Bosch Video Management System
High availability with VMware

en  Technical Note
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1 Introduction

VMware allows virtual servers to share hardware in a network and to improve the reliability, manageability, and availability in case of a hardware failure.

Bosch VMS is located as virtual machine on VMware. If the first server fails, VMware HA mode on the second server automatically starts the virtual machine to undertake the tasks of the first server. The down times takes 2 - 4 minutes. Supported is redundancy concerning redundant switches, network interfaces, storage and server that are redundant over VMware.

Caution!

Bosch recommends that you use DSA-E Series as shared storage. After installing the required generic firmware from NetApp on a Bosch DSA E-Series storage device you cannot use this device as a video recording device in Bosch video networks and you cannot restore it to a Bosch DAS E-Series storage device.

You find the generic firmware in the Bosch product catalog on the Bosch VMS product page.

Documentation for Bosch Security Systems products can be found as follows:

- Open any browser > enter www.boschsecurity.com > select your region and your country > start a search for your product > select the product in the search results to show the existing documents.

Supported features:
- Snapshots
- Clones

See also
- Configuring DSA E-Series, page 6

1.1 Restrictions

Observe the following restrictions:
- Max. 3 hosts
- Max. 12 cores per processor
- Allegiant: connection via remote computer
- Server down-time: approximately 5 minutes
2 Overview

See also
- Configuring DSA E-Series, page 6
3 Installing and configuring ESXi server

3.1 Installing the ESXi server

1. Insert Setup Disk. The setup starts automatically from the disk. Follow the instructions on the screen.
2. Start installation from the menu and follow the instructions on the screen.

Note:
To configure the ESXi server, see Configuring ESXi server, page 6.

3.2 Configuring ESXi server

To configure the ESXi server use the System Customization tool.

1. Turn on ESXi server and boot into hypervisor.
2. In the Configure Password menu, type in the password.

Note:
We recommend that you assign a password for ESXi. If you do not assign a password, the setup still works. Error messages can occur later.

3. In the Configure Management Network menu, type in the host name, IP address, subnet mask, default gateway, and DNS configuration.

Note:
We recommend that you assign a DNS name. If you do not assign a DNS name, the server uses localhost. Error messages can occur later.

3.3 Configuring DSA E-Series

For installing the firmware and assigning static IP addresses, install SANtricity ES Storage Manager software.

You need the default NetApp firmware to install it on your DSA E-Series device. This firmware is available on the Bosch VMS product catalog page.

Contact Bosch Technical Support for these software packages.

See also
- Installing SANtricity on vCenter client computer, page 6
- Assigning static IP addresses (part 1), page 6
- Installing the firmware on a DSA E-Series, page 7
- Assigning static IP addresses (part 2), page 8
- Configuring storage for Hyper-V or VMware, page 9

3.3.1 Installing SANtricity on vCenter client computer

- Start Setup.exe and follow the instructions on the screen.

3.3.2 Assigning static IP addresses (part 1)

Refer to the SANtricity manual for performing the following tasks.

Switch on the DSA E-Series device. The device waits 4 minutes for a DHCP server assigning IP addresses. If no DHCP server is available or the DHCP does not assign IP addresses, default IP addresses are automatically assigned for both the iSCSI Controller and the Management Controller. SANtricity can only detect devices in the same subnet. If DHCP server is available, this is not a problem. Otherwise you must configure an alternative IP address for your network adapter so that you can reach iSCSI storage devices in other subnets.

Assign the static IP addresses for the iSCSI controller after you installed the NetApp firmware on your DSA E-Series device.
Assign IP addresses:
1. After this automatic assignment, start SANtricity to configure static IP addresses.
2. For the Management Controller configure port 1.
   For better network redundancy, you can also configure port 2.
3. Exit SANtricity and restart it.
4. Remove the old array entry and rescan.

3.3.3 Installing the firmware on a DSA E-Series

To install:
1. Start SANtricity ES Storage Manager.
2. Click the Support tab.
3. Click View Event Log.
   The Event Log dialog box is displayed.
4. Click Clear All....
5. In the next dialog box, type in yes and click OK.
   Old event logs are removed. This is a prerequisite for installing the firmware.
6. Click Download Firmware.
   The following dialog box is displayed.
7. Select **Download controller firmware** and click **OK**.
   The following dialog box is displayed.

