

# USER MANUAL

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BXAMGR

# BOXILLA® KVM & AV/IT MANAGER

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24/7 TECHNICAL SUPPORT AT 1.877.877.2269 OR VISIT [BLACKBOX.COM](http://BLACKBOX.COM)



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## SYMBOLS USED IN THIS MANUAL

### INSTRUCTIONS



This symbol is intended to alert the user to the presence of important operating and maintenance (servicing) instructions in the literature accompanying the appliance.

### DANGEROUS VOLTAGE



This symbol is intended to alert the user to the presence of uninsulated dangerous voltage within the product's enclosure that may be of sufficient magnitude to constitute a risk of electric shock to persons.

### POWER ON



This symbol indicates the principal on/off switch is in the on position.

## SYMBOLS USED IN THIS MANUAL

### POWER OFF



This symbol indicates the principal on/off switch is in the off position.

### PROTECTIVE GROUNDING TERMINAL



This symbol indicates a terminal that must be connected to earth ground prior to making any other connections to the equipment.

# CHAPTER 1: SPECIFICATIONS

**TABLE 1-1. SPECIFICATIONS**

SPECIFICATION	DESCRIPTION
Approvals	CE, FCC
Connectors	10/100/1000 Ethernet (RJ-45) , Serial (DB9), (4) USB 2.0 (USB Type A), DVI
Power	AC input: 120–240 V, 50–60 Hz
Power Dissipation	<75 W (PSU rated for 250 W)
Dimensions	System: 1.73"H x 17.3"W x 10.6"D (4.4 x 44 x 26.8 cm); Shipping box: 7.2"H x 22.4"W x 15.4"D (18.5 x 57 x 39 cm)
Weight	System: 10.96 lb. (4.98 kg); Shipping: 14.92 lb. (6.78 kg)
Compatibility	Works with Emerald Unified KVM (EMD4000T, EMD4000R, EMD2002T, EMD2002R, EMD2000T, EMD2000R, EMD2000SE-T, EMD2000SE-R, EMD2002SE-T, EMD2002SE-R), EMD200DV-T, InvisaPC (DTX1002-R, DTX1002-T, DTX1000-R, DTX1000-T) and DKM (multiple part numbers)
Serial Port Configuration	115,200 baud, 1 Stop bit, No Parity, No Handshake
Default IP Address	192.168.1.24
Default Username	admin
Default Password	admin



## CHAPTER 2: PRODUCT OVERVIEW

Boxilla® is a state-of-the-art KVM and AV/IT Manager designed to provide pro-active support to the System Manager and enable efficient operation of KVM and AV systems. Its core focus is to provide simple mechanisms to discovery, configure, upgrade and monitor the deployed systems. It provides insight into performance of the deployed system and alerts the System Manager to potential performance or security issues. Comprehensive features include:

- ♦ automatic search and detection of Black Box products (discovery),
- ♦ device configuration across multiple sites,
- ♦ configuration backup,
- ♦ central upgrades,
- ♦ performance and security statistics with user-defined triggers for alerts.

Using the intuitive Boxilla web-based interface, one or more administrators can manage potentially thousands of users who are interacting with an almost unlimited number of devices. Boxilla operates as a self-contained compact server unit that can be located anywhere within your network. Boxilla is supplied pre-loaded and is straightforward to deploy, requiring only a network connection and a power input to begin operation.

The current version of Boxilla provides management of Black Box's Emerald Unified KVM or InvisaPC system, Modular and Compact DKM KVM Matrix Switches, and Black Box IP Network Switches. The Emerald or InvisaPC system provides users with a seamless desktop experience anywhere on a TCP/IP network, while allowing the actual hardware to be securely housed in a corporate data center or in the cloud.

Emerald or InvisaPC enables the same high-fidelity experience of a desktop PC even for media-rich applications, for example, watching videos, photo editing with Photoshop or 3D design with AutoCAD. The remote desktops may be hosted on a physical PC / workstation or may be a virtual desktop hosted on a private server or in the cloud. The Emerald or InvisaPC system provides its users with Receivers that communicate with target compute nodes (whether physical PC or virtual desktop) over a standard TCP/IP network. Physical PCs/Workstations/Servers have an Emerald or InvisaPC Transmitter unit physically connected to provide communication over the TCP/IP network. The performance of Emerald or InvisaPC allows them to be deployed on standard corporate networks and even across Wide-Area-Networks (WANs).

Desktop users can use remote keyboard, mouse, video, audio, USB mass storage devices, headsets and other USB devices from the Receiver unit to the remote PC/workstations or Virtual Desktop via the Emerald or InvisaPC system.

**NOTE:** References to the Emerald or InvisaPC system or Modular or Compact DKM KVM Switch systems in this document refer to both Receivers and Transmitters.

An Emerald or InvisaPC system can be composed of just Receivers and Transmitters. In these types of systems—called unmanaged—there is no central management. Each device needs to be configured individually and upgraded individually. Often to keep the system in sync, the admin exports the configuration from one Receiver and imports it to all other Receivers using a USB Flash Drive.

For larger configurations, a central manager is needed—Boxilla. Boxilla operates as a central manager for a “managed domain.” A managed domain is a collection of Emerald or InvisaPC Receivers and Transmitters managed by a Boxilla. Once a Receiver or Transmitter has been added to a managed domain, it can only communicate with other Receivers or Transmitters within this managed domain. They are not able to communicate to “unmanaged” devices or devices that are part of a different managed domain (i.e., a domain managed by a different manager). Boxilla is used to configure users, connections, hotkeys and other parameters. The database created on the Boxilla is synchronized to each Receiver on a Boxilla user login. If the Boxilla for the managed domain is not reachable (e.g. powered-down), the Receiver will use the last updated database. This ensures that there is no single point of failure in the managed domain. Users can login and connections can be made even if the manager of the domain is not reachable.

When a Receiver is managed, most of the configuration options on the OSD are disabled (i.e., grayed out). These configuration options can only be updated on the manager.

## CHAPTER 2: PRODUCT OVERVIEW

A Boxilla system can also include IP network switches. Black Box offers the following:

- 48-Port 1G IP Network Switch (EMS1G-48)
- 12-Port 10G IP Network Switch (EMS10G-12)
- 28-Port 10G IP Network Switch (EMS10G-28)
- 32-Port 100G IP Network Switch (EMS100G-32)

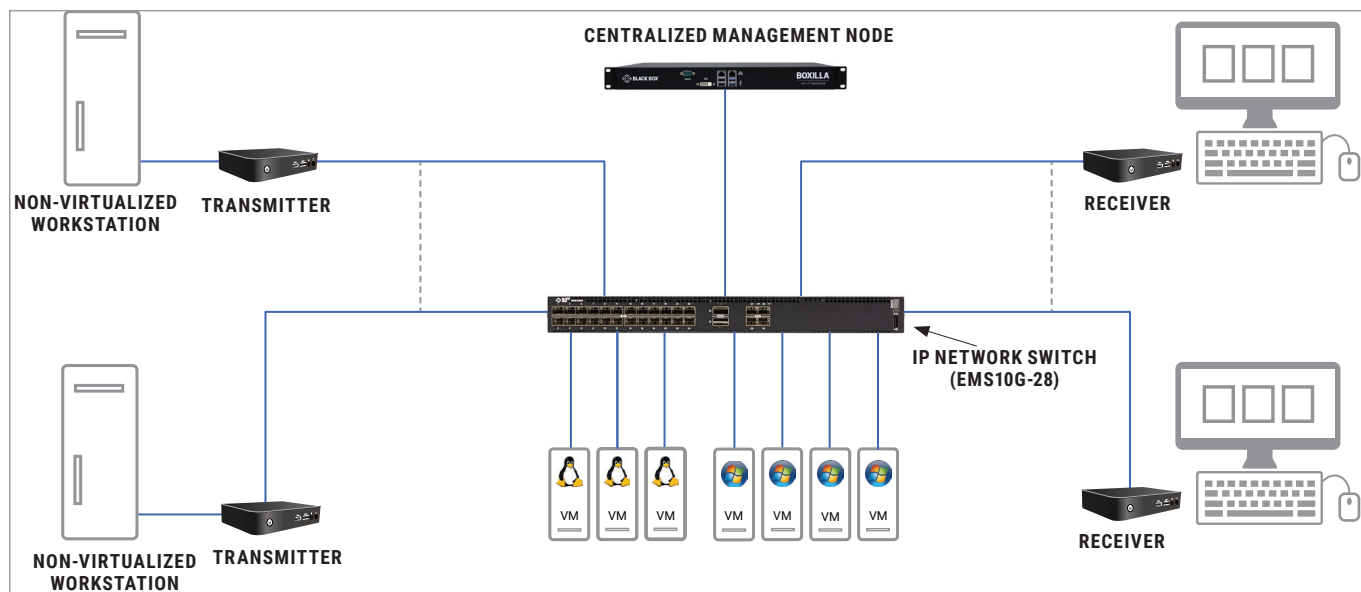


FIGURE 2-1. EMERALD OR INVISAPC SYSTEM EXAMPLE—INCLUDING IP NETWORK SWITCH

### 2.1 OVERVIEW OF BOXILLA CONCEPTS

The Emerald family is composed of Receivers, Transmitters and Switches. The Emerald or InvisAPC family is composed of Receivers, Transmitters and Managers. Boxilla is the Enterprise class Manager for Emerald or InvisAPC and Modular and Compact DKM KVM Matrix Switches and Black Box IP Network Switches. The core design of the Emerald or InvisAPC architecture is that there is no single point of failure. This means that even if Boxilla goes off-line, the Emerald or InvisAPC system will continue to function—allowing users to login, make connections and operate the system as normal. When the Boxilla manager comes back on line, the various devices will update Boxilla with their performance and security statistics from the period it was offline.

## CHAPTER 2: PRODUCT OVERVIEW

### 2.2 BOXILLA MANAGED DOMAIN

Boxilla creates a managed domain—a set of devices it manages. Devices that are members of this managed domain can only be managed by this Boxilla unit. Devices in a managed domain can only connect to other devices in the managed domain. No other manager or unmanaged device can configure or connect to devices in this managed domain.

A managed domain is composed of:

- ♦ Boxilla Manager—to centrally create, configure and monitor domain;
- ♦ Devices—KVM and AV appliances that can communicate with each other. In the current release, Emerald or InvisaPC devices, DKM KVM Matrix Switches, and Black Box IP Network Switches devices are supported;
- ♦ Users—provides various login rights for different users such as their access rights (what connections they can make, level of control they have to change configurations);
- ♦ Connections—defines how a Receiver can connect to a Transmitter or a Virtual Machine with properties such as private or share mode, USB re-direction enabled or disabled among others;
- ♦ Alerts—events detected by Boxilla in the managed domain (such as new device added, firmware upgrade, connection made) and classified as critical, warning or info based on nature of event.

As part of creating a managed domain, the administrator will add Devices to the domain, create Users, define Connections and set Alerts. The following sections will describe how to do this with Boxilla.

Once a domain has been defined (devices, users, connections, etc.) Boxilla monitors the operation of the domain, reports on its performance and indicates any security events detected. The monitoring of the system is presented to the user in advanced graphical and tabular formats. Typically the dashboard is used to get an overview of the domain's operation. An example of the Dashboard is shown in Figure 2-2. From the dashboard the administrator can drill down for more detail on activity, errors and individual devices.

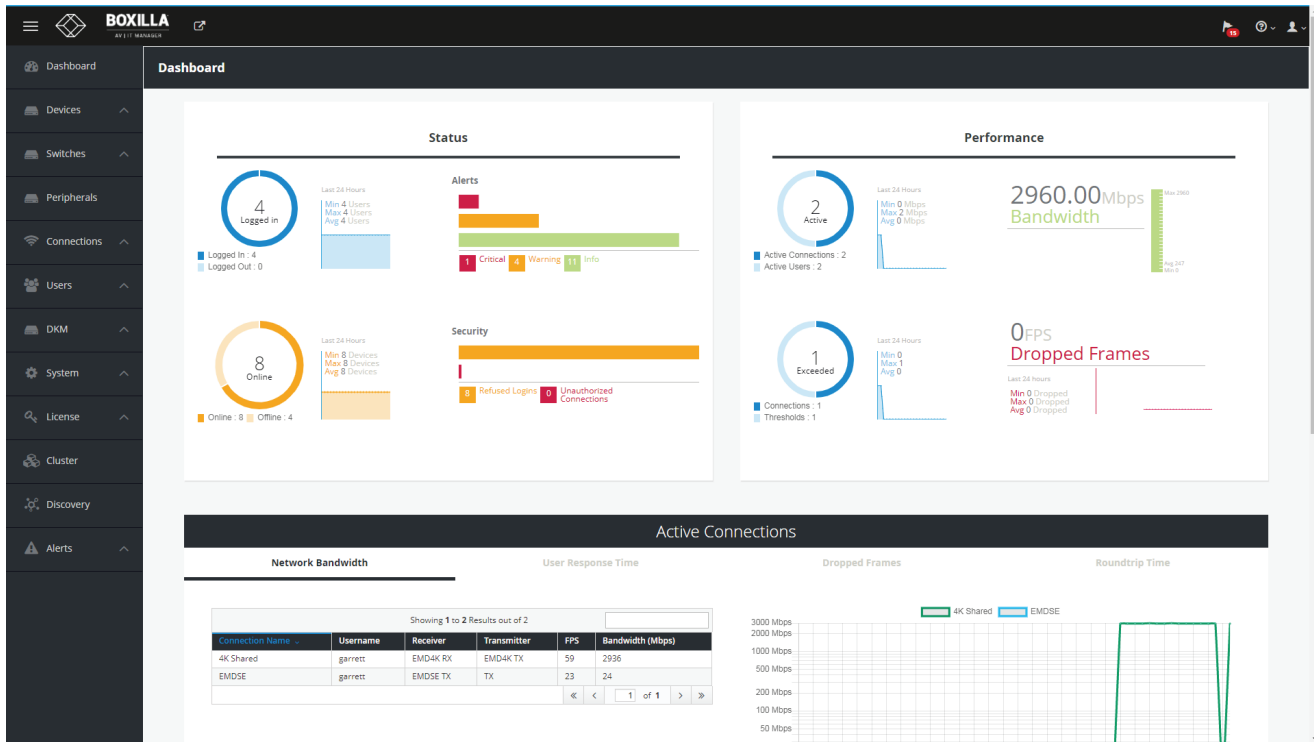


FIGURE 2-2A. BOXILLA TOP DASHBOARD EXAMPLE

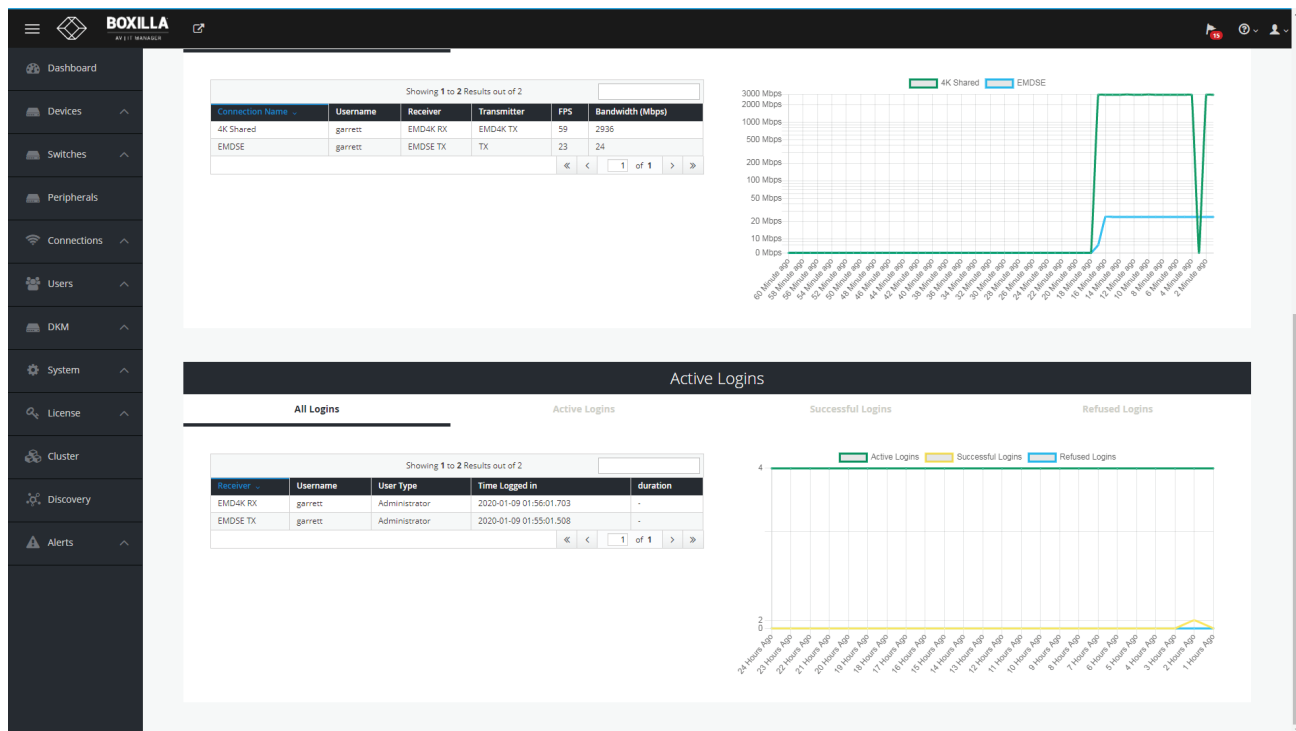


FIGURE 2-2B. BOXILLA BOTTOM DASHBOARD EXAMPLE



## CHAPTER 2: PRODUCT OVERVIEW

A Manager's User Profile is protected by a username and password to permit different users to access the same unit securely. It maintains the central database that is distributed to all Receivers in the "domain" of the Manager (i.e. discovered and added to manager)— called the "managed domain." This distribution ensures that there is no single point of failure in the Emerald or InvisaPC system— each Receiver has a copy of the database. This enables each Receiver to continue operation—log users in, make connections as required—even if the Manager goes off-line.

### 2.3 BOXILLA SCREEN LAYOUT

Boxilla is designed to provide quick access to key operational functions. This is achieved by the use of the Main Menu and Quick Access Toolbar as shown in Figure 2-3. The Main Menu provides access to:

- ◆ Dashboard
- ◆ Devices
- ◆ Switches
- ◆ Peripherals
- ◆ Connections
- ◆ Users
- ◆ DKM
- ◆ System
- ◆ License
- ◆ Cluster
- ◆ Discovery
- ◆ Alerts

The Quick Access toolbar provides access to active Alerts, access to Help and access to Logout.

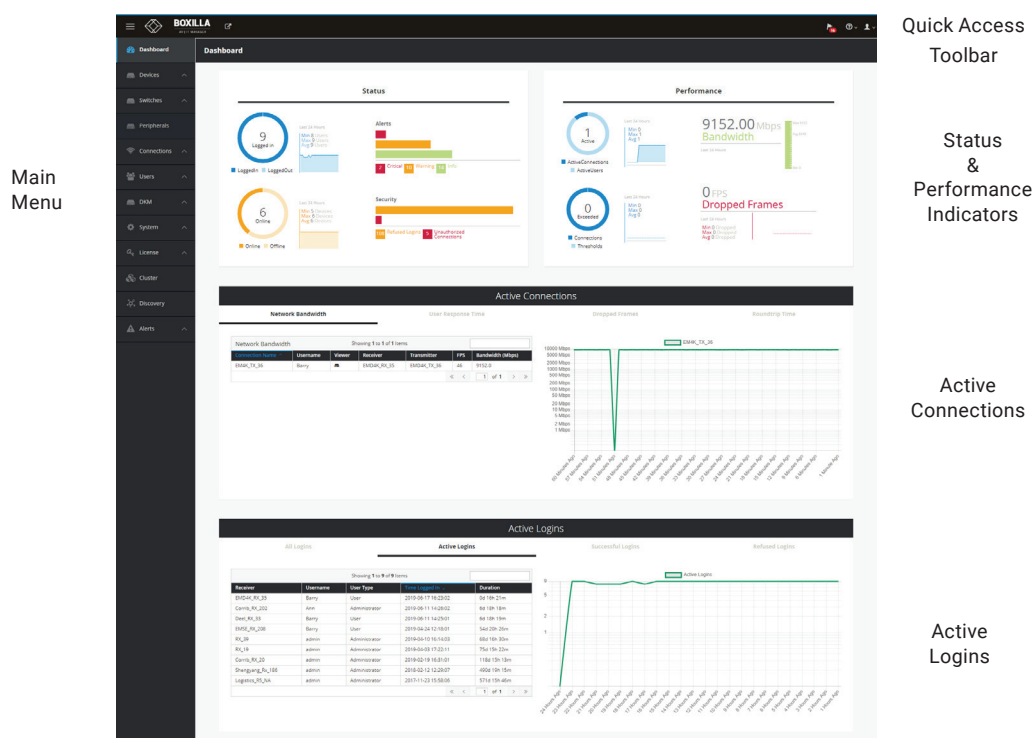


FIGURE 2-3. SCREEN LAYOUT

## CHAPTER 2: PRODUCT OVERVIEW

A common feature of tables in Boxilla is that they can be sorted by each column (alphabetically either ascending or descending). Click on the column's label (e.g. Connection Name) and the table will be sorted by that column in ascending order. Click on the same column label again and the order will be reversed. Also, a filter can be applied to the values in the column to pick out a subset of rows in the table. For example, typing in RnD into the filter box in the Network Bandwidth table in Active Connection section of the Dashboard in Figure 3 would result in three instead of four rows being displayed as shown in Figure 2-4.

Network Bandwidth

User Response Time

Network Bandwidth			Showing 1 to 3 of 3 Items (of 4)		RnD
Connection Name	Username ^	Receiver	Transmitter	FPS	Bandwidth (Mbps)
RnD_3	Rebecca	R&D_R2	R&D_T2	23	9.87
RnD_4	Robert	Logistics_R5	R&D_T3	30	63.33
RnD_1	Rodrik	R&D_R1	R&D_T1	23	30.13
			<< <		1 of 1 > >>

FIGURE 2-4. FILTERING TABLE

## 2.4 MODES OF OPERATION

The Emerald or InvisaPC system has various modes of operation, such as Auto-Login, Auto-Connect, Private Connection and Shared Connection Modes. The Emerald or InvisaPC devices can obtain their IP address data from a DHCP server in any of these modes or use static addresses. For stable operation with Boxilla, we strongly recommend that Static IP addresses are assigned to Emerald or InvisaPC devices or that you use DHCP addresses with “infinite time-outs.”

### 2.4.1 AUTO LOGIN

In Auto-Login Mode, turning on the Emerald or InvisaPC Receiver automatically causes a login as a pre-defined user. The user is presented with the permitted connections that have been predefined.

### 2.4.2 AUTO CONNECT

In Auto-Connect Mode, when a user logs-in to the Emerald or InvisaPC Receiver, it causes an automatic connection to their pre-allocated workstation or virtual desktop. Auto-Login and Auto-Connect are defined independently of each other.

### 2.4.3 PRIVATE CONNECTION

In Private Connection Mode, when a user makes a connection to a target workstation/virtual desktop, this connection is only accessible by this user. All other users will receive a “busy” message if they attempt to connect to the same workstation/virtual machine. This is the default mode for connections.

### 2.4.4 SHARED CONNECTION (INVISAPC ONLY)

In Shared Connection Mode on InvisaPC, multiple users can connect to the audio and video of the same target computer over the network. They arbitrate for control of the keyboard and mouse of that computer. Non-keyboard and mice devices are not supported on shared connections.

## CHAPTER 3: APPLICATIONS

The Emerald or InvisaPC system is architected to be flexible so that it can be deployed in many different types of applications such as basic extension, switching applications (sometimes called matrix), cloud-based desktops, control rooms, digital signage and kiosk applications among others in banking, financial services, broadcast, network operations, industrial, government and enterprise computing sectors. Emerald or InvisaPC provides the state-of-the art performance by:

- ♦ using digital sources for video and audio, hence removing analog noise issues or other potential environmental issues;
- ♦ using advanced optimized compression to enable visually lossless video over standard low-bandwidth networks rather than a proprietary connection or dedicated gigabit networks of many systems.

### 3.1 VIDEO, AUDIO AND USB SWITCHING

Numerous applications require being able to switch between different target PCs or Virtual Desktops. The user wants to be able to change the source of Video, Audio or USB extension (or all three together).

Connections can be made to a target using Emerald or InvisaPC's intuitive On-Screen-Display (OSD). Figure 2-1 in the previous section shows an example of a switching or matrix type of deployment. In this deployment, there are several Receivers and Transmitters and a Boxilla manager as well as virtual desktops.

See [www.blackbox.com](http://www.blackbox.com) for the full catalog of available Emerald or InvisaPC products.

## CHAPTER 4: INITIAL INSTALLATION

### 4.1 HARDWARE DESCRIPTION

A Boxilla manager is supplied with the items shown in Table 4-1.

**TABLE 4-1. WHAT'S INCLUDED**

ITEM
Boxilla Unit
IEC power cord
(4) rubber feet for tabletop deployments
(1) ESD screw
Quick Start Guide

Once the contents of the Boxilla package have been verified, the first task is to configure the IP address of the unit. This can be set in two ways: (1) using the serial port and (2) using the network port via a browser.

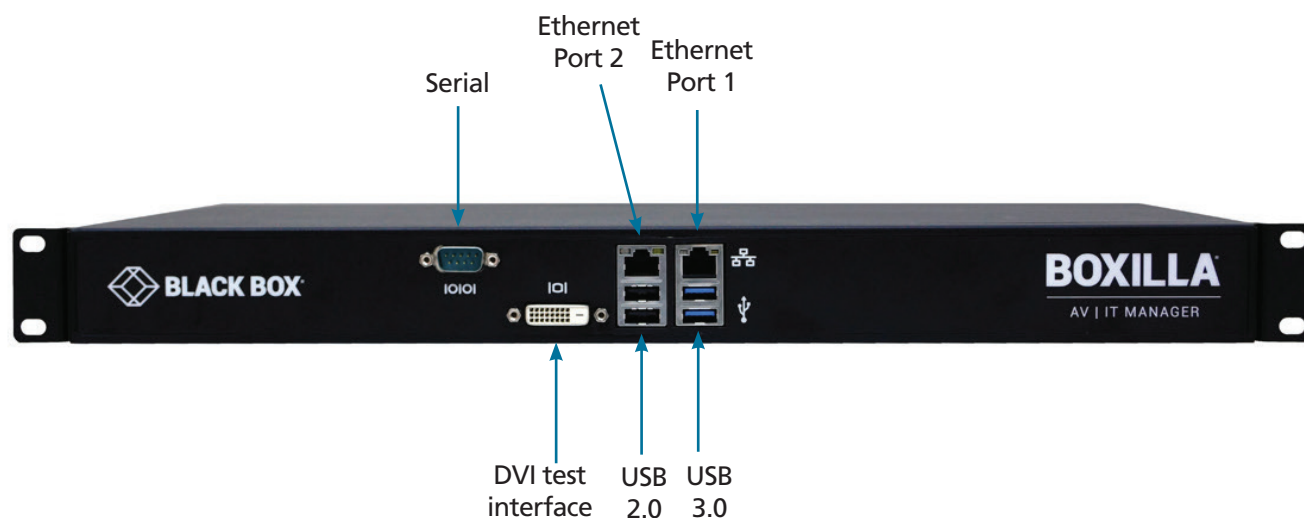


FIGURE 4-1. BOXILLA FRONT PANEL

#### CONNECTORS NEEDED FOR INSTALLATION

- Serial Port
- Network Ports (2)
- Power connector

## CHAPTER 4: INITIAL INSTALLATION



FIGURE 4-2 BOXILLA REAR PANEL

TABLE 4-2. PANEL COMPONENTS

COMPONENT	DESCRIPTION
Serial port	DB9 male console
DVI port	Test interface
(2) Network ports	1G Ethernet RJ-45 connectors
(2) USB Type A ports	USB 2.0, used for exporting log files
(2) USB Type A ports	USB 3.0, used for exporting log files
Power switch	ON/OFF switch
3-prong outlet	100–240 VAC, 50-60 Hz

### CONNECT THE POWER

1. Locate the AC line cord.
2. Attach the AC line cord to the power supply connector on the rear of the unit.
3. Power up the unit by turning on the power switch on the back of the unit.

### 4.2 LED IDENTIFICATION

Two LEDs are built into the RJ-45 connectors on the Boxilla Manager. The definition of the operation of these LEDs is shown in Table 4-3.

TABLE 4-3. RJ-45 CONNECTOR LEDS

LED	INDICATION	MEANING
Speed	Green ON	1 Gbps link
	Amber ON	100 Mbps link
	OFF	10 Mbps link
Activity	Amber blinking	Valid link
	OFF	No link

## CHAPTER 4: INITIAL INSTALLATION

### 4.3 INSTALLATION SAFETY

To avoid a potentially fatal shock hazard and possible damage to equipment, please observe the following precautions:

- ♦ Test AC outlets at the workstation and monitor for proper polarity and grounding.

NOTE: The AC inlet is the main disconnect.

### 4.4 SERIAL CONFIGURATION OF IP ADDRESS

The default IP address for Boxilla on leaving the factory is 192.168.1.24 and needs to be configured to an appropriate address for where it will be deployed. To access the serial menu, connect to the DB9 connector on the front of the unit. The serial port has a fixed configuration of:

- ♦ Baud-Rate: 115,200 Baud
- ♦ Data: 8 bits
- ♦ Stop-Bits: 1
- ♦ Parity: None
- ♦ XON/XOFF: None

Once the connecting PC has the correct configuration, the following menu should appear when connected to Boxilla's serial port. Make sure you turn echo on for the terminal to see the output.

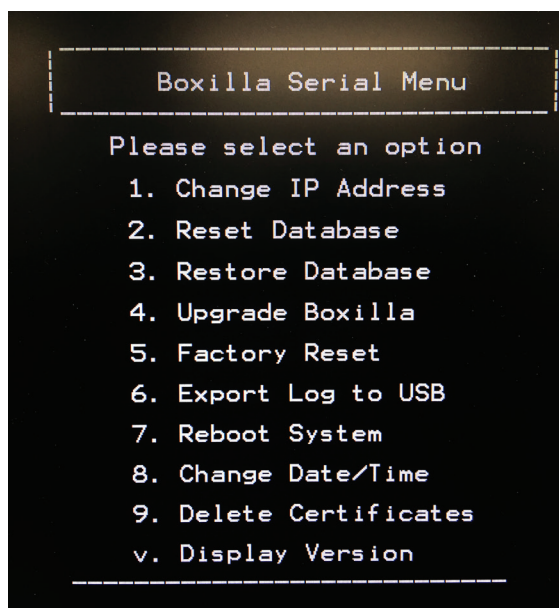


FIGURE 4-3. BOXILLA SERIAL MENU

Select "Change IP address" by entering 1. Then follow the prompts to set the new IP address, Net Mask and Gateway IP address.

## CHAPTER 4: INITIAL INSTALLATION

### 4.5 BROWSER CONFIGURATION OF IP ADDRESS

The default IP address for Boxilla on leaving the factory is 192.168.1.24 and needs to be configured to an appropriate address for where it will be deployed. Use a computer located within the local network that can address the default IP address and ensure that Boxilla is connected to this network via its Ethernet Port 1 (RJ-45) as shown in Figure 4-1, open a web-browser and enter the default IP address for the Boxilla AV/IT Manager: 192.168.1.24. This should bring up the Boxilla login screen shown below in Figure 4-4.

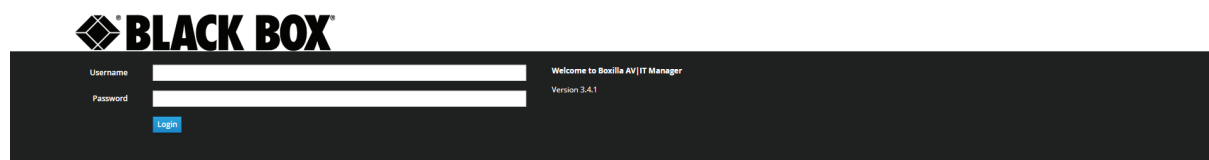


FIGURE 4-4. BOXILLA LOGIN SCREEN

When the login screen appears, enter the default username “admin” and the default password “admin.” This will bring you to the Boxilla dashboard screen. On the Boxilla menu (see the menu on the left in Figure 10), select the menu item “System” on the left of the screens.

On the tabs that appear on the main section of the screen, click System → Settings → Network. Now you will be presented with the current IP settings for the system. Enter the new IP settings into the supplied fields and click “submit.” Boxilla will be updated with the new network settings. From now on, you need to point your Browser to the new IP address.

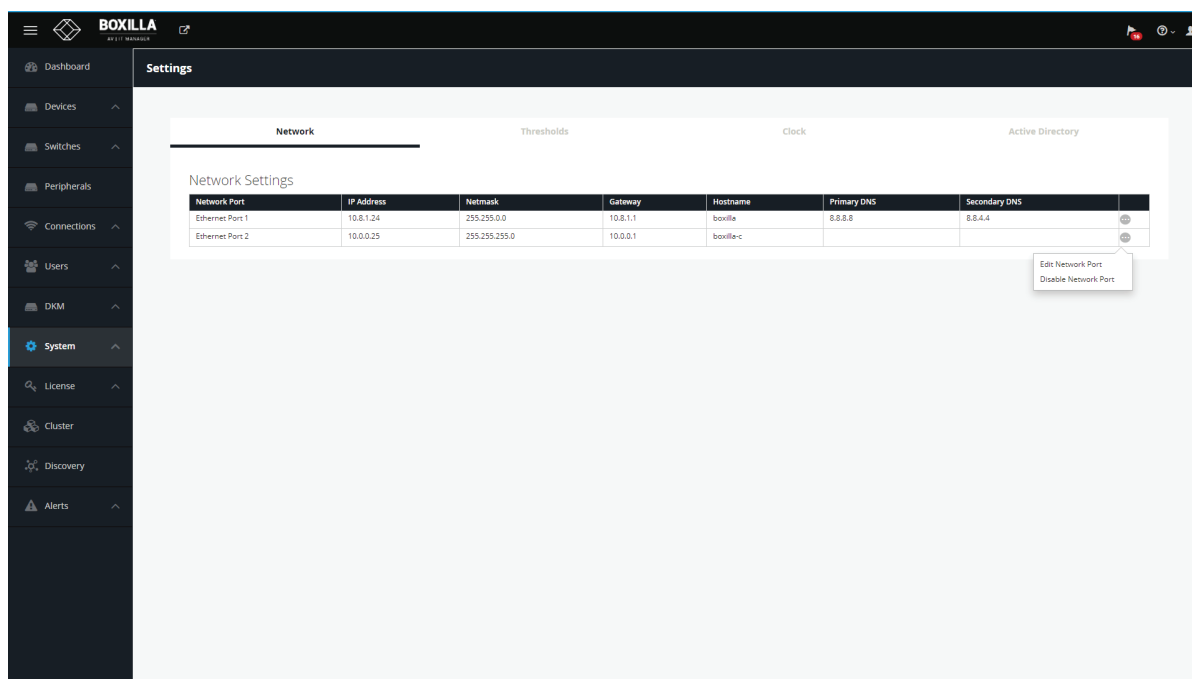


FIGURE 4-5. SYSTEM → SETTINGS → NETWORK SCREEN

## CHAPTER 4: INITIAL INSTALLATION

### 4.6 MOUNTING BOXILLA IN A RACK

The Boxilla unit is designed to be easy to mount within a standard 19" rack. The unit requires just a 1U space within the rack.

To mount the Boxilla unit within a rack:

1. Slide the Boxilla unit into the vacant 1U space within the rack.
2. Secure each bracket to the rack using two screws per side as shown below.

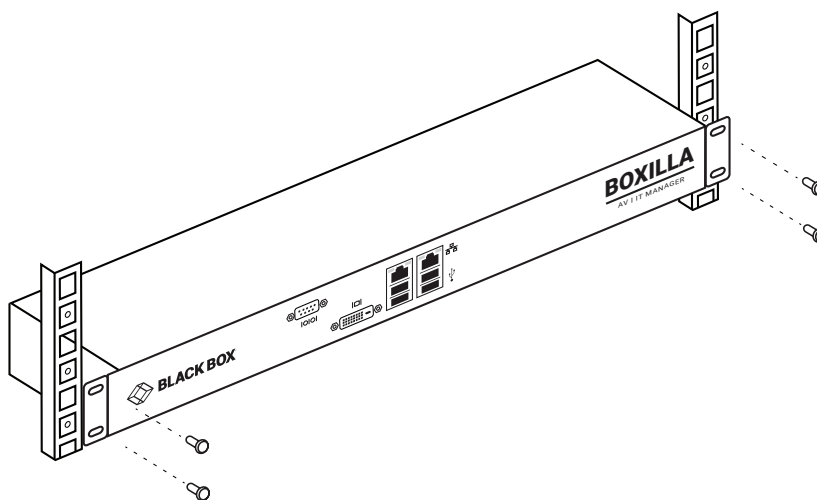


FIGURE 4-6. MOUNTING BOXILLA IN A RACK

To protect the unit, please use the ground point on the Boxilla unit on the rear of the Boxilla unit shown in Figure 4-7 (using the provided screw) for connecting to the ground point of the rack or cabinet.

#### 4.6.1 RACKMOUNT SAFETY CONSIDERATIONS

- ♦ **Elevated Ambient Temperature:** If installed in a closed rack assembly, the operating temperature of the rack environment may be greater than room ambient. Use care not to exceed the rated maximum ambient temperature of the Boxilla unit.
- ♦ **Reduced Air Flow:** Installation of the equipment in a rack should be such that the amount of airflow required for safe operation of the equipment is not compromised.
- ♦ **Mechanical Loading:** Mounting of the equipment in the rack should be such that a hazardous condition does not exist due to uneven mechanical loading.
- ♦ **Circuit Overloading:** Consideration should be given to the connection of the equipment to the supply circuit and the effect that overloading of circuits might have on overcurrent protection and supply wiring. Consider equipment ratings for maximum current.
- ♦ **Reliable Earthing:** Reliable earthing of rack mounted equipment should be maintained. Pay particular attention to supply connections other than direct connections to the branch circuit (for example, use of power strips).





FIGURE 4-7. ESD CONNECTION

## CHAPTER 5: BOXILLA CONFIGURATION

This section covers the configuration of Boxilla for administrators.

### 5.1 SUPPORTED BROWSERS

Boxilla will operate with most modern client browsers. It requires the browser to have JavaScript enabled. The list of supported browsers is as follows:

- ♦ Google Chrome
- ♦ Internet Explorer
- ♦ Firefox
- ♦ Safari

NOTE: For the best experience, always use the latest versions of supported browsers.

### 5.2 LOGIN

Ensure the Boxilla unit is powered up. Wait two minutes after applying power before attempting to access to allow the system to boot up.

Using a computer located anywhere within the network, open a web browser (see supported browsers list above) and enter the default IP address for the Boxilla server: 192.168.1.24 .

The Login screen will be displayed as shown in Figure 5-1.

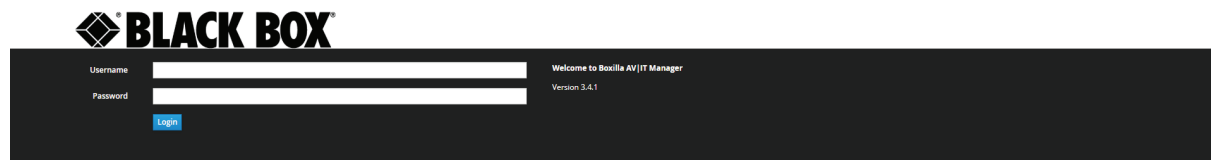


FIGURE 5-1. BOXILLA LOGIN SCREEN

Enter your Username and Password and click the Login button.

Default username: admin

Default password: admin

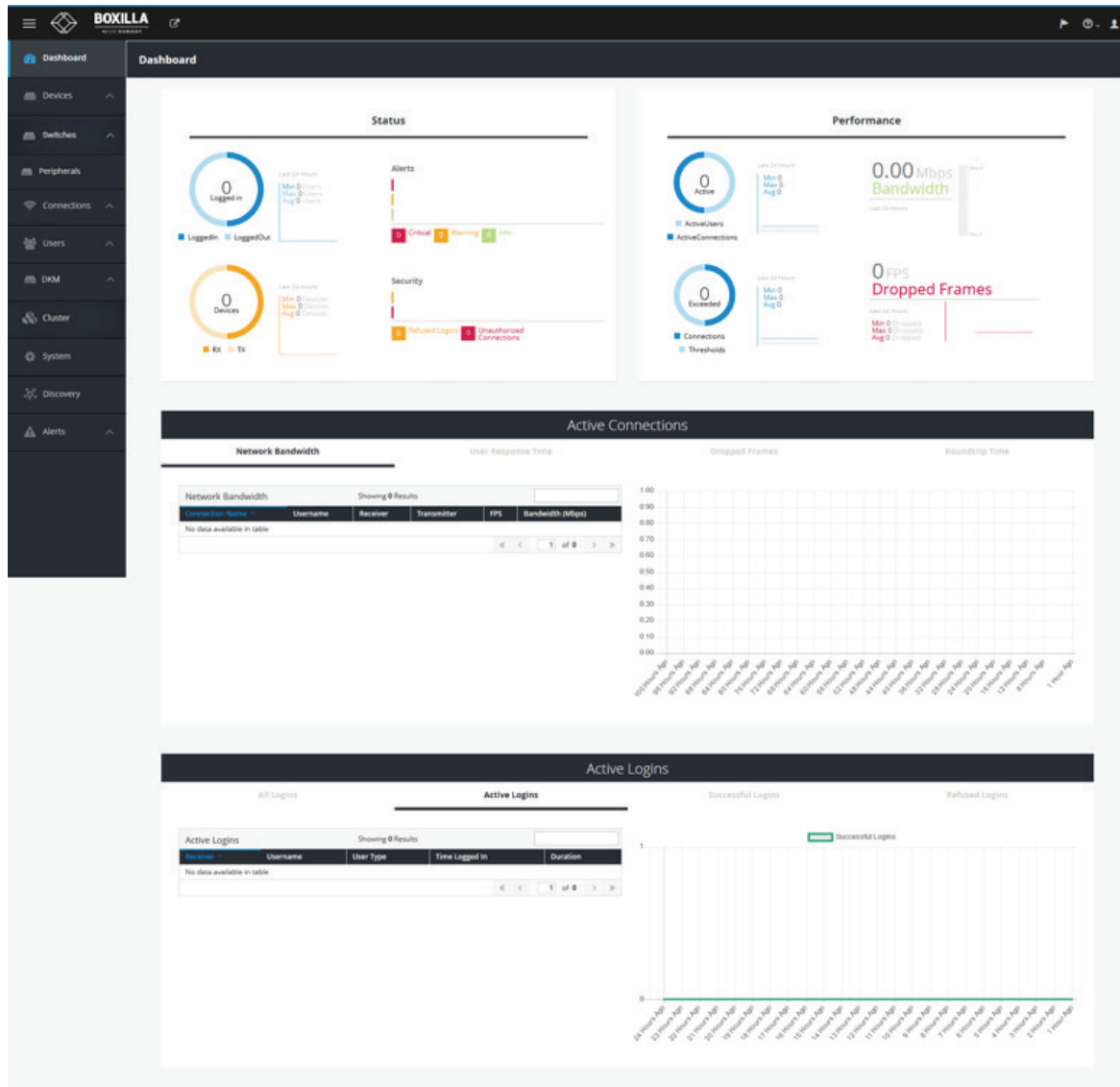


FIGURE 5-2. BOXILLA INITIAL SCREEN ON LOGIN

TABLE 5-1. BOXILLA INITIAL SCREEN MENU COMPONENTS

MENU OPTION	DESCRIPTION
Dashboard	The dashboard is divided into three main areas: Status & Performance Indicators, Active Connections and Active Logins.
Devices	Under the Devices drop-down menu on the left of the Dashboard screen, you will see four options: Settings, Upgrades, Global and Statistics.
Switches	<p>The “Switches” menu has two subheadings: Status and Upgrades. These all link to individual pages.</p> <p>The status page initially shows a list of all the switches in the KVM Network. Clicking on a particular switch then brings you to a page displaying all the ports of that particular switch. This page also allows you to perform certain actions on the switch.</p> <p>The Upgrades page is similar to the InvisaPC/Emerald Upgrade page. This shows a list of all the switches in the KVM network plus their current firmware version. If there is a mismatch to the activated firmware release, this will be flagged. You can also upload a release from this page.</p>

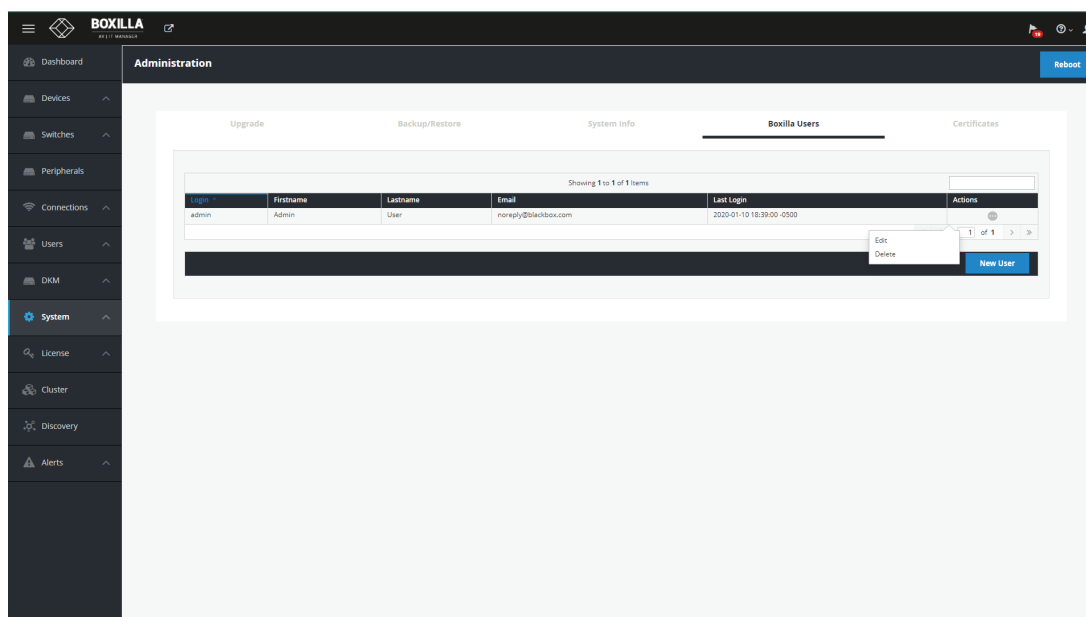
## CHAPTER 5: BOXILLA CONFIGURATION

**TABLE 5-1 (CONTINUED). BOXILLA INITIAL SCREEN MENU COMPONENTS**

MENU OPTION	DESCRIPTION
Peripherals	Boxilla uses USB Hub bonding to support external USB switching at speeds up to 480 Mbps.
Connections	Connections define the properties for the flow of keyboard, mouse, video, audio and USB traffic between an Emerald or InvisaPC Receiver and an Emerald or InvisaPC Transmitter or Virtual Machine. Connections are created and then allocated to Users to provide them access to Transmitters or Virtual Machines. A connection is a definition and can be allocated to multiple users. When a user logs into an Emerald or InvisaPC Receiver, they are presented with their allocated connections on the Connections Tab of the OSD on that Receiver.
Users	Users are defined in the Emerald or InvisaPC system to provide rights to manage the system, rights to connect to different target devices and rights to set parameters for connections.
DKM	This option enables you to integrate your DKM system with Boxilla. It includes the configuration elements for Boxilla and DKM.
System	The System button in the main menu brings up the System → Administration → Upgrade screen. This screen allows the Boxilla unit itself to be managed.
License	The License tab enables you to add/manage licenses for Boxilla and remote applications.
Cluster	Boxilla offers a redundancy feature for fail-safe operation. Your system can contain two Boxilla units, one as the primary Boxilla and one as a backup. If the first Boxilla cannot be found, the system will use a backup Boxilla to get the information. The primary and backup Boxilla are known as a cluster.
Discovery	The process of adding devices to Boxilla to manage is known as discovery. The discovery process can be automatic or can be manual.
Alerts	Alert history is a time-stamped log of events across the system. Active Alerts are alerts that are currently active, e.g. devices that are offline, thresholds that are exceeded, and devices with mis-matched software versions.

You are strongly recommended to change the default admin password as one of your first actions:

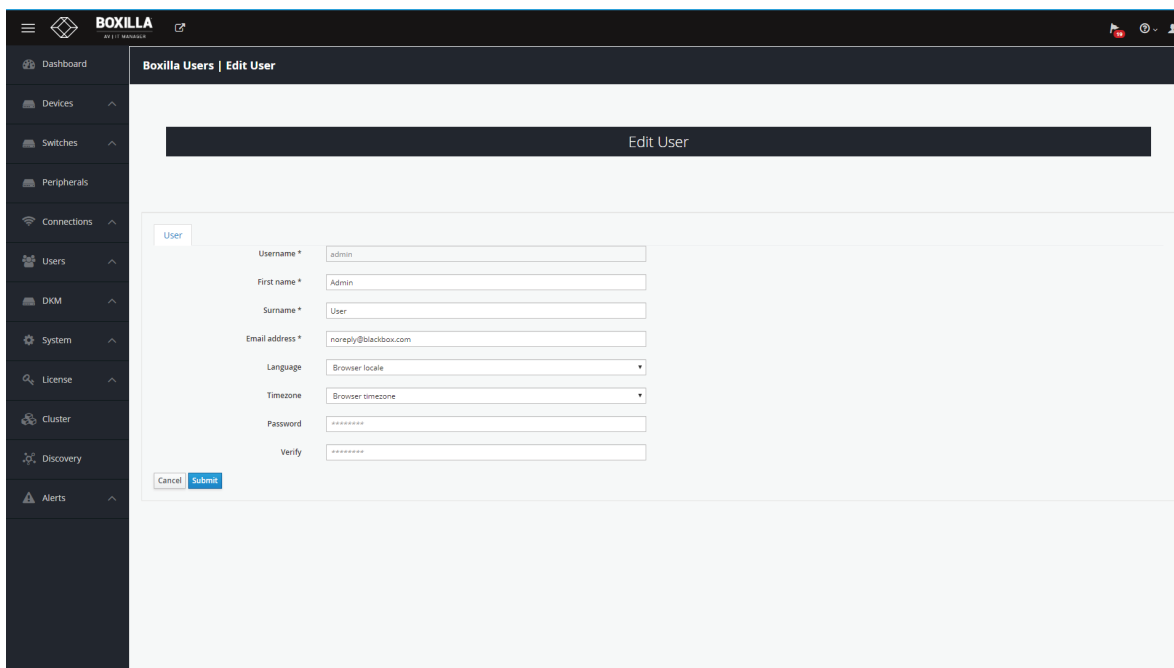
- Click on System button on the main menu and then select the Users tab as shown in Figure 5-3.
- Click the “...” icon on the Admin row and click on the edit option.



**FIGURE 5-3. CHANGING ADMIN USER PASSWORD**

## CHAPTER 5: BOXILLA CONFIGURATION

This allows the Admin user to be edited. The default password would be changed for security. The other properties can be used as required.



The screenshot shows the Boxilla web interface with a sidebar menu on the left containing options like Dashboard, Devices, Switches, Peripherals, Connections, Users, DDM, System, License, Cluster, Discovery, and Alerts. The main content area is titled 'Boxilla Users | Edit User' and features a form for editing a user. The form includes fields for Username (admin), First name (Admin), Surname (User), Email address (noreply@blackbox.com), Language (Browser locale), Timezone (Browser timezone), Password (masked with dots), and Verify (masked with dots). There are 'Cancel' and 'Submit' buttons at the bottom left of the form.

FIGURE 5-4. EDIT ADMIN USER

### 5.3 IMPORTANT FIRST CONFIGURATION STEPS

There are several important configuration steps that must be carried out when starting a new Boxilla server for the first time.

1. Set the IP address for the Boxilla Server.
2. Change the default password for the default user "admin" (for security).

**NOTE:** Make sure that your computer can view the new IP address; otherwise, the Boxilla server will appear to be offline. Depending on your network configuration and that of the computer, you may need to change the computer's configuration to be able to see Boxilla server's new network address.

**IMPORTANT NOTE:** If an existing Boxilla server must be replaced, follow the important advice given within Appendix A: Swapping Out a Boxilla Server.

## CHAPTER 6: DISCOVERY—ADDING DEVICES

The process of adding devices to Boxilla to manage is known as discovery. The discovery process can be automatic or can be manual.

### 6.1 DISCOVERY—AUTOMATICALLY FINDING DEVICES

Boxilla uses Black Box's discovery protocol to automatically find devices to be managed on the network. This discovery protocol can span across subnets. To allow Black Box's Emerald or InvisaPC automatic discovery protocol to operate across subnets, multicast routing should be enabled in the routers in the network. Black Box's discovery protocol is not required for Emerald or InvisaPC systems to operate but it is recommended to enable Boxilla to search for devices across multiple subnets. If the Emerald or InvisaPC discovery protocol is not enabled, i.e. routers do not have multicast routing enabled, the administrator will have to manually add in devices not on its subnet, i.e. add in each device individually by its IP address.

To start adding devices to Boxilla, click on the Discovery button on the main menu. The Discovery page is displayed as shown in Figure 6-1. The example page already has some devices "discovered." The devices are listed in a table as shown in Figure 6-1.

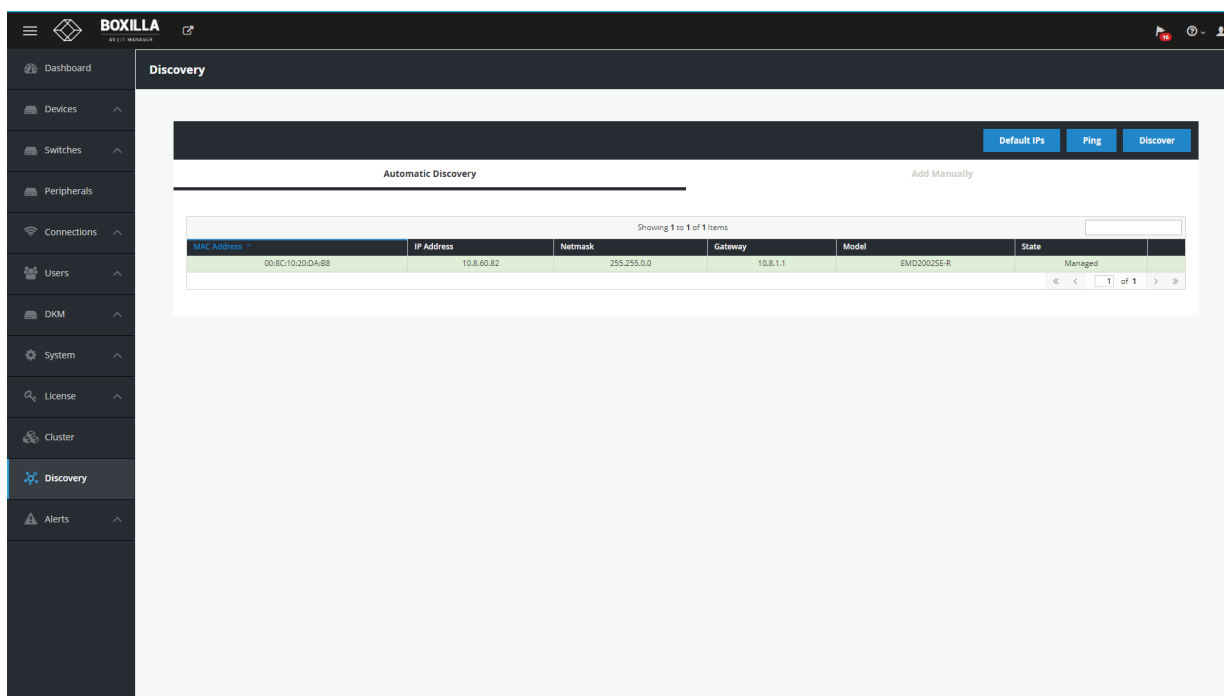


FIGURE 6-1. DISCOVERY PAGE

This table shows all devices "discovered" automatically or manually added. To discover devices automatically, click on the "discover" button on the page. This causes the Black Box Discovery protocol to be run where a "discovery" packet is broadcasted to network and devices respond to Boxilla by sending a UDP unicast back to Boxilla. See Appendix B: Overview of Boxilla and Emerald or InvisaPC Network Protocols for more details on the actual protocol sequence.

## CHAPTER 6: DISCOVERY—ADDING DEVICES

The state of a device shown in the table can be one of the following:

- ♦ UnManaged—this device is currently not part of any managed domain
- ♦ Managed—this device is part of the domain managed by this Boxilla manager
- ♦ ManagedOther—this device is part of a domain managed by another Manager—and cannot be managed by this Boxilla manager
- ♦ Orphaned—there is a conflict between the reported state on the Manager and that of the device. This may occur where the device was removed from the Manager’s database when the device was off-line, or if the Manager was restored to factory default settings. A device in the orphaned state can be set back to “Managed” by selecting the Manage button and following the same process as for unmanaged devices

To edit a discovered device, click on the “...” icon on the row for the device and select the Edit option. This allows the Network configuration of a device to be changed as shown in Figure 6-2. Typically, this is used to change a device from its default IP address to a unique address.

The administrator should be aware that the IP address should be changed to one reachable by Boxilla (i.e. if moved to a subnet different to Boxilla manager, a router is required to enable communication).

FIGURE 6-2. EDIT DEVICE SCREEN

Once the IP address has been specified, an unmanaged device can now be set to be part of this Boxilla’s managed domain. This is done by clicking on the Manage option. This causes the device’s state to change from UnManaged to Managed. The device is given a name as part of the process of making it managed. This name is used to make it easier for administrators and users to refer to the device (e.g. ControlRoom1 to name a device in Control Room 1). Once managed by Boxilla, this device cannot be managed or configured by any other manager.

## CHAPTER 6: DISCOVERY—ADDING DEVICES

### 6.2 DISCOVERY—MANUALLY ADDING DEVICES

Sometimes an administrator may want to add a device manually, for example, where a device is on a different subnet to the Boxilla Manager and multicast routing is not enabled to this subnet.

To manually add a device, click on the “Add Manually” tab on the discovery page. This brings up the page shown in Figure 6-3. Enter the IP address of the device to be added and click on “Get Information.” This causes Boxilla to retrieve the device’s information if reachable. If Boxilla has no valid path on the network to the device (or IP address is not for an Emerald or InvisaPC device), the system will return a message of “device not reachable.”

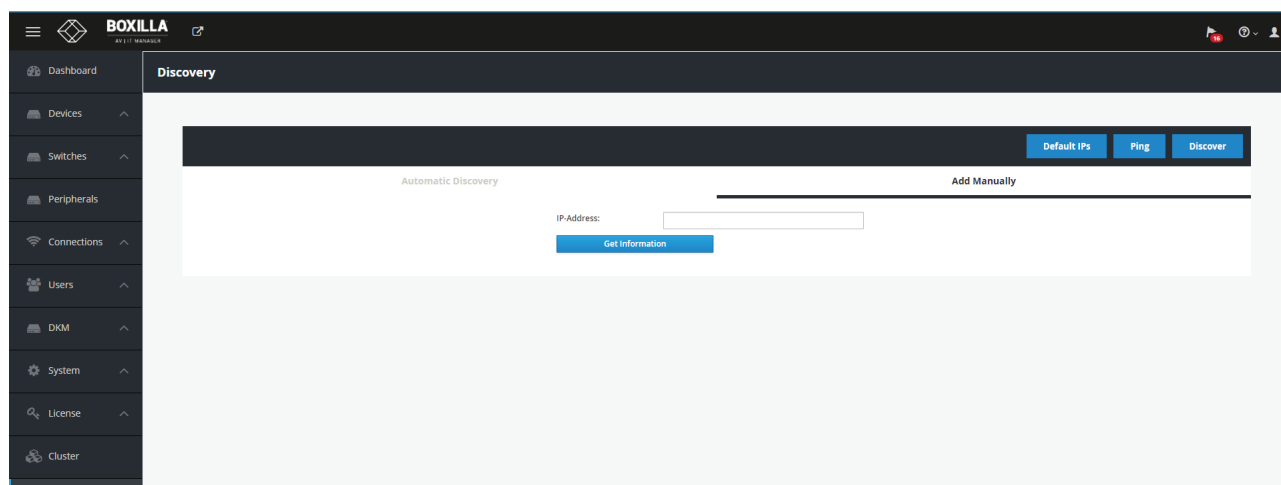


FIGURE 6-3. DISCOVERY—MANUAL ADD

The administrator can give the device a name and check that the device’s details are correct if required to ensure it is the correct device (IP address, Serial Number and Model type). To manage this device, click on “Manage Device” button as shown in Figure 6-4.

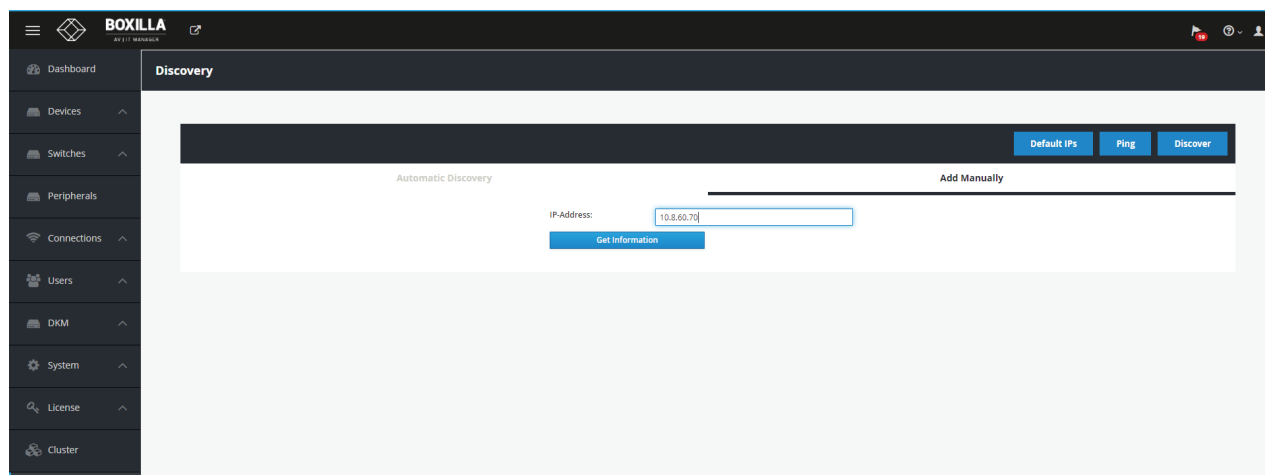


FIGURE 6-4. DISCOVERY MANUAL ADD & MANAGE DEVICE



## CHAPTER 6: DISCOVERY—ADDING DEVICES

### 6.3 DISCOVERY—WHAT HAPPENS TO A DEVICE WHEN MANAGED

Emerald or InvisaPC units can be configured locally when in UnManaged state. When a unit becomes “Managed,” its local database is replaced with the database from Boxilla. The IP address of the device is preserved—but can be changed from Boxilla. The administrator can no longer change users, connections and various properties locally on the device—these can only be changed on Boxilla.

Once a device is managed by Boxilla, Boxilla’s database is “synchronized” to the device when a user logs in to the device. The following sections outline how to use Boxilla to configure and monitor devices.

There are operating options that can only be configured locally for this current release. These are:

- ♦ Power-Mode— whether an Emerald or InvisaPC Receiver powers up automatically when power is applied or needs the power button to be pressed;
- ♦ Auto-Login—whether an Emerald or InvisaPC Receiver will automatically login as a specific user on power up;
- ♦ OSD Resolution—resolution that the OSD is displayed at when on screen;

See the Emerald or InvisaPC device manual for full details of these options.

### 6.4 DISCOVERY—IF A DEVICE IS NOT FOUND

There can be several reasons why a device has not been discovered by Boxilla:

- ♦ The device may be turned off.
- ♦ The device may not be reachable on the network— no valid path to device. This can happen if device is on a different network subnet to Boxilla and no router is between the two subnets. Use PING to verify the device can be reached.
- ♦ Automatic discovery may not find the device if it is on a different subnet to Boxilla and the router does not allow Multicast UDP packets to be forwarded to it. The router path to subnet manual addition should work.
- ♦ There is a potential cabling problem between the device and the Boxilla Manager. Check and where necessary, replace faulty cables.

Devices part of the managed domain can be reviewed, upgraded and configured. These actions are performed by clicking the devices' options from the main menu. Figure 7-1 shows the Device—Settings Page. This page shows all the devices that are part of the managed domain.

Boxilla constantly polls devices to determine their state and operational statistics. The state of a device in the table can be:

- ♦ Online—means the device is contactable from Boxilla during recent polling cycles;
- ♦ Offline—means the device did not respond during any of the last few polling cycles. This can mean the device is powered-down or is not reachable on the network;
- ♦ Demo—means the device is a simulated device for demonstration purposes;

Under the Devices drop-down menu on the left of the Dashboard screen, you will see four options: Settings, Upgrades, Global and Statistics. These options are described in the following sections. Click on Settings and the following screen appears.

FIGURE 7-1. DEVICES SETTINGS SCREEN

Click on Video Settings in the middle of this screen to see the Device Name, Configuration, IP Address, Model, State, Status, Video Quality, Video Source Opt, EDID Settings DVI 1, Cloned Receiver, EDID Settings DVI 2, Cloned Receiver and Options for each TX or RX unit.

