Welcome to the course for SAP Business One Analytics Powered by SAP HANA: Administration and System Management. This course is valid for release 9.0.
At the end of this course, you will be able to:

- Perform system administration tasks for SAP Business One, version for SAP HANA

At the end of this course, you will be able to perform administration tasks.
In this topic, we will discuss how to monitor the system in the SAP HANA Studio and the Administration Console Web Portal. We will discuss methods used to back up and restore databases. We will also take a look at security administration.
Now we will look at System Management with the SAP HANA Studio.
For day to day management of the SAP HANA system, customers use the SAP HANA Studio. The SAP HANA Studio is used to perform administrative tasks, develop extreme applications and extend the semantic layer using modeling functions.

The implementation team at XYZ Consulting does a knowledge transfer session for the customers to explain how monitor the system effectively and to set up automatic alerts.
The SAP HANA Studio has the tools to effectively monitor the system.
- Enables you to check system is running as expected
- Provides possibilities to analyze issues
- Contains the SAP HANA modeler
- Allows you to create and manage user authorizations for SAP HANA
- Manages backup housekeeping and executes database restores

The SAP HANA Studio also includes other functions besides administration such as modeling or development. These functions are discussed in other units.
In the SAP HANA Studio, choose the Administration Console perspective for system management. Double-click on the system to view the system management tabs.

The first tab you will come to is the Overview tab.
The Overview tab page displays a summary of the most important system information. You should regularly check the system status here. You can view the overall system state, general system information such as software versions, any alerts, and get an overview from bar charts with an overview of important system resources.
The bar charts display information for memory consumption, CPU load, filling level of the disks used for traces, data and logs.

When specific thresholds are violated, the bars will be colored yellow or red to easily detect bottlenecks of these resources.
The Services tab page is found under the Landscape tab. Here, you can check all services that belong to your system are running:

- Preprocessor
- Name server
- Index server
- Statistics server
- Daemon
- XS engine
- Scripts server

The Services tab page is found under the Landscape tab. From this tab, you can check all services belong to your system are running: preprocessor, name server and index server for each host and one statistics server. A statistics server exists on each host of a distributed landscape, however the service is actually running only on the master host.

Typically if all is well, everything is marked with a green square.
Diagnosis and Trace Files

To monitor system health, go to the tab with the Diagnosis Files. Double-click on any log file to see the trace.

A useful tool for troubleshooting, go to the Diagnosis Files tab. Double-click on any log file to see the trace.
The Statistics Server is one of the services of the SAP HANA database system. In addition to collecting historical performance and resource data, the statistics server issues system resource alerts to warn of potential problems.

The statistics server is started automatically when a system is started. The statistics server internally uses SQL statements to collect information from all index servers. Important alerts from the collected information on the system state are summarized on the Overview tab and displayed in detail on the alerts tab. You can also receive e-mail alerts.

The next few graphics discuss how to ensure the statistics server is enabled from a configuration point of view and gives more details about the alerts generated.

The note 1943067 contains the recommended configuration settings for optimal performance of the statistics server.
Alerts generated by the Statistics Server appear in the Overview tab for the SAP HANA server.

Additionally all tables of the statistics server can be accessed in the SAP HANA studio in the Navigator. Under the schema _SYS_STATISTICS, they can be found in the Tables folder. Open the context menu on a specific table entry and choose Content to display the content of the required table.
A high-level alert overview is shown on the Overview tab of the Administration Perspective. The Overview tab shows the number of current alerts per alert priority. This tab does not list individual alerts. Individual alerts are shown in a tooltip while the mouse cursor is hovering on top of the Current Alerts area.

An alert is shown in the Current Alerts section if a situation which would trigger the alert was active during the last execution of the alert.

To see details of the current and historical alerts, use the Alerts tab. Per default, only current alerts are displayed. It is also possible to view historical alerts, grouped by date criteria such as today, yesterday, last week, and so on.
You can configure the settings for the types of checks and alerts. You can set up email alerts to be sent to your inbox. You can configure the threshold for alerts. Defaults are preset for low, medium and high, but you can change them. You can enter start times for a six hour check interval and a 24 hour check interval. You can also filter the type of alerts and limit their output.
You can check system configuration in the SAP HANA Studio. When you go to the configuration tab, you will see a list of the different configuration parameters.

The parameters’ values are shown in a hierarchy. Host overrules Tenant overrules System overrules Default. Whenever a parameter has an active value which is different from the default, the cell containing the active value is marked with a green dot. A diamond symbol indicates the value was altered from the default.

