

# Configure CGM-SRV IOx Module on CGR1xxx

## Contents

[Introduction](#)

[Prerequisites](#)

[Requirements](#)

[Components Used](#)

[Background Information](#)

[Configure](#)

[Network Diagram](#)

[Installation of CGM-SRV Module in CGR1000](#)

[Install Compute Image on CGM-SRV Module](#)

[Configure Interfaces, DHCP and NAT](#)

[Verify](#)

[Troubleshoot](#)

## Introduction

This document describes how to configure the Connected Grid Routers (CGR) 1000-series platform devices for use with an IOx Connected Grid Module (CGM) - System Server (SRV) module.

## Prerequisites

### Requirements

Cisco recommends that you have knowledge of these topics:

- Routing
- Switching
- Network Address Translation (NAT)
- Understand Virtualization concepts

### Components Used

The information in this document is based on these software and hardware versions:

- CGR1120 Runs at least 15.6-3 (CGR1000) -universalk9-bundle.SSA.156-3.M2Free module slotIP address on Gi2/1Secure Shell (SSH) configured
- CGM-SRV-XX module

## Background Information

When you want to run IOx applications or virtual machines on the CGR1000 platform, you can use the CGM-SRV compute module. The CGM-SRV module is actually a small server that contains a multi-core x86 CPU, memory and storage. Both the CGR1120 and CGR1240 can have one of these modules to add IOx capabilities.

There are, at the time you write, two types available as shown in the table:

Stock Keep Unit (SKU)	Solid State Drives (SSD)	RAM	CPU
CGM-SRV-64	64GB (50GB usable)	4GB	4 core 800Mhz
CGM-SRV-128	128GB (100GB usable)	4GB	4 core 800Mhz

Each module also has two USB ports for storage and its own external gigabit Ethernet interface.

As with any other IOx-capable device, the module can host different types of IOx applications but due to the larger capacity of the CGM-SRV module, it can also run a fully configured Windows or standard Linux distro (for example Ubuntu or CentOS) as shown in the image.



