Efficiency Unlocked: Mastering Service Sync between Netbox and NSO

Energi

internet

og tv.

ICTRLYS



Niclas Skøtt Petersen

Level(age): 27

Class(role): Network Specialist in Automation

Background:

6 years in Norlys in 4 different roles

Started my IT education in 2013.

Voluteer for many things

Warning: Will continue to talk for hours about most fields in Tech if disturbed. No specific disturbance required.





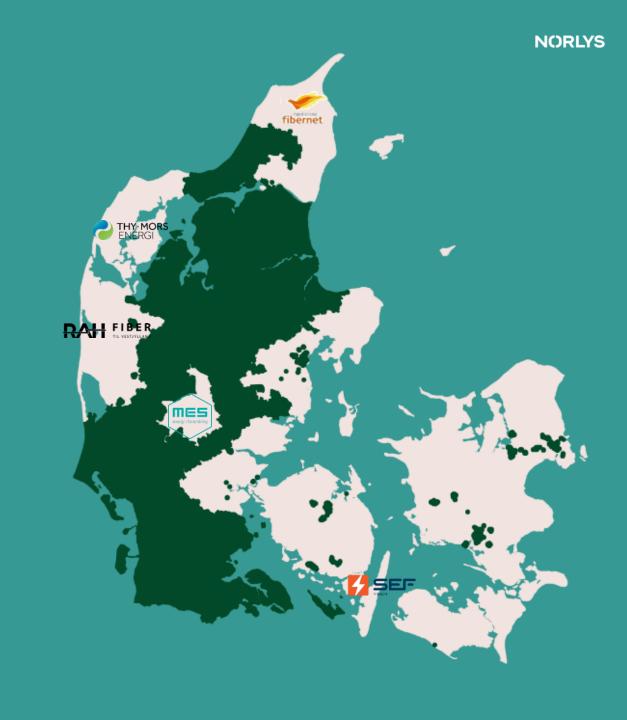




Who is Norlys Fibernet?

- Norlys Fibernet owns, operates and maintains the largest fibre network in Denmark measured by the number of households that have access to the network.
- The fibre network is available to more than **880,000 addresses**
- Norlys Fibernet also operates several other fibre networks, including SEF, RAH, ThyMors Energi, Nord Energi and MES
- Norlys Fibernet owns 45% of RAH Fiber and 25% of SEF Fiber

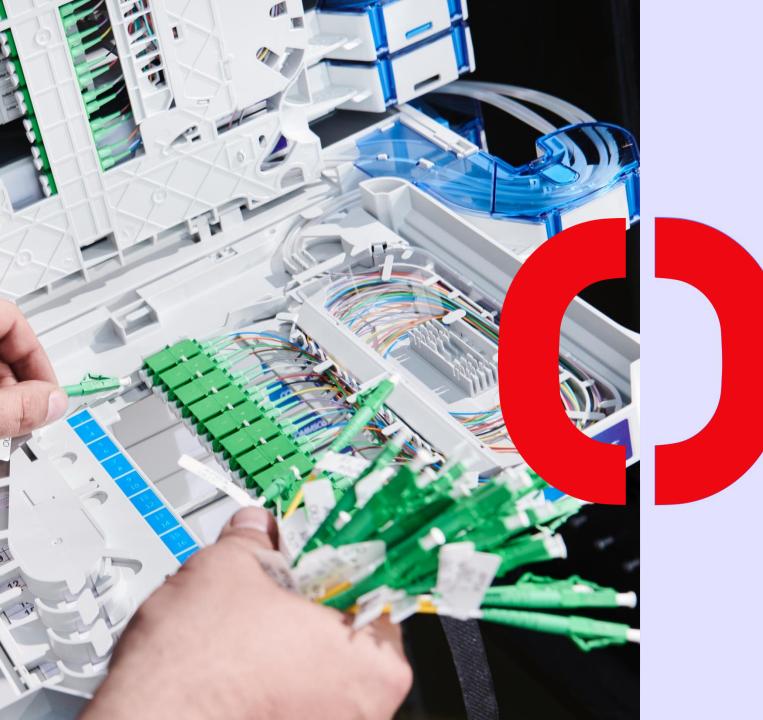
→ The green area roughly corresponds to Norlys' electricity supply area





