



Cisco Enterprise Networks Routing Portfolio

Delivering an Uncompromised Experience Across the Branch, WAN, Data Center and Cloud



Cisco Integrated Services Routers (ISR)

Converged Infrastructure to Enable the Next Generation Branch Services

Feature	819	860VAE	880	890	4321	4331	4351	4431	4451-X
Form Factor	Desktop & Ruggedized (M2M)	Small Desktop	Desktop	Desktop	1 RU Desktop	1 RU	2 RU	1 RU	2 RU
Integrated WAN Ports	1 GE, 1 Serial	1 GE, 1 VADSL	1 FE, 1 VADSL, 1 G.SHDSL	1 GE (1 SFP), 1 VADSL, 1 G.SHDSL	1 GE / SFP, 1 GE	1 GE / SFP, 1 GE	2 PoE GE / SFP, 1 GE SFP	2 PoE GE / SFP, 2 GE / SFP	2 PoE GE / SFP, 2 GE / SFP
Performance	15 Mbps	8 Mbps	15 Mbps	25 Mbps	50 Mbps	100 Mbps	200 Mbps	500 Mbps	1 Gbps
Management Port	N/A	N/A	N/A	N/A	N/A	1 GE (Integrated Out of Band)	N/A	N/A	N/A
Network Interface Modules (NIM)	0	0	0	0	2	2	3	3	3
Enhanced Services Module (SM-X)	0	0	0	0	2	2	3	3	3
Integrated Services Card (ISC) Slots	0	0	0	0	1 (PVDIM 4)	1 (PVDIM 4)	1 (PVDIM 4)	1 (PVDIM 4)	1 (PVDIM 4)
USB Ports Type A	0	1	1	1 or 2	1	1	2	2	2
Default/Max Flash	512 MB-1 GB (fixed)	56-128 MB (fixed)	128 MB/256 MB (fixed)	256 MB (fixed)	4 GB/8 GB	4 GB/16 GB	4 GB/16 GB	8 GB/32 GB	8 GB/32 GB
Default/Max DRAM	512 MB/1 GB	256-512 MB/256-512 MB	256-512 MB/512-1024 MB	256-512 MB/512-1024 MB	4 GB/8 GB	4 GB/16 GB	4 GB/16 GB	8 GB/32 GB	8 GB/32 GB
Power Supply Type	External AC, DC	External AC	External AC, PoE	External AC, PoE	Internal AC, PoE	Internal AC, PoE	Internal AC, PoE	Internal AC, PoE	Internal AC, PoE
Redundant Power Supply	No	No	No	No	No	No	No	Yes	Yes
Module Online Insertion and Removal (OIR)	No	No	No	No	Yes	Yes	Yes	Yes	Yes
Server Virtualization Platform (UCS E-Series)	No	No	No	No	Yes	Yes	Yes	Yes	Yes

