Cisco TechClub webinář

Modernizace základů konvergované infrastruktury

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Agenda

MDS

- Přírůstky v portfoliu
- SW novinky

UCS X-Series

- Novinky
- Řešení nejen konvergovaná

MDS

Přírůstky v portfoliu

Cisco MDS 9000 Switch Family – Overview

SAN Directors

16/32/64G

MDS 9718 — 26RU — 768 ports
MDS 9710 — 14RU — 384 ports
MDS 9706 — 9RU — 192 ports

Modules

64G
48 x 64G FC

32G
48 x 32G FC

FCIP
24 x 16G FC, 8 x 1/10 GE & 2 x 40 GE

Fabric Switches

32G
MDS 9132T
MDS 9148T
MDS 9396T

16G
MDS 9148S
MDS 9396S

FCIP
MDS 9220i
MDS 9250i

All Certified NVMe/FC Switching and analytics

Legend
- 8/16/32/64G FC
- SAN Analytics
- FCIP
- 4/8/16/32G FC
- 2/4/8/10/16G FC
- FICON

Line-rate, non-blocking, non-oversubscribed, since 2013

MDS 9124V Overview

MDS 9124V Overview

- Fixed configuration: 24 x 64G FC line-rate ports
  - Port expansion through port-licensing from 8 → 16 → 24 port
  - 24 port active with 32/64G SW optics bundles available

- Dedicated Network Processor Unit for SAN Analytics

- 24000 buffer credits total, default 1000 and up to 16000 credits per single port

- Supports 8/16/32/64G FC speeds

- Supported SFPs: 64G SW, 32G FC SW/LW/ELW, 16G FC SW/LW/ELW

MDS 9124V Rear view

- Hot swappable, Field replaceable 500W PSUs with N+N redundancy

- Hot swappable, Field replaceable fan modules
  - 2 fan modules minimum
  - 4 fan modules for N+N redundancy

- Color coded FAN and PSUs:
  - Blue: Port side exhaust airflow
  - Red: Port side intake airflow

MDS 9148V Overview

MDS 9148T Overview

- Fixed configuration: 48x 64G FC line-rate ports
  - 24 active port with 8-port incremental license (24port → 32→ 40 → 48port)
  - 48 port active with 32/64G SW optics bundles available

- Supports 8/16/32/64G FC speeds

- Dedicated Network Processor for SAN Analytics

- 2x 24-port group, each 24000 buffer credits, default 1000 and up to 16000 credits per single port

- Supported SFPs: 64G SW, 32G FC SW/LW/ELW, 16G FC SW/LW/ELW

MDS 9148V Rear view

- Hot swappable, Field replaceable 500W PSUs with N+N redundancy

- Hot swappable, Field replaceable fan modules
  - 2 fan modules minimum
  - 4 fan modules for N+N redundancy

- Color coded FAN and PSUs:
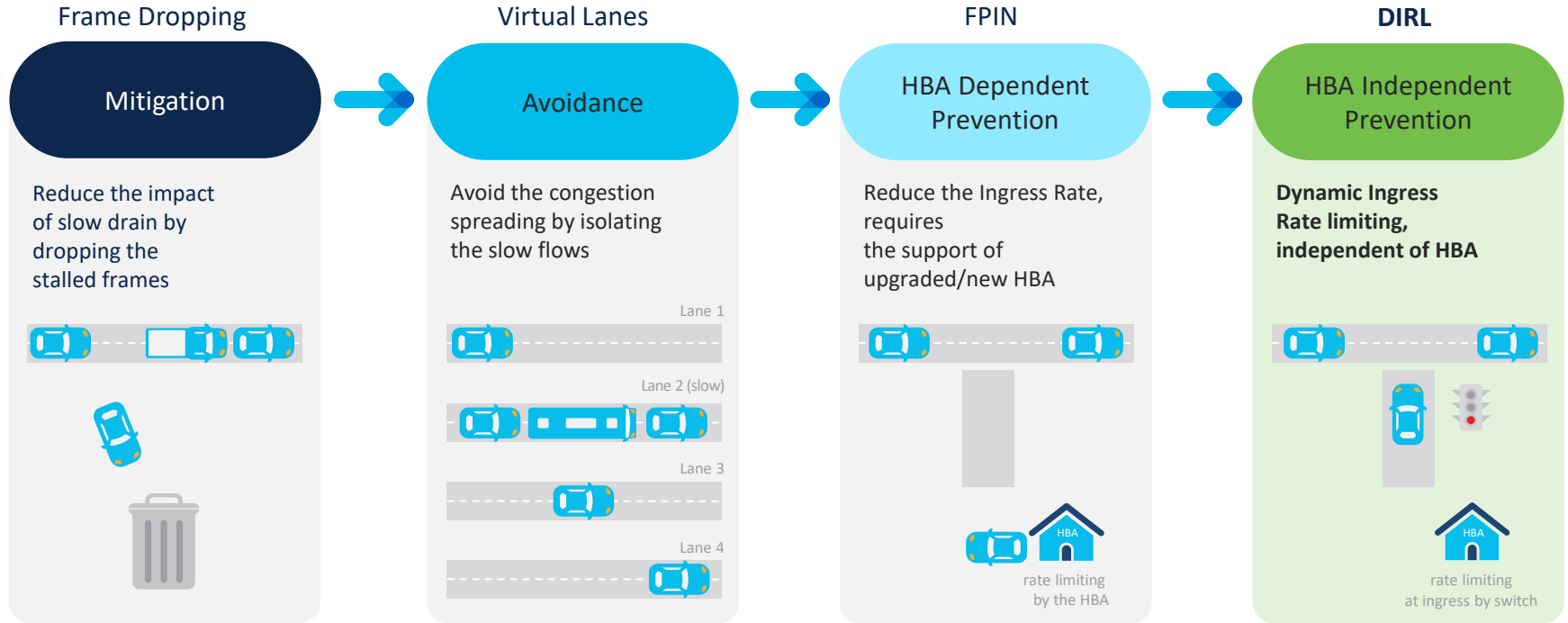 - Blue: Port side exhaust airflow
  - Red: Port side intake airflow

