



Juniper Open Learning presents:

Create a Juniper lab with EVE-NG

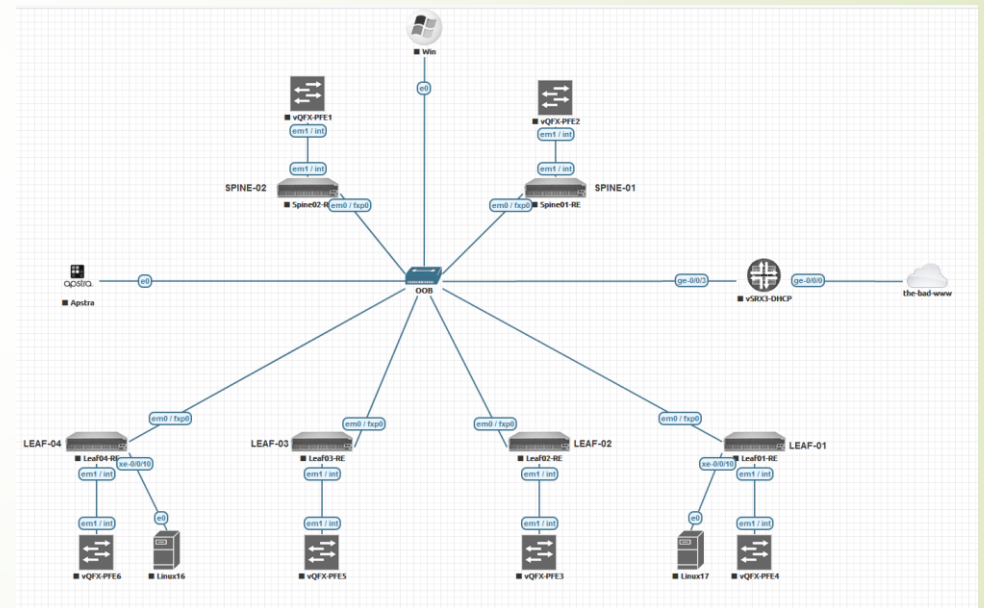
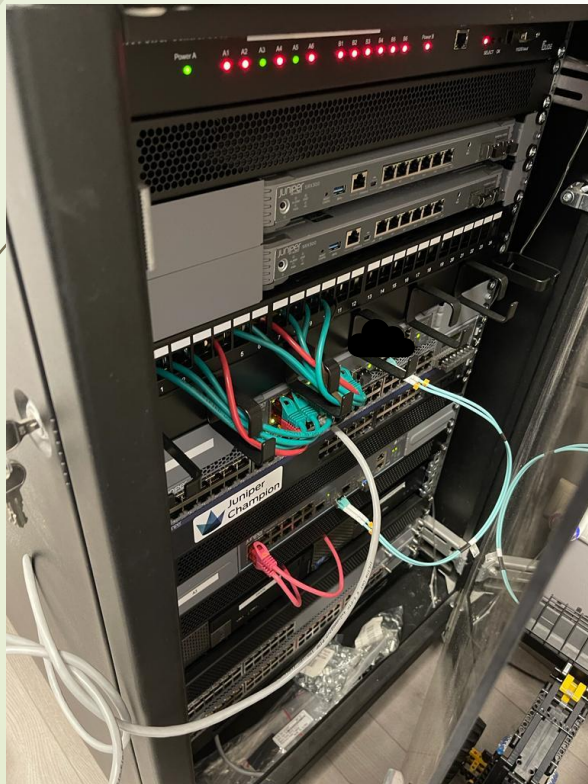
Sep 03rd, 2024, 1:30 PM PST

JUNIPER
NETWORKS

Education Services

Why Virtual Labs

Save Power / Rackspace / Hardware Costs



What is EVE-NG?