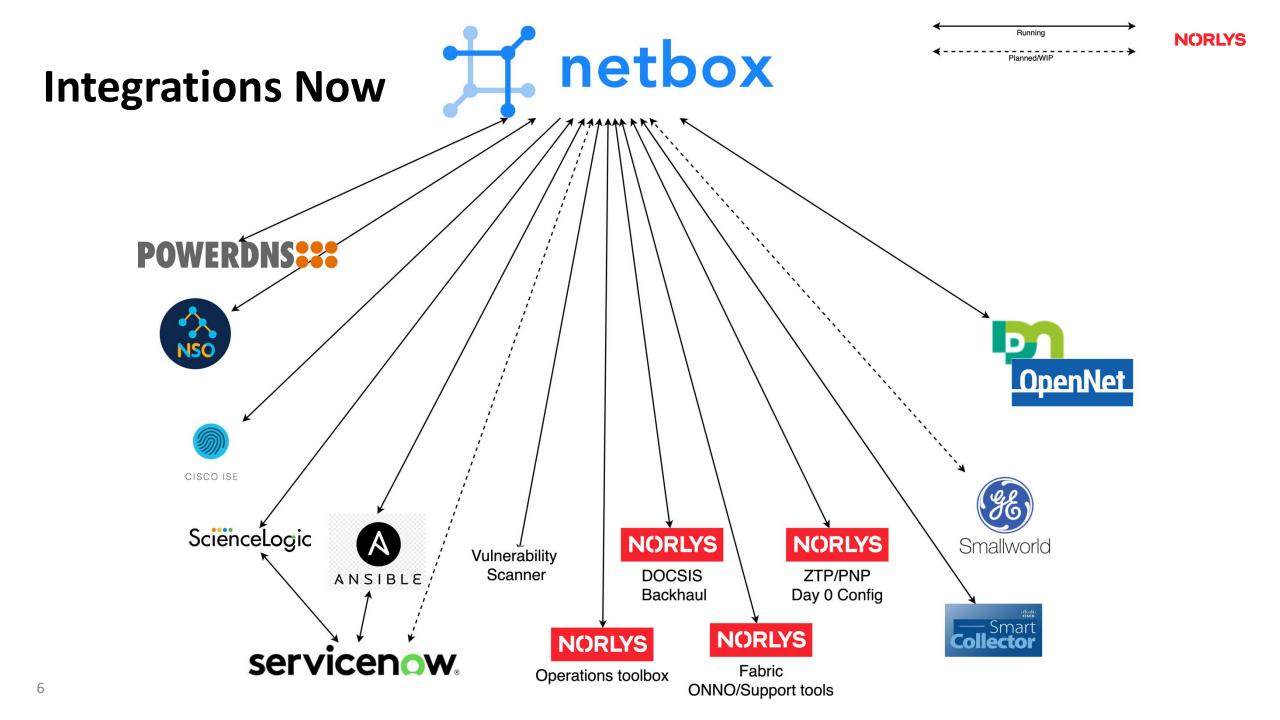
Agenda

- Short intro to Norlys Fibernet and me
- SSOT introduction Netbox
- The Challenge
- Solution
- The "Demo"
- Next steps and Lessons learned
- Questions



SSoT introduction

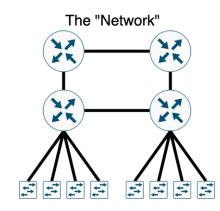
SSoT - Netbox





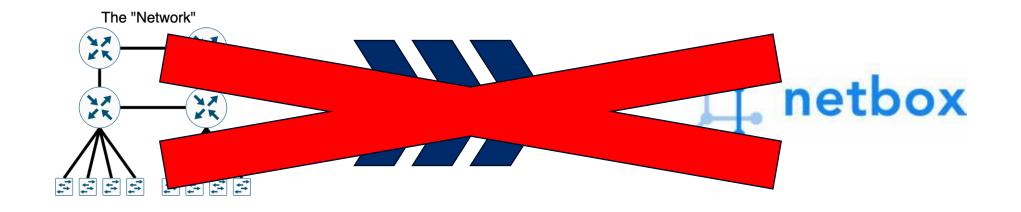
Flipping the script

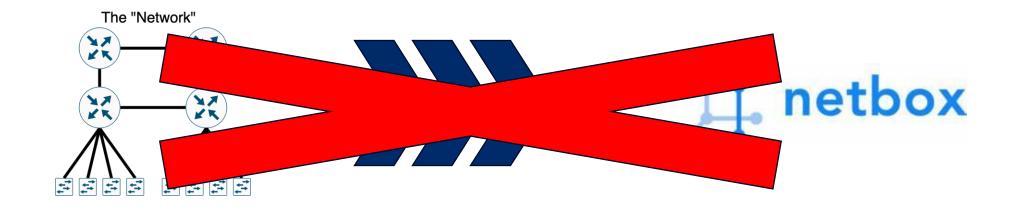
The "Network"





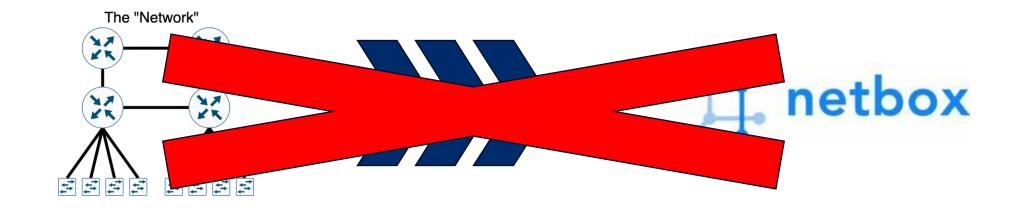






netbox

Flipping the script



The "Network"

XX XX KK KK 1 netbox •± XX XX XX

Sync of Services

Goals and Solution



Goals for Service sync

Dry-run verification of config as day 1

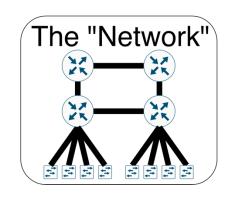
No values should be duplicated if possible.

