Plixer Replicator Documentation

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Plixer

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Welcome to the Plixer Replicator online manual. Click here for the maintenance and troubleshooting FAQs. This manual is also available in .pdf format.

Tip: For questions or concerns, contact *Plixer Technical Support*.

ONE

PLIXER REPLICATOR - OVERVIEW

1.1 What is Plixer Replicator?

Plixer Replicator is a networking appliance that collects, load balances, and forwards streams from UDP metadata-exporting devices to any number of products or systems that can transform that information into tangible business value.

1.2 How does Plixer Replicator work?

When set as the destination for flows and log data from network devices like switches, routers, and firewalls, Plixer Replicator automatically replicates the packets and distributes them to destinations based on user-configured Profiles.

This eliminates the typical 1:1 limitation between devices generating log data and network management tools, such as Plixer Scrutinizer, SIEMs, and IPSs, and allows an organization to maximize the value delivered by their existing network security and monitoring infrastructure.

Plixer Replicator is available as either a rack-mountable hardware appliance or a virtualized ESX, Hyper-V, or KVM solution.
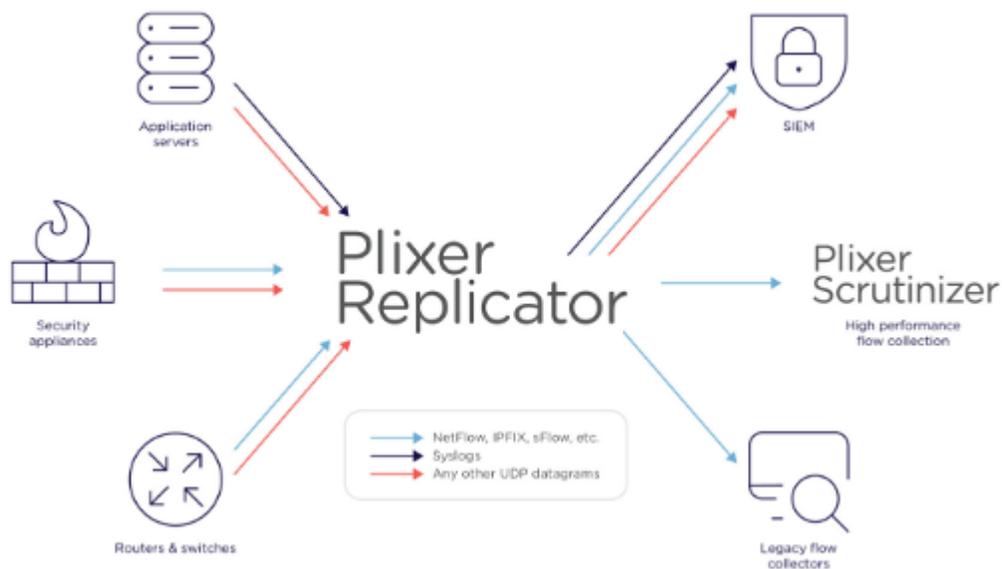
1.3 Main features

Fully configurable replication
Create Profiles and Policies to replicate flow and log data streams and forward them to any number of network management systems of your choosing

Insightful, real-time Alarms
Gain visibility over all network devices linked to Plixer Replicator and get instantly alerted to drops in inbound and/or outbound traffic and other irregularities

Full-featured web interface
View and manage the Plixer Replicator environment, including all connected devices, with an intuitive web-based user interface

Robust command line interface (CLI)
Use Interactive Mode to issue remote commands to configure Plixer Replicator's functions and leverage its advanced features

DEPLOYMENT GUIDES

This section covers the process of setting up the Plixer Replicator hardware or virtual appliance for use and includes detailed instructions for each type of deployment.

To complete the setup process for either type of Plixer Replicator, you will need to provide a subscription or evaluation key. You can obtain a license key from Plixer or a local reseller.

Hint: You can review and manage the Plixer Replicator's license details by navigating to **Settings > Licensing** in the web interface.

2.1 Hardware appliance

The Plixer Replicator is a 1U rack mounted server. Before deploying the Plixer Replicator appliance, make sure to secure it first in a server rack with the provided hardware.

To deploy the Plixer Replicator hardware appliance, follow these steps after it has been mounted in a server or network rack:

1. Apply power to the Plixer Replicator using the power cable that's provided.

2. Connect the Plixer Replicator to the network. If you are facing the back of the server, the NIC on the left hand side will be used. Connect an Ethernet cable into this NIC and then into your network.

3. Using a keyboard and monitor, connect directly to the Plixer Replicator server and power the server on.

4. Login to the Plixer Replicator with the username `replicator` and the password `replicator`.

5. Once you are logged in, you will be presented with a **Getting Started** script that you will need to fill out. After you have finished filling out the information, the server will reboot.

This will allow you to configure the networking configuration of the server as well as hostname/DNS servers, NTP servers, and passwords for the user `replicator`.

2.2 Virtual appliance - ESX

To deploy the Plixer Replicator virtual appliance for ESX environments, note the following system requirements and proceed with the instructions that follow:

Note: The Plixer Replicator virtual appliance for ESX is provided as an all-in-one OVF template to streamline the deployment process.

System requirements for ESX deployments:

- RAM: 2 GB
- Storage: 100 GB
- Processor: 2 CPU, 2 cores, 2 GHz+
- OS: ESX/ESXi5+
- VMware Tools (to shut down the machine via the VMware vSphere client)

Deploying the OVF template

1. After connecting to the ESX host via VMware vSphere or vCenter, select **File > Deploy OVF Template**.
2. Select *Deploy from File*, navigate to the OVF Template, and click *Next*.
3. Review the OVF template details and click *Next*.
4. Provide a name for the virtual appliance and follow the deployment wizard that follows.
5. Review the virtual settings provided and click *Finish* to complete importing the OVF Template.
6. Right-click on the Plixer Replicator virtual machine to boot it up.
7. Navigate to the **Console** tab and log in with the username `replicator` and password `replicator`.
8. After the machine performs a quick setup, follow the instructions on the screen.
9. Log in to the UI, and then go through the configuration steps that follow.

Note: VMware Tools are installed by default in the Plixer Replicator package. For more information, refer to the VMware Tools documentation.

Upgrading the virtual machine hardware version

The Plixer Replicator virtual appliance for ESX is built on virtual machine hardware version 7 to maintain backwards compatibility with ESXi 5 hypervisors.

To upgrade the hardware version:

1. Shut down the virtual machine.
2. Right-click on the virtual machine in vSphere (or vCenter) and select *Upgrade Virtual Hardware*.

2.3 Virtual appliance - Hyper-V

To deploy the Plixer Replicator virtual appliance for Hyper-V environments, note the following system requirements and proceed with the instructions that follow:

System requirements for Hyper-V deployments:

- RAM: 2 GB

- Storage: 100 GB

- Processor: 2 CPU, 2 cores, 2 GHz+

Importing the virtual machine

1. Unzip the latest Plixer Replicator virtual appliance package on the Hyper-V server.

2. In **Hyper-V Manager**, select *Import Virtual Machine* and browse to the Plixer Replicator system folder.

3. Select the virtual machine and import type.

4. Go to **Settings**, select the network adapter, and assign it to the appropriate virtual switch.

5. In the network adapter's **Advanced Features** section, set the MAC address to *Static*, enter a unique MAC address, and press *OK*.

6. Start the virtual machine, right-click on it, and select *Connect*.

7. Log in with the username `replicator` and password `replicator` and wait for the server to reboot after a quick setup.

8. Log in to the UI, and then go through the configuration steps that follow.

2.4 Virtual appliance - KVM

To deploy the Plixer Replicator virtual appliance for KVM environments, note the following system requirements and proceed with the instructions that follow:

System requirements for KVM deployments:

- RAM: 2 GB

- Storage: 100 GB

- Processor: 2 CPU, 2 cores, 2 GHz+

Importing the virtual machine

1. Create a directory for the install (e.g., `mkdir kvm/plixer_replicator/`).

2. Download the latest Plixer Replicator virtual appliance package by entering `wget https://files.plixer.com/Replicator_KVM.tar.gz`

Important: If the URL above does not work, contact support for the latest image.

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3. Unzip the file in the install directory on the KVM server by entering `sudo tar xvzf Replicator_KVM.tar.gz`.

4. Enter `sudo ./install.sh` to run the install script.

5. Log in to the virtual appliance and use the `virsh console Replicator` command to get to the console.

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6. Log in to the UI, and then go through the configuration steps that follow.

2.5 Basic configuration

Before the Plixer Replicator can start replicating and forwarding packets to network management devices or systems, it must first be configured for use.

To assist with the basic configuration process, a setup wizard is triggered when the user first logs in to the web interface.

Note: The default username for the web interface is `admin` and the default password is `admin`. To change the default login credentials, use the Interactive Mode command `password webui`.

2.5.1 Logging in for the first time

To enable LDAP authentication, go to the **Settings** tab and enter the LDAP server details. The LDAP password can be updated using the Interactive Mode command `ldapadminpass`.

The setup wizard will walk the user through the following steps:

Applying a license key
When the user first logs in, Plixer Replicator automatically checks for a valid license key before proceeding. If no license key has been applied, the user will be prompted to enter one.

Once a valid subscription or evaluation key has been entered, the wizard will continue to the next step.

Note: License keys are available from Plixer or local resellers. Users can view and manage their license details by going to **Settings > Licensing** in the web interface.

Creating a Profile
If there are currently no Profiles configured, the wizard will walk the user through creating one.

Important: Before attempting to add a Profile, configure a device to start sending packets to the Plixer Replicator and take note of the port it uses to send data.

To create a Profile, the user will need to provide the following:

1. A unique name for the profile

2. The port for inbound packets (*In Port*)

3. The port for outbound packets (*Out Port*)

For more information on creating and configuring Profiles, see the section on *profile management*.

After a Profile has successfully been created, the wizard will continue to the next step.

Confirming that packets are inbound
The **Dashboard** and **Streams** tabs of the Plixer Replicator web interface provide real-time oversight of the appliance's packet activity.

As the last step of the setup wizard, the user will be directed to the **Streams** tab to verify the the Plixer Replicator is receiving packets from devices that have been configured to send log data to it.

See the section on the Plixer Replicator *web interface* to learn more about the functions of each tab.

2.5.2 Setting up SSL

SSL support can be enabled for the Plixer Replicator during the initial deployment process. Alternatively, a user can run the `/home/replicator/conf/enable_ssl.sh` script to enable SSL at a later time.

