

# **AOS-CX Switch Simulation Software OVA Release Notes 10.09.1000**



a Hewlett Packard  
Enterprise company

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### Description

The AOS-CX Simulation Software OVA is a virtual platform to enable simulation of the AOS-CX Network Operating System. Simulated networks can be created using many of the protocols in the AOS-CX operating system like OSPF and BGP. Key features like the Aruba Network Analytics Engine and the REST API can be simulated, providing a lightweight development platform for building the modern network. This software can be easily implemented in the EVE-NG or GNS3 simulation platforms to enable drag and drop network design for building complex simulated topologies.

### Important information

This section contains important information about the OVA.

### Verifying the package using GPG

You should verify, through GPG/RPM, that the code you received has been signed with digital private keys only held by Hewlett Packard Enterprise Company. In addition, this ensures that a third party has not manipulated the file. To verify the GPG digital signature of the OVA package, perform these steps:

1. Download and install public keys. This is a one-time Installation.
  - a. Download the HPE-GPG-Public-Key.tar.gz file from <https://myenterpriselicense.hpe.com/cwp-ui/free-software/HPLinuxCodeSigning>.
  - b. Extract the public key 9A7241F1.pub.



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For Linux and Ubuntu systems, the GPG utility may come as part of the OS. For Windows, you must download and install GPG software if it has not already been installed.

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2. Import the 9A7241F1.pub key into the GPG ring.

```
gpg --import /tmp/9A7241F1.pub
gpg: keyring `/users/fred/.gnupg/secring.gpg' created
gpg: key 9A7241F1: public key "Hewlett Packard Enterprise Company RSA-2048-51
<signhp@hpe.com>" imported
gpg: Total number processed: 1
gpg: imported: 1 (RSA: 1)
```

3. List the newly-installed key.

```
gpg --list-keys
/users/fred/.gnupg/pubring.gpg
-----
```

```
pub 2048R/9A7241F1 2016-08-03 [expires: 2026-08-01]
uid Hewlett Packard Enterprise Company RSA-2048-51
<signhp@hpe.com>
```

#### 4. Set the public key 9A7241F1.pub to "trust ultimately".

```
gpg --edit-key 9A7241F1
gpg (GnuPG) 1.4.20; Copyright (C) 2015 Free Software Foundation, Inc.
This is free software: you are free to change and redistribute it.
There is NO WARRANTY, to the extent permitted by law.

pub 2048R/9A7241F1 created: 2016-08-03 expires: 2026-08-01 usage: SCEA
trust: unknown validity: unknown
[ unknown] (1). Hewlett Packard Enterprise Company RSA-2048-51
<signhp@hpe.com>

gpg> trust
pub 2048R/9A7241F1 created: 2016-08-03 expires: 2026-08-01 usage: SCEA
trust: unknown validity: unknown
[ unknown] (1). Hewlett Packard Enterprise Company RSA-2048-51
<signhp@hpe.com>

Please decide how far you trust this user to correctly verify other users'
keys
(by looking at passports, checking fingerprints from different sources, etc.)

 1 = I don't know or won't say
 2 = I do NOT trust
 3 = I trust marginally
 4 = I trust fully
 5 = I trust ultimately
 m = back to the main menu

Your decision? 5
Do you really want to set this key to ultimate trust? (y/N) y

pub 2048R/9A7241F1 created: 2016-08-03 expires: 2026-08-01 usage: SCEA
trust: ultimate validity: unknown
[ unknown] (1). Hewlett Packard Enterprise Company RSA-2048-51
<signhp@hpe.com>
Please note that the shown key validity is not necessarily correct
unless you restart the program.

gpg> quit
```

```
gpg --edit-key 9A7241F1
gpg (GnuPG) 1.4.20; Copyright (C) 2015 Free Software Foundation, Inc.
This is free software: you are free to change and redistribute it.
There is NO WARRANTY, to the extent permitted by law.

pub 2048R/9A7241F1 created: 2016-08-03 expires: 2026-08-01 usage: SCEA
trust: unknown validity: unknown
[ unknown] (1). Hewlett Packard Enterprise Company RSA-2048-51
<signhp@hpe.com>

gpg> trust
pub 2048R/9A7241F1 created: 2016-08-03 expires: 2026-08-01 usage: SCEA
```

```

trust: unknown      validity: unknown
[ unknown] (1). Hewlett Packard Enterprise Company RSA-2048-51 <signhp@hpe.com>

Please decide how far you trust this user to correctly verify other users' keys
(by looking at passports, checking fingerprints from different sources, etc.)

  1 = I don't know or won't say
  2 = I do NOT trust
  3 = I trust marginally
  4 = I trust fully
  5 = I trust ultimately
  m = back to the main menu

Your decision? 5
Do you really want to set this key to ultimate trust? (y/N) y

pub 2048R/9A7241F1 created: 2016-08-03 expires: 2026-08-01 usage: SCEA
trust: ultimate   validity: unknown
[ unknown] (1). Hewlett Packard Enterprise Company RSA-2048-51 <signhp@hpe.com>
Please note that the shown key validity is not necessarily correct
unless you restart the program.

gpg> quit

