Cisco Cloud Services Router 1000V with Cisco IOS-XE® Software Release 3.9

Q. What is the Cisco Cloud Services Router 1000V?

A. The Cisco Cloud Services Router (CSR) 1000V is a router in virtual form factor. It contains selected features of the Cisco IOS-XE® Operating System and can run on Cisco UCS® servers or servers from leading vendors that support the VMware ESXi 5.0 virtualization platform.

Q. Where is the CSR 1000Vdeployed?

A. The CSR 1000V is intended for deployment in cloud data centers. It serves as a single-tenant router in a multi-tenant cloud. It is deployed at the edge of a tenant's network segment (or virtual private cloud [VPC]).

Q. What type of customer is the CSR 1000V intended for?

A. An enterprise can purchase and deploy the CSR 1000V in its VPC in an external provider-hosted cloud. The CSR 1000V enables the enterprise to transparently extend its WAN to its VPC in the external cloud.

A cloud service provider also can purchase the CSR 1000V and offer it as a per-tenant networking service. The CSR 1000V enables the service provider to offer end-to-end managed connectivity to its customers (tenants).

Q. What networking problems are addressed by the CSR 1000V?

A. The multi-tenant, shared-infrastructure, shared-resource public cloud environment poses networking and security problems to enterprises:

- The enterprise does not own its cloud connectivity, so cannot extend its network configuration into the cloud. As a result, it has to support different IP addresses and management tools in its premises and in the cloud.

- The enterprise does not enjoy the same levels of privacy and security for its cloud deployment as it does in its premises. So it has to handle inconsistent VPN and security policies and limited connection reliability.

- The enterprise cannot directly connect its distributed sites to its cloud applications, having to instead redirect all network traffic through its data center, and it is unable to prioritize and optimize its traffic. This causes a poor user experience for its cloud-deployed IT applications.

The cloud also presents networking challenges to cloud providers:

- The current cloud network switching (VLAN) architecture is limited in scale.

- The cloud provider lacks all the components of an end-to-end managed connectivity service offering to its customers, including QoS, application visibility and Service Level Agreements (SLAs).

Q. What are the typical uses of the CSR 1000V?

A. The typical cloud uses of the CSR 1000V are:

- **Secure VPN Gateway:** The CSR 1000V offers route-based IPSec VPNs (DMVPN, EasyVPN, and FlexVPN), along with the Cisco IOS® Zone-based Firewall and access control, enabling an enterprise to securely connect distributed sites directly to its cloud deployment.

- **MPLS Endpoint:** The CSR 1000V can serve as an MPLS Customer Edge (CE) router that enables a service provider to offer a customer end-to-end managed connectivity with performance guarantees. Also, by extending the MPLS WAN deeper into the cloud network, the service provider can increase network scale - more tenants and more networks per tenant.

- **Network Extension:** The CSR 1000V offers features such as NAT and LISP that enables an enterprise to maintain addressing consistency across premise and cloud as it moves applications back and forth or bursts compute capacity into the cloud.

- **Network Control Point:** The CSR 1000V can redirect traffic to Cisco virtual WAAS appliances deployed in the cloud. It also offers integrated networking services such as the Cisco IOS® Zone-based Firewall, HSRP, QoS, and Application Visibility & Control (AVC) and Application Performance Monitoring. These features enable a cloud tenant to receive a comprehensive networking experience.

Q. What makes the CSR 1000V unique?

A. Built on the same proven Cisco IOS® Software platform that is inside the Cisco Integrated Services Router (ISR) and Aggregation Services Router (ASR) product families, the CSR 1000V offers a rich set of features, including routing, VPN, firewall, NAT, QoS, application visibility, failover, and WAN optimization. These functions empower enterprises and cloud providers to build highly secure, optimized, scalable and consistent hybrid networks. The CSR 1000V also offers the same IOS® CLI and supports the same IOS® management tools as the ISRs and ASRs, allowing for unified network management. The CSR 1000V is the only virtualized router that combines the networking quality demanded by enterprises with the flexibility benefits offered by virtualization.

Q. What virtualization platforms can the CSR 1000V run on?

A. The CSR 1000V supports VMware ESXi 5.0.

Q. Which servers can the CSR 1000V run on?

A. The CSR 1000V can run on Cisco UCS® servers or servers from leading vendors that support VMware ESXi 5.0.

The server must support at least the following:

- Intel Nehalem CPU with clock frequency 2.0 GHz
- Gigabit Ethernet interfaces

Q. What minimum resources does the CSR 1000V need from the underlying server?

A. The CSR 1000V requires the following from the virtualized server hardware:

- **CPU:** 4 virtual CPUs
- **Memory:** 4 GB
- **Disk Space:** 8 GB
- **Network Interfaces:** Three or more virtual Network Interface Cards (vNICs), up to the maximum allowed by the hypervisor

Q. What Cisco IOS Software version runs in the CSR 1000V?

A. The CSR 1000V runs Cisco IOS-XE® Software Release 3.9, offering selected IOS-XE® features.

Q. What Cisco IOS Software features do the CSR 1000V support?

A. The CSR 1000V supports the following Cisco IOS-XE® features:

- **Routing:** BGP, OSPF, EIGRP, Policy-based Routing, IPv6, VRF-Lite, Multicast, LISP, GRE
- **Addressing:** DHCP, NAT, 802.1Q VLAN, EVC
- **VPN:** IPSec VPN, DMVPN, EasyVPN, FlexVPN
- **MPLS:** MPLS VPN, VRF, BFD
- **Security:** Cisco IOS® Zone-Based Firewall, ACL, AAA, RADIUS, TACACS+
- **High Availability:** HSRP, VRRP, GLBP
- **Traffic Redirection:** AppNav (to vWAAS), WCCP
- **Application Visibility, Performance Monitoring and Control:** QoS, AVC

Q. How can I deploy the CSR 1000V?

A. You can download the CSR 1000V software from the following Cisco website in ISO, OVA and BIN formats: http://software.cisco.com/download/release.html?mdfid=284364978&flowid=39582&softwareid=282046477&release=3.9.0aS&relind=AVAILABLE&rellifecycle=ED&reltype=latest.

