KONFERENCE/INTERNET
/A\TECHNOLOGIE/11
08–09\06/2011
Klub/Lávka\Praha

Inteligentní Access

Možnosti a výhody MPLS/IP v přístupových sítích

Martin Slinták, xmpp: mslintak@cisco.com

Systems Engineer SP, Cisco

9. června 2011

Simplify The Network
Evolution to Cisco ASR 9000 System

- 1996:
  Cisco released Tag Switching, which became MPLS and forever changed Internet architecture.
- 1998:
  Cisco introduces the 12000 core router.
- 2004:
  Cisco launched the CRS-1, establishing the benchmark for "core" routing, and in 2010 raised the bar with the CRS-3.
- 2008:
  Cisco reinvents the edge with ASR 1000 and 9000 routers.
- 2009:
  Cisco acquires Starent and redefines the mobility landscape with the ASR 5000.
- 2011:
  At CES, Cisco introduces Videoscape, a new way to experience video.
- **2011, June 7th:**
  Cisco announced a better, simpler way to build the next-generation Internet, setting a new industry standard for the network "edge."

ASR 9000 System with *nV* (Network Virtualization)
One system to support many services

Before: *nV* Technology

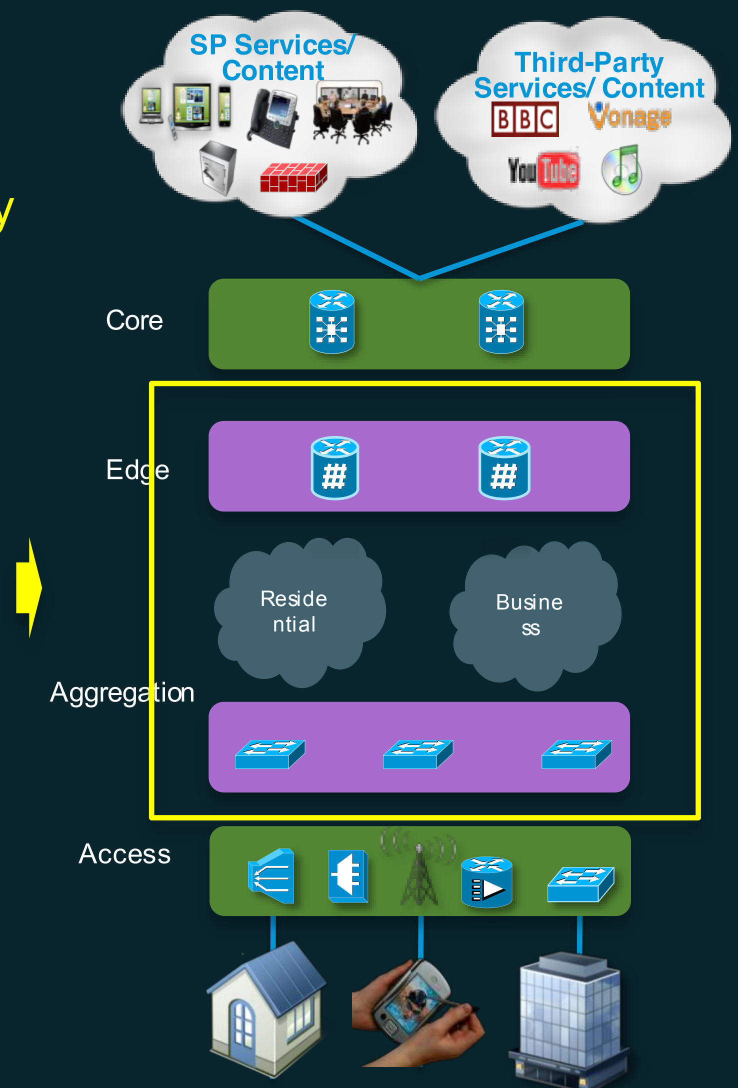
Each device managed separately.

Inconsistent features between edge and aggregation.

Siloed service domains.

Inconsistent service outages upon device failure.

Port scale limited to chassis.



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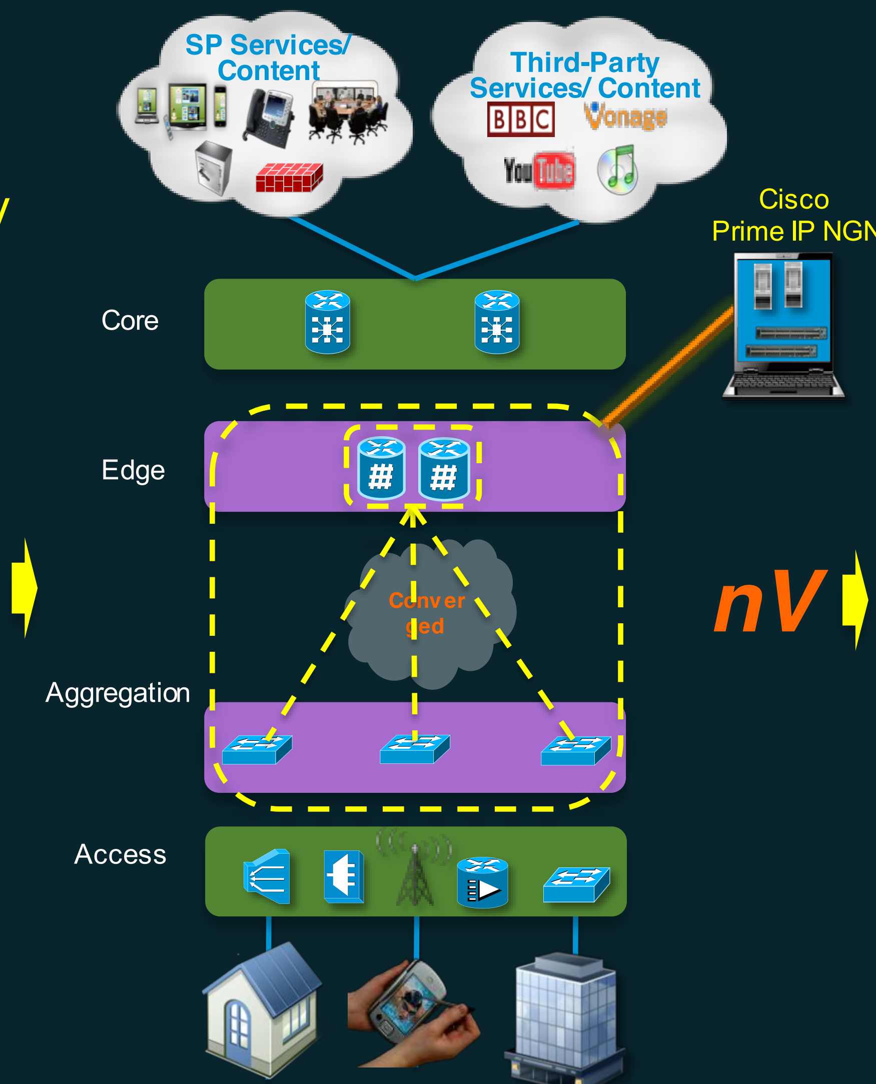


After: *nV* Technology

Edge and aggregation managed as one virtual system through Cisco Prime IP NGN.

Single release vehicle offering feature consistency.

Offers up to 71% reduction in OPEX over 6 years vs competitors.

Reduced protocol complexity between edge and aggregation

Up to 84,480 GE ports managed through a single virtual system

Simplify the Network—What is New?

Introducing Cisco ASR 9000 System & *nV* technology

ASR 9000 System NEW

SP Benefits

Multi-Dimensional Scale

Simplify Operations

Service Velocity

Single 96 Tb IPv6 System

36x More Capacity than the Closest Competitive Platform

Introducing *nV* (Network Virtualization) Technology
Simplify the network

ASR 9000 System

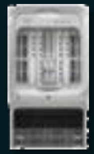
Edge

ASR 9922 /
9010 / 9006

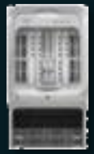
Introducing *nV* (Network Virtualization) Technology
Simplify the network

