Cisco Intelligent Node Manager 1.0.0 User Guide

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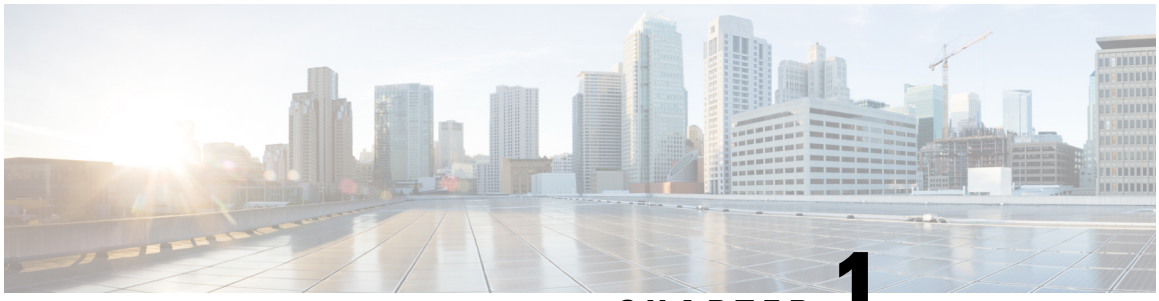


CHAPTER 1

Information about Cisco iNode Manager

This document provides information on the Cisco Intelligent Node (iNode) Manager and how to install and use the application.

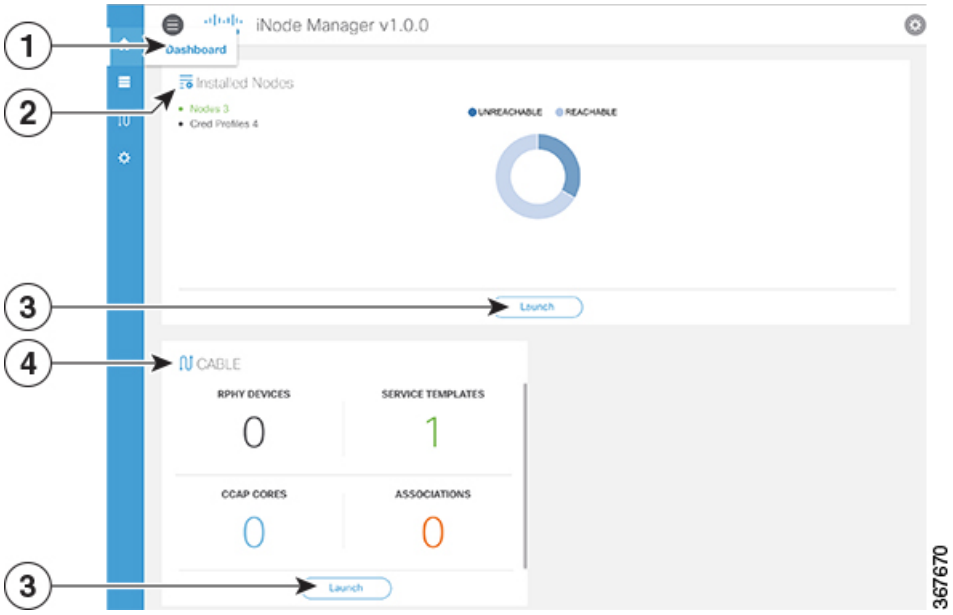
Overview

The Intelligent Node Manager (iNode Manager) allows you to remotely manage one or more Intelligent Nodes (iNodes) running version 2.0 or later. The iNode Manager is similar to the Local Control Software (LCS) with the Intelligent Node application (iNode App).