Click on Misc Settings in the middle of this screen to see the Device Name, Configuration, IP Address, Model, State, Status, HID Configuration, Shared Mouse Timer, Power Mode, HTTP Enabled and Options settings for each TX or RX unit.

## NOTES:

- It's not possible to configure the TX settings of an Emerald 4K TX device.
- A user can configure the HTTP\_Enable attribute for Emerald RX devices, but it is not possible to configure the Power Mode setting for Emerald RX devices.

## 7.1 DEVICES—SETTINGS

You now have the option to configure unique, template or system-wide settings. Here you can:

- ♦ Create/edit/delete device templates
- ♦ Edit system properties
- ♦ Edit individual device settings
- ♦ Apply bulk updates to appliances

NOTE: Updates to Transmitter devices result in the device rebooting.

## CHAPTER 7: DEVICES

- Video Source Opt: Select from Off, DVI Optimized, VGA - High-Performance, VGA - Optimized, VGA - Low Bandwidth (only applied in case of a single-head transmitter).
- HID Configuration: Select from Default, Basic, MAC, Absolute, or Absolute MAC. The Absolute Mouse feature can be used to enable interoperability with KM switches with built-in “Glide & Switch” capability such as ServSwitchTC and Freedom. If the target systems are MAC OS, you can use the Absolute MAC setting for best user experience.

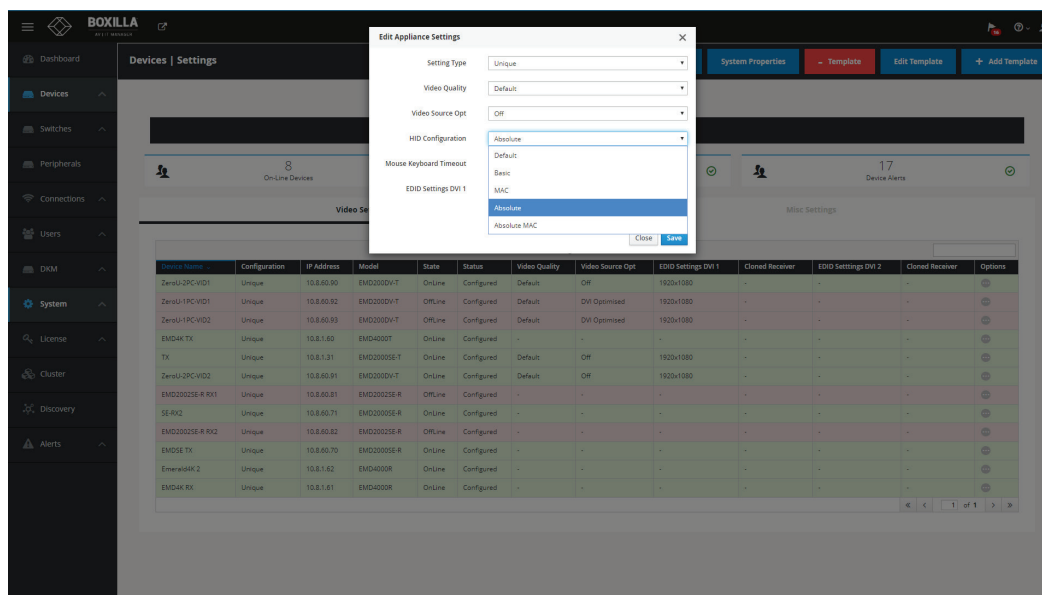


FIGURE 7-3. TEMPLATE SETTINGS SCREEN

- Mouse Keyboard Timeout: Choose an option from 0 to 5 seconds.
- EDID Settings DVI 1: Choose from 1920 x 1080, 1920 x 1200, 1680 x 1050, 1280 x 1024, or 1024 x 768.
- EDID Settings DVI 2: Choose from 1920 x 1080, 1920 x 1200, 1680 x 1050, 1280 x 1024, or 1024 x 768.

To save the settings, click the Save button. Otherwise, click the Cancel button.

To edit a device template, click on the blue Edit Template button at the top of the Devices → Settings screen. The Edit Appliance Template screen pops up. Select the desired template from the drop-down menu, then select the desired options for the Template Name, Video Quality, Video Source Opt, HID Configuration, Mouse Keyboard Timeout, EDID Settings DVI 1 and EDID Settings DVI 2 settings. Click the Save button to save your changes, or click the Cancel button to cancel the settings.

**NOTE:** The EDID of the remote display can also be copied instead of using the built-in resolutions. This can be done from the receiver menu by connecting to the transmitter and cloning the EDID.

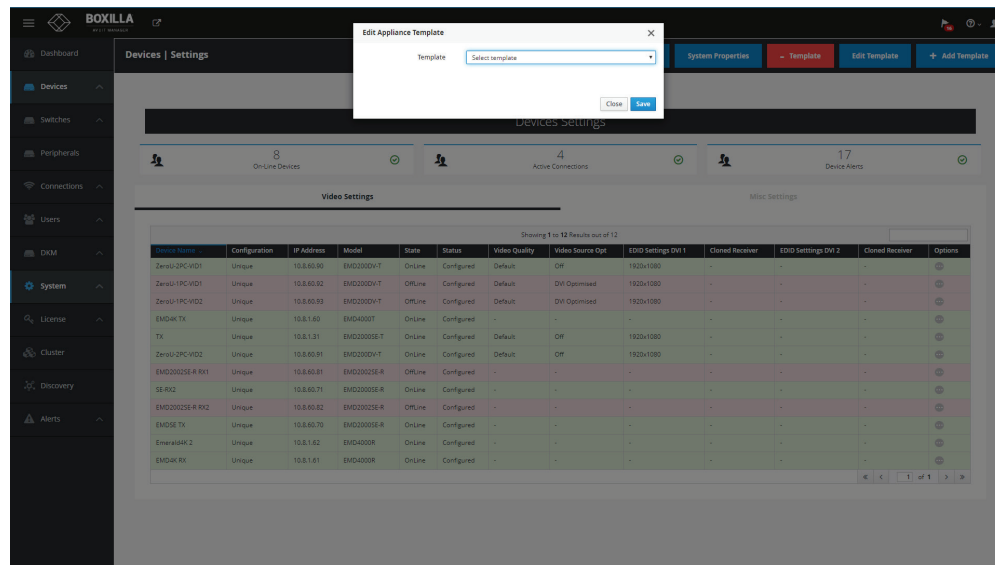


FIGURE 7-4. EDIT TEMPLATE SCREEN

To delete a device template, click on the red -Template button at the top of the Devices → Settings screen. The Delete Appliance Template screen pops up. Select the template you want to delete from the drop-down menu, then click the Delete button to delete the template, or click the Cancel button to cancel the deletion.

**NOTE:** You can only delete a template that is currently not in use.

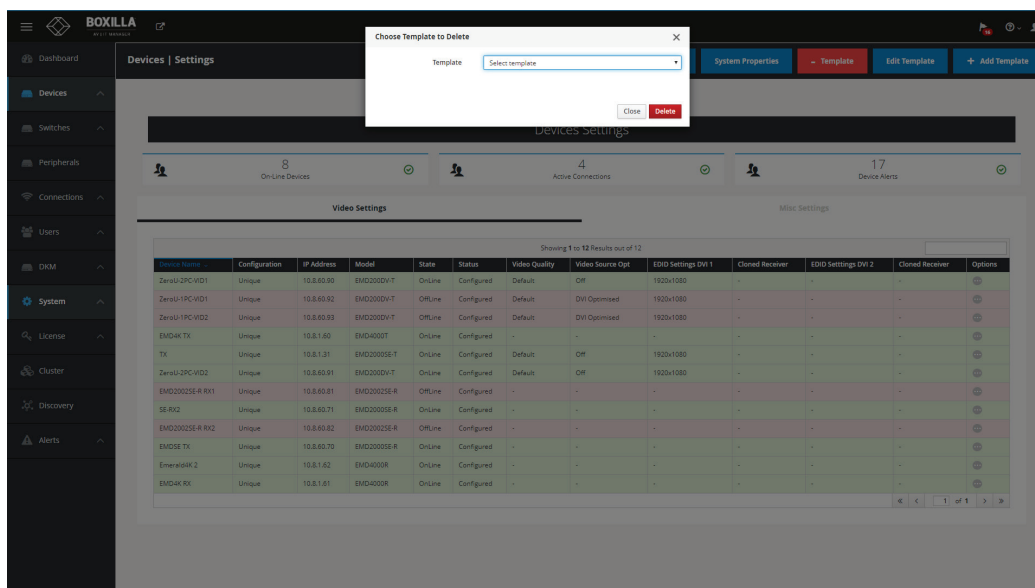


FIGURE 7-5. DELETE TEMPLATE SCREEN

## CHAPTER 7: DEVICES

### 7.1.2 EDIT SYSTEM PROPERTIES

To edit the system properties, click on the blue System Properties button at the top right of the Devices Settings screen. The System Properties Settings screen with editable options pops up. Changes can be saved or canceled.

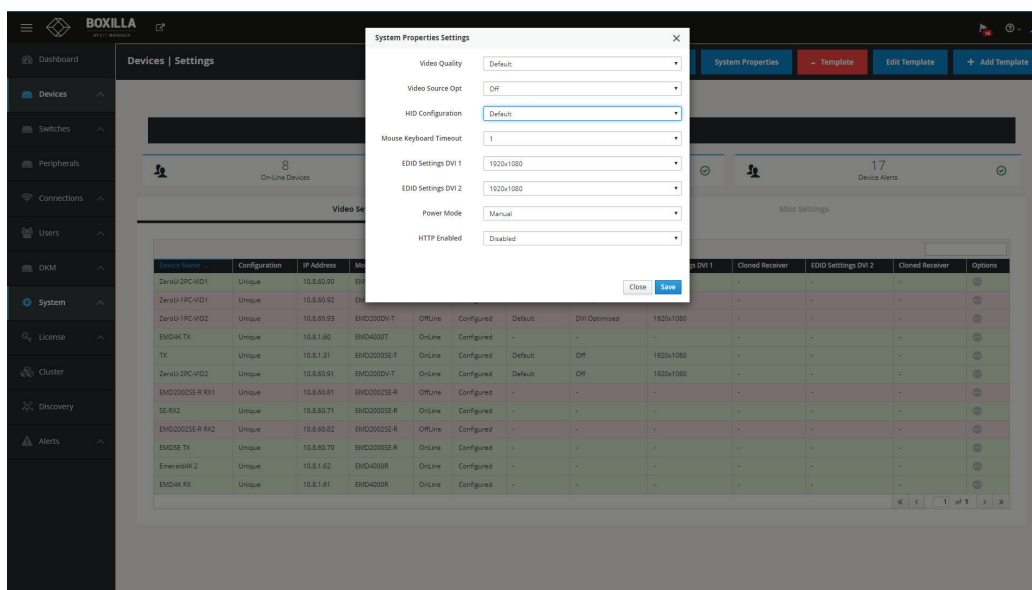


FIGURE 7-6. EDIT SYSTEM PROPERTIES SCREEN

- ♦ Video Quality: Select from these options: Best Quality, 2, Default, 4, or Best Compression.
- ♦ Video Source Opt: Select from Off, DVI Optimized, VGA - High-Performance, VGA - Optimized, VGA - Low Bandwidth (only applied in the case of a single-head transmitter).
- ♦ HID Configuration: Select from Default, Basic, MAC, Absolute, or Absolute MAC.

## CHAPTER 7: DEVICES

Absolute mouse:

This feature can be used to enable interoperability with KM switches with built-in “Glide & Switch” capability such as ServSwitchTC and Freedom. For normal usage, where mouse is directly connected to Receiver, then the Default or Basic options should be used.

If the target computers are MAC OS, you can use the Absolute MAC HID configuration for the best user experience.

OSD option:

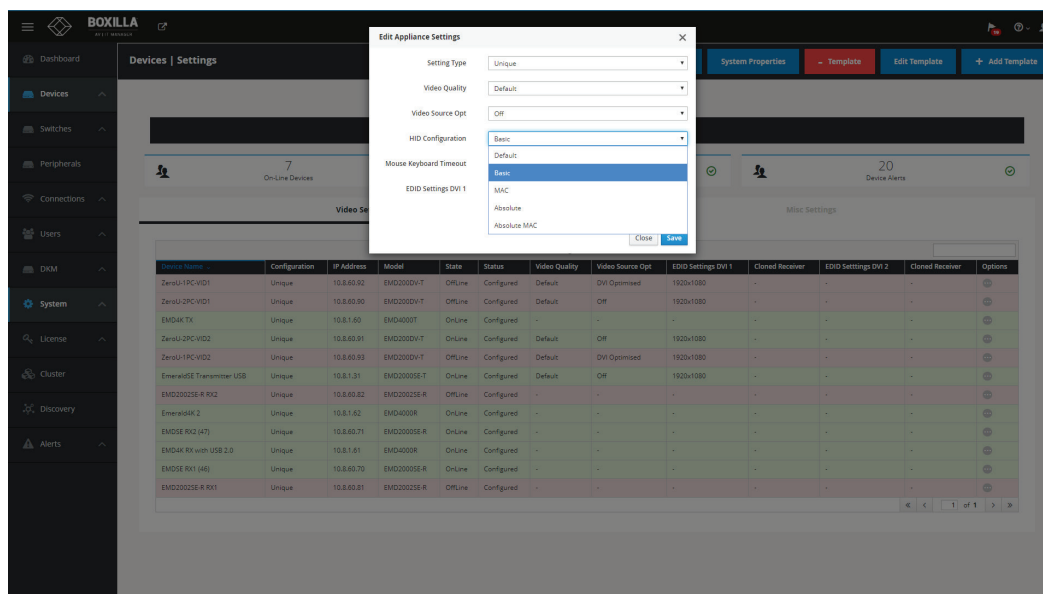


FIGURE 7-7. ABSOLUTE MOUSE SCREEN

- ◆ Mouse Keyboard Timeout: Choose an option from 0 to 5 seconds.
- ◆ EDID Settings DVI 1: Choose from 1920 x 1080, 1920 x 1200, 1680 x 1050, 1280 x 1024, or 1024 x 768.
- ◆ EDID Settings DVI 2: Choose from 1920 x 1080, 1920 x 1200, 1680 x 1050, 1280 x 1024, or 1024 x 768.
- ◆ Power Mode: Choose Manual or Auto.
- ◆ HTTP Enabled: Choose Enabled or Disabled.

To save the settings, click the Save button. Otherwise, click the Cancel button.

## 7.1.3 EDIT INDIVIDUAL DEVICE SETTINGS

To edit the individual device settings, click on the Video Settings or Misc Settings in the middle of the Devices → Network Settings screen. Then click on the Device Name that you want to edit. Select each of the settings you want to change from the drop-down boxes. Options include Setting Type, Video Quality, Video Source, HID Configuration, Mouse Keyboard Timeout, EDID Settings DVI 1 and EDID Settings DVI 2. Click Save, or click Cancel to cancel the changes without saving.

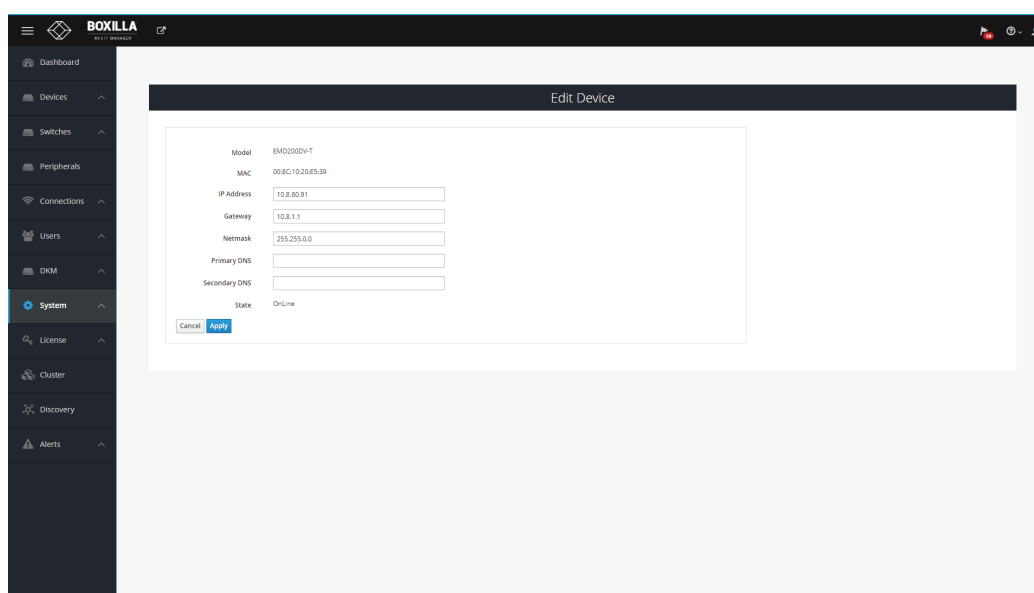


FIGURE 7-8. EDIT INDIVIDUAL DEVICE SETTINGS SCREEN

An individual device can have various operations performed on it by clicking on the “...” icon on the row for the device as shown in Figure 7-9. These are:

- ♦ Details—get summary details on the device, including its Network configuration, Operational Status, Firmware Version and Serial Number
- ♦ Ping—tests the reachability of the device on the network
- ♦ Edit Settings—Edit device settings
- ♦ Retrieve—Retrieve device settings
- ♦ Force Logout—logs out the current user attached to this unit (if any)
- ♦ UnManage— removes the device from the managed domain and restores the device back to factory defaults
- ♦ Change Device Name — allows the network settings to be changed
- ♦ Reboot—power cycles the device



**BOXILLA AV 3.17 MANAGER**

**Devices | Settings** [Bulk Update](#) [System Properties](#) [- Template](#) [Edit Template](#) [+ Add Template](#)

**Devices Settings**

7 On-Line Devices [+](#) 4 Active Connections [+](#) 20 Device Alerts [+](#)

**Video Settings** **Misc Settings**

Showing 1 to 12 Results out of 12

Device Name	Configuration	IP Address	Model	State	Status	Video Quality	Video Source Opt	EDID Settings DVI 1	Cloned Receiver	EDID Settings DVI 2	Cloned Receiver	Options
ZeroU-1PC-VID1	Unique	10.8.60.92	EMD200DV-T	OffLine	Configured	Default	DVI Optimised	1920x1080	-	-	-	⋮
ZeroU-2PC-VID1	Unique	10.8.60.90	EMD200DV-T	OffLine	Configured	Default	Off	1920x1080	-	-	-	⋮
EMD4K TX	Unique	10.8.1.60	EMD400T	OnLine	Configured	-	-	-	-	-	-	⋮
ZeroU-2PC-VID2	Unique	10.8.60.91	EMD200DV-T	OnLine	Configured	Default	Off	1920x1080	-	-	-	⋮
ZeroU-1PC-VID2	Unique	10.8.60.93	EMD200DV-T	OffLine	Configured	Default	DVI Optimised	1920x1080	-	-	-	⋮
EmeraldSE Transmitter USB	Unique	10.8.1.31	EMD2000SE-T	OnLine	Configured	Default	Off	1920x1080	-	-	-	⋮
EMD2002SE-R RX2	Unique	10.8.60.82	EMD2002SE-R	OffLine	Configured	-	-	-	-	-	-	⋮
Emerald4K 2	Unique	10.8.1.62	EMD400R	OnLine	Configured	-	-	-	-	-	-	⋮
EMD5E RX2 (47)	Unique	10.8.60.71	EMD2000SE-R	OnLine	Configured	-	-	-	-	-	-	⋮
EMD4K RX with USB 2.0	Unique	10.8.1.61	EMD400R	OnLine	Configured	-	-	-	-	-	-	⋮
EMD5E RX1 (46)	Unique	10.8.60.70	EMD2000SE-R	OnLine	Configured	-	-	-	-	-	-	⋮
EMD2002SE-R RX1	Unique	10.8.60.81	EMD2002SE-R	OffLine	Configured	-	-	-	-	-	-	⋮

Details  
Ping  
UnManage  
Edit Settings  
Retrieve  
Edit Network  
Change Device Name  
Reboot  
Force Logout

FIGURE 7-9. DEVICE OPTIONS

## CHAPTER 7: DEVICES

### 7.1.4 APPLY BULK UPDATE SETTINGS

To update the individual device settings all at once, click on the Bulk Update button in the middle of the Devices → Settings screen. From the drop-down menu, select the appliance type: Transmitter or Receiver. Click the Save button to apply the updates to all Transmitters or all Receivers, or click cancel to Cancel without saving.

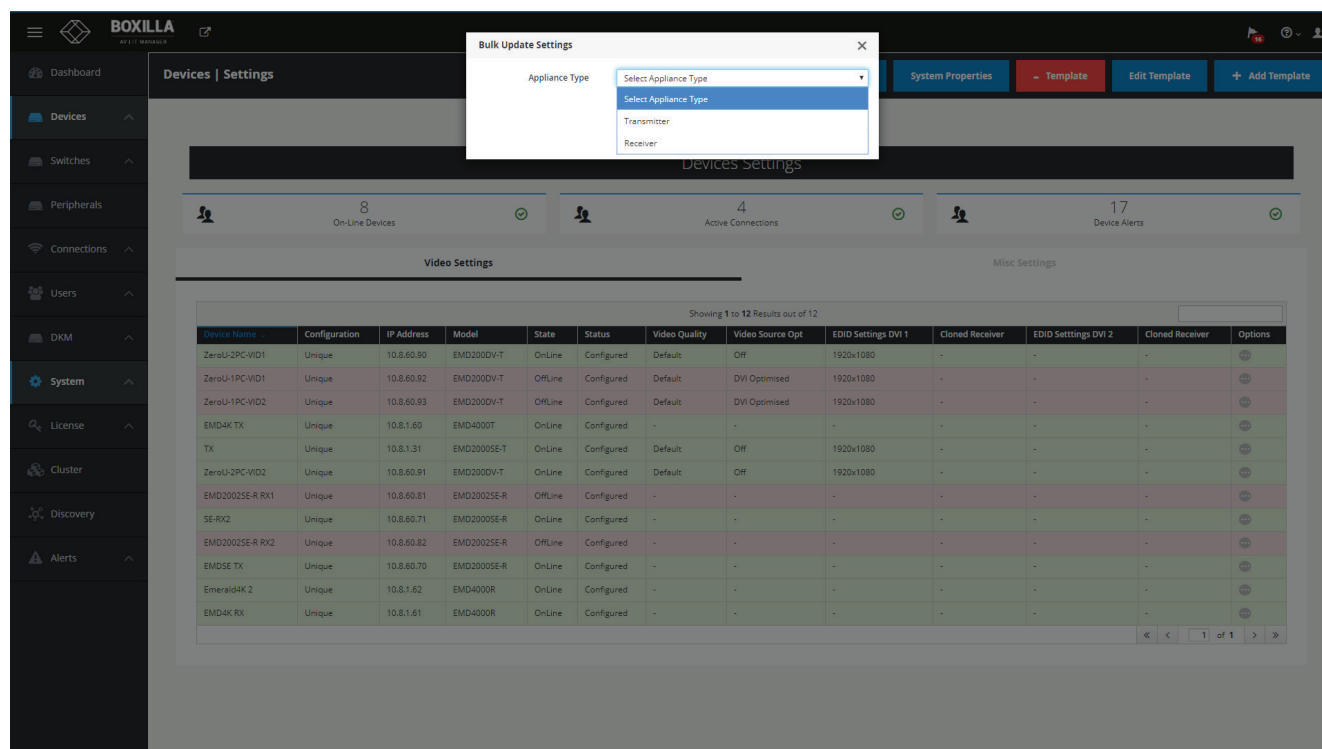


FIGURE 7-10. BULK UPDATE SETTINGS SCREEN

## 7.2 DEVICES—UPGRADE

Boxilla centrally upgrades devices that are part of its managed domain. The administrator performs this via the Devices— Upgrade page shown in Figure 7-11.

### 7.2.1 DEVICES— UPGRADE—RELEASES

The Releases tab shows the list of available versions of firmware that can be used to upgrade devices. The administration selects the firmware to be used for upgrades. To select a specific firmware release, click the “Activate” button for the specific version of firmware from the Release options (“...” icon). For Emerald or InvisaPC, this needs to be done for both Receivers (DTX-R, EMD4K-R, or EMDSE-R) and Transmitters (DTX-T, EMD4K-T, EMDSE-T, or EMDDV-T).

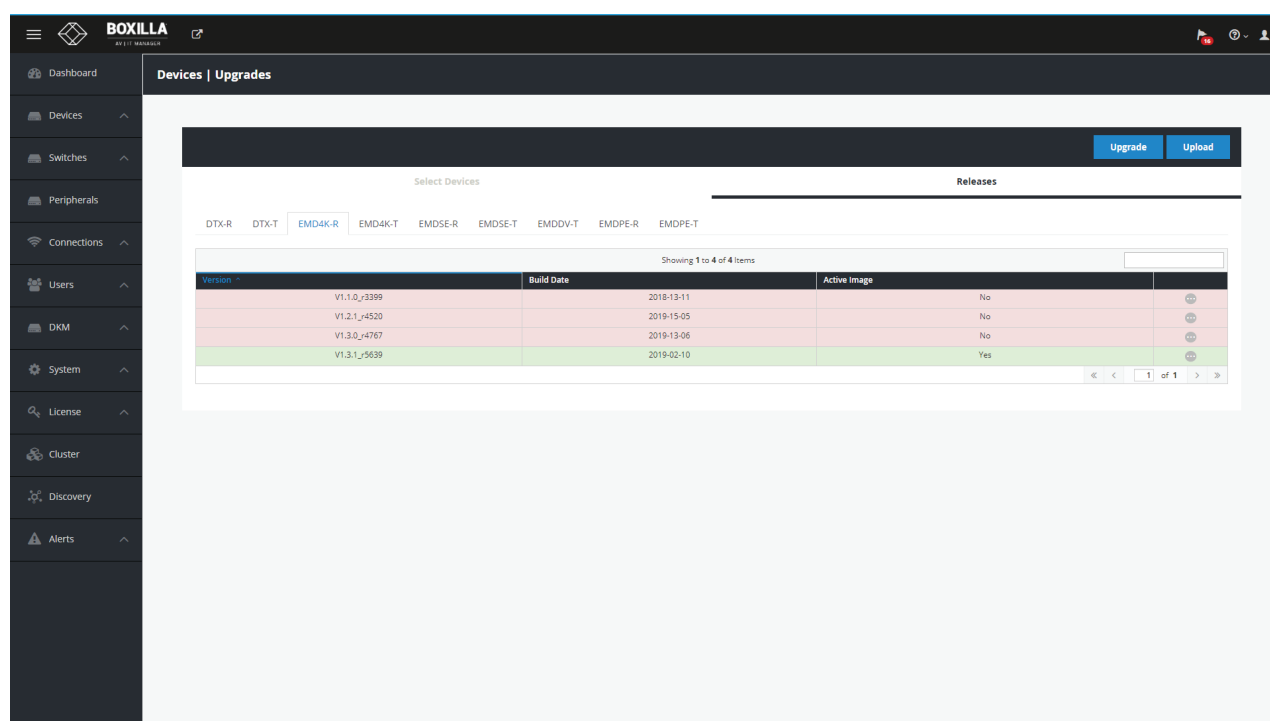


FIGURE 7-11. DEVICE UPGRADE PAGE

The Administrator loads a new version of firmware by clicking on the “Upload” button on the page and choosing the file to be uploaded. The upload file can be stored anywhere the client browser can access (on local hard-drive, USB thumb-drive, a network file, etc.). This new firmware version will be added to appropriate Device list (i.e. Receiver or Transmitter list).

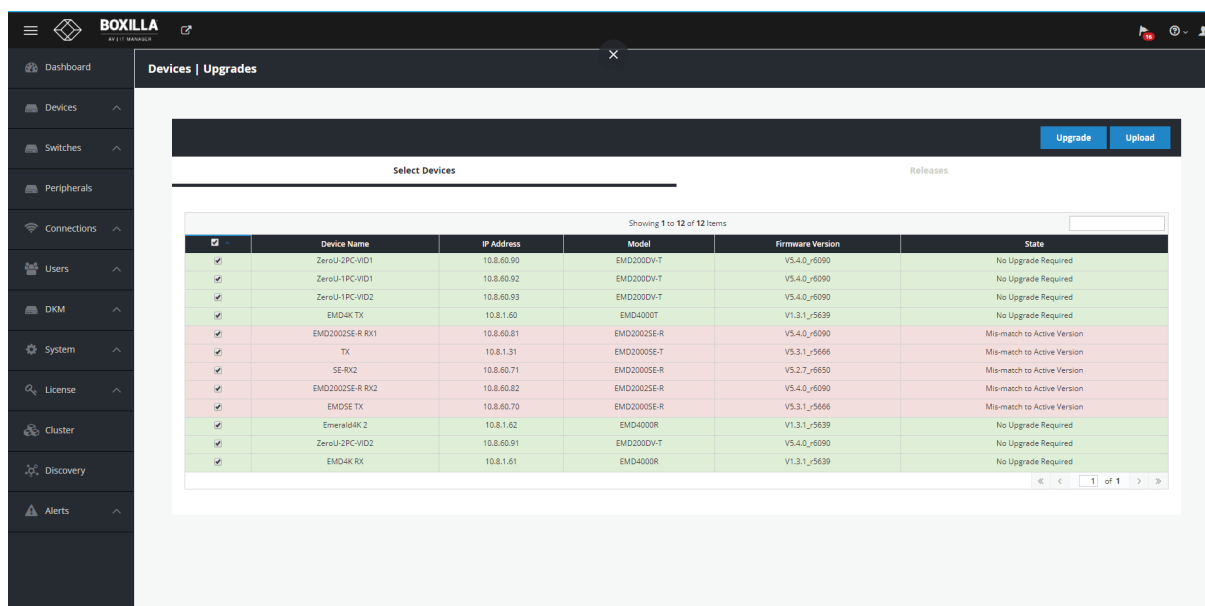
To delete a firmware version, the administrator just needs to click on the “delete” option for that release.

## CHAPTER 7: DEVICES

### 7.2.2 DEVICES— UPGRADE—SELECT DEVICES

The administrator needs to select devices to be upgraded to the active firmware versions. The “Select Devices” tab provides a table of all managed devices and allows the administrator to define devices to be upgraded.

The State column shows which devices do not match the active firmware version selected—by showing “Mis-match to Active Firmware Version.” Devices with firmware that match the active firmware version selection will show a “No Upgrade Required” state. The “Idle” state refers to devices that have recently been managed, where no version information has been retrieved from the devices for upgrade purposes.



	Device Name	IP Address	Model	Firmware Version	State
<input checked="" type="checkbox"/>	Zerou-2PC-VID1	10.8.60.90	EMD200DV-T	V5.4.0_6090	No Upgrade Required
<input checked="" type="checkbox"/>	Zerou-1PC-VID1	10.8.60.92	EMD200DV-T	V5.4.0_6090	No Upgrade Required
<input checked="" type="checkbox"/>	Zerou-1PC-VID2	10.8.60.93	EMD200DV-T	V5.4.0_6090	No Upgrade Required
<input checked="" type="checkbox"/>	EMD4K TX	10.8.1.60	EMD400T	V1.3.1_5639	No Upgrade Required
<input checked="" type="checkbox"/>	EMD2002SE-R RX1	10.8.60.81	EMD2002SE-R	V5.4.0_6090	Mis-match to Active Version
<input checked="" type="checkbox"/>	TX	10.8.1.31	EMD2002SE-T	V5.3.1_5666	Mis-match to Active Version
<input checked="" type="checkbox"/>	SE-RX2	10.8.60.71	EMD2002SE-R	V5.2.7_6650	Mis-match to Active Version
<input checked="" type="checkbox"/>	EMD2002SE-R RX2	10.8.60.82	EMD2002SE-R	V5.4.0_6090	Mis-match to Active Version
<input checked="" type="checkbox"/>	EMDSE TX	10.8.60.70	EMD2002SE-R	V5.3.1_5666	Mis-match to Active Version
<input checked="" type="checkbox"/>	Emerald4K 2	10.8.1.62	EMD400R	V1.3.1_5639	No Upgrade Required
<input checked="" type="checkbox"/>	Zerou-2PC-VID2	10.8.60.91	EMD200DV-T	V5.4.0_6090	No Upgrade Required
<input checked="" type="checkbox"/>	EMD4K RX	10.8.1.61	EMD400R	V1.3.1_5639	No Upgrade Required

FIGURE 7-12. DEVICE UPGRADE SELECTION

Once the administrator has selected devices to be upgraded (typically all devices that mis-match the active firmware version), the administrator clicks the Upgrade button on the page to initiate the upgrade. All devices can be selected by clicking the tick-box on the top of the column.

The Upgrade button is clicked to initiate the upgrade of all selected devices. Devices that match the “active” firmware version will return “No Upgrade Required” and no upgrade will take place. The rest of the selected devices will be upgraded with various “states” of upgrade being communicated to the administrator during the upgrade process.

**NOTE:** We recommend that the administrator not move to a different page once starting an upgrade to allow the upgrade process to be monitored. If the administrator does change to a different page, the upgrade will continue in the background. What is mandatory is that Boxilla and devices being upgraded stay powered up.

## CHAPTER 7: DEVICES

### 7.3 DEVICES—GLOBAL

Boxilla controls global configuration settings for the managed domain. These are settings that apply across all devices in the same way. The administrator changes the parameters to the desired settings and clicks apply to have the changes take effect. This is done on the Devices—Settings page as shown in Figure 7-13. The admin changes the settings and then clicks “Apply.” Changes only take effect when “Apply” is clicked. The properties that can be changed are described in the following sections.

The Emerald or InvisaPC devices only pick up the changes to the settings when a user logs in to the device. To ensure global settings are changed on all units at the same time, the Administrator should log out all Users.

FIGURE 7-13. DEVICE SETTINGS—CONFIGURATION SETTINGS

#### 7.3.1 HOTKEY

The hotkey is used with the “o” key to terminate the current connection and bring up the OSD on an Emerald or InvisaPC Receiver. The hotkey with “p” key is used to switch to the previous connection without loading the OSD.

The default hotkey is Print-Screen (PrntScrn). The alternatives are shown in the table below.

TABLE 7-1. HOTKEY SEQUENCES

SEQUENCE	DESCRIPTION
Print Screen (Default)	press Prnt Scrn key
Ctrl + Ctrl	press Ctrl key twice within 1 second
Alt + Alt	press Alt key twice within 1 second
Shift + Shift	press Shift key twice within 1 second
Mouse-Left + Right	press mouse left and right buttons at the same time for 2 seconds

## CHAPTER 7: DEVICES

Open OSD: "Hotkey" O

Switch to previous target: "Hotkey" P

The "Functional Hot-Key" is used to enable or disable the use of function keys after the hot-key. When the Functional Hot-key is disabled, only the Hot-Key is required to bring up the OSD on an Emerald or InvisaPC Receiver. This means only CTRL-CTRL needed to bring up OSD if CTRL-CTRL selected as hot-key rather than CTRL-CTRL-O when Functional Hot-Key is enabled. It also means the "Hotkey" P, switch to previous target, is no longer enabled.

The Enable Function key is set by default.

### 7.3.2 RDP CONNECTION RESOLUTION

---

This defines the resolution to be requested from the Server when a connection is defined to be to a virtual machine. The actual resolution that the connection actually uses will depend on the Server configuration (see Microsoft documentation).

### 7.3.3 TIMER SETTINGS

---

There are two timer settings available. By default they are turned off. The Administrator clicks enable to turn them on and set the timer value required. The two timer settings are:

1. OSD Inactivity Timer—This sets a limit on how long a user can be logged on to the Emerald or InvisaPC OSD without any keyboard or mouse activity. Once the user reaches the inactivity timer limit, the user will be logged out of the OSD.
2. Connection Inactivity Timer—This sets a limit on how long a user can be connected to a source (Transmitter) without any keyboard or mouse activity. Once the session reaches the inactivity timer limit, the user will be logged out of the connection and return to the OSD on Emerald or InvisaPC.

NOTE: Inactivity occurs when the mouse or keyboard is not pressed or moved for a set period of time.

### 7.3.4 RDP BROKER SETTINGS

---

There are two types of Broker types—Connection Broker Server and Web Access Server. The default is none, which means the system uses a connection broker. The Broker type is used to validate the User Credentials (username and password) and determine where the user will be connected to.

The Connection Broker type causes the User Credentials to be sent to the specified Connection Broker. If accepted, then the broker will return the IP address of a local VM from the pool, and this is the IP address used for a connection from the Emerald or InvisaPC Receiver.

NOTE: We currently do not cater for hostnames, so use the IP of the connection broker server.

When "Connection Broker Server" type is selected, the following settings should be set by the Administrator:

1. Enter in the domain name as defined on the local network.
2. Enter in your load balance address as defined in the local server configured, e.g. tsv://VMResource.1.Win7Pool.

The "Web Access Server" setting is used to allow access to a local copy of Active Domain server. If this setting is configured correctly, then if a user who is not configured in the local database attempts to login, the device will redirect the username and password to the local active directory installation and validate the user credentials.

## CHAPTER 7: DEVICES

If the user is validated, the Active Directory Server will return a valid VM pool-name to the device. The device sends this pool-name information to the Connection Broker which then allocates a Virtual Machine to the User provided a VM is available.

The following settings need to be set when “Web Access Server” is selected as Broker Connection Type:

1. The Web Access Address should be the login page of the local RD Web Access Server using its IP address, e.g. <https://192.168.10.7/RDWeb/Pages/en-US/login.aspx>.

NOTE: We currently do not cater for hostnames in the web address, so please use the IP of the Web Access server. You must place the full address in the login page of the RD Web Access server ([https://\\*\\*\\*\\*\\*.apxsx](https://*****.apxsx)).

2. Enter the local Connection Broker IP address.
3. Enter the local domain name.

On the Emerald or InvisaPC Receiver, when the user attempts to log in, the login will now take the following steps in this order:

1. The login credentials are checked to see if the user is configured locally on the Receiver. If the user exists, they will be logged in as normal. If not, then step two will occur. If Broker Connection Type is set to “None,” the Emerald or InvisaPC Receiver at login will only attempt to authenticate the user locally. This is the default setting.
2. If the Broker Connection Type is set to “Web Access Server,” the Receiver will attempt to launch a connection to an RD Web Access server. This will allow the user to be Authenticated against the Domain Controller (Active Directory), allowing the user to access Virtual Desktop Pools and Personal Virtual desktops.

### 7.4 DEVICES—STATISTICS

The Device Statistics page provides an overview of the operation of the managed domain as shown in Figure 7-14. It provides an overview of the device on-line and off-line (not contactable). Then a table of devices is displayed showing what user is logged in to what device, when they logged in and how long they were logged in.

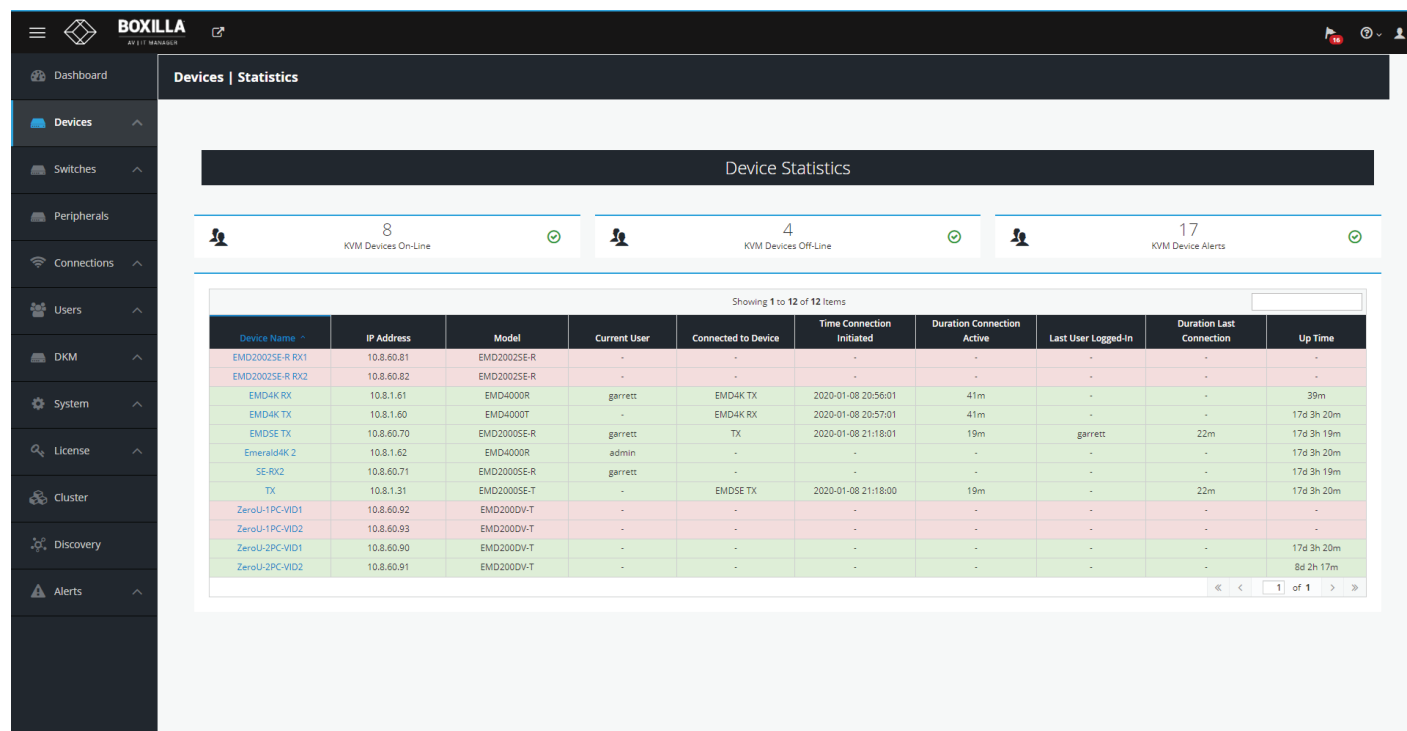


FIGURE 7-14. DEVICE STATISTICS

## CHAPTER 8: SWITCHES

### 8.1 SWITCHES

The “Switches” menu has two subheadings:

- Status
- Upgrades

These all link to individual pages.

The status page initially shows a list of all the Black Box branded switches in the KVM Network. Clicking on a particular switch brings you to a page displaying all the ports of that particular switch. This page also allows you perform certain actions on the switch as detailed below.

Black Box offers the following IP Network Switches:

- 48-Port 1G IP Network Switch (EMS1G-48)
- 12-Port 10G IP Network Switch (EMS10G-12)
- 28-Port 10G IP Network Switch (EMS10G-28)
- 32-Port 100G IP Network Switch (EMS100G-32)

The Upgrades page is similar to the InvisaPC/Emerald Upgrade page. This shows a list of all the Black Box branded switches in the KVM network plus their current firmware version. If there is a mismatch to the activated firmware release, this is flagged. You can also upload a release from this page. NOTE: Uploading a release takes about 15 minutes to reboot.

#### 8.1.1 STATUS PAGE - SWITCH VIEW

The status page when clicked shows a list of the active switches in the KVM network. This has three summary info cards on the top of the screen that detail the number of switches currently online managed by Boxilla, how many ports have a cable connected and are active, and how many alerts are across the whole Boxilla system relating to switches. In the table, we display the Switch Name, Switch Status, Model, IP Address, how many ports online per switch, whether or not Shared Mode is enabled, the bandwidth in and out figures/graph, the number of alerts on that switch and an option menu. The switch names will be hyperlinks that take you to another page where you get a drill-down of the ports on that switch.

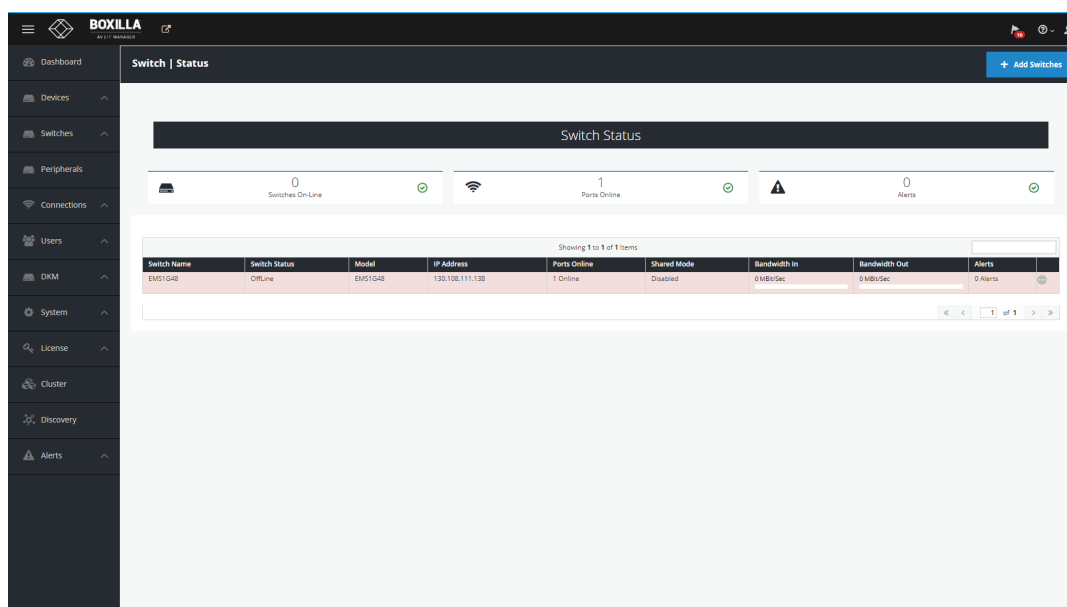


FIGURE 8-1. SWITCH STATUS SCREEN



## 8.1.2 ADDING A SWITCH

There are two ways you can add a switch to be managed. You can automatically discover it by clicking on the Discovery tab in the main menu, or you can click on the + Switch button on the top of the switch status page to add it manually into the Boxilla system.

### AUTOMATIC DISCOVERY

Click on the Discovery tab from the main menu. A screen showing the Automatic Discovery tab appears. On this screen an UnManaged switch appears shaded in pink and a managed switch appears in green.

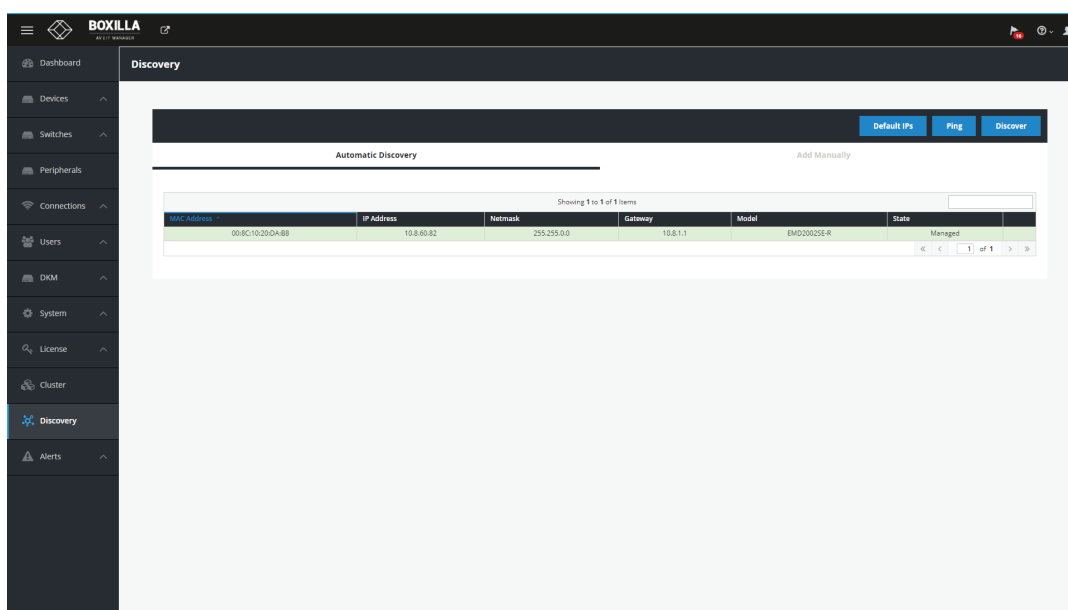


FIGURE 8-2. AUTOMATIC DISCOVERY TAB

Click on the ellipsis “...” icon and the drop-down menu to Edit or Manage the switch.

If you select Edit, the Edit Device screen appears.

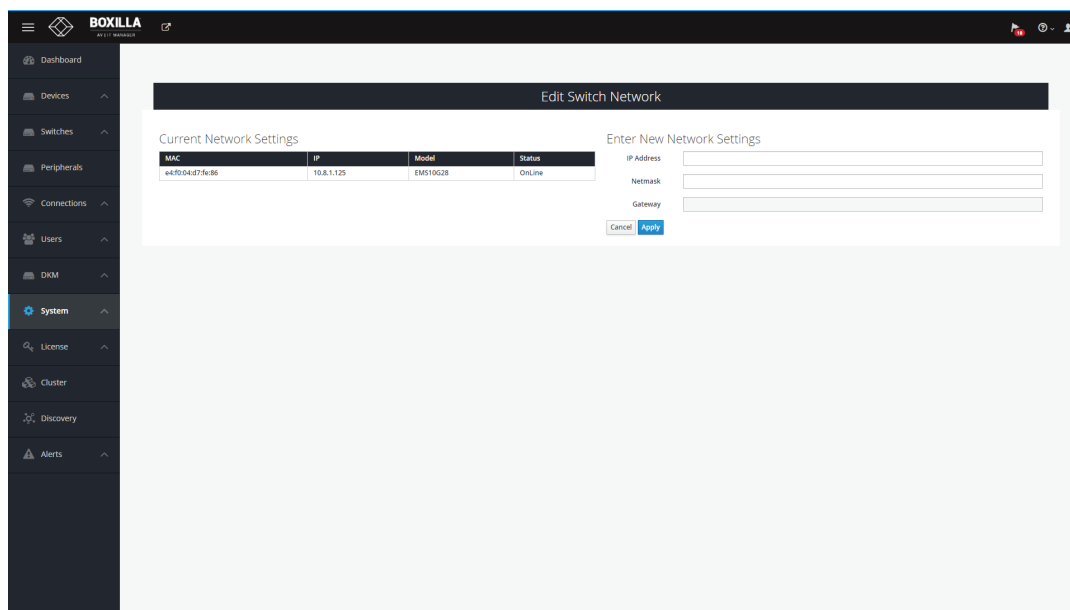


FIGURE 8-4. EDIT DEVICE SCREEN

Enter the IP address and net mask.

Click on Apply to confirm the changes or Cancel to cancel the changes.

When you click on Apply, a popup box tells you that editing network settings will reboot the device.

NOTE: The switch takes about 5 minutes to reboot.

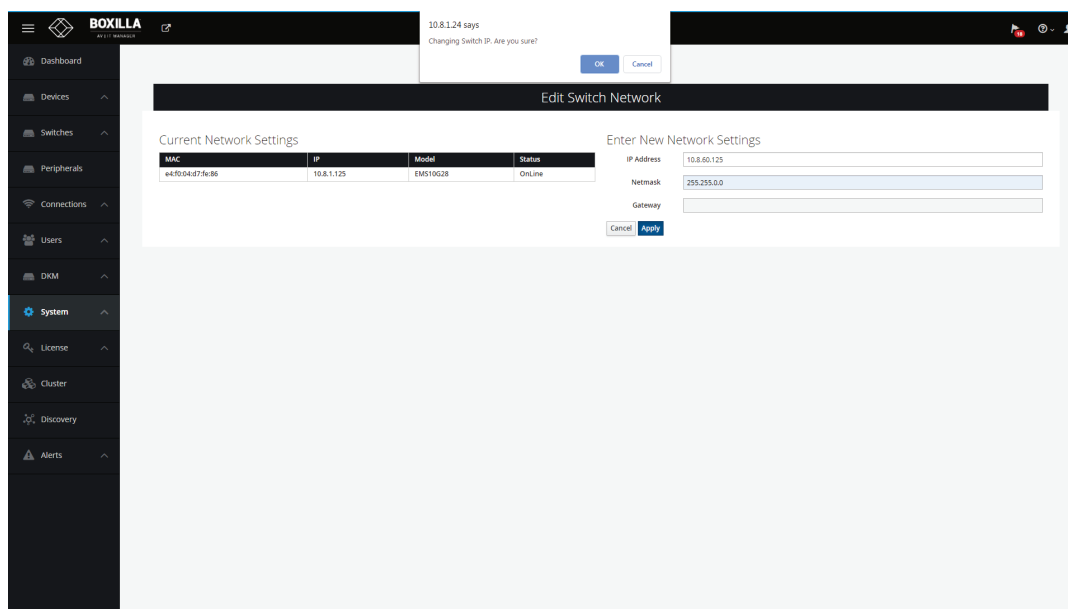


FIGURE 8-5. CONFIRM CHANGES ON DEVICE

## Manage

If you select Manage, the Manage Device screen appears.

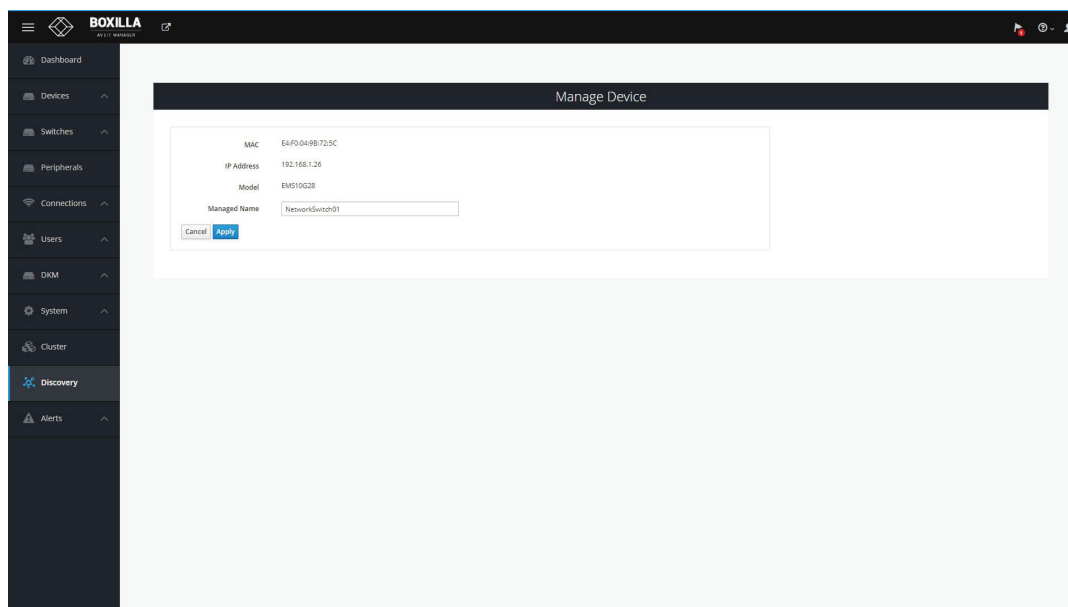


FIGURE 8-6. MANAGE DEVICE SCREEN

Enter the Managed Name and click on Apply.

A popup box asks: Are you sure you want to manage this device?

Click on OK.

## CHAPTER 8: SWITCHES

### ADDING A SWITCH VIA THE +SWITCH BUTTON

Clicking the blue “+ Switch” button on the top right corner of the Switch status page pops up a modal window with the following editing options for the details of the switch to be added:

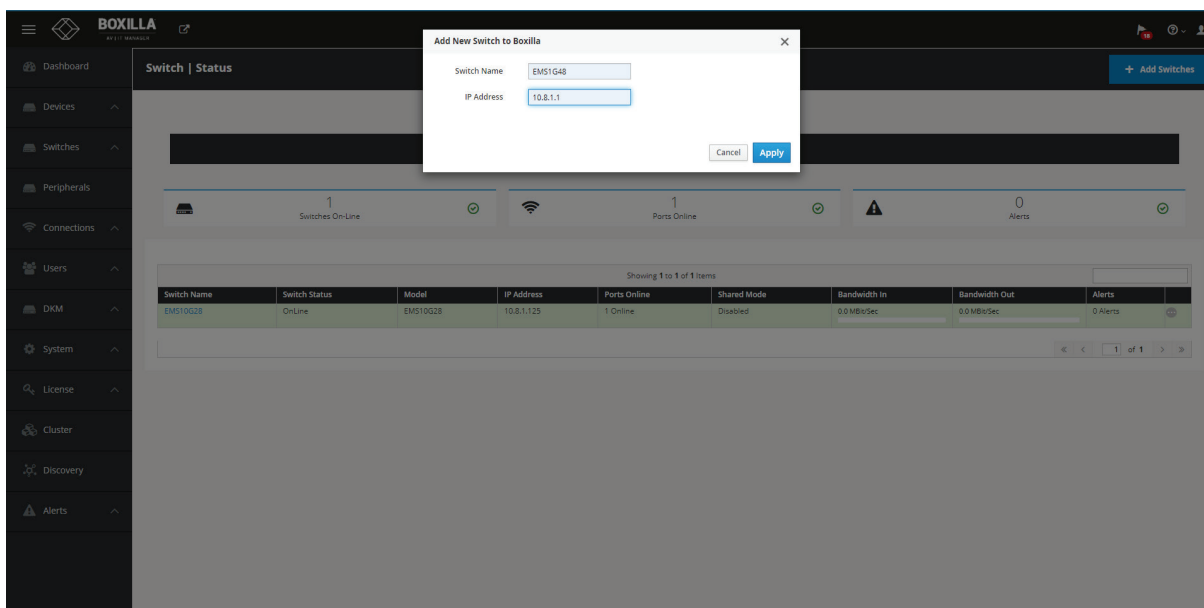


FIGURE 8-7. ADD NEW SWITCH TO THE BOXILLA SCREEN

Clicking “Apply” adds the switch into the table on the status page. As part of the manage process, we first ensure that it is a Black Box switch by studying the bbx.info file to ensure it has the correct data. You then query the switch and get the port information and switch properties and populate our database with the new information. You also copy our domain token to the switch so the switch is then managed by that Boxilla.

#### Switch Actions/Options menu

Clicking the “options” ellipsis button on the right-hand side of each switch row will give you a drop-down with some options. These are as below:

- Details: This retrieves details about the switch. Example display below.

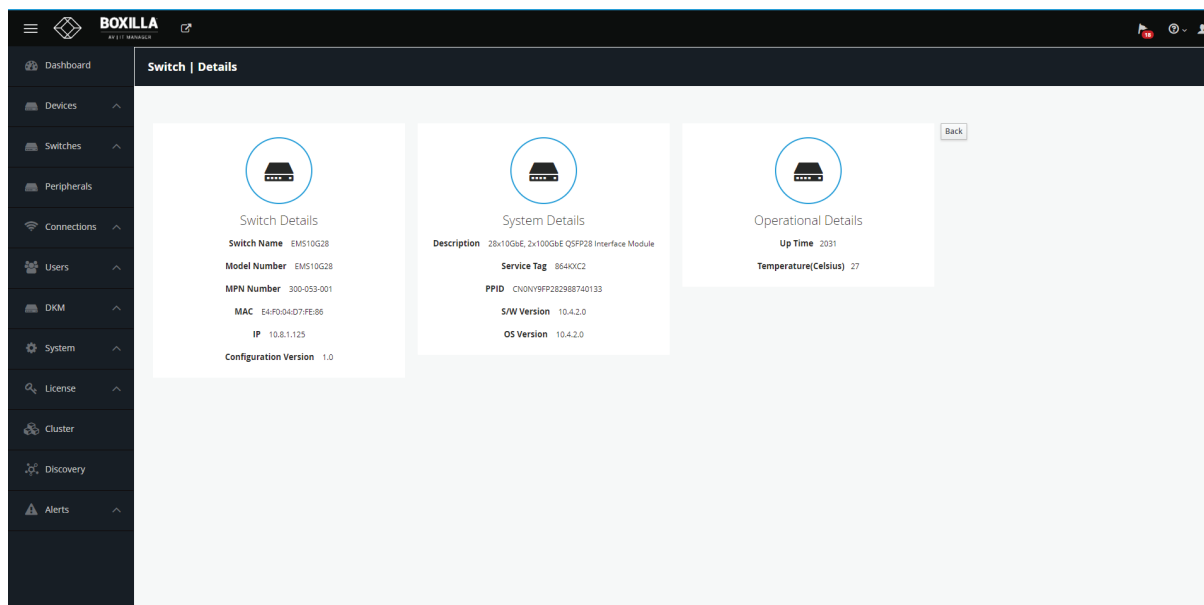


FIGURE 8-8. SWITCH ACTIONS/OPTIONS MENU

- ♦ Ping: This pings the management port of the network switch to verify it is powered up and connected.
- ♦ Enable/Disable Shared Mode: If you enable shared mode, Boxilla creates VLAN 1003, Boxilla moves all ports into that VLAN and globally enables IGMP Snooping on the switch. Shared analog audio is enabled when shared mode is enabled. When disabling shared mode, Boxilla disables IGMP Snooping and removes VLAN 1003 which moves all ports back into VLAN 1. This functionality is automatically completed once the Enable/Disable Share Mode option is selected. By enabling Shared Mode, Boxilla performs these operations in the background automatically.
- ♦ Change Name: Change the name of the switch in the Boxilla database. This also renames all alerts to the new name.
- ♦ Edit Network: This allows the user to change the IP address of the switch.
- ♦ Reboot: Reboot the switch.
- ♦ Unmanage: This disables IGMP Snooping, MRouter details and the custom VLAN 1003 and moves all ports back to VLAN 1 and then deletes the switch from our database. It also removes the domain token from the switch. If you lose communication with the switch but still wish to unmanage it, you have the option to locally unmanage. Unmanaging also sets the switch in a factory default state. If you wish to keep the switch settings but remove it from Boxilla, you will need to disconnect the network switch first completely from the setup and then in Boxilla you can Unmanage it.

## PING SWITCH

To ping this switch, click on the ellipsis “...” icon and a drop-down menu appears.

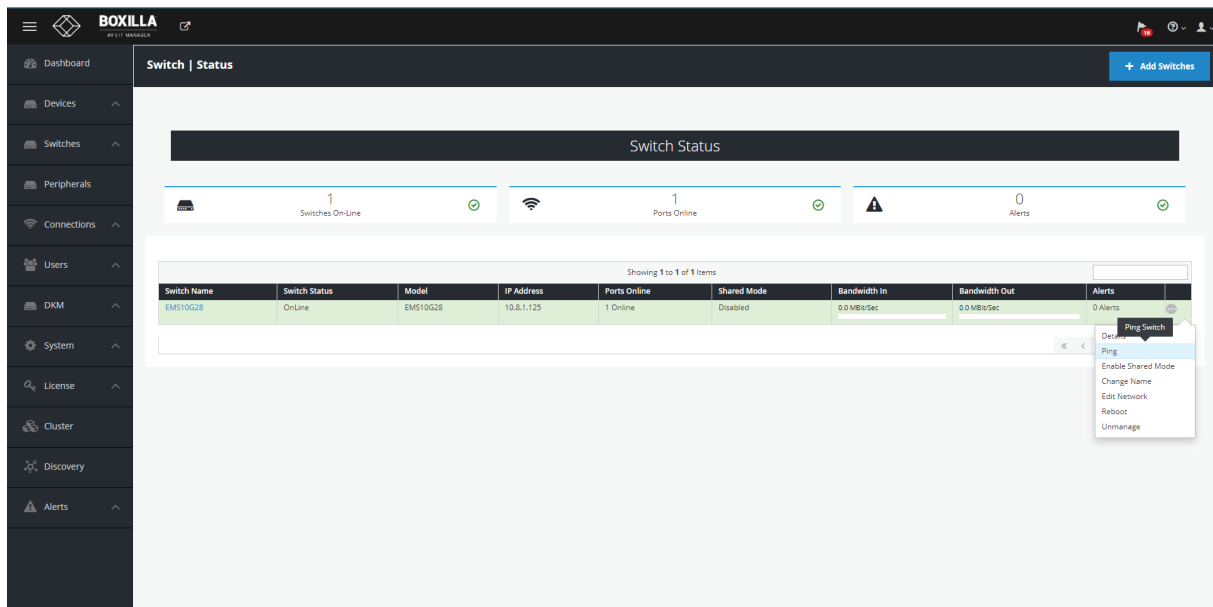


FIGURE 8-9. PING SWITCH

Select ping and the following confirmation screen appears.

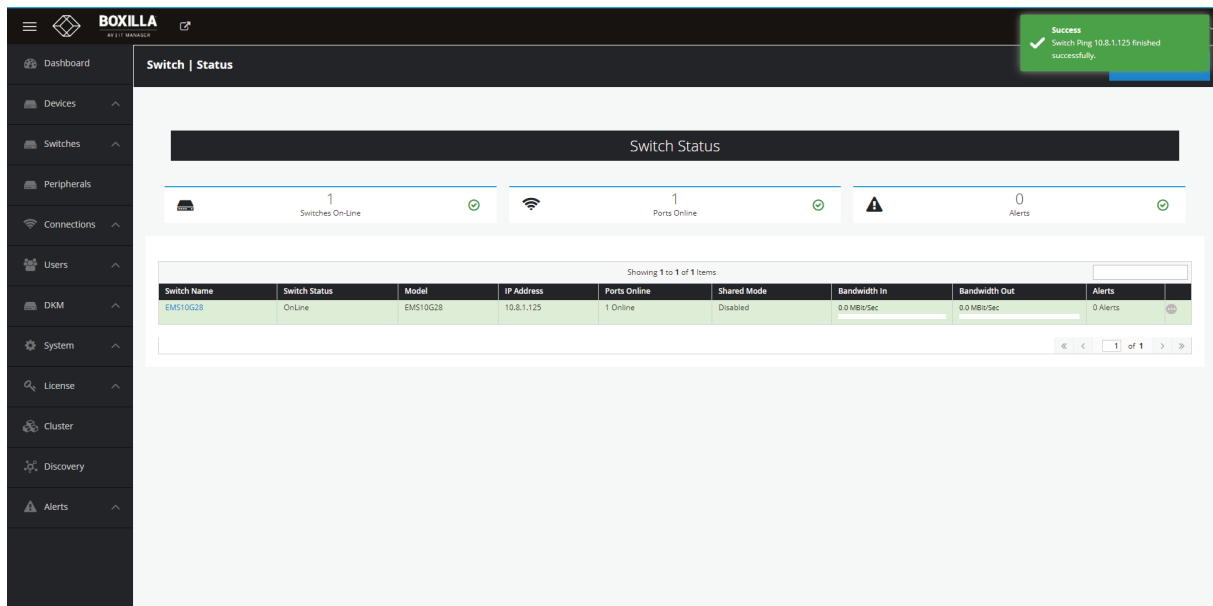


FIGURE 8-10. PING CONFIRMATION

## CHAPTER 8: SWITCHES

### EDIT NETWORK

To Edit the Switch Network switch, click on the ellipsis “...” icon and a drop-down menu appears.

