



Cisco Cloud Services Router (CSR 1000V)

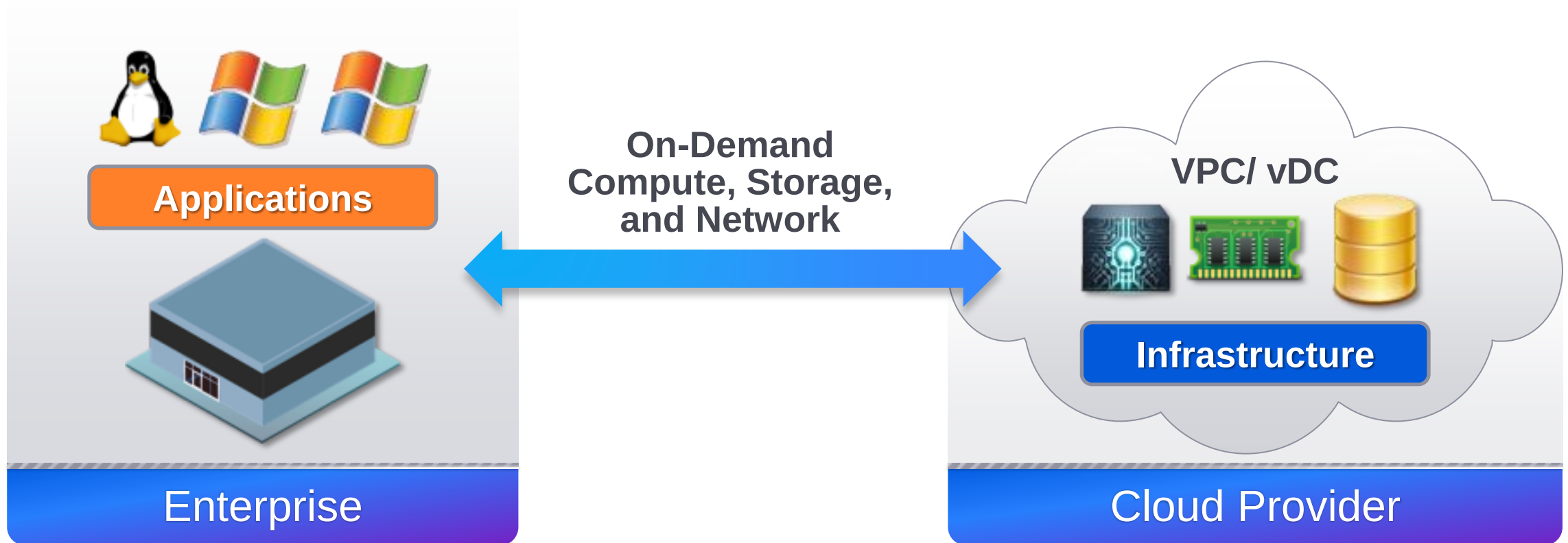
Armin Rishi
Product Manager

Agenda

- Cloud IaaS Networking Challenges
- What is the CSR 1000V?
- Where is the CSR 1000V deployed?
- CSR vs. ISR G2 vs. ASR 1000
- CSR 1000V Management and Licensing
- Available for Download and Purchase
- Cisco Virtualized Networking and Security Products

Infrastructure as a Service (IaaS)

Changing the Cost Economics and Business Responsiveness of IT



Pay-For-Use Pricing, Rapid Provisioning, Elastic Scalability

Cloud Networking Challenges

Lack of Enterprise Network Services Creates Barriers to Adoption

Enterprise

Security

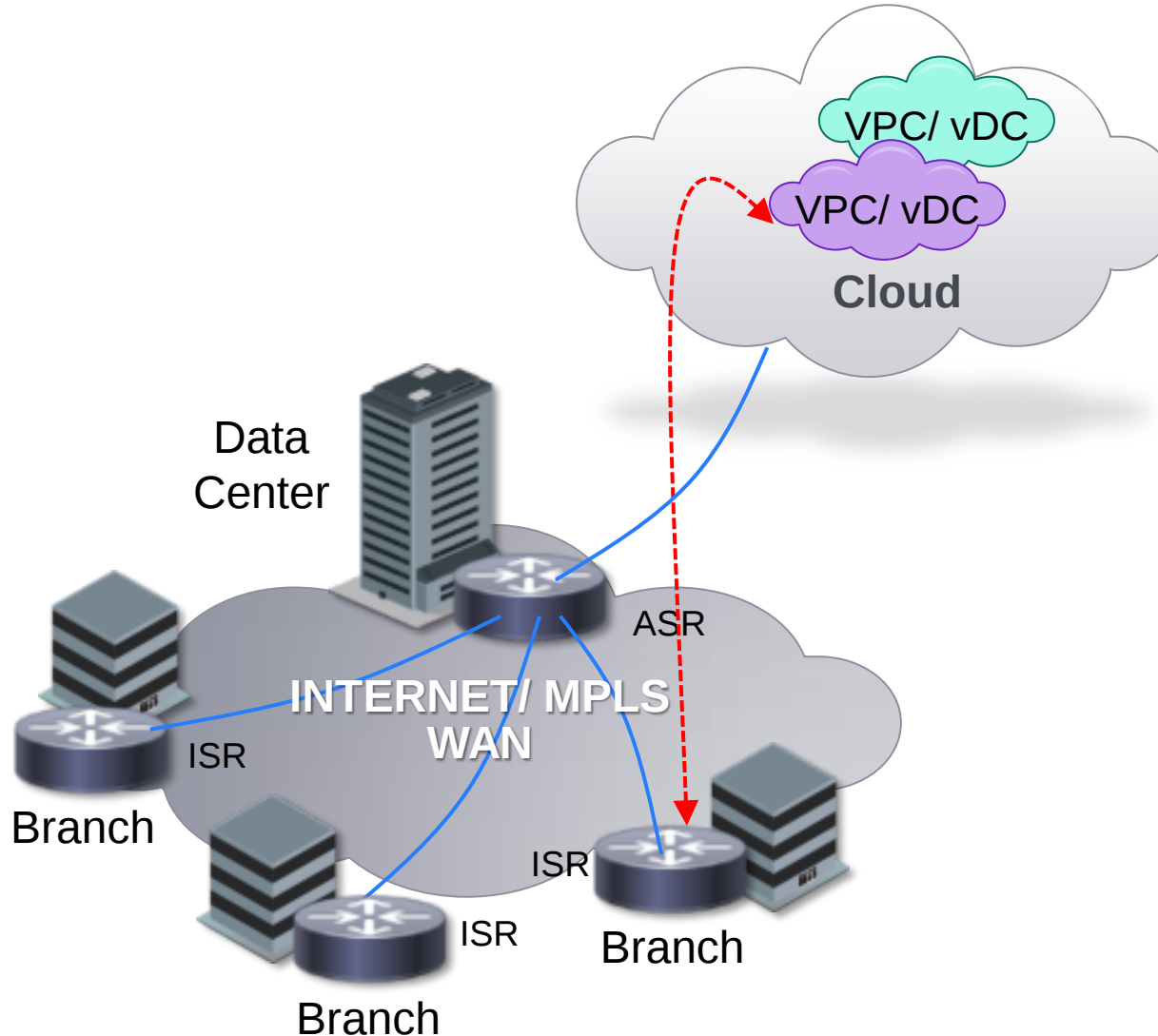
- Inconsistent VPN/ Firewall Policies
- Limited Connection Reliability
- Error-prone Topology Changes