Emulated Virtual Environment
Next Generation



Why EVE-NG | Why Virtual Labs

- ▶ Quickly Lab / Test a new Design
- ▶ No additional Hardware Costs for Equipment
- ▶ GREAT for Certification → Combine with vLabs and AATP
- ▶ Get started for free with the Community Edition
- ▶ Vendor-Neutral! Great for Migrations / Interop Tests
- ▶ Extremely Flexible (Bare-Metal, VM | On-Prem | Colocation | Cloud)

EVE-NG Flavors

- Bare-Metal (best performance)
Needed for some vDevices
- VMware (best flexibility)
- Cloud (best „power-boost“ option)



EVE-NG Installation, Setup and more

- 3-Part Video Series
- https://learningportal.juniper.net/juniper/user_activity_info.aspx?id=EDU-JUN-WBT-JOL-EVENG

Course Modules ▲

#	Module	Duration	Lab	Required	Status
1	Module 01: Building a Juniper EVE-NG Lab Environment for Daily Usage Part 1: EVE-NG Overview ●	52m		<input type="radio"/>	Not Started
2	Module 02: Building a Juniper EVE-NG Lab Environment for Daily Usage Part 2: Overview of vMX, vSRX, and vQFX ●	59m		<input type="radio"/>	Not Started
3	Module 03: Building a Juniper EVE-NG Lab Environment for Daily Usage Part 3: Overview of Clustering ●	50m		<input type="radio"/>	Not Started

Course Details ▲

Juniper Ambassador Christian Scholtz teams up with the Juniper Open Learning to teach you how to build virtual lab environments to help with your preparation for Juniper Networks certification. The video starts with an overview of EVE-NG. It then details how to perform the initial setup of EVE-NG with a demonstration. Basic and advanced lab actions are then covered. If you plan to pursue Juniper certification, this video will help you build a virtual lab for practice.

Difficulty: Foundational
Last Updated: Wednesday, October 26, 2022

[Copy Shortcut](#)

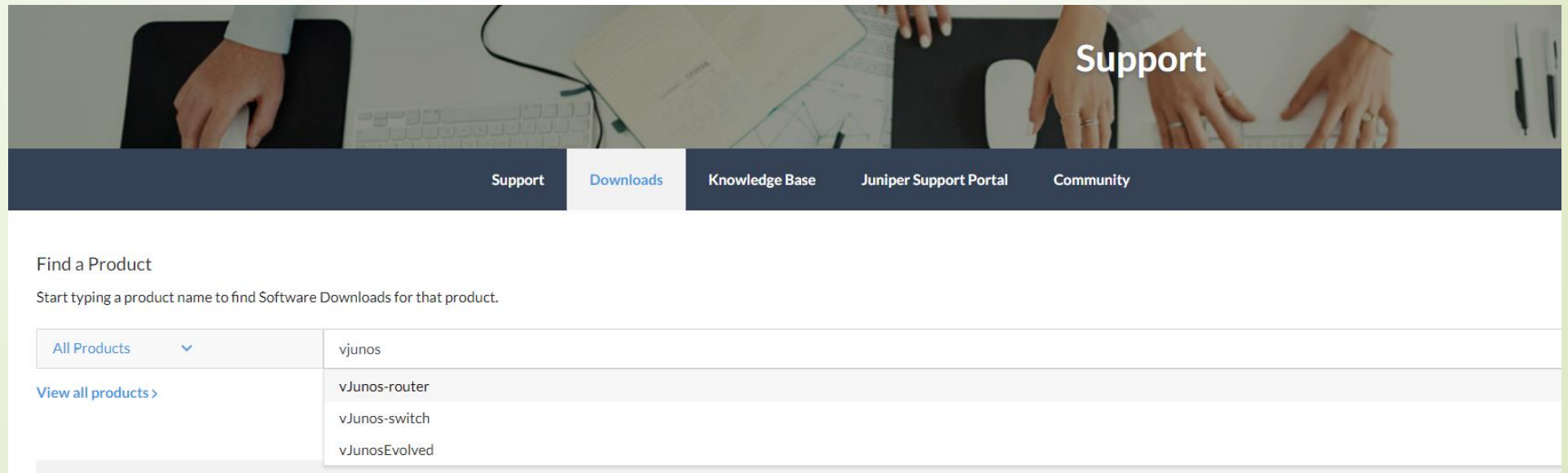


Lab Environment Considerations

- DHCP needed?
- DNS needed?
- AD? Management-PC's? Clients? Test-Servers? (commit Feature in EVE-NG)
- Outside Network? Test-Lab (Hardware) needed? Interface-Cards in Server?
- Firewalls / NAT?
- VPN / MIST-Edge into your Lab?
- Traffic-Generators? Tip: <https://ostinato.org/>
- Your own „Chaos-Monkey“ / „Break-Fix-Tools“?
- One Big Topology VS multiple smaller ones?