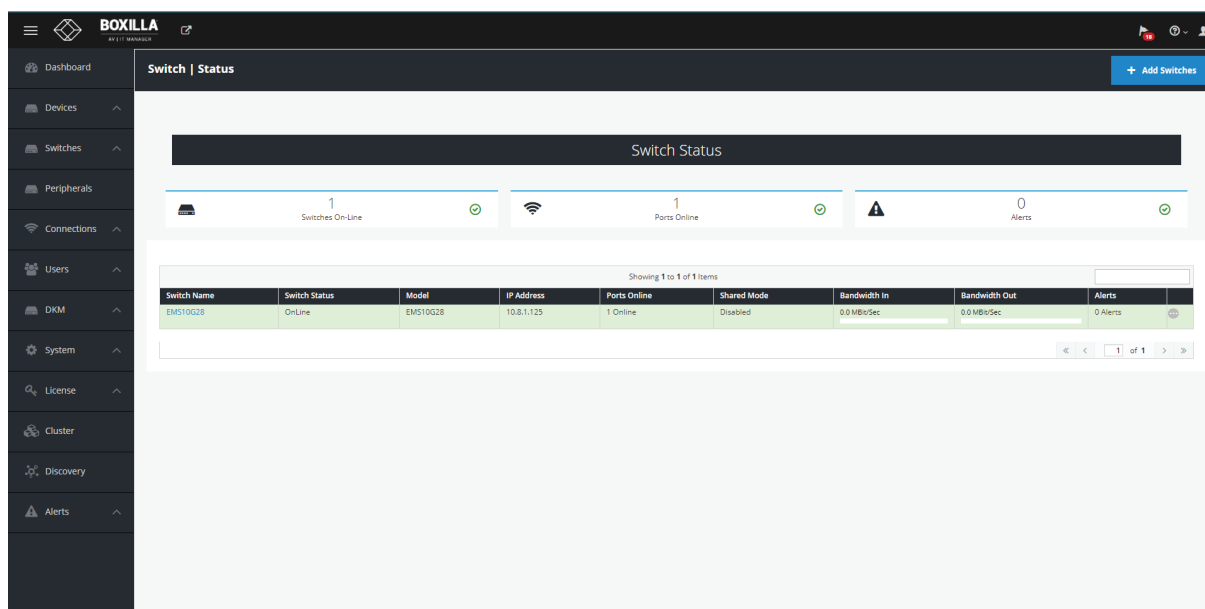


FIGURE 8-11. SWITCH VIEW STATUS

Click on the Edit Network option.

The Edit Switch Network screen appears.

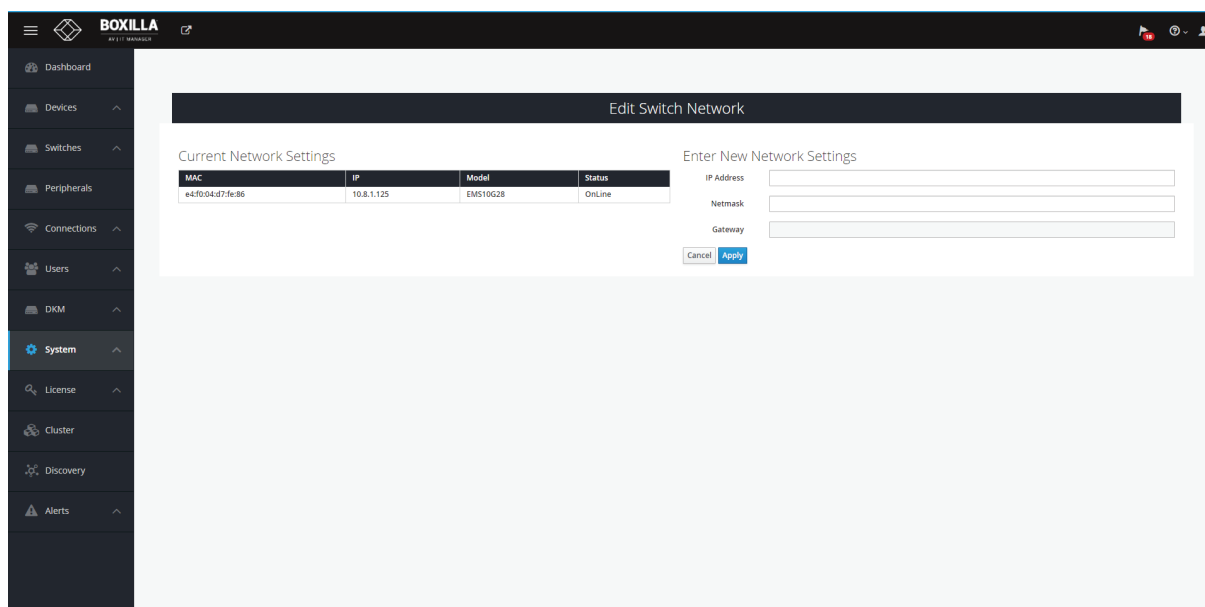


FIGURE 8-12. EDIT SWITCH NETWORK SCREEN

The screen shows the current network settings and has fields where you can type in the new network settings. Enter the IP Address and Netmask.

Click Apply to save your changes.

The following popup box appears.

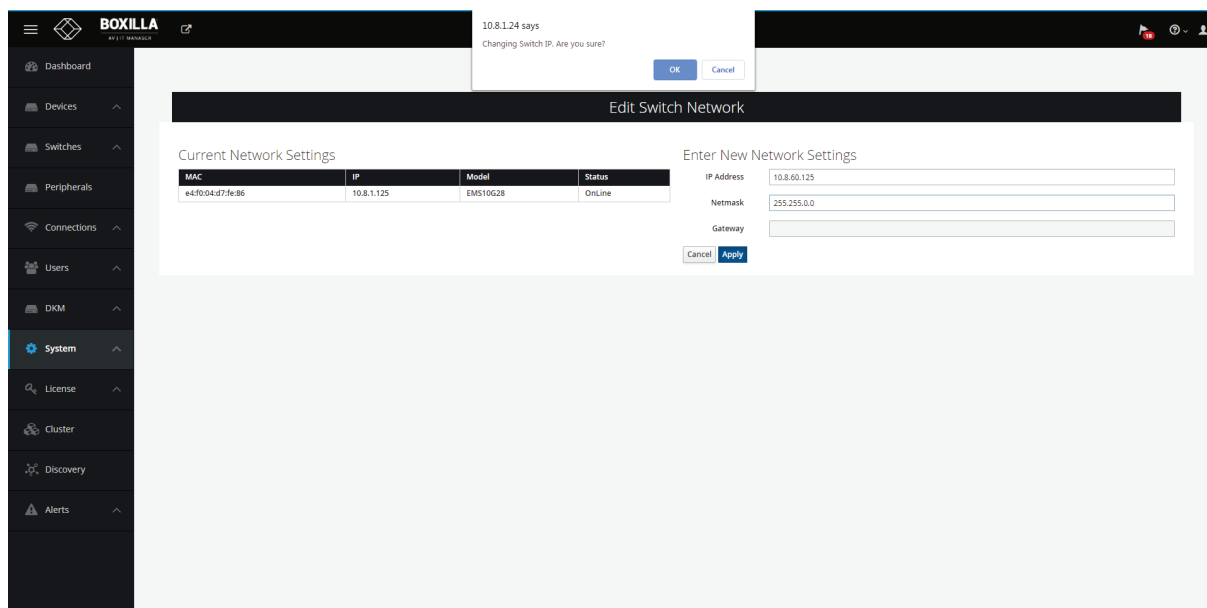


FIGURE 8-13. CONFIRM CHANGES ON DEVICE

Click OK to confirm your changes. The switch takes about 5 minutes to reboot.



## UPDATE SWITCH

To update the network switch, see the screen below.

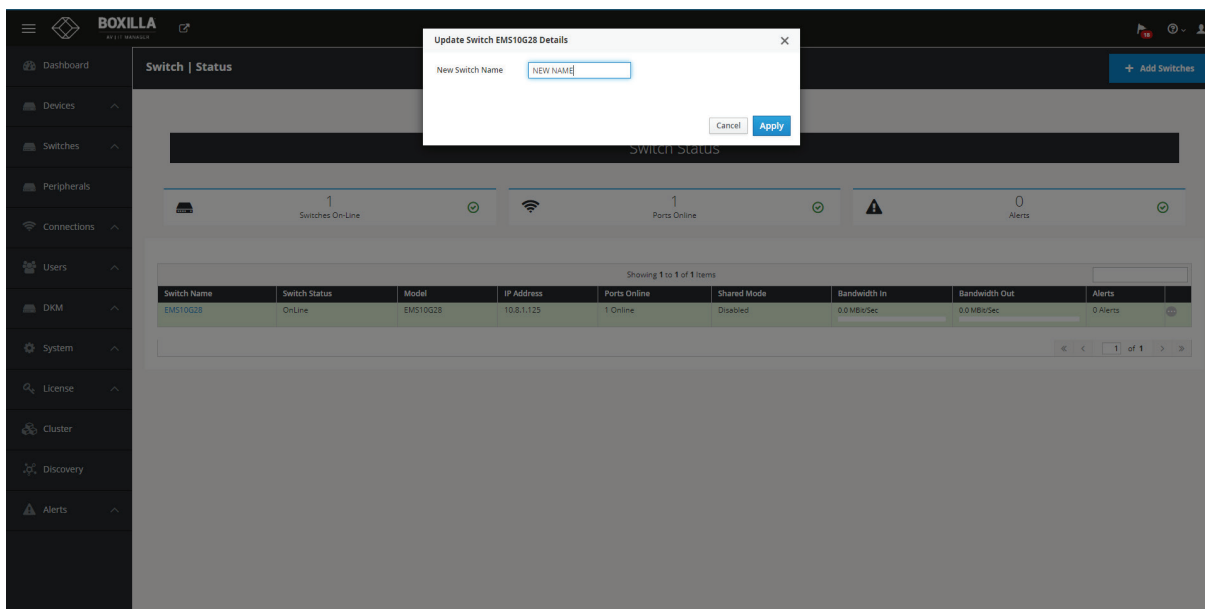


FIGURE 8-14. UPDATE NETWORK SWITCH

Type in the new switch name and click Apply.

## SHARED MODE

To enable Shared mode on a switch from the Switch Status screen, click on Enable Shared Mode from the drop-down menu. Shared analog audio is enabled when shared mode is enabled.

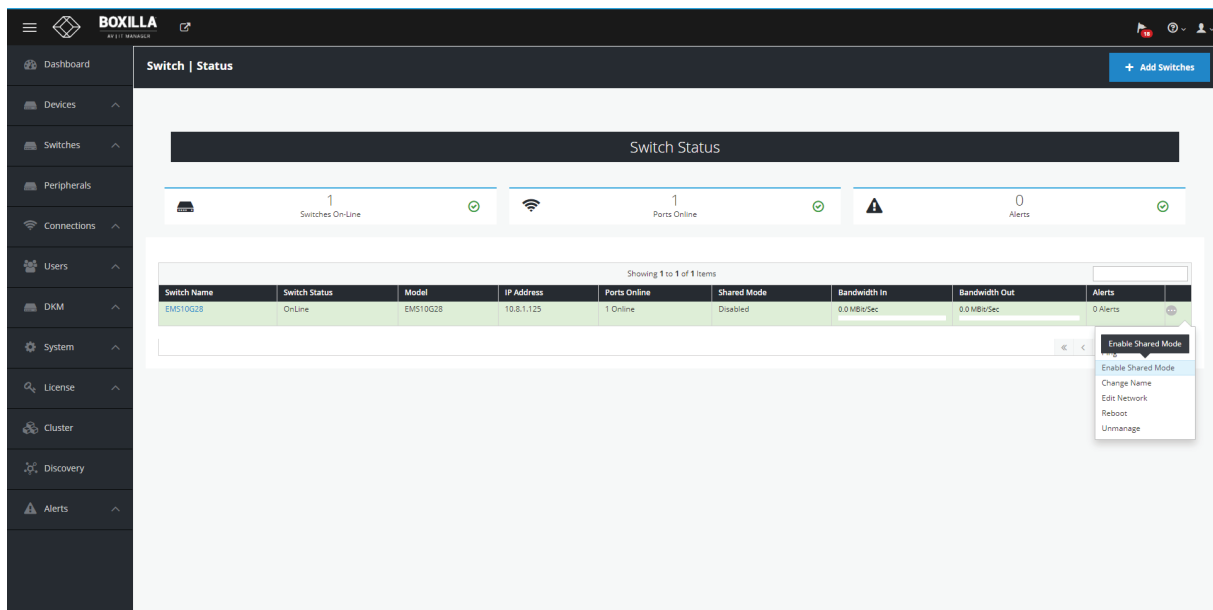


FIGURE 8-15. ENABLE SHARED MODE

The set of operations are performed automatically once the option has been selected.

## CHAPTER 8: SWITCHES

### 8.1.3 STATUS PAGE - PORTS VIEW

Once you click a switch name, you are presented with a table view of all the ports on that particular switch. This shows some summary information of that port similar to the active connection table today. This table tells you the following:

- ♦ PortName
- ♦ The status of the switch. Green means it's online. Grey means it's offline. Red means it's disabled.
- ♦ The Media type as reported by the Black Box Switch.
- ♦ The Bandwidth In and Out (integer and bar chart)
- ♦ Packets In and Out (integer and bar chart)
- ♦ Line Usage in and Out (integer and chart)
- ♦ Port Errors
- ♦ Port Options
  - Enable/Disable Port
  - Enable MRouter

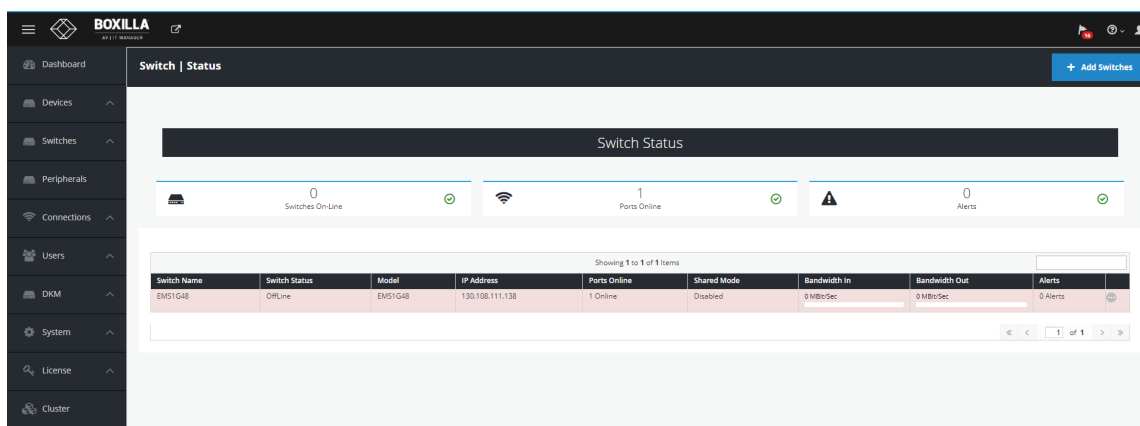


FIGURE 8-16. SWITCH STATUS PORTS VIEW

This information is polled every minute and the page updates on the next page refresh.

## CHAPTER 8: SWITCHES

### PORT OPTIONS—ENABLE/DISABLE PORTS

To get to the Ports screen, click on a switch. A list of ports in the system appears.

Port Name	Status	Charts	MRouter	Line Speed	Media	Bandwidth In (Mbps)	Bandwidth Out (Mbps)	Packets In (/Second)	Packets Out (/Second)	Line Usage In (%)	Line Usage Out (%)	Errors
ethernet1/1/1				10GIGE	AR_POPTICS_NOTPRESENT	0.0	0.0	0	0	0.0	0.0	0
ethernet1/1/2				10GIGE	AR_POPTICS_NOTPRESENT	0.0	0.0	0	0	0.0	0.0	0
ethernet1/1/3				10GIGE	AR_POPTICS_NOTPRESENT	0.0	0.0	0	0	0.0	0.0	0
ethernet1/1/4				10GIGE	AR_POPTICS_NOTPRESENT	0.0	0.0	0	0	0.0	0.0	0
ethernet1/1/5				10GIGE	AR_POPTICS_NOTPRESENT	0.0	0.0	0	0	0.0	0.0	0
ethernet1/1/6				10GIGE	AR_POPTICS_NOTPRESENT	0.0	0.0	0	0	0.0	0.0	0
ethernet1/1/7				10GIGE	AR_POPTICS_NOTPRESENT	0.0	0.0	0	0	0.0	0.0	0
ethernet1/1/8				10GIGE	AR_POPTICS_NOTPRESENT	0.0	0.0	0	0	0.0	0.0	0
ethernet1/1/9				10GIGE	AR_POPTICS_NOTPRESENT	0.0	0.0	0	0	0.0	0.0	0
ethernet1/1/10				10GIGE	AR_POPTICS_NOTPRESENT	0.0	0.0	0	0	0.0	0.0	0
ethernet1/1/11				10GIGE	AR_POPTICS_NOTPRESENT	0.0	0.0	0	0	0.0	0.0	0
ethernet1/1/12				10GIGE	AR_POPTICS_NOTPRESENT	0.0	0.0	0	0	0.0	0.0	0
ethernet1/1/13				10GIGE	AR_POPTICS_NOTPRESENT	0.0	0.0	0	0	0.0	0.0	0
ethernet1/1/14				10GIGE	AR_POPTICS_NOTPRESENT	0.0	0.0	0	0	0.0	0.0	0

FIGURE 8-17. PORTS CONFIGURATION OVERVIEW

Click on the ellipsis “...” icon and a drop-down menu appears.

Port Name	Status	Charts	MRouter	Line Speed	Media	Bandwidth In (Mbps)	Bandwidth Out (Mbps)	Packets In (/Second)	Packets Out (/Second)	Line Usage In (%)	Line Usage Out (%)	Errors
ethernet1/1/1				10GIGE	AR_POPTICS_NOTPRESENT	0.0	0.0	0	0	0.0	0.0	0
ethernet1/1/2				10GIGE	AR_POPTICS_NOTPRESENT	0.0	0.0	0	0	0.0	0.0	0
ethernet1/1/3				10GIGE	AR_POPTICS_NOTPRESENT	0.0	0.0	0	0	0.0	0.0	0
ethernet1/1/4				10GIGE	AR_POPTICS_NOTPRESENT	0.0	0.0	0	0	0.0	0.0	0
ethernet1/1/5				10GIGE	AR_POPTICS_NOTPRESENT	0.0	0.0	0	0	0.0	0.0	0
ethernet1/1/6				10GIGE	AR_POPTICS_NOTPRESENT	0.0	0.0	0	0	0.0	0.0	0
ethernet1/1/7				10GIGE	AR_POPTICS_NOTPRESENT	0.0	0.0	0	0	0.0	0.0	0
ethernet1/1/8				10GIGE	AR_POPTICS_NOTPRESENT	0.0	0.0	0	0	0.0	0.0	0
ethernet1/1/9				10GIGE	AR_POPTICS_NOTPRESENT	0.0	0.0	0	0	0.0	0.0	0
ethernet1/1/10				10GIGE	AR_POPTICS_NOTPRESENT	0.0	0.0	0	0	0.0	0.0	0
ethernet1/1/11				10GIGE	AR_POPTICS_NOTPRESENT	0.0	0.0	0	0	0.0	0.0	0

FIGURE 8-18. PORT OPTIONS

## CHAPTER 8: SWITCHES

NEED HELP?  
LEAVE THE TECH TO US

**LIVE 24/7  
TECHNICAL  
SUPPORT**

**1.877.877.2269**

The drop-down menu has two options: Disable Port and Enable MRouter.

If you click on Disable Port, the relevant port is disabled and you get a confirmation screen.

To enable a port again, click on the ellipsis “...” icon next to a port that has status red in the following screen.

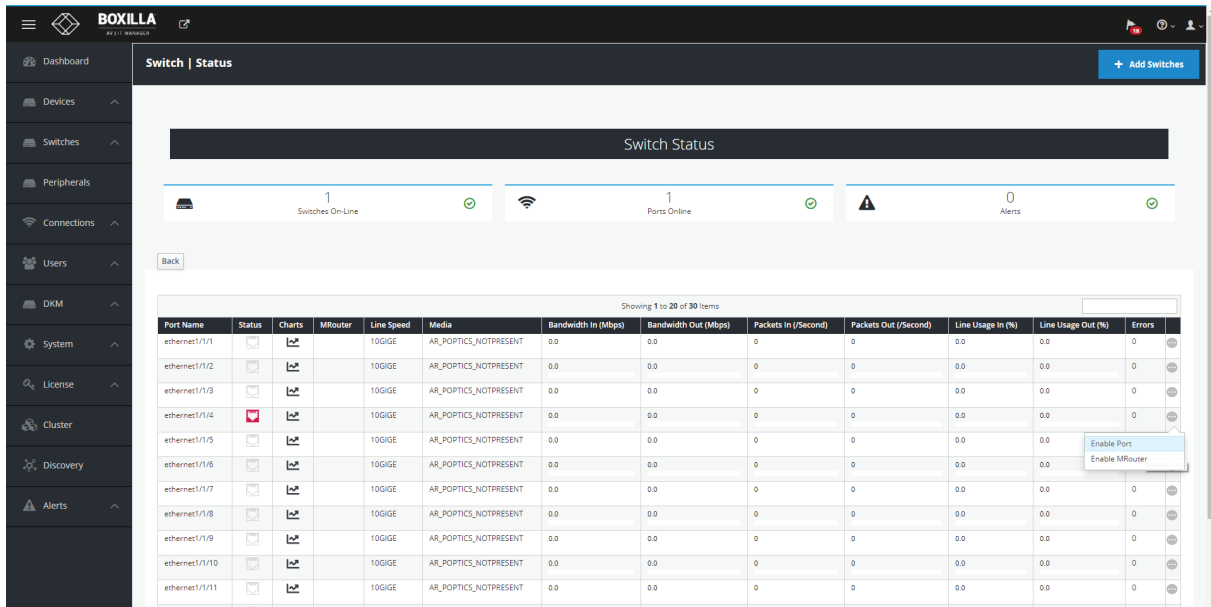


FIGURE 8-19. ENABLE PORT AGAIN

A drop-down menu appears. This menu has two options: Enable Port and Enable MRouter.

If you click on Enable Port, the following screen appears. Click on this option to enable the port.

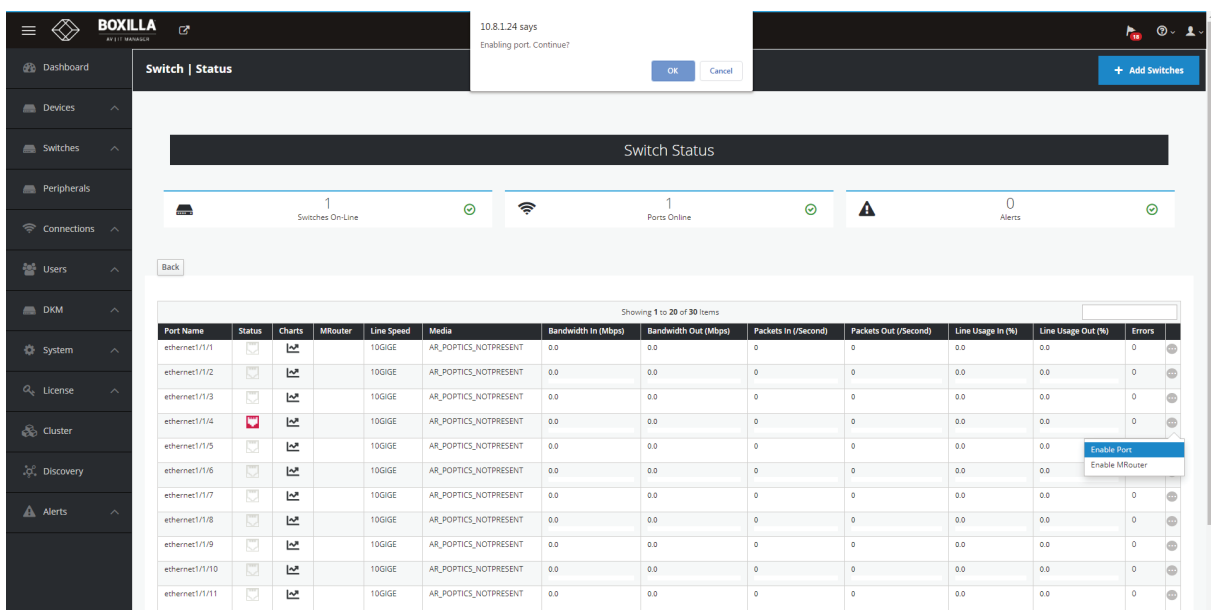


FIGURE 8-20. ENABLE PORT CONFIRM

## CHAPTER 8: SWITCHES

### MROUTER

When you select MRouter it goes to the switch and issues the MRouter command. You only want one port to be the MRouter at any time on the switch, so any time the user selects an MRouter, you remove the current MRouter and select the new one.

If you click on Enable MRouter, the popup shown next appears. Click on this option then OK to confirm.

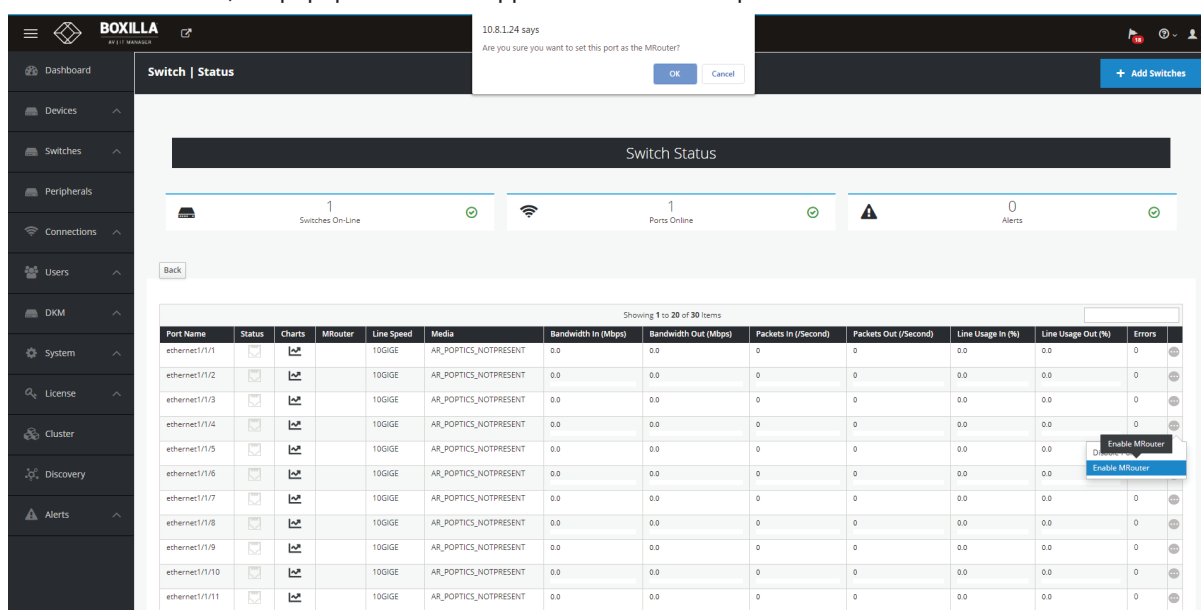


FIGURE 8-21. ENABLE MROUTER

## 8.2 SWITCHES - UPGRADES

The upgrades page is similar to the appliance upgrades page. It lists the switches currently in the database and also indicates “active release” in the database. Any switch that does not match this release is highlighted in red. You can then select multiple switches and upgrade them in parallel. The upgrade state changes dynamically as the switch goes through different stages of the upgrade process. It transfers the file to the switch, upgrades the switch, then reboots and verifies the upgrade. If all is successful, the switch is now be highlighted in green. If there has been an error, the switch row is highlighted in red with the error state displaying. NOTE: The switch takes about 15 minutes to upgrade and restart.

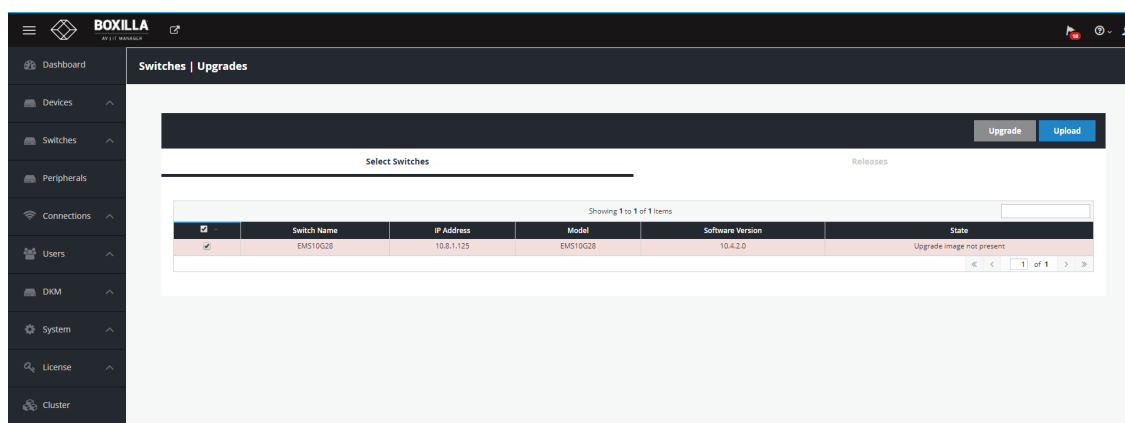


FIGURE 8-22. SWITCH UPGRADES PAGE

## CHAPTER 8: SWITCHES

### Activate Release

Click on the Releases tab, then click on the drop-down menu item and Activate the release.

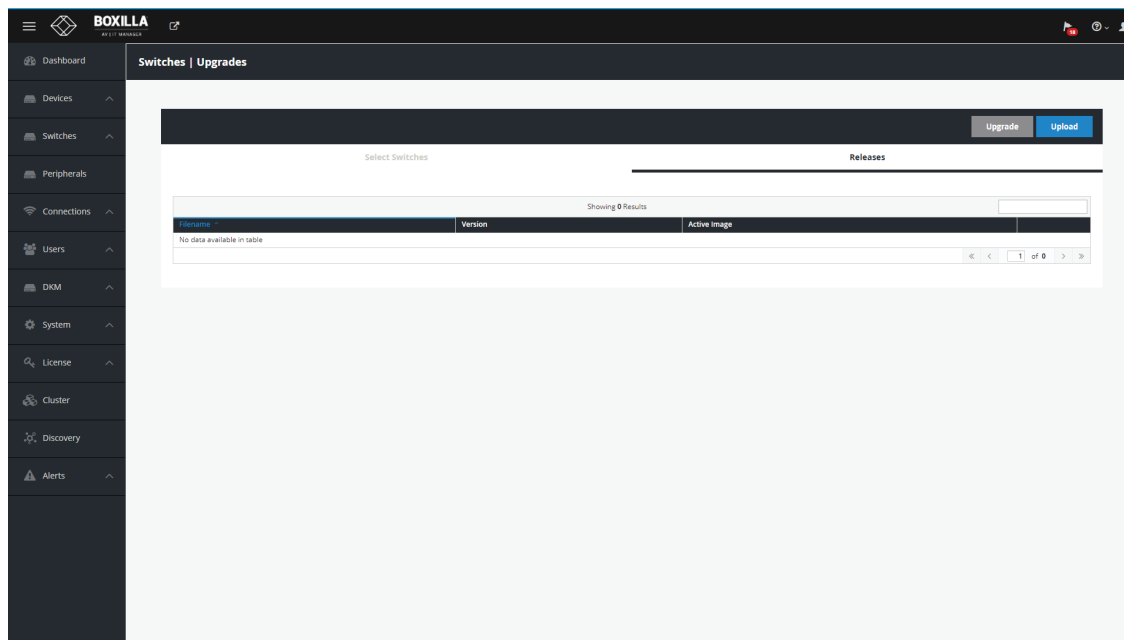


FIGURE 8-23. ACTIVATE RELEASE

You can also delete this release.

### Upload Release

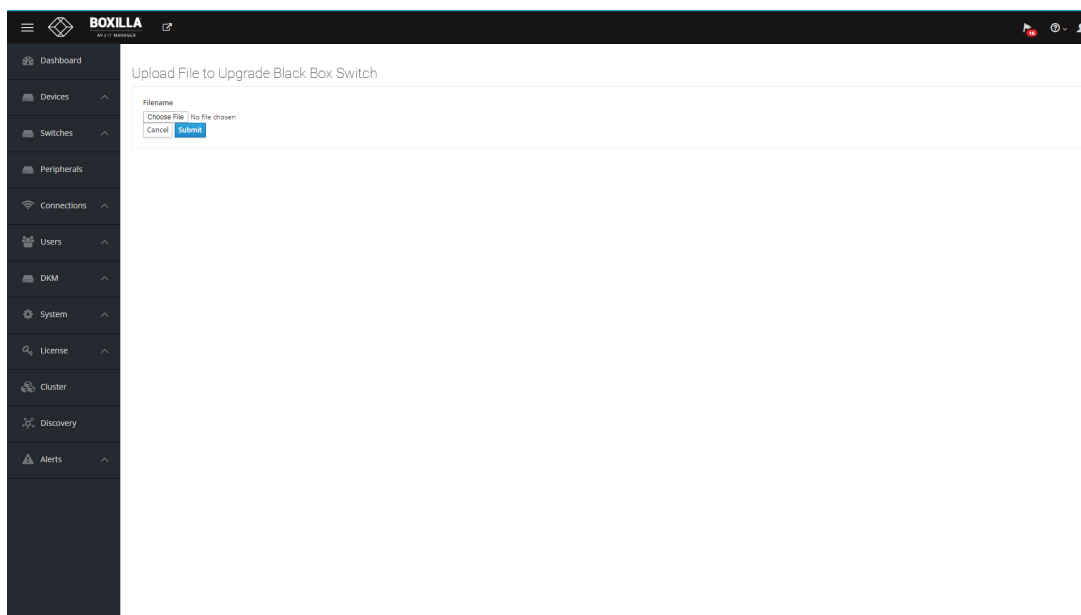


FIGURE 8-24. UPLOAD RELEASE

To support external USB switching that can handle speeds up to 480 Mbps (USB High Speed), additional USB hubs can be bonded with the Emerald technology. To configure the USB Hub bonding, the Boxilla will need to be part of the application.

Connect the USB 2.0 Transmitters and Receivers to the Emerald/Boxilla network. In Boxilla, the administrator can navigate to the “Peripherals” tab and discover the USB 2.0 Transmitters and Receivers. The EMD100USB extenders are the only USB 2.0 devices that are supported for Boxilla bonding.

## 9.1 PERIPHERALS - DISCOVERY TAB

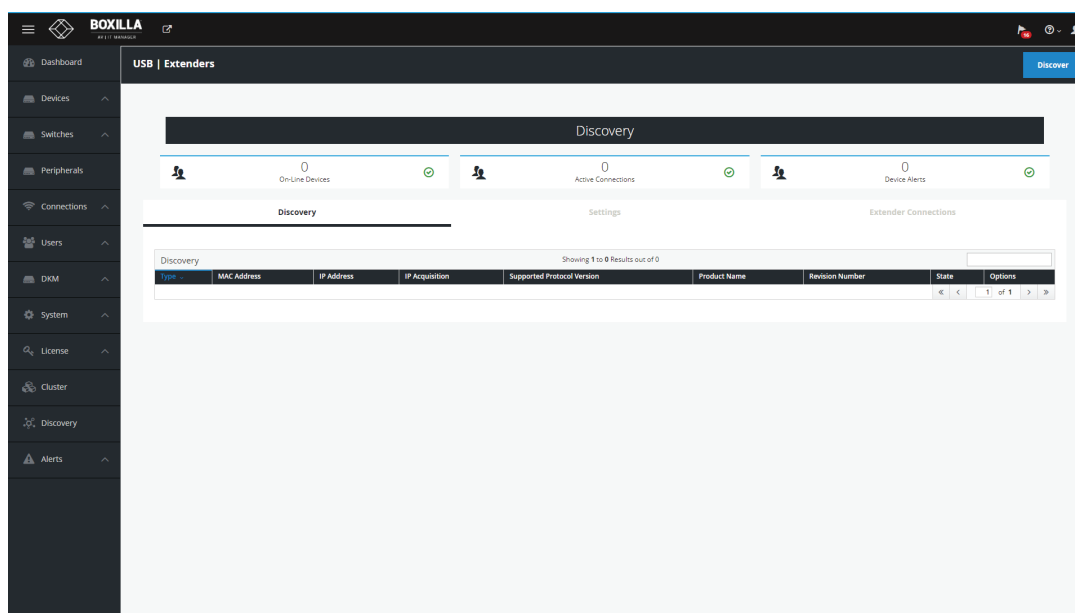


FIGURE 9-1. DISCOVERY TAB

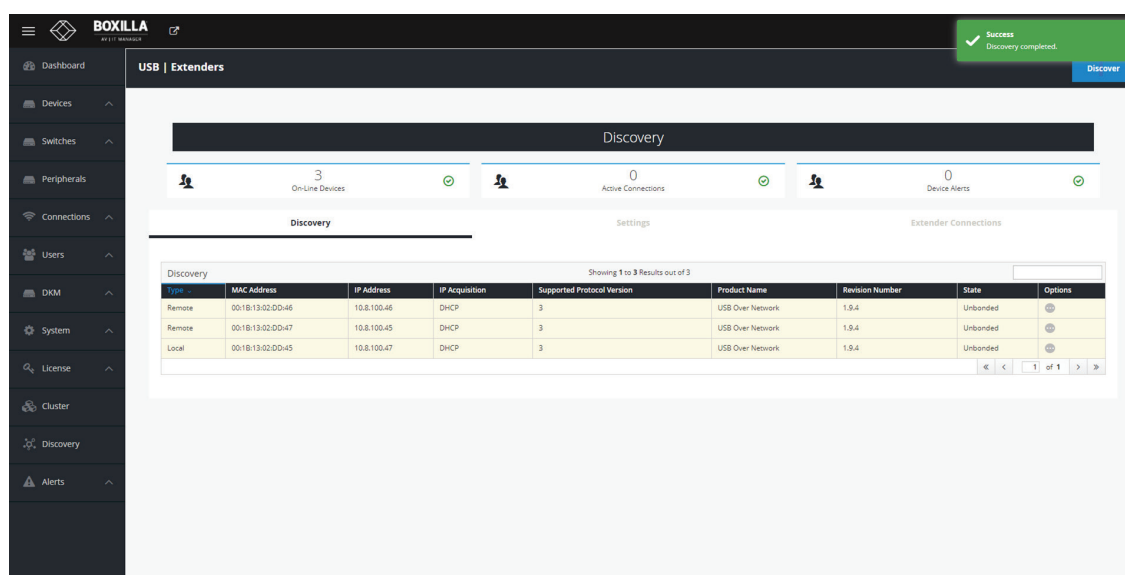


FIGURE 9-2. DISCOVERY SUCCESS



Once discovered, the DHCP IP address will need to change to Static by using the “Edit Network” option, so be sure to configure the devices with Static IP addresses that are part of the same subnet as the Emerald technology.

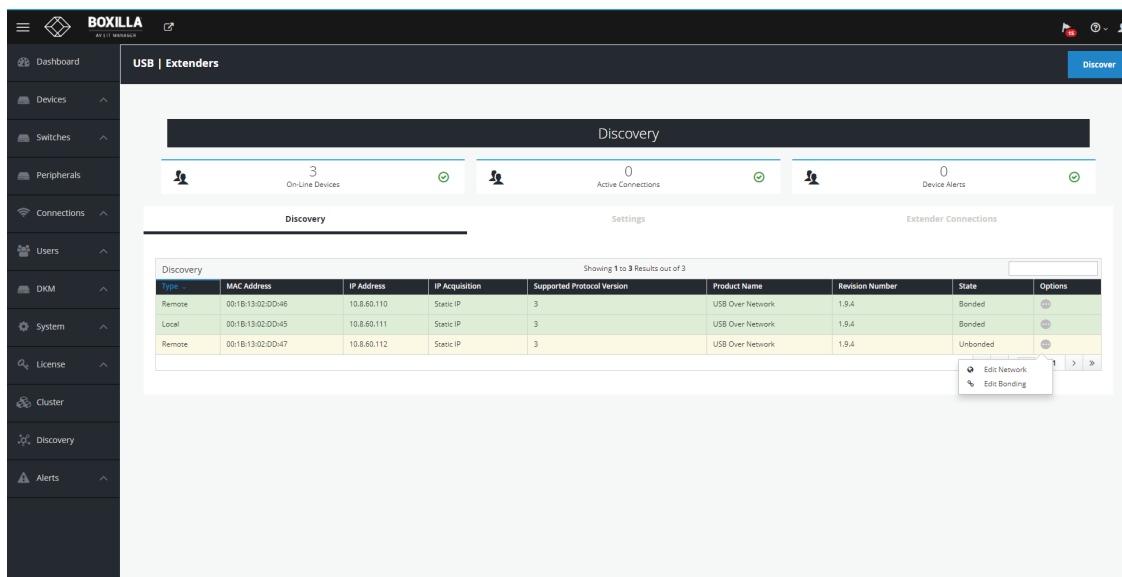


FIGURE 9-3. EDIT NETWORK OPTION

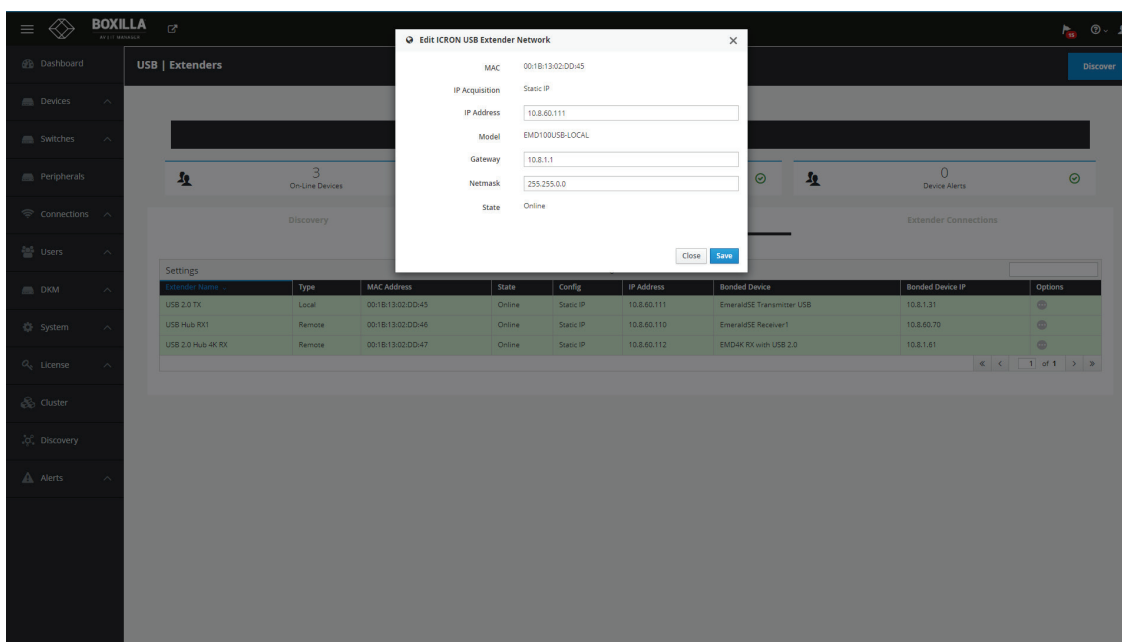


FIGURE 9-4. EDIT USB EXTENDER NETWORK SCREEN

You can now Bond the USB 2.0 Transmitters and Receivers to the Emerald Transmitters and Receivers by choosing “Edit Bonding” and giving the device a name and selecting which Emerald device it is bonded with.

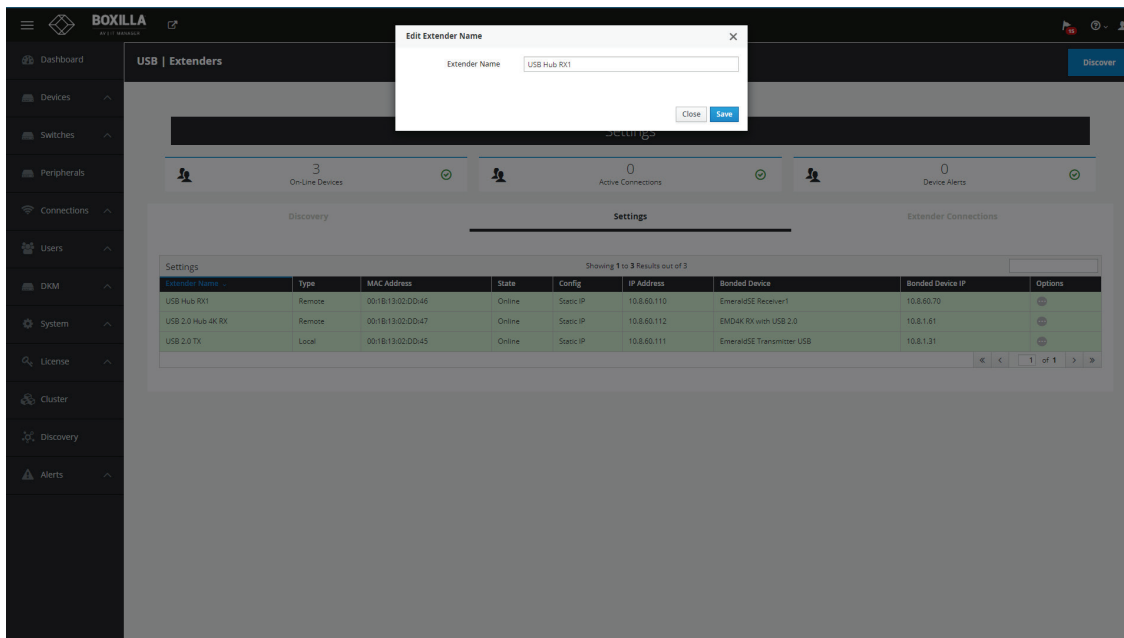


FIGURE 9-5. ENTER EXTENDER NAME SCREEN

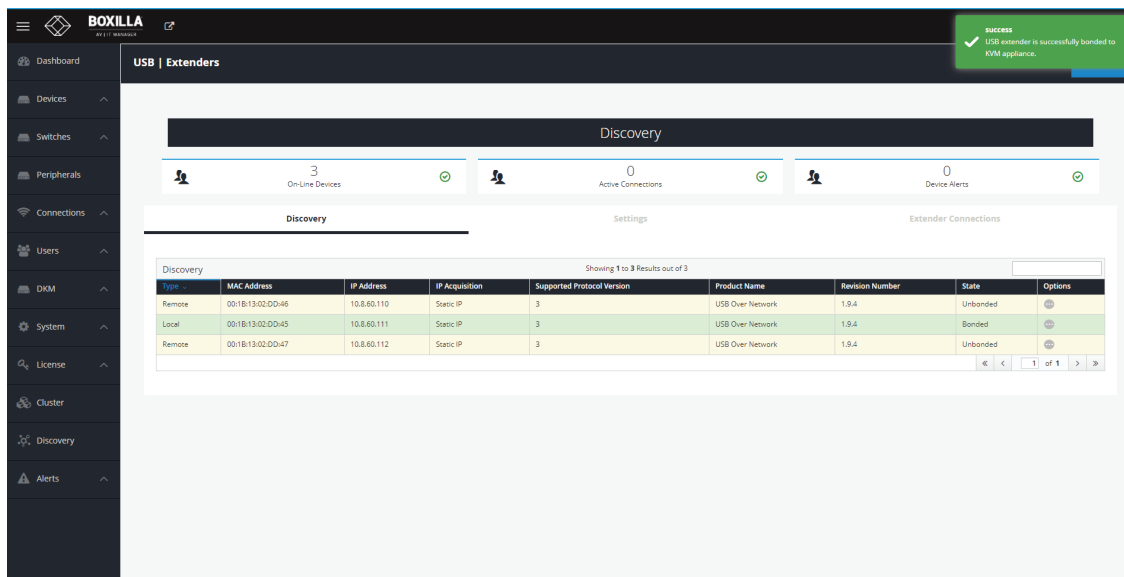


FIGURE 9-6. BONDING SUCCESS, DEVICE 1 SCREEN

Repeat the bonding for additional extenders.

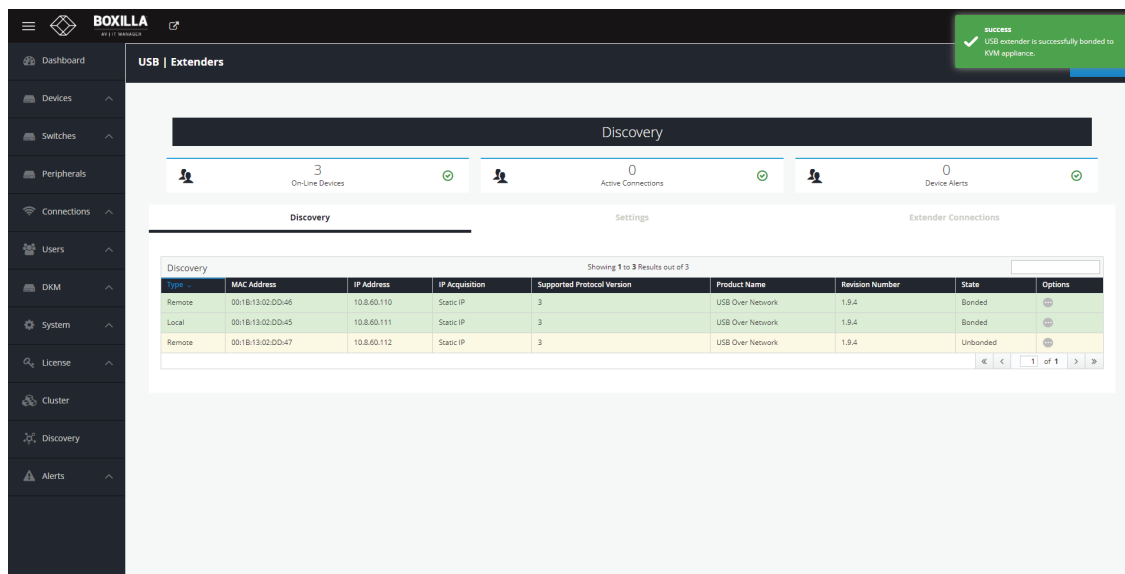


FIGURE 9-7. BONDING SUCCESS, DEVICE 2 SCREEN

Once the USB 2.0 Transmitters and Receivers are bonded with Emerald hardware, they can be used during the connection. When establishing a new connection or breaking a connection, the USB 2.0 Transmitters and Receivers will switch with their respective bonded Emerald connection.

## 9.2 PERIPHERALS - SETTINGS TAB

Additional functions can be used with the USB 2.0 Transmitter and Receivers hubs by navigating to Peripherals>>Settings.

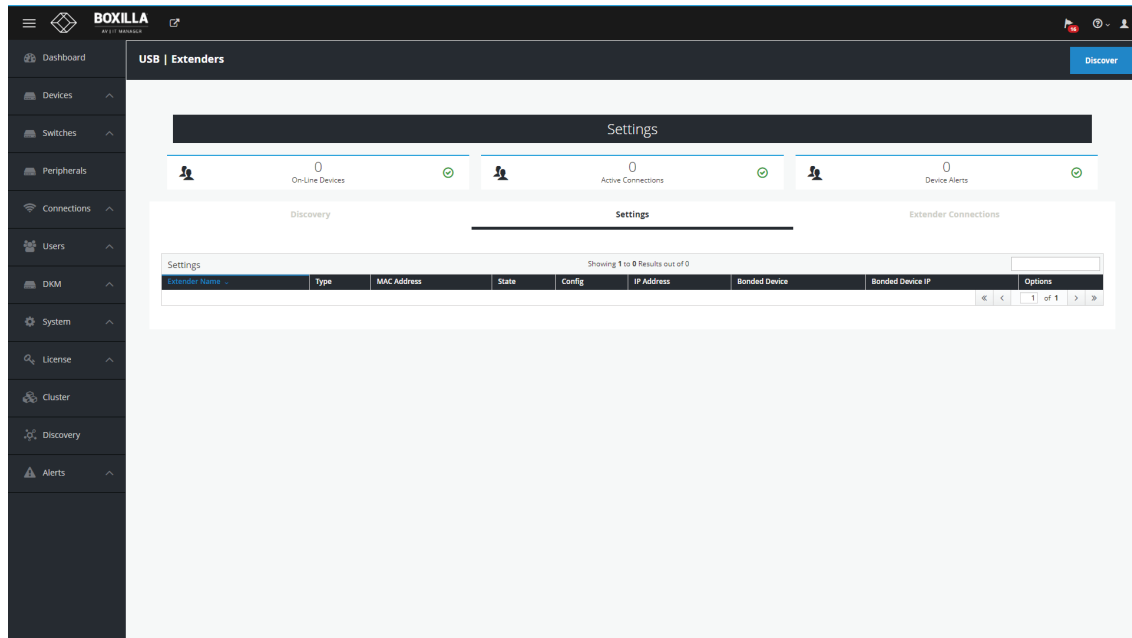


FIGURE 9-8. PERIPHERALS>>SETTINGS TAB

These functions include:

- ◆ Getting Details of the devices such as IP and Mac Address

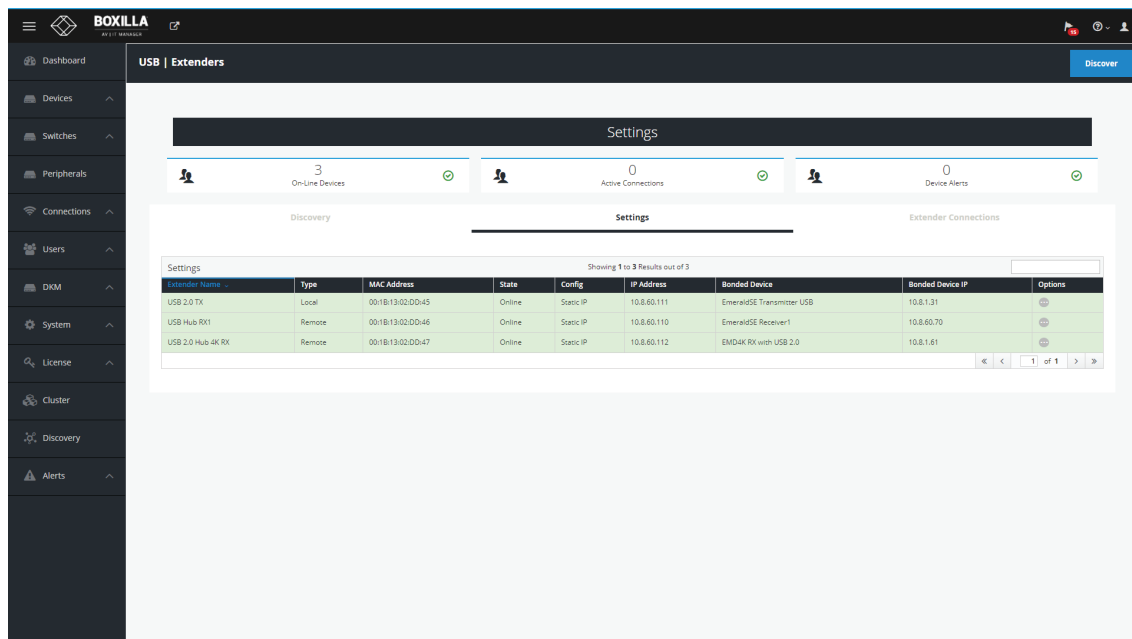


FIGURE 9-9. DEVICE DETAILS

♦ Pinging devices

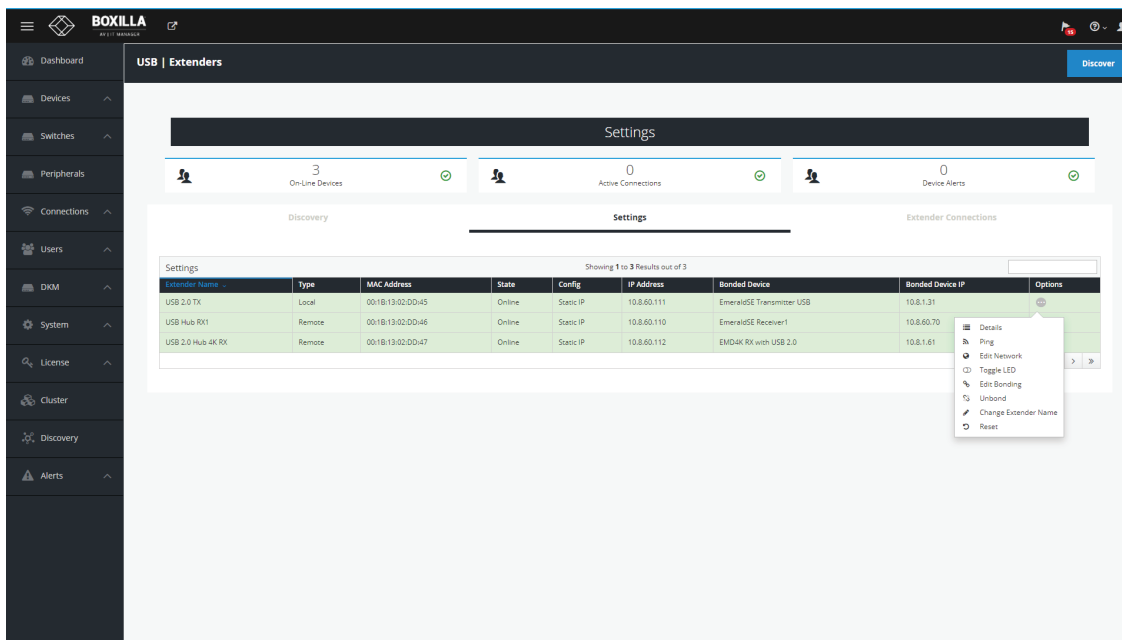


FIGURE 9-10. OPTIONS MENU

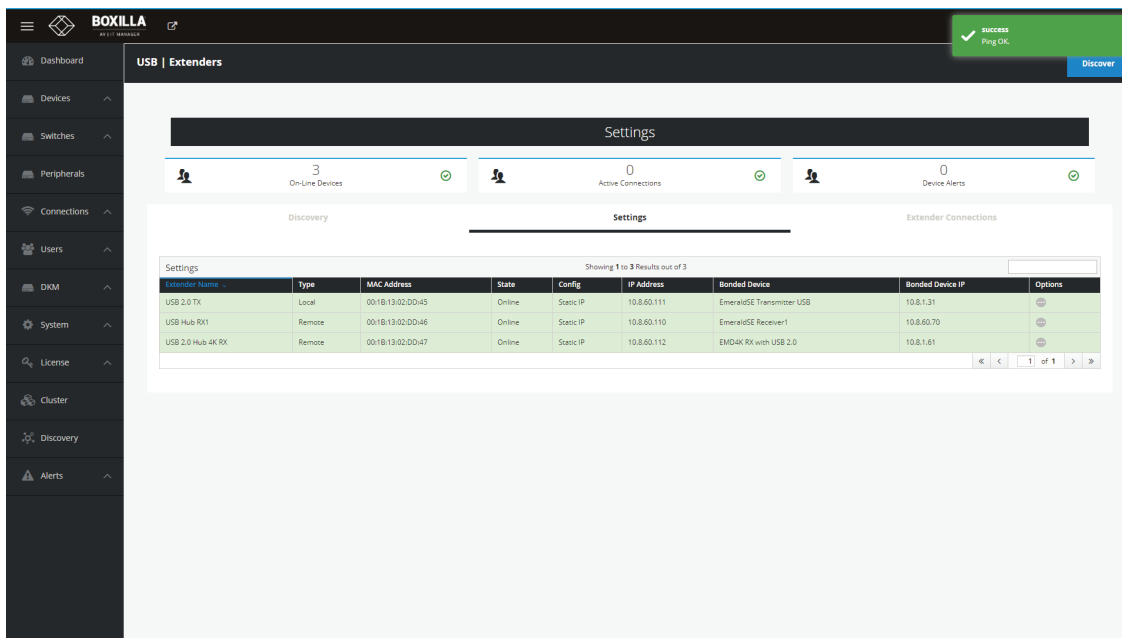


FIGURE 9-11. PING OK SCREEN

- ◆ Edit Network Settings

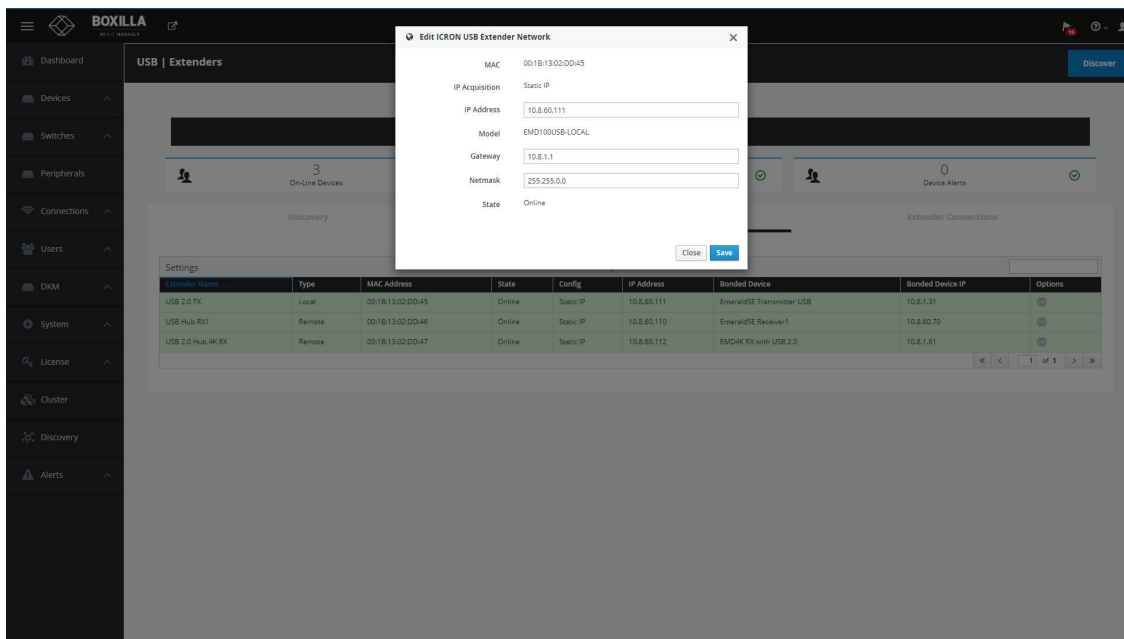


FIGURE 9-12. EDIT NETWORK SETTINGS SCREEN

- ◆ Toggle LED for identification

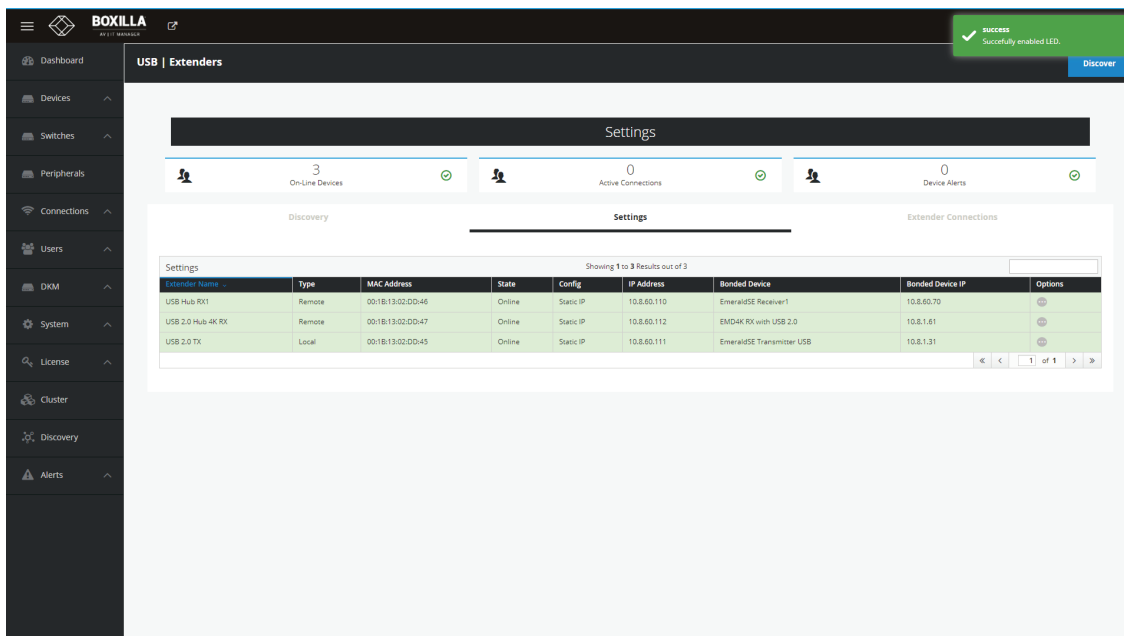


FIGURE 9-13. TOGGLE LED SUCCESS SCREEN

- ◆ Edit Bonding Settings

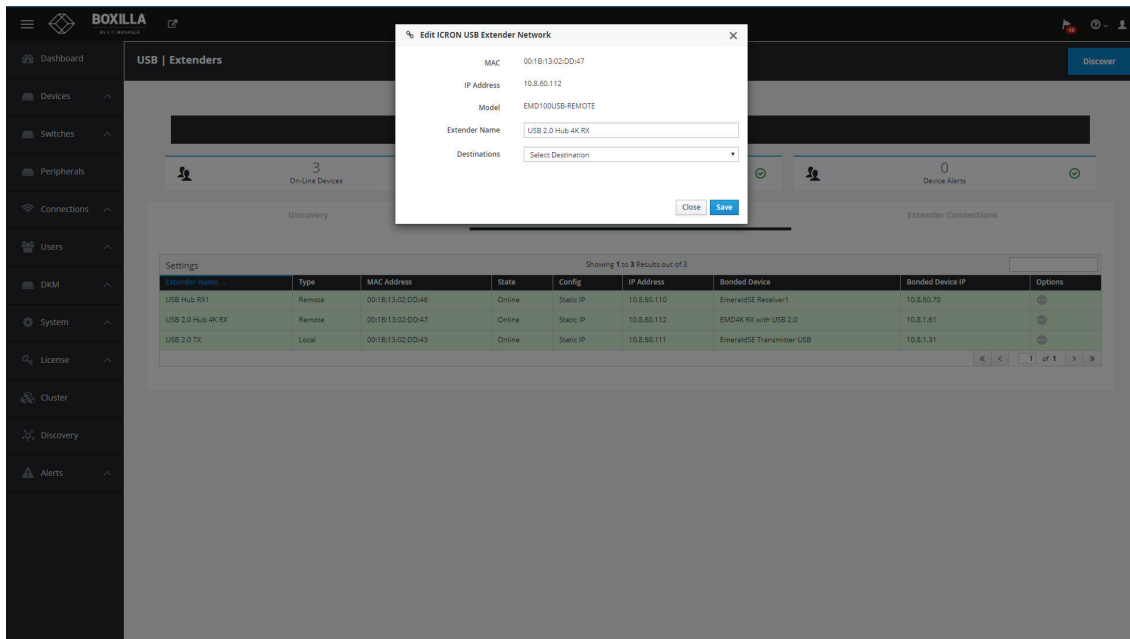


FIGURE 9-14. EDIT BONDING SETTINGS SCREEN

- ◆ Unbond the USB hub
- ◆ Change extender name
- ◆ Reset the unit

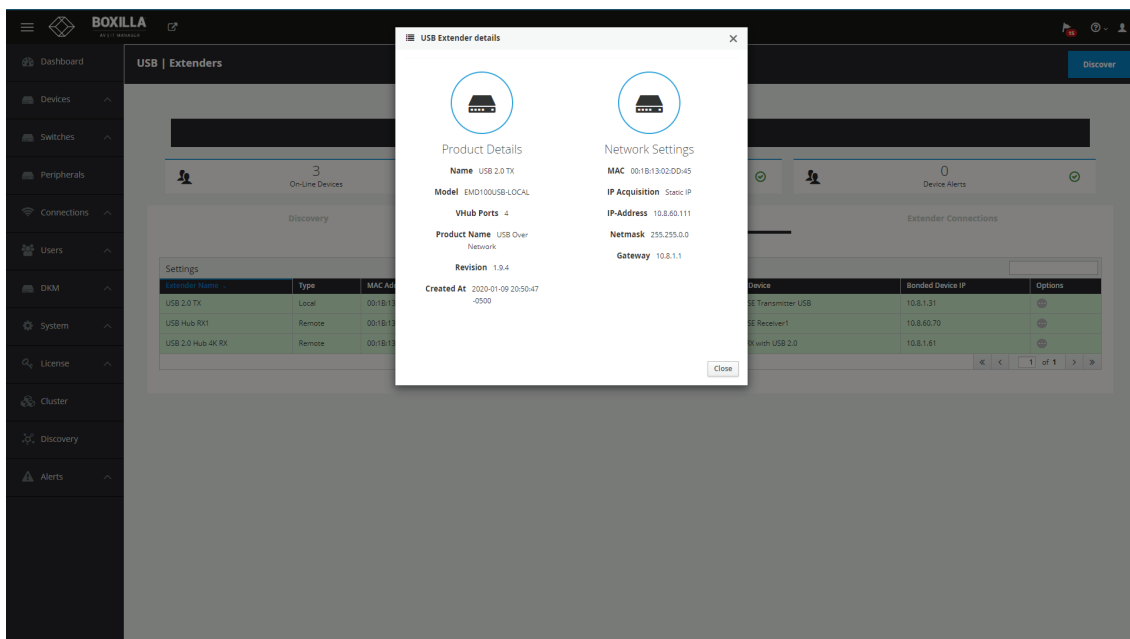


FIGURE 9-15. EXTENDER DETAILS SCREEN

## 9.3 PERIPHERALS - EXTENDER CONNECTIONS TAB

Additionally, you can see the active connections under Peripherals>>Extender Connections.

