Cisco Virtual Update

Cloud Services Router Overview

Extending Enterprise WAN to External Clouds

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Cisco Cloud Intelligent Network
Providing Optimal Experience, Pervasive Security, and Simplified Operations

Integrated Management and Policy

Cloud Connectors
- Collaboration Survivability
- Web Security
- Cloud Storage
- Third Party

Cloud-Ready Network Services
- Visibility
- Optimization
- Security
- Collaboration
- App Hosting

Cloud-Ready Platforms
- ISR
  - Branch Office
- ASR
  - HQ/Data Center
- CSR
  - Cloud

Users
Branch

Cloud Services
Private/Public/Hybrid
Cisco Cloud Intelligent Network
Connecting Users to the Cloud with Confidence

Users
- Branch/Remote User

Cloud Services
- Private Cloud
- Public Cloud
- SaaS

WAN/Internet
- ISR G2 with UCS E-Series
- AVC with Prime Assurance Manager
- FlexVPN
- ASR 1002-x
- AppNav for WAAS
- CSR

Connectors
- HCS Connector
- ScanSafe Connector
- Ctera Storage Connector

Platforms

Network Services

Optimal Experience
Pervasive Security
Simplified Operations
Infrastructure as a Service (IaaS) in External Cloud
Changing the Cost Economics and Business Responsiveness of IT

Pay-For-Use Pricing, Rapid Provisioning, Elastic Scalability
External Cloud Networking Challenges
Lack of Consistency Creates Barriers to Adoption

Security Risks
- Inconsistent VPN policies
- Limited connection reliability
- Error-prone topology changes

Integration Issues
- Incompatible IP addressing
- Incomplete network services
- Different management tools

User Experience
- Indirect traffic path through DC
- Few WAN optimization options
- Inability to prioritize traffic
Cisco Cloud Services Router (CSR) 1000V
Extending Enterprise WAN to External Clouds

Secure Connectivity
- Globally uniform VPN policies
- Scalable and reliable VPNs
- Automatic topology updates

Network Consistency
- Datacenter to Cloud IP mobility
- Full range of network services
- Familiar management tools

Traffic Control
- Shortest path from any location
- Interception and redirection
- Classification and prioritization
Cisco CSR 1000V
Cisco IOS Software in Virtual Form-Factor

Cisco IOS XE Cloud Edition
- Selected feature set of Cisco IOS XE
- Virtual Route Processor (RP)
- Virtual Forwarding Processor (FP)

Virtual Private Cloud/Data Center Gateway
- Optimized for single tenant use cases

Agnostic to Other Infrastructure Elements
- Hypervisor agnostic
- Virtual switch agnostic
- Server agnostic
Requirements (first release)

- VMWare ESXi 5.0 and higher
- CPU: Minimum 4 vCPUs
- RAM: 4 GB
- Hard Disk: 8GB
- Default video, SCSI controller
Cisco CSR 1000V Deployment in External Cloud
Single Tenant WAN Gateway for Shared Infrastructure Environments

Flexible
- Infrastructure agnostic
- Term-based licensing

Automated
- Rapid deployment
- RESTful API

Elastic
- Vertical scaling
- Horizontal scaling
Use Case: Secure VPN Gateway

Scalable, Dynamic, and Consistent Connectivity to External Cloud

Challenges
- Inconsistent security
- High network latency
- Limited scalability

Benefits
- Direct, secure access
- Scalable, reliable VPN
- Operational simplicity

Solutions
- IPSec VPN, DMVPN, EZVPN, FlexVPN
- Routing and addressing
- Firewall, ACLs, AAA

Enterprise

Cloud Provider Data Center

CSR 1000V

WAN Router

Switches

Servers

VPC/vDC

CSR 1000V

VPC/vDC

Internet

Public WAN VPN tunnel

Private address space
Use Case: Data Center to Cloud IP Mobility
Simplified Application Deployment to External Cloud

Challenges
- Simple, fast, transparent application onboarding
- Consistency with DC network features

Benefits
- Simpler app integration
- Dynamic infrastructure
- Consistent management

Solutions
- LISP for VM Mobility
- Routing, NAT, DHCP
- EoMPLS, OTV
Use Case: Traffic Control and Management
Comprehensive Networking Services Gateway in External Cloud

