



JUNIPER APSTRA

Матвей Александров, системный инженер

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JUNIPER
NETWORKS

Driven by
Experience™

JUNIPER APSTRA



- Программное обеспечение для управления сетевой инфраструктурой ЦОД
- Изначально, продукт компании Apstra
- Поддержка полного жизненного цикла сети (Underlay и Overlay)
 - Дизайн (Day 0)
 - Внедрение/Запуск (Day 1)
 - Управление и мониторинг (Day 2)

Juniper Networks Announces Close of Apstra Acquisition

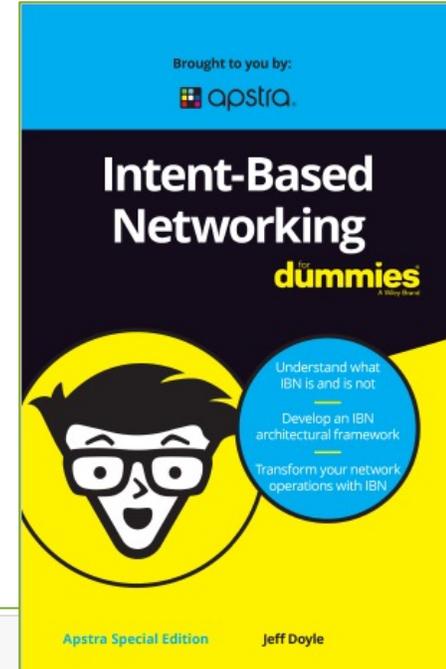
01/27/2021

Complete Data Center solution from Juniper assures experiences and drives business outcomes with best-in-class automation, open programmability and scalability

SUNNYVALE, Calif.--(BUSINESS WIRE)-- Juniper Networks (NYSE: JNPR), a leader in secure, AI-driven networks, today announced that the company has finalized its acquisition of Apstra, a leader in intent-based networking and automated closed-loop assurance. The closing of the deal marks a meaningful step toward delivering an unmatched, experience-led portfolio for the data center across all customer segments – enterprise, service provider and cloud provider.

INTENT-BASED NETWORKING SYSTEM (IBNS)

- Декларативная модель
 - “Что сделать?” вместо “Как сделать?”
- Использование Абстракций
 - leaf, spine, border leaf, external system, tenant, vlan, VNI ...
- Управление IP фабрикой как одним целым (вместо набора отдельных коммутаторов)
 - Commit/Rollback на уровне всей фабрики
- Непрерывный мониторинг
 - Насколько наша сеть соответствует заданному intent?
- (Практически) нет необходимости использовать CLI



RFC 9315

Internet Research Task Force (IRTF)
Request for Comments: 9315
Category: Informational
ISSN: 2070-1721

A. Clemm
Futurewei
L. Ciavaglia
Nokia
L. Z. Granville
Federal University of Rio Grande do Sul (UFRGS)
J. Tantsura
Microsoft
October 2022

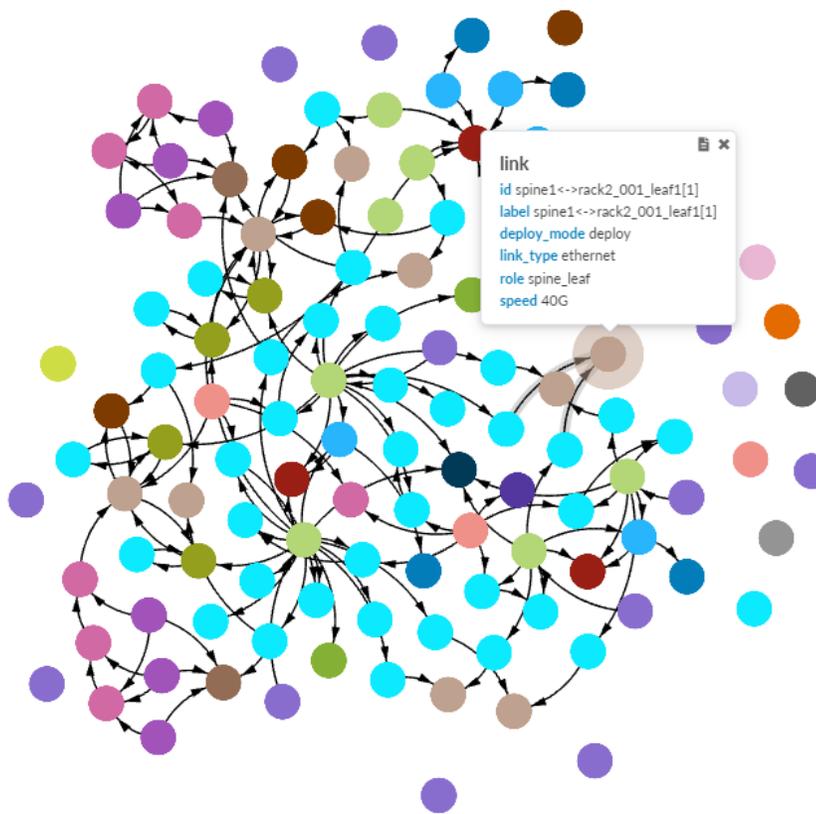
Intent-Based Networking - Concepts and Definitions

SINGLE SOURCE OF TRUTH (SSOT)

☆ 🏠 > Platform > Developers > Graph Explorer

Apstra Graph Explorer Mode: GraphQL Blueprint: JCL-Fabric Type: deployed

Show reference design schema Show full blueprint Fetch contextual data Refresh Execute

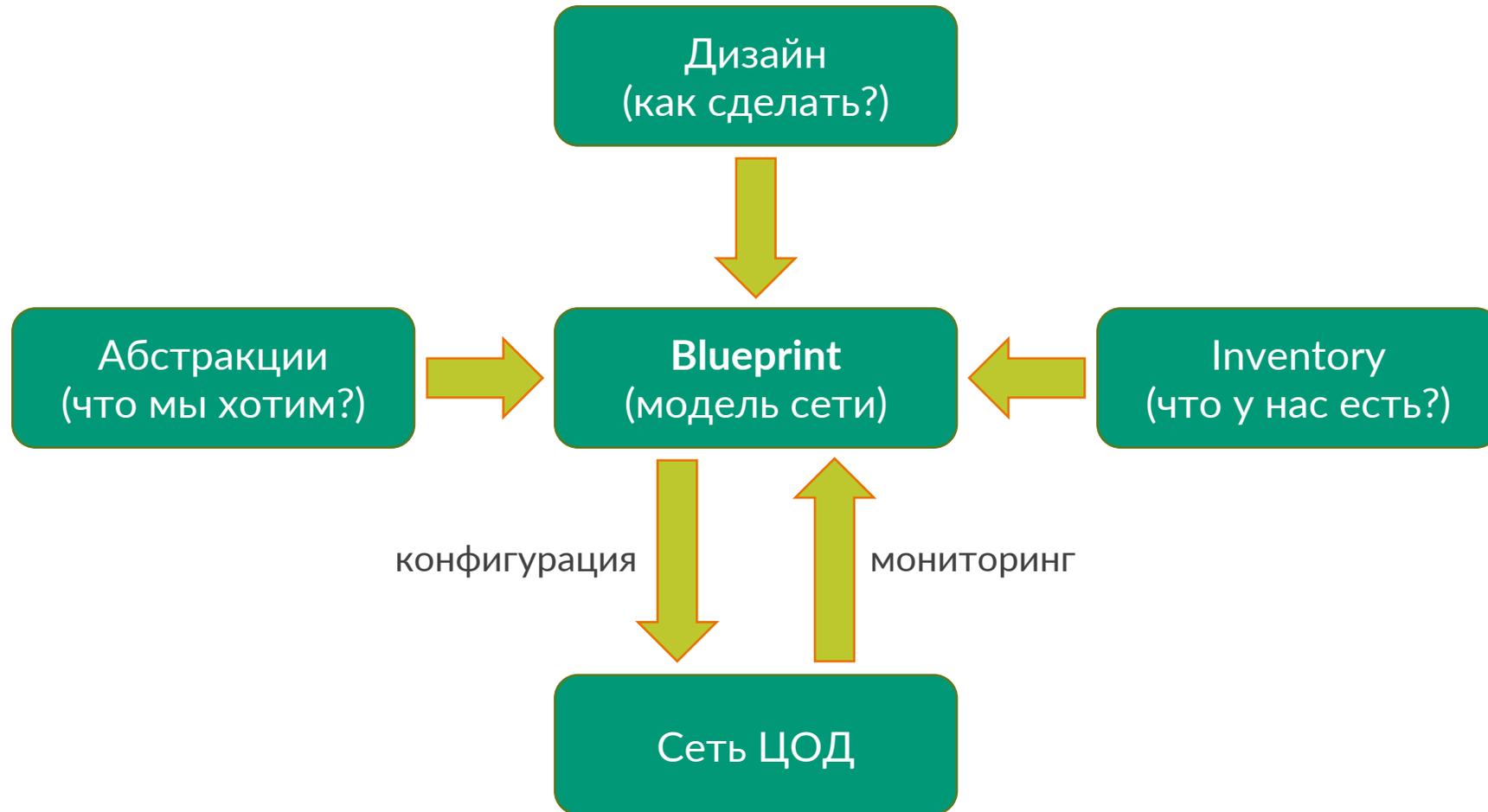


link

```
id spine1<->rack2_001_leaf1[1]
label spine1<->rack2_001_leaf1[1]
deploy_mode deploy
link_type ethernet
role spine_leaf
speed 40G
```

ep_endpoint_policy	6
ep_group	2
fabric_addressing_policy	1
gbp_config	1
group	1
interface	31
interface_map	6
l3_edge_ip_connectivity_policy	1
link	7
logical_device	3
metadata	1
pod	1
policy	1
rack	2
resource_allocation_group	9
routing_policy	1
security_zone	2
system	7

СОСТАВНЫЕ ЧАСТИ



СТРОИТЕЛЬНЫЙ МАТЕРИАЛ (1)

Inventory
(что у нас есть?)

- Juniper Apstra поддерживает нескольких сетевых вендоров
 - Juniper, Cisco, Arista, Dell

Name	Manufacturer	Hardware Model	OS Family	OS Version	ASIC	Actions
Juniper_QFX5700_2x4CD_2x16C_4x20Y	Juniper	QFX5700	Junos	(20\[.34].* 2[12]\[.]*)-EVO\$	TD4	 
Juniper_QFX5220-128C	Juniper	QFX5220-128C.*	Junos	(20\.4.* 2[12]\[.]*)-EVO\$	TH3	 
Juniper_QFX5220-32CD	Juniper	QFX5220-32CD.*	Junos	(20\.4.* 2[12]\[.]*)-EVO\$	TH3	 
Juniper_QFX5210-64C	Juniper	QFX5210-64C	Junos	(1[89] 2[0-2])\[.]*	TH3	 
Juniper_QFX5200-32C	Juniper	QFX5200-32C.*	Junos	(1[89] 2[0-2])\[.]*	TH	 
Juniper_QFX5130-32CD	Juniper	QFX5130-32CD.*	Junos	(20\.4.* 2[12]\[.]*)-EVO\$	TD4	 
Juniper_QFX5120-48YM	Juniper	QFX5120-48YM.*	Junos	(1[89] 2[0-2])\[.]*	T3	 
Juniper_QFX5120-48Y	Juniper	QFX5120-48Y.*	Junos	(1[89] 2[0-2])\[.]*	T3	 
Arista DCS-7280QRA-C36S	Arista	DCS-7280QRA-C36S	monolithic	EOS	4\. (22 23 24 25 27)\[.]*	Jericho  
Cisco C9332PQ	Cisco	C9332PQ	monolithic	NXOS	7\.0\ (3\) [4-7]\ (\\w[a-z]?\\) 9\.[23]\ (\\w+)	 

СТРОИТЕЛЬНЫЙ МАТЕРИАЛ (2)

Inventory
(что у нас есть?)

Name	Juniper_QFX5120-48Y
Device Profile Type	monolithic
Modular?	no
Slot count	0
Physical Device	yes
Ports preview	

Manufacturer [?]	Juniper
Model [?]	QFX5120-48Y.*
OS family [?]	Junos
Version [?]	(1[89] 2[0-2])\.\..*

Hardware Capabilities		Software Capabilities	
CPU [?]	x86	LXC [?]	no
Userland (bits) [?]	64	ONIE [?]	no
RAM (GB) [?]	16	Config Apply Support [?]	complete_only
ECMP limit [?]	64		
Form factor [?]	1RU		
ASIC [?]	T3		

Panel #1

INTERFACES CAPACITY

80 x 25 Gbps 80 x 10 Gbps 48 x 1 Gbps 8 x 40 Gbps 8 x 100 Gbps

PORTS *Click on port to toggle the details* Port breakout Autonegotiation

0	2	4	6	8	10	12	14	16	18	20	22	24	26	28	30	32	34	36	38	40	42	44	46	48	50	52	54
1	3	5	7	9	11	13	15	17	19	21	23	25	27	29	31	33	35	37	39	41	43	45	47	49	51	53	55

ВЗЯТИЕ ПОД УПРАВЛЕНИЕ

Inventory
(что у нас есть?)

