Cisco VG420 Analog Voice Gateway

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The Cisco VG420 High-Density Analog Voice Gateway enables an IP telephony solution to continue using traditional analog devices while taking advantage of the productivity afforded by IP infrastructure.

The Cisco® Unified Communications portfolio of voice and IP communications products and applications enables organizations to communicate more effectively, helping them to streamline business processes, reach the right resource the first time, and improve revenue sales and profitability. The Cisco Unified Communications portfolio is a critical part of the Cisco Business Communications Solution, an integrated solution for organizations of all sizes that also includes network infrastructure; security and network management products; wireless connectivity; and a lifecycle services approach, along with flexible deployment and outsourced management options, end-user and partner financing packages, and third-party communications applications.



Figure 1.
Cisco VG420 High-Density Analog Voice Gateway series

The Cisco VG420 High-Density Analog Gateway (Figure 1) is a Cisco IOS-XE Software-based analog phone gateway. It connects analog phones, fax machines, modems, and speakerphones to an enterprise voice system based on Cisco Unified Communications Manager (UCM). The tight integration with the IP-based phone system is advantageous for increased manageability, scalability, and cost-effectiveness. Businesses can also use the Cisco VG420 with Cisco Unified Communications Manager Express to effectively augment an Integrated Services Router (ISR) environment. Either topology environment will support business needs for high concentration of analog voice ports for modem calls, fax calls, and analog supplementary services (Figures 2 and 3).

The Cisco VG420 offers Cisco IOS-XE Software manageability on analog phone lines to enable them to be used as extensions to the Cisco Unified Communications Manager or Cisco Unified Communications Manager Express system. The Cisco VG420 is offered in a 2-Rack Unit (2RU), 19-inch rack-mount chassis form.

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Features and benefits

- Cisco IOS-XE Software-based hardware: The hardware includes uniform Cisco Command-Line Interface (CLI) and Simple Network Management Protocol Version 3 (SNMPv3) support for ease of gateway configuration and operation.
- Robust voice quality: Cisco experience in providing toll-quality packet-voice service helps ensure that the Cisco VG420 provides the clear, robust voice quality end users have come to expect from telephony services.
- Investment protection: Customers can continue to use existing analog phones, fax machines, and modems while taking advantage of IP telephony. Basic analog phone connectivity is needed when the infrastructure (wiring) or application does not support or require IP phones. The Cisco VG420 is the ideal platform to support centralized and highly concentrated analog phone line deployments, allowing organizations to deploy IP telephony without having to purchase IP phones for all users and to continue using existing devices. The Cisco VG420 can also be used in a Cisco Unified Communications Manager Express environment and migrated to Cisco Unified Communications Manager deployment with 100-percent investment protection.
- High availability: The Cisco VG420 has two Gigabit Ethernet ports to enable link redundancy configurations and hence, customers will experience less voice downtime due to WAN link failure.
- Cisco VG420 powered by high-performance multicore Intel x86 SoC processor: In this platform, power redundancy will be available by installing an optional integrated Cisco Redundant Power System (RPS), thereby decreasing network downtime and protecting the network from power-supply failures. Optional DC power supply is also available.
- Reduced barrier to entry: The Cisco VG420 provides a low-cost alternative for low-end analog phones and allows organizations to take advantage of IP telephony with a lower overall IP telephony investment.

