and periodical business processes asynchronously without user interface at best performance. SAP NetWeaver offers a wide variety of scheduling options, including time-based, event-based, and calendar-based scheduling.
In addition to the local job scheduling functionality (Transactions SM36/SM37), Central Process Scheduling (CPS) offers a new solution for the SAP NetWeaver platform to help companies manage, monitor, and execute business-critical processes from a central location.


- **Adaptive Computing**
  Adaptive computing is a new approach to designing hardware, software, and system services in ways that reflect the business driven reality of continuous change, and the need for constant adaptability. Adaptive computing empowers the user to be able to run any application service, anytime, on any server. (In this context the term "application service" is used to describe any kind of IT scenario, solution, or application component.)

  Adaptive computing works by flexibly assigning hardware resources to support specific application services, using standardized building blocks for the computing, network, storage, and control elements of the data center. By supporting adaptive computing, SAP NetWeaver provides a way to virtualize application services, and provides a single, central point of control for assigning computing resources. For more information, see [Adaptive Computing](https://www.sdn.sap.com/irj/sdn/nw-scheduling).

- **Reporting**
  Detailed information regarding reporting capabilities, like central performance history (CPH), reporting in SAP Solution Manager and SAP NetWeaver BI, are described in the solution operations standard for system monitoring.

### 4.4 Organization (People)

The following roles are significant in the area of technical operations:

- **Technical System Administrator (SysAdmin)**
  The technical system administrator manages the SAP systems belonging to the system landscape. Therefore, he or she is a generalist for the SAP applications implemented in the solution. These are usually systems with distinct features that are used to execute a business process (for example, ECC, BI, PI, and so on). The technical system administrator is responsible for:
    - Planning the system landscape
    - Starting and stopping the systems
    - Configuring and monitoring the processes involved
    - Setting up and maintaining the system
    - Monitoring the system
    - Planning, executing, and verifying the data backup
    - Monitoring performance and tuning
The technical system administrator requires appropriate tools to complete these tasks. These are provided centrally in the System Administration work center of SAP Solution Manager (for example, monitoring background jobs), installed as standalone software (such as Visual Administrator or Config Tool), or integrated locally in individual systems (such as local NetWeaver Administrator NWA).

- **Database Administrator (DBA)**
  A typical component expert is the database expert since databases are involved in almost every solution.
  Data in a complex system landscape is saved in relational database management systems (RDBMS). One or more RDBMSs are managed by the database administrator. The database administrator is therefore defined as a role and not a person. Consequently, the following tasks can be carried out by various persons:
  - Designing and modifying the database layout
  - Starting and stopping the RDBMS
  - Managing the file structure on which the RDBMS is based (for example, data files, log files, and so on)
  - Managing the storage space for the RDBMS on the storage subsystem
  - Planning, executing, and verifying the data backup
  - Performance monitoring and tuning
  - Maintaining the RDBMS (for example, generating statistics, implementing patches, and so on)

  Various tools are available for the database administrator to complete these tasks. Alongside the standard tools provided by the RDBMS, SAP provides the DBACOCKPIT as a central administration tool for the RDBMS of different providers.

Special roles are required for system administrators. For details, see the relevant sections in the SAP Security Guide.

### 4.5 Tools

Due to the distributed architecture in Enterprise SOA and the numerous technical components that interact with each other, the system administration tools are numerous, even if the tasks are comparable. SAP Solution Manager combines general tasks and enables central administration within SAP Solution Manager. Besides these typical system administration tasks, there may also be other, component-specific activities that remain in the responsibility of component experts. It is possible to distinguish between general system administration tasks and local (occasionally even manufacturer-specific) tasks that are required in exceptional cases. This document deals solely with the general tasks that are usually executed centrally.
4.5.1 Work Center

Tasks required for a specific operating process and for accessing related information are combined in SAP Solution Manager into work areas or “work centers” to support standard, role-based system administration. The required work centers can be assigned in accordance with the customer-specific role characteristics in system administration, allowing employees with these roles to access their tasks using role-specific navigation (see Figure 2).

