Agenda list

1 MIG Portfolio Overview

2 New Hardware

3 400G Use Cases

4 Platform Implementation

5 Key Takeaways

MIG Portfolio Overview

MIG Routing & Optical Portfolio

CISCO 8000

400 GE
260Tb System
14.4T per Slot

NCS 5700

400 GE
153.6Tb System
9.6T per Slot

ASR 9000

400 GE
80Tb System
4.0T per Slot

NCS 500

10/25/100 GE
300GB System

IOS XR7

SR
EVPN

NCS 1000   **Optical Switches**   NCS 4000 & 2000

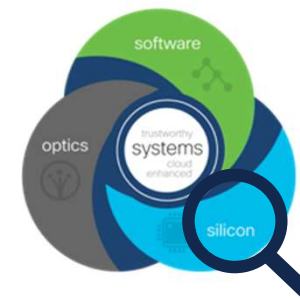**Optics Pluggables**

Management & Orchestration

Traditional and Flexible Consumption Models

NCS 55/57xx in Numbers

DC/Web OTT

Core/LSR

Aggregation

Peering

We leverage the best technology available to focus development on innovation

895
Customers

2015
Launched

1.3M
100GE Ports

54K
Systems

NCS 55/57xx
Innovations in Software, Hardware, and System Design

NCS55A1-24Q6H-S

NCS55A1-48Q6H

NCS 55A1-36H/SE

NCS 55A1-24H

NCS 55A2-MOD/HD/SE
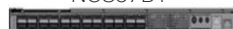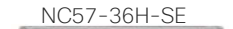
NCS 5501/SE

NCS 5502/SE

NCS 5504

NCS 5508

NCS57B1

NC57-24DD

NC57-36H-SE

NCS 5516

High density and low power
- Integrated forwarding and fabric interface
- Full portfolio breadth – 800G to 154Tb systems
- Modular and Fixed form factors

Feature parity among NCS 5500 systems

Base and Scale (external TCAM) options

IEEE1588, SyncE, GPS timing support

1/10/25/40/50/100/400GE interface support

IPoDWDM, 200G (CFP2 DCO)

MACSec Support

6

New 5700 Hardware

NCS 5700 – 400GE line cards

NC57-24DD (Base)

- Ideal for Core/LSR, DCI & Aggregation Hub roles

- 24x400G QSFPDD Base Line Card

- Flexible ports enabling 10GE (SFP+), 100GE (QSFP28), and 400GE (QSFP-DD)

- 9.6T line card with 2 Jericho2 NPUs (4.8T per J2)

- Support for ZR/ZR+ Optics

NC57-18DD-SE (Scale)

- Ideal for Peering

- 18 x 400G or 30 x 200G/100G Scale Line Card

- 100/200G/400G combination up to a maximum of 7.2T

- 7.2T line card with 2 Jericho2 NPUs (3.6T per J2)

- Next Generation **TCAM** for Lookup and Stats, (1 per J2)

- Support for ZR/ZR+ Optics

NC5700 – 100GE Line card

NC57-36H-SE

- 1x Jericho2
  - 36x 100 GE ports
  - 10G/25G Breakout options on even numbered ports
  - ZR Optics support
- Class B timing support on all ports
- Power (Max): 758W, 0.2 W/Gig

NCS-57B1 – Fixed Chassis

- 1x Jericho2, 4.8Tbps

- 1 RU fixed
  - 24X100G QSFP-DD, 6x400G QSFP-DD
  - 5x400G in –SE version
  - Support for ZR/ZR+ Optics

- Class C Timing, MACSec support
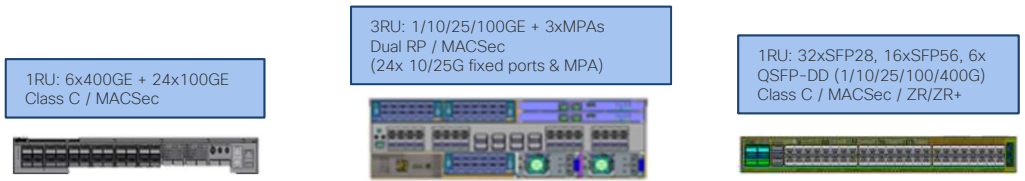
- On Early Orderability

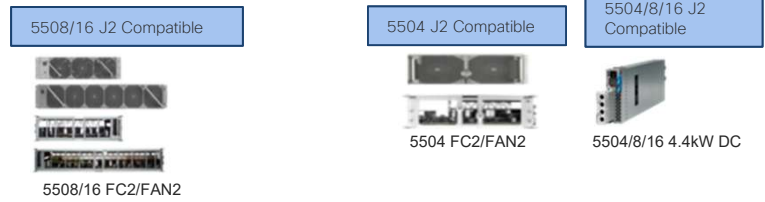

NCS-57B1-6D24
Base Variant
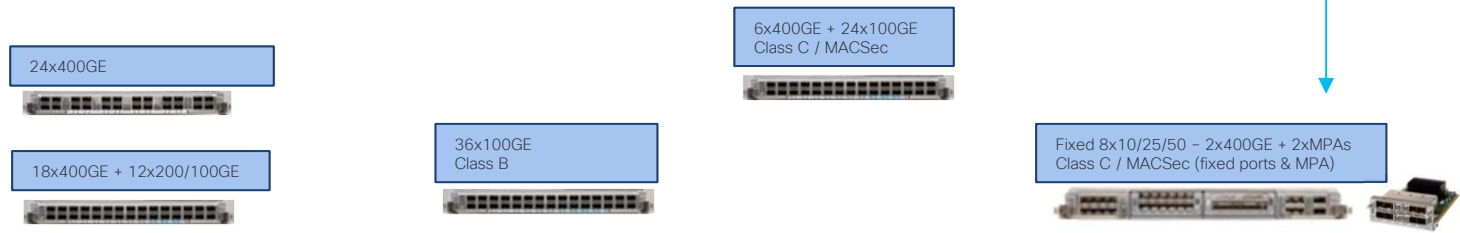

NCS-57B1-5DSE
Scale Variant

NCS 57xx (J2) HW Strategy

Fixed Routers

1RU: 6x400GE + 24x100GE
Class C / MACSec

3RU: 1/10/25/100GE + 3xMPAs
Dual RP / MACSec
(24x 10/25G fixed ports & MPA)

