1.0 - Concept: As-Built Report Generator

Jira Project: [Installs] Create As-Built record functionality

CSSCRUM-4186: [Installs] Create As-Built record functionality TO DO

Initial Kick-off Meeting Notes: 8/29/25 @ 12:30pm PST

- Travis Mickelberry
- Mike Slisinger
- Brad Faas
- Ray Stamps

Goal:

- Define method/approach to generate standardized post deployment "As Built" Reporting

Agenda:

- Define information to include, level of detail, and format
- Identify data sources, available tools, and gaps
- Scope requirements and target timeline

Target Outcome:

- Set MVP requirements and timeline target

Research: Identify Information Available via VAST API

Cluster Hardware Details:

- BOM
  - Part Numbers*
  - Quantities
  - Serial Numbers
- CBoxes
  - Quantity
  - Hardware type & manufacturer

    - # of Nodes
    - # of NICs
    - B2B enabled?
    - Encryption enabled?
    - Similarity enabled?
    - VAST Code Version(s)
    - Rack Height (U#)
- DBoxes
    - Quantity
    - Hardware type & manufacturer
    - # of Nodes
    - B2B enabled?
    - VAST Code Version(s)
    - Rack Height (U#)
- Switches
    - Quantity
    - Hardware type & manufacturer - Mellanox / Cisco / Aruba
    - Protocol - Ethernet / IB
    - Ports Count - 16 / 32 / 40 / 64
    - Port Speed(s)
    - Port Function - Node / IPL / ISL / MLAG
    - Ports in use
    - Ports Available
    - Switch role - Master / Slave*
    - Switch tier - Leaf / Spine*
    - Firmware Version(s)
    - Rack Height (U#)*
    - Cables - direct / splitter*
- Northbound Connection - Switch to Switch / CNode to Switch*

Cluster Deployment Details:

- Usable Capacity
- Licensed Capacity

- Protocol - NFS, SMB, Object, Block, etc
- Use Case(s) - AI, ML, HPC, DB, BU, Cloud, Hybrid, etc*
- Advanced Features - Replication, DataBase, etc

Cluster Administration Details:

- Cluster Name
- Cluster PSNT
- Cluster VMS VIP
- Default Users & Passwords*
  - VMS
  - IPMI
  - Mgmt Port
  - Tech Port
- IP Information
  - Network Services
    - DNS
    - DNS Search Domain
    - NTP
    - AD
    - LDAP
    - Other
  - CNode & DNode & Switch Management
    - Port Label
    - Port IP
    - Port Function
    - IPMI
    - Mgmt Port
    - Tech Port
  - Data Network
    - VIP
    - Replication
    - Other
- Node to Switch to Switch Connectivity map*

- Network Port Map
- Switch Configuration*
- Switch Cable Routing Validation Report*

NOTE: * indicates API alternative or manual data entry required

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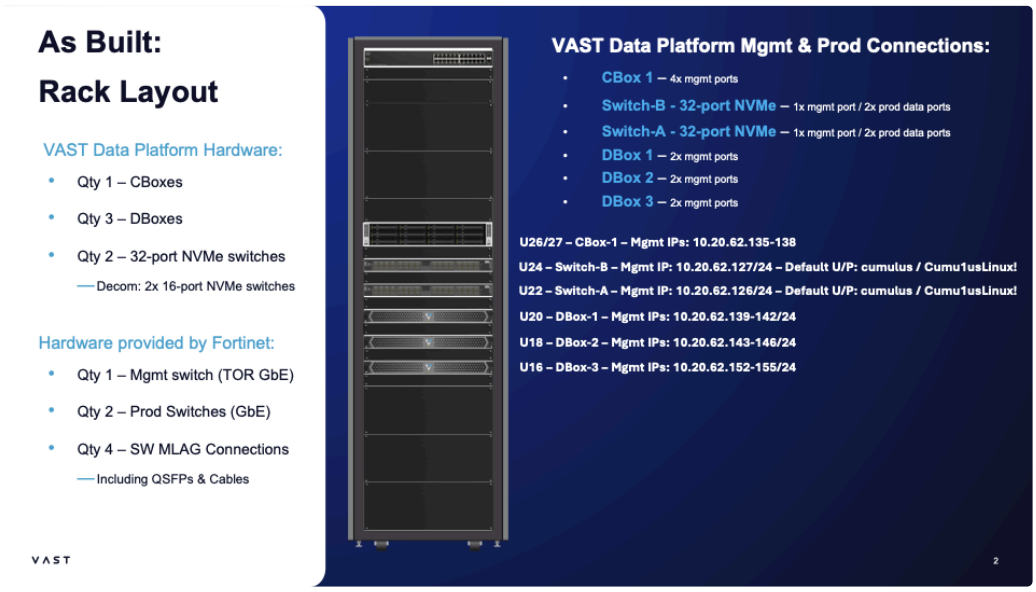
Data Requiring Alternative Methods

