DATACENTER INFRASTRUCTURE MANAGEMENT NETBOX REVISED

Audience:
- General

Prepared by:
- Feng Xia
(fengxia41103@gmail.com)

Last updated on:
- 08/2018

Also available: PDF

TABLE OF CONTENTS

PROBLEMS TO SOLVE

Datacenter devop headaches:

1. I'm using Excel to track hardware inventory and networks, but it has too many conflicting errors now to be useful anymore.

Diagnosis: Only having a data model built with accurate domain knowledge of data center components and operation, can one be sure erroneous inputs stand no chance to pollute your data.

1. Logging server information such as UUID is tedious and error prone. But without being fully accurate, these information have little value as reference.

Diagnosis: If these information can be collected from device directly, machine can do it better than human operator.

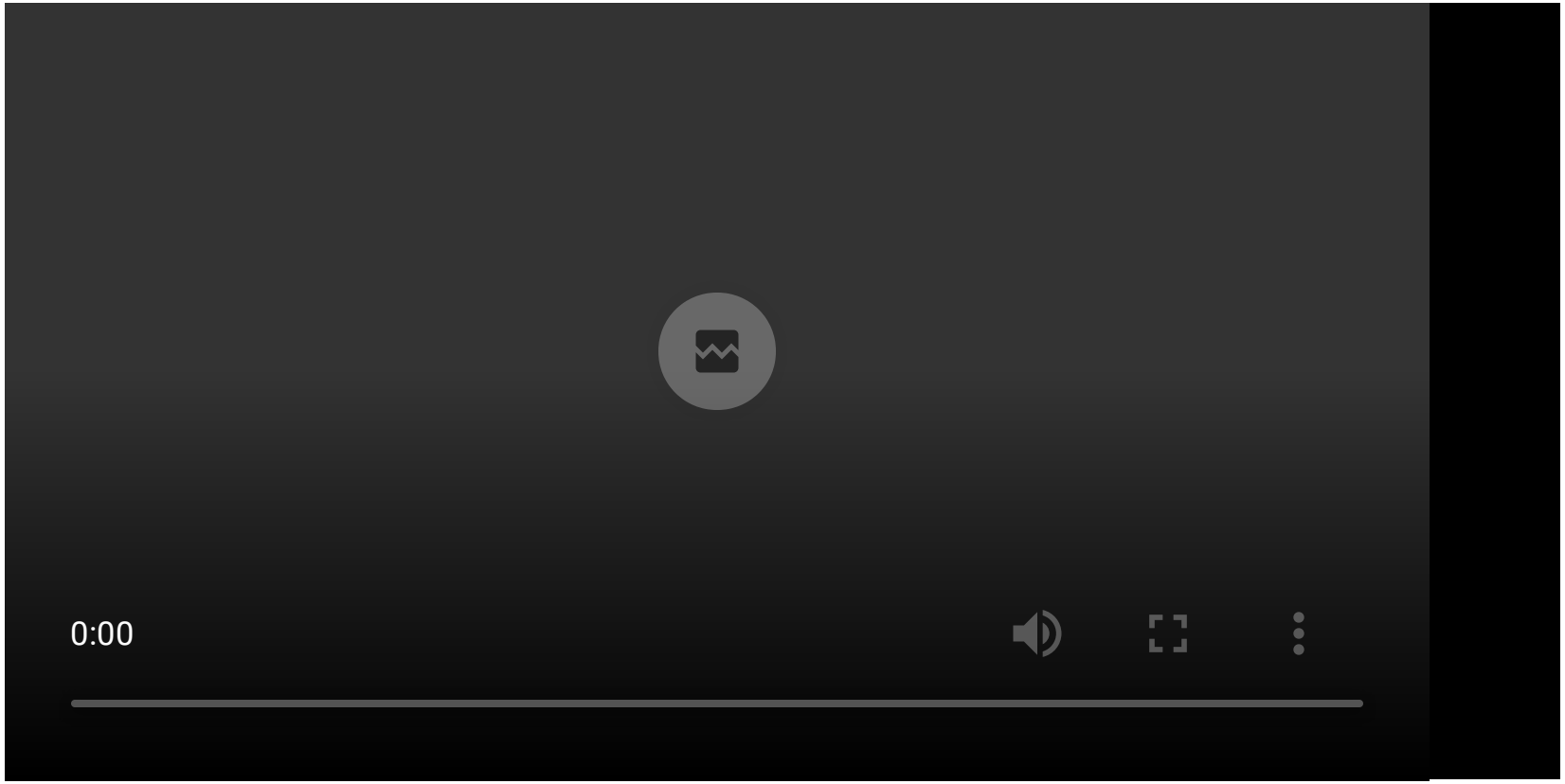
1. There is a jungle of cables on the back of my rack. Detecting a loose connection or a cable plugged into a wrong port is nearly impossible.

Diagnosis: Visualizing physical connection was limited to you looking at the cable jungle. Not anymore. Smart tool can figure this out by tracing MAC through the entire infrastructure.