```

5. Verify your OVA image.
  - a. Unzip the ArubaOS-CX\_10\_09\_1000\_ova.zip file.
  - b. Run the `verify` command.

```

gpg --verify ArubaOS-CX_10_09_1000.ova.sig ArubaOS-CX_10_09_1000.ova
gpg: Signature made Day dd Mon yyyy 08:12:46 AM PDT using RSA key ID 9A7241F1
gpg: Good signature from "Hewlett Packard Enterprise Company RSA-2048-51
<signhp@hpe.com>"

```

## End User License Agreement (EULA) and Additional License Authorization (ALA)

The End User License Agreement (EULA) and Additional License Authorization (ALA) documents are available at [https://www.arubanetworks.com/assets/support/ArubaOS-CX\\_OVA\\_EULA.pdf](https://www.arubanetworks.com/assets/support/ArubaOS-CX_OVA_EULA.pdf) and [https://www.arubanetworks.com/assets/support/ArubaOS-CX\\_OVA\\_ALA.pdf](https://www.arubanetworks.com/assets/support/ArubaOS-CX_OVA_ALA.pdf), respectively.

By downloading, copying, or using the AOS-CX OVA you agree to both the End User License Agreement and the Additional License Authorization.

## Feature caveats

The AOS-CX OVA is a simulation environment and is not designed to be fully feature-compatible with AOS-CX running on switching hardware in the Aruba 4000, 6000, or 8000 series of switches. The following features may be configurable in the AOS-CX Simulation environment, but are non-functional:

|           |                                    |                   |
|-----------|------------------------------------|-------------------|
| CoPP      | Link detection (link is always on) | Classifier policy |
| ECMP      | MAC ACLs                           | QoS               |
| ADC (NAE) | UDLD                               | Mirroring         |

|                        |                             |                |
|------------------------|-----------------------------|----------------|
| ERPS                   | Firmware upgrade            | DCBx           |
| PBR                    | VXLAN support with L3 VTEPs | UBT            |
| VSF                    | VLAN translation            | Watchdog       |
| PBT                    | MAC Lockdown/Lockout        | Captive Portal |
| VXLAN support with VSX |                             |                |

The OVA is a virtual switch and unable to determine the link status of interfaces, so a simulated status is used. You may need to manually adjust the status of an interface using the `shutdown` or `no shutdown` commands from the CLI to get the desired results.

## Version history

All released versions are fully supported by Hewlett Packard Enterprise, unless noted in the table.

| Version number | Release date | Remarks  |
|----------------|--------------|--|
| 10.09.1000     | 2022-02-23   | Second release of AOS-CX 10.09 OVA. Released and posted on the web.  |
| 10.09.0002     | 2021-12-08   | Initial release of AOS-CX 10.09 OVA. Released and posted on the web. |
| 10.08.0001     | 2021-08-13   | Initial release of AOS-CX 10.08 OVA. Released and posted on the web. |
| 10.07.0010     | 2021-06-10   | Second release of AOS-CX 10.07 OVA. Released and posted on the web.  |
| 10.07.0004     | 2021-04-20   | Initial release of AOS-CX 10.07 OVA. Released and posted on the web. |
| 10.06.0001     | 2021-02-04   | Initial release of AOS-CX 10.06 OVA. Released and posted on the web. |
| 10.05.0020     | 2020-09-23   | Initial release of AOS-CX 10.05 OVA. Released and posted on the web. |
| 10.04.3000     | 2020-06-11   | Third release of AOS-CX 10.04 OVA. Released and posted on the web.   |
| 10.04.1000     | 2020-03-17   | Second release of AOS-CX 10.04 OVA. Released and posted on the web.  |
| 10.04.0001     | 2019-10-31   | Initial release of AOS-CX 10.04 OVA. Released and posted on the web. |
| 10.03.0020     | 2019-08-01   | Initial release of AOS-CX 10.03 OVA. Released and posted on the web. |
| 10.02.0010     | 2019-01-29   | Initial release of AOS-CX 10.02 OVA. Released and posted on the web. |
| 10.01.0001     | 2018-07-13   | Initial release of AOS-CX 10.01 OVA. Released and posted on the web. |

