vxAG Administration Guide

For ArrayOS AG 9.4 Release

March 11, 2016

1 Server Hardware Requirement

The server hosting vxAG must meet the following minimal requirements:

- CPU: One or more Intel 64-bit x86 multi-core CPUs supporting Virtualization Technology (VT).
- RAM: 2GB or 4GB available for vxAG
- Storage: 40GB of available hard drive space for vxAG

2 Hypervisor Guest Definition

The following hypervisors are supported for vxAG administration:

- VMware ESXi 4.1 or later (64-bit only)
- Citrix XenServer 5.6 or later (64-bit only)
- OpenXen 4.0 or later (64-bit only)
- KVM-0.15.1-1.8.1 or later (64-bit only)

The VMware virtual machine guest environment for the vxAG must include:

- 2 vCPUs
- 2 GB or 4GB vRAM
- 4 x virtual e1000 Ethernet adapters (other Ethernet adapter types are not supported, for example, VMXNET)
- 40 GB of available hard drive space

The Citrix XenServer virtual machine guest environment for the vxAG must include:

- 2 vCPUs
- 2 GB or 4GB vRAM
- 4 x virtual network interfaces
- 40 GB of available hard drive space

The OpenXen virtual machine guest environment for the vxAG must include:

- 2 vCPUs
- 2 GB or 4GB vRAM
- 4 x virtual e1000 Ethernet adapters
- 40 GB of available hard drive space

The KVM virtual machine guest environment for the vxAG must include:

- 2 vCPUs
- 2 GB or 4GB vRAM

- 4 x Virtual network interfaces
- 40 GB of available hard drive space

Note: Array Networks only qualifies the above-mentioned virtual machine configurations. Other configurations of the virtual machine instances are not tested and may or may not work. Please consult with Array Customer Support before altering the configurations.

3 Deploying the vxAG Virtual Machine

3.1 Deploying the vxAG on ESXi

The first step in deploying the vxAG virtual machine on ESXi is to download the OVA file to your local system. Next, you must run the "**Deploy OVF Template**" wizard from within the VMware vSphere™ client. Detailed steps are as follows:

1. Please contact the Array Customer Support (support@arraynetworks.com) for download instructions.
2. Download the Array vxAG file package ending with .ova.
3. From the "**File**" menu, choose "**Deploy OVF Template**". (This will start the "**OVF Template**" wizard.)
4. In the "**Source**" pane, click "**Deploy from file**" and locate the OVA file using the "**Browse**" button. For example, the OVA file is in the path "\MyDocuments\Work\Virtualization\<vxAG_OVA_filename>".
5. Click "**Next**" to open the "**OVF Template Details**" pane and verify that the OVF template details are correct.
6. Click "**Next**" to open the "**Name and Location**" pane.
7. In the "**Name**" field, type a name for the vxAG virtual machine, for example vxAG.
8. In the "**Disk Format**" pane, select "**Thick provisioned format**".
9. Click "**Next**" to open the "**Ready to Complete**" screen.
10. Verify that all deployment settings are correct and click "**Finish**".
11. Once the virtual machine is deployed, it can be started.

Note: If the 4GB vRAM for vxAG is used, select the newly created virtual machine, and click **Edit virtual machine settings.** In the pop-up dialog box, select **Hardware > Memory** and set the Memory Size to 4 GB.

3.2 Deploying the vxAG on XenServer

The first step in deploying the vxAG virtual machine on XenServer is to download the .rar containing the XVA file to your local system. Next, you must run the "**Import**" from within the XenCenter. Detailed steps are as follows:

1. Please contact the Array Customer Support (support@arraynetworks.com) for download instructions.
2. Download the .rar file containing the .xva image.
3. Open the .rar file by using WinRAR archiver and extract the Array vxAG file package ending with .xva.
4. From the "**File**" menu, choose "**Import**". (This will start the "**XVA import**" wizard.)
5. In the "**Import Source**" pane, locate the XVA file using the "**Browse**" button. For example, the XVA file is in the path "\MyDocuments\Work\Virtualization\<vxAG_XVA_filename>".
6. Click "**Next**" to open the "**Home server**" pane, and select the home server on which the virtual machine should be run.