Ready for multiple Sources of Record

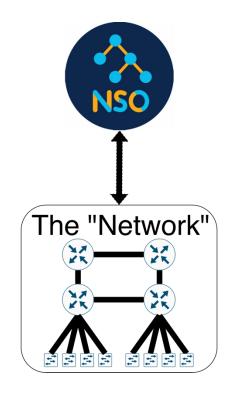
Services local for device

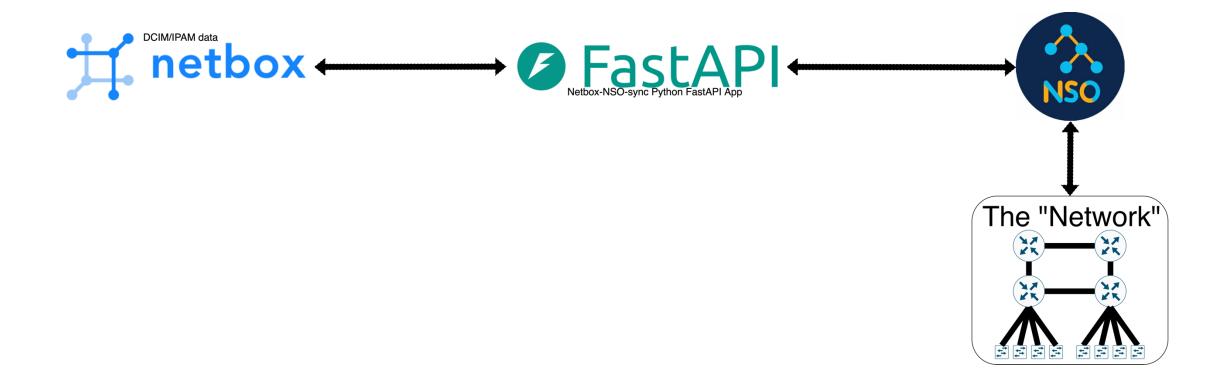
Services on global/group level

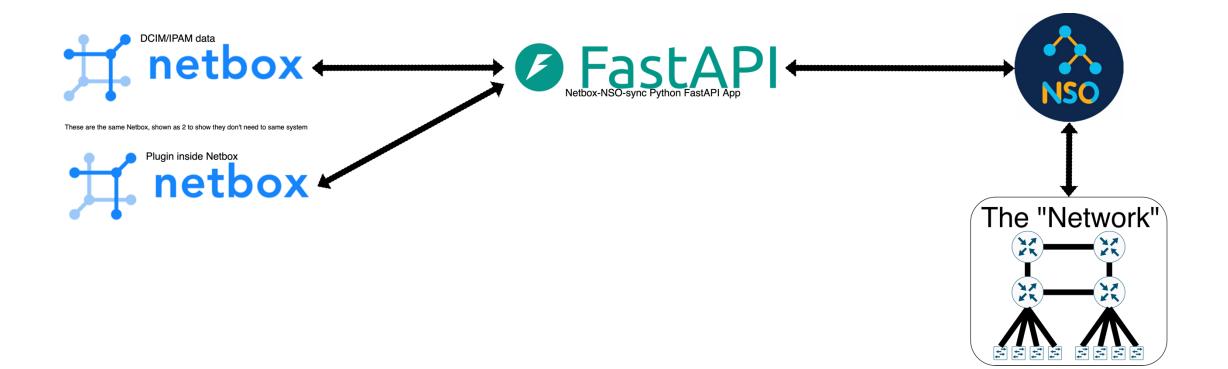


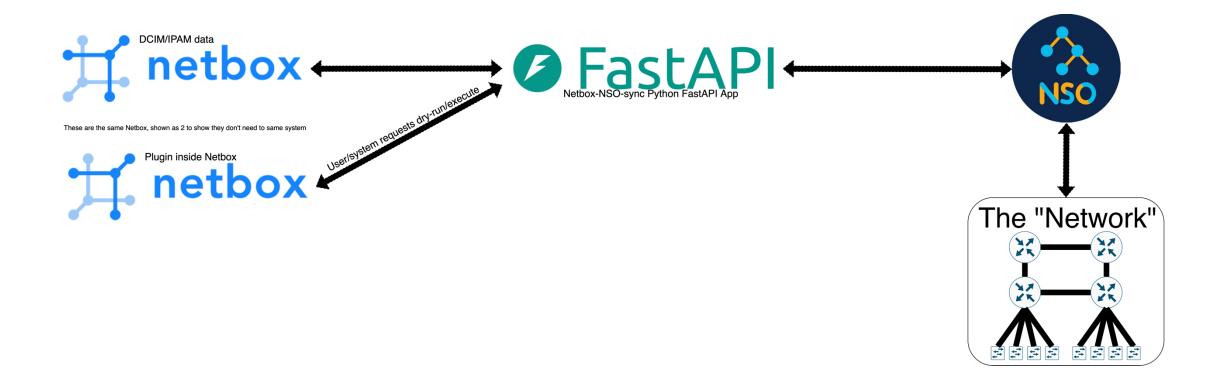


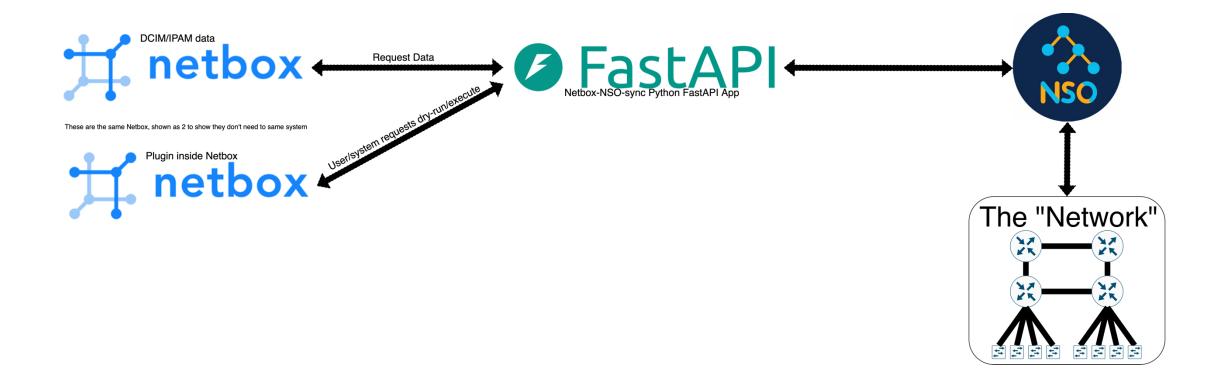


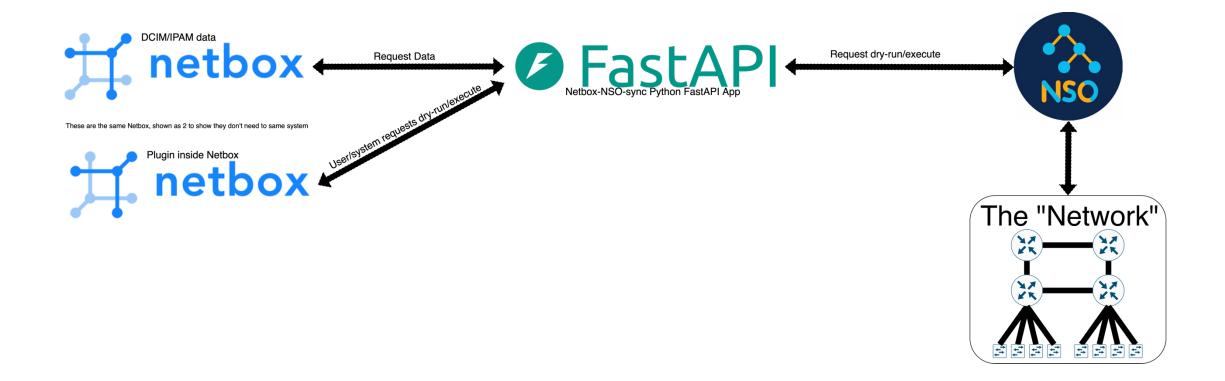


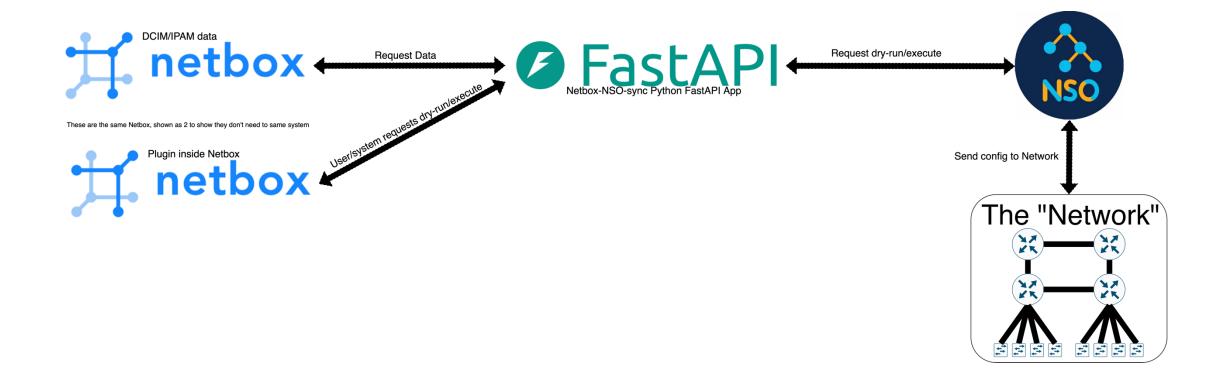




