

This document is designed as a reference for installing or upgrading to AirWave 8.2.11.0 with the CentOS software bundled with the ISO disc image.

### Download Files

The table below describes the different files that you might see on the Support site when you download AirWave. For more information, see [Manually Download the Software](#).

**Table 1:** *Download Page File Types*

File Type	Description
Install ISO	Standalone installation media, including the CentOS operating system. This image can fit on a CD/DVD, or it can be mounted as a virtual disk for installation.
Install OVA (Virtual appliance)	VMware OVA template for AirWave deployment on VMware ESXi infrastructure. Optimized for deployments up to 100 devices.

### Minimum Supported Browsers

AirWave supports the following browsers:

- Internet Explorer 11.0.9 or later on Windows
- Firefox 57.0 or later on Windows and macOS
- Chrome 65.0.3299.0 (64-bit) or later on Windows and macOS
- Safari 11.0.2 or later for macOS

### Hardware Requirements

AirWave supports any hardware that is Red Hat Enterprise Linux 7.6 or later. By default, all installations are based on a 64-bit operating system.

If you're using the Central Ready HPE DL360 Gen10 appliance, the appliance ships with Unified Extensible Firmware Interface (UEFI) as the boot environment instead of Basic Input/Output System (BIOS). For the Pro HPE DL360 Gen9 and Enterprise HPE DL360 Gen9 appliances that use BIOS, the AirWave 8.2.11.0 install ISO includes a workaround that eliminates the need to replace BIOS in these appliances or boot in Legacy BIOS.

AirWave hardware requirements vary by version. As additional features are added to AirWave, increased hardware resources become necessary. For the most recent hardware requirements, refer to the *AirWave 8.2.11.0 Server Sizing Guide*.



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AirWave does not support downgrading to older versions. In unusual circumstances requiring that you return to an earlier version of AirWave, we recommend you perform a fresh installation of the earlier AirWave version, and then restore data from a backup taken before the upgrade.

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## Pre-Installation Checklist

Use this check list to ensure installation goes smoothly.

**Table 2:** *Pre-Installation Checklist*

Task	Completed
Have available the AirWave license key sent to you in an email from Aruba.	
Obtain dedicated server(s) meeting Aruba sizing specifications.	
Determine the static IP address for each AirWave server.	
Provision firewall and enable proper ports.	
Determine WLAN infrastructure properties (type, quantity, and location).	
Determine WLAN infrastructure access credentials (SNMP, telnet, SSH, etc.).	
Determine WLAN security policy specifications.	
Set router and switches to monitoring (optional).	
Configure upstream NMS applications (optional).	
Determine wireless client authentication servers (optional).	
Determine AirWave administrative authentication servers like TACACS+, LDAP, or RADIUS (optional).	
Contact <a href="#">Technical Support</a> to help you upgrade the software if your software is more than two versions old.	

## Installation Workflow

This section provides step-by-step instructions to install Linux CentOS 7.7, configure the AirWave server, and prepare your deployment.

### Step 1: Install Linux CentOS 7.7

You must install Linux before you install AirWave on the network management system. Installing the CentOS software takes 10 to 20 minutes to complete.



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This procedure erases the hard drive(s) on the server.

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To install the Linux CentOS 7.7 operating system:

1. Insert the AirWave installation DVD into the drive and boot the server.
2. Press **Enter**.
3. Allow the installation process to continue. Upon completion, the system reboots automatically.
4. Remove the DVD from the drive and store it in a safe location.

## Step 2: Configure the Date and Time

AirWave 8.2.4 introduced a new, modular command line interface (CLI). After completion of installation, you will no longer have root user access to the Linux shell, and you can no longer use legacy commands to run AMP services.



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Use only included or Aruba-specified cables, power cords, AC power supplies and batteries. Don't use the power cord with other electrical equipment than what is specified by Aruba.