- OOB network (em0 для коммутаторов Juniper)
- Ручная конфигурация или ZTP
 - Apstra ZTP Server

☆ 🏠 ▶ Devices ▶ Managed Devices

Query: All

1-4 of 4

Columns (15/17) Page Size: 25

Filter selected by all selected only unselected only

	Device Information									Agent Information					
<input type="checkbox"/>	Management IP	Device Key	Device Profile	Hostname	OS	State	Comms	Acknowledged?	Blueprint	Type	Agent Profile	Apstra Version	Last Job Type	Job State	Actions
<input type="checkbox"/>	192.168.56.73	080027F161D9	Juniper vQFX		Junos 20.2R1.10	IS-ACTIVE	📶	✅	DC3	OFFBOX	UNASSIGNED	AOS_4.1.2_OB.269	INSTALL	SUCCESS	⋮
<input type="checkbox"/>	192.168.56.71	080027CEF4E1	Juniper vQFX		Junos 20.2R1.10	IS-ACTIVE	📶	✅	DC3	OFFBOX	UNASSIGNED	AOS_4.1.2_OB.269	INSTALL	SUCCESS	⋮
<input type="checkbox"/>	192.168.56.74	08002709CD25	Juniper vQFX		Junos 20.2R1.10	IS-ACTIVE	📶	✅	DC3	OFFBOX	UNASSIGNED	AOS_4.1.2_OB.269	INSTALL	SUCCESS	⋮
<input type="checkbox"/>	192.168.56.72	0800271D6FC8	Juniper vQFX		Junos 20.2R1.10	IS-ACTIVE	📶	✅	DC3	OFFBOX	UNASSIGNED	AOS_4.1.2_OB.269	INSTALL	SUCCESS	⋮

РЕСУРСНЫЕ ПУЛЫ

- IPv4/IPv6 подсети
- Номера AS
- Диапазоны VLAN
- Диапазоны VxLAN

Inventory
(что у нас есть?)

☆ 🏠 Resources > IP Pools

[+ Create IP Pool](#)

Pool Name	Total Usage	Per Subnet Usage	Status	Actions
Fabric-links	1.56%	3.13% 10.10.0.0/24	♥ IN USE	✎ 🗑️
		0% 10.11.0.0/24		
Fabric-loopbacks	1.56%	1.56% 7.7.0.0/24	♥ IN USE	✎ 🗑️
Tenant-loopbacks	1.56%	1.56% 9.9.0.0/24	♥ IN USE	✎ 🗑️
Tenant-networks	0.39%	0.78% 55.55.0.0/16	♥ IN USE	✎ 🗑️
		0% 66.66.0.0/16		

ЛОГИЧЕСКИЕ УСТРОЙСТВА

Абстракции
(ЧТО МЫ ХОТИМ?)

- Дизайн фабрики не привязан к конкретному вендору
- Библиотека логических устройств
 - Легко создать свое собственное логическое устройство
- На этапе запуска фабрики, выбирается конкретная модель коммутатора

Name: AOS-48x10+6x100-1

PANEL #1

TOTAL: 48 ports PORT GROUPS: 48 x 10 Gbps (Access • Peer • Generic) Connected to ▾

1	3	5	7	9	11	13	15	17	19	21	23	25	27	29	31	33	35	37	39	41	43	45	47
2	4	6	8	10	12	14	16	18	20	22	24	26	28	30	32	34	36	38	40	42	44	46	48

PANEL #2

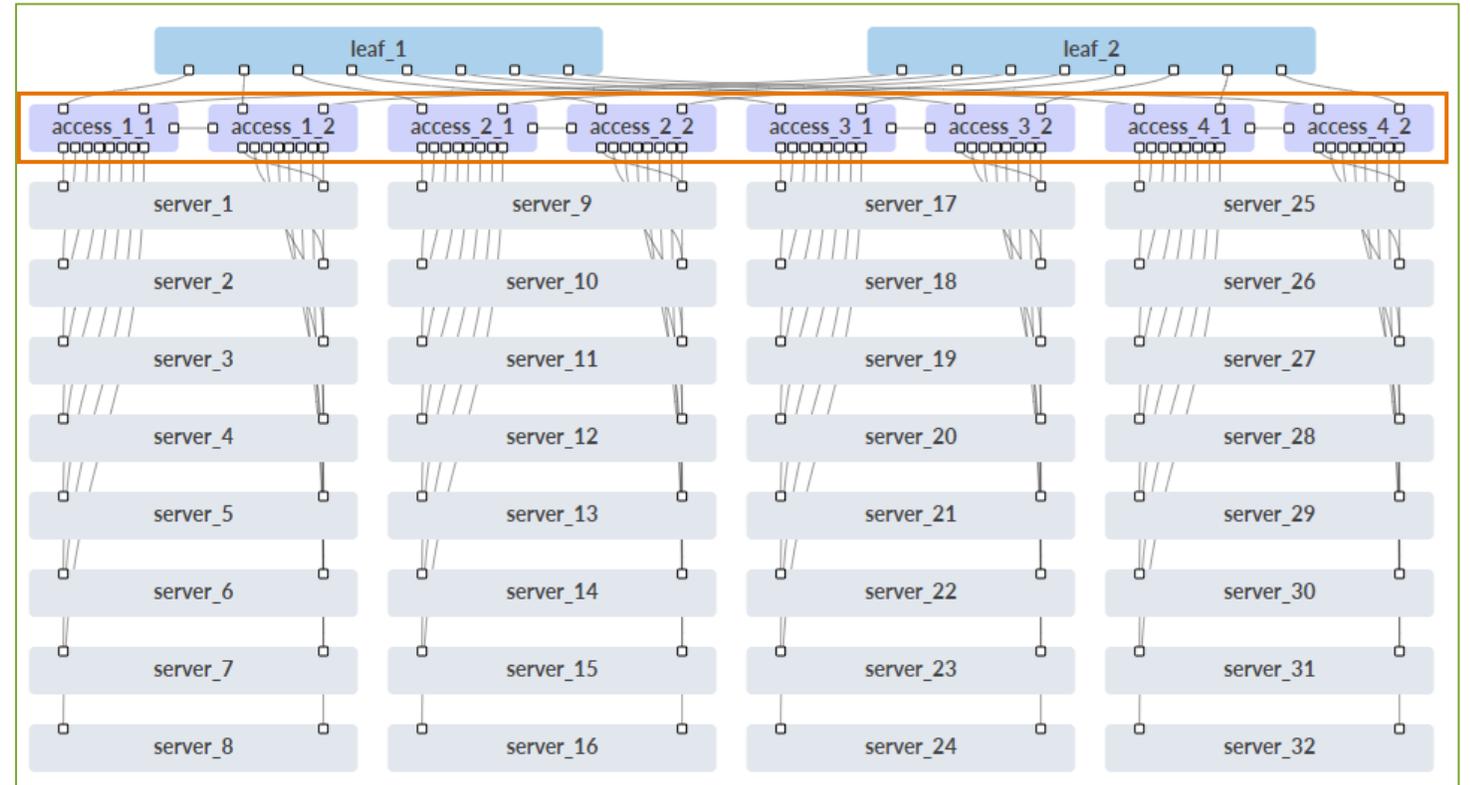
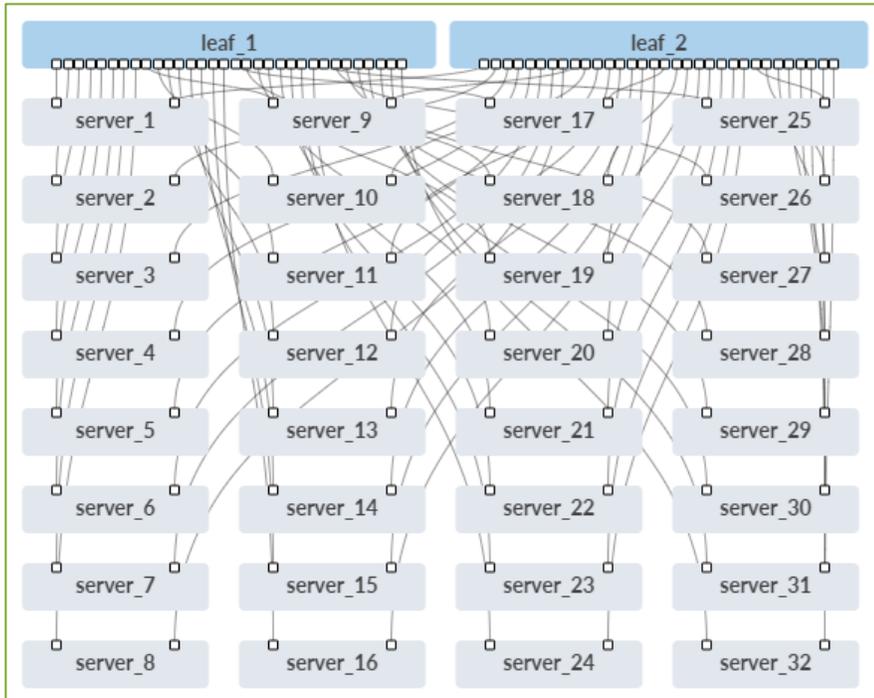
TOTAL: 6 ports PORT GROUPS: 6 x 100 Gbps (Spine • Generic) Connected to ▾

1	3	5
2	4	6

Шаблон стойки (Rack)

Абстракции
(ЧТО МЫ ХОТИМ?)

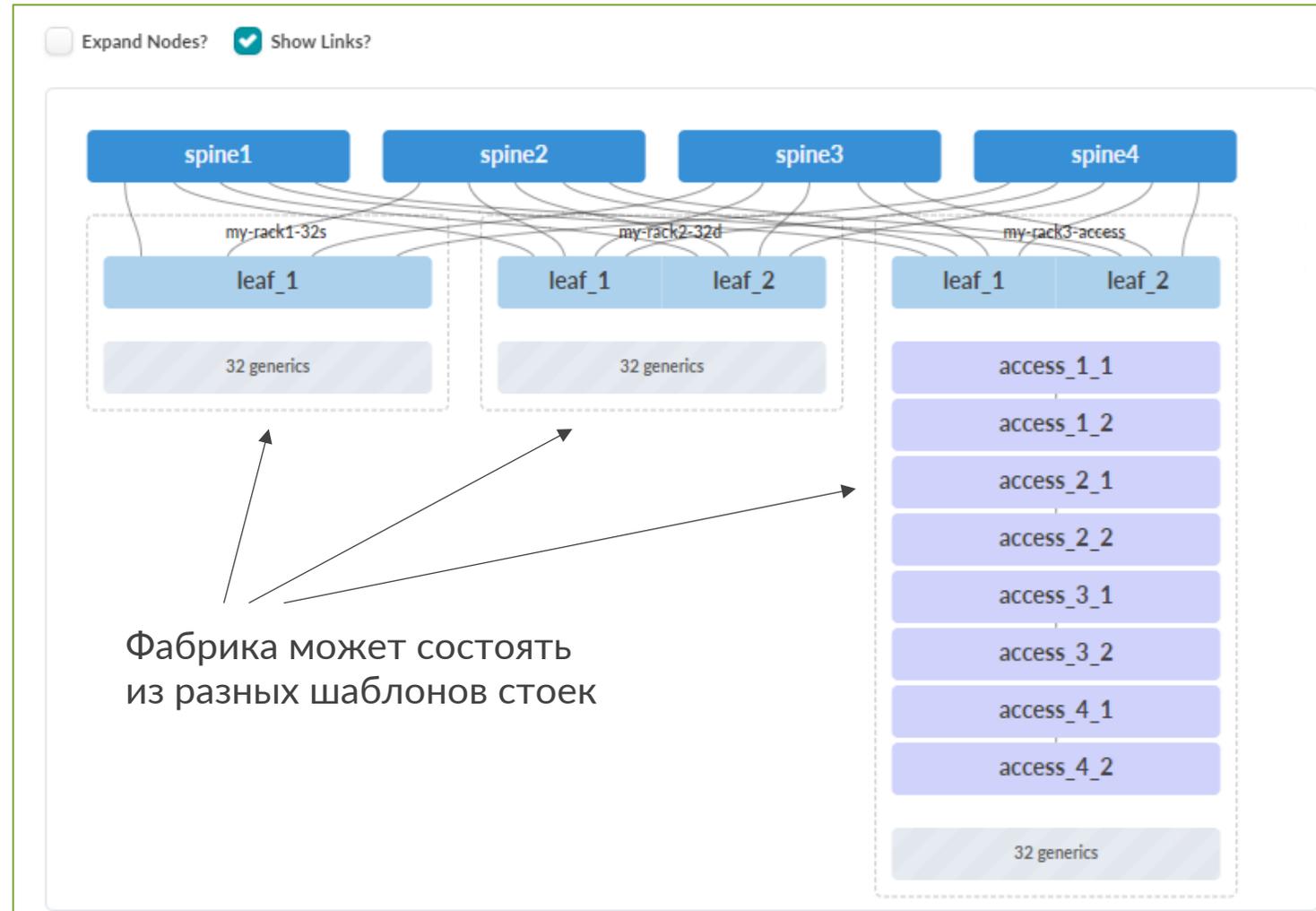
- ESI-LAG или MLAG могут быть использованы для мульти-хоминга
- Поддерживается промежуточный уровень access (L2) коммутаторов



3-х уровневый CLOS шаблон

Дизайн
(как сделать?)

