

# Compute Modules for the Cisco 1000 Series Connected Grid Routers

Enable high-performance distributed intelligence for Industrial Internet of Things networks with Cisco® IOx and Cisco 1000 Series Connected Grid Routers.

## Product overview

The Cisco Compute Modules for the Cisco 1000 Series Connected Grid Routers (CGR1000) bring fog computing for distributed intelligence to operational networks for industrial Internet of Things (IoT) markets such as utilities, manufacturing, and smart cities. Distributed intelligence enables IoT applications to scale with the ability to perform functions such as application protocol translation, data filtering, complex event processing logic, and local low-latency control decisions, intrusion detection at the edge of the network, where the sensor data is generated. These ruggedized servers support the Cisco IOx application environment and are built as field-replaceable modules for the CGR1000 Series. (See Figure 1.)

**Figure 1.** Cisco Connected Grid Compute Modules for CGR1000 Series



## Product Summary

The CGR1000 Series Compute Modules use a high-performance, power-efficient AMD 800MHz four-core x86 processor. The modules support two USB2.0 interfaces and an external 10/100/1000Base-T Gigabit Ethernet interface. There are two Cisco compute modules models:

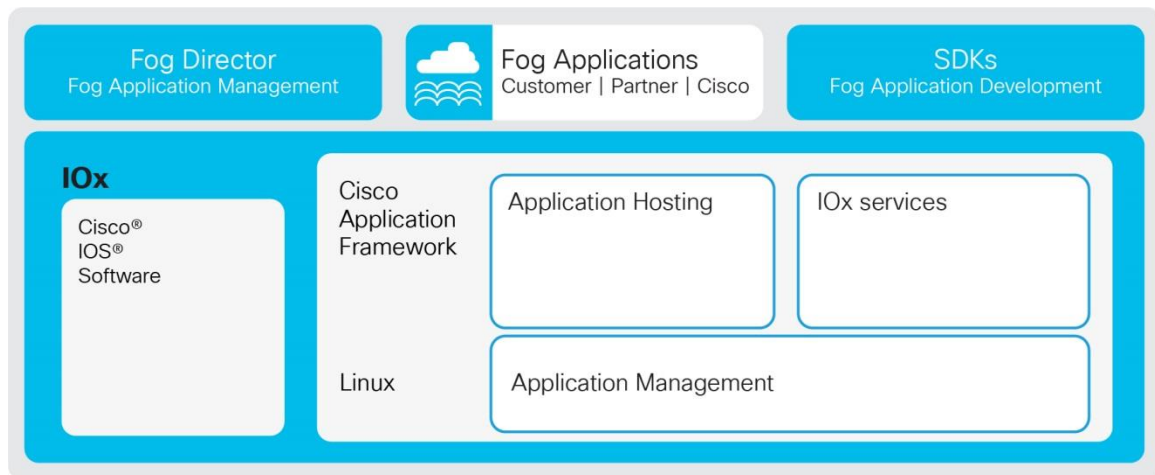
- CGM-SRV-64 with 50 GB bulk storage available with pluggable mSATA drive for IOx and applications
- CGM-SRV-128 with 100 GB bulk storage available with pluggable mSATA drive for IOx and applications

By providing expanded computing and storage resources, the compute modules for CGR1000 series not only support IOx fog computing, they also support VM images (Windows7, Windows10, Ubuntu Linux 14.04LTS minimum, etc) hosting.

## Cisco IOx

The Cisco<sup>®</sup> IOx application environment combines IoT application execution within the fog, secure connectivity with Cisco IOS<sup>®</sup> Software, and powerful services for rapid, reliable integration with Internet of Things (IoT) sensors and the cloud. By bringing application execution capability to the source of IoT data, customers overcome challenges with high volumes of data and the need for automated, near-real time system responsiveness. Cisco IOx offers consistent management and hosting across network infrastructure products, including Cisco routers, switches, and compute modules. Cisco IOx allows application developers to work in the familiar Linux application environment with their choice of languages and programming models with familiar open-source development tools. (See Figure 2 for Major components of Cisco IOx application environment.)

**Figure 2.** Major components of Cisco IOx application environment



## Cisco IOx components

- **Cisco IOx:** Cisco IOx provides uniform and consistent hosting capabilities for fog applications across Cisco IoT network infrastructure. The application environment brings together Cisco IOS Software, the industry-leading networking operating system, and Linux, the leading open-source platform. With Cisco IOx, your developers benefit from familiar processes and open-source tools prevalent with Linux while generating applications that execute on Cisco IoT network infrastructure.
- **Fog Director:** Cisco Fog Director allows administrators to manage, administer, monitor, and troubleshoot fog applications running in the Cisco IOx environment remotely over the network.
- **SDK and development tools:** Cisco IOx SDK is a collection of tools and methodology guidelines to help developers package their applications for execution on IOx-enabled network infrastructure products.

For key benefits of IOx as well as more detail for this platform, please refer IOx datasheet

(<https://www.cisco.com/c/en/us/products/collateral/cloud-systems-management/iox/datasheet-c78-736767.html>).