For information on Intelligent Nodes, refer the iNode documentation. The following table lists the major differences between an iNode Manager and an iNode App:

Managing iNodes	iNode Manager	iNode Mobile App (LCS)
Platform	Server or VM	Smart phone or Tablet
Location	Remote	Local (using USB cable)
Number of nodes	Multiple	One at a time

Dashboard

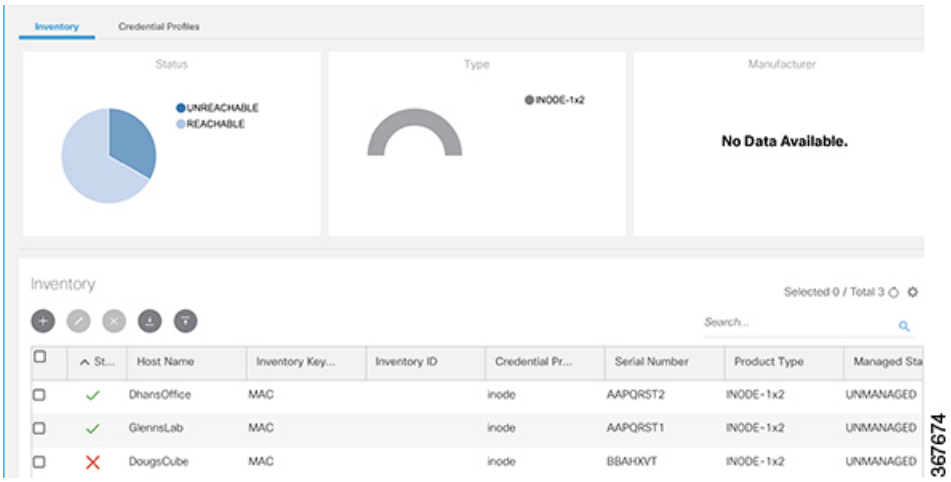


Following are the field descriptions:

Callout #	Name	Description
1	Dashboard	Snapshot view of all devices managed and monitored by the Cisco iNode Manager application.
2	Installed Nodes	Not applicable in this release.
3	Launch	Takes you to the iNode Manager page.
4	Cable	Not applicable in this release.

Inventory

Inventory has two tabs; Inventory and Credential Profiles.



Inventory

The Inventory tab enables you to organize and update information about the Intelligent Nodes.

Following are the field descriptions for Inventory:

Name	Description
Status	Shows a graphical pie chart of all devices in the network, categorized by status: • Reachable • Unreachable
Type	Shows a graphical chart of all iNodes in the network.
Manufacturer	Shows a graphical chart of all iNodes in the network.
	Not applicable to iNode Manager.
	Edits device information.
	Deletes a device from the inventory.
	Exports device information to a CSV file.
	Not supported.
	Sets the columns in the device table.
Search	Allows you to search for and filter the network devices.

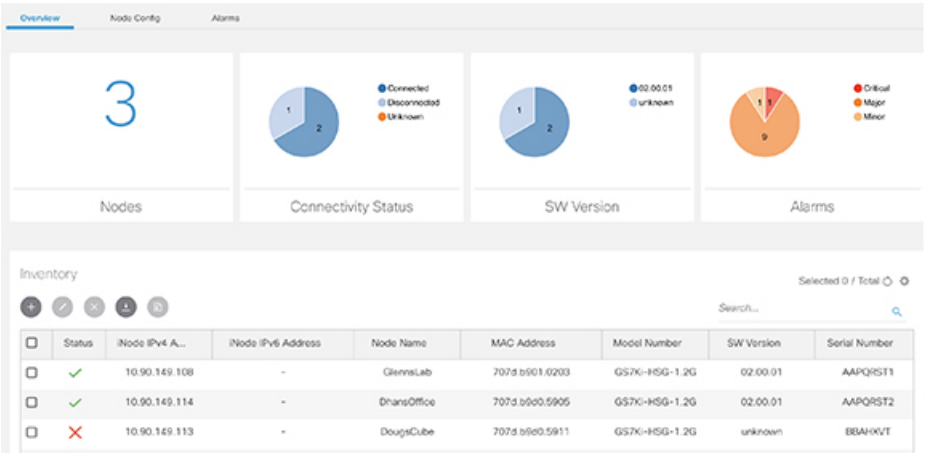
Name	Description
Devices table	Allows you to search and filter the iNodes.

iNode Manager

The iNode Manager page enables you to add, organize, and update information about the iNodes in the network.