Integration

- Incompatible IP Addressing
- Incomplete Network Services
- Different Management Tools

User Experience

Indirect Traffic Path through DC
No Traffic Optimization and QoS
Limited End-to-End SLAs



Cloud Provider

Tenant Scalability

VLAN-dependent Tenant Scale
Limited Number of VLANs
No WAN Extensibility

Enterprise Services

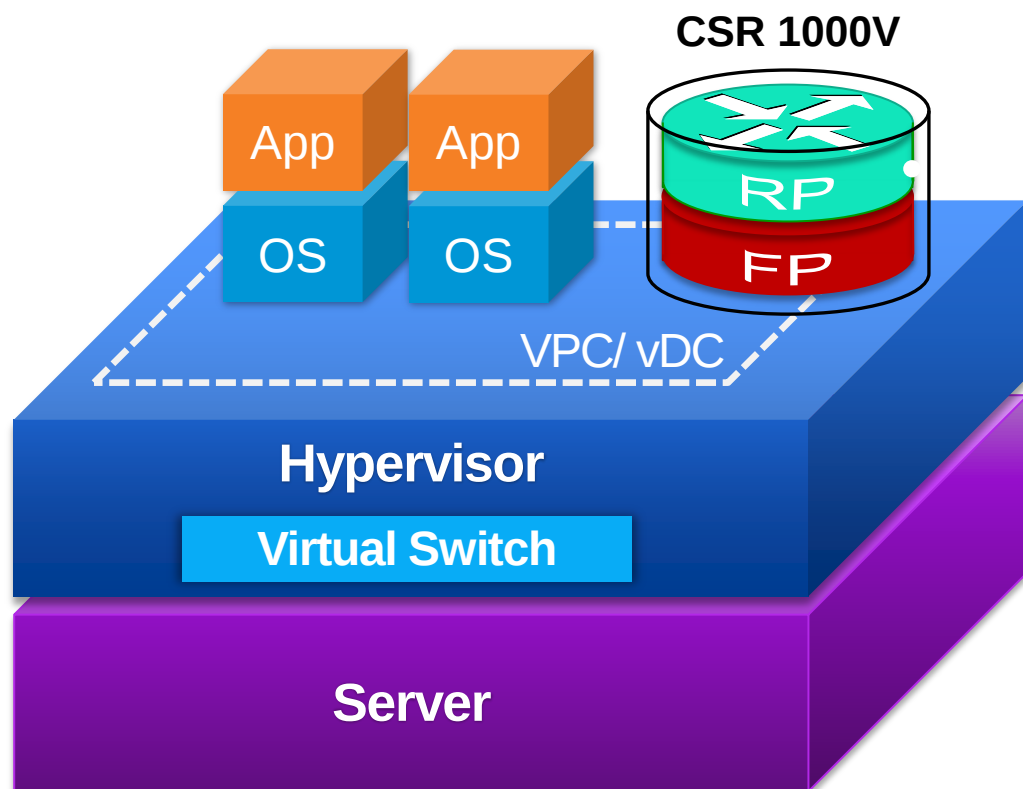
- Lack of Enterprise-class VPNs
- No Traffic Optimization and QoS
- Limited Performance SLAs

Tenant Manageability

- Limited Bandwidth Elasticity
- Limited Programmability
- Inefficient Licensing

Cisco Cloud Services Router (CSR) 1000V

Cisco IOS Software in Virtual Form-Factor



IOS XE Cloud Edition

- Selected Features of IOS XE primarily for Cloud Use Cases

Infrastructure Agnostic

- Server, Switch, Multi-Hypervisor (*ESXi, KVM, Xen, AMI**)

Single-tenant WAN Gateway

- Small Footprint (*reducing from 4 vCPU to 1*), Low Performance

Term and Usage*-based Licenses

- Elastic Capacity (*10 Mbps to 1 Gbps* Throughput, 2 to 8 GB RAM*)

Programmability

- RESTful APIs (*leverages OnePK*) for Automated Management

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Enterprise-class Networking with Rapid Deployment and Flexibility