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Follow these steps to perform a fresh install:

1. Press **Enter** or wait six seconds. The system automatically loads the kernel.
2. When the kernel is loaded, log into the server using the following credentials:
  - login = **root**
  - password = **admin**
3. Configure the date and time for the AirWave server when the following message appears:

```
----- Date and Time Configuration -----  
Current Time: Mon Apr 27 12:14:02 PST 2020  
1) Change Date and Time  
2) Change Time Zone  
0) Finish
```

- a. Select **1** to set the date and select **2** to set the time zone. Press **Enter** after each configuration to return to the message menu above.
- b. Select **0** to complete the configuration of date and time information, then press **Enter**.

## Step 3: Check Installed Software

The installer automatically checks for an earlier version of AirWave. If your server has an earlier version of AirWave installed, you'll see a message that asks you to reinstall AirWave.



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This action erases the current database, including all historical information. To ensure that the AMP database is backed up prior to reinstallation, answer **n** at the prompt and contact your Value Added Reseller or Aruba support.

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Wait for the installer to check that the database is up and running the current version.

## Step 4: Create the Recovery User

During this step, AirWave configures the AMP CLI while creating the recover user account. At the prompt, enter a user name for the recovery user. If you don't enter a username, AirWave uses the default recovery user, called "amprecovery".



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You can change the password later from the AMP CLI by selecting **5** to open the Users menu, then **2-2** to change the CLI user password for the "amprecovery" user. For more information, refer to the *AirWave 8.2.11.0 User Guide*.

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## Step 5: Create the Admin User

At the prompt, enter a user name and password for the admin CLI user account. If you don't enter a user name, AirWave uses the default admin user, called "ampadmin".



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You can change the password later from the AMP CLI by selecting **5** to open the Users menu, then **2-1** to change the CLI user password for the "ampadmin" user. For more information, refer to the *AirWave 8.2.11.0 User Guide*.

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Save your user name and password somewhere safe because you'll need them to log in to the CLI.

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## Step 6: Configure the Network

If the installer only detects one interface, it will call that interface eth0. The following example shows how to configure the default eth0 interface. If you want to configure additional interfaces, repeat this step for each interface.

Enter the IPv4 static IP address, subnet mask, and gateway addresses when the following message appears:

```
AirWave must be configured with a static IP.
Here are the ethernet interfaces with hardware present:
  1. eth0          default          08:df:37:c4:57:b0
  2. eth1          default          08:df:37:c4:57:b1
  3. eth2          default          08:df:37:c4:57:b2
  4. eth3          default          08:df:37:c4:57:b3
  q. Quit
```

Which interface shall we configure?

- a. Select **1** and press **Enter**.

```
----- Network Interface Configuration for eth0 -----
  1) IPv4 Address           : xxx.xxx.xxx.xxx
  2) IPv4 Netmask          : xxx.xxx.xxx.xxx
  3) IPv4 Gateway          : xxx.xxx.xxx.xxx
  4) IPv6 Address (optional) : xxx.xxx.xxx.xxx
  5) IPv6 Gateway (optional) : xxx.xxx.xxx.xxx
  6) Primary DNS           : xxx.xxx.xxx.xxx
  7) Secondary DNS        : xxx.xxx.xxx.xxx

  9) Commit Changes
  0) Exit (discard changes)
```

- b. Select **1** to enter the network information, then press **Enter**.
- c. Select **2** to enter the subnet mask, then press **Enter**.
- d. Select **3** to enter the gateway, then press **Enter**.
- e. Select **6** to enter the primary DNS address, then press **Enter**.
- f. To commit the changes, type **9** and then press **Enter**. To discard the changes, type **0** and then press **Enter**.
- g. To restart the network with the configured settings, type **y**.

## Step 7: Generate an SSL Certificate

To generate the SSL certificate for the AirWave server:

- If AirWave does not have a valid host name on the network, type **n**.
- If AirWave has a valid host name on the network, type **y** and enter the fully qualified domain name for the AirWave server (for example, *myserver.example.com*)



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After installing AirWave, you can install a new SSL certificate, or generate a CSR to install a signed certificate from the AMP CLI.

