Cisco
Refresh

Cisco 8000 Routers

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Product Manager, Mass Scale Infrastructure Group
October 27, 2021

Agenda

1. Introduction
2. Cisco 8000 Series Router
3. Cisco 8000 TCO Savings
4. HW and SW Roadmaps
5. Customer Momentum

The Future of the Internet

New Normals

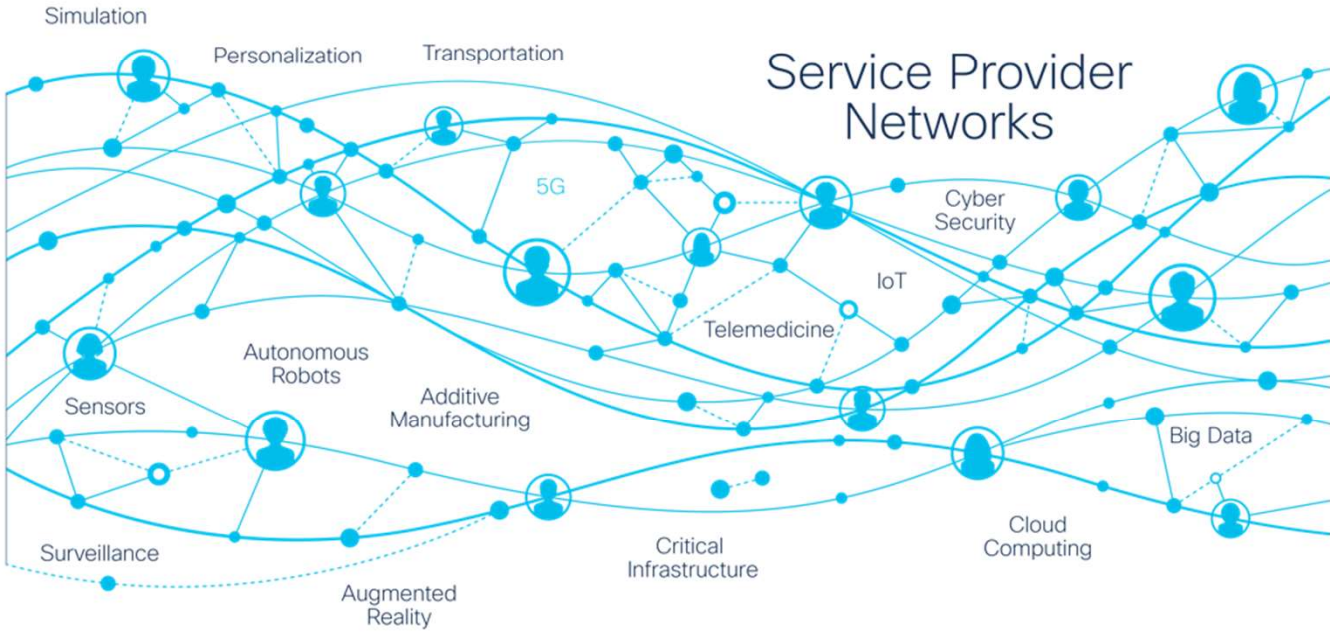
For the way we Work, Live, Play, and Learn

New Participants

Many remain unconnected and emerging IoT

New Potentials

The foundation of economies, governments, and societies



Market Dynamics

Explosive Internet Growth

2018 Cisco VNI

Economic Challenges for SPs

IHS Markit Report

0.5%

Flat Revenue Growth
(2017 – 2022 CAGR: 0.5%)

11X

$1 of CapEx in 2020 has to do 11X the work it did in 2012

5X

Today, operators spend $5 of OpEx for each $1 of CapEx

SPs Want More for Less

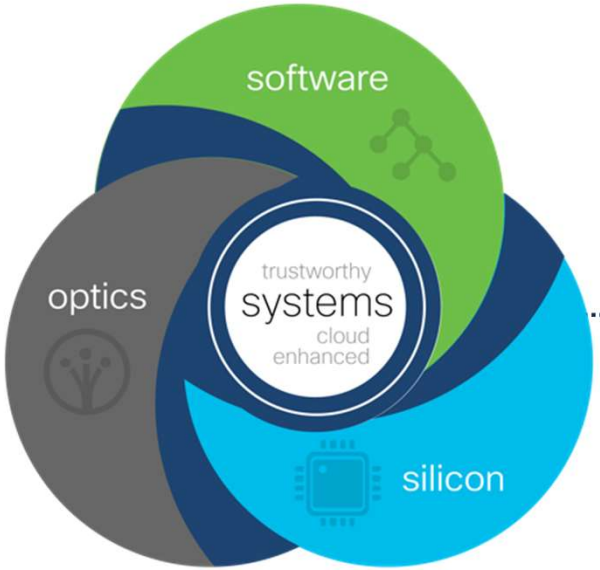
Reduce Costs (CapEx, OpEx) and Latency. Increase Capacity.

Create New Revenue. Improve Experiences and Time to Service

Increase Trust and Security

HOWEVER, BUDGETS REMAIN FLAT

Redefining the Economics of the Internet



Innovation across multiple dimensions can shift the paradigm.

New Possible Network Architectures

Converged

Cloud Enhanced

Fabric Based

Delivering Unprecedented

Cost & Power Efficiency

Prioritized Operations

Augmented Intelligence

Cisco Silicon ONE

Back to index

One architecture. Unmatched capabilities

Unmatched programmability, performance, flexibility, and efficiency

Higher bandwidth

More network bandwidth than other routing silicon

Better Performance

More packets per second than other networking silicon

Lower Power

Routing features, scale, and performance at better than switching power efficiency