Cisco Cloud Services Router (CSR) 1000V

Extending Enterprise WAN to Cloud

Enterprise

Security

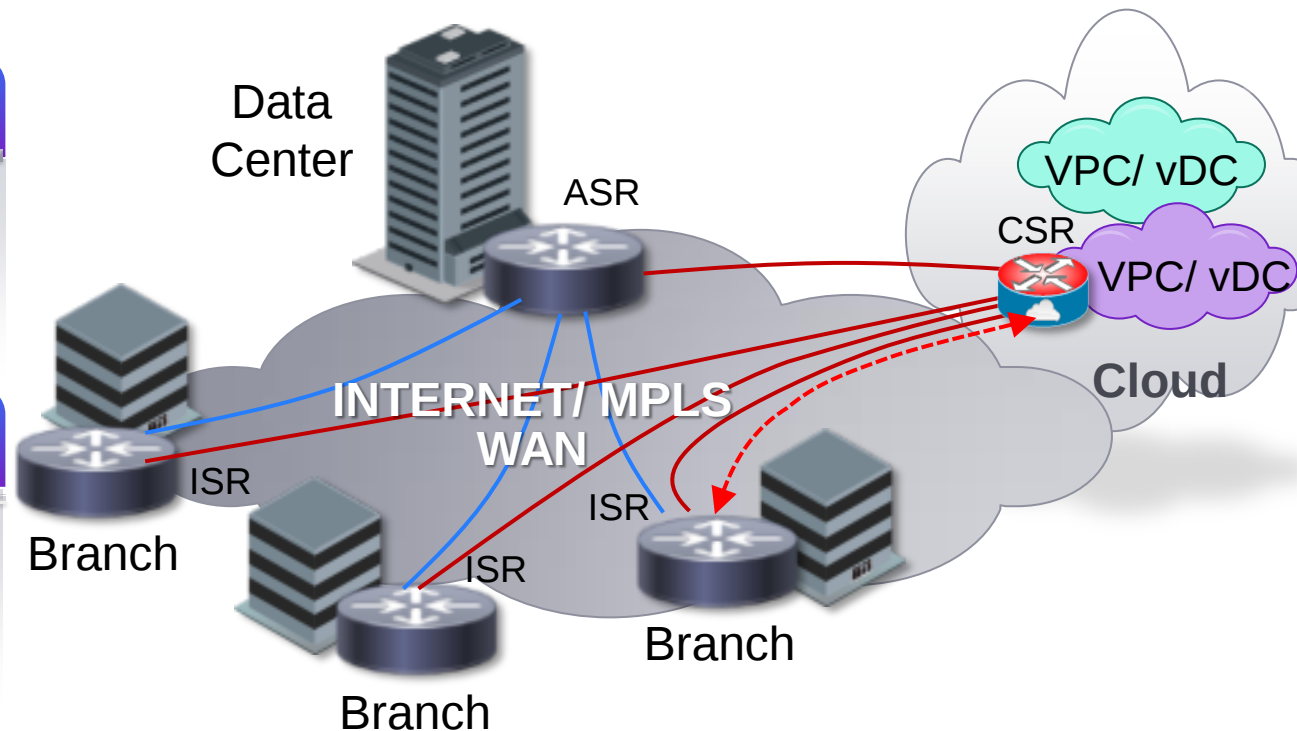
IPSec VPN, L2TP
Route-based VPNs (DMVPN, ..)
Firewall, ACL, AAA

Integration

NAT, LISP, OTV
HSRP, QoS, AVC
IOS-XE CLI, Cisco Prime

User Experience

Routing (BGP, EIGRP, Multicast, ..)
AppNav, WCCP, QoS, AVC
IP SLA, NetFlow, SNMP



Cloud Provider

Tenant Scalability

802.1Q VLAN, VXLAN*
Routing (BGP, GRE, VRF-Lite)
MPLS (MPLS VPN, VRF)