## Compatibility/interoperability

The switch web agent supports the following web browsers:

| Browser          | Minimum supported versions       |
|------------------|----------------------------------|
| Edge (Windows)   | 41                               |
| Chrome (Ubuntu)  | 76 (desktop)                     |
| Firefox (Ubuntu) | 56                               |
| Safari (MacOS)   | 12                               |
| Safari (iOS)     | 10 (Version 12 is not supported) |




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Internet Explorer is not supported.

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The following table provides information on the minimum hardware resources needed on the host to be made available to the OVA appliance:

| Feature | Requirement      |
|---------|------------------|
| RAM     | 4 GB             |
| CPU     | 2 core, 2100 Mhz |

The switch OVA requires the following software:

| Hypervisor  | Minimum supported versions     |
|---|--------------------------------|
| Oracle Virtual Box  | 5.2.8, release 121009          |
| Oracle Virtual Box with GNS3  | 5.2.8, release 121009<br>2.1.4 |
| VMWare Workstation Pro  | 12.5.8, build 7098237          |
| VMWare FusionHPE recommends running only one OVA at a time on VMWare Fusion | 10.0.1-6754183                 |
| VMWare ESXi   | 6.0.0, build 5224934           |

The number of OVAs supported is dependent on the amount of RAM available to the virtual machine.

## Enhancements

This section lists enhancements added to this branch of the software.

Software enhancements are listed in reverse-chronological order, with the newest on the top of the list. Unless otherwise noted, each software version listed includes all enhancements added in earlier versions.




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The number listed with the category is used for tracking purposes.

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## Version 10.09.1000

| Category                     | Description   |
|------------------------------|---|
| Security<br>AOSCXREQ-4545    | Compatibility is added to generate a randomized SALT required by SNMPv3 for storing encryption keys.          |
| IP Services<br>AOSCXREQ-3489 | Support was added for the switch to extract and use PSK received through DHCP option 43 from the DHCP Server. |

## Version 10.09.0002

| Category        | Description  |
|-----------------|--|
| Layer 3 Routing | Added functionality that allows for Dynamic inter-VRF route-leaking from/to the default VRF.<br>See the <i>IP Routing Guide</i> for more information.  |
| MPLS            | Added support for MPLS L3 VPN solution with IPv4 unicast with support for static routing and eBGP for PE and CE routing.<br>See the <i>MPLS Guide</i> for more information.  |
| Multicast       | Added support for PIM-SSM using IGMPv3 for IPv4.<br>See the <i>Multicast Guide</i> for more information.   |
| Multicast       | Extended support for PIM Source-Specific Mode (PIM-SSM) on a VSX cluster.<br>See the <i>Multicast Guide</i> for more information.  |
| Multicast       | Added the ability to filter the sources for multicast groups in PIM Source-Specific Mode (PIM-SSM) range in MSDP advertisements.<br>See the <i>Multicast Guide</i> for more information.   |
| Multicast       | Added support for PIM Source-Specific Mode (PIM-SSM) for IPv6.<br>See the <i>Multicast Guide</i> for more information.   |
| Multicast       | Added the ability to support ACLs to define PIM Source-Specific Mode (PIM-SSM) group ranges.<br>See the <i>Multicast Guide</i> for more information.   |
| OSPF            | Added an option for users to set metric value for default routes in OSPFv2/v3.<br>See the <i>IP Routing Guide</i> for more information.  |
| OSPF            | Added the ability to specify administrative distance for OSPF LSA type5 routes.<br>See the <i>IP Routing Guide</i> for more information.   |
| Routing         | Added support for Layer 3 on LAG interfaces.<br>See the <i>Layer 2 Bridging Guide</i> for more information.  |
| Security        | Added a CLI command ( <code>logging threshold</code> ) to enable/disable or change the logging threshold limit. The switch now triggers an event log when the specific logging exceeds a set threshold.<br>See the <i>Security Guide</i> for more information. |
| SNMP            | Added SNMP trap support for STP New Root notification.<br>Added SNMP trap support for STP Topology Change notification.<br>See the <i>Layer 2 Bridging Guide</i> for more information.   |
| SNMP            | Added SNMP write support to set the description on an interface.<br>See the <i>SNMP/MIB Guide</i> for more information.  |



## Fixes

This section lists released builds that include fixes found in this branch of the software. Software fixes are listed in reverse-chronological order, with the newest on the top of the list. Unless otherwise noted, each software version listed includes all fixes added in earlier versions.