Fetching images

- ▶ 3 „base“ v-Images:
- ▶ vJunOS-Switch (virtual EX9214)
- ▶ vJunOS-Router (virtual MX304)
- ▶ vJunOS-Evolved (based on JunOS Evo)



The screenshot shows the Juniper Support website interface. At the top, there is a navigation bar with the word "Support" in large white text on a dark blue background. Below this, a secondary navigation bar contains links for "Support", "Downloads", "Knowledge Base", "Juniper Support Portal", and "Community". The main content area features a search section titled "Find a Product" with the instruction "Start typing a product name to find Software Downloads for that product." A search input field contains the text "vjunos". To the left of the search field is a dropdown menu labeled "All Products" with a downward arrow. Below the search field, there is a link "View all products >". A list of search results is displayed below the input field, including "vJunos-router", "vJunos-switch", and "vJunosEvolved".

Support

Support Downloads Knowledge Base Juniper Support Portal Community

Find a Product

Start typing a product name to find Software Downloads for that product.

All Products vjunos

View all products > vJunos-router vJunos-switch vJunosEvolved

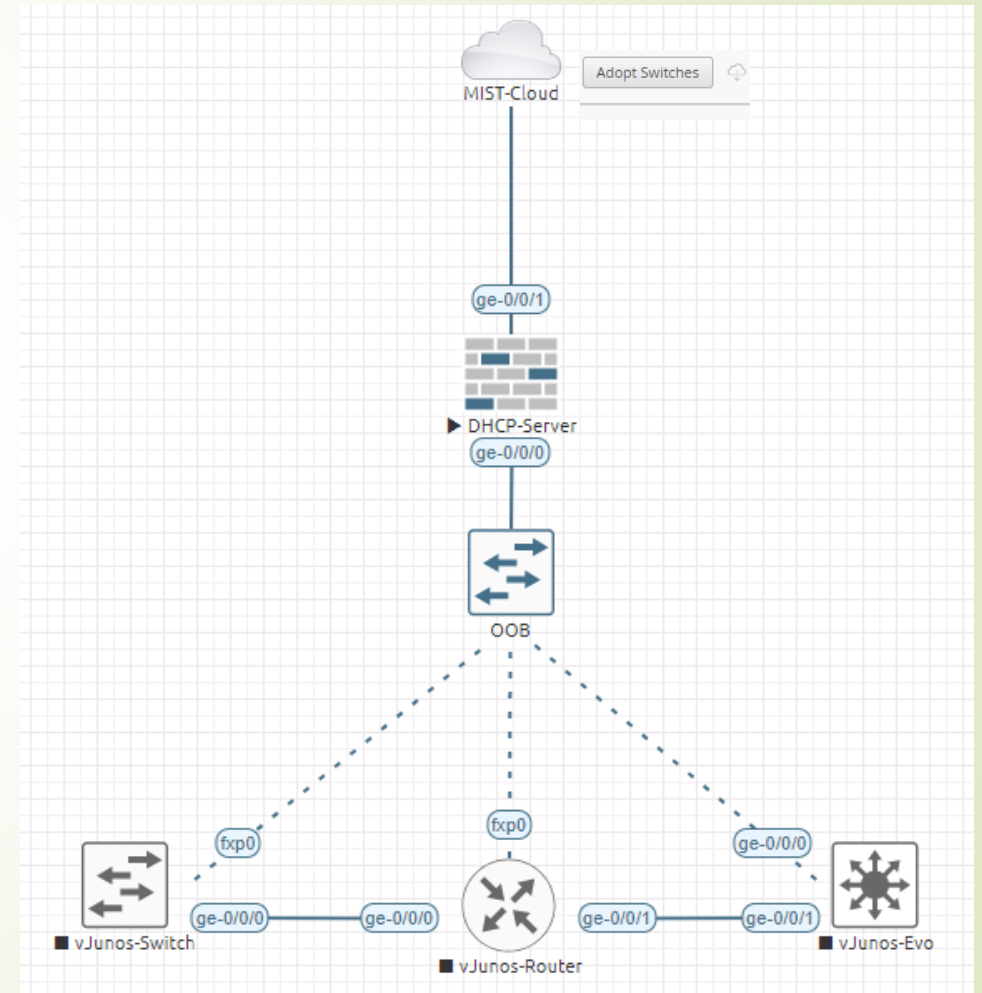
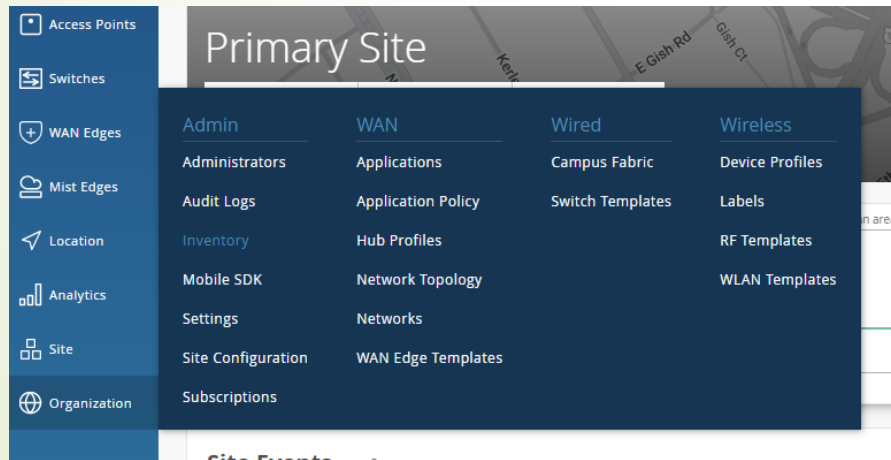