The iNode Manager page has three tabs; Overview, Node Config, and Alarms.

Overview



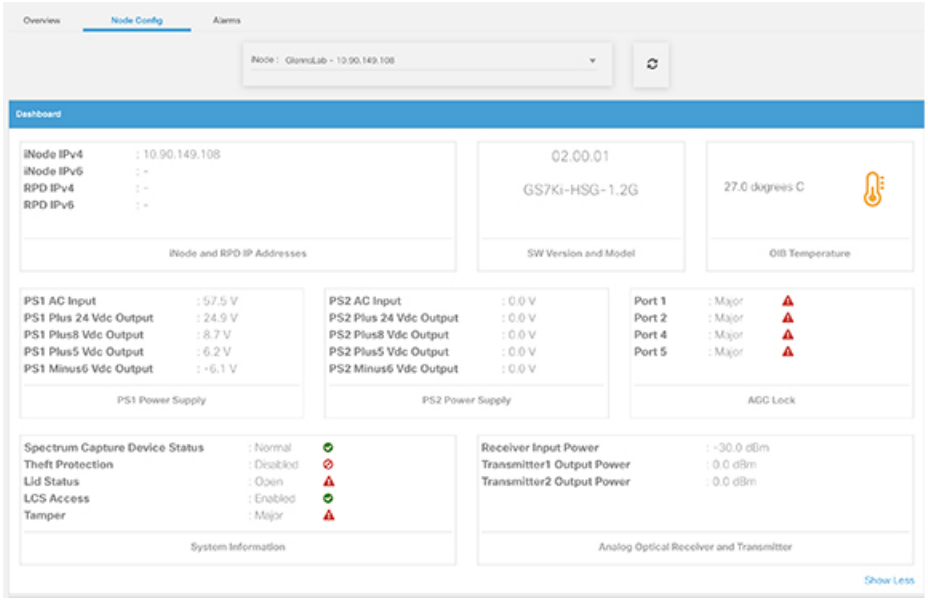
This page provides a view of the number of iNodes, their connectivity status, the version of the software running on the iNodes, and the number and type of alarms raised on these iNodes. The page also provides a dashboard view of the iNodes and their statuses.

To add an iNode, click the  , enter the IP address of the iNode, and click the **Save** button.

Node Config

Node Config page shows you the configuration details of each iNode managed by the iNode Manager application. It has three sections:

Dashboard

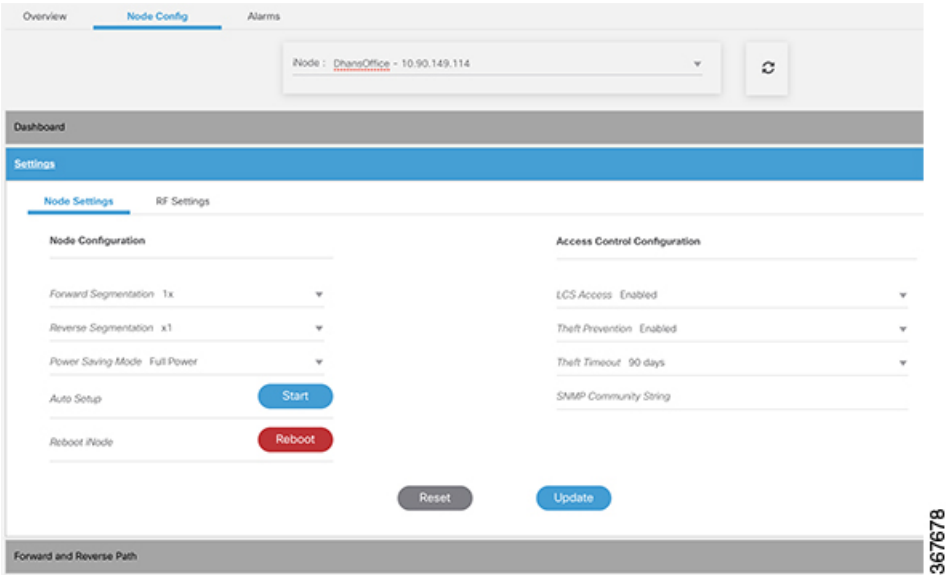


Providesthefollowing details:

Parameter	Description
iNode and RPD IP Addresses	IPv4 and IPv6 addresses of the iNode and the connected RPD.
SW Version and Model	Software version running on the iNode and the model number of the iNode.
OIB Temperature	I/O board temperature
Power Supply	Provides details of the input and output power.
AGC Lock	Details of the AGC lock on each port.
System Information	Provides information such as the following: • Spectrum Capture Device Status • Theft Protection • Lid Status • LCS Access • Tamper
Analog Optical Receiver and Transmitter	Input and output power of the receiver and the transmitters.

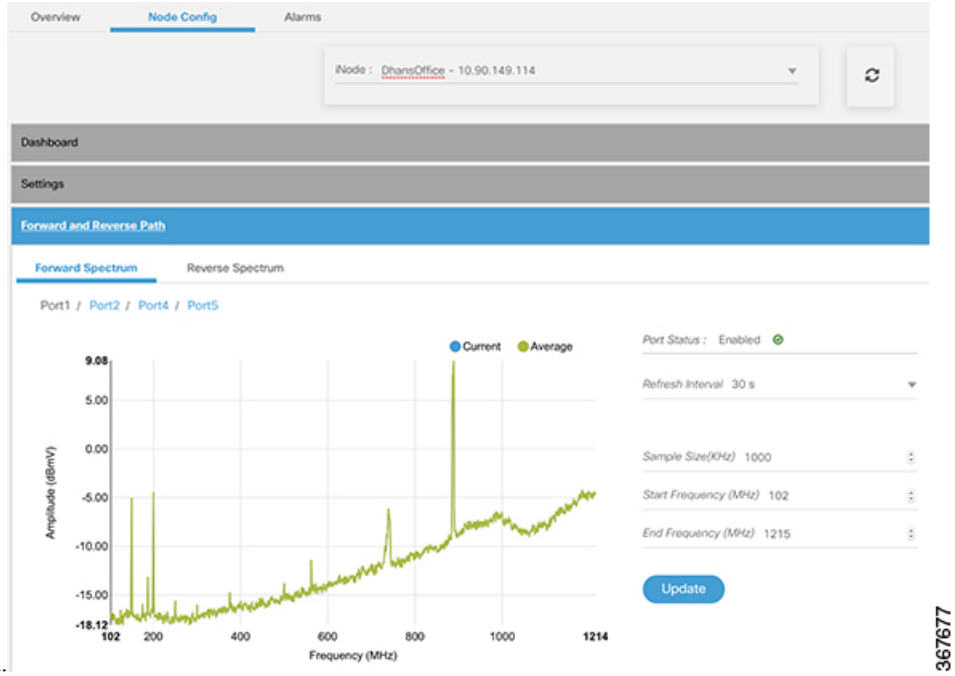
Settings

You can configure the iNode and access control parameters through this page.



Forward and Reverse Path

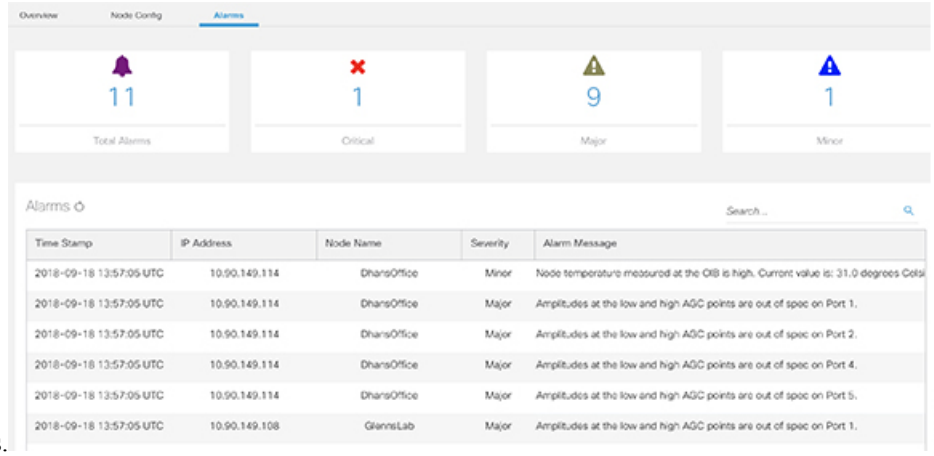
Allows you to configure spectrum analysis on a per port basis. This page also provides the analysis using graphs for forward spectrum and reverse spectrum.