## Cisco Compute Module Product Details

Table 1 shows the product specifications for CGR1000 Series Compute Modules, plus listing of regulatory compliance and safety data.<sup>1</sup>

**Table 1.** Product specifications for CGR1000 Series Compute Modules

Feature	Description
<b>CPU</b>	<ul style="list-style-type: none"> <li>• AMD GX-410VC four-core 800 MHz</li> </ul>
<b>DRAM</b>	<ul style="list-style-type: none"> <li>• 4 GB</li> </ul>
<b>HDD</b>	<ul style="list-style-type: none"> <li>• mSATA SSD drive (50 GB and 100 GB)</li> </ul>
<b>External interfaces</b>	<ul style="list-style-type: none"> <li>• Two USB 2.0 interfaces</li> <li>• One 10/100/1000Base T Gigabit Ethernet interface</li> </ul>
<b>Form factor</b>	<ul style="list-style-type: none"> <li>• Connected Grid module form factor; single compute module per platform (CGR1240 and CGR1120)</li> </ul>
<b>Dimensions (H x W x D)</b>	<ul style="list-style-type: none"> <li>• 1.50 in. x 3.5 in. x 4.46 in.</li> <li>• 3.81cm x 8.89cm x 11.32cm</li> </ul>
<b>Weight</b>	<ul style="list-style-type: none"> <li>• 0.5 lb</li> </ul>
<b>MTBF</b>	<ul style="list-style-type: none"> <li>• CGM-SRV-64: 826,280 hours</li> <li>• CGM-SRV-128: 722,080 hours</li> </ul>
<b>Power consumption</b>	<ul style="list-style-type: none"> <li>• Typical 6–8 watts and maximum 10 watts</li> </ul>
<b>Operating system support</b>	<ul style="list-style-type: none"> <li>• MontaVista Linux</li> <li>• Ubuntu Linux versions 14.04 minimum as VM</li> <li>• Windows 7 or 10 as VM</li> </ul>
<b>Minimum Cisco IOS Software</b>	<ul style="list-style-type: none"> <li>• 15.6(3)M, refer to IOS release notes for new feature set</li> </ul>
<b>Operating Conditions</b>	
<b>Operating temperature</b>	–40°F to +122°F (–40°C to +50°C)
<b>Shock and vibration</b>	30 G at 11ms Class Cm IEEE 1613 CLASS VS3 IEC 870-2-2 Class Cm
<b>Operating seismic earthquake</b>	IEC 61850-3, Class S3
<b>Altitude</b>	13,000 ft. (4000m) optimum operating temperature is derated with increasing altitude per IEEE1613a-2008
<b>Relative humidity</b>	5 to 95 percent noncondensing
<b>Nonoperating Conditions</b>	
<b>Temperature</b>	–40°F to +185°F (–40°C to +85°C)
<b>Nonoperating relative humidity</b>	5 to 95 percent noncondensing
<b>Altitude</b>	15,000 ft. (4572m)
<b>Nonoperating free-fall drop</b>	4 in. (100mm) per ENG-339611
<b>Nonoperating shock and vibration</b>	50–60 G (3.76 m/s minimum)
<b>Immunity</b>	<ul style="list-style-type: none"> <li>• EN61000-6-2</li> <li>• EN61000-4-2 (ESD)</li> <li>• EN61000-4-3 (RF)</li> <li>• EN61000-4-4 (EFT)</li> <li>• EN61000-4-5 (SURGE)</li> <li>• EN61000-4-6 (CRF)</li> <li>• EN61000-4-11 (VDI)</li> <li>• EN 55024, CISPR 24</li> <li>• EN50082-1</li> </ul>

Feature	Description
<b>Safety</b>	<ul style="list-style-type: none"> <li>• USA: UL 60950-1</li> <li>• Canada: CAN/CSA C22.2 No. 60950-1</li> <li>• Europe: EN 60950-1</li> <li>• China: GB 60950-1</li> <li>• Australia and New Zealand: AS/NZS 60950-1</li> <li>• Rest of world: IEC 60950-1</li> <li>• CSA-certified to UL/CSA 60950-1, 2<sup>nd</sup> Ed.</li> <li>• CB report to IEC60950-1, 2<sup>nd</sup> Ed., covering all group differences and national deviations</li> </ul>
<b>Electromagnetic compliance</b>	<ul style="list-style-type: none"> <li>• 47 CFR, Part 15</li> <li>• ICES-003 Class A</li> <li>• EN55022 Class A</li> <li>• CISPR22 Class A</li> <li>• AS/NZS 3548 Class A</li> <li>• VCCI V-3</li> <li>• CNS 13438</li> <li>• EN 300-386</li> </ul>
<b>Smart Grid</b>	<ul style="list-style-type: none"> <li>• IEC61850-3</li> <li>• IEEE1613</li> </ul>

<sup>1</sup> For more information, consult the Product Approval Database at <https://www.ciscofax.com/> or consult your local Cisco representative (Cisco.com login required).

## Ordering information

These products are available to any Cisco authorized partner. For more information, contact your Cisco representative. Table 2 lists ordering information for CGR1000 Series Compute Modules.

**Table 2.** Ordering information for CGR1000 Series Compute Modules

Item	Specification
<b>CGM-SRV-64</b>	CGR1000 Compute Module with 50 GB bulk storage
<b>CGM-SRV-128</b>	CGR1000 Compute Module with 100 GB bulk storage
<b>IOX-SOFTWARE</b>	IOx and Fog Director software license for CGR1000 Compute Modules (IOX-CGRSRV-CORE)
<b>MEM-CGMSRV-64=</b>	Spare 64 GB mSATA drive (50 GB bulk storage available)
<b>MEM-CGMSRV-128=</b>	Spare 128 GB mSATA drive (100 GB bulk storage available)

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## For more information

To learn more about Cisco Compute Modules for the Cisco 1000 Series Connected Grid Routers, visit <https://www.cisco.com/c/en/us/products/routers/1000-series-connected-grid-routers/relevant-interfaces-and-modules.html>.

Find out more about the Cisco CGR1000 by visiting <https://www.cisco.com/go/cgr1000>.

For more information on the Cisco Field Area Network (FAN) solution, visit <https://www.cisco.com/go/fan>.

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