Fetching images

- ▶ „Specialized“ images:
- ▶ 128T:
Reach out to your Juniper SE
- ▶ APSTRA + APSTRA-ZTP + APSTRA-Flow (4.2.1):
<https://support.juniper.net/support/downloads/?p=apstra>
- ▶ JSA:
<https://support.juniper.net/support/downloads/?p=juniper-secure-analytics>
- ▶ vRR:
<https://support.juniper.net/support/downloads/?p=virtual-route-reflector>

Our Lab Topology

- vJunos-Switch, vJunos-Router and vJunos-Evo
- Connected via OOB-Port towards OOB-Switch
- OOB-Switch connected to DHCP-Server for Phone-Home
- DHCP-Server connected to Uplink (Mist-Cloud)
- Onboarded in MIST to save time:



Our Lab Topology

- Add config to vjunos-switch

```
vJunos-Switch
[edit]
root# load set terminal
[Type ^D at a new line to end input]
set system services ssh protocol-version v2
set system authentication-order password
set system login user mist class super-user
set system login user mist authentication encrypted-password $6$1fLlvz78BsafUvc3$I/qwr3G5PIOQn1Cxe2G
N.K880boqffh1RIKqE0nNctxstsf02Re6581xnTLqJkdbJMdB/bxZzgNCj kFWDHLaq0
set system login user mist authentication ssh-rsa "ssh-rsa AAAAB3NzaClyc2EAAAADAQABAAQGC2"
set system services outbound-ssh client mist device-id 93771c6d-62af-4697-all4-8b29eeab8c52
set system services outbound-ssh client mist secret 7a3de7543c298134057a86d7a4a4a42006d303b11922c2bf
ea42195c5ab5ad131e9536065d9d0287cb8ac4ff5f0ff2cdc251845b60cafce0caal5f311fbae6a5
set system services outbound-ssh client mist services netconf keep-alive retry 12 timeout 5
set system services outbound-ssh client mist oc-term.eu.mist.com port 2200 timeout 60 retry 1000
delete system phone-home
terminal:10:(14) syntax error: phone-home
load complete

[edit]
root# commit and-quit
commit complete
Exiting configuration mode
root>
```