Larger Scale

Ready for massive internet scale

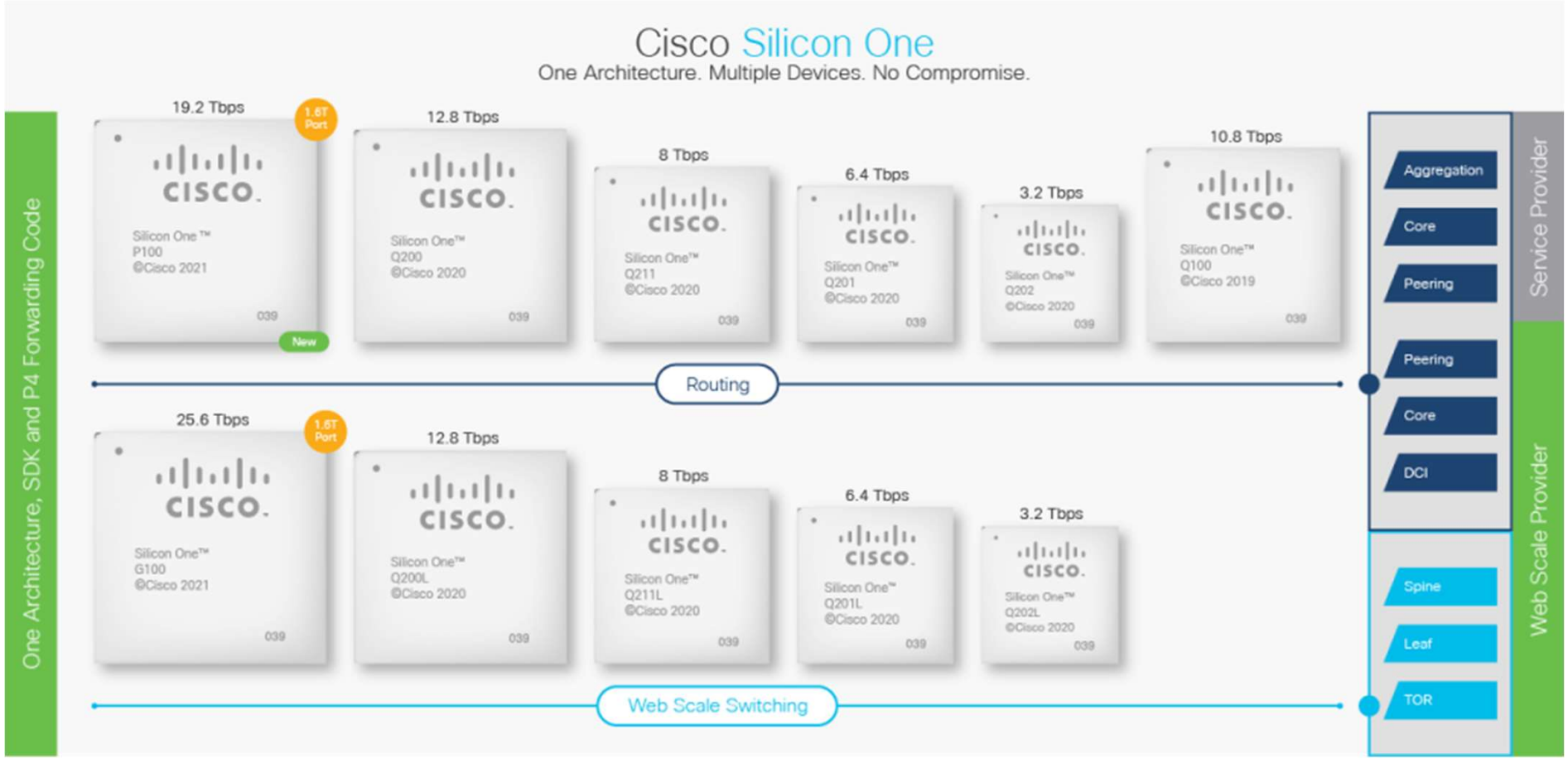
Endlessly programmable

Fully programmable for faster feature delivery and future-ready deployments

Deeper buffers

Switching devices with fully shared on-die buffers and routing devices with seamless extension to large buffers

Cisco Silicon One Family



Cisco 8000 Routers

Cisco 8800 Modular Routers

Service Provider scale and flexibility with Cisco Silicon ONE ASIC

Cisco 8800 Modular Routers

Portfolio

8804

8808

8812

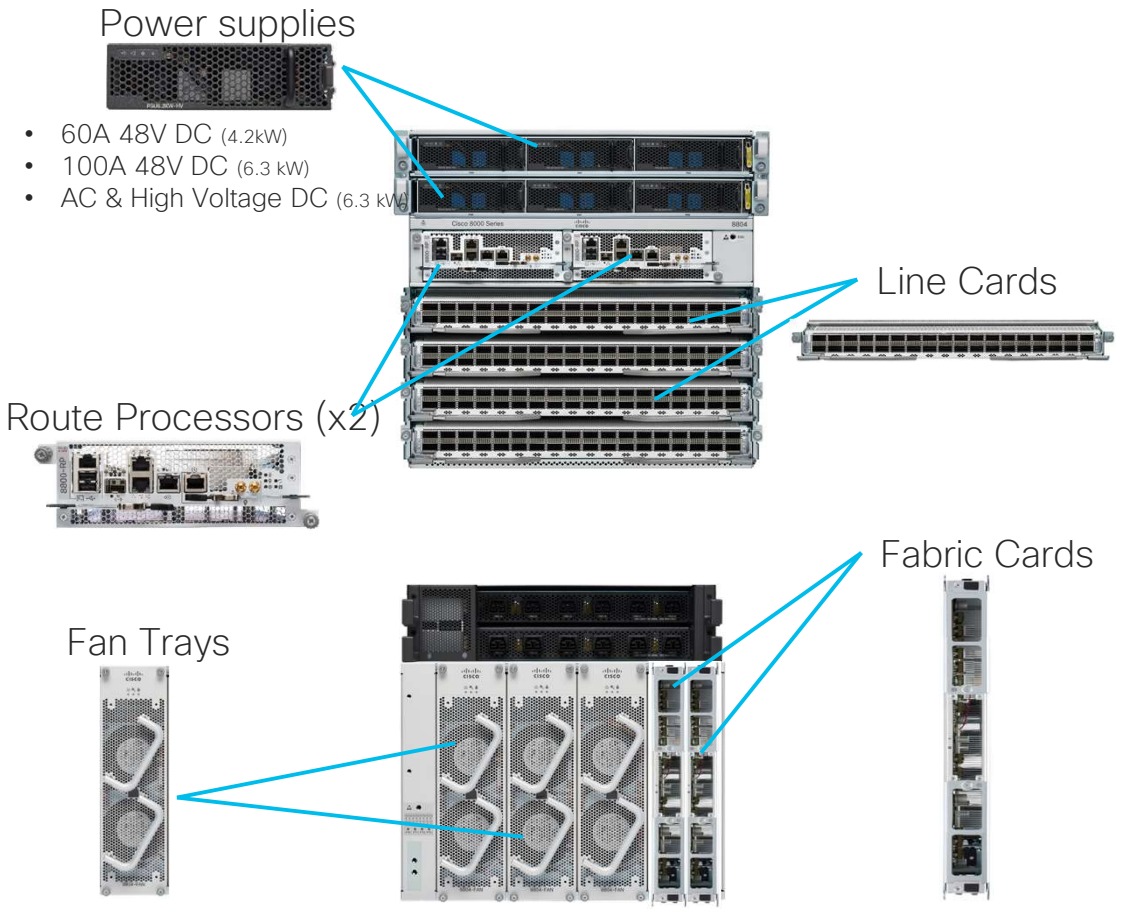
8818

	8804	8808	8812	8818
FCS	Q4 2021	Shipping	Shipping	Shipping
Rack Units	10 RU	16 RU	21 RU	33 RU
Slots	4	8	12	18
Ports & Line Cards	 48x100GE w/ MACSec  36x400GE w/ Q100	 36x400GE w/ Q200 - MACSec  36x400GE w/ Q200	 34x100GE & 14x400GE w/ Q200	
Total Throughput	57.6 Tbps	115 Tbps	172 Tbps	259.2 Tbps
Typical Power	4.2 KW	9.3 KW	16.3 KW	22 KW