The Symptom statement describes what a user might experience if this is seen on the network. The Scenario statement provides additional environment details and trigger summaries. When available, the Workaround statement provides a workaround to the issue for customers who decide not to update to this version of software.



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The Bug ID is used for tracking purposes.

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### Version 10.09.1000

| Category | Bug ID | Description  |
|----------|--------|--|
| Config   | 94162  | <p><b>Symptom:</b> MAC address of a client disconnected from the second port of IP phone is not removed from the mac-address table immediately.</p> <p><b>Scenario:</b> When a cable which connects a PC behind the IP phone port is pulled out, then the mac-address is not removed from the mac-address table.</p> <p><b>Workaround:</b> The MAC address will be flushed automatically after MAC age-out expiry. If a MAC address needs to be flushed immediately, then issue the command <code>port-access log-off client mac MAC</code>.</p> |

### Version 10.09.0002

| Category | Bug ID | Description   |
|----------|--------|---|
| Config   | 172116 | <p><b>Symptom:</b> Attempts to unconfigure PIM using NetEdit fails.</p> <p><b>Scenario:</b> If a PIM configuration has any interval range, an attempt to unconfigure the PIM configuration using the <code>no</code> form of the command with the interval range in the command using NetEdit fails with a message similar to <code>Failed to apply no-form command</code>.</p> <p><b>Workaround:</b> Remove the number range from the <code>no</code> form of the command. For example, <code>no ip pim-sparse hello-interval</code>.</p>  |
| Config   | 173361 | <p><b>Symptom:</b> Attempts to use the <code>no</code> form of various <code>ssh</code> commands fails.</p> <p><b>Scenario:</b> When attempting to use the <code>no</code> form of various <code>ssh</code> commands including parameters (for example, <code>no ssh public-key-algorithms ssh-rsa ecdsa-sha2-nistp256 ecdsa-sha2-nistp384</code> or <code>no ssh macs hmac-sha2-256 hmac-sha2-512 hmac-sha1</code>) using a downloaded config file or NetEdit, the commands fail.</p> <p><b>Workaround:</b> Remove the parameters from the commands, for example, <code>no ssh public-key-algorithms</code> or <code>no ssh macs</code>.</p> |

## Using Network Analytics Engine (NAE) scripts on the OVA

The OVA allows you to use NAE. This section describes how to enable the HTTPS user interface and log into the switch, download and install an NAE script from ASE, and install an NAE script from a local directory. For more information on NAE, see the *Network Analytics Engine Guide*.

## Enabling the switch HTTPS user interface and logging in

In order to use and configure NAE scripts, you must enable the WebUI on the switch.

1. Log in to the switch console as the admin user. There is no password.
2. Enable the management interface of the switch.

The management interface is enabled for DHCP by default. If you want to use a static IP address, do the following:

```
switch# config
switch(config)# int mgmt
switch(config-int-mgmt)# ip static <IP_ADDRESS>
switch(config-int-mgmt)# default-gateway <GATEWAY_IP_ADDRESS>
switch(config-int-mgmt)# exit
```