1RU: 32xSFP28, 16xSFP56, 6x
QSFP-DD (1/10/25/100/400G)
Class C / MACSec / ZR/ZR+

Modular Routers

5508/16 J2 Compatible

5508/16 FC2/FAN2

5504 J2 Compatible

5504/8/16 J2
Compatible

5504 FC2/FAN2

5504/8/16 4.4kW DC

Line Cards

24x400GE

18x400GE + 12x200/100GE

36x100GE
Class B

6x400GE + 24x100GE
Class C / MACSec

Fixed 8x10/25/50 – 2x400GE + 2xMPAs
Class C / MACSec (fixed ports & MPA)

7.0.x 7.3.1 7.4.1 7.5.1 7.6.1

400G Optics

Product ID	Description
QDD-400-CUxM	Passive Copper Cable, x meter
QDD-400G-DR4-S	400GBASE-DR4 QSFP-DD, 500m over parallel SMF
QDD-400G-FR4-S	400GBASE-FR4 QSFP-DD, 2km over duplex SMF
QDD-400G-LR8-S	400GBASE-LR8 QSFP-DD, 10km over duplex SMF
QDD-400G-ZR-S	400G Coherent QSFP-DD, 100km over duplex SMF
QDD-400G-ZRP-S	100/200/300G/400G Metro Coherent QSFP-DD, duplex SMF

DSP

- 400G ZR/ZR+ makes use of Coherent Optical Technology
- It uses QAM Technology to modulate the light in Phase and Amplitude
- It uses Orthoganal Polarization to transport two independent Bit-streams via same wavelength

400G Applications and Use cases
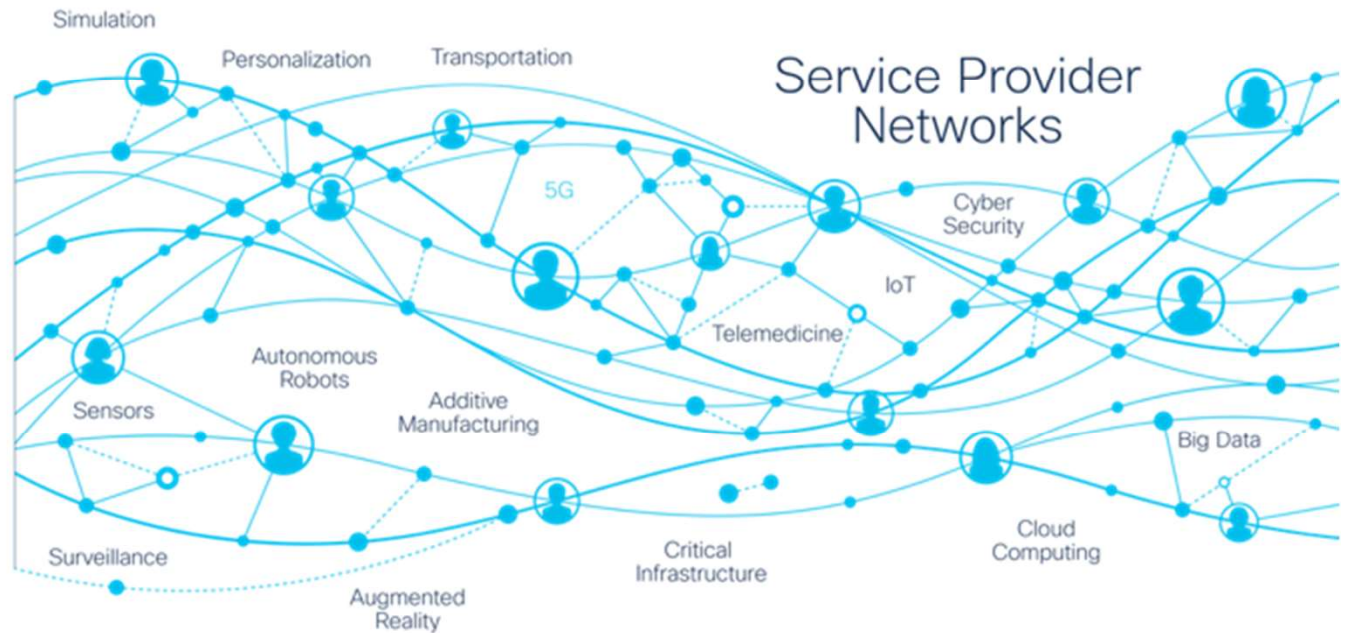
The Future of the Internet