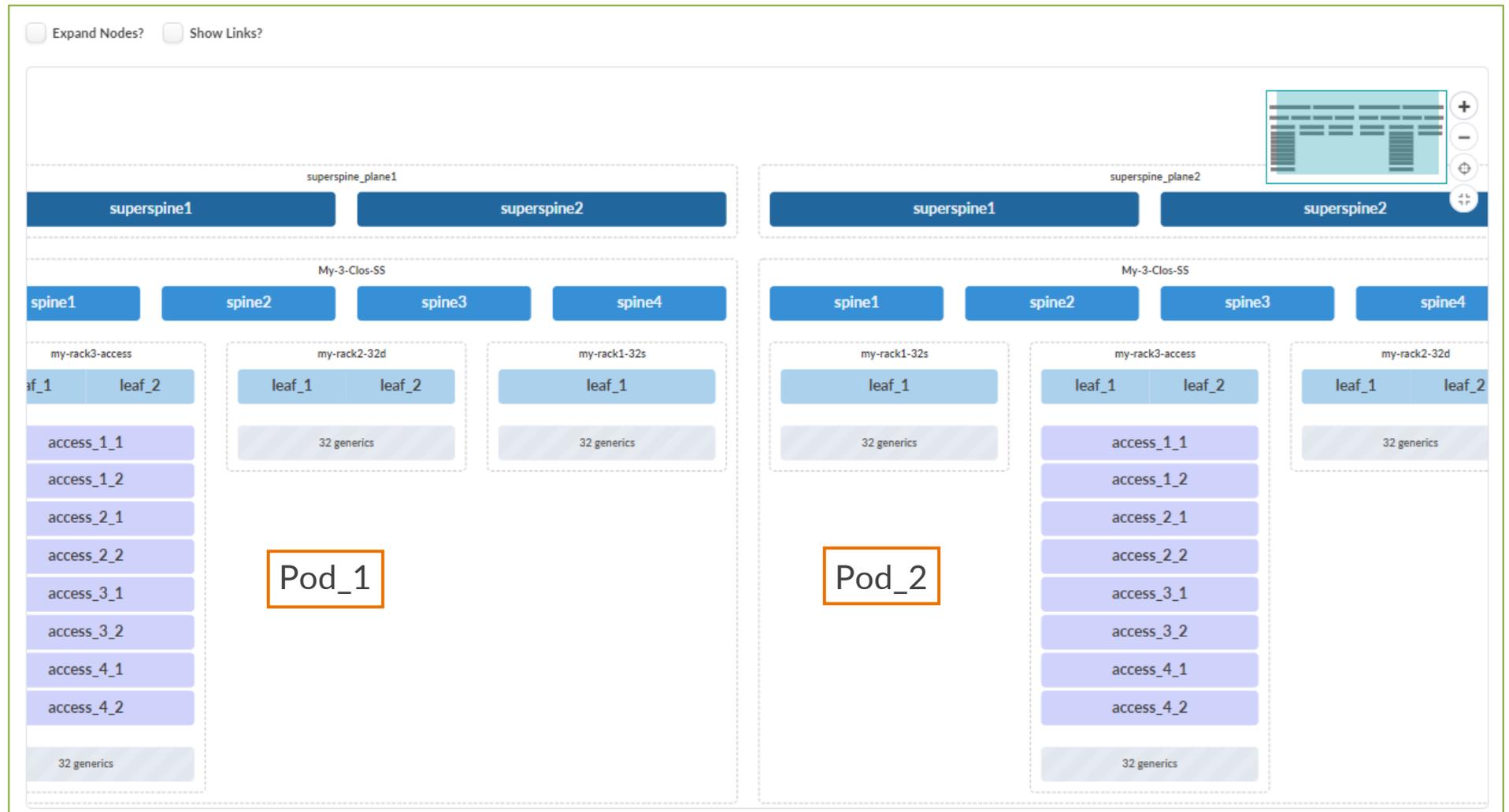
- Архитектура Leaf & Spine
- eBGP underlay & overlay
- VxLAN data plane
- ERB
 - L3 VxLAN Gateway на уровне leaves



5-и уровневый CLOS шаблон

Дизайн
(как сделать?)

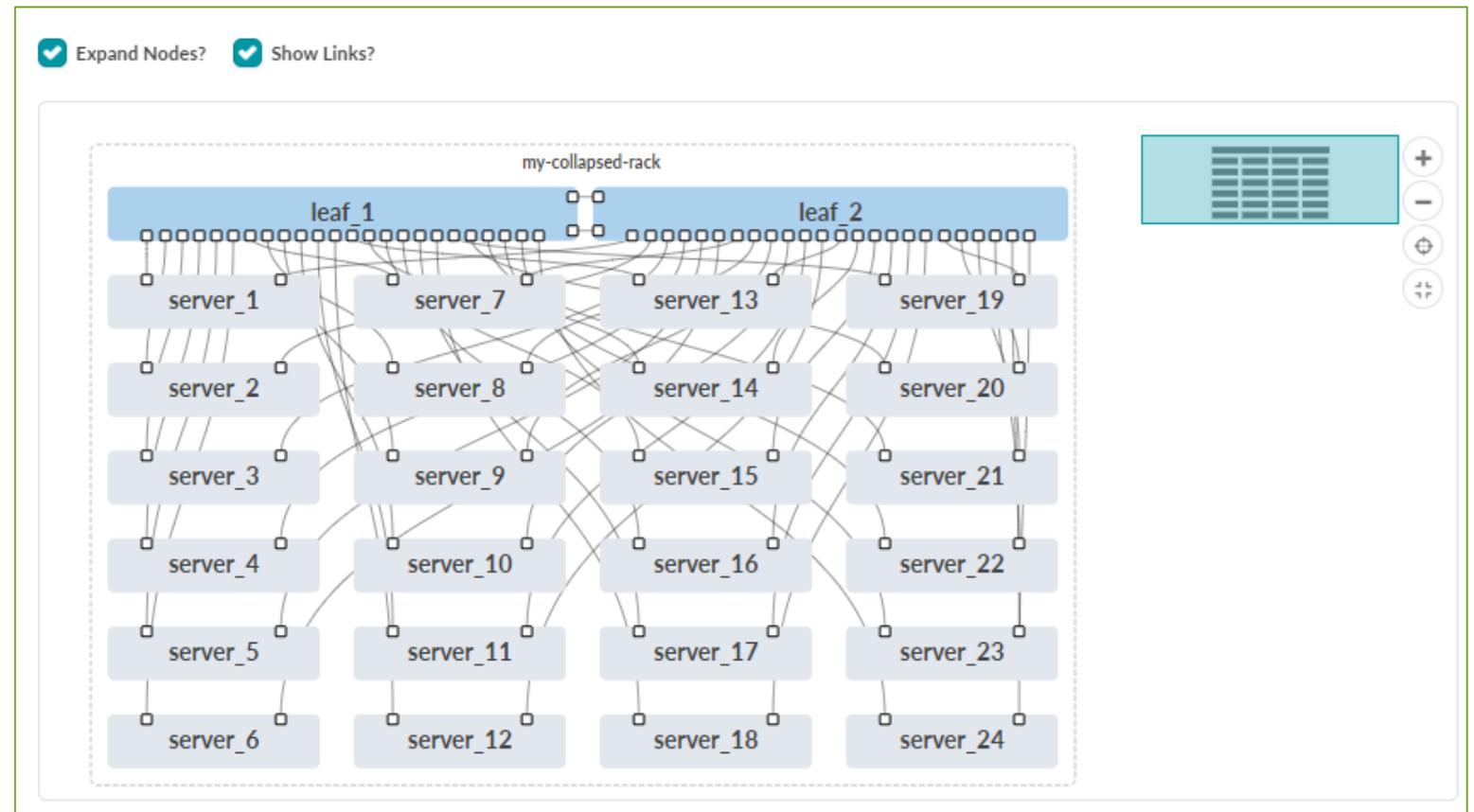
- Доп. уровень Super-spine



Collapsed Spine шаблон

Дизайн
(как сделать?)

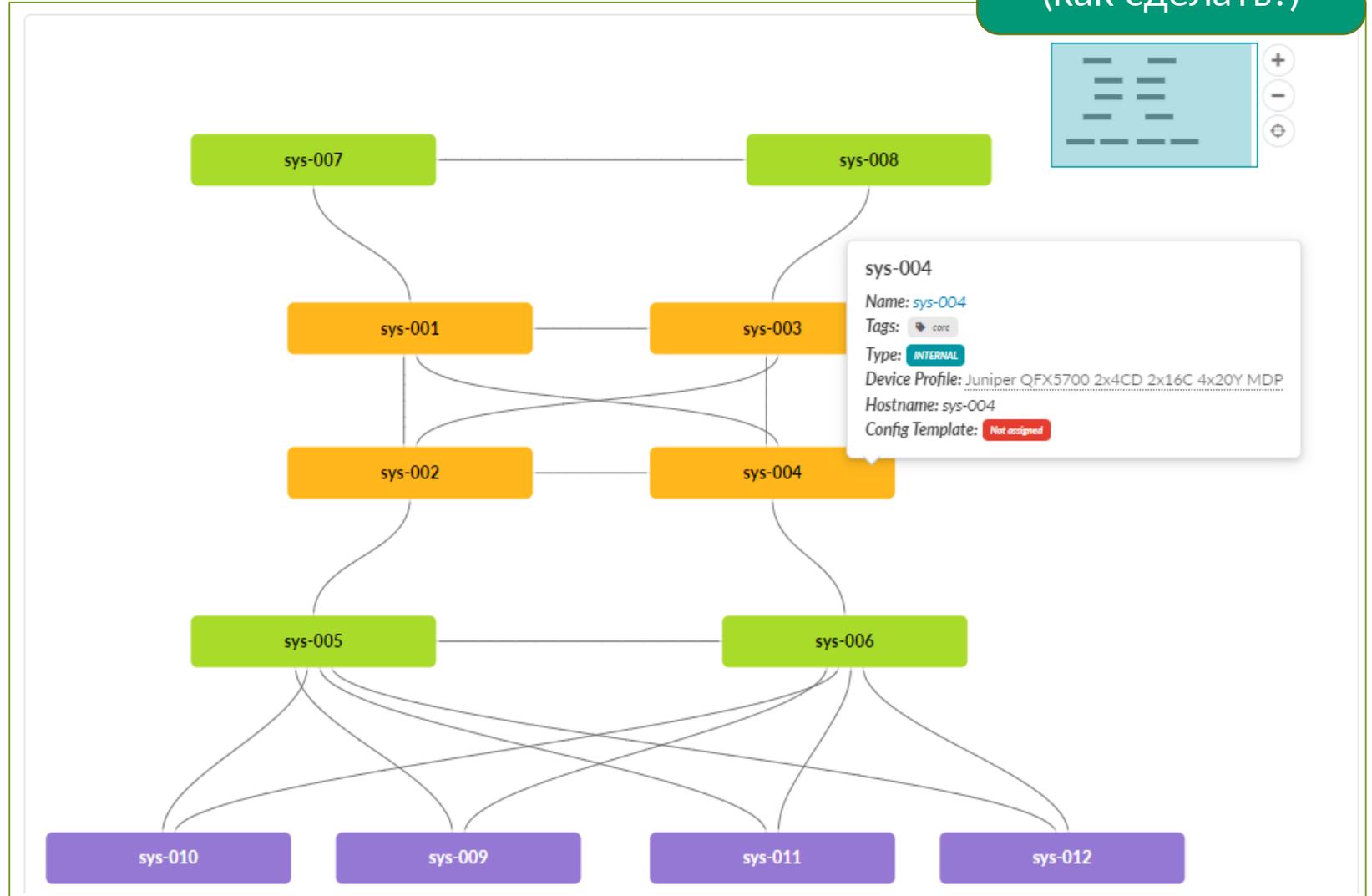
- Только пара leaves
- ESI-LAG
- Вариант для “маленького” ЦОД



Freeform – уход от шаблона

- “Своя” топология? OSPF? CRB routing? ...
- Freeform поддерживает любую топологию / протокол / опцию
- Шаблоны конфигураций – Jinja2
- Для “продвинутых” Заказчиков

Дизайн
(как сделать?)