## Configure

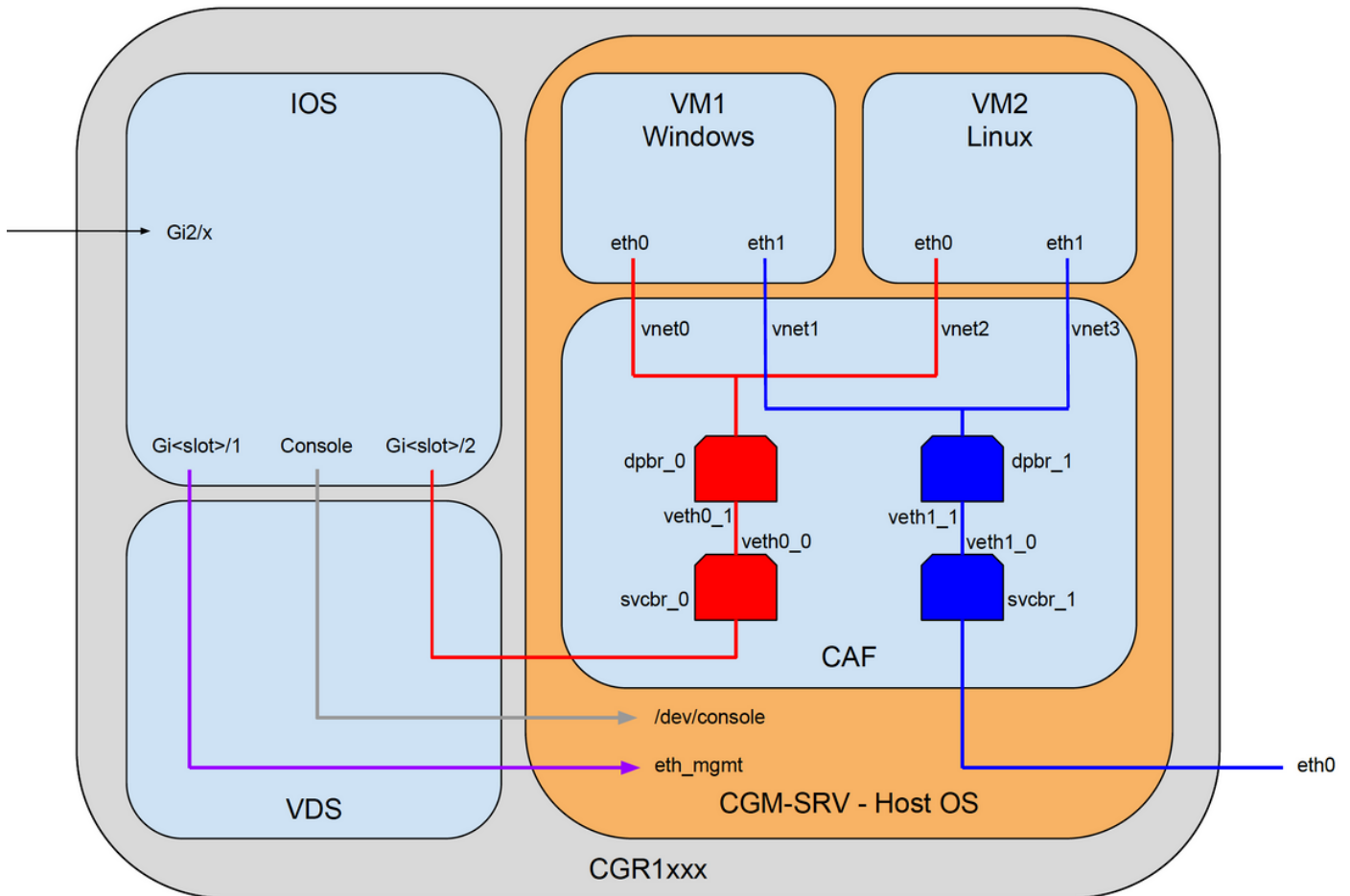
### Network Diagram

The CGM-SRV module has three network interface, two internal interfaces towards Cisco IOS ® and one external for a dedicated connection to the guests which runs on the CGM-SRV module.

The interfaces used are as shown in the table:

Name	Location	Connects to	Remark
Gi<slot>/1	internal to Cisco IOS ®	CGM-SRV host OS (which runs Cisco Application-Hosting Framework (CAF))	eth_mgmt interface host OS
Gi<slot>/2	internal to Cisco IOS ®	CGM-SRV guest VMs (IOx apps)	svcbr_0 on host C
eth0	external on module	CGM-SRV guest VMs (IOx apps)	dpbr_0 svcbr_1 on host C dpbr_1

A diagram of how everything is interconnected is as shown in the image:



## Installation of CGM-SRV Module in CGR1000

In order to configure the CGM-SRV on CGR1000, you need to start with the insertion of the module in the CGR1120. This can be done without the need to take the device offline as follows:

Step 1. Shut down the module port in which you want to install the CGM-SRV module:

```
KJK_CGR1120_20#conf t
Enter configuration commands, one per line. End with CNTL/Z.
KJK_CGR1120_20(config)#hw-module poweroff 4
```

Step 2. You can physically insert the module in slot 4. Once the module has been inserted, you can power the module slot back on:

```
KJK_CGR1120_20(config)#no hw-module poweroff 4
```

Step 3. Let's check if the module is recognized as you expect it to be:

```
KJK_CGR1120_20#sh module 4
```

```

Mod  Ports  Module-Type                Model                Status
---  -
4    1      CGR1000 Server Module 64GB Disk  CGM-SRV-64         ok

Mod  Hw      Serial-Num                Last reload reason
---  -
4    1.0    FOCXXXXXXXXX

```

As you can see in the output here, the module is recognized and ready in slot 4. You are now ready to start to configure everything.

## Install Compute Image on CGM-SRV Module

The next step is to load the host Operating System (OS) image on the module. The image for this can be downloaded from:

<https://software.cisco.com/download/release.html?mdfid=284174271&softwareid=286312260>

After you download the image from Cisco Connection Online (CCO), upload/download it to the CGR1000:

```

KJK_CGR1120_20#copy scp://jedepuyd@10.X.X.X/cgr1000-compute-1.2.5.1.SPA flash:
Destination filename [cgr1000-compute-1.2.5.1.SPA]?
Password:
Sending file modes: C0644 69765564 cgr1000-compute-1.2.5.1.SPA
...
69765564 bytes copied in 1367.560 secs (51015 bytes/sec)

```

Once the image is available on the CGR1000, you can install it on the CGM-SRV module:

```

KJK_CGR1120_20#server-module 4 install flash:cgr1000-compute-1.2.5.1.SPA
Operation requires module reload, do you want to continue? [yes]: yes
Installing image: /cgr1000-compute-1.2.5.1.SPA ..... Done!

```

## Configure Interfaces, DHCP and NAT

As mentioned before, you have two internal interface on Cisco IOS ® that connect with CGM-SRV. Since you inserted the module in slot 4, these interfaces are named: Gi4/1 and Gi4/2. The IP addresses on these interfaces, when you use NAT, are only used internally.