New Normals
For the way we Work, Live, Play, and Learn
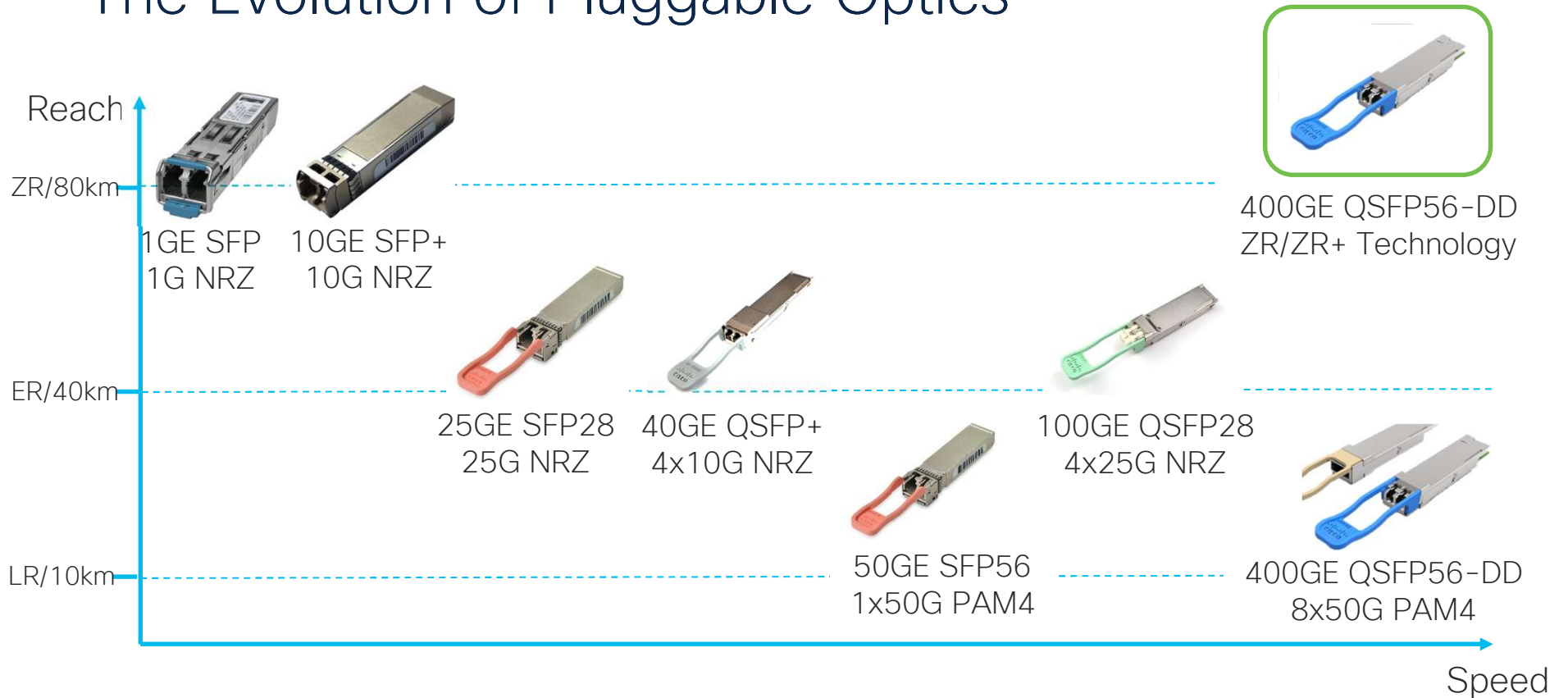
New Participants
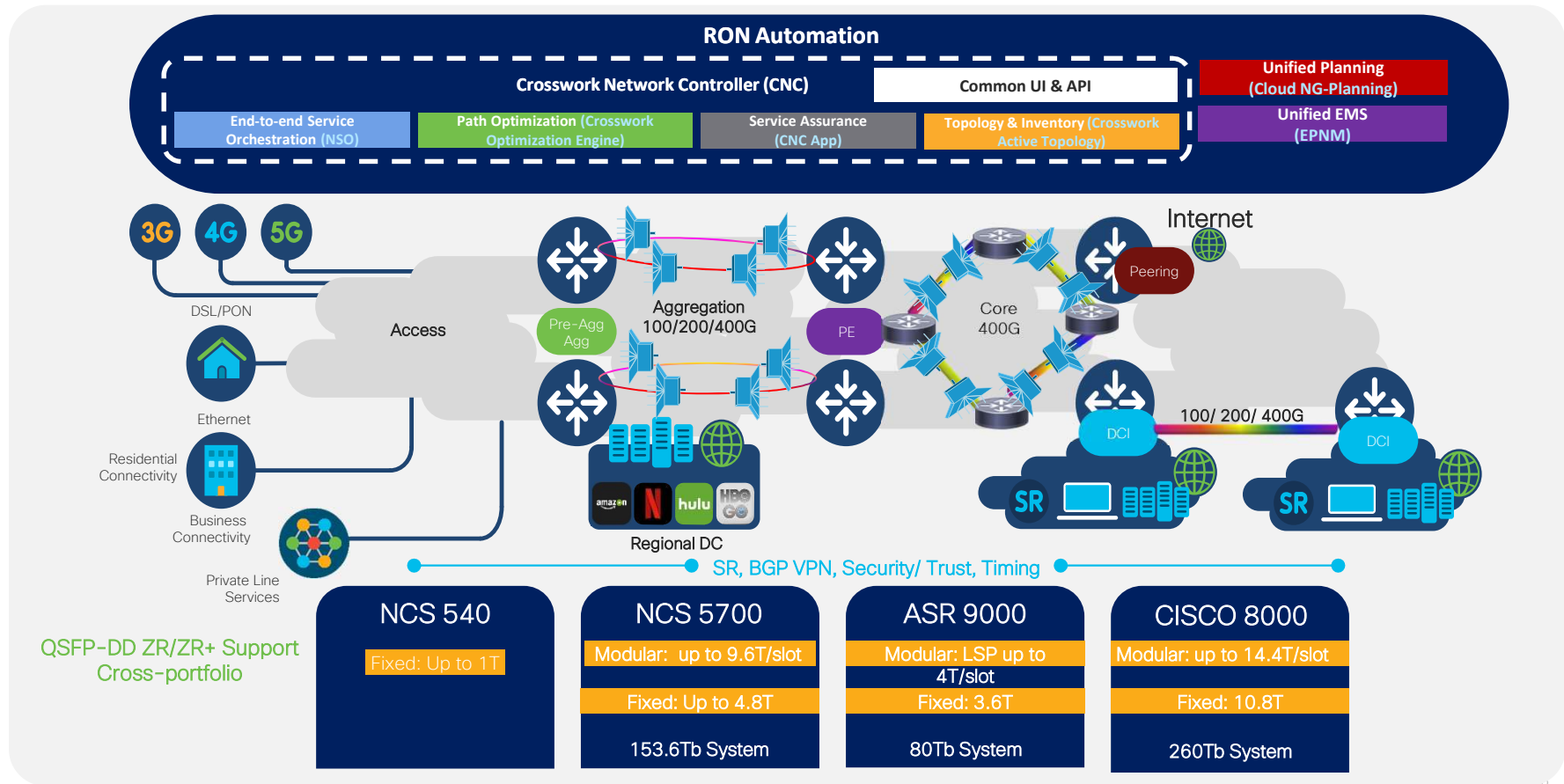Many remain unconnected and emerging IoT

