Cisco ISR & ASR Application Experience Routers

Cisco ISR-AX router bundles directly integrates Cisco Wide Area Application Services (WAAS), Security (SEC), and Data (DATA) licenses into a platform that is simple to order, configure, and deploy for secure, optimized cloud connectivity and branch-office routing. By providing a system that is simple to order and deploy, the Cisco ISR-AX platforms add to the rich breadth of services available on the ISRs. Cisco® Intelligent WAN (IWAN) is enabled by the Cisco Application Experience (AX) platform and delivers an uncompromised user experience over any connection, allowing businesses to right-size their networks with operational simplicity and lower costs, freeing up resources for additional IT initiatives/spend.

Similar to the ISR portfolio, the Application Experience (AX) portfolio consists of five product families: the Cisco 4400-AX, 3900-AX, 2900-AX, and 1900-AX Series Application Experience Routers and an AX Feature Set software licensing option for 800 Series. The portfolio provides increasing performance and module slot density and each ISR AX platform comes equipped and ready to deploy, and all ISR-AX platforms include licenses for; Data, Security and WAAS. The ISR AX Feature set software licensing option that is available for the Cisco ISR 800 Series routers combines: WAAS Express and Cisco Application Visibility and Control (AVC) for a simple to order, configure, and deploy solution for optimized branch office routing. The 1900-AX series, 2900-AX series and the 3925-AX, 3945-AX routers come equipped with maximum DRAM for WAAS express enabled out of the box.

The ASR 1000 AX bundles offer optimal application experience from anywhere. Cisco is enabling customers to deploy application centric networking, designed to help IT deliver applications from anywhere the business requires, with an optimal user experience that results in greater employee productivity and customer satisfaction.

- **Your business applications can run faster**. We work with leading app vendors to tune their applications to run more efficiently on a Cisco network, automatically… reducing bandwidth by up to 70% and supporting more sessions and a better user experience. The business investment on mission critical applications will be more productive with Cisco, giving a better ROI on their investment.
- **IT gains pervasive visibility across their network** to over 1000 apps, without expensive or difficult to deploy probes that are often deployed in selective areas of the network. This means IT can quickly answer why an application is running slow, validate SLAs, and verify the ROI on network services.

All of this is available at **lower TCO**, with lower OPEX for maintenance and troubleshooting.

Cisco 4451-X-AX Series Integrated Services Routers

The Cisco 4451-X-AX provides optimal performance for applications delivered from a central data center to branch-office users. The solution allows you to consolidate costly server, storage, and backup infrastructure into data centers while maintaining LAN-like service levels for remote users. The Cisco 4451-X-AX includes licenses for, Data, Security, and a Right to Use (RTU) license for 2500 ISR-WAAS or Virtual WAAS (vWAAS) connections. Each 4451-X-AX includes 4-GB DRAM and 8 GB of flash memory by default and does not include solid state drives (SSDs) by default.

When ordering, you have two options to enable either ISR WAAS or vWAAS as follows:

- 2500 ISR-WAAS connections: DRAM upgrade to 16 GB, flash memory upgrade to 32 GB, SSD carrier, and two 200-GB SSDs must be included in the configuration to enable 2500 ISR-WAAS connections.
- 2500 ISR-vWAAS connections: A Cisco Unified Computing System (Cisco UCS®) E-Series module must be included in the configuration to enable 2500 ISR-vWAAS connections.

Cisco 3900-AX, 2900-AX, and 1900-AX Series Integrated Services Routers

The Cisco 3900-AX includes licenses for, Data, Security, WAAS Express (WAASX), and a RTU for 2500 WAAS or vWAAS connections and a 1300 WAAS or vWAAS RTU license for the Cisco 2911-AX Series platforms and later. You can use this RTU on any combination or multiples of modules for WAAS and/or vWAAS connections on the Cisco 2900-AX or 3900-AX Series Routers, respectively. The Cisco 1900-AX Series includes licenses for Data, Security, and WAASX.

Options when ordering:

- The Cisco Services-Ready Engine (SRE). Enabling WAAS requires a Cisco SRE 710 or SRE 910
- The Cisco UCS E-Series module. Enabling vWAAS requires a UCS-E module

  The SRE or Cisco UCS E-Series module is not included by default with Cisco ISR-AX Routers when ordering, but are optional when ordering - **not including by default gives you flexibility in choosing modules when ordering and enabling either WAAS or vWAAS**. The RTU can be spread across multiple SRE and/or Cisco UCS E-Series modules in a single router.