Готовность запустить фабрику

- Создан конкретный Blueprint (референс-дизайн или Freeform)
- Выбраны коммутаторы
- Присвоены ресурсы
- Commit!

Commit changes from Staged to Active?

This action will commit your changes to the active blueprint and will also automatically create a revision.

Revision Description (optional)

My first commit - fabric deployment

Commit

Name	Tags	Role	External?	Deploy Mode	Device Profile	Hostname	ASN	Loopback IPv4	Port Channel ID Range
spine1		Spine	N/A	Deploy	Juniper vQFX	spine1	64700	1.2.3.2/32	n/a
spine2		Spine	N/A	Deploy	Juniper vQFX	spine2	64701	1.2.3.3/32	n/a
test_rack1_2srv_001_leaf1		Leaf	N/A	Deploy	Juniper vQFX	rack1-leaf1	64702	1.2.3.0/32	n/a
test_rack2_1srv_001_leaf1		Leaf	N/A	Deploy	Juniper vQFX	rack2-leaf1	64703	1.2.3.1/32	n/a
test_rack1_2srv_001_sys001		Generic System	No	Deploy	Generic_Server_1RU_1x10G	test-rack1-2srv-001-sys001	Not assigned	Not assigned	0-0
test_rack1_2srv_001_sys002		Generic System	No	Deploy	Generic_Server_1RU_1x10G	test-rack1-2srv-001-sys002	Not assigned	Not assigned	0-0
test_rack2_1srv_001_sys001		Generic System	No	Deploy	Generic_Server_1RU_1x10G	test-rack2-1srv-001-sys001	Not assigned	Not assigned	0-0

Selection Build

- 2/2 ASNs - Spines
- 2/2 ASNs - Leafs
- 2/2 Loopback IPs - Spines
- 2/2 Loopback IPs - Leafs
- 8/8 Link IPs - Spines<>Leafs

Карта кабельных соединений

- Экспорт в Excel/JSON
- Контроль через LLDP

↕
↗
↖
↔
↻

Export cabling map

Filter selected by all selected only unselected only

	Name ↕	Role ↕	Speed ↕	Endpoint 1 ↕				Endpoint 2 ↕			
				Name ↕	Role ↕	Interface ↕	IPv4 ↕	Name ↕	Role ↕	Interface ↕	IPv4 ↕
<input type="checkbox"/>	spine1<->test_rack1_2srv_001_leaf1[1]	Spine to Leaf	10G	spine1	Spine	xe-0/0/0	10.10.0.31	test_rack1_2srv_001_leaf1	Leaf	xe-0/0/0	10.10.0.1/31
<input type="checkbox"/>	spine1<->test_rack2_1srv_001_leaf1[1]	Spine to Leaf	10G	spine1	Spine	xe-0/0/1	10.10.0.2/31	test_rack2_1srv_001_leaf1	Leaf	xe-0/0/0	10.10.0.3/31
<input type="checkbox"/>	spine2<->test_rack1_2srv_001_leaf1[1]	Spine to Leaf	10G	spine2	Spine	xe-0/0/0	10.10.0.4/31	test_rack1_2srv_001_leaf1	Leaf	xe-0/0/1	10.10.0.5/31
<input type="checkbox"/>	spine2<->test_rack2_1srv_001_leaf1[1]	Spine to Leaf	10G	spine2	Spine	xe-0/0/1	10.10.0.6/31	test_rack2_1srv_001_leaf1	Leaf	xe-0/0/1	10.10.0.7/31
<input type="checkbox"/>	test_rack1_2srv_001_leaf1<->test_rack1_2srv_001_sys001[1]	To Generic System	10G	test_rack1_2srv_001_leaf1	Leaf	xe-0/0/4	N/A	test_rack1_2srv_001_sys001	Generic System	eth0	N/A
<input type="checkbox"/>	test_rack1_2srv_001_leaf1<->test_rack1_2srv_001_sys002[1]	To Generic System	10G	test_rack1_2srv_001_leaf1	Leaf	xe-0/0/6	N/A	test_rack1_2srv_001_sys002	Generic System	eth0	N/A
<input type="checkbox"/>	test_rack2_1srv_001_leaf1<->test_rack2_1srv_001_sys001[1]	To Generic System	10G	test_rack2_1srv_001_leaf1	Leaf	xe-0/0/4	N/A	test_rack2_1srv_001_sys001	Generic System	eth0	N/A

Export Cabling Map

Mode
 JSON CSV

```

1 {
2   "version": 7,
3   "links": [
4     {
5       "role": "spine_leaf",
6       "assigned_tag_ids": [],
7       "speed": "10G",
8       "aggregate_link_id": null,
9       "type": "ethernet",
10      "endpoints": [
11        {
12          "interface": {
13            "ipv6_addr": null,
14            "if_name": "xe-0/0/0",
15            "port_channel_id": null,
16            "ipv4_addr": "10.10.0.0/31"
17            "if_type": "ip",

```

Copy
Save As File

1-7 of 7

Page Size: 25

Что происходит “за сценой”?

- NetConf (пример для Junos)
- Best practices

```
Leaf1 x Leaf2 Spine1 Spine2
{master:0}[edit]
jcluser@rack1-leaf1# show | compare rollback 1
[edit system]
- host-name vqfx-re;
+ host-name rack1-leaf1;
[edit interfaces xe-0/0/0]
+ description facing_spine1:xe-0/0/0;
+ mtu 9216;
[edit interfaces xe-0/0/0 unit 0 family inet]
+ address 10.10.0.1/31;
[edit interfaces xe-0/0/1]
+ description facing_spine2:xe-0/0/0;
+ mtu 9216;
[edit interfaces xe-0/0/1 unit 0 family inet]
+ address 10.10.0.5/31;
[edit interfaces xe-0/0/4]
+ description to.test-rack1-2srv-001-sys001:eth0;
[edit interfaces xe-0/0/6]
+ description to.test-rack1-2srv-001-sys002:eth0;
[edit interfaces]
+ lo0 {
+   unit 0 {
+     family inet {
+       address 1.2.3.0/32;
+     }
+   }
+ }
```

```
Leaf1 x Leaf2 Spine1 Spine2
+ policy-statement PFE-LB {
+   then {
+     load-balance per-packet;
+   }
+ }
+ community FROM_SPINE_EVPN_TIER members 0:14;
+ community FROM_SPINE_FABRIC_TIER members 0:15;
+ }
+ routing-options {
+   forwarding-table {
+     export PFE-LB;
+     ecmp-fast-reroute;
+     chained-composite-next-hop {
+       ingress {
+         evpn;
+       }
+     }
+   }
+   router-id 1.2.3.0;
+   autonomous-system 64702;
+ }
[edit protocols]
+ bgp {
+   group l3clos-1 {
+     type external;
+     multipath {
+       multiple-as;
+     }
+     neighbor 10.10.0.0 {
+       description facing_spine1;
+       local-address 10.10.0.1;
+       family inet {
+         unicast;
+       }
+     }
+     export ( LEAF_TO_SPINE_FABRIC_OUT && BGP_PEER_AS )
+     peer-as 64700;
+   }
+ }
```

```
Leaf1 x Leaf2 Spine1 Spine2
[edit]
+ policy-options {
+   policy-statement AllPodNetworks {
+     term AllPodNetworks-10 {
+       from {
+         family inet;
+         protocol direct;
+       }
+       then accept;
+     }
+     term AllPodNetworks-100 {
+       then reject;
+     }
+   }
+   policy-statement BGP-AOS-Policy {
+     term BGP-AOS-Policy-10 {
+       from policy AllPodNetworks;
+       then accept;
+     }
+     term BGP-AOS-Policy-100 {
+       then reject;
+     }
+   }
+   policy-statement LEAF_TO_SPINE_EVPN_OUT {
+     term LEAF_TO_SPINE_EVPN_OUT-10 {
+       from {
+         protocol bgp;
+         community FROM_SPINE_EVPN_TIER;
+       }
+       then reject;
+     }
+     term LEAF_TO_SPINE_EVPN_OUT-20 {
+       then accept;
+     }
+   }
+   policy-statement LEAF_TO_SPINE_FABRIC_OUT {
+     term LEAF_TO_SPINE_FABRIC_OUT-10 {
+       from {
+         protocol bgp;
+         community FROM_SPINE_FABRIC_TIER;
+       }
+       then reject;
+     }
+     term LEAF_TO_SPINE_FABRIC_OUT-20 {
+       then accept;
+     }
+   }
+ }
```

Готовая фабрика (главный dashboard)

The dashboard is titled "Ready Factory (main dashboard)" and shows a navigation breadcrumb: Blueprints > Test-DC1 > Dashboard > Status. A "Delete Blueprint" button is visible in the top right. The main navigation bar includes: Dashboard (highlighted with a red box), Analytics, Staged, Uncommitted, Active, and Time Voyager. The "Anomalies" section is divided into several categories, each with a "Now" timestamp and an "Anomaly History" link:

- All Probes:** 0 anomalies
- IP Fabric:** BGP (0 anomalies), Cabling (0 anomalies), Interface (0 anomalies), Hostname (0 anomalies), LAG (0 anomalies)
- Generic System Connectivity:** BGP (0 anomalies), Interface (0 anomalies), MLAG (0 anomalies), LAG (0 anomalies)
- Liveness:** Spine (0 anomalies), Leaf (0 anomalies), Generics (0 anomalies)
- Deployment Status:** Deployment (0 anomalies), Config Dev. (0 anomalies), Config Ren. (0 anomalies)
- Route Verification:** Route Table (0 anomalies)
- Leaf Peering:** LAG (0 anomalies)

The "Nodes Status" section at the bottom lists: Deployment, BGP, Cabling, Config, Interface, Liveness, Route, Hostname.

Провижининг сервисов

- Apstra Routing zone = Junos VRF
- Адреса лупбэков, номера VNI – автоматически могут быть взяты из пулов

Build

0/2 Tenant1: Leaf Loopback IPs

1-5 of 6

Pool Name
<input type="checkbox"/> Private-172.16.0.0/12
<input type="checkbox"/> My-Loopbacks
<input checked="" type="checkbox"/> Tenant-Loopbacks

0/1 EVPN L3 VNIs

Create Routing Zone

VRF Name*
Tenant1

VLAN ID

VNI

Routing Policies
Select...

Route Target Policies

Import Route Targets
Add Import Route Target

Export Route Targets
Add Export Route Target

Create Another? Create

```
jcluser@rack1-leaf1# show | compare rollback 1
[edit interfaces lo0]
+   unit 2 {
+     family inet {
+       address 10.99.0.0/32;
+     }
+   }
[edit]
+ routing-instances {
+   Tenant1 {
+     routing-options {
+       multipath;
+       auto-export;
+     }
+     protocols {
+       evpn {
+         ip-prefix-routes {
+           advertise direct-nexthop;
+           encapsulation vxlan;
+           uni 10000;
+           export BGP-AOS-Policy;
+         }
+       }
+     }
+     instance-type vrf;
+     interface lo0.2;
+     route-distinguisher 1.2.3.2:2;
+     vrf-target target:10000:1;
+     vrf-table-label;
+   }
+ }
[edit protocols evpn]
+ default-gateway do-not-advertise;
```

Провижининг сервисов

Create Virtual Network

Virtual Network Parameters

Type
 VLAN VXLAN

i Will create single VXLAN for all selected nodes

Name *
Green

Routing Zone
Tenant1

VNI(s) [?] From resource pool

VLAN ID (on leafs)

Route Target [?]
Not assigned

DHCP Service
 Disabled
 Enabled

IPv4 Connectivity
 Disabled
 Enabled

IPv4 Subnet
192.168.100.0/24

Virtual Gateway
 IPv4 Enabled?

