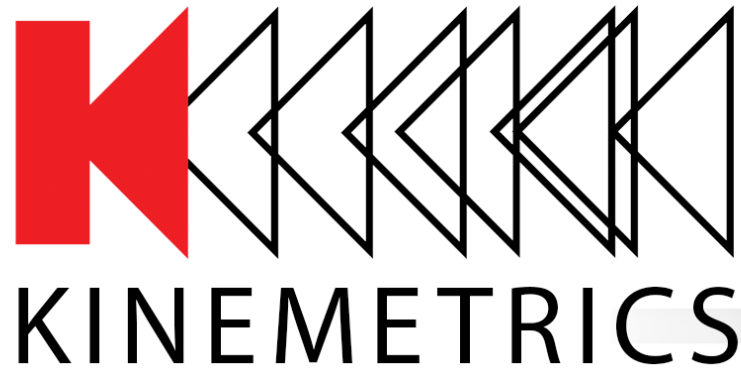




Advancement through Innovation

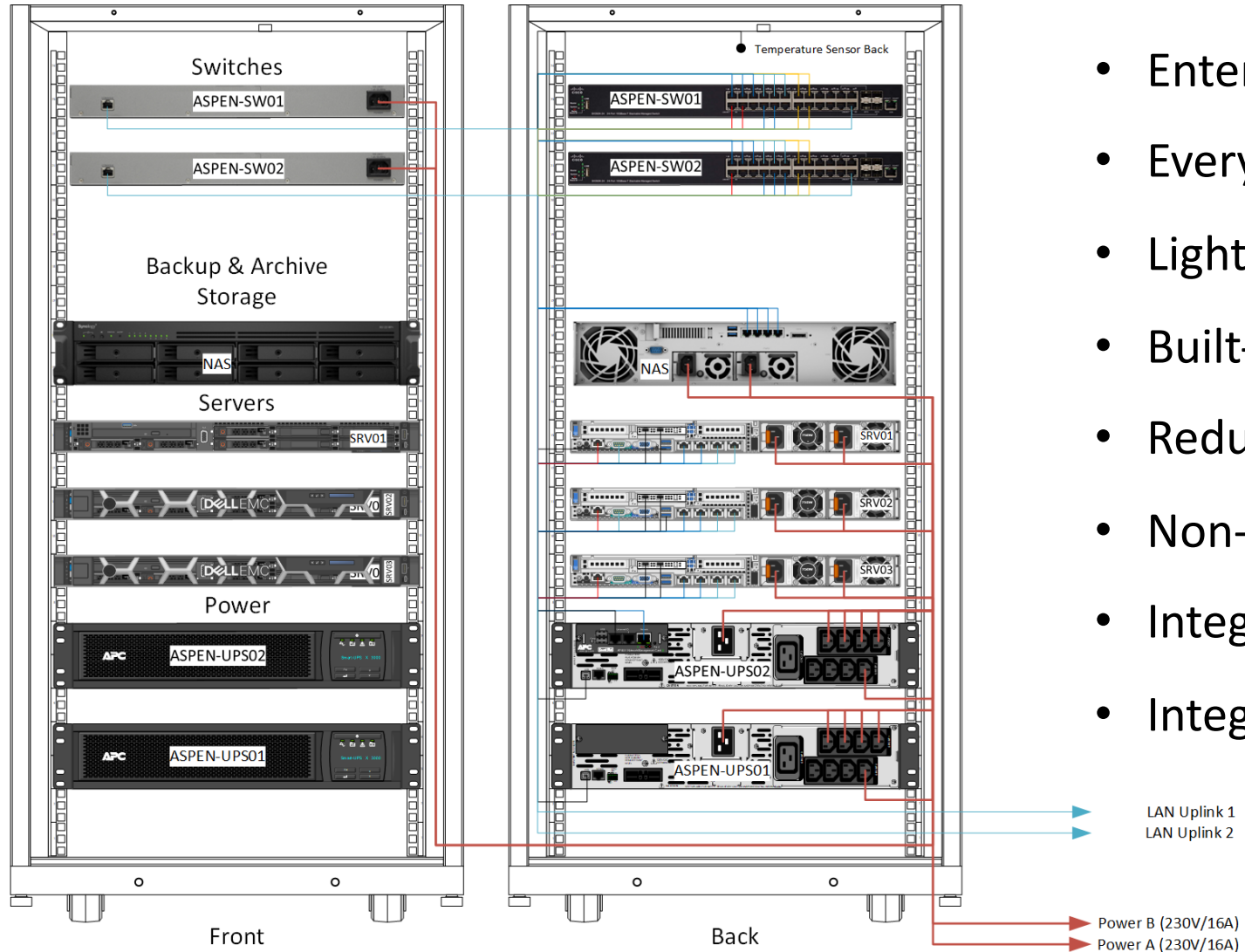
www.kinematics.com

HCI/HA Cluster for Antelope with Proxmox VE and Ceph