8. Click to check **Transfer NVSRAM file with controller firmware**.
9. In both selection fields, enter the appropriate path and filenames.
10. Click **Transfer...**
    The firmware is transferred and installed on your device.
    This process can last 10 minutes or longer.

3.3.4 **Assigning static IP addresses (part 2)**
Refer to the SANtricity manual for performing the following task.
Assign static IP addresses for the iSCSI controllers.
Assign IP addresses:
- For each iSCSI controller configure 2 iSCSI ports with static IP addresses.
  Configure the correct port speed used in your network.

3.3.5 Configuring storage for Hyper-V or VMware

Create volume group with volume:
1. Click the Storage & Copy Services tab.
2. Create a volume group.
3. For this group configure Automatic and RAID 6.
4. In Map to host: list, select Map Now to Default Group.

5. In this group, create a 1 TB volume for VMware.
6. For Hyper-V create 3 volumes:
   - 1x 100GB Quorum
   - 2x 1TB as Cluster Shared Volumes

   For VMware: Change the default host operating system type:
1. Click the Host Mappings tab.
2. Right-click Default Group and click Change Default Host Operating System.
3. As the new host type configure VMWare.

For Hyper-V: Change the default host operating system type:
1. Click the Host Mappings tab.
2. Right-click Default Group and click Change Default Host Operating System.
3. As the new host type configure.
4 Installing vCenter Server

- Double-click autorun.exe in the root folder of the CD. Select vCenter Server. Follow the instructions on the screen.

Prerequisites:
On of the following operating systems is required:
- Windows Server 2008 Service Pack 2
- Windows Server 2008 Service Pack 1
- Windows Server 2008 R2 Service Pack 1
- Windows Server 2008 R2
- Windows Server 2003 R2 Service Pack 2
- Windows Server 2003 R2
- Windows Server 2003 Service Pack 2
5 Installing and configuring vSphere Client

5.1 Installing vSphere Client

Double-click autorun.exe in the root folder of the CD. Select vSphere Client. Follow the instructions on the screen.

5.2 Creating a VMware HA Cluster

Home > Inventory > Hosts and Clusters

We recommend that you first create an empty cluster. After this you can use the vSphere Client to add hosts to the cluster and specify the cluster's VMware HA settings.

Note:
- Connect vSphere Client to vCenter Server.
- The iSCSI system must be already configured.

To create a VMware HA cluster

1. In the WIN-xx - vSphere Client window, right-click the root element in the inventory tree, and then click New Datacenter. Type the name of the datacenter.

2. Right-click the created datacenter, and then click New Cluster....
3. The **New Cluster Wizard - Cluster Features** page is displayed.
   In the **Name** box, type the name of the cluster, for example, Bosch VMS.
   Select the **Turn On VMware HA** check box to use Fault Tolerance.
   Click **Next**.
4. **VMware HA** page is displayed.

   Select the **Enable Host Monitoring** check box. This allows ESXi hosts in the cluster to exchange network heartbeats and VMware HA to take action in case of failures.

   Click **Enable: Do not power on VMs that violate availability constraints**.

   Click **Host failures cluster tolerates**, and then select the maximum number of host failures. vCenter Server allows a maximum of 4 host failures.

   Click **Next**.
5. **Virtual Machine Options** page is displayed.
   - In the **VM restart priority** list, click **Medium**.
   - In the **Host Isolation response** list, click **Shut down**.
   - Click **Next**.
6. VM Monitoring page is displayed.
   In the VM Monitoring: list, click Disabled.
   In Monitoring sensitivity, move the slider to High.
   Click Next.
7. **VMware EVC** page is displayed.
   
   * Click **Disable EVC**.
   * Click **Next**.
8. **VM Swapfile Location** page is displayed.
   - Click **Store the swapfile in the same directory as the virtual machine (recommended)**.
   - Click **Next**.
9. **Ready to Complete** page is displayed.

   Review the cluster options in the right pane.
   Click **Finish**.
10. You have created an empty cluster.

5.3 Adding hosts

Home > Inventory > Hosts and Clusters

1. In the vSphere Client window, right-click the cluster in the inventory tree, and then click Add Host....
2. The **Add Host Wizard - Connection Settings** page is displayed.