7. Click "**Next**" to open the "**Storage**" pane, and select the storage repository to store the virtual disks for the new virtual machine.
8. Click "**Import >**" to prepare the importing process.
9. In the "**Network**" pane, add or delete any existing networks.
10. Click "**Next**" to open the "**Finish**" screen.
11. Select the check box at the bottom of the "**Finish**" pane, to start the virtual machine as soon as the import process is over.
12. The virtual machine would be deployed and started automatically.

3.3 Deploying the vxAG Virtual Machine on OpenXen

The first step in deploying the vxAG virtual machine on OpenXen is to download the .gzip file containing the bootable hard disk of the virtual machine and the vxAG configuration file. Next you must create a virtual machine by using these files. Detailed steps are as follows:

1. Please contact the Array Customer Support (support@arraynetworks.com) for download instructions.
2. Download the .gzip file containing the disk0.raw file and vxAG configuration file to "/var/lib/xen/images". Please make sure that you have more than 40GB of free space after the download.
3. Open the .gzip file by using the "**tar xvzf <vxAG_image>.tar.gz**" command. This creates a folder "vxAG" which contains the disk0.raw file and vxAG configuration file.
4. Place the vxAG configuration file in the path "/etc/xen/vm folder".
5. Edit the configuration file to specify the appropriate bridge name that you want the interfaces to be connected to. Please do not change any other fields as it might lead to licensing conflicts.
6. Attach the virtual machine to OpenXen by issuing "**xm new vxAG**".
7. Start the virtual machine by issuing "**xm start vxAG**".

3.4 Deploying the vxAG Virtual Machine on KVM

The first step in deploying the vxAG virtual machine on KVM is to download the compressed file containing the bootable hard disk of the Virtual Machine and the XML formatted configuration file. Next you must create a Virtual Machine by using these files. Detailed steps are as follows:

1. Please contact the Array Customer Support (Email: support@arraynetworks.com) for download instructions.
2. Download the compressed file (for example, vxAG_image.tar.gz) containing the disk.qcow2 disk image file and the XML configuration file (for example, vxAG.xml). Please make sure that you have more than 40 GB of free space after the download.
3. Open the compressed file by using the "**tar xvzf <vxAG_image>.tar.gz**" command. This creates a folder "vxAG_image" which contains the disk.qcow2 disk image file and the XML configuration file.
4. Enter the folder "vxAG_image", and edit the XML configuration file to specify the qcow2 disk image file location and the appropriate bridge name that you want the interfaces to be connected to.
5. Create a virtual machine from the XML configuration file by using the "**virsh define vxAG.xml**" command.
6. Start the virtual machine by using the "**virsh start vxAG**" command.

Note: The deployment steps of vxAG on KVM are based on the OpenSUSE 12.3 environment. The deployment steps on other Linux environments are similar. For any questions on the deployment, please contact the Array Customer Support (Email: support@arraynetworks.com).

4 Post-Installation Configuration

1. Please finalize all virtual machine configurations before requesting a new license.

Caution: Any virtual machine configuration change may invalidate current license.

2. Please contact the Array Customer Support to obtain a license key (E-Mail: support@arraynetworks.com).

5 Array vxAG Series Installation Guide

Once the virtual machine starts, the login shell will appear on the console tab of the vxAG virtual machine, for example, on the Citrix XenCenter, the VMware vSphere™ client or the OpenXen client. Please note that it may take a couple of minutes for the login shell to appear.

The initial username/password is array/admin.

6 Minimum Initial Configuration

Three ways are available to connect the vxAG to begin configuration:

1. Console (recommended)
2. SSH
3. Web browser

To set up the vxAG via SSH or a Web browser, first you need to complete the network setting of the vxAG through the Console connection.