New Potentials
The foundation of economies, governments, and societies

# The Evolution of Pluggable Optics

Reach

ZR/80km

1GE SFP
1G NRZ

10GE SFP+
10G NRZ

400GE QSFP56-DD
ZR/ZR+ Technology

ER/40km

25GE SFP28
25G NRZ

40GE QSFP+
4x10G NRZ

100GE QSFP28
4x25G NRZ

50GE SFP56
1x50G PAM4

LR/10km

400GE QSFP56-DD
8x50G PAM4

Speed

Routed Optical Network

RON Automation

Crosswork Network Controller (CNC) | **Common UI & API**

| End-to-end Service Orchestration (NSO) | Path Optimization (Crosswork Optimization Engine) | Service Assurance (CNC App) | Topology & Inventory (Crosswork Active Topology) |

Unified Planning (Cloud NG-Planning)

Unified EMS (EPNM)

3G 4G 5G

Internet

DSL/PON

Access

Pre-Agg Agg

Aggregation 100/200/400G

PE

Core 400G

Peering

Ethernet

Residential Connectivity

Business Connectivity

Private Line Services

DCI 100/ 200/ 400G DCI

SR SR

amazon Netflix hulu HBO GO

Regional DC

SR, BGP VPN, Security/ Trust, Timing

QSFP-DD ZR/ZR+ Support Cross-portfolio

NCS 540	NCS 5700	ASR 9000	CISCO 8000
Fixed: Up to 1T	Modular: up to 9.6T/slot	Modular: LSP up to 4T/slot	Modular: up to 14.4T/slot
	Fixed: Up to 4.8T	Fixed: 3.6T	Fixed: 10.8T
	153.6Tb System	80Tb System	260Tb System

Distributed Peering for Content Providers

- Enabled by increased peering locations and dedicated peering routers
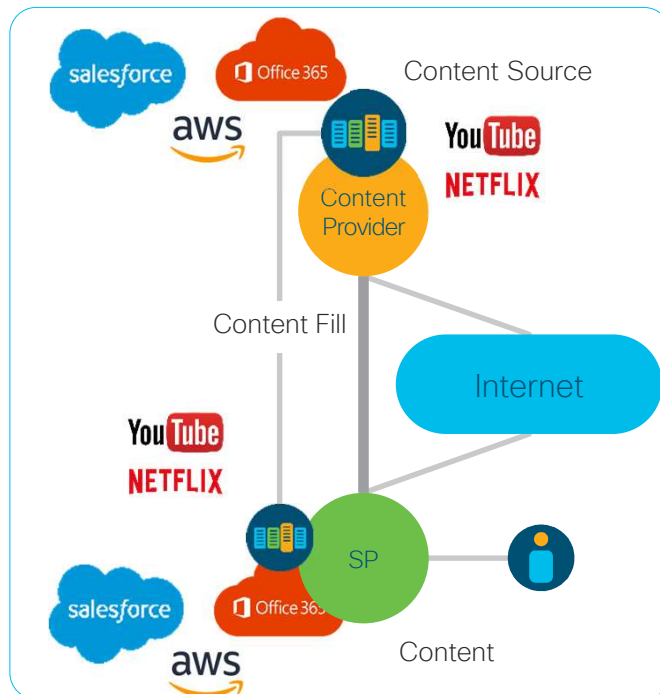
For users

- Lower latency
- Higher reliability
- Better performance

For network operators

- Less network congestion
- Better performance for customers
- Lower costs with automation and data center operations
- Greater flexibility in route controls
- Mutually beneficial relationship with partner
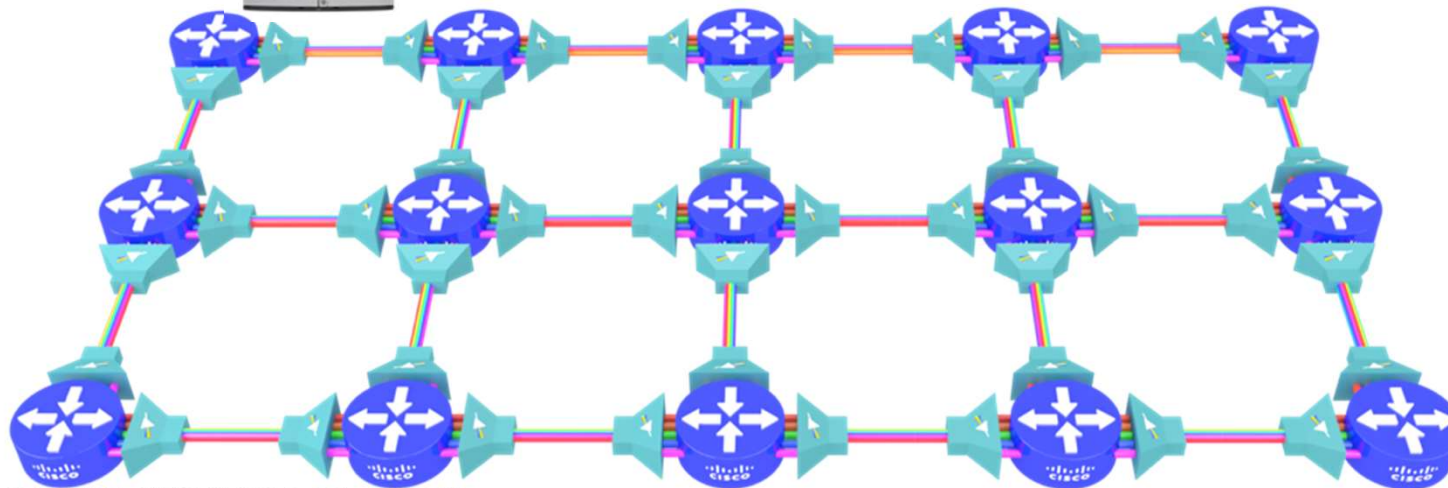
IP and Optical Networks Evolution
Converged SDN Transport