Challenges
- Response time of apps
- Resource guarantees
- Resilient connectivity

Solutions
- AppNav for WAAS
- QoS prioritization
- HSRP VPN failover

Benefits
- Rich portfolio of network features and services
- Single point of control
CSR 1000V Benefits – Enterprise customers
Reducing Barriers to IaaS Adoption in External Cloud

Secure Connectivity
- Reduce security vulnerabilities with uniform VPN access policy
- Eliminate operational overhead with dynamic VPN scalability
- Facilitate network evolution with dynamic routing protocols

Network Consistency
- Remove integration barriers with uniform network services
- Prevent connectivity issues with holistic WAN architecture
- Extend operational practices into cloud with familiar IOS

Traffic Control
- Improve user experience with WAN optimization and QoS
- Increase service availability with granular resiliency control
- Minimize risk of threats with granular inspection policies
CSR 1000V Benefits – Cloud Providers
Reducing Barriers to IaaS Adoption

Secure Connectivity
- Increase confidence in cloud security with enterprise VPNs
- Eliminate operational overhead with dynamic VPN scalability
- Facilitate network changes with dynamic routing protocols

Tenant Scalability
- Reduce dependence on VLANs with end-to-end L3 connectivity
- Improve tenant access with any-to-any MPLS WAN
- Remove integration barriers with uniform network services

Traffic Control
- Improve user experience with WAN optimization and QoS
- Increase service availability with granular resiliency control
- Minimize risk of threats with granular inspection policies
# CSR 1000V Management

Familiar Management Tools and API Support

## CSR 1000V

<table>
<thead>
<tr>
<th>Hypervisor&lt;sup&gt;2&lt;/sup&gt;</th>
<th>Self-Managed Environment</th>
<th>Automated Environment</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>• Cisco Prime NCS</td>
<td>Cisco CSR 1000V RESTful API&lt;sup&gt;1&lt;/sup&gt;</td>
</tr>
<tr>
<td></td>
<td>• Cisco IOS CLI and SNMP</td>
<td></td>
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<td></td>
<td>• Third Party Network Management</td>
<td></td>
</tr>
<tr>
<td></td>
<td>VMware vCenter Server</td>
<td>VMware vSphere Management API</td>
</tr>
</tbody>
</table>

| Multi-Tenant Environment<sup>2, 3</sup> | | |
|----------------------------------------|---------------------|
| • Cisco VNMC and NSM                   | • Cisco NSM API |
| • VMware vCloud Director               | • 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 available in phases
## CSR 1000V Offering – Nov 2012 (Controlled Availability)

Term-Based Licensing Model with Integrated Technical Support

<table>
<thead>
<tr>
<th>License SKU</th>
<th>Term (Years)</th>
<th>Description², ³</th>
<th>Minimum Hardware¹</th>
<th>Hypervisor</th>
<th>List Price</th>
</tr>
</thead>
<tbody>
<tr>
<td>L-CSR-ELS-50M-1Y=</td>
<td>1</td>
<td>CSR 1000V w/ 50 Mbps throughput with software upgrades and support</td>
<td>4 GB RAM, 4-core x86 CPU</td>
<td>VMware vSphere 5</td>
<td>$3,000</td>
</tr>
<tr>
<td>L-CSR-ELS-50M-3Y=</td>
<td>3</td>
<td>CSR 1000V w/ 50 Mbps throughput with software upgrades and support</td>
<td>4 GB RAM, 4-core x86 CPU</td>
<td>VMware vSphere 5</td>
<td>$8,500</td>
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<tr>
<td>L-CSR-ELS-50M-5Y=</td>
<td>5</td>
<td>CSR 1000V w/ 50 Mbps throughput with software upgrades and support</td>
<td>4 GB RAM, 4-core x86 CPU</td>
<td>VMware vSphere 5</td>
<td>$13,500</td>
</tr>
</tbody>
</table>

Notes:

¹Minimum System Requirements: 4 physical cores, 4 virtual CPU, 4GB RAM
²Additional capacities and upgrade licenses for throughput and memory will be available later
³Software (IOS XE for CSR) available for download from CCO with free two-month evaluation license
CSR 1000V Licensing