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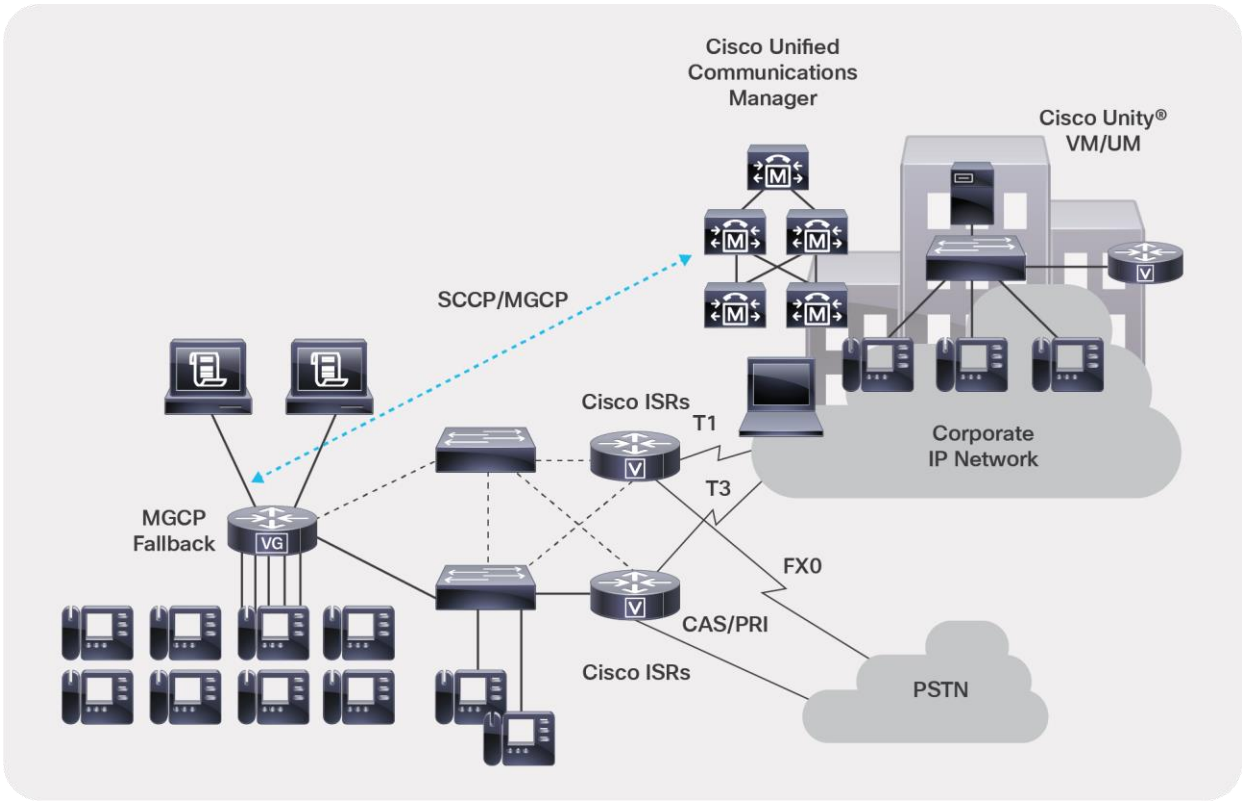


Figure 2.
Cisco VG integration with Cisco Unified Communications Manager

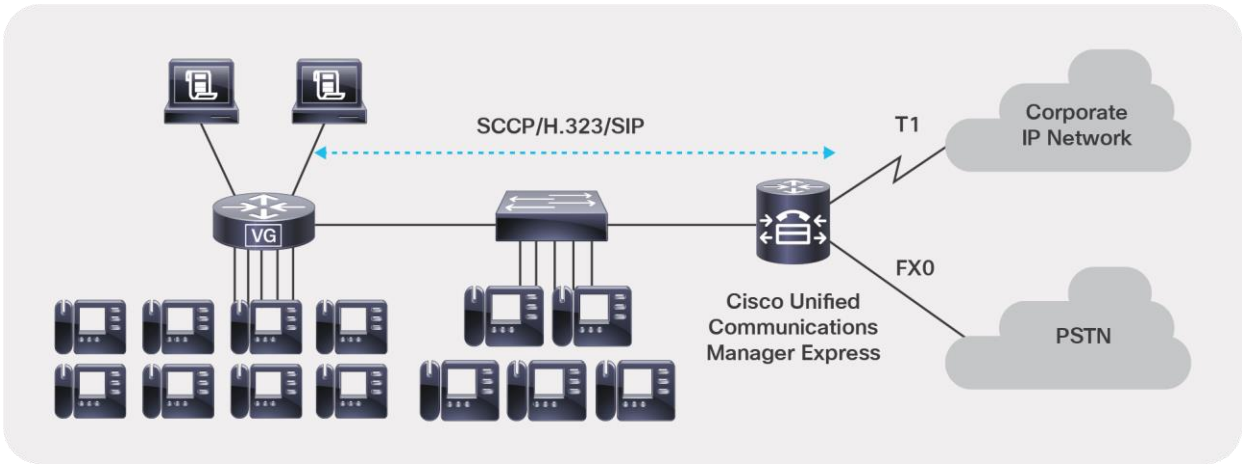


Figure 3.
Cisco VG integration with Cisco Unified Communications Manager Express

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Analog phone connectivity

The Cisco VG420 is ideal for analog phone deployments ranging from centralized to sparsely concentrated or distributed topologies. It provides a high level of availability at locations with Media Gateway Control Protocol (MGCP) Fallback, with ease of manageability using Cisco IOS-XE Software monitoring features. The VG420 offers many supplementary analog calling features depending on the call control and signaling type used. Refer to Table 1 for the supplementary analog calling features available.