There is also an indicator showing whether there are host or system specific parameterizations on file and on [section] level.
In the HANA studio, show the Administration Perspective. Open the information on the HANA database instance. The Overview tab page displays the most important system information. We recommend regularly checking the system status here. You can view the overall system state, general system information such as software versions, any alerts, and get an overview from bar charts with an overview of important system resources. The bar charts display information for memory consumption, CPU load, filling level of the disks used for traces, data and logs. When specific thresholds are violated, the bars will be colored yellow or red to easily detect bottlenecks of these resources. The resource bars are based on configurable thresholds. Note that the physical memory bar and the virtual memory bar are related. Physical memory is the actual physical RAM. Virtual memory includes swap-space on disk. See the total disk space occupied. See the number of CPUs available and overall usage.

The services tab page is found under the Landscape tab. The landscape tab enables you to check system is running and status of hosts and processes. The services sub tab contains information on the status of operating system processes. From this tab, you can check all services belong to your system are running: preprocessor, name server and index server for each host and one statistics server. You can add additional columns by configuring the table. A statistics server exists on each host of a distributed landscape, however the service is actually running only on the master host. Typically if all is well, everything is marked with a green square.

To monitor performance, go to the Diagnosis Files tab. Double-click on any log file to see the trace.

You can check system configuration in the SAP HANA Studio. When you go to the configuration tab, you will see a list of the different configuration parameters. Whenever a parameter has an active value which is different from the default, the cell containing the active value is marked with a green dot. There is also an indicator showing whether there are host or...
system specific parameterizations on file and on [section] level. The configuration of the IMCE is stored in flat files. These files can be edited on the operating system level. Here on the configuration tab, we can check whether or not the statistics server is enabled by choosing the daemon.ini file. Expand that file and the section [daemon]. Check the setting of parameter programs. The Default configuration does not include the statistics server. So customers should add it into the System configuration. The list of started programs should contain the statistics server. In addition to checking that the statistics server is enabled, you should also check that it is actually running. Go to the list of services in on the Landscape tab. The statistics server should be listed and display a green status on the first host in the landscape. It should be listed for all other hosts, although it will not display the green status. Alerts generated by the Statistics Server appear in the Overview tab for the HANA server. Additionally all tables of the statistics server can be accessed in the SAP in-memory computing studio in the Navigator. Under the schema _SYS_STATISTICS_, they can be found in the Tables folder. Open the context menu on a specific table entry and choose Content to display the content of the required table. A high-level alert overview is shown on the Overview tab of the Administration Perspective. The Overview tab shows the number of current alerts per alert priority. This tab does not list individual alerts. Individual alerts are shown in a tooltip while the mouse cursor is hovering on top of the Current Alerts area. An alert is “current” if a situation which would trigger the alert was active during the last execution of the alert. To see details of the current and historical alerts, use the Alerts tab. Per default, only current alerts are displayed. It is also possible to view historical alerts, grouped by date criteria such as today, yesterday, last week, and so on. Volumes tab - provides more detailed information about the disk usage on your server. For each service the size of the data and log area is displayed as well as the directory in which they are located. The lower part of the page provides information about the physical disk usage. The total size as well as the used size of the physical disks is displayed. In the admin console ➔ Services tab ➔ Load there is a display of the system load history over the past <x> days where <x> is probably known to someone. Displayed values are either averages or sums of the given KPI over one minute (whatever is canonically appropriate). KPIs presently are:

- CPU (avg. CPU load of all CPU cores combined)
- Memory used (some kind of memory usage, but unclear whether it is total used, used by application or …)
- Memory size: amount of RAM installed on the host – nice for comparison to used memory
- Disk used and disk size – obvious, assuming that here we are talking about the disk volume containing table data)
- Network in / Network out ➔ some measure of the system activity
- Swap in / swap out ➔ if the system was swapping, it’s interesting to know when this happened
- Tenant specific
  - CPU, Memory
  - Threads – number of threads of the indexserver process
  - Handles – number of handles in use
  - Ping time – who is pinging whom?
- Swap in - ...
- SQL: displays activity counters (statements per minute, transactions per minute, open transactions, blocked transactions)
- Column store: some column store specific KPIs known (and not documented) from BWA/TREX times
At the top of the Alerts tab, see a field displaying the time of the last check. You can view either All Alerts or Current Alerts. If you choose All Alerts, the alerts are broken into time periods. In this way you can compare performance by periods. You can enter a filter by alert text. Double-click an alert to see detailed information, including a full description, a time stamp, info on how to resolve the alert and a history on when this alert was previously generated.

The Configuration tab allows you view and define properties of the system. You can change a parameter by choosing the relevant config file and choosing Change in the context menu then entering the new value. To reset the value to the default, expand the configuration file, choose the parameter, then choose Delete from the context menu.

