ARGENT
ENCYCLOPEDIA

Monitoring SAP
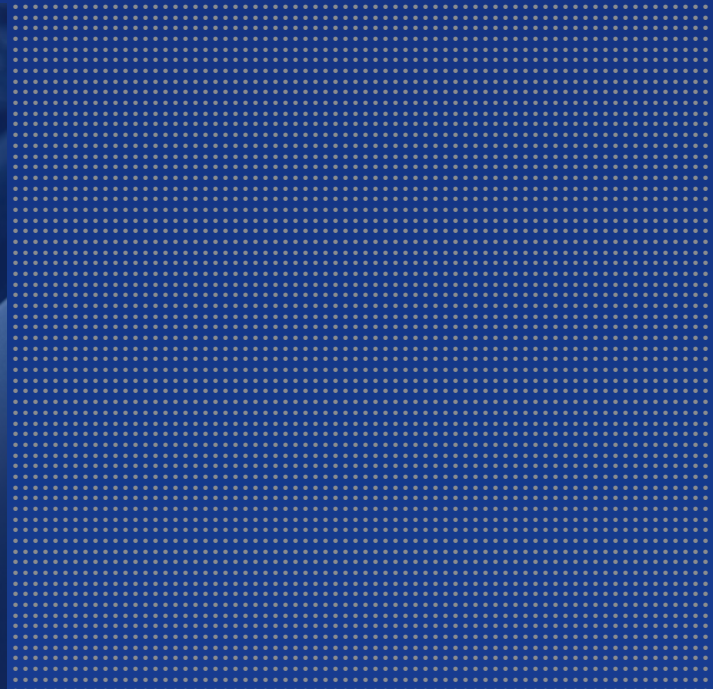
Contents

# Argent for SAP Overview

Introduction

Argent for SAP is a comprehensive monitoring and alerting solution for SAP systems. SAP enterprise applications can be deployed in a two or three-tier architecture. The three-tier client/server architecture generally consists of a **presentation layer**, an **application layer**, and a **database layer**. The SAP application layer contains the following components:

Central services - which include messaging (manages client connections and communications) and enqueue (SAP lock management) services.

Application services - that process online and batch workloads, which can be further categorized into the following types:

• ABAP: processes workloads based on an SAP proprietary programming language.

• Java: processes Java based workloads.

• ABAP + Java: processes both ABAP and Java based workloads

The specific SAP product determines the type of application service required (ABAP, Java or both).
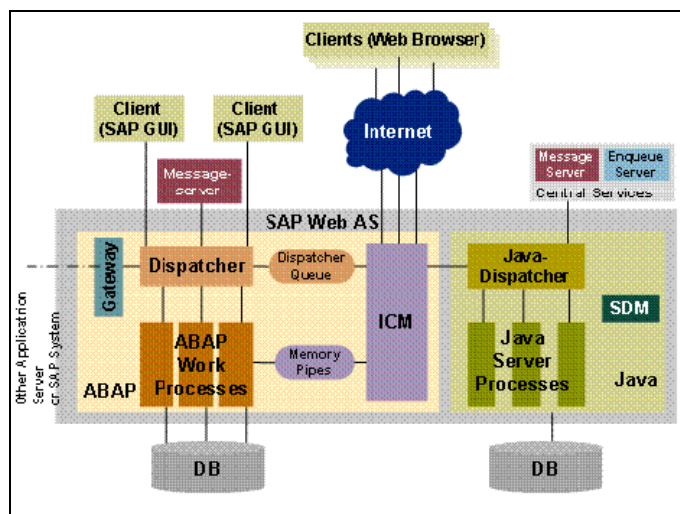
The above image illustrates the architecture of the SAP NetWeaver application server which includes both the ABAP and Java stack. Note that the two stacks can be installed separately or together.

Internet Communication Manager (ICM)

ICM handles communication between the SAP Application Server and the outside world via HTTP, HTTPS and SMTP protocols.

Central Services

Central services comprise message and enqueue services. There are separate central services for the ABAP and Java stack (image above shows two message servers, while the second enqueue server for the ABAP stack is not shown).

SAP System

A SAP Application Server system consists of one or more instances. An instance is a "server" in the sense that a user can connect to every instance individually. An instance typically consists of many running operating system processes that are connected by shared memory, TCP/IP connections on the local host and other means. All instances belonging to the same system are connected to the same RDBMS. A system has a three-letter name, the system identifier (SID).

Instances of a system do not have to be configured identically; instead, different instances may offer different services. Some services are unique in a system, i.e. only one instance is configured to offer these services (e.g. Enqueue, Message Server). A system may have an instance called "central instance", which offers many of these unique services.