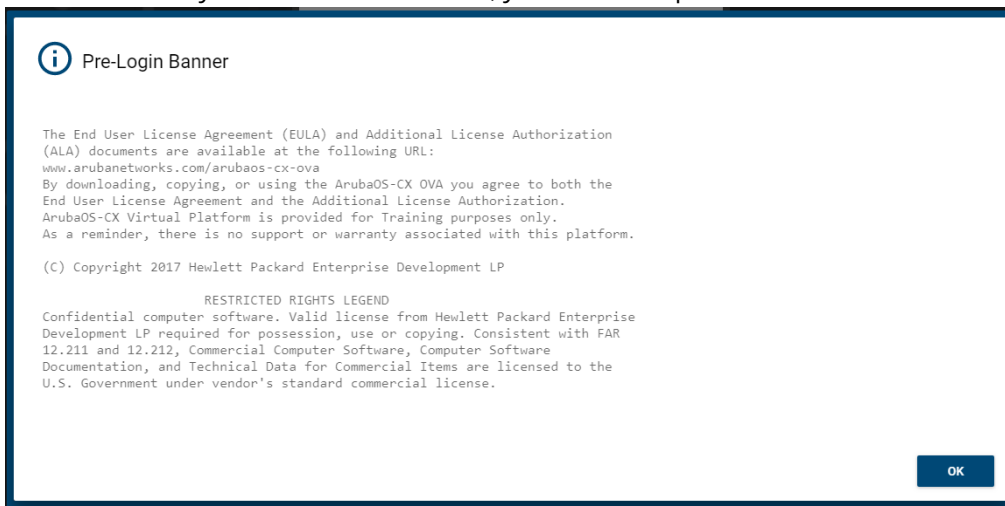
3. Set the admin password.

```
switch(config)# user admin password
Changing password for user admin
Enter password: *****
Confirm new password: *****
```

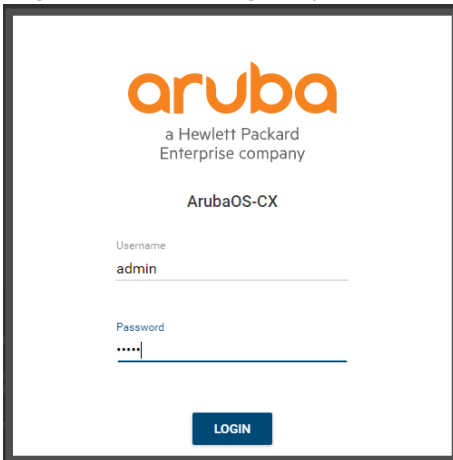
4. The HTTPS server is enabled by default on `vrf mgmt`.
5. Save the switch config to startup-config.

```
switch(config)# do copy running-config startup-config
Success
```

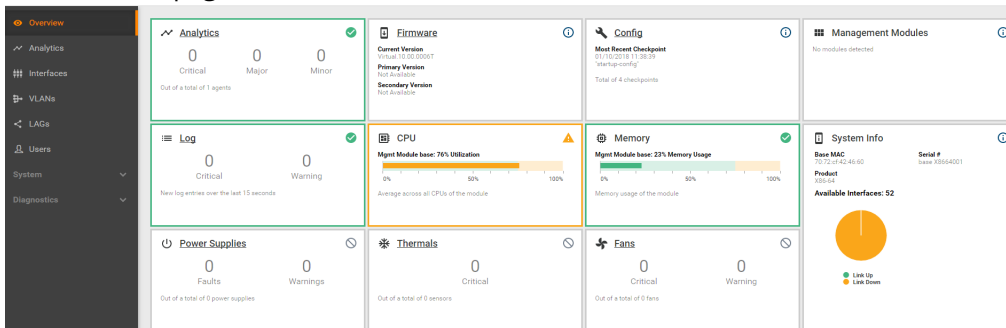
6. Log in to the switch WebUI at `https://<SWITCH_IP_ADDRESS>`.
7. Once the security certificate is confirmed, you must accept the EULA.



8. Log in as admin using the password created earlier.

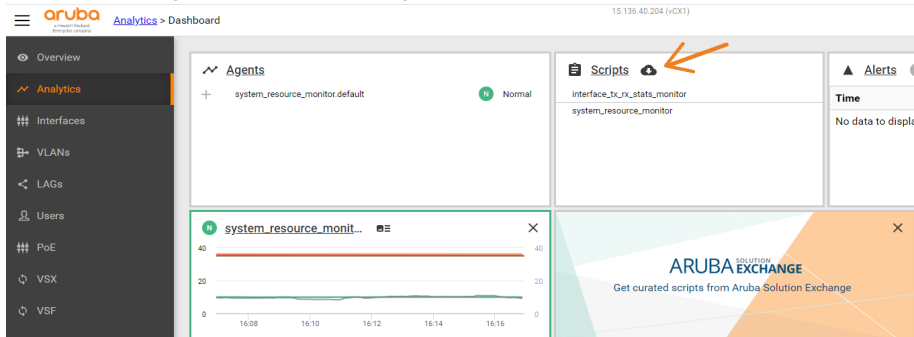


The Overview page should now be available.