64G FC Fabric Switches: Quick Overview

Description	MDS 9124V	MDS 9148V
Max Port Density	24	48
Maximum Throughput	(24x64G) 1.5Tbps	(48x64G) 3Tbps
Port Upgrade Combination	8 → 16→ 24	24 → 32 → 40 → 48
Port Upgrade (expansion)	8-Port upgrade	8-Port upgrade
Form factor	1RU	1RU
PSU	500W	500W
Power Consumption with 64G Optics (<50% throughput)	146W	286W
Minimum NX-OS requirement	9.3(1)	9.3(1)
Weight (unpopulated)	18.73 lb. (8.5 kg)	21.8 lb. (9.9 kg)

MDS

SW novinky

Slow Drain – from mitigation to prevention

Frame Dropping

Mitigation

Reduce the impact of slow drain by dropping the stalled frames

Virtual Lanes

Avoidance

Avoid the congestion spreading by isolating the slow flows

Lane 1

Lane 2 (slow)

Lane 3

Lane 4

FPIN

HBA Dependent Prevention

Reduce the Ingress Rate, requires the support of upgraded/new HBA

rate limiting by the HBA

DIRL

HBA Independent Prevention

Dynamic Ingress Rate limiting, independent of HBA

rate limiting at ingress by switch

Prevent SAN Congestion with MDS DIRL – Cisco exclusive capability/patent

Nexus Dashboard Fabric Controller - SAN
Visibility & analytics with SAN Insights

Host and flow path visualization

- NDFC provides a view of the discovered hosts and end-to-end flows

- Path from source to destination shown in physical topology

- Provides information to show the congestion points in the path
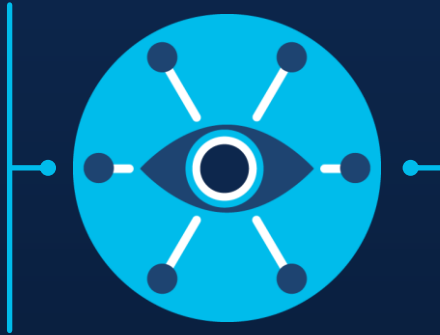
Auto learning

- NDFC aggregates hundreds of thousands of auto learned FC flows

- No need to program source and destination information or protocol type

- Integrates slow drain metrics from end-to-end

Benefits

High level of network visibility for diagnostics

Monitoring and management of SAN networks

What is Smart Licensing ?

- Smart Licensing is a **flexible software licensing model** that simplifies the way you activate and manage licenses across your organization.

- The Smart Licensing model makes it **easier to procure, deploy, and manage** your Cisco software licenses.
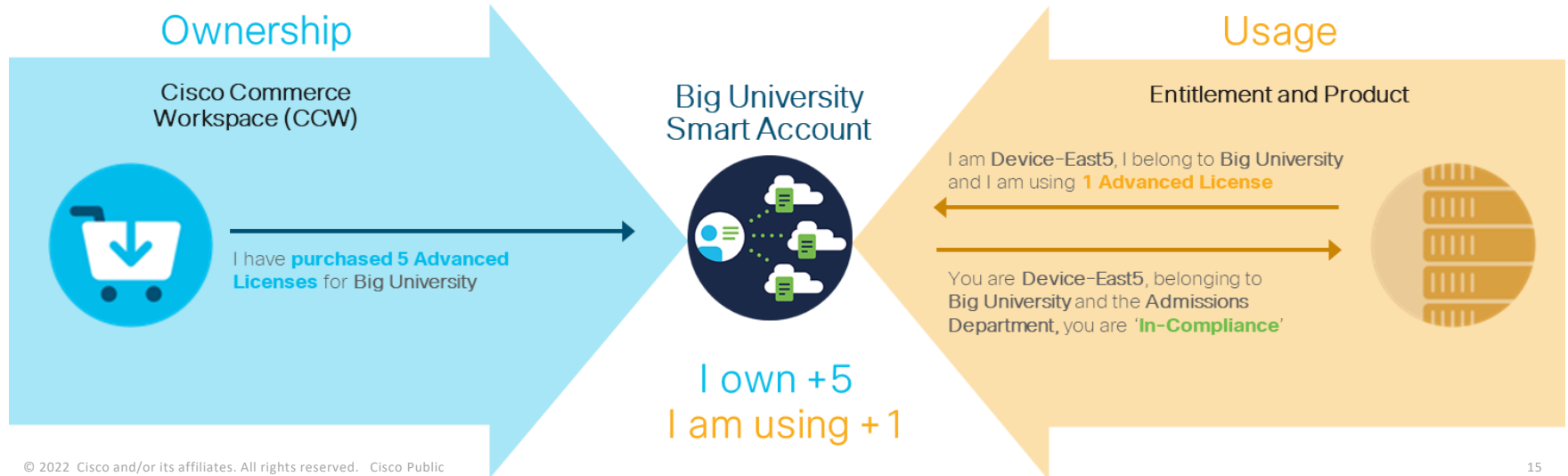
Classic vs. Smart Licenses

Classic Licenses

Limited View
Customers do not know what they own.