To configure an e-mail notification for an alert, choose the Alerts tab. Choose Configure Check Settings. The default tab is Email-functions. Enter the appropriate address(es) either for all checks or for specific checks.

To configure thresholds for the checks, choose the Configure Check Thresholds tab (in the Configure Check Settings), choose the field you want to change and enter a threshold. You can also configure start times on check intervals, in the same area, choose the Configure Start Time on Check Intervals tab. There are two sections – one for setting the start time for checks with 6-hour intervals and one for setting start time for checks with 24-hour intervals. You can use the buttons to the right of each time field to set the time.

There is a great deal of detail information on monitoring performance and optimizing the system in the SAP HANA Database Administration Guide.
Now we will discuss backup and restore options.
During the implementation, the XYZ Consulting team will set up automatic backup functions for their customer.

They explain to the customer how SAP HANA holds the majority of data in memory for quick transaction processing and complex analytics. They explain how persistent memory is managed automatically using save points.

They also discuss the need for long term backups and the options available for the SAP Business One companies and the SAP HANA database.
The SAP HANA database holds its data in memory for maximum performance, but still uses persistent storage to provide a fallback in case of failure.

During normal operation of the database, data is automatically saved from memory to disk at regular save points. Additionally, all data changes are captured in the log. The log is saved from memory to disk after each committed database transaction.

After a power failure, the database can be restarted like any disk-based database and returned to its last consistent state by replaying the log since the last savepoint.
Additionally, customers like to have another backup to the data saved on the disk.

Backups can be performed for a system from the SAP HANA Studio. Choose the system in the Navigator and open the context menu to select the option for Backup. Then provide the location details and name the backup. Review the settings. The backup begins when you choose the Finish button.
During the backup you can monitor the progress. When the backup finishes you will see the success message.

SAP provides backup checks and alerts to warn you of any errors connected with the backup process. These alerts can be found with the other alerts we previously mentioned in the Alerts tab of Administration perspective in the SAP HANA Studio.
Using data and log backups, the SAP HANA database can be recovered.

- Recover the database to its most recent state
- Recover the database to the following point in time
- Recover the database to a specific data backup
- Recover the database to a log position (in exceptional cases if previous recoveries failed)

Using data and log backups the SAP HANA database can be recovered. You can recover the database to its most recent state using the most recent data backup, the log backups made since the most recent database backup and the log area. You can recover the database to the following point in time using the last data backup available before the specific point in time, log backups made since the data backup to be used and the log area. You can recover the database to a specific data backup using a specified data backup. Or you can recover the database to a log position. This recovery type is an advanced option that can be used in exceptional cases if a previous recovery failed. This option uses the most recent data backup available before the specified log position, log backups made since the data backup to be used and log areas.
You can use SAP HANA Studio to restore customer-specific changes to a SAP HANA database. Recovery menu option is available in the Context menu for a system in the Navigator tab.

You will see a prompt to take the system offline. Then you will be prompted to log into the system host. You can then select the backup you wish to use to restore the database. You will see the details of the row you select. When you choose Next, you will be given a chance to indicate you wish to initialize the log area and/or install a new license key. You will have a chance to review the settings for the recovery before you begin.

For more information on restoring the database, consult the Backup and Recovery Guide.
Cron job for backups

You can schedule periodic backups for the SAP HANA database

See the SCN blog post “How do I use the cron to schedule a backup?”

http://scn.sap.com/community/business-one/blog/2013/07/24/how-do-i-use-the-cron-to-schedule-a-backup

You can schedule backups for the SAP HANA database in Linux. This is done using a cron job. Cron is driven by a crontab (cron table) file, a configuration file that specifies shell commands in Linux to run periodically on a given schedule.

Detailed instructions on using a cron job to schedule a backup are available in a blog post on SCN in the SAP Business One application area. (See http://scn.sap.com/community/business-one/blog/2013/07/24/how-do-i-use-the-cron-to-schedule-a-backup). The SCN blog post contains a link to a SAP note 1651055 that provides a backup script and a PDF that explains how to use the script.
In addition to backing up your database, you may have a need to export and import a database schema.

- You can import/export a database schema one by one using the following SQL commands:
  - `Export <db_schema>.'*' as binary into 'export_path' with replace;`
  - `Import <db_schema>.'*' as binary from 'import_path' with replace;`

- You can import the backup schema as a different schema name with a rename option.
  

If you ever need to recover a schema from a backup folder, you can use the import command with the backup folder path.

You can import the backup schema as a different schema name with a rename option. More details are available in an SCN blog on SAP Business One version 90 version for SAP HANA.

