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Feature Scope Description - SAP NetWeaver 7.5 for SAP S/4HANA, on-premise edition

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1 Operating the Application Server for ABAP

Administrators can use the concepts and functions of the SAP Application Server for ABAP (AS ABAP) as a basis for the monitoring and administration of AS ABAP.

Key Features

The following features are available:

General Administration Tasks

Key Feature	Use
Managing SAP licenses	Assign license keys for SAP systems, determine the number of users and used engines of the SAP software for each system, and consolidate measurement results of one or more systems.
Configuring AS ABAP	Configure AS ABAP using profile parameters. For central scenarios you do not need to explicitly set parameter values, since defaults are set and values adapt automatically to physical conditions. Manual configuration of additional scenarios is possible.
Starting and stopping AS ABAP	Start and stop individual instances of your AS ABAP system or the complete system.
Managing and monitoring your AS ABAP within your system landscape	Use SAP Solution Manager to manage and monitor several AS ABAP systems centrally within your system landscape. The functional scope of SAP Solution Manager that is supported for SAP S/4HANA, on-premise edition, depends on your SAP maintenance contract: See also [https://support.sap.com/solution-manager/usage-rights.html].
Providing and managing hosts, instances, databases, or systems	Provide, monitor, and control any host, instance, database, or SAP system centrally.
Managing network access to your SAP systems and configuring load balancing	Configure the access you want to allow to your SAP network and define access points for Web requests to your network. Such requests can be distributed (using load balancing) between individual Application Servers of your SAP system.

Key Feature	Use
Printing	SAP provides its own spool service and a spool database for printing.
E-mailing	Send e-mails from and receive e-mails within the AS ABAP. Streamline your e-mail correspondence by creating custom templates based on predelivered templates.
Scheduling batch jobs	Schedule local batch jobs in your AS ABAP system.
Backing up and restoring your SAP system	Back up and restore your SAP system on operating system level and database level, if required.
Archiving your data	Use the data archiving functions to archive any completed business transactions that are no longer relevant for your daily operations, and so significantly reduce the load on the database. SAP S/4HANA, on-premise edition, uses the functions for archiving provided by SAP NetWeaver.
Managing the lifecycle of current and historic data	Move large amounts of data within a database to gain more working memory. This lets you manage current and historic data using the data aging framework.
Managing the lifecycle of live data and archived data based on rules	Use SAP Information Lifecycle Management (SAP ILM) to manage the lifecycle of live and archived data based on rules. • Optimize the data volume of an application system by moving data that is no longer required for operations to a storage system and by destroying live data and stored data according to legal requirements. • Enable the decommissioning of legacy systems by transferring legacy data to an ILM Retention Warehouse and by retaining and destroying the legacy data independently of the legacy system according to legal requirements. SAP ILM requires an additional license.
Enabling your system for SAP remote support	Set up a remote service connection for each ABAP system to use SAP remote services (for example, SAP EarlyWatch or Remote Consulting), or if you would like to permit an SAP support consultant to work directly in your system to make a more precise problem diagnosis.

Local Administration Tasks for AS ABAP

Key Feature	Use
Exchanging the kernel without system downtime	Use an automated procedure to automatically exchange the kernel in an ABAP system, or to make parameter changes while the system is running.
Monitoring components of AS ABAP	Check the consistency of an installation, get an overview of all application server instances and their states, monitor processes, users, lock entries, Internet requests, RFC connections, and RFC calls, and cross-component processes.
Configuring and administering special AS ABAP components	Configure asynchronous RFCs, logon load balancing, operation modes, area menus, and the number range buffer. You can also send important notifications to all users that are logged on to the ABAP system in the form of short messages.
Troubleshooting	Use the trace function, the ABAP dump analysis, and the system log to identify and solve issues.
Managing concurrent database access	The SAP system is equipped with a special lock mechanism that synchronizes database access. The purpose of the lock mechanism is to prevent two transactions from changing the same data in the database simultaneously. You can configure, administer, and monitor database updates related to ABAP transactions.
Managing the available memory of your ABAP system	Use profile parameters to configure SAP Memory Management in order to adjust the ABAP Server to hardware and software requirements.
Managing background processing	Configure and monitor background processing of the AS ABAP, and schedule and manage local background jobs.