PAK Registration
Manually register each device. Unlock with license key.

Device-Specific
Licenses are specific to only one device.

License-Locked
You cannot use more than you paid for.

Smart Licenses

Complete View
Software and devices in easy-to-use portal.

Easy Registration
No PAKs. Easy activation. Ready to use.

Company-Specific
Flexible licensing. Use across devices.

License-Unlocked
Use what you need, when you need it.

Smart Licensing Deployment Options
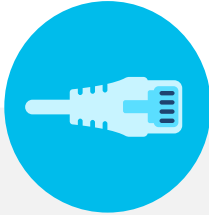
Direct
(Most Common)

- Cisco product sends usage information directly over internet
- Access with **Cisco Smart Software Manager (CSSM)**

On-Prem
(Optional)

- Usage information sent to a locally installed appliance
- Information exchange periodically with Cisco to keep in sync
- Access with **Cisco Smart Software Manager On-Prem**
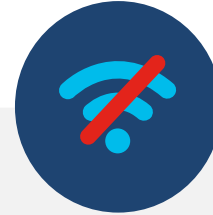
Offline
(Not Recommended)

- Use copy/paste information between product and Cisco.com to manually check licenses in & out
- Functionally equivalent to current node locking, but with Smart License tracking

https://www.cisco.com/c/en/us/td/docs/dcn/mds9000/sw/9x/configuration/licensing/cisco-mds-9000-nx-os-licensing-guide-9x/m_licensing_cisco_mds_9000_family_nx-os_software_features.html

MDS 9000 New Licensing

Advantage

1,3,5,7 Years

DCNM + Enterprise: Smart only Subscription based

Premier

1,3,5,7 Years

DCNM + Enterprise + SAN Analytics: Smart only Subscription based

Port Expansion

Node Locked Smart only Perpetual

FICON

Smart only Subscription based

9220i Upgrade

Node Locked Smart only Perpetual

UCS X-Series

Novinky

Hybrid cloud infrastructure for the coming decade – launched June 2021

Simplify with cloud-operated infrastructure

Simplify with a system designed for traditional & modern applications

Simplify with a system engineered for the future

CISCO INTERSIGHT

UCS X-Series

600+	~100TB	48M	~1.0 PB
Cores	Memory	IOPS	Storage

2030+

Liquid-cooling

Silicon photonics

Future fabrics ready

Power-hungry processing

2021

The Follow On March 2022 Launch

**PCIe Nodes
with UCS X-Fabric**

PCIe Node 1
PCIe Node 2
PCIe Node 3
PCIe Node 4

Run any app with adaptable system

**5th Gen
Unified Fabric**

5th Gen FI
100G

100G IFM

5th Gen VIC
2 x 100G Ports

1 VIC = 2x 10G + 2x 16G FC OR
        = 2x 10G + 2x 32G FC OR
        = 2x 25G + 2x 16G FC OR
        = 2x 25G + 2x 32G FC (OS)   X 2

Bandwidth for today and the future.
Adapter Reduction

**Cisco UCS X210c
compute node with
integrated GPUs**

Run more apps in less space

All these products shipping now!!!

UCS X-Fabric Technology and PCIe Nodes with GPU

PCIe node supports Nvidia GPUs:

- 2 x A16
- 2 x A40
- 4 x T4
- 2 x A100-80G

PCIe Node 1
PCIe Node 2
PCIe Node 3
PCIe Node 4

CISCO INTERSIGHT

X-Fabric
X-Fabric

UCS X-Fabric Technology
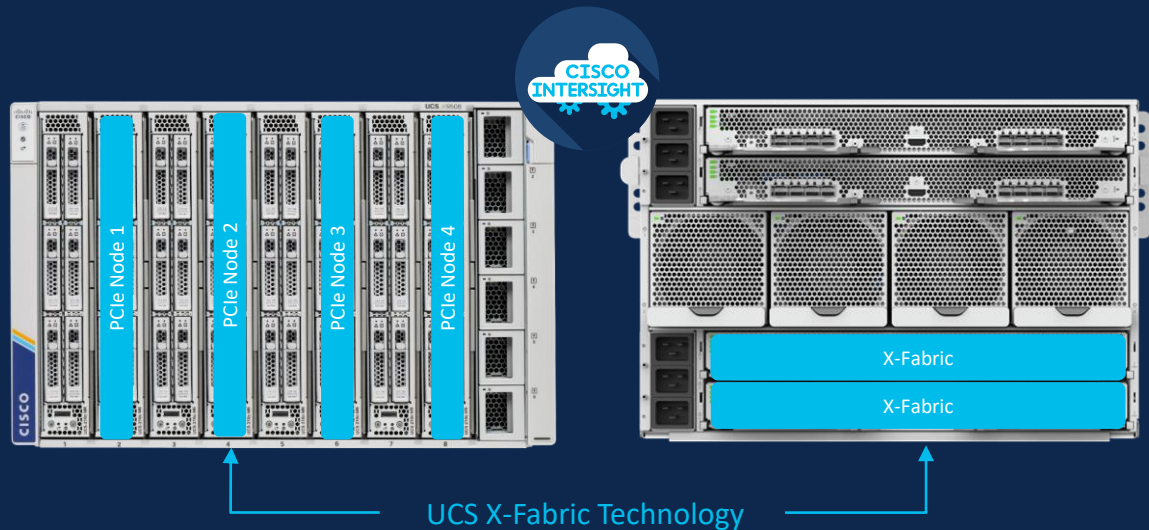
✓ Based on native PCIe Gen. 4