- Depending on DHCP you need to add a static route and a nameserver and NAT!

```
root> configure
Entering configuration mode

[edit]
root# set routing-options static route 0/0 next-hop 10.10.100.1

[edit]
root# set system name-server 1.1.1.1

[edit]
root# commit
commit complete

[edit]
root#
```

Our Lab Topology

- ▶ Sampel SRX config for Source-NAT in the Lab

Configure Source NAT using interface IP

In this example, all traffic from the trust zone to the untrust zone is translated to the egress interface, ge-0/0/2 interface IP address.

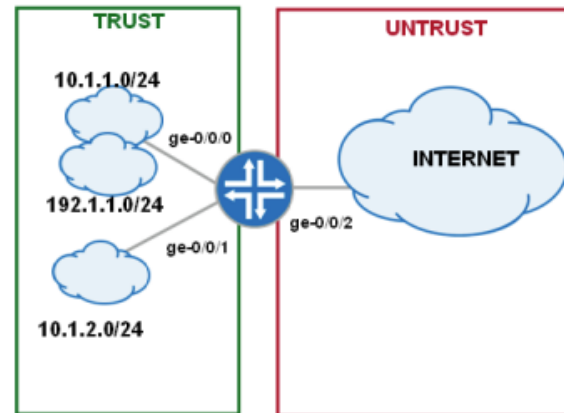


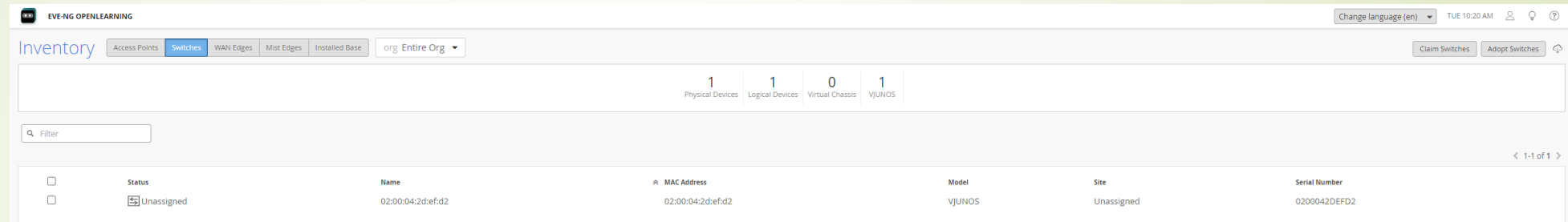
Fig1: source NAT using interface IP

```
[edit security nat source]
set rule-set rs1 from zone trust
set rule-set rs1 to zone untrust
set rule-set rs1 rule r1 match source-address 0.0.0.0/0
set rule-set rs1 rule r1 match destination-address 0.0.0.0/0
set rule-set rs1 rule r1 then source-nat interface

[edit security policies from-zone trust to-zone untrust]
set policy internet-access match source-address any destination-address any application
any
set policy internet-access then permit
```