Advanced Security	819	860VAE	880	890	4321	4331	4351	4431	4451-X
Zone-based Firewall and NAT Services	VRF aware FW and NAT				VRF aware FW and NAT				
Hardware VPN Acceleration (DES, 3DES, AES)	Yes				No				
IPSEC VPN Services	FlexVPN, Easy VPN Remote, Enhanced Easy VPN Remote, Dynamic Multipoint VPN (DMVPN), Group Encrypted Transport VPN (GET VPN), V3VPN, MPLS VPN IP Services license	FlexVPN, Easy VPN Remote, Enhanced Easy VPN Remote, Dynamic Multipoint VPN (DMVPN), Group Encrypted Transport VPN (GET VPN), V3VPN, MPLS VPN IP Services license	FlexVPN, Easy VPN Remote, Enhanced Easy VPN Remote, Dynamic Multipoint VPN (DMVPN), Group Encrypted Transport VPN (GET VPN), V3VPN, MPLS VPN IP Services license	FlexVPN, Easy VPN Remote, Enhanced Easy VPN Remote, Dynamic Multipoint VPN (DMVPN), Group Encrypted Transport VPN (GET VPN), V3VPN, MPLS VPN IP Services license	FlexVPN, Easy VPN Remote server, Enhanced Easy VPN, Dynamic Multipoint VPN (DMVPN), Group Encrypted Transport VPN (GET VPN), V3VPN, MPLS VPN IP Services license				
SSL VPN	Yes	N/A	Yes	Yes	No	Yes	No	Yes	Yes
Intrusion Prevention	Yes	N/A	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Network Foundation Protection	ACL, FPM, Control Plane Protection, Control Plane Policing (CoPP), QoS, Role-based CLI Access, Source-based RTBH, uRPF, SSHv2	ACL, QoS (limited support), Role-based CLI Access, Source-based RTBH, uRPF, SSHv2	ACL, FPM, Control Plane Protection, Control Plane Policing (CoPP), QoS, Role-based CLI Access, Source-based RTBH, uRPF, SSHv2	ACL, FPM, Control Plane Protection, Control Plane Policing (CoPP), QoS, Role-based CLI Access, Source-based RTBH, uRPF, SSHv2	ACL, FPM, Control Plane Protection, Control Plane Policing (CoPP), QoS, Role-based CLI Access, Source-based RTBH, uRPF, SSHv2				
Cisco Cloud Web Security	Yes (Requires Additional Subscription License)				Yes*				
Identity Based Networking	802.1X, MAB, WebAuth, RADIUS CoA	MAB, WebAuth, RADIUS CoA	802.1X, MAB, WebAuth, RADIUS CoA	802.1X, MAB, WebAuth, RADIUS CoA	No				
Cisco TrustSec	<ul style="list-style-type: none"> Security Group Tag Exchange Protocol (SGTP), SGT over GETVPN Port/L3 Interface/PSubnet-to-SGT mapping SGT export in Flexible NetFlow 				<ul style="list-style-type: none"> Security Group Tag Exchange Protocol (SGTP), SGT over GETVPN SGT over DMVPN SGT-based ZRPW Port/L3 Interface/PSubnet-to-SGT mapping SGT export in Flexible NetFlow 				

Unified Communication	Enabled via Unified Communications License for Universal IOS Image. CCME/SRST support through separate feature licenses								
Local Conferencing	N/A	N/A	N/A	N/A	Yes	Yes	Yes	Yes	Yes
Digital Signal Processor Support	N/A	N/A	N/A	N/A	PVDM4	PVDM4	PVDM4	PVDM4	PVDM4
Cisco Unified Survivable Remote Site Telephony Support	N/A	N/A	N/A	N/A	Up to 50	Up to 100	Up to 750	Up to 1200	Up to 2000
Cisco Unified Communications Manager Express Support	N/A	N/A	N/A	N/A	Up to 50	Up to 100	Up to 250	Up to 350	Up to 450
Cisco Unity Express (NM, SM or SM)	N/A	N/A	N/A	N/A	Use Cisco Unity Connection on UCSE	Use Cisco Unity Connection on UCSE	Use Cisco Unity Connection on UCSE	Use Cisco Unity Connection on UCSE	Use Cisco Unity Connection on UCSE
Cisco Unified Border Element (CUBE) (SIP/123 Sessions)	N/A	N/A	N/A	N/A	100	400	1000	3000	6000
nano Cisco Unified Border Element (nanoCUBE) (Sessions)	N/A	N/A	N/A	25	50	N/A	N/A	N/A	N/A
Digital Voice and Video (T1/E1 channels)	N/A	N/A	N/A	N/A	Up to 240	Up to 360	Up to 720	Up to 1200	Up to 1200
Analogy/BRI Voice	N/A	N/A	N/A	N/A	FXS, FXO, FXM, BR	Up to 12 ports (FXS, FXO, FXM, BR)	Up to 12 ports (FXS, FXO, FXM, BR)	Up to 12 ports (FXS, FXO, FXM, BR)	Up to 12 ports (FXS, FXO, FXM, BR)