Table 1. Analog supplementary features available on analog voice gateways

	Skinny Client Control Protocol (SCCP) features with Cisco Unified Communications Manager	SCCP features with Cisco Unified Communications Manager Express	Session Initiation Protocol (SIP) features with Cisco Unified Communications Manager
Basic call	X	X	X
Call forward all	X	X	
Call forward busy	X	X	
Call forward cancel	X	X	
Call forward no answer	X	X	
Call hold or resume	X	X	X
Call pickup group	X	X	
Call pickup local	X	X	
Call transfer blind	X	X	
Call transfer consultative	X	X	X
Call waiting	X	X	X
Caller ID	X	X	X
Caller ID on call waiting	X	X	X
Malicious caller ID	X		
Conference call	Up to 3 parties	Up to 3 parties	Up to 3 parties
Impromptu conference call	Up to 3 parties	Up to 3 parties	
Meet-me conference call	X	X	
Directed call park		X	
Directed call pickup		X	
Directed call pickup of ringing extension		X	

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	Skinny Client Control Protocol (SCCP) features with Cisco Unified Communications Manager	SCCP features with Cisco Unified Communications Manager Express	Session Initiation Protocol (SIP) features with Cisco Unified Communications Manager
Redial	X	X	
Speed dial	X	X	
Call toggle	X	X	X
Music on Hold (MoH)	X		
Shared-line support*	X		
Shared line - privacy	X		
Precedence and preemption	X		
Call back on busy	X		
DC voltage Visible Message Waiting Indication (VMWI)	X		

*Simultaneous ringing, hold, and resume across analog and IP phones

The Cisco VG420 supports Feature Access Codes (FAC) in conjunction with Cisco Unified Communications Manager and Cisco Unified Communications Manager Express. Refer to Cisco Unified Communications Manager and Cisco Unified Communications Manager Express documentation for details.

Fax and modem connectivity

The Cisco VG420 supports fax machines and modems. When using fax machines, VG420 supports T.38 fax relay and fax pass-through. T.38 fax relay technologies allow transfer of faxes across the network with high reliability using less bandwidth than a voice call. All modems can be connected to the Cisco VG420 and will be transferred over the network using modem pass-through.

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Protocols supported

- SCCP, MGCP, SIP
- Real-Time Transport Protocol (RTP)
- Secure Real-Time Transport Protocol (SRTP)
- Trivial File Transfer Protocol (TFTP)
- HTTP server
- SNMP
- Telnet
- Dynamic Host Configuration Protocol (DHCP)
- Domain Name System (DNS)
- T.38 fax relay, and modem-relay
- Codecs supported: G.711, G.726, G.729A, G.729AB, G.722
- RADIUS and TACACS+ for Telnet and authorization

VG420 model variants

The VG420 comes with three different variants of fixed FXS/FXO port-densities, as shown in Table 2.

Table 2. VG420 Product-ID's

Part number	Number of FXS ports	Built-in FXO failover bypass ports	FXS-E enabled ports	NIM slots
VG420-144FXS	144	0	108	2
VG420-132FXS/6FXO	132	6	108	2
VG420-84FXS/6FXO	84	6	84	2

FXO failover bypass ports

A failover bypass port, also called a failover trunk bypass, provides a way to use designated analog phones on FXS ports to make phone calls through the PSTN in the event of the chassis losing power completely.

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Analog and digital voice Network Interface Module (NIM) support

The VG420 supports all the existing analog and digital voice modules. All three variants of VG420 have two NIM slots.

Table 3 shows all the analog voice NIM modules supported in the NIM slots on the VG420.