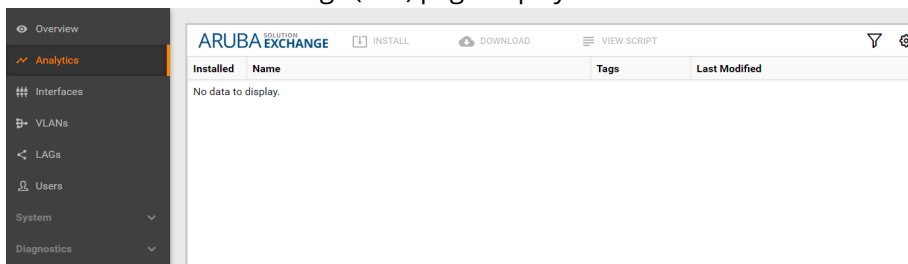


## Installing a Network Analytics Engine (NAE) script from ASE

1. From the Analytics tab, in the Scripts tile, click the Cloud icon.

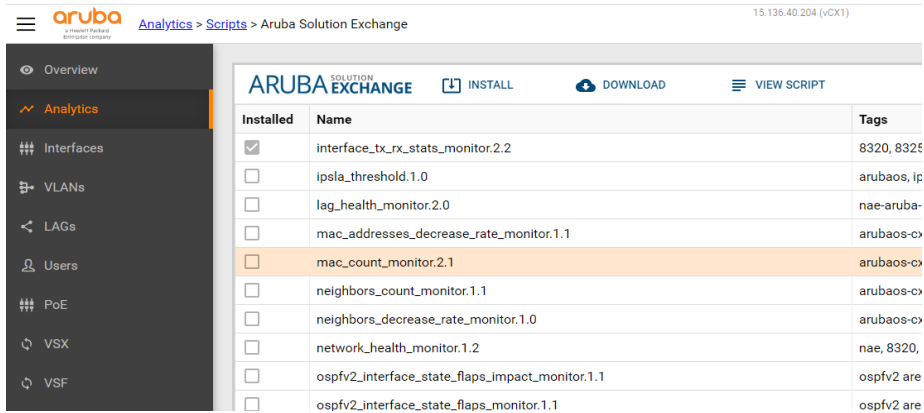


The Aruba Solution Exchange (ASE) page displays.

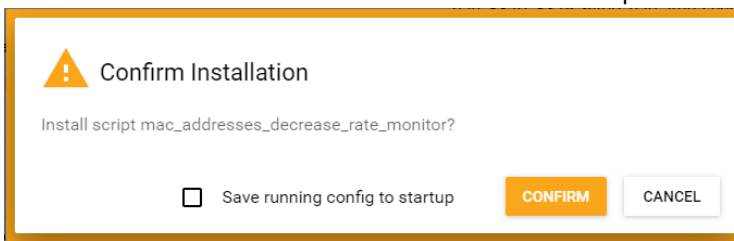


After a few moments, content from the ASE will be downloaded to the OVA.

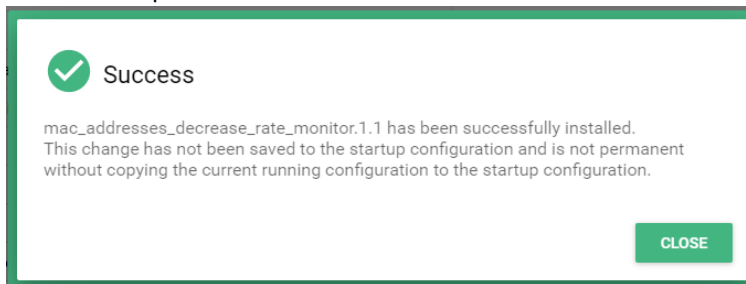
2. Click ACCEPT to accept the license agreement.
3. Select the desired script to be installed and click the INSTALL button at the top of the screen.