8804 Modular Router

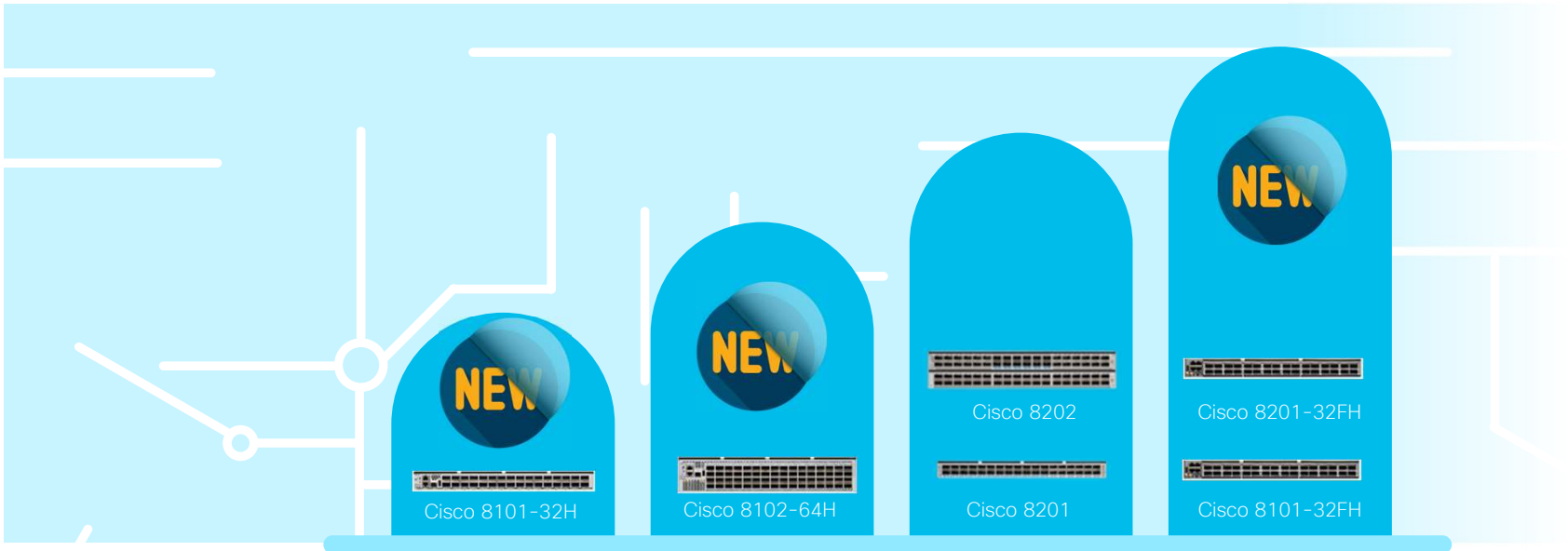
FCS XR 7.3.2 – Sep / Oct CY2021

Physical Summary
57.6 Tbps in 10 RU
4 Line Card slots
2 Redundant Route Processors
4 Redundant Fan Trays
8 Redundant Fabric Cards
Port Density: 144 x 400GE ports 576x 100GE breakout ports 192 QSFP28 ports
2 Power Shelves (6 AC or 8 48V DC supplies)



Cisco 8100 & 8200 Fixed Routers

Service Provider scale and flexibility with Cisco Silicon ONE ASIC



Throughput	3.2 Tbps	6.4 Tbps	10.8 Tbps	12.8 Tbps
Silicon	Q202	Q201	Q100	Q200

Cisco 8100 and 8200 Fixed Routers

Portfolio






	8201	8202	8101-32H	8102-64H	8101-32FH	8201-32FH
FCS	Shipping	Shipping	Q4 2021	Q3 2021	Q3 2021	Q3 2021
Rack Units	1 RU	2 RU	1 RU	2 RU	1 RU	1 RU
Ports	24 QSFP56-DD 400 GbE + 12 QSFP28 100 GbE	12 QSFP56-DD 400 GbE + 60 QSFP28 100 GbE	32 QSFP28 100 GbE	64 QSFP28 100 GbE	32 QSFP56-DD 400 GbE	
Total Throughput	10.8 Tbps		3.2 Tbps	6.4 Tbps	12.8 Tbps	
NPU	Q100		Q202L	Q201L	Q200L	Q200
Memory	HBM	HBM	No HBM	No HBM	No HBM	HBM
Typical Power	415 W	750 W	172 W	256 W	288 W	

Cisco 8000 Routers

Positioning

Key Features

- Up to ~260Tbps
- 400GbE Optimized with support for Terabit ports
- Fixed and Modular systems
- IP+Optical capabilities with 400G ZR/ZRP and 100G ZR*

Target Use Cases

- Core LSR
- Cloud Aggregation
- DC ToR/ Leaf
- SP Aggregation
- Peering

Value Propositions

- Unprecedented scale & performance
- Trusted SW & HW platform
- Programmability accelerates feature velocity to unlock customer-led innovation
- Fabric redundancy without compromise
- New silicon architecture ensures Cisco standard platform longevity

Software IOS XR

Cisco IOS XR 7

Redefining software for better operations

Simple

- Optimized to reduce memory, downloads, and boot times
- Streamlined protocols with SR/EVPN
- Secure zero-touch rollout

Modern

- Open APIs
- Customizable software images
- Cloud-enhanced

Trustworthy

- Assess hardware and software authenticity at boot and runtime
- Immutable record of all software and hardware changes
- Real-time visibility of trust posture

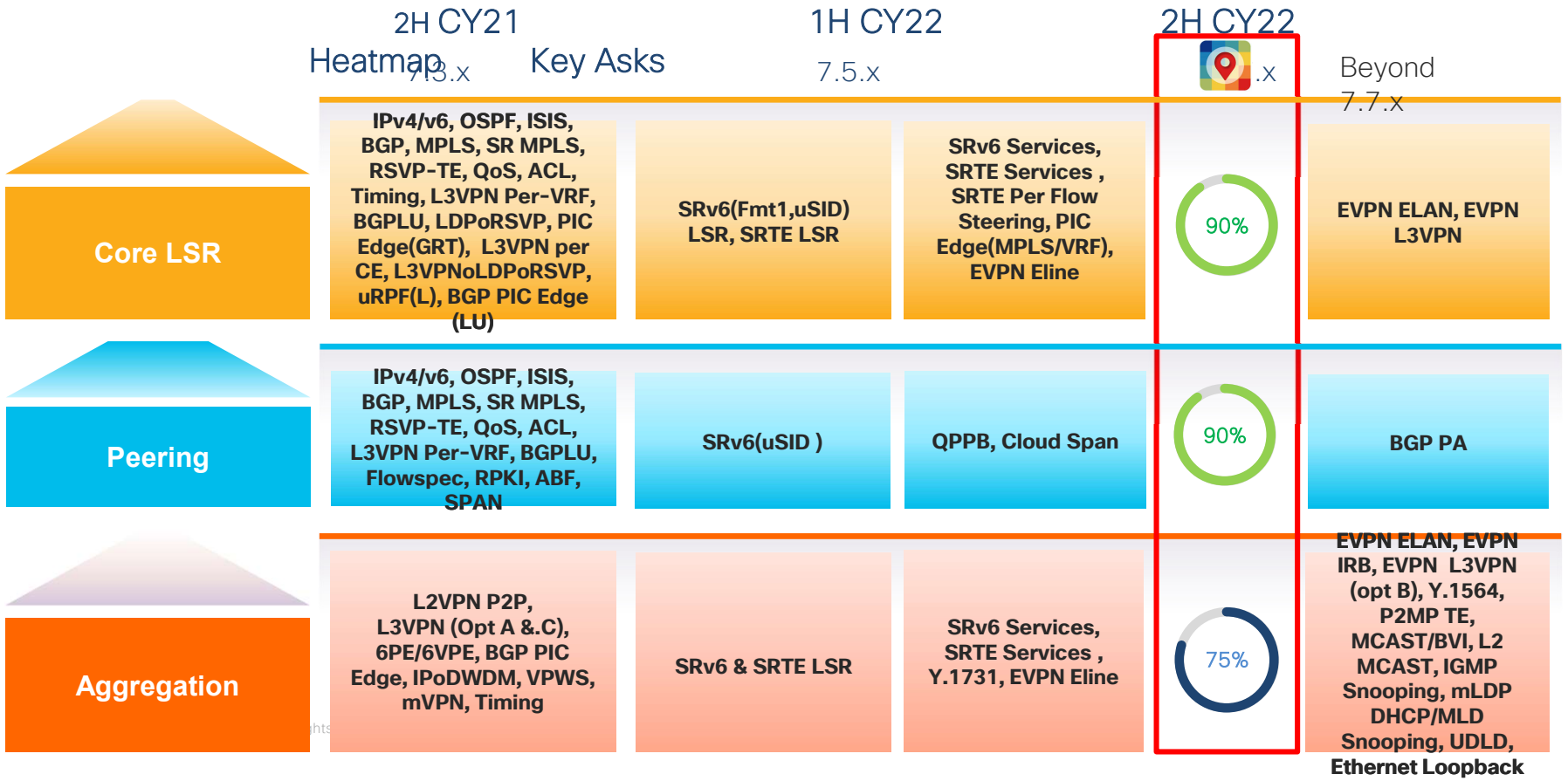
50% Less
Memory Footprint

50% Faster
Boot Times

40% Smaller
Image Sizes

40% Faster
Download

Cisco 8000 Software Strategy



Cisco IOS XR 7
Cloud enhanced

Cisco Crosswork Data Gateway
(inside SP Network)