Enterprise Services

DMVPN, EasyVPN, FlexVPN
Firewall, NAT, WCCP, QoS, AVC
IP SLA, NetFlow, SNMP

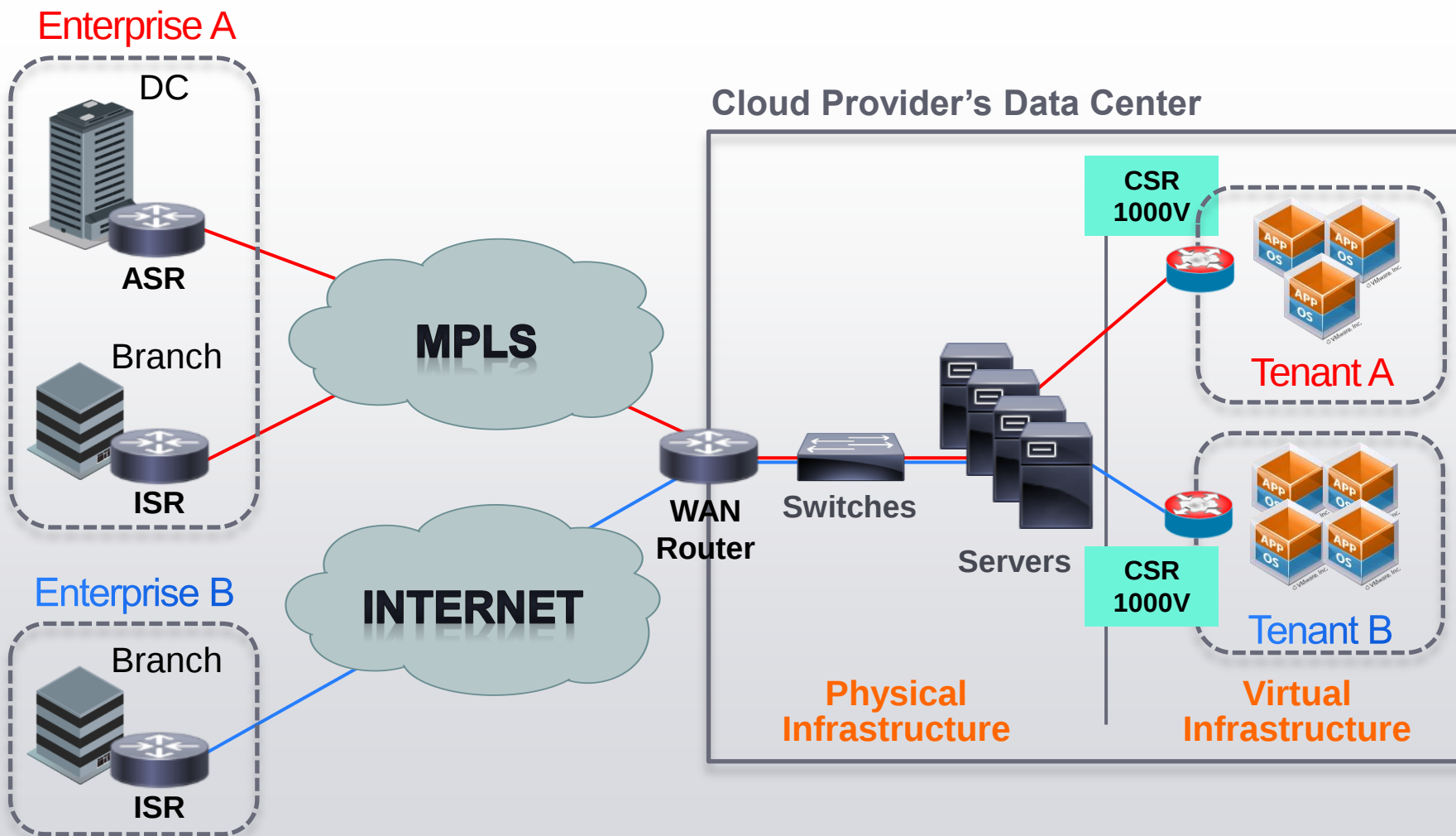
Tenant Manageability

10 Mbps to 1 Gbps*
RESTful APIs
Term and Usage* Licensing

* 2H CY 2013

Single-Tenant WAN Gateway in Shared Multi-tenant Clouds

Can be deployed by Enterprises or Cloud Providers



Enterprise Use Cases

- Network Services - VPN Gateway, Control Point
- Hybrid Cloud – L2/ L3 Xtns

Cloud Provider Use Cases

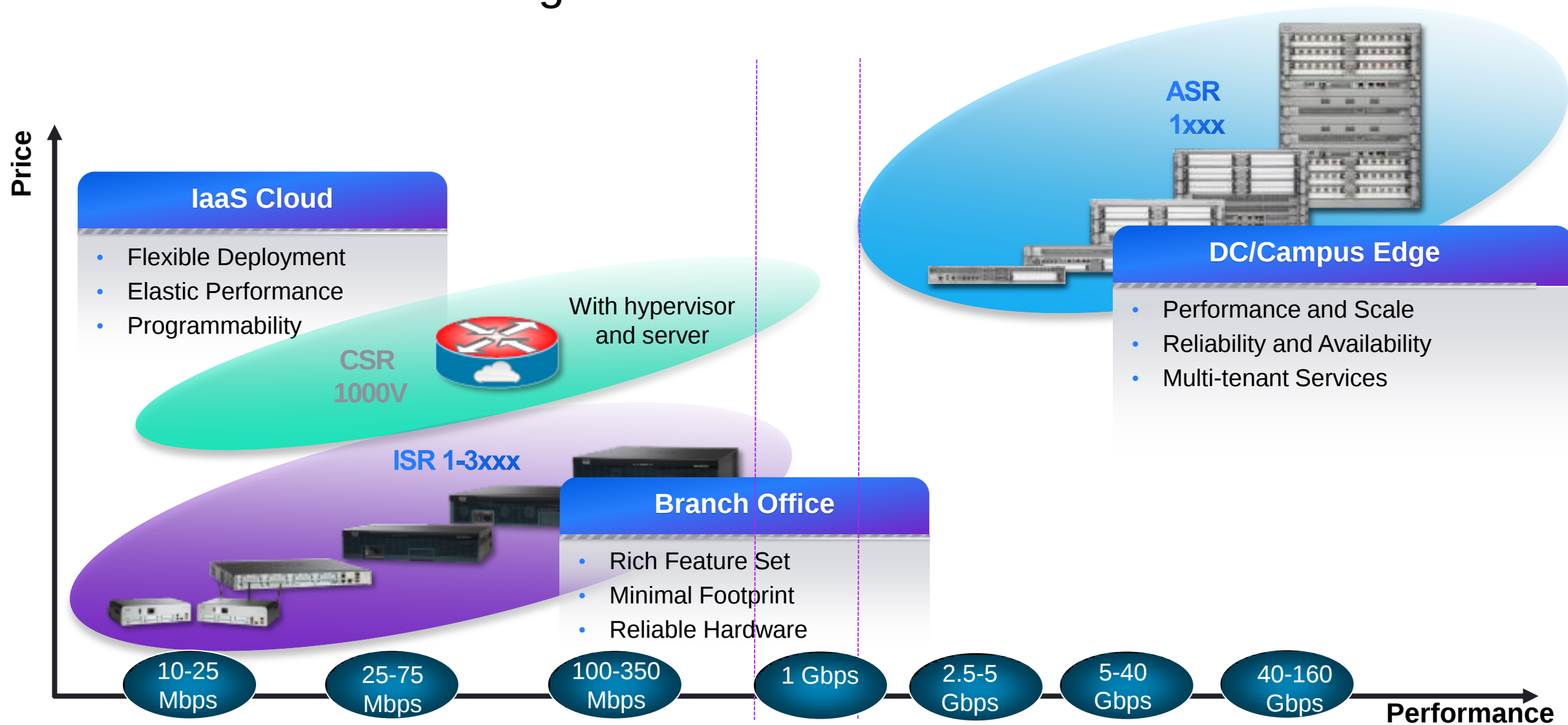
- MPLS Extension – vCE, vPE
- Network Services - VPN Gateway, Control Point
- Hybrid Cloud – L2/ L3 Xtns