Other Administration-Related Services for AS ABAP

Key Feature	Use
Managing alerts	Inform responsible or interested parties immediately via a predefined alert if the application detects a critical situation and triggers the alert management to create the alert.

Database Administration for SAP HANA

Key Feature	Use
Starting and stopping the SAP HANA database	Start and stop the SAP HANA database.
Monitoring and administering the SAP HANA database	Monitor and administer local or remote SAP HANA databases in SAP systems in an ABAP environment.

Software Logistics

Key Feature	Use
Managing and transporting development objects	Organize ABAP development projects and transport changes between SAP systems in your system landscape. As well as ABAP objects, you can also transport Java objects and SAP-specific non-ABAP applications in your system landscape. A close integration for transporting development objects of ABAP and SAP HANA is provided. You can also copy ABAP clients, and transport languages.

Related Features

- See [Custom Application Development for ABAP \[page 10\]](#) for more information about the following key features:
 - [Managing database updates](#)
 - [Scheduling batch jobs](#)
 - [Managing the lifecycle of development activities](#)
- See [Operating the Application Server for Java \[page 7\]](#) for more information about [Form processing and form printing](#).
- See [Software Logistics for SAP S/4HANA \[page 22\]](#) for more information about the following key features:
 - [Installing systems](#)
 - [Copying systems](#)
 - [Installing and distributing front-end software](#)
 - [Renaming existing SAP systems](#)
 - [Updating and Patching](#)

2 Operating the Application Server for Java

Business Background

Application Server for Java (AS Java) is used as a runtime platform to support form-based processing of business data triggered by both ABAP- and Java-based applications.

Key Features

The following features are available:

Printing Forms

Key Feature	Use
Form processing and form printing	Adobe Document Services (ADS) enable form-based processing of business data triggered by both ABAP- and Java-based applications.

Configuring Application Server for Java

Key Feature	Use
Configuring AS Java automatically	Automatically configure your system directly after installation by using the functional unit configuration tool, which makes the technical settings for Java functional units.
Configuring AS Java manually	Configure AS Java for scenarios that go beyond the automatic configuration.

Administering Application Server for Java

Key Feature	Use
Modifying service, manager, or application properties	View the current system configuration and edit the service, manager, and application properties.
Managing applications	Manage applications with their modules (Web, Enterprise Java Beans, and so on) and resources (JDBC, JMS, JCA).
Managing ICM	Administer the Internet Communication Manager (ICM), which is responsible for accepting and forwarding requests in an AS Java instance.
Managing locks	Administer and monitor SAP locks (held in the lock table by the enqueue server) with different tools.
Managing the SAP Message Server	Monitor and administer the SAP Message Server.
Using the Startup Framework of AS Java	Start, stop, and monitor the AS Java using the Startup Framework
Backing up and restoring	Back up AS Java and the relevant database to prevent data loss. This is essential for the recovery of the server after the system breaks down.
Managing the gateway	Administer and monitor the gateway that enables SAP systems and external programs to communicate with one another.
Manage your system landscape information	Store information about technical systems, landscapes, business systems, products, and software components in a central repository.

Monitoring of Application Server for Java Using SAP NetWeaver Administrator

Key Feature	Use
Using history reports to monitor AS Java	To monitor your local system, you use the SAP NetWeaver Administrator tool History Reports.
Monitoring and displaying log files	Check the logs regularly for error messages to ensure the stable and error-free operation of the system.
Using open SQL monitors	Monitor the execution of SQL statements, the status of the table and catalog buffers, as well as the availability and the use of Open SQL database connections.

Key Feature	Use
Using JPA monitors	Monitor information about all JPA applications that are running on a given cluster.
Monitoring JCo connections	Analyze JCo connections, organize the metadata cache, and change the settings for JCo traces.