Important: An active Internet connection is required to download the latest OpenSSL and httpd packages.

As part of the process, the script will walk the user through the creation of a self-signed SSL certificate.

Enter the following information when prompted to create the certificate:

Name Field	Description
Country name	The two-letter ISO abbreviation for a country
	example: US = United States
State / province	The state/province where the organization is located (no abbreviations)
	example: Maine
City / locality	The city where the organization is located (no abbreviations)
	example: Kennebunk
Organization	The full legal name of the organization
	example: Plixer
Email address	The email address for the CA (whom to contact)
	example: someone@your.domain
Common name	URL to attach to the certificate
	example: 10.1.1.19 or replicator.company.com
Extra attributes	A challenge password and an optional company name can be added to the certificate request

2.5.3 Creating a CA-signed certificate

To create an SSL certificate signed by a trusted certificate authority or CA, follow these steps:

1. After enabling SSL, send the `/etc/pki/tls/private/ca.csr` file to the CA to be signed and ask them to return it as **Base64** encoded.

Important: When exporting a certificate, do *not* select **DER** encoded as the export file format.

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2. Once the CA-signed certificate is received, stop the Apache service by entering `service httpd stop`.

3. Replace the active SSL certificate with the new one and rename the file to `*//etc/pki/tls/certs/ca.crt`.

4. Restart the Apache service by entering `service httpd start`.

FEATURES AND FUNCTIONALITY

This section includes all necessary background information as well as detailed instructions for the use of Plixer Replicator's core replication and stream monitoring functionalities.

3.1 Profile management

Plixer Replicator relies on user-defined Profiles to determine where a packet it receives on a particular UDP port should be replicated and/or forwarded to any network management systems.

In addition to its name, In Port, and Out Port, each Plixer Replicator Profile contains the following details:

1. *Exporters*: Networked devices, such as routers, switches, or servers, that generate log data for use by network management systems and send it to the Plixer Replicator for replication and/or forwarding

2. *Collectors*: SIEMs, Flow Collectors, SNMPTrap Receivers, or other network management systems that analyze data forwarded by the Plixer Replicator from other networked devices

3. *Policies*: Used by the Plixer Replicator to automatically determine whether an Exporter should be included or excluded from the Profile

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Note: When Collectors receive packets from the Plixer Replicator, they interpret its origin as the IP address of the Exporter that sent it.

When the Plixer Replicator receives a packet, it references all currently enabled Profiles and Policies to verify that the packet's origin is a valid Exporter.

After the first Profile has been created during the appliance's initial setup, additional Profiles can be created or configured using either the web interface or Interactive Mode.

3.1.1 Managing Profiles - web interface

The **Profiles** tab of the Plixer Replicator web interface allows users to create, modify, or delete Profiles and displays all existing Profiles and their details.

For more information on the **Profiles** tab and other UI elements, see the section on the *Plixer Replicator web interface*.

Creating a new Profile

To add a new Profile from the **Profiles** tab of the web interface:

1. Click on the + icon near the upper-left corner of the page.

2. In the window that opens, enter a name for the Profile, the In Port, and the Out Port.

3. To automatically add devices sending packets to the Plixer Replicator as Exporters, leave the checkbox ticked.

4. Click on *Save* to create the Profile.

Once created, the new Profile should be accessible from the main list of the **Profiles** tab.

Adding an Exporter to an existing Profile

To add an Exporter to a Profile from the **Profiles** tab of the web interface:

1. Click on the pencil icon under the **Actions** column for the Profile.

2. On the Profile Details page, click on the + icon to the left of **Exporters** in the lower-half of the page.

3. Enter the IP address of the Exporter in the window that opens.

4. Click on *Save* to add the Exporter.

The new Exporter should now be visible under the **Exporters** column in the lower-half of the Profile Details page.

Adding a Collector to an existing Profile

To add a Collector to a Profile from the **Profiles** tab of the web interface:

1. Click on the pencil icon under the **Actions** column for the Profile.

2. On the Profile Details page, click on the + icon to the left of **Collectors** in the lower-half of the page.

3. Enter the IP address of the Collector in the window that opens.

4. Click on *Save* to add the Collector.

The new Collector should now be visible under the **Collectors** column in the lower-half of the Profile Details page.

Adding a Policy to an existing Profile

To add a Policy to a Profile from the **Profiles** tab of the web interface:

1. Click on the pencil icon under the **Actions** column for the Profile.

2. On the Profile Details page, click on the + icon to the left of **Policies** in the lower-half of the page.

3. Enter the subnet/CIDR of the Exporter(s) to include or exclude from the Profile.

4. Select *include* or *exclude* from the drop-down menu.

5. Click on *Save* to add the Policy.

The new Policy should now be visible under the **Policies** column in the lower-half of the Profile Details page.

3.1.2 Managing Profiles - Interactive Mode

After connecting to the Plixer Replicator in Interactive Mode, the user can create, modify, or remove Profiles using the relevant commands.

For more information on other Interactive Mode commands, see the *list of Interactive Mode commands* under the *Advanced Services tab*.

Creating a new Profile

To create a new Profile, enter the following at the Interactive Mode prompt:

```
REPLICATOR> profile add [profile_name] [in_port] [out_port]
```

This will create a Profile called *profile_name* with the specified In Port and Out Port.

To completely remove a Profile, along with any Policies associated with it, use:

```
REPLICATOR> profile remove [profile_name]
```

Profiles can also be temporarily disabled and later re-enabled using `profile disable` and `profile enable`, respectively.

Adding an Exporter to an existing Profile

To add an Exporter to an existing Profile, enter the following at the Interactive Mode prompt:

```
REPLICATOR> exporter add [exporter_ip] [profile_name]
```

This will add the Exporter from the specified Profile. To remove an Exporter from all existing Profiles, use the Interactive Mode command:

```
REPLICATOR> exporter allremove [exporter_ip]
```

Adding a Collector to an existing Profile

To add a Collector to an existing Profile, enter the following at the Interactive Mode prompt:

```
REPLICATOR> collector add [collector_ip] [profile_name]
```

This will add the Collector from the specified Profile. To remove a Collector from all existing Profiles, use the Interactive Mode command:

```
REPLICATOR> collector allremove [collector_ip]
```

Adding a Policy to an existing Profile

To add a Policy to include all Exporters on a given subnet/CIDR in a Profile, enter the following at the Interactive Mode prompt:

```
REPLICATOR> policy add [subnet/CIDR] [profile_name] include
```

This will add a Policy to the Profile that instructs the Plixer Replicator to replicate and/or forward packets from the specified subnet/CIDR to its Collectors. `exclude` Policies can be used in conjunction with `include` Policies to exempt packets from specific Exporters from being replicated and/or forwarded. To remove a Policy from a Profile, use the Interactive Mode command:

```
REPLICATOR> policy remove [subnet/CIDR] [profile_name]
```

3.2 Web interface

The Plixer Replicator web interface provides full transparency into the appliance's interfaces and processes. It also allows the user to configure its features and functionality.

3.2.1 Dashboard tab

The **Dashboard** tab provides an at-a-glance overview of the Plixer Replicator's operations through the following visualizations:

- Gauge charts displaying CPU usage, packets received/sent, and inbound/outbound bits per second
- Live trend line graphs showing the last 20 traffic data points
- Full summary of all associated devices, Profiles, and most recent traffic totals

The time period covered by the **Dashboard** tab's data is based on the live data's refresh rate, which can be configured in the *Settings tab* of the web interface.

3.2.2 Streams tab

The **Streams** tab displays details about the current status of all Exporters sending packets to the Plixer Replicator. Lines highlighted in red are Exporters whose packet streams have stopped and triggered Alarms.

The table of Exporters in the **Streams** tab can be filtered using the following options:

- Display only streams that have triggered Alarms by ticking the **Alarms Only** checkbox near the upper-left corner of the page.
- Display only streams that match a keyword by entering text in the search field near the upper-right corner of the page.

To force the system to attempt to resolve the Exporter's name, click on the corresponding globe icon under the **DNS NAME** column of the table.

3.2.3 Exporters tab

The **Exporters** tab displays detailed information about Exporters sending packets to the Plixer Replicator, and includes additional options for Exporter management.

If there are Exporters that have active Alarms, the number will be displayed in a notification badge in the upper-right corner of the tab label.

The table in the **Exporters** tab supports the following filtering options:

- Display only *Exporters in Profiles* or *Exporters Not in a Profile* using the dropdown near the upper-left corner of the page
- Alarms-only view via the checkbox near the upper-left corner of the page
- Keyword match filtering using the search field near the upper-right corner of the page

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Note: When viewing only Exporters that are not in any Profiles, only previously assigned Exporters will be highlighted in red if they have an active Alarm.

3.2.4 Collectors tab

The **Collectors** displays detailed information about all currently configured Collectors and includes options for Collector management.

If there are Collectors that have active Alarms, the number will be displayed in a notification badge in the upper-right corner of the tab label.

The table in the **Collectors** tab supports the following filtering options:

- Alarms-only view via the checkbox near the upper-left corner of the page
- Keyword match filtering using the search field near the upper-right corner of the page

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Hint: To set an Alarm threshold for packet volume for a Collector, click on the corresponding gauge icon under the **THRESHOLD** column of the table.

3.2.5 Profiles tab

The **Profiles** tab displays detailed information about all currently configured Profiles and includes options for Profile management.

If there are Profiles that include Exporters or Collectors that have active Alarms, the number of will be displayed in a notification abdge in the upper-right corner of the tab label.

For more information and detailed instructions, see the section on *managing profiles in the web interface*.

3.2.6 Settings tab

The **Settings** tab allows the user to configure the Plixer Replicator to suit different scenarios.

The included options will allow the user to:

- Enable or disable Plixer Replicator features (e.g., pinging collectors at regular intervals)
- Change default values (e.g., update refresh rate)
- Configure login and connection settings (e.g., LDAP settings)

The appliance OS automatically verifies all settings modifications and will output an error message if a non-working value is entered.

Hint: The Plixer Replicator's settings can also be configured using Interactive Mode. For more information on the CLI and the different commands supported, see the section on Plixer Replicator's *Interactive Mode*.

3.2.7 Server Health LED

The Server Health LED is a virtual notification LED that provides quick access to the status of the Plixer Replicator and all configured Profiles. It is located near the upper-right corner of the web interface, next to the **Log Out** icon.

