IBM QRadar Network Packet Capture
7.4.3

Administration Guide

Note

Before you use this information and the product that it supports, read the information in "Notices" on page 43.

Contents

Introduction to QRadar Network Packet Capture product administration

Administrators use IBM® QRadar® Network Packet Capture to manage the dashboard.

Intended audience

This guide is intended for all QRadar Network Packet Capture users responsible for investigating and managing network security. This guide assumes that you have QRadar Network Packet Capture access and a knowledge of your corporate network and networking technologies.

Technical documentation

To find IBM Security QRadar product documentation in the QRadar products library, see Accessing IBM Security Documentation Technical Note (www.ibm.com/support/docview.wss?rs=0&uid=swg21614644).

Contacting customer support

For information about contacting customer support, see QRadar Support – Assistance 101 (https://ibm.biz/qradarsupport).

Statement of good security practices

IT system security involves protecting systems and information through prevention, detection and response to improper access from within and outside your enterprise. Improper access can result in information being altered, destroyed, misappropriated or misused or can result in damage to or misuse of your systems, including for use in attacks on others. No IT system or product should be considered completely secure and no single product, service or security measure can be completely effective in preventing improper use or access. IBM systems, products and services are designed to be part of a lawful comprehensive security approach, which will necessarily involve additional operational procedures, and may require other systems, products or services to be most effective. IBM DOES NOT WARRANT THAT ANY SYSTEMS, PRODUCTS OR SERVICES ARE IMMUNE FROM, OR WILL MAKE YOUR ENTERPRISE IMMUNE FROM, THE MALICIOUS OR ILLEGAL CONDUCT OF ANY PARTY.

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Chapter 1. What's new in QRadar Network Packet Capture

This IBM QRadar Network Packet Capture release includes fixes for defects and security vulnerabilities.

The following QRadar Network Packet Capture versions include these updates:

- QRadar Network Packet Capture 7.4.3 Fix Pack 2 (Build 1304)
- QRadar Network Packet Capture 7.3.3 Fix Pack 8 (Build 20)

Related concepts

Administering QRadar Network Packet Capture appliances

QRadar Network Packet Capture packet capture monitoring
Use the Monitoring widgets on the Dashboard to view the overall status of one or more QRadar Network Packet Capture appliances in a group.

QRadar Network Packet Capture searches and queries
To look for specific packets within a specific time range, and from a specific port, use the **SEARCH** tab. When you specify any combination of source IP, destination IP, source port, destination port, or protocol fields a QRadar Network Packet Capture Query Language (NTQL) string is generated. You can modify the NTQL string, or you can create your own NTQL expression from scratch.

Grouped QRadar Network Packet Capture appliances
Use the QRadar Network Packet Capture grouping feature to group multiple physical appliances together to form a single logical entity for administration and searching. By using the grouping feature, multiple tap points and multiple QRadar Network Packet Capture appliances can be accessed and operated as if they were one appliance.

Stacked QRadar Network Packet Capture appliances
You can extend the storage available for capture data by connecting multiple QRadar Network Packet Capture appliances together in a ring topology to create a stack.

Troubleshooting issues with QRadar Network Packet Capture appliances
Use this information to troubleshoot issues with the QRadar Network Packet Capture appliance.

What's new for administrators in previous releases of QRadar Network Packet Capture

Find out what's new or changed in previous releases of IBM QRadar Network Packet Capture.

What's new in QRadar Network Packet Capture 7.4.3

IBM QRadar Network Packet Capture 7.4.3 introduces ....

License terms and conditions

QRadar Network Packet Capture 7.4.3 Fix Pack 1 (Build 1302)

Users must now review terms and conditions before they can log in to QRadar Network Packet Capture. The **Login** button appears only after you click the checkbox that indicates that you have read and accept the terms.

Improved security features

QRadar Network Packet Capture 7.4.3 Fix Pack 1 (Build 1302)

To limit the information that is available to users who are not authenticated, the **Login** screen does not show the QRadar Network Packet Capture version. To view the version information after you log in, click the question mark icon in the upper right, and then select **About**.

What's new in QRadar Network Packet Capture 7.4.2

IBM QRadar Network Packet Capture 7.4.2 introduces terms and conditions for software use, as well as security improvements.

These updates are applicable to QRadar Network Packet Capture 7.4.2 Fix Pack 1 (Build 1203).

License terms and conditions

Users must now review terms and conditions before they can log in to QRadar Network Packet Capture. The **Login** button appears only after you click the checkbox that indicates that you have read and accept the terms.

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What's new in QRadar Network Packet Capture 7.4.1

IBM QRadar Network Packet Capture 7.4.1 introduces direct-attached storage devices.

Direct-attached storage devices

Expand the storage capacity of your QRadar Network Packet Capture appliance by attaching direct-attached storage (DAS) devices. Each DAS device that you connect adds 80 TB of storage capacity.

DAS devices can be used with only some QRadar Network Packet Capture appliances. The number of DAS devices that you can connect depends on which hardware you are using.

Learn more about adding direct-attached storage devices......

What's new in QRadar Network Packet Capture 7.4.0

QRadar Network Packet Capture 7.4.0 introduces changes to the Support Login capability.

Changes to the Support Login capability

By turning on the Support Login capability, you allow specific users to use SSH to connect to the QRadar Network Packet Capture appliance with root-level access. The capability requires a public and private SSH key pair, and the capability is automatically disabled when the key expires after a specified period of time. This level of access is useful for advanced troubleshooting and debugging activities.

Learn more about enabling the support login...

What's new in QRadar Network Packet Capture 7.3.2

With QRadar Network Packet Capture 7.3.2 you can run simultaneous searches. Other features include improvements to packet capture, search, and retention settings.

Parallel searching

You can use the parallel search feature to query the PCAP repository with up to five simultaneous searches. This includes remote and local searches.

Previously, queries were executed one by one using a queuing system. Queries could be held up for many minutes behind a long-running, complex search. Now you can run your searches in parallel.

Streaming bandwidth is shared between running searches. This means that for simple searches that retrieve many results, the bandwidth is shared and might still take some time to complete. However, for indexed searches (that is, when searching for and retrieving very specific data), the search performance is not adversely affected.

QRadar Network Packet Capture traffic capture settings

Packet capture settings are retained after a restart

Previously, packet capture needed to be restarted manually, but now you can configure this using the API, or check the **Remember state** check box on the **Admin** tab.