Every instance has a number between 00 and 98, the so called instance number (abbreviated by InstNr or NN to indicate the numerical value). The installation default is 00. If more than one instance is installed on the same host, they MUST have different InstNr. InstNrs are usually part of the port numbers to ensure that there is no conflict between instances.

An instance uses a number of TCP and UDP ports for internal communication. These ports are usually not configurable and not relevant for the "outside world". They are interesting only in the rare case when a conflict with other software on the same host occurs. The InstNr for an instance can be chosen freely. Different instances belonging to the same system can have different InstNrs. The InstNr is chosen during the installation.

Dispatcher

Accepts requests from the ICM or external SAP clients and places them into a queue from which it distributes requests to other SAP processes to execute application logic.

Message Server

The SAP Message Server runs as a separate process mostly on the same host as the central instance. Only one message server can run on each SAP System. The task of the message server is to inform all the servers (instances) belonging to an SAP System of the existence of the other servers. When an instance is started, the dispatcher process attempts to establish a connection to the message server so that it can announce the services it provides (DIA, BTC, SPO, UPD, etc.). If this does not work, an appropriate entry is made in the system log. If the messages server stops working, it must be restarted as quickly as possible, to ensure system continues to operate trouble-free.

Enqueue Server

Enqueue server is the server that administers the Lock Table. The enqueue server is also known as the lock server. There is only one enqueue server in a distributed SAP system, and it runs on the central instance.

Monitoring With Argent for SAP

Argent for SAP monitors the following SAP system components:

SAP Instance

The instance of the SAP system can be defined as an administrative unit which consist of different components that makes up the SAP system. A SAP instance defines a group of resources such as work processes, dispatcher, internet communication manager, memory and the gateway.

Basically there are three types of instances:

SAP System = Dialog Instance + Central Instance + Database Instance

Dialog Instance: - Dialog instance exists in the application layer. Its purpose is to maintain load on the server. Dialog instance exists on different host. If number of dialog instance increases hardware resources, dispatcher, work processes also increases so that more number of users can login at a time.

Central Instance: - Central instance can also work as dialog instance. But the main thing is that it contains Enqueue and message servers. All dialog instances communicate with central instance before requesting database with message server. When an instance is started, the dispatcher process attempts to establish a connection to the message server so that it can announce the services it provides (DIA, BTC, SPO, UPD, etc.).Lock table is managed in central instance by enqueue service.

Database Instance: - As normal database instance accepts requests from central instance to fulfill the user's requests. As lock management system provided by enqueue server it will provide service to users.

Argent for SAP will do the monitoring of all components in a SAP instance.

SAP Processes

Depending on the type of SAP instance each instance must have one or more processes running. It includes Dispatcher process (Central process on an instance. It is responsible for starting work processes and distributing transaction load across work processes), Message server process (Independent program that maintains a list of all instances in a SAP system. The message server determines which instance a user logs on to and organizes communication between instances) etc. Argent for SAP enumerates all the processes from the process table and verifies that the processes are running successfully.

Work Process

An SAP application server has to process SAP requests from multiple front ends. The application server has the use of a dispatcher, which gathers the requests and transfers them for processing to the work processes. The work processes then execute the desired requests (for example, an ABAP program).

Here are the following types of work processes:

Work Process Type	Use
Dialog (DIA)	Executes dialog programs (ABAP)
Update (UPD)	Asynchronous database changes (is controlled by a COMMIT WORK statement in a dialog work process)
Background (BTC)	Executes time-dependent or event-controlled background jobs
Enqueue (ENQ)	Executes locking operations (if SAP transactions have to synchronize themselves)
Spool (SPO)	Print formatting (to printer, file or database)

Argent for SAP enumerates all work processes from WP table and alert if,

- Any of the work process is down
- Any error occurred in any of the work process
- Any of the work process's response time is low

Dispatcher Queue

The dispatcher process forwards each request it receives to a work process of the appropriate type. If all the processes of this type are occupied, the dispatcher stores the request in a queue. Argent for SAP monitors the number of waiting requests in the queue, total number of requests written since the server has been running, total number of requests read since the server has been running etc.

Internet Communication Manager (ICM)

The Internet Communication Manager ensures that communication between the SAP System (SAP Web Application Server) and the outside world via HTTP, HTTPS and SMTP protocols works properly. In its role as a server, the ICM can process requests from the Internet that arrive as URLs with the server/port combination that the ICM can listen to. The ICM then calls the relevant local handler for the URL in question.

Argent for SAP monitors the following ICM components.

- Count of Worker Threads (These threads handle connection requests and responses).
- Status of Watchdog thread (Usually a worker thread waits for a response (regardless of whether it is a client or a server thread). If there is a timeout the watchdog takes on the task of waiting for the response. Then the worker thread can again be used for other requests. If the watchdog receives the response, it informs the thread control component, which then wakes up a worker thread)
- Status of Signal thread (This thread processes signals that are sent by an operating system or another process (for example, the dispatcher))

System Logs and Trace Files

The trace and system logs contain important information about the system operations. Argent for SAP uses these log files to find out any errors or undesired behavior in the SAP system.