Central Monitoring of Application Server for Java Using CCMS

Key Feature	Use
Monitoring using the CCMS	Monitor the status data of AS Java from a central SAP monitoring system using the CCMS.

3 Custom Application Development for ABAP

Business Background

A key ingredient for business applications is custom development. The ABAP development environment offers a wide range of options for custom application development from extensions and modification of SAP standard applications by customers up to the development of completely new applications.

Key Features

The following key features are available:

ABAP Language

ABAP is a fourth-generation (4GL) as well as an object-oriented programming language developed and constantly improved/enhanced by SAP for programming business applications in the SAP environment.

Key Feature	Use
Internal tables	Store and process mass table data dynamically in the working memory.
Managing updates of data in the database	Use the concept of the SAP Logical Unit of Work (LUW) integrated into the ABAP runtime environment which enables multiple users to access the central database at the same time.
Using external interfaces	Use Remote Function Call as an interface to other programming environments. Use the Internet Communication Framework (ICF) as an interface to the Internet. Use the built-in transformation capabilities to support XML and JSON.
Supporting UIs in multiple languages	Extract language-specific program components from the source code, which are reloaded when the program executes in accordance with the environment.

Data Modeling

Data modeling provides capabilities for defining data models in the database that can be used for business applications.

Key Feature	Use
ABAP Dictionary	Maintain data types in a persistent repository that are visible in all repository objects. The database tables of the central database, views, and lock objects are managed in ABAP Dictionary.

Key Feature	Use
ABAP Core Data Services (CDS)	Implement SAP's CDS concept for AS ABAP. The concept provides a platform-independent Data Definition Language (DDL) to define CDS views and CDS table functions that implement a semantically rich data model.

Database Access

Database access provides capabilities for accessing database entities.

Key Feature	Use
Open SQL	Access data through Open SQL statements integrated into the ABAP programming language. The ABAP statements allow platform-independent access to entities defined in the ABAP Dictionary or by ABAP CDS.
Native SQL	Platform-dependent access to a database. Native SQL includes an embedded static access (<code>EXEC SQL</code> ABAP statement), a class-based, general purpose access using ABAP Database Connectivity (ADBC), and ABAP-managed database procedures for SAP HANA.

ABAP Application Infrastructure

The ABAP Application Infrastructure adopts technical details from the application development and improves the overall development process.

Key Feature	Use
Exposing CDS views through OData	Generate OData services based on a CDS view without any additional implementation.
Supporting stateless transactional applications	Expose application logic through stateless OData services.

Business Object Processing Framework (BOPF)

The Business Object Processing Framework is an ABAP object-oriented framework that provides a set of generic services and functionalities to speed up, standardize, and modularize your development. BOPF manages the entire life cycle of your business objects and covers all aspects of your business application development.

Key Feature	Use
Creating and defining business objects	Create new business objects in order to encapsulate business logic and data to be exposed through common interface. Use BOPF tools for developing and testing business objects.
Enhancing business objects	Enhance existing business objects through custom business logic and data.
Integrating as well as combining business objects and non-BOPF applications	Invoke application logic that is not built on BOPF through BOPF objects and vice versa.
Reusing application infrastructure	Reduce development and maintenance effort through reuse of existing BOPF services.

Service Adaptation Description Language (SADL)

SADL enables fast read access to data for scenarios on mobile and desktop applications using query push-down.

Key Feature	Use
Creating OData services based on SADL models	Establish a mapping between an OData model and an entity (SADL model) that contains modeled associations to other entities.
Using OData analytics in SADL-based services	Annotate SADL-based Gateway Services to use analytical features.
Using query options for executing SADL-based Gateway Services	Use query options to parameterize and fine-tune the execution of SADL-based SAP Gateway Services.

Server Technology

The components of the infrastructure server technology provide a reusable runtime environment for other components that also uses client server technology to process requests.