Clicking on the Server Health LED will bring up a list of all services that are currently active. Services that have encountered issues will be marked with a yellow exclamation point (!) and include additional details about the issues and recommendations for their resolution.

3.3 Alarms

Plixer Replicator actively tracks the number of packets received and sent by the appliance to monitor the status of each assigned Exporter and Collector. When an Exporter stops sending packets or a Collector becomes uncreachable, all Profiles associated with the device are marked with the *Alarm* status and a syslog alarm is sent.

3.3.1 How Alarms are triggered

Once every minute, the Plixer Replicator scans the netstat details of each interface in either direction (Rx and Tx). When the OS detects interface drops, it sends a syslog alarm to the server configured in the Notification section of the web interface's **Settings** tab. After a preset amount of time has passed, the unresponsive Exporter or Collector is flagged as being down and an Alarm is triggered for all Profiles it has been assigned to.

Alarms are also triggered when the Plixer Replicator OS detects high CPU usage or abnormal process termination.

Note: Plixer Replicator web interface metrics are a good reference point for packet activity but not for drops.

3.3.2 Configuring Alarms

To change the behavior of Alarms globally, the user can use the following arguments in conjunction with the Interactive Mode command `setting`:

Flag	Description
downDisplayHours	Sets the number of hours before an incoming stream is automatically acknowledged as being down
	Default: 24 hours
flowStopAlert	Sets the number of minutes an incoming stream must stop or a Collector must be unreachable before it is considered down
	Default: 70 minutes
highCPUThreshold	Sets the threshold for CPU usage before an Alarm is triggered
	Default: 90%
notificationServer	Sets the IP address and port of the server destination for Alarms and syslog notifications
	Format: *[server_ip] [port]*
noRepWhenDown	When disabled, the Plixer Replicator will continue trying replicate and/or forward packets to unreachable Collectors
	Default: enabled
pingCollectors	When disabled, the the Plixer Replicator will stop regularly pinging Collectors to confirm availability
	Default: enabled

Hint: Plixer's Scrutinizer Incident Response System includes policies for all possible Alarms triggered in Plixer Replicator.

For more information on issuing commands, see the section on Plixer Replicator's *Interactive Mode*.

3.3.3 Alarm reports

Exporters, Collectors, and Profiles that have triggered Alarms will all be highlighted in red in their respective tabs in the Plixer Replicator web interface. To view additional information about the Alarm, open the device's or Profile's details page.

As an alternative, the user may issue the following Interactive Mode command to generate a list of Exporters that have stopped sending data to or Collectors that are no longer reachable by the Plixer Replicator:

```
REPLICATOR> show alarms
```

The Interactive Mode commands `show` and `setting` can also be used to display additional metrics or generate reports based on live data. For more information on these commands and their directives, see the section on Plixer Replicator's *Interactive Mode*.

ADVANCED SERVICES

This section covers the use of Plixer Replicator's advanced services, which allow the appliance to support a wider range of complex scenarios.

4.1 Interactive Mode

Interactive Mode is Plixer Replicator's command line interface (CLI) and is an alternative to the web interface as a means utilizing and managing the appliance's features and functionality.

4.1.1 Launching Interactive Mode

To start issuing commands to the Plixer Replicator in Interactive Mode, first establish a connection with the hardware or virtual appliance using an SSH client and the credentials configured during initial deployment.

Important: Starting an SSH session as the `root` user only grants OS level access to the appliance. To start an Interactive Mode session (indicated by the REPLICATOR> prompt), either SSH to the appliance as the `replicator` user or enter `su replicator` while connected as the `root` user.

```
[root@demo ~]# ssh replicator@qa.replicator.local
replicator@qa.replicator.local's password:
Plixer Replicator (TM) v19.0.0.101236
2019-12-03 13:07:44 -0500 (Tue, 03 Dec 2019)
Copyright (C) 2012 - 2019 Plixer, All rights reserved.
Replicate Anything!
Need an IPFIX Collector? Download Scrutinizer at https://www.plixer.com
Machine ID : 6YZ6XEPT66FPH6364A1VQ8NY
Customer ID : qa replicator
Licensed Version : 18.5
Licensed Type : subscription (standalone/primary)
Expiration : 11/30/2020
REPLICATOR>
```

The REPLICATOR> prompt confirms that the Plixer Replicator is ready to accept commands.

4.1.2 Interactive Mode command list

The following commands and their directives can be used once connected to the Plixer Replicator in Interactive Mode and at the REPLICATOR> prompt.

Hint: For assistance while in Interactive Mode, enter command help, help <command>, <command> ?, or ? at any time.

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acknowledge

Function	Sets the status of an unavailable Exporter or Collector as *acknowledged* and stops the Plixer Replicator from sending additional notifcations about the resource being down

Syntax	• *acknowledge <exporter|collector> [ip_address:port]*
	
	`REPLICATOR> acknowledge exporter 10.1.1.2`
	`REPLICATOR> acknowledge collector 10.1.1.`
	↪`1:2055`

backup

Function	Creates a backup of the Plixer Replicator database in `/home/replicator/backups/`. Backup filenames cannot contain spaces. *See also: restore, show*
Syntax	• *backup [filename]* `REPLICATOR> backup replicator_backup`

collect supportfiles

Function	Gathers all relevant logs and configuration files and compresses them into a tar.gz file in the `/home/replicator/supportfiles` directory
Syntax	• *collect supportfiles* `REPLICATOR> collect supportfiles`

collector

Function	Adds or removes a Collector from a Profile
Syntax	• *collector <add|remove> [collector_ip] [profile_name]* REPLICATOR> collector add 10.1.1.1␣ →maineStreet REPLICATOR> collector remove 10.1.1.1␣ →maineStreet
Directives	• *allremove [collector_ip]* - Removes the Collector from all Profiles • *threshold [collector_ip] [limit]* - Sets the maximum packets/second for the Collector REPLICATOR> collector allremove 10.1.1.1 REPLICATOR> collector threshold 10.1.1.1␣ →100000

exporter

Function	Adds or removes a Collector from a Profile
Syntax	• *exporter <add|remove> [exporter_ip] [profile]* `REPLICATOR> exporter add 10.1.1.2`␣ `↪maineStreet` `REPLICATOR> exporter remove 10.1.1.2`␣ `↪maineStreet`

Directives	• *allremove [exporter_ip]* - Removes the Exporter from all Profiles
	• *noprofile* - Returns a list of all Exporters not currently assigned to any Profile
	
	`REPLICATOR> exporter allremove 10.1.1.2`
	`REPLICATOR> exporters noprofile`
	
	`+---------------------------------------`
	`↪----------------------------------+`
	`| 10.1.73.1        Fri Nov 15 13:48:52`␣
	`↪2019         1 packet(s)`
	`| 10.1.29.60        Fri Nov 15 13:48:52`␣
	`↪2019         2 packet(s)`
	`| 10.202.0.103       Fri Nov 15 13:48:52`␣
	`↪2019         5 packet(s)`
	`| 10.200.10.1       Fri Nov 15 13:48:52`␣
	`↪2019         32 packet(s)`
	`| 172.20.124.41      Fri Nov 15 13:48:52`␣
	`↪2019         1 packet(s)`
	`+---------------------------------------`
	`↪----------------------------------+`
	`Done in 0.035998 secs`

It is recommended for unassigned Exporters to either be added to a Profile or configured to stop sending packets to the Plixer Replicator.

Note: It is normal for Exporters that export data infrequently to be listed with 0 packets.

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ldapadmin

Function	Sets the admin password for LDAP configuration

Syntax	• *ldapadmin*, *ldapadminpass* (alternative)
	
	`REPLICATOR> ldapadmin`
	`REPLICATOR> ldapadminpass`

license

Function	Checks the status of the currently active license key or applies a new license key To generate a license key, Plixer or the reseller will need the Plixer Replicator's unique machine ID. The machine ID is displayed when issuing the *license check* command:

Syntax	• *license <check|status>* - Returns the details of the currently applied license key
	• *license <set|update>* - Opens a popup for the user to enter a new license key
	
	`REPLICATOR> license check`
	
	`Machine ID : 6YZ6XEPT66FPH6364A1VQ8NY`
	`Customer ID : austin replicator`
	`Licensed Version : 18.5`
	`Licensed Type : subscription (standalone/`
	`↪primary)`
	`Expiration : 11/30/2020`
	
	`REPLICATOR> license set`
	
	`[replicator]`
	`engine=pg`
	`dbname=/home/replicator/html/db/`
	`↪replicator.db`
	`user=`
	`pass=`
	`license=Nb7RuYhxJWxUv9u+nTdHCnRj5R9EiXQv5qD$9WO41jC4XBBYkI`
	`↪txz6yhFurK7Cz4Js1kuraTt96Q1pRru9zCk5gUxbNjISzI3BlY75eMMI`
	`↪HgVYMahQgDjPHhbuq2ft2HA1iuhRZU2q0Bt8TbSy+6CmvKLe7tSqht5V`
	`↪gntqAJaa4dGG4fBGmDgK30zLkC+OEFm402axzCmQ==`

Important: To generate a license key, Plixer or the reseller will need the Plixer Replicator's unique machine ID displayed when entering the `license check` command. The license key must be entered in the popup as a single continuous string with no line feeds or carriage returns.

Hint: Both the `license check` and `show status` comands can be used to verify that a license key has been properly applied. Contact technical support to obtain a new license key.

---

notate

Function	Adds a description or note that will be displayed in various reports to a Profile or IP address
Syntax	*notate profile [profile_name] [description]* - Adds a description to the Profile *notate ip [ip_address] [description]* - Adds a description to an IP address `REPLICATOR> notate profile maineStreet A`␣ `↪fun and happy place` `REPLICATOR> notate ip 10.1.1.2 my awesome`␣ `↪router`

password

Function	Sets the login password for the Plixer Replicator web interface or Interactive Mode. The new password will be applied when the user next logs in
Syntax	*password <interactive|webui>* - Returns a prompt for the user to enter a new password `REPLICATOR> password interactive` `(current) UNIX password:` `New password:` `Retype new password:`

Important: To successfully change the Interactive Mode password, the user must first enter the current, i.e. UNIX password.

policy

Function	Adds a Policy to the Profile that automatically includes or excludes the Exporters that match the provided subnet/CIDR When the appliance receives a packet, include policies are checked beforeexclude policies.
Syntax	*policy <add|remove> [subnet/cidr] [profile] <include|exclude>* - Adds or removes the Policy from the Profile `REPLICATOR> policy add 192.168.0.0/16`␣ `↪maineStreet include` `REPLICATOR> policy add 192.168.2.0/24`␣ `↪maineStreet exclude` `REPLICATOR> policy remove 192.168.2.0/24`␣ `↪maineStreet`

Important: A Policy must be entered in the subnet/CIDR notation.