Our Lab Topology

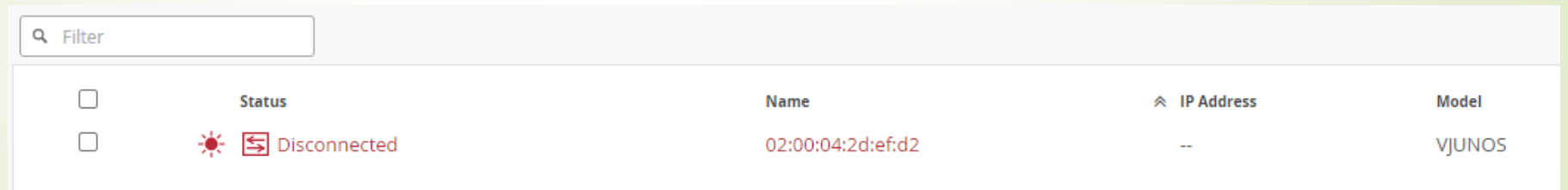
- Wait for MIST to show the Device




The screenshot shows the MIST Inventory page for 'EVE-NG OPENLEARNING'. The page has tabs for 'Access Points', 'Switches', 'WAN Edges', 'Mist Edges', and 'Installed Base'. The 'Switches' tab is active. A summary bar shows: 1 Physical Devices, 1 Logical Devices, 0 Virtual Chassis, and 1 VJUNOS. A search filter is present. The table below has columns: Status, Name, MAC Address, Model, Site, and Serial Number. One device is listed with status 'Unassigned', name '02:00:04:2d:efd2', MAC Address '02:00:04:2d:efd2', Model 'VJUNOS', Site 'Unassigned', and Serial Number '0200042DEFD2'.

Status	Name	MAC Address	Model	Site	Serial Number
<input type="checkbox"/> Unassigned	02:00:04:2d:efd2	02:00:04:2d:efd2	VJUNOS	Unassigned	0200042DEFD2

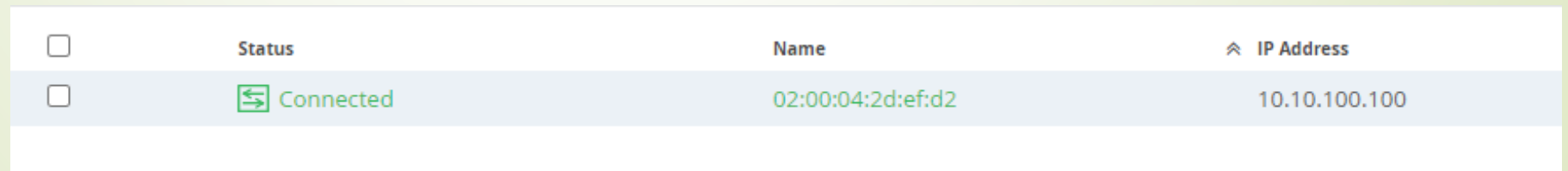
- Assign Device to a site WITHOUT using the „manage config via MIST“ checkbox!




The screenshot shows the MIST Inventory page with the device status updated to 'Disconnected'. The table has columns: Status, Name, IP Address, and Model. The device entry shows a status of 'Disconnected' (indicated by a red sun icon), name '02:00:04:2d:efd2', IP Address '--', and Model 'VJUNOS'.

Status	Name	IP Address	Model
<input type="checkbox"/>  Disconnected	02:00:04:2d:efd2	--	VJUNOS

- Wait for the Device to come online



The screenshot shows the MIST Inventory page with the device status updated to 'Connected'. The table has columns: Status, Name, and IP Address. The device entry shows a status of 'Connected' (indicated by a green double arrow icon), name '02:00:04:2d:efd2', and IP Address '10.10.100.100'.

Status	Name	IP Address
<input type="checkbox"/>  Connected	02:00:04:2d:efd2	10.10.100.100

Our Lab Topology

- Device is shown in MIST but no Interfaces can be used (yet). This is planned for some time now but still (not yet) implemented.

The screenshot displays the MIST interface for a switch. At the top, there are tabs for 'Front Panel' and 'Port List'. A large box in the center contains the text 'Switch information not available'. Below this, the interface is divided into three main sections: METRICS, PROPERTIES, and STATISTICS.