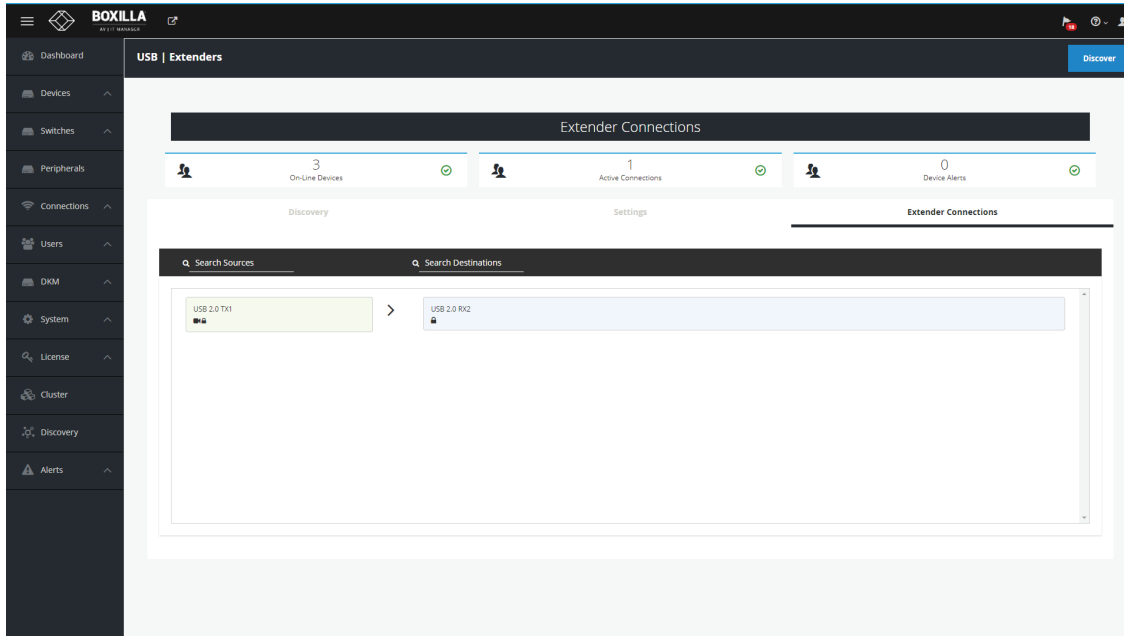


FIGURE 9-16. EXTENDER CONNECTIONS TAB



## CHAPTER 10: CONNECTIONS

Connections define the properties for the flow of keyboard, mouse, video, audio and USB traffic between an Emerald or InvisaPC Receiver and an Emerald or InvisaPC Transmitter or Virtual Machine. Connections are created and then allocated to Users to provide them access to Transmitters or Virtual Machines. A connection is a definition and can be allocated to multiple users. When a user logs into an Emerald or InvisaPC Receiver, they are presented with their allocated connections on the Connections Tab of the OSD on that Receiver.

### 10.1 CONNECTIONS—MANAGE

The Connections — Manage page lists the currently defined connections and allows them to be edited, deleted or new connections to be added. The connections are listed shown in Figure 10-1.

Connection Name	Based On Template	Connection Type	Connect Via	Options
1PC Dual Head	-	Private	TXPair	[Icons: Video, Audio, Keyboard/Mouse]
4K Audio USB	-	Private	ConnectViaTx	[Icons: Video, Audio, Keyboard/Mouse]
4K Private	-	Private	ConnectViaTx	[Icons: Video, Audio, Keyboard/Mouse]
4K Shared	-	Shared	ConnectViaTx	[Icons: Video, Audio, Keyboard/Mouse]
EMDSE	-	Private	ConnectViaTx	[Icons: Video, Audio, Keyboard/Mouse]
Template 1PC Paired	1PC Pairing Template_template	Private	TXPair	[Icons: Video, Audio, Keyboard/Mouse]
TEST: 1 PC DH	-	Shared	TXPair	[Icons: Video, Audio, Keyboard/Mouse]
TEST: Dual Targets	-	Shared	TXPair	[Icons: Video, Audio, Keyboard/Mouse]

FIGURE 10-1. CONNECTIONS MANAGE SCREEN

The table shows the connection name, whether the connection is linked to a connection template (see section 9.1.2), connection type (private or shared), what/how the connection is made (via Tx, Direct to VM, via VM Pool or via Connection Broker or TX pair) and the connection options. The options for connections are the parameters that can be defined for the connection. The icons represent the parameters—when enabled the icon is Green and when disabled it is Grey. Hovering over the icon provides details of the parameter status. The icon definitions are:



**Extend desktop:** On a dual-video head Emerald or InvisaPC, when set it enables the secondary video interface (by default it is disabled). This setting has no effect on a single-video head Emerald or InvisaPC.



**Audio:** When set, this enables analog audio to be supplied to the remote audio connectors.



**View only:** When enabled, users can only view connections with no keyboard and mouse controls during the connection.

## CHAPTER 10: CONNECTIONS



USB Redirection: When set, this enables non-keyboard and non-mice devices to be redirected for this connection.



Persistent Connection: When turned on, Persistent Connection will constantly try to connect to the Transmitter until successful. This is useful when using Emerald or InvisaPC for digital signage or applications with no keyboard/mouse that need to stay connected to a defined source.



NLA: When set, this enables Network Level Authentication, requiring that the user be authenticated to the RD Session Host server before the session is created. This setting needs to match the NLA setting on the target VM for a successful connection. Emerald 1.0 has NLA set to “disabled” by default and user doesn't have option to change. On VM, the NLA setting has to be set to “disabled”.

The administrator can edit the connections parameters or delete the connection using the ellipsis “...” icon on the specific connection row. The parameters for a connection are defined in more detail in section 9.1.1.

When you left-click on a connection name, a popup box appears that tells you details about the connection and gives you the option to disconnect.

NLA Note: If connecting to a Windows 10 VM and you encounter NLA issues, you can use the steps below to fix it.

1. Open RegEdit

2. Navigate to this Key:

HKEY\_LOCAL\_MACHINE\SYSTEM\CurrentControlSet\Control\Terminal Server\WinStations\RDP-Tcp

3. Change “SecurityLayer” to a zero

4. Reboot and done!

### 10.1.1 CONNECTIONS—ADD CONNECTION

To allow an Emerald or InvisaPC Receiver to connect to a target Emerald, ZeroU or InvisaPC Transmitter or Virtual Machine, an administrator must create a connection. This is done on the Connections — Manage page from the main menu as shown in Figure 9-1.

Clicking on the +Connection button launches a wizard that takes the Administrator step-by-step through the creation of a new connection.

On the first screen of the wizard the Administrator selects the type of connection. This can be one of four types (as set by Connect Via parameter):

- ♦ Tx—connect to an Emerald, ZeroU or InvisaPC Transmitter;
- ♦ Direct to RDP VM—connect directly to a virtual machine using its IP address or hostname;
- ♦ RDP Broker—connect to a virtual machine via a connection broker (i.e., indirect connection);
- ♦ RDP Pool—connect to a virtual desktop that is hosted in VM Pools. The IP address for this Pool is defined in the global settings;
- ♦ VM Horizon View - connect to a VM Horizon server;
- ♦ TX Pair - for paired connections (i.e. two paired single head EMD200DV-T connecting to one EMD200SE-R).



## CHAPTER 10: CONNECTIONS

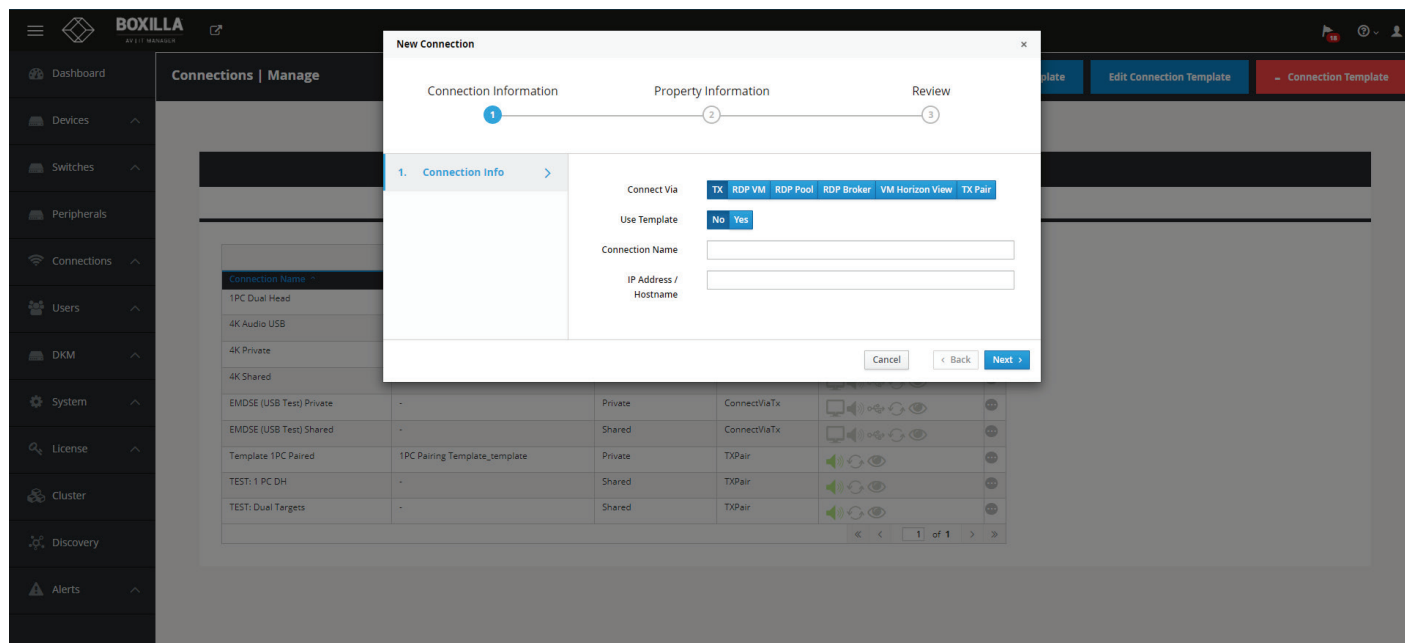


FIGURE 10-2. ADD CONNECTION—TX

The other parameters on this screen are:

- **Connection Name:** this is a unique name for the new connection. The name can be between 1 and 32 characters. The name can be composed of any Alphanumeric characters and special characters except for " / \ [ ] : ; | = , + \* ? < > `".
- **IP Address/Hostname:** the IP address of the Emerald or InvisaPC Transmitter or the Virtual Desktop in IP v4 format.

If the Connect Via is set as "Broker" as shown in the figure below, extra parameters can be defined.

If the TX Pair is set, you can set how many targets will be used in the connection. See the TX Pairing section in the Emerald user manual for more details.

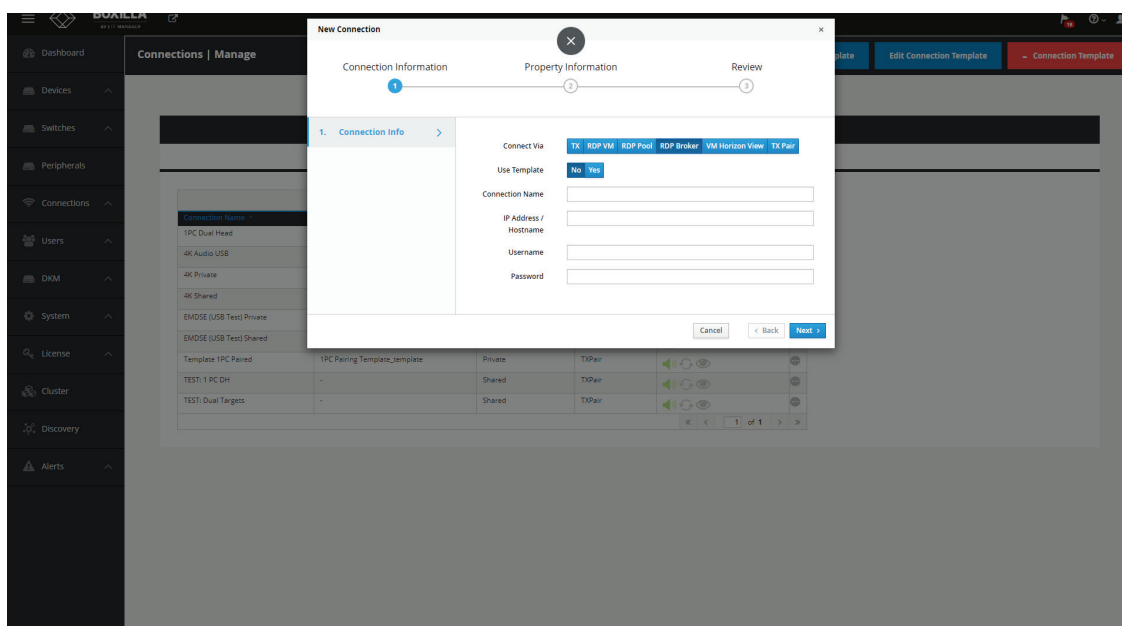


FIGURE 10-3. ADD CONNECTION—BROKER OR VM

## CHAPTER 10: CONNECTIONS

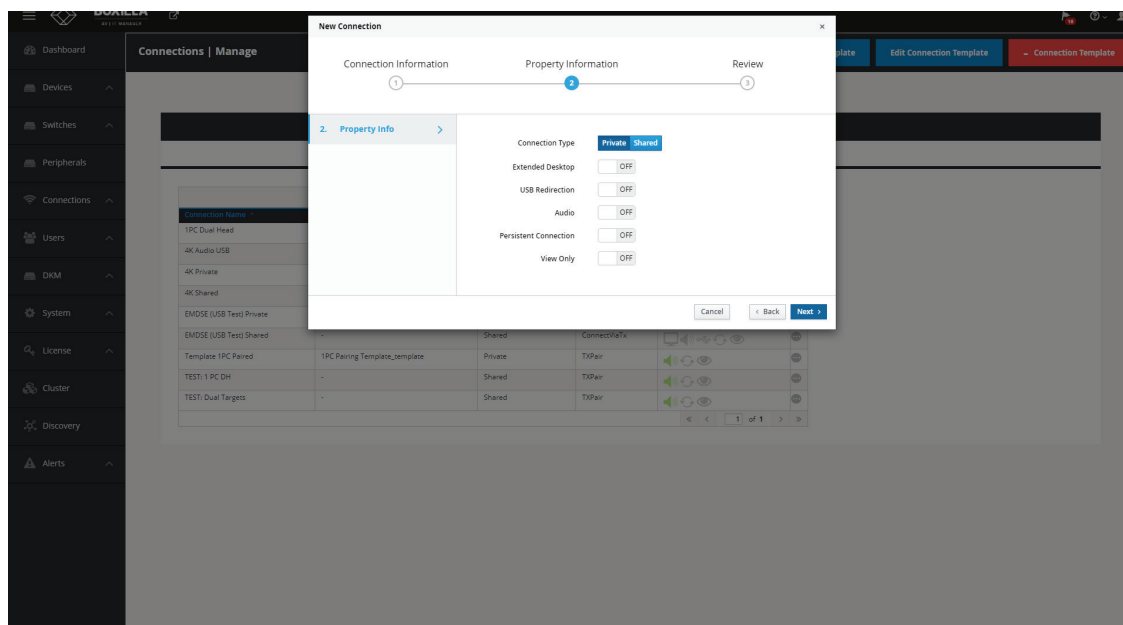


FIGURE 10-4. ADD CONNECTIONS—PROPERTIES

The extra parameters that can be defined are:

- **Connection Type:** This defines the connection as being private to this user when the connection is made or is open to be shared with other users. A shared connection allows the keyboard, video and mouse to be shared to all users that join the connection. Audio and USB re-direction disabled on shared connections.
- **Extended Desktop:** On a dual-video head Emerald or InvisaPC, this enables the second video head to operate if connected to a source that supports dual-head operation (e.g. Dual-head Emerald or InvisaPC Transmitter). This setting has no effect on a single-video head Emerald or InvisaPC.
- **USB Redirection:** When set, this enables non-keyboard and non-mice devices to be redirected for this connection.
- **Audio:** When set, this enables analog audio to be supplied to the remote audio connectors.
- **Persistent Connection:** When turned on, Persistent Connection will constantly try to connect to the Receiver until successful. This is useful when using Emerald or InvisaPC for digital signage or an application with no keyboard/mouse that needs to stay connected to a defined source.
- **Enable View Only mode:** View only setting for a connection allows user to monitor what is been transmitted from a source without being able to interact with the source. This feature allows a user or administrator to monitor the actions on the network without accidentally interacting with other users. View only connection is available in both private and shared mode connections with or without analog audio.

**Orientation:** When using TX Paired with two different targets you can select how the displays will be layed out. You can currently have them side by side or on top of each other.

When Connect Via is set to VM (i.e. connect directly to a VM), there is an extra parameter to define:

- **NLA:** When set, this enables Network Level Authentication, requiring that the user be authenticated to the RD Session Host server before the session is created. This setting needs to match the NLA setting on the target VM for a successful connection. If you are having issues connecting to a Windows 10 VM, read section 10.1 about NLA for Windows 10

When Connection Type is Private, the following parameters are shown in the New Connection screen: Connection Type (Private), Connection Name, Host IP address, Extended Desktop, USB Redirection, Audio, and Persistent Connection. When using the shared connection, the USB Re-direction will not be available to support transparent USB devices that require USB Re-direction.

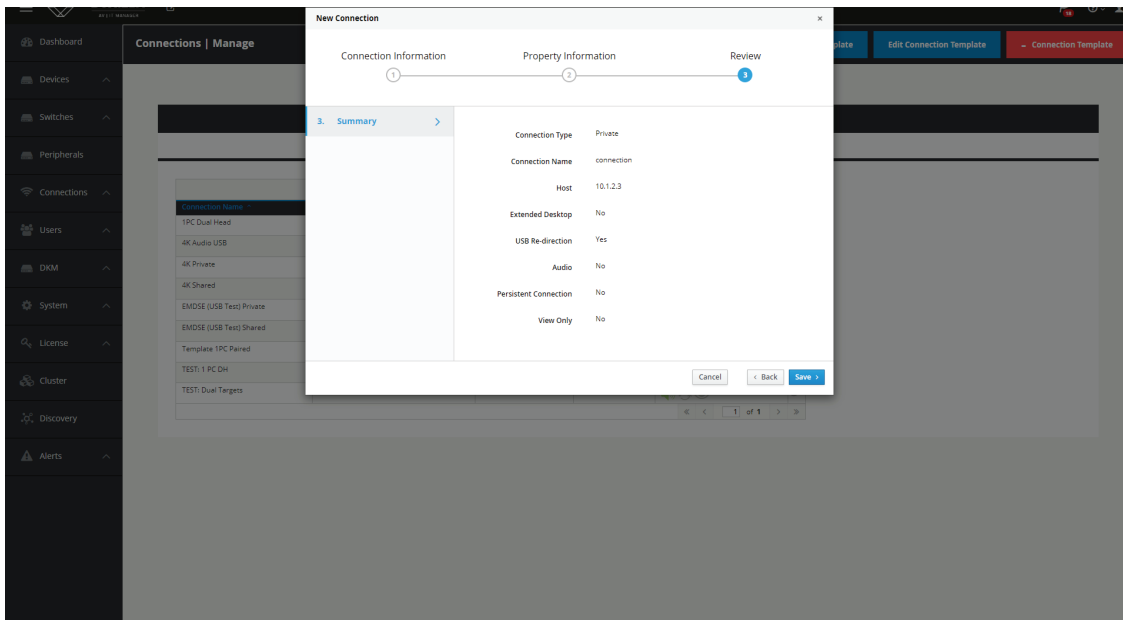


FIGURE 10-5. CONNECTION TYPE – PRIVATE

## 10.1.2 CONNECTIONS—EDIT CONNECTIONS

To edit connections, click on the Edit Connections button.

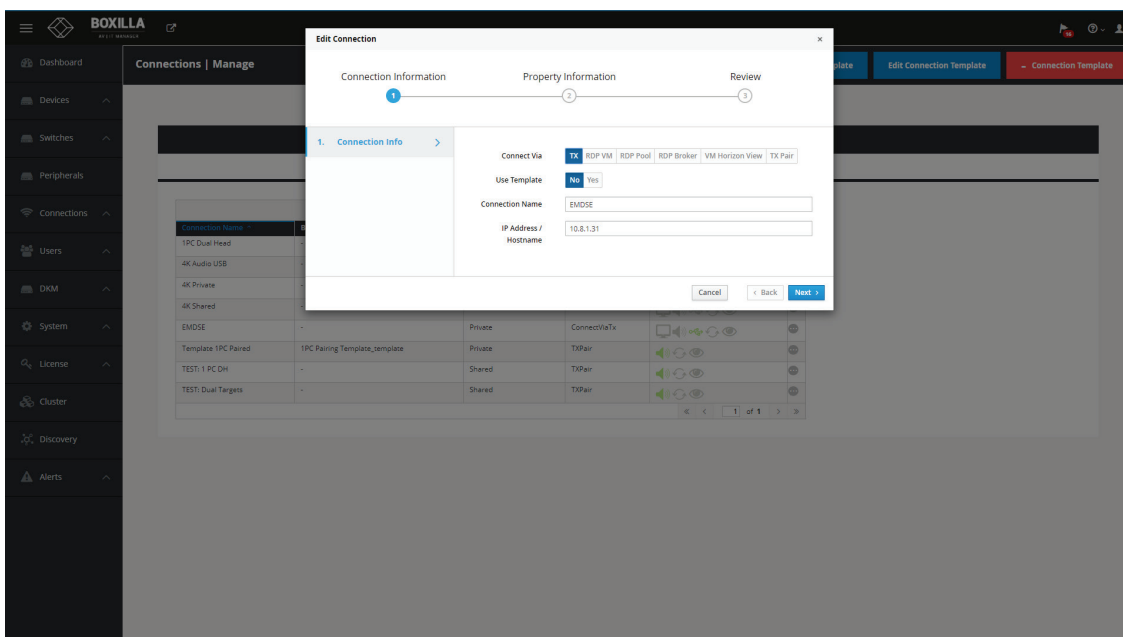


FIGURE 10-6. EDIT CONNECTIONS

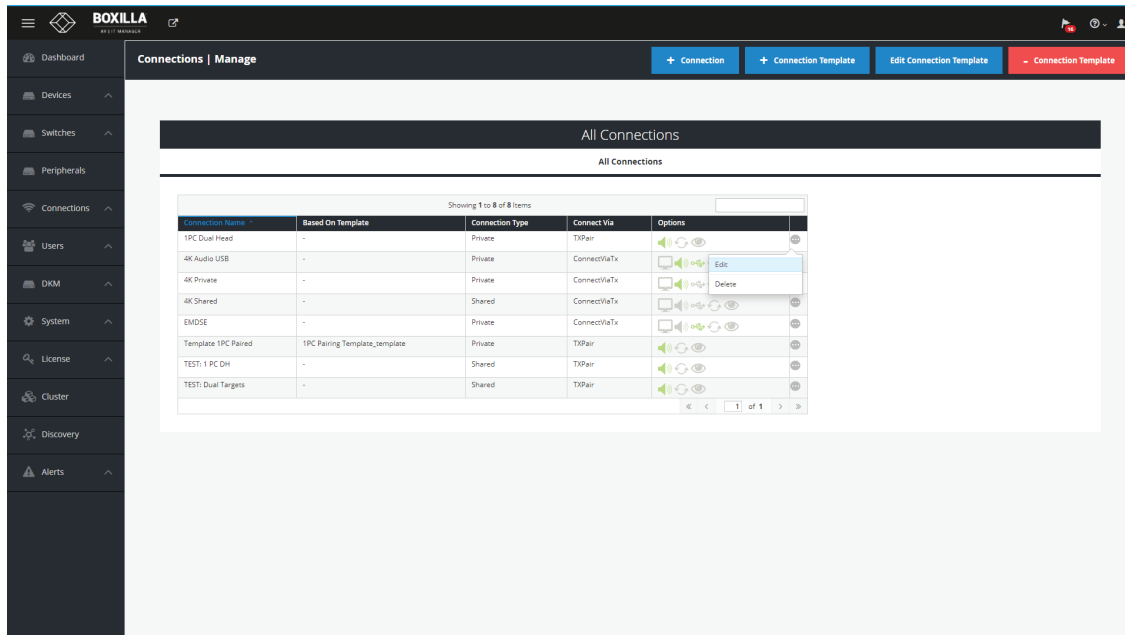


FIGURE 10-7. CONNECTIONS

The next step is to enter the Property Information.

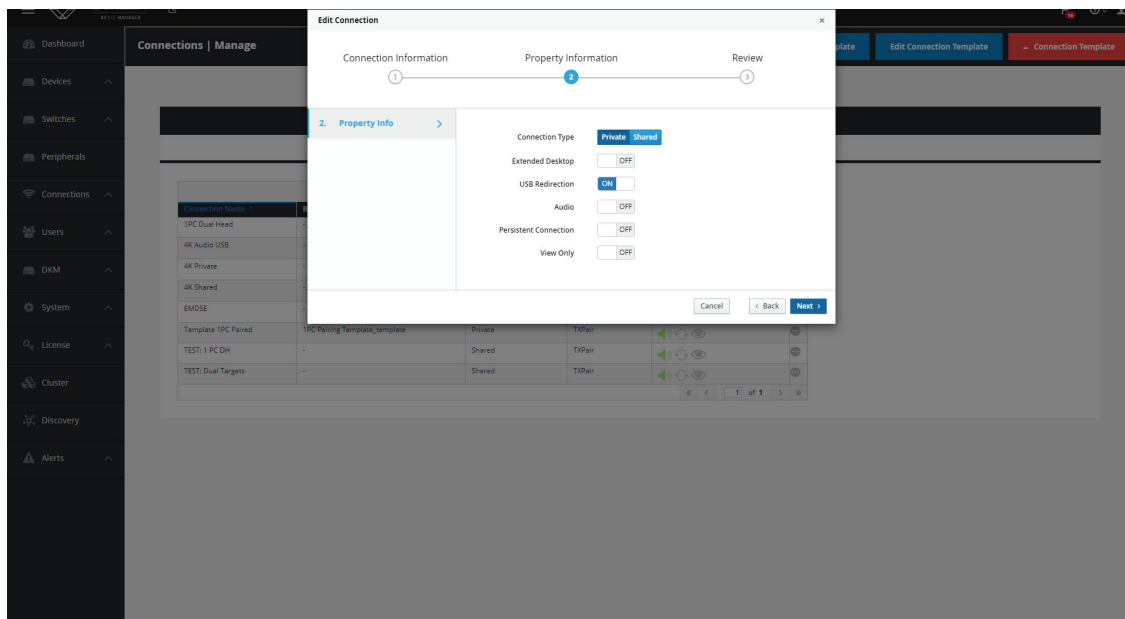


FIGURE 10-8. EDIT CONNECTION

## CHAPTER 10: CONNECTIONS

After configuring the connection, you will be able to review the final connection parameters to make sure it is properly configured.

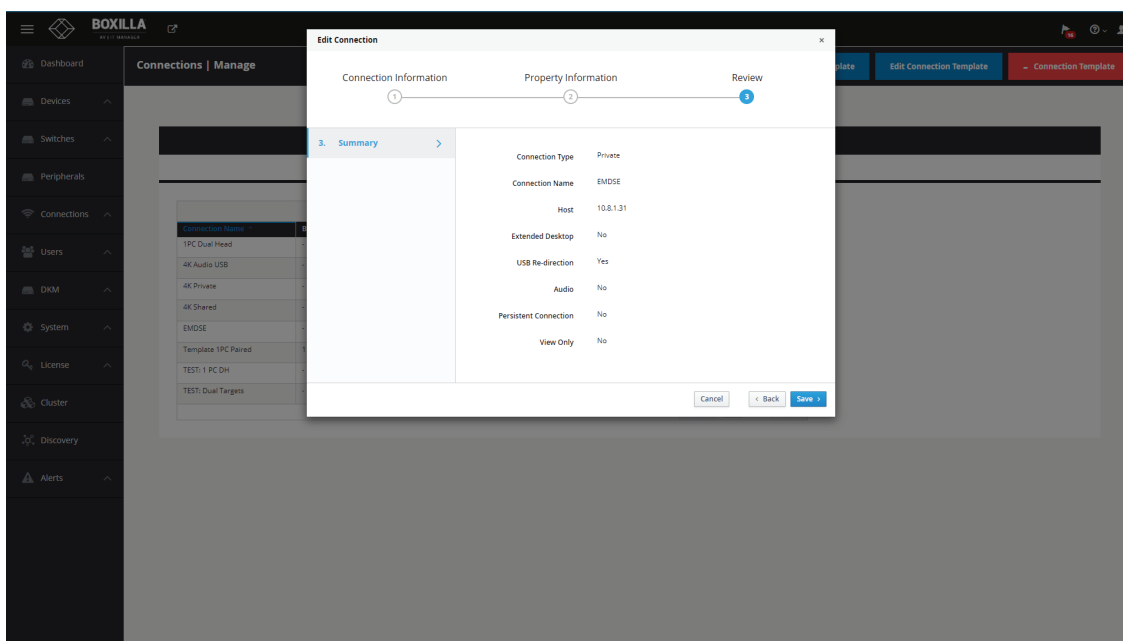


FIGURE 10-9. EDIT CONNECTIONS

### 10.1.3 CONNECTIONS—ADD CONNECTION TEMPLATE

Connection Templates are used to aid in the creation of connections. Templates define a set of properties as shown in Figure 9-6. The template can be used when creating a connection to ensure that the same properties are attached to a group of the connection. Clicking on +Connection Template launches the screen to set these properties.

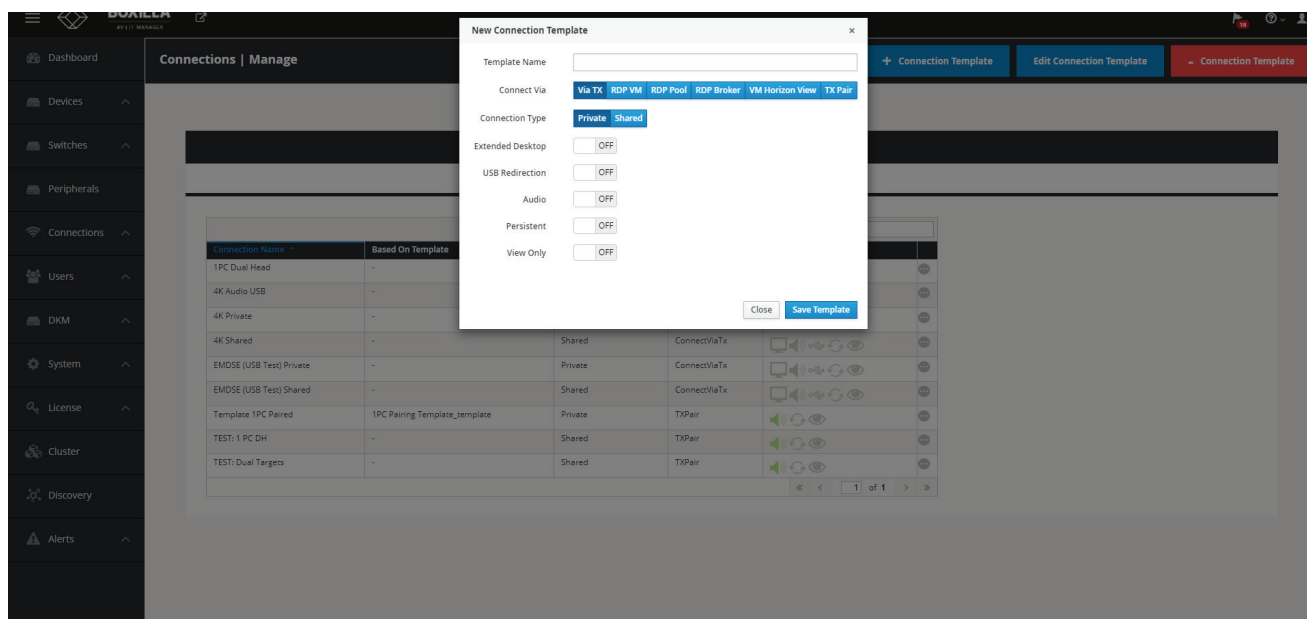


FIGURE 10-10. ADD CONNECTION TEMPLATE

## CHAPTER 10: CONNECTIONS

### 10.1.4 CONNECTIONS—DELETE CONNECTION TEMPLATE

To delete a connection template, click -Connection Template and this launches a screen that shows a list of connection templates. Select the template(s) to be deleted and click on delete.

Boxilla will only display the list of connection templates that are not currently assigned to connections. If you wish to delete a template that is associated with a connection, you will first need to remove the template from the connection.

## 10.2 CONNECTIONS—GROUPS

Boxilla supports the creation of a connection group to make it easier to allocate a common set of resources to user. If a connection group gets changed, it will be reflected on all users allocated to this Connection Group.

Connections option can be found on left side pane of the Boxilla user interface.

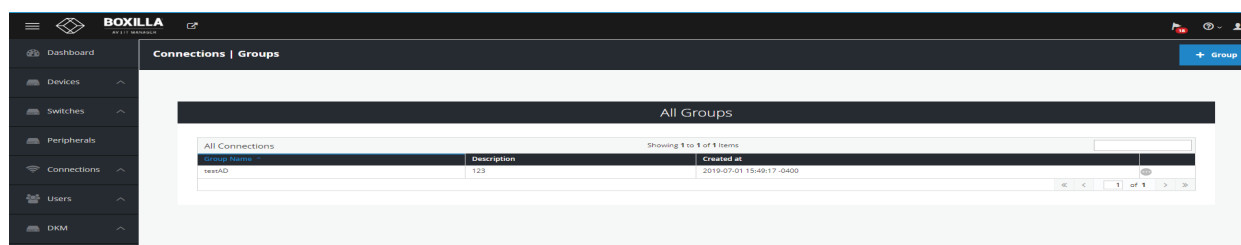


FIGURE 10-11. CONNECTIONS OPTION

To add a connection group:

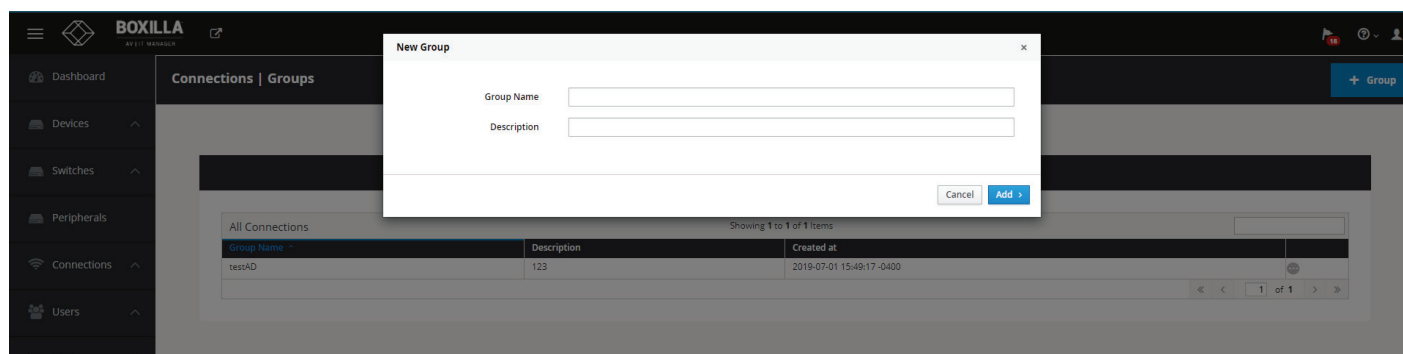


FIGURE 10-12. ADD CONNECTION GROUP SCREEN



## CHAPTER 10: CONNECTIONS

Once a connection group has been added, you will see the following screen.

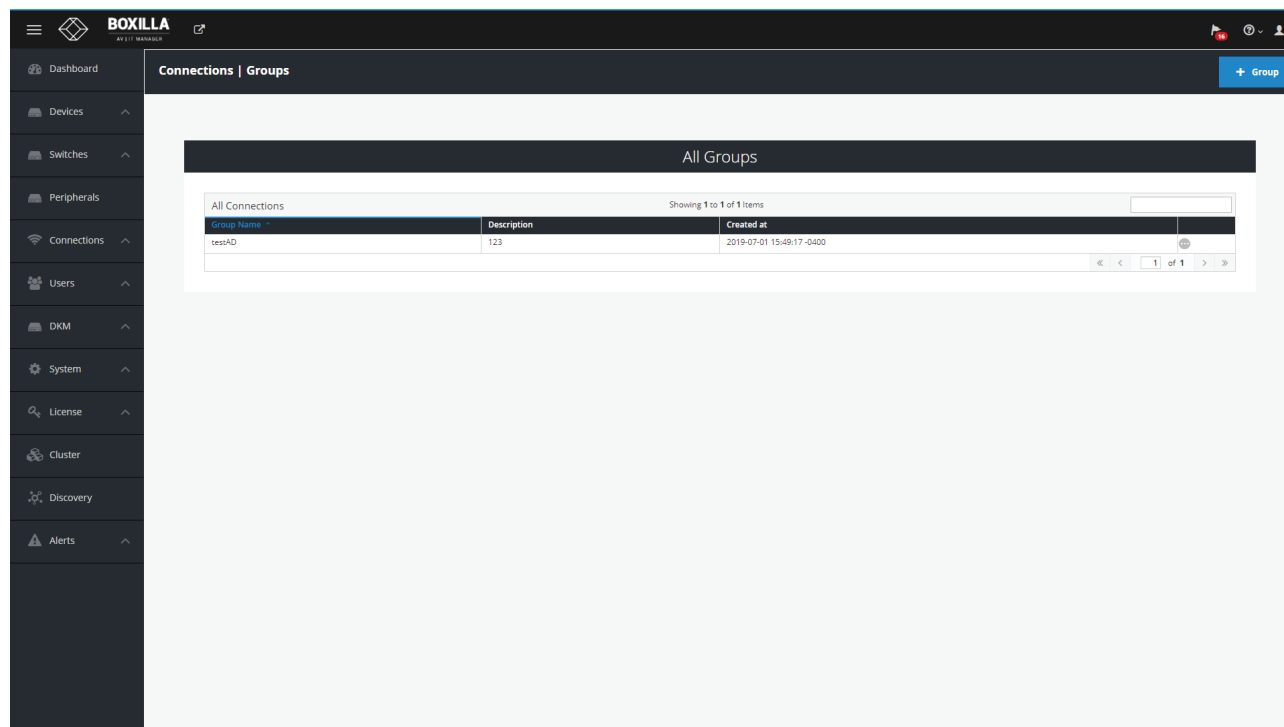


FIGURE 10-13. UPDATED CONNECTION GROUP SCREEN

You can manage connections by adding or removing connections to or from the connections group.

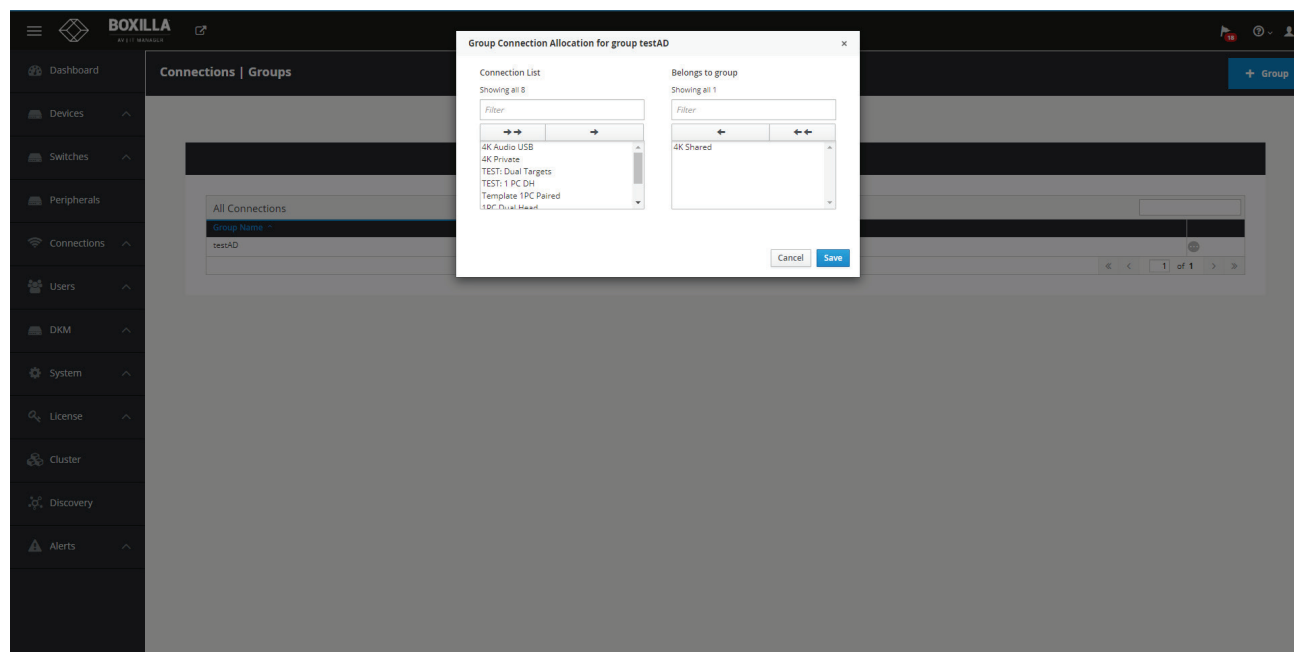


FIGURE 10-14.. MANAGE CONNECTIONS SCREEN

You can add / manage groups from individual Users under Users -> Manage. Once a user logs in at the appliance GUI, all the assigned connections (both individual and group connections) will be visible to the user.

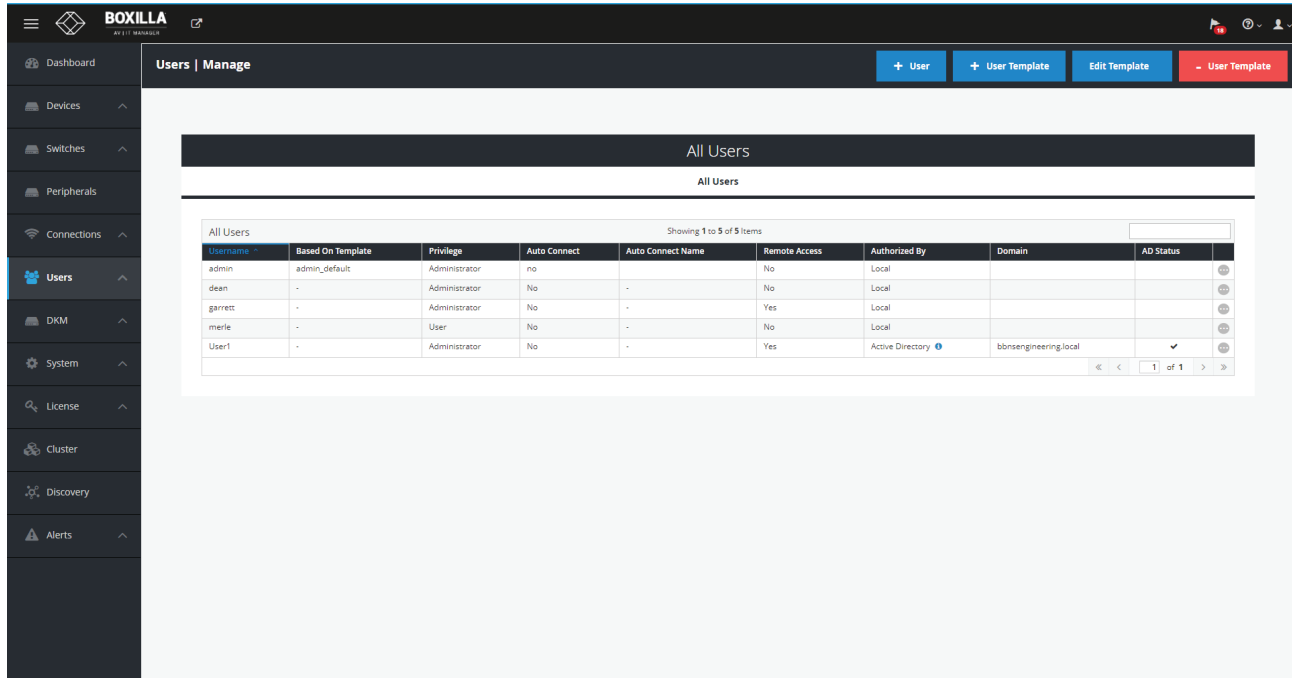


FIGURE 10-15.. MANAGE USERS SCREEN

Active connections will be listed under Connections -> Active.

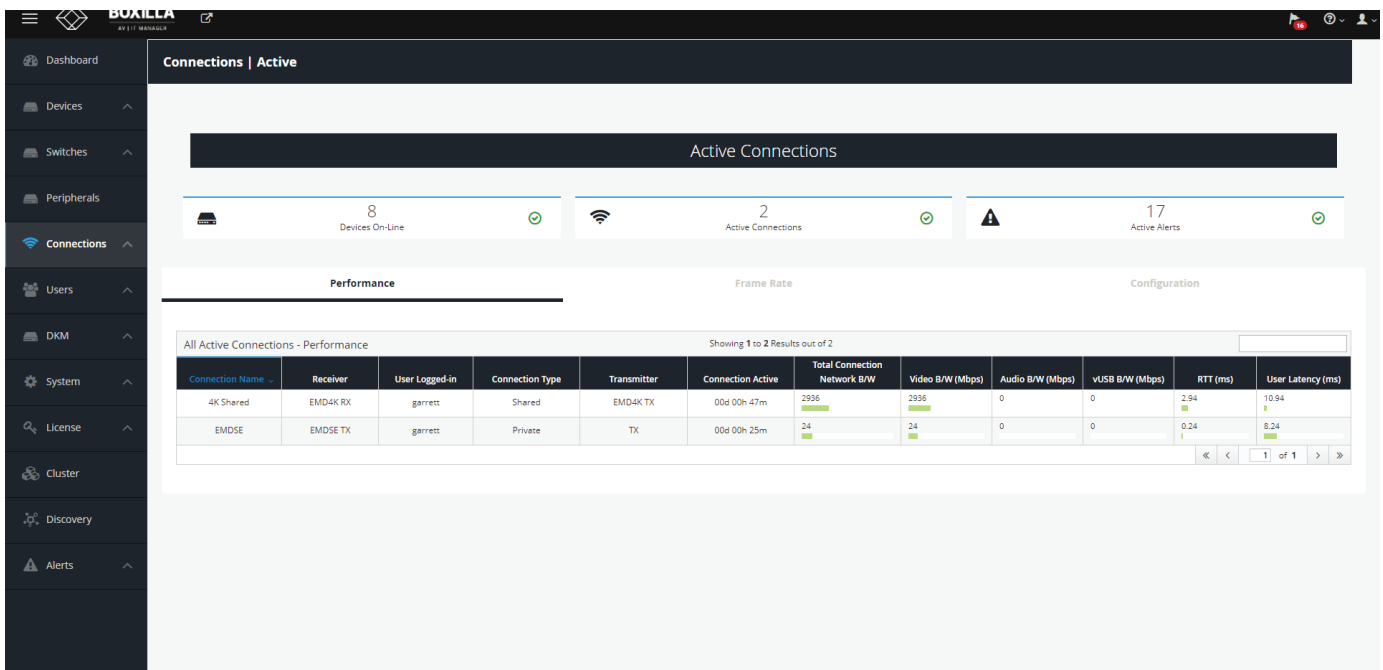


FIGURE 10-16.. ACTIVE CONNECTIONS SCREEN

To dissolve a connection group (Map Connections from Connection Group to Individual Connections):

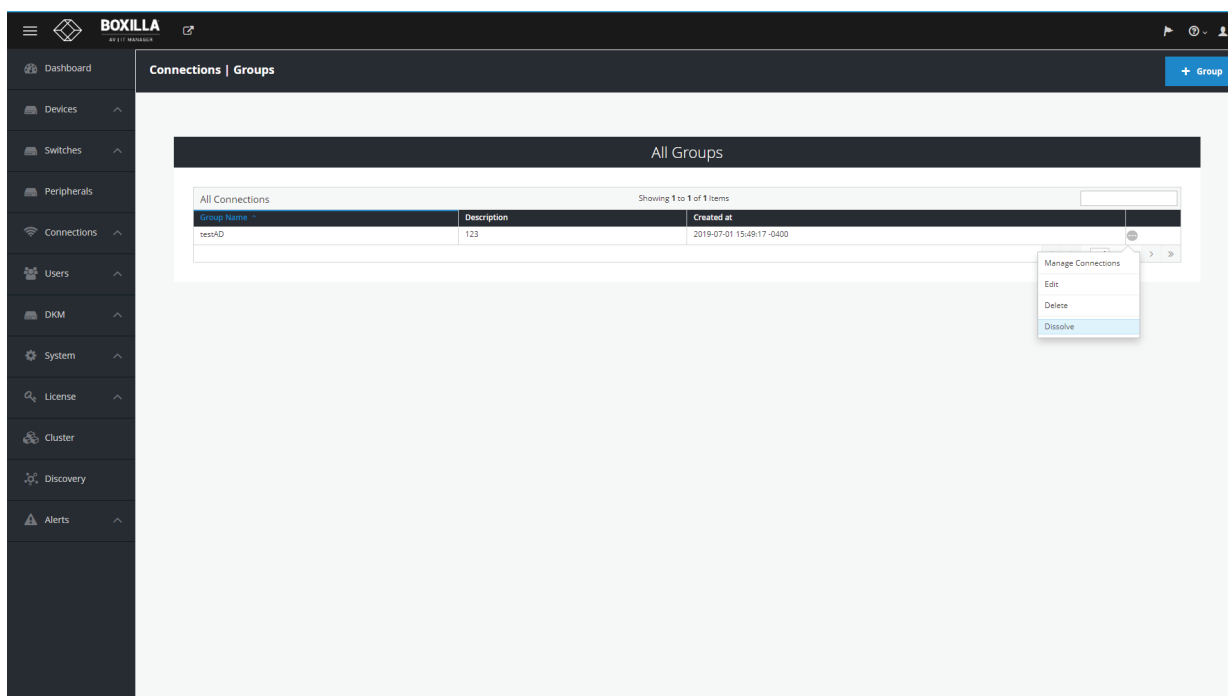


FIGURE 10-17.. DISSOLVE CONNECTION GROUP SCREEN

Once you confirm with OK, a success message will be prompted.

By dissolving a group, the group no longer appear under Connections-Groups but the active connections are retained with the users logged in.

Unlike Delete groups, Dissolve Groups doesn't leave any impact on connections.

After dissolving a Connection Group, all Connections from the Connection Group are moved to the list of Managed Connections for each User that was assigned to the Connection Group.

Delete Connection Group: Delete the Connection Group and everywhere it is used.

Confirm with OK and a confirmation message about deletion is displayed.

The maximum number of connection groups is 100 and once it is reached, the add group button gets disabled.

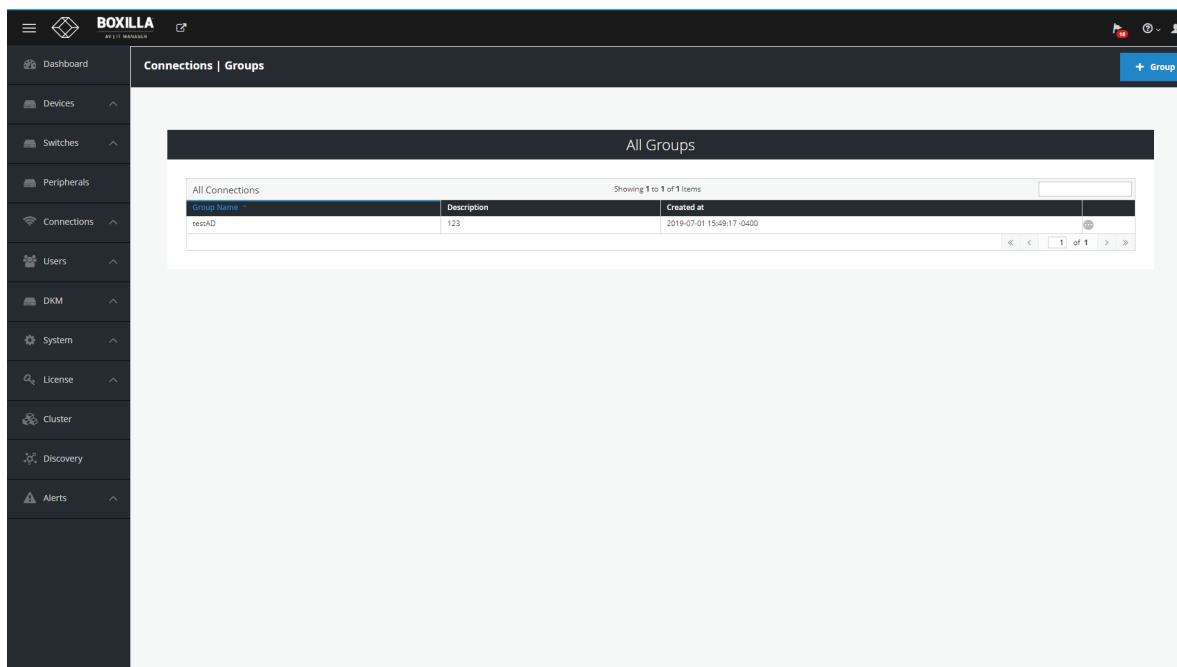


FIGURE 10-18.. MAXIMUM NUMBER OF CONNECTION GROUPS

**IMPORTANT NOTE:** Boxilla restricts the total number of User Connections across the system to 22500 unique User Connections. Boxilla supports:

- ♦ 150 users, each supporting a maximum of 150 unique connections
- ♦ 150 users, each supporting a maximum of 10 Connection Groups each group supporting a maximum of 15 unique connections
- ♦ 200 users, each supporting a maximum of 112 unique connections
- ♦ 200 users, each supporting a maximum of 10 Connection Groups each group supporting a maximum of 11 unique connections
- ♦ 250 users, each supporting a maximum of 90 unique connections
- ♦ 250 users each supporting a maximum of 10 Connection Groups each group supporting a maximum of 9 unique connections

## CHAPTER 10: CONNECTIONS

### 10.3 CONNECTIONS—ACTIVE

The Connections—Active page lists the currently active connections—a live connection between a Receiver and a Transmitter. There are three tabs on this page: Performance, Frame-Rate and Configuration. These pages provide information on all active connections: the name of the connection, the Receiver in the connection, the user who is logged into the Receiver, the type of connection (e.g. private or shared), the Transmitter in the connection and then statistics on the connection. The statistics include:

- ♦ On the Performance tab:
  - Connection Active: the total time the connection has been established
  - Connection Bandwidth: network traffic generated on the connection during the last polling interval
  - Video/Audio/vUSB Bandwidth: a breakdown of connection bandwidth into its individual components of video, audio and vUSB
  - Round-trip time: the round-trip latency between Receiver and Transmitter on the network during last polling interval
  - User Latency: the latency a user experiences on video/mouse during the last polling interval
- ♦ On the Frame-Rate tab:
  - Frame-per-Second: active frames sent from Transmitter to Receiver (typically will be 60 fps)
  - Dropped-Frames-per-Second : number of frames dropped on the Transmitter. Normally this should be 0. Frames can be dropped for reasons such as network congestion.
- ♦ On the Connection tab:
  - Shows the properties active on the connection: USB and Audio (i.e., is USB and Audio enabled or disabled on the connection)
  - If a statistic exceeds a threshold, the color changes from green to amber to red as shown in Figure 9-18.

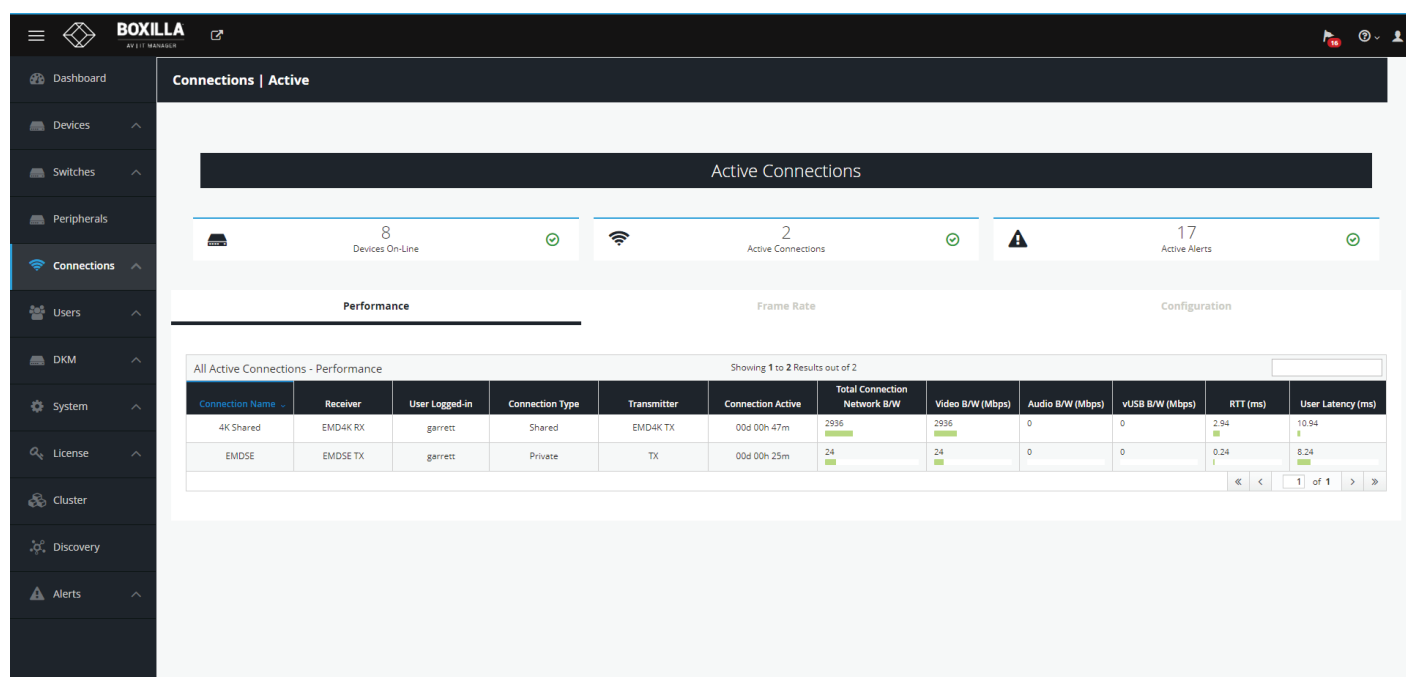


FIGURE 10-19. ACTIVE CONNECTIONS

## 10.4 CONNECTIONS—VIEWER

On the Connections drop-down menu, click on Viewer. The Emerald or InvisaPC Connection Matrix screen appears.