---

profile

Function	Adds or updates a Profile and manages other Profile-related settings

Syntax	• *profile <add|update> [profile_name] [in_port] [out_port]*
	
	REPLICATOR> `profile add maineStreet 2002`␣
	`→2055`
	REPLICATOR> `profile update maineStreet`␣
	`→2003 2056`

Directives	• *profile <remove|disable|enable> [profile_name]* - Removes, disables, or enables the Profile
	• *profile rename [old_name] [new_name]* - Renames the Profile
	• *profile singularity [profile_name] <enable|disable>* - Enables or disables replication using the Plixer Replicator's IP instead of Exporters' (default: disabled)
	
	REPLICATOR> `profile remove maineStreet`
	REPLICATOR> `profile disable maineStreet`
	REPLICATOR> `profile enable maineStreet`
	
	REPLICATOR> `profile rename maineStreet`␣
	`→streetOfMaine`
	
	REPLICATOR> `profile singularity`␣
	`→maineStreet enable`
	REPLICATOR> `profile singularity`␣
	`→maineStreet disable`

rebuild

Function	Used to rewrite the internal configuration of the Plixer Replicator when replication services are down and issues are otherwise unresolvable The sampcfg command is an alias for the rebuild command.
Syntax	• *rebuild*, *sampcfg* (alias) REPLICATOR> `rebuild`

restore

Function	Restores a database backup from files in `/home/replicator/backups`
Syntax	• *restore [filename]* `REPLICATOR> restore backup20210214`

Important: Restore also reverts to the same version of PostgreSQL that was in use when the backup file was created.

---

role

Function	Assigns roles to individual appliances in configurations using multiple Plixer Replicators For more information, see the section on *fault tolerant deployments*.

Syntax	• *role set ha master [ip_address]*
	• *role set ha off*
	• *role set ha on [priority] [virtual_ip] [ifname] <master|backup>*
	• *role set primary*
	• *role set secondary [primary_replicator_ip:listener_port] [timeout]*
	• *role test <ha|secondary>*
	
	`REPLICATOR> role set master <ip_address>`
	`REPLICATOR> role set ha off`
	`REPLICATOR> role set ha on 101 10.1.4.223⌴`
	`↪eth0 master`
	`REPLICATOR> role set primary`
	`REPLICATOR> role set secondary 10.1.4.`
	`↪66:2002 10`
	`REPLICATOR> role test secondary`

setting

Function	Configures the Plixer Replicator's global settings, allowing features to be enabled, disabled, or modified *See also: show*

Syntax	• *setting set <flag> [value]*
	• *setting <enable|disable> <flag>*
	
	`REPLICATOR> setting set metricsSent 10.1.`
	`↪4.66:2003`
	`REPLICATOR> setting disable convertSyslog`

Hint: The **Settings** tab of the Plixer Replicator web interface can also be used to configure certain global settings.

show

Function	Generates various reports based on the Plixer Replicator's configuration and operational data
Syntax	• *show [directive] [filter]*

Directives	• *alarm [filter]* - Lists Exporters that have stopped sending packets to the Plixer Replicator and COllectors that are no longer reachable
	• *asset [filter]* - Lists IP addresses associated with the Plixer Replicator along with their roles (Exporter or Collector), DNS names, and descriptions/notes
	• *backups [filter]* - Lists files in the `home/replicator/backups directory` along with the date they were last accessed
	• *show collector [filter]* - Lists Collectors along with their IP addresses, DNS names, descriptions/notes, and Profiles they're currently assigned to
	• *show config* - Lists all commands necessary to rebuild Profile settings
	• *show exporter [filter]* - Lists Exporters along with their IP addresses, DNS names, descriptions/notes, and Profiles they're currently assigned to
	• *show profile [filter]* - Lists Profiles along with their Policies and any Exporters and/or Collectors currently assigned to them
	• *show realtime [filter]* - Displays real-time data on Exporters, such as their inbound and outbound traffic and CPU usage (press CTRL+C to exit the report)
	• *show setting [filter]* - Displays all global settings along with their statuses (enabled or disabled) and/or current values
	• *show status* - Lists all of the Plixer Replicator's services and licenses along with their statuses
	
	`REPLICATOR> show status`
	
	`+---------------------------------------`
	`↪--------------------------------+`
	`| Version                    v18.5.24.`
	`↪2345`
	`| Replicating Port 2055        ACTIVE`
	`| Replicator Vitalizer         ACTIVE`
	`| Replicator API               ACTIVE`
	`| Replicator Monitor           ACTIVE`
	`| Replicator State             ACTIVE`
	`| Replicator License          License␣`
	`↪Expires: 380`
	`+---------------------------------------`
	`↪--------------------------------+`
	`+ process checking took 0.22578 secs`

Hint: Most `show` commands can also be entered with a filter argument to display only details that match the provided string. When no filter is entered, the full report will be generated.

---

snoop

Function	Displays packet data for a certain address or interface
Syntax	*snoop <ip_address>* *snoop interface <interface_name> <port [port_number]>* `REPLICATOR> snoop 10.1.1.1` `REPLICATOR> snoop eth0`

Hint: The snoop command can be used to verify that packets are being received from or sent to the specified IP address.

---

system

Function	Manages the state and certain settings of the Plixer Replicator
Syntax	*system <restart|shutdown>* `REPLICATOR> system restart` `REPLICATOR> system shutdown`

Directives	*change* - Changes the host name or the IP address of the appliance *virtualip <enable|disable> <interface_name> [virtual_ip]* - Adds or removes a virtual IP address for High Availability (HA) configurations `REPLICATOR> system change`
	`REPLICATOR> system virtualip enable eth0␣`
	`↪10.1.4.223`
	`REPLICATOR> system virtualip disable eth0␣`
	`↪10.1.4.223`

upload supportfiles

Function	Sends collected support files to Plixer support for analysis after using the `collect supportfiles` command
Syntax	• *upload supportfiles* `REPLICATOR> upload supportfiles`

version

Function	Shows the current version of the Plixer Replicator
Syntax	• *version* `REPLICATOR> version`

4.2 High Availability Configurations

A second Plixer Replicator can be set up to create a fault tolerant system in scenarios where the primary appliance needs to be taken offline or becomes unavailable for any reason. This functionality is available for both hardware and virtual appliances (or a combination of the two).

There are two methods for configuring the secondary or backup Plixer Replicator for fault tolerance:

Single Network High Availability configuration:
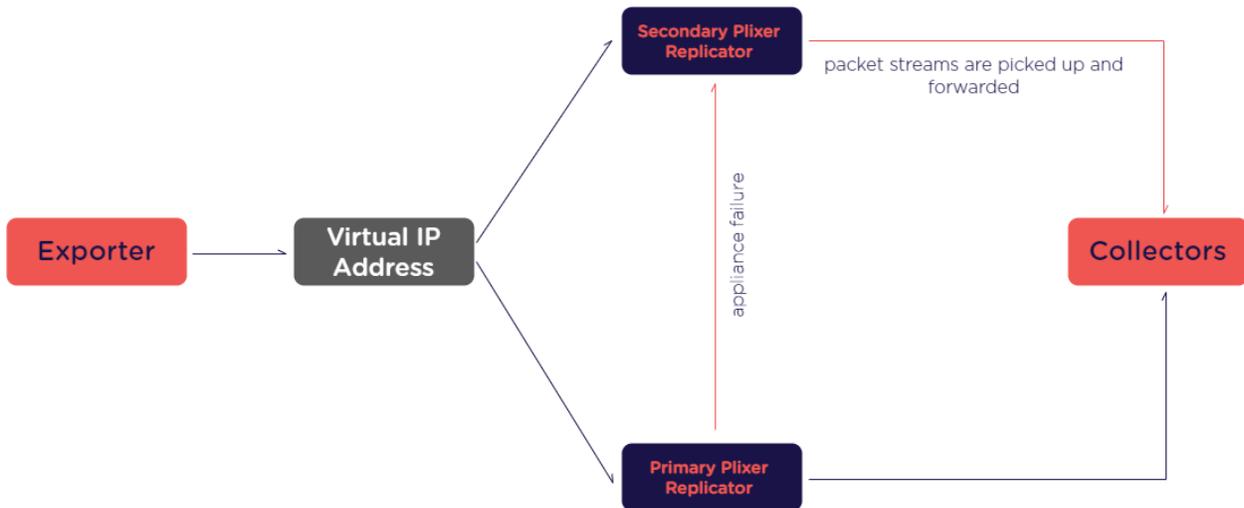
Multi-Network High Availability configuration:
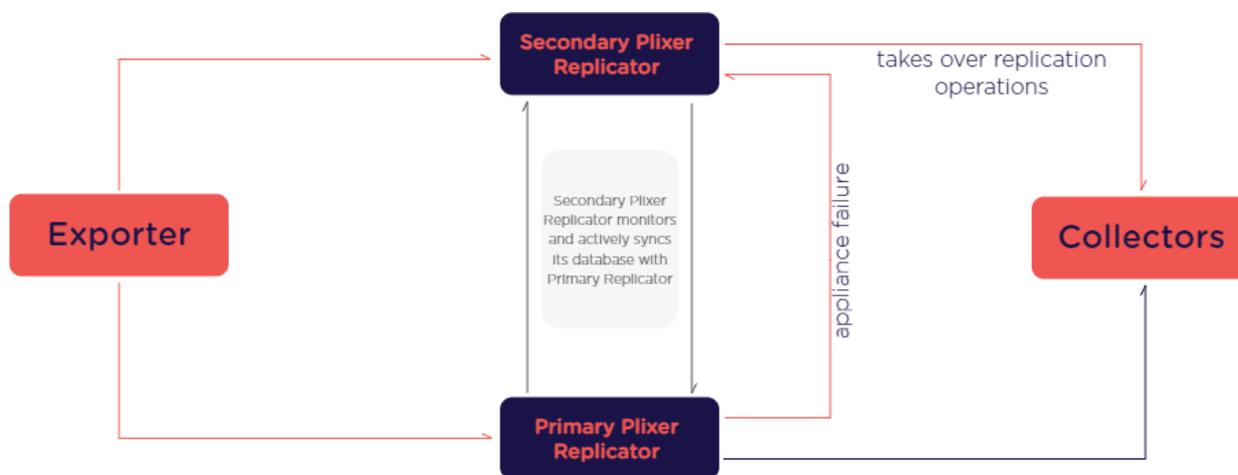
Important: To set up either type of HA configuration, a failover license must first be obtained and applied to the Plixer Replicator appliance intended for use as the secondary/backup. Contact *Plixer Technical Support* to learn more.