Routing and Multicast	819	860VAE	880	890	4321	4331	4351	4431	4451-X
IPv4 Routing Protocols	RP v1v2, EIGRP, OSPF, BGP, PBR	RP v1v2, BGP	RP v1v2, EIGRP, OSPF, BGP, PBR, PIR	RP v1v2, EIGRP, OSPF, BGP, PBR, PIR	RP v1v2, EIGRP, OSPF, BGP, PBR, PIR	RP v1v2, EIGRP, OSPF, BGP, PBR, PIR	RP v1v2, EIGRP, OSPF, BGP, PBR, PIR	RP v1v2, EIGRP, OSPF, BGP, PBR, PIR	RP v1v2, EIGRP, OSPF, BGP, PBR, PIR
Multicast Routing Protocols	PM-SM, mroute (static route), and MLD	N/A	PM-SM, mroute (static route), and MLD	PM-SM, mroute (static route), and MLD	PM-SM, mroute (static route), and MLD	PM-SM, mroute (static route), and MLD	PM-SM, mroute (static route), and MLD	PM-SM, mroute (static route), and MLD	PM-SM, mroute (static route), and MLD
IPv6 Routing Protocols	EIGRP, RP, OSPFv3, IS-IS, BGP and PBR	N/A	EIGRP, RP, OSPFv3, IS-IS, BGP and PBR	EIGRP, RP, OSPFv3, IS-IS, BGP and PBR	EIGRP, RP, OSPFv3, IS-IS, BGP and PBR	EIGRP, RP, OSPFv3, IS-IS, BGP and PBR	EIGRP, RP, OSPFv3, IS-IS, BGP and PBR	EIGRP, RP, OSPFv3, IS-IS, BGP and PBR	EIGRP, RP, OSPFv3, IS-IS, BGP and PBR
Wireless LAN	Cisco Unified Border Element (CUBE) (SIP/123 Sessions)								
Integrated 802.11 a/b/g/n Access Point	N/A	Yes	Yes	N/A	N/A	N/A	N/A	N/A	N/A
Integrated 802.11 a/b/g/n Access Point	N/A	Yes	Yes	N/A	N/A	N/A	N/A	N/A	N/A
Unified and Autonomous Mode	Both	Autonomous	Both	Both	N/A	N/A	N/A	N/A	N/A
RP-TNC Connectors for Field-replaceable Optional High-gain Antennas	Yes	No (Integrated antennas)	No (Integrated antennas)	No (Integrated antennas)	N/A	N/A	N/A	N/A	N/A
Diversity (Dual Antennas)	Yes	Yes	Yes	Yes	N/A	N/A	N/A	N/A	N/A
Wireless LAN Controller Module	N/A	N/A	N/A	N/A	Available on UCS E-Series	Available on UCS E-Series	Available on UCS E-Series	Available on UCS E-Series	Available on UCS E-Series

Wireless WAN	819	860VAE	880	890	4321	4331	4351	4431	4451-X
3G /4G Cellular	Yes	N/A	Yes (3G)	N/A	N/A	N/A	Yes*	N/A	N/A
TNC Connectors for Field-replaceable Optional High-gain Antennas	Yes	N/A	Yes	N/A	N/A	N/A	N/A	N/A	N/A
Diversity (Dual Antennas)	Yes	N/A	Yes	N/A	N/A	N/A	N/A	N/A	N/A
Outdoor Antennas	Yes	N/A	Yes	N/A	N/A	N/A	N/A	N/A	N/A