Virtual Gateway IPv4
192.168.100.1

Create Connectivity Templates for
 Tagged Untagged

Assigned To

```
Leaf1 x Leaf2
jcluser@rack1-leaf1# show | compare rollback 1
[edit interfaces xe-0/0/4]
+ native-vlan-id 3;
+ mtu 9100;
[edit interfaces xe-0/0/4 unit 0]
- family inet;
+ family ethernet-switching {
+   interface-mode trunk;
+   vlan {
+     members vn3;
+   }
+ }
[edit interfaces]
+ irb {
+   unit 3 {
+     family inet {
+       mtu 9000;
+       address 192.168.100.1/24;
+     }
+     mac 00:1c:73:00:00:01;
+   }
+ }
[edit routing-instances Tenant1]
+ interface irb.3;
[edit protocols evpn]
+ uni-options {
+   uni 10001 {
+     vrf-target target:10001:1;
+   }
+ }
[edit protocols rstp]
+ interface xe-0/0/4 {
+   edge;
+ }
[edit vlans]
+ vn3 {
+   description Green;
+   vlan-id 3;
+   l3-interface irb.3;
+   vxlan {
+     uni 10001;
+   }
+ }
```

Configlets

- Configlets позволяют залить на коммутатор любую дополнительную конфигурацию
- Могут быть параметризованы через **Property Sets**
- Могут быть применены избирательно по ролям/тегам
 - например, только для “leaves”

Create Configlet

Start creation of a new configlet by filling the form. Alternatively, you can [Import Configlet](#) from JSON

Name *
Configlet-DNS

Generators *

Config Style *
 Cumulus NXOS EOS Junos SONiC

Section *

Top-Level Hierarchical Set / Delete

Interface-Level Hierarchical Set Delete

Template Text *

```
1 system {
2   name-server {
3     8.8.8.8;
4     8.8.4.4;
5   }
6 }
```

Configlet Scope

role in ["spine", "leaf"]

Role

Filter results

spine

leaf

Create Another?

Time Voyager

- Позволяет откатиться на предыдущую конфигурацию фабрики
- Network-wide (!)

The screenshot shows the 'Revisions' page in the Juniper Time Voyager interface. The breadcrumb navigation is 'Blueprints > Test-DC1 > Time Voyager > Revisions'. The top navigation bar includes 'Dashboard', 'Analytics', 'Staged', 'Uncommitted', 'Active', and 'Time Voyager' (highlighted with an orange box). Below the navigation is a 'Revisions' section with a search query 'Query: All' and pagination controls showing '1-4 of 4' and 'Page Size: 25'. A table lists four revisions with columns for Description, Created At, User, and Actions. The first revision is marked as 'current'. A 'Jump to this revision' button is highlighted with an orange box at the bottom right of the table.

Description	Created At	User	Actions
add DNS configlet to the Test-DC1 fabric	2023-03-12, 15:00:10 current	admin	
Add virtual network Green to Tenant1	2023-03-12, 14:20:10	admin	
Add VRF for Tenant1	2023-03-12, 13:36:53	admin	
My first commit - fabric deployment	2023-03-12, 12:52:48	admin	

Авария на фабрике

```

jcluser@rack1-leaf1# run show lldp neighbors
Local Interface    Chassis Id          Port info           System Name
xe-0/0/1          02:05:86:71:5a:00  xe-0/0/0           spine2
xe-0/0/0          02:05:86:71:7d:00  xe-0/0/0           spine1

jcluser@rack1-leaf1# set interfaces xe-0/0/0 disable

jcluser@rack1-leaf1# commit
    
```

☆ 🏠 > Blueprints > Test-DC1 > Dashboard > Status 🗑️ Delete Blueprint 🔒

Dashboard ▲ Analytics ✔ Staged ✔ Uncommitted ✔ Active ▲ Time Voyager

Anomalies

All Probes

All Probes
0 anomalies

IP Fabric

BGP 4 anomalies
Cabling 2 anomalies
Interface 2 anomalies
Hostname 0 anomalies
LAG 0 anomalies

Generic System Connectivity

BGP 0 anomalies
Interface 0 anomalies
MLAG 0 anomalies
LAG 0 anomalies

Liveness

Spine 0 anomalies
Leaf 0 anomalies
Generics 0 anomalies

Deployment Status

Deployment 0 anomalies
Config Dev. 1 anomaly
Config Ren. 0 anomalies

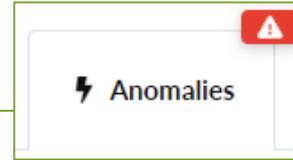
Route Verification

Route Table 7 anomalies

Nodes Status

	Deployment	BGP	Cabling	Config	Interface	Liveness	Route	Hostname	Total
spine1		●	●				●		3
spine2							●		1
st_rack1_2srv_001_leaf1		●	●	●	●		●		9 anomalies
st_rack2_1srv_001_leaf1							●		1

Различные типы аномалий



Query: Service = IP Fabric and Anomaly Type = interface

Node	Hostname	Service	Anomaly Type	Role	Anomaly Extra Details	Expected	Actual	Time Updated												
test_rack1_2srv_001_leaf1	rack1-leaf1	IP Fabric	interface	Spine to Leaf	<table border="1"> <tr><td>Property</td><td>Value</td></tr> <tr><td>Interface</td><td>"xe-0/0/0.0"</td></tr> </table>	Property	Value	Interface	"xe-0/0/0.0"	<table border="1"> <tr><td>Property</td><td>Value</td></tr> <tr><td>value</td><td>"up"</td></tr> </table>	Property	Value	value	"up"	<table border="1"> <tr><td>Property</td><td>Value</td></tr> <tr><td>value</td><td>"down"</td></tr> </table>	Property	Value	value	"down"	14 minutes ago
Property	Value																			
Interface	"xe-0/0/0.0"																			
Property	Value																			
value	"up"																			
Property	Value																			
value	"down"																			
test_rack1_2srv_001_leaf1	rack1-leaf1	IP Fabric	interface	Spine to Leaf	<table border="1"> <tr><td>Property</td><td>Value</td></tr> <tr><td>Interface</td><td>"xe-0/0/0"</td></tr> </table>	Property	Value	Interface	"xe-0/0/0"	<table border="1"> <tr><td>Property</td><td>Value</td></tr> <tr><td>value</td><td>"up"</td></tr> </table>	Property	Value	value	"up"	<table border="1"> <tr><td>Property</td><td>Value</td></tr> <tr><td>value</td><td>"down"</td></tr> </table>	Property	Value	value	"down"	14 minutes ago
Property	Value																			
Interface	"xe-0/0/0"																			
Property	Value																			
value	"up"																			
Property	Value																			
value	"down"																			

Query: Service = IP Fabric and Anomaly Type = cabling

Node	Hostname	Service	Anomaly Type	Role	Anomaly Extra Details	Expected	Actual	Time Updated																
spine1	spine1	IP Fabric	cabling	Spine to Leaf	<table border="1"> <tr><td>Property</td><td>Value</td></tr> <tr><td>Interface</td><td>"xe-0/0/0"</td></tr> </table>	Property	Value	Interface	"xe-0/0/0"	<table border="1"> <tr><td>Property</td><td>Value</td></tr> <tr><td>neighbor interface</td><td>"xe-0/0/0"</td></tr> <tr><td>neighbor name</td><td>"rack1-leaf1"</td></tr> </table>	Property	Value	neighbor interface	"xe-0/0/0"	neighbor name	"rack1-leaf1"	<table border="1"> <tr><td>Property</td><td>Value</td></tr> <tr><td>neighbor interface</td><td>"</td></tr> <tr><td>neighbor name</td><td>"</td></tr> </table>	Property	Value	neighbor interface	"	neighbor name	"	18 minutes ago
Property	Value																							
Interface	"xe-0/0/0"																							
Property	Value																							
neighbor interface	"xe-0/0/0"																							
neighbor name	"rack1-leaf1"																							
Property	Value																							
neighbor interface	"																							
neighbor name	"																							
test_rack1_2srv_001_leaf1	rack1-leaf1	IP Fabric	cabling	Spine to Leaf	<table border="1"> <tr><td>Property</td><td>Value</td></tr> <tr><td>Interface</td><td>"xe-0/0/0"</td></tr> </table>	Property	Value	Interface	"xe-0/0/0"	<table border="1"> <tr><td>Property</td><td>Value</td></tr> <tr><td>neighbor interface</td><td>"xe-0/0/0"</td></tr> <tr><td>neighbor name</td><td>"spine1"</td></tr> </table>	Property	Value	neighbor interface	"xe-0/0/0"	neighbor name	"spine1"	<table border="1"> <tr><td>Property</td><td>Value</td></tr> <tr><td>neighbor interface</td><td>"</td></tr> <tr><td>neighbor name</td><td>"</td></tr> </table>	Property	Value	neighbor interface	"	neighbor name	"	19 minutes ago
Property	Value																							
Interface	"xe-0/0/0"																							
Property	Value																							
neighbor interface	"xe-0/0/0"																							
neighbor name	"spine1"																							
Property	Value																							
neighbor interface	"																							
neighbor name	"																							

Отклонение от intended конфигурации

☆ 🏠 > Blueprints > Test-DC1 > System Nodes > test_rack1_2srv_001_leaf1 > Active > Telemetry > Config

Staged Active

Physical Telemetry

Anomalies Config Interface MAC LLDP BGP Route Hostname

Actual config deviated from golden config

Apply Full Config Accept Changes

Intended running configuration	Actual running configuration
<pre>1 version 20.3R1.8; 2 system { 3 host-name rack1-leaf1; 4 root-authentication { 5 encrypted-password "\$6\$oP9nSjfu\$y0Ye7e/.JD7dPBzww4.gckkMSTQBdU86H 6 ssh-rsa "ssh-rsa AAAAB3NzaC1yc2EAAAABIwAAAQEa6NF8ia1DkTkyrtvp9eWw 7 } 8 login { 9 user jcluser { 10 uid 2001; 11 class super-user; 12 authentication {</pre>	<pre>1 version 20.3R1.8; 2 system { 3 host-name rack1-leaf1; 4 root-authentication { 5 encrypted-password "\$6\$oP9nSjfu\$y0Ye7e/.JD7d.g.lbzRh1JckkMSTQBdU86H.4073GdTi.6mQpdw 6 ssh-rsa "ssh-rsa AAAAB3NzaC1yc2EAAAABIwAAAQEa1lvQVp22WdkTkyrtvp9eWwGhzIw+niNltGEFH 7 } 8 login { 9 user jcluser { 10 uid 2001; 11 class super-user; 12 authentication {</pre>

```
71 xe-0/0/0 {
72   description facing_spine1:xe-0/0/0;
73   disable;
74   mtu 9216;
75   unit 0 {
76     family inet {
77       address 10.10.0.1/31;
78     }
79   }
80 }
```