Network Services Orchestrator
Optimization Engine
Health Insights
Situation Manager
and more...

IOS XR 7

Cisco
Crosswork Cloud

Cisco Crosswork
Network Insights

Visibility and intelligence to assess network routing health.

Cisco Crosswork
Trust Insights

High-fidelity measurement, auditing, verification, and enforcement of network hardware and software trustworthiness.

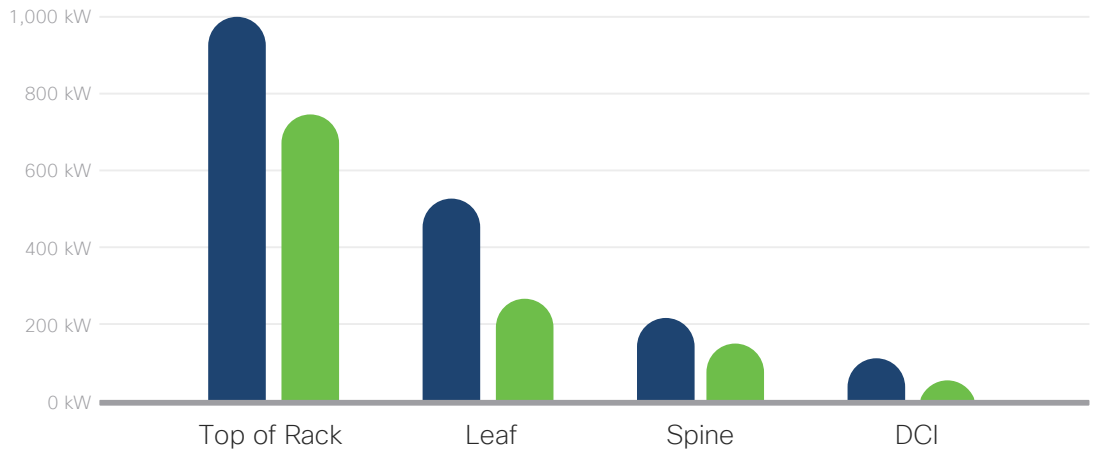
new!

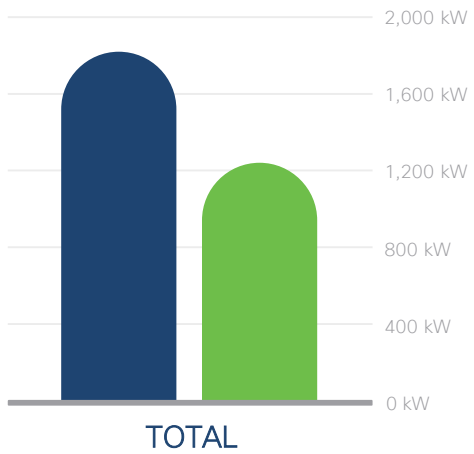
Cisco Crosswork
Qualification Environment

Automated and cloud-based environment to accelerate new software deployment.