Open Alerts

The SAP Computing Center Management System (CCMS) provides a special alerting system for SAP Exchange Infrastructure. The alerts are triggered as soon as a particular threshold value is not reached, or is exceeded. Argent for SAP uses this alert database to monitor the ABAP and Java components (including the Business Process Engine) of your Exchange Infrastructure centrally, and to identify different categories of system errors and application errors in the various interfaces and interface namespaces of the components involved.

Enqueue Server

The enqueue server (also known as the lock server) is the SAP system component that manages the lock table. The enqueue server receives a lock request and checks the lock table to determine whether the lock request collides with an existing lock. If it does, the enqueue server rejects it. If it does not collide, the enqueue server sets the lock and makes the entry in the lock table.

Argent for SAP monitors important enqueue server parameters such as enqueue lock count, enqueue request count, enqueue reject count, Enqueue error count etc.
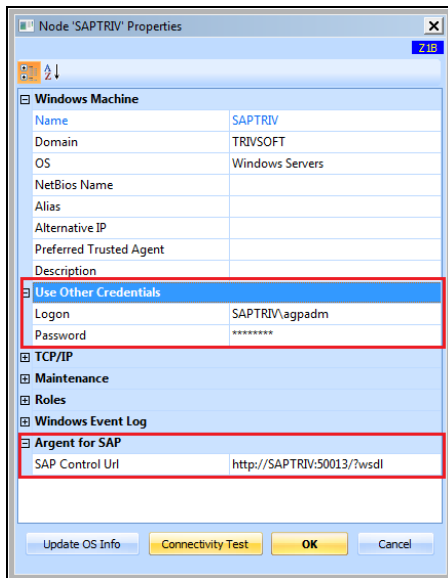
Access Points

Access Point table contains the information of all the network access points of the running processes. Argent for SAP monitors the heartbeat of all access points in a sap instance.

SAP Instance Connectivity Test

Add SAP server to CMDB-X
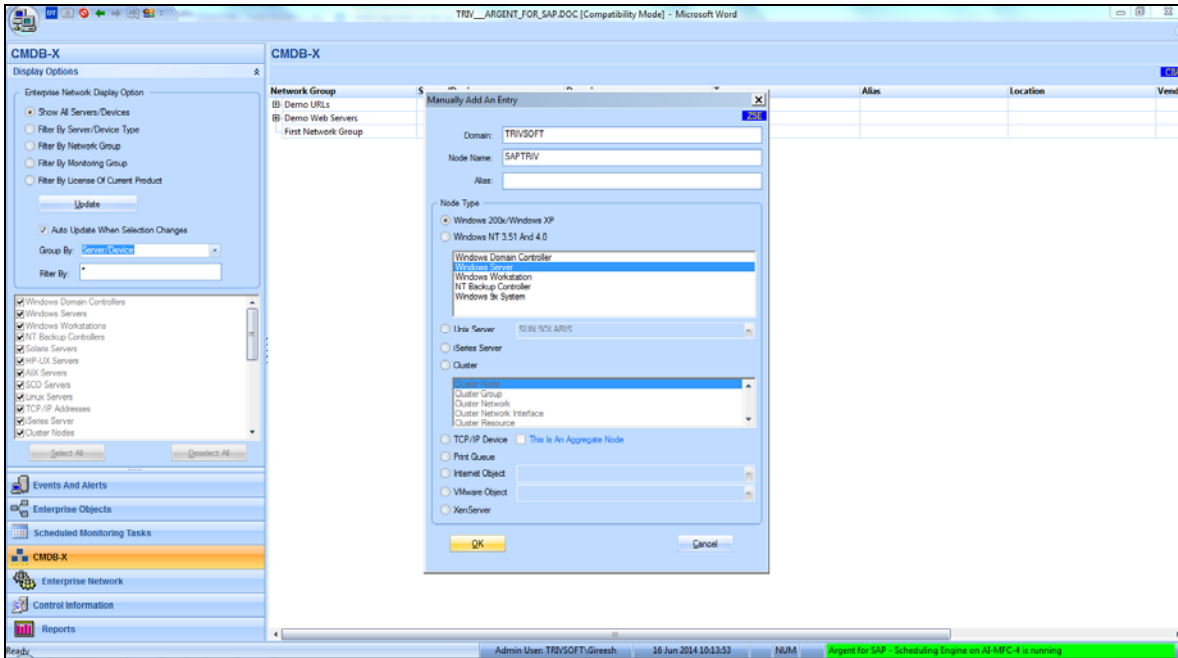
License SAP Server And Configure SAP Instance