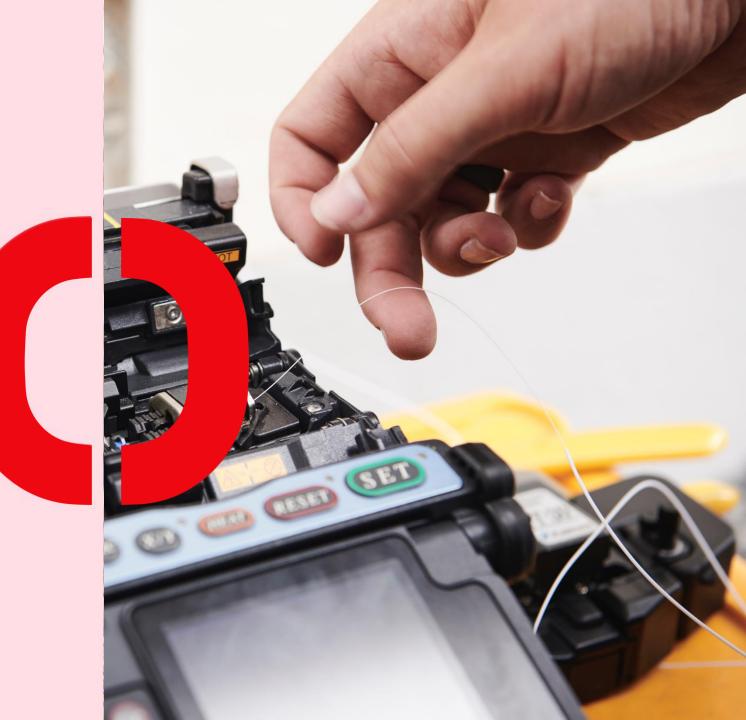








The "Demo"



The Task

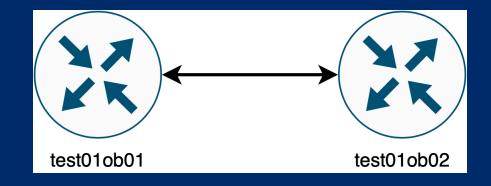
Hello Network Engineer.

We need you to add a link between test01ob01 and test01ob02.

Can you plan it and return documentation for the new link?

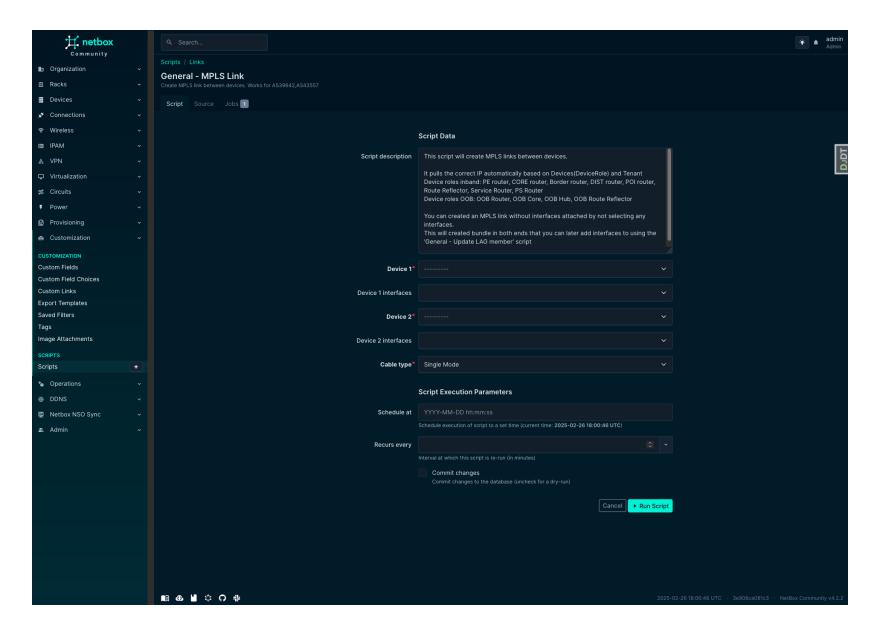
Then we will schedule technician to execute.

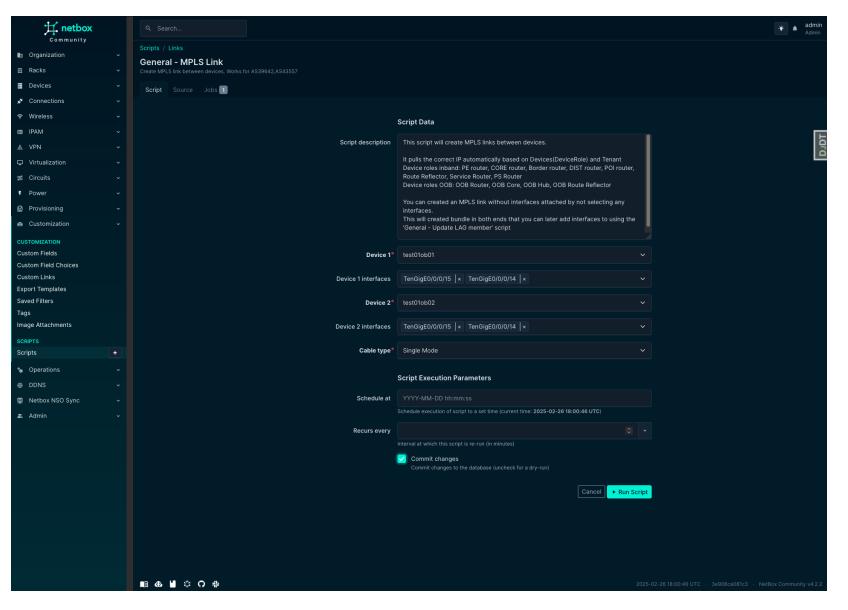
Speed should 2x10G.