It is recommended to access the vxAG system via the Console. Since the vxAG does not support serial console, you need to use the virtual machine console tab on the XenCenter, the vSphere Client or the Virtual Machine Manager. The vxAG will prompt you for a User Privilege Password. The prompt like "Array Networks Login (AN):" may appear. If this is the first time you connect the vxAG, or if you have not changed the default password, then enter the user name "array" and the password "admin".

Now enter "**enable**" and press "**Enter**" to switch to the enable mode. You will be prompted to enter an enable password. The default enable password is null. Therefore, just press "**Enter**". The prompt like "AN#" will appear.

Now enter "**config terminal**" and press "**Enter**" to switch to the configuration mode. The prompt like "AN(config)#" will appear. At this point, the administrator will have full access to the vxAG CLI.

The CLI commands required for minimum configuration are listed below. It is recommended that you set port1 and port2, the default route, and WebUI IP address and port.

ip address *{system_ifname|vlan_ifname|bond_ifname}* <*ip_address*> <*netmask*>

Allows the user to set the interface's IP address and netmask.

ip route default <*gateway_ip*>

Allows the user to set the default gateway IP address.

webui ip <*ip_address*>

Allows the user to set the IP address that the vxAG will accept Web User Interface commands via the Web browser. It is recommended that a management IP address be used for configuring the WebUI IP address.

webui port <*port*>

Allows the user to set the port from which the vxAG will accept WebUI commands. The port must be designated within the range from 1024 to 65000. The default port is 8888.

webui {on|off}

Enables or disables the WebUI.

With the above network setting completed for the vxAG, you may set up the vxAG via SSH or a Web browser. You may use a Web browser to connect to the WebUI IP address assigned to the vxAG (with WebUI enabled) or establish an SSH connection to the IP address of the vxAG.

Note: If you change the setting of the vxAG's port1 IP address or WebUI IP address, the connection to the vxAG will terminate and you will have to reconnect the vxAG with the new network addresses.

Configuration Example

AN(config)#**ip address port1 10.3.0.71 255.255.255.0**

AN(config)#**ip address port2 192.168.10.1 255.255.255.0**

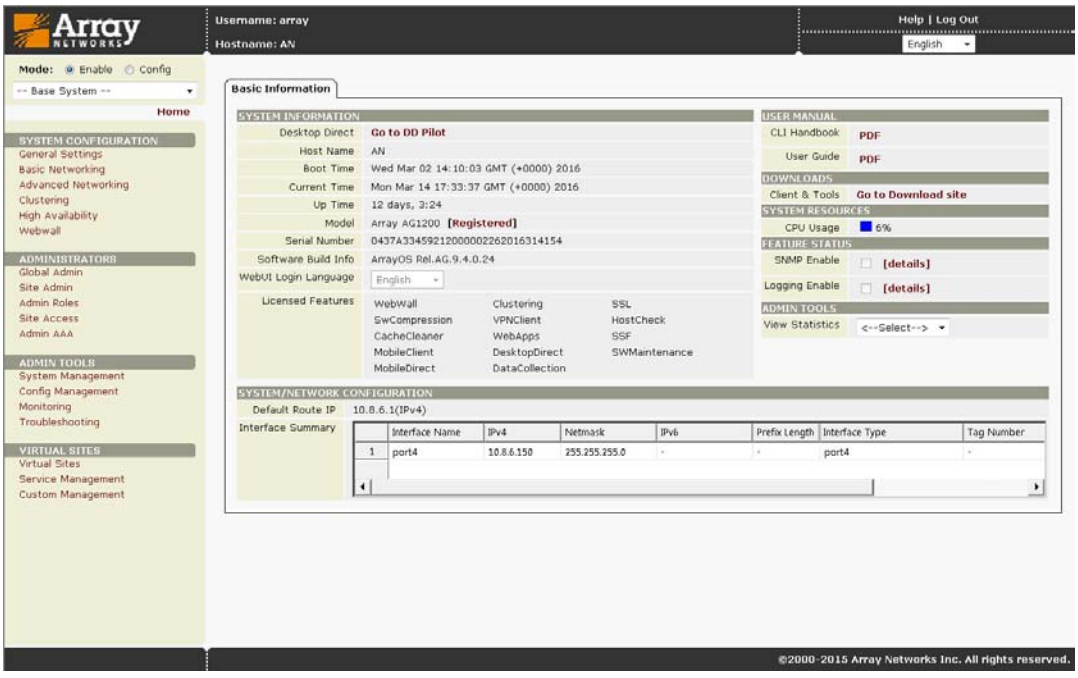
AN(config)#**ip route default 10.3.0.1**