Key Feature	Use
Application Server ABAP	Use the ABAP runtime environment as a virtual machine for ABAP programs.
Building globalized custom applications	Build globalized custom applications using internationalization technologies and data encodings.
Internationalization	Provides technologies and data encodings for building globalized custom applications.

ABAP Development Tools

The ABAP development tools enable ABAP developers to build their own applications and features using the ABAP programming language and the ABAP Application Server capabilities in an Eclipse-based IDE or on the classic SAP GUI-based ABAP Workbench.

Key Feature	Use
Creating and managing data definitions	Specify ABAP coding such as reports and includes, function modules, classes, and interfaces. Use ABAP Dictionary artifacts such as structures and data elements to create and manage data definitions (metadata).
Rearranging table columns to application-specific needs	Build CDS views on existing database tables using Core Data Services.
Converting between ABAP data and XML formats	Describe transformations between ABAP data and XML formats using transformations (XSLT and ST).
Error handling	Use options such as message classes to inform the user about an error or a status, or to issue a warning

Key Feature	Use
Developing SAP standard UI technology	Use Web Dynpro applications to develop SAP solutions of the SAP NetWeaver Application Server
Modularizing and encapsulating development objects	Modularize SAP systems and encapsulate development objects using packages and package interfaces.
Managing the lifecycle of development activities	Modularize, encapsulate, and decouple units in the SAP System using a Package Builder. Transport objects to other SAP systems.

ABAP Testing and Quality Tools

The AS ABAP offers a set of specialized test and analysis tools that are useful at different phases of the software lifecycle (development, testing, and production).

Key Feature	Use
Checking code quality	Use static checks of the ABAP Test Cockpit and the Code Inspector to analyze customer code for functional, usability, or performance issues. In addition, use static checks of the Code Vulnerability Analyzer (extra license required) to analyze customer code for possible security vulnerabilities.
Unit testing ABAP programs	Use ABAP Unit test classes to develop and execute test classes that ensure the correct behavior of program logic.

ABAP Troubleshooting Tools

The ABAP Troubleshooting Tools enable you to detect functional and performance issues through debugging, tracing, monitoring, and logging applications.

Key Feature	Use
Debugging	Set breakpoints and step through a running ABAP application, analyze and change variable values, and examine the call stack to understand the program integration in the general application context. Debug ABAP-managed database procedures (AMDP) and simple transformations.
Profiling ABAP source code	Create ABAP trace files to analyze the distribution of an application's time consumption with respect to database and ABAP runtime. Also, to significantly improve the overall performance and detect hotspots such as: • SQL accesses • ABAP procedures or statements with poor performance • redundant executions of same program parts
Monitoring SQL performance of an ABAP system	Collect essential SQL performance data along with the ABAP contexts of all SQL statements performed in an ABAP system. Analyze the collected data for time intervals of your choice.

Key Feature	Use
Dynamic logging	Create dynamic logpoints for specific code positions to gain runtime information like the number of executions, variable values, call stack information, or to use them for triggering system functions like the SQL trace. It is not necessary to change source code in order to use dynamic logpoints.

Extensibility

The extensibility configuration framework allows different interface implementations of the application parts to be exchanged during the runtime of an application.

Key Feature	Use
Creating custom fields	Create, edit, publish, and delete custom fields for specific business contexts of extensible applications. Enable field usage for UIs, reports, email templates, and form templates. Make field content relevant for free-text search.
Creating custom logic	Create, test publish, edit, and delete enhancement implementations for specific business contexts of extensible applications. Use the full ABAP language for extensions of AS ABAP implementations.

Related Features

See [Operating the Application Server for ABAP \[page 3\]](#) for more information about the following key features:

- Managing concurrent database access
- Scheduling batch jobs
- Managing and transporting development objects

4 Security

Business Background

In today's world of collaborative business processes and open system environments, security no longer means just adding a firewall and using passwords to log on. It requires a complete approach that not only applies to your own IT landscape, but also to issues that arise beyond your own borders, in which even simple organizational measures can have a significant impact. The infrastructure of the SAP NetWeaver technology platform supports you by delivering comprehensive security features for heterogeneous environments.