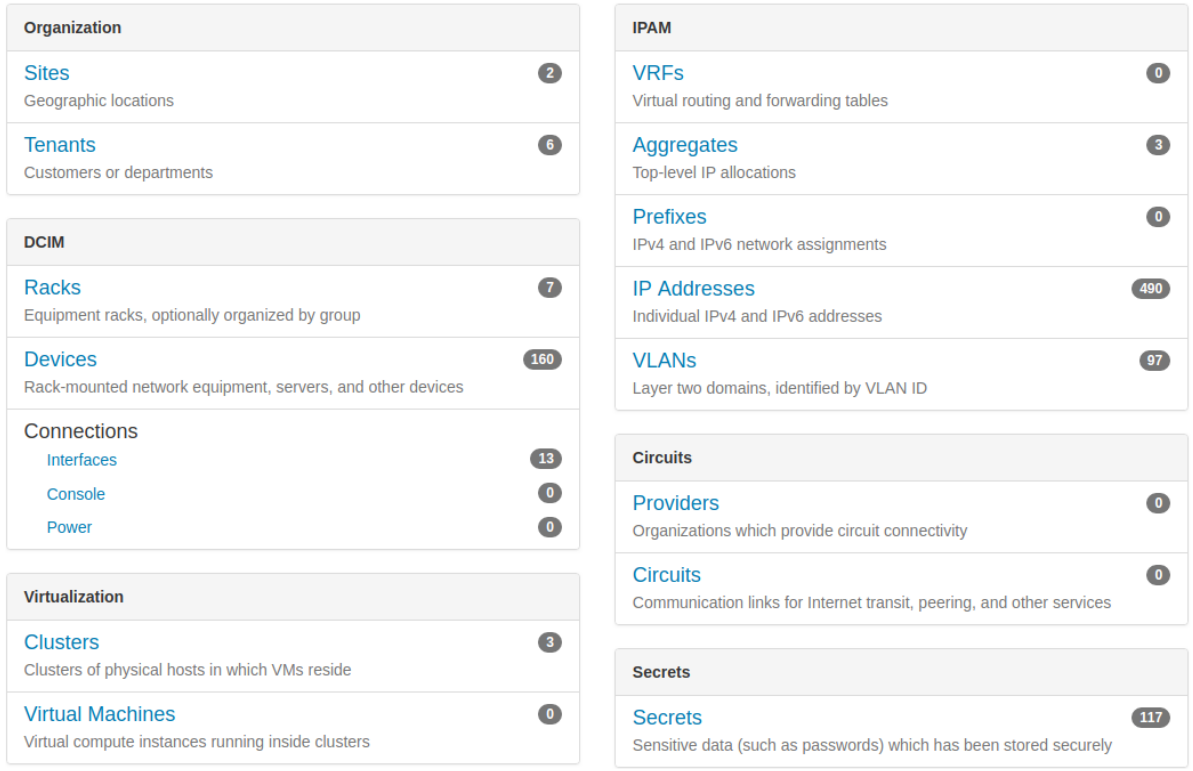
1. I need to run sever and network report by geo location, by tenants, and by networks. But creating them is time consuming.

Diagnosis: There are unlimited ways to view and aggregate your infrastructure components. Netbox created a cohesive data model that can be reported and aggregated. Let the computer to compile that report for you.