The ISR AX bundles include the option for purchase of SRE or UCS-E at a promotional price, when the SRE or UCS-E is purchased separately it is not at the promotional price. Customers who will initially deploy WAAS Express but who plan to deploy full WAAS or vWAAS later are encouraged to buy the ISR AX with SRE or UCS-E to take advantage of the promotional pricing.

AX Licensing for the Cisco® 800 Series

The AX licensing for the Cisco® 800 Series combines Cisco Wide Area Application Services (WAAS) Express and Cisco Application Visibility and Control (AVC) in a way that is simple to order, configure, and deploy for optimized branch office routing.

The AX licensing for the Cisco 800 Series consists of a combination of Right-to-Use software licenses and necessary DRAM memory as shown below that will get applied to the Cisco 800 Series Integrated Services Router:

- Advanced IP License
- Wide Area Application Services (WAAS) Express Right-To-Use License
- Application Visibility and Control (AVC) Right-To-Use
- DRAM maximum memory upgrade

The AX Feature Set for the 800 series is a selectable option that can be added when configuring a Cisco 890 Series Integrated Services Router. Spare licenses may also be purchased and added to existing 890 series routers for these features.

Table 1. ISR Application Experience Routers Overview and Ordering Information

Platform ID	Estimated Router WAN BW w/ Services	Description	WAAS/VWAAS/ISR WAAS Options	WAAS Optimized TCP Connections	Target Optimized WAN Capacity
C1921-AX/K9	15Mb	CISCO 1921 Modular Router, 2 GE, 2 EHWIC slots, 256F/512D, with AX license	-	50 (WAAS-Express)	0.512 Mbps
C1941-AX/K9	25Mb	Cisco ISR 1941 Router w/2 GE,2 EHWIC slots, 256MB CF, 2.5GB DRAM, with AX license	-	150 (WAAS-Express)	4 Mbps
C2901-AX/K9	25Mb	Cisco ISR 2901 w/2 GE, 4 EHWIC, 2 DSP, 256MB CF, 2.5GB DRAM, with AX license	-	150 (WAAS-Express)	6 Mbps
C2911-AX/K9	35Mb	Cisco ISR 2911 w/3 GE,4 EHWIC, 2 DSP, 1 SM, 256MB CF, 2.5GB DRAM, with AX license WAAS/vWAAS with 1300 connection RTU)	• SRE-710 option for WAAS • SRE-910 option for WAAS • UCS-E140/160 single wide option for vWAAS	• 250 (WAAS-Express) • 500 (SRE-710) • 1000 (SRE-910) • >1001 and up to 1300 add UCS-E (vWAAS) • >1300 add UCS-E and vWAAS-2500 or 6000	• 6 Mbps (WAAS Express) • 20 Mbps (SRE-710) • 50 Mbps (SRE-910) • 100 Mbps (vWAAS-1300) • 200 Mbps (vWAAS-2500 or 6000)
C2921-AX/K9	50Mb	Cisco ISR 2921 w/3 GE, 4 EHWIC, 3 DSP, 1 SM, 256MB CF, 2.5GB DRAM with AX license (WAAS/vWAAS with 1300 connection RTU)	• SRE-710 option for WAAS • SRE-910 option for WAAS • UCS-E140/160 single wide option for vWAAS	• 250 (WAAS-Express) • 500 (SRE-710) • 1000 (SRE-910) • >1001 and up to 1300 add UCS-E (vWAAS) • >1300 add UCS-E and vWAAS-2500 or 6000	• 6 Mbps (WAAS Express) • 20 Mbps (SRE-710) • 50 Mbps (SRE-910) • 100 Mbps (vWAAS-1300) • 200 Mbps (vWAAS-2500 or 6000)
C2951-AX/K9	75Mb	Cisco ISR 2951 w/3 GE, 4 EHWIC, 3 DSP, 2 SM, 256MB CF, 4 GB DRAM with AX license (WAAS/vWAAS with 1300 connection RTU)	• SRE-710 option for WAAS • SRE-910 option for WAAS • UCS-E140/160 single wide option for vWAAS	• 400(WAAS-Express) • 500 (SRE-710) • 1000 (SRE-910) • For >1000 and up to 1300 add 2nd SRE for WAAS or UCS-E for vWAAS up to 1300 connections • For >1300 add UCS-E and vWAAS-2500 or 6000	• 6 Mbps (WAAS Express) • 20 Mbps (SRE-710) • 50 Mbps (SRE-910) • 100 Mbps (vWAAS-1300) • 200 Mbps (vWAAS-2500 or 6000)
C3925-AX/K9	100Mb	Cisco ISR 3925 w/ SPE100 (3GE, 4EHWIC, 4DSP, 2SM, 256MBCF, 4GBDRAM with AX license (WAAS/vWAAS with 2500 connection RTU)	• SRE-710 option for WAAS • SRE-910 option for WAAS • UCS-E140/160 single wide option for vWAAS	• 400 (WAAS-Express) • 500 (SRE-710) • 1000 (SRE-910) • For >1000 and up to 2000 add 2nd SRE for WAAS or UCS-E for vWAAS up to 2500 connections • For >2500 add UCS-E and vWAAS-6000	• 6 Mbps (WAAS Express) • 20 Mbps (SRE-710) • 50 Mbps (SRE-910) • 100 Mbps (vWAAS-1300) • 200 Mbps (vWAAS-2500 or 6000)
C3925E-AX/K9	250Mb	Cisco ISR 3925 w/SPE200, 4GE, 3EHWIC, 3DSP, 2SM,	• SRE-710 option for WAAS	• 400 (WAAS-Express)	• 6 Mbps (WAAS Express)