✓ Provides GPU acceleration to enterprise application

✓ No backplane or cables = Easily upgrades

X440p PCIe Node

- The X440p PCIe node provides 2 or 4 PCIe slots connected to an adjacent compute node

- Includes two riser cards, type A or B

- Riser A – Up to two dual width GPUs
  - **A16, A40, or A100**
- Riser B – Up to four single width GPUs
  - **T4**

- No mixing of GPU models on a server
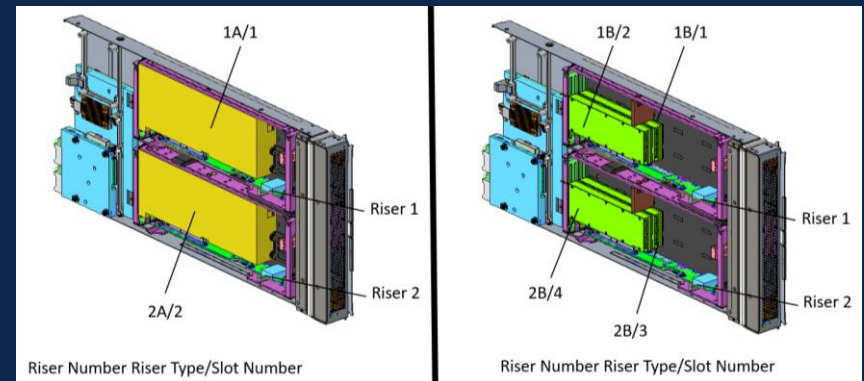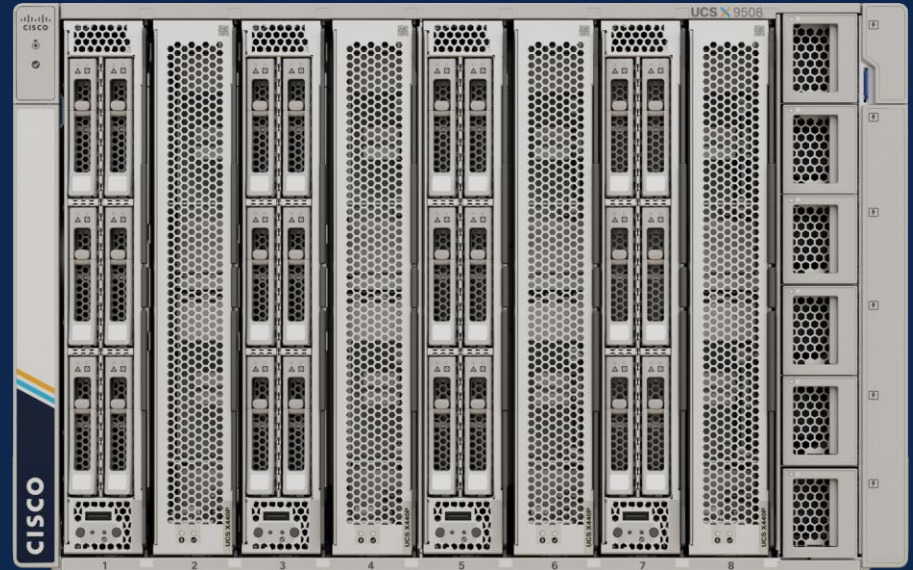
GPU on X210C

- 2x T4 (with modified heat sink) in the front mezz slot

- Supports 2x NVME drives

- High GPU density solution with GPU node (24xT4 in 7RU with 4 nodes)
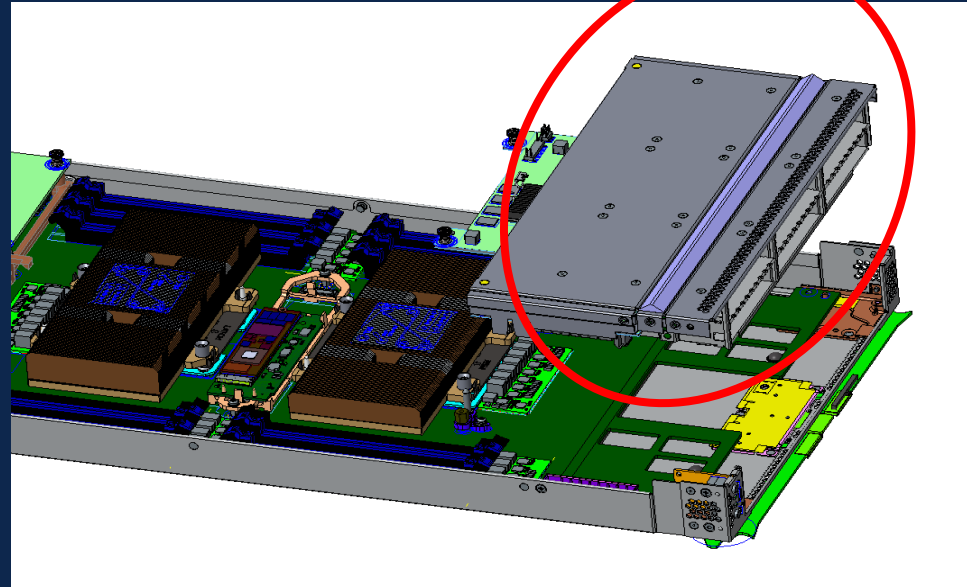
5th Generation UCS Fabric with Intersight Managed Mode