METRICS

--	Switch-AP Affinity	--	PoE Compliance
--	VLANs	100%	Version Compliance
100%	Switch Uptime	100%	Config Success

PROPERTIES

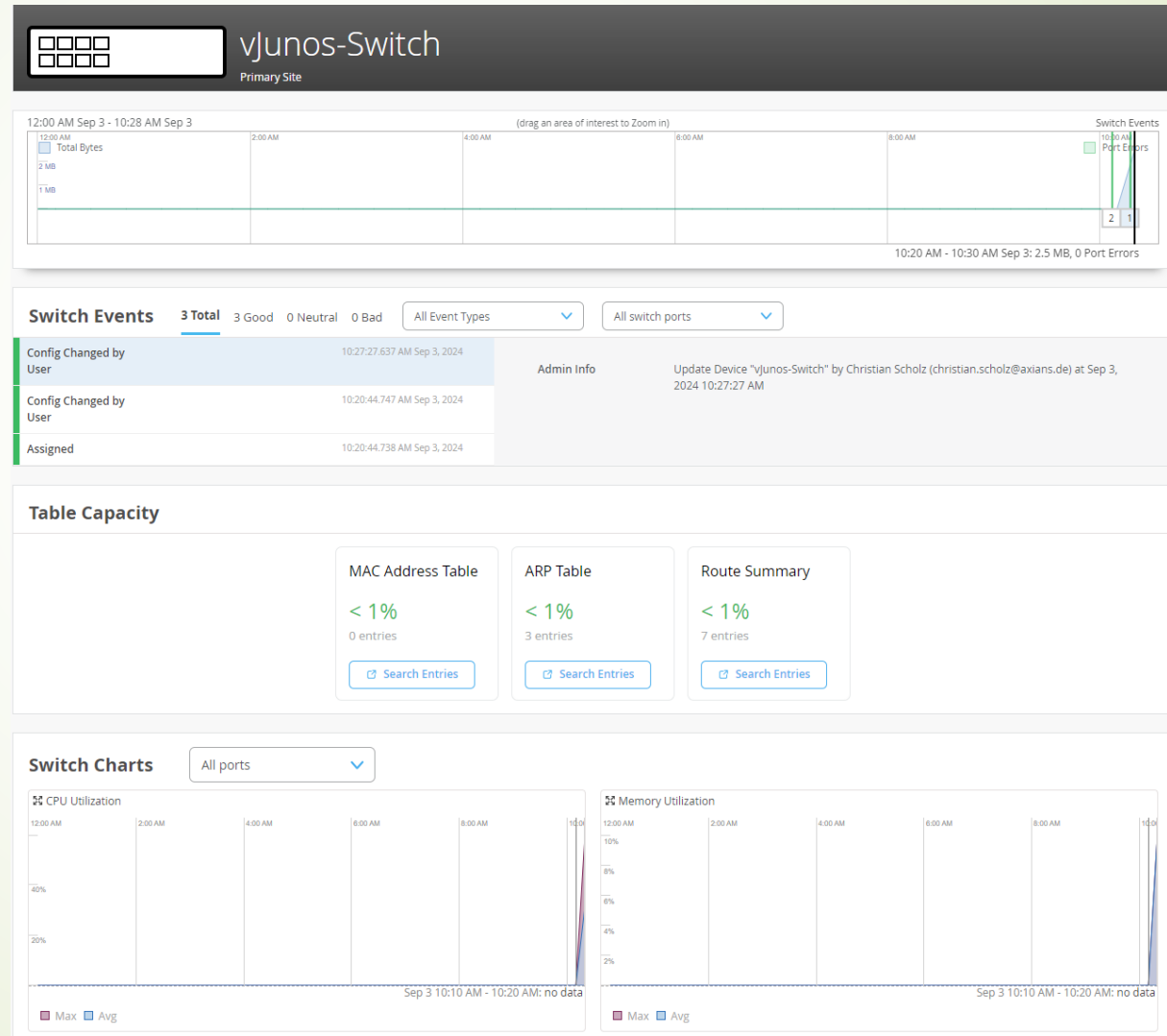
INSIGHTS	Switch Insights
LOCATION	not on floorplan
MAC ADDRESS	02:00:04:2d:ef:d2
MODEL	vJUNOS
VERSION	23.2R1.14
TEMPLATE	None (Configure)
SWITCH PHOTOS	