Phased Rollout

- **Phase 1** (up to IOS-XE 3.9) will support Medium/ Large Deployments
  - Minimum System Requirements: 4 Cores, 4 vCPU, 4 GB RAM
  - **Recommended Performance**: Up to 100 Mbps IMIX (IP CEF, IPSec, FW, ACL, NAT)

- **Phase 2** (IOS-XE XE 3.9 and 3.10) will add Small Deployment and upgrades
  - Minimum System Requirements: 1 Core, 2 vCPU, 2 GB RAM
  - **Performance**: 10 Mbps, 25 Mbps, 50 Mbps

- **Phase 3** (post-IOS-XE 3.9) will support usage based billing

**License Type**
- Subscription

**Time Duration**
- 1,3,5 Years

**Unit of Measure**
- Capacity S, M, L
  - Throughput (Cores)
  - Scale (vRAM)

**Upgrade**
- Core Upgrade License
- vRAM Upgrade License

**Cloning**
- Convert to evaluation license

**vMotion**
- Yes

**Support**
- SASU
## CSR 1000V Features

<table>
<thead>
<tr>
<th>IOS-XE 3.6/ 3.7 May 2012/ July 2012 EFT Releases</th>
<th>IOS-XE 3.8 November 2012 Controlled Availability</th>
<th>IOS-XE 3.9 March 2013 General Availability</th>
</tr>
</thead>
</table>
| **IOS-XE** | • IPSec, GRE  
• DMVPN, EasyVPN, FlexVPN  
• BGP, EIGRP, OSPF  
• AAA, ZBF, ACL  
• NAT, DHCP, 802.1Q VLAN  
• HSRP | • MPLS VPN, VRF  
• VRF-Lite  
• LISP  
• AppNav (traffic redirection to WAAS) | • QoS  
• Multicast  
• OTV |
| **Performance/ System Requirements** | • Up to 50 Mbps IMIX/ 75% CPU (IP CEF, IPSec, FW, ACL, NAT)  
• 4 cores, 4 vCPU, 4 GB RAM | • 10/ 25/ 50 Mbps  
• 2 cores, 4 vCPU, 4 GB RAM |
| **Licensing** | • 1/ 3/ 5-year term, fixed capacity (throughput, memory) | • 1/ 3/ 5-year term, variable capacity (throughput, memory) |
| **Virtualization** | • VMware ESXi 5.0 (basic) | • Support for copy operations (clone, template)  
• Support for default settings (hyper-threading, vMotion, DRS, no CPU affinity)  
• VMware ESXi 5.0 (advanced) – VM-level HA, direct path I/O, hot-add vNICS/ RAM |
| **Management** | • CLI, SSH, Telnet, Cisco Prime NCS, SNMP, Syslog, IPSLA  
• VMware vCenter | • RESTful APIs (config and reporting) for license activation and basic networking - interface/ static routes/ BGP/ IPSec/ FW/ ACL/ NAT/ DHCP  
• VMware vCloud Director |

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CSR 1000V Price/Performance Comparison
Providing Flexibility, Elasticity, and Programmability for Cloud Environments

IaaS Cloud
- Flexible deployment
- Elastic performance
- Programmability

With hypervisor and server

CSR 1000V

ISR 1-3xxx

Branch Office
- Rich feature set
- Minimal footprint
- Reliable hardware

DC/Campus Edge
- Performance and scale
- Reliability and availability
- Multi-tenant services

Performance

Price
Cisco Virtual Networking and Security Services

Cloud Provider's Data Center

WAN Router Switches Servers

Physical Infrastructure

Cloud Network Services

Tenant A

ASA 1000V

vWAAS

AppNav

vPath

Nexus 1000V

Department A

Department B

Ecosystem 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

Citrix NetScaler VPX ADC
- Imperva Web App. Firewall
Summary

- Cisco IOS software in virtual form factor
- Optimized for single-tenant external cloud environments
- Secure connectivity, network consistency, and traffic control benefits
- Secure VPN gateway, MPLS connectivity, IP mobility, traffic redirection use cases
- Subscription-based licensing with integrated technical support and updates
- Extends enterprise network to IaaS in externally hosted cloud
CSR on Cisco.com:

www.cisco.com/go/cloudrouter/