4. Click CONFIRM to confirm the installation of the script.

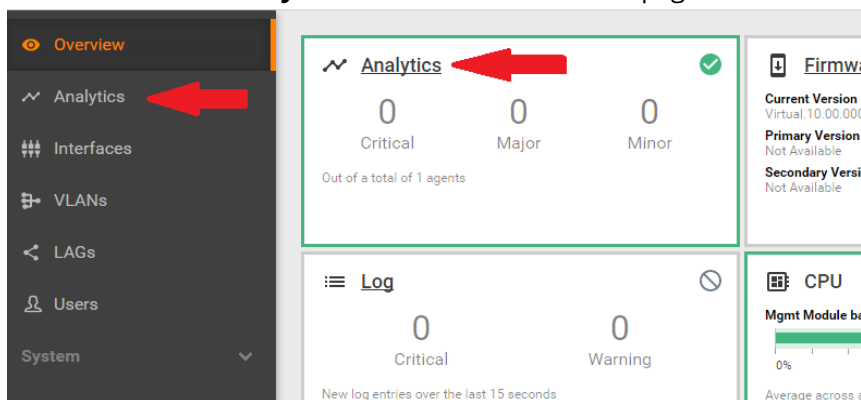


5. After the script is installed, click CLOSE.

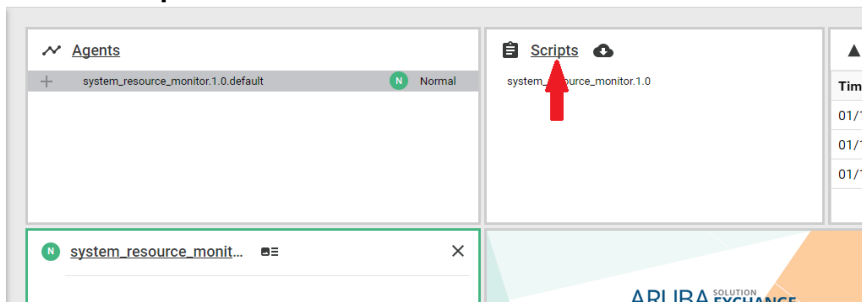


## Installing a Network Analytics Engine (NAE) script from a local directory

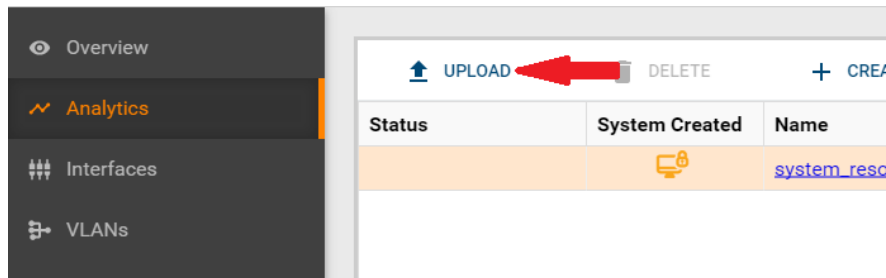
1. Click either of the **Analytics** links from the Overview page.



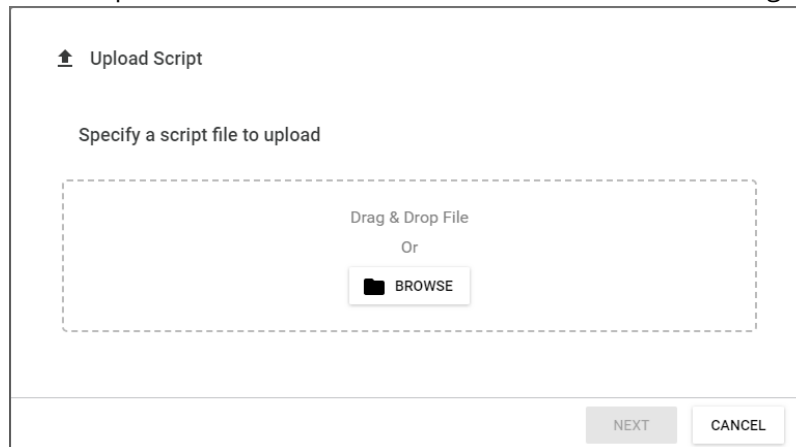
2. Click the **Scripts** link.



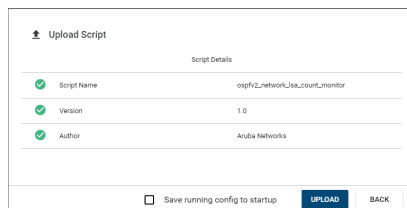
3. Click the **UPLOAD** link.