AN(config)#**webui ip 10.3.0.71**

AN(config)#**webui port 8888**

AN(config)#**webui on**

After completing these steps, administrators may continue to configure the vxAG via the CLI or WebUI. To access and configure vxAG via WebUI, enter the URL **https://10.8.6.150:8888** in the address bar of a browser. Then follow the prompts to log in the vxAG and enter the password for the "enable" mode. After you entered the "enable" mode, the following window will be displayed.



For more detailed configuration information, please refer to the User Guide and CLI Handbook of the AG series products.

7 Known Limitations

- Serial console is not supported.

- Hardware monitoring (on fan speed, system/CPU temperature, etc.) is not supported.
- SSL cannot be enabled for a virtual site if the CPU type of the vxAG deployed on ESXi, XenServer and OpenXen is not Intel.

8 vxAG FAQs

8.1 General

- **What is the system limitation for vxAG with different memory allocations?**

Table 1 RAM-related System Limitation

RAM	2G	4G
Virtual Site	20	256
ACL Resource	3,000	50,000
Concurrent Session	600	10,000
LocalDB Account	20,000	200,000
LocalDB Group	2,000	10,000
SSL Connection	2,400	20,000

Note: The RAM-related system limitation dictates that the 2G vxAG can have at most 600 concurrent sessions, even if the vxAG has the license of 1,000 concurrent sessions.

- **How is vxAG upgraded?**

  vxAG is supported from ArrayOS AG 9.3 release. Simply use the CLI command "**system update**" to upgrade the system to future releases.

- **Can I use a third party hardware SSL accelerator?**

  No. You cannot install any third party hardware accelerator and expect it to work with vxAG.

- **Can I put vxAG in a cluster/HA configuration with physical AG?**

  No, vxAG cluster with physical AG is not supported.

- **Why is a vxAG as an HA unit remain active when its port becomes "DOWN"?**

  Because vxAG uses virtual NICs, hypervisors do not provide the physical port status to our virtual device. For HA to work, condition of gateway health check (using the command "**ha hc gateway**") should be used instead of port status condition, for the port status is always "UP".

- **Why there is no default IP address assigned like AG does?**

  The default IP address assignment is removed from vxAG to avoid potential IP address conflicts in the case that multiple instances of vxAG are first installed on the same hypervisor.

- **Is VMware vMotion supported on vxAG?**

  Yes. vMotion operates on the virtual machine using generic interfaces, therefore no GuestOS support is required. vxAG has been tested and proven that it can work with vMotion. Array Networks will help customers with any issue occurs when vMotion operates on vxAG.

- **Is VMWare HA supported?**

  Yes. vxAG supports VMware HA. Array Networks will work with customers if any issues are found while vxAG is running VMware HA.

- **Is VMware Tools supported on vxAG?**

vxAG integrates VMware Tools, with which the following buttons besides the power button can work properly for vxAG:

- Shutdown
- Reset
- Suspend
- Resume

- **Is XenServer Tools supported on vxAG?**

  vxAG integrates XenServer Tools, with which the following buttons can work properly for vxAG:

  - Shutdown
  - Reboot
  - Suspend

  Besides, the administrator can view the memory usage of vxAG on the Performance tab.

8.2 Configuration

- **How to configure bond on ESXi?**

  Configuring bond interfaces on vxAG will cause duplicate packets. Thus, it is recommended to use the ESXi NIC teaming function to configure bond interfaces for vxAG. Detailed steps are as follows:

  1. Select the target ESXi host.
  2. Click "**Configure** > **Network** > **Add Network**". Select the physical interfaces for bonding while creating the vSphere standard switch (vSwitch), and complete the operation as prompted.
  3. Select the vxAG that requires interface bonding, and click "**Edit Virtual Machine Setting**". Then, associate the network adapter (vxAG's virtual network interface) with the vSwitch just created.