![Figure 2: Work Centers and Roles](image)

Activities in the system administration area are available in the “System Administration” work center, which is shown in Figure 3. Important tasks and work areas are combined and provided on the left of the screen. In addition, you can branch to the online help, documentation, or SAP Notes from the system administration work center by choosing “Related Links”.

![Figure 3: Overview of Work Centers Currently Available](image)
Besides calling individual activities for specific tasks, you can also branch to other tools for special areas of administration. These can be transactions that run centrally in SAP Solution Manager (such as DBACOCKPIT) as well as transactions that are called in the monitored system (such as local SAP NetWeaver Administrator). A list of important administration tools is provided in the next section. Additional tools for experts display the system status. For example, this allows proactive, manual health checks.

### 4.5.2 Important Administration Tools

**ABAP Tools**

In AS ABAP systems, you find a set of tools (SM50, SM51, SMGW, SM59, ST02, etc.) for displaying detailed information on user sessions, work processes, and on the servers in your SAP system. CCMS offers tools for configuring AS ABAP (RZ10) and operational modes for day and night processing (RZ04), database related tools like db activity planning calendar (DB13), and the system log (SM21).

For more information, see the corresponding Tool section in the Technical Operations Manual.

**DBACOCKPIT**

A system landscape generally comprises several independent and even different databases in which the application and administration data of individual systems is permanently stored. SAP provides the DBACOCKPIT tool to manage and monitor these databases, to support administrators in their regular tasks, and to analyze performance issues and errors.

The DBACOCKPIT replaces a range of previously standalone tools (SAP transactions) and therefore provides a central point of access for database administration. The DBACOCKPIT contains information from the following, individual transactions:

- DB02 – Storage management for tables and indexes
- DB12 – Security logs
- DB13 – Scheduling calendar for database administration activities
- DB13C – Central database scheduling calendar
- DB14 – DBA operations logs
- ST04 – Database performance

The information displayed may vary depending on the RDBMS used. However, you can use the DBACOCKPIT to manage all RDBMSs supported by SAP. This applies to the local database of the SAP NetWeaver system in which the DBACOCKPIT was started as well as to remote databases. Consequently, remote databases that have to be monitored do not need to be set up manually, but can be configured centrally in the system landscape directory (SLD).

The DBACOCKPIT therefore provides a central administration tool for database administration that can be used not only for everyday tasks such as checking database health or...
whether database changes have been saved successfully, but also for specific analyses if errors occur (for example, analyzing lock situations) or performance issues arise (for example, evaluating execution plans).

**SAP Print Assistant for Landscape (PAL)**

PAL is an ABAP WebDynpro based tool which is used for central printer configuration.

The administrator can use PAL to:

- Configure printers centrally
- Distribute printer definitions to other systems
- Bundle printers and systems into groups and assign them to each other. This allows large printers in system landscapes to be maintained efficiently.

PAL is especially suited for front-end printing and printing using a print server. In the future, you will also be able to request the printer status centrally.

**SAP NetWeaver Administrator (NWA)**

NWA is used for administration of managed systems and can be centrally started from the work center System Administration.

![Architecture of the SAP NetWeaver Administrator](image)

*Figure 4: Architecture of the SAP NetWeaver Administrator*
SAP NetWeaver Administrator (NWA) focuses on system administration for Java based systems. It can be accessed from within the SAP Solution Manager work center “System Administration” and “System Monitoring”.

NWA is part of the AS Java component and does not need to be installed separately. It delivers functionality to administer an SAP NetWeaver Application Server Java and can contain usage type specific enhancements. For SAP NetWeaver Composition Environment (SAP NetWeaver CE) it contains important functionality to administer service oriented applications as well as the management of service oriented architectures within SAP NetWeaver Process Integration 7.10. NWA will be continuously enhanced and replaces the SAP Visual Administrator completely.

