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

- **Programmability**
  - Elastic Capacity (*10 Mbps to 1 Gbps* Throughput, 2 to 8 GB RAM)
  
  - RESTful APIs (*leverages OnePK*) for Automated Management

- **Selected Features**
  - CP/MP Agnostic
  - VPC/vDC

- **Virtual Switch**

- **Server**

- **Hypervisor**

- **Enterprise-class Networking with Rapid Deployment and Flexibility**

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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

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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

IaaS Cloud
- Flexible Deployment
- Elastic Performance
- Programmability

CSR 1000V
- With hypervisor and server
- Performance and Scale
- Reliability and Availability
- Multi-tenant Services

ISR 1-3xxx
- Rich Feature Set
- Minimal Footprint
- Reliable Hardware

Branch Office
- 10-25 Mbps
- 25-75 Mbps
- 100-350 Mbps
- 1 Gbps
- 2.5-5 Gbps
- 5-40 Gbps
- 40-160 Gbps

DC/Campus Edge
- 2.5-5 Gbps
- 5-40 Gbps
- 40-160 Gbps
# CSR1000V vs. ISR G2 vs. ASR 1000

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

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## CSR 1000V Management

Familiar Management Tools and API Support

<table>
<thead>
<tr>
<th>CSR 1000V</th>
<th>Enterprise - Self-Managed</th>
<th>Cloud Provider - Automated</th>
</tr>
</thead>
</table>
| **Hypervisor**<sup>2</sup> | • Cisco Prime Infrastructure  
• Cisco IOS CLI and SNMP  
• Third Party Network Management | CSR 1000V RESTful API<sup>1</sup> |

<table>
<thead>
<tr>
<th><strong>Multi-Tenant Environment</strong>&lt;sup&gt;2, 3&lt;/sup&gt;</th>
<th>VMware vCenter Server</th>
<th>VMware vSphere Management API</th>
</tr>
</thead>
</table>
| • 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
(Standard, Advanced, Premium)

Premium
(Advanced + MPLS + Application Experience + Data Center Interconnect)

Advanced
(Standard + Security)

Standard
(Routing)

Throughput
(10 Mbps – 1 Gbps)

Scale
(2 - 8 GB)

Performance/ Scale
(Throughput/ RAM)

Term
(1, 3, 5 Year)

Usage
(Per Hour, Per GB of Data)

Payment Options
(Term, Usage, Perpetual)

Perpetual

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## Technology Package based on Use Case

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

* 2H CY 2013 ** Future
<table>
<thead>
<tr>
<th>Customer Segment</th>
<th>Model</th>
<th>Pricing Metric</th>
</tr>
</thead>
</table>
| 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)  
Data Volume (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

**OVA:** Initial deployment. Preferred format.

**BIN:** Upgrade only

**ISO:** Initial deployment
### CSR 1000V Term Offering – March 2013 – 50 Mbps

<table>
<thead>
<tr>
<th>License SKU</th>
<th>Term (Years)</th>
<th>Description</th>
<th>Minimum Hardware</th>
<th>Hypervisor</th>
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<tbody>
<tr>
<td>L-CS-50M-PRM-1Y=</td>
<td>1</td>
<td>1-year license for 50 Mbps Max throughput,</td>
<td>4 GB RAM</td>
<td>VMware</td>
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<tr>
<td></td>
<td></td>
<td>Premium package, excludes SASU</td>
<td>4 virtual CPU</td>
<td>vSphere 5</td>
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<td>3-year license for 50 Mbps Max throughput,</td>
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1. Software (IOS XE for CSR) available for download from cisco.com with free two-month evaluation license
2. Max Throughput is the license-limited throughput, i.e. CSR throughput cannot exceed this limit
3. Software Updates and Support (SASU) sold separately and is 20% of product list price
4. Minimum Physical CPU Requirements: Intel Nehalem processor family or higher

Similar Set of SKUs for 25 Mbps and 10 Mbps

100 Mbps and 250 Mbps Standard available upon request
Cisco Virtual Networking and Cloud Network Services

Cloud Provider’s Data Center

- WAN Router
- Switches
- Servers

Physical Infrastructure

Nexus 1000V

- Distributed Switch
- NX-OS Consistency

Cisco Services:

- ASA 1000V
  - Edge Firewall
  - Protocol Inspection
- VSG
  - Zone-based Firewall
  - VM-level Control
- CSR 1000V
  - WAN Gateway
  - IOS Networking
- vWAAS
  - WAN Optimization
  - Application Traffic
- VSG
  - Citrix NetScaler VPX ADC
  - Imperva Web App. Firewall

Ecosystem Services

Tenant A

- AppNav
- vPath

Department A

- ASA 1000V

Department B

Cloud Network Services

Multi-Hypervisor

Multi-Hypervisor
Cisco ONE - Cloud Technology Stacks
Multi-Hypervisor and Multi-Orchestration Strategy

Cloud Portal and Orchestration
- vCloud Director/DynamicOps
- System Center
- Open Source
- CIAC/OpenStack/Partners

Virtual Network Infrastructure
- NSM
- ASA 1KV
- vWAAS
- CSR 1KV
- Nexus 1KV
- vPath

Hypervisor
- NSM
- ASA 1KV
- vWAAS
- CSR 1KV
- Nexus 1KV
- vPath

Computing Platform
- NSM
- ASA 1KV
- vWAAS
- CSR 1KV
- Nexus 1KV
- vPath

Physical Network
- NSM
- ASA 1KV
- vWAAS
- CSR 1KV
- Nexus 1KV
- vPath

Storage Platform
- NSM
- ASA 1KV
- vWAAS
- CSR 1KV
- Nexus 1KV
- vPath

UCS
- Nexus 2K-7K + ASR 9K (Edge)

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

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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.