DEMO

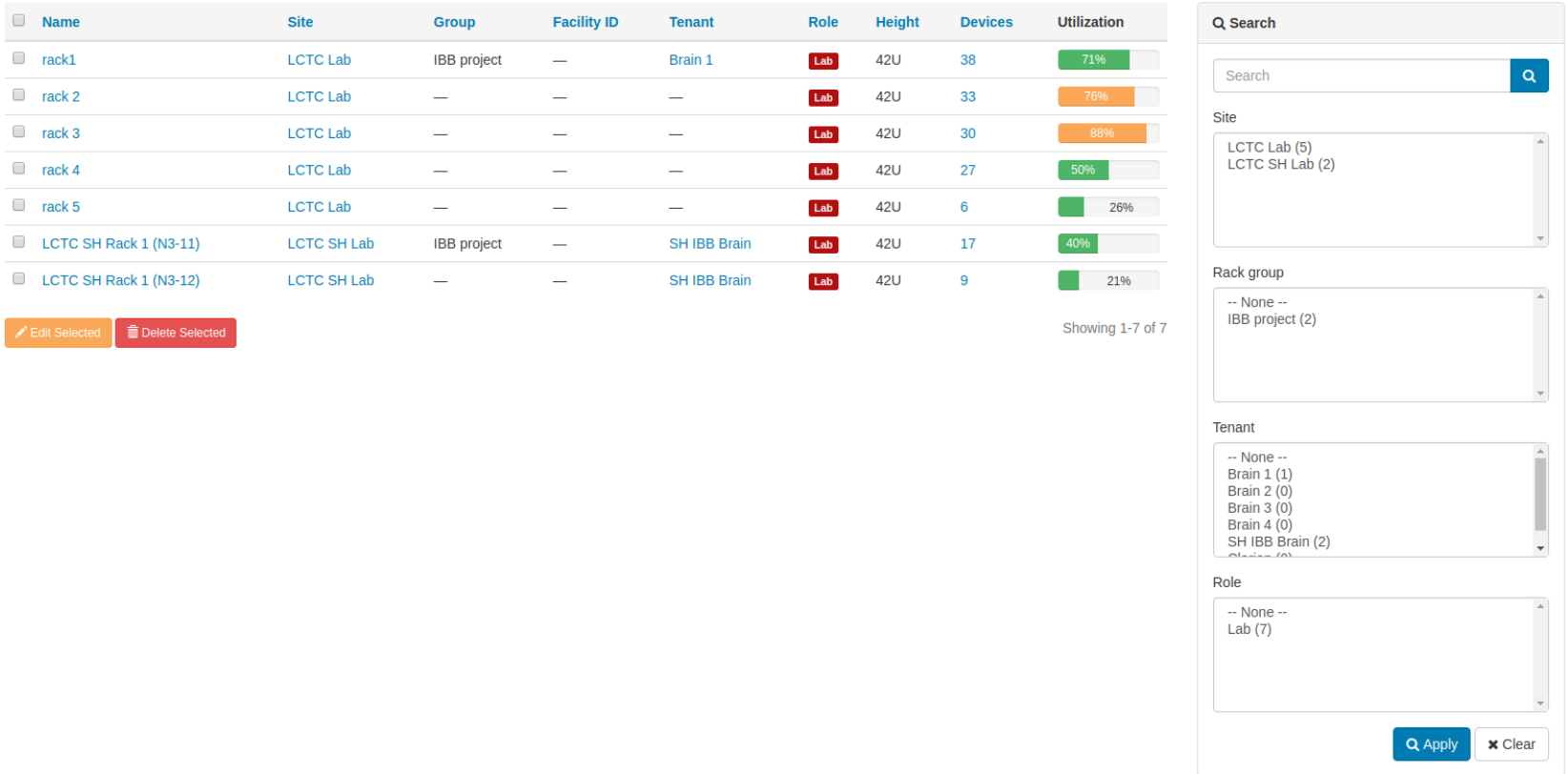


DASHBOARD



1. Covers all data points a datacenter management needs.
2. At glance of all inventory and their use.
3. Initiate a drill down from any view point.
4. Inter-linked data model guarantees information consistency.

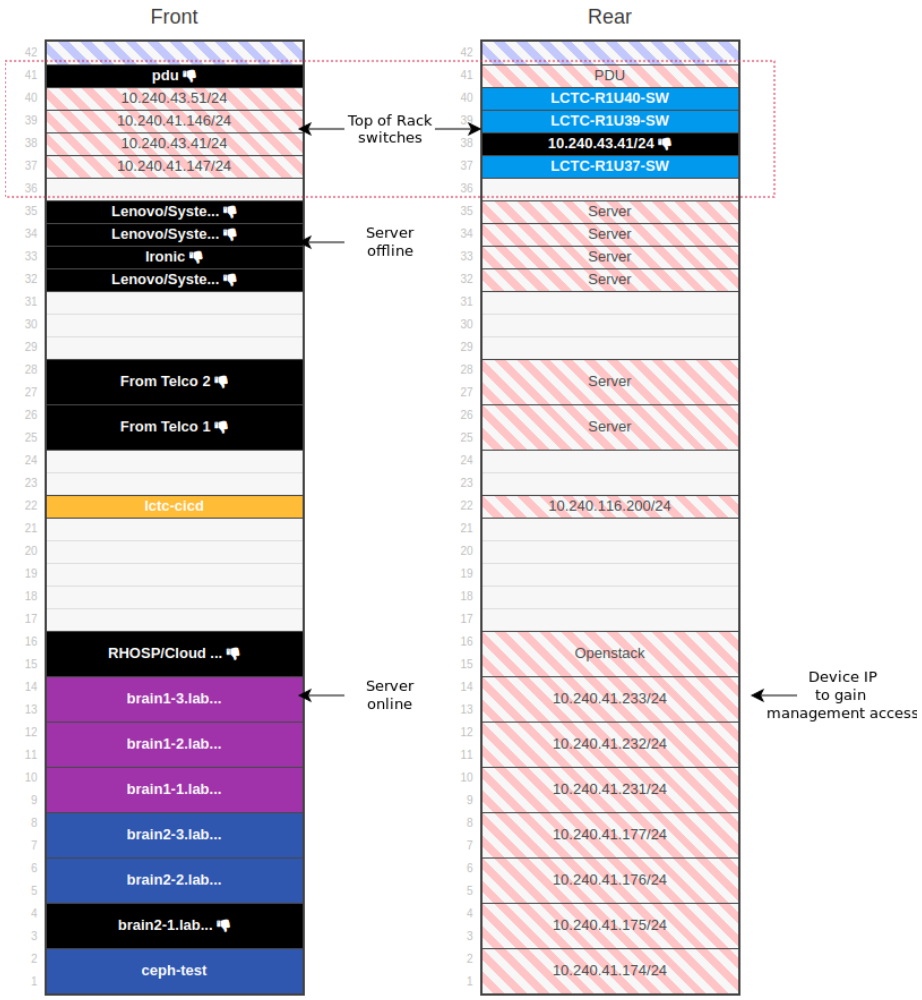
RACK



Name	Site	Group	Facility ID	Tenant	Role	Height	Devices	Utilization
rack1	LCTC Lab	IBB project	—	Brain 1	Lab	42U	38	71%
rack 2	LCTC Lab	—	—	—	Lab	42U	33	76%
rack 3	LCTC Lab	—	—	—	Lab	42U	30	88%
rack 4	LCTC Lab	—	—	—	Lab	42U	27	50%
rack 5	LCTC Lab	—	—	—	Lab	42U	6	26%
LCTC SH Rack 1 (N3-11)	LCTC SH Lab	IBB project	—	SH IBB Brain	Lab	42U	17	40%
LCTC SH Rack 1 (N3-12)	LCTC SH Lab	—	—	SH IBB Brain	Lab	42U	9	21%