STATISTICS

STATUS	Connected
IP ADDRESS	● 10.10.100.100 (fxp0.0) ● 192.168.10.1 (ge-0/0/0.0)
MIST APS	0
WIRELESS CLIENTS	0
TOTAL POWER DRAW	0.00 W
UPTIME	16m
LAST SEEN	Sep 3, 2024 10:27:11 AM
LAST CONFIG	--

Our Lab Topology

Switch insights

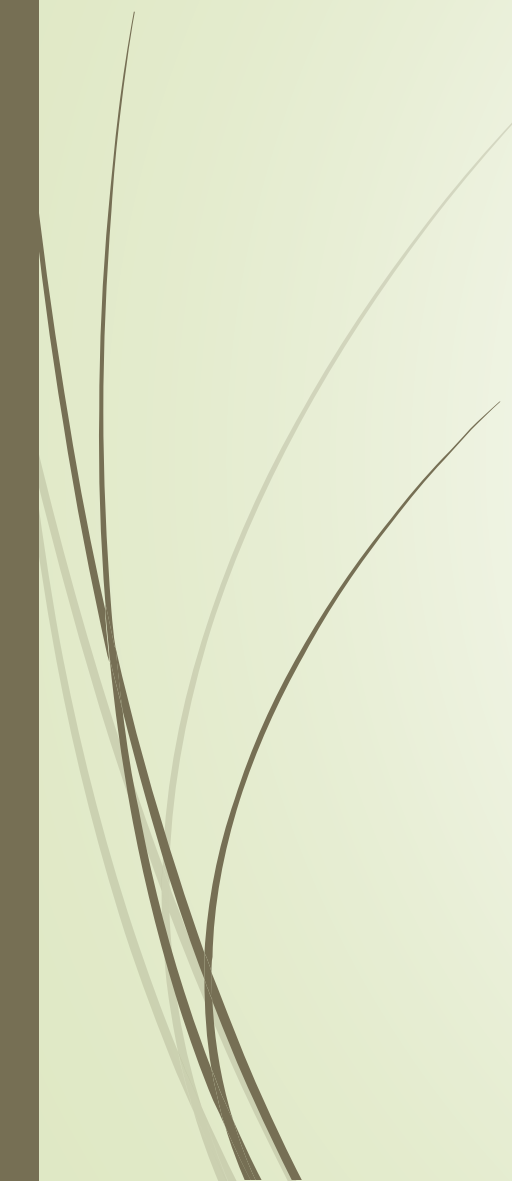


What to do in case something goes wrong?





Pitfall: not enough resources (CPU / RAM)

- ▶ Symptom:
 - ▶ Multiple unexplainable errors / strange behavior in multiple ways
 - ▶ Cause:
 - ▶ Device has not enough CPU / RAM to perform basic tasks
 - ▶ Solution:
 - ▶ NEVER go below the recommendation from the template
- 

Pitfall: booting up everything at once

- Symptom:
- Lab takes literally forever to start
- Cause:
- Device takes WAY more resources during bootup and CPU is overwhelmed
- Solution:
- Use the „delay“-option to start the devices one after another



Startup configuration	Satellite
None ▾	master ▾
Delay (s)	
0	

Pitfall: eve-ception

- Symptom:
- Running EVE-NG on your Laptop in vmware Workstation and starting a lab is not working

➤ Cause:



- Solution:
- Don't use EVE-NG on your Laptop
Use a proper Server (Vmware, Cloud or Bare-Metal)
and access it via your Webbrowser
Usually cheap to fetch on eBay



More Infos

- ▶ YouTube Video Series covering EVE-NG and Juniper:
<https://www.youtube.com/netchron>
- ▶ EVE-NG YouTube Channel:
<https://www.youtube.com/@eve-ng-emulatedvirtualenvi9759>
- ▶ EVE-NG Website:
<https://www.eve-ng.net/>
- ▶ EVE-NG Forum:
<https://www.eve-ng.net/forum/>
- ▶ EVE-NG Helpdesk (Live-Chat):
<https://www.eve-ng.net/index.php/live-helpdesk/>

KAHOOT Time!



Q&A



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