Cisco 8000 and TCO Savings

Cisco 8000 optimized for cost savings





Up to **27%** power reduction in leaf and spine

Up to **66%** power reduction in DCI layer

Other

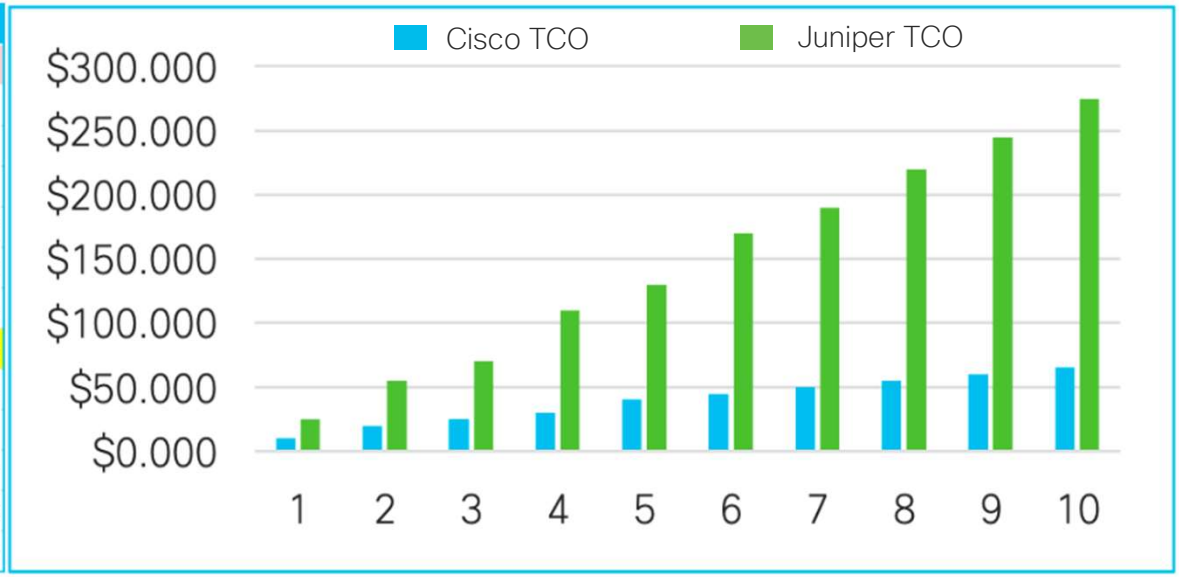
Silicon One

i2 Proposed solution – cost savings

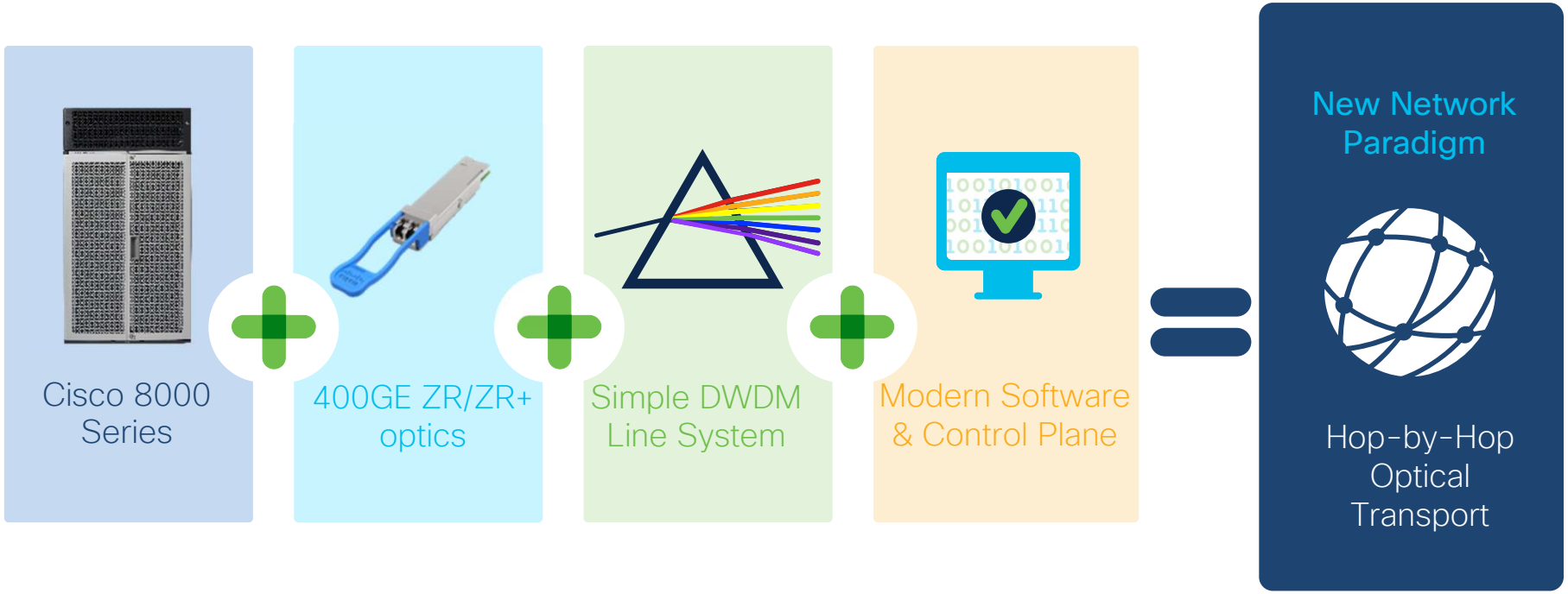
- 61x Cisco 8201 and 14x Cisco 8202 to upgrade the aging infrastructure
- $94 OPEX savings per 100G/ year compared to the alternative

Colocation TCO			
8201		MX10003	
Capex	$0	$0	
Year	w/CAPEX	w/CAPEX	Difference
1	$7,142	$27,382	$20,241
2	$14,283	$54,765	$40,482
3	$21,425	$82,147	$60,723
4	$28,566	$109,530	$80,964
5	$35,708	$136,912	$101,205
6	$42,849	$164,295	$121,446
7	$49,991	$191,677	$141,687
8	$57,132	$219,060,	$161,927
9	$64,274	$246,442	$182,168
10	$71,416	$273,825	$202,409

$94	OPEX savings per 100G per year



Routed Optical Networking (RON) – Supercharging the TCO savings with total savings up to 45%