1. Multiple filters
2. Utilization

RACK: DEVICE LAYOUT



1. Front & Rear view handles half-depth device and different mount orientation.
2. View access information, eg. server's IP address.
3. Can make reservation, thus allowing infrastructure planning ahead of time.
4. Color code to group device by its purpose.
5. Flag if device is not accessible (in black) ← powered off, or credential needs an update. In both cases, it highlights a need of admin attention.

RACK: DEVICE LIST

Name	Position (U)	Status	Tenant	Site	Rack	Role	Type	IP Address
10.240.43.107/24	—	Offline	—	LCTC Lab	rack1	BMC	Lenovo.BMC	10.240.43.107
10.240.43.139/24	—	Offline	Brain 1	LCTC Lab	rack1	BMC	Lenovo.BMC	10.240.43.139
10.240.43.150/24	—	Offline	Brain 2	LCTC Lab	rack1	BMC	Lenovo.BMC	10.240.43.150
10.240.43.172/24	—	Offline	Brain 1	LCTC Lab	rack1	BMC	Lenovo.BMC	10.240.43.172
10.240.43.188/24	—	Offline	Brain 1	LCTC Lab	rack1	BMC	Lenovo.BMC	10.240.43.188
10.240.43.230/24	—	Offline	—	LCTC Lab	rack1	BMC	Lenovo.BMC	10.240.43.230
10.240.43.238/24	—	Offline	—	LCTC Lab	rack1	BMC	Lenovo.BMC	10.240.43.238
10.240.43.249/24	—	Offline	Brain 1	LCTC Lab	rack1	BMC	Lenovo.BMC	10.240.43.249
10.240.43.254/24	—	Offline	Brain 1	LCTC Lab	rack1	BMC	Lenovo.BMC	10.240.43.254
10.240.43.41/24	38	Offline	Brain 1	LCTC Lab	rack1	Access Switch	Lenovo.G8272	10.240.43.41
10.240.43.90/24	—	Offline	Brain 1	LCTC Lab	rack1	BMC	Lenovo.BMC	10.240.43.90
brain1-1.labs.lenovo.com	9	Active	Brain 1	LCTC Lab	rack1	RHV	Lenovo.System x3650 M5	10.240.41.231
brain1-2.labs.lenovo.com	11	Active	Brain 1	LCTC Lab	rack1	RHV	Lenovo.System x3650 M5	10.240.41.232
brain1-3.labs.lenovo.com	13	Active	Brain 1	LCTC Lab	rack1	RHV	Lenovo.System x3650 M5	10.240.41.233

Search

Search

Site

LCTC Lab (134)
LCTC SH Lab (26)

Rack group

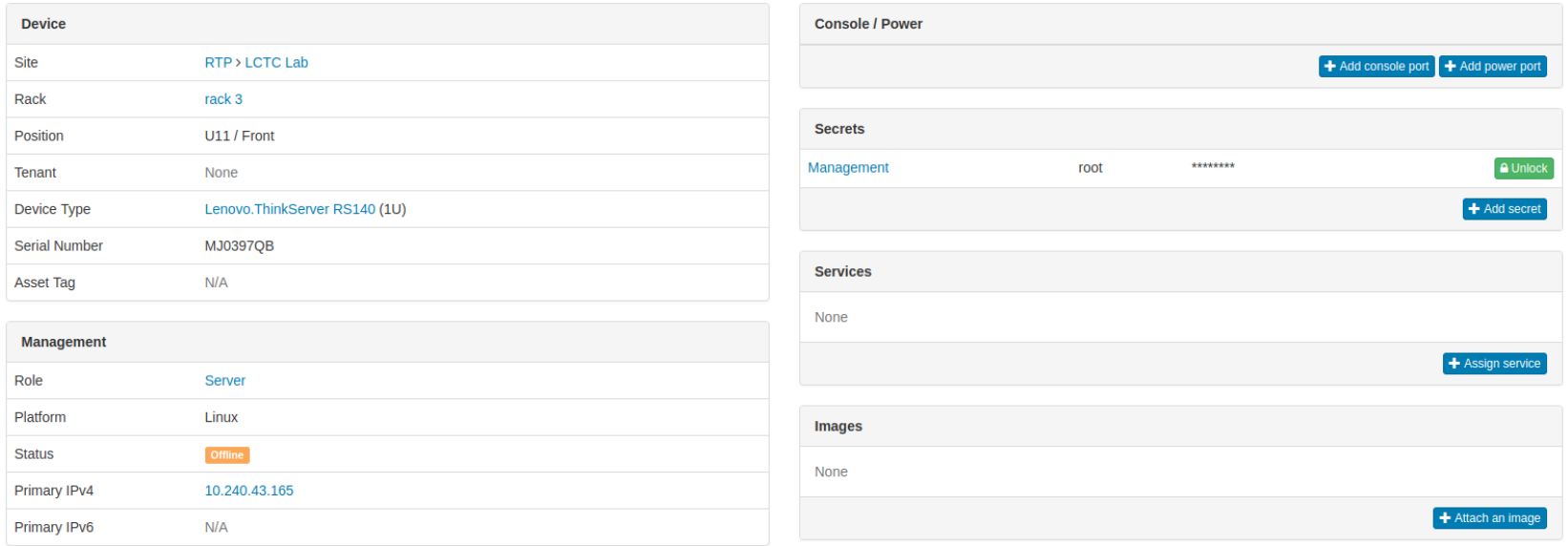
IBB project (55)