Platform ID	Estimated Router WAN BW w/ Services	Description	WAAS/VWAAS/ISR WAAS Options	WAAS Optimized TCP Connections	Target Optimized WAN Capacity
		256MBCF, 2GB DRAM, with AX license (WAAS/vWAAS with 2500 connection RTU)	• SRE-910 option for WAAS • UCS-E140/160 single wide option for vWAAS	• 500 (SRE-710) • 1000 (SRE-910) • For >1000 and up to 2000 add 2nd SRE for WAAS or UCS-E for vWAAS up to 2500 connections • For >2500 add UCS-E and vWAAS-6000	• 20 Mbps (SRE-710) • 50 Mbps (SRE-910) • 100 Mbps (vWAAS-1300) • 200 Mbps (vWAAS-2500 or 6000)
C3945-AX/K9	150Mb	Cisco ISR 3945 w/SPE150, 3GE, 4EHWIC, 4DSP, 4SM, 256MBCF, 4GBDRAMwith AX license (WAAS/vWAAS with 2500 connection RTU)	• SRE-710 option for WAAS • SRE-910 option for WAAS • UCS-E140/160 single wide option for vWAAS	• 400 (WAAS-Express) • 500 (SRE-710) • 1000 (SRE-910) • For >1000 and up to 2000 add 2nd SRE for WAAS or UCS-E for vWAAS up to 2500 connections • For >2500 add UCS-E and vWAAS-6000	• 6 Mbps (WAAS Express) • 20 Mbps (SRE-710) • 50 Mbps (SRE-910 • 100 Mbps (vWAAS-1300) • 200 Mbps (vWAAS-2500 or 6000)
C3945E-AX/K9	350Mb	Cisco ISR 3945E w/ SPE250, 4GE, 3EHWIC, 3DSP, 4SM, 256MBCF, 2GBDRAMwith AX license (WAAS/vWAAS with 2500 connection RTU)	• SRE-710 option for WAAS • SRE-910 option for WAAS • UCS-E140/160 single wide option for vWAAS	• 400 (WAAS-Express)[5] • 500 (SRE-710) • 1000 (SRE-910) • For >1000 and up to 2000 add 2nd SRE for WAAS or UCS-E for vWAAS up to 2500 connections • For >2500 add UCS-E and vWAAS-6000	• 6 Mbps (WAAS Express) • 20 Mbps (SRE-710) • 50 Mbps (SRE-910 • 100 Mbps (vWAAS-1300) • 200 Mbps (vWAAS-2500 or 6000)
ISR4451-X-AX/K9	1Gb or 2Gb	Cisco ISR 4451 w/ 4GE,3NIM,2SM,8G FLASH, 4G DRAM, with AX license (ISR-WAAS with 2500 connection RTU)	• 16GB DRAM, 32GB Flash and 2x200GB SSD drives for ISR-WAAS • UCS-E140/160 single wide or doublewide option for vWAAS	• 2500 with ISR-WAAS • or 2500 with UCS-E for vWAAS • For >2500 add UCS-E and vWAAS-6000	• 150 Mbps (ISR-WAAS) • 200 Mbps (vWAAS-2500 or 6000)