Other Use Cases

- SP Edge Network Services – vCPE, BRAS
- Control Plane Functions – Key Server, Route Reflector, ..
- Military Applications – MANET/ Radio-aware Routing

CSR 1000V Complements the ISR G2 and ASR 1000

End-to-End IOS Networking



CSR1000V vs. ISR G2 vs. ASR 1000

	ASR 1xxx	ISR 1-3xxx	CSR 1000V
Place in the Network	DC/ Campus Edge	Branch Office	IaaS Cloud
Form Factor	Physical	Physical	Virtual
Key Characteristics	Hardware-based Performance and Reliability	Hardware-based Performance and Reliability	Software Flexibility and Programmability
Key Features and Use Cases	• High speed CPE • Broadband Gateway • IPSec Gateway • L2VPN and L3VPN PE • Internet Gateway • VoIP SBC	Multi-service Branch • Secure Connectivity • Voice and Video • Wireless and Mobility • WAN Optimization • Application Hosting	Per-tenant VPC/ vDC Gateway • Secure VPN Gateway • MPLS Gateway • DC to Cloud IP Mobility • Traffic Control and Redirection
Cisco IOS	XE	Classic	XE (Selected Features)
Software Architecture	Multi-tenant	Single-tenant	Single-tenant
Throughput Range (w/ IPSec, FW, ACL, NAT, QoS)	0.5 – 7.5 Gbps Recommended	15 - 350 Mbps Recommended	10 Mbps - 1 Gbps* Max
Licensing	Perpetual	Perpetual	Term, Usage*, Perpetual*

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CSR 1000V Management

Familiar Management Tools and API Support

	Enterprise - Self-Managed	Cloud Provider - Automated
CSR 1000V	• Cisco Prime Infrastructure • Cisco IOS CLI and SNMP • Third Party Network Management	CSR 1000V RESTful API ¹
Hypervisor ²	VMware vCenter Server	VMware vSphere Management API
Multi-Tenant Environment ^{2, 3}	• Cisco VNMC and NSM • VMware vCloud Director	• Cisco NSM API • VMware vCloud API

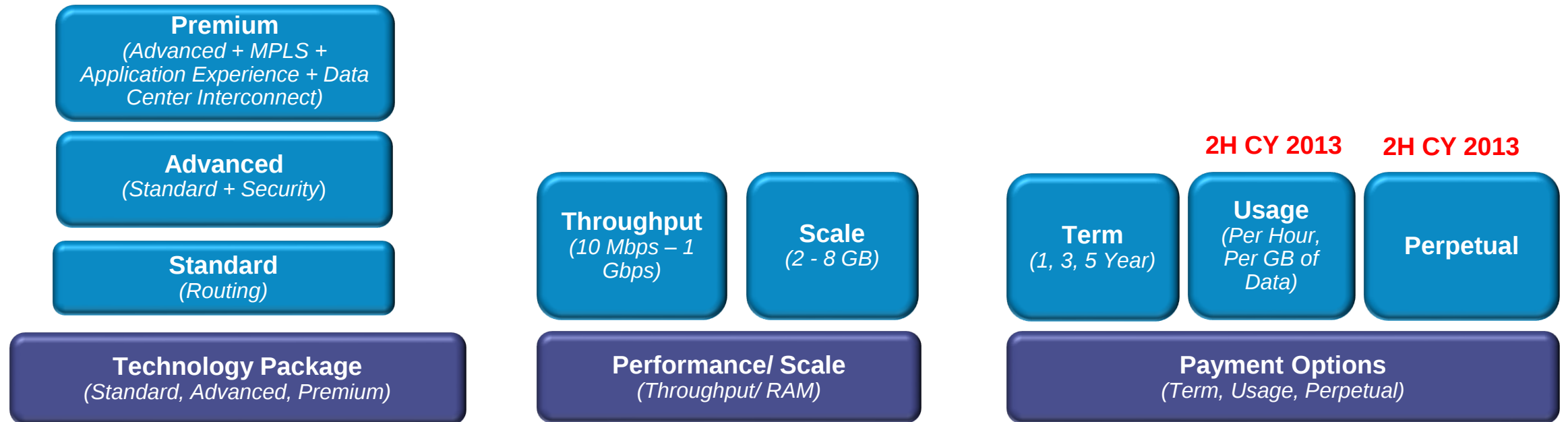
Notes:

¹**RESTful APIs** for automated deployment (VM creation, license activation) and config (IOS features)

²**Additional hypervisor options** (KVM, XenServer, Hyper-V) will be available in the future

³**Multi-tenant management options** (including Cisco management stack) available in phases

CSR 1000V Licensing Structure



Technology Package based on Use Case

Use Case	Technology Package	Key Features
vCE	STANDARD	<i>Routing</i>
vPE	PREMIUM	<i>MPLS</i>
Network Services – VPN Gateway, Control Point	ADVANCED, PREMIUM	<i>VPN, Firewall, NAT, AppNav, QoS, AVC, HSRP, ..</i>
Hybrid Cloud Connectivity – L2/ L3 Extensions	PREMIUM	<i>LISP, OTV, VXLAN*</i>
SP Edge Network Services – vCPE, BRAS	PREMIUM	<i>VPN, Firewall, AppNav, QoS, AVC</i>
Control Plane Functions – Key Server, Route Reflector, ..	STANDARD	<i>Routing</i>
Military Applications	ADVANCED, PREMIUM	<i>Routing (including Radio-aware**), VPN, Firewall, IPS**, FIPS/ CC Certifications**</i>