Rack

-- None --
rack1 (38)
rack 2 (33)
rack 3 (30)
rack 4 (27)
rack 5 (6)

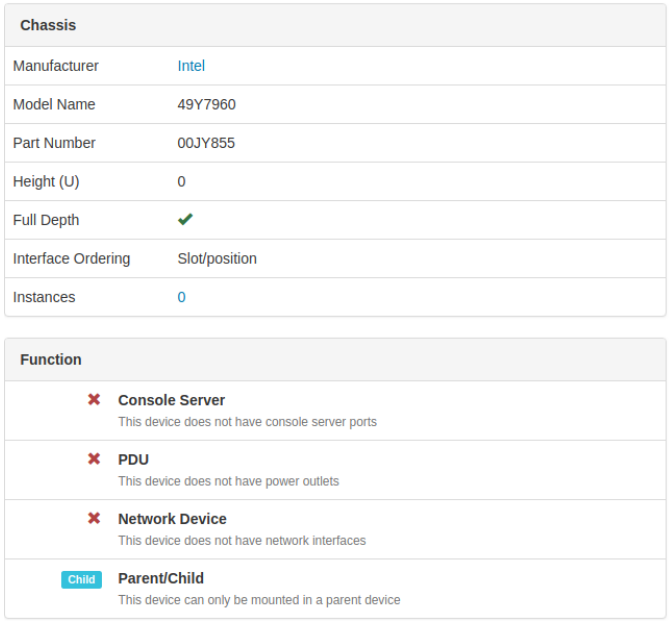
1. Easy to sort by any header.
2. Can be exported as report.
3. All associated data is a link.

DEVICE



1. The center piece of Netbox models is the Device, representing a physical device such as server and switch. This makes sense as the primary physical asset of a data center are certainly these devices.
2. Device can be assigned `role` and a `type`.

DEVICE: TYPE



1. Inventory manufacturer, part number, and such.
2. Setup rules to allows network interface (is `Network Device`), console port, etc..

DEVICE: ROLE

Name	Devices	VMs	Label	VM Role	Slug
Access Switch	15	0	Access Switch	✔	access-switch
BMC	60	0	BMC	✘	bmc
Ceph	8	0	Ceph	✔	ceph
Console Server	0	0	Console Server	✔	console-server
Core Switch	0	0	Core Switch	✔	core-switch
Distribution Switch	0	0	Distribution Switch	✔	distribution-switch
Firewall	0	0	Firewall	✔	firewall
Management Switch	2	0	Management Switch	✔	management-switch
Openstack	1	0	Openstack	✔	openstack
PDU	3	0	PDU	✔	pdu
RHV	3	0	RHV	✔	rhv
Router	0	0	Router	✔	router
Server	65	0	Server	✔	server
Storage	3	0	Storage	✔	storage