Integrated Switching	819	860VAE	880	890	4321	4331	4351	4431	4451-X
Maximum Switched Ethernet Ports	4	5	4	8	N/A	24	48	N/A	48
Maximum Switched Ethernet LAN Ports with PoE	0	1	2	4	N/A	24	48	N/A	48
PoE Support (Wattage) Without PoE Boost	N/A	15.4W	31W	62W	120W	250W	500W	250W (With Optional Power Supply Redundancy)	500W (With Optional Power Supply Redundancy)
PoE Support (Wattage) With PoE Boost	N/A	N/A	N/A	N/A	260W	530W	990W	500W (No Power Supply Redundancy)	990W (No Power Supply Redundancy)
EtherSwitch Service Module Type (Width)	N/A	N/A	N/A	N/A	N/A	1 Single	2 Single or 1 Double	N/A	2 Single or 1 Double
Application Services	Cisco Unified Border Element (CUBE) (SIP/123 Sessions)								
Intelligent Path Control	PIR	N/A	PIR (Requires Advanced IP Services license)	PIR	PIR	PIR	PIR	PIR	PIR
Network Contention Control	QoS, HqoS	QoS, HqoS (HqoS on 860VAE-W only)	QoS, HqoS	QoS, HqoS	QoS, HqoS	QoS, HqoS	QoS, HqoS	QoS, HqoS	QoS, HqoS
Application Visibility	NBAR v2	N/A	NBAR v2	NBAR v2	NBAR v2	NBAR v2	NBAR v2	NBAR v2	NBAR v2
WAN Optimization	Limited WAAS Express	N/A	WAAS Express (1 GB DRAM minimum)	ISR-WAAS	ISR-WAAS	ISR-WAAS	ISR-WAAS	ISR-WAAS	ISR-WAAS
Alkamal Connect	No								
Cisco Application Centric Infrastructure	Application Performance Infrastructure Controller (APIC) with Enterprise Module								

* Planned for 1H 2015

Cisco ISR Routers

- Cisco 800 Series: 819, 860VAE, 880, 890
- Cisco 4300 Series: 4321, 4331, 4351
- Cisco 4400 Series: 4431, 4451-X

For more information on the Cisco ISR routers, please visit: www.cisco.com/go/isr