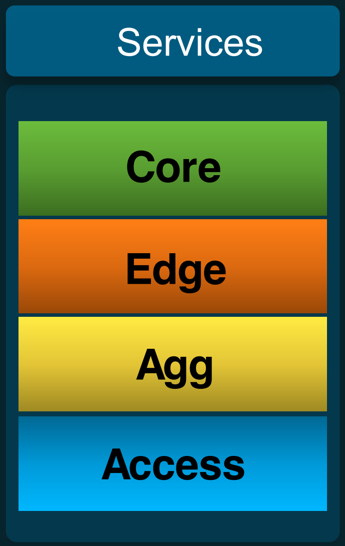
ASR 9000 System

Edge

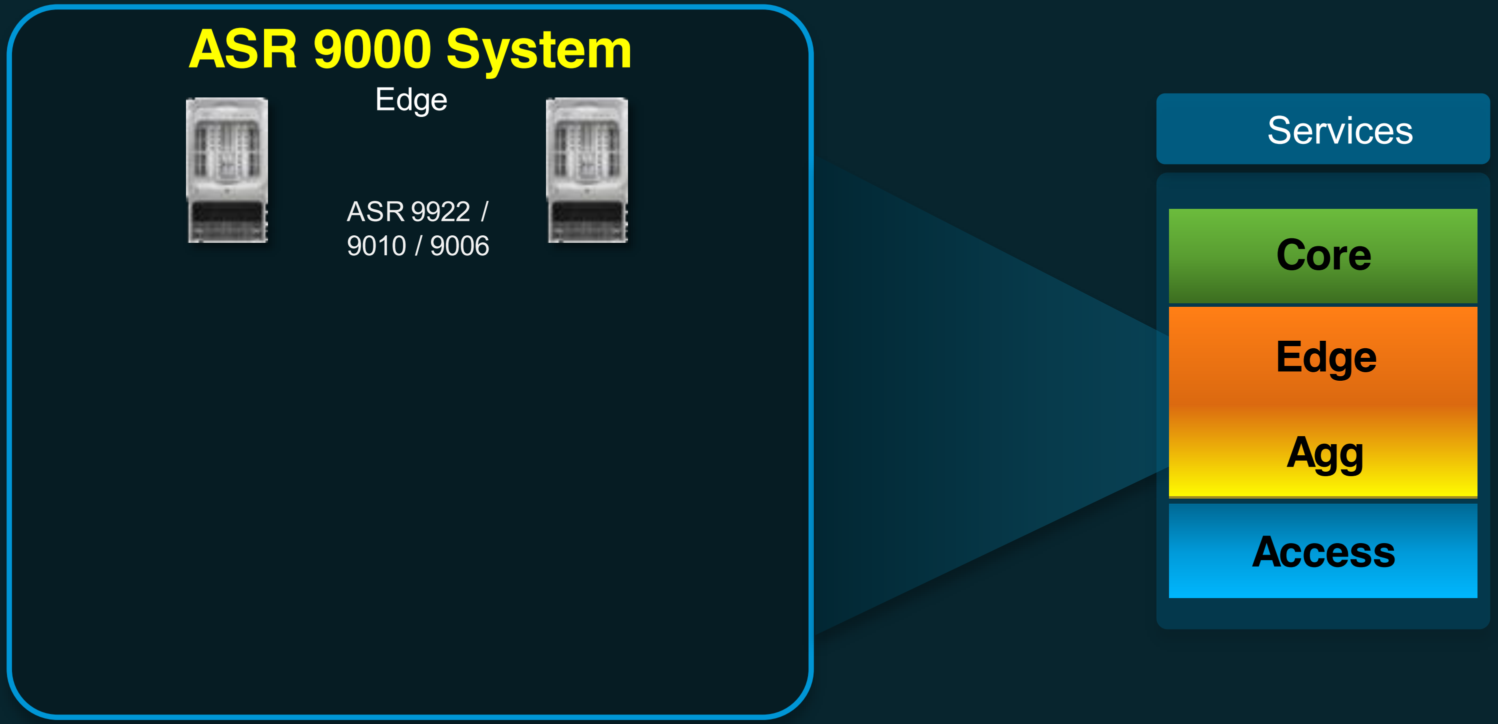


ASR 9922 /
9010 / 9006





Introducing *nV* (Network Virtualization) Technology
Simplify the network



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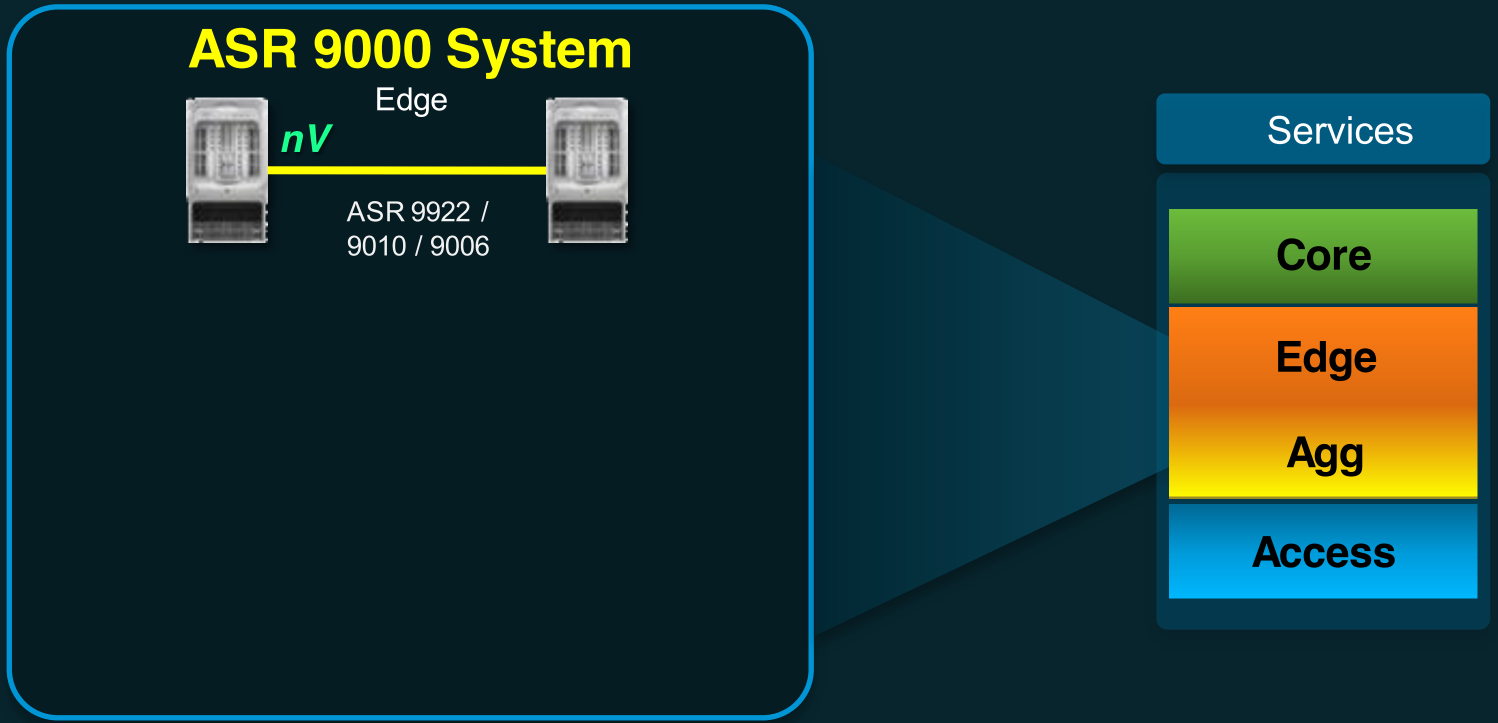
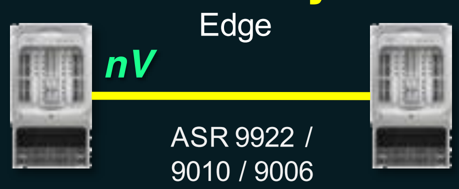