Simplify
Cloud-operated infrastructure management
Reduces adapters, cables, Switches, power
Lowers server and network TCO
One VIC replaces multiple NICs, HBAs, and Mgmt adapters

Scalable and Resilient
Converged fabric for modern applications
Single-fabric for Mgmt, Data, Storage (FC, iSCSI, NFS/SMB, NVMeOF-ROCEv2, NVMEoF/FC, NVMeOF/TCP)
Flexible Blade/Rack connectivity at 10/25/40/100-Gbps

Future-ready
Industry-first End-to-End 100G fabric for blades
Enables High N/W workloads (BigData, SDS, HCI, CloudNative etc)
Single-flow 32G FC and 100G Ethernet
14.8 Tbps bandwidth per UCS domain
1.6 Tbps bandwidth per X9508 Chassis
Cost optimized sustainable fabric

<u>FCS</u> : July 2022
IMM bundle : 4.2(2a)

CISCO INTERSIGHT

6536 Fabric Interconnect

9108-100G IFM

VIC 15000 Series

Comparing 4th Gen and 5th Gen FI Licensing

4th Gen FI / 6400 Series

Pricing Model

Two Components
- Base HW Purchase (20 port default license)
- Add-on Port licenses

Port based licensing. Host attach to licensed ports

Port license price based on port type, host type etc.

PAK licensing: Bound to FI serial number, tied to FIs

5th Gen FI / 6500 Series

Pricing Model

Two components
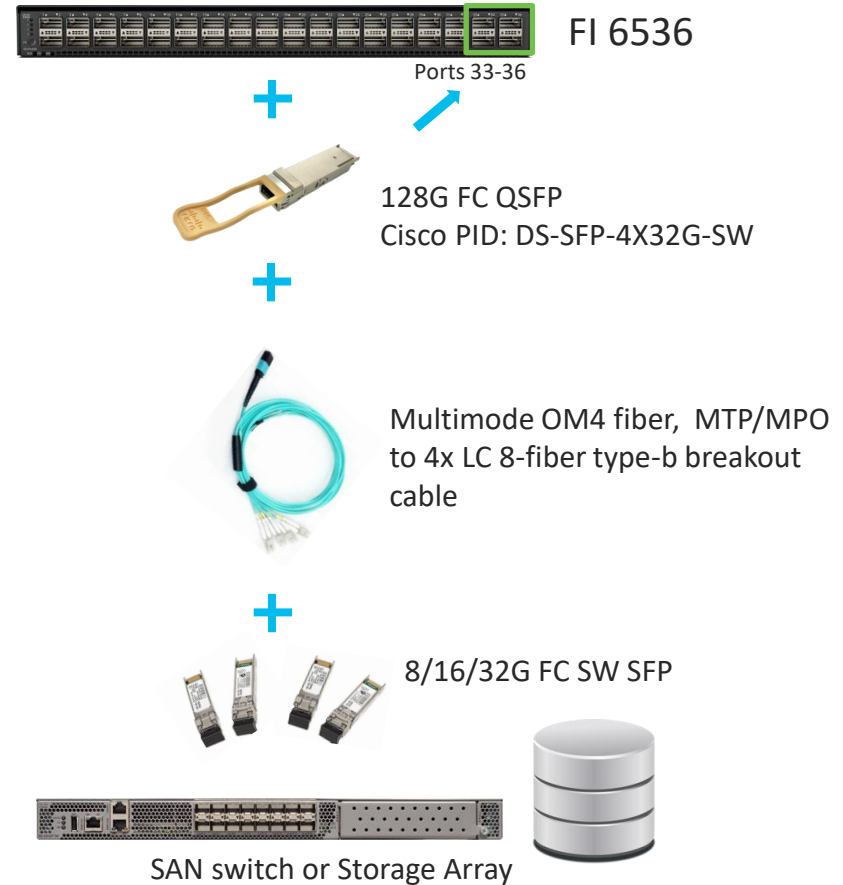- Base HW Purchase
- Mandatory term-based SW licenses [Term 36-60 months]

All ports included in SW license. Host attach to any port

License price depends only on term of usage.

Smart licensing: Transferable within same generation of FI

Fibre Channel Connectivity

FI 6536

Ports 33-36

128G FC QSFP
Cisco PID: DS-SFP-4X32G-SW

Multimode OM4 fiber, MTP/MPO to 4x LC 8-fiber type-b breakout cable

8/16/32G FC SW SFP

SAN switch or Storage Array

UCS X-Series With Intersight

Profiles/Workflow

AI AI/ML

Accelerated VDI
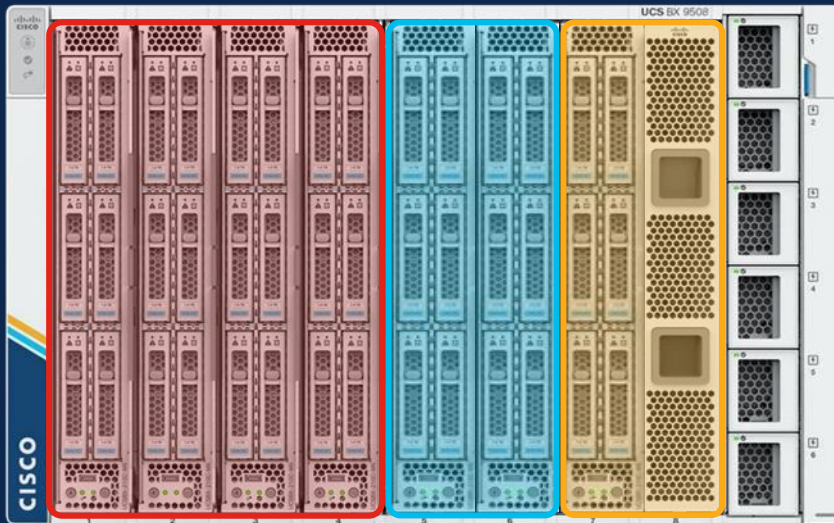
Big Data, SDS, Containers