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**** Future**

CSR 1000V Licensing Models per Customer Segment

Customer Segment	Model	Pricing Metric
Enterprise	Term (pre-paid)	Throughput (Mbps) Technology (Standard, Advanced, Premium)
Private Cloud Provider	Term (pre-paid)	Throughput (Mbps) Technology (Standard, Advanced, Premium)
Public Cloud Provider	Usage (post-paid)	Uptime (hour) Throughput (Mbps) Technology (Standard, Advanced, Premium) Data Volume (GB)
Managed Service Provider	Perpetual (pre-paid)	Throughput (Mbps) Technology (Standard, Advanced, Premium) Memory (GB)
Government	Perpetual (pre-paid)	Throughput (Mbps) Technology (Standard, Advanced, Premium)

CSR Features

Technology Package	IOS-XE Features
STANDARD	▪ Basic Networking: BGP, OSPF, EIGRP, RIP, ISIS, IPv6, GRE, VRF-LITE, NTP ▪ High Availability: HSRP, VRRP, GLBP ▪ Addressing: NAT, DHCP, DNS ▪ Basic Security: ACL, AAA, RADIUS, TACACS+ ▪ Management: SSH, Flexible NetFlow, SNMP, EEM
ADVANCED	▪ STANDARD ▪ Multicast: IGMP, PIM ▪ Advanced Security: Zone Based Firewall, IPsec VPN, EZVPN, DMVPN, FlexVPN
PREMIUM	▪ ADVANCED ▪ Advanced Networking: L2TPv3, BFD, MPLS ▪ Application Experience: WCCPv2, APPNAV, QoS, NBAR2, AVC, IP SLA ▪ Hybrid Cloud Connectivity: LISP, OTV

Virtualization	Supported Features
ESXi 5.0	▪ Multiple Instances: Cloning, Templates ▪ Interfaces: NIC Teaming ▪ High Availability: vMotion

IOS-XE Release 3.9 of CSR 1000V is available on cisco.com

The screenshot shows the Cisco Systems website in a Mozilla Firefox browser. The page is titled "Download Software" and displays the "Cisco Cloud Services Router 1000V" release information for "Release 3.9.0aS ED". The page includes a search bar, a navigation menu, and a table of available software files for download.

File Information	Release Date	Size	Download
Cisco CSR 1000V Series ADVANCED ENTERPRISE SERVICES - OVA csr1000v-adventerprisek9.03.09.00a.S.153-2.S0a-C4-M4G-N3-D8.ova	01-APR-2013	302.64 MB	Download Add to cart
Cisco CSR 1000V Series ADVANCED ENTERPRISE SERVICES - BIN csr1000v-adventerprisek9.03.09.00a.S.153-2.S0a.SPA.bin	01-APR-2013	302.06 MB	Download Add to cart
Cisco CSR 1000V Series Advanced Enterprise Services - ISO csr1000v-adventerprisek9.03.09.00a.S.153-2.S0a.iso	01-APR-2013	302.45 MB	Download Add to cart

OVA: Initial deployment. Preferred format.
BIN: Upgrade only
ISO: Initial deployment

CSR 1000V Term Offering – March 2013 – 50 Mbps

License SKU	Term (Years)	Description ¹	Minimum Hardware ⁴	Hypervisor
L-CSR-50M-PRM-1Y=	1	1-year license for 50 Mbps Max throughput ² , Premium package, excludes SASU ³	4 GB RAM 4 virtual CPU	VMware vSphere 5
L-CSR-50M-PRM-3Y=	3	3-year license for 50 Mbps Max throughput ² , Premium package, excludes SASU ³	4 GB RAM 4 virtual CPU	VMware vSphere 5
L-CSR-50M-PRM-5Y=	5	5-year license for 50 Mbps Max throughput ² , Premium package, excludes SASU ³	4 GB RAM 4 virtual CPU	VMware vSphere 5
L-CSR-50M-ADV-1Y=	1	1-year license for 50 Mbps Max throughput ² , Advanced package, excludes SASU ³	4 GB RAM, 4-virtual CPU	VMware vSphere 5
L-CSR-50M-ADV-3Y=	3	3-year license for 50 Mbps Max throughput ² , Advanced package, excludes SASU ³	4 GB RAM, 4-virtual CPU	VMware vSphere 5
L-CSR-50M-ADV-5Y=	5	5-year license for 50 Mbps Max throughput ² , Advanced package, excludes SASU ³	4 GB RAM, 4-virtual CPU	VMware vSphere 5
L-CSR-50M-STD-1Y=	1	1-year license for 50 Mbps Max throughput ² , Standard package, excludes SASU ³	4 GB RAM, 4-virtual CPU	VMware vSphere 5
L-CSR-50M-STD-3Y=	3	3-year license for 50 Mbps Max throughput ² , Standard package, excludes SASU ³	4 GB RAM, 4-virtual CPU	VMware vSphere 5
L-CSR-50M-STD-5Y=	5	5-year license for 50 Mbps Max throughput ² , Standard package, excludes SASU ³	4 GB RAM, 4-virtual CPU	VMware vSphere 5