Introducing *nV* (Network Virtualization) Technology
Simplify the network

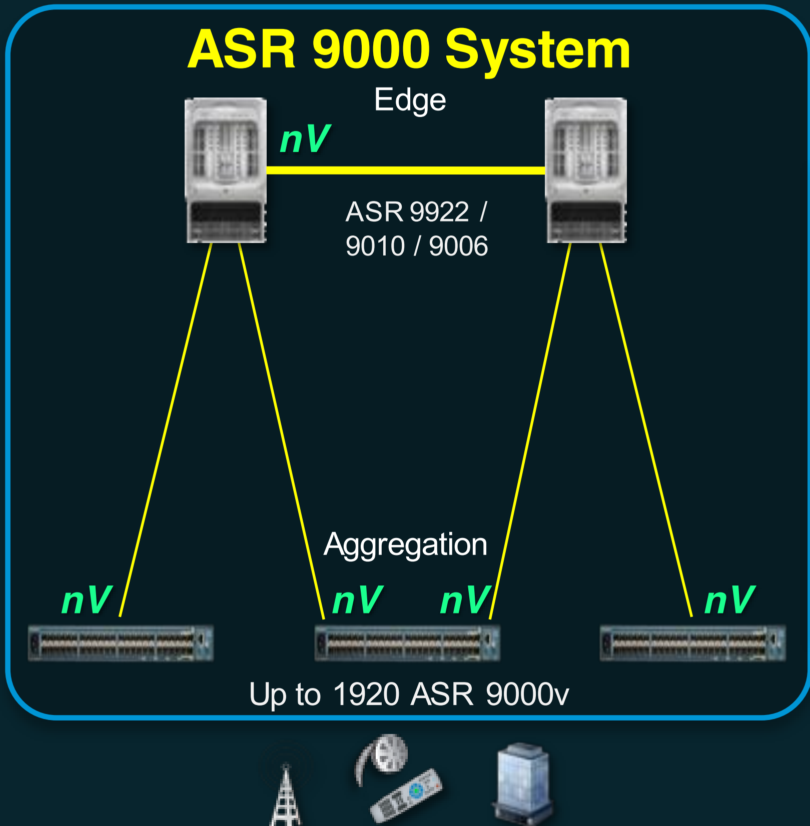
ASR 9000 System



Virtualized Control Plane
Virtualized Management Entity

Scalability & Resiliency
Simplicity

Introducing *nV* (Network Virtualization) Technology
Simplify the network



Virtualized Control Plane
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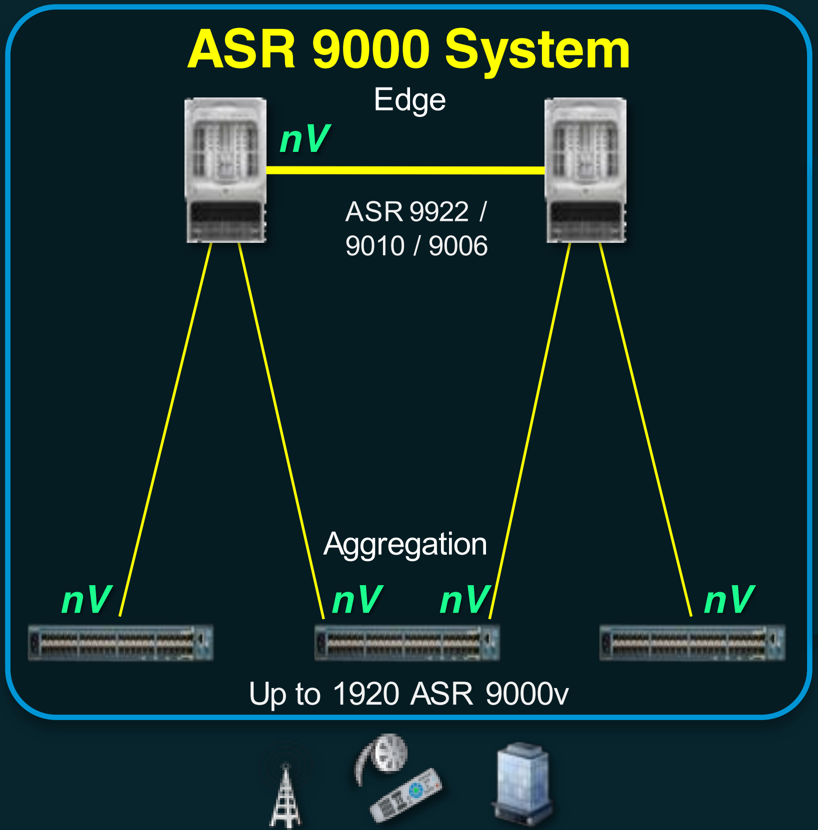
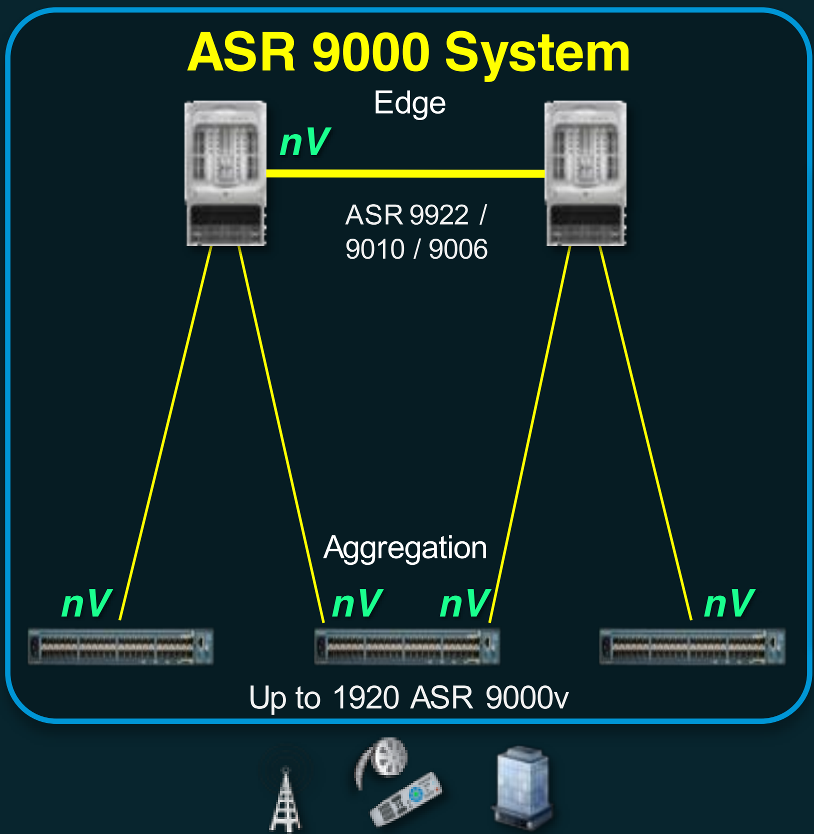


Virtualized Control Plane — **Scalability & Resiliency**
Virtualized Management Entity — **Simplicity**

Virtualized Switching Fabric — **Scalability**
Virtualized Common Features — **Service Velocity**
Virtualized Management Entity — **Simplicity**

Introducing *nV* (Network Virtualization) Technology
Simplify the network

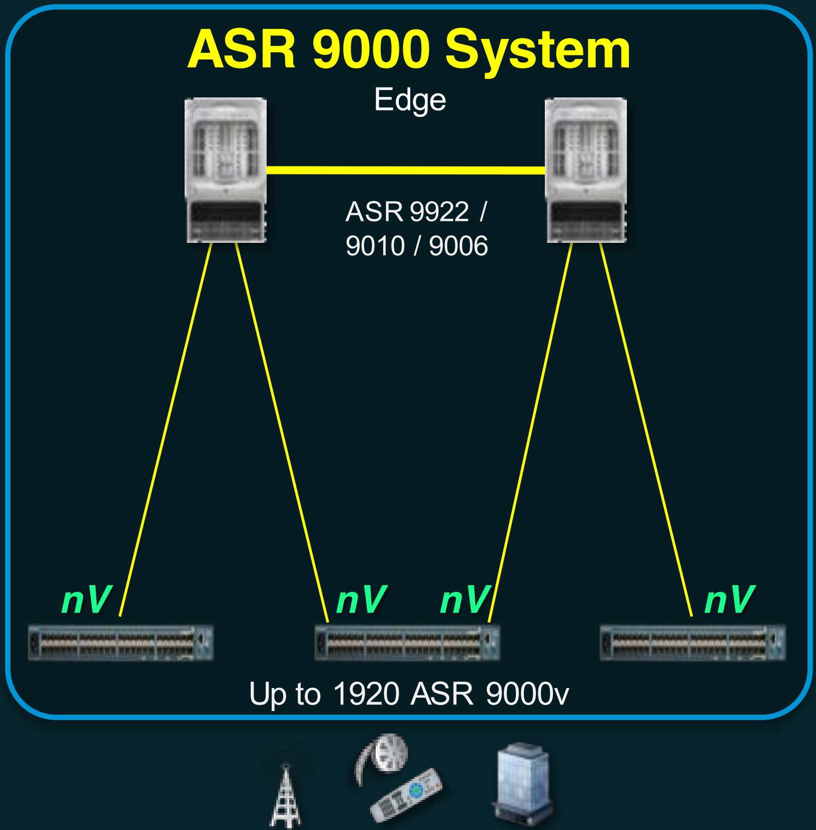


Virtualized Control Plane	Scalability & Resiliency
Virtualized Management Entity	Simplicity

Virtualized Switching Fabric	Scalability
Virtualized Common Features	Service Velocity
Virtualized Management Entity	Simplicity

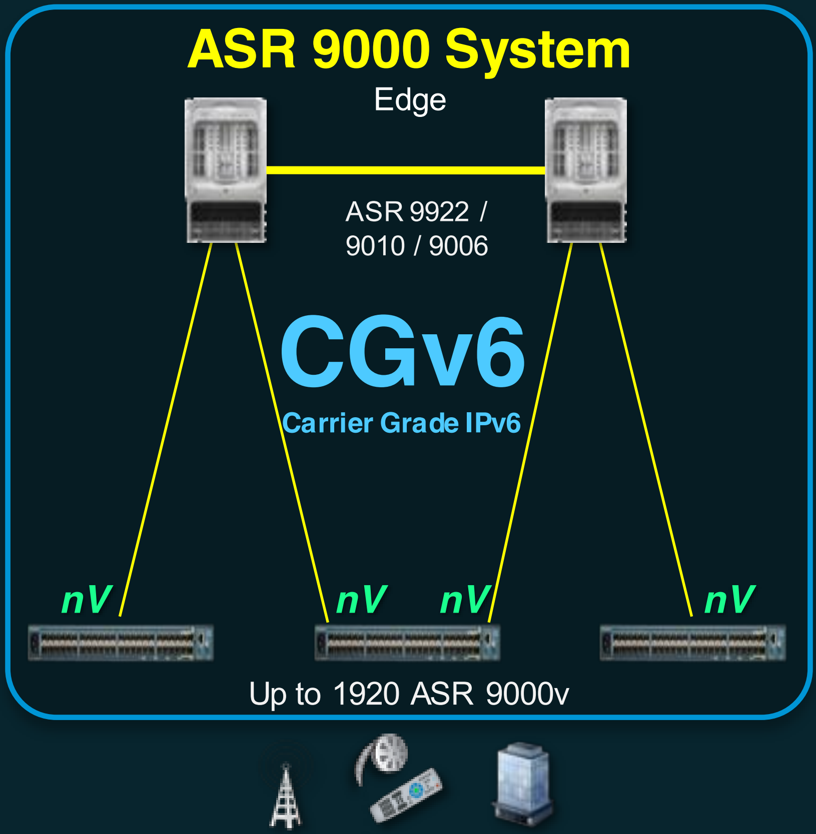
Expand any Cisco ASR 9000 to a System with
a ***Simple Upgrade***