Antelope User Group, Vienna, June 5-7, 2023

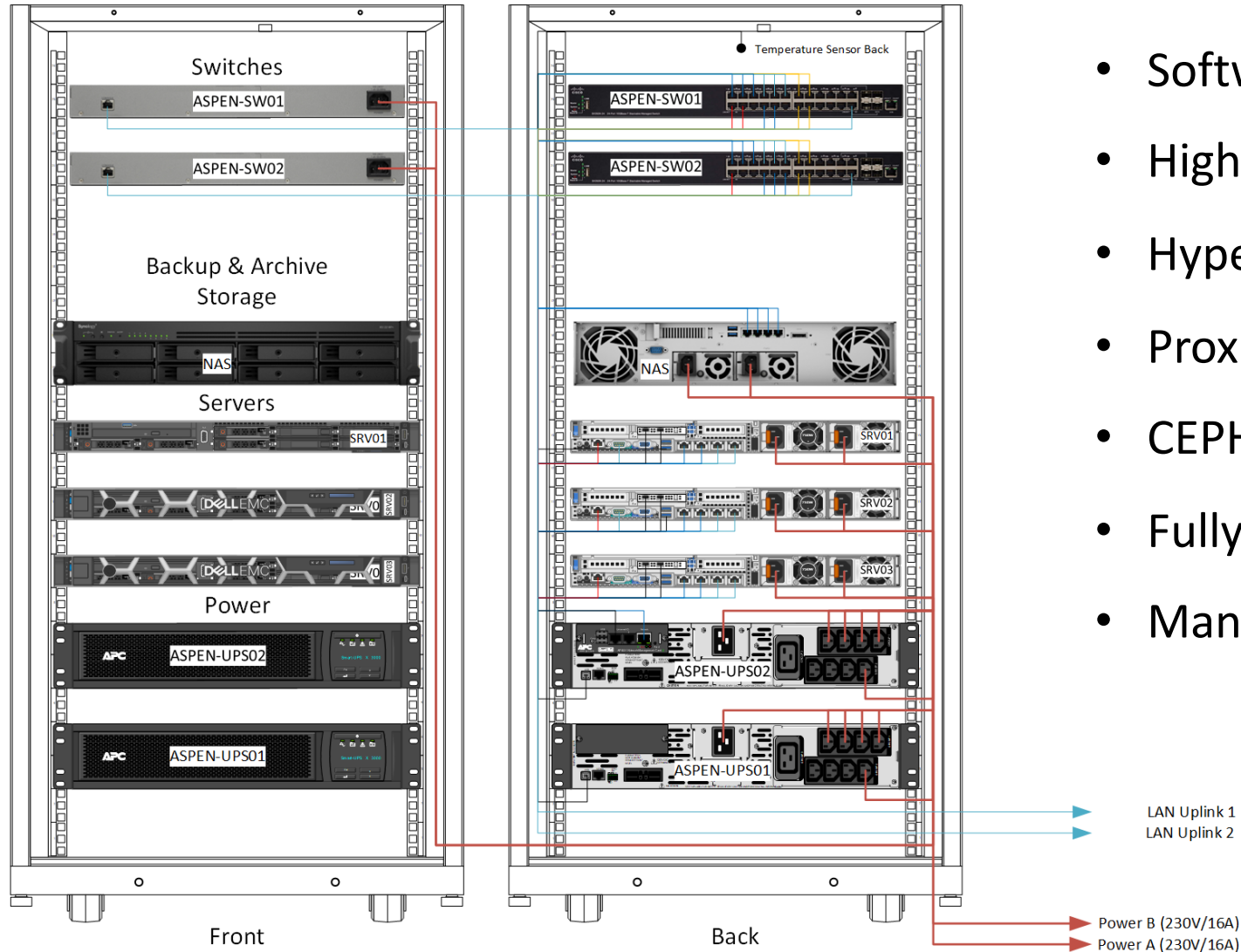
Stefan Radman, Senior ICT Engineer, Open Systems and Services