4.2.1 Single Network High Availability configuration

The Single Network High Availability (SNHA) configuration for fault tolerance is meant for systems with Plixer Replicators on the same subnet. In this configuration, packets are sent to a virtual IP address that the primary (master) and secondary (backup) appliances are both configured to listen to for traffic. Because each Plixer Replicator in High Availability mode is assigned a priority, they are aware of their primary/secondary role in the configuration.

When the primary Plixer Replicator fails, the packet streams are immediately picked up by the secondary appliance and forwarded to the same Collectors. Once the primary is active again, it will resume its previous replication functions.

The Single Network High Availabiity configuration can be used to set up redundancy beyond basic primary and secondary roles.

Requirements

The following are required to set up a fault tolerant configuration using the traditional method:

- A primary Plixer Replicator
- A secondary Plixer Replicator
- Exporters that are configured to send data to a single virtual IP address

Important: The secondary Plixer Replicator must be licensed specifically for use as a secondary/backup appliance in an SNHA configuration. After a valid failover license is obtained, it should be applied to the appliance intended for use as the secondary/backup in the SNHA configuration. Contact *Plixer Technical Support* to learn more.

Single Network High Availability configuration

To set up the Plixer Replicator as the secondary appliance in the High Availability configuration:

1. Deploy the appliance as normal following the instructions in the *deployment guides*.

2. Add the virtual IP address to the primary Plixer Replicator using the following command: `REPLICATOR> system virtualip enable eth0 [virtual_ip]`

3. Set the IP address of the primary appliance: `REPLICATOR> role set ha master [primary_ip]`

4. Enable Single Network High Availability on the primary Plixer Replicator: `REPLICATOR> role set ha on 101 [virtual_ip] eth0 master`

Note: When prompted, enter the admin user's password for the web UI.

---

5. Add the virtual IP address to the secondary Plixer Replicator by running the following command: `REPLICATOR> system virtualip enable eth0 [virtual_ip]`

6. Set the IP address of the primary Plixer Replicator on the secondary appliance: `REPLICATOR> role set ha master [primary_ip]`

7. Enable Single Network High Availability on the secondary Plixer Replicator: `REPLICATOR> role set ha on 100 [virtual_ip] eth0 backup`

Note: When prompted, enter the admin user's password for the web UI.

---

8. Test whether Single Network High Availability has been successfully configured:

    a. Run the following command on the primary and secondary Plixer Replicators: `REPLICATOR> role test ha`

    b. Shut down the primary appliance and ping the virtual IP address.

If a response is received from the virtual IP address, Single Network High Availability has been correctly configured and the primary Plixer Replicator can be restarted as normal.

Important: The admin user's password for the web UI must be set to the same password on the primary and secondary Plixer Replicators for the configuration to be successful.

Disabling the Single Network configuration

To revert Plixer Replicators from single network to their previous state, run the following commands on the primary and secondary Plixer Replicators:

```
REPLICATOR> role set ha off
REPLICATOR> system virtualip disable eth0 [virtual_ip]
```

4.2.2 Multi-Network High Availability configuration

The Multi-Network or traditional configuration for fault tolerance is meant for systems with two Plixer Replicators on different subnets. In this configuration, the secondary appliance actively monitors the state of the primary appliance and regularly syncs its database with the primary's settings.

When the secondary Plixer Replicator detects that the primary appliance is offline, it attempts to reach all known Collectors. If the Collectors are reachable, the secondary Plixer Replicator takes over replication operations based on the Profiles configured when its database was last synced with the primary appliance. If Collectors are not reachable, it maintains its secondary state until a Collector or the primary Plixer Replicator becomes reachable again.

The secondary Plixer Replicator will continue to monitor the state of the primary appliance, even after it has taken over replication functions. When the primary Plixer Replicator is reachable again, the secondary will sync any updates to the primary's database before reverting to its previous monitor-and-sync state.

Important: When a Plixer Replicator is set as a secondary appliance, its current configuration will be replaced by the database synced from the primary appliance and it will no longer allow changes to its settings. The `role` and `show` commands may still be issued in Interactive Mode, but any modification of its Profile and global settings must be done through the primary Plixer Replicator.

Requirements

The following are required to set up a fault tolerant configuration using the multi-network method:

- A primary Plixer Replicator
- A secondary Plixer Replicator
- Exporters that are configured to send data to the IP addresses of the primary and secondary appliances

Configuring the secondary Plixer Replicator (Multi-Network)

To set up the Plixer Replicator as the secondary appliance in the multi-network configuration:

1. Deploy the appliance as normal following the instructions in the *deployment guides*.

2. Use the `role` command to set it as the secondary Plixer Replicator:

   ```
   REPLICATOR> role set secondary [primary_ip:listner_port] [timeout]
   ```

   The `listener_port` must be a port being used by the primary Plixer Replicator to actively listen for packets, and the timeout argument sets the number of polls the primary appliance must miss before the secondary attempts to take over replication functions. The default timeout value is 2 polls.

3. Test the the secondary Plixer Replicator's connectivity to the primary appliance by running the following command:

   ```
   REPLICATOR> role test secondary
   ```

If the test runs successfully, the secondary Plixer Replicator has been correctly configured for fault tolerance.

Disabling Multi-Network configuration

A secondary Plixer Replicator in the multi-network configuration can be set as a standalone appliance at any time by issuing the command:

```
REPLICATOR> role set primary
```

4.3 Plixer Replicator APIs

4.3.1 Authentication

Used to authenticate the user and start/stop API sessions

Login
> Starts a new API session

GET request:

Note: Legacy API – Deprecated- recommend using POST

Resource URL:
> https://{[}replicator{]}/api/1/login/{[}sha2]

Parameter	Description
[replicator]	Hostname or IP address of the Plixer Replicator
[sha2]	Interactive Mode (CLI) password converted to SHA2 512-bit hex

Example request:
> https://10.30.17.131/api/1/login/098f6bcd4621d373ca098f6bcd4621d563cade4e832629b4f6d098f4bcd4621d373cade4e831627b

POST request:
> Starts a new API session

Resource URL:
> POST https://{[}replicator{]}/api/1/login/

```
{
 "user" : "admin"
 "passwd": "[passwd]"
}
```

Parameter	Description
[replicator]	Hostname or IP address of the Plixer Replicator
[passwd]	SHA512 hash of the password for the admin username

Example response:

```
{
  "path": "login successful.",
"result": "success"
}
```

Log out

Manually terminates an API session (API sessions are automatically terminated after 30 minutes)

Resource URL:

https://{[}replicator{]}/api/1/logout

Parameter	Description
[replicator]	Hostname or IP address of the Plixer Replicator

Example request:

https://10.30.17.131/api/1/logout

Example response:

```
{
  "path": "logout successful.",
  "result": "success"
}
```

4.3.2 Acknowledge

Used to acknowledge Collectors and Exporters that have triggered Alarms

Resource URL:

https://{[}replicator{]}/api/1/acknowledge/{[}entity{]}/{[}ip:port]

Parameter	Description
[replicator]	Hostname or IP address of the Plixer Replicator
[entity]	`exporter` or `collector`
[ip:port]	IP address and port of the [entity] to be acknowledged

Example request:

https://10.30.17.131/api/1/acknowledge/collector/10.1.10.4:2055

Example response:

```
{
    "description": "Success: collector '10.1.10.4:2055' acknowledged.",
    "result": "success"
}
```

4.3.3 Collector

Used for Collector management operations within Profiles

Resource URL:

Manages a Collector for an individual Profile

https://{[}replicator{]}/api/1/collector/{[}action{]}/{[}ip{]}/{[}profile]

Parameter	Description
[replicator]	Hostname or IP address of the Plixer Replicator
[action]	`add` or `remove`
[ip]	IP address of the Collector
[profile]	Target Profile for the operation

Example request:

https://10.30.17.131/api/1/collector/add/10.1.10.60/myprofile

Example response:

```
{
  "description": "Success: Collector [10.1.10.60] -> Profile [myprofile]",
  "result": "success"
}
```

Resource URL:

Removes a Collector from all Profiles

https://{[}replicator{]}/api/1/collector/allremove/{[}ip]

Parameter	Description
[replicator]	Hostname or IP address of the Plixer Replicator
[ip]	IP address of the Collector to be removed

Example request:

https://10.30.17.131/api/1/collector/allremove/10.1.10.4

Example response:

```
{
  "description": "Success: Collector [10.1.10.4] <- All Profiles",
  "result": "success"
}
```

4.3.4 DNSCheck

Used to perform a DNS check on an IP address

Resource URL:

Forces a DNS name resolution for an IP address

https://{[}replicator{]}/api/1/dnscheck/{[}ip]

Parameter	Description
[replicator]	Hostname or IP address of the Plixer Replicator
[ip]	IP address to resolve

Example request:

https://10.30.17.131/api/1/dnscheck/10.1.1.3

Example response:

```
{
  "dnscheck": {
  "addr": "10.1.1.3",
  "expiry": {
  "epoch": 1462801036,
  "time": "Mon May 9 09:37:16 2016"
  },
  "name": "newexp.plxr.local",
  "resolveTime": 0.04485,
  "status": "success"
  }
}
```

4.3.5 Exporter

Used for Exporter management operations within Profiles

Resource URL:

Manages an Exporter for an individual Profile

https://{[}replicator{]}/api/1/exporter/{[}action{]}/{[}ip{]}/{[}profile]

Parameter	Description
[replicator]	Hostname or IP address of the Plixer Replicator
[action]	add or remove
[ip]	IP address of the Exporter
[profile]	Target Profile for the operation

Example request:

https://10.30.17.131/api/1/exporter/add/10.1.1.1/myprofile

Example response:

```
{
  "description": "Success: Exporter [10.1.1.1] -> Profile [myprofile]",
  "result": "success"
}
```

Resource URL:

Removes an Exporter from all Profiles

https://{[}replicator{]}/api/1/exporter/allremove/{[}ip]