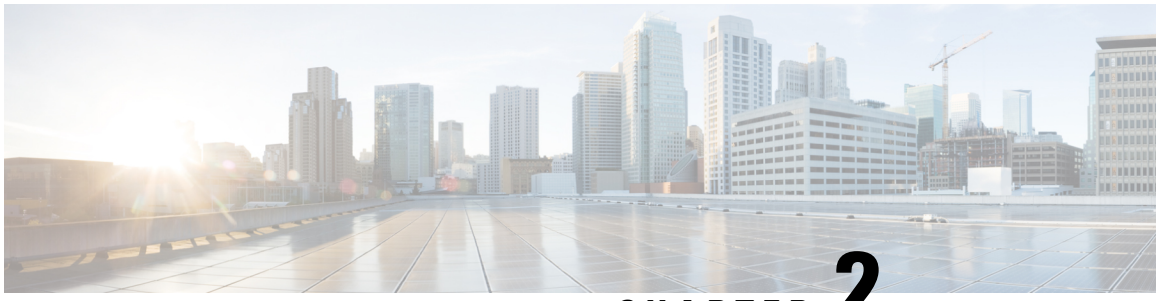


For more details, refer the iNode documentation.

Alarms

Provides the total number of alarms raised on the iNode including the type of alarms.





CHAPTER 2

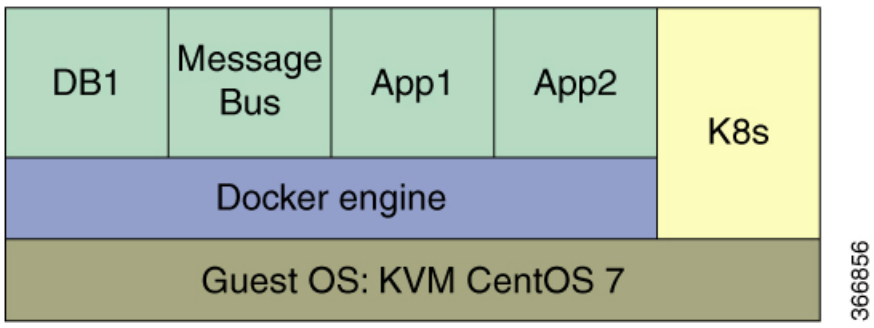
How to Install Cisco iNode Manager

This section describes how to install the Cisco iNode Manager application:

Installation Overview

The Cisco iNode Manager application is based on the next generation architecture that includes Kubernetes and Docker containers. It includes a platform that is extensible and scalable.

The Cisco iNode Manager installer is a self-contained package. The Cisco iNode Manager application installation includes a KVM-based guest OS running CentOS7 that runs Docker images orchestrated by Kubernetes.



The Cisco iNode Manager application is supported on both bare metal server with a CentOS 7 OS and VMware ESXi virtual machine (VM) with VM-in-VM configuration.

Note

- If you are using a VM, you must enable the HW virtualization.
- You must have access to the Internet for installing the Cisco iNode Manager application. If necessary, use a proxy server.

System Requirements

Note The iNode Manager requires the iNode software version to be at 2.0 or later.