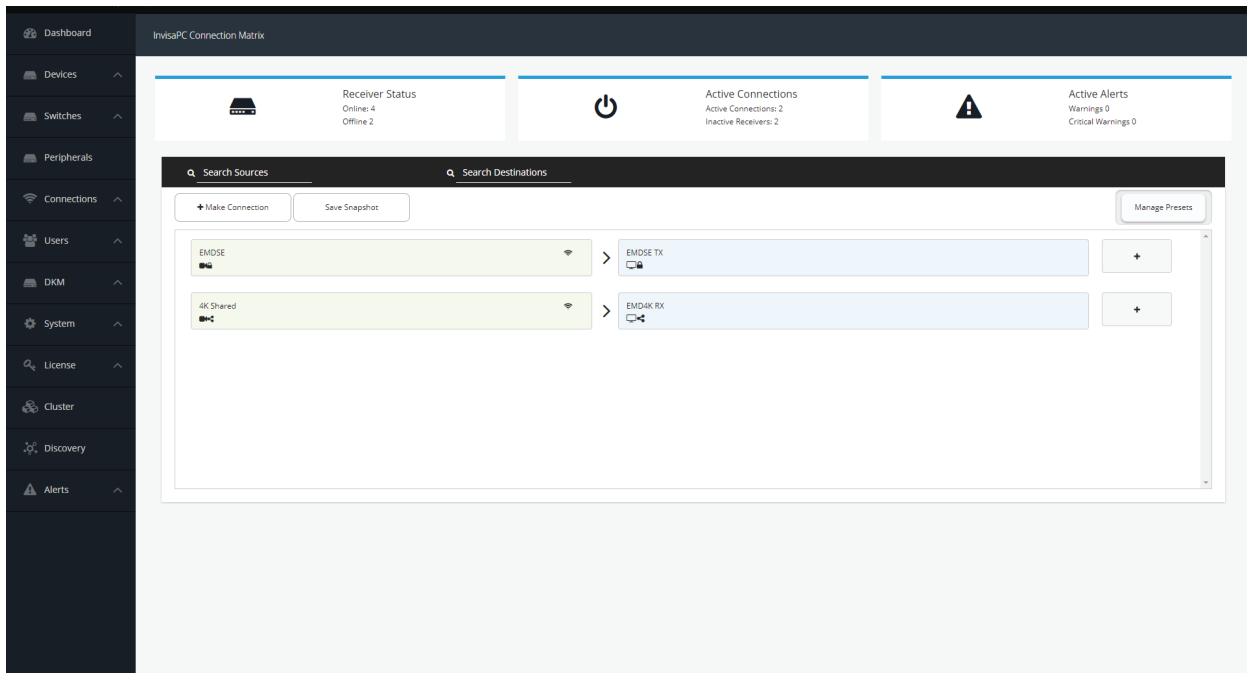


FIGURE 10-20. CONNECTIONS—VIEWER SCREEN

NOTE: For instructions on how to bond two Emerald ZeroU Transmitters to one Dual-Head Emerald SE Receiver, refer to the Emerald SE manual.

## CHAPTER 10: CONNECTIONS

### 10.4.1 MAKE CONNECTIONS

Click on the Make Connections button, and the Add Source screen pops up.

NOTE: It is only possible to connect InvisaPC Receivers to InvisaPC Transmitters and Emerald Receivers to Emerald Transmitters. Boxilla does not support connection interoperability between Emerald and InvisaPC devices.

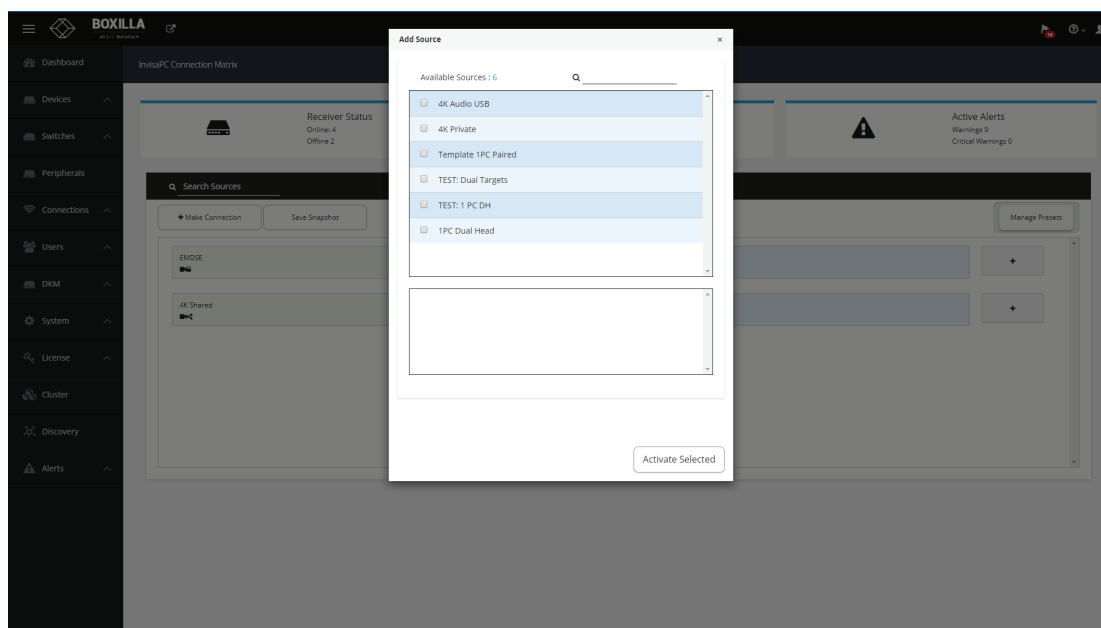


FIGURE 10-21. ADD SOURCE BUTTON

Select a source from the list and press Activate Selected. Once the source connection is added successfully, add a destination (RX) from the available destinations to the selected source and activate by clicking the “Add Destination” button. To detach a destination, click on “X.”

Once you have a connection established, you will see the Connection Viewer page reflect this by displaying the connection name alongside all the attached receivers. To detach one of the receivers, move your mouse over that receiver tile and you will see an ‘X’ appear on the button. Clicking this X detaches only that receiver from the connection and leaves the rest of them intact.

By moving your mouse over the connection name tile you will also see an X appear. Clicking this will break all connections from any receiver connected with this connection name.

To revert, select Delete from the dropdown list to delete the source entry. This should show the “X” button, which is the Delete button.

If you click to ‘add destination’ to a private connection, you will only have the option to select one receiver. This is the receiver that is then used in the connection. If you wish to establish to the same connection from another receiver you will have to break this connection and establish the new one.



FIGURE 10-22. CONNECTIONS—ADD DESTINATION TO A PRIVATE CONNECTION

## 10.4.2 MANAGE PRESETS

Click on the Manage Presets button, and the Manage Presets screen pops up. Under this page all the existing presets will be listed. In Emerald or InvisaPC Viewer — Preset Manage, you can rearrange the preset priority to change what presets display on the main Viewer screen. Essentially, you can pick your top three presets.

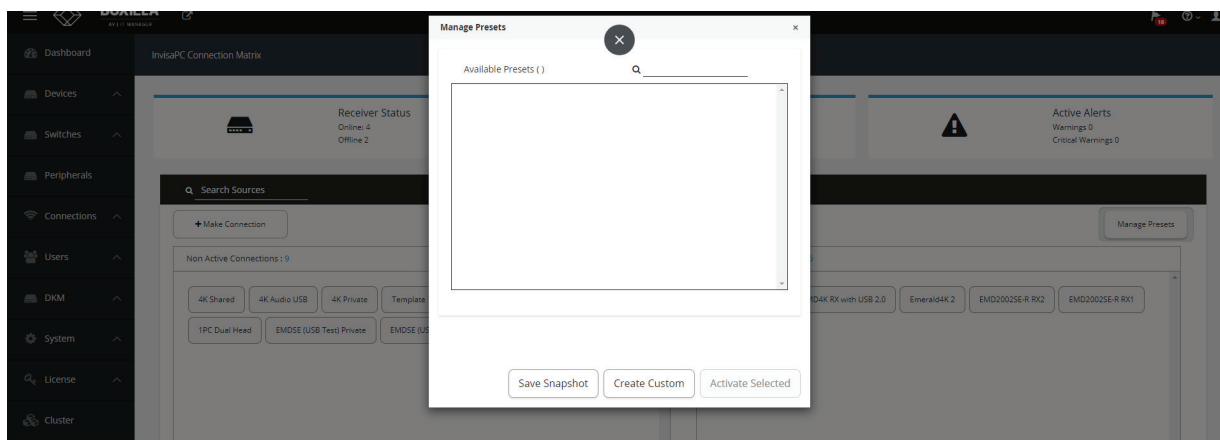


FIGURE 10-23. MANAGE PRESETS SCREEN



## CHAPTER 10: CONNECTIONS

To create a new / custom template , click on “ Create Custom ” and select the required sources from the available list.

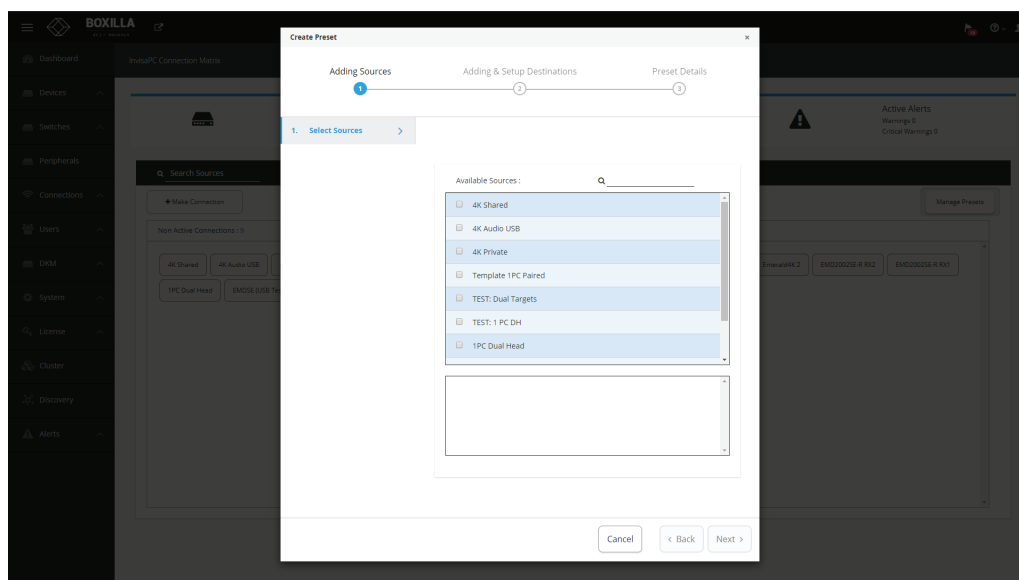


FIGURE 10-24. SELECT SOURCES SCREEN

Click next and select the destinations per source. Save the preset with a name and type (Partial or Full).  
The icons on the sources screen are:






Icon	Meaning
	Source
	Destination
	View Only
	Shared Mode
	Private Mode

FIGURE 10-25. ICONS ON THE SOURCES SCREEN

## CHAPTER 10: CONNECTIONS

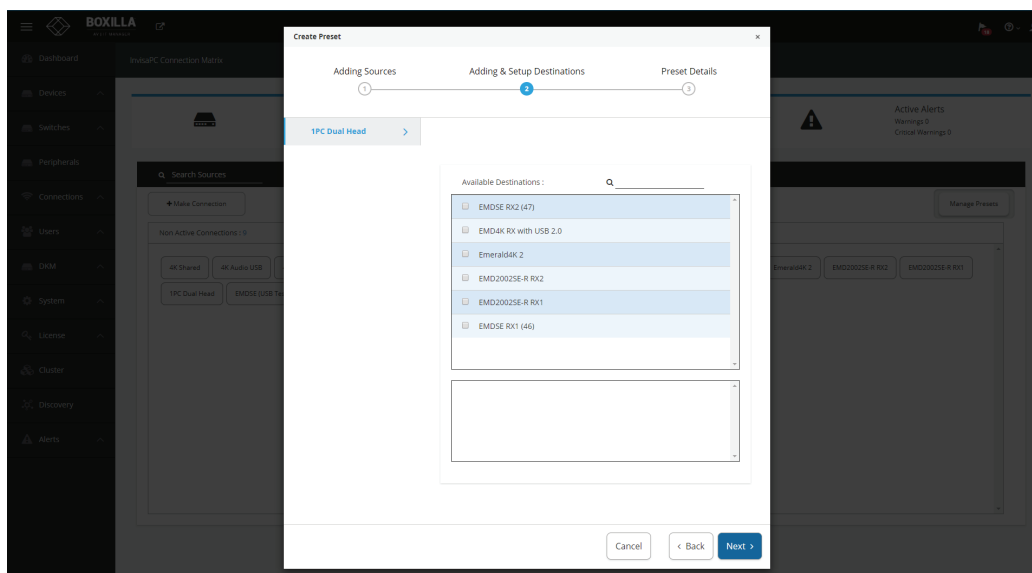


FIGURE 10-26. SELECT DESTINATIONS SCREEN

The icons on the destination screen are:






Icon	Meaning
	Source
	Destination
	View Only
	Shared Mode
	Private Mode

FIGURE 9-26. ICONS ON THE DESTINATIONS SCREEN

Both preset types will forcibly take any source and destinations required to establish their configuration, i.e., if those TX / VM and RX are already in active connections then these connections will be broken.

The partial type applies only to the specific Tx/Vm and RX that are selected in this preset type.

The full type is applied to all the Tx/Vm and RX. Any Tx/Vm and RX not selected in this preset type will become inactive when this preset is launched.

Click "Complete" to save the preset.

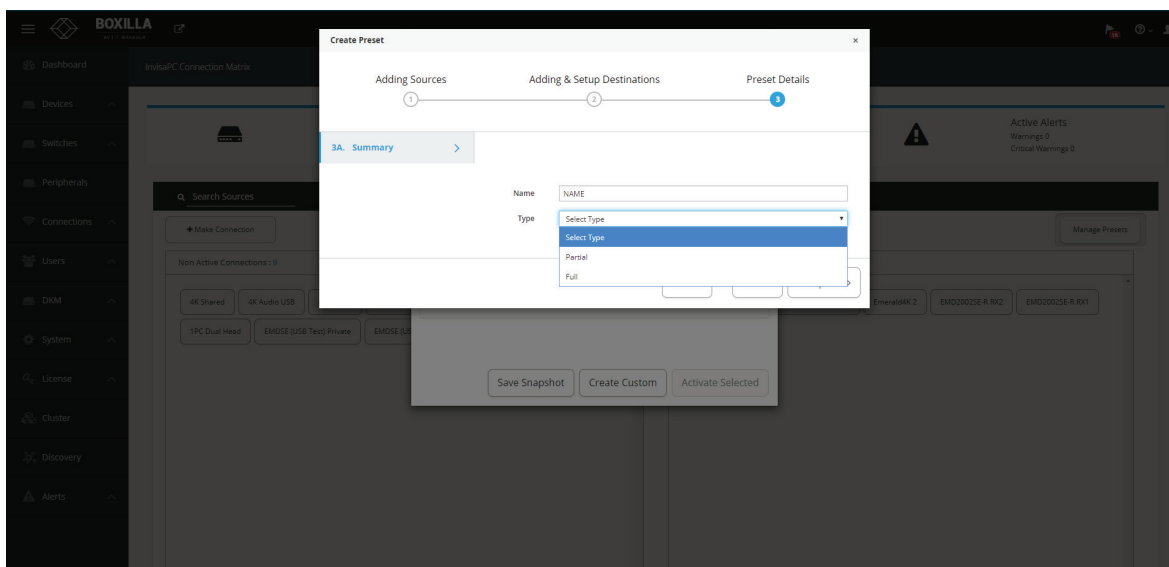


FIGURE 10-27. SAVE PRESET SCREEN

The following methods are available to activate presets:

1. Direct preset activation in the Viewer: The first three presets (ordered by creation) are presented directly in the Viewer and can be activated with a direct click.
2. Activation via Manage Presets: All presets can be activated with the “Activate Selected” option in “Manage Presets.” This is mandatory for any preset that is the fourth or later one created, as there is no other method to activate these presets from within Boxilla.

Under manage presets, we have a snapshot option, which will automatically save the current active connections as a “Preset”.

## CHAPTER 11: USERS

Users are defined in the Emerald or InvisaPC system to provide rights to manage the system, rights to connect to different target devices and rights to set parameters for connections.

### 11.1 USER TYPES

There are three types of users that can be created in an Emerald or InvisaPC system:

1. Administrator: Users of this class have full rights to configure the system. They can create/modify/delete users and connection, change network settings, etc.
2. Power User: Users of this class can modify resolution for connections to virtual desktops and change his/her local password.
3. Standard Users: Users of this class can only select from a list of pre-defined connections to access and view system information. They cannot change any configuration settings.

The Boxilla has one default user —admin, which is a member of the administrator group. This user is defined by default and cannot be deleted. Boxilla currently supports up to 1,000 individual users.

To manage users, an administrator selects the Users button on the main menu.

### 11.2 USER—MANAGE

The User—Manage screen is used to create, edit and delete users as shown in Figure 10-1. It provides a list of the currently created users.

Username	Based On Template	Privilege	Auto Connect	Auto Connect Name	Remote Access	Authorized By	Domain	AD Status
admin	admin_default	Administrator	No	-	No	Local		
dean	-	Administrator	No	-	No	Local		
garrett	-	Administrator	No	-	Yes	Local		
marie	-	User	No	-	No	Local		
User1	-	Administrator	No	-	Yes	Active Directory	bbnsengineering.local	✓

FIGURE 11-1. USERS—MANAGE

## CHAPTER 11: USERS

### 11.2.1 ADD USER

To create a user, click on the +User button at the top of the page and this opens up the new user wizard. The initial page of this wizard is shown in Figure 10-2.

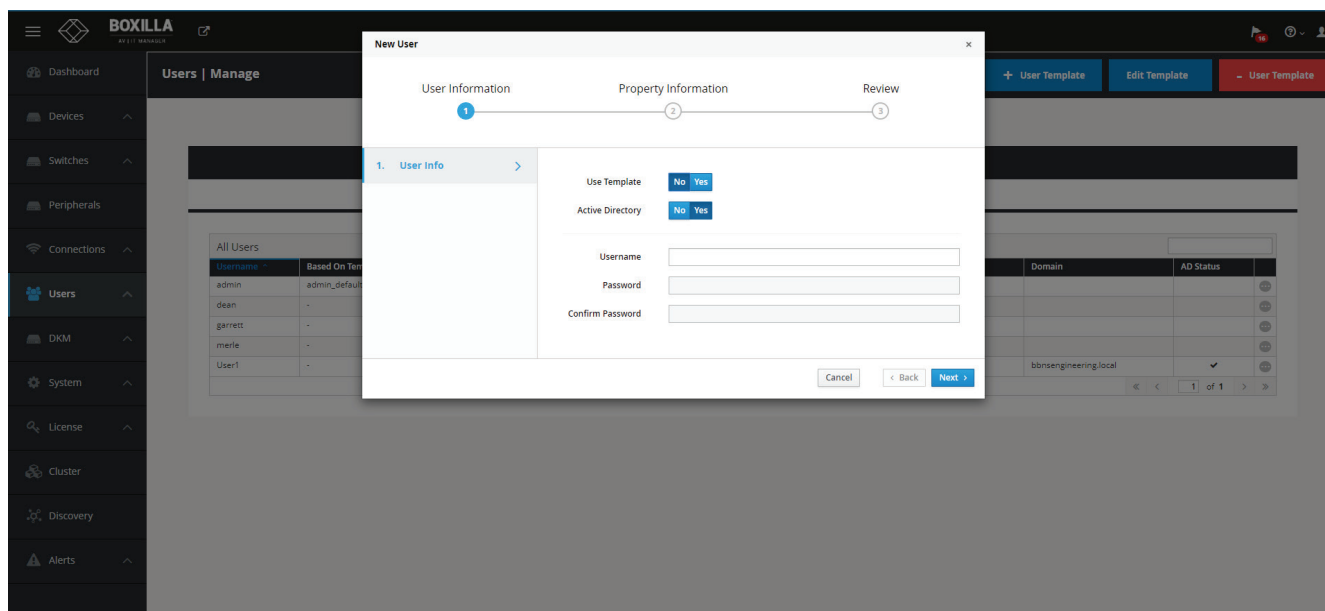


FIGURE 11-2. NEW USER WIZARD

The administrator can use a template to follow a common set of properties for a user as described in the next section. The definitions of the properties of a user are:

- **User Name:** This is a unique name that uses 1–32 characters. The username can be any valid username for a Microsoft O/S. This means the username cannot contain " / \ [ ] : ; | = , + \* ? < > `".
- **Active Directory:** Select "Yes" if the user belongs to Active Directory that is enabled on Boxilla.
- **Password:** This field can be a minimum of 0 characters (i.e. blank) and a maximum of 32 characters. The password can be any valid password for a Microsoft O/S. This means the password cannot contain " / \ [ ] : ; | = , + \* ? < > `".
- **User Privilege:** This field defines the type of user the new user will be: Administrator, General User or Power User.
- **Auto-Connect:** This enable/disable whether the Emerald or InvisaPC Receiver attempts to connect immediately to the selected connection after a logon by this user. This automatic connection only occurs after a logon. If a user exits the connection, the connection tab is displayed to the user for selection of a connection.

Once the new user fields have been filled out, you must click the Save button to create the new user. Clicking the Save button causes the validation of the new username, checking that it is unique and that the two password entries match. If this validation fails, a pop-up window displays the reason for the failure, and the new user is not created. After dismissing the pop-up window, the user can fix the error and click Save again.

## CHAPTER 11: USERS

### 11.2.2 MANAGE USER CONNECTIONS

The new user must be allocated Connections that he/she can access. This is done by clicking on “Manage Connection” option on the ellipsis “...” icon in the required user row. The required connections are selected from the available Connections—click on the connection in the Non-Selected List and then click the “->” button). This causes the selected connections to be “added” to a user’s selected connection window as shown in Figure 10-3. Click Save to complete the selection. It is a similar process to edit an existing users list of connections. To remove a connection from a user, select the specific connection in the Selected list (i.e. current connections allocated to the user) and click on the “<-” button. Click Save to complete the task.

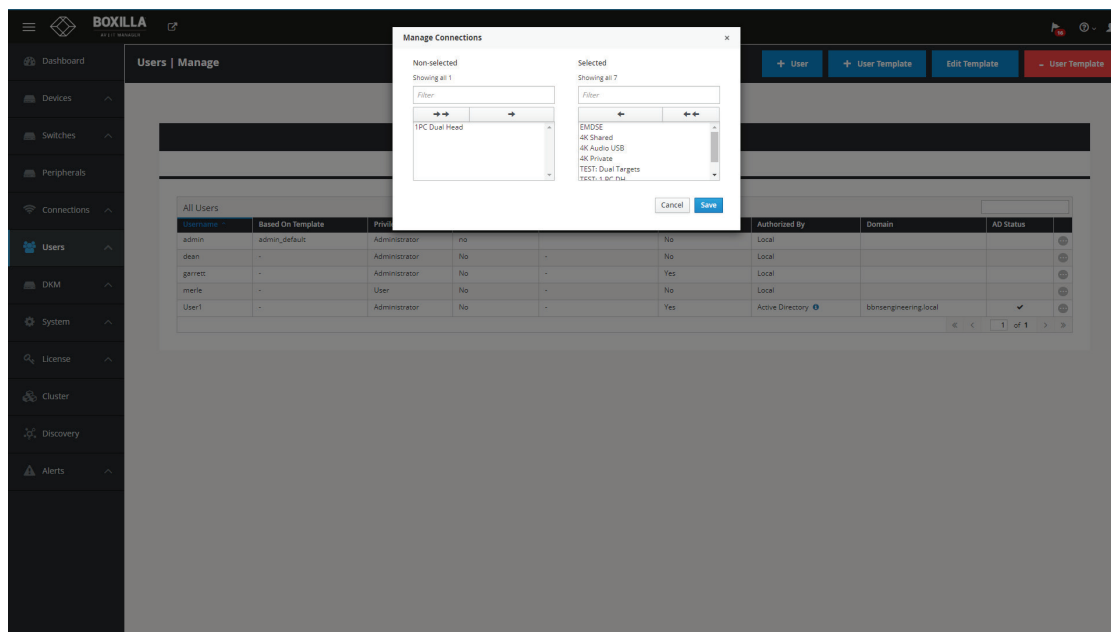


FIGURE 11-3. MANAGE USER CONNECTIONS

### 11.2.3 ACTIVE DIRECTORY USER MANAGEMENT

When you create a new Boxilla user and save it as an Active Directory user, you will see the “AD Status” change to a spinner. This means Boxilla is attempting to retrieve the DN string for the user that contains the OU and CN information. If the retrieve was successful, the spinner will change to a “tick” or check mark and we will store the new OU tree information in our database. If the retrieve was not successful, then the spinner will change to an X. If the Boxilla administrator wishes to manually specify an OU for this user, then they can manually “edit” the user and they will then be presented with the text fields to enter the OU information manually.

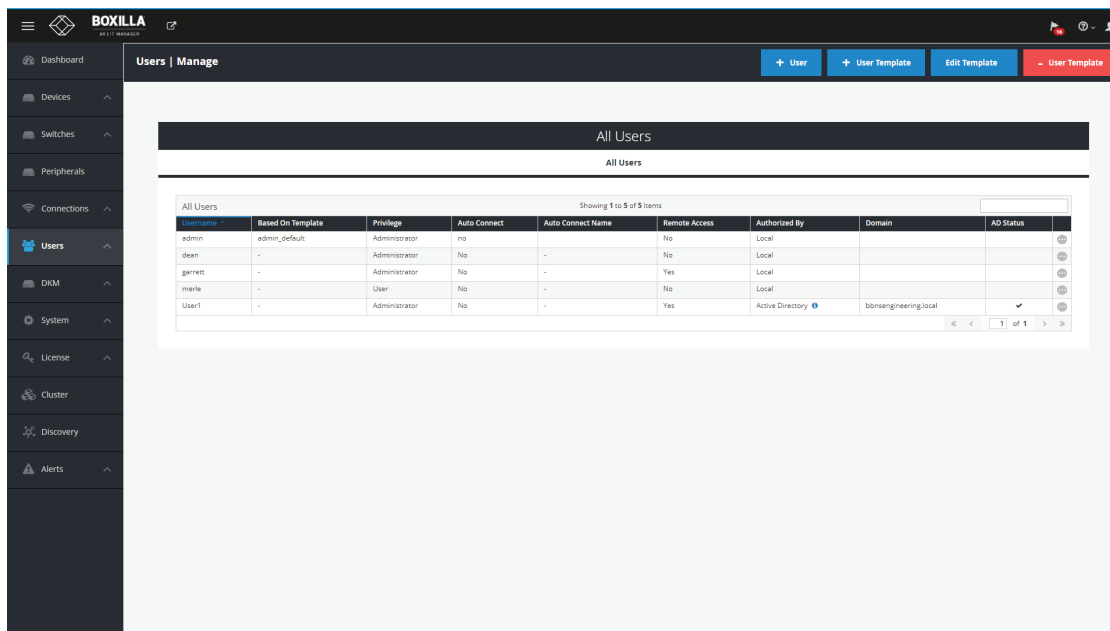


FIGURE 11-4. USERS → MANAGE

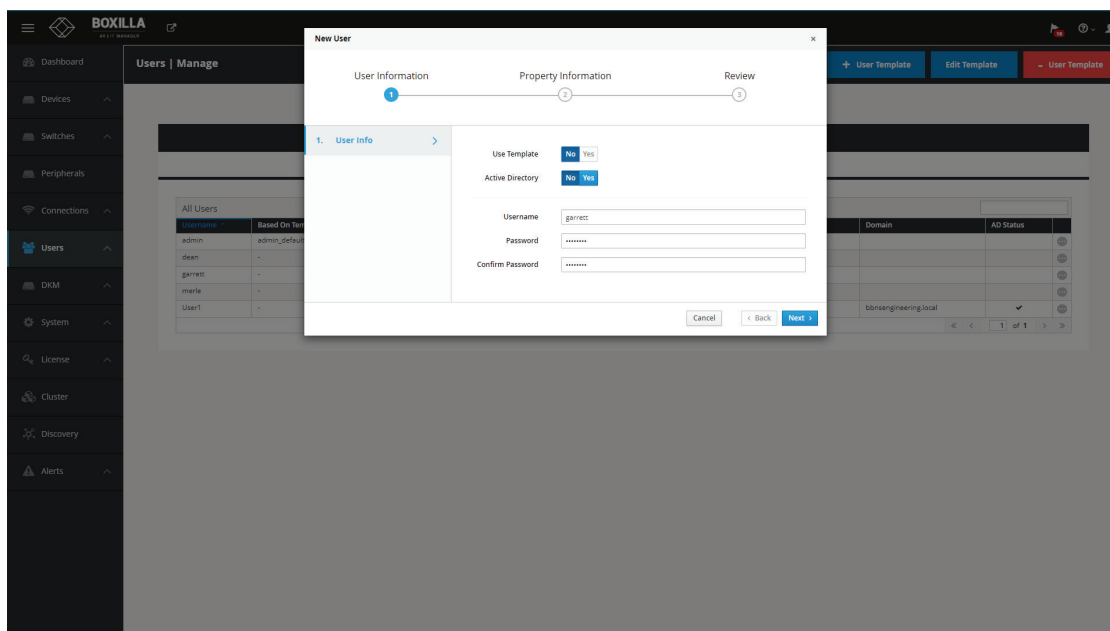


FIGURE 11-5. EDIT USER DETAILS

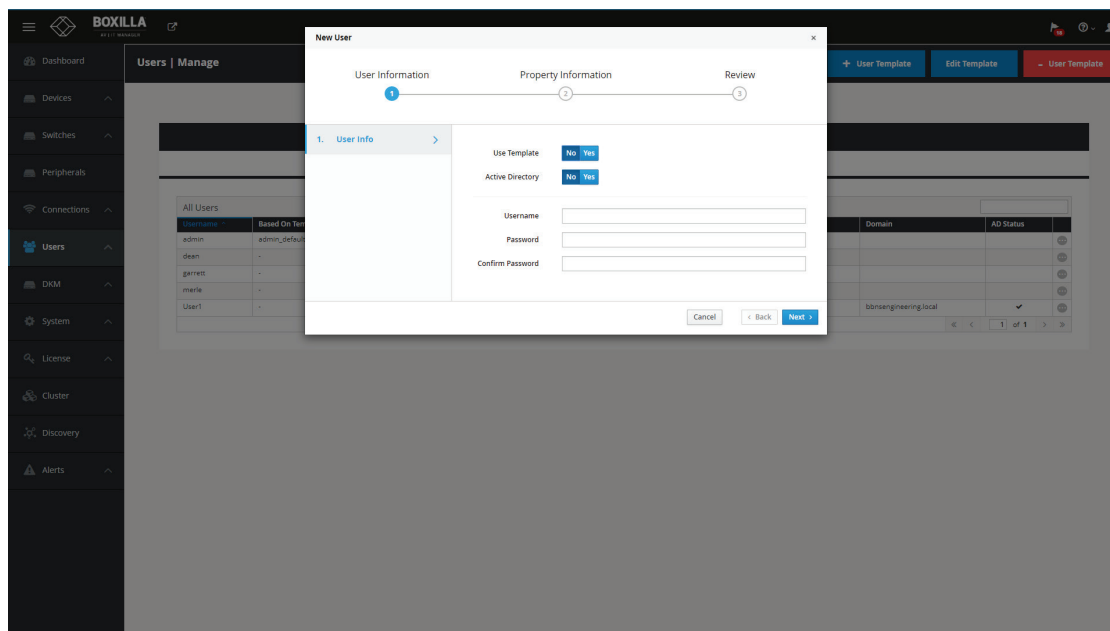


FIGURE 11-6. CREATE AD USER

## ACTIVE DIRECTORY USER LOGGING INTO RECEIVER

When a user logs onto the receiver as an AD user, Boxilla queries Active Directory server for authentication. When the Active Directory returns the result, the local user is allowed to log into the device.

### 11.2.4 CONNECTION FAVORITES

Connection favorites provide a quick convenient mechanism for users to switch between their pre-defined connections. Favorites are configured by the administrator where a maximum of 10 favorites can be assigned to users using a combination of hotkey and [0-9].

#### Assigning Connection Favorites

A pre-requisite is that the user exists and has connections assigned.

The following screenshot demonstrates the administrator assigning connections for the user to the available hotkeys. Favorites do not need to be allocated sequentially and hotkeys can be skipped.



## CHAPTER 11: USERS

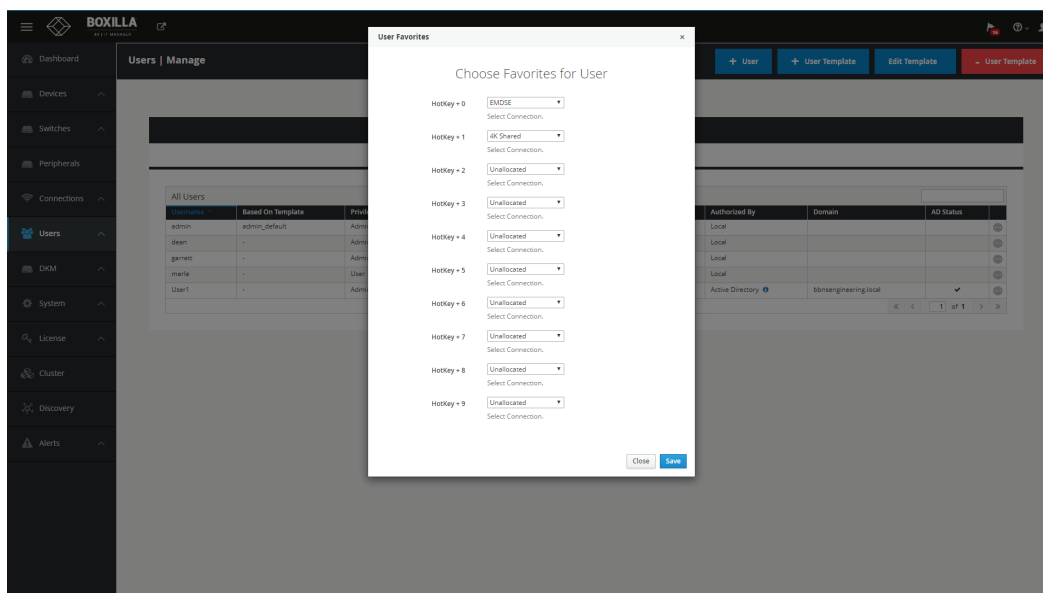


FIGURE 11-7. CONNECTION FAVORITES SCREEN

Listing Connection Favorites:

When a user logs in they can view their assigned favorites.

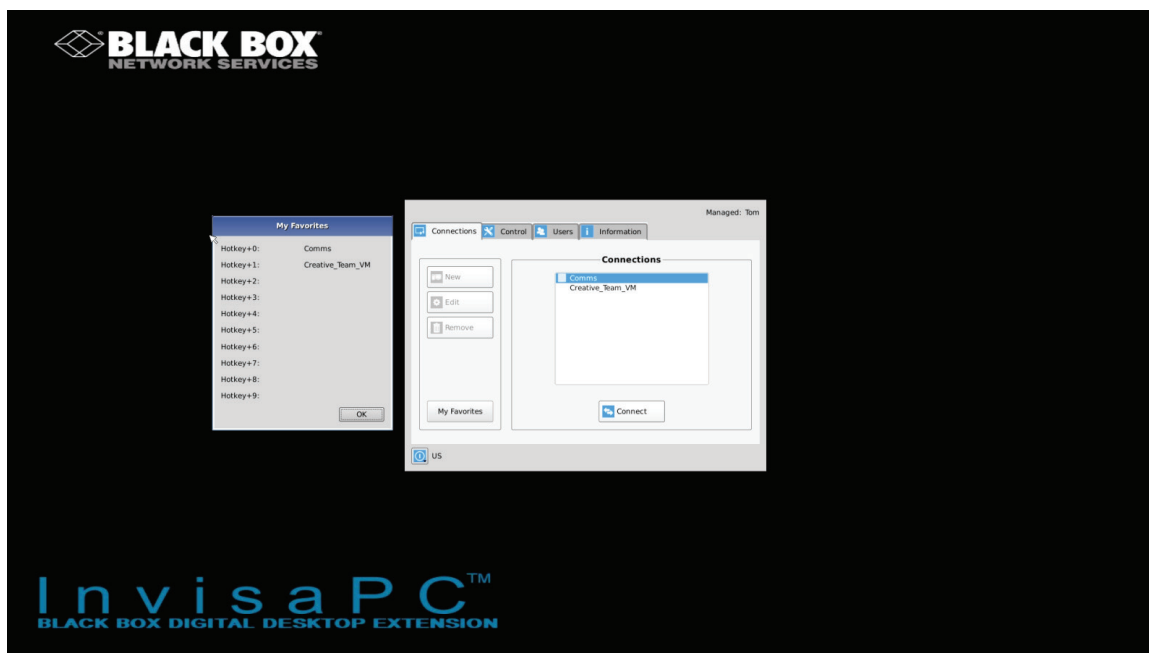


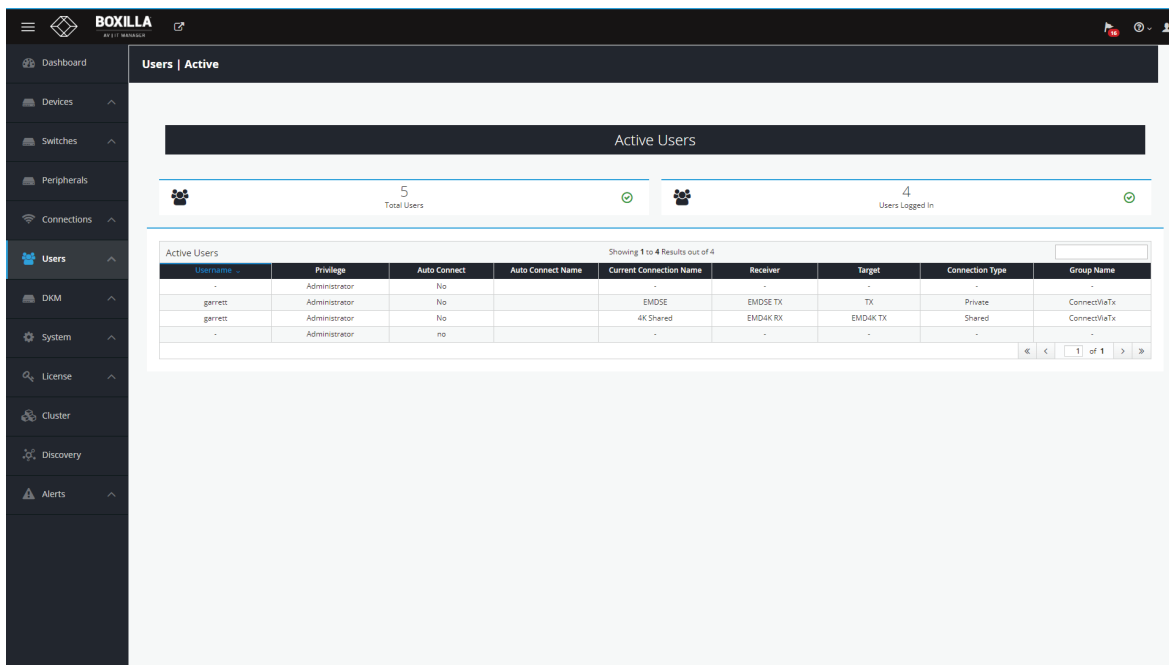
FIGURE 11-8. CONNECTION FAVORITES SCREEN

### 11.2.5 DELETE USER

To remove a user from the system, click on the ellipsis “...” icon on the row of the user to be deleted and click on the delete option.

## 11.3 USER—ACTIVE

The User—Active page shows a list of all the users logged in to an Emerald or InvisaPC Receiver. The page provides information on what Receiver the user is logged in on and details on any active connection as shown in Figure 10-6.



The screenshot shows the BOXILLA web interface. The left sidebar contains navigation links: Dashboard, Devices, Switches, Peripherals, Connections, Users (selected), DiM, System, License, Cluster, Discovery, and Alerts. The main content area is titled 'Users | Active' and displays 'Active Users'. It shows 5 total users and 4 users logged in. Below this is a table with 9 columns: Username, Privilege, Auto Connect, Auto Connect Name, Current Connection Name, Receiver, Target, Connection Type, and Group Name. The table lists three users: an administrator, 'garrett' (Administrator), and another administrator. The 'garrett' user is shown with two active connections: 'EMDGE' and 'AK Shared'.

Username	Privilege	Auto Connect	Auto Connect Name	Current Connection Name	Receiver	Target	Connection Type	Group Name
-	Administrator	No		-	-	-	-	-
garrett	Administrator	No		EMDGE	EMDGE TX	TX	Private	ConnectiaTx
garrett	Administrator	No		AK Shared	EMD4K RX	EMD4K TX	Shared	ConnectiaTx
-	Administrator	no		-	-	-	-	-

FIGURE 11-9. ACTIVE USERS

# CHAPTER 11: USERS

## 11.4 MANAGE GROUPS

Once a user is registered in Boxilla, the administrator can assign the user to a User Group by using the Manage Groups option. Once the group profile is assigned to a user, that user will be able to make a connection to the targets found in that group.

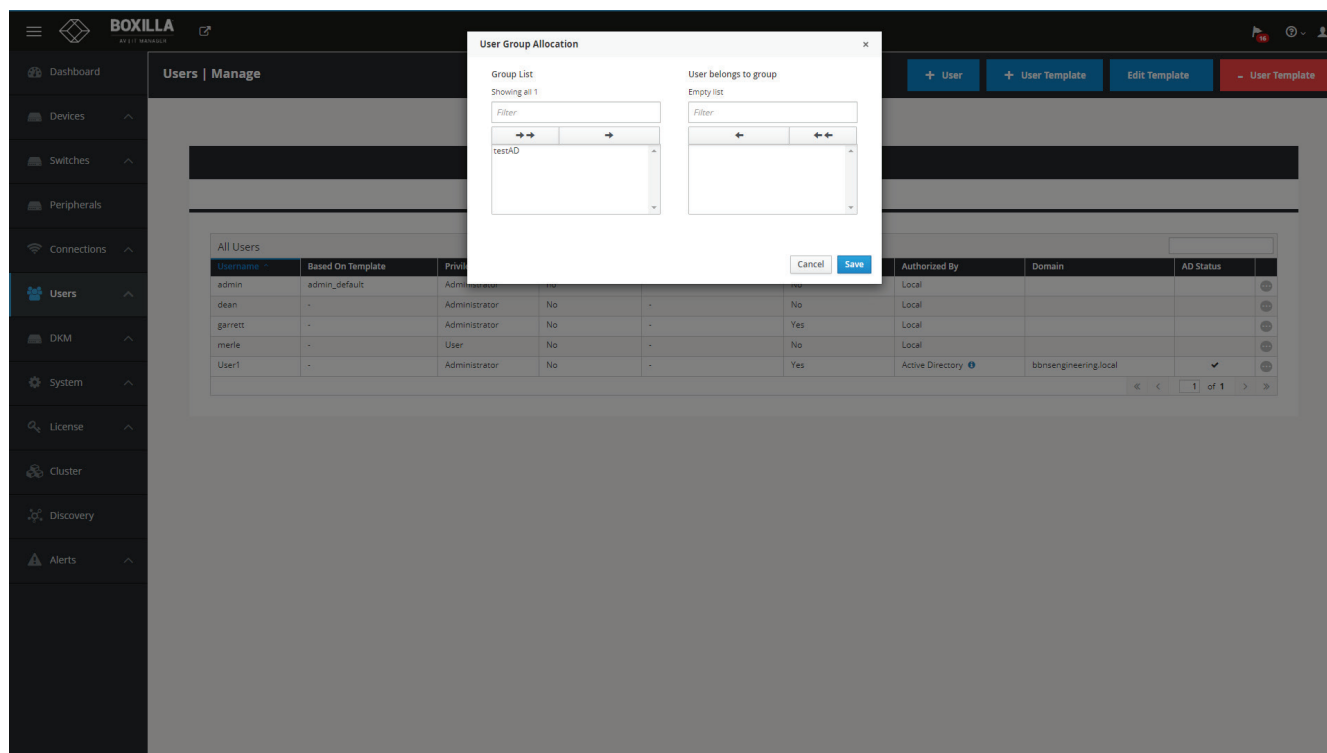


FIGURE 11-10. MANAGE GROUPS

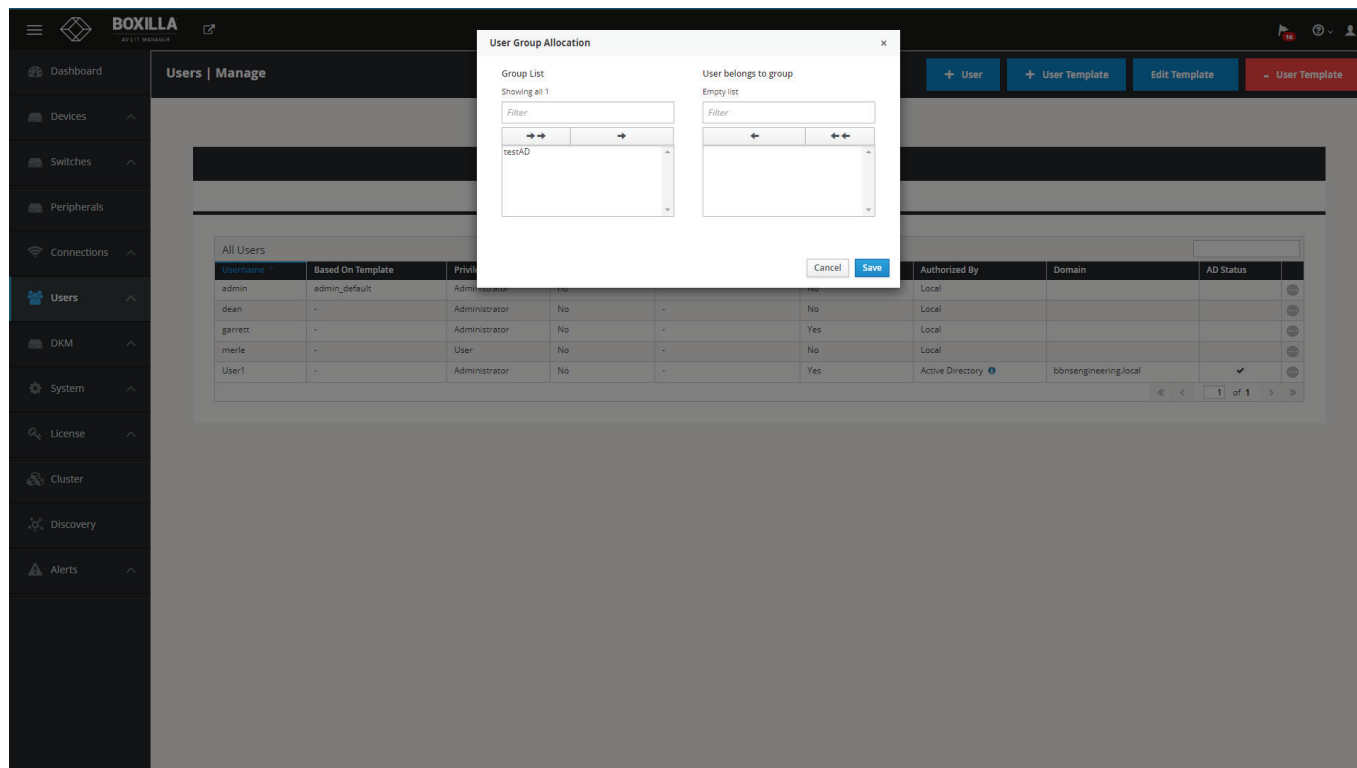


FIGURE 11-11. USER GROUP ALLOCATION SCREEN

## CHAPTER 12: DKM INTEGRATION

### 12.1 INTRODUCTION

This chapter considers integration aspects of Boxilla. The chapter is divided into two main sections, which include activities on the DKM end and on the Boxilla side. The chapter describes the configuration elements for Boxilla and DKM.

Boxilla manages DKM connections towards Emerald and InvisaPC appliances by means of Virtual CPUs. The VirtualCPU name must match the Emerald/InvisaPC Connection name. When the DKM Connection (vCPU to CON) is established, the DKM switch will echo this operation onto the network. This will be picked up by Boxilla and Boxilla will initiate the desired connections between the InvisaPC Receiver and the InvisaPC Transmitter/VM.

Follow these steps:

1. Create desired InvisaPC Connection.
2. Add a DKM Switch under Boxilla -> DKM -> Switches.
3. Create a Virtual CPU on the DKM JavaTool (named the same name as the Emerald/InvisaPC Connection). Physically attach this to the Emerald/InvisaPC Receiver. When the DKM CON is then connected to the VirtualCPU, the connection name will be picked up and the Emerald/InvisaPC leg of the connection will be set up.

### 12.2 STEPS TO CREATE AND MANAGE VCPU CONNECTIONS ON THE UTILITY

Assumed: You have the desired Emerald/InvisaPC connection setup.

Open the Java Tool and select "Activate Online Configuration," which is found in the toolbar of the DKM FX Tool. Select Yes when you are asked to confirm. NOTE: The screen you see depends on the version of the DKM Java Tool used.

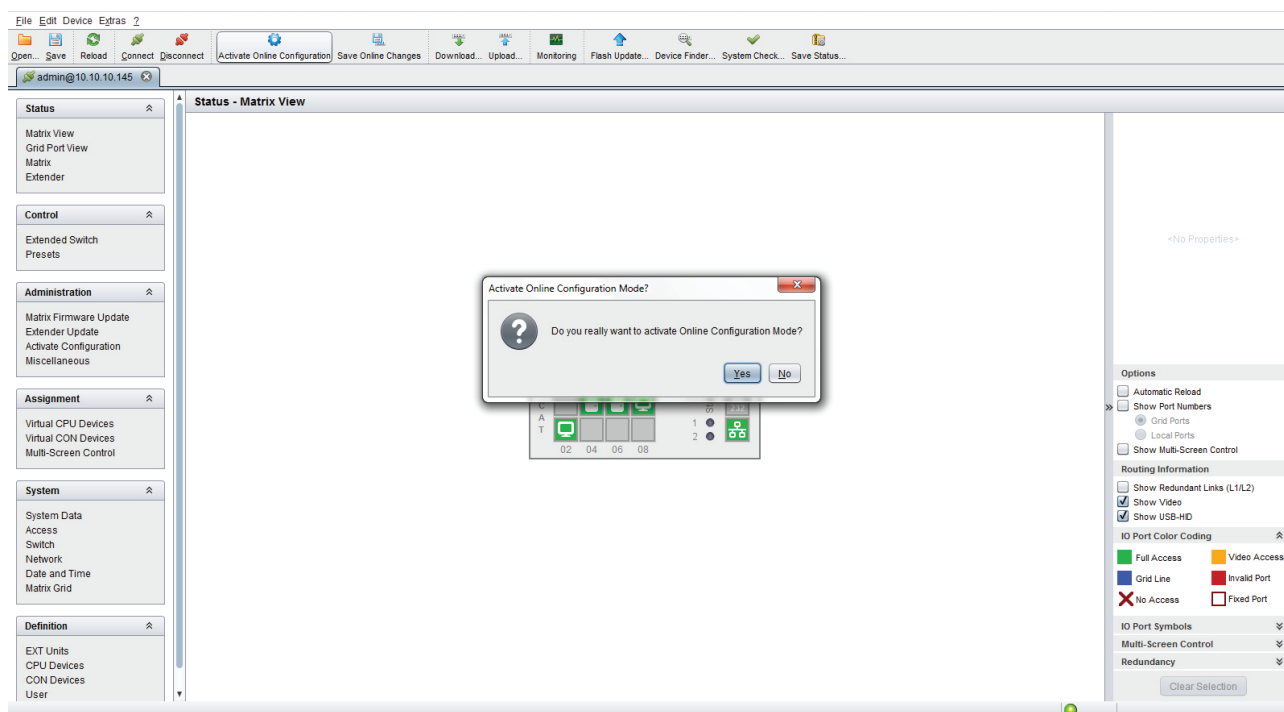


FIGURE 12-1. JAVA TOOL SCREEN

Click "CPU Devices," which is a menu item under "Definition" on the lower left side. Next, select the "New Device" button on the lower right side of the screen. Select "Create a virtual CPU."

## CHAPTER 12: DKM INTEGRATION

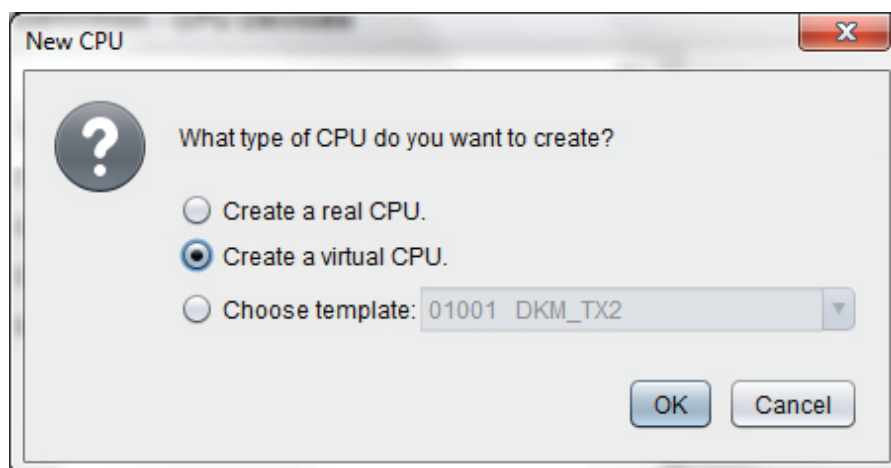


FIGURE 12-2. CREATE A VIRTUAL CPU OPTION

You will then have the option to name your Virtual CPU.

**IMPORTANT:** This name must be the same as the Emerald/InvisaPC Connection name that you want it to be associated with.

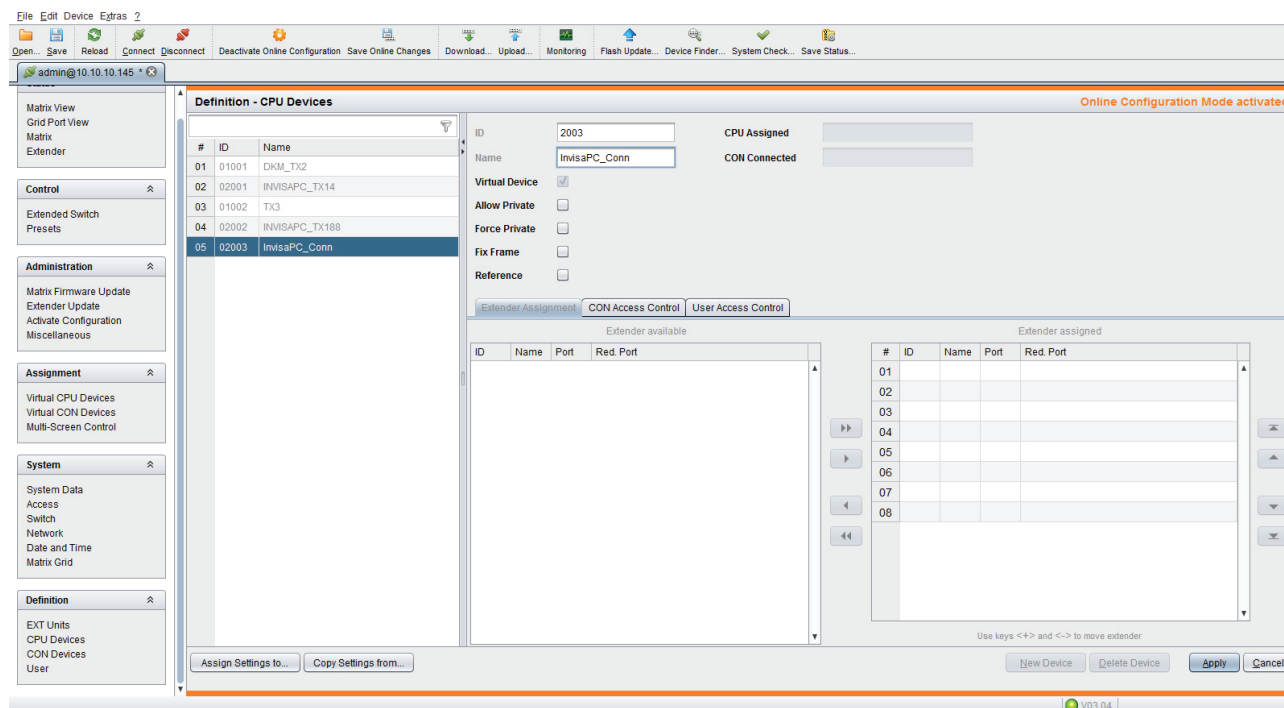


FIGURE 12-3. NAME VIRTUAL CPU SCREEN

Press “Apply.”

## CHAPTER 12: DKM INTEGRATION

Next, navigate to “Virtual CPU Devices,” which appears under the “Assignment” tab on the main menu on the left side of the application window. Here you can assign your new Virtual CPU to the real CPU that’s physically connected into your Emerald/InvisaPC receiver. This is done by clicking the empty space in the “Name” column and seeing the drop down of available Real CPUs.

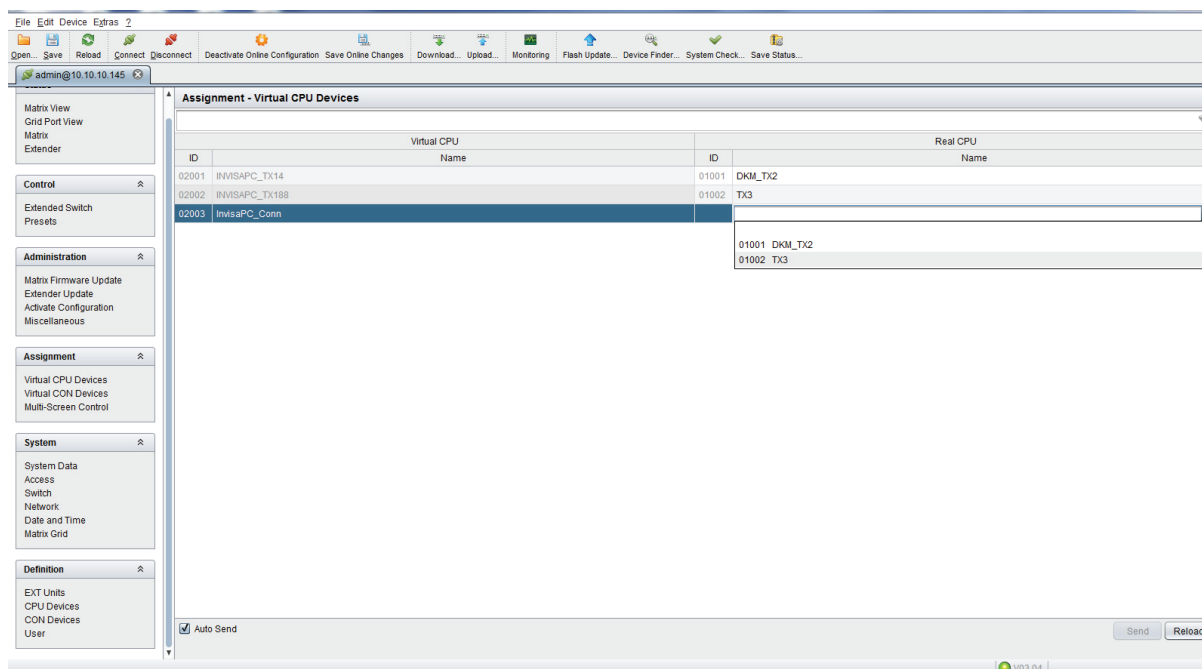


FIGURE 12-4. DROP DOWN LIST OF AVAILABLE REAL CPUS

## CHAPTER 12: DKM INTEGRATION

Next, click “Save Online Changes.” This pushes the changes down to the DKM switch so even if it reboots it will hold onto the new settings.

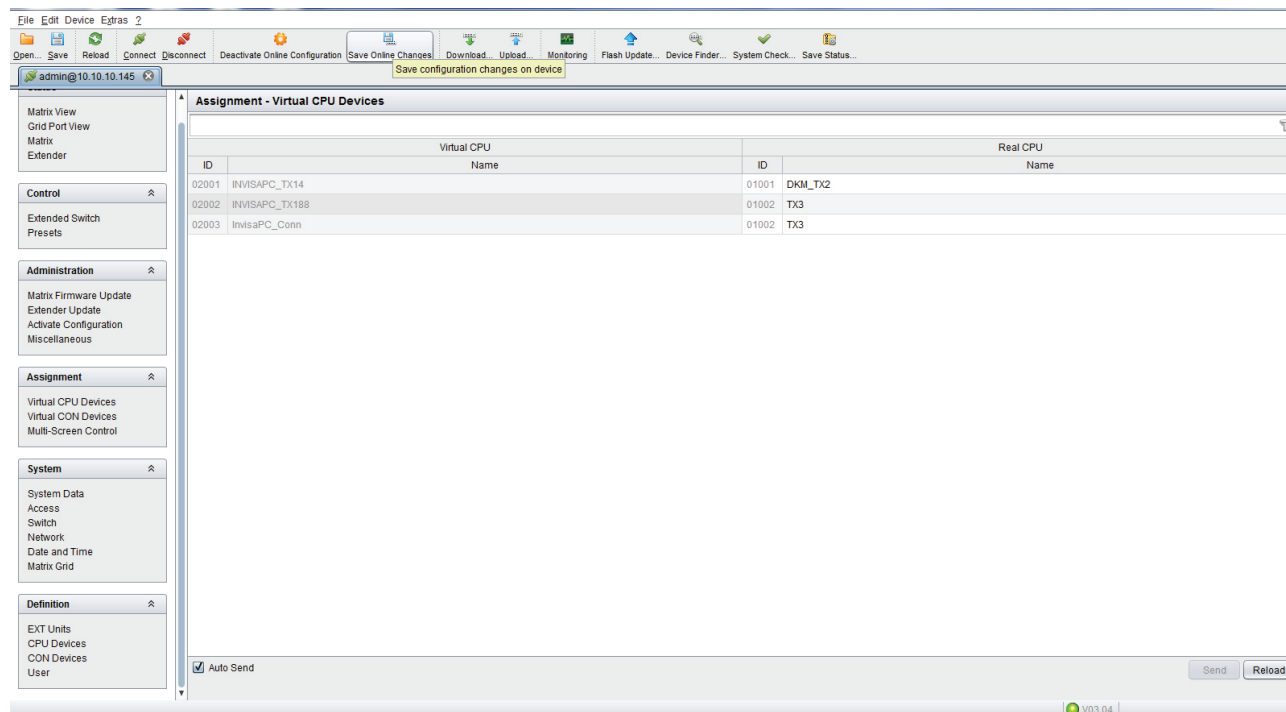


FIGURE 12-5. SAVED CHANGES



## CHAPTER 12: DKM INTEGRATION

### HOW TO ENABLE LAN ECHO

Next, you must Enable LAN Echo. This will enable the switch to echo the results of the connection initiations to the network, where Boxilla can put them up and set up the corresponding Emerald/InvisaPC Connections.

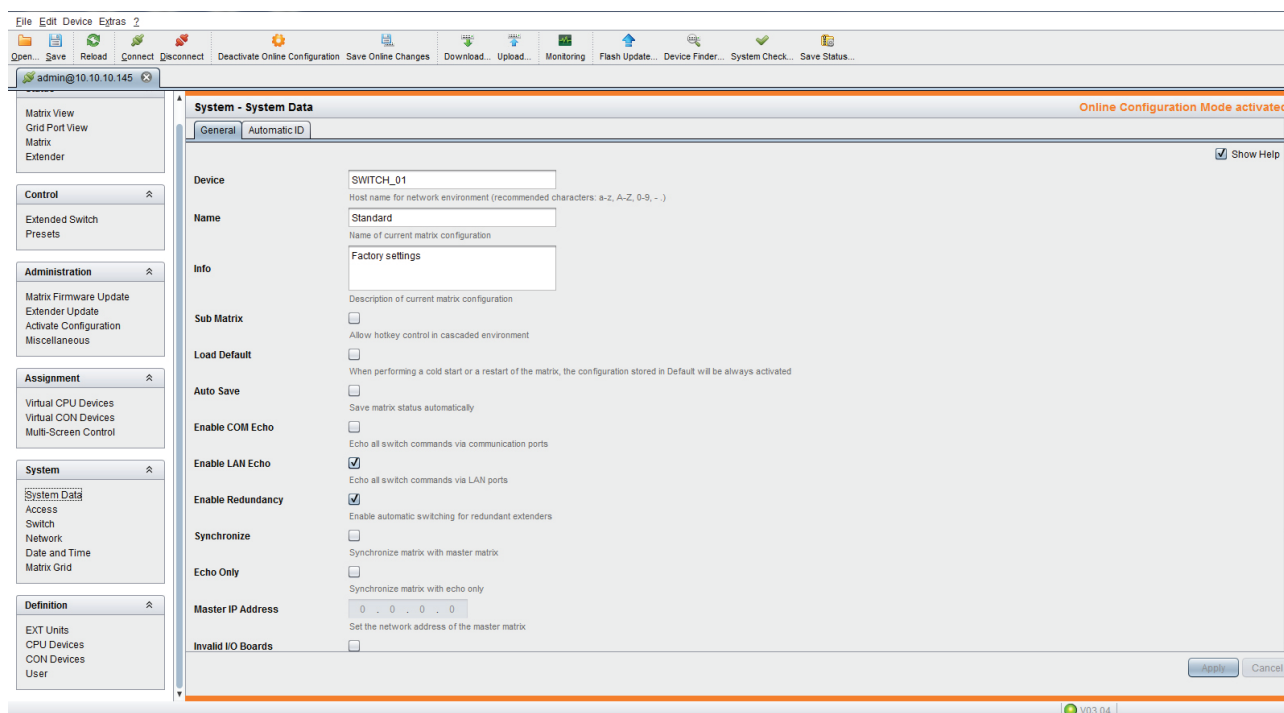


FIGURE 12-6. ENABLE LAN ECHO

If you encounter issues with the configuration not staying in place, you will need to save the DKM DTC file on a local computer, then using the Java Tool go to File>>Upload and activate the configuration which also requires a DKM switch reboot.

## CHAPTER 12: DKM INTEGRATION

### 12.3 STEPS TO ADD SWITCHES

Under Boxilla, to add the DKM switch, navigate to DKM —Switches and click the blue “Add Switch” button on the top right of the screen.