Parameter	Description
[replicator]	Hostname or IP address of the Plixer Replicator
[ip]	IP address of the Exporter to be removed

Example request:

https://10.30.17.131/api/1/exporter/allremove/10.1.1.4

Example response:

```
{
    "description": "Success: Exporter [10.1.1.4] <- All Profiles",
    "result": "success"
}
```

Resource URL:

Identifies Exporters that are sending data to the Plixer Replicator but not assigned to any Profiles

https://{[]}replicator{]}/api/1/exporter/noprofile/{[]}filter]

Param- eter	Description
[replica- tor]	Hostname or IP address of the Plixer Replicator
[filter]	Optional filter to apply to the displayed list of Exporters not assigned to any Profiles; returns the full list if not provided

Example request:

https://10.30.17.131/api/1/exporter/noprofile/0

Example response:

```
{
  "noprofile": {
    "10.30.17.131": {
      "in_o_delta": 0,
      "in_o_rate": "0.0",
      "in_p_delta": 0,
      "in_p_rate": "0.0",
      "lastseen": "Tue Apr 19 09:55:18 2016",
      "out_o_delta": 1493,
      "out_o_rate": "49.8",
      "out_p_delta": 6,
      "out_p_rate": "0.2",
      "unixtime": 1461074118
    },
    "total": 1
  }
}
```

4.3.6 License

Used to check the status of the current Plixer Replicator license

Resource URL:

Returns the details of the current license

https://{[]}replicator{]}/api/1/license/check

Parameter	Description
[replicator]	Hostname or IP address of the Plixer Replicator

Example request:

> https://10.30.17.131/api/1/license/check

Example response:

```
{
    "daysLeft" : "365 day(s)",
    "expiration" : "Thu May 18 2017",
    "licensedType" : "eval",
    "licensedVersion" : "16.6",
    "machineID" : "6YZ6XEPTA66JA6VHFPXG749B",
    "role" : "failover"
}
```

4.3.7 Notate

Used to add a description to an Exporter, Collector, or Profile

Resource URL:

> https://{[}replicator{]}/api/1/notate/{[}entity{]}/{[}identity{]}/{[}description]

Parameter	Description
[replicator]	Hostname or IP address of the Plixer Replicator
[entity]	`profile` or `ip`
[identity]	[`profile_name`] or [`ip_address`] of entity specified
[description]	Description or note to add to the entity in standard ASCII URI-compatible characters

Example request:

> https://10.30.17.131/api/1/notate/profile/myprofile/My_Fantastic_Description

Example response:

```
{
    "description": "Success: Profile 'myprofile' has a new description",
    "result": "success"
}
```

4.3.8 Policies

Used to manage Policies for Profiles

Resource URL:

> https://{[}replicator{]}/api/1/policies/{[}action{]}/{[}network{]}/{[}cidr{]}/{[}profile{]}/{[}incexc]

Parameter	Description
[replicator]	Hostname or IP address of the Plixer Replicator
[action]	`add` or `remove`
[network]	address of the network (e.g. 172.17.0.0)
[cidr]	CIDR of the network specified (e.g. 16)
[profile]	Target Profile for the operation
[incexc]	`include` or `exclude`

Example request:

https://10.30.17.131/api/1/policies/add/10.1.20.0/16/myprofile/include

Example response:

```
{
    "description": "Success: Policy [10.1.20.0/16] -> Profile [myprofile]",
    "result": "success"
}
```

4.3.9 Profile

Used to manage Profile settings and behavior

Resource URL:

Renames an existing Profie

https://{[}replicator{]}/api/1/profile/rename/{[}current{]}/{[}new]

Parameter	Description
[replicator]	Hostname or IP address of the Plixer Replicator
[current]	Name of the Profile to be renamed
[new]	New name for the Profile

Example request:

https://10.30.17.131/api/1/profile/rename/oldprofile/myprofile

Example response:

```
{
    "description": "Success: Profile 'oldprofile' is now 'myprofile'",
    "result": "success"
}
```

Resource URL:

Toggles the Singularity flag for a Profile

https://{[}replicator{]}/api/1/profile/singularity/{[}name{]}/{[}action]

Parameter	Description
[replicator]	Hostname or IP address of the Plixer Replicator
[name]	Name of the Profile to be updated
[action]	`enable` or `disable`

Example request:

https://10.30.17.131/api/1/profile/singularity/myprofile/enable

Example response:

```
{
    "description": "Success: Profile 'myprofile' singularity enabled",
    "result": "success"
}
```

Resource URL:

Removes, disables, or enables a Profile

https://{[}replicator{]}/api/1/profile/{[}action{]}/{[}name]

Parameter	Description
[replicator]	Hostname or IP address of the Plixer Replicator
[action]	`remove`, `disable`, or `enable`
[name]	Target Profile for the operation

Example request:

https://10.30.17.131/api/1/profile/disable/myprofile

Example response:

```
{
    "description": "Success: Profile myprofile has been set to 'disable'",
    "result": "success"
}
```

Resource URL:

Creates a new Profile or updates an existing one

https://{[}replicator{]}/api/1/profile/{[}action{]}/{[}name{]}/{[}listeningport{]}/{[}sendingport]

Parameter	Description
[replicator]	Hostname or IP address of the Plixer Replicator
[action]	`add` or `update`
[name]	Name of the Profile to create or update
[listeningport]	UDP port to listen to for incoming packets (In Port)
[sendingport]	The UDP port to send packets from (Out Port)

Example request:

https://10.30.17.131/api/1/profile/add/myprofile/2055/4739

Example response:

```
{
    "description": "Success: Profile 'myprofile' has been added and enabled.",
    "result": "success"
}
```

4.3.10 Rebuild

Used to force the Plixer Replicator to immediately rebuild its internal configuration

Resource URL:

https://{[}replicator{]}/api/1/rebuild

Parameter	Description
[replicator]	Hostname or IP address of the Plixer Replicator

Example request:

https://10.30.17.131/api/1/rebuild

Example response:

```
{
    "description": "rebuild request submitted",
    "result": "success"
}
```

4.3.11 Role

Used to test whether a secondary Plixer Replicator in a fault tolerant configuration has been configured correctly

Resource URL:

> https://{[}replicator{]}/api/1/role/test/secondary

Parameter	Description
[replicator]	Hostname or IP address of the Plixer Replicator

Example request:

> https://10.30.17.131/api/1/role/test/secondary

Example response:

```
{
    "description": "!!! This replicator is the primary !!!",
    "result": "error"
}
```

4.3.12 Setting

Used to manage the Plixer Replicator's global settings

Resource URL:

> Sets the value for the specified setting
>
> https://{[}replicator{]}/api/1/setting/set/{[}name{]}/{[}value]

Parameter	Description
[replicator]	Hostname or IP address of the Plixer Replicator
[name]	Exact name of the setting to modify
[value]	New value for the setting specified

Example request:

> https://10.30.17.131/api/1/setting/set/metricssent/10.1.2.3:2055

Example response:

```
{
    "description": "Success: setting 'metricssent' has been set to '10.1.2.3:2055'",
    "result": "success"
}
```

Resource URL:

> Enables or disables the specified setting

https://{[}replicator{]}/api/1/setting/{[}action{]}/{[}name]

Parameter	Description
[replicator]	Hostname or IP address of the Plixer Replicator
[action]	`enable` or `disable`
[name]	Exact name of the setting to modify

Example request:

https://10.30.17.131/api/1/setting/disable/metricssent

Example response:

```
{
    "description": "Success: setting 'metricssent' has been set to 'disable'",
    "result": "success"
}
```

4.3.13 Show

Displays configuration details and real-time information from the Plixer Replicator

Resource URL:

Displays the current configuration of the Plixer Replicator

https://{[}replicator{]}/api/1/show/config

Parameter	Description
[replicator]	Hostname or IP address of the Plixer Replicator

Example request:

https://10.30.17.131/api/1/show/config

Example response:

```
{
 "api": {
  "collector": [
   "/api/1/collector/add/10.30.1.20/benchmark-20",
   ...
  ],
  "notate": [
   "/api/1/notate/ip/10.1.4.101/ej-win2012 install test machine (fresh)",
   ...
  ],
  "policy": [
   "/api/1/policies/add/10.1.1.252/32/buildqa/include",
   ...
  ],
  "profile": [
   "/api/1/profile/add/frandev/2002/2055",
   ...
  ]
 },
```

```
 "cli": {
  "collector": [
   "collector add 10.30.1.20 benchmark-20",
   ...
  ],
  "notate": [
   "notate ip 10.1.4.101 ej-win2012 install test machine (fresh)",
   ...
  ],
  "policy": [
   "policy add 10.1.1.252/32 buildqa include",
   ...
  ],
  "profile": [
   "profile add frandev 2002 2055",
   ...
  ]
 }
}
```

Resource URL:

Displays the current status of the Plixer Replicator

https://{[}replicator{]}/api/1/show/status

Parameter	Description
[replicator]	Hostname or IP address of the Plixer Replicator

Example request:

https://10.30.17.131/api/1/show/status

Example response:

```
{
    "converting syslog" : "active",
    "ipfixify system metrics" : "active",
    "replicating port 2002" : "active",
    "replicating port 2003" : "active",
    "replicating port 2055" : "active",
    "replicator api" : "active",
    "replicator license" : "259 day(s)",
    "replicator monitor" : "active",
    "replicator vitalizer" : "active",
    "result" : "success",
    "version" : "v17.12.19.2255"
}
```

Resource URL:

Displays real-time data from the Plixer Replicator

https://{[}replicator{]}/api/1/show/realtime/{[}filter]

Parameter	Description
[replicator]	Hostname or IP address of the Plixer Replicator
[filter]	Currently not supported; defaults to full report if not provided