Note: Functions of the system-wide SAP NetWeaver Administrator are being integrated into SAP Solution Manager as the central platform to administer system landscapes and can be accessed from the respective work centers.

**SAP Management Console (SAP MC)**

In a “worst case” scenario, and especially if it is not possible to log onto an SAP instance, administrators require a tool that allows them to execute basic tasks such as starting and stopping instances or analyzing log files, without having to log onto the system. This is known as “bootstrap management”.

Whereas administrators of SAP landscapes in Windows environments have been using a convenient tool for starting, stopping, and analyzing SAP systems for a long time (the SAP snap-in for Microsoft Management Console, or SAP MMC), administrators in Unix environments had to master a range of tools and scripts, such as startsap script, stopsap script, or dpmon.

Even though the Unix tools were simple to use and functioned stably, they still had some disadvantages such as:

- No clear indication of the current system status
- No option to work remotely, for example, starting a remote system
- No central point of access for administration of multiple systems
- Different concepts for Unix and Windows environments

The SAP Management Console now provides the administrator with one, platform-independent tool that can be used to complete nearly all of the basic administration tasks such as starting or stopping the system or analyzing log files, without having to log onto an SAP instance.

---

1 Bootstrap: “Do without the help of others”
The SAP MC interface is based on the interface of the SAP MMC. Both tools exist in parallel and will also be supported by SAP in the future.

![Figure 5: SAP Management Console](image)

To implement SAP MC on Unix-based systems, a new SAP startup framework has been developed, which comprises the SAPStartSRV and SAPHostControl services. SAPStartSRV, which is implemented on Unix platforms as a daemon, starts for each SAP instance when the system is started and provides instance-specific information. SAPHostControl, which is also implemented as a daemon, provides host-specific information and is started once for each host.

SAP MC itself does not have to be installed, but connects to the corresponding services via a Web interface. It is implemented as a Java applet can be called in a browser with the following URLs:

- http://<host>:5<instance number>13
- https://<host>:5<instance number>14

A Java runtime environment (JRE) with a minimum release level of 1.4.2 is required for this. The SAPStartSRV and SAPHostControl services are both implemented when a current SAP NetWeaver system is installed. However, it is also possible to use this technology on earlier SAP NetWeaver platforms if certain technical framework conditions are met. For more information, see SAP Note 1014480.

**Visual Administrator**

With the Visual Administrator, SAP provides a graphical user interface for the administration of a J2EE instance. The Visual Administrator connects directly to a J2EE instance, and so the Java instance must be started.
The Visual Administrator can also be installed on a host on which no SAP Web AS Java instance is installed. This enables remote administration. The services and managers of all Java instances can be configured in the cluster using the Visual Administrator. Changes to selected parameters already take effect at runtime. Services can be started and stopped with the Visual Administrator. However, it cannot be used to change the JVM parameters.

The Visual Administrator is integrated into the local SAP NetWeaver Administrator with SAP NetWeaver Release 7.1. NWA therefore replaces the Visual Administrator as the administration tool for SAP NetWeaver AS Java.

Config Tool

The Config tool allows you to configure a J2EE instance offline. You do not have to start the J2EE engine while you are working with this tool. The tool connects directly to the database (which must be started) of the J2EE instance and changes the configuration here.

Java Virtual Machine (JVM) settings of the J2EE engine can be configured only with the Config tool. The Config tool can be used only locally on the central instance of the SAP NetWeaver AS Java. It allows to export all of the configuration settings of a J2EE instance as an XML file so that they can be reused later.
5 How to Implement the System Administration Standard?

5.1 Prerequisites

To implement System Administration, knowledge regarding the business requirements for performance and throughput of the systems and technologies is required as well as technical details for the systems and interfaces involved. The affected business units should be identified.