The following data points will require manual input or the use of external tools:

- Hardware:
  - Bill of Materials (BOM) part numbers
  - Switch roles (Master/Slave) and tiers (Leaf/Spine)
  - Cable types (direct/splitter)
- Deployment:
  - Use cases (AI, ML, HPC, etc.)
- Administration:
  - Default users and passwords (should be managed securely and not stored in the report)
  - Node to switch to switch connectivity map
  - Switch configurations
  - Switch cable routing validation report

Example - Manually Generated Report:



Rack – Front View

Switch Migration (6/23/25):

U25 – Add 32-port Switch B
U24 – Add 32-port Switch A
U23 – Remove 2x 16-port switches / Decommission

Capacity Expansion (6/24/25):

U16 – DBox 3 – Staged for Expansion on 6/24/25

Rack – Rear View

Pending:

U25 – Switch B
Relocate to U24

U24 – Switch A
Relocate to U22

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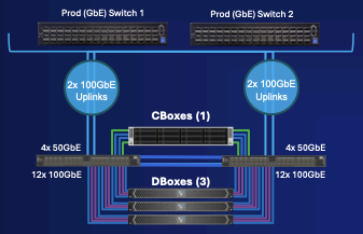
Data Network Connections:

– 4x 100GbE Uplink Data Paths
– 8x 50GbE CBox Split Data Paths
– 2x 100GbE IPL Switch Paths
– 24x 100GbE DBox Data Paths



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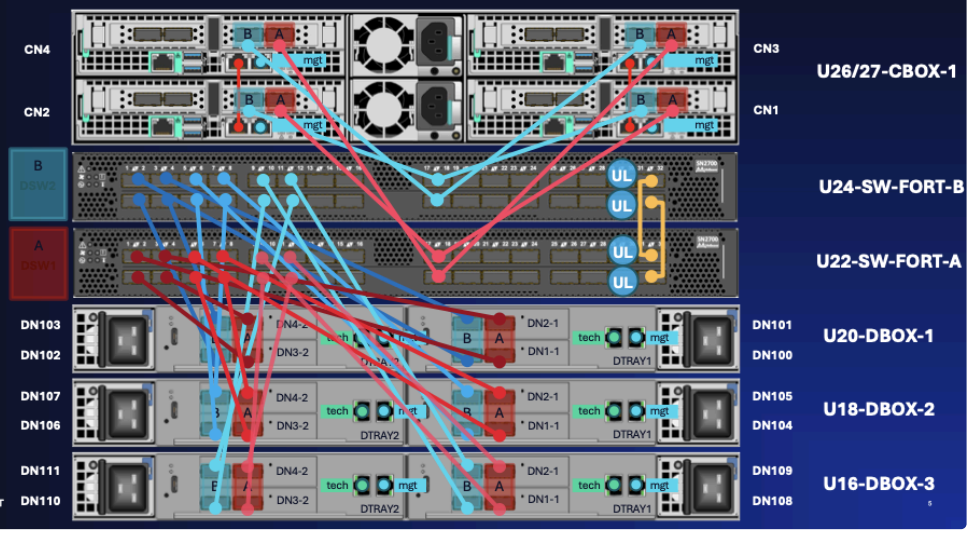
Backend Data Network – Connection Map