Simplify IPv6 Transition
nV Technology accelerates CGv6 transition



Simplify IPv6 Transition

nV Technology accelerates CGv6 transition



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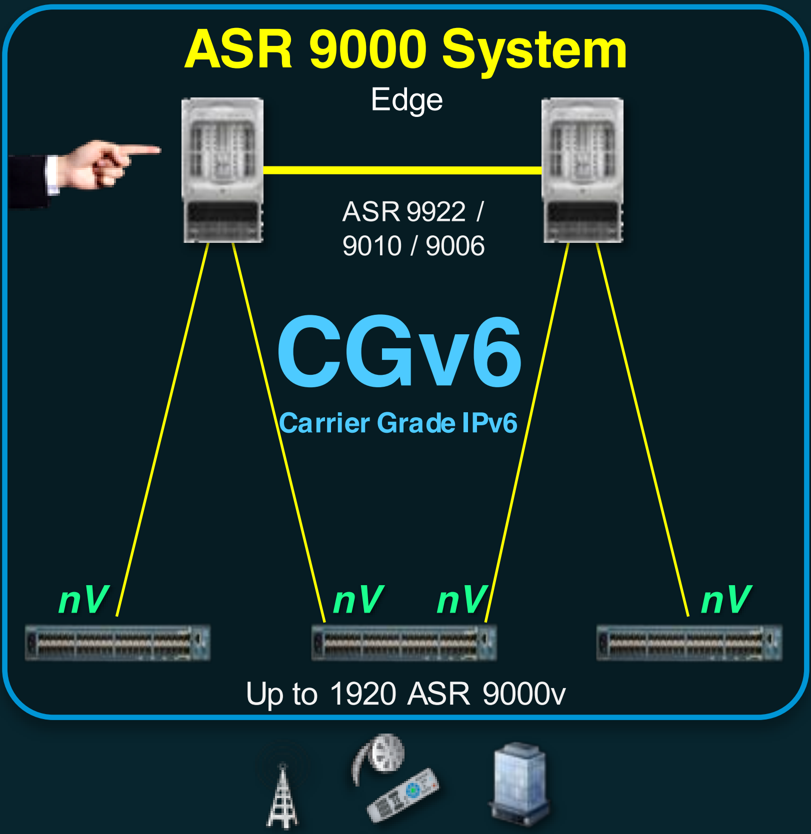
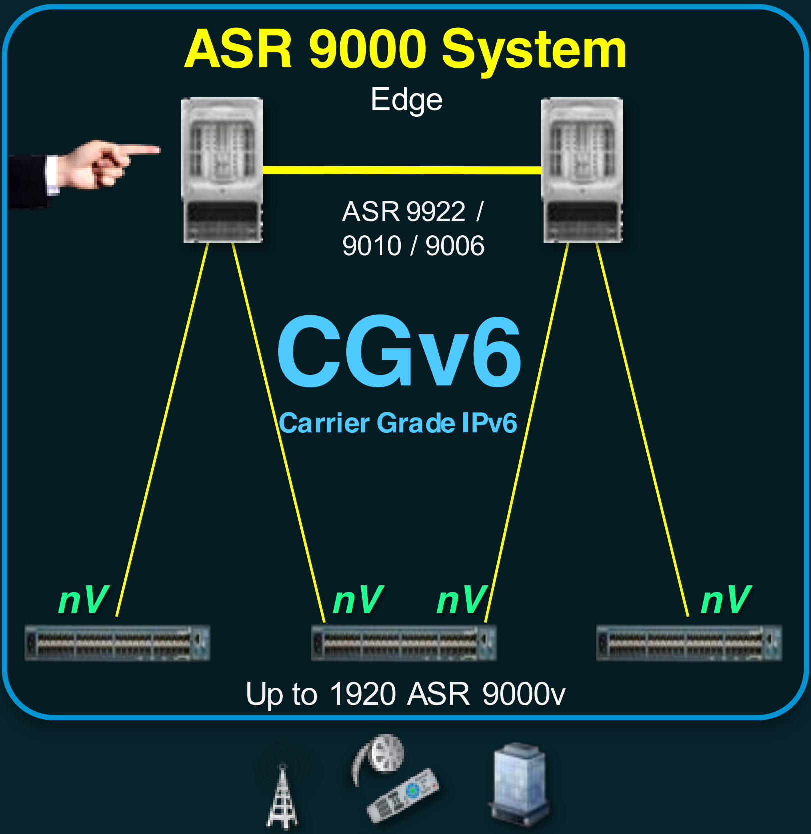


Simplify

Single touch-point for 1000s of devices

Simplify IPv6 Transition

nV Technology accelerates CGv6 transition



Simplify

Single touch-point for 1000s of devices

Complete Lifecycle

Preserve IPv4 investment
Prepare to co-exist IPv4 & IPv6
Prosper to full IPv6

Simplify IPv6 Transition

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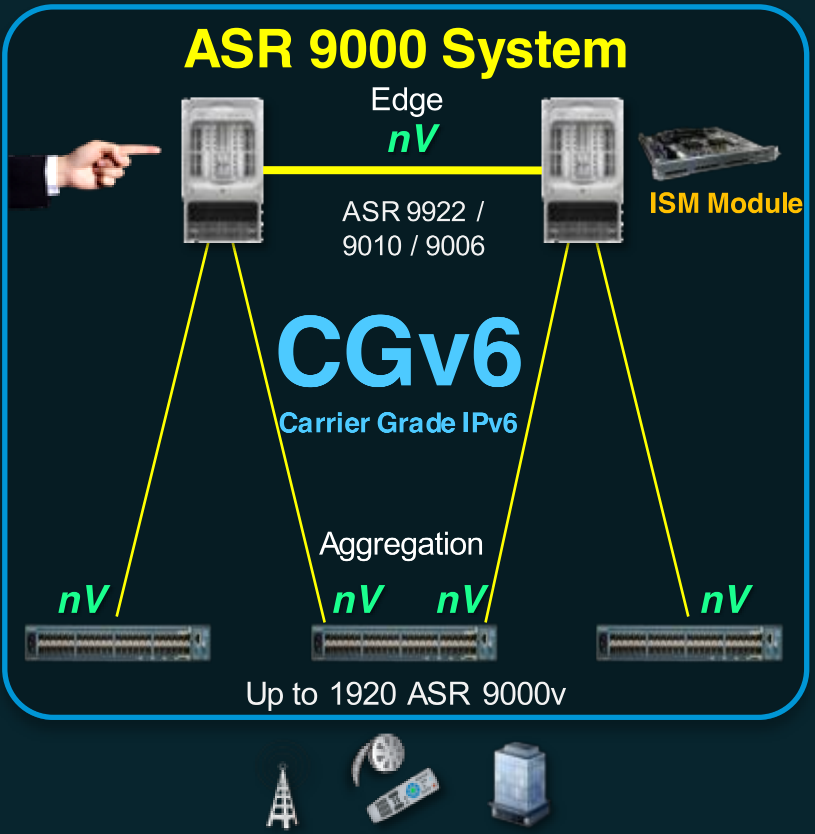