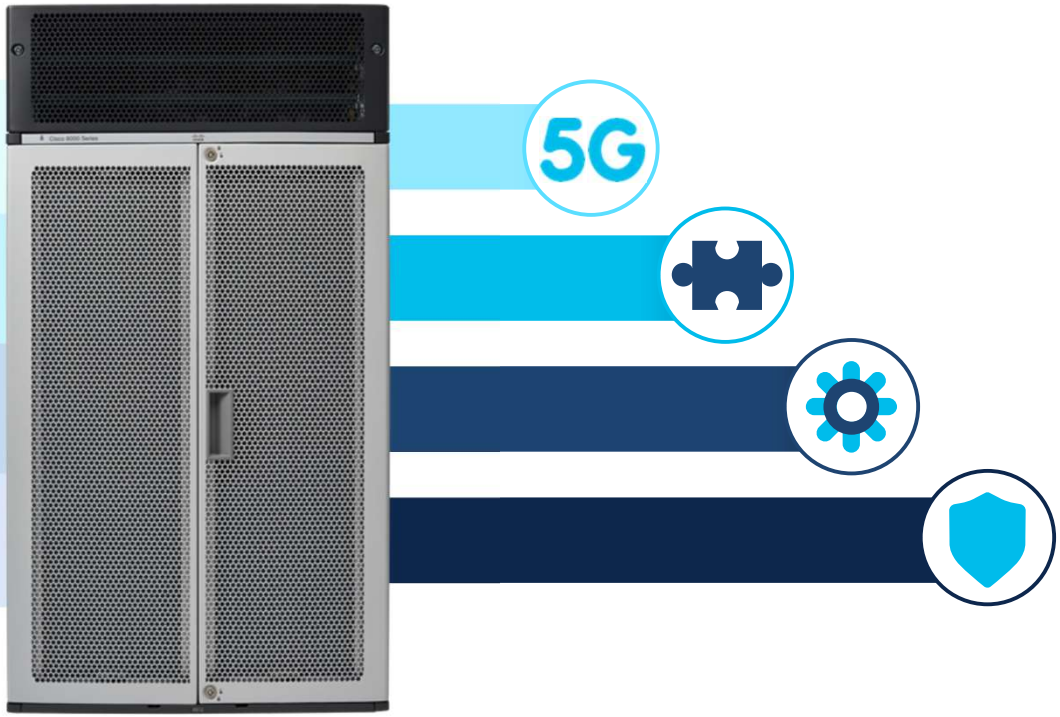
Cisco 8000 Routers

Grow revenue
Monetize new services

Simplify architecture
Scale & performance

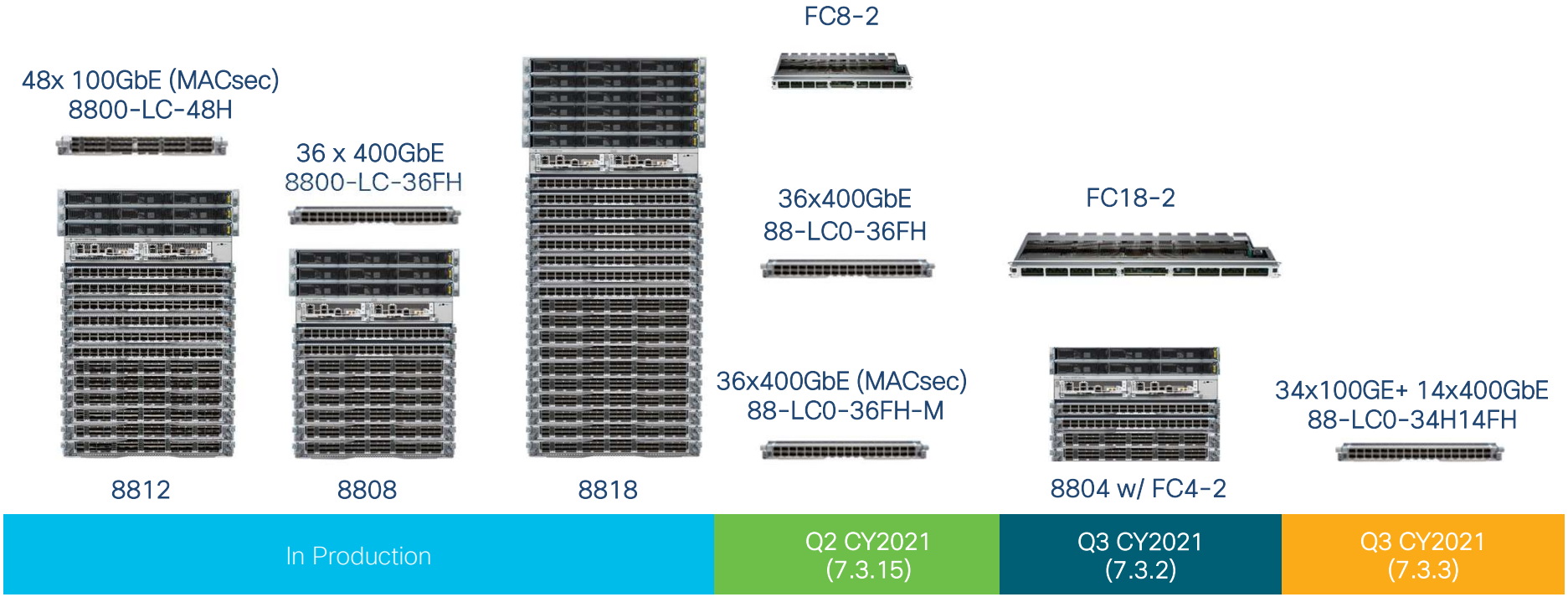
Reduce costs
Programmable & automatable

Mitigate risks
Secure infrastructure

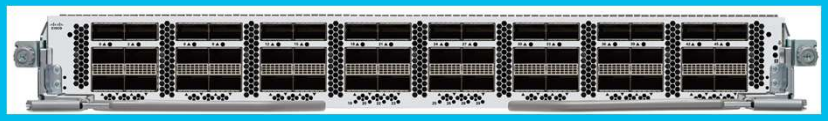


Cisco 8000 Series Roadmap

Modular Systems Shipping & Roadmap



Dauntless: 88-LC0-34H14FH



FCS Dec 2021
XR 7.3.3 & 7.5.1

Quick Facts	
Capacity	9T
NPU	2 x Q200 (HBM)
Port Configuration	48x100G or 34x100GE + 14x400GE
Power	Estimated Typical : 900W
Hardware capabilities	MACSEC, Class C Timing, No ZR/ZRP support on 400GE ports

- Flexible 9T Combo line card with 100GbE and 400GbE ports
- Ideal for: Core & Peering
- 48x100G or 34x100GE QSFP28 + 14x400GE QSFP28/DD
- Supports MACSec on up to 16ports 100GbE
- Full 4x breakout on all ports
  - 400GbE → 2x 100GbE, 4x 100GbE, and 4x 10GbE
  - 100GbE → 4x 10GbE
- No Support for ZR/ZRP

Fixed Systems Roadmap

32 x 400GbE Mono

8101-32FH

32 x 400GbE
with HBM

8201-32FH

64 x 100GbE

8102-64H-O

64 x 100GbE

8102-64H w/ XR

32 x 100GbE

8101-32H w/ XR

32 x 100GbE

8101-32H-O

24 x 100GbE + 8 x
400GbE

8201-
24H8FH

32 x 400GbE
with HBM & MACsec

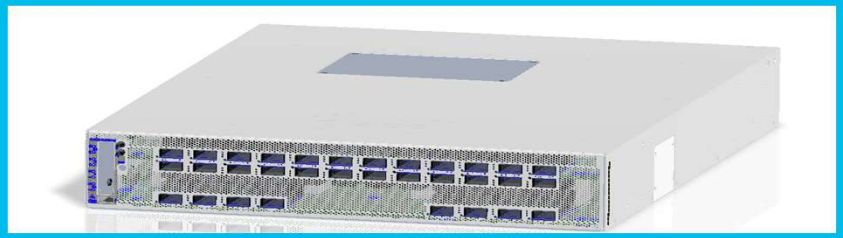
8202-32FH-M

Q3 CY2021

Q4 CY2021

1H CY 2022

Yukon: 8202-32FH-M



Quick Facts	
Capacity	12.8T
NPU	Q200 (Gibraltar HBM)
Port Configuration	32x 400G
Power	Typical (25° C): ~600W Maximum (40° C): ~1600W
Hardware capabilities	Class C Timing, MACSec, PSI Support

FCS April 2022
XR 7.5.2

- 2RU, 600mm depth, PSI (port side intake), 2 PSU, 4 fan trays, MACSec
- Ideal for : Cloud/ WAN Edge, DCI, ToR, Peering, SP Aggregation
- Supports XR & SONIC
- Support ZR on all ports and ZRP in top row ports (with 3KW PSU)
- Ports can also work in 40G/100G or can be broken out into 4x10/25G or 4x100G

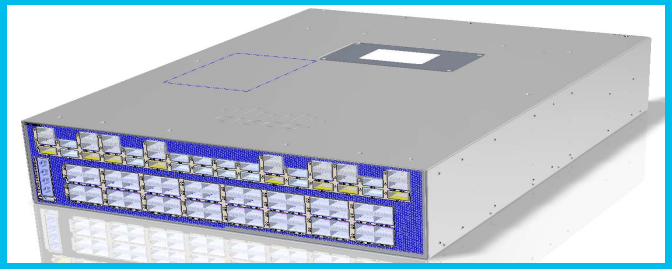
Rhine: 8201-24H8FH

FCS April 2022
XR 7.3.3

Quick Facts	
Capacity	5.6T
NPU	Q200 (Gibraltar HBM)
Port Configuration	24 x 100G + 8 x 400G
Power	Typical (25° C): ~288W Maximum (40° C): ~800W
Hardware capabilities	Class C Timing, PSI Support, PSE Support

- Compact 1RU, 600mm depth, PSI/PSE, 2 PSU, 6 fan trays
- Ideal for: IP Fabric, Distributed Core, Peering, SP Aggregation,
- Supports XR and SONIC (TBD)
- Will support 1.4KW AC , 2KW AC/DC & 2KW HV PSU
- Platform will also support ZR / ZRP on all 8 400G ports
- Can be used as 32 x 100G, also supports breakouts to 10G, 25G & 100G

Parana: 8203-88H16FH-M



FCS Aug 2022
XR 7.7.1

Quick Facts	
Capacity	12.8T
NPU	Q200 (Gibraltar HBM)
Port Configuration	104 x 100G or 64 x 100G + 16 x 400G
Power	Typical (25° C): ~1.0KW Maximum (40° C): ~2.5KW
Hardware capabilities	Class C Timing, PSI Support, MACSEC

- 3RU Fixed Platform, 600mm depth, PSI, 4 PSU & 4 fan trays
- Ideal for: Distributed Core, Peering, SP Aggregation, Web / Cloud Deployments
- 88 x 100G + 16 x 400G – 104 total ports
  - 64 x 100G + 16 x 400G
  - 104 x 100G (natively)
  - 128 x 100G (w/breakout)
- Supports ZR / ZRP on all 400G ports & MACSec on all 100G/400G ports

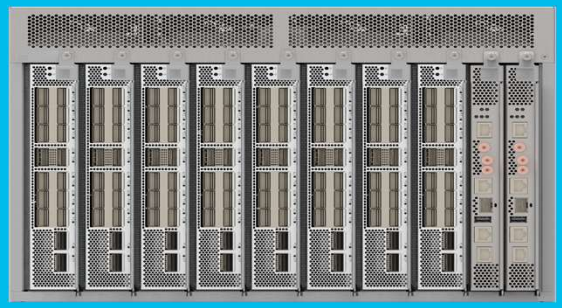
Crocodile: 8111-32EH

FCS Aug 2022
XR 7.7.2

Quick Facts	
Capacity	25.6T
NPU	G100 (Graphene)
Port Configuration	32x 800G 64x 400G
Power	Typical (25° C): TBD Maximum (50° C): TBD