Incoming and captured traffic display

The **Traffic** widget on the **Dashboard** tab has been enhanced so that you can now monitor incoming or captured traffic.

Previously, only a combination of this data was available. The new feature is useful because the bit rate for incoming traffic can vary significantly from captured traffic.

GeneralQRadar Network Packet Capture improvements

The following features are available:

- Search history is now available after a reboot.
- Predictive retention time display has been added in the **Group List View** widget on the **Dashboard** tab. This feature provides the predicted retention time based on the current capture rate, which helps you to estimate how much data you can keep based on the current volume.

What's new in QRadar Network Packet Capture 7.3.1

In IBM QRadar Network Packet Capture V7.3.1, you can stack appliances to extend the storage that is available for capture data.

Extend storage for Packet Capture data stacking

QRadar Network Packet Capture stacking is used to connect multiple QRadar Network Packet Capture appliances so that you can extend the storage available for capture data. For example, you now have the ability to stack up to 16 QRadar Network Packet Capture storage devices to increase their data retention time.

Chapter 2. Administering QRadar Network Packet Capture appliances

You must make sure that you are logged in as an administrator when you perform packet capture tasks.

Related concepts

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QRadar Network Packet Capture user accounts and authentication setup

User authentication on the QRadar Network Packet Capture appliance is a two-stage process. When a user tries to log in, authentication is done locally. If authentication fails, the user is authenticated against any configured Active Directory or Lightweight Directory Access Protocol (LDAP) server. If both types of authentication fail, the user is not granted access.

Note: If the QRadar Network Packet Capture appliance is a member of a QRadar Network Packet Capture group, the user account and authentication configurations are automatically synchronized across to the entire group.

Creating a new local user

If you have a small user base and don't need an authentication provider such as Active Directory or an LDAP server, create a local account for each user that needs access to the IBM QRadar Network Packet Capture appliance.

Before you begin

Log in to the QRadar Network Packet Capture appliance as an administrator.

The QRadar Network Packet Capture appliance also supports full user authentication as specified by configuring Microsoft® Active Directory or LDAP services, see "Configuring Active Directory or an LDAP server for user authentication" on page 7.

Procedure

1. In QRadar Network Packet Capture, click the **ADMIN** tab.
2. Go to the **ACCOUNTS** widget, and enter values in the **user** and **password** fields for the new user.
3. Select a user level:

   - For administrators who need the highest level of access and can change any configuration, select **Admin**.
   - For users who need to use QRadar Network Packet Capture for operational uses, like searches and queries, select **Operator**.
   - For users who only need to monitor results from the QRadar Network Packet Capture appliance, select **Monitor**.

   Use the following information to determine the user level that you require:

Activity	Monitor level	Operator level	Admin level
Get statistics information from device	X	X	X
Get information about the current group setup	X	X	X
Start a search and query of data from the appliance		X	X
Cancel an ongoing search		X	X
Change any configuration for the device including add or remove a user account			X
Reset/clear the statistics information of the appliance			X
Get support information from the device including logs and support archive			X
Start and stop capturing of data			X
Change group setup			X

4. Click **Add account**.

Changing user passwords when logged in as an administrator

When you are logged in as an administrator, you can change the password for any user.

When you change the password for another user, they are automatically logged out and must log in again by using the new password.

As an administrator, when you change your own password, you must also log in again.

Procedure

1. In QRadar Network Packet Capture, click the **ADMIN** tab.
2. In the **User** field in the **ACCOUNTS** widget, type the username that you want to change.
3. In the **Password** field, type the new password.
4. In the **Level** list, select the permissions and click **Update Account**.

   A confirmation appears, and the new password takes immediate effect. The affected user must log back into the system.

Changing passwords when logged in as a non-admin user

New Non-administrative users can change their own password without assistance from an administrator.

This capability is available in the following versions:

- QRadar Network Packet Capture 7.4.3 Fix Pack 1 (Build 1302)
- QRadar Network Packet Capture 7.3.3 Fix Pack 7 (Build 17)

Procedure

1. In QRadar Network Packet Capture, click the **Account** tab.

   The **Account** window opens and the **User** field is auto-populated with the user that is logged in.
2. Type the new password in the **New Password** field and click **Update Account**.

   You are logged out of the system when the new password is applied.

What to do next

Log in using the new password.

Resetting the admin password by using the command line

The recommended method for changing the local admin account password is by using the user interface (UI). However, since this method requires you to log in to the UI with the admin account, you might have to reset the admin account password by using the IMM2 command line interface (CLI).

Procedure

1. Log in to the IMM browser and open a remote control session.
2. Log in to the Red Hat® operating system as the `root` user.

   The default password is `napatech10`.
3. In 7.4.0, type this command to remove the accounts file:

   ```
   rm /opt/pandion/conf/accounts.json
   ```

Results

The admin user password is reset to the default password, which is `pandion`.

Configuring Active Directory or an LDAP server for user authentication

The IBM QRadar Network Packet Capture integrates into your security infrastructure by using your existing authentication provider. Use the **AUTHENTICATION AND AUTHORIZATION** widget to configure Active Directory and LDAP. QRadar Network Packet Capture supports full user authentication as specified by Microsoft® Active Directory services or an LDAP server. Microsoft® Active Directory and LDAP servers as an authentication source are disabled by default.

Before you begin

Log into the QRadar Network Packet Capture appliance as an administrator.

Procedure

1. In QRadar Network Packet Capture, click the **ADMIN** tab, and go to the **AUTHENTICATION AND AUTHORIZATION** widget.
2. Select the appropriate **Server Type**, and click **Apply**.

   The parameters that you configure depend on the authentication server type.

Note: If the primary authentication and authorization server is inaccessible when a user requests authentication, a service record (SRV) lookup is performed against the DNS name. The list of resolved SRV IP addresses is used as secondary authentication servers.

Important: If Active Directory is enabled, the user name must be a fully qualified domain name, for example, `\\[domain]\[user name]` or `[user name]@[domain]`.

Use the following table to choose and configure the correct **Server type**.