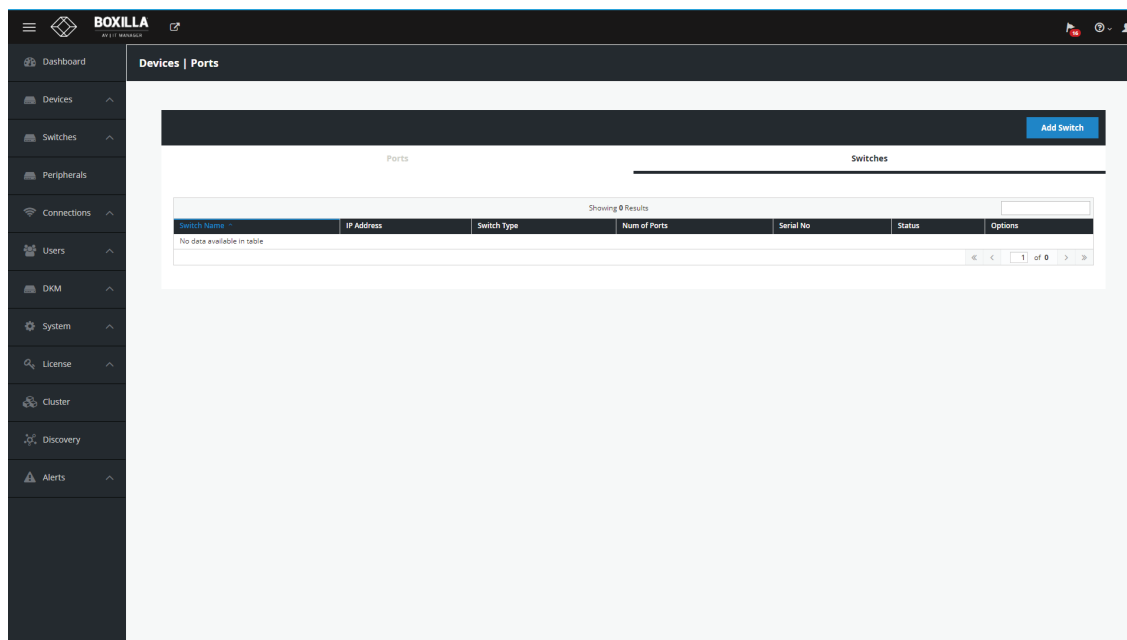


FIGURE 12-7. ADD SWITCH SCREEN

The Add new switch box will appear on the page. The only critical detail here is the IP address. Fill in the details and press Save.

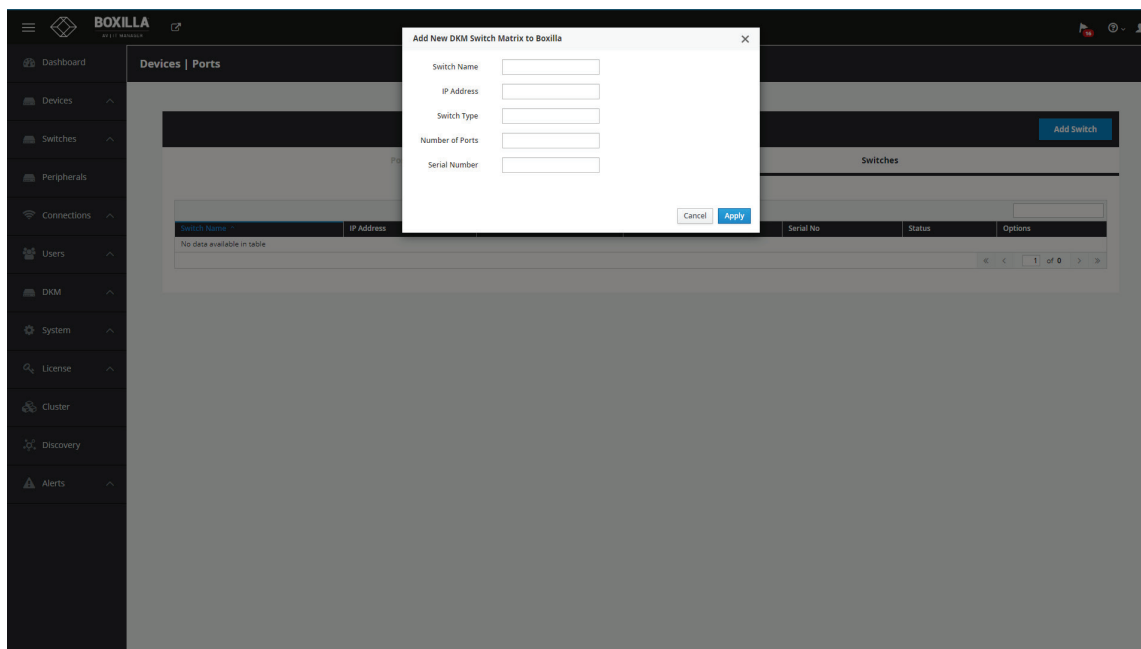


FIGURE 12-8. ADD NEW SWITCH BOX

Once the switch is added successfully, it gets listed with an online status.

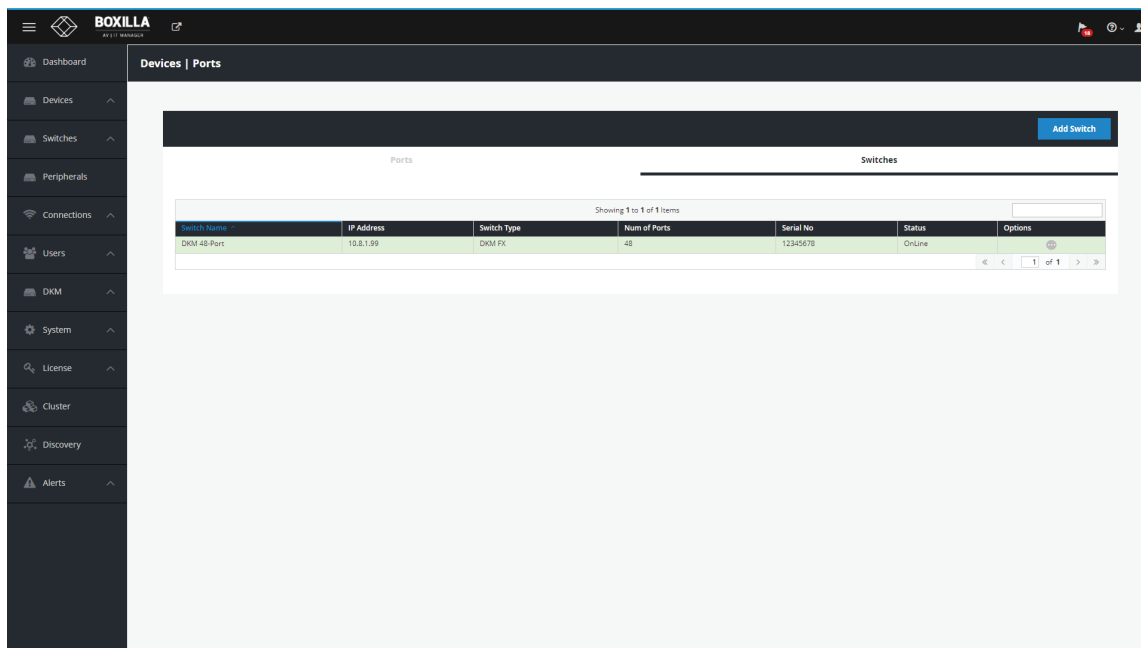


FIGURE 12-9. ONLINE STATUS OF SWITCH

If you wish to revert, select Delete from the dropdown list within options to delete the switch entry.

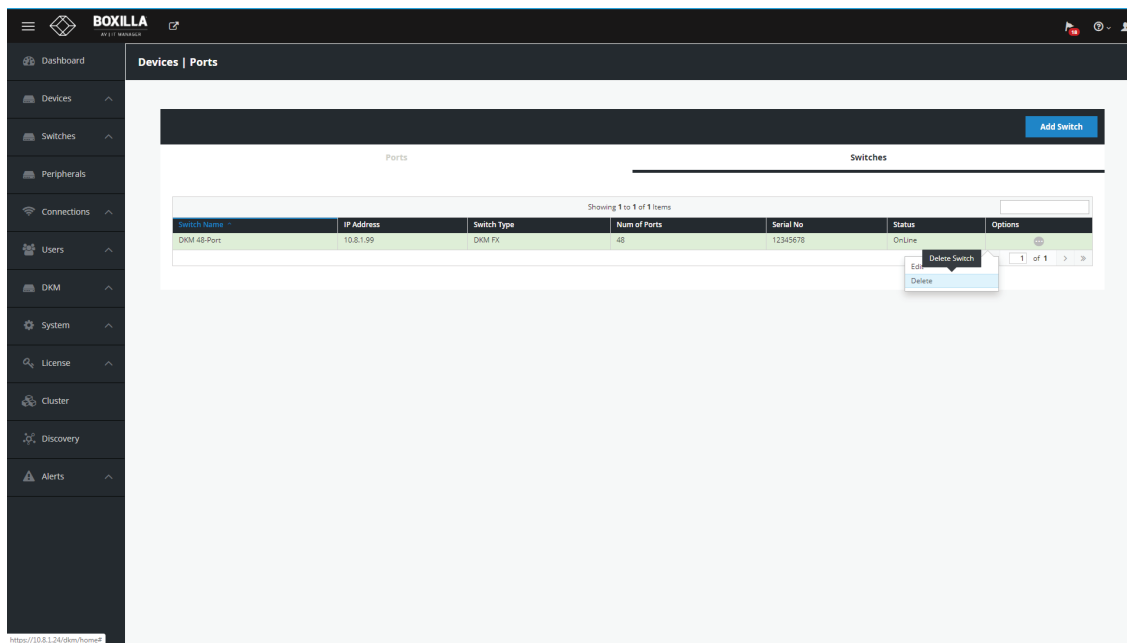


FIGURE 12-10. DELETE THE SWITCH ENTRY

If using multiple DKM switches, you can search for a switch by entering the switch name into quick search box at the right corner.

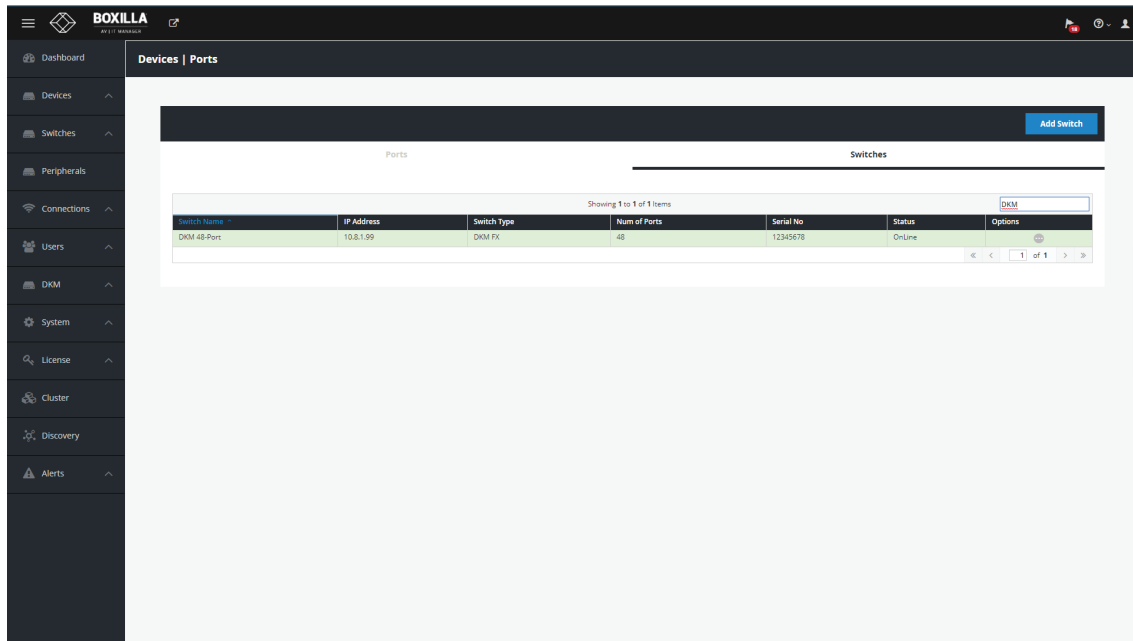


FIGURE 12-11. SEARCH FOR A SWITCH

Once the switch is added successfully, all DKM CONs and DKM CPUs (physical) connected will be listed on Boxilla. Also any Virtual CPUs configured on the DKM switch will be listed. Boxilla will automatically update with any new DKM CONs, DKM CPUs and Virtual CPUs that may be added in the future. Follow the next steps to create a new connection.

The DKM Ports Table displays ports based on the DKM switch that has been added.

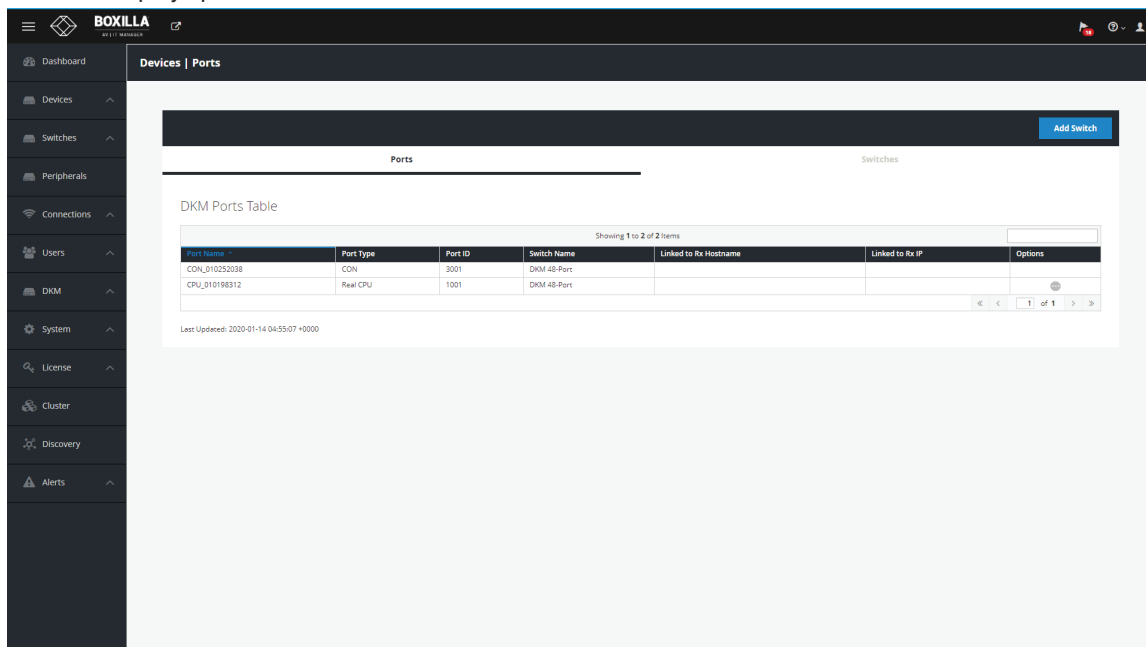


FIGURE 12-12. DKM PORTS TABLE

## CHAPTER 12: DKM INTEGRATION

The “Last Updated” text at the bottom of the screen is the last time Boxilla audited the DKM switch.

Find the Virtual CPU in the “Ports” list on the DKM-Switches page. Click the options button on the right hand side to “Attach to InvisaPC Connection.”

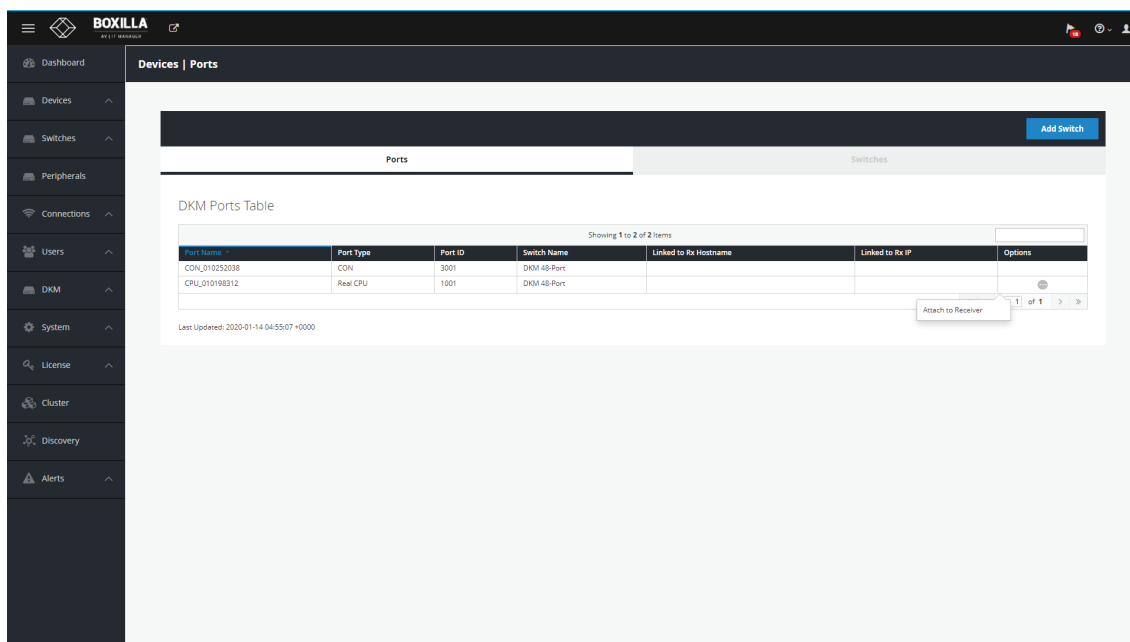


FIGURE 12-13. ATTACH TO INVISAPC CONNECTION

If you wish to search for a specific port, enter the Port ID at the search box within ports table.

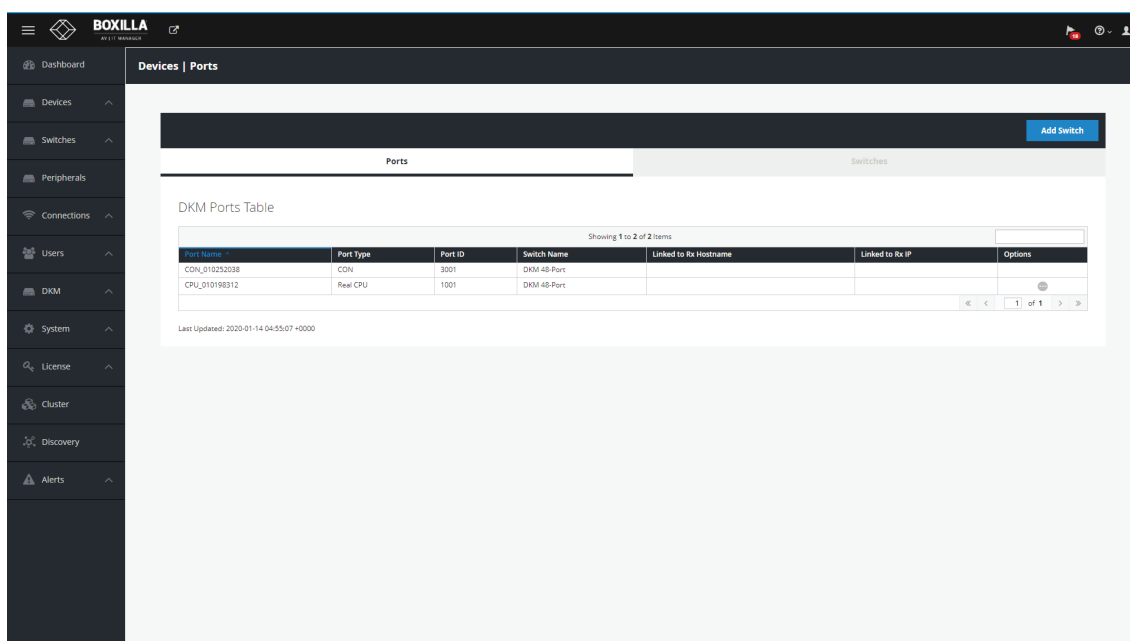


FIGURE 12-14. PORT ID SCREEN

## CHAPTER 12: DKM INTEGRATION

To start a connection you have two options:

1. Manual connections using “Add custom Source,” which lasts until the connection is broken.
2. Saving connection configurations as “Presets,” which can be activated on demand.

To detach a connection, left-click on the connection name. You will see a popup box that gives you the option to disconnect.

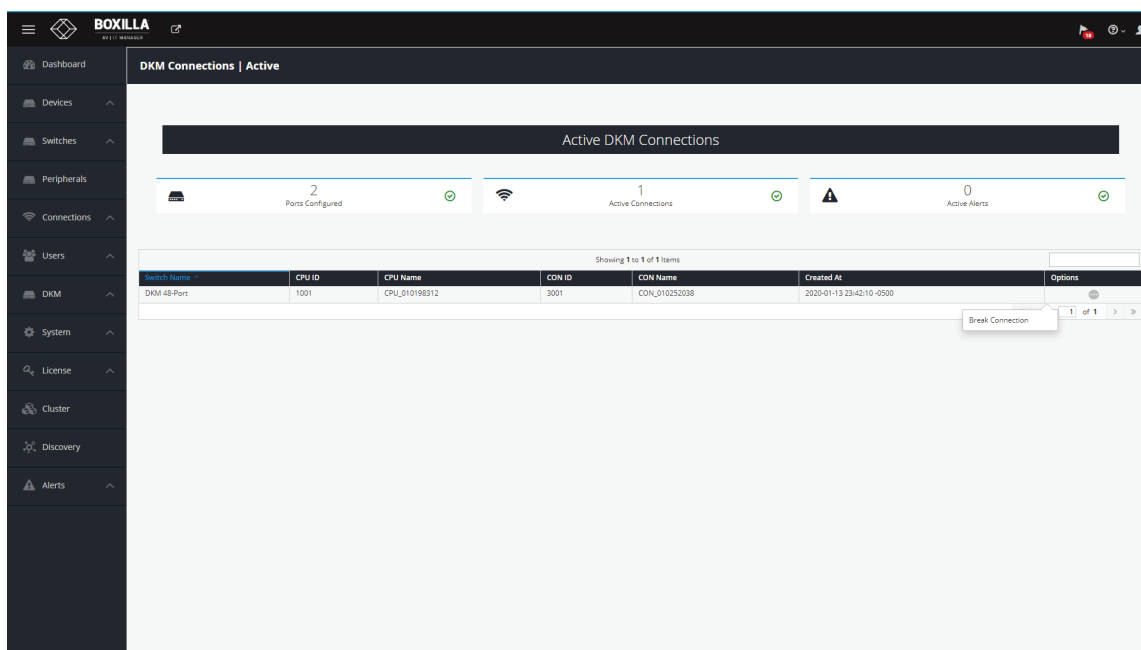


FIGURE 12-15. DETACH CONNECTION SCREEN

## CHAPTER 12: DKM INTEGRATION

### 12.4 ADD CUSTOM SOURCE

Under Viewer, click “Make a Connection” and select one or multiple sources from the list of available sources to activate, which will create connections with the selected sources.

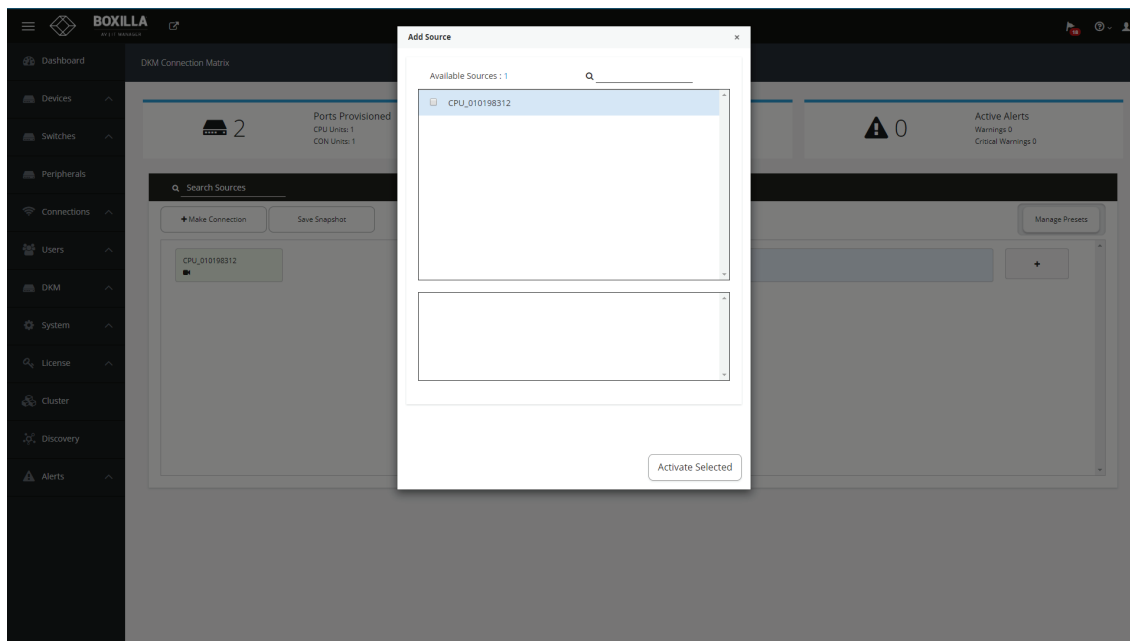


FIGURE 12-16. ADD CUSTOM SOURCE SCREEN

Once these connections are listed, each connection needs at least one destination added to form a functional connection.

Connections have the following options:

1. Detach Source: Break the connection by detaching the source.
2. Detach Destination: Break the connection by detaching the destination.
3. Add Destination: Add additional destinations to the source, e.g. if you wish to share the source.

You also have the option of saving the current connections in the Viewer as a preset via “Save Snapshot.” Save Snapshot is located under “Manage Presets.”

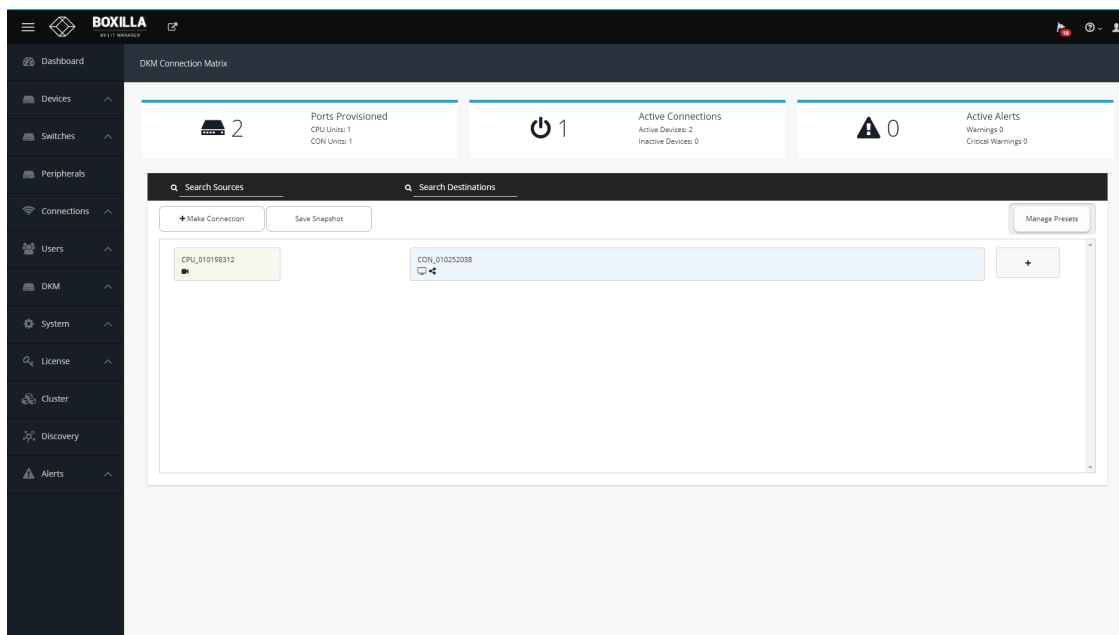


FIGURE 12-17. MANAGE PRESETS BUTTON

Search of available destinations can be completed within the “Add Destinations” popup box.

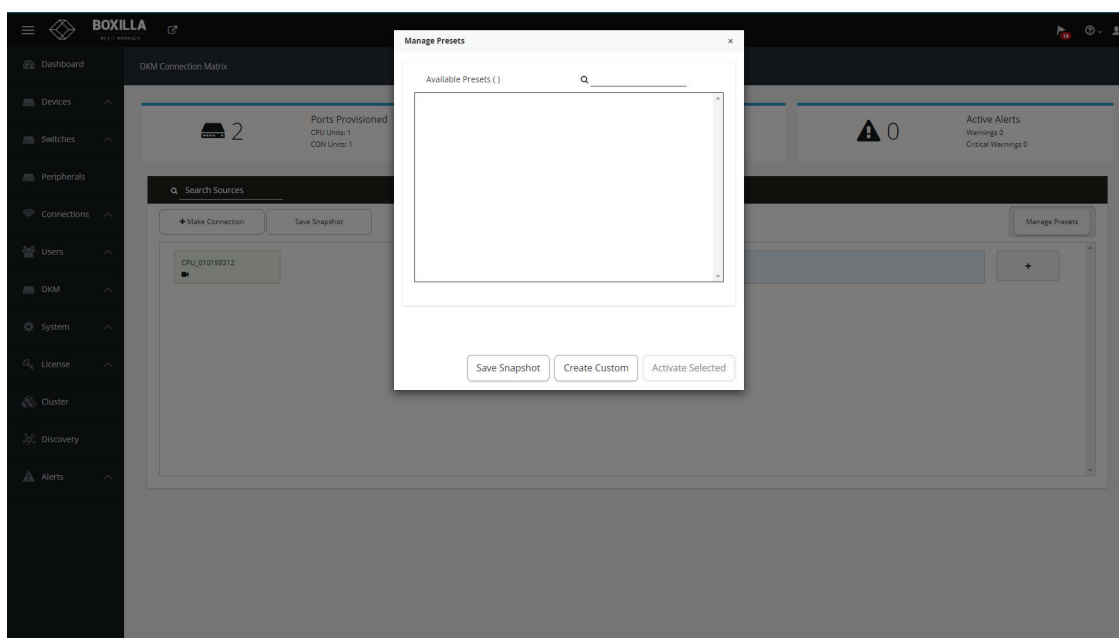


FIGURE 12-18. ADD DESTINATION POPUP BOX



## CHAPTER 12: DKM INTEGRATION

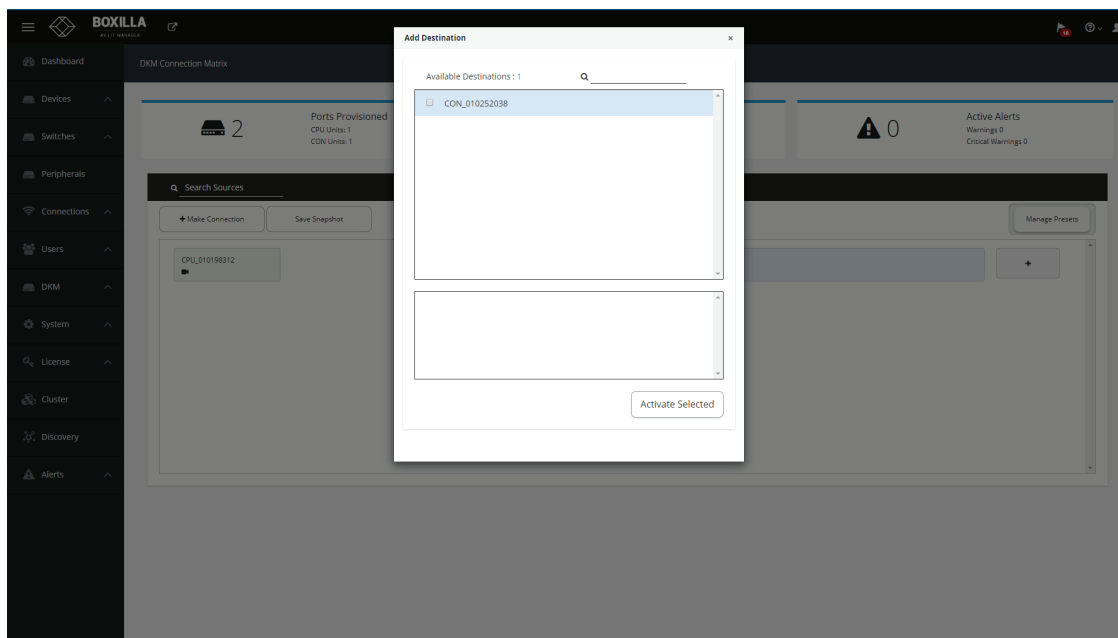


FIGURE 12-19. ADD DESTINATION POPUP BOX, ACTIVATE SELECTED BUTTON

Select the Destinations from the available destinations and click next.

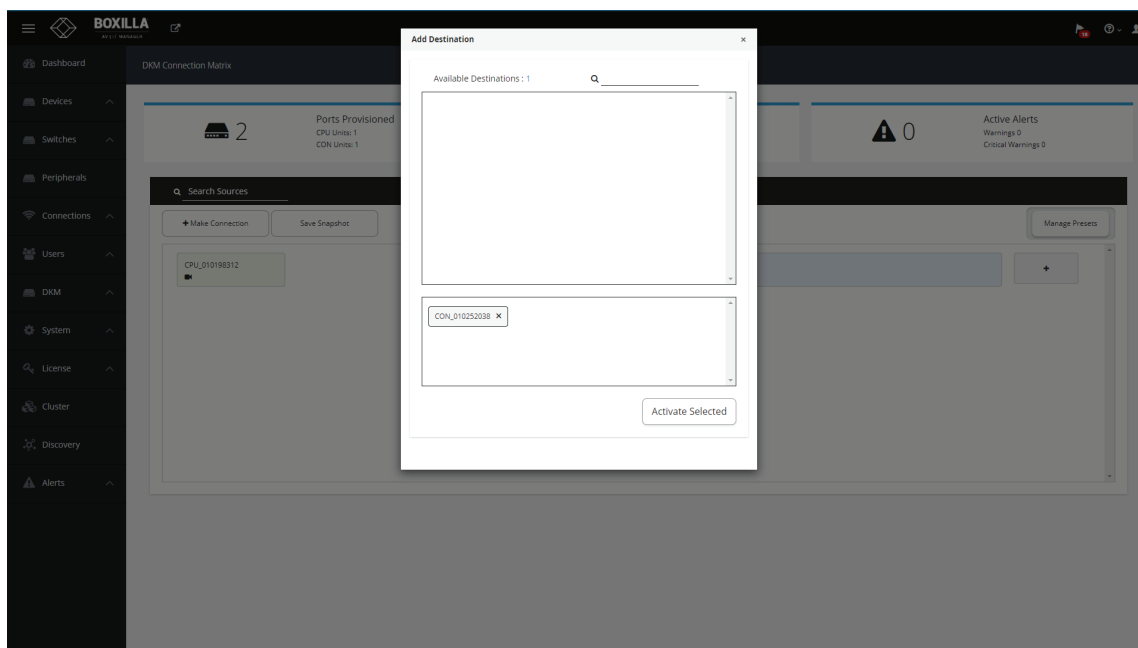


FIGURE 12-20. ADD DESTINATION RESULTING CONNECTION SCREEN

Once Activated, connections get listed under the Viewer screen.

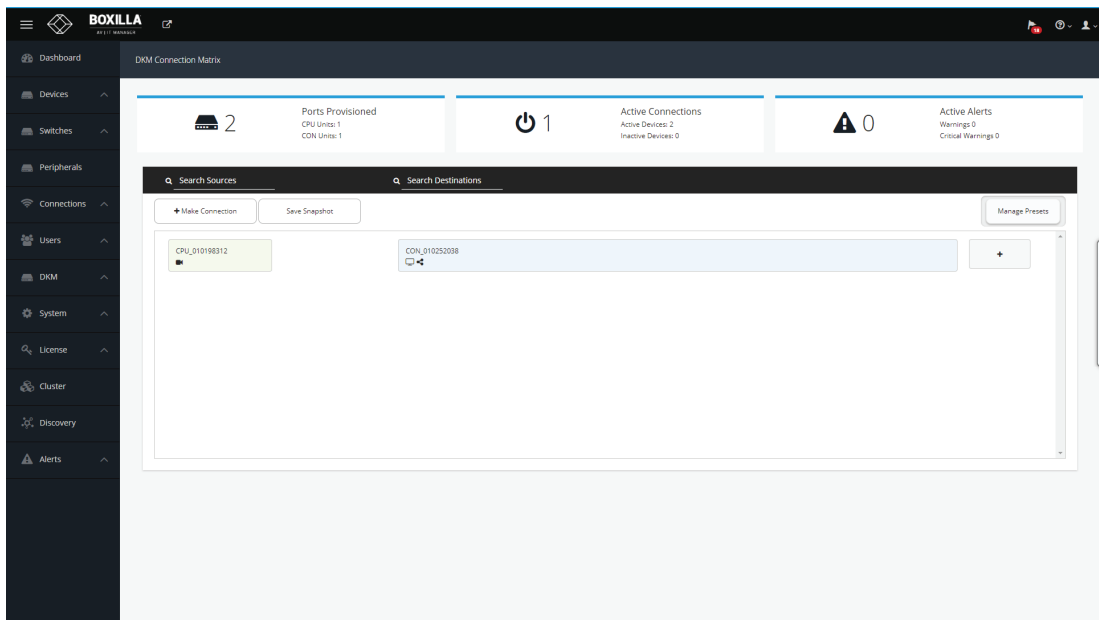


FIGURE 12-21. VIEWER SCREEN

Active connections are listed under the Connections link. Each connection has the option of remotely breaking it.

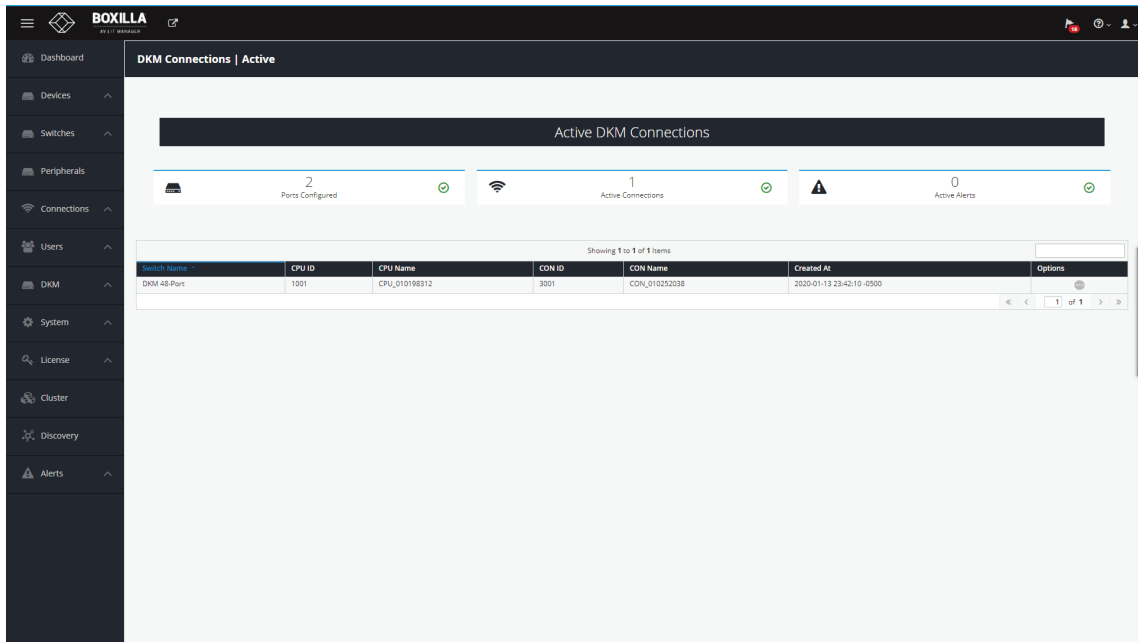


FIGURE 12-22. ACTIVE DKM CONNECTIONS

## CHAPTER 12: DKM INTEGRATION

### 12.5 PRESETS

Under Viewer, click “Manage Presets,” then click “Create Custom” and select one or more available sources.

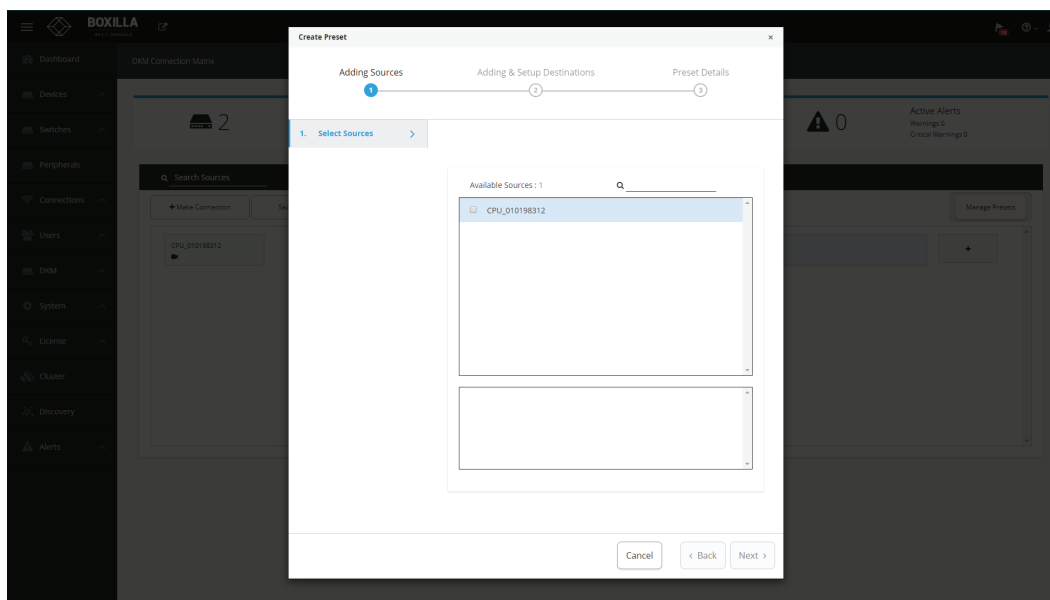


FIGURE 12-23. CREATE CUSTOM PRESETS

Next, select one or more destinations from the list of available destinations.

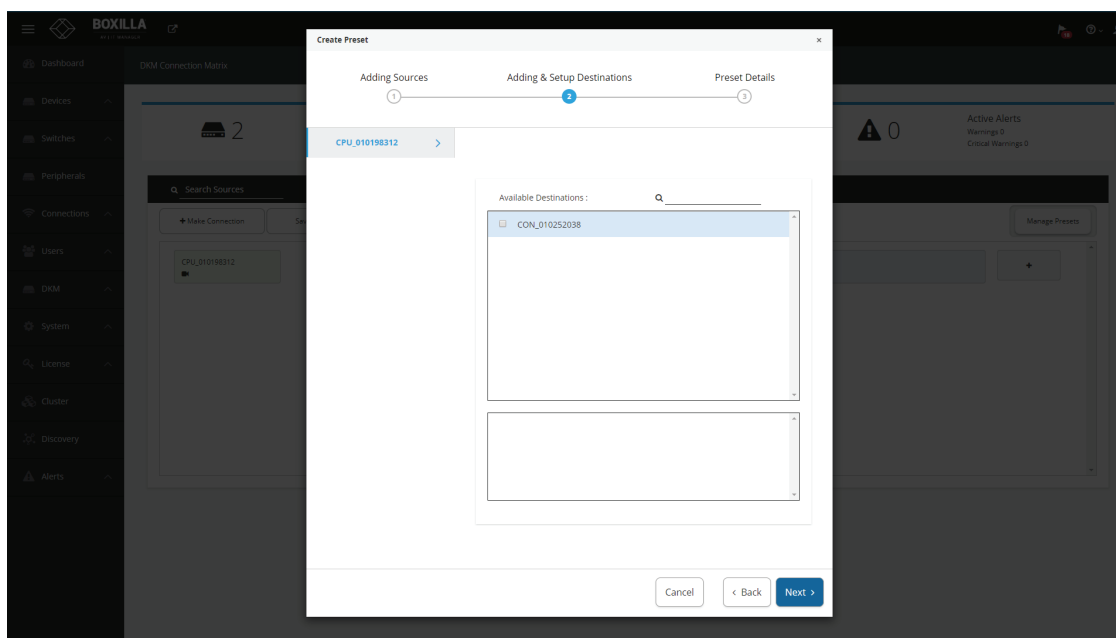


FIGURE 12-24. SELECT DESTINATIONS

## CHAPTER 12: DKM INTEGRATION

Now enter the name for the preset and choose the type of preset you want.

Both preset types will forcibly take any CONs and CPUs required to establish their configuration, i.e., if those CONs and CPUs are already in active connections then these connections will be broken.

The partial type applies only to the specific CONs and CPUs that are selected in this preset type.

The full type is applied to all the CONS and CPUS. Any CONs and CPUs not selected in this preset type will become inactive when this preset is launched.

Click “Complete” to save the preset.

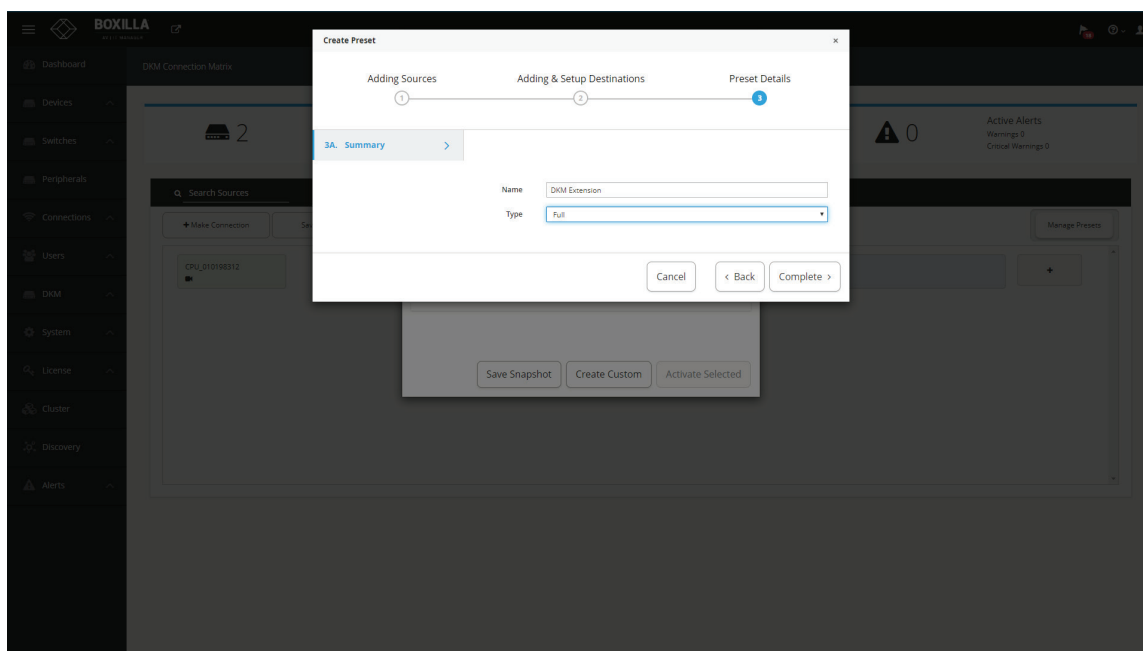


FIGURE 12-25. PRESETS SCREEN

The following methods are available to activate presets:

1. Direct preset activation in the Viewer: The first three presets (ordered by creation) are presented directly in the Viewer and can be activated with a direct click.
2. Activation via Manage Presets: All presets can be activated with the “Activate Selected” option in “Manage Presets.” This is mandatory for any preset that is the fourth or later one created, as there is no other method to activate these presets from within Boxilla.

## CHAPTER 12: DKM INTEGRATION

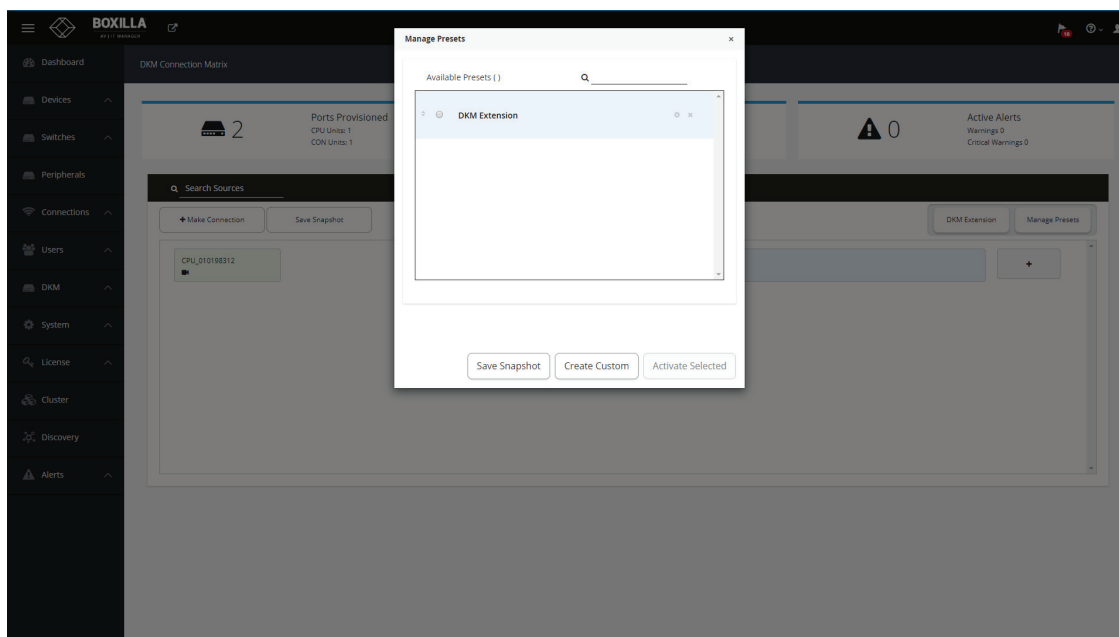


FIGURE 12-26. CREATE CUSTOM PRESETS COMPLETED SCREEN

Connections started via Presets will be displayed in the work area with the following options:

1. Detach Source: Break the connection by detaching the source.
2. Detach Destination: Break the connection by detaching the destination.
3. Add Destination: Add additional destinations to the source, e.g., if you wish to share the source.

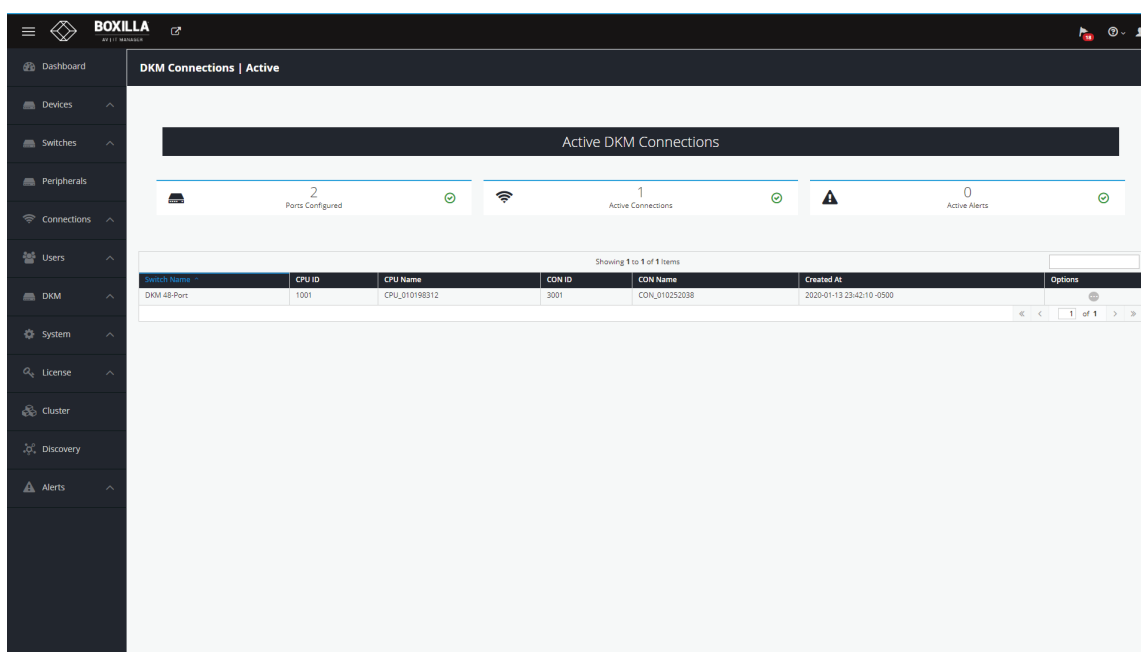


FIGURE 12-27. ACTIVE DESTINATIONS SCREEN

## CHAPTER 12: DKM INTEGRATION

Deselect a source/destination

To disconnect a connection while active status, click on 'x' on either destination / source ( in case of one to one only)

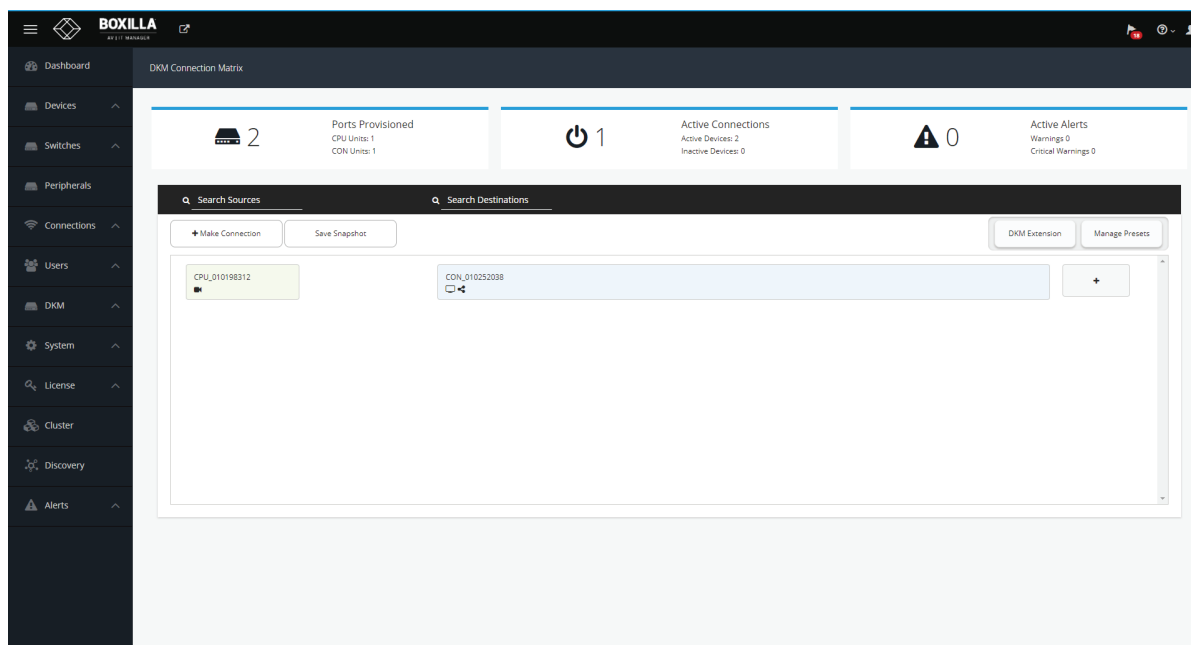


FIGURE 12-28. DESELECT A SOURCE/DESTINATION

### 12.6 ATTACHING VIRTUAL CPUS TO INVISAPC RX

Virtual CPU based connections from a DKM switch can be connected directly to a managed Emerald/InvisaPC RX on Boxilla by attaching them.

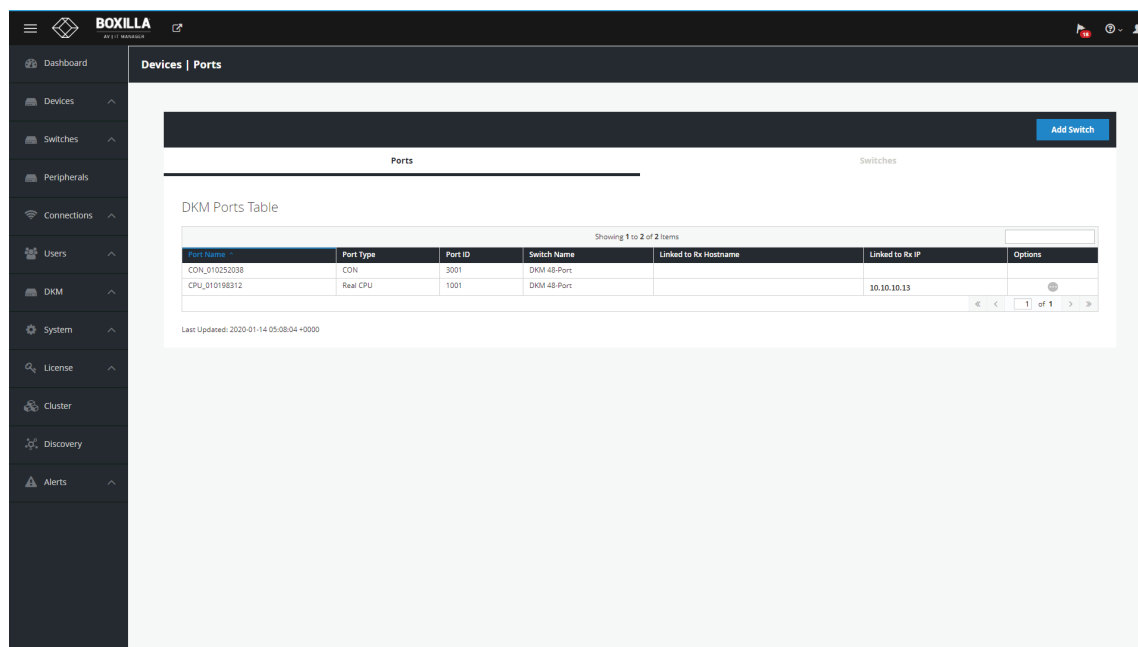


FIGURE 12-29. VIRTUAL CPUS CONNECTED TO INVISAPC SCREEN

The System button in the main menu brings up the System → Administration → Upgrade screen shown next. This screen allows the Boxilla unit itself to be managed:

- ♦ upgrade the firmware;

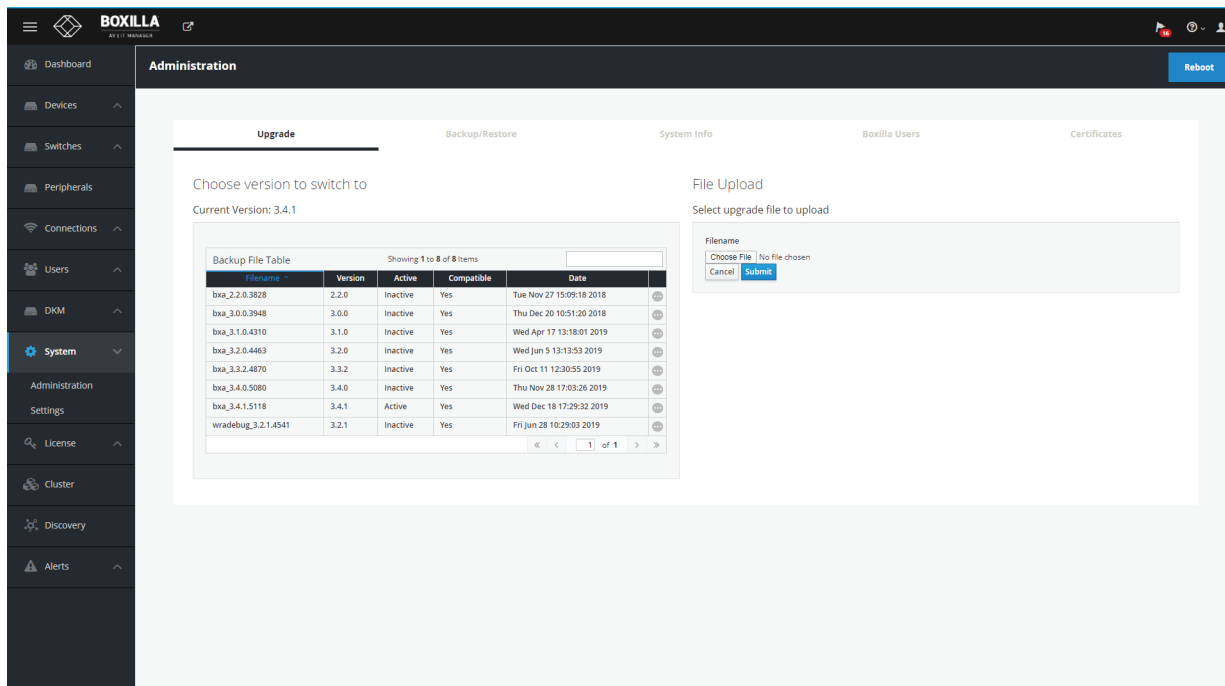


FIGURE 13-1. UPGRADE FIRMWARE SCREEN

- ♦ generate your own self-signed certificate;
- ♦ backup/restore the database (go to System → Administration → Backup/Restore);

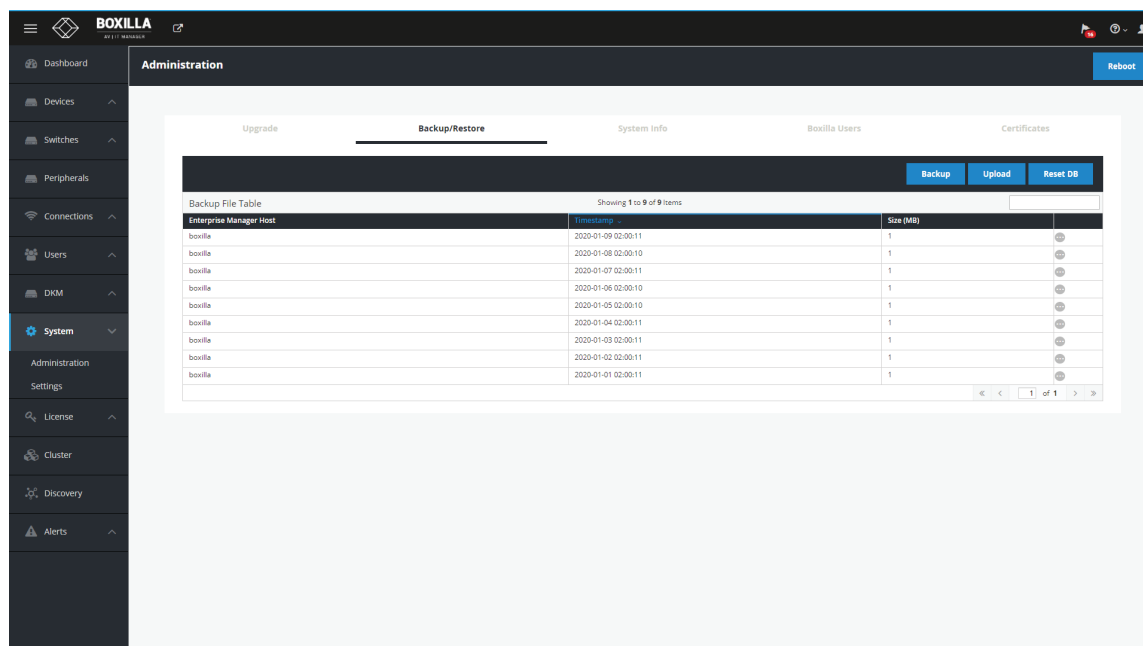


FIGURE 13-2. BACKUP/RESTORE DATABASE SCREEN

- ◆ check system information (go to System → Administration → System Info page):

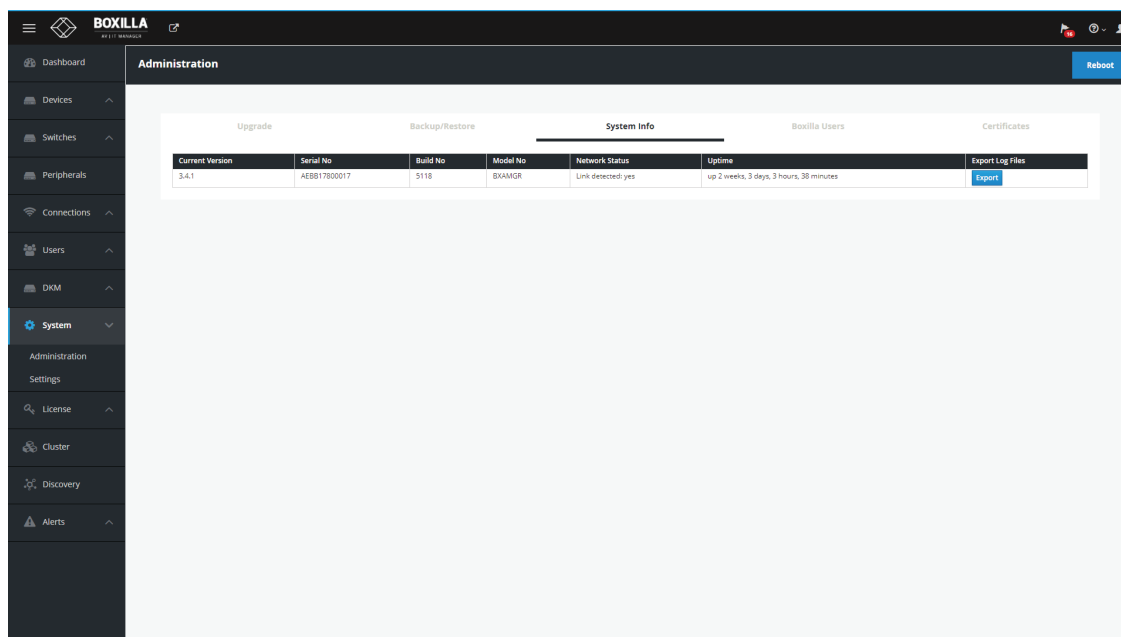


FIGURE 13-3. CHECK SYSTEM INFORMATION SCREEN

- ◆ set thresholds for alerts (go to System → Settings → Thresholds page):

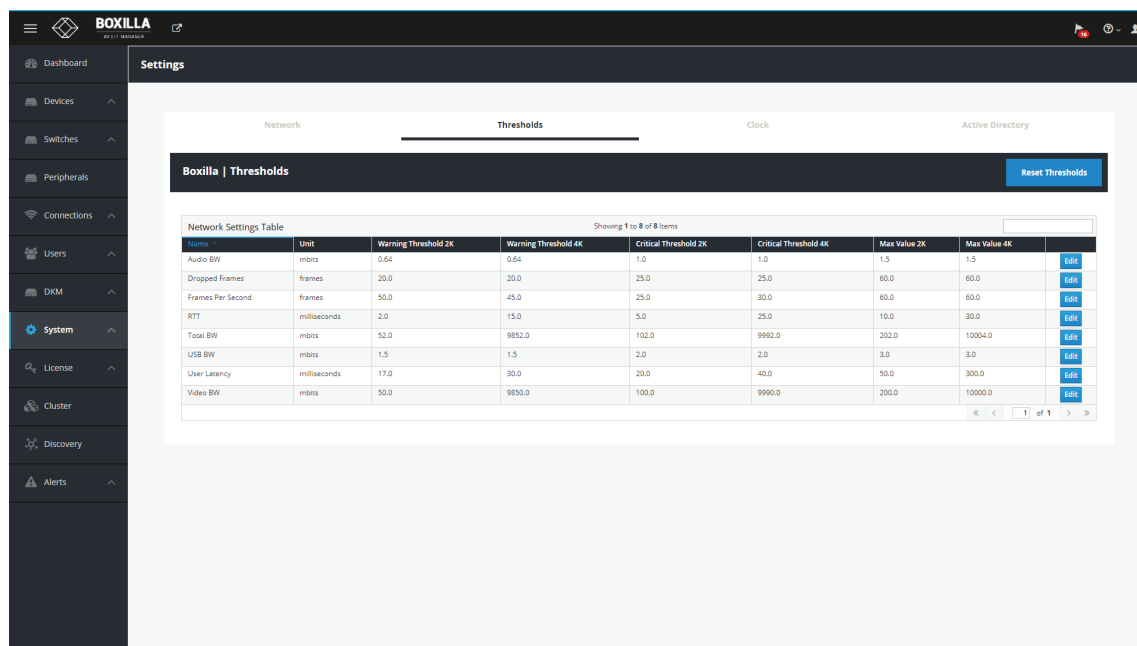


FIGURE 13-4. SET THRESHOLDS FOR ACTIVE ALERTS SCREEN



- ♦ change network settings (go to System → Settings → Network page):

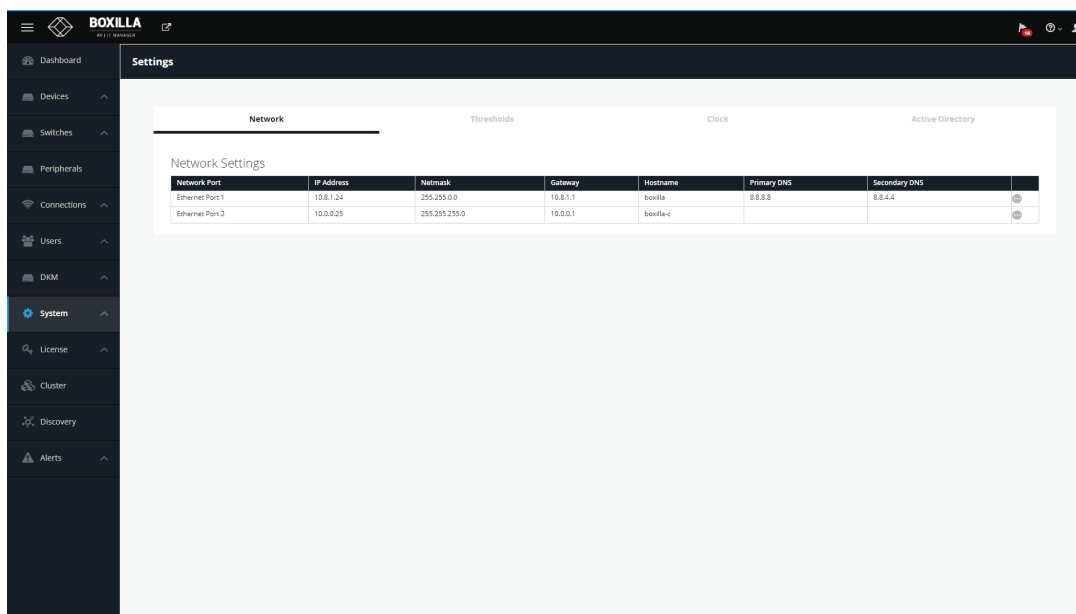


FIGURE 13-5. NETWORK SETTINGS SCREEN

- ♦ create/edit Boxilla users (go to System → Administration → Boxilla Users page):

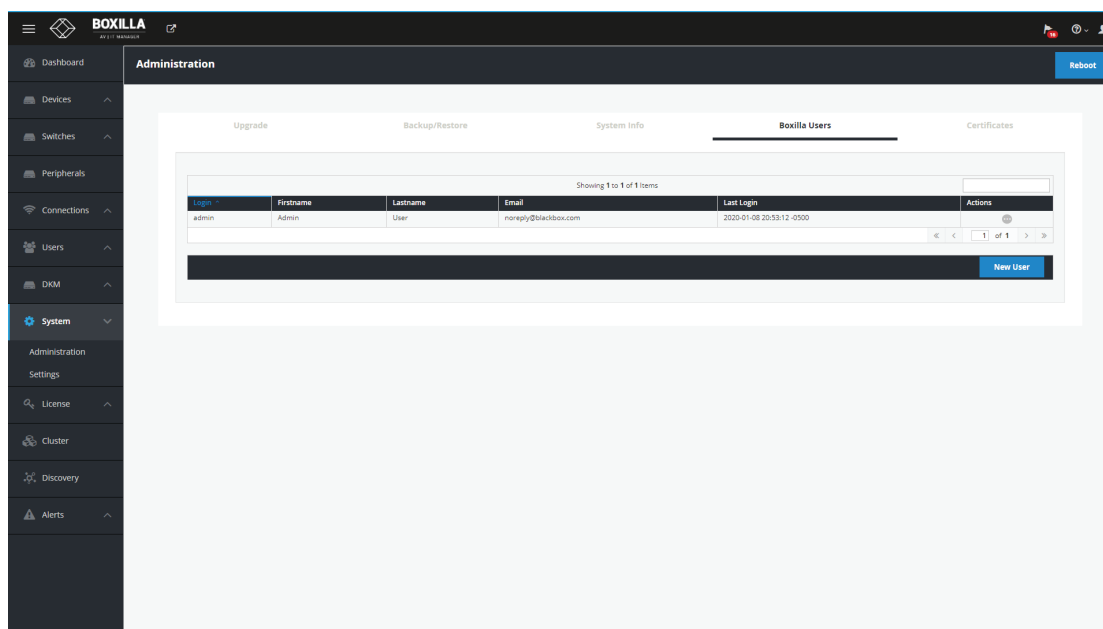


FIGURE 13-6. CREATE/EDIT BOXILLA USERS SCREEN

The administrator can reboot the Boxilla unit by clicking on the Reboot button on the top right of the System → Administration screen.