- 1st G100-based Compact 1RU platform without HBM
- Ideal for : Large AI/ ML cluster, DC ToR, Leaf & Spine
- 400G ZR/ZRP support, 800G & 1.6T (post FCS)

WASP: Cisco 8608



Quick Facts	
Capacity	12.8T
NPU	Q200 (Gibraltar HBM)
Port Configuration	128 x 100G, 32 x 400G , 192 x 10G/25G (With MPAs)
Power	Typical (25° C): ~1.6KW Maximum (40° C): ~3.2KW
Hardware capabilities	Class C Timing, PSI Support, MACSEC

FCS Aug 2022
XR 7.7.1

- Centralized 7RU Platform, 600mm depth, PSI, 4 PSU, 8 fan trays
- Ideal for: IP Fabric, Core, Peering, SP Aggregation, Tier 2 Cloud
- Redundant Active/Standby RPs & Switch Cards (*CPU, NPU & LC Redundancy with no BW reduction*)
- 8 x MPAs :1.6T per slot
  - Combo:16 x 100G or 8 x 100G + 2 x 400G
  - 4 x 400G
  - 24 x 10/25/50G

Supports ZR / ZRP on all 400G ports

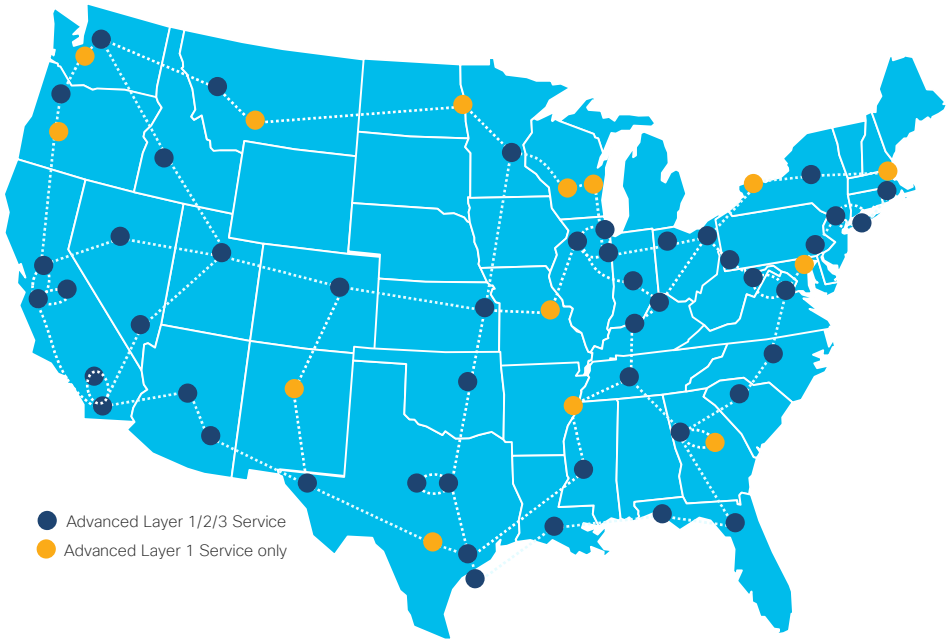
Cisco 8000

Customer Momentum

- 20+ wins with major SP customers: all placed orders
  - Large Tier 1 SP already deployed Cisco 8812 with live traffic in one of the large PoP's in EMEA
- Over 60 active customer engagements. Examples:
  - America: Three MSDC Cloud customers
  - America: Two large Cable customers & five large Telco customers
  - EMEA: Three large SP's
  - APJC: Six large SP's
- 8 major live traffic deployments and 12 ongoing pilots

Cisco 8000 Series customer engagement:

i2 Next Generation Infrastructure (NGI) Program



- 400G Internet2 Network
- 30.4 TB/s of optical capacity with 15,700 miles of dark fiber capacity
- 7+ Petabytes of network traffic per day
- 320+ universities scientific & research fsacilities, data assets and HPC resources connected
- 100 countries
- 65 partner networks

INTERNET2®

https://www.cisco.com/c/en/us/about/case-studies-customer-success-stories/internet2.html

Case Study: Internet2

Internet2 accelerates new scientific possibilities

With bandwidth demand increasing by 20 times in 10 years, Internet2 needed to deliver increased capacity for research and education. Learn how Cisco 8000 routers delivered massive scale, while lowering power consumption.

Watch the video (1:35) | Read full story

Summary | Case Studies | Customer Statistics | Contact Cisco

Summary

Challenges

- Bandwidth demand increased by 20 times in 10 years
- Access to larger data sets and cloud connectivity
- Avoid costly updates to existing infrastructure
- Reduce power and cooling expenses

Solutions

- Cisco 8000 Series Routers
- Cisco Network Services Orchestrator

Results

- Upgraded network backbone capacity up to 32 Tbps
- Delivered massive scale for 48 400G access sites
- Reduced footprint with higher density solutions
- Lowered power consumption by almost 70 percent

https://newsroom.cisco.com/press-release-content?type=webcontent&articleId=2163046

Colt Takes Network Innovation to New Heights with a 400G-Capable Routed Optical Networking Solution on its IQ Network

May 27, 2021

News Summary:

- Colt is further future-proofing its global IQ Network with the Cisco 8000 router series powered by Cisco Silicon One, Segment Routing MPLS, and Acacia 400G OpenZR+ technology
- Cisco 8000 and Acacia 400G Open ZR+ technology provide a simpler and more scalable architecture that delivers cost efficiency with reduced space and power usage
- These Cisco technologies within the IQ Network will help Colt address the exponential increase in demand for high bandwidth services from its customers

WebSprix to Deploy Cisco Routed Optical Networking Solution with Cisco 8000 to Help Shrink the Digital Divide in Ethiopia

December 10, 2020

News Summary:

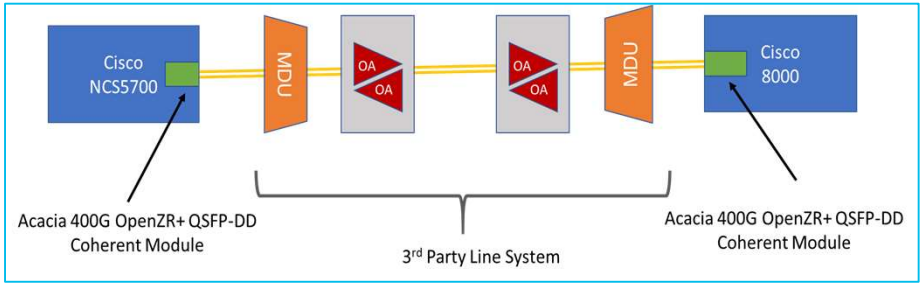
- WebSprix to deploy Cisco Routed Optical Networking solution with Cisco 8000 series routers for enhanced resiliency, reduced cost, and greater network simplicity
- WebSprix first service provider to offer high-speed broadband access in Ethiopia, helping build a stronger IT infrastructure and boost economic growth
- Cisco 8200 series routers with 400 GbE ZR/ZR+ coherent optics to build a high-speed network backbone with long distance fiber connections

Related Media

https://newsroom.cisco.com/press-release-content?type=webcontent&articleId=2133658

Telia Carrier Press Release with Acacia's OpenZR+ and Cisco 8000

Telia Carrier is the first network operator to demonstrate 400G coherent connections between Cisco's NCS 5700 and Cisco 8000 platforms over a third-party open line system.