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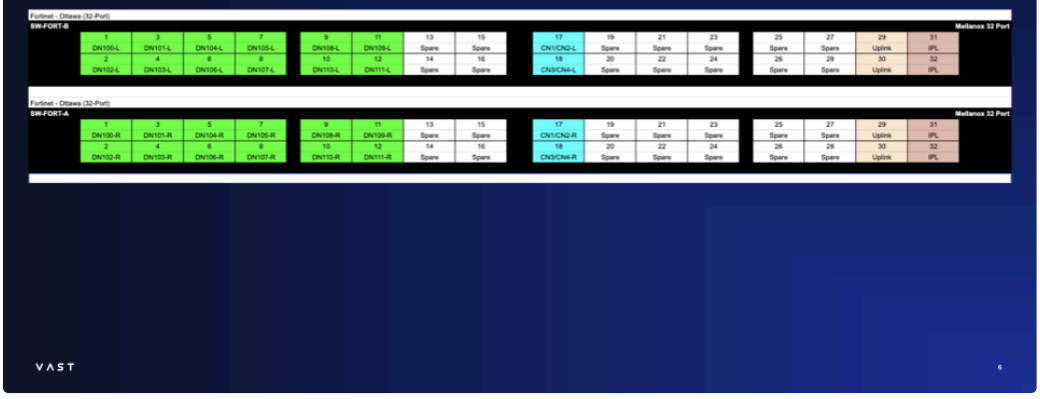
Mellanox 32-port Switch – Port Map



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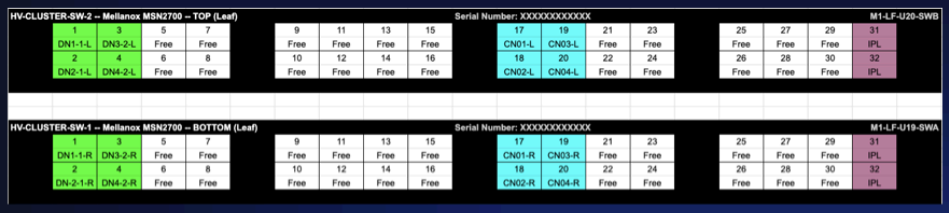
6

Alternative Option w/Labeling Chart:

32port NVMe Switch Configuration (A & B)



Cable Labels and Locations

QTY:	LABEL NAME:	SWITCH LOC:	DNODE LOC:	CNODE LOC:
2	DN1-R-SWA-1	Bottom-1	Bottom-R-R	
2	DN2-R-SWA-2	Bottom-2	Top-R-R	
2	DN3-R-SWA-3	Bottom-3	Bottom-L-R	
2	DN4-R-SWA-4	Bottom-4	Top-L-R	
2	CN1-R-SWA-17	Bottom-17		Bottom-R-R
2	CN2-R-SWA-18	Bottom-18		Top-R-R
2	CN3-R-SWA-19	Bottom-19		Top-L-R
2	CN4-R-SWA-20	Bottom-20		Bottom-L-R
1	IPL-SWA-31	Bottom-31		
1	IPL-SWA-32	Bottom-32		

QTY:	LABEL NAME:	SWITCH LOC:	DNODE LOC:	CNODE LOC:
2	DN1-L-SWB-1	Top-1	Bottom-R-L	
2	DN2-L-SWB-2	Top-2	Top-R-L	
2	DN3-L-SWB-3	Top-3	Bottom-L-L	
2	DN4-L-SWB-4	Top-4	Top-L-L	
2	CN1-L-SWB-17	Top-17		Bottom-R-L
2	CN2-L-SWB-18	Top-18		Top-R-L
2	CN3-L-SWB-19	Top-19		Top-L-L
2	CN4-L-SWB-20	Top-20		Bottom-L-L
1	IPL-SWB-31	Top-31		
1	IPL-SWB-32	Top-32		

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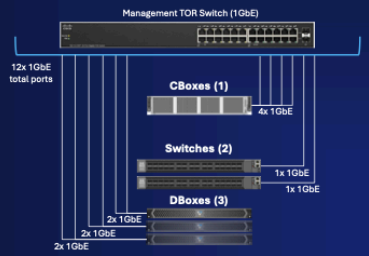
7