Мониторинг – Active Tab

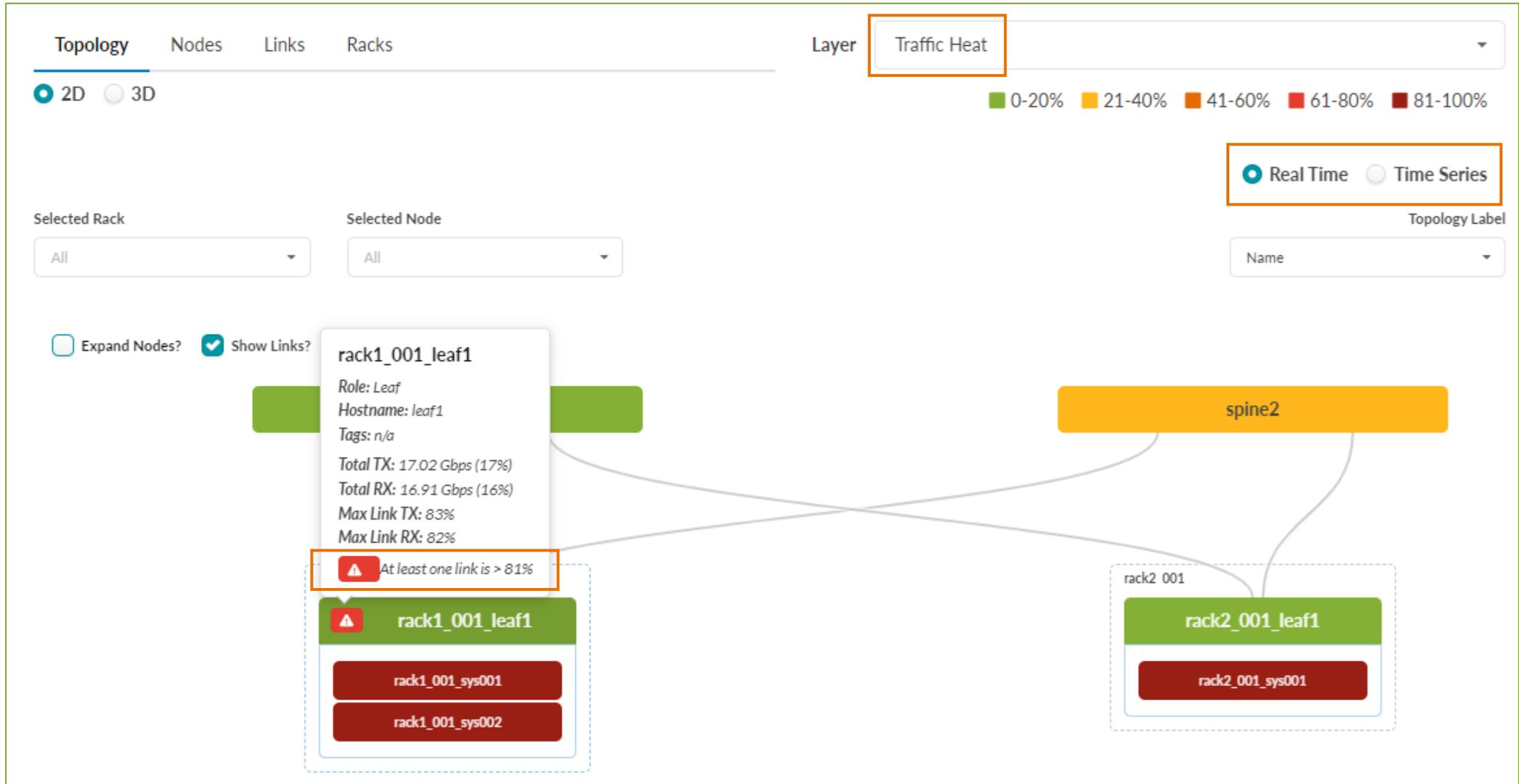
The screenshot displays the Juniper Active Tab monitoring interface. The breadcrumb navigation at the top reads: **Blueprints > JCL-Fabric > Active > Physical > Status**. The main navigation bar includes tabs for **Dashboard**, **Analytics**, **Staged**, **Uncommitted**, **Active** (highlighted with an orange box), and **Time Voyager**. Below this, a secondary navigation bar features **Physical** (highlighted with an orange box), **Virtual**, **Policies**, **Catalog**, **Query**, **Anomalies**, **Root Causes**, and **Connectivity Templates**. A search bar labeled "Find by tags" is positioned on the right.

The main content area shows a network topology. On the left, there are filters for **Nodes: All** and **Links: All**. Below these are tabs for **Topology** (highlighted with an orange box), **Nodes**, **Links**, and **Racks**. Under the **Topology** tab, there are radio buttons for **2D** (selected and highlighted with an orange box) and **3D**. A **Layer** dropdown menu is set to **Anomalies: All Services**. Below the topology are dropdowns for **Selected Rack** (set to All) and **Selected Node** (set to All). There are also checkboxes for **Expand Nodes?** (unchecked) and **Show Links?** (checked).

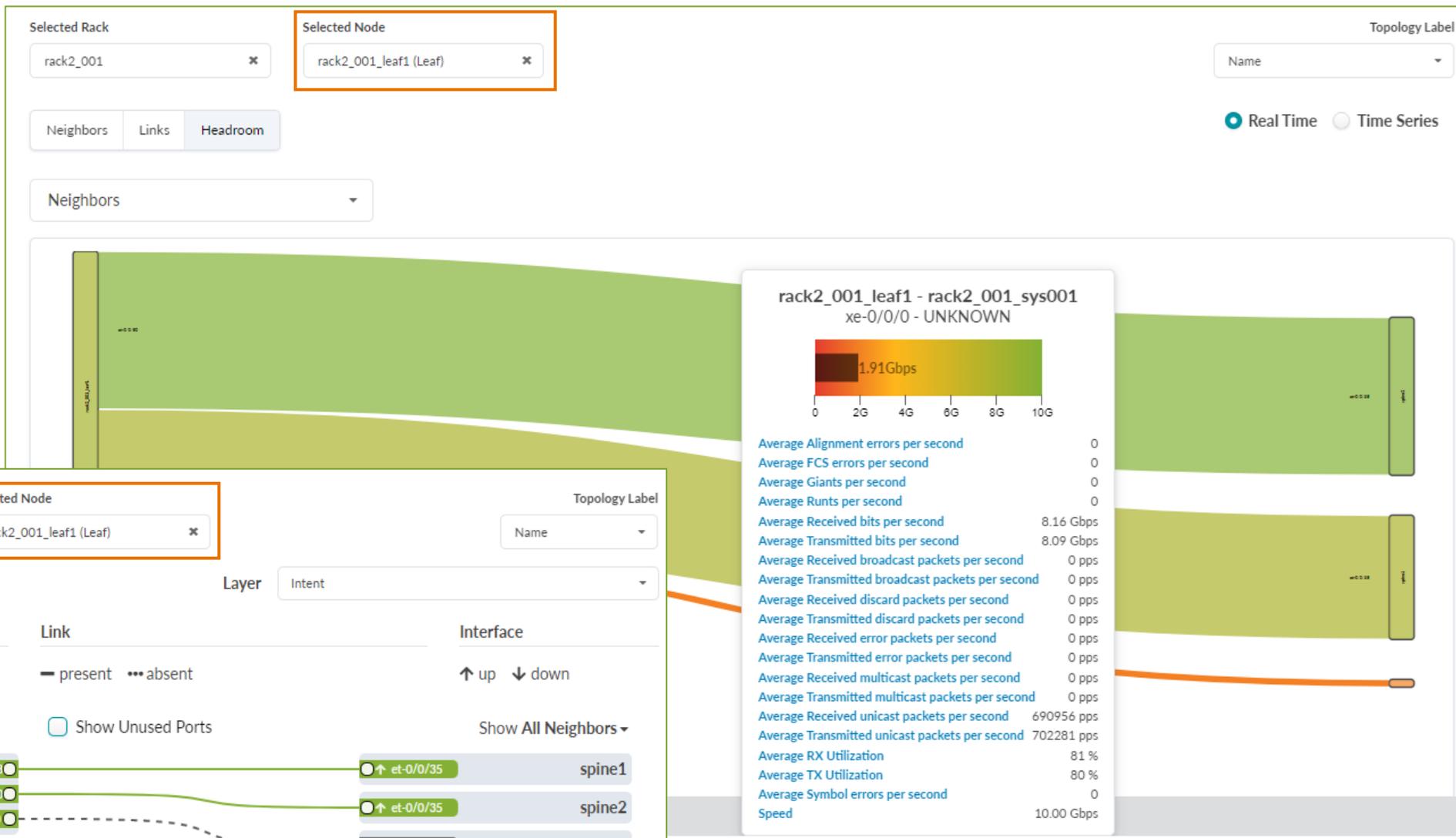
The network diagram shows two spine switches, **spine1** and **spine2**, connected to two racks, **rack1 001** and **rack2 001**. Each rack contains a leaf switch (**rack1_001_leaf1** and **rack2_001_leaf1**) and two system nodes (**rack1_001_sys001**, **rack1_001_sys002** and **rack2_001_sys001**). All nodes in the diagram are green, indicating no anomalies.

On the right side, there is a **Status** panel with a list of anomaly categories. Each category has a green bar with a "0" and a text label. The categories are: **Anomalies: All Services**, **Anomalies: BGP**, **Anomalies: Cabling**, **Anomalies: Config**, **Anomalies: Hostname**, **Anomalies: Interface**, **Anomalies: LAG**, **Anomalies: Liveness**, **Anomalies: MLAG**, **Anomalies: Probes**, **Anomalies: Route**, and **4/0/0/0 Deploy Mode**.

Мониторинг – Traffic Heat

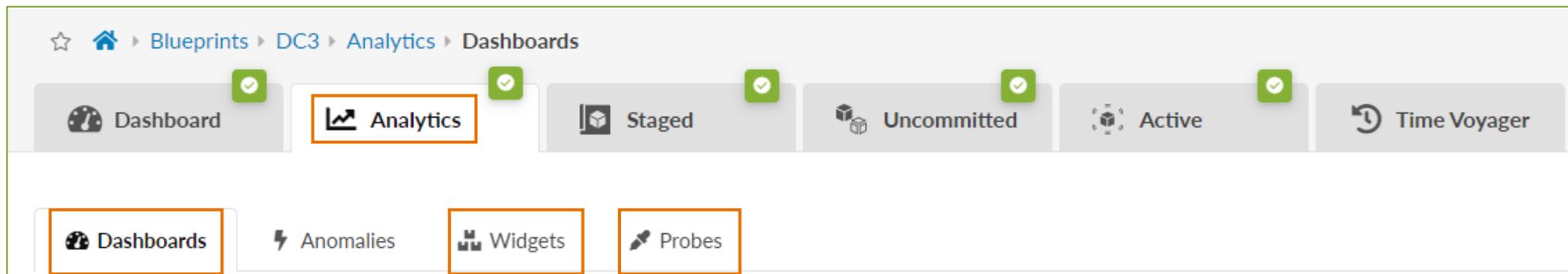
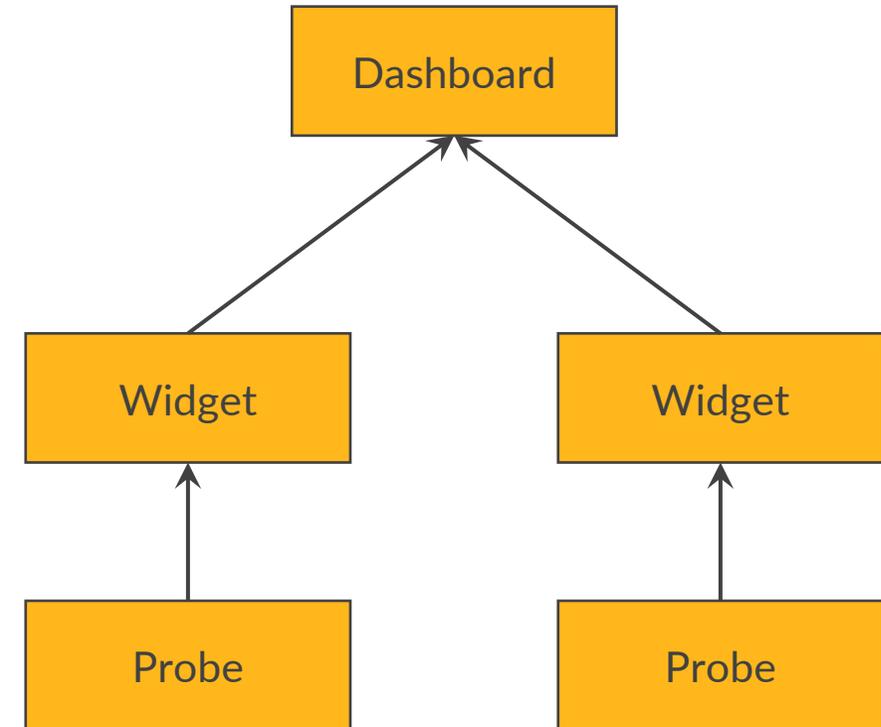