+

Traditional Blade Workloads

UCS X-Series – 7 RU, 8 Nodes

New With March 2022 Announcement

600+	~100 TB	~1 PB 48 Drives	48M IOPs	~1600G	~100G	24
Cores	Memory	Storage	In a Chassis	Agg N/W in a Chassis	End-to-end	GPUs per Chassis

Unmatched Compatibility of 5th Generation Fabric

Cisco Intersight
Policy-driven Infrastructure Provisioning

Cisco UCS Fabric Interconnect
100GE unified fabric switch
7.4 Tbps bandwidth

Cisco UCS Fabric Extender
IFM-100G for 1.6 Tbps per X9508 Chassis
IFM-25G, IOM-2304/2408, FEX 93180YC-FX3

Cisco UCS I/O Adapters
VIC 1300/1400/14000/15000 Series

Cisco UCS X-Series Chassis
200G per x210c compute node
E2E 100G, 32G FC

Cisco UCS Blade and Rack Servers
Support for M5/M6 B-,C- Series
E2E 25/40/100G, 32G FC
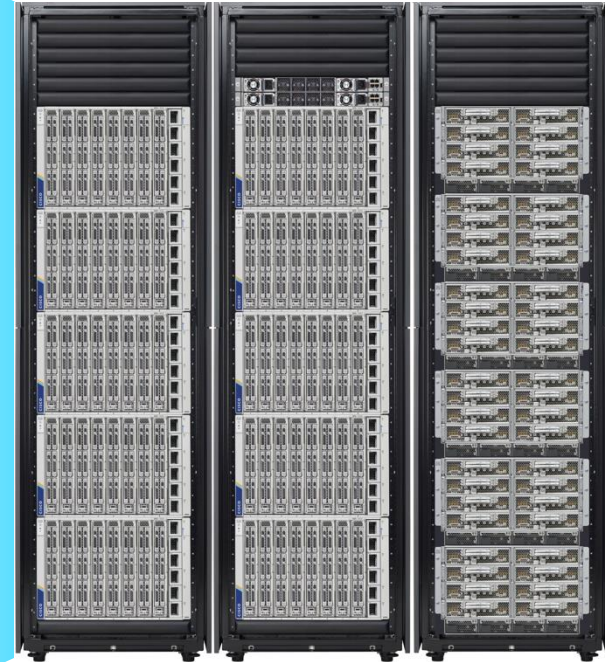
UCS X-Series

Řešení nejen konvergovaná

Cisco UCS X-Series
with FlexPod and FlashStack

Converged Infrastructure with X-Series– IP Design

FlexPod

FlashStack

Cisco UCSX-9508 Chassis
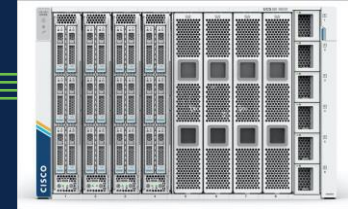- **Cisco UCSX 9108-100G**
- Cisco UCS X210c M6 with **Cisco UCS VIC 15231**

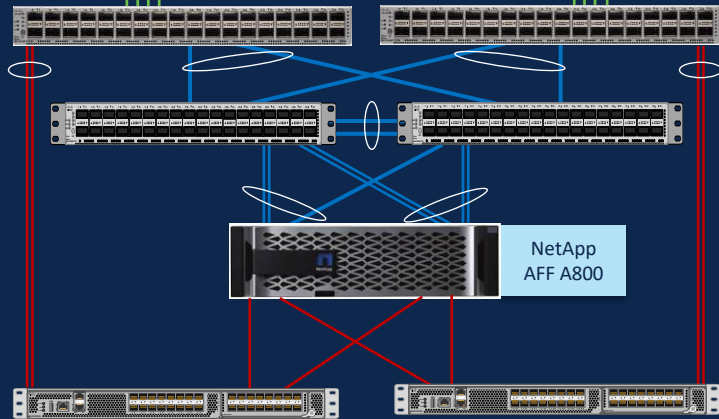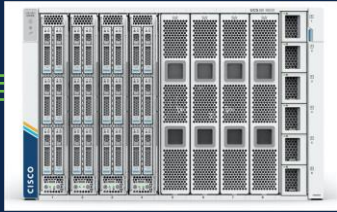**Cisco UCS 6536 Fabric Interconnect**