Management Network 1GbE Connections:

12x 1GbE management ports



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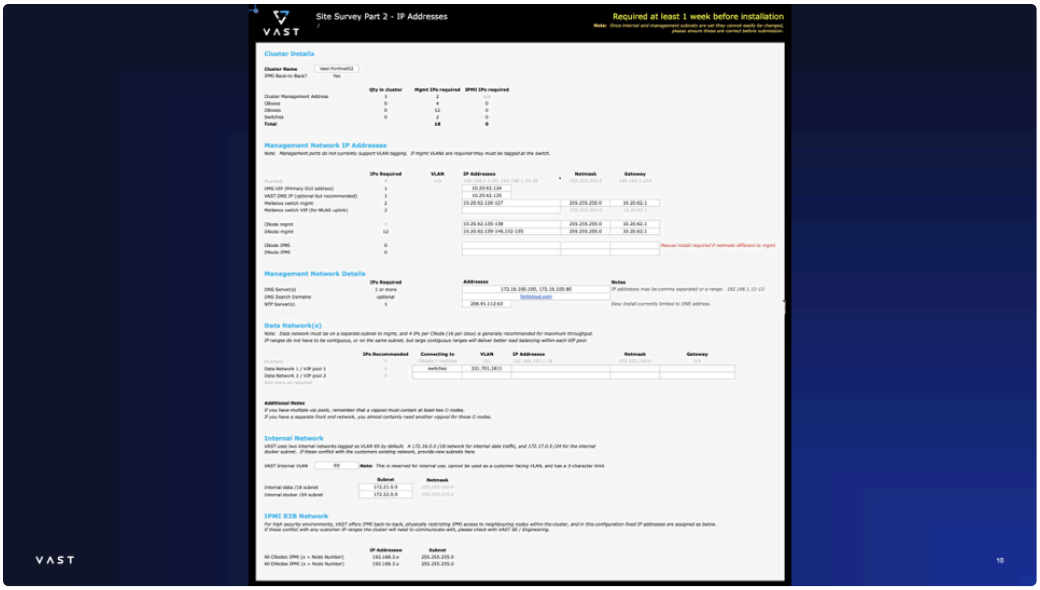
VAST Data 2025

7



Variables for switch_conf.py

- OTT SW Migration: 16-port to 32-port
- Onyx to Cumulus
- Created on: 6/23/25

```
### update Mellanox Onyx to Cumulus
New default user/pw: cumulus / Cumu1usLinux!

### add the following exports within command line:
export MLNX1=10.20.62.126
export MLNX2=10.20.62.127
export MCIDR=24
export MGW=10.20.62.1
export CLUSTERNAME=VAST-FORTINET02
export UPLINKMTU=9216
export NTP1=208.91.112.63
export HOSTNAME=SW-FORT-A

### switch_conf.py file location:
cd ~/Documents/Customers/Fortinet/OTT/switch-conf-resources

### Command w/Options
python3 switch_conf.py cumulus --mgmt-ips $MLNX1,$MLNX2 --mgmt-subnet $MCIDR --mgmt-gateway $MGW --cnode-ports 1-12 --cnode-ports 17/2,18/2 --external-ports 29-30 --external-vlans 221+701+1811/trunk --ipl-ports 31,32 --cluster-name $CLUSTERNAME --mtu $UPLINKMTU --ntp $NTP1 --hostname $HOSTNAME

### File output notes:
Edit switchA.conf hostname to SW-FORT-A
Edit switchB.conf hostname to SW-FORT-B

### login via serial console (unconfigured switch)
Copy / Paste switch.conf file content to switch console
Run nv config apply -y & nv config save after conf competes successfully

### switch verification commands
nv config show
nv show int
date
ntpq –p
nv show mlag

### Apply --vxlan network setting to C & D Node (req. for Cumulus)
Add --vxlan flag and run configure_network via change_cn.sh
See procedure in appendix
```