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## Step 8: Complete the Installation

Upon completion of all previous steps, the following message appears.

```
CONGRATULATIONS! AMP is configured properly.
```

To access the AMP web console, browse to `https://<IP Address>`  
Login with the following credentials:  
Username: `admin`  
Password: `[User-provided password from above for 'ampadmin' user]`



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Once you log out, the root user will be disabled. Subsequently, you must use the `ampadmin` user generated during the software installation to log in to the CLI.

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- To view the Phase 1 installation log file, type `cat /root/install.log`.
- To view the Phase 2 installation log file, type `cat /root/amp-install.log`.

## Install AirWave on a Virtual Machine

The following sections provide information to help you install AirWave on VMware® ESX(i).

- ["VMware Requirements" on page 5](#)
- ["Creating a VMware Virtual Machine " on page 5](#)

### VMware Requirements

AirWave supports VMware ESX(i) 6.5 and later. To be sure that enough resources are allocated to the virtual machine, consult the *AirWave 8.2.11.0 Server Sizing Guide*.

If your VM host is hosting other instances, ensure that the AirWave instance has the highest priority. A virtual SCSI disk is recommended over IDE.

### Creating a VMware Virtual Machine

The VMware Infrastructure Client provides a wizard to create a new virtual machine. The resulting virtual machine acts like physical host, in which you install the AirWave software.

The recommended OS is CentOS 7.6 or later (64-bit). Refer to the *AirWave 8.2.11.0 Server Sizing Guide* for memory and storage requirements.

To create a virtual machine:

1. From the VMware Infrastructure Client, select **Create a new virtual machine**.
2. Select **Next**, and then select **Typical > Virtual Machine Configuration**.
3. Name your virtual machine (for example, AirWave), and then click **Next**.
4. Select an available datastore with sufficient space for the number of APs that your AirWave will manage, choosing the right server hardware to comply with the hardware requirements. Click **Next**.
5. Select the **Linux** radio button, and then select the OS. Click **Next**.
6. Select the appropriate number of processors, and then specify the minimum virtual RAM.
7. Accept the VMware default virtual network adapter, and click **Next**.
8. Allocate a virtual disk large enough to contain the AirWave operating system, application, and data files.
9. Review the virtual machine settings, and then click **Finish** when you are done.

## Install AirWave Using Hyper-V

The following sections provide information to help you install AirWave on a virtual machine running a Hyper-V:

- ["Hyper-V Requirements" on page 6](#)
- ["Adding the Hyper-V Network Adapter" on page 6](#)

## Hyper-V Requirements

AirWave supports using Hyper-V Manager on:

- Windows Server 2003 or later.
- Windows Server 2012 R2. You might experience boot issues using Windows Server 2012 Standard (not R2).



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AirWave does not support a Hyper-V Generation 2 VM