Table 3. Analog voice NIM module Product IDs (PIDs) supported on the VG420

Part number	Number of ports	Product description
NIM-2FXO	2	2-port Network Interface Module - FXO (Universal)
NIM-4FXO	4	4-port Network Interface Module - FXO (Universal)
NIM-2FXSP	2	2-Port Network Interface Module - FXS, FXS-E and DID
NIM-4FXSP	4	4-Port Network Interface Module - FXS, FXS-E and DID
NIM-2FXS/4FXOP	6	2-Port FXS/FXS-E/DID and 4-Port FXO Network Interface Module
NIM-4E/M	4	4-Port E/M Network Interface Module
NIM-2BRI-NT/TE	2	2-Port BRI Network Interface Module
NIM-4BRI-NT/TE	4	4-Port BRI Network Interface Module

The digital T1/E1 voice modules contain a Cisco Packet Voice Digital Signal Processor Module 4 (PVDM4) daughter-board module. A PVDM4 on the T1/E1 module is necessary for TDM voice features. The PVDM4 also provides for echo cancellation of up to 128 ms echo-tail length for demanding network conditions. Figure 4 displays all the digital T1/E1 NIM modules supported in the NIM slots of VG420. Table 4 provides the part numbers and descriptions.



Figure 4.
Cisco T1/E1 NIMs compatible with the VG420

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Table 4. Digital voice NIM module support on the VG420

Part number	Number of ports	Product description
NIM-1MFT-T1/E1	1	1-port Multi-flex Trunk Voice/Clear-channel Data T1/E1 Module
NIM-2MFT-T1/E1	2	2-port Multi-flex Trunk Voice/Clear-channel Data T1/E1 Module
NIM-4MFT-T1/E1	4	4-port Multi-flex Trunk Voice/Clear-channel Data T1/E1 Module
NIM-8MFT-T1/E1	8	8-port Multi-flex Trunk Voice/Clear-channel Data T1/E1 Module

Software compatibility

The VG420 does not natively support Cisco Unified Border Element (CUBE), Cisco Unified Call Manager Express (UCME), or Survivable Remote Site Telephony (SRST). Additionally, the VG420 does not support DSP farm capability. These functions are only available in the Cisco 4000 Series Integrated Services Routers (ISR 4000 Series) and Cisco Catalyst® 8300 and 8200 Series Edge Platforms. Table 5 shows the minimum software compatibility of the VG420.

Table 5. Software compatibility

Product category	Compatible versions
Cisco IOS-XE compatibility	Cisco IOS-XE 17.6.1 or later
Cisco Unified Communications Manager	14.0 (SU1), 12.5 (SU4)
Cisco Unified Communications Manager Express	All versions of Cisco UCME compatible with Cisco IOS-XE 17.6.1 or higher
Third-party call control	IP-based trunk: SIP

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VG420 Regulatory compliance and technical specifications

Table 6. Regulatory standards compliance: Safety and EMC

Specification	Description
Safety certifications	• UL 62368-1 • CAN/CSA C22.2 No. 62368-1 • EN 62368-1 • IEC 62368-1 • IEC/EN/UL/CSA 60950-1
Telecom	• TIA/EIA/IS-968 • CS-03 • TBR21 (FXO) • ES 201 970 (FXS) • S002, S003 • Homologation requirements vary by country and interface type. For specific country information, refer to the online approvals database at https://www.ciscofax.com/.
EMC (Emissions)	• 47 CFR, Part 15 • ICES-003 Issue 6 • EN55032 • CISPR32 • CNS 13438 • KS C 9832 • NM EN 55032 • QCVN 118/BTTTT • VCCI-CISPR 32 • EN IEC 61000-3-2 • EN61000-3-3
EMC (Immunity)	• EN 55024 • CISPR 35 • KS C 9835 • NM EN 55024 • TCVN 7317 • EN61000-6-1
EMC (ETSI/EN)	• EN 300 386

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VG420 technical specifications

Table 7 gives the Cisco VG420 technical specifications.