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SW-Fort-A – switchA.conf

- Mellanox SN2700 – 32-port
- Cumulus ver. 5.11.1
- Deployed: 6/23/25

```
nv unset interface eth0 ip address dhcp
nv set interface eth0 ip address 10.20.62.126/24
nv set interface eth0 ip gateway 10.20.62.1
nv set interface eth0 ip vrf mgmt
nv set interface eth0 type eth
nv set bridge domain br_default vlan 69
nv set interface swp17,18 link breakout 2x
nv set interface swp1-12,swp17s0-1,swp18s0-1 bridge domain br_default
nv set interface swp1-12,swp17s0-1,swp18s0-1 qos pfc-watchdog
nv set interface swp1-12,17,18,swp17s0-1,swp18s0-1 type swp
nv set interface swp31,32 type swp
nv set interface swp29-30 type swp
nv set qos roce
nv set system hostname SW-FORT-A
nv set qos pfc-watchdog polling-interval 200
nv set qos pfc-watchdog robustness 5
nv set interface peerlink bond member swp31
nv set interface peerlink bond member swp32
nv set interface peerlink type peerlink
nv set mlag mac-address 44:38:39:ff:22:86
nv set mlag backup 10.20.62.127 vrf mgmt
nv set mlag enable on
nv set mlag peer-ip linklocal
nv set bridge domain br_default untagged 10
nv set interface vlan221,701,1811 type svi
nv set bridge domain br_default vlan 221
nv set interface vlan221 vlan 221
nv set bridge domain br_default vlan 701
nv set interface vlan701 vlan 701
nv set bridge domain br_default vlan 1811
nv set interface vlan1811 vlan 1811
nv set interface vlan69 vlan 69
nv set interface bond1 bond member swp29
nv set interface bond1 bond member swp30
nv set interface bond1 bridge domain br_default
nv set interface bond1 bond mlag id 1
nv unset service ntp default
nv set service ntp mgmt server 208.91.112.63 iburst on

nv config apply -y
nv config save
```

SW-Fort-B – switchB.conf

- Mellanox SN2700 – 32-port
- Cumulus ver. 5.11.1
- Deployed: 6/23/25

```
nv unset interface eth0 ip address dhcp
nv set interface eth0 ip address 10.20.62.127/24
nv set interface eth0 ip gateway 10.20.62.1
nv set interface eth0 ip vrf mgmt
nv set interface eth0 type eth
nv set bridge domain br_default vlan 69
nv set interface swp17,18 link breakout 2x
nv set interface swp1-12,swp17s0-1,swp18s0-1 bridge domain br_default
nv set interface swp1-12,swp17s0-1,swp18s0-1 qos pfc-watchdog
nv set interface swp1-12,17,18,swp17s0-1,swp18s0-1 type swp
nv set interface swp31,32 type swp
nv set interface swp29-30 type swp
nv set qos roce
nv set system hostname SW-FORT-B
nv set qos pfc-watchdog polling-interval 200
nv set qos pfc-watchdog robustness 5
nv set interface peerlink bond member swp31
nv set interface peerlink bond member swp32
nv set interface peerlink type peerlink
nv set mlag mac-address 44:38:39:ff:22:86
nv set mlag backup 10.20.62.126 vrf mgmt
nv set mlag enable on
nv set mlag peer-ip linklocal
nv set bridge domain br_default untagged 10
nv set interface vlan221,701,1811 type svi
nv set bridge domain br_default vlan 221
nv set interface vlan221 vlan 221
nv set bridge domain br_default vlan 701
nv set interface vlan701 vlan 701
nv set bridge domain br_default vlan 1811
nv set interface vlan1811 vlan 1811
nv set interface vlan69 vlan 69
nv set interface bond1 bond member swp29
nv set interface bond1 bond member swp30
nv set interface bond1 bridge domain br_default
nv set interface bond1 bond mlag id 1
nv unset service ntp default
nv set service ntp mgmt server 208.91.112.63 iburst on

nv config apply -y
nv config save
```