Parameter	Server Type	Description	Default
Protocol for communicating with the Active Directory or LDAP server	All	Protocol and encryption method. Possible values: • LDAP • LDAP + TLS • LDAP + SSL	LDAP
Host name or IP address of the Active Directory or LDAP server	All		N/A
Port number to connect to on the Active Directory or LDAP server	All		389
Timeout in seconds of the connection to the Active Directory or LDAP server	All		25 seconds
Base Domain Name	All	The distinguished name where the query has to be started.	N/A
Administrator level group	All	Name of the group that is used to identify the admin level privileges	N/A
Operator level group	All	Name of the group that is used to identify the operator level privileges	N/A
Monitor level group	All	Name of the group that is used to identify the monitor level privileges	N/A
Filter	LDAP	The condition the entries must meet	N/A
Scope of the filter	LDAP	Possible values: • Base • One Level • Subtree	Subtree
Attribute name used for assigning groups to users	LDAP	Name of the returned objects attribute that contains group names	

Parameter	Server Type	Description	Default

LDAP userbase used when binding to LDAP server	LDAP	Specify authentication information to allow users to log in with a short user name.
		For example, you can specify:
		`cn={},dc=company,dc=com`
		where `{}` denotes the user name (for example, `admin`), and `company.com` is your domain.
		Another example might be:
		`uid={},ou=people,`
		`dc=company,dc=com`
		When this USERBASE field is set, a user can log on using their short user name, (for example, `admin`) without needing to specify a fully qualified domain name.	

Enabling remote login by using SSH

You can restrict SSH access to specific IP addresses by configuring the **SUPPORT LOGIN (SSH)** widget. This capability provides specific users with remote root-level access to the system, which is useful for advanced troubleshooting and debugging.

About this task

SSH access to the system is disabled by default. After it is enabled, any user can temporarily access the system with a public and private SSH key pair.

After the SSH key expires, no new connections are allowed. Connections that are running when the key expires must be manually terminated.

If the system is rebooted before the SSH key expires, SSH is automatically disabled, and you must re-enable the **Support Login** function.

Procedure

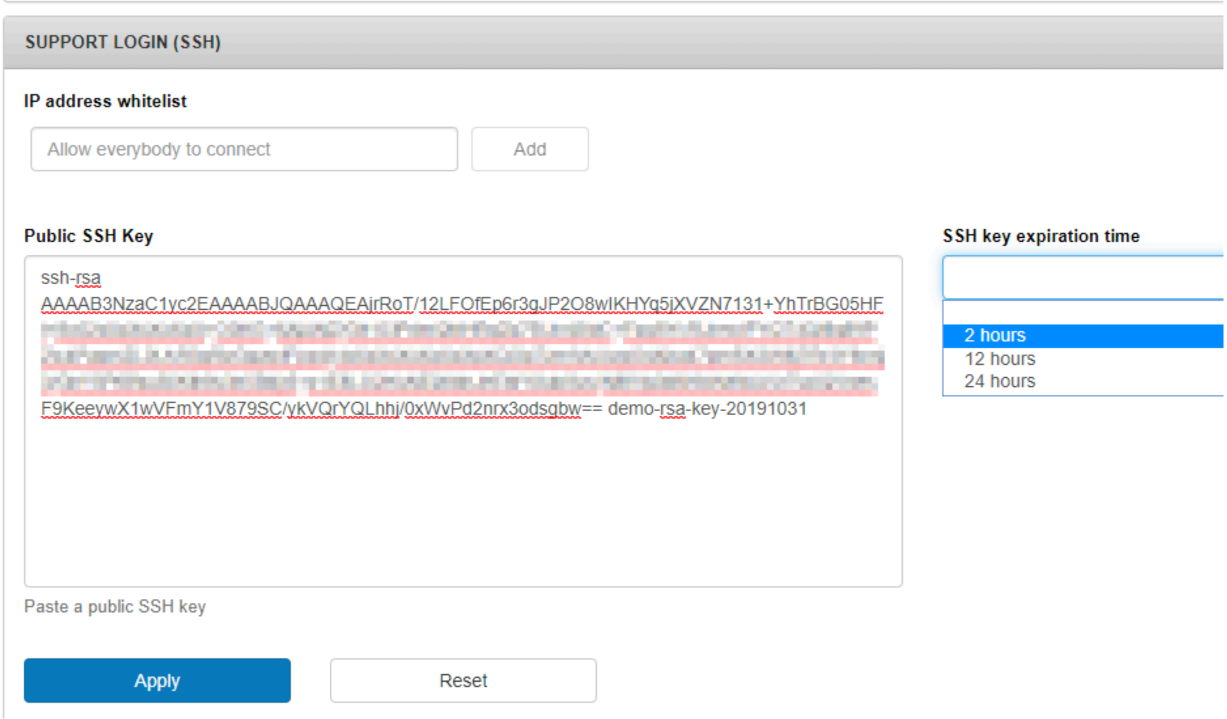
1. Log in to QRadar Network Packet Capture as an administrator.
2. Click the **ADMIN** tab.
3. Configure the following parameters:

Table 1. Support Login (SSH) parameters

Field	Description
IP address whitelist	The IP addresses that are allowed to access the system by using SSH. Only the specified IP addresses are granted access to the system. Access is limited to one IP address at a time.
Public SSH Key	The public SSH key used for authentication.

Table 1. Support Login (SSH) parameters (continued)

Field	Description
SSH key expiration time	The length of time (in hours) that the SSH key remains valid. When the key expires, new SSH connections are not allowed.



SUPPORT LOGIN (SSH)