High Availability Aspen Data Center



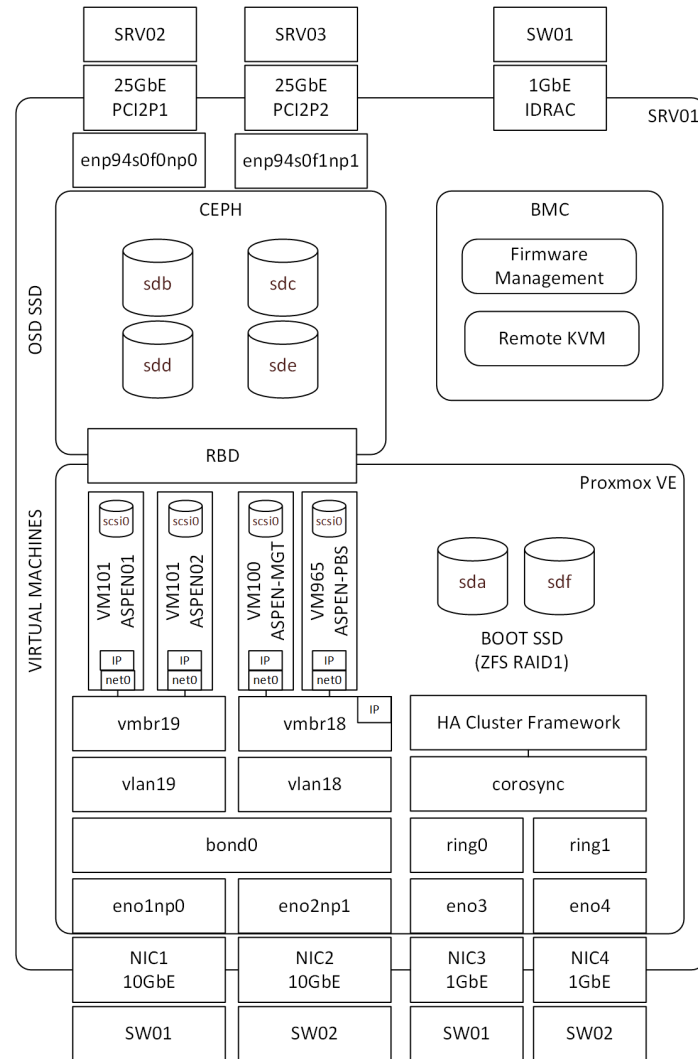
- Enterprise hardware (COTS)
- Every box and cable labeled
- Lights-Out Management
- Built-in Fault Tolerance
- Redundant Power
- Non-Stop Operation 24/7/365
- Integrated Power Monitoring
- Integrated Backup & Archive