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11

Switch Migration Procedure

- Working Session: 6/23/25
- Fortinet Lead: Mansoor Ahmad Baig
- Local SE: Elie Awaad
- Account SE: Ray Stamps
- SMEs: Madu, Casey, Marcus

```
### Pre-Staging Requirements
- Upgrade New switches to latest version of Cumulus (5.11.1 as of 6/23/25)
- Generate switch port map for cabling
- Generate switch.conf files using switch_conf.py (see above)
- Validate healthy cluster - ssh access to all nodes
- Confirm/Open Support Case with CS
- Create Event in Field Activity Calendar
- Notify / Coordinate with CoPilot CSM

### Switch Migration Procedure

## Manage Cluster Dependencies

# Deactivate Replication @ Source Cluster
VMS/Data Protection/Protected Paths, Select All, Right-click, Select Deactivate, Confirm

# Disable Call-Home
VMS/Settings/Call Home/Cloud, Toggle Enable to Disable, Save

### Set --vxlan flag - All Nodes

## Deactivate cluster / Enter Maintenance Mode
VMS/Infrastructure/Cluster, Right-click cluster, Select Deactivate, Confirm

# SSH to CNode1 - Tech or Mgmt Port

# Test SSH access / set DONT_RUN_LEADER on all CNodes / Verify
clush -g cnodes echo vast
clush -g cnodes 'touch /vast/data/DONT_RUN_LEADER'
clush -bg cnodes 'ls /vast/data/DONT_RUN_LEADER'

# Run Suicide command
vtool suicide

# Verify containers aren't stuck / confirm vms & leader don't exist
clush -ba "docker images -a"
clush -ba "docker ps -a"
find-vms
find-leader

# Cluster In Maintenance Mode

### Add and Apply --vxlan to configure_network on all nodes

## Pull & Save copy of configure_network settings from all nodes
clush -a "grep -a 'command' /vast/log/configure_network/configure_network.log | grep -a -v load-params-from-file | tail -1 | awk -F\': '{print \$NF}' > /tmp/change_cn.sh"

# Copy output to txt file

# Modify configure network file for all node to include vxlan

# Start screen on CNode1
sudo chmod 777 /run/screen
screen -S cn

# Append --vxlan
clush -a "sed -i 's/\t\$/ --vxlan/g' /tmp/change_cn.sh"

# Add sudo
clush -a "sed -i 's/^/sudo/' /tmp/change_cn.sh"

# Validate all files look correct
clush -a -L "cat /tmp/change_cn.sh"

### Apply configure_network - Run from CNode1

## Verify internal IPs use x.x.128
ip -br a | grep bond

# Run configure_network on all nodes except cnode1 (Confirm IP matches CNode1 bond IP captured above)
clush -a -x 172.16.128.1 "bash /tmp/change_cn.sh"

# Verify SSH access through Mgmt port on alternate CNode (other than CNode1)

# Restart SSH connection to CNode1

# Restart screen on cnode1 (IMPORTANT)
sudo chmod 777 /run/screen
screen -S cn

# Run configure_network on CNode1
bash /tmp/change_cn.sh

### Reboot all nodes
clush -a 'sudo shutdown -r +1'

### Move Cables over to new switches

## Verify access to all nodes

# Run A & B path validation scripts

echo `date` List switch name and IP addresses of all A side switches... ;
clush -Ba "dev=\$(ip a | egrep inet\ | egrep :[ab] | sort -t . -nk3 | tail -1 | awk '{print \$NF}' | awk -F: '{print \$1}') ; maddr=\$(ip a s \$dev | grep ether | awk '{print \$2}') ; [[ \$(sudo dmidecode | grep -A1 Chassis\ Information | grep -i Supermicro) ]] && dev=\$(ibdev2netdev | grep \$dev | awk '{print \$1}') ; sudo tcpdump -nn -v -i \$dev -s 1500 -c 1 -Z root ether proto 0x88cc and not ether host \$maddr 2>/dev/null | egrep 'System Name TLV|IPv4' | awk '{print \$NF}' | paste -sd ' '"

echo `date` List switch name and IP addresses of all B side switches... ;
clush -Ba "dev=\$(ip a | egrep inet\ | egrep :[ab] | sort -t . -nk3 | tail -1 | awk '{print \$NF}' | awk -F: '{print \$1}') ; maddr=\$(ip a s \$dev | grep ether | awk '{print \$2}') ; [[ \$(sudo dmidecode | grep -A1 Chassis\ Information | grep -i Supermicro) ]] && dev=\$(ibdev2netdev | grep \$dev | awk '{print \$1}') ; sudo tcpdump -nn -v -i \$dev -s 1500 -c 1 -Z root ether proto 0x88cc and not ether host \$maddr 2>/dev/null | egrep 'System Name TLV|IPv4' | awk '{print \$NF}' | paste -sd ' '"

### Bring up cluster

# Remove DONT_RUN_LEADER file from all CNodes
clush -g cnodes 'rm /vast/data/DONT_RUN_LEADER'
clush -bg cnodes 'ls /vast/data/DONT_RUN_LEADER'

# Confirm VMS & Leader start-up
find-vms
find-leader

## Activate cluster
VMS/Infrastructure/Cluster, Right-click cluster, Select Activate, Confirm

# Activate Replication @ Source Cluster
VMS/Data Protection/Protected Paths, Select All, Right-click, Select Activate, Confirm

# Enable Call-Home
VMS/Settings/Call Home/Cloud, Toggle Disable to Enable, Save
```