IP address whitelist

Allow everybody to connect

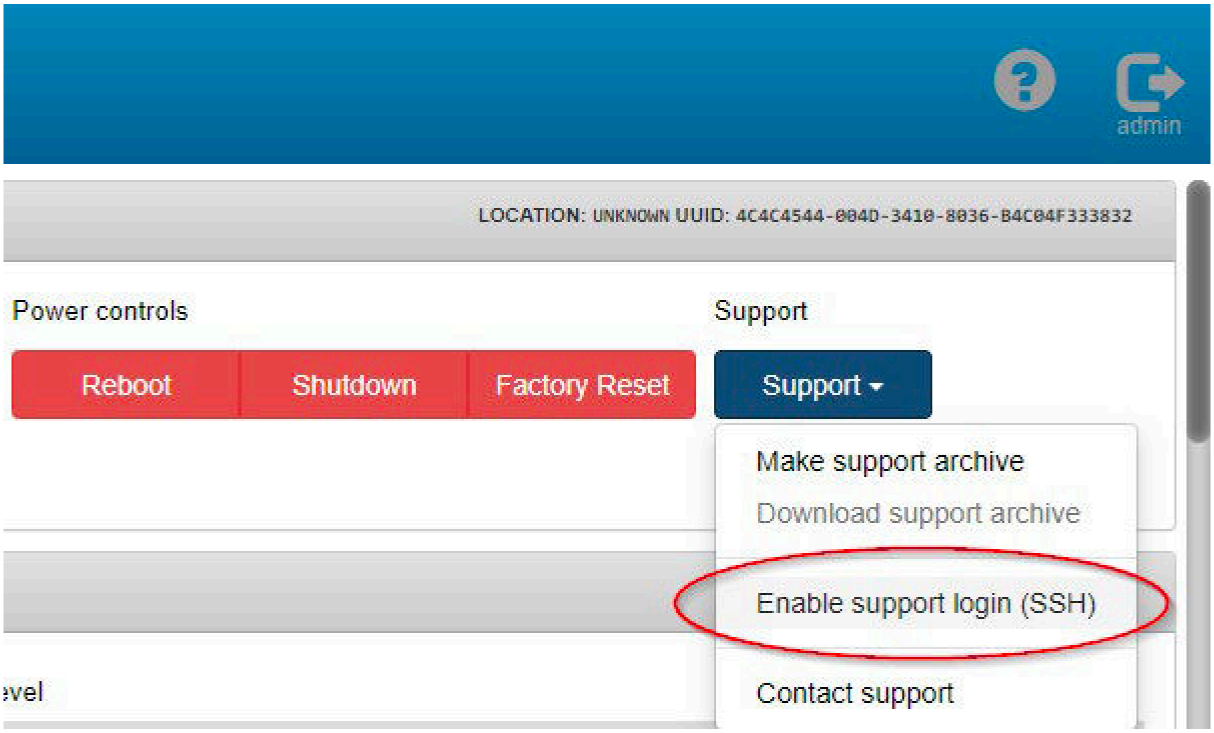
Public SSH Key

```
ssh-rsa
AAAAB3NzaC1yc2EAAAABJQAAAQEAjrRoT/12LFOfEp6r3gJP2O8wIKHYq5jXVZN7131+YhTrBG05HF
[redacted]
F9KeeywX1wVFmY1V879SC/ykVQrYQLhhj/0xWvPd2nrx3odsgbw== demo-rsa-key-20191031
```

Paste a public SSH key

SSH key expiration time

4. Click **Apply**.
5. From the **Support** drop-down list, select **Enable support login (SSH)**.



LOCATION: UNKNOWN UUID: 4C4C4544-004D-3410-8036-B4C04F333832

The support login capability is enabled. The capability remains enabled for the time that was specified in the configuration, or until the system is rebooted.

Users who have the corresponding private key can use SSH to connect to the IP address or hostname on port 8022 as the **root** user.

6. After the capability is enabled, you can disable it by selecting **Disable support login (SSH)** from the **Support** drop-down list.

Data consistency check during startup

Stored data is checked for integrity and consistency during the startup of the IBM QRadar Network Packet Capture appliance.

A message is displayed after you log in to QRadar Network Packet Capture, indicating that the service is initializing. A status bar at the top of the window shows the initialization progress.

The duration of the consistency check depends on the amount of data stored on the QRadar Network Packet Capture appliance.

Configuring date and time

To ensure that captured data is time-stamped correctly, you must configure the date and time that QRadar Network Packet Capture uses. You can configure a local date and time for QRadar Network Packet Capture, or you can enable Network Time Protocol (NTP) or Precision Time Protocol (PTP) to synchronize the date and time from an external source.

About this task

Ensure that a PTP cable is **not** connected to the QRadar Network Packet Capture appliance.

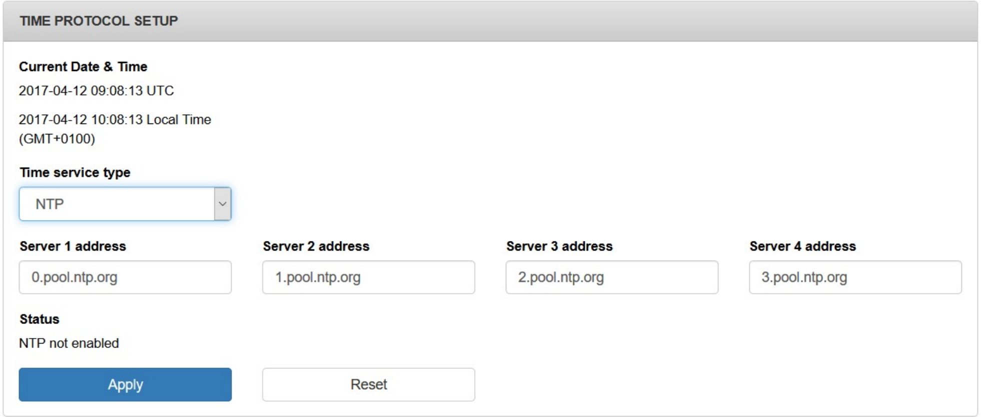
If you are modifying the time system from a previous setting, make sure you turn off the data capture before you install any updates.

If a significant time-jump (greater than one minute) is expected, restart the QRadar Network Packet Capture appliance after the update to ensure that all the subsystems are synchronized.

If a negative time-jump is expected, erase all captured data before the update to avoid timestamp problems. For more information about using Clean Slate to do this, see "Restarting the appliance and performing a factory reset" on page 16.

Procedure

1. In QRadar Network Packet Capture, click the **ADMIN** tab and scroll to the **TIME PROTOCOL SETUP** widget.



TIME PROTOCOL SETUP

Current Date & Time
2017-04-12 09:08:13 UTC

2017-04-12 10:08:13 Local Time
(GMT+0100)

Time service type: NTP

Server 1 address: 0.pool.ntp.org
Server 2 address: 1.pool.ntp.org
Server 3 address: 2.pool.ntp.org
Server 4 address: 3.pool.ntp.org

Status
NTP not enabled

*Figure 1. **TIME PROTOCOL SETUP** widget*

2. Choose a **Time service type** based on your requirements:

Time service type	Description
NTP	Synchronize the date and time with an external server.
RDate	Synchronize the current date and time from a network server.
Manual	Enter the date and time using either `ISO8601` or `dd/mm/yyyy h:m:s` format.