Simplify

Single touch-point for 1000s of devices

Complete Lifecycle

Preserve IPv4 investment

Prepare to co-exist IPv4 & IPv6

Prosper to full IPv6

Scale

Hardware-accelerated by ISM module

ISM = Integrated Services Module

Simplify the Operations

Reduce the lifecycle OPEX up to 70% by ***nV*** technology

Acquisition
Engineering
Integration

Qualify ASR 9000 System
only once

Train your staff
only once

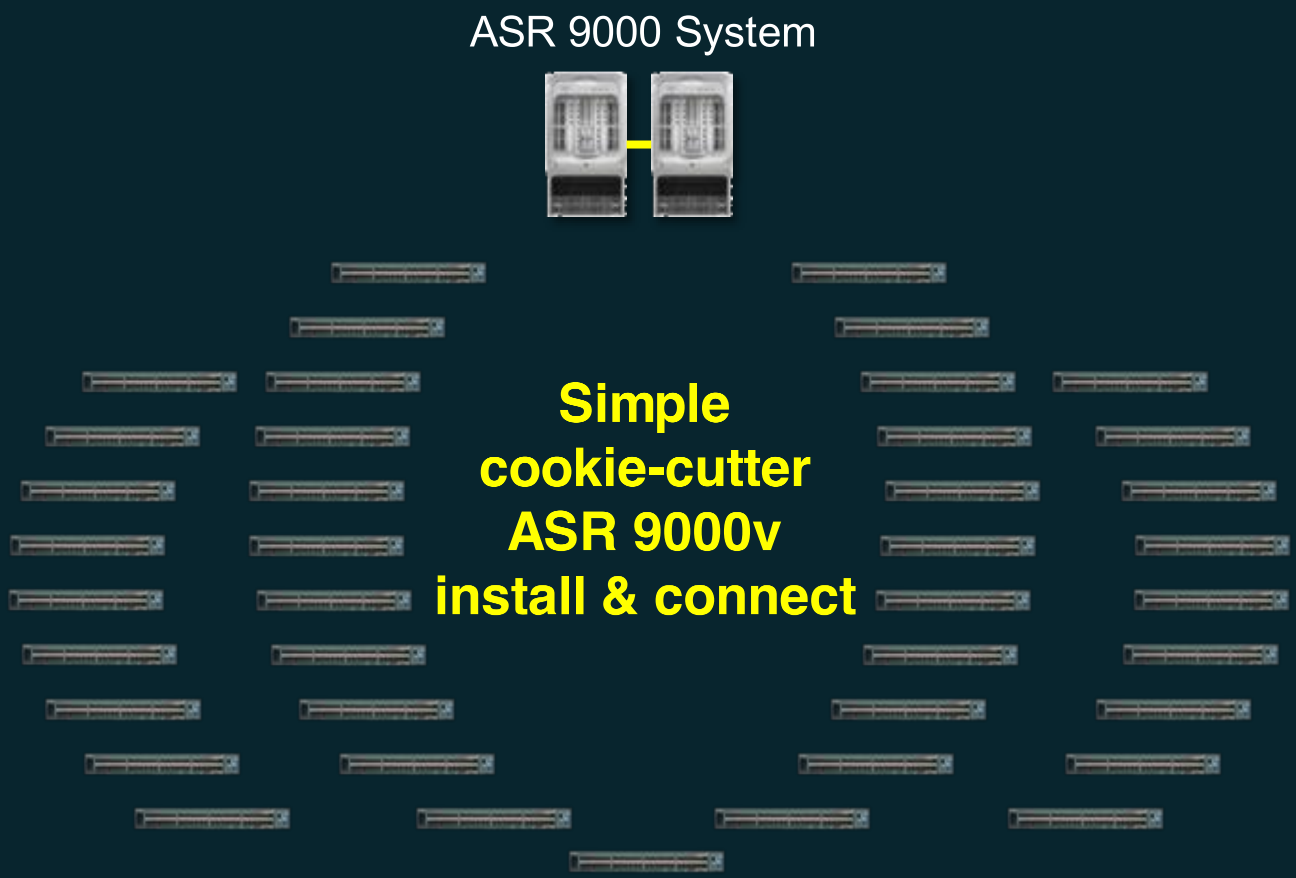
For current & future needs

Simplify the Operations

Reduce the lifecycle OPEX up to 70% by ***nV*** technology

Acquisition
Engineering
Integration

Install
Commission



Simplify the Operations

Reduce the lifecycle OPEX up to 70% by ***nV*** technology

Acquisition
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Install
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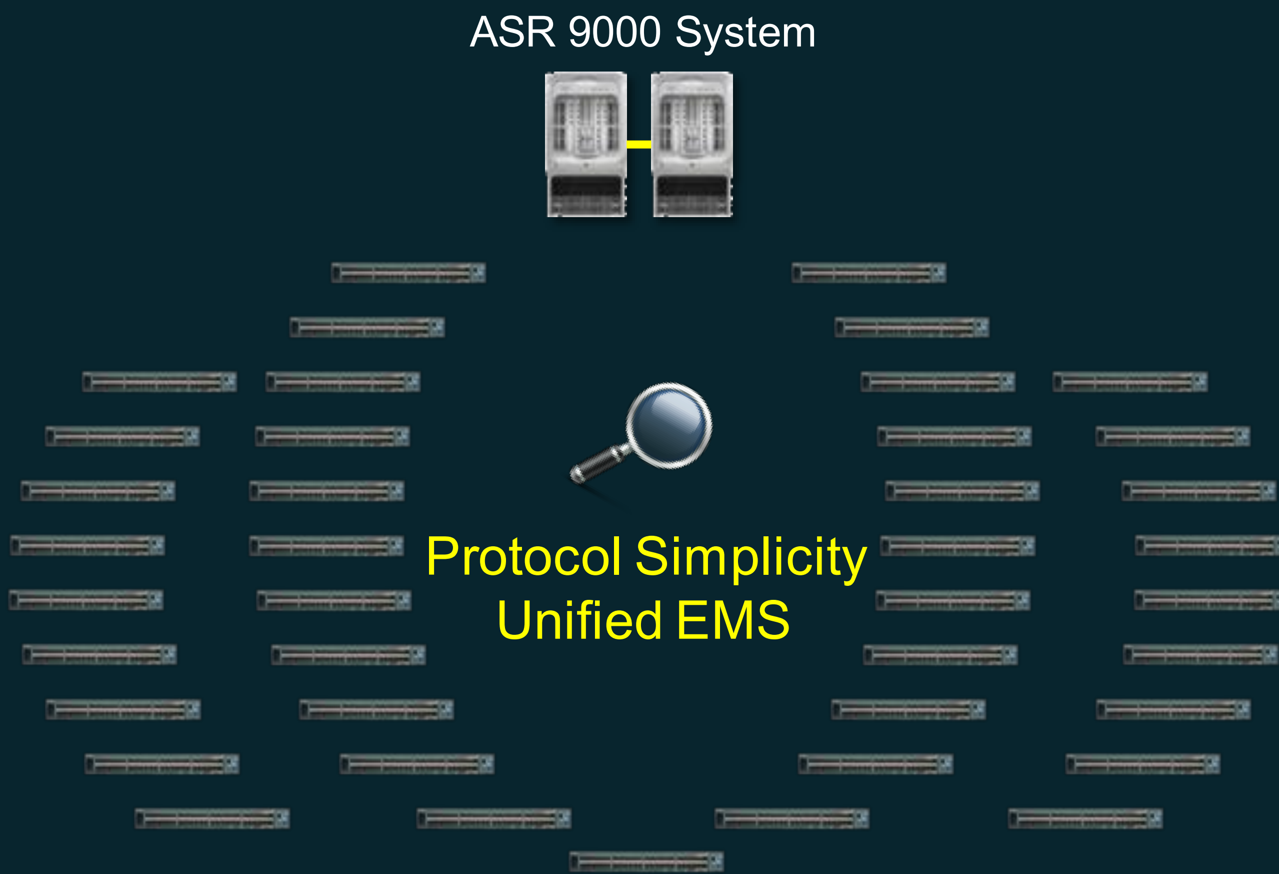
Software
Maintenance

Simplify the Operations

Reduce the lifecycle OPEX up to 70% by ***nV*** technology

- Acquisition Engineering Integration
- Install Commission
- Software Maintenance
- Trouble-shooting



Simplify the Operations

Reduce the lifecycle OPEX up to 70% by ***nV*** technology

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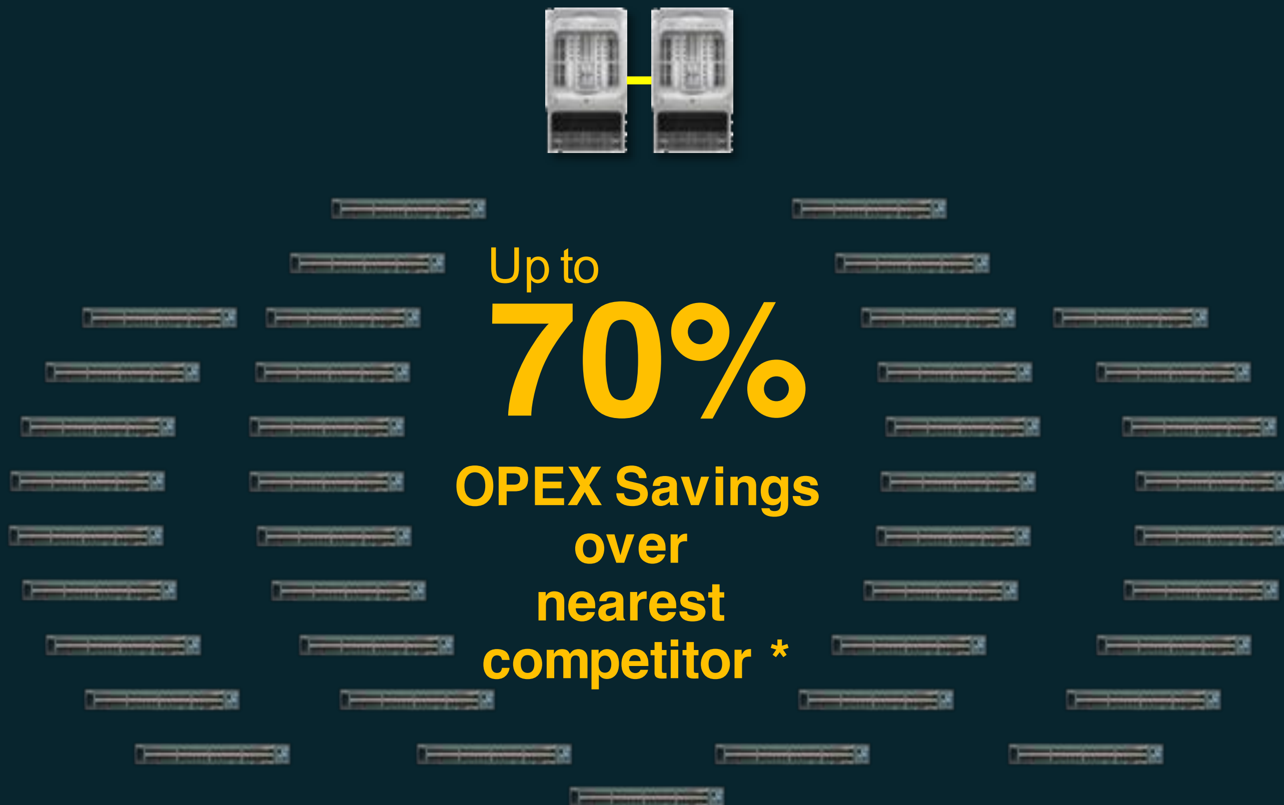
ASR 9000 System