   In the **Host**: box, type the name or IP address of the host to be added.

   Type the user name and password for a user account that has administrator rights on the selected host.

   Click **Next**.
3. **Host Summary** page is displayed.  
   Review the product information for the added host.  
   Click **Next**.

4. **Assign License** page is displayed.  
   Click **Assign a new license key to this host**, then click **Enter Key**.  
   Type the new license key, then click **Next**.
5. **Lockdown Mode** page is displayed.
   Click Next.

6. **Virtual Machine Location** page is displayed.
   Select a location, and then click Next.
7. **Ready to Complete** page is displayed. Review the summary, and then click **Finish**.

### 5.4 Configuring VM Network to manage virtual machine network traffic

**Home > Inventory > Hosts and Clusters**

1. In the vSphere Client window, right-click the IP address of the ESXi server in the inventory tree, and then click the **Configuration** tab. Under **Hardware**, select **Networking**, and then click **Properties...** for the vSwitch that you want to edit.
2. In the vSwitch Properties dialog box, select VM Network, then click Add....

3. The Add Network Wizard - Connection Type page is displayed. Select Virtual Machine, then click Next.
4. **Network Access** page is displayed.
   Click **Create a virtual switch**, then select the virtual switch which will handle the network traffic, for example, *vmnic1*. Then click **Next**.
5. **Connection Settings** page is displayed.
   In the **Network Label** box, type the text that should be displayed.
   In the **VLAN ID (Optional)** box, select the ID, then click **Next**.

6. **Summary** page is displayed.
   Verify the configuration of the virtual switch, then click **Finish**.
7. Perform the same for the second ESXi server.

5.5 Configuring NetApp iSCSI

**General**
The LUNs for the ESXi server must be set up with the LUN type VMware.
For detailed information use the documentation delivered with the NetApp device.

**Note:**
The access to the NetApp device must occur with iSCSI. The NetApp Filer is delivered with an iSCSI license.

5.6 Configuring VM Network for ESXi services (iSCSI)

**Home > Inventory > Hosts and Clusters**

1. In the vSphere Client window, right-click the IP address of the ESXi server in the inventory tree, and then click the **Configuration** tab.
   Under **Hardware** select **Networking**, and then click **Properties...** for the vSwitch that you want to edit.

2. In the **vSwitch Properties** dialog box, select **VM Network**, then click **Add...**
3. The **Add Network Wizard - Connection Type** page is displayed. Select **VMkernel**, then click **Next**.

4. **Network Access** page is displayed. Click **Create a virtual switch**, then select the virtual switch which will handle the network traffic, for example, **vmnic2**. Then click **Next**.
5. **Connection Settings** page is displayed.
   In the **Network Label** box, type the text that should be displayed as label.
   In the **VLAN ID (Optional)** box, select the ID, then click **Next**.

6. **Summary** page is displayed.
   Verify the configuration of the virtual switch, then click **Finish**.
7. The Networking overview for the ESXi server is displayed.

8. Perform the same for the second ESXi server.
5.7 Configuring Storage Adapter

Home > Inventory > Hosts and Clusters

1. In the vSphere Client window, right-click the IP address of the ESXi server in the inventory tree, and then click the Configuration tab.

Under Hardware, select Storage Adapter, and then select iSCSI Software Adapter in the Storage Adapters pane.
2. In the iSCSI initiator Properties dialog box, click **Configure**.

3. In the **General Properties** dialog box, verify that the **Enabled** check box is selected, then click **OK**.

4. In the iSCSI initiator Properties dialog box, click the **Dynamic Discovery** tab. Select the corresponding item in the list, then click **Add**.
5. In the **Add Send Target Server** dialog box, type the IP address of the iSCSI Server and the port number, then click **OK**.

Repeat this step for all available iSCSI servers.
6. Right-click the storage adapter entry and click Manage Path.

7. In the Path Selection list, select Most Recently Used (VMware).
8. Click Close.

5.8 Configuring Storage

Home > Inventory > Hosts and Clusters

1. In the vSphere Client window, right-click the IP address of the ESXi server in the inventory tree, and then click the Configuration tab. Under Hardware, select Storage, and then click Add Storage....
2. The **Add Storage** wizard / **Disk/LUN** page is displayed. Under **Storage Type**, click **Disk/LUN**, then click **Next**.