Table 1: System Requirements for Cisco iNode Manager Application

Requirement	Description
Operating system	CentOS Linux 7 (core; English distributions only)
CPE OS name	cpe:/o:centos:centos:7
Kernel	Linux 3.10.0-514.6.1.el7.x86_64
Architecture	x86-64
Host version	The Cisco Crosswork Network Automation VM runs on a CentOS 7.2 host Ubuntu 14.04 LTS is also supported Nested virtualization is not supported
Memory	64 GB
Swap space	4 GB
Disk space	600 GB
CPU	4 cores (16 CPUs)
Interface	Two physical interfaces: • One interface for management traffic • One interface for data traffic
Processor speed	2.10 GHz or higher
L1 cache	32 K
L2 cache	256 K
L3 cache	30720 K

Open Ports for Cisco iNode Manager

The following table lists the open ports that Cisco iNode Manager application uses to listen for connection requests from devices. For security hardening, this table also specifies whether it is safe to disable the port without any adverse effects to the product.

Disbale the ports that are not needed and are not secure.

Table 2: Open Ports for Cisco iNode Manager

Port	Protocol	Usage	Safe to Disable?	Procedure to Disable
22	TCP	To initiate SSH connections with the server, and to copy files to the Cisco iNode Manager server using SCP or SFTP.	Depends	This might be still needed by older managed devices that only supports TFTP and not SFTP or SCP.
30604	TCP	For browser access to the Cisco iNode Manager server via HTTPS.	No	-
30629	TCP	To allow iNodes to register with iNode Manager.	No	-
8514	UDP	To receive syslog messages from network devices.	No	-
8190	TCP	To receive GCP messages from the RPD	No	-

Install the OS

Procedure

Step 1 Install Linux, such as CentOS7 on the host system or the VM.

Step 2 Log in as `root` and add a user.

```
adduser inadmin
passwd inadmin
```

Step 3 Make sure that the user is a member of the group which has the privilege to use the `sudo` command.

```
usermod -G wheel inadmin
```

Configure Network

If the system is not already configured on the network, configure the system using the following procedure.

Procedure

Step 1 Set up a static IP address on CentOS7 by using the `nmtui` command.

```
nmtui
```

Step 2 Do the following using the text-based menu system.

a) Edit a connection.
b) Change the IP address from `Automatic` to `Manual`.
c) Set the static IP addresses and Gateway according to your network.
d) Set a DNS according to your network.
e) Set the interface to automatically connect by checking the box.
f) To quit `nmtui` interface, use `OK`, `Back`, and `Quit` as needed after saving the changes.

Step 3 Reboot the system and log back in as `inadmin` to verify that the network is up.

```
reboot
```

Log in as `inadmin` rather than `root`.

Install Additional Linux Packages

Install the following additional packages using the following commands. You must have network connectivity to install these packages.

```
sudo yum install -y wget
sudo yum install -y sshpass
sudo yum clean all
```

Ping a website and verify the network connectivity.

Snapshot of Virtual Machine

Note If you are installing the application on a bare metal server, ignore this section.

If you are using a VM, power off and create a snapshot.

```
sudo poweroff
```

Use the virtualization software to take a snapshot and then power the VM back on.

Install Cisco iNode Manager

Procedure

Step 1 Download the Cisco iNode Manager release image tarball (which is about 30 GB) from Cisco Software Central.

Step 2 Unzip and untar the file into a sub directory:

```
mkdir inodemanager
tar -xvf inodemanager-v1.0.0.180911150500-k8s.tar -C inodemanager
```

Step 3 Run the installer.

```
./install.sh inodemanager
```

The installation may prompt you to enter the `sudo` password twice. At the end of the installation, the script prompts you to set the password for the `inodemanager` instance. Note the password you set here.

Note You must watch the installation and provide the `sudo` password the second time before it times out. Or the installation might fail.

The installer automatically adds a DNS entry in `/etc/hosts` to identify the new VM.