Up to

70%

OPEX Savings over nearest competitor *

* Reference ACG report, Includes power, cooling & space savings also

Simplify the Operations

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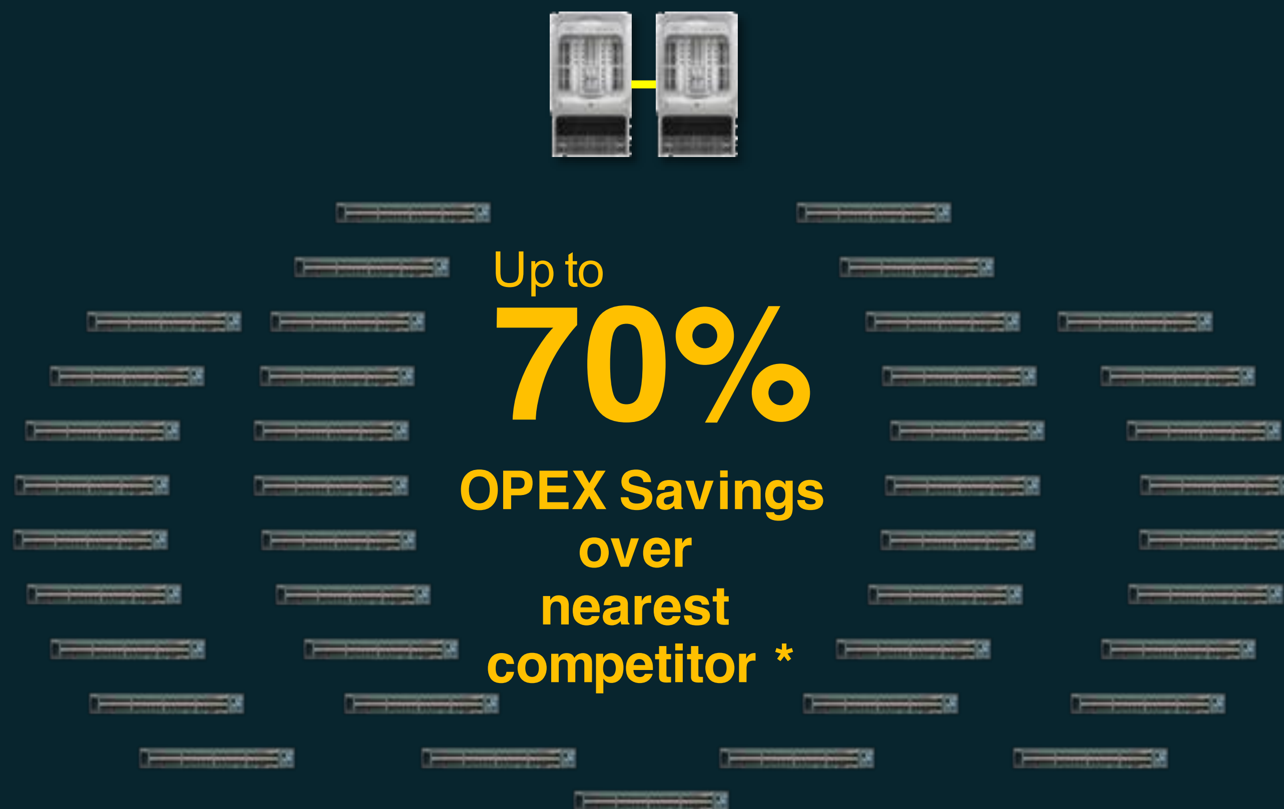


Up to
70%
OPEX Savings over nearest competitor *

System pays for itself within a year

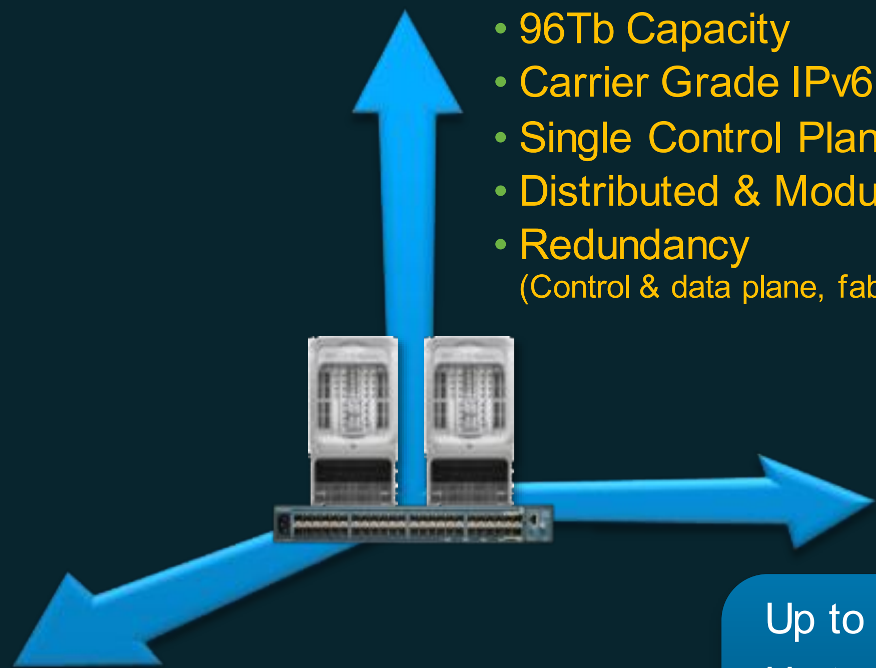
* Reference ACG report, Includes power, cooling & space savings also

Multi-dimension Scalability

Ready to Grow in Any Dimension with ASR 9000 System

System

- 96Tb Capacity
- Carrier Grade IPv6
- Single Control Plane
- Distributed & Modular OS
- Redundancy
  (Control & data plane, fabric, link & more)



Ports

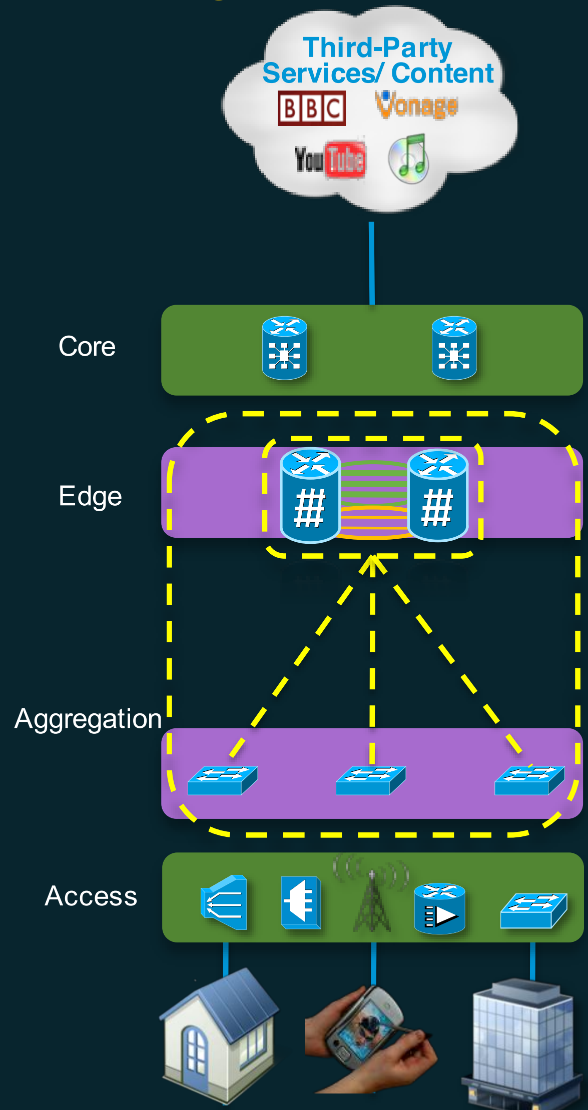
Up to **1,920** ASR 9000v
Up to **84,480** GE Ports
Up to **1,920** 10GE Ports
Up to **480** 100GE Ports

Services

Virtualized features across business & residential for video, mobile & cloud services