Community	Q Sea	irch										*	admin Admin
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Racks	Results												
Devices													
💉 Connections						Search*	test01ob0						
↔ Wireless													
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.å. VPN						Lookup	Partial match			~			DJDT
Virtualization									_				
😅 Circuits									Sector Sector	earch			
¥ Power	ТҮРЕ	OBJECT	FIELD	VALUE	ATTRIBUTES								
Provisioning	Device	test01ob01	Name	test01ob0 1	Site: test01 Locati	ion: NH2 Rack	: NH02R04 Status: Active	Device Type: NCS-55A2-MOD-S	S Role: OOB Core Tena	nt: Fibernet Test Platfo	rm: IOS-XR		
▲ Customization	Device	test01ob02	Name	test01ob0 <mark>2</mark>	Site: test01 Locati	ion: NH2 Rack	: NH02R04 Status: Active	Device Type: NCS-55A2-MOD-S	S Role: OOB Core Tena	nt: Fibernet Test Platfo	rm: IOS-XR		
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回 Netbox NSO Sync													
🙁 Admin													
		≝ ¢ ∩ :	<i>*</i> :										

Community	Q Search														Admin Admin
	Devices / test01													dcim.c	device:38055
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🖽 Racks 🗸 🗸	Created 2023-01-25 00:00 · Updated 2025-02-26 17:22	🖽 Racks 🗸 🗸		ed 2025-02-26 1											A Monitoring
Devices ~	Device Interfaces 46 Console Ports 1 Power Ports 2 Nett	🚍 Devices 🗸 🗸	Device Interfaces 47		s 1 P	ower Ports 2	Neti		INSYNC						
DEVICES	Device interfaces ab Console Ports Power Ports 2 Nett	DEVICES													
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Platforms		Platforms	🔽 🖻 TenGigE0/0/0/15 —		SFP+								+	-	r / Lé
Virtual Chassis	✓	Virtual Chassis			(10GE)									-	
Virtual Device Contexts	🔽 🗖 TenGigE0/0/0/14 — 🗴 SFP+ (10GE) — —	Virtual Device Contexts	🔽 🖪 TenGigE0/0/0/14 —		SFP+								+	-	· · · ·
DEVICE TYPES	□ TenGiqE0/0/0/13 - × SFP+ (10GE)	DEVICE TYPES			(10GE)										
Device Types	TenGigE0/0/0/13 — × SFP+ (10GE) — —	Device Types	TenGigE0/0/0/13 —		SFP+								+	-	🖊 1
Module Types	TenGigE0/0/0/12 — X SFP+ (10GE) — — •	Module Types			(10GE)										
Manufacturers	□ TenGiaE0/0/0/11 — × SFP+ (10GE) — —	Manufacturers	TenGigE0/0/0/12 —		SFP+								+	-	r 🗸 🗸 🗸
DEVICE COMPONENTS		DEVICE COMPONENTS			(10GE)										
Interfaces	TenGigE0/0/0/10 — X SFP+ (10GE) — —	Interfaces	TenGigE0/0/0/11 —		SFP+								+	-	r 🗸 🖍 🔪
Front Ports	TenGigE0/0/0/9 — × SFP+ (10GE) — —	Front Ports			(10GE)										
Rear Ports		Rear Ports	TenGigE0/0/0/10 —		SFP+								+	-	r 👻 🖍 👻
Console Ports	TenGigE0/0/0/8 — X SFP+ (10GE) — —	Console Ports			(10GE)										
Console Server Ports	TenGigE0/0/0/7 — X SFP+ (10GE) — — •	Console Server Ports	TenGigE0/0/0/9 —		SFP+								•	2	• · · ·
Power Ports	□ TenGigE0/0/0/6 — 🗙 SFP+ (10GE) — —	Power Ports			(10GE)										
Power Outlets		Power Outlets	TenGigE0/0/0/8 —		SFP+ (10GE)								+	-	r 👻 🖍 👻
Module Bays	TenGigE0/0/0/5 — K SFP+ (10GE) —	Module Bays													
Device Bays	TenGigE0/0/0/4 — × SFP+ (10GE) — —	Device Bays	TenGigE0/0/0/7 —		SFP+ (10GE)								+	2	i 🔪 🖍 👻
Inventory Items		Inventory Items											_		
Inventory Item Roles	□ TenGigE0/0/0/3 — × SFP+ (10GE) — —	Inventory Item Roles	TenGigE0/0/0/6 —		SFP+ (10GE)								•	<u>- III (II</u>)	• · · ·
ADDRESSING	TenGigE0/0/0/2 — × SFP+ (10GE) — —	ADDRESSING												_	
MAC Addresses		MAC Addresses	TenGigE0/0/0/5 —	×	SFP+ (10GE)		_		—	—	—		+	*	