Мониторинг – конкретный коммутатор

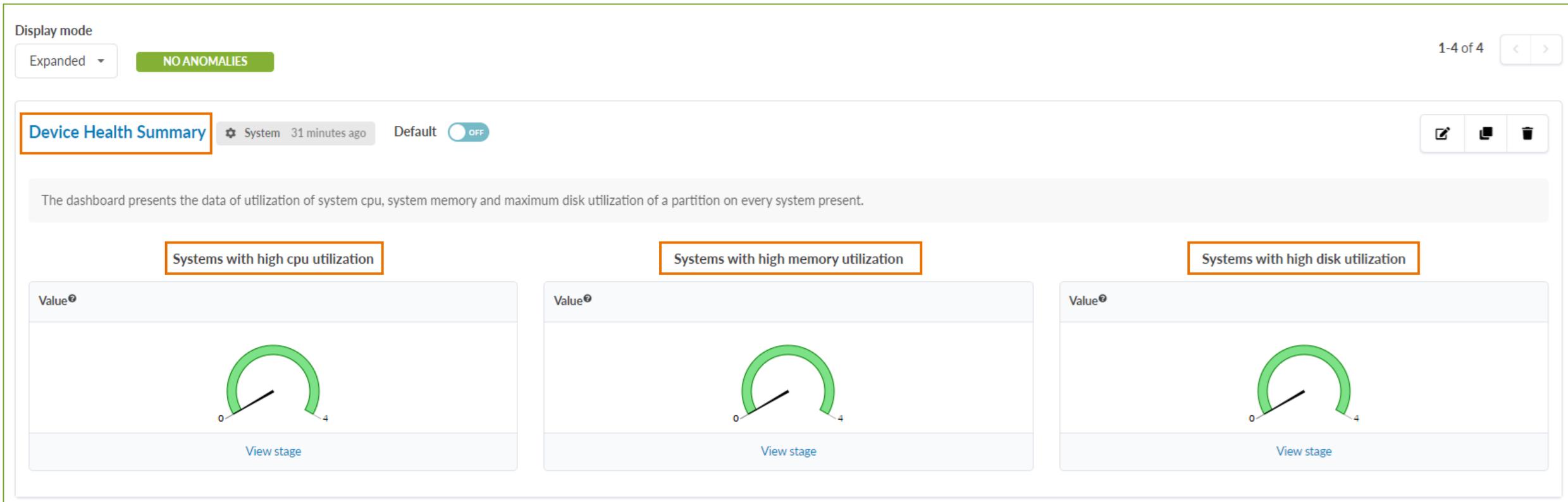


Пробы, виджеты, дашборды

- Проба – что именно мониторим
 - метод, частота, трешхолды ...
- Виджет – визуализация пробы
- Дашборд – набор виджетов
- Множество predetermined проб, виджетов и дашбордов доступно “из коробки”



Пример дашборда (3 виджета)



Детали пробы

☆ 🏠 > Blueprints > DC3 > Analytics > Dashboards

Dashboard Analytics Staged

Dashboards Anomalies Widgets Probes

Query: All

<input type="checkbox"/>	Name ▲	Anomalies ▾	State ▾
<input type="checkbox"/>	Device System Health 🗑️	✔️ No anomalies	✔️ Operations
<input type="checkbox"/>	Device Telemetry Health 🗑️	✔️ No anomalies	✔️ Operations
<input type="checkbox"/>	Device Traffic 🗑️	✔️ No anomalies	✔️ Operations
<input type="checkbox"/>	ECMP Imbalance (Fabric Interfaces) 🗑️	✔️ No anomalies	✔️ Operations
<input type="checkbox"/>	LAG Imbalance 🗑️	✔️ No anomalies	✔️ Operations

Edit Predefined Probe

Predefined Probe *
Device System Health

Probe Label *
Device System Health

CPU utilization threshold
80
If percentage CPU utilization exceeds the threshold, an anomaly is raised

Memory utilization threshold
95
If percentage memory utilization exceeds the threshold, an anomaly is raised

Disk utilization threshold
80
If percentage disk utilization exceeds the threshold, an anomaly is raised

Duration
10 Minutes
Time period in recent-history over which utilization data will be considered

Threshold Duration
5 Minutes
Total amount of time in recent-history during which the utilization has to be high for anomaly to be raised

History retention period
1 Day
Time period to preserve historical data.

🔒

Create Probe ▾

Actions

✎ 🗑️ 🗑️

✎ 🗑️ 🗑️

✎ 🗑️ 🗑️

✎ 🗑️ 🗑️

Детали пробы

Probes ▸ **Device System Health** Operational No anomalies admin an hour ago 93.41 KB Enabled ON

This probe alerts if the system health parameters (CPU, memory and disk usage) exceed their specified thresholds for the specified duration.

Search stages...

- Disk utilization data
- Disk utilization data per partition
- System cpu utilization data**
- System memory utilization data
- Check cpu utilization threshold
- Check disk utilization threshold

Stage: System cpu utilization data Persisted 1 day / 37.44 KB

System cpu utilization percentage

Data source: Time Series Aggregation: 10 Seconds Last 1 Hour

Combine graphs: Stacked

Query: All

2023-03-28 15:32:30.000

- 080027F161D9 (leaf1 • leaf) • system_cpu_utilization • 36%
- 080027CEF4E1 (spine1 • spine) • system_cpu_utilization • 31%
- 0800271D6FC8 (spine2 • spine) • system_cpu_utilization • 32%
- 08002709CD25 (leaf2 • leaf) • system_cpu_utilization • 23%

Предопределенные пробы

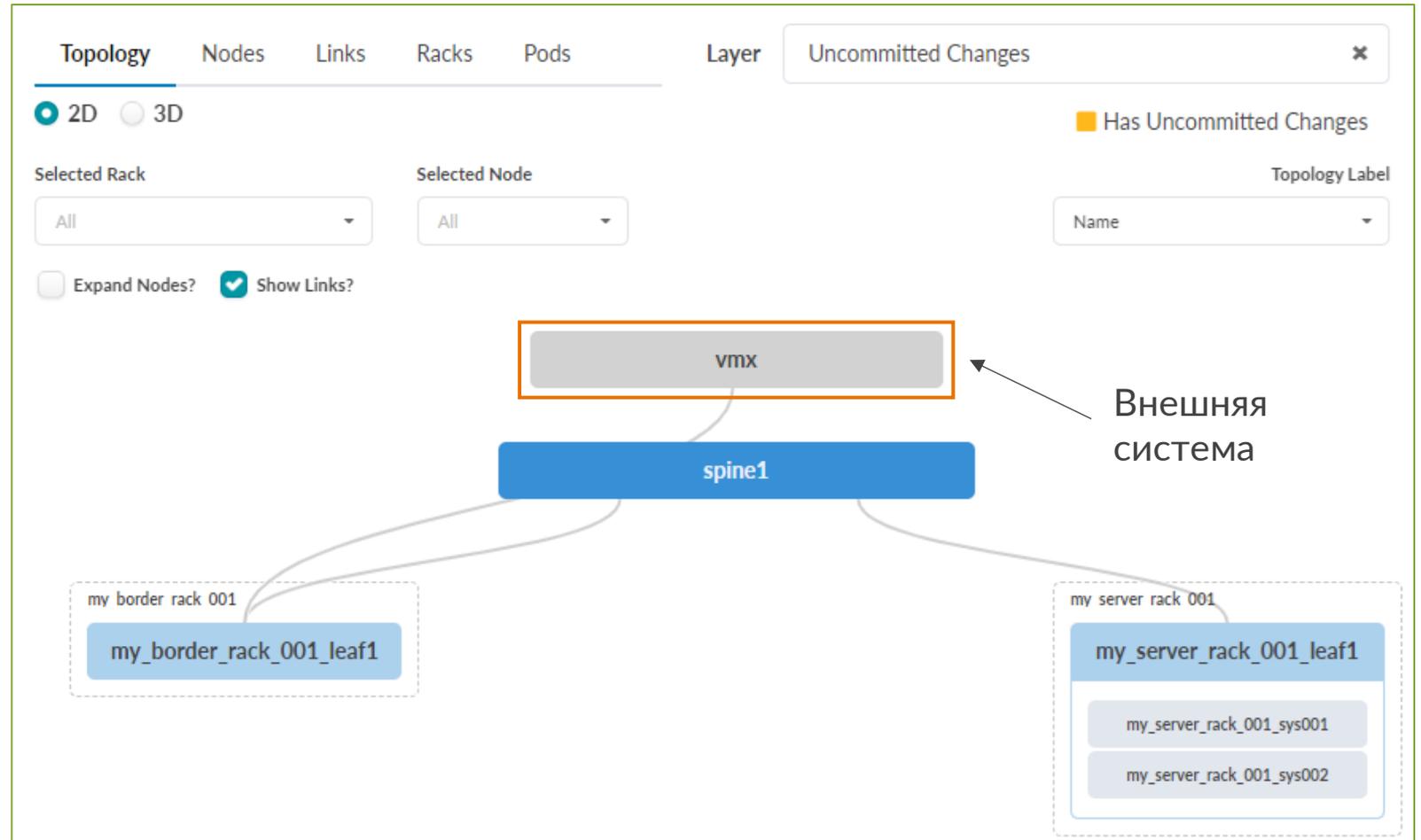
- Device health
 - CPU, Memory, Disk
- Device environment
 - power, temperature, fans
- Device traffic
- ECMP & LAG Imbalance
- Type-3 route validation
- Type-5 route validation
- Packet discards
- Optical transceivers
- BGP & Interface flapping

Predefined Probes (Analytics)

- BGP Session Flapping Probe | 970
- Bandwidth Utilization Probe | 972
- Critical Services: Utilization, Trending, Alerting Probe | 975
- Device Environmental Checks Probe (New in 4.1.2) | 976
- Device System Health Probe | 977
- Device Telemetry Health Probe | 979
- Device Traffic Probe | 980
- Drain Traffic Anomaly Probe | 984
- ECMP Imbalance (External Interfaces) Probe | 985
- ECMP Imbalance (Fabric Interfaces) Probe | 987
- ECMP Imbalance (Spine to Superspine Interfaces) Probe | 990
- ESI Imbalance Probe | 992
- EVPN Host Flapping Probe | 994
- EVPN VXLAN Type-3 Route Validation Probe | 995
- EVPN VXLAN Type-5 Route Validation Probe | 997
- External Routes Probe | 999
- Hot/Cold Interface Counters (Fabric Interfaces) Probe | 1000
- Hot/Cold Interface Counters (Specific Interfaces) Probe | 1004
- Hot/Cold Interface Counters (Spine to Superspine Interfaces) Probe | 1006
- Hypervisor and Fabric LAG Config Mismatch Probe (Virtual Infra) | 1008
- Hypervisor and Fabric VLAN Config Mismatch Probe (Virtual Infra) | 1009
- Hypervisor MTU Mismatch Probe (Virtual Infra) | 1016
- Hypervisor MTU Threshold Check Probe (Virtual Infra) | 1016
- Hypervisor Missing LLDP Config Probe (Virtual Infra) | 1017
- Hypervisor Redundancy Checks Probe (Virtual Infra) | 1018
- Interface Flapping (Fabric Interfaces) Probe | 1019
- Interface Flapping (Specific Interfaces) Probe | 1021
- Interface Flapping (Specific Interfaces) Probe | 1022
- Interface Policy 802.1x Probe | 1024
- LAG Imbalance Probe | 1025
- Leafs Hosting Critical Services: Utilization, Trending, Alerting Probe | 1027
- Link Fault Tolerance in Leaf and Access LAGs Probe | 1028
- MLAG Imbalance Probe | 1030
- Multiagent Detector Probe | 1034
- Optical Transceivers Probe | 1035
- Packet Discard Percentage Probe | 1037
- Spine Fault Tolerance Probe | 1039
- Total East/West Traffic Probe | 1040
- VMs without Fabric Configured VLANs Probe (Virtual Infra) | 1042
- VXLAN Flood List Validation Probe | 1045

Внешняя связность (DCI, Firewalls, GWs ...)

- Apstra не управляет устройствами, внешними по отношению к фабрике
- Apstra конфигурирует и мониторит связность с внешними устройствами
 - Как правило, со стороны border leaf
 - Layer2/Layer3, BGP сессии, input/output политики ...