Notes:

1. TCP connection requirements vary by application; some applications consume multiple TCP connection resources for WAAS optimization

2. Target WAN bandwidth is not limited in software or by any other system limit, but is rather provided as guidance for deployment sizing purposes

3. Cisco 1921 routers have fixed non-expandable memory. DRE is disabled on these platforms

4. Typical WAN interfaces for maximum benefit with Cisco WAAS Express include T1/E1, 3G, and multi-T1, and smaller interfaces such as 256 or 384Kbps interfaces

5. 2.5GB DRAM included for WAAS-Express on Cisco 1941/2901/2911/2921-AX and for 2951-AX and 3925/3945-AX series routers 4GB DRAM is included for WAAS Express, the 1921-AX has 512MB DRAM only. 3925E/3945E-AX have 2GB DRAM by default and do not support WAAS Express.

6. To run ISRWAAS natively on the 4451-X, memory upgrade to 16GB, flash memory upgrade to 32 GB and 2*200G SSD storage is needed.

7. Please verify the vWAAS target bandwidth rating is not greater than the router's rating with services enabled. Some ISR routers will not support the full vWAAS 1300, 2500 or 6000 capacity.

APP License Product IDs for ISR 1900/2900/3900/4400 Series

You can also purchase APP licenses and add them to any appropriately equipped Cisco 1921, 1941, 2900, 3900, or 4451-X Series ISR by purchasing the APP license as a separate line item. Table 2 gives the product IDs for ordering APP spare licenses.

Table 2. Ordering Spare APP Licenses

Ordering SKU	Description
SL-19-APP-K9 (=)	Application Experience License ISR 1921 or 1941 (spare) – includes: DATA and WAAS
SL-29-APP-K9 (=)	Application Experience License for ISR 2900 series (spare) – includes: DATA and WAAS
SL-39-APP-K9 (=)	Application Experience License for ISR 3900 series (spare) – includes: DATA and WAAS
SL-44-APP-K9 (=)	Application Experience License for ISR 4400 series (spare) – includes; DATA,and WAAS

Please note that the Spare APP license does not include Security license.

APP License for Cisco 800 Series Routers

The APP License may be a separate line item for select Cisco 800 Series Routers. The table below gives the product IDs for ordering APP Feature Set for 800 series.

Table 3. Ordering APP Licenses for Cisco 800 Series Routers

Ordering SKU	Description
FL-C800-APP	WAAS-Express/AVC/Advanced IP with upgrade up to 1GB DRAM for Cisco 800 Series Routers
FL-C800-APP=	WAAS- Express/AVC/Advanced IP with upgrade up to 1GB DRAM for Cisco 800 Series Routers (spare)
L-FL-C800-APP=	WAAS- Express/AVC/Advanced IP with upgrade up to 1GB DRAM for Cisco 800 Series Routers (spare, e-delivery)

Supported Cisco 800 Series Routers

The AX License may be added to any of the following Cisco 800 Series Routers

Table 4. Supported Cisco 800 Series Routers

Supported Platform	Description
C892FSP-K9	Cisco 892 FSP Router
C896VA-K9	Cisco 896 VA router
C897VA-K9	Cisco 897 VA router
C897VAW-A-K9	Cisco 897 AW A router
C897VA-M-K9	Cisco 897 Annex M over POTs and 1GE/SFP Sec Router
C898EA-K9	Cisco 898 G.SHDSL ATM/EFM Multi-mode & 1GE/SFP Sec Router
C897VAW-E-K9	Cisco 897 VDSL2/ADSL2+ over POTs, 1GE/SFP, 802.11n ETSI Comp
C897VAM-W-E-K9	Cisco 897 Annex M over POTs & 1GE/SFP, 802.11n ETSI

Overview

The APP Feature Set on the Cisco 890 Series Integrated Services Router with 1 GB DRAM can support a target WAN capacity of 11Mbps and up to 125 concurrent TCP connections.