Specify the logon credentials:

Logon user name and password to connect SAP server

Specify SAP control URL:

Format:

```
http://<Host>:5<NR>13(or sapctrl <NR> in /etc/services)/?wsdl, where
"<NR>" corresponds to the SAP instance number (00…98)
https://<Host>:5<NR>14(or sapctrl <NR> in /etc/services)/?wsdl, where
"<NR>" corresponds to the SAP instance number (00…98)
```

To find out the instance number:

- Logon to SAP server
- Open SAP Management Console (MMC), you can find out the list of instances installed. Please see the below screenshot.
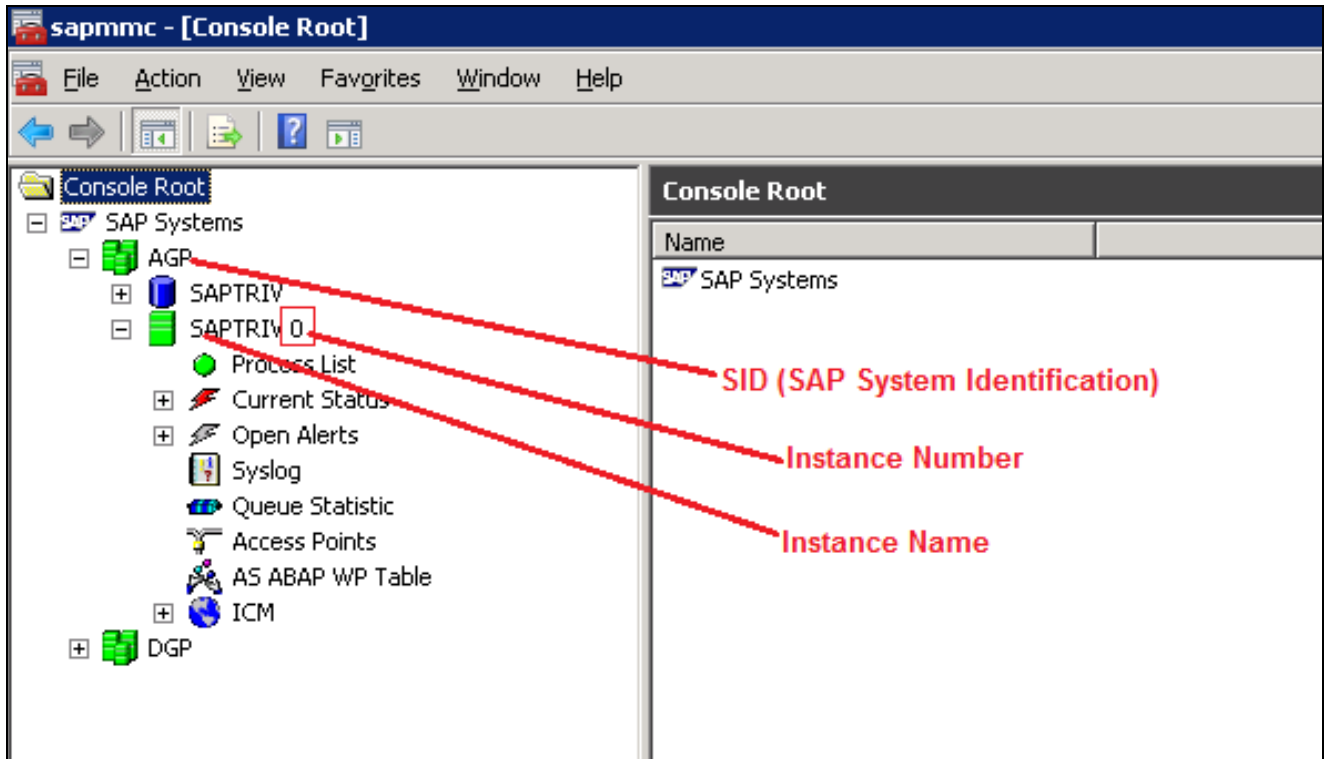
(In the above screenshot only one instance (SAPTRIV 0) is installed in the SAP system AGP)

After configuring the instance, do the connectivity test and make sure that 'SAP server Connectivity (Test 17)' is '[VALID]'.

The SAP start service runs on every computer where an instance of a SAP system is started. It is implemented as a service on Windows, and as a daemon on UNIX. The process is called sapstartsrv.exe on Windows, and *sapstartsrv* on UNIX platforms.

The SAP start service provides the following functions for monitoring SAP systems, instances, and processes.

- Starting and stopping
- Monitoring the runtime state
- Reading logs, traces, and configuration files
- Technical information, such as network ports, active sessions, thread lists, etc.

These services are provided on SAPControl **SOAP** Web Service.