![Add Storage wizard](image)

3. **Select Disk/LUN** page is displayed.
   Select the corresponding item in the list, then click **Next**.

![Select Disk/LUN](image)
4. The **File System Version** page is displayed. Select **VMFS-5**, then click **Next**.

5. **Current Disk Layout** page is displayed. Review the current disk layout, then click **Next**.
6. **Properties** page is displayed.
   Type a datastore name, then click **Next**.

   ![Properties page](image)

7. **Formatting** page is displayed.
   Select the maximum file size.
   Select the **Maximize capacity** check box, and enter a value in the **GB** box.
   Click **Next**.

   ![Formatting page](image)
8. **Ready to Complete** page is displayed. Review the disk layout, then click **Finish**.

![Add Storage](image1.png)

9. The added storage is displayed in the **Datastores** pane.

![Datastores](image2.png)

10. Add the same LUN to the second host as described before. Formatting is not necessary.
6 Installing VM

To install VM:
1. In the vSphere Client window, right-click the IP address of the ESXi server in the inventory tree, and then click **New Virtual Machine**....
2. The **Create New Virtual Machine - Configuration** page is displayed. Select **Typical**, then click **Next**.
3. **Name and Location** page is displayed.
   In the **Name** box, type the name of the virtual machine (for example **BVMS Central Server**), then click **Next**.

4. **Datastore** page is displayed.
   Select the line with the LUN (not the line with the datastore), then click **Next**.
   **Note:** Both servers access the same shared storage.
5. **Guest Operating System** page is displayed.
   In the **Guest Operating System** area, select **Microsoft Windows**.
   In the **Version** list, select **Microsoft Windows Server 2008 R2 (64 bit)**, then click **Next**.

6. **Create a Disk** page is displayed.
   In the **Virtual disk size** box, enter the value (for example 50 GB), then click **Next**.
7. Ready to complete page is displayed. Select the Edit the virtual machine settings before completion check box. Click Continue to start a task that will create the new virtual machine.

8. In the Virtual Machine Properties window of the virtual machine, select the Hardware tab. In the Hardware list, click Memory (adding). In the Memory Size list, select 4 GB.
9. In the **Hardware** list, click **CPUs (adding)**. Select the number of CPUs. We recommend 4 CPUs.

10. In the **Hardware** list, click **New CD/DVD (adding)**. Select the **Connect at power on** check box.

Click **Host Device**.

Click **Finish** to complete creation of the virtual machine.

11. In the vSphere Client window, the status **Completed** for the virtual machine is displayed in the taskbar.
12. Installing Windows Server 2008 R2

In the vSphere Client window, right-click the name of the virtual machine (for example **BVMS Central Server**) in the inventory tree.

Insert the Windows Server 2008 Setup Disk in the drive of the ESXi server you have selected in step 1.

Select the **Console** tab and in the toolbar, click ![Power On](Power On).

Windows is loading the files.

13. In the **Install Windows** wizard, select the language and other preferences, then click **Next**. Follow the instructions on the screen to complete the setup.
14. Installing VMware Tools

Right-click the name of the virtual machine (for example **BVMS Central Server**) in the inventory tree > Guest > **Install/Upgrade VMware Tools**.
15. The **Install/Upgrade Tools** window is displayed. Click **Automatic Tools Upgrade**, then click **OK**. vCenter will upgrade VMware tools. The virtual machine restarts automatically after the upgrade.

16. In **Server Manager** an icon displays that the VMware Tools are installed.
17. Open the **Virtual Machine Properties** window of the virtual machine again.
   Select the **Hardware** tab.
   In the **Hardware** list, select the CD/DVD Drive.
   Click **Client Device**.
   Click **Finish**.

**Note!** You can suppress the following alarm message:

The number of heartbeat datastores for host is 1, which is less than required: 2

See the VMWare Knowledge Base on Heartbeat Datastores (no. 2004739).
7 Installing Bosch VMS

- Install Bosch VMS.
  To do this, see Quick Install Guide Bosch VMS.