Step 4 Add routes to the VM for both management and CIN network if applicable. Then, run the `iptables.sh` and `ip6tables.sh` scripts individually for the management and CIN network as applicable.

```
./iptables.sh <HostOS_IP> <GuestOS_IP>
./ip6tables.sh  <HOST_IPv6_ADDRESS>  <GuestOS_IPv6_ADDRESS>
```

Note The IP address of the VM is displayed during the install process. To get the MAC and IP address of the VM, do the following:

MAC Address:

```
sudo virsh domiflist vmname | grep robot-br1
```

IP Address:

```
sudo virsh net-dhcp-leases robot-br1 | grep MAC
```

Access iNode Manager

Access the iNode Manager Web UI using the following URL, where the IP address is the address of the host machine or VM.

```
https://<host_machine>:30604
```

You may have to accept the validity of the system's certificate. The default login credentials are the following:

- Username: `admin`
- Password: `admin`

How to Uninstall the Cisco iNode Manager

Note Be aware that this procedure removes all of your Cisco iNode Manager data.

Procedure

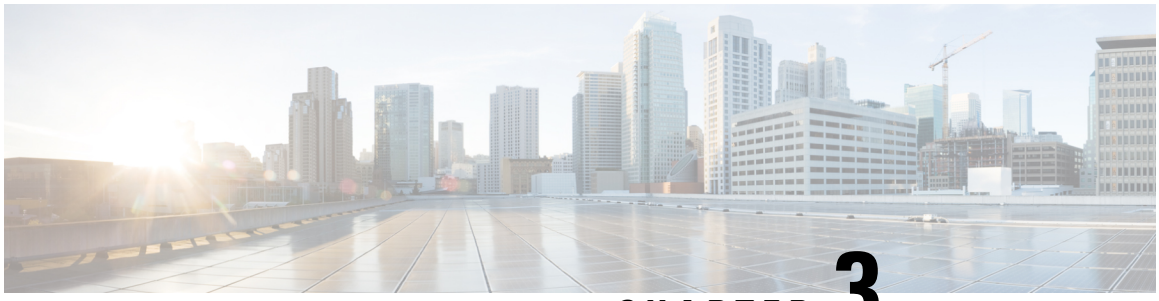
Step 1 (Recommended) Back up your current data. Uninstalling the Cisco iNode Manager application will permanently delete all data on the bare metal server.

Step 2 On the bare metal server, enter the following commands to remove the VM:

```
sudo virsh destroy VM_name
sudo virsh undefine VM_name
```

Step 3 To remove the VM network, enter the following commands:

```
sudo virsh destroy VM_name
sudo virsh undefine VM_name
```



CHAPTER 3

How to Use Cisco iNode Manager

This section describes how to use the Cisco iNode Manager application:

Log In using a Browser

Procedure

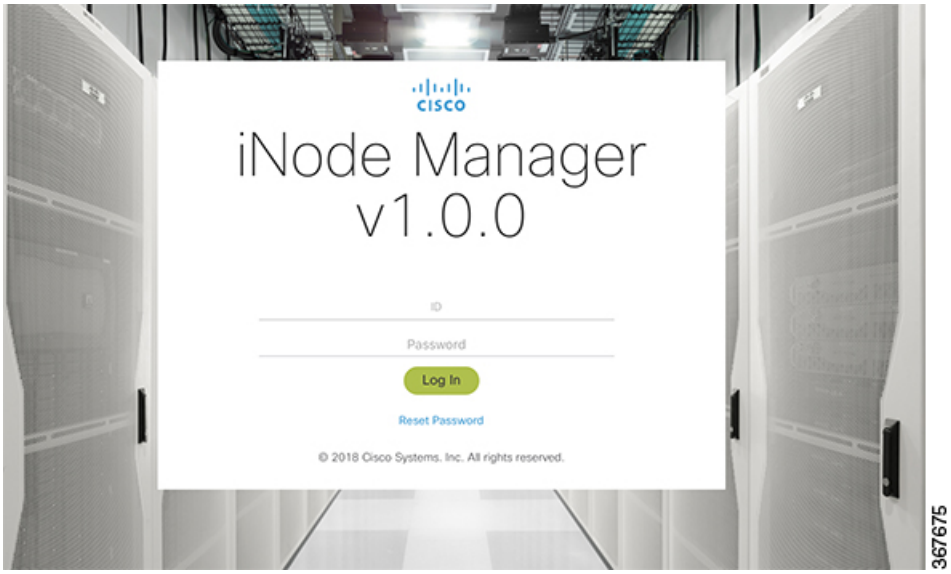
Step 1 Make sure that the `iptables.sh` script has been executed for the management interface.