Cisco Aggregation Services Routers (ASR) 1000 Series

Transforming the Enterprise Network Edge

Platform	1001-X	1002-X	1001-HX	1002-HX	1004	1006	1006-X	1009-X	1013	
Form Factor	1RU	2RU	1RU	2RU	4 RU	6RU	6RU	8RU	13 RU	
Chassis	Scalable to 20 Gbps	Scalable to 36 Gbps	Scalable to 60 Gbps	Scalable to 100 Gbps	Scalable to 40 Gbps	Scalable to 100 Gbps	Scalable to 100 Gbps	Scalable to 200 Gbps	Scalable to 200 Gbps	
Integrated WAN Ports	6x 1GE ports 2x10GE	6x 1GE ports	Scalable to 60 Gbps	Scalable to 100 Gbps	N/A	N/A	N/A	N/A	N/A	
Embedded Services Processor (ESP)	Integrated 2.5-Gbps ESP	Integrated ESP	Integrated ESP 44 - 60 Gbps via port licenses	Integrated ESP 44 - 100 Gbps via port licenses	ASR1000-ESP20 (single or dual)	ASR1000-ESP20 (single or dual)	ASR1000-ESP20 (single or dual)	ASR1000-ESP20 (single or dual)	ASR1000-ESP20 (single or dual)	
Route Processor (RP)	Integrated Route Processor with 8 GB memory, field upgradable to 16 GB memory	Integrated Route Processor with 4 GB memory, field upgradable to 8 GB or 16 GB memory	Integrated Route Processor with 8GB memory, field upgradable to 16 GB memory	Integrated Route Processor with 16 GB memory, field upgradable to 32 GB memory	ASR1000-RP2 (single) 8 GB or 16 GB memory	ASR1000-RP2 (single or dual) 8 GB or 16 GB memory	ASR1000-RP2 (single or dual) 8 GB or 16 GB memory	ASR1000-RP2 (single or dual) 8 GB or 16 GB memory	ASR1000-RP2 (single or dual) 8 GB or 16 GB memory	
SPA Interface Processor (SIP) Card Slots / MP100 slots	1 SPA slot	3 SPA slots	N/A	1 EPA slot	8 SPA slots	12 SPA slots	8 SPA slots or 4 EPA slots	12 SPA slots or 6 EPA slots	24 SPA slots or 12 EPA slots	
Shared Port Adapter (SPA) Slots / EPA slots	1	0	0	1	0	0	0	0	0	
Network Interface Module (NIM)	1	0	0	1	0	0	0	0	0	
Interface Support	FE, GE, 10GE, OC3 (POS/ATM), OC48 (POS), OC-192 (POS), channelized STM-1/OC3, (channelized-non-channelized) T3/E3, T1/E1, Serial	FE, GE, 10GE, OC3 (POS/ATM), OC48 (POS), OC-192 (POS), channelized STM-1/OC3, (channelized-non-channelized) T3/E3, T1/E1, Serial	FE, GE, 10GE	FE, GE, 10GE, 40GE, 100GE, T1/E1, Serial	FE, GE, 10GE, OC3 (POS/ATM), OC12 (POS/ATM), OC48 (POS), OC-192 (POS), channelized STM-1/OC3, (channelized-non-channelized) T3/E3, T1/E1, Serial	FE, GE, 10GE, OC3 (POS/ATM), OC12 (POS/ATM), OC48 (POS), OC-192 (POS), channelized STM-1/OC3, (channelized-non-channelized) T3/E3, T1/E1, Serial	FE, GE, 10GE, 40GE, 100GE, OC3 (POS/ATM), OC12 (POS/ATM), OC48 (POS), OC-192 (POS), channelized STM-1/OC3, (channelized-non-channelized) T3/E3, T1/E1, Serial	FE, GE, 10GE, 40GE, 100GE, OC3 (POS/ATM), OC12 (POS/ATM), OC48 (POS), OC-192 (POS), channelized STM-1/OC3, (channelized-non-channelized) T3/E3, T1/E1, Serial	FE, GE, 10GE, 40GE, 100GE, OC3 (POS/ATM), OC12 (POS/ATM), OC48 (POS), OC-192 (POS), channelized STM-1/OC3, (channelized-non-channelized) T3/E3, T1/E1, Serial	FE, GE, 10GE, 40GE, 100GE, OC3 (POS/ATM), OC12 (POS/ATM), OC48 (POS), OC-192 (POS), channelized STM-1/OC3, (channelized-non-channelized) T3/E3, T1/E1, Serial
Forwarding Rate	Up to 17 Mpps	Up to 36 Mpps	Up to 60 Mpps	Up to 100 Mpps	Up to 15 or 23 Mpps	Up to 23 or 29 Mpps	Up to 23 or 29 Mpps	Up to 23 or 29 Mpps	Up to 23 or 29 Mpps	
Minimum Cisco IOS XE Release	IOS XE 3.7.1S	IOS XE 3.7.1S	IOS XE 3.7.1S	IOS XE 3.7.1S	IOS XE 2.1.0	IOS XE 2.1.0	IOS XE 3.16.1S	IOS XE 3.16.1S	IOS XE 3.16.1S	
System DRAM Memory	8 GB (default), 16 GB (max.) - for Integrated Route Processor	4 GB (default), 8 GB or 16 GB (max.) - for Integrated Route Processor	8 GB (default), 16 GB (max.) - for Integrated Route Processor	16 GB (default), 32 GB (max.) - for Integrated Route Processor	8 GB (default), 16 GB (max.) - for ASR1000-RP2	8 GB (default), 16 GB (max.) - for ASR1000-RP2	8 GB (default), 16 GB (max.) - for ASR1000-RP2	8 GB (default), 16 GB (max.) - for ASR1000-RP2	8 GB (default), 16 GB (max.) - for ASR1000-RP2	
Redundant Power Supply	Yes, Dual AC or DC by default	Yes, Dual AC or DC by default	Yes, Dual AC or DC by default	Yes, Dual AC or DC by default	Yes, Dual AC or DC by default	Yes, Dual AC or DC by default	Yes, N+1 AC or DC Power supply redundancy	Yes, Dual AC or DC by default	Yes, Dual AC or DC by default	