Key Features

The following features are available:

Key Feature	Use
Authorization management	Assign authorizations to users with roles. Create roles. Mass maintenance enables authorization management for many users. ABAP-only: User information system allows for reporting of roles and their authorizations.
Identity management	Define user validity. Maintain user master data. Set user types. Support for mass maintenance of user data. Delegated user administration. ABAP-only: User information system allows for reporting of users. Synchronize users with SAP HANA database management system and LDAP. Java-only: Source user data from LDAP or ABAP system. Export and import principal data. Provision and manage principals with an SPML interface. Enable support for self-registration and logon help, such as forgotten passwords. Configure virtual groups based on user attributes. User mapping for principals for single sign-on to back-end systems. Configure e-mail notification for user management events.
Central user administration	ABAP-only: Push users and authorizations from a central system in a system landscape.

Key Feature	Use
Security policy	Define security policies to control password policies, logon policies, and policies for logon IDs.
User authentication and single sign-on	Configure the authentication methods and policies supported by the system. For the following scenarios, SAP NetWeaver Application Server supports the following authentication and single sign-on (SSO) methods: • SAP GUI logon ◦ Password-based authentication ◦ SSO for SAP Shortcuts ◦ SSO with an external SNC product • Web-based logon ◦ Password-based authentication ◦ SSO with logon tickets ◦ SSO with logon tickets ◦ Kerberos with SPNego ABAP requires integration with SAP Single Sign-On to support ◦ SSO with external SAML 2.0 identity provider ◦ Java-only: Header variables • Web Services ◦ Transport level authentication and SSO with user ID and password, X.509 certificates, and authentication assertion tickets. ◦ Message level authentication using user name token, X.509 certificate token, and SAML token. You can also use WS-specific security and authentication mechanisms, such as XML encryption, XML signatures, Message Aging, and WS SecureConversation • ABAP-only: OAuth 2.0 for authentication of OData requests • Log off methods where possible
Digital signatures and encryption	Encrypt data during transport: Support of transport layer security (TLS), secure network communication (SNC), and web service security. Offer functions for the encryption of data at rest, whether it is passwords, credit card data, in the database, or in the file system. Digitally sign and verify signed documents. Manage digital keys.

Key Feature	Use
System security functions	A virus scan interface enables you to connect third-party virus scan software to detect malware during uploads or stored in your system. Logging functions record security-related events. The audit information system provides an infrastructure for conducting audits in SAP NetWeaver Application Server. Store connection information for RFC and HTTP destinations.

5 UI Technologies

Business Background

SAP provides a wide set of user interface (UI) technologies for different purposes. The UI frameworks provide capabilities for developing applications tightly integrated into the respective landscapes.

The frameworks and tools available include several that are focused on developing transactional applications, as well as others that help business experts create appealing, state-of-the-art user interfaces without the need for development skills. In the ABAP environment in particular, there are many options available for extending or adapting existing applications. The user interface clients provide a consolidated access to all of these different applications. They provide structured access through role-based navigation, and a harmonized look and feel across the various underlying UI technologies.

Key Features

The following features are available:

Key Feature	Use
Developing and adapting applications	UI frameworks can be used to develop user interfaces by coding or based on a composition and orchestration environment that builds screens with specific UI elements. Use one of the following UI frameworks to develop applications tightly integrated into the corresponding landscapes: • SAPUI5 (UI development toolkit for HTML5): Create apps with rich user interfaces for modern Web business applications, responsive across browsers and devices, based on HTML5. • Web Dynpro ABAP: Develop Web applications based on ABAP from scratch or use the templates/patterns provided by Floorplan Manager (FPM) for easy and efficient development. Adapt your WDA applications without touching the code, and define the range in which users can personalize these applications further. • Dynpro ABAP/ SAP GUI for HTML Create classical SAP GUI transactions. • SAP Visual Business: Visualize and combine enterprise data with geographical or 3D real-world scenes
Creating your own themes	With the UI theme designer you can create your own themes to adapt the visual appearance of applications based on different UI technologies (including SAPUI5 and Web Dynpro ABAP).
Providing consolidated access to your applications	Use one of the following UI clients to provide structured access through role-based navigation, and a harmonized look and feel across the various underlying UI technologies: • SAP Fiori launchpad • SAP NetWeaver Business Client (NWBC) • SAP GUI

6 Integration and Connectivity

Business Background

Core technologies for communication of the SAP NetWeaver Application Server.