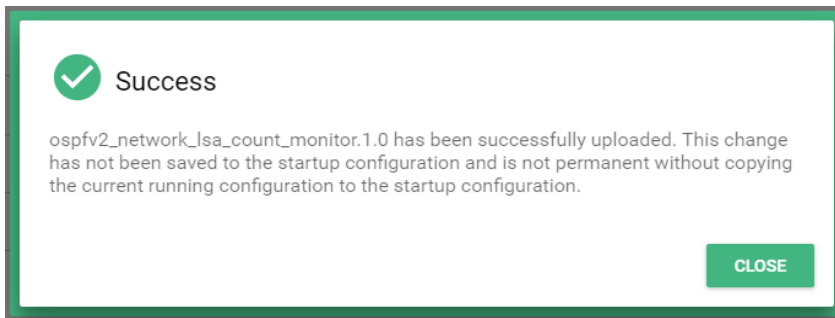
4. Select the NAE script to upload.
  - a. Either drop a file onto the screen or browse for a select a file using the BROWSE button.



- b. Click the Next button.
- c. (Optional) Check the **Save running config to startup** checkbox.
- d. Click the **UPLOAD** button.



5. If the upload is successful, a confirmation box will be displayed. Click the **CLOSE** button.



6. Select the uploaded script by clicking in the Status or System Created column for that script; do not click the name of the script.
7. Create a new agent by clicking the **CREATE AGENT** link.
  - a. Enter a name for the agent in the **Agent Name** field.
  - b. Modify any default values populated by the script.
  - c. (Optional) Check the **Save running config to startup** checkbox.
  - d. Click the **CREATE** button.

+ Create Agent

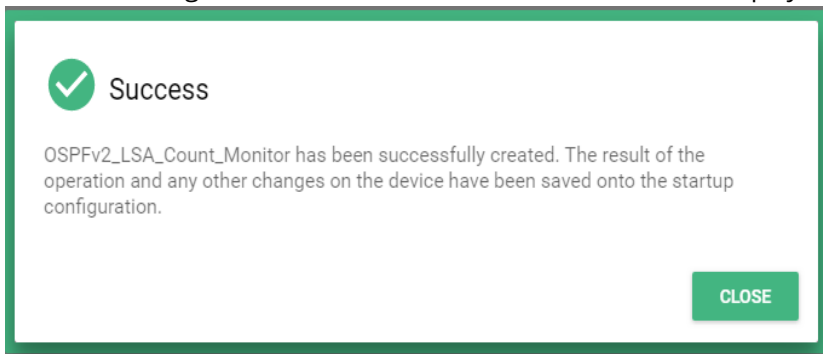
Script: ospfv2\_network\_lsa\_count\_monitor.1.0

Agent Name: OSPFv2\_LSA\_Count\_Monitor

| Type    | Name            | Description       | Value   |
|---------|-----------------|-------------------|---------|
| STRING  | ospf_area_id    | OSPFV2 area id    | 0.0.0.0 |
| INTEGER | ospf_process_id | OSPFV2 process id | 1       |
| STRING  | vt_name         | vt Name           | default |

Save running config to startup CREATE CANCEL

8. If the CREATE agent is successful, a confirmation box will be displayed. Click the **CLOSE** button.



9. Click the link for the agent that was just created to see the agent status.

CREATE EDIT DELETE DISABLE

| System Created | Name  | Status                |
|----------------|---|-----------------------|
|                | <a href="#">ospfv2_packet_mismatch_int-1-0</a>      | <span>N</span> Normal |
|                | <a href="#">system_resource_monitor.1.0.default</a> | <span>Mi</span> Minor |

The agent details are displayed along with any alerts that are generated.

**Agent Details**

Name: OSPFv2\_LSA\_Count\_Monitor

Script Name: ospfv2\_network\_lsa\_count\_monitor 1.0

Version: 1.0

**Status**

Normal

Last Status: Never

**Parameters**

- ospf\_area\_id: 0.0.0.0 (OSPFv2 area id)
- ospf\_process\_id: 1 (OSPFv2 process id)
- vrf\_name: default (Vrf Name)

**Alerts**

| Time                | Rule | Action(s) |
|---------------------|------|-----------|
| No data to display. |      |           |

**Chart**

Y-axis: count

X-axis: 14:20:35, 14:20:40, 14:20:45, 14:20:50, 14:20:55, 14:21:00

Legend: Network LSA Count Monitor (OSPFv2\_...), Network NSSA LSA Count Monitor (OS...)

Alert: No Data Available (4)