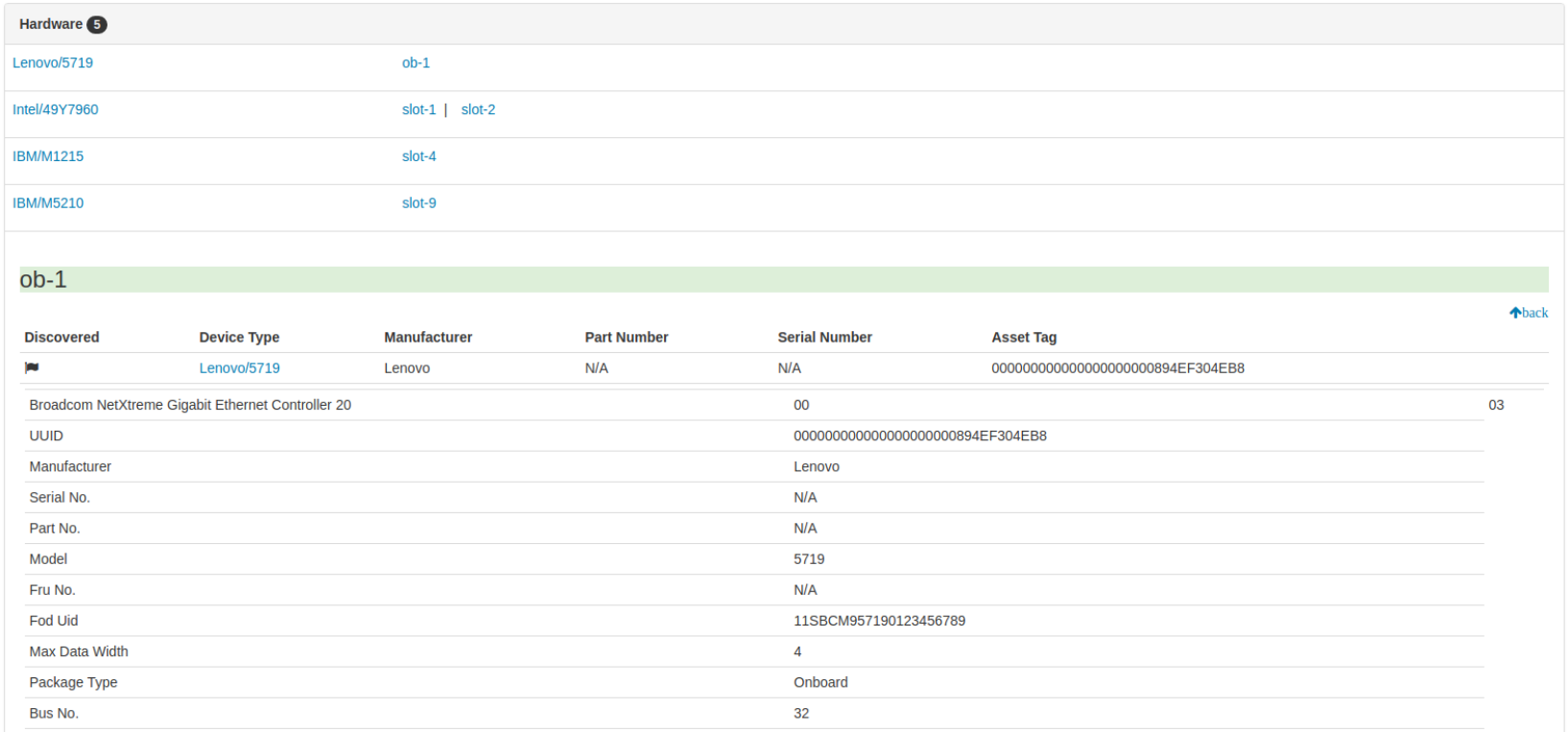
1. Flexible for your environment to logically group and manage devices.
2. Color code.

DEVICE: INTERFACE

Name	LAG	Description	MAC Address	Untagged VLAN	Allowed VLANs	Connection	
⇄ mgmt0			A4:8C:DB:9B:01:00			Not connected	
10.240.43.29/24		Primary Active	Global				
⇄ MGT			A4:8C:DB:9B:01:FE	4095	4095	Not connected	
⇄ 1			A4:8C:DB:9B:01:00	598	1-19,100-108,200-209,300-309,400-409,500-509,591-700	rack 4.10.240.43.28/24.39	XGE4
⇄ 10			A4:8C:DB:9B:01:00	1	1	Not connected	
⇄ 11			A4:8C:DB:9B:01:00	598	1-19,100-108,200-209,300-309,400-409,500-509,591-700	Not connected	
⇄ 12			A4:8C:DB:9B:01:00	598	1-19,100-108,200-209,300-309,400-409,500-509,591-700	Not connected	
⇄ 13			A4:8C:DB:9B:01:00	598	1-19,100-108,200-209,300-309,400-409,500-509,591-700	Not connected	
⇄ 14			A4:8C:DB:9B:01:00	1	1	Not connected	
⇄ 15			A4:8C:DB:9B:01:00	1	1	Not connected	
⇄ 16			A4:8C:DB:9B:01:00	1	1	Not connected	
⇄ 17			A4:8C:DB:9B:01:00	1	1	Not connected	
⇄ 18			A4:8C:DB:9B:01:00	1	1	Not connected	
⇄ 19			A4:8C:DB:9B:01:00	1	1	Not connected	

1. Best way to manage dynamic list such as interface list through automation.
2. Diagnose network issue by seeing exactly which inteface serves the IP you know.
3. The only tool on the market to show cable connections. In the example above, it shows a switch port `1` is connected to port `XGE4` of another switch with IP `10.240.43.28` and is on in slot 39 on rack 4.