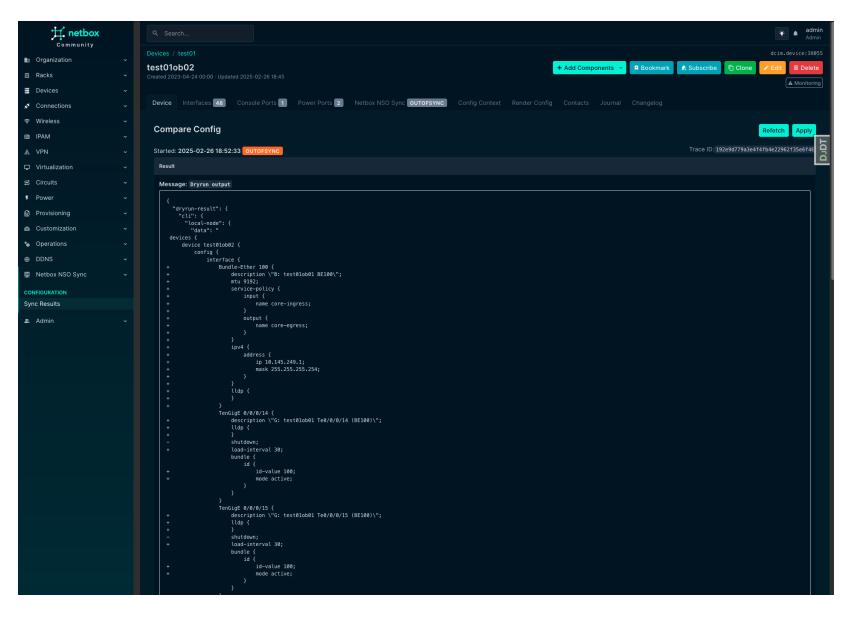
Executing the task

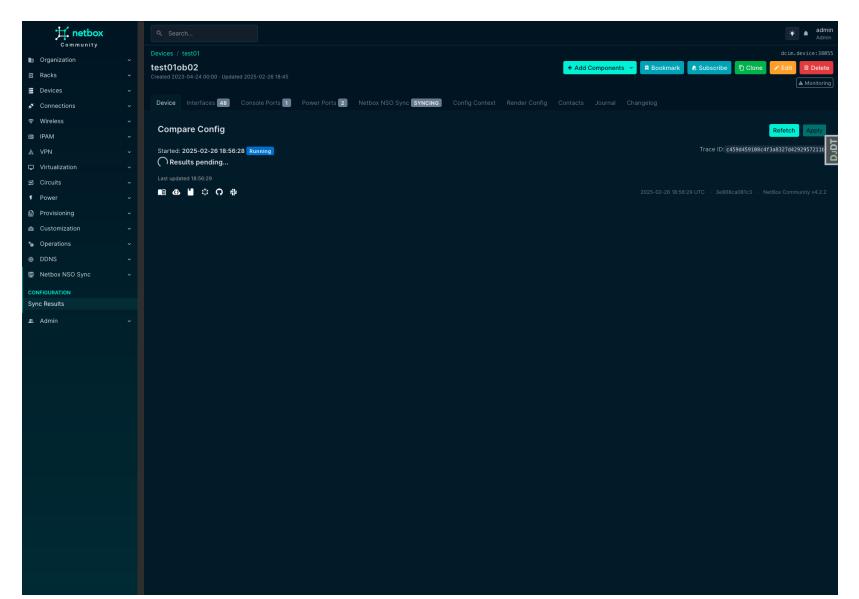
ti netbox	Q Search	💥 🛦 admin Admin
Community	1 2025-02-26T18:45:53.514833+00:00 Into — Device 1: 618353 618354	
Organization	2 2025-02-26T18:45:53.514869+00:00 Into — Device 2: 748772[748773	
Racks	3 2025-02-26T18:45:53.592000+00:00 Success — 'object-case:5579079a-eb48-493a-a76e-f0d5b7845a2	c' created
Devices	4 2025-02-26T18:45:53.633968+00:00 Info — Checking roles of devices	
Connections	5 2025-02-26T18:45:53.651445+00:00 Info — Match found, MPLS like kind is mfa-oob-core	
	6 2025-02-26T18:45:54.581477+00:00 Info — Connected SMF cable between 'test01ob01/TenGigE0/0	/0/14' and 'test01ob02/TenGigE0/0/0/14. Cable id = 97769'
III IPAM	7 2025-02-26T18:45:55:107512+00:00 Info — Connected SMF cable between 'test01ob01/TenGigE0/0	/0/15' and 'test01ob02/TenGigE0/0/0/15. Cable id = 97770'
Virtualization	8 2025-02-26T18:45:55.123214+00:00 Info — Lag ID: 100	
S Circuits	9 2025-02-26T18:45:55.308616+00:00 Info — Added Bundle-Ether100 to test01ob01	
F Power	10 2025-02-26T18:45:55.325815+00:00 Into — Adding TenGigE0/0/0/14 to lag Bundle-Ether100 on test	01ob01
Provisioning	11 2025-02-26T18:45:55.608756+00:00 Info — Setting test01ob01/TenGigE0/0/0/14 description to G: te	est01ob02 Te0/0/0/14 (BE100)
Customization	12 2025-02-26T18:45:55.704194+00:00 Into — Adding TenGigE0/0/0/15 to lag Bundle-Ether100 on test	01ob01
CUSTOMIZATION	13 2025-02-26T18:45:56.035477+00:00 Info — Setting test01ob01/TenGigE0/0/0/15 description to G: te	est01ob02 Te0/0/0/15 (BE100)
Custom Fields	14 2025-02-26T18:45:56.136815+00:00 Warning — Updating service data for device test01ob01, please go	sync config!
Custom Field Choices	15 2025-02-26T18:45:56.485515+00:00 mfo — test01ob01 Bundle-Ether100 got these interfaces added	I: TenGigE0/0/0/14, TenGigE0/0/0/15
Custom Links	16 2025-02-26T18:45:56.485544+00:00 Info — Added Bundle-Ether100 to test01ob02	
Export Templates Saved Filters	17 2025-02-26T18:45:56.497384+00:00 Info — Adding TenGigE0/0/0/14 to lag Bundle-Ether100 on test	01ob02
Tags	18 2025-02-26T18:45:56.779053+00:00 Info — Setting test01ob02/TenGigE0/0/0/14 description to G: te	est01ob01 Te0/0/0/14 (BE100)
Image Attachments	19 2025-02-26T18:45:56.871529+00:00 Info — Adding TenGigE0/0/0/15 to lag Bundle-Ether100 on test	01ob02
SCRIPTS	20 2025-02-26T18:45:57.112394+00:00 Info — Setting test01ob02/TenGigE0/0/0/15 description to G: te	est01ob01 Te0/0/0/15 (BE100)
	+ 21 2025-02-26T18:45:57186474+00:00 Warning — Updating service data for device test01ob02, please go	sync config!
°✿ Operations	22 2025-02-26T18:45:57.257765+00:00 Info — test01ob02 Bundle-Ether100 got these interfaces added	d: TenGigE0/0/0/14, TenGigE0/0/0/15
DDNS	23 2025-02-26T18:45:57.572619+00:00 Info — Setting test01ob01/Bundle-Ether100 description to B: te	st01ob02 BE100
Netbox NSO Sync	24 2025-02-26T18:45:57.654534+00:00 Info — Setting test01ob02/Bundle-Ether100 description to B: te	st01ob01 BE100
🛋 Admin	25 2025-02-26T18:45:57.716975+00:00 Info — Set description, MTU and enabled LAG.	
	26 2025-02-26T18:45:57.739615+00:00 Info — CIDR valid	
	27 2025-02-26T18:45:57.739646+00:00 Info — Getting all prefixes in Role: OOB-NCS-linknet and Tenan	t Fibernet Test
	28 2025-02-26T18:45:58.059754+00:00 Success — Created prefix: 10.145.249.0/31	
	29 2025-02-26T18:45:58.071429+00:00 Success — Prefix assigned	
	30 2025-02-26T18:45:58.244876+00:00 Info — Added 10.145.249.0/31 to test01ob01 Bundle-Ether100	_
	31 2025-02-26T18:45:58.291444+00:00 Info — Added 10.145.249.1/31 to test01ob01 Bundle-Ether100	
	32 2025-02-26T18:45:58.291507+00:00 Warning — Updating service data for device test01ob01, please go	sync config!
	33 2025-02-26T18:45:58.396895+00:00 Warning — Updating service data for device test01ob02, please go	
	34 2025-02-26T18:45:58.477664+00:00 Success — MPLS succesfully created and connected	
	35 2025-02-26T18:45:58.477708+00:00 Success — Script completed succesfully	