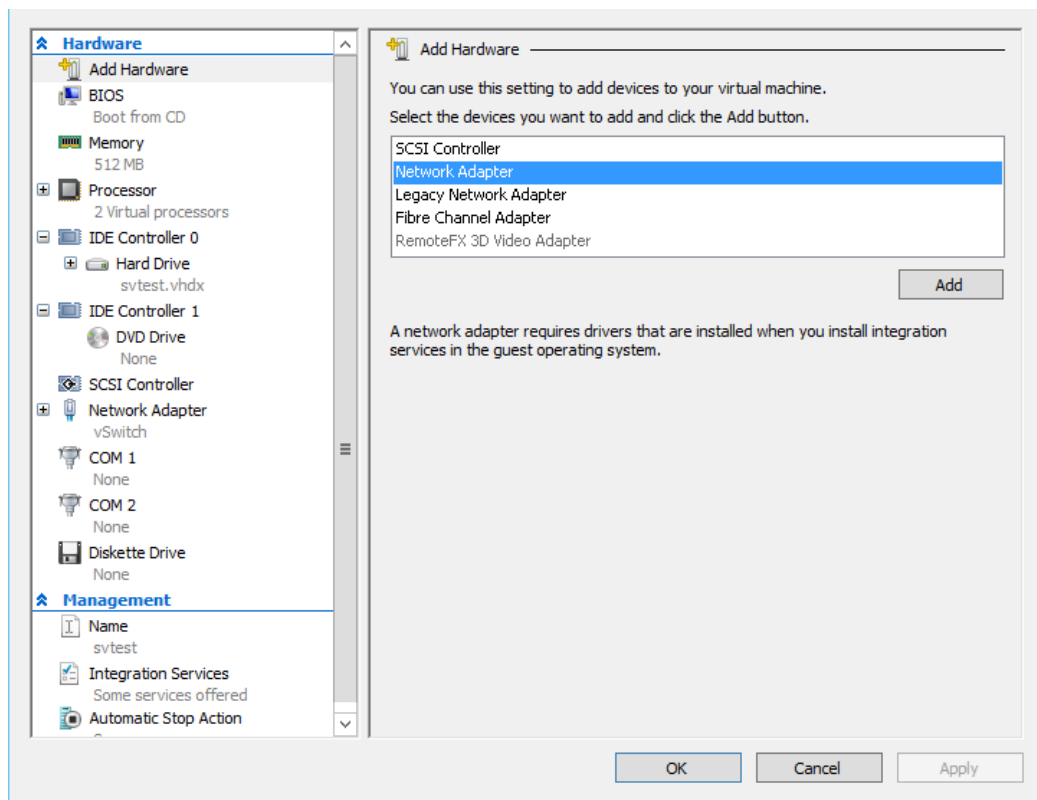
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## Adding the Hyper-V Network Adapter

When you create the virtual machine in Hyper-V Manager, you must configure a virtual network adapter in order to install AirWave. Hyper-V provides two virtual network adapters: a default and a legacy adapter (for generation 1 virtual machines). If you use the legacy network adapter to establish networking, you might experience connectivity issues even though there are no resource constraints on the server.

To add the Hyper-V network adapter:

1. Open Hyper-V Manager, then connect to the Hyper-V host.
2. Right-click the virtual machine and select **Settings**.
3. From the Add Hardware window, select **Network Adapter** then click **Add**.



4. View the adapter properties, and click **OK**.
5. Click **OK**.

## Install AirWave on a KVM Virtual Machine

The following sections provide information to help you install AirWave on a KVM:

- "KVM Requirements" on page 7

- "Creating a KVM Virtual Machine" on page 7

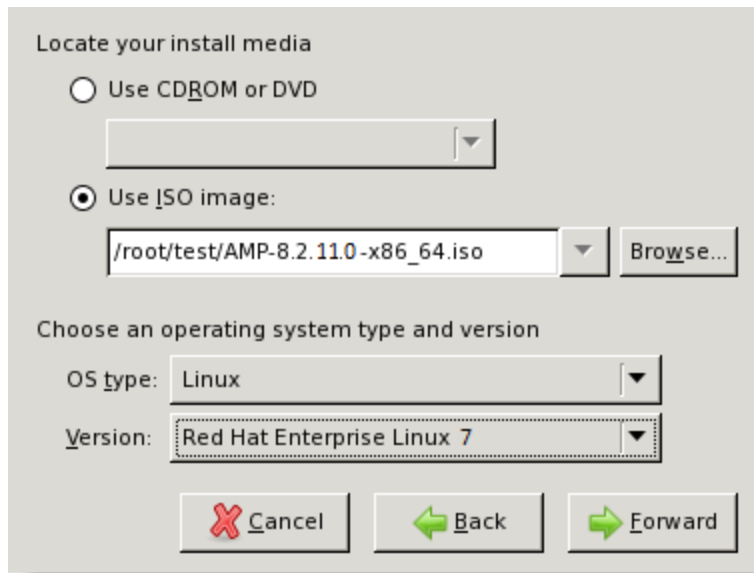
## KVM Requirements

The recommended OS is CentOS 7.6 or later (64-bit). Refer to the *AirWave 8.2.11.0 Server Sizing Guide* for memory and storage requirements.