Cisco Nexus 9336C-FX2

iSCSI

NFS

NetApp AFF A800

iSCSI

Pure Storage FlashArray//XL
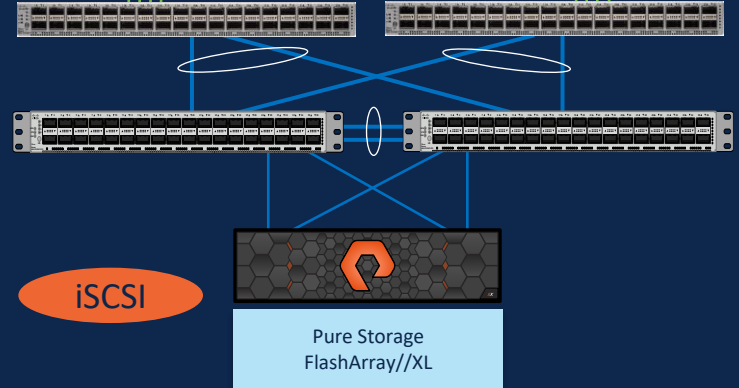
— 100 GE
— 100 GE

Converged Infrastructure with X-Series – FC Design

Cisco UCSX-9508 Chassis
- **Cisco UCSX 9108-100G**
- Cisco UCS X210c M6 with **Cisco UCS VIC 15231**

Cisco UCS 6536 Fabric Interconnect

Cisco Nexus 9336C-FX2

Pure Storage FlashArray//XL

NetApp AFF A800

FC   NFS

FC
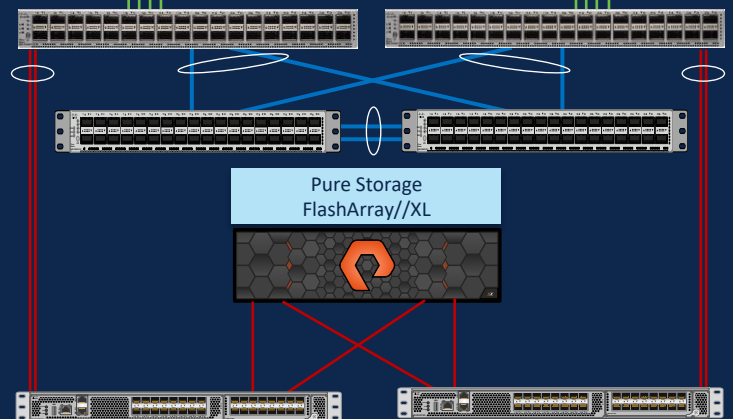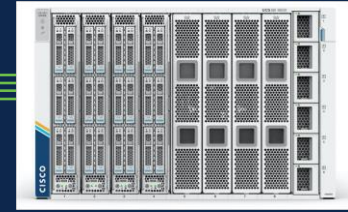
100 GE
100 GE
32Gbps FC

Data Protection – Cohesity

Modern Data Protection at the Speed of Flash

Fast Backup, Operational Recoveries and More across Hybrid Cloud

Apps, VMs, DBs

HyperFlex or Other Primary

Backup & Recovery

Cohesity Helios

Azure

aws

S3 / NFS Compatible Cloud

Cisco HyperFlex

Converged Infrastructure

UCS X-Series

Single Global Platform

One platform to protect, manage and extract value from data anywhere

Ease of Management

Day 0 and Day 1 deployment with Cisco Intersight

Native Cloud Integration

Leverage public cloud for data archival, replication and dev/test and enable flash-to-flash-to-cloud backup and recovery

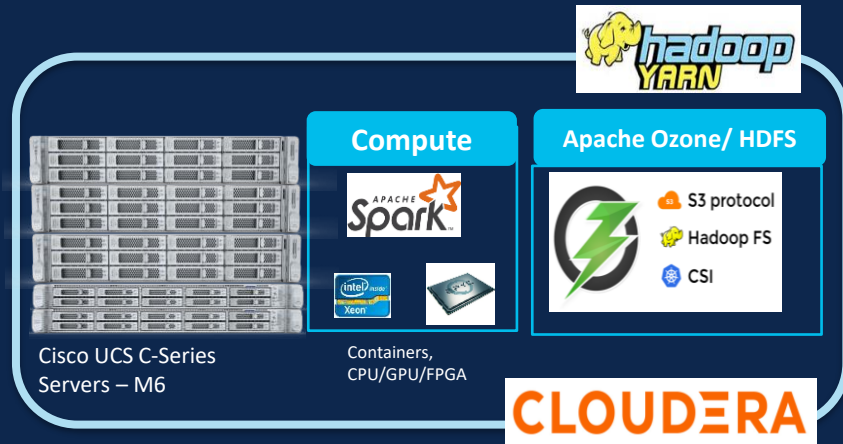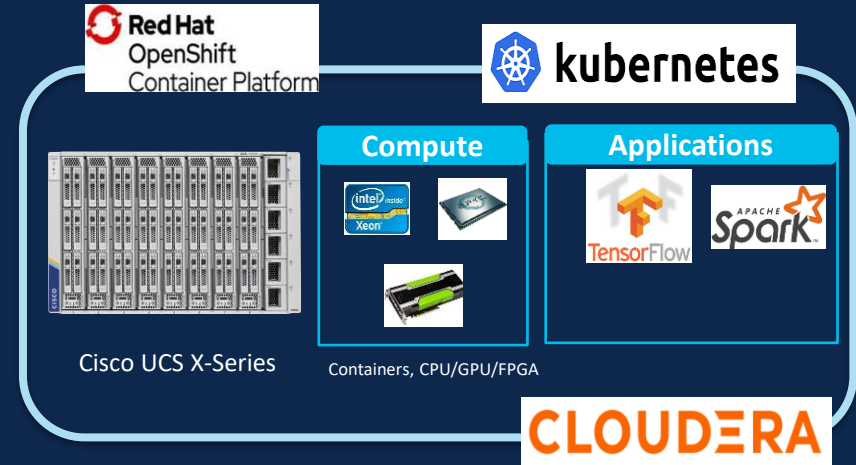# Cisco Data Intelligence Platform – C & X-Series