Example request:

https://10.30.17.131/api/1/show/realtime/0

Example response:

```
{
 "collector": {
  "10.1.4.19": {
   "in": {
    "octets": {
     "delta": 0,
     "rate": 0
    },
     "packets": {
     "delta": 0,
     "rate": 0
    }
   }
  },
  "10.1.4.20": {
   ...
  },
 },
 "exporter": {
  "10.30.17.131": {
   "awareness": {
    "last_epoch": 1461175921,
    "last_timestamp": "2016-04-20 14:12:01"
   },
   "in": {
    "octets": {
     "delta": 0,
     "rate": "0.0"
    },
    "packets": {
     "delta": 0,
     "rate": "0.0"
    }
   },
   "out": {
    "octets": {
     "delta": 0,
     "rate": "0.0"
    },
    "packets": {
     "delta": 0,
     "rate": "0.0"
    }
   },
```

```
   "profiles": [
    "benp"
   ]
  }
 },
 "pair": {
  "10.30.17.131 -> 10.1.4.19": {
   "octets": {
    "delta": 0,
    "rate": 0
   },
   "packets": {
    "delta": 0,
    "rate": 0
   }
  },
  "10.30.17.131 -> 10.1.4.20": {
   ...
  },
  "profile": {
   "benp": {
    "in": {
     "octets": {
      "delta": 0,
      "rate": 0
     },
     "packets": {
      "delta": 0,
      "rate": 0
     }
    },
    "out": {
     "octets": {
      "delta": 0,
      "rate": 0
     },
     "packets": {
      "delta": 0,
      "rate": 0
     }
    }
   }
  }
 },
 "stats": {
  "totals": {
   "collectors": 2,
   "exporters": 1,
   "pairs": 2,
   "profiles": {
    "disabled": 3,
    "enabled": 67,
    "total": 70
```

```
   }
  }
 },
 "system": {
  "cpu": "0"
 }
}
```

Resource URL:

Displays various configured information for the Plixer Replicator

https://{[}replicator{]}/api/1/show/{[}entity{]}/{[}filter]

Parameter	Description
[replicator]	Hostname or IP address of the Plixer Replicator
[entity]	`alarms`, `assets`, `collectors`, `config`, `exporters`, `profile`, `realtime`, `settings`, or `status`
[filter]	Optional filter to apply to the output; defaults to the full report if not provided

Example request:

https://10.30.17.131/api/1/show/collector/10.1.10.1

Example response:

```
{
 "collector": {
  "10.1.10.1": {
   "acknowledged": [
    9996
   ],
   "description": "erpdev",
   "in_profiles": [
    "steady-replays"
   ],
   "ip": "10.1.10.1",
   "name": null,
   "status": {
    "unreachable_port": [
     "9996"
    ],
   }
   "threshold": 10000
  }
 }
}
```

4.3.14 Threshold

Used to set packet per second thresholds that will trigger warnings for Collectors

Resource URL:

https://{[}replicator{]}/api/1/collector/threshold/{[}collector{]}/{[}threshold]

Parameter	Description
[replicator]	Hostname or IP address of the Plixer Replicator
[collector]	IP address of the Collector
[threshold]	Threshold value in packets per second; disabled if set to 0

Example request:

https://10.30.17.131/api/1/collector/threshold/10.1.5.2/10000

Example response:

```
{
  "description": "Success: Collector [10.1.5.2] threshold set to 10000",
  "result": "success"
}
```

4.3.15 Version

Used to display the Plixer Replicator's version information

Resource URL:

https://{[}replicator{]}/api/1/version

Parameter	Description
[replicator]	Hostname or IP address of the Plixer Replicator

Example request:

https://10.30.17.131/api/1/version

Example response:

```
{
      "apiversion" : "1",
      "bestipfixcollector" : "Need an IPFIX Collector? Download Scrutinizer at
→https://www.plixer.com",
      "build" : "2019-12-03 13:07:44 -0500 (Tue, 03 Dec 2019)",
      "copyright" : "Copyright (C) 2012 - 2019 Plixer, All rights reserved.",
      "name" : "Plixer Replicator (TM) v19.0.0.101236",
      "result" : "success",
      "yeswecan" : "Replicate Anything!"
}
```

4.4 Version upgrades

Version upgrades may include additional functionality, performance enhancements, and/or other improvements over previous versions. Fixes for certain types of issues will also be included in these updates.

Select a version below for upgrade instructions:

4.4.1 Upgrading to v19.0.1

To upgrade to Plixer Replicator v19.0.1, v18.14 or higher is required.

Hint: For clarifications or assistance with upgrading, contact *Plixer Technical Support*.

Upgrade requirements

- v18.14 or higher installed
- CentOS 7 (OS)
- An active Internet connection

Upgrade instructions

Before performing an upgrade (or any other system change), it is highly recommended to use the `backup` *interactive mode command* to back up the Plixer Replicator database.

Hint: Backups are stored in `/home/replicator/backups`. To restore from a backup file, use the *restore command*.

Important: When upgrading Plixer Replicator appliances in *HA configurations*, the fail-over appliance should be upgraded before the primary to minimize downtime.

The following instructions cover the upgrade process for both primary and fail-over appliances in HA configurations:

1. SSH to the appliance as the `replicator` user and start a new tmux session:

```
tmux new -s upgrade
```

2. Download the installer/upgrade script:

```
cd /tmp
curl -o replicator-install.run https://files.plixer.com/plixer-repo/replicator/19.0.
↪1/replicator-install.run
```

3. Download the checksum file and validate the integrity of the `replicator_install.run` file:

```
curl -o replicator-checksums.txt https://files.plixer.com/plixer-repo/replicator/19.
↪0.1/replicator-checksums.txt
cat replicator-checksums.txt
sha256sum replicator-install.run
```

4. Set the correct permissions for the installer:

```
chmod 755 replicator-install.run
```

5. Run `replicator-install.run`:

```
./replicator-install.run
```

After the upgrade is complete, the appliance will automatically reboot. To verify that the upgrade was successful, *launch interactive mode* and check the version number when the tool loads.

Hint: After upgrading a fail-over appliance in an HA deployment, use the `role test secondary` *interactive mode command* to verify the current HA configuration before proceeding to upgrade the primary appliance.

4.4.2 Upgrading to v18.14

To upgrade to Plixer Replicator v18.14 from v18.5 or higher, follow the steps described below.

Hint: For clarifications or assistance with upgrading, contact *Plixer Technical Support*.

Upgrade requirements

- v18.5 or higher installed
- An active Internet connection

Upgrade instructions

Before performing an upgrade (or any other system change), it is highly recommended to use the `backup` *interactive mode command* to back up the Plixer Replicator database.

1. SSH to the appliance as the `replicator` user and start a new tmux session:

```
tmux new -s upgrade
```

2. Download the upgrade script:

```
cd /home/replicator/files
wget https://files.plixer.com/downloads/replicator/18/upgrade_18.14.sh
```

3. Set the correct permissions for the upgrade script:

```
chmod 755 upgrade_18.14.sh
```

4. Run `upgrade_18.14.sh`:

```
./upgrade_18.14.sh
```

After the upgrade is complete, the appliance will automatically reboot. To verify that the upgrade was successful, *launch interactive mode* and check the version number when the tool loads.

FIVE

ADDITIONAL RESOURCES

This section includes additional resources and materials relevant to the use of Plixer Replicator and this user manual.

5.1 Changelog

For additional details on any of the new features below, refer to the Plixer Replicator documentation on the Plixer website.

KEY: Description (Ticket Number)

Ex. Added thresholds based on outbound traffic (1640)

5.1.1 Version 19.0.1 - January 2024

Fixes

Addressed various security issues
Fixed authentication issue (150)

5.1.2 Version 19.0.0 - November 2023

Updates

Improved UI responsiveness
Updated EULA
Updated branding

Fixes

Addressed various security issues
API may hang on invalid input (23)
Exporter id out of range (25)

Remote root access disabled by default (34)

Improved process management (60)

5.1.3 Version 18.14.1 - 1/28/2020

New Features

Updated the EULA

New Plixer Replicator UI skin

Fixes

Fixed a potential issue when setting up High Availability pairs (931)

Plixer Replicator's vitals processes can no longer enter a bad state, which may cause it to lock up indefinitely (1739)

Plixer Replicator excludes Collectors from being Exporters in Profiles with the same destination port the Collector is already receiving on (1771)

Exporters will now be added to Profiles correctly regardless of the time of the matching Policy's creation (1891)

Very high volume Plixer Replicators will no longer crash due to a database integer overflow (2007)

5.1.4 Version 18.12.14 - 1/25/2019

Updates

Future Plixer Replicator releases will no longer support CentOS 6

Fixes

Replication no longer starts and restarts spontaneously (410)

Plixer Replicator will no longer attempt to sync with its own database (428)

`system change` now works on all configurations (436)

Plixer Replicator stats are now more reliable (611)

5.1.5 Version 18.5 - 5/31/2018

Updates

Updated the EULA (5633)

Fixes

`show config` output now has Profile names enclosed in quotation marks ("") (25257)

Fixed an issue where Apache fails to start if SSL is enabled/setup via install script or enable_SSL.sh (25292)

Updated licensing checks (25653)

Fixed an issue where an install script was pointing to a previous version (25770)

Added the new online manual from docs.plixer.com (25828)

Fixed an issue where `policy remove profile include/exclude` results in an internal error (500) but still removes profile (25832)

Fixed an issue where the refresh countdown timer would default to one (1) day (26000)

5.1.6 Version 18.1 - 1/30/2018

New Features

LDAP authentication support

Profiles displayed in alphabetical order

Replicator install and upgrade logs

Backup process from the CLI

Ability to make API calls via HTTPS

Support for upper case letters and spaces in profile names

Ability to restrict snoop command by port

Current Plixer Replicator version displayed under the Status LED

Postgres replicator database support

Fixes

Improved performance and responsiveness of the web interface (22918)

Replicator now replicates SNMP traps on low port numbers (23820)

Exporters no longer enter a false Alarm state at start up (23824)

Exporters not in Profiles and not sending packets are no longer displayed under 'Exporters Not in Profiles' indefinitely (23828)

Search filters are no longer lost on page refresh (23904)

Fixed an issue that could result in phantom Collector alarms (23977)

Upgrades no longer reset the web interface password (24299)

5.1.7 Version 17.6 - 7/14/2017

New Features

Web interface updates
Fully supported and documented API
Ability to receive packets from multiple interfaces
Profile singularity

Fixes

Licensing says expired one day before expiration date (19835)
ICMP drops have been added to iptables (19396)
Semicolon at end of command yields unexpected results (19285)
Removing a Policy doesn't remove the associated Exporters (20848)
Plixer Replicator falsely reporting more packets inbound than out (21086)

5.1.8 Version 16.9 - 10/3/2016

New Features

New web interface
Fully supported and documented API
Ability to receive packets from multiple interfaces
Profile singularity

Fixes

Licensing says expired one day before expiration date (19835)
ICMP drops have been added to iptables (19396)
Semicolon at end of command yields unexpected results (19285)
Removing a policy doesn't remove the associated Exporters (20848)
Plixer Replicator falsely reporting more packets inbound than out (21086)

5.2 FAQ

Important: For additional questions or concerns, contact *Plixer Technical Support*.