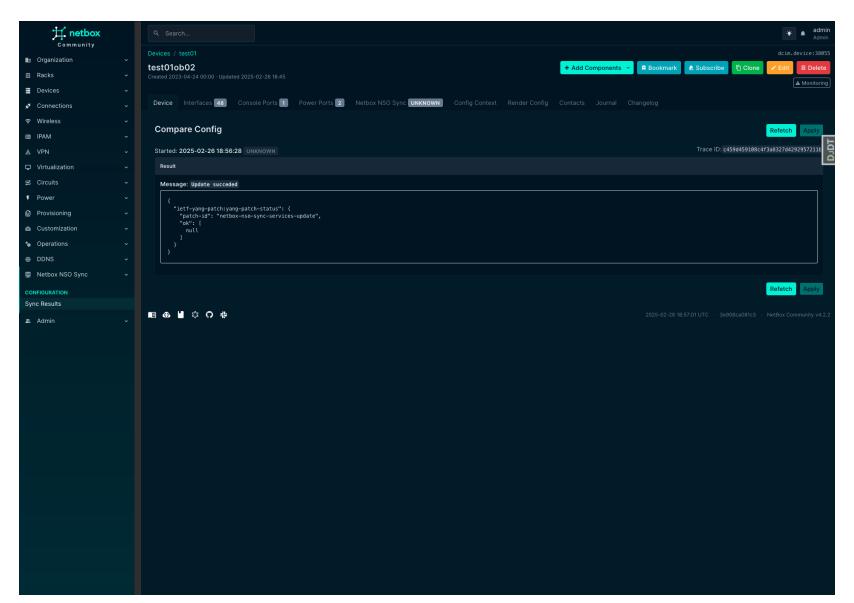
Devices / test01 test01ob01 Created 2023-01-25 00:00 - Upc Device Interfaces 47		25-02-26 18		Ports 2	Nethor	NSO 51		TOFSYNC	Config Context	Render C	+ Add Component		Bookmark	& Subscribe	Clone		.device:	lete
100		8 0			✓				coming context							🌣 Co	nfigure Ta	
NAME * *	LABEL	ENABLED	TYPE	PARENT	LAG	MTU	MODE	DESCRIPTION	IP ADDRESSES	CABLE	CONNECTION	VRF						
Bundle-Ether100			Link Aggregation Group (LAG)			9192		B: test01ob02 BE100	10.145.249.0/31				interface_role:	mpls-link-interfac	e		+ 🔪 🔽	Ļ
TenGigE0/0/0/15			SFP+ (10GE)		Bundle- Ether100			G: test01ob02 Te0/0/0/15 (BE100)			test01ob02 > TenGigE0/0/0/15		interface_role:	ag-interface-men	ıber <mark>+</mark>	y 👪 🚰	î 🗸	~
TenGigE0/0/0/14			SFP+ (10GE)		Bundle- Ether100			G: test01ob02 Te0/0/0/14 (BE100)			test01ob02 → TenGigE0/0/0/14		interface_role:	ag-interface-men	nber <mark>+</mark>	<mark> </mark>	1 - 1	-
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Devices / test01																dcim.d	levice:38055
test01ob02 Created 2023-04-24 00:00 · Up	dated 20	125-02-26 1	19-45								+ Add Component	s ×	Bookmark	A Subscribe	Clone	🖌 Edit	Delete
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Device Interfaces 48			s 🚺 🛛 Power	Ports 2	Netbox		/nc OU	TOFSYNC									
100		8 0														🌣 Confi	igure Table
NAME^ ×	LABEL	ENABLED	түре	PARENT	LAG	мти	MODE	DESCRIPTION	IP ADDRESSES	CABLE	CONNECTION	VRF					Ę
Bundle-Ether100			Link Aggregation Group (LAG)			9192		B: test01ob01 BE100	10.145.249.1/31				interface_role:	mpls-link-interfac		+	
TenGigE0/0/0/15			SFP+ (10GE)		Bundle- Ether100			G: test01ob01 Te0/0/0/15 (BE100)			test01ob01 → TenGigE0/0/0/15		interface_role:	lag-interface-men	ber <mark>+</mark>	<mark>/ 🖘 🔁 🗖</mark>	· / ·
TenGigE0/0/0/14			SFP+ (10GE)		Bundle- Ether100			G: test01ob01 Te0/0/0/14 (BE100)			test01ob01 > TenGigE0/0/0/14		interface_role:	lag-interface-men	ber +	<mark>/ 🖻 🕄 🚺</mark>	· / ·
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```
"nso": {
"services": {
    "lag-interface:lag-interface": {
        "DevID38055-IntId1016013": {
            "device": "{{ netbox.dcim.devices.id.38055.name.short_name }}",
            "lag-description": "{{ netbox.dcim.interfaces.id.1016013.description }}",
            "lag-members": [
                    "description": "{{ netbox.dcim.interfaces.id.748772.description }}",
                    "interface": "{{ netbox.dcim.interfaces.id.748772.name }}"
                ł
                    "description": "{{ netbox.dcim.interfaces.id.748773.description }}",
                    "interface": "{{ netbox.dcim.interfaces.id.748773.name }}"
            "lag-name": "{{ netbox.dcim.interfaces.id.1016013.name }}",
            "lldp": true,
            "mtu": "{{ netbox.dcim.interfaces.id.1016013.mtu }}",
            "name": "DevID38055-IntId1016013",
            "netbox-nso-sync": 38055
    "mpls-link-interface:mpls-link-interface": {
        "DevID38055-IntId1016013": {