Similar Set of SKUs for 25 Mbps and 10 Mbps

100 Mbps and 250 Mbps Standard available upon request

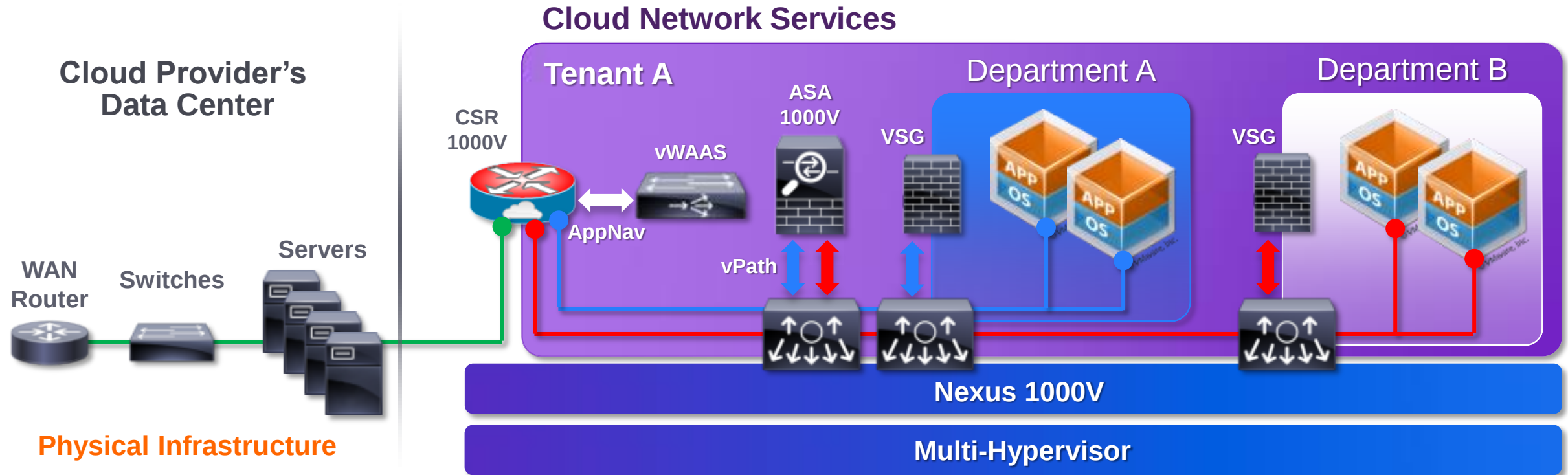
¹Software (IOS XE for CSR) available for download from cisco.com with free two-month evaluation license

²Max Throughput is the license-limited throughput, i.e. CSR throughput cannot exceed this limit

³Software Updates and Support (SASU) sold separately and is 20% of product list price