Step 2 Launch one of the supported browsers (see Supported Web Browsers).

Step 3 In the browser's address bar, enter **https://***server_name***:30604**.

The Cisco iNode Manager web GUI displays the Login window. When you access Cisco iNode Manager for the first time, some browsers display a warning that the site is untrusted. When this happens, follow the prompts to add a security exception and download the self-signed certificate from the Cisco iNode Manager server. After you do this, the browser accepts the Cisco iNode Manager server as a trusted site in all future login attempts.

Figure 1: Login



Step 4 Enter the web GUI username and password as specified when you installed the server, then click Log In.

The default username is **admin** and password is **admin**.

Step 5 To exit the web GUI, close the browser window or click the **Settings** icon in the top right of the Cisco iNode Manager home page and choose Log out.

Exiting a Cisco iNode Manager web GUI session does not shut down Cisco iNode Manager on the server.

If a system administrator stops the Cisco iNode Manager server during your Cisco iNode Manager session, your session ends. Your session does not reassociate to Cisco iNode Manager when the server restarts; you must start a new Cisco iNode Manager session.

Note For details of the DHCP server options, see the iNode documentation.

How to Delete a Device from the Inventory

Procedure

Step 1 Choose **Inventory** > **Inventory**.

Step 2 (Optional) In the **Inventory** section, filter the device list by entering text in **Search** or filtering specific columns.

Step 3 Check the check boxes for the devices you want to delete.

Step 4 Click **Delete**.

Step 5 In the confirmation dialog box, click **Delete**.

Export Device Information to a CSV File

When you export the device list to a file, all device information is exported into a CSV file. The exported file includes device credentials, but does not include credential profiles.

Caution The CSV file lists all of the credentials for the exported devices. Handle the CSV file with care. Ensure that only users with special privileges can perform a device export.

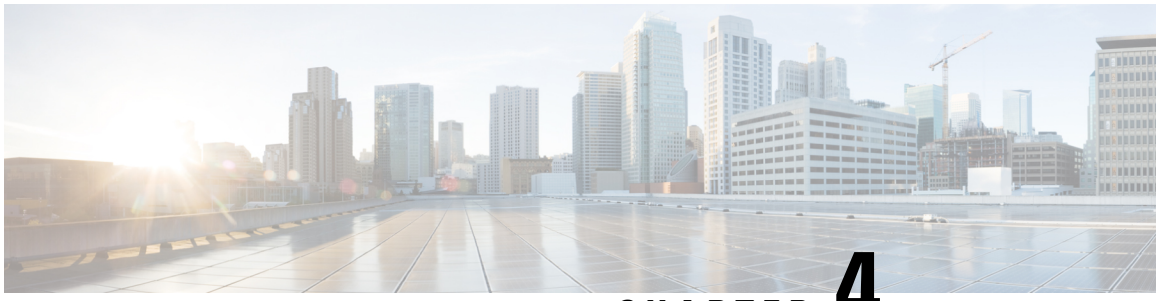
Procedure

Step 1 Choose **Inventory** > **Inventory**.

Step 2 (Optional) In the **Inventory** section, filter the device list by entering text in the **Search** field or filtering specific columns.

Step 3 Check the check boxes for the devices you want to export.

Step 4 Click **Export**.



CHAPTER 4

How to Troubleshoot Cisco iNode Manager

Following are some troubleshooting tips for installing and using the Cisco iNode Manager.

- How to Troubleshoot Cisco iNode Manager Application, on page 19

How to Troubleshoot Cisco iNode Manager Application

Following are some of the troubleshooting tips for installing and using the the Cisco iNode Manager application.

Problem	Solution
Unable to access the UI.	Run the following command to view the iptable rules: `iptables -L -t nat -n`
File system out of memory.	Restart the logger: `sudo docker restart robot-logger`

libguestfs appliance crash.	Clean the directory:
	`sudo rm -fr .guestfs-0/`
	`pwd`
	`/var/tmp`