3. Choose the relevant server addresses for the date and time sources.
4. Click **Apply** to complete.

Results

The QRadar Network Packet Capture appliance automatically synchronizes its time to the operating system time.

Configuring a location name and contact

To make it easier to identify the QRadar Network Packet Capture appliance, ensure that you give it a recognizable name.

Procedure

1. In QRadar Network Packet Capture, click the **ADMIN** tab.
2. Scroll down to the **GENERAL SETUP** widget.
3. Enter a location name and optionally the name of a contact person.
4. Click **Apply**.

Starting or stopping packet capture

You can control the number of recordings your appliance captures.

Before you begin

- Verify that the links are up, see "Capture port verification" on page 40.
- Verify that PTP is running and locked (if applicable), see "Time Sync Verification" on page 40.

Procedure

1. In QRadar Network Packet Capture, click the **ADMIN** tab.
2. Go to the **CONTROL** widget.
3. Set **Traffic Capture** to **Turn On** or **Turn Off**.

   Check the **Remember state** check box to retain your settings.

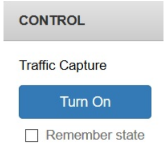
   

   Figure 2. CONTROL widget: Traffic Capture option

   By default, packet capture is turned on. If the QRadar Network Packet Capture appliance is not capturing packets, then **Traffic Capture** is set to **Turn On**. If the QRadar Network Packet Capture appliance is capturing packets, then **Traffic Capture** is set to **Turn Off**.

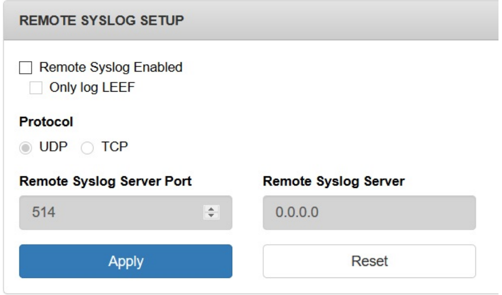
Configuring the remote syslog setup

Use the **REMOTE SYSLOG SETUP** widget to enable remote system logging and to configure protocol details.

Procedure

1. In QRadar Network Packet Capture, click the **ADMIN** tab.
2. Go to the **REMOTE SYSLOG SETUP** widget.
3. Select the **Remote Syslog Enabled** check box to enable system logging.

   Select **Only log LEEF** if you want to capture only Log Event Extended Format (LEEF) syslog events.

   REMOTE SYSLOG SETUP

   □ Remote Syslog Enabled
   □ Only log LEEF

   Protocol
   ● UDP ○ TCP

   Remote Syslog Server Port: 514
   Remote Syslog Server: 0.0.0.0

   Figure 3. Remote Syslog Setup widget

4. Check **UDP** or **TCP** protocol according to your settings.
5. Specify a port number for the **Remote Syslog Server Port** and an IP address for the **Remote Syslog Server** fields.
6. Click **Apply**.

Viewing system logs

Use **SYSLOGS** to troubleshoot the device.

By default, the **SYSLOGS** widget displays the last 500 lines of syslog in the IBM QRadar Network Packet Capture appliance.

You can filter and adjust the number of displayed lines by using the **Syslog Level** and **Log Lines** controls.

SNMP setup configuration

Use the **SNMP SETUP** widget to set up SNMP for the QRadar Network Packet Capture appliance.

You can include the IP address of where to send SNMP traps.

X509 configuration

Use the **X509 SETUP** widget to install a new X509 certificate that is used by HTTPS to authenticate the IBM QRadar Network Packet Capture appliance.

A per device unique factory installed certificate is used when no user-installed certificate is present. This certificate is self-signed.

Configuring the SmartNIC

Use the **SMARTNIC SETUP** widget to configure SmartNIC port settings, packet processing, and prefilters.

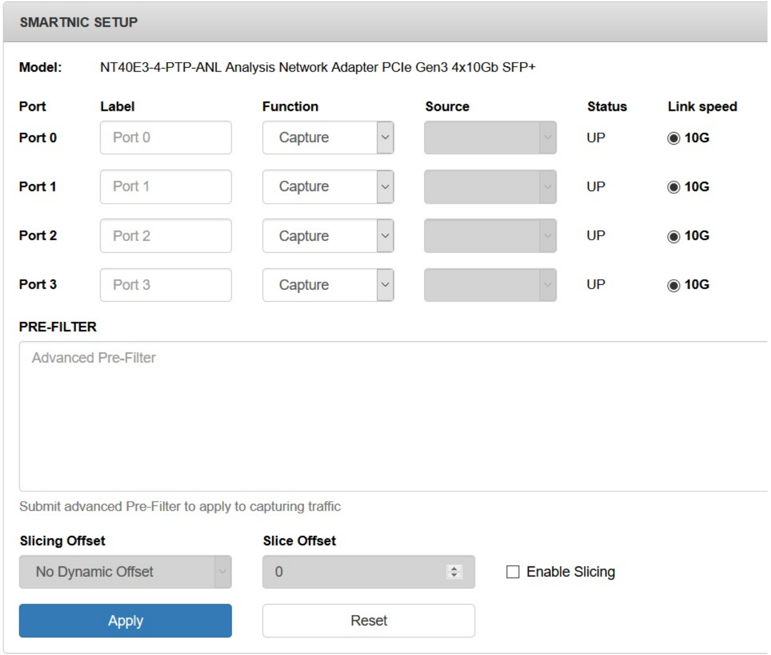
Port Settings

If a transceiver module is installed in a port, it is enabled by default. You can manually disable the module in the **SMARTNIC SETUP** widget. By default, each port auto-detects the link speed of the transceiver module. However, if you are using dual rate modules you can manually set the speed using the radio buttons.

The following table describes the function configuration for each port. If you choose to name a port, this name is reflected in other parts of the user interface where the port number is referenced.

Table 2. Configuring the function for port settings

Port function setting	Description
Capture	Default setting. Packets are captured.
Disabled	Packet capture is turned off, and no packets are captured.
Local retransmit	Packets are transmitted to another local port. Choose the port where you want the packets to be retransmitted.
Retransmit ETS	An ETS (Encapsulated Time Stamp) is appended to every packet, and all packets are retransmitted to another local port. See "Setting up local retransmission" on page 15 for more information.