ASR 9000 Virtual System with *nV* Technology

Self protected, self managed ASR 9000 virtualized system



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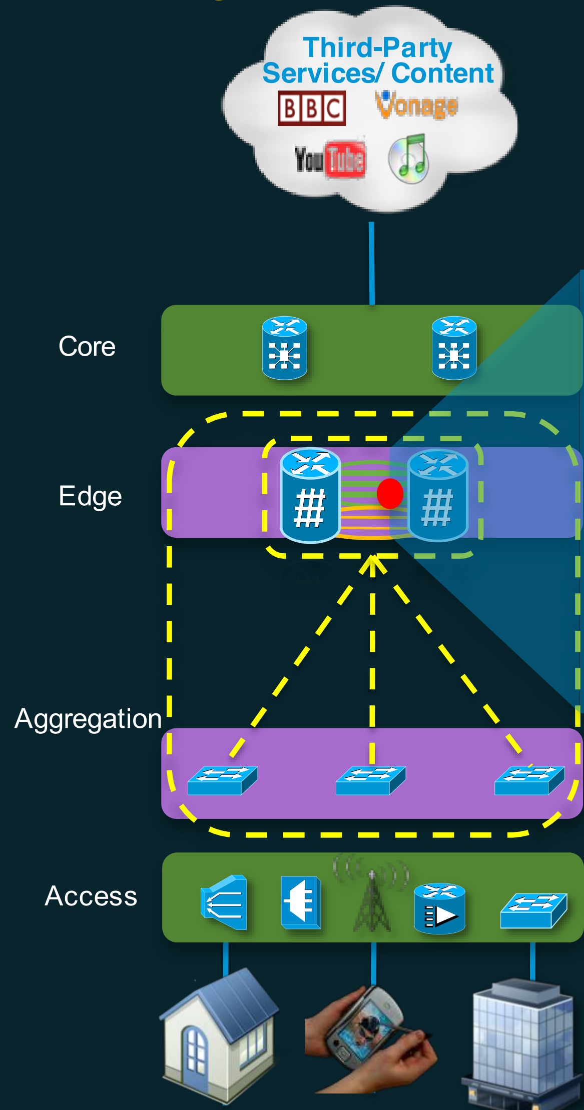
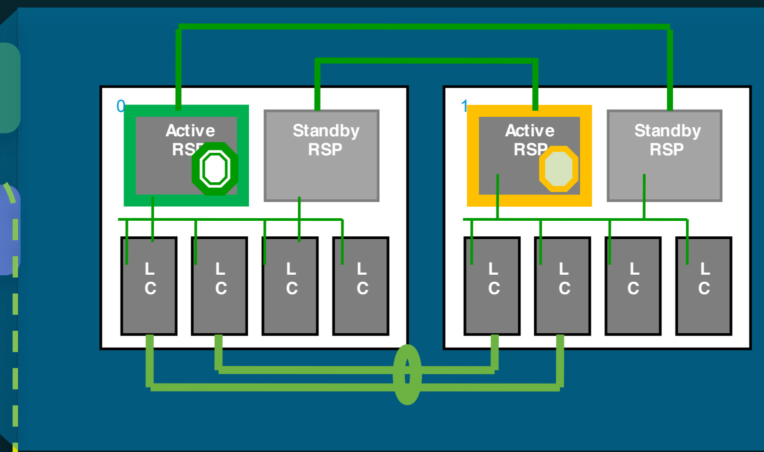


Virtualized Control & Data Plane Inter-chassis Connections



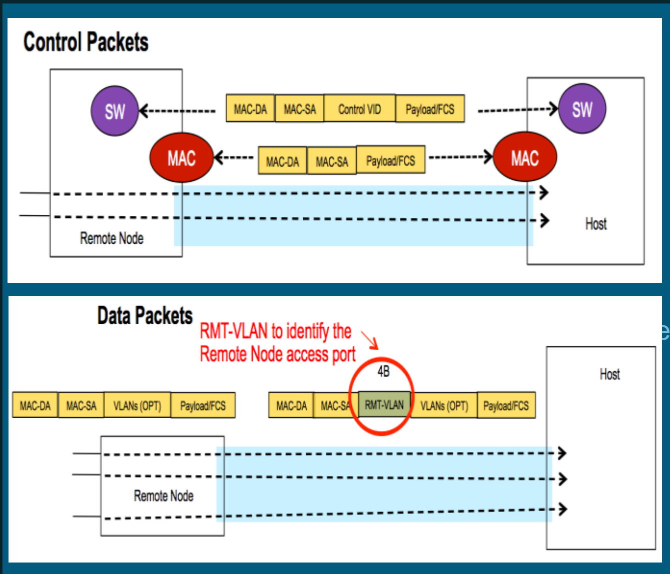
Virtualized control plane achieved via EOBC between RSP's provides hitless outage upon node failure.

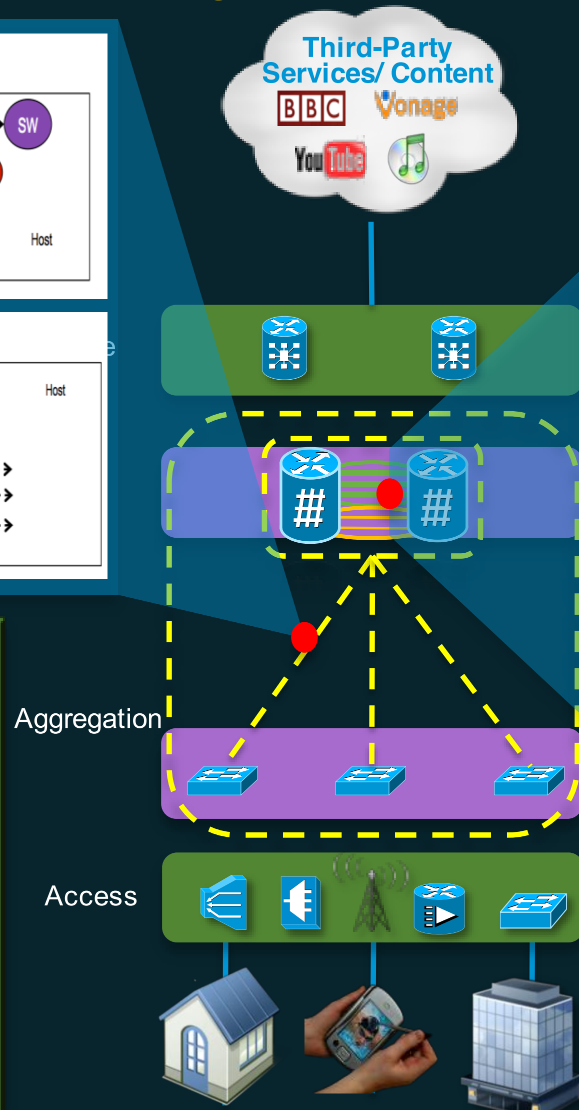
Virtualized data plane achieved through linecard inter-chassis connections.

A self-protected virtual chassis is created doubling the system capacity.

ASR 9000 Virtual System with *nV* Technology

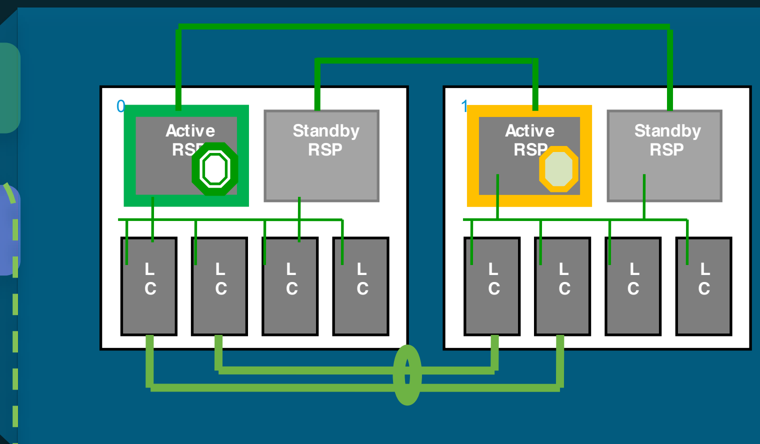
Self protected, self managed ASR 9000 virtualized system





Virtualized Control & Data Plane

Inter-chassis Connections



Remote nodes are viewed as linecards and remote platforms are discovered automatically.

Remote platforms are provisioned by the host.

Software images for remote nodes can be upgraded automatically and features are in sync.

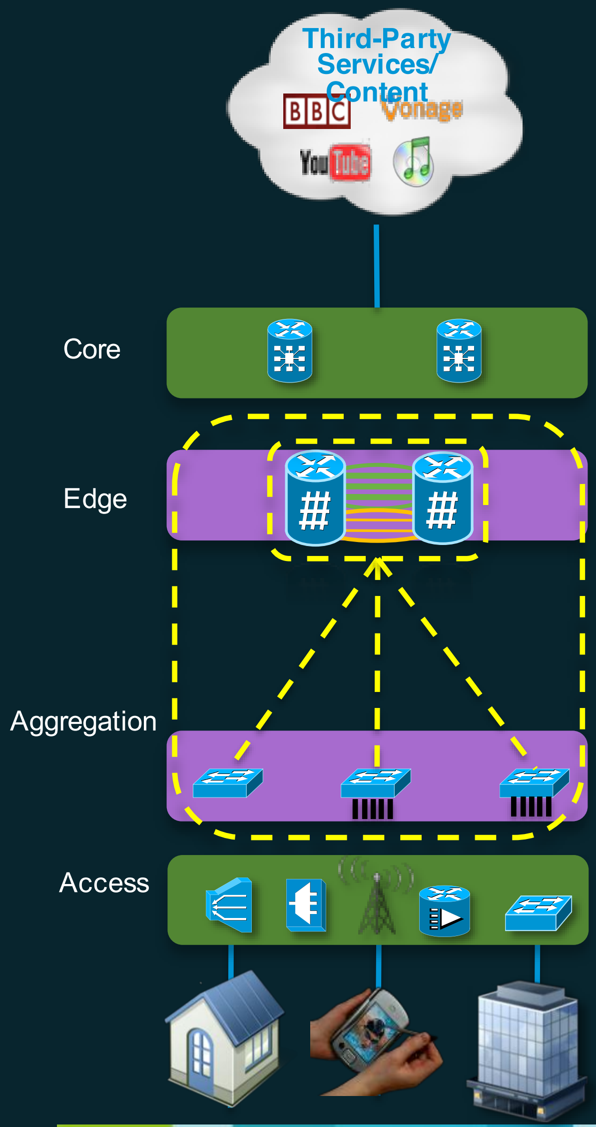
A self-managed access is created allowing scale to be decoupled from a single platform.

Virtualized control plane achieved via EOBC between RSP's provides hitless outage upon node failure.

Virtualized data plane achieved through linecard inter-chassis connections.