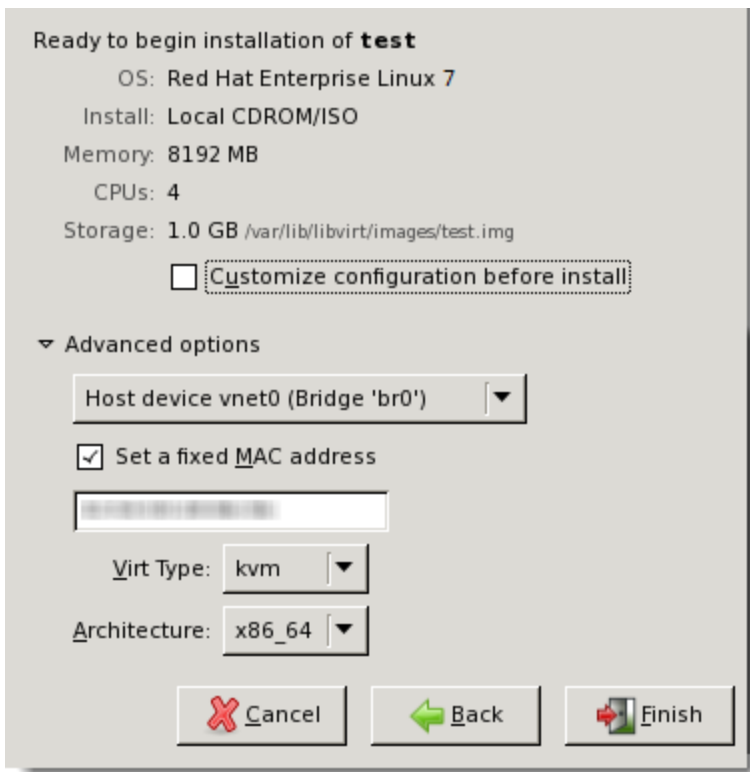
## Creating a KVM Virtual Machine

To create a KVM virtual machine:

1. On the local host, type **virt manager** to run the New VM wizard.
2. Type a name for the virtual machine, select **Local install media (ISO image or CDROM)**, and then click **Forward**.
3. Click **Browse** to find the ISO image. Select **Linux** and **Red Hat Enterprise Linux 7** from the drop-down menus, then click **Forward**.



4. Assign memory to the KVM and CPUs, then click **Forward**.
5. Assign disk storage, enable the **Allocate entire disk now** option, and then click **Forward**.
6. Before you start the installation, under the Advanced options, select the Host device and enter the fixed MAC address of the bridge (typically br0) into the text box.



7. Click **Finish**. The Virtual Machine Manager creates the virtual machine and opens the AirWave console.

## Appendix A: Communication Protocols and Ports

The following table itemizes the communication protocols and ports necessary for AirWave to communicate with wireless LAN infrastructure devices, including access points (APs), controllers, routers, switches, and RADIUS servers. Assign or adjust port usage on the network administration system as required to support these components.

**Table 3:** *AirWave Protocol and Port Chart*

Port	Type	Protocol	Description	Data Flow Direction	Device Type
21	TCP	FTP	Firmware distribution	>	APs or controllers
22	TCP	SSH	Configure devices	>	APs or controllers
22	TCP	SSH	Configure AirWave from the CLI	<	Laptop or workstation
22	TCP	VTUN	Support connection (optional)	>	Aruba supports home office
22	TCP	SCP	Transfer configuration files or FW	<	APs or controllers