Table 7. Cisco VG420 technical specifications

Category		
System	VG420-144FXS, VG420-132FXS/6FXO, VG420-84FXS/6FXO	
Processor	High-performance Intel X86 SoC multicore processors	
Memory DRAM (default) / (max)	4 GB – DDR4 SDRAM	
Compact Flash (default) / (max)	8 GB fixed	
Ethernet	Two 10/100/1000 RJ45 Ethernet LAN ports	
Console / auxiliary (max)	RJ45 Serial Console and Micro USB console	
Power		
AC input voltage	100 to 240 VAC auto ranging	
AC input current (max)	8.2A – 3.4A	
AC input frequency	50 to 60 Hz	
Maximum power with AC power supply (Watts)	389 W	
Power dissipation (max Watts)	109 W	
Redundant power s supply	Optional integrated Redundant Power Supply (RPS). DC RPS is planned for future release.	
Physical		
Dimensions (H x W x D)	3.50 x 17.25 x 21.0 in (8.89 x 43.81 x 53.34 cm)	
Weight (max)	33.3 lbs. (15.1 Kg) 34.8 lbs. (15.8 Kg)	VG420-84FXS/6FXO VG420-144FXS VG420-132FXS/6FXO
Mounting	2RU, 19 in	

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Category	
Environment	
Operating temperature	32 to 104°F (0 to 40°C)
Non-operating temperature	-40 to 158°F (-40 to 70°C)
Operating humidity	5 to 85%
Noise level (max)	Sound pressure: 48 dBA typical, 68 dBA maximum Sound power: 61 dBA typical, 78 dBA maximum
On premises or off premises	On premises only, restricted access area, permanent ground required, to be installed and serviced only by trained professionals

Homologation

The VG420 is approved for the countries listed in Table 8 for off-premises (FXO) and on-premises (FXS) connections. Approval for other countries is in progress. Refer to the Cisco Telecom Approvals website for approval progress for other countries: https://pas.cisco.com/pdtcnc/#/

Table 8. Telecom approvals

VG420-144FXS	VG420-132FXS/6FXO	VG420-84FXS/6FXO
United States	United States	United States
United Kingdom	United Kingdom	United Kingdom
Canada	Canada	Canada
CE countries[1]	CE countries[1]	CE countries[1]
Australia	Australia	Australia
Japan	Japan	Japan

[1]The CE mark is recognized in the following countries: Austria, Belgium, Bulgaria, Croatia, Cyprus, Czech Republic, Denmark, Estonia, Finland, France, Germany, Gibraltar, Greece, Hungary, Iceland, Ireland, Italy, Latvia, Liechtenstein, Lithuania, Luxembourg, Malta, Monaco, Netherlands, Norway, Poland, Portugal, Romania, Slovakia, Slovenia, Spain, Sweden, Turkey, and Switzerland.

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Ordering information

To order this product, use the information provided in Table 9.

Table 9. Ordering information

Product number	Product description
VG420 system	
VG420-144FXS	Cisco Analog Voice Gateway VG420 - 144FXS
VG420-132FXS/6FXO	Cisco Analog Voice Gateway VG420 - 132FXS/6FXO
VG420-84FXS/6FXO	Cisco Analog Voice Gateway VG420 - 84FXS/6FXO
VG420 power supply	
PWR-VG420-650WAC	Cisco VG420 650W AC Power supply
PWR-VG420-650WAC2	Cisco VG420 650W AC Power supply - Secondary
PWR-VG420-650WAC=	Cisco VG420 650W AC Power supply - SPARE
PWR-VG420-650WDC	Cisco VG420 650W DC Power supply
PWR-VG420-650WDC2	Cisco VG420 650W DC Power supply - Secondary
PWR-VG420-650WDC=	Cisco VG420 650W DC Power supply - SPARE
VG420-FAN-2R	Cisco VG420 Fan Tray, 2RU
VG420-FAN-2R=	Cisco VG420 Fan Tray, 2RU SPARE
VG420 blanks and accessories	
VG420-NIM-BLANK	Cisco VG420 NIM Blank
VG420-NIM-BLANK=	Cisco VG420 NIM Blank Spare
VG420-RM-19-2R	Cisco VG420 Rack mount kit - 19" 2R
VG420-RM-19-2R=	Cisco VG420 Rack mount kit for 2RU - 19" Spare
VG420-RM-23-2R	Cisco VG420 Rack mount kit - 23" 2R
VG420-RM-23-2R=	Cisco VG420 Rack mount kit for 2RU - 23" Spare

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Product number	Product description
VG420 licenses	
SL-VG420-SEC-K9	Unified Communication Security License for Cisco VG420
SL-VG420-SEC-K9=	Unified Communication Security License for Cisco VG420 - SPARE
SL-VG420-UC-K9	Unified Communication License for VG420 Series
FL-VG4XX-CC	Cloud Calling License for Cisco VG4XX series
FL-VG4XX-CC=	Cloud Calling License for Cisco VG4XX series - SPARE

Cisco IOS-XE Software packaging and Smart Licensing

Universal Cisco IOS-XE image

A single Cisco IOS-XE universal image encompassing all functions is delivered with all the Cisco analog voice gateway VG4xx series of platforms. Advanced features can be enabled simply by activating a software license (delivered as a SMART license) on the universal image. All technology package licenses and feature licenses are Right To Use (RTU) and can be enabled through CLI, thus simplifying software delivery and decreasing the operational costs of deploying new features.