Configure Gi4/1, for the connection between Cisco IOS ® and the host OS which runs in CGM-SRV:

```

KJK_CGR1120_20#conf t
Enter configuration commands, one per line. End with CNTL/Z.
KJK_CGR1120_20(config)#int gi4/1
KJK_CGR1120_20(config-if)#ip addr 192.168.100.1 255.255.255.0
KJK_CGR1120_20(config-if)#ip nat inside
KJK_CGR1120_20(config-if)#ip virtual-reassembly in
KJK_CGR1120_20(config-if)#duplex auto
KJK_CGR1120_20(config-if)#speed auto
KJK_CGR1120_20(config-if)#ipv6 enable
KJK_CGR1120_20(config-if)#no shut
KJK_CGR1120_20(config-if)#exit

```

Configure Gi4/2; for the connection between Cisco IOS ® and the guests which runs on CGM-SRV:

```

KJK_CGR1120_20#conf t
Enter configuration commands, one per line. End with CNTL/Z.
KJK_CGR1120_20(config)#int gi4/2
KJK_CGR1120_20(config-if)#ip addr 192.168.101.1 255.255.255.0

```

```
KJK_CGR1120_20(config-if)#ip nat inside
KJK_CGR1120_20(config-if)#ip virtual-reassembly in
KJK_CGR1120_20(config-if)#duplex auto
KJK_CGR1120_20(config-if)#speed auto
KJK_CGR1120_20(config-if)#ipv6 enable
KJK_CGR1120_20(config-if)#no shut
KJK_CGR1120_20(config-if)#exit
```

Configure the interface on Cisco IOS ® side that gives you the access to the CGR1000 as NAT outside:

```
KJK_CGR1120_20(config)#int gi2/1
KJK_CGR1120_20(config-if)#ip nat outside
```

Set up DHCP for the host OS and guests:

```
KJK_CGR1120_20#conf t
Enter configuration commands, one per line. End with CNTL/Z.
KJK_CGR1120_20(config)#ip dhcp pool iox_host_pool
KJK_CGR1120_20(dhcp-config)#network 192.168.100.0 255.255.255.0
KJK_CGR1120_20(dhcp-config)#default-router 192.168.100.1
KJK_CGR1120_20(dhcp-config)#lease infinite
KJK_CGR1120_20(dhcp-config)#exit
KJK_CGR1120_20(config)#ip dhcp pool iox_guest_pool
KJK_CGR1120_20(dhcp-config)#network 192.168.101.1 255.255.255.0
KJK_CGR1120_20(dhcp-config)#default-router 192.168.101.1
KJK_CGR1120_20(dhcp-config)#lease infinite
KJK_CGR1120_20(dhcp-config)#exit
```

After you enable DHCP, you need to ensure that the host OS on the CGM-SRV module picks up an IP. At this stage, the easiest is to restart the module:

```
KJK_CGR1120_20#conf t
Enter configuration commands, one per line. End with CNTL/Z.
KJK_CGR1120_20(config)#ip dhcp pool iox_host_pool
KJK_CGR1120_20(dhcp-config)#network 192.168.100.0 255.255.255.0
KJK_CGR1120_20(dhcp-config)#default-router 192.168.100.1
KJK_CGR1120_20(dhcp-config)#lease infinite
KJK_CGR1120_20(dhcp-config)#exit
KJK_CGR1120_20(config)#ip dhcp pool iox_guest_pool
KJK_CGR1120_20(dhcp-config)#network 192.168.101.1 255.255.255.0
KJK_CGR1120_20(dhcp-config)#default-router 192.168.101.1
KJK_CGR1120_20(dhcp-config)#lease infinite
KJK_CGR1120_20(dhcp-config)#exit
```

Once the module is back online, you can check which IP address has been given to it:

```
KJK_CGR1120_20#conf t
Enter configuration commands, one per line. End with CNTL/Z.
KJK_CGR1120_20(config)#ip dhcp pool iox_host_pool
KJK_CGR1120_20(dhcp-config)#network 192.168.100.0 255.255.255.0
KJK_CGR1120_20(dhcp-config)#default-router 192.168.100.1
KJK_CGR1120_20(dhcp-config)#lease infinite
KJK_CGR1120_20(dhcp-config)#exit
KJK_CGR1120_20(config)#ip dhcp pool iox_guest_pool
KJK_CGR1120_20(dhcp-config)#network 192.168.101.1 255.255.255.0
KJK_CGR1120_20(dhcp-config)#default-router 192.168.101.1
KJK_CGR1120_20(dhcp-config)#lease infinite
KJK_CGR1120_20(dhcp-config)#exit
```

Next configuration step is to finish the rest of the NAT configuration and forward these ports to the IP of the host OS on the module:

- 2222 -> 22 -> on the module: SSH access to the host OS
- 8443 -> CAF (Local Manager and IOxclient API access)

- 5900 -> VNC (access to the GUI for Windows VM)

```
KJK_CGR1120_20#conf t
Enter configuration commands, one per line.  End with CNTL/Z.
KJK_CGR1120_20(config)#ip access-list standard IOX_NAT
KJK_CGR1120_20(config-std-nacl)#permit 192.168.0.0 0.0.255.255
KJK_CGR1120_20(config-std-nacl)#exit
KJK_CGR1120_20(config)#ip nat inside source list IOX_NAT interface Gi2/1 overload
KJK_CGR1120_20(config)#ip nat inside source static tcp 192.168.100.3 8443 interface Gi2/1 8443
KJK_CGR1120_20(config)#ip nat inside source static tcp 192.168.100.3 22 interface Gi2/1 2222
KJK_CGR1120_20(config)#ip nat inside source static tcp 192.168.100.3 5900 interface Gi2/1 5900
```

One last step is required in order to be able to access Local Manager and the host OS console.