Furthermore, possible dependencies must be known and there should exist a holistic System Administration concept. This should be aligned with a holistic Solution Monitoring Concept.

Considering the inherent supervising function from a technical perspective, there are dependencies on all other topics, especially the following:

- **Incident Management**: In case of incidents, relevant information is provided by System Administration tools.
- **Data Management**: The safeguarding of data integrity and data growth is a fundamental condition for other services managed by System Administration.
- **Change Management**: Change requests and deployments have direct impact on System Administration tools.
- **Root Cause Analysis**: Description of strategy and usage of tools to locate and solve the root cause of an incident.
- **System Monitoring**: architecture, strategy and method to setup and operate a proactive monitoring of a solution landscape.

Business processing strongly depends on System Administration tools, especially in error cases. This requires an interruption-free availability which can be achieved by the implementation of systems as high-availability solutions.

5.2 Methodology

The way of implementing and configuring system administration highly depends on the scenario being executed, and the usage types. Usage types are possible ways of using SAP NetWeaver. You can select during the installation, which usage type you want to use. The links below lead you to usage type-specific administration tasks for SAP NetWeaver 7.0 (2004s) systems. These include:

- Application Server ABAP (AS ABAP)
- Application Server Java (AS Java)
- EP Core (EPC)
- Enterprise Portal (EP)
- Business Intelligence (BI)
- Mobile Infrastructure (MI)
For example, if you are interested how to configure and activate the Universal Work List as an optional alert browser of the CCMS monitoring infrastructure, you select the EP Core Link, click on Universal Work List, and select Administration and Configuration of the UWL. As mandatory configuration steps, you have to perform user mapping, backend system registration, and the registration of work item types.

### 5.3 Setup

Setup of central administration is divided into:

- An initial setup
- A continuous optimization of initial settings

In addition, a distinction is made between activities in the central part of the infrastructure and in the components that have to be maintained.

Requirements for a successful setup are:

- The availability of a dedicated system for central administration. This can be SAP Solution Manager 7.0 SP15 providing the System Administration work center.
- The system landscape is entered in an SAP System Landscape Directory (SLD). From there, the landscape data will be transferred into the repository of SAP Solution Manager (SMSY).

#### 5.3.1 Process Implementation Steps

In the initial setup phase, the following activities must be addressed:

1. Configuration of central system monitoring. The CCMS monitoring infrastructure provides an overview screen detailing the systems that are available and that can be maintained.
2. Configuration of central system administration.
3. Configuration of the DBACOCKPIT in SAP Solution Manager.
4. Configuration of SAP Print Assistant for Landscape in SAP Solution Manager.

As part of the continuous optimization process, the following questions must be answered:

1. Are any additional administrative tasks to be considered for secure system operation? Do basic errors occur even though all planned activities have been carefully carried out?
2. Have recurrence frequencies set appropriately?
3. Are the administration activities documented sufficiently?
4. Are technical components exchanged or are basic changes such as upgrades planned that will also require the administration tool environment to be modified? As part of this process, the affected settings must be adapted continuously.

5.3.2 Output

The result of the setup is the final operations handbook where the following information is included:

- Definition and usage of the tools & procedures
- Organization of operations processes in the company including responsibilities, roles and activities

5.4 Trainings

The following basic training courses are available for system administration:

ADM100 – SAP Web AS Administration I

Implementation of basic administrative tasks in a production environment

Course Content
- Starting and stopping an SAP system
- System configuration options
- Configuration of online documentation
- Configuration of periodic, automated work with a database, e.g. scheduling backups
- Transport functions in SAP systems
- Importing support packages and add-ons
- Scheduling background jobs
- Definition and integration of printers
- Fundamentals of user administration
- Setting up remote connections
- Using system monitors
- Fundamentals of SAP document archiving
- Structured error searches
- Fundamentals of system security
ADM102 – SAP Web AS Administration II