Data Lake (Hadoop)

Private Cloud

Data Intensive Workloads

Compute Intensive Workloads

Pre-validated
- Fully supported
- Architectural innovations with Partners

Centralized Management
- Infrastructure management

Scaling
- Independently scale storage and compute

World record performance
- TPCx-HS (20 plus)
- Proven linear scaling
- Only to publish 300 TB test

https://www.cisco.com/c/en/us/products/collateral/servers-unified-computing/ucs-c-series-rack-servers/data-intelligence-platform-cdip-so.html

UCS X-Series with Red Hat OpenShift and OpenShift Data Foundation

UCS X-Series with Red Hat OpenShift and OpenShift Data Foundation

- Cisco UCS X-Series connected to FI-6454 and managed by Intersight through IMM

- Configuration and deployment through Intersight Ansible

- Automated vSphere 7 and RHEL 8 install

- Preparation of all nodes through Ansible

- Install of OCP, Ceph, and ODF

- Performance tests

https://github.com/ucs-compute-solutions/UCSX_IMM_OCP_ODF
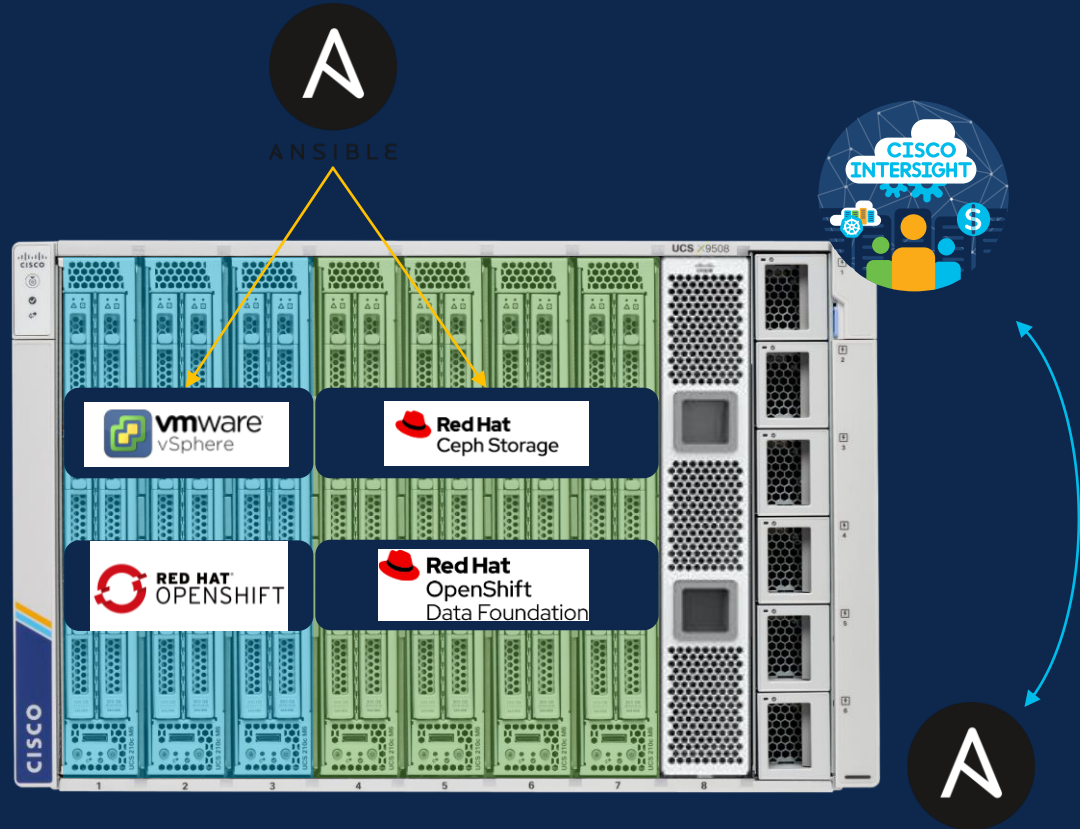
Shrnutí

Cisco SAN Innovation

MDS 9000 64G
Modular and Fixed
with NVMe Enhanced
SAN Analytics

Accelerating
SAN
Performance with
Adaptive SAN &
Congestion
Prevention

Next Gen SAN
Insights
with Nexus
Dashboard
Fabric Controller

UCS X-Series 5th gen Fabric Value

UCS-X with end-to-end 100G is the new standard

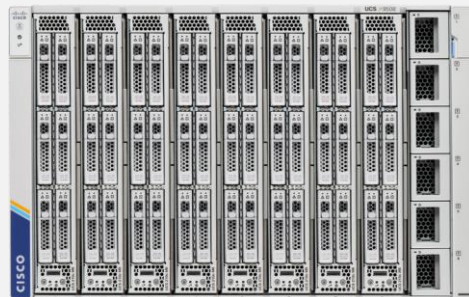Simplified management and automation of network infrastructure through Intersight

Bandwidth is not the only advantage – think about Sustainability, Future Readiness, etc.

With 5th Gen Fabric performance, any solution is possible.

CapEx and OpEx savings through 100G Unified Fabric

CISCO

The bridge to possible