High Availability Aspen Data Center



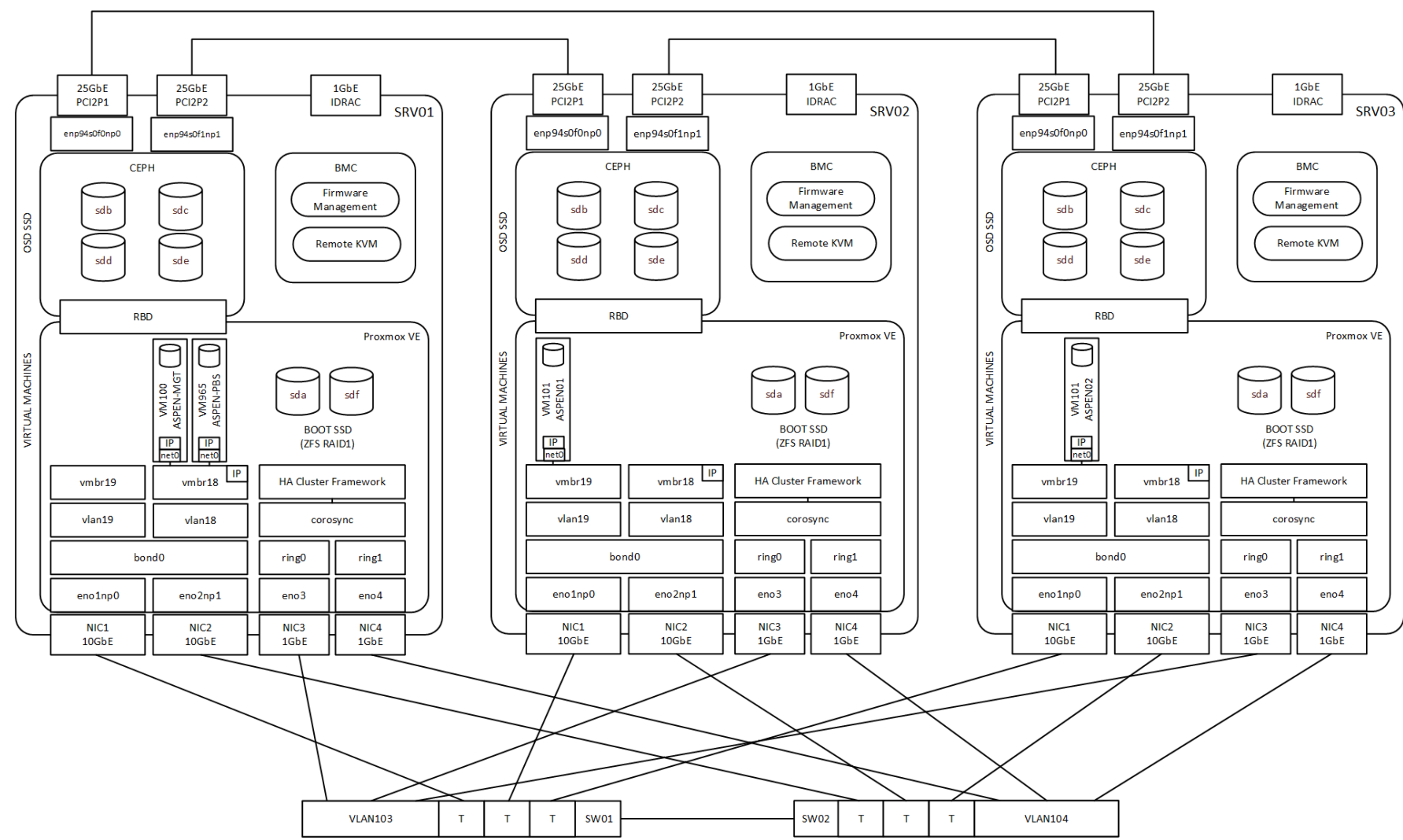
- Software-defined Datacenter
- High-Availability Architecture
- Hyperconverged Infrastructure (HCI)
- Proxmox VE
- CEPH Storage
- Fully virtualized
- Managed over IP