⁴Minimum Physical CPU Requirements: Intel Nehalem processor family or higher

Cisco Virtual Networking and Cloud Network Services



CSR 1000V

- WAN Gateway
- IOS Networking

vWAAS

- WAN Optimization
- Application Traffic

ASA 1000V

- Edge Firewall
- Protocol Inspection

VSG

- Zone-based Firewall
- VM-level Control

Nexus 1000V

- Distributed Switch
- NX-OS Consistency

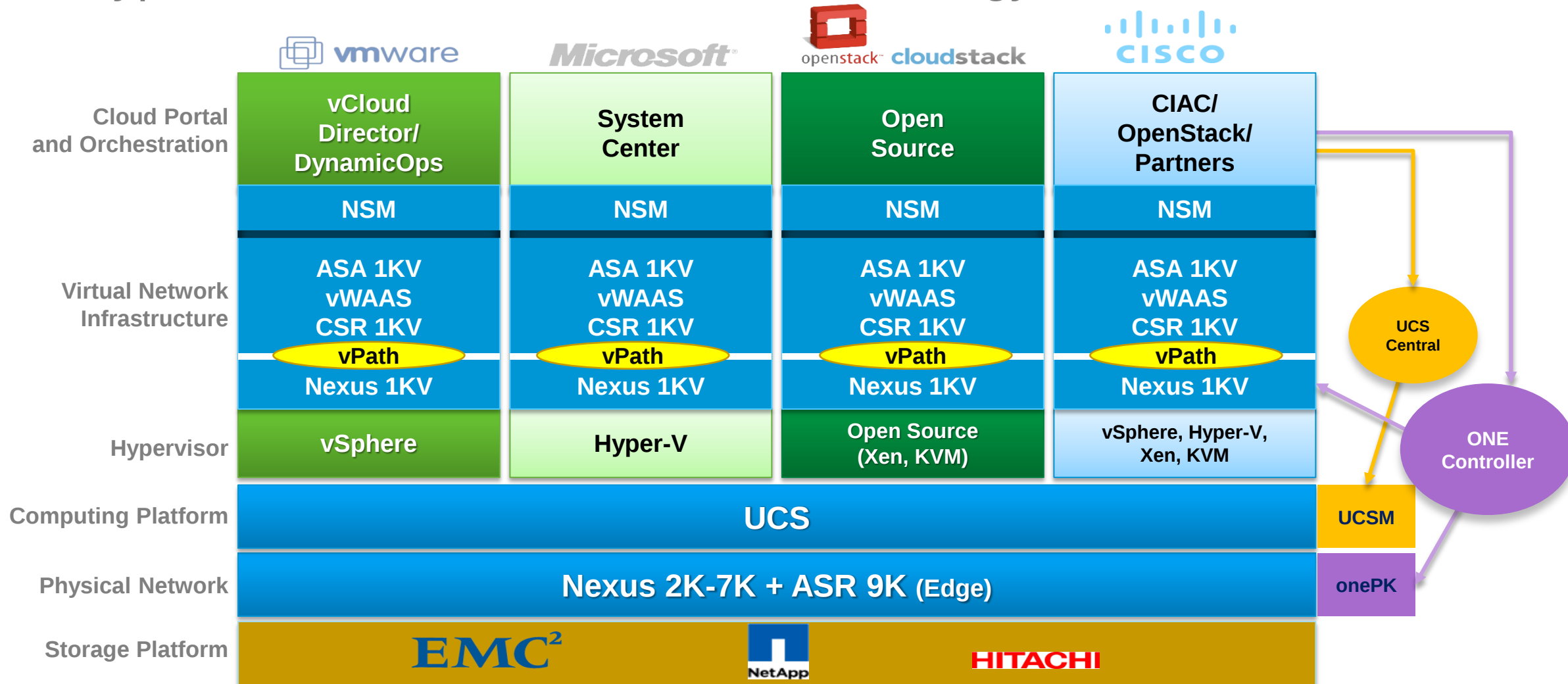
Ecosystem Services

- Citrix NetScaler VPX ADC
- Imperva Web App. Firewall



Cisco ONE - Cloud Technology Stacks

Multi-Hypervisor and Multi-Orchestration Strategy

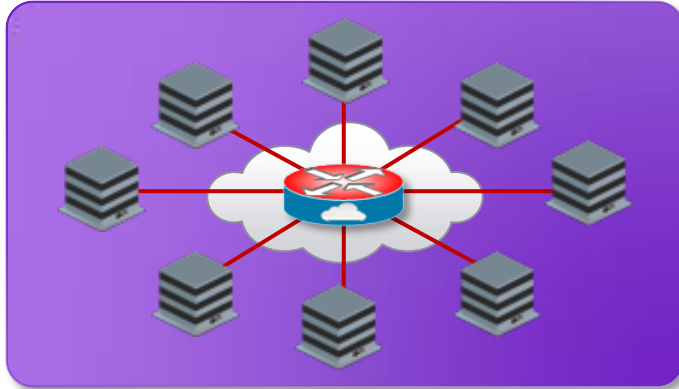


Solutions: Vblock, FlexPOD, VMDC, VDI, HCS, Cross-DC Mobility

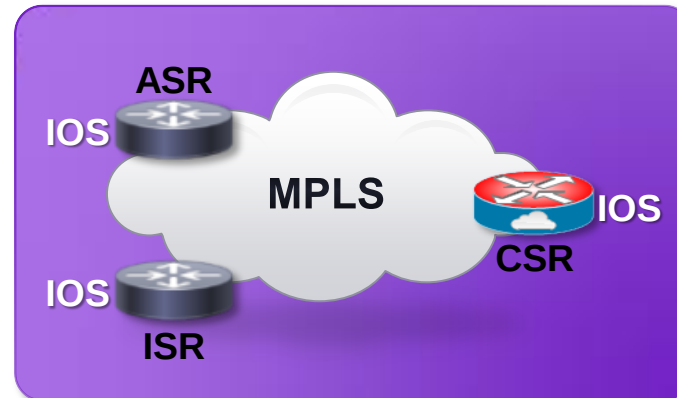
CSR 1000V Benefits

Reducing Barriers to IaaS Adoption

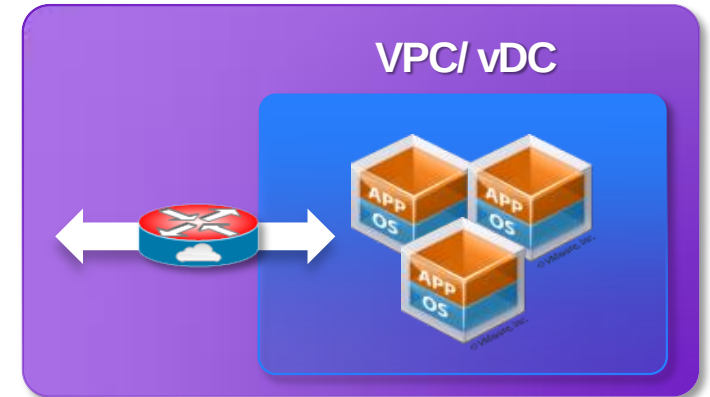
Any-to-Any Connectivity



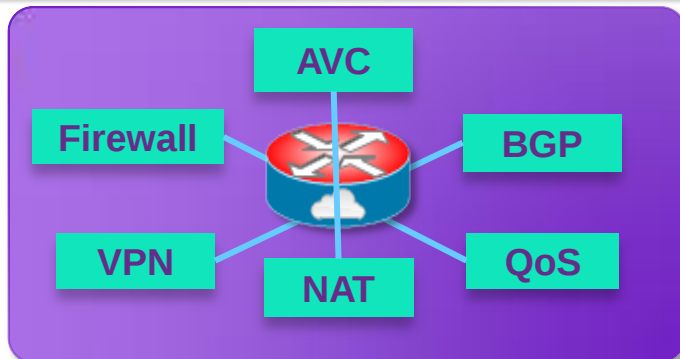
Network Consistency



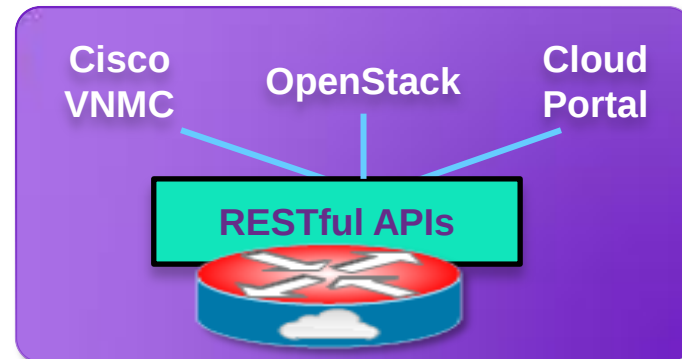
Traffic Redirection/ Control



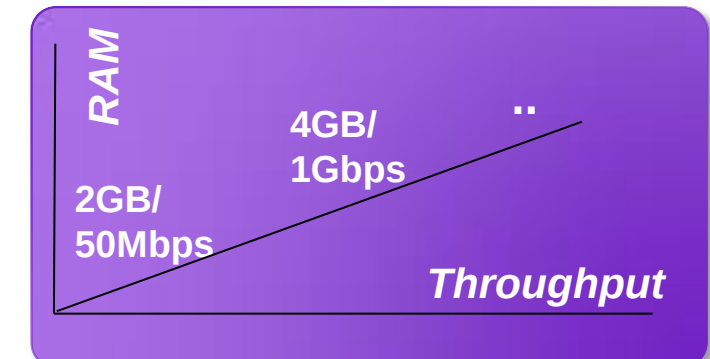
Integrated Services



Programmability



Licensing Elasticity



CSR 1000V Availability

- For questions and ordering information, contact your local Cisco sales representative
- For information on CSR 1000V, visit <http://www.cisco.com/go/cloudrouter/>

Thank you.