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12

Report Links:

Fortinet Expansion - Ottawa

https://vastdata-my.sharepoint.com/:b:/g/personal/ray_stamps_vastdata_onmicrosoft_com/EbNdBOxGbZdHiSibsoQy7oUBTB11GmtkELu2txI_ShmTLQ?e=bGdPQR Connect your OneDrive account

Fortinet Expansion - Vancouver (Burnaby)

https://vastdata-my.sharepoint.com/:p:/g/personal/ray_stamps_vastdata_onmicrosoft_com/EVCYEcpyOxRJuWycSG5MnRoBcwQEfT-UBp86mjY1kTpLXw?e=eWbFXo Connect your OneDrive account

Cerebras Installation - OKC

https://vastdata-my.sharepoint.com/:p:/g/personal/ray_stamps_vastdata_onmicrosoft_com/EdrgmtQRH9dAvZgcvxsYKAQBfrJXzTWzpA8UGZPHOYthTQ?e=2sdOss Connect your OneDrive account

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Review API documentation:

https://10.143.11.204/docs/en/index-en.html

Vast Support Portal

Review monitor data:

https://monitor.vastdata.com/d/-MwXN3SWz/system-report?orgId=1&var-psnt=VA251913658

Review deployment scripts:

Review Install Plan - HERE

Expansion Plan - HERE

Review Slack channel content:

Cerebras EKM Redeployment

External - https://vastsupport.slack.com/archives/C08NT1HH6Q0 Connect your Slack account

Internal - https://vastdata.slack.com/archives/C099RR1FHGF Connect your Slack account

SSP1 - Cerebras-OKC-2x2-IL-Ceres-April-2025-SiteSurvey-Part1-Opp-13658-v26.1.1-OOB1

SSP2 - Cerebras-OKC-2x2-IL-Ceres-April-2025-SiteSurvey-Part2-Opp-13658-v26.1.1-OOB1

Install Plan - Cerebras-OKC-2x2-IL-Ceres-April-2025-SiteSurvey-Part2-Opp-13658-v26.1.1-OOB1

Fortinet Expansion (VAN)

External - https://vastsupport.slack.com/archives/C05KVSHKP7E Connect your Slack account

Internal - https://vastdata.slack.com/archives/C096DK0TE6Q Connect your Slack account

SSP1 - Fortinet-VAN-2x3-Expansion-IL-Ceres-April-2025-SiteSurvey-Part1-Opp-14007-v26.1.1-OOB1

SSP2 - Fortinet-VAN-2x3-Expansion-IL-Ceres-April-2025-SiteSurvey-Part2-Opp-14007-v26.1.1-OOB1

Install Plan - Fortinet - VAN - 3x2 IL/Ceres Expansion Plan 07/2025