A self-protected virtual chassis is created doubling the system capacity.

nV Technology in Action
Host CLI Configuration Example



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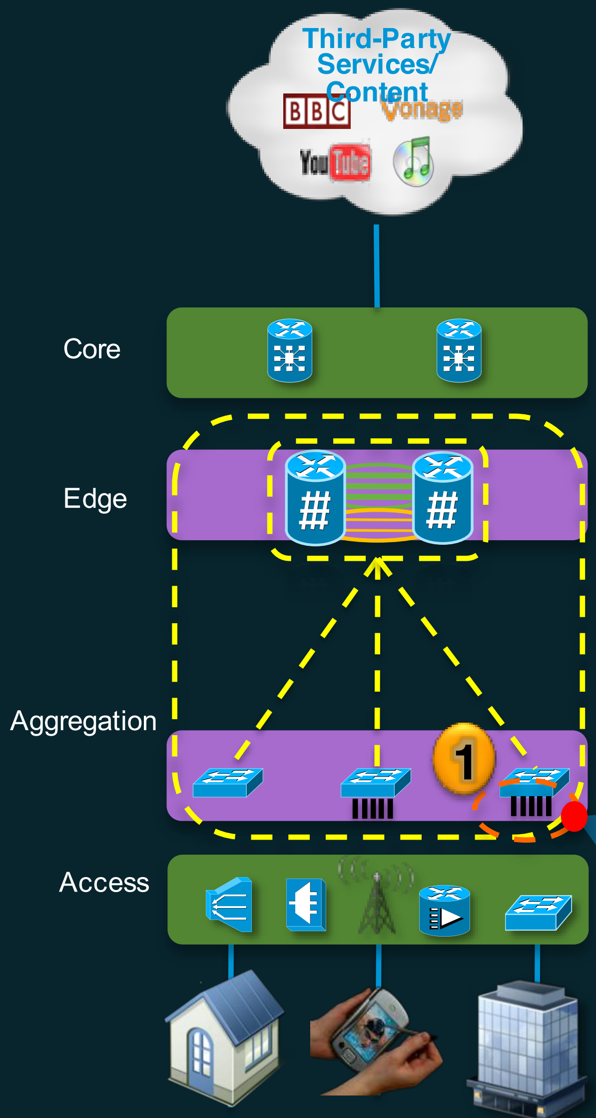
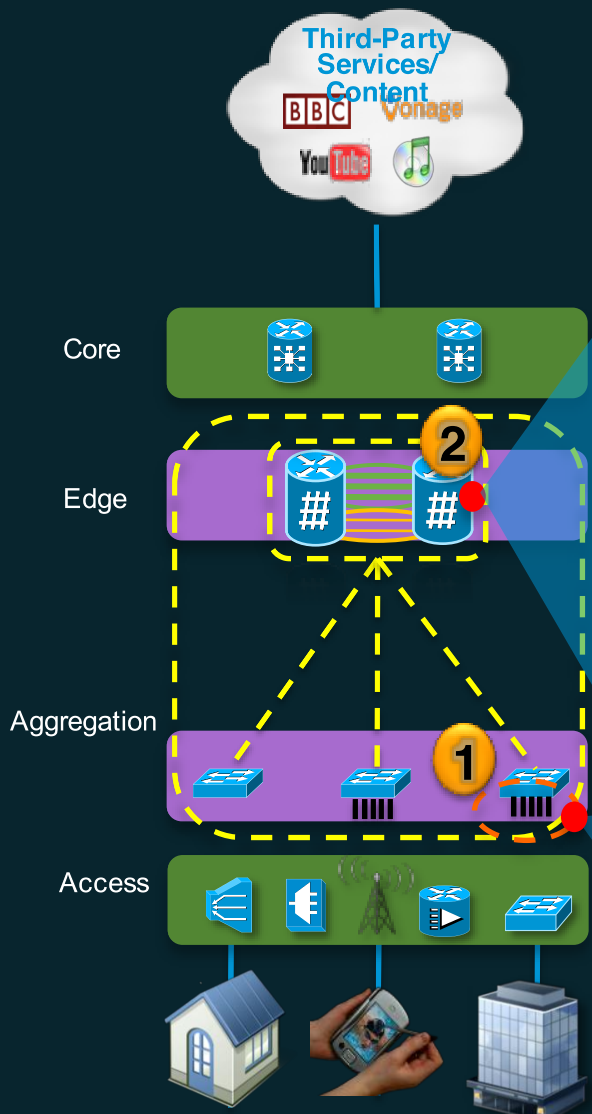


GE ports need to be provisioned to the access block

nV Technology in Action
Host CLI Configuration Example



Host CLI Example Configuration for Remote Node

```
!
Interface remoteEthernet 0/0/0/1/100/0/0/1
        Ipv4 address …….
!
Interface remoteEthernet 0/0/0/1/100/0/0/2.1
        Ipv4 address ….
        Encapsulation dot1q 201
        Rewrite ingress tag ………
!
```

CLI uses 8 values

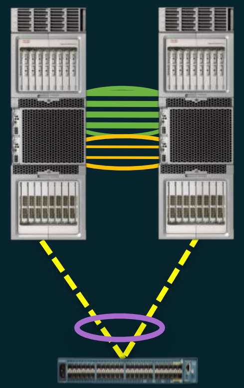
- First 4 define the remote uplink location
- Second 4 define the remote node itself

GE ports need to be provisioned to the access block

Simplify Multi-dimension Scale
ASR 9000 System deployment options

Deployment Scenario #1:
ASR 9922
ASR 9000v bundled

Deployment Scenario #2:
ASR 9922
ASR 9000v bundled



Single adjacency over link bundle

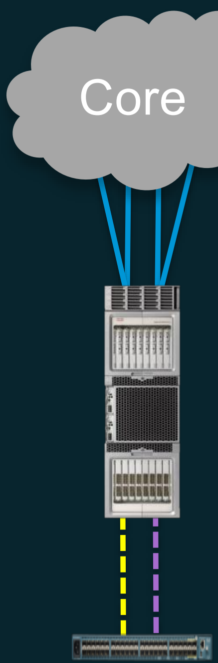
Traffic load balanced over link bundle

Link bundle remains up when link or node fails

Different Deployment Scenario's depending on your desired outcome

Simplify Multi-dimension Scale
Example #1

Deployment Scenario #1:
ASR 9922
ASR 9000v Single Homed



….. (n) ASR 9000v

Assumptions

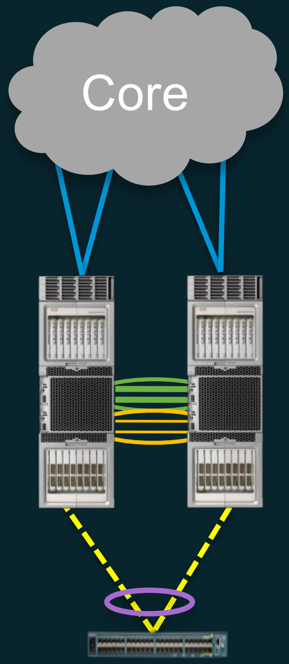
20 linecard slots usable on the ASR 9922
2 slots reserved = 2x100GE for uplink connectivity
18 slots reserved = 24x10GE connecting ASR 9000v

Total ASR 9922 10GE's supported	ASR 9000v Connectivity	Link Protection	ASR 9000v Oversubscription	ASR 9000v's Supported	ASR 9000v GE's Supported
432	1x10GE	No	4:1	432	19,008
432	2x10GE	Yes	2:1	216	9,504
432	4x10GE	Yes	1:1	108	4,752

Different Deployment Scenario's depending on your desired outcome

Simplify Multi-dimension Scale
Example #2

Deployment Scenario #2:
ASR 9922
ASR 9000v bundled



Assumptions

20 linecard slots usable on the ASR 9922
2 slots reserved = 2x100GE for uplink connectivity
2 slots reserved = 2x100GE for inter-chassis data plane connectivity
16 slots reserved = 24x10GE connecting ASR 9000v

Total ASR 9922 10GE's supported	ASR 9000v Connectivity	Link Protection	ASR 9000v Oversubscription	ASR 9000v's Supported	ASR 9000v GE's Supported
768	2x10GE	Yes	2:1	384	16,896
768	4x10GE	Yes	1:1	192	8,448

Different Deployment Scenario's depending on your desired outcome

Superior Network Capacity

36x better than competitive offering

96 Tb Capacity

HD video call for everyone in USA

Download 180,000 DVDs in 60 Seconds

Up to 84,480 GE Ports per System

1 GE Connection to every home in Orlando, Kowloon or Florence

One System, Many Service

Cisco ASR 9000 System

Converge Video, Mobile & Cloud Services

One System, Many Service

Cisco ASR 9000 System

Converge Video, Mobile & Cloud Services

Simplify Network Operations

With *nV* (Network Virtualization) Technology

Manage 1900+ Devices as Single System

Simplify Network Operations

With *nV* (Network Virtualization) Technology

Single Touch IPv6 Transition for 1900+ Devices

Simplify Network Operations

With *nV* (Network Virtualization) Technology

Single Touch Software Upgrade for 1900+ Devices

Otázky ..?

Q2 SP Seminář – 22.6.2011, Praha

- Jak stavět cloud služby
- Podpora mobilních sítí 3G na směrovačích ISR a využití u poskytovatelů služeb
- IPv6 aktuality – novinky ve standardizačním procesu, porovnání přechodových scénářů
- Dynamic Ethernet Services Activation (DESA)
- Inovace v IOS XR 4.1, parita s IOS trainy, příklady nových aplikací na ASR9000 a roadmapy
- Cisco podpůrné nástroje: DocWiki, Support Wiki, TAC eskalace

Nashledanou