Advanced Security	1001-X	1002-X	1001-HX	1002-HX	1004	1006	1006-X	1009-X	1013
Zone-based Firewall and NAT Services	Up to 20 Gbps VRF aware FW and VRF aware NAT	Up to 36 Gbps VRF aware FW and VRF aware NAT	Up to 60 Gbps VRF aware FW and VRF aware NAT	Up to 100 Gbps VRF aware FW and VRF aware NAT	Up to 20 Gbps (ESP20), or 400 Gbps (ESP40), or VRF aware FW and VRF aware NAT	Up to 20 Gbps (ESP20), or 100 Gbps (ESP100), or VRF aware FW and VRF aware NAT	Up to 40 Gbps (ESP40), or 100 Gbps (ESP100), or VRF aware FW and VRF aware NAT	Up to 40 Gbps (ESP40), or 100 Gbps (ESP100), or VRF aware FW and VRF aware NAT	Up to 40 Gbps (ESP40), or 100 Gbps (ESP100), or VRF aware FW and VRF aware NAT
Total Firewall Session	2M	2M	2M	6M	2M (ESP20 and ESP40)	2M (ESP20 and ESP40)	2M (ESP40)	2M (ESP40)	2M (ESP40)

VPN services	1001-X	1002-X	1001-HX	1002-HX	1004	1006	1006-X	1009-X	1013
IPsec, GRE + IPsec, VTI, FlexVPN, Easy VPN, Multipoint VPN (DMVPN), 2547 over DMVPN, Group Encrypted Transport VPN (GET VPN), IPv6 IPsec, SVTI	<ul style="list-style-type: none"> IPsec, GRE + IPsec, VTI, FlexVPN, Easy VPN, Multipoint VPN (DMVPN), 2547 over DMVPN, Group Encrypted Transport VPN (GET VPN), IPv6 IPsec, SVTI ** FlexVPN is recommended over EasyVPN/DMVPN 								
Onboard Hardware VPN Encryption (DES, 3DES, AES)	Yes, up to 5 Gbps (IMX) *Suite-B supported in control and data planes	Yes, up to 4 Gbps (IMX) *Suite-B supported in control and data planes	Yes, 8 Gbps (IMX) or 16 Gbps (IMX) *Suite-B supported in control and data planes	Yes, 8 Gbps (IMX) or 16 Gbps (IMX) *Suite-B supported in control and data planes	Yes, up to 13 Gbps (IMX) *Suite-B supported in control plane	Yes, up to 16 Gbps (IMX) *Suite-B supported in control plane with ESP40	Yes, up to 16 Gbps (IMX) *Suite-B supported in both control and data plane with ESP100	Yes, up to 16 Gbps (IMX) *Suite-B supported in control plane with ESP40	Yes, up to 16 Gbps (IMX) *Suite-B supported in both control and data plane with ESP100 and ESP200
Maximum IPsec Tunnels	10000								
Network Foundation Protection	ACL, FPM, Control Plane Protection (CPV), Control Plane Policing (CoPP), QoS, Role-based CLI Access, Source-based RTBH, uRPF, SSHv2								
Cisco TrustSec	Security Group Tag Exchange Protocol (SGTP), SGT-over-GETVPN, SGT-over-DMVPN, SGT-based ZRPW								

High Availability	1001-X	1002-X	1001-HX	1002-HX	1004	1006	1006-X	1009-X	1013
In-Service Software Upgrade (ISSU)	No	No	No	No	No	No	Yes	Yes	Yes
Software Redundancy (Equal IOS on same Route Processor)	Yes	Yes	Yes	Yes	Yes	Yes	N/A (HW redundancy)	N/A (HW redundancy)	N/A (HW redundancy)
NSF/SSO	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Quality of Service	3-level hierarchical QoS (e.g. on GRE tunnels), 1000 Class-maps per policy, 4000 unique policy maps, support for 128,000 queues, allows all queues to have a minimum, maximum, and excess bandwidth with priority propagation	3-level hierarchical QoS (e.g. on GRE tunnels), 1000 Class-maps per							