SMARTNIC SETUP

Model: NT40E3-4-PTP-ANL Analysis Network Adapter PCIe Gen3 4x10Gb SFP+

Port	Label	Function	Source	Status	Link speed
Port 0	Port 0	Capture		UP	● 10G
Port 1	Port 1	Capture		UP	● 10G
Port 2	Port 2	Capture		UP	● 10G
Port 3	Port 3	Capture		UP	● 10G

PRE-FILTER

Advanced Pre-Filter

Submit advanced Pre-Filter to apply to capturing traffic

Slicing Offset: No Dynamic Offset

Slice Offset: 0

□ Enable Slicing

Figure 4. Accelerator Setup

Configuring prefilters

Use the **SMARTNIC SETUP** widget to filter the packets that are captured to reduce the size of captured and stored packets.

About this task

The Napatech Programming Language (NTPL) tool is a command-line tool that is used for changing the stream behavior and filter settings on a Napatech card. The **SMARTNIC SETUP** widget uses the NTPL tool to specify the packet filter expression.

The NTPL command syntax uses Backus-Naur Form (BNF) notation. When you specify the filter expressions in the **SMARTNIC SETUP** widget, you must use BNF syntax. For more information about creating BNF expressions, see NTPL Overview and Filter Expressions in the Napatech Documentation Portal.

Procedure

1. In QRadar Network Packet Capture, click the **ADMIN** tab.
2. Go to the **SMARTNIC SETUP** widget.
3. Configure prefilters:
   a) Enter your statement in the **PRE-FILTER** field.
   b) Click **Apply**.
4. Configure packet processing:
   a) Enter your statement in the **PRE-FILTER** field.
   b) Select **Enable Slicing** and set the offset to enable slicing. The slicing offset is configured as a dynamic offset plus a static offset so that all packets are sliced.
   c) Click **Apply**.

Setting up local retransmission

By locally retransmitting traffic you can send any packet received on one network interface (a physical port) to one or more network interface. For example, you can retransmit all packets received on port 1 to port 2.

About this task

Insert the QRadar Network Packet Capture appliance between an existing network tap and any network device. By enabling local retransmit you can receive all traffic into the QRadar Network Packet Capture appliance and also forward all traffic to the connected network device.

Retransmission of a packet does not affect the capture of the packet.

The QRadar Network Packet Capture appliance retransmits traffic to the selected ports.

Procedure

1. When the devices are connected, log in to the QRadar Network Packet Capture appliance as an administrator and click the **ADMIN** tab.
2. Scroll to the **SMARTNIC SETUP** widget.
3. For each port connected to the network tap, select the relevant ports connected to the analysis appliance or appliances.

   Select either of these options for the port:

   - **Local retransmit**
   - **Retransmit ETS**: A timestamp is appended to every packet in the session.

4. Click **Apply**.

Clearing statistics or searches

Use the **CONTROL** widget to clear all ongoing and queued searches.

Procedure

1. In QRadar Network Packet Capture, click the **ADMIN** tab.
2. Go to the **CONTROL** widget.
3. Set **Clear Statistics** to **Clear Stats** to clear historical data.
4. Set **Clear All Searches** to **Clear Searches** to clear all your recent searches.

Restarting the appliance and performing a factory reset

Use the **CONTROL** widget to access the QRadar Network Packet Capture power settings.

Procedure

1. To restart or to shut down the QRadar Network Packet Capture appliance:
   a) In QRadar Network Packet Capture, click the **ADMIN** tab.
   b) Go to the **CONTROL** widget.
   c) Set **Power Controls** to **Reboot** or **Shut Down**.
2. To erase network packets and perform a factory reset:
   a) In QRadar Network Packet Capture, click the **ADMIN** tab.
   b) Go to the **CONTROL** widget.
   c) To erase network packets from the RAID disk array, under **Erase Capture Data**, select **Clean Slate**.

      Note: This action removes data, but it is not a secure erase. It does not do multiple passes, nor does it include secure wiping algorithms.

   d) To reset the QRadar Network Packet Capture appliance, under **Power Controls**, select **Factory Reset**.

      Note: Factory Reset resets all settings with the exception of the network configuration.

Chapter 3. QRadar Network Packet Capture packet capture monitoring

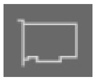
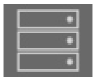
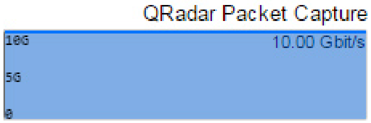
Use the Monitoring widgets on the Dashboard to view the overall status of one or more QRadar Network Packet Capture appliances in a group.

A QRadar Network Packet Capture group consists of physically separate appliances, that capture data from separate network taps. Use the grouping feature to form one logical entity that is easier to administer and search. A group can consist of up to eight QRadar Network Packet Capture appliances.

GROUP VIEW

Each QRadar Network Packet Capture group consists of the following monitoring components:

Table 3. Monitoring components

Icon	Description
	SmartNIC
	System
	Storage
	Traffic

The state of the component is indicated by its color: light gray, yellow and red.

GROUP LIST VIEW

Use the **GROUP LIST VIEW** widget to monitor the health of each QRadar Network Packet Capture appliance in the group.

UNIT VIEW

Use the **UNIT VIEW** to see more detailed information about the QRadar Network Packet Capture appliance selected in the **GROUP VIEW** widget.

The **UNIT VIEW** presents overview information about retention and appliance health for the QRadar Network Packet Capture appliance.

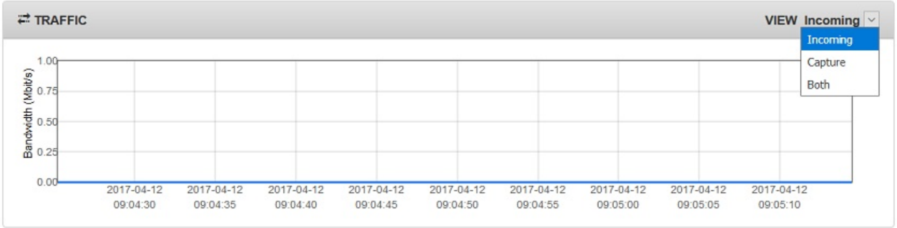
Detailed information is displayed for the SmartNIC, System and Storage.

CPU UTILIZATION

Use the **CPU UTILIZATION** widget to individually monitor the CPU usage for each hyper-threaded core.