Add a user with privilege 15:

```
KJK_CGR1120_20#conf t
Enter configuration commands, one per line.  End with CNTL/Z.
KJK_CGR1120_20(config)#username admin privilege 14 password cisco
```

At this point, the configuration is complete and you should be able to verify and use the CGM-SRV module for IOx.

## Verify

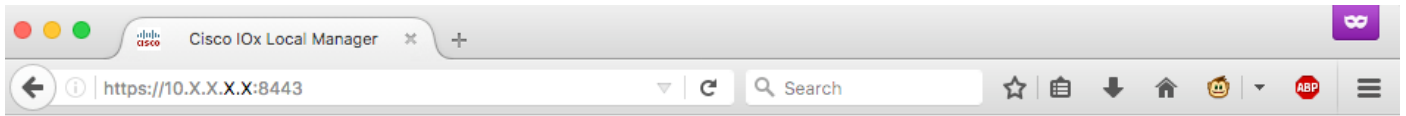
Use this section in order to confirm that your configuration works properly.

From Cisco IOS®, you can verify if IOx is configured correctly with these command:

```
KJK_CGR1120_20#conf t
Enter configuration commands, one per line.  End with CNTL/Z.
KJK_CGR1120_20(config)#username admin privilege 14 password cisco
```

Another way to verify if the above configuration is successful, is to connect with your browser to Local Manager. Since you configured NAT, Local Manager must be accessible on <https://<outside IP of CGR1000>:8443> .

If all went well, you should be able to see the Local Manager login prompt as shown in the image:



Here you can log in with the privilege 15 user which you created earlier and access Local Manager as shown in the image:

The screenshot displays the Cisco IOx Local Manager web interface. The top navigation bar includes 'Applications', 'Cartridges', 'System Info' (selected), 'System Setting', and 'Middleware Service'. The main content area is divided into several sections:

- Host Info:** Host name: KJK\_CGR1120\_20, Uptime: 0 Day(s) and 02:12:19, System time: 03/25/2017 21:12:01 UTC(UTC-0:00:00), Software ver: 1.2.3.0, System ID: FOC.
- CPU & Processes:** @ 0 MHz, 1 Cores; (Family: 0, Model: 0, Stepping: 0). Utilization: System: 0.2%, User: 0.2%, I/O Wait: 0.0%, Idle: 99.6%. Load Average: 1 min: 0.00, 5 min: 0.00, 15 min: 0.00. Processes: Total: 102, Stopped: 0, Zombie: 0.
- Memory:** RAM: 3.8 GB (Used: 94.4 MB, Free: 3.7 GB), SWAP: 4.0 GB (Used: 0).
- Storage:** Table showing device, mount point, size, file system, and space usage.
- Serial Interfaces:** Table with columns for Device Name, Device Id, Port, Available, and Used by.
- IP v4 Routing:** Table with columns for Dest, G/W, Mask, Flags, Metric, and Int.
- DNS and NTP Settings:** Fields for Domain, Name Servers, and NTP Servers.
- Logs:** Logging Management section with a table of log files (Log name, Timestamp, Log Size, View).
- TechSupport Information:** Sections for Tech Support snapshot file name and Core file name, each with a Refresh List button.

## Troubleshoot

This section provides information you can use in order to troubleshoot your configuration.

In order to troubleshoot CAF and/or the host os which runs on the CGM-SRV module, you can access the console with the use of these command:

You can login to the host OS with the use of the credentials of the privilege 15 user created on Cisco IOS ® earlier:

```
KJK_CGR1120_20#server-module 4 console
Escape sequence: ctrl-shift-^ x, then disconnect command

MontaVista Carrier Grade Express Linux 2.0.0 CGM-SRV-64-4 /dev/console

CGM-SRV-64-4 login: admin
Cisco IOS @ user password:
CGM-SRV-64-4:~#
```

In order to check the status of CAF and Local Manager:

```
KJK_CGR1120_20#server-module 4 console
Escape sequence: ctrl-shift-^ x, then disconnect command
```



MontaVista Carrier Grade Express Linux 2.0.0 CGM-SRV-64-4 /dev/console

CGM-SRV-64-4 login: **admin**

Cisco IOS ® user password:

CGM-SRV-64-4:~#

The log for CAF can be found in **/var/log/caf.log**.