- **How to configure trunk VLAN on ESXi?**

  1. Edit the virtual machine portgroup associated with the vxAG by setting the VLAN ID as 4095. Thus, ESXi will not untag the VLAN.
  2. Configure VLAN on the vxAG and the peer physical switch respectively.

- **How to configure bond on XenServer?**

  XenServer supports creating bond interfaces for vxAG. Detailed steps are as follows:

  1. Enter the XenCenter, click the XenServer host that requires interface bonding, and select "**NICs**".
  2. Click "**Create Bond**".
  3. Select the interfaces for bonding, and click "**Create**" to complete the bond creation.
  4. Reboot the XenServer host.
  5. Associate the bond just created with the interfaces of the vxAG.

- **How to configure VLAN on XenServer?**

  Virtual machines running on XenServer do not see VLAN tags. To support VLAN tagging it must be configured on XenServer. Detailed steps are as follows:

1. Enter the XenCenter, select the target XenServer host, and click "**Networking** > **Add Network** > **External Network** > **Next**".
2. In the new "**New Network**" pane, select the NIC which you want set VLAN on it.
3. Set the VLAN ID, which should be the same as the VLAN ID set on the switch connected with the XenServer, and click "**Finish**".
4. Select the desired vxAG, and click "**Networking** > **Add Interface**".
5. In the new "**Add Virtual Interface**" pane, select the network to set VLAN on it. Then, click "**Add**" to complete the operation.

- **How to configure bond on OpenXen?**

  Configure the bond interfaces on the hypervisor or dom0, to bond the NICs.

- **How to configure trunk VLAN on OpenXen?**

  VLAN can be configured on the hypervisor or dom0 and interfaces can be added to the virtual machine.

- **How to limit interface speed on vxAG?**

  On vxAG, the interface speed setting only supports the “auto” mode, i.e. it is negotiated automatically. Even if you set the interface speed manually on vxAG, the setting will not work.

8.3 License

- **How to import a valid license to vxAG?**

  Please perform the following steps to generate a serial number and import a new valid license:

  1. Generate a new serial number by executing the command “**system serialnumber**”.
  2. Contact Array Sales/Support to apply for a new license based on the serial number in the output of the command “**show version**”.
  3. Import the license obtained from Array Sales/Support by executing the command “**system license**”.

  For example:

```
AN(config)#system license “JLdPrrQ4-0/s2TZBQ-cJ6vNoWJ-qu0=#131-4d61c9ab-a9cf1221-6367ea23-feef0173-4d#7ebaa-ecfd0#dc-ba98765”
```

Note: You cannot copy and paste the command out when accessing the system via the server’s console. It is recommended to access the system via SSH in order to generate serial number and import a valid license.

8.4 Performance

- **What is the expected performance on my server?**

  The performance you should expect largely depends on the available CPU power of your server up to the licensed amount of bandwidth. Below is a reference table of performance data collected from QA lab (using Intel Xeon E5620 CPU and Intel 1G NIC).

vxAG (9.4)				
Hypervisor	ESXi 5.0	XenServer 6.0	OpenXen 4.0	KVM
SSL Throughput(Mbps)	450	140	140	280
SSL TPS (1024-bit)	1000	330	360	720

vxAG (9.4)				
SSL TPS (2048-bit)	240	190	195	220
LDB Login CPS	520	220	260	30

- **Can more than 1 vxAG instance run on the same hypervisor?**

  Yes.

- **Can I add more vCPUs to boost the performance?**

  You can only deploy 2 vCPUs on the vxAG. If more performance is needed, please move the vxAG instance to a more power server running a faster processor.

- **Why do I observe CPU usage while no traffic is running through my vxAG?**

  This is the same behavior as AG. AG is constantly monitoring the system and looking for work to do. This CPU usage is already accounted for when measuring the performance. In another word, this “extra” CPU usage does not affect the overall system performance.