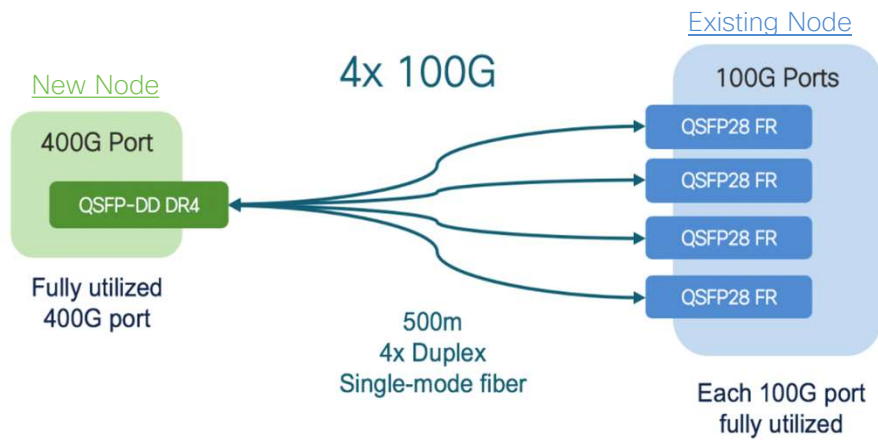**High Density Routers Up to 260 Tbps**

400GE ZR/ZR+

Simple Line System Mux/ Demux/ Amplifier

Automation

Single Layer Hop-by-hop Design

=

+

+

+

Unified Capacity Planning

Unified Path Optimization

Orchestration & Assurance

Unified EMS

400G Migration Path
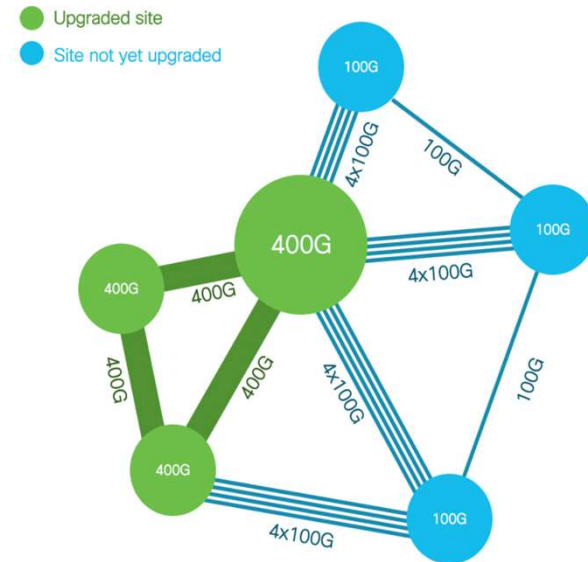
Platform Implementation

ASIC Evolution

	Jericho	Jericho +	Jericho 2	Jericho2C
Bandwidth Gbps	720	900	4,800	2,400
Performance PPS	720M	835M	2B	1B
Network IF	24x 25G+36x 12.5G	48x25G+24x12.5G	96x 50G	32x50G+96x25G
Fabric IF	36x 25G	48x 50G	112x 50G	48x 50G
OCB	16MB	16MB	32MB	32MB
Buffer	4GB (GDDR)	4GB (GDDR)	8GB (HBM)	4GB (HBM)
VOQ	96K	96K	64K per core	128K per core
Counters	256K	256K	192K	384K
Power	120W	150W	300W-350W	150-200W
Timing Support (on Chip)	Class B	Class B	Class B	Class C
Macsec	No	No	No	No

NCS 5500/5700 ASICs in April 2021

Qumran-MX 800G
600/720Mpps

NCS5501
NCS5501-SE

Jericho 720G
600/720Mpps
900G
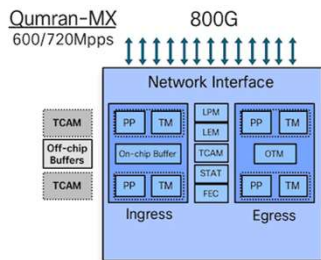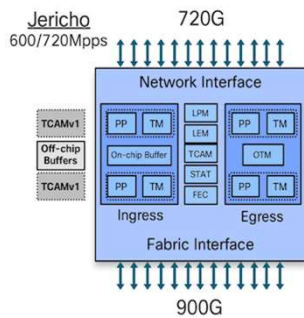
NCS5502
NCS5502-SE
NC55-36X100G
NC55-36X100G-S
NC55-18H18F
NC55-24X100G-SE
NC55-24H12F-SS
NC55-6X2H-DWDM-S

Jericho+ 900G
835Mpps
1200G
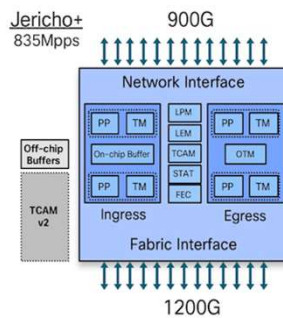
NCS55A2-MOD*
NCS55A1-24Q6H-S
NCS55A1-36H-S
NCS55A1-36H-SE-S
NC55-36X100G-A-SE
NC55-MOD-A-S
NC55-MOD-A-SE-S
NC55-32T16Q4H-A