Key Features

The following features are available:

Key Feature	Use
Remote Function Call (RFC)	Communication via RFC/bgRFC. Communication between applications of different systems in the SAP environment includes connections between SAP systems as well as between SAP systems and non-SAP systems. Remote Function Call (RFC) is the standard SAP interface for communication between SAP systems. RFC calls a function to be executed in a remote system. bgRFC provides additional services, such as queues, and qualities, such as exactly-once-in-order execution of RFC function modules.
UCON RFC Security	Restricted external RFC access and simplified RFC administration. UCON RFC security allows the administrator to restrict external access to RFC function modules. In addition, it provides simplified administration, for example, by analyzing the required RFC authorizations and creating different RFC user roles.
Internet Communication Framework (ICF)	Communication via HTTP. Internet Communication Framework (ICF) enables communication with the SAP system using Internet standard protocols (HTTP, HTTPS, and SMTP). ICF is an integrated component of AS ABAP.
ABAP Channels (AC)	ABAP Push Channels (APC) provide "push" messages between the ABAP Application Server and Web browsers. ABAP Message Channels (AMC) provide a publish/subscribe messaging inside the ABAP Application Server. TCP sockets enable the ABAP Application Server to communicate directly via simple TCP protocols with programmable logic controllers (PLCs) and other devices.

Key Feature	Use
Web Services ABAP	ABAP Web service provisioning. A Web service is an independent, modular, self-describing application function or service. Based on XML and other standards, this application function can be described, made available, located, or called using Internet protocols. The Web service infrastructure in the ABAP Application Server provides functionality to develop, configure, execute, and monitor both inbound and outbound Web services.
SAP Web Dispatcher	HTTP(S) load balancing and request routing. SAP Web Dispatcher is a software load balancer and reverse proxy for the HTTP(S) protocol. It supports SAP systems and their load balancing and request routing requirements.
SAP Gateway Foundation	SAP Gateway Foundation offers development and generation tools to create OData services to a variety of client development tools. It establishes a connection between application or SAP Business Suite data and target clients, platforms, and programming framework.

7 Software Logistics for SAP S/4HANA

Business Background

Procedures such as installing SAP S/4HANA, on-premise edition, keeping the system up-to-date, and other system- and database-related procedures require the use of a separate toolset, which is available for customers of SAP S/4HANA, on-premise edition.

Not supported (and will not be mentioned here):

- Upgrade to SAP S/4HANA, on-premise edition (as it is first product)

Key Features

Table 1: Software Maintenance for SAP S/4HANA, on-premise edition

Key Feature	Use
Installing systems	Plan new SAP systems and reliably install and initially configure them in your landscape according to your requirements (for example, as regards the distribution of instances to single hosts).
Copying systems	Create consistent copies of your SAP system, for example, to create a test system as a copy from production.
Installing and distributing front-end software	Install/update front-end software (such as SAP GUI) and distribute it to your client computers.
Renaming existing SAP systems	Change technical characteristics of an existing SAP system, for example, change the SAP system ID, instance number, or host name.
Updating and patching	Import support packages and deploy patches and SAP Notes to keep your system up to date.

8 Services for Business Users on the Application Server for ABAP

Key Features

The following key features are available:

Key Feature	Use
Building structured record and case views of diverse application data and electronic documents to boost business user productivity	Simplify your business user interaction with complex application data by relating to this data in the way users think. You can orchestrate data from SAP software in cases and records, search and retrieve data, manage cases, and define ad-hoc workflows.

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