Cluster Node Architecture

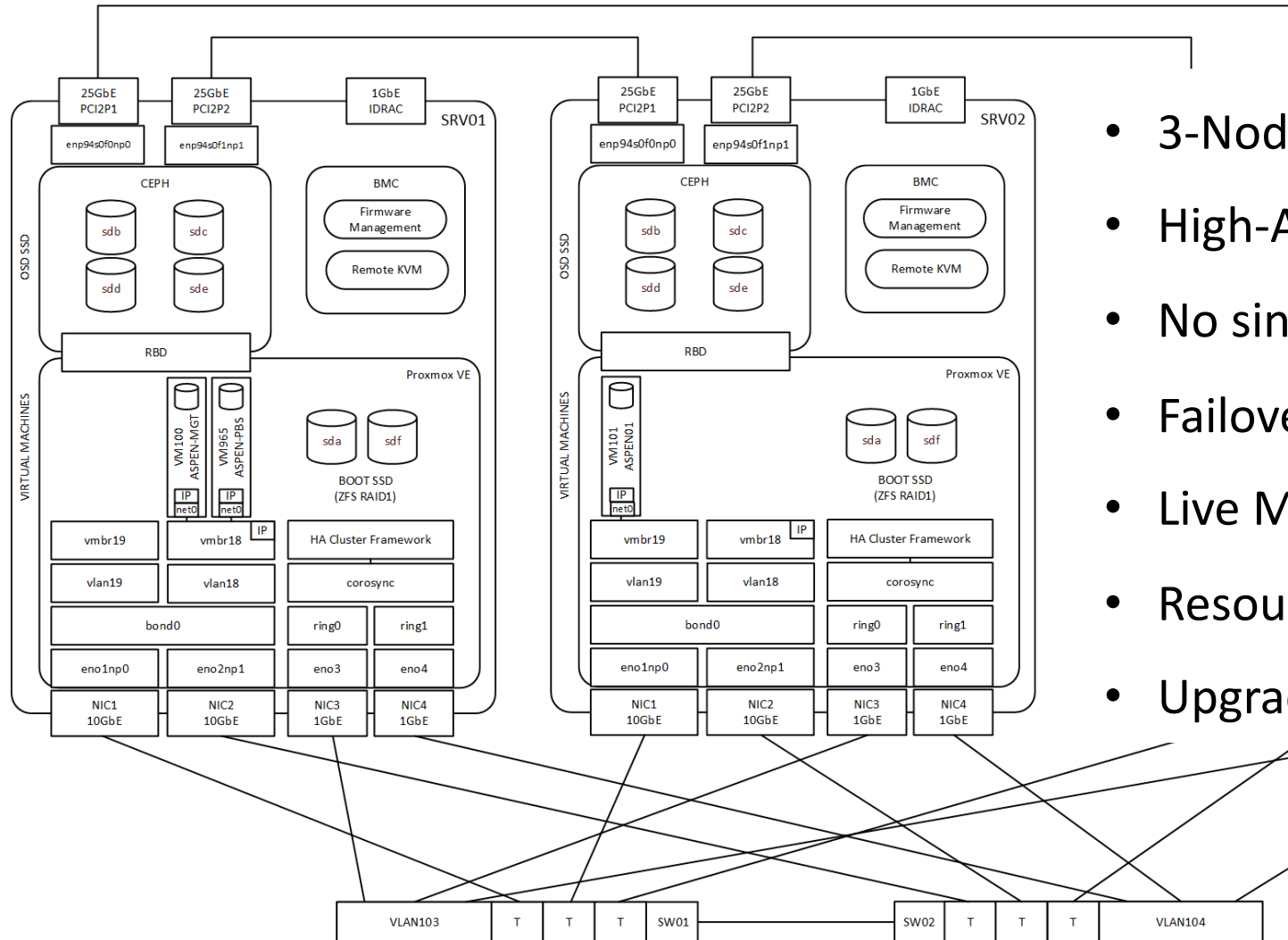


- Proxmox VE
- Hyperconverged Infrastructure (HCI)
- CEPH Storage (SSD)
- Redundant Boot SSD
- Redundant Network Interfaces
- Fully virtualized
- Managed through Web Browser
- Remote Control
- Integrated Backup
- Live Restore