Jericho+ large LPM 900G
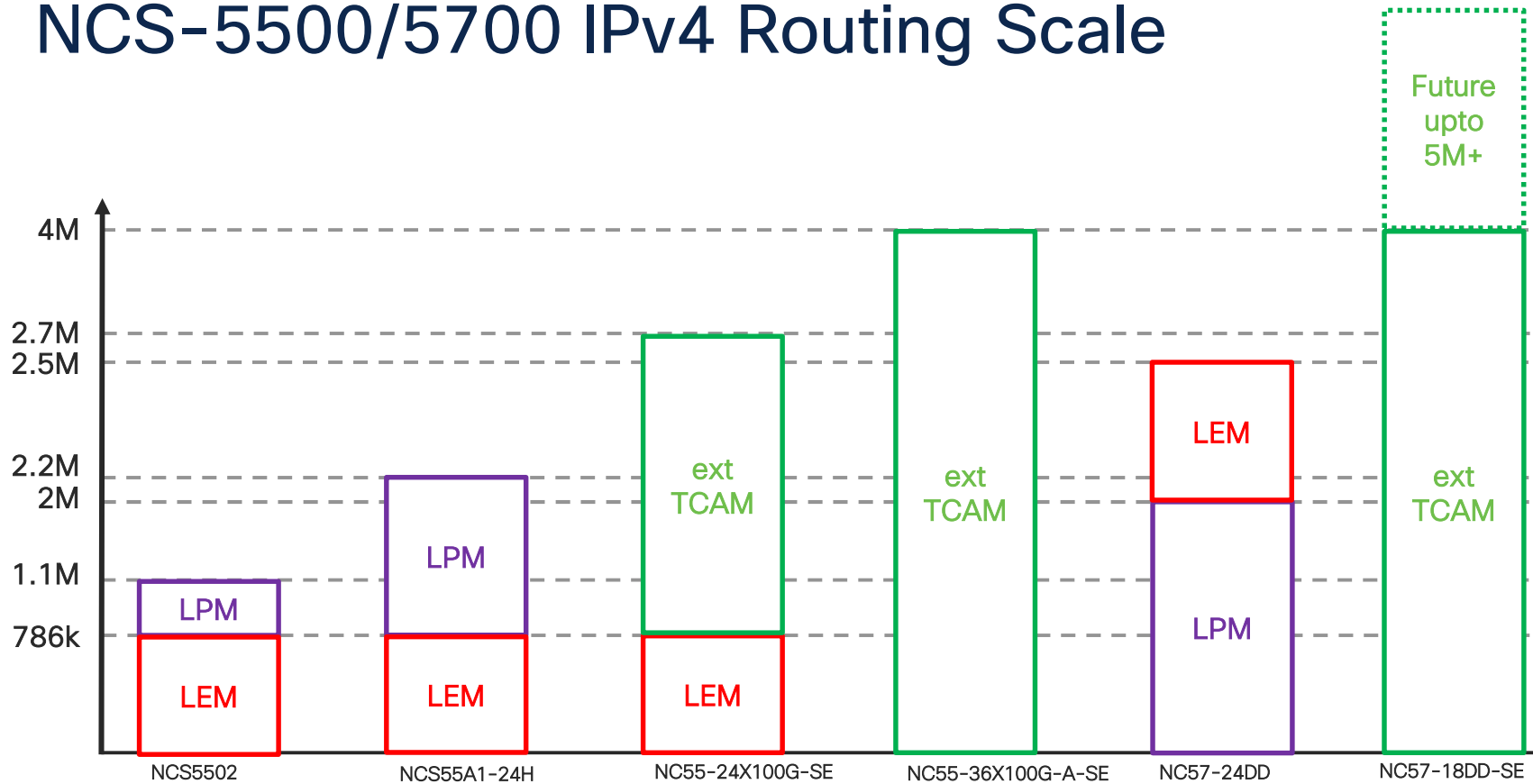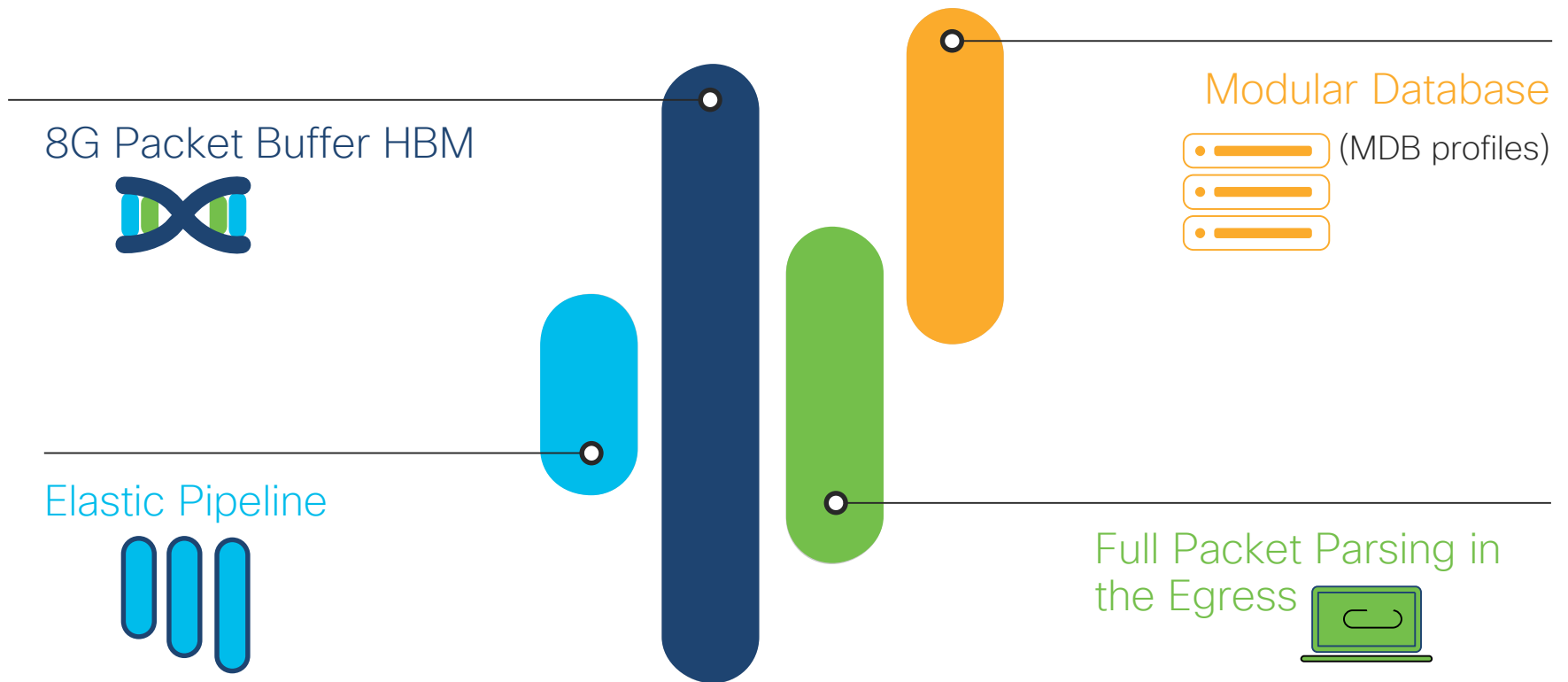835Mpps
1200G
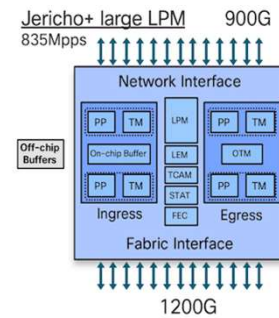
NCS55A1-24H
NCS55A1-48Q6H