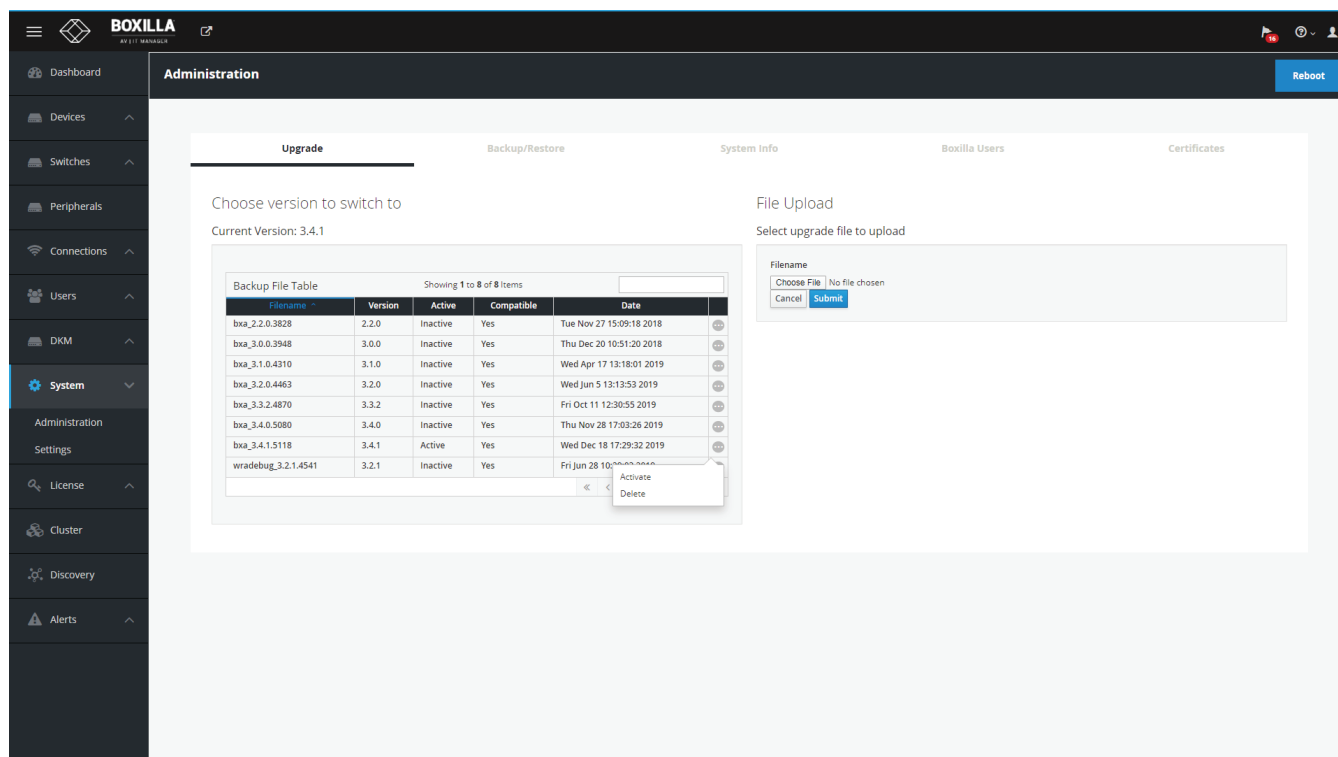


FIGURE 13-7. SYSTEM SCREEN—UPGRADE

## CHAPTER 13: SYSTEM

### 13.1 SYSTEM—UPGRADING BOXILLA UNIT FIRMWARE

To upgrade the firmware on the Boxilla unit, choose the file to be used to upgrade and click on submit and follow the instructions provided. This will cause the new firmware to be added to the Backup Image table (i.e., the firmware file is copied onto the Boxilla unit). To initiate the upgrade of the the Boxilla unit, click on Activate on ellipsis “...” icon options on the row of the firmware to be used to upgrade the unit.

NOTE: Boxilla supports the uploading and storage of a maximum of 10 Boxilla upgrade images.

The upgrade will not change the contents of the database. If you are upgrading to Boxilla 1.2 from a Boxilla 1.0, 1.0.1, or 1.1 unit, you will need to reboot the Boxilla unit when the upgrade is completed.

**VERY IMPORTANT:** Ensure the Boxilla unit stays powered-up during the upgrade. Losing power during an upgrade may cause the unit to cease functioning.

### 13.2 SYSTEM—ADMINISTRATION – CERTIFICATES UPLOAD

Users who wish to remove the “This connection is insecure” need to have the ability to generate their own self signed certificates with their own company information or certificates generated form a registered Certificate Authority (CA). The system allows the users to upload these files into Boxilla. This will then act as an authenticated certificate and the user will no longer get the security warning.

Under the System → Administration page, go to the Certificates tab to add and manage certificates.

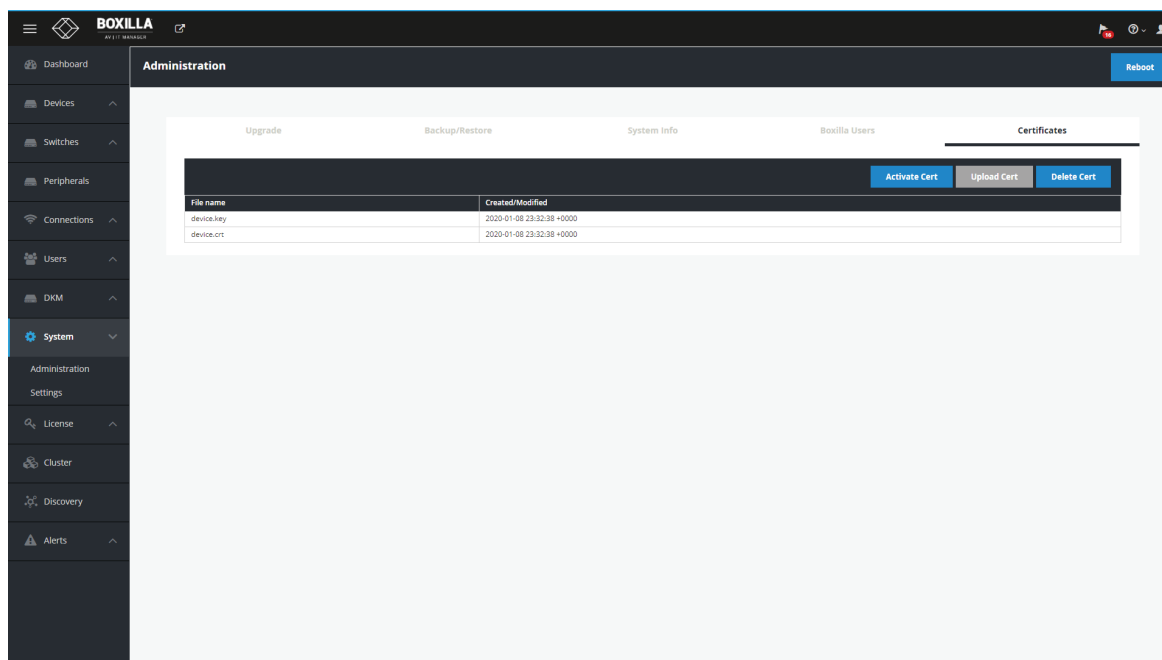


FIGURE 13-8. CERTIFICATES TAB

To upload a certificate, click on the Upload certificate button under the Certificates tab. Browse to the where the file is located and select it to upload the certificate.

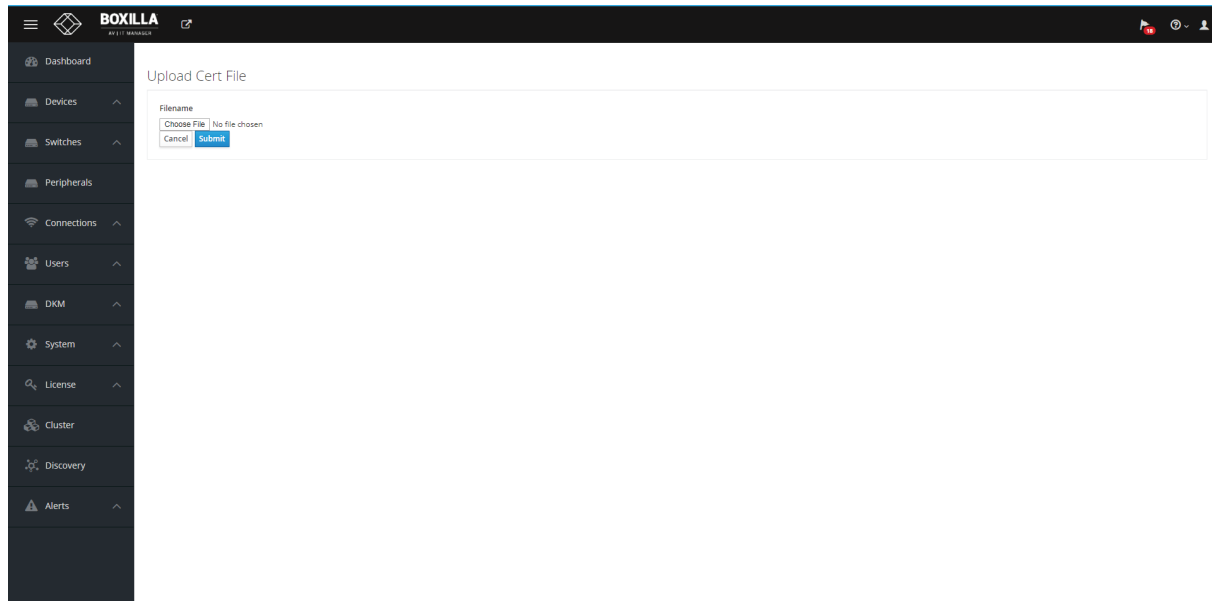


FIGURE 13-9. UPLOAD CERTIFICATE BUTTON

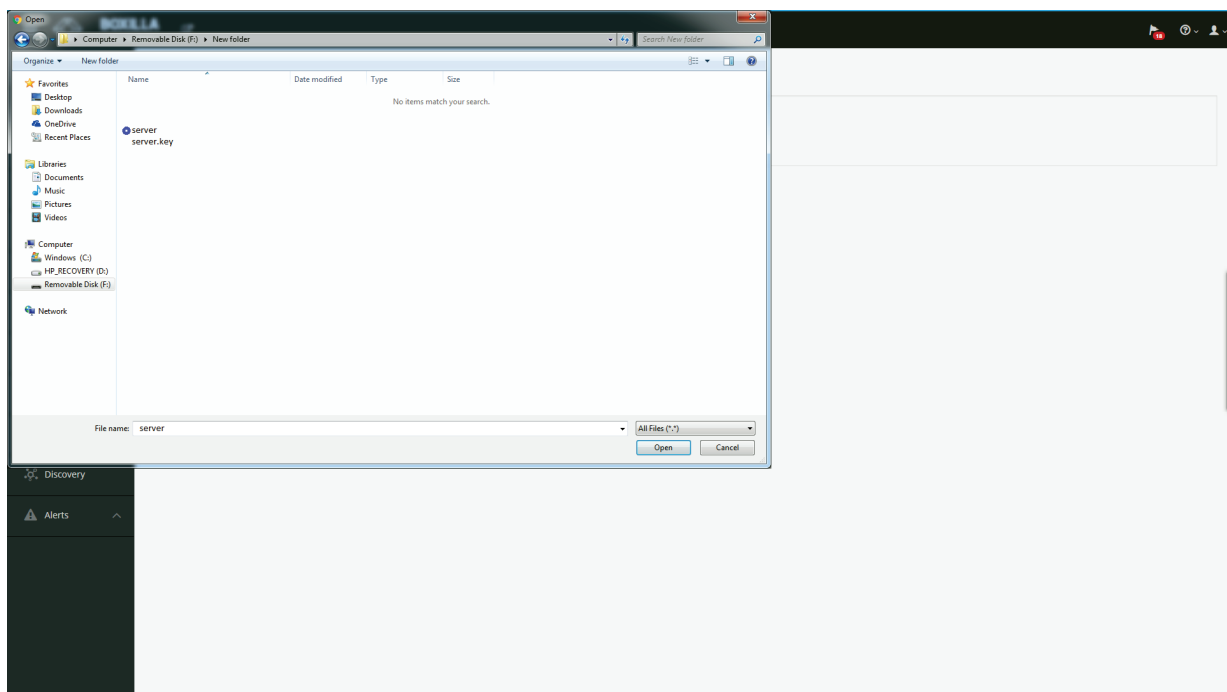


FIGURE 13-10. SELECT THE CERTIFICATE FILE

A green alert on the page indicates that the certificate is uploaded.

To delete any existing certificates, click on the delete cert button under certificates tab.

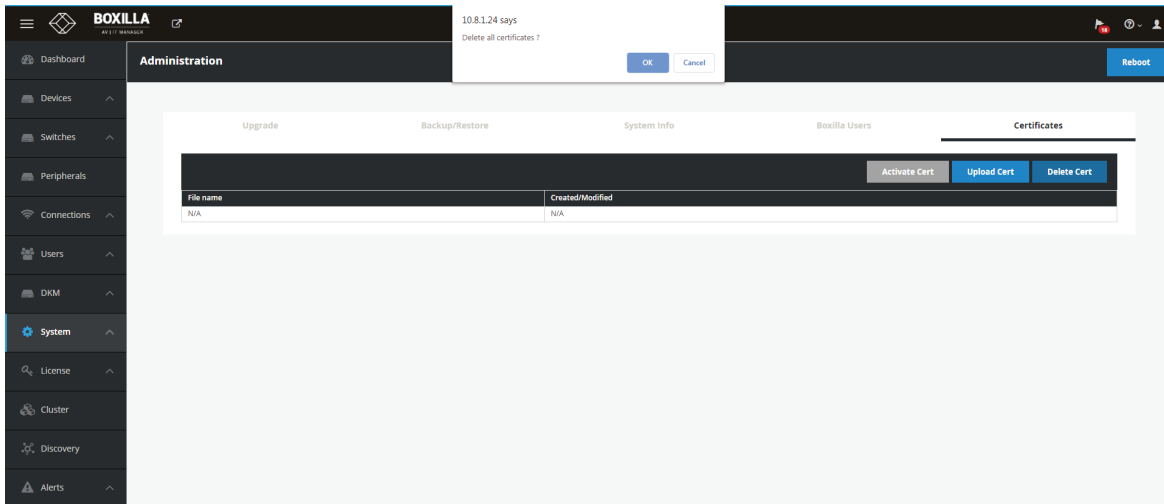


FIGURE 13-11. DELETE BUTTON

A popup message will be displayed once the certificate is deleted.

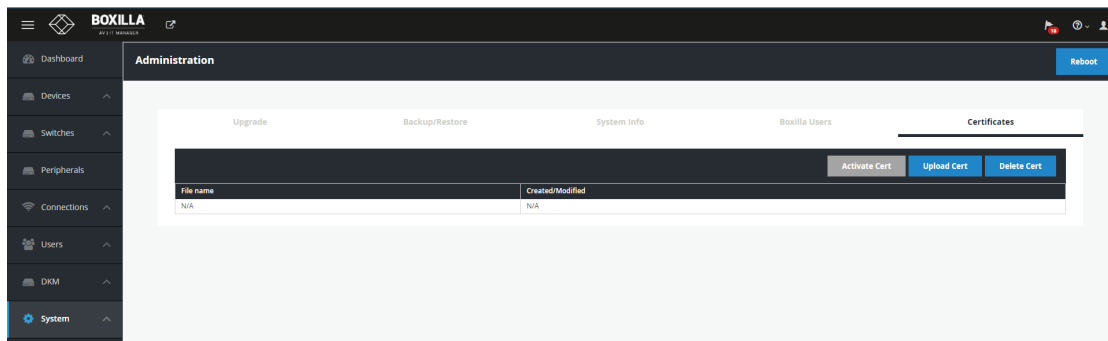


FIGURE 13-12. DELETE SUCCESSFUL

## CHAPTER 13: SYSTEM

### 13.3 SYSTEM—BACKUP/RESTORE

The Administrator can backup and restore the database of the Boxilla unit on the Backup/Restore tab on the System screen. When the Backup button is clicked, a complete backup of the Boxilla unit is created and added to the Backup table with a timestamp. This file is still on the Boxilla unit. To save this backup file to your local system, click on Download using the ellipsis “...” icon found next to the specific backup.

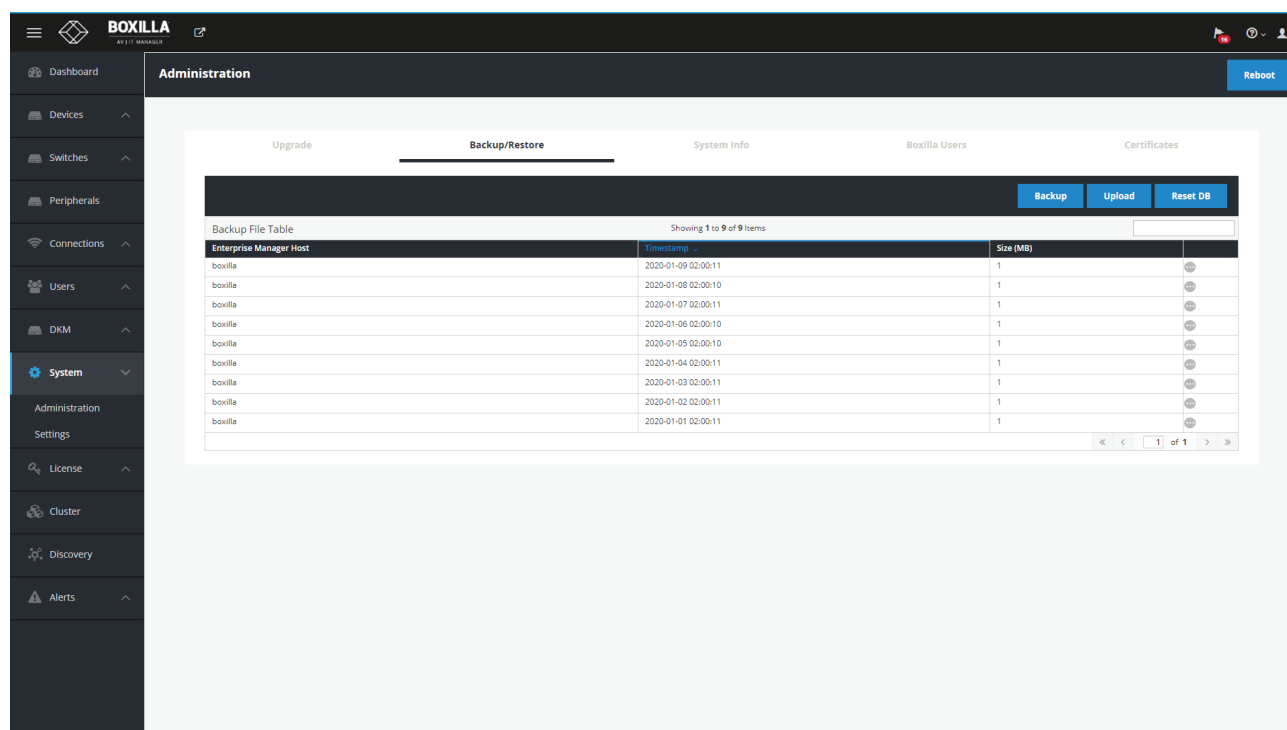


FIGURE 13-13. SYSTEM BACKUP/RESTORE TAB

There is a two-step process to restore a Boxilla unit from an external backup file. First the file must be uploaded to the Backup table and then the backup file in the table must be imported into the Boxilla unit.

When the Upload button is clicked, the administrator is prompted for the filename to upload into the Backup Table. Once the upload has been completed, the administrator clicks on Import using the ellipsis “...” icon found next to the specific backup.

Clicking on ResetDB purges the database on the Boxilla unit and restores it to a default state. The IP address will not be changed when using the ResetDB option.

The Enterprise Manager Host column refers to the name of the host machine where the backup was generated. Currently, this will always be this Boxilla unit.

## CHAPTER 13: SYSTEM

### 13.4 SYSTEM —SYSTEM INFO

The System Info tab provides summary information on the Boxilla unit. This information is:

- Current Version: Version of firmware currently running on the Boxilla Unit.
- Serial No: The serial number of the Boxilla unit.
- Build No: The software build number (internal Black Box number to software control of firmware on the Boxilla unit).
- Model No: The model number of the Boxilla unit (internal Black Box number to indicate hardware version on Boxilla unit).
- Network Status: Whether Boxilla is active on the network.
- Uptime: Length of time that the Boxilla unit has been powered up.
- Export Log files: allows the administrator to export log files from the Boxilla unit.

### 13.5 SYSTEM — SETTINGS —THRESHOLDS

The System → Settings→ Threshold tab shows the level used to define an alert for various measurements recorded on a connection and enables the Administrator to change them.

Name	Unit	Warning Threshold 2K	Warning Threshold 4K	Critical Threshold 2K	Critical Threshold 4K	Max Value 2K	Max Value 4K	
Audio BW	mbps	0.64	0.64	1.0	1.0	1.5	1.5	Edit
Dropped Frames	frames	20.0	20.0	25.0	25.0	60.0	60.0	Edit
Frames Per Second	frames	50.0	45.0	25.0	30.0	60.0	60.0	Edit
RTT	milliseconds	2.0	15.0	5.0	25.0	10.0	30.0	Edit
Total BW	mbits	52.0	9852.0	102.0	9992.0	202.0	10004.0	Edit
USB BW	mbits	1.5	1.5	2.0	2.0	3.0	3.0	Edit
User Latency	milliseconds	17.0	30.0	20.0	40.0	50.0	300.0	Edit
Video BW	mbits	50.0	9850.0	100.0	9990.0	200.0	10000.0	Edit

FIGURE 13-14. ALERT THRESHOLDS

The Warning Threshold sets the level above which a measurement must be below to be classified as normal or at “info” level. Measurements above the Warning Threshold and below Critical Threshold are classified as at “Warning” level. Measurements at or above the Critical Threshold are classified as “Critical” level.

The color coding on graphs and tables for measurements (such as Bandwidth) follow these rules:

- Info Level (or normal level): color set as Green
- Warning Level: color set as Amber
- Critical Level : color set as Red

## CHAPTER 13: SYSTEM

### 13.6 SYSTEM—SETTINGS—NETWORK

The System → Settings → Network tab shows the IP settings for the Boxilla unit and enables the Administrator to change the IP settings for the Boxilla unit (enter IP address, Net Mask, Gateway, and DNS in IPv4 format and click Apply). The second Ethernet port is disabled by default. Also note when setting up a Primary / Backup Boxilla that if the Primary Ethernet 2 is enabled, it must also be enabled on the Backup, otherwise they will fail to link together.

NOTE: Ethernet Port 2 is disabled by default.

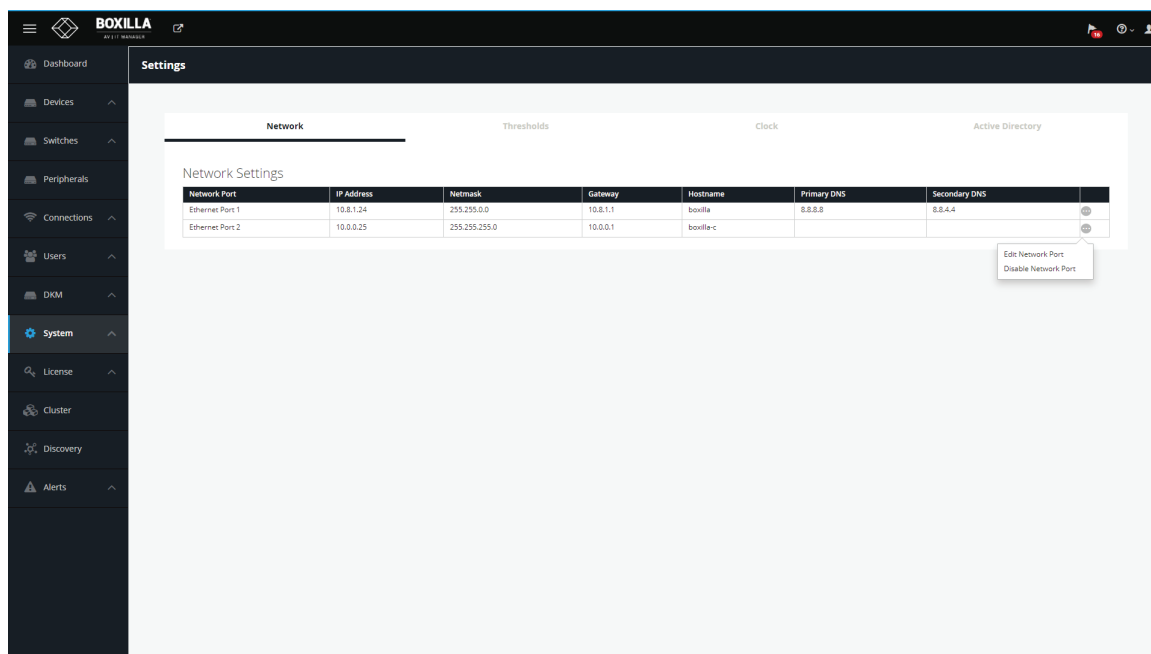


FIGURE 13-15. SYSTEM → SETTINGS → NETWORK SCREEN

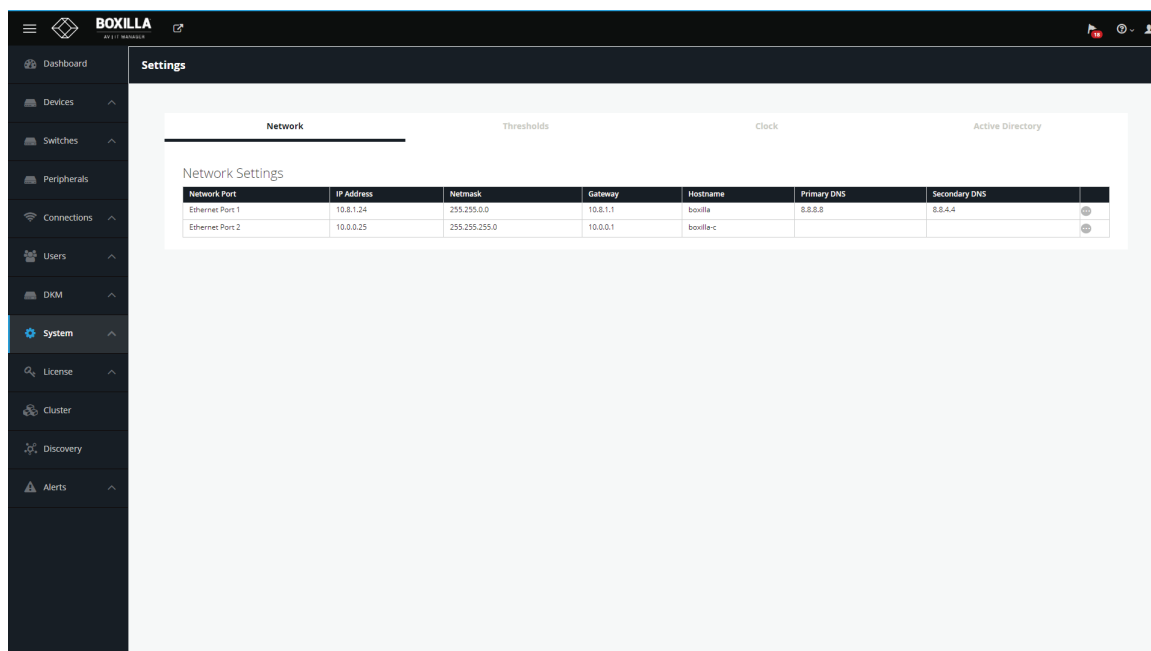


FIGURE 13-16. SYSTEM → SETTINGS → NETWORK SCREEN 3



## CHAPTER 13: SYSTEM

### 13.7 SYSTEM – SETTINGS – CLOCK

The System → Settings → Clock tab enables the Administrator to see the current system time and to change it.

There are two options for the Clock.

1. Manually configure time, time is not maintained.
2. Use NTP Server to set and maintain time.

Time Zone setting can be applied to both options above.

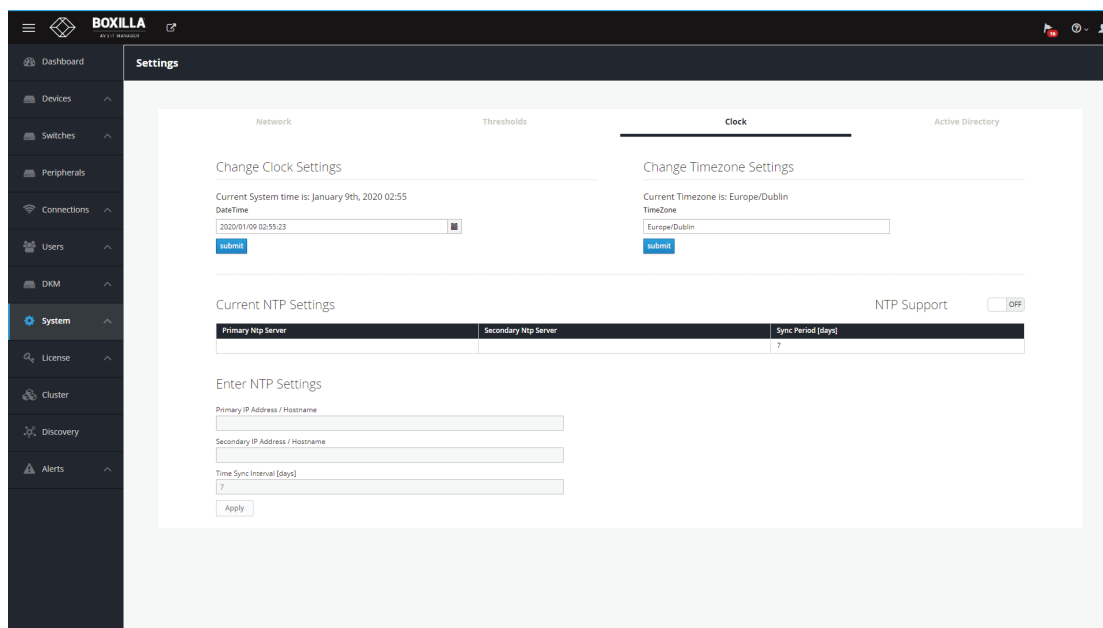


FIGURE 13-17. CLOCK (OR TIME) SETTINGS

## CHAPTER 13: SYSTEM

### 13.8 SYSTEM – ADMINISTRATION – BOXILLA USERS

The System → Administration – Boxilla Users tab shows a table of users for the Boxilla unit (not the same as users for the managed domain) as shown below, System Users. The users here should be considered Administrative users.

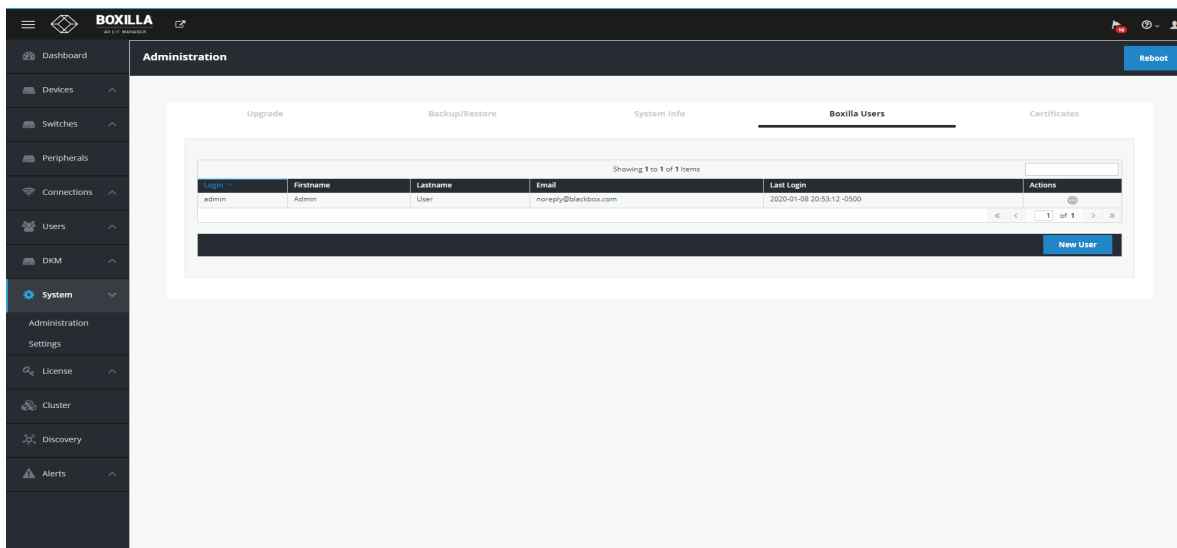


FIGURE 13-18. SYSTEM USERS

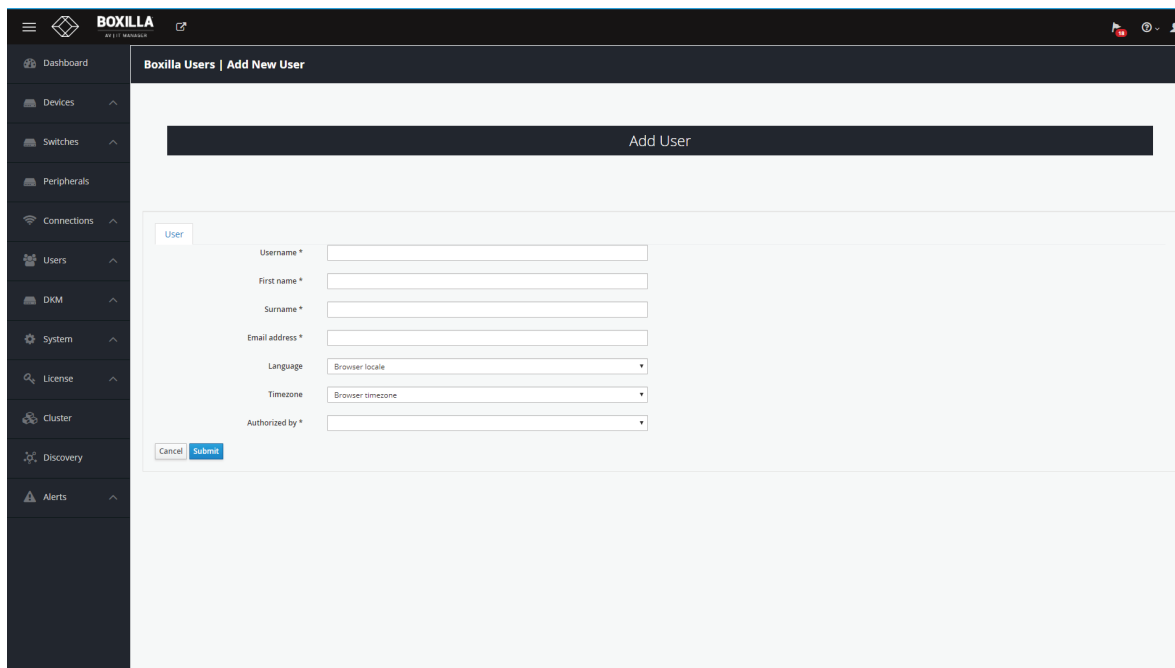


FIGURE 13-19. NEW SYSTEM USER

Enter Username, First name, Surname, Email address, Language, Time zone, and Authorized by. Then click Submit to save your changes or Cancel to cancel your entries.

## CHAPTER 13: SYSTEM

### 13.9 SYSTEM – SETTINGS

Active Directory is a Directory Services implementation that allows for user/group authentication, group policies etc. LDAP (lightweight Directory Access Protocol) is a cross platform protocol used for such directory services authentication.

#### 13.9.1 ADMIN USER ENABLING ACTIVE DIRECTORY ON BOXILLA

The Boxilla administrator can enable Active Directory for any KVM Network by enabling Active Directory authentication by switching the option ON/OFF under System -> Settings -> Active Directory tab

For individual users, the option can be switched by enabling/disabling Active Directory Authentication.

To enable Active Directory support on Boxilla:

1. In System -> Settings -> Active Directory tab, you will see the ON/OFF switch, which needs to be ON to globally enable Active Directory support.
2. You then need to enter the Active Directory server details. IP, Port (by default this is 389), the domain of the active directory server, the AD Username and AD Password, which are any administrator account on Active Directory. This account is not used for authentication and is used to retrieve OU information for the users in Boxilla.
3. You then save your settings and Boxilla is set up for Active Directory support.

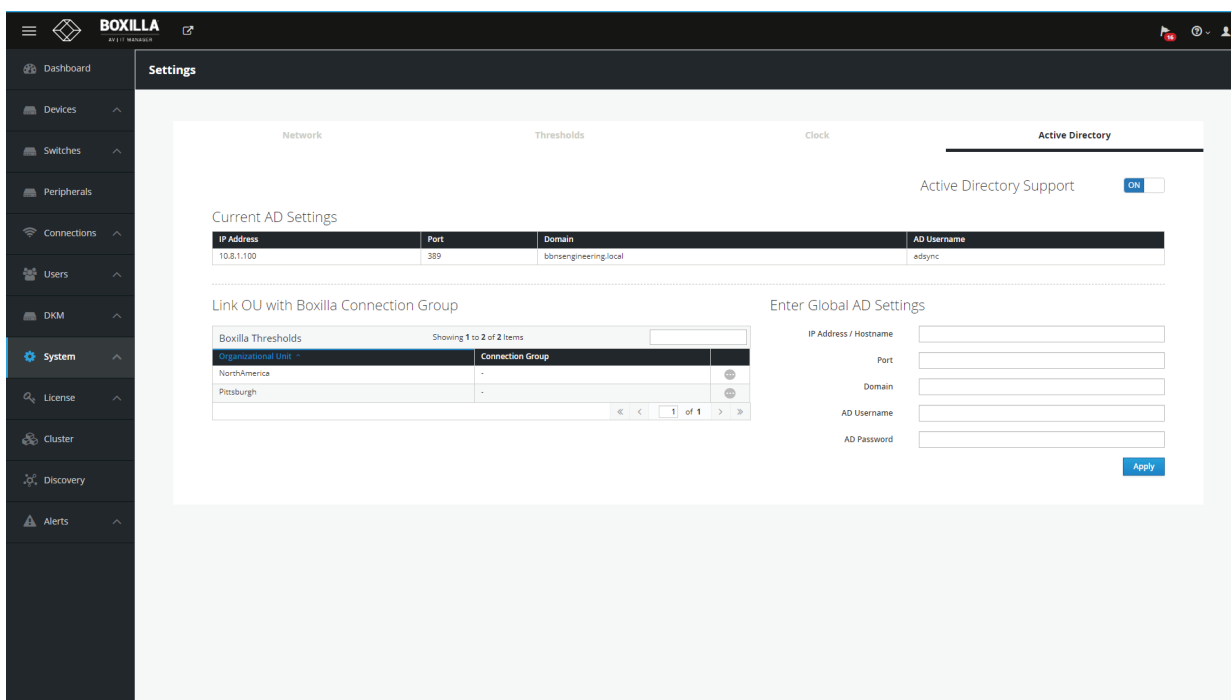


FIGURE 13-20. ACTIVE DIRECTORY DETAILS—SYSTEM CONFIGURATION

## 13.9.2 LINKING AN ACTIVE DIRECTORY OU TO A BOXILLA CONNECTION GROUP

The AD admin user will have the option to specify what Active Directory OU they are a part of.

Once Active Directory is successfully connected, Boxilla automatically retrieves the OU information and stores it in its database.

The Boxilla administrator has the option to associate the Active Directory user with a connection group. They will also have the option to associate an OU with a Connection Group. Connections are automatically assigned to the users.

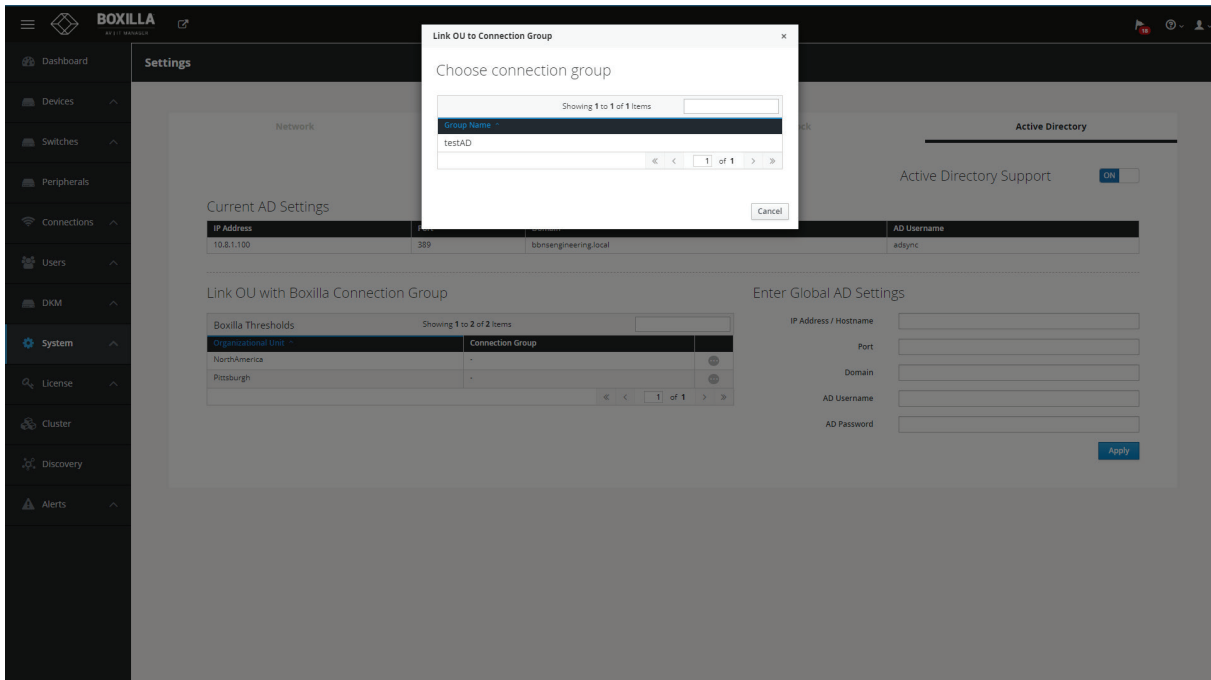


FIGURE 13-21. CONNECTING OU TO CONNECTION GROUP

## CHAPTER 14: LICENSE

### 14.1 LICENSE PAGE – BOXILLA LICENSING

Boxilla licensing allows for customization of the system. It gives the ability to add licenses to Boxilla to define number of Users, Connections, and Devices to be supported in a Managed Domain. Release 2.0 default licensing model will be 25 Devices, 25 Connections, and 25 Users (BXAMGR).

The system supports the addition of:

- BXAMGR-LIC-25 (25 more devices/users/connections)
- BXAMGR-LIC-50 (50 more devices/users/connections)
- BXAMGR-LIC-100 (100 more devices/users/connections)
- BXAMGR-LIC-200 (200 more devices/users/connections)
- BXAMGR-LIC-300 (300 more devices/users/connections)
- BXAMGR-LIC-ULT (unlimited devices/users/connections)
- BXAMGR-LICBAK-25 (Boxilla KVM Manager 25 Device License for Active and Standby Boxilla)
- BXAMGR-LICBAK-100 (Boxilla KVM Manager 100 Device License for Active and Standby Boxilla)
- BXAMGR-LICBAK-200 (Boxilla KVM Manager 200 Device License for Active and Standby Boxilla)
- BXAMGR-LICBAK-300 (Boxilla KVM Manager 300 Device License for Active and Standby Boxilla)
- BXAMGR-LICBAK-ULT (Boxilla KVM Manager Unlimited Device License for Active and Standby Boxilla)

Licenses can be added under the System -> License Page.

To find the current license, the License button and you will be able to verify the Boxilla Endpoint and RemoteApp licenses available.

## 14.1.1 HOW TO REQUEST A LICENSE

To procure a new license file, generate the info file from your current system using Generate Info File option at the top of the License page. The info file will be downloaded onto the local machine. Provide the info file to Black Box Technical Support (contact us at 877-877-2269 or info@blackbox.com) to generate the license file for you. Additional licenses will need to be purchased.

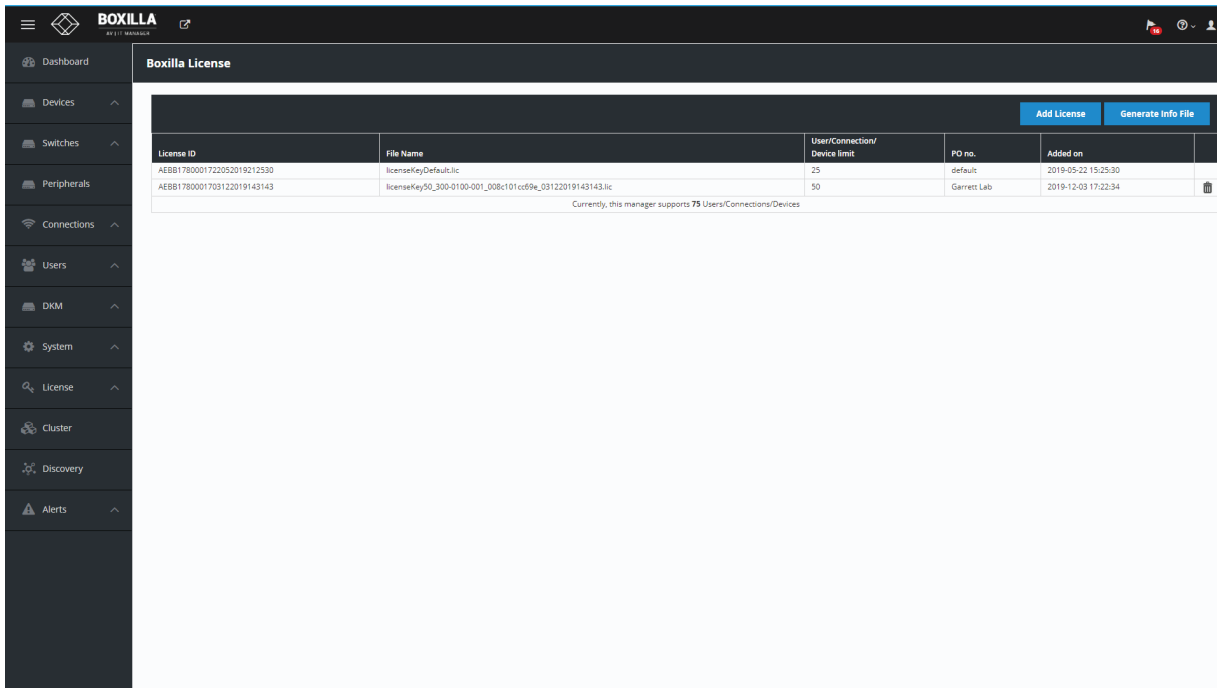


FIGURE 14-1. ADD LICENSE SCREEN



## 14.1.2 HOW TO UPLOAD A LICENSE FILE

Once you receive the license file, upload the new license.

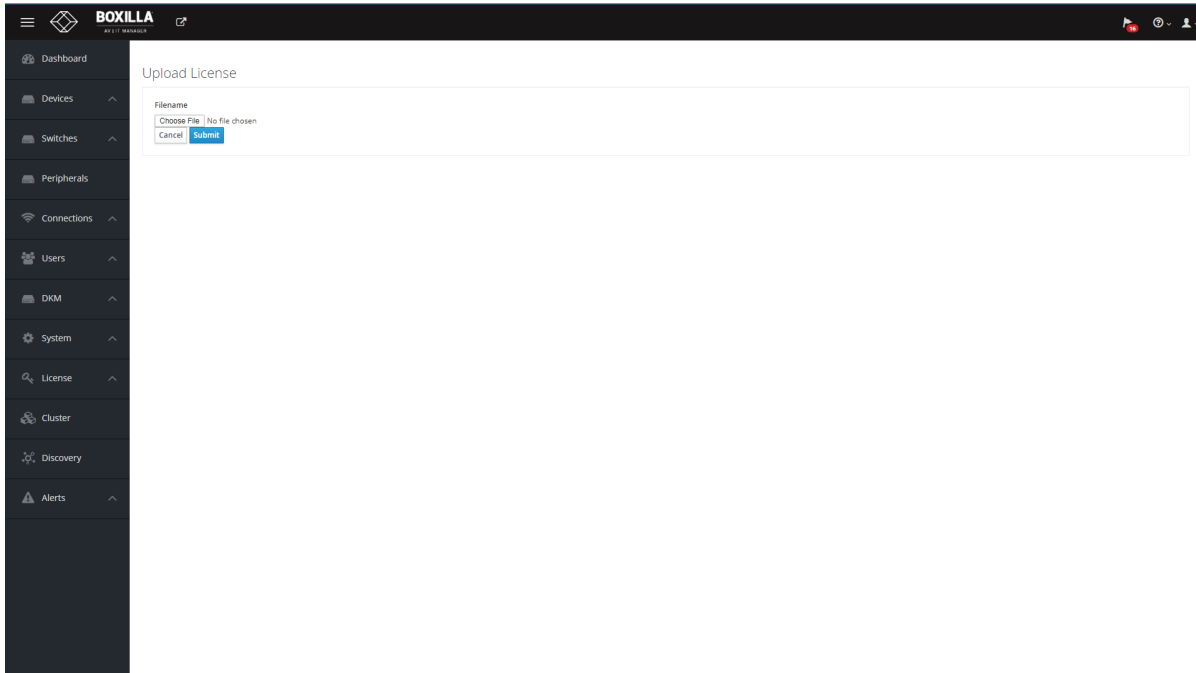


FIGURE 14-2. UPLOAD LICENSE SCREEN

## CHAPTER 15: CLUSTER

### 15.1 INTRODUCTION

The Boxilla system can support a Primary/Standby manager that allows the standby to take over if the Primary is not online. This ensures a smooth operating environment for users and administrators.

### 15.2 BEFORE YOU BEGIN/PREREQUISITES

Before you begin configuring the Boxilla managers for Primary / Standby mode, verify the following prerequisites have been met first; otherwise, the Primary / Standby mode will not work.

- ♦ Boxilla managers must have firmware 3.0 or higher
- ♦ Boxilla managers must be on the same firmware version
- ♦ Boxilla managers must be using the same endpoint license
- ♦ Boxilla managers must be on the same subnet and connected to the network so they can be seen
- ♦ Both the Primary / Standby must have matching Ethernet Port Configurations (i.e. if Primary has Ethernet 2 enabled, so does the standby, if it is disabled on the Primary, then the Standby must also be disabled).

### 15.3 OVERVIEW OF OPERATION

When the system is configured for Primary / Standby, you will use a Virtual IP address to access the managers (*you won't use the actual Boxilla IP address unless you are initially creating the cluster, updating the managers, or breaking the clusters*), and all activity will be managed via the Virtual IP address. The Virtual IP address is assigned during the configuration of the Primary Boxilla.

If the Primary Boxilla goes offline and the Virtual IP is no longer accessible, it will take approximately 4 minutes between the time the Primary goes offline and when you can access the Virtual IP again. This timeout occurs to make sure the Primary is truly offline before the Standby takes over. Once this time has elapsed, you can access the Virtual IP again to manage the system.

In certain situations, when the Primary Boxilla goes offline and the Standby takes over, you will be required to login into the Virtual IP interface to make sure both Boxilla managers are operating in their proper roles after bringing the Primary back online, and in some instances when the Primary comes back online, you may need to swap the roles (Primary / Standby). In this situation, where the roles must be swapped, it is because both managers think they are Primary, but they do not have valid Standby configurations. To swap the roles, simply select the ellipsis “...” icon and select “Make Standby” for the old Primary.

An example of this situation is when the Primary Boxilla gets disconnected from the network and comes back eventually. If you log into the Virtual IP address and see that the Primary is still offline (but you can physically ping it and access it on its own IP), click the ellipsis “...” icon of the old Primary Boxilla, and click on “Make Standby”. This will address the roles for all managers' part of that cluster.

When configuring the Primary / Standby system, keep in mind the following functions and what they really do:

- ♦ Make Standalone – This will factory restore the Boxilla and clear the users, connections, and endpoints, but keep the existing network configuration, endpoint licenses, and firmware.
- ♦ Detach – This will disconnect the Boxilla from the cluster, but will keep all of its configuration parameters including users, connections, and endpoints. This is used to perform firmware updates primarily, or to start the Cluster Dissolving process.
- ♦ Prepare Standby – This will take the active configuration of the designated Primary and overwrite the configuration in the Standby Boxilla manager.





## CHAPTER 15: CLUSTER

### 15.4 CREATING THE CLUSTER

To create a Boxilla Primary / Standby system, first make sure you have met all of the prerequisites as stated above. The next step is to make a backup of the existing Boxilla configuration in case it is needed to be uploaded to restore the system endpoints, connections, users, and settings.

#### PREPARING THE PRIMARY

1. Within the Boxilla Primary manager, login and navigate to “Cluster” in the menu.
2. Click the “Prepare Master” button and enter the configuration information. Use the help windows throughout this process. The Virtual IP will be used as a single point of access to the Primary / Standby cluster.

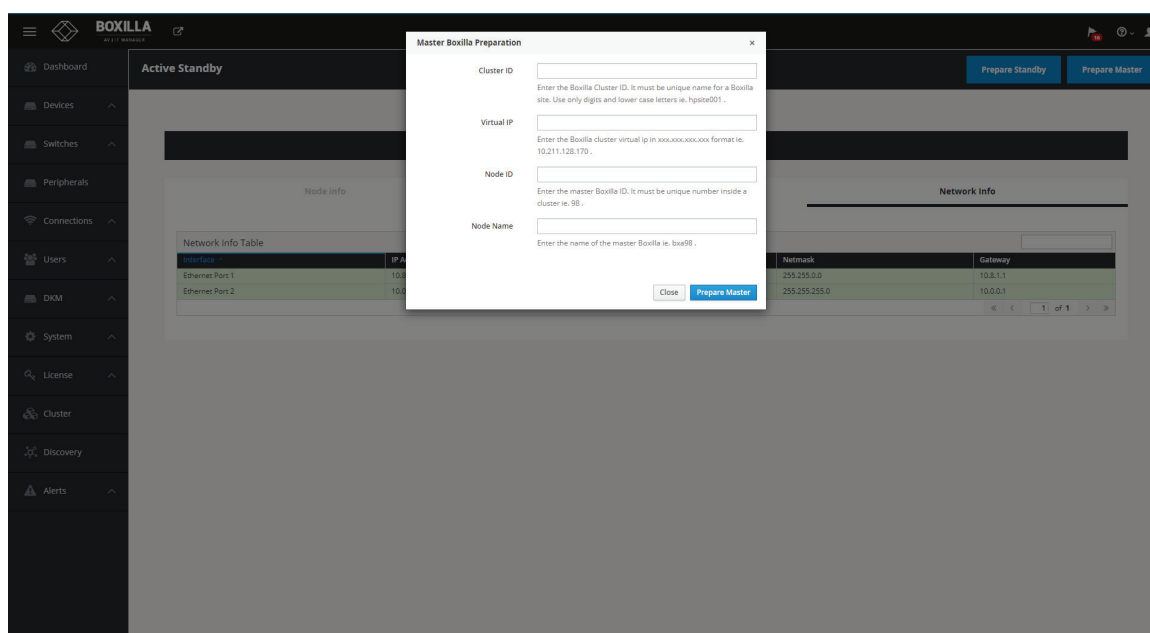


FIGURE 15-1. SETUP NEW MASTER SCREEN

#### PREPARING THE STANDBY

1. Within the Boxilla Standby manager, login and navigate to “Cluster” in the menu.
2. Click the “Prepare Standby” button and enter the configuration information. Use the help windows throughout this process.

## CHAPTER 15: CLUSTER

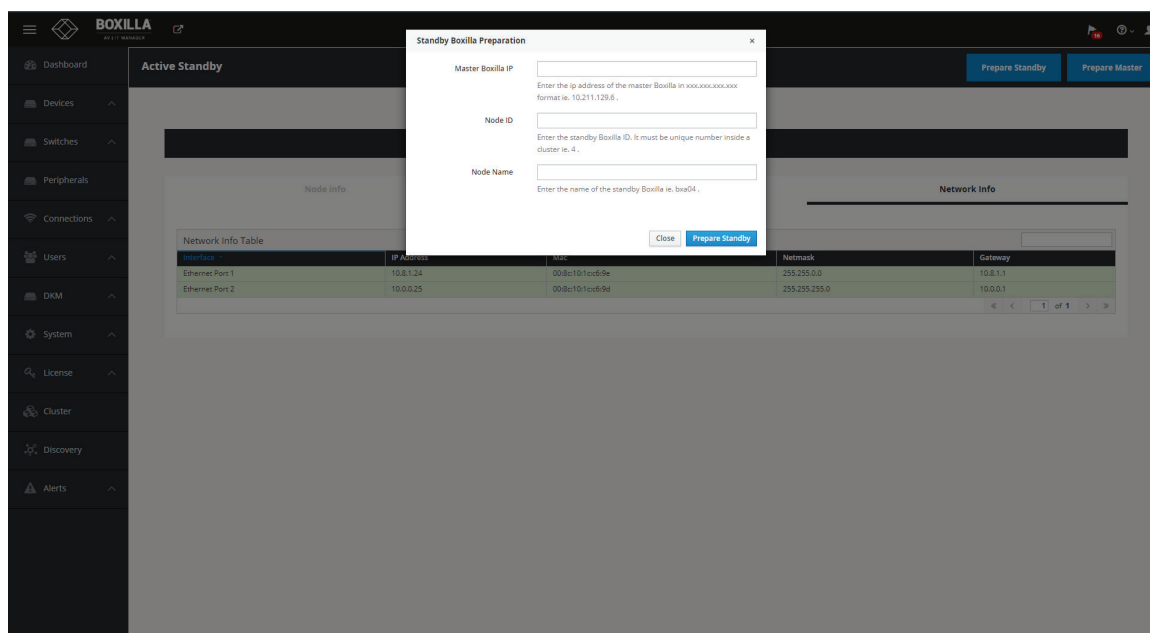


FIGURE 15-2. STANDBY BOXILLA PREPARATION

At this time, you should only be able to access the Boxilla Primary web interface and Virtual IP web interface. The Standby manager can be pinged, but the Standby web interface will be disabled on purpose.