**Table 3: AirWave Protocol and Port Chart (Continued)**

Port	Type	Protocol	Description	Data Flow Direction	Device Type
23	TCP	Telnet	Configure devices	>	APs or controllers
23	TCP	VTUN	Support connection (Optional)	>	Aruba supports home office
25	TCP	SMTP	Support email (optional)	>	Aruba supports email server
49	UDP	TACACS	AirWave Administrative Authentication	>	Cisco TACACS+
53	UDP	DNS	DNS lookup from AirWave	>	DNS Server
69	UDP	TFTP	Transfer configuration files or FW	<	APs or controllers
80	TCP	HTTP	Configure devices	>	Legacy APs
80	TCP	VTUN	Support connection (optional)	>	Aruba supports home office
161	UDP	SNMP	Get and Set operations	>	APs or controllers
162	UDP	SNMP	Traps from devices	<	APs or controllers
162	UDP	SNMP	Traps from AirWave	>	NMS
443	TCP	HTTPS	Web management	<	Laptop or workstation
443	TCP	HTTPS	WLSE polling	>	WLSE
443	TCP	VTUN	Support connection (optional)	>	Aruba supports home office
1701	TCP	HTTPS	AP and rogue discovery	>	WLSE
1741	TCP	HTTP	WLSE polling	>	WLSE
1812	UDP	RADIUS Auth	Authenticate & authorize AirWave administrative users on a RADIUS server.	>	RADIUS auth server

**Table 3: AirWave Protocol and Port Chart (Continued)**

Port	Type	Protocol	Description	Data Flow Direction	Device Type
1813	UDP	RADIUS accounting	Retrieve user names for authenticated WLAN clients from NAS (captive portal, controller, autonomous AP). Only used when user names are not available in the SNMP MIB of a controller or autonomous AP.	<	RADIUS accounting client
2002	TCP	HTTPS	Retrieve client authentication info	>	ACS
5050	UDP	RTLS	Real Time Location Feed	<	Aruba thin APs
8211	UDP	PAPI	Real Time Feed (AMON)	< >	WLAN controllers
		ICMP	Ping Probe	>	APs or controllers

## Appendix B: Migration to Aruba Central (On-Prem)

If you are going to use the Central-Ready HPE DL360 Gen10 appliance with AirWave, you can restore from a nightly backup when you're ready to migrate to Aruba Central (On-Prem).

To download the migration file:

1. Log in to the AirWave with the WebUI admin user.
2. Go to **System > Backups**, then click **Download Migration File** (see Figure 1).

**Figure 1: Download Migration File**

Backups are run nightly.

[nightly\\_data001.tar.gz](#) Backup of 3570870358 bytes made 16 hrs 11 mins ago.  
[nightly\\_data002.tar.gz](#) Backup of 4072871966 bytes made 1 day 16 hrs 7 mins ago.  
[nightly\\_data003.tar.gz](#) Backup of 4071679382 bytes made 2 days 16 hrs 10 mins ago.  
[nightly\\_data004.tar.gz](#) Backup of 4220449844 bytes made 3 days 16 hrs 9 mins ago.

## Contacting Support

Main Site	<a href="http://arubanetworks.com">arubanetworks.com</a>
Support Site	<a href="http://support.arubanetworks.com">support.arubanetworks.com</a>
Airheads Social Forums and Knowledge Base	<a href="http://community.arubanetworks.com">community.arubanetworks.com</a>
North American Telephone	1-800-943-4526 (Toll Free) 1-408-754-1200
International Telephone	<a href="http://arubanetworks.com/support-services/contact-support/">arubanetworks.com/support-services/contact-support/</a>
Software Licensing Site	<a href="http://lms.arubanetworks.com">lms.arubanetworks.com</a>
End-of-life Information	<a href="http://arubanetworks.com/support-services/end-of-life/">arubanetworks.com/support-services/end-of-life/</a>
Security Incident Response Team (SIRT)	Site: <a href="http://arubanetworks.com/support-services/security-bulletins/">arubanetworks.com/support-services/security-bulletins/</a> Email: <a href="mailto:aruba-sirt@hpe.com">aruba-sirt@hpe.com</a>



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