DEVICE: INVENTORY ITEM



Hardware 5

Lenovo/5719	ob-1
Intel/49Y7960	slot-1 | slot-2
IBM/M1215	slot-4
IBM/M5210	slot-9

ob-1

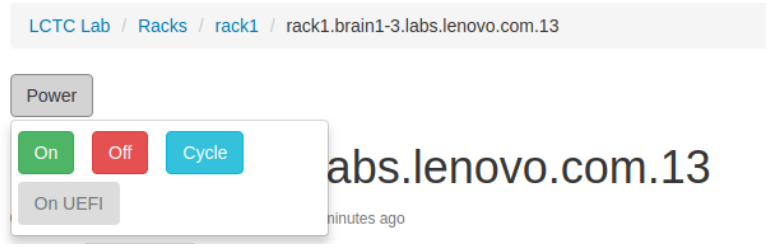
back

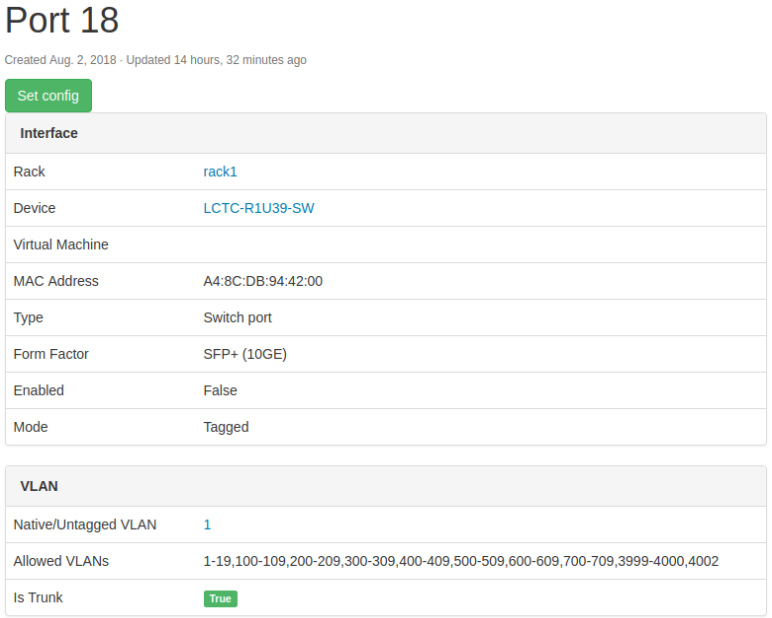
Discovered	Device Type	Manufacturer	Part Number	Serial Number	Asset Tag
	Lenovo/5719	Lenovo	N/A	N/A	00000000000000000000894EF304EB8

Broadcom NetXtreme Gigabit Ethernet Controller 20	00	03
UUID	00000000000000000000894EF304EB8	
Manufacturer	Lenovo	
Serial No.	N/A	
Part No.	N/A	
Model	5719	
Fru No.	N/A	
Fod Uid	11SBCM957190123456789	
Max Data Width	4	
Package Type	Onboard	
Bus No.	32	

1. Build inventory of sub-components inside a server.
2. Never again to type in serial number of a device by hand.
3. View its configuration and state.