Based on a customer's needs, we have the ability to provide solutions for high availability. A customer can balance the need to avoid downtime with the costs associated. A customer can have a hot stand-by server with automatic fail-over. The system can be set up for automatic data replication to the second server. Other less costly options include a higher service level agreement for hardware replacement and repair with a hardware supplier. This would allow the customer to reduce costs while keeping an acceptable down-time for your company. For example a customer might not need immediate switch over to a second server but would be comfortable with the hardware supplier guaranteeing a response within 4 hours.
The SAP HANA system replication function brings the high availability solution to SAP Business One, version for SAP HANA and ensures an even higher reliable database service and a near zero data loss in case of an unplanned downtime. The high availability landscape allows you to quickly switch from one HANA server to another. Users will not notice if switched over to a second server.

No additional software is needed for the client PCs.

The central server can be a non-certified Linux server or virtual machine, running the SAP Business One server tools and using an Apache load balancer.

Both the active and standby HANA servers contain the SAP HANA database and the SAP HANA server.

All three servers (Central, Active and Standby) need the 32-bit and 64-bit SAP HANA database client installed. Only one SAP HANA license is required. The license will be replicated and applied automatically to the other SAP HANA database server.

More information on High Availability can be found in the High Availability guide on SCN.
Demo - Backup
Now we will discuss security.
In SAP Business One 9.0, version for SAP HANA, database credentials are saved in the SLD Authentication service, which serves as the security server. Database credentials are obtained by supplying SAP Business One, version for SAP HANA logon credentials for authentication against the license server. Upon successful authentication, the connection to the databases can be established using database credentials from the license server.

The graphic is a representation of the security workflow for SAP Business One, version for SAP HANA.

1. Authenticate using SAP Business One/Site User credentials.
2. Validate SAP Business One credentials using database credentials.
3. Provide database credentials.
The SYSTEM user is the SAP HANA Database Administrator user. The password for this user is set when the SAP HANA database is installed. Note that unlike other passwords, we do not recommend changing the password after SAP Business One is installed. However if you must change the password, see the note 1958908.

The user ndbadm is the operating system user for managing the SAP HANA database. This is the user that is used to start and stop the SAP HANA database. This user's password is initially set when installing the SAP HANA database.

The B1SiteUser is automatically defined in SAP Business One, version for SAP HANA. This user serves as site-level authentication for creating new companies, installing or upgrading the SAP Business One server, importing or exporting the license configuration file, configuring security settings in the SLD service and registering databases in the SLD service. The password for this user is initially set when installing the SAP Business One server tools.

At that point you can also choose whether to enter certificate details or choose self signed. The initial install can use a self-signed certificate. If you do not wish to use a self-signed certification, you will need to have a signed certificate ready. Self-signed certificates are less secure and browsers will give warnings, but because this certificate is only used for accessing the admin page and inner process communications, a self-signed certificate is fine for this purpose.
SAP Business One version for SAP HANA supports single sign-on (SSO) functionality.

You can tie the SAP Business One user account to a Microsoft Windows domain account. When users log into SAP Business One, they can start the application without having to enter their SAP Business One logon credentials.

To use this functionality, you must specify a domain user and password when you install the server tools on the SAP HANA server. Then register a service principal name (SPN) with the domain user you specified previously. Then you can enable the single sign-on function in the SLD and tie SAP Business One users to Microsoft Windows accounts.

Detailed information in this area is available in the SAP Business One Administrator’s Guide, version for SAP HANA.
SAP HANA Studio has tools to effectively monitor system performance. The overview tab summarizes the system state.

SAP HANA Studio’s statistics server collects historical performance and resource data to alert you to issues.

Backups can be performed in the HANA Studio.

You can also set periodic backups for the SAP HANA database using a cron job.

A customer can ensure high availability with a hot stand-by server with automatic fail-over. The primary system can be set up for automatic data replication to a second server.

Security is managed through the SLD Authentication Service where database credentials are stored.

SAP Business One, version for SAP HANA supports single sign-on.
See the SCN blog on regular System Administration Tasks for SAP Business One Analytics and SAP Business One version for SAP HANA
http://scn.sap.com/docs/DOC-44558

Documentation on SAP HANA (not SAP Business One specific):
http://help.sap.com/hana_appliance

SAP Business One, version for SAP HANA documentation
SAP Partner Edge Portal
menu path: Applications > SAP Business One > Solutions > SAP Business One 9.0 > Documentation for the 9.0 Release Family > SAP Business One 9.0, version for SAP HANA.

SAP Business One version for SAP HANA documentation is delivered with the software.
In addition there is SAP Business One specific documentation on the SAP Partner Edge portal under the menu path: Applications > SAP Business One > Solutions > SAP Business One 9.0 > Documentation for the 9.0 Release Family > SAP Business One 9.0, version for SAP HANA.
Thank you

This concludes the topic for administration.

Thank you for your time.