Benefits of transitioning existing metro and long-haul networks to a Routed Optical Networking Solution
- easier to maintain
- faster to adapt
- cheaper to operate

https://www.teliacarrier.com/about-us/press-releases/tc-pluggables-using-acacias-modules-cisco.html

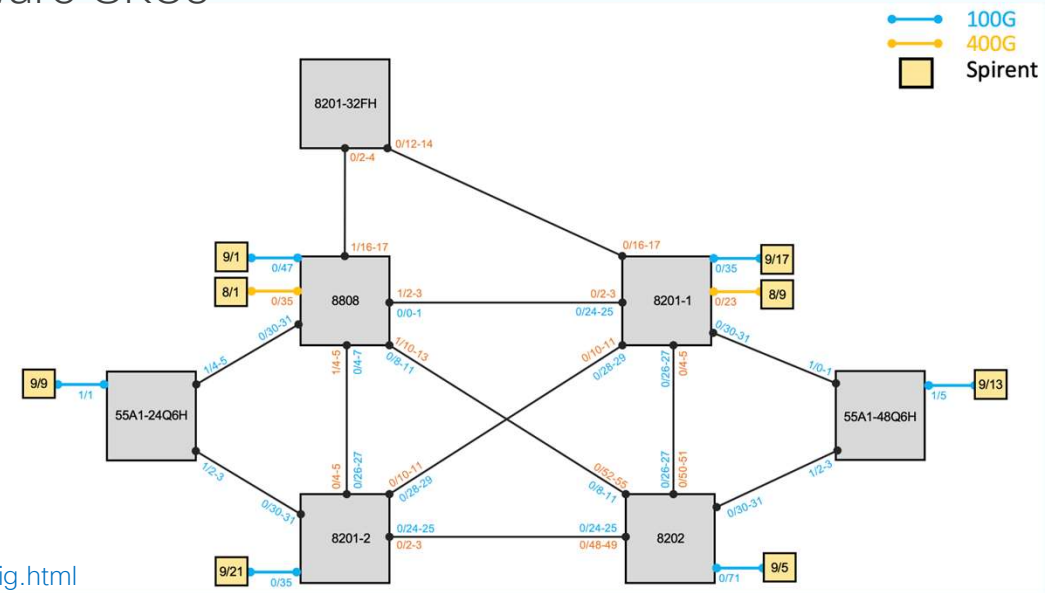
Cisco 8000 Series Routers earned the Best of Show Award, for Network Infrastructure at Interop Tokyo two years in a row.

https://f2ff.jp/award/winner/interop-2020/?lang=en

8000 Qualification Lab

- The 8000 Hardware / Software Qualification Lab provides the field and customers with hands-on access to the latest products in 8000 portfolio.
- Hosted at Cisco CPoC lab facility, accessible via dCloud
- Topology comprises of below Hardware SKUs
  - 8201 / 8202
  - 8201-32FH
  - 8808
  - 8800-LC-48H
  - 8800-LC-36FH
  - More HW is added on an ongoing basis

Please work thru your account teams on CPoC / Reservation requests



URL:
https://dcloud-docs.cisco.com/c/r/dcloud-docs/sites/en_us/explore/mig.html

The Cisco difference

Breadth of portfolio
1G to 100G and now 400G

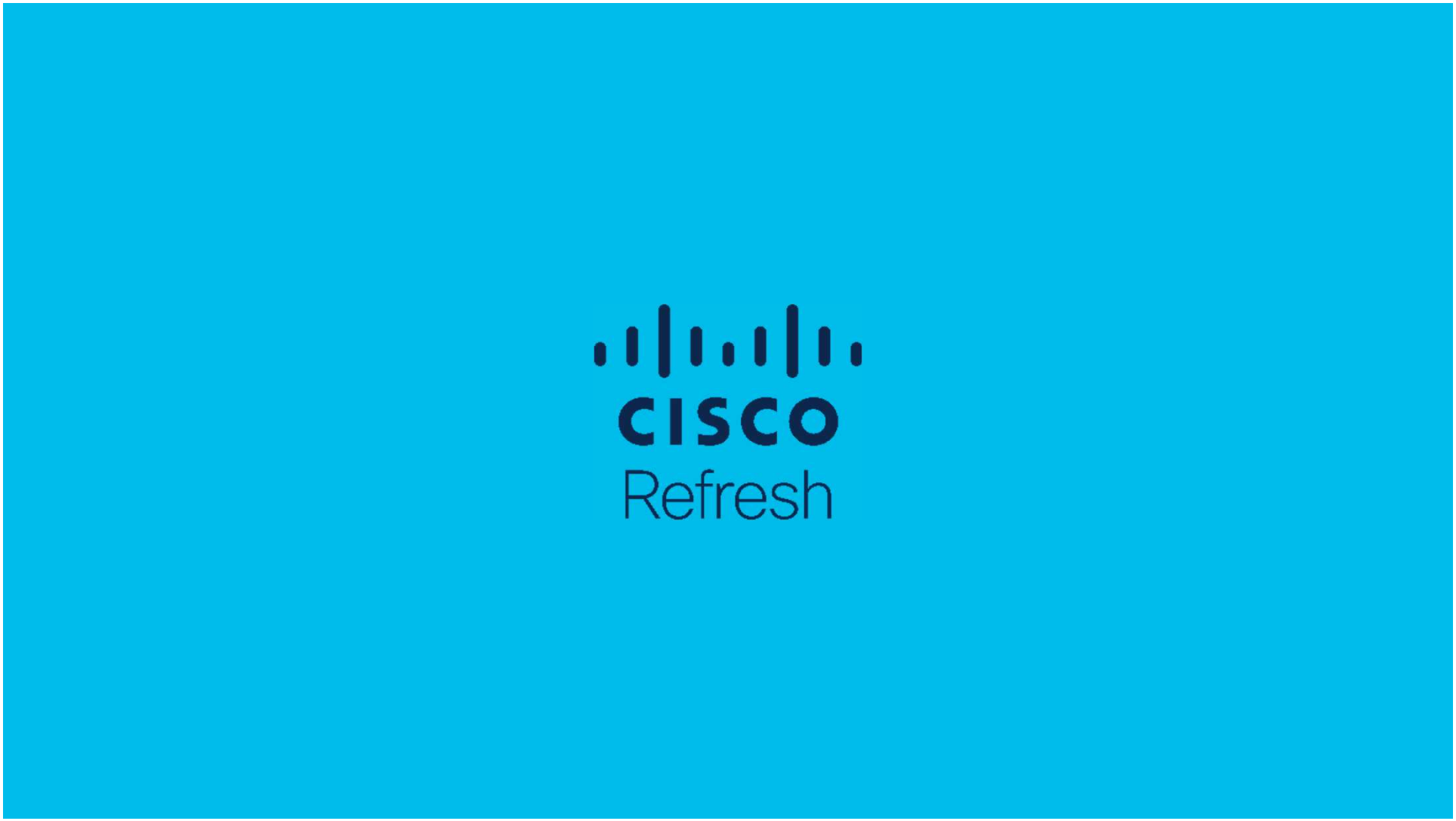
Unmatched SW and HW Platform
IOS XR 7, Trusted SW & HW

Technical expertise & Industry thought leadership
Switch, Router, Optics, Silicon photonics and and leadership with SR, EVPN etc. technologies.

End-to-End Architecture
Fabric Architectures, FTTH, 5G, Cable rPHY, TDM2IP

World class service
Renown Cisco TAC experience

Innovative Business Model
Subscription based SIA, RTU Licenses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