ASR 1000 Application Experience

The ASR 1000 Application Experience (AX) bundles consist of the following items:

- AVC License with NBAR2 DPI, Flexible NetFlow (FNF) and Performance Monitoring
- AppNav for WAN optimization
- Option to purchase heavily discounted vWAAS licenses, to be run on a standalone server

Table 5.　ASR AX Router Bundles

Part Number	Product Description	Quantity
ASR1001-5G-AES-AX	**ASR1001 AX, AVC, AES, 5G, vWAAS, Bundle, includes:**	
	ASR1001	1
	SLASR1-AES	1
	FLS-ASR1001-5G	1
	FLSASR1-AVC	1
ASR1001-5G-AIS-AX	**ASR1001 AX, AVC, AIS, 5G, vWAAS, Bundle, includes:**	
	ASR1001	1
	SLASR1-AIS	1
	FLS-ASR1001-5G	1
	FLSASR1-AVC	1
ASR1002X-AES-AX	**ASR1002X AX, AVC, AES, vWAAS Bundle, includes:**	
	ASR1002-X	1
	SLASR1-AES	1
	FLSASR1-AVC	1
ASR1002X-AIS-AX	**ASR1002X AX, AVC, AIS, vWAAS Bundle, includes:**	
	ASR1002-X	1
	SLASR1-AES	1
	FLSASR1-AVC	1

Virtual WAAS Ordering Option with ASR AX Bundles

With each of the above ASR bundles in Table 5, Cisco is providing the option to purchase a discounted vWAAS license; these licenses may then be deployed on standalone server, product IDs are as shown in Table 6.

Table 6.　vWAAS Product IDs for Specific ASR AX Configurations Only

Part Number	Product Description
FLASR1-AX-VWAAS12K	License for Virtual WAAS 12000 Connections
FLASR1-AX-VWAAS50K	License for Virtual WAAS 50000 Connections

Promotional Upgrades to Existing ASR to Include AX Features

Cisco is offering promotional upgrades for existing ASRs to include the AX features; the promotion is valid for purchase to 14-April-2014. An existing ASR 1001 or 1002 may be upgraded to include the AX feature set for the ASR, Tables 7 and 8 include product IDs for the promotional upgrades.

Table 7.   Promotional Upgrade for IPBase to Advanced Enterprise Services (AES) or Advanced IP Services (AIS) for AX

Part Number	Product Description
FLASR1-AX-IPB-AES	Cisco ASR 1000 Series IP BASE to ADV ENT SERVICES Upg For AX
FLASR1-AX-IPB-AIS	Cisco ASR 1000 Series IP BASE to ADV IP SERVICES Upg For AX

Table 8.   Promotional Upgrades for ASR to Include AX Features

Part Number	Product Description
SLASR1-1AX-5G-AES=	ASR1001 AX Upg with AVC, AES, 5G Upgrade License
SLASR1-1AX-5G-AIS=	ASR1001 AX Upg with AVC, AIS, 5G Upgrade License
SLASR1-1AX-5G=	ASR1001 AX Upg with AVC and 5G Upgrade License
SLASR1-1AX-AES=	ASR1001 AX Upg with AVC, AES Licenses
SLASR1-1AX-AIS=	ASR1001 AX Upg with AVC, AIS Licenses
SLASR1-2XAX-AES=	ASR1002X AX Upg with AVC, AES Licenses
SLASR1-2XAX-AIS=	ASR1002X AX Upg with AVC, AIS Licenses
SLASR1-2XAX-AVC=	ASR1002X AX Upg with AVC

Virtual WAAS ordering option with Promotional Upgrades

With each of the promotional upgrades in above Table 8 Cisco is providing the option to purchase a discounted vWAAS license, these licenses may then be deployed on standalone server, product IDs for discounted vWAAS are shown in Table 6.

Additional Information

To obtain current information about prices for products in the Cisco Integrated Services Routers Generation 2 (ISR G2) portfolio, please refer to the Cisco price list.

- Cisco Commerce Warehouse Tool:
  http://www.cisco.com/web/partners/events/commerce_workspace.html
- Cisco global price list:
  https://tools.cisco.com/qtc/pricing/MainServlet
- Cisco WAAS Software data sheets:
  http://www.cisco.com/en/US/products/ps6870/products_data_sheets_list.html
- Cisco WAAS Modules for Cisco ISRs data sheets:
  http://www.cisco.com/en/US/products/ps9750/index.html
- Cisco WAAS Express data sheet:
  http://www.cisco.com/en/US/prod/collateral/contnetw/ps5680/ps11211/datasheet_c78-611644.html
- Cisco Technical Services:
  http://www.cisco.com/go/ts

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