Настройка связности (Connectivity Templates)

Create Connectivity Template

Parameters Primitives User-defined Pre-defined

Tags
No tags

IP Link

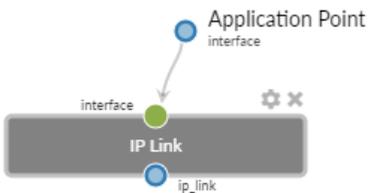
Routing Zone *
Default routing zone

Interface Type *
 Tagged
 Untagged

VLAN ID *
2

IPv4 Addressing Type *
 None
 Numbered

IPv6 Addressing Type *
 None
 Link local



Create Connectivity Template

Parameters Primitives User-defined Pre-defined

Summary
BGP with VMX

Description

Tags
No tags

BGP Peering (Generic System)

ON IPv4 AFI *
 OFF IPv6 AFI *

TTL *
2

OFF Enable BFD *

Password

Hold Time Timer (sec)

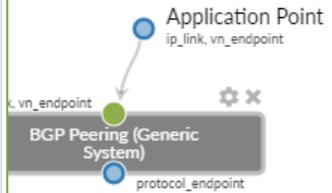
IPv4 Addressing Type *
 None
 Addressed

IPv6 Addressing Type *
 None
 Link local

Neighbor ASN Type *
 Static
 Dynamic

Peer From *
 Loopback
 Interface

Peer To *
 Loopback
 Interface/IP Endpoint
 Interface/Shared IP Endpoint



Commit на border leaf (Junos)

```
{master:0}[edit]
jcluser@dc1-border# show | compare rollback 1
[edit interfaces xe-0/0/2]
+   description "URF default to vmx";
[edit interfaces xe-0/0/2 unit 0 family inet]
+   address 10.3.0.2/31;

{master:0}[edit]
jcluser@dc1-border#
```

```
[edit protocols bgp]
  group 13clos-1-evpn { ... }
  group 13rtr {
+   type external;
+   multihop {
+     ttl 1;
+   }
+   family inet {
+     unicast {
+       loops 2;
+     }
+   }
+   multipath {
+     multiple-as;
+   }
+   neighbor 10.3.0.3 {
+     description facing_vmx;
+     multihop {
+       ttl 2;
+     }
+     local-address 10.3.0.2;
+     import ( RoutesFromExt-default-Default_immutable2 );
+     family inet {
+       unicast;
+     }
+     export ( RoutesToExt-default-Default_immutable2 );
+     peer-as 65500;
+   }
+   vpn-apply-export;
+ }
```

Remote EVPN Gateway

- Необходим в сценарии DCI (для связи с удаленным border leaf в другом ЦОД)

Create Remote EVPN Gateway

Parameters

Name *
EVPN GW

IP Address *
8.0.0.1

ASN *
65201

TTL

Password

Keep-alive Timer

Expand Nodes? Show Links?

my border rack 001
my_server rack 001

my_border_rack_001_leaf1
my_server_rack_001_leaf1

my_server_rack_001_sys001
my_server_rack_001_sys002

Hold-time Timer

EVPN Route Types *
 All Routes (I2+I3 mode) Type-5 Only (I3-only mode)

Local Gateway Nodes

Query: All 1-3 of 3

Filter selected by all selected only unselected only

<input type="checkbox"/>	Label	Role	Group Label	ASN	Hostname
<input type="checkbox"/>	spine1	Spine	N/A	65000	dc1-spine
<input checked="" type="checkbox"/>	my_border_rack_001_leaf1	Leaf	BORDER-LEAF	65001	dc1-border
<input type="checkbox"/>	my_server_rack_001_leaf1	Leaf	SERVER-LEAF	65002	dc1-leaf

Commit на border leaf (Junos)

```
jcluser@dc1-border# show | compare rollback 1
```

```
[edit policy-options]
```

```
+ policy-statement EVPN_GW_IN {  
+   term EVPN_GW_IN-10 {  
+     from family evpn;  
+     then {  
+       community add EVPN_GW;  
+       accept;  
+     }  
+   }  
+ }  
+ policy-statement EVPN_GW_OUT {  
+   term EVPN_GW_OUT-10 {  
+     from {  
+       family evpn;  
+       community EVPN_GW;  
+     }  
+     then reject;  
+   }  
+   term EVPN_GW_OUT-20 {  
+     from family evpn;  
+     then {  
+       community delete PATH_HUNT_PREVENTION;  
+       accept;  
+     }  
+   }  
+ }
```

```
[edit policy-options policy-statement RoutesToExt-default-Default_immutable2 term RoutesToExt-default-Default_immutable2-10 then]
```

```
+ next-hop self;
```

```
[edit policy-options]
```

```
+ community EVPN_GW members 0:2;
```

```
[edit protocols bgp]  
group 13rtr { ... }  
+ group evpn-gw {  
+   type external;  
+   multihop {  
+     ttl 30;  
+     no-nexthop-change;  
+   }  
+   multipath {  
+     multiple-as;  
+   }  
+   neighbor 8.0.0.1 {  
+     description facing_evpn-gw-evpn-gateway;  
+     local-address 7.0.0.1;  
+     import ( EVPN_GW_IN );  
+     family evpn {  
+       signaling;  
+     }  
+     export ( EVPN_GW_OUT );  
+     peer-as 65201;  
+   }  
+   vpn-apply-export;  
+ }
```

Интеграция с VMWare

- Arstra может подключаться к инфраструктуре VMWare для получения информации

Create Virtual Infra Manager

Summary

Address *

Virtual Infra Type

VMware vCenter Server VMware NSX-T Manager

Username *

Password *

Create Another?

Address ↕	Virtual Infra Type ↕	State ↕	Last Successful Collection Time ↕	Actions
100.123.91.107	VMware vCenter Server	CONNECTED	2023-03-23, 16:56:35	  

Информация о виртуальной инфраструктуре

Dashboard Analytics Staged Uncommitted Active Time Voyager

Physical Virtual Policies Catalog Query Anomalies Root Causes Connectivity Templates Find by tags

MAC ARP VMs

Query: All 1-8 of 8

VM Name	Hosted On	Hypervisor Hostname	Hypervisor Version	VM IPs	ToR Switch:Interface	Port Group Name:VLAN ID	MAC Addresses	Virtual Infra Address	Virtual Infra Type
VCSA-7.0	100.123.91.1 (rack1_001_sys001)	esxi-1	6.7.0	100.123.91.107				100.123.91.107	vcenter
VM-Client1	100.123.91.2 (rack1_001_sys002)	esxi-2	6.7.0		rack1_001_leaf1:xe-0/0/3 rack1_001_leaf1:xe-0/0/2	DSwitch:(vn-302)	00:50:56:84:64:5f	100.123.91.107	vcenter
VM-Client2	100.123.91.2 (rack1_001_sys002)	esxi-2	6.7.0		rack1_001_leaf1:xe-0/0/3 rack1_001_leaf1:xe-0/0/2	DSwitch:(vn-302)	00:50:56:84:6f:ec	100.123.91.107	vcenter
VM-Client3	100.123.91.3 (rack2_001_sys001)	esxi-3	6.7.0		rack2_001_leaf1:xe-0/0/1 rack2_001_leaf1:xe-0/0/0	DSwitch:(vn-302)	00:50:56:84:6a:22	100.123.91.107	vcenter
VM-lperf-Server	100.123.91.1 (rack1_001_sys001)	esxi-1	6.7.0		rack1_001_leaf1:xe-0/0/1 rack1_001_leaf1:xe-0/0/0	DSwitch:(vn-302)	00:50:56:84:9d:a9	100.123.91.107	vcenter
VM-lperf-Server2	100.123.91.1 (rack1_001_sys001)	esxi-1	6.7.0		rack1_001_leaf1:xe-0/0/1 rack1_001_leaf1:xe-0/0/0	DSwitch:(vn-302)	00:50:56:84:35:37	100.123.91.107	vcenter
VM-test	100.123.91.3 (rack2_001_sys001)	esxi-3	6.7.0		rack2_001_leaf1:xe-0/0/1 rack2_001_leaf1:xe-0/0/0	DSwitch:(vn-302)	00:50:56:84:57:17	100.123.91.107	vcenter
VMware vCenter Server Appliance	100.123.91.1 (rack1_001_sys001)	esxi-1	6.7.0	100.123.91.106	rack1_001_leaf1:xe-0/0/1 rack1_001_leaf1:xe-0/0/0	DSwitch:(vn-302)	00:0c:29:c4:fe:7e	100.123.91.107	vcenter

Virtual Infra Fabric Health Check дашборд

☆ [Home](#) > [Blueprints](#) > [DC1](#) > [Analytics](#) > [Dashboards](#)

Dashboard Analytics Staged Uncommitted Active Time Voyager

Virtual Infra Fabric Health Check admin 5 hours ago Default OFF Find problems in physical or virtual infrastructure that affect workload connectivity.

Hypervisor VLANs missing in Fabric

Anomaly Remediation
It is possible to automatically fix the anomalies.

[Remediate Anomalies](#)

Hypervisor	Connected To	Fabric Interface	Vlan	Traffic
100.123.91.1	rack1-001-leaf1	ae1	303	tagged
100.123.91.2	rack1-001-leaf1	ae2	303	tagged
100.123.91.3	rack2-001-leaf1	ae1	303	tagged

[View stage](#)

Critical services affected by VLAN misconfig

Hypervisor	Virtual Machine	Virtual Machine Ip
100.123.91.3	VM-Client3	

[View stage](#)

Hypervisor have inconsistent MTU

No anomalies!

[View stage](#)

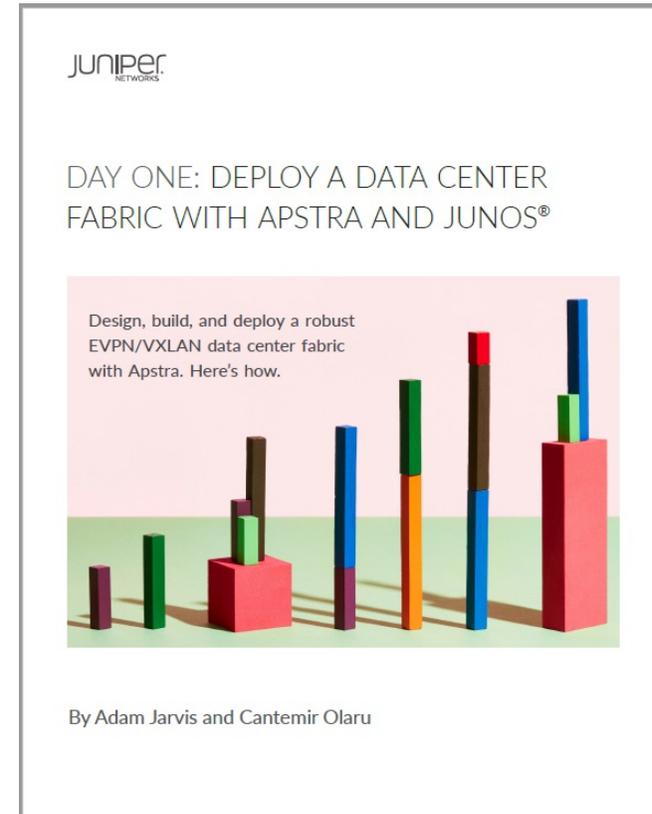
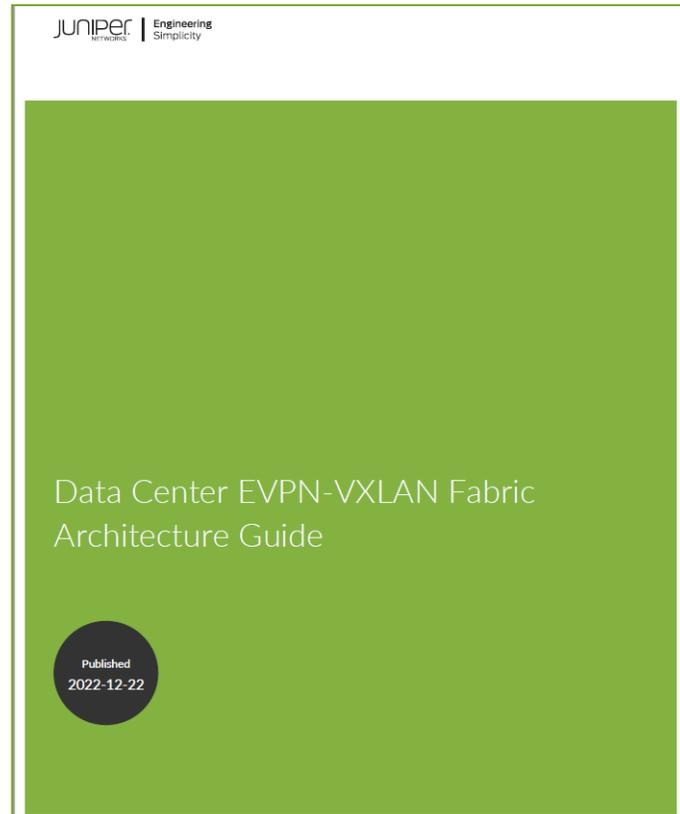
Hypervisor PNIC LAG status

No anomalies!

[View stage](#)

Дополнительные материалы

- Data Center EVPN-VXLAN Fabric Architecture Guide (https://www.juniper.net/documentation/en_US/release-independent/solutions/information-products/pathway-pages/sg-005-data-center-fabric.html)
- DAY ONE: Deploy a Data Center Fabric with Apstra and Junos (https://www.juniper.net/documentation/en_US/day-one-books/DO_Apstra.pdf)





THANK YOU

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