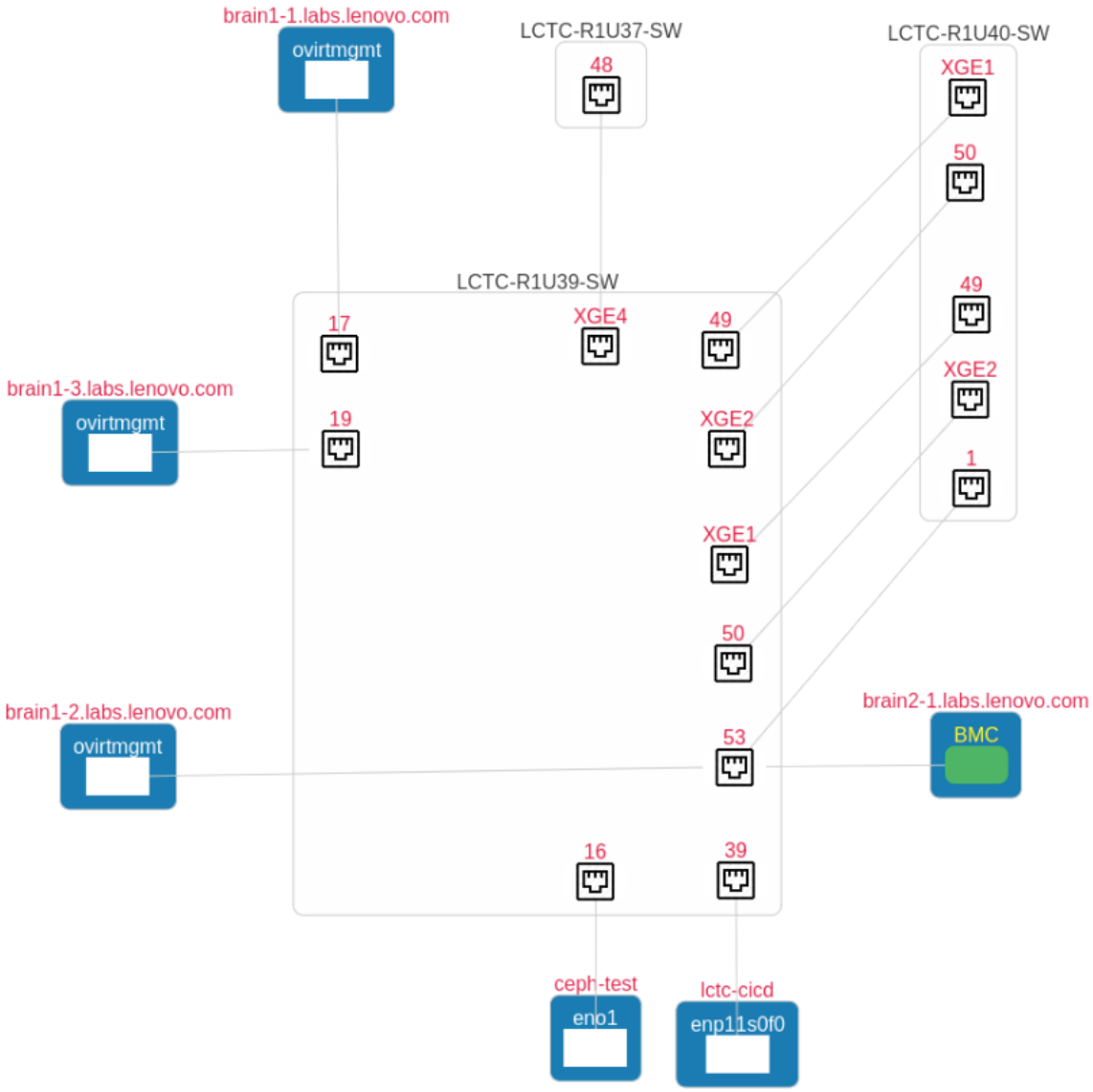
DEVICE: REMOTE MANAGEMENT





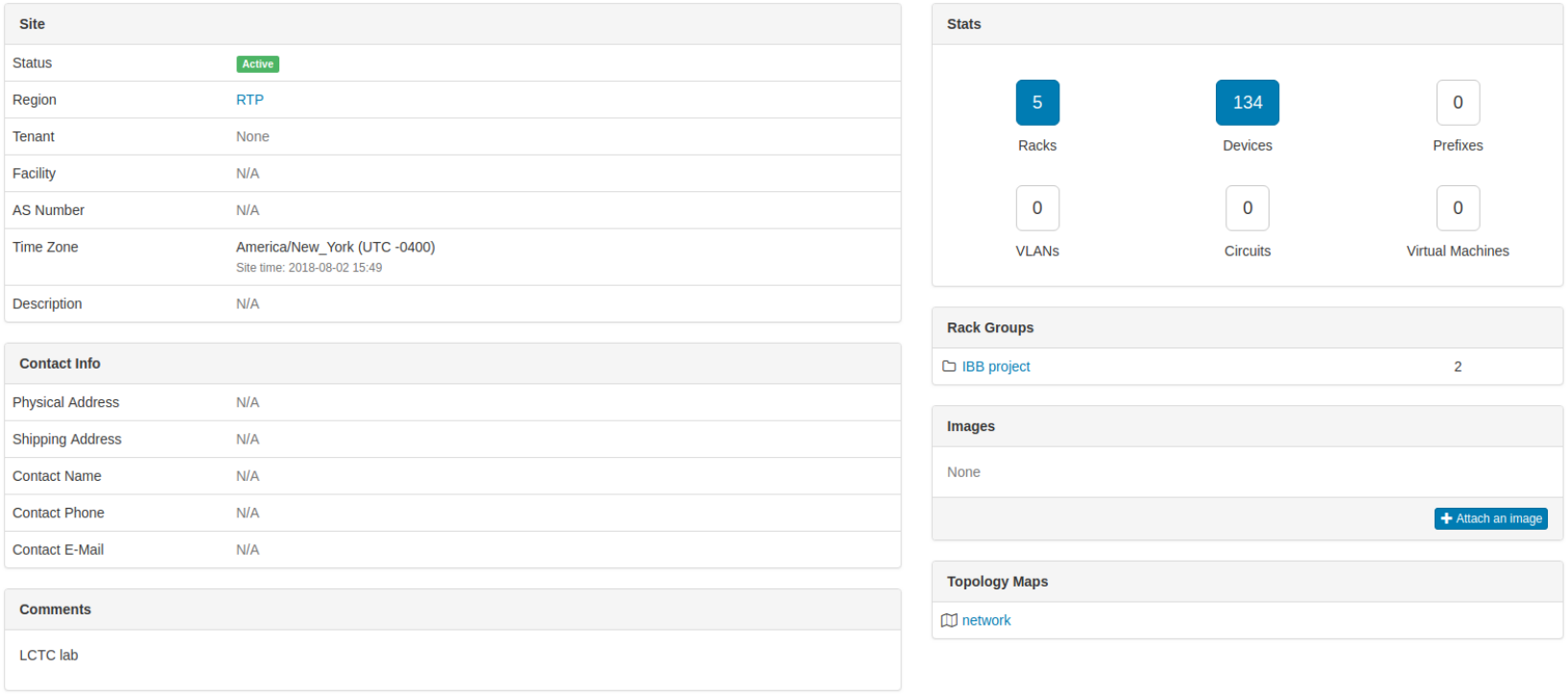
1. Power cycle server and choose a `boot mode`, eg. UEFI, PXE.
2. Manage switch config at port level.

DEVICE: NETWORKING CABLE CONNECTIONS



1. Unique feature in the market.
2. Visualize networking cable connections including inter-switch and server-switch down to the switch port level.
3. Easy to drill down by simply clicking on `port` and `interface`.

LOGICAL GROUPING



1. Map infrastructure to your business hierarchy.
2. Data model supports flexible many ways of reporting and information aggregation.
    1. By `region`, `site` and `tenant`.
    2. By `device type`, `device role`, `platform`.
    3. By `rack group`, `tenant group`.
    4. By `cluster`
    5. Ultimately, by any device attribute.

THE END