TRAFFIC

Use the **TRAFFIC** widget to monitor the history of the packet capture traffic that is received by the QRadar Network Packet Capture appliance. By default, incoming traffic is displayed. You can view incoming or captured traffic, or both types of traffic.



This chart is updated periodically and scrolls to the right showing only the last period of historical data.

PACKET DISTRIBUTION

Use the **PACKET DISTRIBUTION** widget to monitor the distribution between broadcast, multicast and unicast frames that are received by the QRadar Network Packet Capture appliance since the last reset of the statistics data.

PACKET SIZE DISTRIBUTION

Use the **PACKET SIZE DISTRIBUTION** widget to monitor the distribution of packet sizes for the frames that are received by the QRadar Network Packet Capture appliance since the last reset of the statistics data.

Related concepts

What's new in QRadar Network Packet Capture
This IBM QRadar Network Packet Capture release includes fixes for defects and security vulnerabilities.

Administering QRadar Network Packet Capture appliances

QRadar Network Packet Capture searches and queries
To look for specific packets within a specific time range, and from a specific port, use the **SEARCH** tab. When you specify any combination of source IP, destination IP, source port, destination port, or protocol fields a QRadar Network Packet Capture Query Language (NTQL) string is generated. You can modify the NTQL string, or you can create your own NTQL expression from scratch.

Grouped QRadar Network Packet Capture appliances
Use the QRadar Network Packet Capture grouping feature to group multiple physical appliances together to form a single logical entity for administration and searching. By using the grouping feature, multiple tap points and multiple QRadar Network Packet Capture appliances can be accessed and operated as if they were one appliance.

Stacked QRadar Network Packet Capture appliances
You can extend the storage available for capture data by connecting multiple QRadar Network Packet Capture appliances together in a ring topology to create a stack.

Troubleshooting issues with QRadar Network Packet Capture appliances
Use this information to troubleshoot issues with the QRadar Network Packet Capture appliance.

Chapter 4. QRadar Network Packet Capture searches and queries

To look for specific packets within a specific time range, and from a specific port, use the **SEARCH** tab. When you specify any combination of source IP, destination IP, source port, destination port, or protocol fields a QRadar Network Packet Capture Query Language (NTQL) string is generated. You can modify the NTQL string, or you can create your own NTQL expression from scratch.

For example, to optimize NTQL, change `dst host` to `host`, or change the and expression to an `or` expression between the source IP and destination IP addresses.

Multiple searches

You can run multiple simultaneous searches.

Note: If you start five or more searches in quick succession, with auto-download enabled, you might experience a slow response rate. This is a web browser limitation due to the number of simultaneous connections.

Limiting search results

To limit search results and reduce the time that it takes the search to deliver results, add scope to the search by using one of the following filters:

- **Time Interval**
- **Receive Ports** (selected ports)

If you are searching on a group of QRadar Network Packet Capture appliances (see Chapter 5, "Grouped QRadar Network Packet Capture appliances," on page 29), make sure that you submit search queries only when logged on to the local appliance. Otherwise, retrieval performance of search results is impaired.

You can also use **Search Targets** to specify which appliances in a stack you want to search.

The format of the search output is in either standard PCAP or PCAP-NG format. The PCAP-NG format contains port number information, even for searches across a group of QRadar Network Packet Capture appliances. For each server in the group, you can also specify the received ports to search for traffic.

FCS (Frame Check Sequence) information is also returned in this search output. This information is sent in addition to the packet data.

Before you submit the search, you can queue the search if the search engine is busy. You can choose whether or not the output should be automatically downloaded as soon as the search is completed, and you can prioritize different searches.

Differences between NTQL and BPF

Use NTQL to accelerate searches based on the index that is built during capture.

NTQL filters work differently than Berkeley Packet Filters (BPF). The following examples describe how NTQL filters work:

- When you search for an IP address, all packets that have this IP address are returned independent of any VLAN, MPLS or ISL tagging or encapsulation.
- When you search for specific TCP or UDP ports, the results that are returned include IPv6 packets with extended headers.

BPF post-filtering is based on the full BPF syntax. You create the BPF expression and this BPF post-filtering filters only the packets that pass the specified NTQL filter.

BPF filters work differently from NTQL and might remove packets that were found by the NTQL filter.

Related concepts

What's new in QRadar Network Packet Capture
This IBM QRadar Network Packet Capture release includes fixes for defects and security vulnerabilities.

Administering QRadar Network Packet Capture appliances

QRadar Network Packet Capture packet capture monitoring
Use the Monitoring widgets on the Dashboard to view the overall status of one or more QRadar Network Packet Capture appliances in a group.

Grouped QRadar Network Packet Capture appliances
Use the QRadar Network Packet Capture grouping feature to group multiple physical appliances together to form a single logical entity for administration and searching. By using the grouping feature, multiple tap points and multiple QRadar Network Packet Capture appliances can be accessed and operated as if they were one appliance.

Stacked QRadar Network Packet Capture appliances
You can extend the storage available for capture data by connecting multiple QRadar Network Packet Capture appliances together in a ring topology to create a stack.

Troubleshooting issues with QRadar Network Packet Capture appliances
Use this information to troubleshoot issues with the QRadar Network Packet Capture appliance.

Queued searches

Queued searches are used when you have multiple searches that you want to run.