Jericho2 4.8T
2BPPS
5.6T
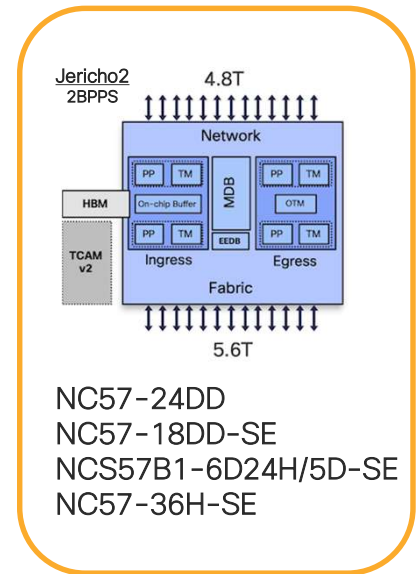
NC57-24DD
NC57-18DD-SE
NCS57B1-6D24H/5D-SE
NC57-36H-SE

NCS-5500/5700 IPv4 Routing Scale

NCS 5700 Main Enhancements

8G Packet Buffer HBM

Elastic Pipeline

Modular Database

(MDB profiles)

Full Packet Parsing in the Egress
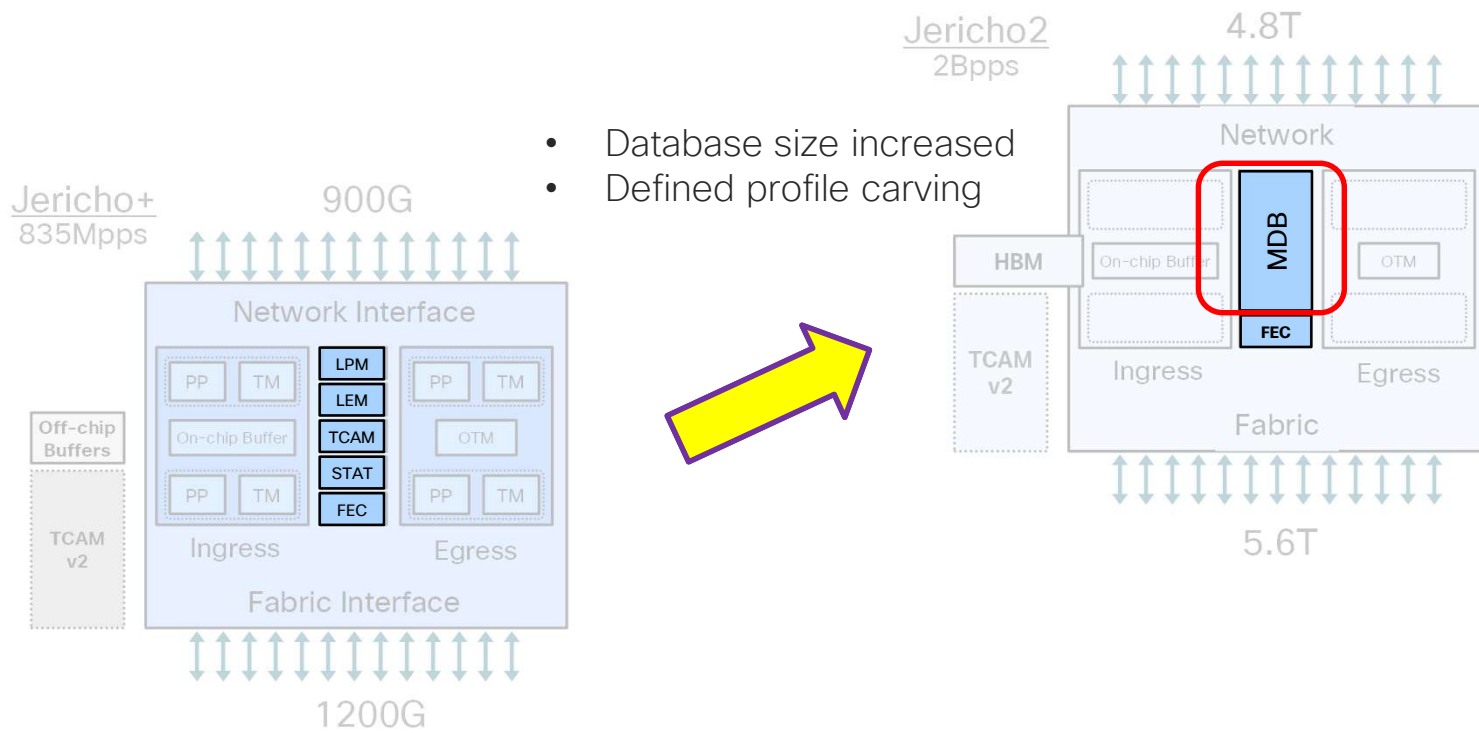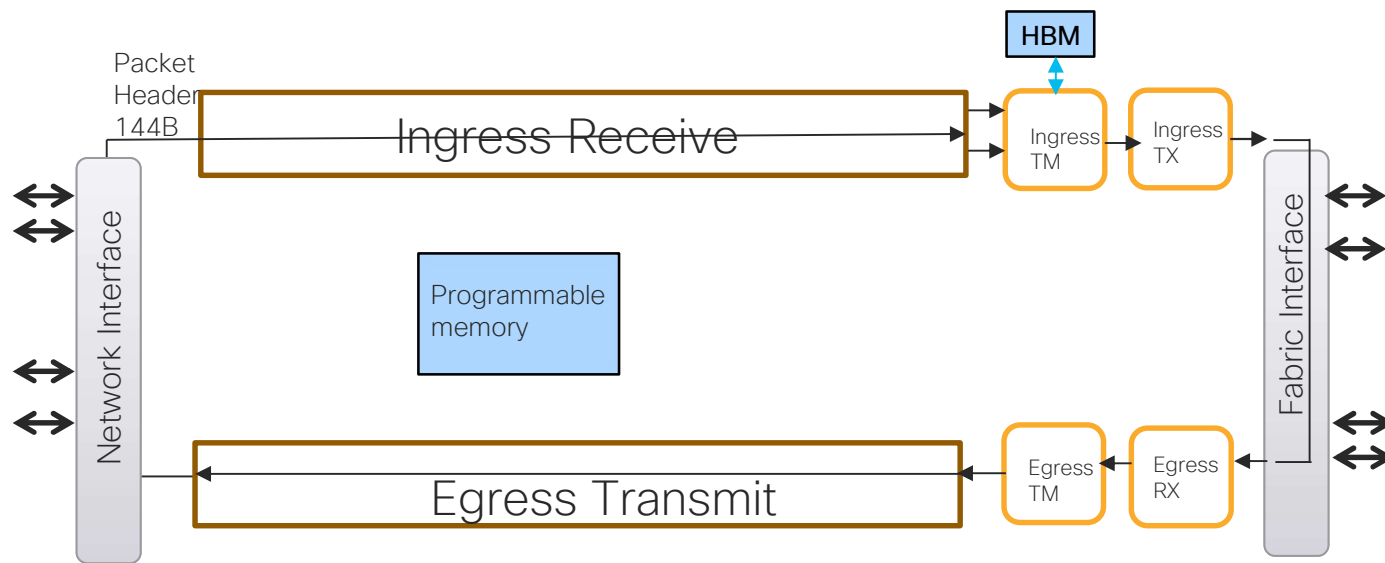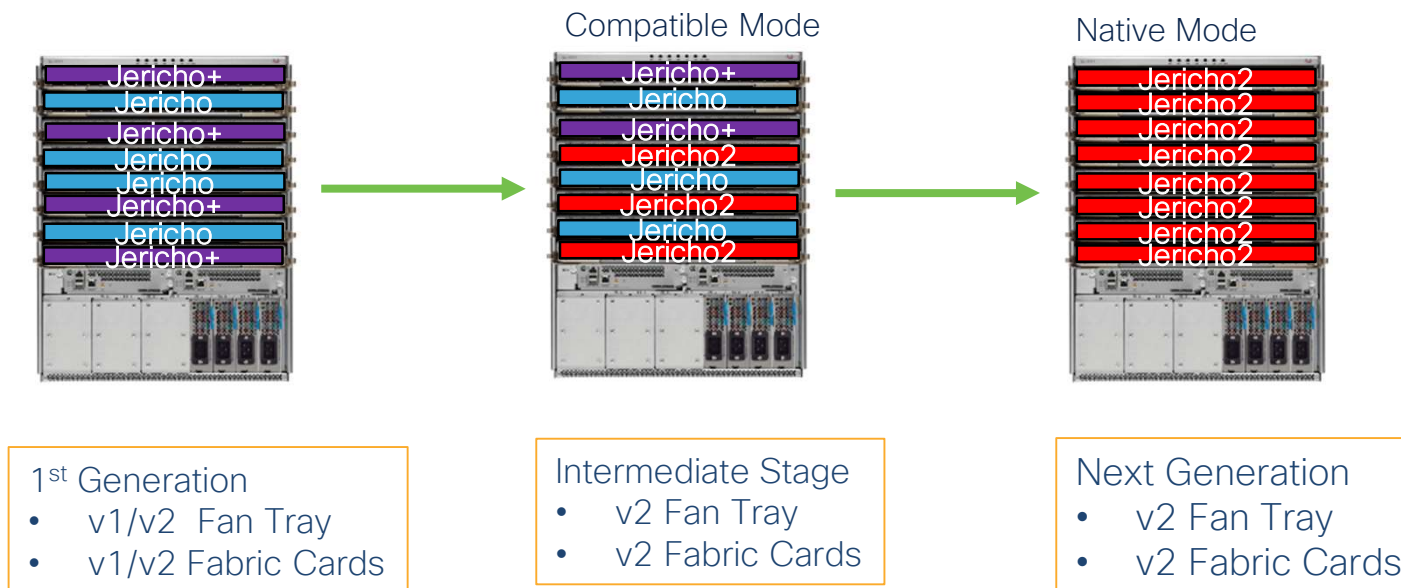
Modular Database