The software image comes with a free 60-day evaluation license, and can be deployed on a virtualized server using VMware vCenter. You can convert the CSR 1000V virtual machine (VM) into a template, from which you can create and customize other VMs, or you can clone multiple instances of the VM.

Q. Does the CSR support VM-level High Availability?

A. The CSR 1000V supports VMware High Availability features including vMotion and DRS.

Q. How can I purchase the CSR 1000V?

A. You can purchase the CSR 1000V directly from Cisco or from a partner. The CSR 1000V is licensed based on throughput and feature set, and you can purchase it for a term of 1, 3 or 5 years.

The IOS-XE® Software Release 3.9 of the CSR 1000V offers five throughput options - 10 Mbps, 25 Mbps, 50 Mbps, 100 Mbps and 250 Mbps. Upon activation of a particular option, the CSR 1000V limits its aggregate bi-directional throughput to that option.

For the 10 Mbps, 25 Mbps and 50 Mbps throughput options, you can select any of the feature sets - Standard, Advanced, and Premium - shown below. For the 100 Mbps and 250 Mbps throughput options, you can only select the Standard feature set. Future releases of the CSR 1000V will offer the Advanced and Premium feature sets for 100 Mbps and 250 Mbps and will offer higher throughput options.

- **Standard:** Includes routing (BGP, EIGRP, OSPF, IPv6, ..), addressing (DHCP, NAT, VLAN), basic security (ACL, AAA), high availability: (HSRP, ..), and management (SSH, SNMP, NetFlow, ..) features
- **Advanced:** Includes Standard and advanced security (Zone-based Firewall, IPSec, Route-based VPNs - DMVPN, FlexVPN, ..) features
- **Premium:** Includes Advanced, MPLS (MPLS VPN, VRF), Application Experience (AppNav, QoS, AVC, IP SLA, ..) and IP mobility (LISP) features

After you purchase a license, you will receive a Product Activation Key (PAK). You must provide the PAK to a Cisco License Server along with a unique device identifier (which is generated when the CSR 1000V VM boots up) in order for the server to generate a license file for the CSR 1000V. You then must install and activate the license file in the CSR 1000V.

Q. How can I manage the CSR 1000V?

A. When the CSR 1000V is operational, you can provision its networking and security features using SSH or Telnet to access the Cisco IOS® CLI. The CSR 1000Vis also manageable by the Cisco Prime Infrastructure, the Cisco network management tool that manages Cisco IOS® devices including ISRs and ASRs. For monitoring and troubleshooting, the CSR 1000V supports SNMP, Syslog and IP SLAs.

Q. Can I deploy the CSR 1000V in the Amazon (AWS) or Microsoft (Azure) clouds?

A. For a CSR 1000V to be deployed in the Amazon cloud, the CSR 1000V needs to be converted into an Amazon Machine Instance (AMI). An AMI version of the CSR 1000V will be offered in a future release of the CSR 1000V.

The CSR 1000V does not support Microsoft Hyper-V virtualization, a requirement for Microsoft Azure deployment. Support for Hyper-V will be offered in a future release of the CSR 1000V.

Q. Is the CSR 1000Vrelated to the Cisco Nexus 1000V Series Switches?

A. The CSR 1000V is not related to the Cisco Nexus® 1000V virtual switches. The CSR 1000V can run on a VMware ESXi hypervisor that contains the Cisco Nexus®1000V or a standard virtual switch, such as a VMware vSwitch.

Q. What is the performance of the CSR 1000V?

A. The CSR 1000V is intended for single-tenant (VPC) networking use in a multi-tenant cloud, where the bandwidth expectations range from 10 Mbps to 1 Gbps.

The IOS-XE® Release 3.9 of the CSR 1000V offers five throughput licenses - 10 Mbps, 25 Mbps, 50 Mbps, 100 Mbps, and 250 Mbps. Upon activation of a particular throughput license, the CSR 1000V limits its aggregate bi-directional throughput to the throughput specified by the license. Future releases of the CSR 1000V will offer higher throughput licenses.

Q. Is the CSR 1000V similar to the Cisco ASR 1000 or Cisco ISR products?

A. The CSR 1000V is a Cisco IOS® networking product like the Cisco ASR 1000 and ISR. Each product serves a specific purpose.

- The Cisco ASR 1000 is deployed primarily in data centers and campuses, the Cisco ISR is intended primarily for branch offices, and the CSR 1000V goes into VPCs. The three products are complementary to each other.
- The feature set of the CSR 1000V supports VPC networking needs. The CSR 1000V offers only selected IOS-XE® features based on the cloud uses of the product.
- The virtual form factor of the CSR 1000V makes it ideal for VPC deployments where flexibility and agility are highly desired. The ASR 1000 and ISR are ideally suited for data centers and branch offices where hardware-based performance and reliability are required to support demanding data, voice, and video networking services. While the ISRs and ASRs are purpose-built networking devices with highly optimized performance, the CSR 1000V runs on general purpose server hardware and shares resources with other applications running on the same hardware.

Q. When will the CSR 1000V be available?

A. The CSR 1000V is generally available now (IOS-XE® 3.9 Release).