Q) Can we use additional Plixer Replicators as failsafes against downtime and other issues?

A) Yes. For instructions on how to configure a secondary or backup Plixer Replicator see the section on *fault tolerant deployments*.

Q) Why is our Plixer Replicator still not receiving packets from our router even though I've configured it to send data to the correct IP address?

A) A firewall or access control list may be blocking traffic to the Plixer Replicator. To verify that it can see traffic from a device, use the Interactive Mode command: `REPLICATOR> snoop [network_device_ip]`.

Q) Can I create additional admin and/or user accounts for other users in our organization?

A) Each Plixer Replicator currently only supports a single adminstrator account for the web interface. However, future updates to the product will add support for multiple local user accounts and roles.

Q) How long should it take for Collectors to start receiving packets after I've configured an Exporter to send flows to the Plixer Replicator?

A) When a new Exporter starts sending UDP packets to the Plixer Replicator, it may take up to two minutes for the packets to be forwarded to Collectors.

Q) How do I find out if there are Exporters not assigned to any profiles sending packets to the Plixer Replicator?

A) To view all currently unassigned Exporters, select *Exporters Not in a Profile* in the **View** dropdown menu in the **Exporters** tab of the web interface. To get a list of unassigned Exporters in Interactive Mode, use: `REPLICATOR> exporters noprofile`.

Q) Why is the Plixer Replicator dropping packets instead of replicating them on our closed network with no gateway?

A) The default behavior for the Plixer Replicator is to drop all packets that come into an interface that the host has no route to. To change this, find the `net.ipv4.all.rp_filter` setting in the `/etc/sysctl.conf` file and change its value to `0`.

Q) How do I configure a Profile to distribute Exporter flows across a distributed Plixer Scrutinizer cluster?

A) If you are using Plixer Scrutinizer's distributed architecture to handle an extremely large number of flows and/or Exporters, you can enable the *autoreplication* feature to have it manage Plixer Replicator Profiles for its Collectors and automatically map Exporters to them as they're added. Additional information and instructions on how to set up Plixer Replicator integration can be found in the Plixer Scrutinizer documentation here.

Q) Does the Plixer Replicator support IPFIX?

A) By default, the Plixer Replicator replicates syslogs received from Exporters and forwards them to all assigned Collectors in the same format. To have syslogs automatically converted to IPFIX before being forwarded, use the Interactive Mode command: `REPLICATOR> setting enable convertSyslog`.

Q) How do I send the syslog notifications and/or IPFIX metrics generated by the Plixer Replicator to multiple Collectors?

A) To send syslog notifications and/or IPFIX metrics from the Plixer Replicator to multiple Collectors, first configure the appliance to send them back to itself. After that, create a Profile with the appliance as the Exporter and assign Collectors as normal.

Note: Since there are separate settings for syslog notifications and IPFIX metrics, they will require separate Profiles.

Q) Why am I receiving an error about a loop being created when I try to add a new Exporter or Collector?

A) A loop is created when a device is set to be both the Exporter and a Collector, which results in a repeating cycle where packets are received from and sent back to the same device. This can happen when a Profile is configured with the same In (listening) and Out (sending) Ports.

Q) Can a Profile have the same listening (In Port) and sending (Out Port) port?

A) Yes. The Plixer Replicator will automatically verify updated Profile settings to ensure that no loops are created when adding new Exporters and/or Collectors.

Q) How do I change the root password on the Plixer Replicator?

A) To change the root password on the Plixer Replicator, log in as the root user and issue the `passwd` command.

Q) How do I change the admin password on the Plixer Replicator?

A) To change the web interface admin password on the Plixer Replicator, log in as the root user and use the Interactive Mode command: REPLICATOR> `password webui`.

Q) How do I change the hostname and IP address of the Plixer Replicator?

A) To change the hostname and IP address of the Plixer Replicator, log in as the root user and run the `/home/replicator/conf/sethostname.sh` script. Alternatively, you can use the Interactive Mode command: REPLICATOR> `system change`.

Q) In traditional configuration for a secondary Plixer Replicator, how many seconds occur between poll checks?

A) Between 30 to 60 seconds. The *Update Interval* on the Settings page is the number of seconds between poll checks.

Q) How often does the secondary Plixer Replicator sync the database from the primary Plixer Replicator?

A) The secondary Plixer Replicator checks the primary Plixer Replicator for changes every 5 minutes. If changes are detected, the secondary Plixer Replicator's configuration is updated.

Q) Does the Plixer Replicator support giant packets?

A) The Plixer Replicator supports jumbo frame sizes up to 65534 bytes. To take advantage of this, interfaces must be configured to support the maximum packet size expected for replication. Fragmented packets are **not** supported, and the Plixer Replicator will not attempt to fragment packets, even if the *do not fragment* bit(DF) bit is not set.

5.3 Glossary

This glossary is meant to serve as a reference for terms and concepts used in the Plixer Replicator system software or this product manual.

5.3.1 Plixer Replicator terms

Exporter
> A networked device such as a router, switch, or server that generates data and sends it to the Plixer Replicator for replication and forwarding

Collector
> SIEMs, Flow Collectors, SNMPTrap Receivers, or other network management systems that analyze data forwarded by the Plixer Replicator from other networked devices

Policy
> A Profile parameter that determines whether an Exporter should be included or excluded from its replication and forwarding processes

Profile
> A user-defined set of parameters that defines how the Plixer Replicator routes packets from specific Exporters to their corresponding Collectors

Interactive Mode
> The command line interface for Plixer Replicator, which allows the user to manage device behavior and settings via a remote SSH session

5.3.2 General networking terms

API (Application Programming Interface)
> A software component that allows applications to share data and functionality

CA (Certification Authority)
> A trusted entity that issues, signs, and stores digital certificates

CIDR (Classless Inter-Domain Routing)
> An Internet Protocol addressing method that improves the efficiency of allocating IP addresses

CLI (Command-line Interface)
> A text-based interface for applications and operating systems that allows a user to enter commands

DNS (Domain Name System)
> The system by which computers and other devices on the Internet or Internet Protocol networks are uniquely identified using names matched to their IP addresses

Fault tolerance
> A system's ability to continue operating without interruptions in the event of a hardware or software failure

IP address
> A unique numerical label assigned to a networked device

IPFIX (Internet Protocol Flow Information Export)
> A protocol that standardizes Internet Protocol flow information from networked devices

LDAP (Lightweight Directory Access Protocol)
> An open, cross platform protocol used to authenticate and store information about users, groups, and applications

MAC (Media Access Control) address
> A unique hardware identifier typically assigned by manufacturers to network adapters and devices

OVF (Open Virtualization Format)
> An open-source standard for packaging and distributing virtual machines and software applications

Packet
> A block of data transmitted across a network

Redundancy

Duplicated or alternative network devices and connections meant to serve as a failsafes against the primary service becoming unavailable

Router

A device that forwards or routes data packets to devices on a network

Server

A system or device that provides resources, data, services, or applications to other devices over a network

SSH (Secure Shell Protocol)

A network communication protocol that allows network services to be used securely over an unsecured network

SSL (Secure Sockets Layer)

A protocol for establishing secure connections between networked devices

Switch

A device that connects devices in a network and allows them to communicate with each other

Syslog

A standard for message logging that allows a wide variety of networked devices to share the same repositories and management systems

UDP (User Datagram Protocol)

A communication protocol used by applications to send messages to other hosts on an Internet Protocol network via low-latency, loss-tolerating connections

Virtual appliance

A pre-configured virtual machine image with pre-installed software meant to serve a specific function

5.4 Third-Party attributions

The open-source or other third-party software components listed below are integrated and/or redistributed with the Plixer Replicator software. The licenses are reproduced here in accordance with their licensing terms. These terms only apply to the libraries themselves and not the Plixer Replicator software.

Additional required license documentation can be found under `/home/Replicator/files/licenses`.

Backbone.js

https://github.com/jashkenas/backbone/blob/master/LICENSE Copyright (c) 2010-2017 Jeremy Ashkenas, DocumentCloud Licensed under the MIT License – see Licenses Directory

C3.js

https://github.com/c3js/c3/blob/master/LICENSE Copyright (c) 2013 Masayuki Tanaka Licensed under the MIT License – see Licenses Directory

D3.js

https://github.com/d3/d3/blob/master/LICENSE Copyright (c) 2010-2014 2010-2017 Mike Bostoc Licensed under the BSD 3-clause License – see Licenses Directory

Hogan.js

https://github.com/twitter/hogan.js/blob/master/LICENSE Copyright (c) 2011 Twitter, Inc. Licensed under the Apache License 2.0 – see Licenses Directory

JQuery

https://jquery.org/license/ Copyright jQuery Foundation and other contributors, https://jquery.org This software consists of voluntary contributions made by many individuals. For exact contribution history, see the revision history available at https://github.com/jquery/jquery Licensed under the MIT License – see Licenses Directory

JQuery.floatThread.js

https://github.com/mkoryak/floatThead/blob/master/LICENSE Copyright (c) 2012-2017 Misha Koryak Licensed under the MIT License – see Licenses Directory

jsSHA

https://github.com/Caligatio/jsSHA/blob/master/LICENSE Copyright (c) 2008-2017 Brian Turek Licensed under the BSD 3-clause License – see Licenses Directory

JustGage

https://github.com/toorshia/justgage/blob/master/LICENSE Copyright (c) 2012-2015 Bojan Djuricic Licensed under the MIT License – see Licenses Directory

Raphaël

https://github.com/DmitryBaranovskiy/raphael/blob/master/license.txt Copyright © 2008-2013 Dmitry Baranovskiy, Sencha Labs Licensed under the MIT License – see Licenses Directory

UDP Samplicator

https://github.com/sleinen/samplicator/blob/master/COPYING Copyright (c) 2000-2015 Simon Leinen Licensed under the GNU GPL 2.0 – see Licenses Directory

Underscore.js

https://github.com/jashkenas/underscore/blob/master/LICENSE Copyright (c) 2009-2017 Jeremy Ashkenas, DocumentCloud and Investigative Reporters & Editors Licensed under the MIT License – see Licenses Directory

5.5 Plixer Technical Support

Plixer Technical Support is available with an active maintenance contract. Contact our support team at:

- +1 (207) 324-8805 ext 4

- https://www.plixer.com/support/