- Database size increased
- Defined profile carving

Elastic Pipeline

Compatibility / Native Mode for Modular Chassis

Compatible Mode

Native Mode

1st Generation
- v1/v2 Fan Tray
- v1/v2 Fabric Cards

Intermediate Stage
- v2 Fan Tray
- v2 Fabric Cards

Next Generation
- v2 Fan Tray
- v2 Fabric Cards

Design it Better With NCS5700

Network Services Orchestrator (NSO)

Crosswork Optimization Engine | Crosswork Network & Health Insights | Cisco Matrix

Smart City/IOT
AR/VR/Gaming
Ent/Public Sector Applications
Collaboration Services
Security Services

3G 4G 5G

DSL/PON

Residential Connectivity

Ethernet

Business Connectivity

cnBNG CP
5G Core

Telco Cloud

Access
10G/25G/100G

(Pre-)Agg

Aggregation
100G/200G/400G

Edge

Core
200/400G

IGW

Internet

Caching
amazon N hulu HBO

| Offload Traffic Closer to Subscriber | Varying UP Choices Based on Requirements | Deploy Based on Today's Scale | Low Latency Based on Class C Timing |

Converged Transport Architecture based on SRv6

Key Takeaways

✓ Solid Roadmap for 400G Transition

✓ Strong Portfolio with previous and new generation ASIC

✓ Continuous investment in the portfolio.

Resources:

- [NCS 5500 Web Page](#)

- [NCS 5700 Line cards Datasheet](#)

- [NCS-57B1 fixed chassis Datasheet](#)

- [NCS-5500 Tutorials](#)

- [Cisco Live Deep dive on 400G optics: BRKSPG-2023](#)