NOTE 1: You will only use the Virtual IP address unless you are dissolving or detaching a cluster (i.e. to perform an update as an example).

NOTE 2: The Standby Boxilla will disable its web interface once part of the system.

You now have a Primary / Standby system configured.

The configured cluster shows up in the Node Info tab on the screen.

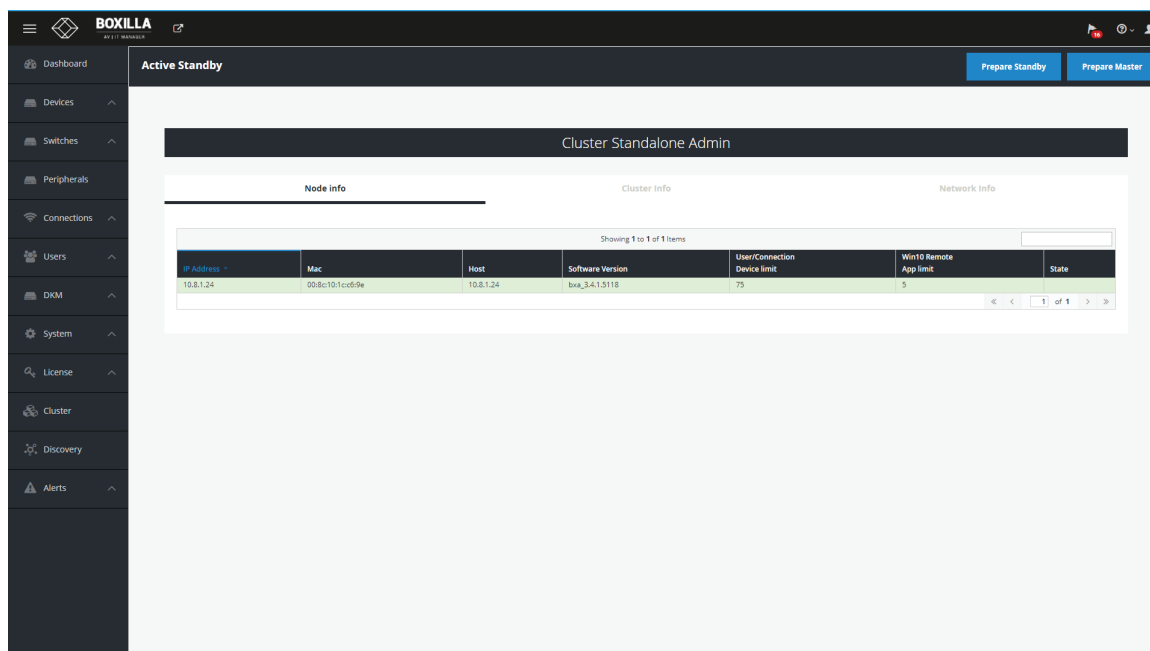


FIGURE 15-3. CONFIGURED CLUSTER PRIMARY VIEW

## CHAPTER 15: CLUSTER

### 15.5 FAILOVER

When a Primary / Standby system is configured and the acting Primary is disconnected or goes offline, it will take about 4 minutes before the Standby will take over and begin responding as the new Primary. There will be a small window where the Virtual IP web interface cannot be accessed.

Once the system has been identified as having performed a failover, it is important as a system admin to go into the Virtual IP web interface and make sure your Primary / Standby are operating in their correct roles. Depending on the circumstances and firmware version of the Boxilla, the system may be restored naturally without any user intervention, but it is always good practice to make sure.

If you navigate to this page and see that the “old Primary” is in a “failed” state, you can simply click the ellipsis “...” icon near the failed controller and click “Prepare Standby”. This will in turn flip the Primary / Standby roles (IP addresses of the Boxilla managers will remain the same) and initialize the cluster again so you still have a Primary / Standby configuration.

The screenshot shows the BOXILLA Active Standby Cluster Admin interface. The left sidebar contains navigation links: Dashboard, Devices, Switches, Peripherals, Connections, Users, DKM, System, License, Cluster, Discovery, and Alerts. The main content area is titled 'Active Standby' and 'Cluster Admin'. It displays a table of node information with columns: IP Address, Mac, Node Id, Node Name, Host, Software Version, User/Connection Device limit, Win10 Remote App limit, and State. The table shows two nodes: one in a 'failed' state and one in an 'active' state.

IP Address	Mac	Node Id	Node Name	Host	Software Version	User/Connection Device limit	Win10 Remote App limit	State
10.8.1.24	00:8c:10:1c:cd:fe	10	box10	10.8.1.24	box_3.4.1.5118	75	5	failed
10.8.1.25	00:8c:10:1c:c7:66	11	box11	10.8.1.25	box_3.4.1.5118	75	5	active

FIGURE 15-4. PRIMARY FAILED VIEW BACKUP ACTIVE SCREEN

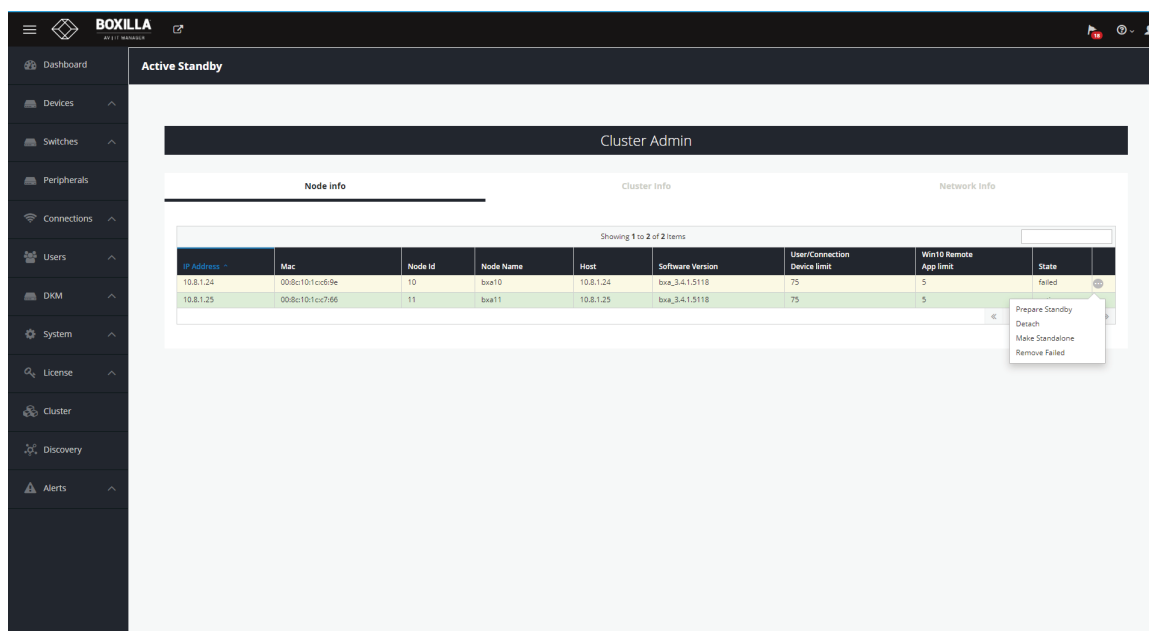


FIGURE 15-5. OPTIONS FOR FAILED VIEW BACKUP DROP-DOWN BOX

## 15.6 PRIMARY/STANDBY FIRMWARE UPDATES

When firmware needs to be applied to the Boxilla managers in a Primary / Standby configuration, a special process needs to be followed. Be sure to make a copy of your Boxilla configuration so you can easily upload it later in case it gets lost.

1. Navigate to the Virtual IP web interface, login, and go to the Cluster menu. In this menu, click the ellipsis “...” icon of the active Standby and select “Detach”. Remember the Standby web interface is disabled when it is part of a cluster, so detaching it allows the administrator to gain access to it again.

**IMPORTANT:** Be sure to use the “Detach” or you will lose your configuration.

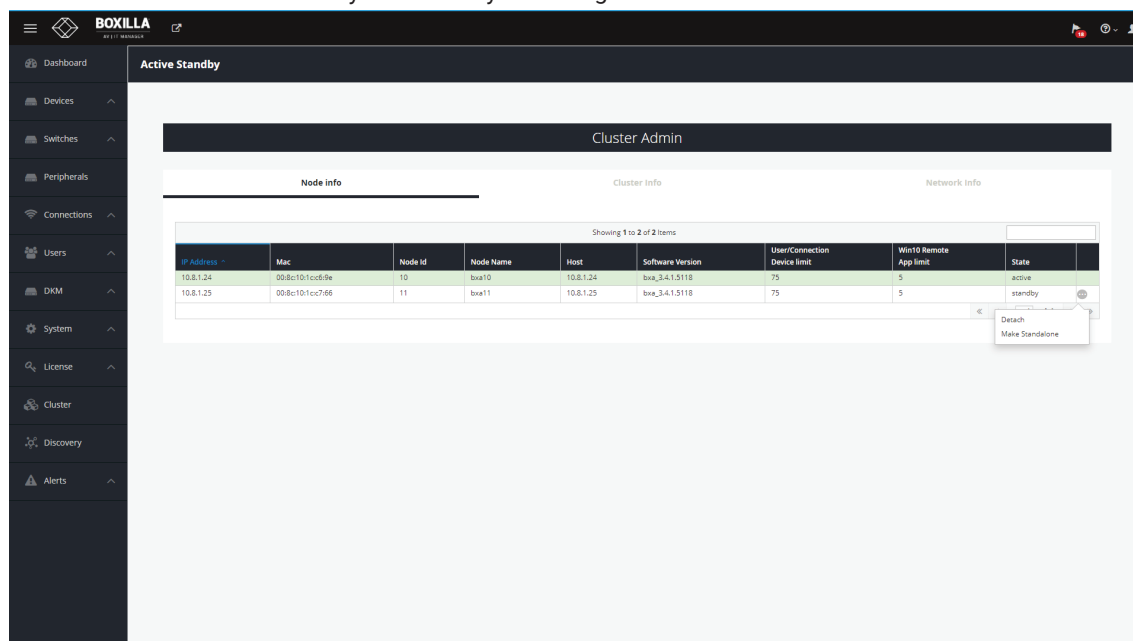


FIGURE 15-6. DETACH BOXILLA FROM DROP-DOWN BOX

## CHAPTER 15: CLUSTER

2. Navigate to the Standby Boxilla IP Address (not the Virtual IP) and perform the firmware upgrade.
3. Now that the Standby Boxilla is updated first, make this the Primary (role switch) by going into the Cluster menu and clicking the Switchover button.
4. Go back to the old Primary and perform the firmware upgrade; once done, make it a Standby by clicking the “Prepare Standby” button.
5. Now your Primary / Standalone is back in order and operating.

### 15.7 DISSOLVE CLUSTER

In certain situations or environments, you may need to dissolve the Boxilla Primary / Standby Cluster. Some of these reasons include:

- ♦ Replacing / Swapping in new Boxilla hardware
- ♦ Wanting to only have a single Boxilla manager without a Standby manager
- ♦ Technical reasons that include synchronization problems

To dissolve a cluster, follow these steps.

1. Navigate to the Primary Boxilla IP address web interface and login.
2. Go to the Cluster menu and verify you still see the Primary and Standby.
3. Next to the Standby Boxilla, click the ellipsis “...” icon and then click on “Make Standalone”. This will factory restore your Standby Boxilla removing the users, connections, and endpoints, but it will remember the Boxilla firmware and network settings.
4. Once the Standby is removed, the web interface will show a button in the top right named “Dissolve Cluster”. Click this to finish the process.

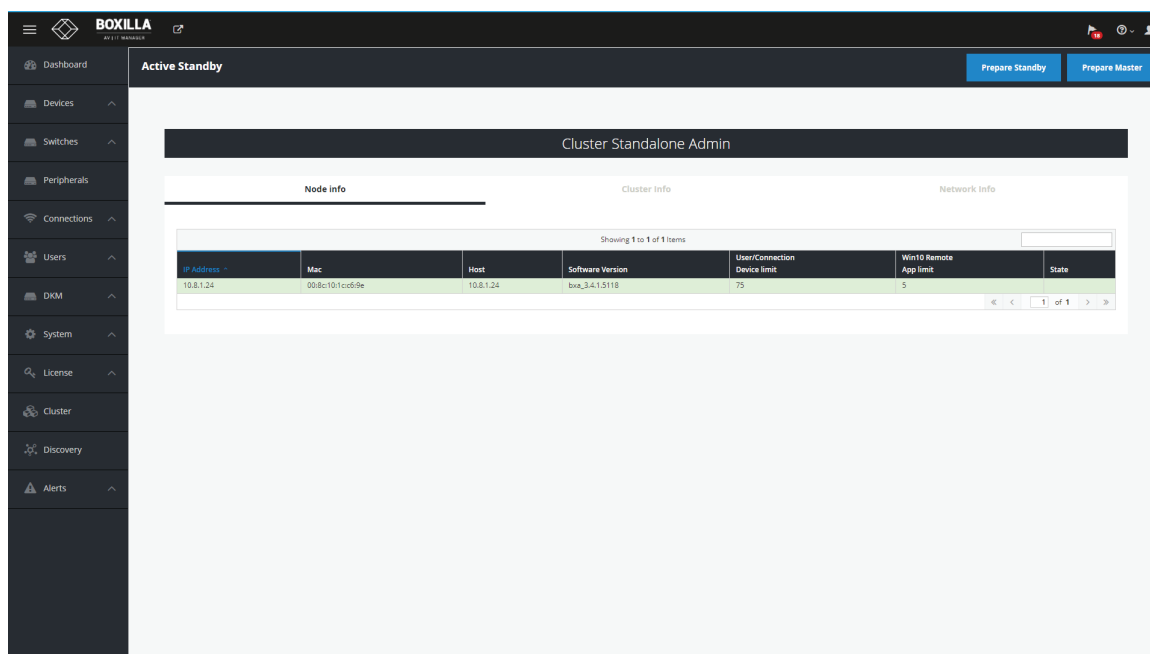


FIGURE 15-7. DISSOLVED CLUSTER SHOWING ONLY ONE CONTROLLER

Now that the Boxilla Primary / Standby are dissolved, the Virtual IP will no longer work, and you must navigate to the original Boxilla IP addresses to gain access to the web interface.

## CHAPTER 16: ALERTS

Alerts in Boxilla log significant events within the Boxilla and its managed domain. Alerts can be normal events such as users logging in, a user making a connection, a user disconnecting or logging out.

Alerts are classified as Info, Warning or Critical. Normal events are Info Alerts. Events that may indicate an unusual activity level is classified as a Warning Alert. Events that indicate a potential serious negative impact on the system is classified as a Critical event.

Events that are classified as Critical are:

- ♦ Failure to update the IP Address of a managed appliance.
- ♦ Failure to retrieve appliance details.
- ♦ Failure to UnManage a managed appliance.
- ♦ Failure to reboot a managed appliance.
- ♦ Failure to Upgrade a managed appliance.
- ♦ When a managed appliance goes Off-Line

Events that are classified as Warnings are:

- ♦ When a user fails to login.
- ♦ Firmware on a device mismatches domain's active firmware version
- ♦ When a device transitions to Out of Service during an upgrade.
- ♦ System threshold is exceeded
- ♦ Forced connection fails to establish



## 16.1 ALERTS— HISTORY

Alert history is a time-stamped log of events across the system. This history can be examined by either looking at all Alerts, or filtering them down to just Critical, Warning or Info by selecting the appropriate tab on the Alerts—History screen as shown in Figure 15-1.

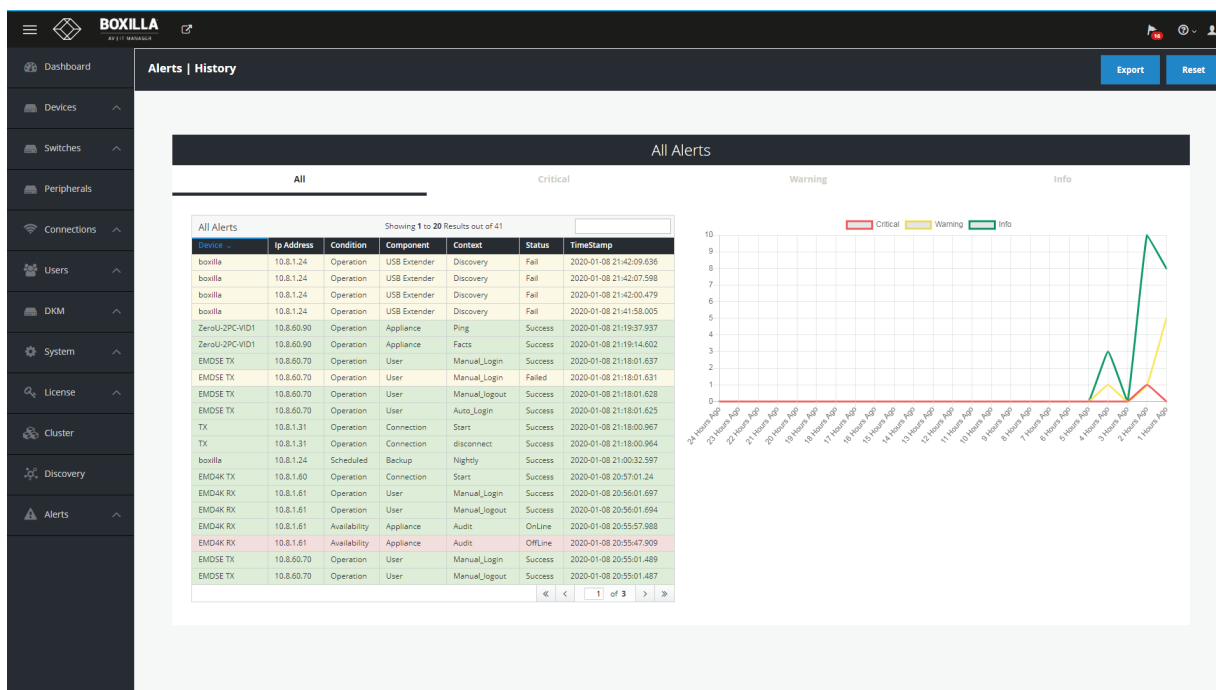


FIGURE 16-1. ALERTS HISTORY

Critical logs are shown below.

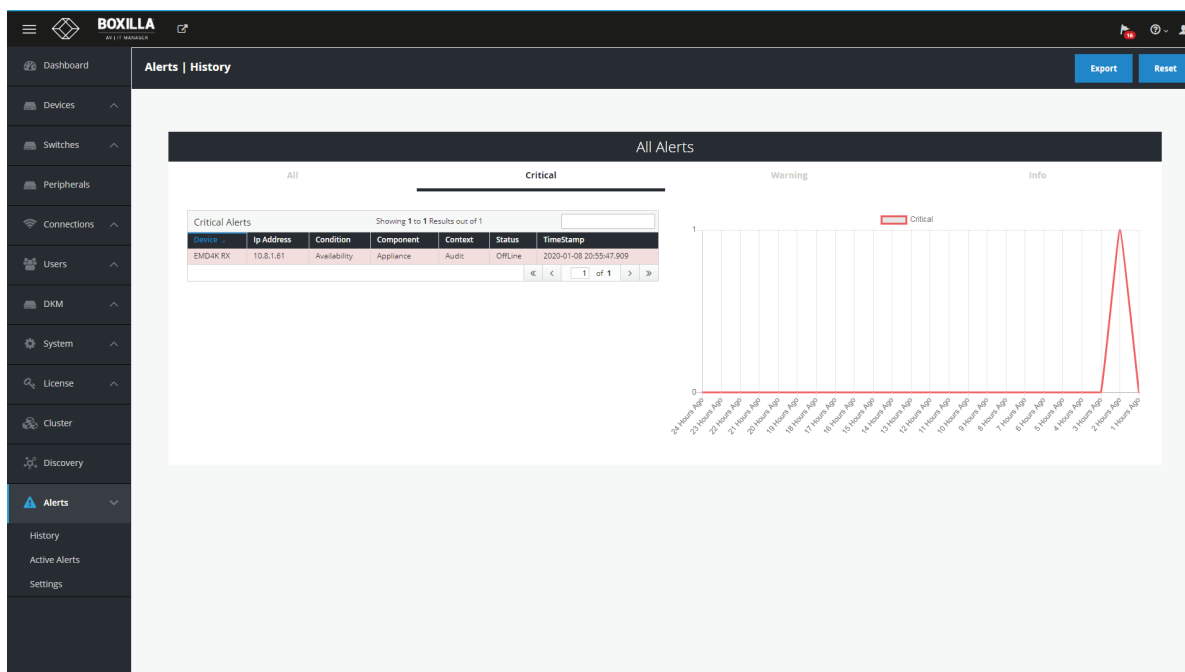


FIGURE 16-2. CRITICAL

Warning logs are shown next.

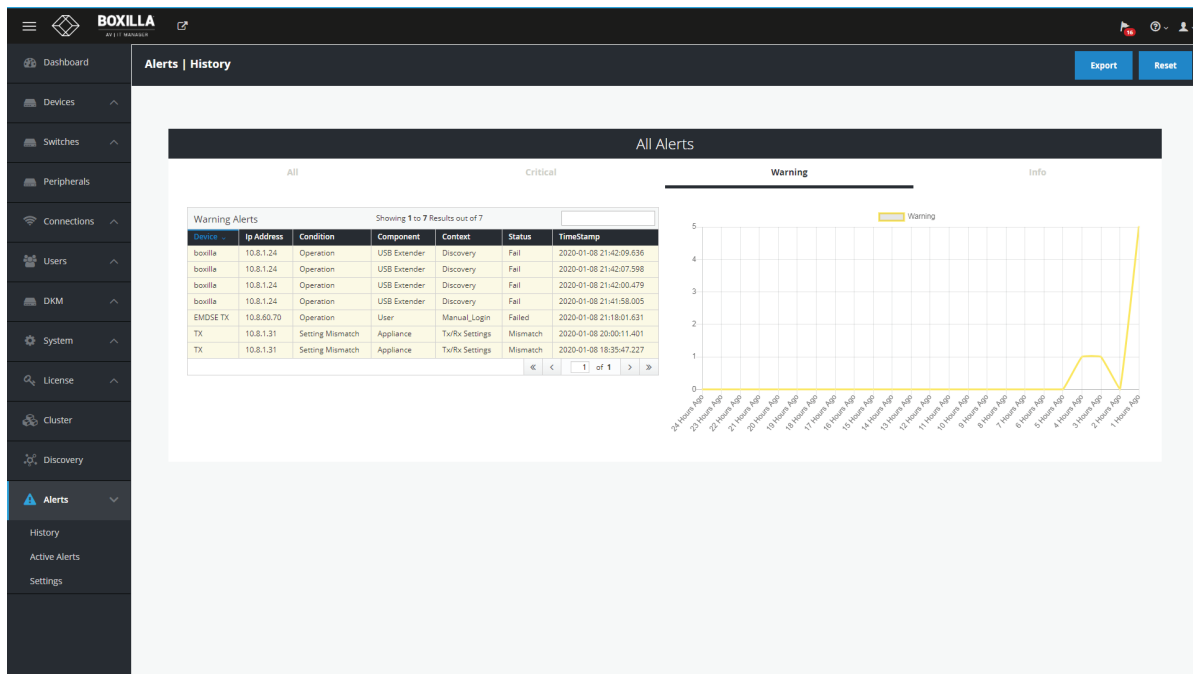


FIGURE 16-3. WARNING

You can also collect info logs.

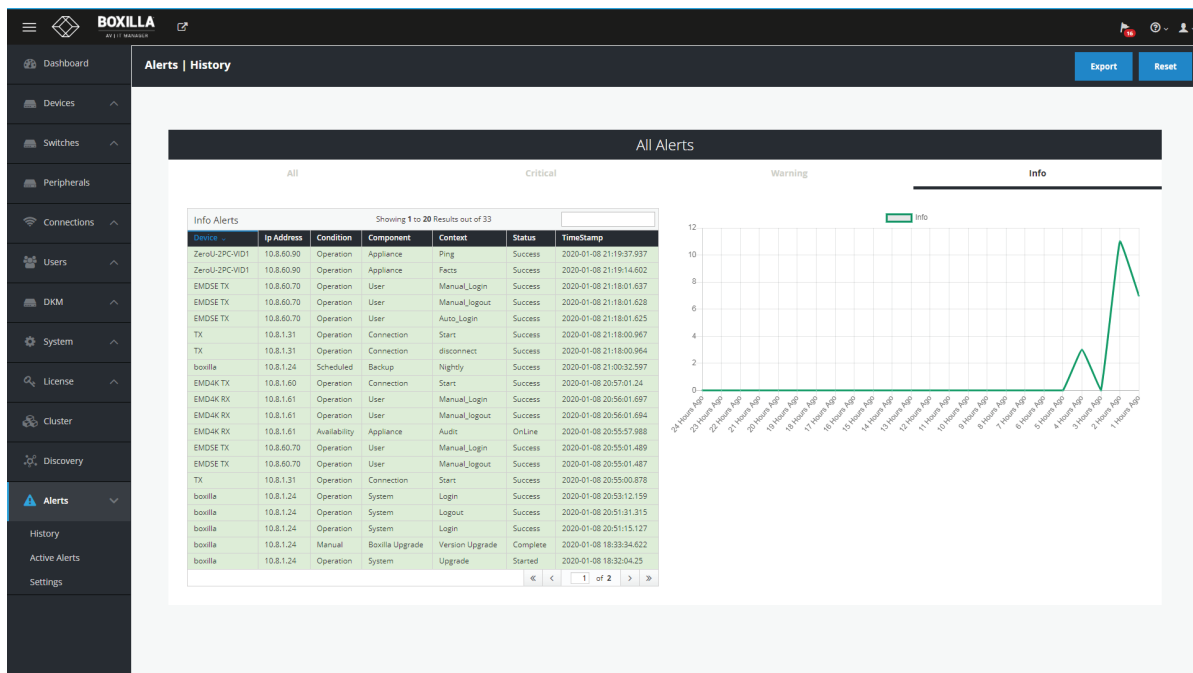


FIGURE 16-4. INFO



## CHAPTER 16: ALERTS

### 16.2 ALERTS—ACTIVE

Active Alerts are alerts that are currently active, e.g. devices that are offline, thresholds that are exceeded, and devices with mis-matched software versions.

These active alerts are cleared when the devices are back online, device metrics return to below threshold levels, and devices are upgraded to the domain's active firmware version.

### 16.3 SYSLOG

Syslog supports the configurable generation of Alert History event and Active Connection statistics to an external Syslog Server. The administrator can use an external SYSLOG server to capture all of the alert details. During the configuration of the SYSLOG server, you can select which alerts you would like to capture on the remote SYLOG server (Info, Warning, Critical, Connections).

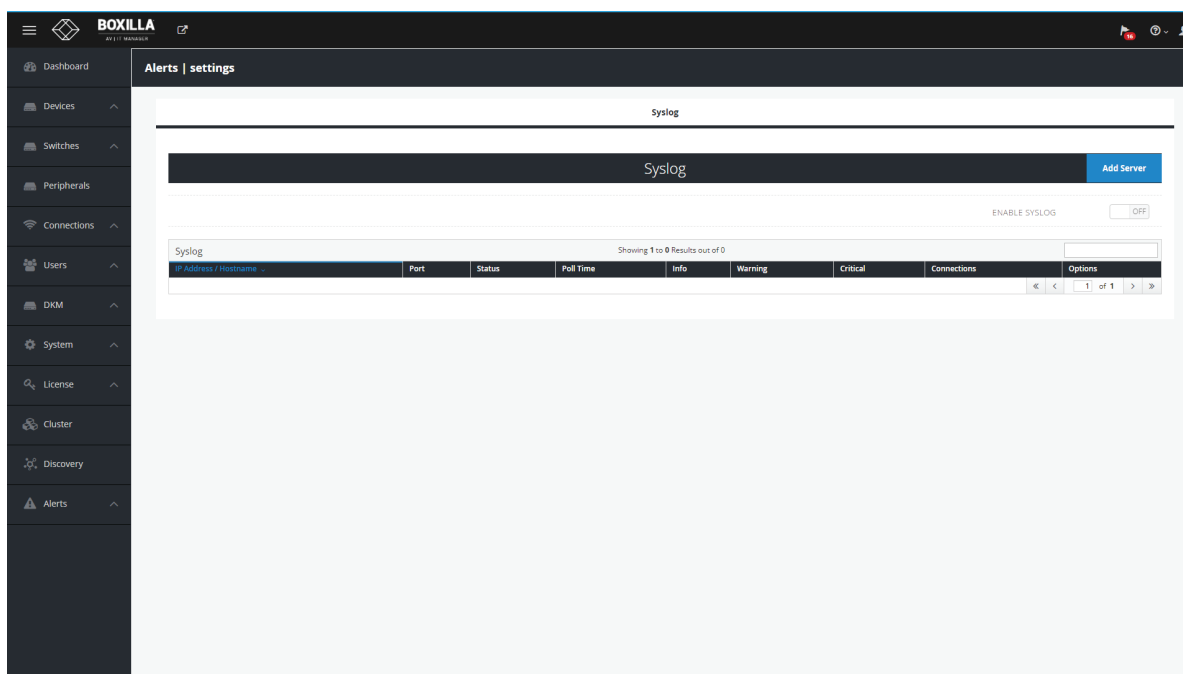


FIGURE 16-5. SYSLOG

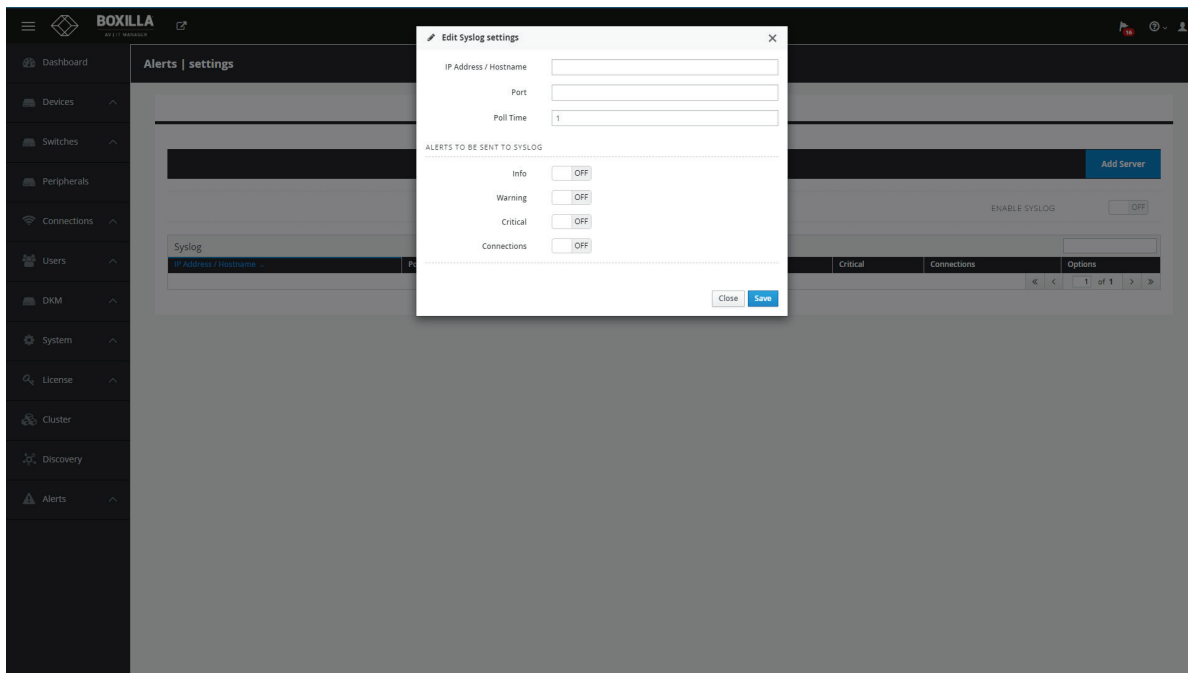


FIGURE 16-6. ADD SYSLOG SERVER

- ♦ IP Address/Hostname – This is the IP address or hostname of the server where the external syslog server is running.
- ♦ Port – The port the syslog server is listening on.
- ♦ Poll time – Poll time sets how often (in minutes) active connections will send connection stats to the syslog server.
- ♦ Alerts to be sent to syslog – You can limit what type of alerts are sent to the syslog server by turning these options on/off.

## CHAPTER 17: DASHBOARD

The dashboard is divided into three main areas: Status & Performance Indicators, Active Connections and Active Logins.

### 17.1 STATUS AND PERFORMANCE INDICATORS

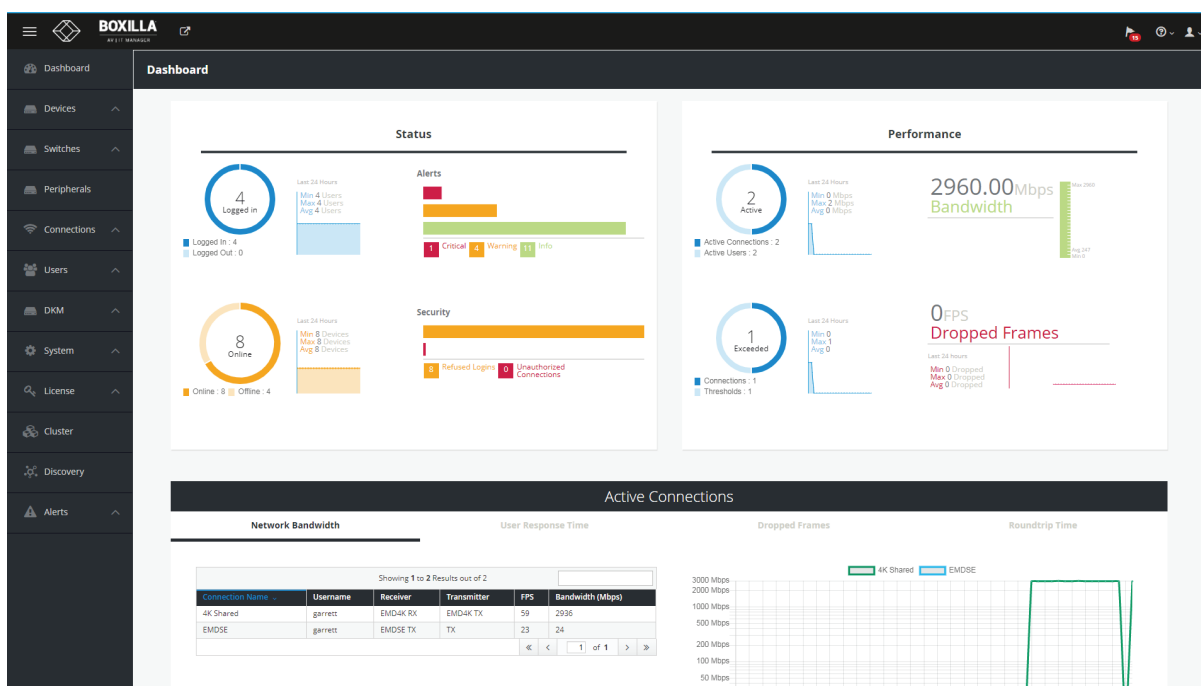


FIGURE 17-1. DASHBOARD TOP

The Status and Performance Indicators are defined as:

#### Status:

1. Logged-In—number of users currently logged-in is displayed in the center of ring. The Ring shows the number of users logged-in on Receivers and the number of Receiver units with no one logged-in (i.e. shows % of Receiver units that have a user logged in).

The graph portion of the Logged-In indicator shows the minimum, maximum and average number of users logged-in over the last 24 hours and a graph of number logged-in over the last 24-hours.

## CHAPTER 17: DASHBOARD

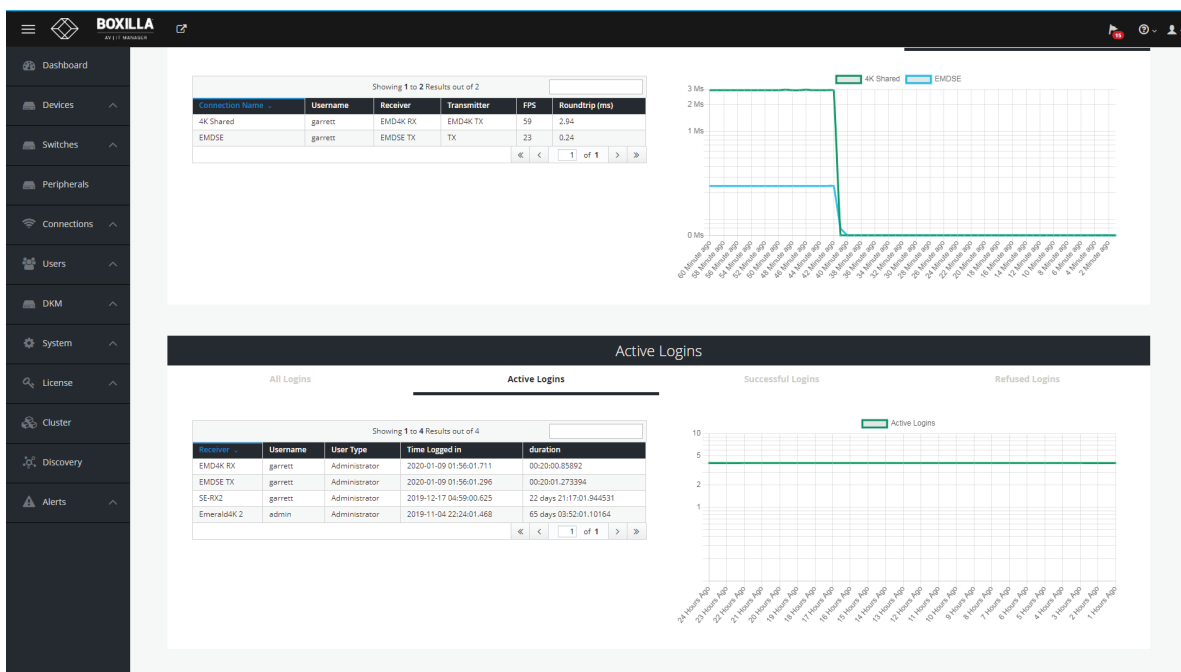


FIGURE 17-2. ACTIVE LOGINS

2. Devices Online—the number of devices (Receivers and Transmitter units) in the managed domain at this time that are online is displayed in the center of the ring. The Ring shows the number of devices in the managed domain that are online and offline. A device is considered online if Boxilla can contact it over the network—and offline if not contactable.

The graph portion of the Devices Online indicator shows the minimum, maximum and average number of devices online over the last 24 hours and a graph of number devices online over the last 24-hours.

3. Alerts—the number of alerts in each category of Critical, Warning and Info (see section 11 for definition of the different categories).

4. Security—the number of Refused Logins and the number of Unauthorized Connections. Refused Logins are counted on each Receiver when a user fails a login attempt. Unauthorized Connections are counted on Receivers and Transmitters when they detected something has attempted to connect to them in an unauthorized manner—such as devices not part of our managed domain trying to connect to a managed device or an attempt to access a service using a network protocol not authorized on a device (SSH, SNMP, etc.) as may occur during a port-scan attack.

### Performance:

1. Active Connections—number of currently Active connections is displayed in center of Ring. The Ring shows the number of Active connections on Receiver units with Active Users (i.e. logged in) and the number of Receivers with no connection that have users logged in.

The graph portion of the Active Connections indicator shows the minimum, maximum and average number of Active Connections over the last 24 hours and a graph of Active Connections over the last 24 hours.

2. Threshold Exceeded —the number of connections with a threshold exceeded is shown in the center of the Ring. The thresholds are defined in section 10.4. The Ring shows the number of active connections that have a threshold exceeded and the number of connections with no threshold exceeded.

## CHAPTER 17: DASHBOARD

The graph portion of the Threshold Exceeded indicator shows the minimum, maximum and average number of connections with a threshold exceeded over the last 24 hours and a graph of number connections with a threshold exceeded over the last 24 hours.

3. Bandwidth— the current total network bandwidth generated by the devices in the domain (i.e., the sum of the network bandwidth of all the active connections) is displayed as a number on the indicator.

The graph portion of the Bandwidth indicator shows the minimum, maximum and average total bandwidth last 24 hours.

4. Dropped Frames— the current number of dropped frames summed across all active connections in frames-per-seconds.

The graph portion of the Dropped Frames indicator shows the minimum, maximum and average number of Dropped Frames across all active connection over the last 24 hours and a graph of Dropped Frames across all active connection over the last 24 hours.

### 17.2 ACTIVE CONNECTIONS

The Active Connections section of the dashboard displays the currently active connections in the managed domain. The table portion provides a sortable list of the active connections. Each column can be used to sort the table—in ascending or descending order—just click on a column header to sort and click again to invert sort order. The filter box at the top right of the table will filter the table based on the filter box contents.

The first five columns of the table are fixed for all the tabs that can be selected (Network Bandwidth, User Response, Dropped Frames or Roundtrip Time). The columns are defined as:

- ♦ Connection Name—the name of the active connection
- ♦ User Name—the user name logged into the Receiver that has initiated the active connection
- ♦ Receiver—the name of the Receiver on the active connection
- ♦ Transmitter—the name of the Transmitter on the active connection
- ♦ FPS—the current frames per second being encoded/transferred on the connection

The contents of the last column in the table will vary depending on the tab selected—Network Bandwidth, User Response, Dropped Frames or Roundtrip Time.

The last column displays when the selected tab is:

- ♦ Network Bandwidth—the total network bandwidth that this connection is generating (in Mbps). Typically, 0 Mbps for a static screen and up to 120 Mbps when playing a 1080p video.
- ♦ User-Response Time—the time it takes for an event on the server to be displayed on the Monitor attached to the receiver. This includes video encode time in the Transmitter, network latency and video decode time in the Receiver as part of its calculation (in milliseconds). Typically 8–16 ms but can grow to 20–30 ms on congested networks due to dropped frames.

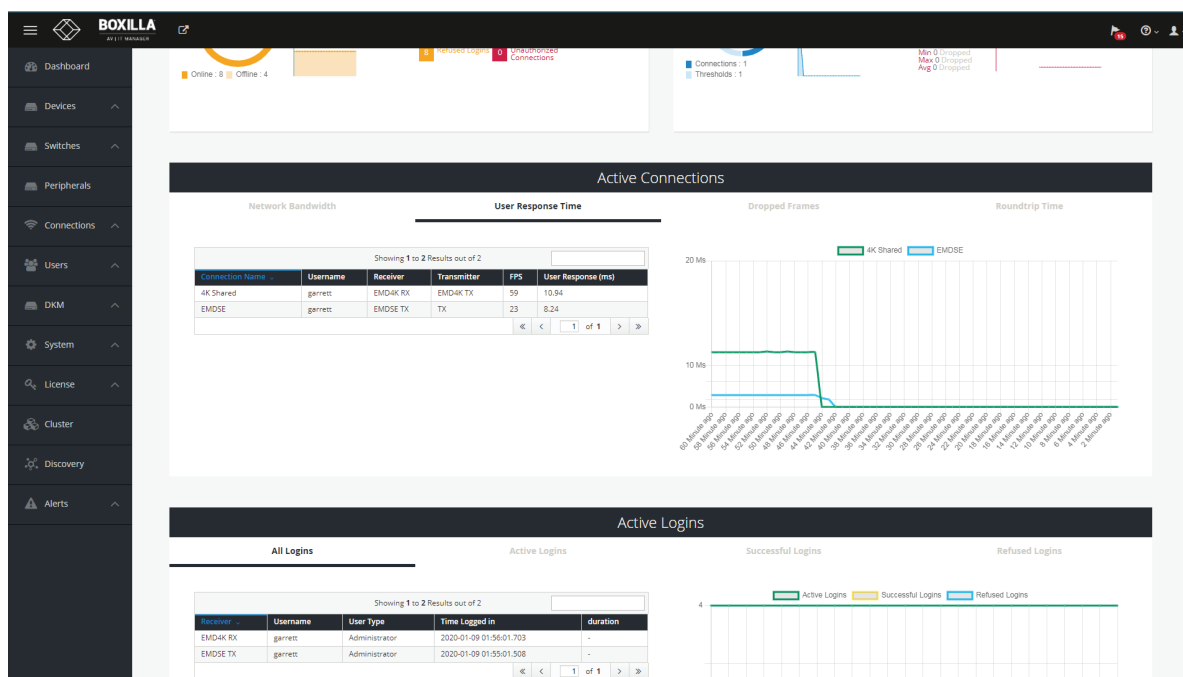


FIGURE 17-3. USER RESPONSE TIME

- ♦ Dropped Frames—the number of dropped frames in the Transmitter that is part of this connection. Dropped frames usually result from network congestion (in frames-per-second). Typically will be 0 fps.
- ♦ Round-trip time—measures the network round-trip time experienced at an IP packet level for the active connection (in milliseconds). Typically this will be 0 ms on a gigabit network with low congestion.

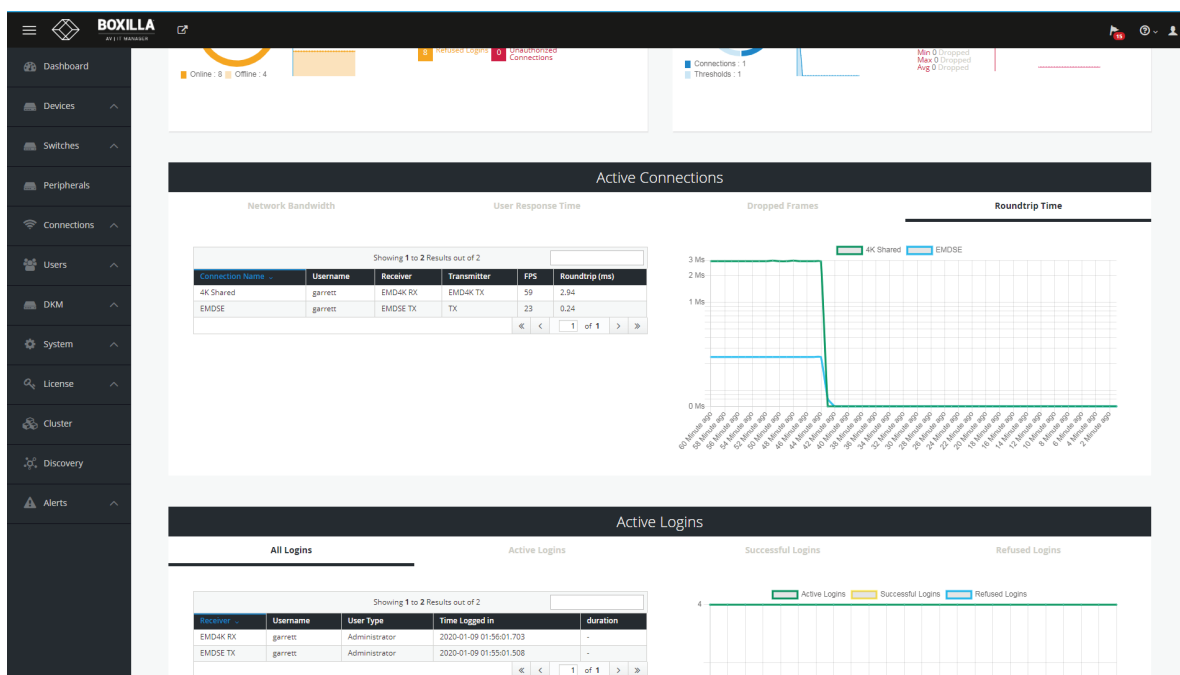


FIGURE 17-4. ROUNDRIP TIME

The graph part of the Active Connections dashboard displays a graph of the last column over time, so it can be network bandwidth, user-response time, dropped frames per second or roundtrip time.

## 17.3 ACTIVE LOGINS

The Active Logins section of the dashboard displays the current active logins in the managed domain. The table portion provides a sortable list of the active connections. Each column can be used to sort the table— in ascending or descending order—just click on column header to sort and click again to invest sort order. The filter box at the top right of the table will filter the table based on the filter box contents.

The table portion has the following columns:

- ♦ Receiver—the receiver name that has been logged into
- ♦ Username—the user name that has logged into the Receiver
- ♦ User-Type—the type of user that has logged in: administrator, Power User, User (see section 9.1 for definitions of user types)
- ♦ Time Logged In —when the user logged-in
- ♦ Duration—how long the user has been logged-in

There are four tabs in the Active Logins section:

- ◆ All Logins—all logins and attempts

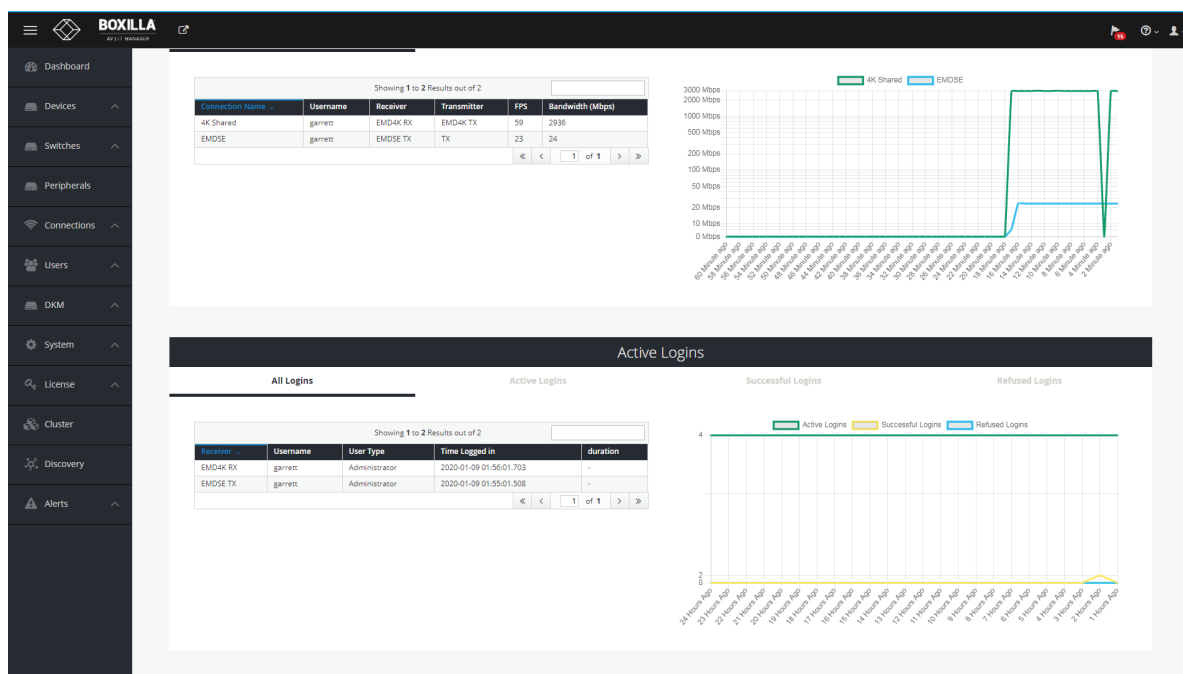


FIGURE 17-5. DASHBOARD BOTTOM

- ◆ Active Logins—all current active logins

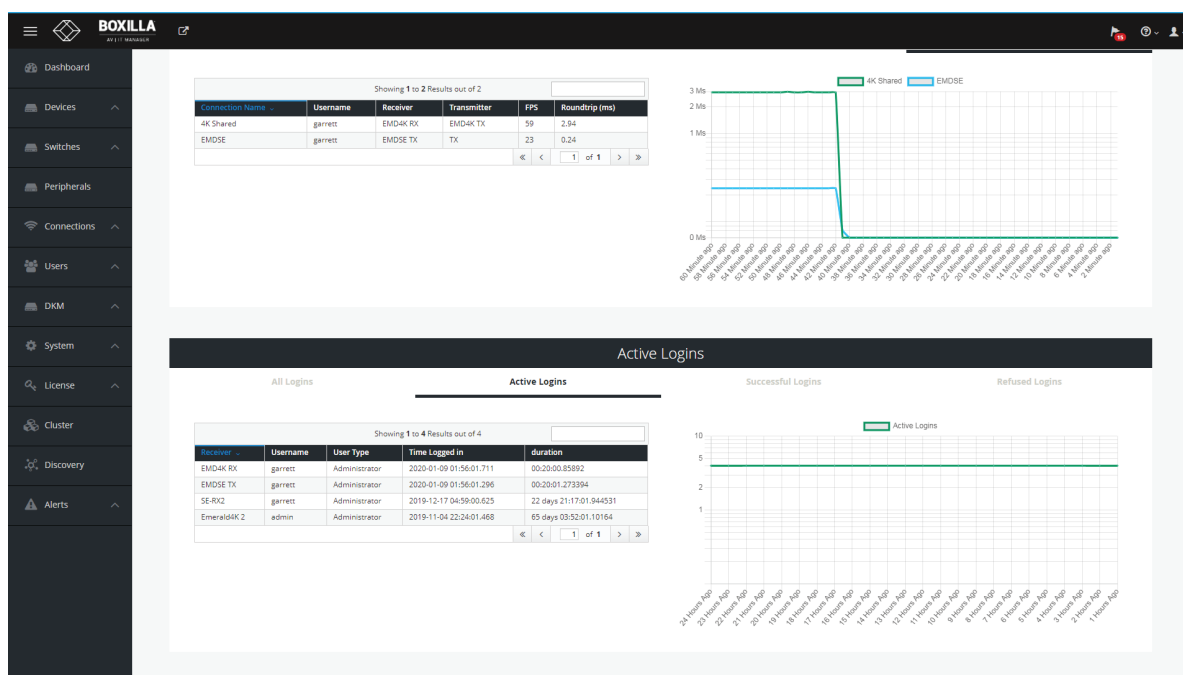


FIGURE 17-6. ACTIVE LOGINS



- ♦ Successful Logins—all Successful logins, both currently active logins and previous ones

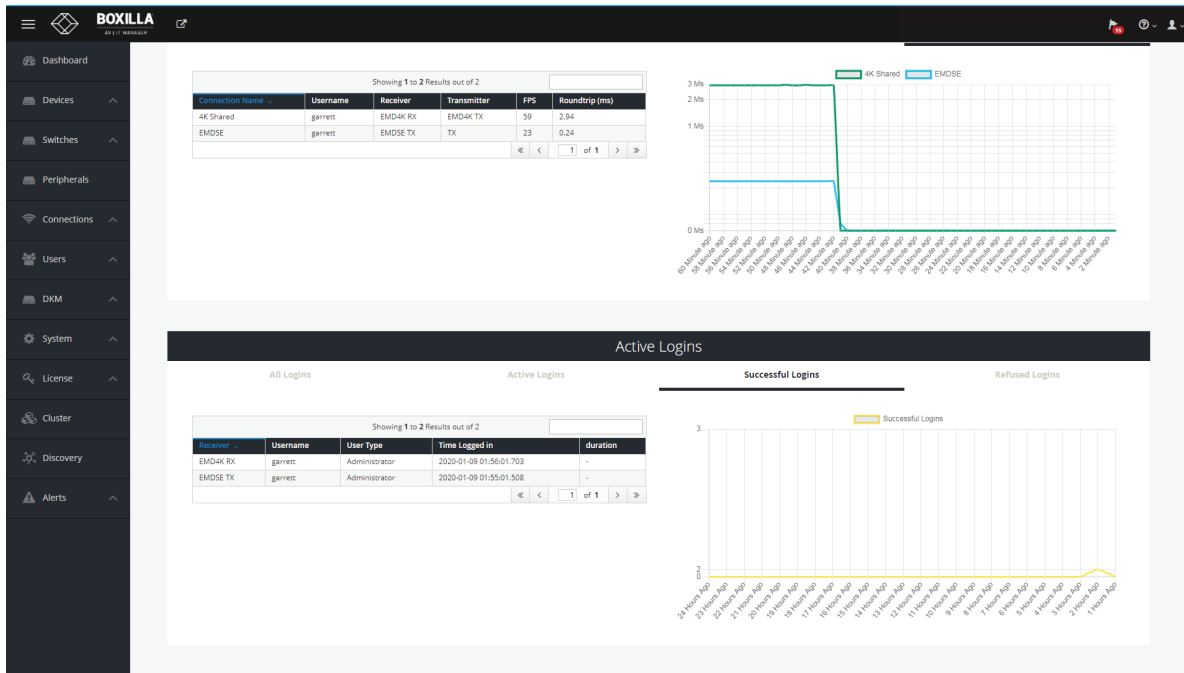


FIGURE 17-7. SUCCESSFUL LOGINS

- ♦ Refused Logins—all refused logins

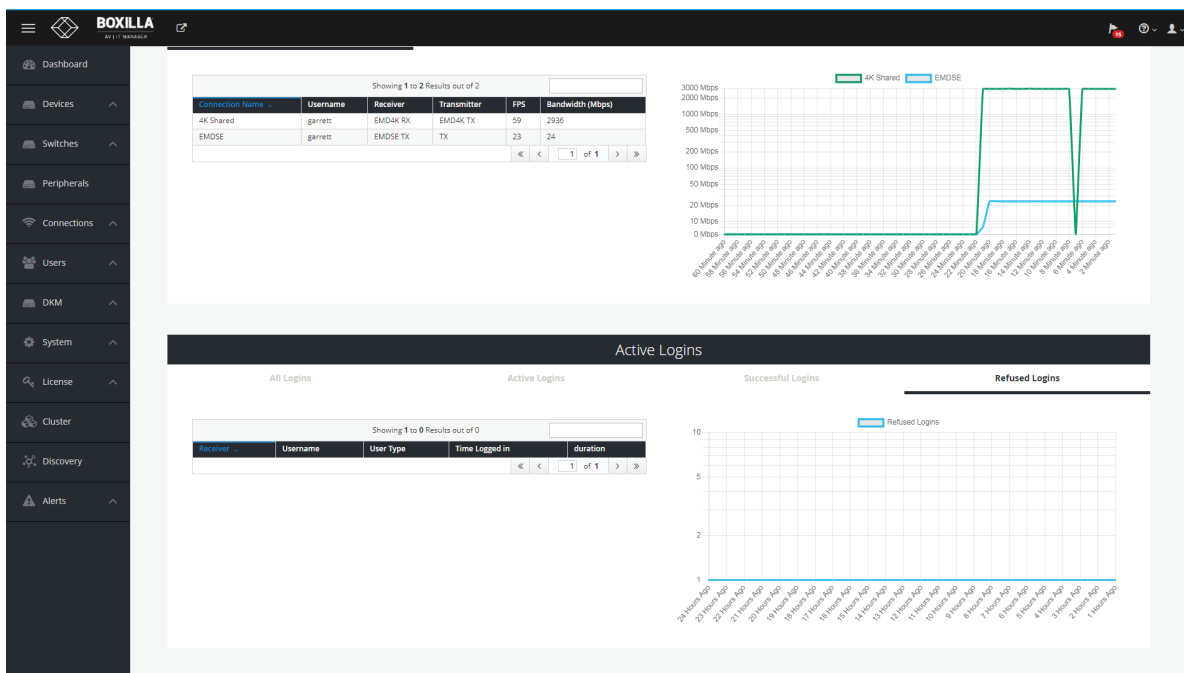


FIGURE 17-8. REFUSED LOGINS

The graph part of the Active Logins dashboard displays a graph of the selected tab information over time.

## APPENDIX A: REPLACING YOUR BOXILLA

This section defines what an Administrator should do to ensure the Boxilla unit can be replaced and the system restored with its previous settings.

A key maintenance task is for the Administrator to backup the system so the system can be restored to a known state. See section 11.4.

1. Remove the original Boxilla from the network. Connect the new Boxilla in its place and power up.
2. Before connecting the new Boxilla unit to the main network, connect the Boxilla unit to a network switch that is isolated from the main network.
3. Use a computer connected to the same switch to login to the new Boxilla Unit.
4. Set the IP address of the Boxilla unit to match that of the original unit. (Ideally, you have all this done in advance of failure.)
5. Add Licenses to the new Boxilla unit, if required.
6. Upload and Activate Certificates to the new Boxilla unit, if required.
7. Restore a backup file of the original Boxilla database to the new device.
8. Navigate to Devices | Settings page, and all devices should appear as OnLine after 10 seconds.
9. The replacement Boxilla unit is now operational.



## APPENDIX B: BOXILLA AND EMERALD PROTOCOLS

### OVERVIEW

Emerald or InvisaPC uses standard IP protocols for communication between Receivers and Transmitters. Port 3389 is used for unicast communications.

For management purposes, some other ports are used. The Black Box Discovery protocol uses UDP Multicast Group 224.0.1.249 (port 39150). This is sent by the Manager to discover Emerald or InvisaPC devices in the network. The router must allow UDP Multicast forwarding to allow devices on a subnet different than where the Manager is located to be discovered.

Emerald or InvisaPC devices respond to the discovery multicast by sending a UDP unicast back to the Manager IP address on the same port (Port 39150).

Once an Emerald or InvisaPC device is part of the managed domain, the Manager periodically “audits” the device to determine information such as is the device on-line, who is logged into device, device statistics, etc. These audit requests and responses are unicast UDP to specific IP addresses (responses are sent back to Manager’s IP address) on port 39150.

On power-up, a Transmitter sends out a “here I am” multicast message on multicast group 225.0.0.37 on port 12345.

Boxilla periodically retrieves device statistics using Port 8888.

Also port 22 and port 443 are used for some manager to appliances communications.

Port 8000 is also used for communications.

**TABLE B-1. PORT USAGE PER APPLIANCE**

COMPONENT	APPLICATION	PORT	EMERALD 4K	EMERALD PE/ZU
Appliance	Appliance REST HTTP	TCP: 7778	Yes	Yes
	Appliance REST HTTPS	TCP: 8888	Yes	Yes
	Stats gathering Internal Port	TCP: 9998 (internal use only; might show on scan)	Yes	Yes
	Communications	TCP: 22	Yes	Yes
	Manager Discovery (to Appliance): Multicast 224.0.1.249. Appliance listens on UDP Port	UDP: 39150	Yes	Yes
	(4K Only) Default Slave Multicast IP Port (IP: 239.0.0.1)	UDP: 8000	Yes	No
	(4K only) Default Master Multicast IP Port (IP: 239.0.0.1)	UDP: 8001	Yes	No
	Audio (Private/Multi Unicast)	TCP: 9000	Yes (1.2 onwards)	Yes (5.0x onwards)
	Video EMDSE & 4K	TCP: 16384	Yes	Yes (5.3x onwards)
	Video, 2nd channel, (Paired only)	TCP: 16385	No	Yes (5.4x only)
	Reserved – Future	TCP: 16387	—	—
	Reserved – Future	TCP: 16388	—	—
	Multicast 225.0.0.37 (Appliance – recovery)	UDP: 12345	Yes	Yes
	RDP VM & RDP Broker	TCP: 3389 (default)	Yes (Default)	Yes (Default)
	Horizon Client	??	—	—
	TX connections	TCP: 3389	Yes	Yes
Boxilla	Boxilla REST HTTPS	TCP: 443	—	—
	Boxilla Smart Proxy HTTP	TCP: 8000 (Boxilla internal only)	—	—
	Communications	TCP: 22	—	—
	Discovery: Multicast 224.0.1.249 (Send)	UDP: 39150	—	—

**NOTE:** Firewalls on the WAN may cause audio to fail due to a protocol issue that prevents it traversing some firewalls. The audio channel does not perform the SYN/SYNACK sequence which leads to some of these streams being blocked.

## APPENDIX C: REGULATORY INFORMATION

### C.1 FCC AND IC STATEMENTS

#### Federal Communications Commission and Industry Canada Radio Frequency Interference Statements

This equipment generates, uses, and can radiate radio-frequency energy, and if not installed and used properly, that is, in strict accordance with the manufacturer's instructions, may cause interference- to radio communication. It has been tested and found to comply with the limits for a Class A computing device in accordance with the specifications in Subpart B of Part 15 of FCC rules, which are designed to provide reasonable protection against such interference when the equipment is operated in a commercial environment. Operation of this equipment in a residential area is likely to cause interference, in which case the user at his own expense will be required to take whatever measures may be necessary to correct the interference.

Changes or modifications not expressly approved by the party responsible for compliance could void the user's authority to operate the equipment.

This digital apparatus does not exceed the Class A limits for radio noise emission- from digital apparatus set out in the Radio Interference Regulation of Industry Canada.

Le présent appareil numérique n'émet pas de bruits radioélectriques dépassant les limites applicables aux appareils numériques de la classe A prescrites dans le Règlement sur le brouillage radioélectrique publié par Industrie Canada.

### C.2 SAFETY AND EMC APPROVALS AND MARKINGS/PATENT INFORMATION

#### C.2.1 SAFETY AND EMC APPROVALS AND MARKINGS

FCC and CE Safety certifications and EMC certifications for this product are obtained under one or more of the following designations: CMN (Certification Model Number), MPN (Manufacturer's Part Number) or Sales Level Model designation. The designation that is referenced in the EMC and/or safety reports and certificates are printed on the label applied to this product.

European Union Notification Warning: This is a class A product. In a domestic environment, this product may cause radio interference in which case the user may be required to take adequate measures.



#### C.2.2 PATENT INFORMATION

This product contains patented designs and is protected by U.S. and international patents and patents pending.

## APPENDIX D: DISCLAIMER/TRADEMARKS

### D.1 DISCLAIMER

Black Box Corporation shall not be liable for damages of any kind, including, but not limited to, punitive, consequential or cost of cover damages, resulting from any errors in the product information or specifications set forth in this document and Black Box Corporation may revise this document at any time without notice.

### D.2 TRADEMARKS USED IN THIS MANUAL

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