HCI/HA Cluster Architecture



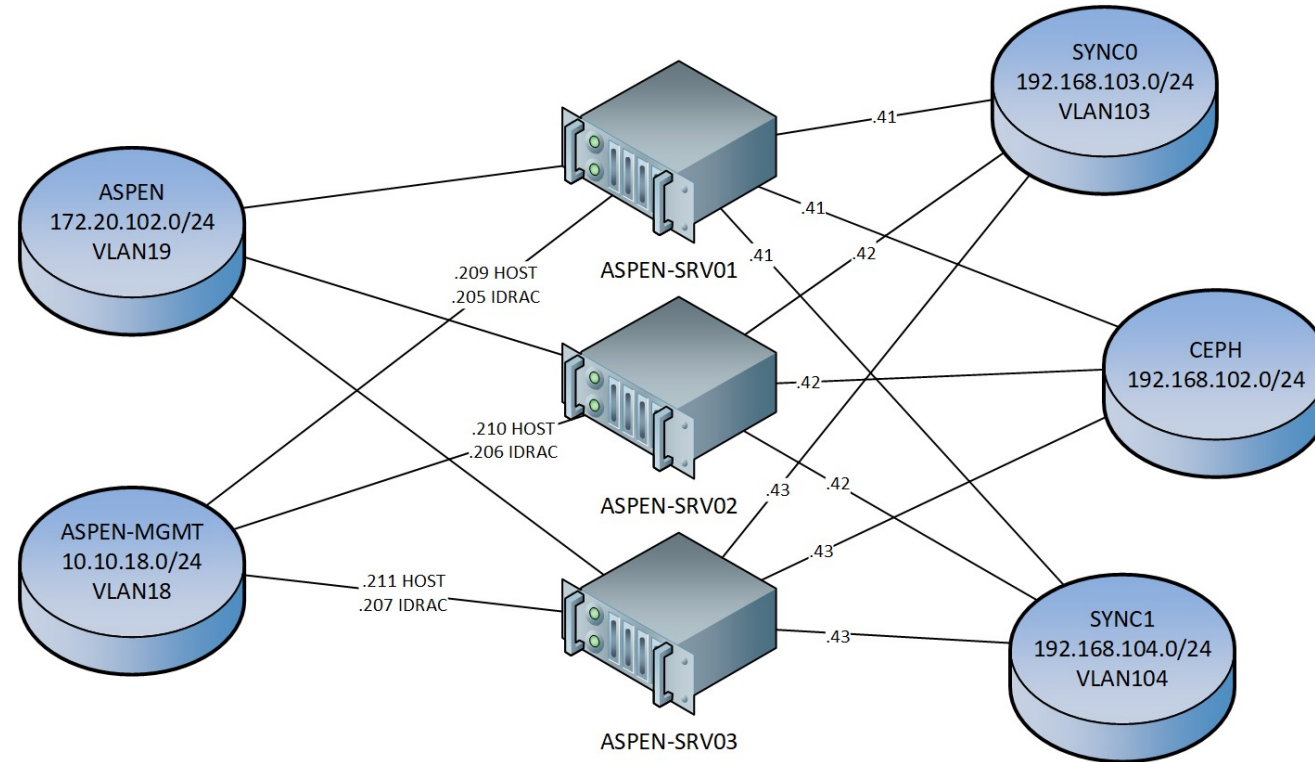
HCI/HA Cluster Architecture



- 3-Node HA Cluster
- High-Availability Architecture
- No single point of failure
- Failover
- Live Migration
- Resource Management
- Upgrades without downtime

High Availability Data Center

- Functional Partitions
- Failure Domains
- Redundancy
- Resilience
- Fault Tolerance



High Availability Aspen Data Center

PROXMOXVirtual Environment 7.2-11

DocumentationCreate VMCreate CTroot@pam

Server View

Datcenter

Search

SummaryNotesClusterCephOptionsStorageBackupReplicationPermissionsUsersAPI TokensTwo FactorGroupsPoolsRoles

Health

Status

Nodes

Ceph

Cluster: Aspen, Quorate: Yes

Online: 3
Offline: 0

HEALTH_OK

Resources

CPU

Memory

Storage

3%
of 144 CPU(s)