Performing additional administrative tasks that are not dealt with in the course ADM100

Course Content

- Internet-based technology components:
  - SAP Internet Transaction Server (SAP ITS)
  - Internet Communication Manager (ICM)
  - SAP Web Dispatcher
- Globalization
  - Several languages in one SAP system
  - Several code pages in one SAP system and Unicode
- Technical aspects of external communication:
  - External mail server links using SAPconnect and SMTP
- Extended Computer Aided Test Tool (eCATT)
- Central user administration (CUA)
- Directory services links using LDAP

ADM 200 – SAP Web AS Java Administration

Carrying out fundamental administration tasks during SAP Web AS Java operation

Course Content

- Fundamentals of SAP Web AS Java
- Installation of an additional Java instance for an existing SAP system
- Starting and stopping
- Basic configuration of SAP Web AS Java
- User management
- Monitoring
- Patching for SAP Web AS Java
- Change management for SAP Web AS Java
- SAP transport management for Java
- Other topics related to system administration
SM100 – SAP Solution Manager for Operations of SAP Solutions

Introduce the Operations and Support Tools of SAP Solution Manager.

Course Content

- SAP Solution Manager Overview
- Installation Overview
- Customizing SAP Solution Manager
  - IMG structure (Basic and Optional Settings)
- Solution Monitoring
  - System Monitoring
  - Business Process Monitoring
- Service Desk
  - Service Desk Reporting
  - Message Processing
- Service Delivery
  - Service Plan
  - Issue tracking
  - Maintenance Optimization
- EarlyWatch Alert Reporting
- Service Level Reporting
- Solution Reporting
  - Service Reporting
  - Availability Reporting
  - System Administration Reporting
- Solution Manager Diagnostics
- Change Request Management

For more information on training courses, see the Online Training Catalog under [http://www.sap.com/services/education](http://www.sap.com/services/education).

Further Information

For more information, see [SAP NetWeaver Life-Cycle Management](http://www.sap.com/services/education) in the SAP Community Network.

6 How to Measure the Success of the Implementation?

6.1 Benefits

When implementing System Administration, customers benefit from using the administration tools provided by the CCMS infrastructure, the Java administration capabilities of SAP NetWeaver Administrator, and the integration capabilities of SAP Solution Manager. These ensure that customers are able to prove operational efficiency, optimize resource utilization, and increase control over enterprise-wide processes.

In addition, establishing one central, proactive, and process-oriented strategy for System Administration reduces cost for solution operations by avoiding organizational redundancies.

Benefits at a glance:

- Central administration and configuration of technical components of a solution landscape.
- Central starting and stopping of instances (depending on platform)
- Central control of technical components, for example ABAP and Java instances
- Global and central information and administration cockpit: SAP Solution Manager
- Increase in administrative efficiency, thereby reducing total cost of operation.

6.2 Setting up KPI monitoring

A successful implementation of System Administration can be verified by installing a set of appropriate Key Performance Indicators (KPIs) and measuring them before and after the implementation. KPIs proposed in this context are:

<table>
<thead>
<tr>
<th>KPI</th>
<th>Measuring</th>
</tr>
</thead>
<tbody>
<tr>
<td>Availability of System Administration</td>
<td>System Administration is set up and applicable</td>
</tr>
<tr>
<td>Availability of related tool chain</td>
<td>Proven monitoring tools &amp; procedures are available</td>
</tr>
<tr>
<td>Availability of automatic alerting</td>
<td>Immediate alerting for business-critical incidents is available</td>
</tr>
</tbody>
</table>

The quality of system administration is reflected on a short or medium-term basis in monitoring and service level reporting. Ultimately, the most important criteria are the availability, per-
formance, and security of the business processes. Meeting these criteria is the benchmark for the quality of the system administration. System monitoring and reporting are therefore permanent quality controls for system administration. In incident cases, the quality can also be measured by the time required to respond to the incident and provide a solution.