All Cisco analog VG4xx series of platforms support the following technology package licenses:

- **Unified communication License (UCK9)** – This is included by default with all Cisco analog voice gateway VG4xx series platforms.
- **Security license (SECK9)** – This is an optional license for enabling all control/data place security features. This license can either be purchased as part of ordering fresh hardware, or as a spare for existing hardware.

Additionally, the VG400 series and VG420 series also support the following feature package license:

- **Cloud Calling License (CC)** – This is an optional license for enabling the VG400/VG420 series with a Webex Calling license. This license can either be purchased as part of ordering fresh hardware, or as a spare for existing hardware. A Cloud Calling license mandatorily requires a SECK9 license to be procured and installed prior to enabling Webex Calling.

Cisco Smart Licensing

All Cisco analog voice gateways in the VG4XX series of platforms are Smart License-only platforms. The Cisco VG420 will only support Smart License Using Policy (SLUP). A Smart Account and a Virtual Account (SA/VA) are mandatory when ordering the Cisco VG420 series platforms.

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Introduction to Smart Licensing

Cisco Smart Licensing is a flexible licensing model that provides you with an easier, faster, and more consistent way to purchase and manage software across the Cisco portfolio and across your organization. And it's secure: you control what users can access. With Smart Licensing you get:

- **Easy activation.** Smart Licensing establishes a pool of software licenses that can be used across the entire organization—no more Product Activation Keys (PAKs).
- **Unified management.** Cisco License Central (CLC) provides a complete view into all your Cisco products and services in an easy-to-use portal, so you always know what you have and what you are using.
- **License flexibility.** Your software is not node-locked to your hardware, so you can easily use and transfer licenses as needed.

To use Smart Licensing, you must first set up a Smart Account on Cisco License Central.

For a more detailed overview on Cisco Licensing, visit the Licensing Hub.

Cisco and Partner Services and support

Services from Cisco and our certified partners can help you transform your network and data center, so you can accelerate business innovation and growth. We have the expertise to create a clear, replicable, optimized footprint across technologies. Planning and design services align technology with your business goals and can increase deployment efficiency. Technical services help you improve operational efficiency, save money, and mitigate risk. Optimization services help you continuously improve performance and succeed with new technologies. For more information, visit https://www.cisco.com/go/services.

Cisco SMARTnet® technical support, as well as Cisco Solution Support and Partner Support Services are just a few of the support options available for the Cisco VG420 Gateway device. All these support contracts include, as a minimum:

- Major Cisco IOS® Software updates for protocol, security, bandwidth, and feature improvements
- Full access rights to Cisco.com technical libraries for technical assistance, electronic commerce, and product information
- Access 24 hours a day to the industry's largest dedicated technical support staff

Warranty information

The VG420 has a 90-day limited hardware warranty. This includes replacement, repair, or refund for 90 days.

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Cisco environmental sustainability

Information about Cisco's environmental sustainability policies and initiatives for our products, solutions, operations, and extended operations or supply chain is provided in the "Environment Sustainability" section of Cisco's Corporate Social Responsibility (CSR) Report.

Reference links to information about key environmental sustainability topics (mentioned in the "Environment Sustainability" section of the CSR Report) are provided in the following table:

Sustainability topic	Reference
Information on product material content laws and regulations	Materials
Information on electronic waste laws and regulations, including products, batteries, and packaging	WEEE compliance

Cisco Capital

Flexible payment solutions to help you achieve your objectives

Cisco Capital makes it easier to get the right technology to achieve your objectives, enable business transformation and help you stay competitive. We can help you reduce the total cost of ownership, conserve capital, and accelerate growth. In more than 100 countries, our flexible payment solutions can help you acquire hardware, software, services and complementary third-party equipment in easy, predictable payments. Learn more.

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