33%
123.89 GiB of 376.55 GiB

21%
7.42 TiB of 35.49 TiB

Guests

Virtual Machines

LXC Container

Running: 4
Stopped: 0

Running: 0
Stopped: 0

Nodes

Name	ID	Online	Support	Server Address	CPU usage	Memory usage	Uptime
pve1	1	✓	Community	10.10.18.10	3%	32%	235 days 00:43
pve2	2	✓	Community	10.10.18.11	4%	33%	235 days 00:26
pve3	3	✓	Community	10.10.18.12	2%	34%	235 days 00:07

Tasks

Cluster log

Start Time	End Time	Node	User name	Description	Status
May 30 05:26:23	May 30 05:26:27	pve3	root@pam	Update package database	OK
May 30 04:42:17	May 30 04:42:21	pve1	root@pam	Update package database	OK
May 30 04:23:38	May 30 04:23:42	pve2	root@pam	Update package database	OK
May 30 00:00:08	May 30 00:03:01	pve2	root@pam	VM/CT 101 - Backup	OK

Aspen Datacenter

ASPEN-UPS02ASPEN-SW01ASPEN-SW02ASPEN-SRV01ASPEN-SRV02ASPEN-SRV03ASPEN-NASPVE1PVE2PVE3PBSUPS02

Schneider Electric

UPS Network Management Card 3

Smart-UPS Application

EcoStruxure IT

No Alarms

Home

Status

Control

Configuration

Tools

Logs

About

UPS Status

Smart-UPS X 3000

Last Battery Transfer

UPS battery test

Runtime Remaining

57minutes 3second

Battery Temperature

31.8°C

UPS Input

Input Voltage

213.3 VAC @ 60.0 Hz

UPS Output

Output Voltage

213.3 VAC @ 60.0 Hz

Output VA

19.3 VA

Output Efficiency

92.7 %

Battery Status

State of Charge

100.0 %

Num of External Batteries

0

Load Current

2.7 Amps

Output Watts

16.3 W

Output Energy Usage

4393.33 kWh

Battery Voltage

134.9 VDC

Next Battery Replacement Date

2038-03-18

UPS Network Management Card 3

IDRAC9 | Enterprise

DashboardSystemStorageConfigurationMaintenanceIDRAC Settings

Dashboard

Graceful shutdownLED OnMore Actions

Health Information

SYSTEM IS HEALTHY

System Health

Healthy

Storage Health

Healthy

System Information

Power State

ON

Model

PowerEdge R640

Host Name

SRV1

Operating System

Operating System Version

F6Y1PF3

BIOS Version

2.15.1

IDRAC Firmware Version

5.10.50.00

IP Address(es)

10.10.18.6

IDRAC MAC Address

b07b25c03404

License

Enterprise

Task Summary

Pending Jobs: 0

No Pending Jobs

In-Progress Jobs: 0

No In-Progress Jobs

Completed Jobs: 0

Recent Logs

Severity

Description

Date and Time

The power supplies are redundant.

Wed 03 Aug 2022 12:36:20

Virtual Console

Settings

Storage Manager

Overview

Storage

Storage Pool 1

Volume 1

HDD/SSD

Healthy

System is healthy.

Volume Usage

Volume 1

Storage Pool 1

2.7 TB / 14 TB

19%

Drive Information

ASPEN-NAS

Task Schedule

System Health

Healthy

System Health

Healthy

Server name

ASPEN-NAS

Bond 1

10.10.18.9

Uptime

235 day(s) 09:25:33

Storage

Volume 1 (Healthy)

2.7 TB / 14 TB

19%

Resource Monitor

CPU

4%

RAM

10%

Total

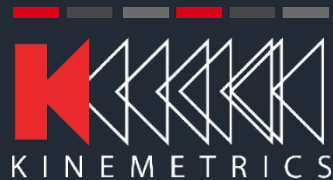
8.5 KiB / 1.8 KiB

Recent Logs





THANK YOU



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