            "area": 0,
            "device": "{{ netbox.dcim.devices.id.38055.name.short_name }}",
            "ipv4-cidr": "{{ netbox.ipam.ip_addresses.interface_id.1016013.address }}",
            "lag-name": "{{ netbox.dcim.interfaces.id.1016013.name }}",
            "link-kind": "oob",
            "name": "DevID38055-IntId1016013",
            "netbox-nso-sync": 38055
```







Executing the task

RP/0/RP0/CPU0:test01ob02#sho int desc | utility egrep "(\/0\/14|\/0\/15)"Wed Feb 26 18:56:15.553 UTCTe0/0/0/14admin-downadmin-downdmin-downadmin-downadmin-down

BE100	up	up	B: te	st01ob01 BE100	
Te0/0/0/14		up		st01ob01 Te0/0/0	
Te0/0/0/15	up	up	G: te	st01ob01 Te0/0/0	0/15 (BE100)
* Indicates MA	D1 intenfer				
# Indicates Ne			ssion up		
# Indicates Ne	ighbor awai		ssion up		
	ighbor awai OSPF 10	ting BFD se		Address	Interface

The Task

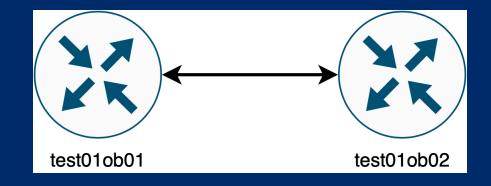
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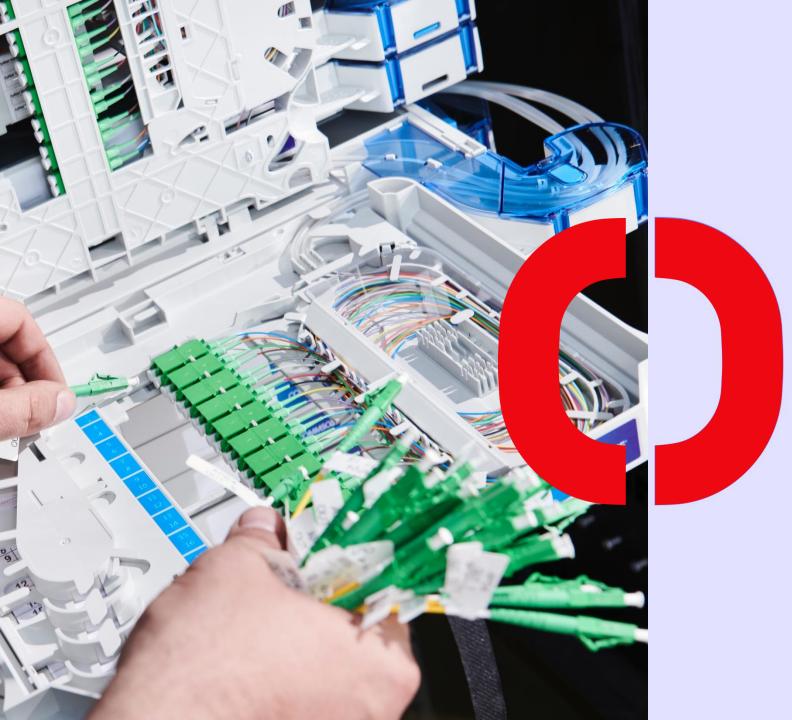
Speed should 2x10G.



Executing the task

٩	Search			
1	2025-02-26T18:45:53.514833+00:00	Info	—	Device 1: 618353 618354
2	2025-02-26T18:45:53.514869+00:00	Info	—	Device 2: 748772 748773
3	2025-02-26T18:45:53.592000+00:00	Success	—	'object-case:5579079a-eb48-493a-a76e-f0d5b7845a2c' created
4	2025-02-26T18:45:53.633968+00:00	Info	—	Checking roles of devices
5	2025-02-26T18:45:53.651445+00:00	Info	—	Match found, MPLS like kind is mfa-oob-core
6	2025-02-26T18:45:54.581477+00:00	Info	—	Connected SMF cable between 'test01ob01/TenGigE0/0/0/14' and 'test01ob02/TenGigE0/0/0/14. Cable id = 97769'

Community		۹ Search							💓 🌲 admin Admin
Organization		Cables						+ Add 😩 Imj	oort ≛ Export ~
🖽 Racks		Results 2 Filters	1						
Devices		X Tags: object-case:5579	9079a-eb48-493a-a76e-f0d5b7845;	22c (2) R Save					
💉 Connections		A Tags. object-case.oo/	50758-6548-4558-8706-1005578458						
CONNECTIONS		Quick search		~					Configure Table
Cables	+ ±	DEVICE A	TERMINATION A	DEVICE B	TERMINATION B	STATUS	ТҮРЕ	COLOR	
Wireless Links									DJDT
Interface Connections		test01ob01	TenGigE0/0/0/15	test01ob02	TenGigE0/0/0/15	Connected	Singlemode Fiber		<u>/</u> (0
Console Connections		test01ob01	TenGigE0/0/0/14	test01ob02	TenGigE0/0/0/14	Connected	Singlemode Fiber		2
Power Connections									
🗢 Wireless	~	Showing 1-2 of 2							Per Page 💙



Next Steps

Next Steps

Brown field strategies	Reconciliation	Expanding Services
NSO and Device interaction	Extra Integrations	Compliance

New feature from the plugin

Community		Q Search				💓 🌲 admin Admin
Organization		Device Sync Results				± Export ∽
🖽 Racks		Results 2 Filters				
Devices						
💉 Connections		Quick search	T V			Configure Table
		DEVICE	MESSAGE	STATUS	NSO INSTANCE	
19 IPAM		test01ob01	Dryrun output	OUTOFSYNC	nsodev01-42n	
.▲ VPN		test01ob02	Dryrun output	INSYNC	nsodev01-42n	
Virtualization						
😅 Circuits		Showing 1-2 of 2				Per Page ~
♥ Power	*					



Questions?

Check out norlys.dk/job