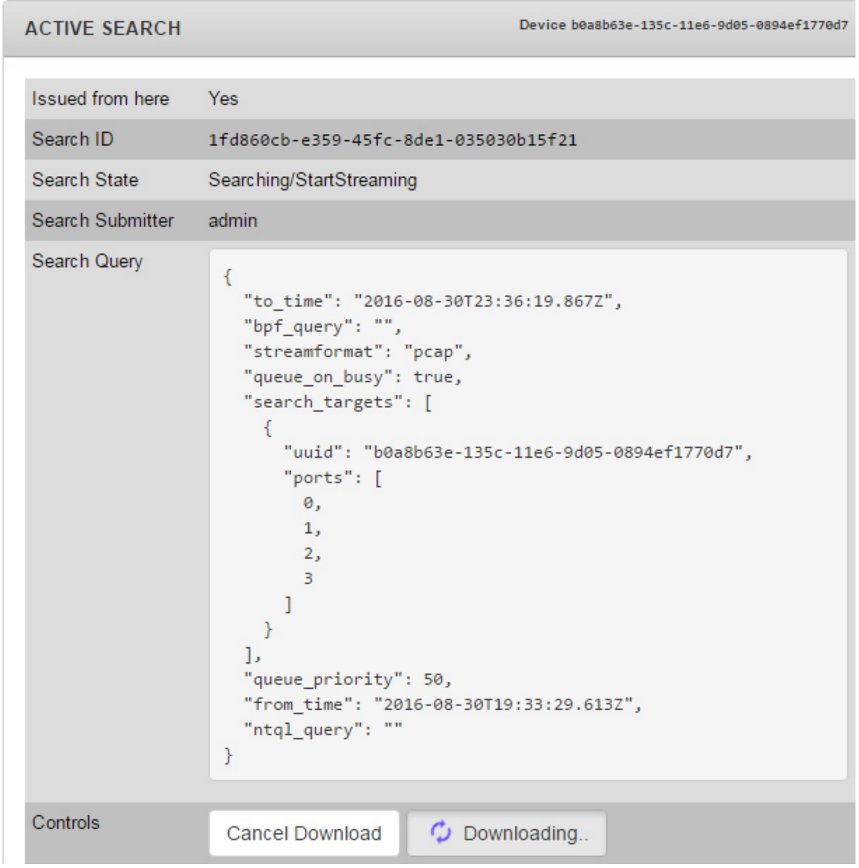
You can run multiple searches at a time. After you reach the maximum number of concurrent active searches, further searches are queued and run according to priority. Queued searches are shown in the **SEARCH QUEUE** widget.

Before you submit the search, check the **Auto-download when ready to stream** option. The search result downloads automatically when the search is complete. You can change this behavior by clicking **Auto Download is On**.

Active searches

Use the **ACTIVE SEARCH** widget to display any active and ongoing searches.

The following image shows an active search query.



ACTIVE SEARCH

Device b0a8b63e-135c-11e6-9d05-0894ef1770d7

Issued from here	Yes
Search ID	1fd860cb-e359-45fc-8de1-035030b15f21
Search State	Searching/StartStreaming
Search Submitter	admin

Search Query

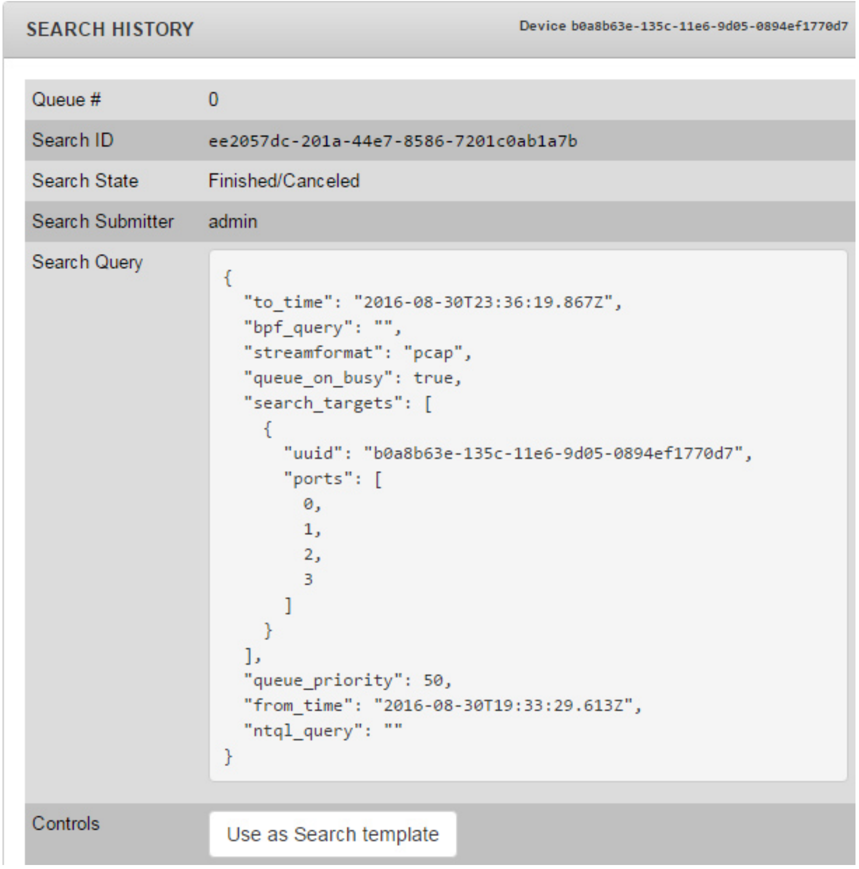
```
{
  "to_time": "2016-08-30T23:36:19.867Z",
  "bpf_query": "",
  "streamformat": "pcap",
  "queue_on_busy": true,
  "search_targets": [
    {
      "uuid": "b0a8b63e-135c-11e6-9d05-0894ef1770d7",
      "ports": [
        0,
        1,
        2,
        3
      ]
    }
  ],
  "queue_priority": 50,
  "from_time": "2016-08-30T19:33:29.613Z",
  "ntql_query": ""
}
```

Figure 5. ***ACTIVE SEARCH*** *widget*

Search history

Use the **SEARCH HISTORY** widget to display the search history on the QRadar Network Packet Capture appliance.

The following image shows the search history of a search query that has finished.



SEARCH HISTORY

Device b0a8b63e-135c-11e6-9d05-0894ef1770d7

Queue #	0
Search ID	ee2057dc-201a-44e7-8586-7201c0ab1a7b
Search State	Finished/Canceled
Search Submitter	admin

Search Query

```
{
  "to_time": "2016-08-30T23:36:19.867Z",
  "bpf_query": "",
  "streamformat": "pcap",
  "queue_on_busy": true,
  "search_targets": [
    {
      "uuid": "b0a8b63e-135c-11e6-9d05-0894ef1770d7",
      "ports": [
        0,
        1,
        2,
        3
      ]
    }
  ],
  "queue_priority": 50,
  "from_time": "2016-08-30T19:33:29.613Z",
  "ntql_query": ""
}
```

Controls

*Figure 6. **SEARCH HISTORY** widget*

Search template

By using the **SEARCH HISTORY** widget, you can use a search that was previously run as a template for your next search. Click **Use as Search Template** and go to the **SEARCH** widget to make necessary modifications to the template.

Delete search

You can stop a queued search by clicking **Cancel Queued Entry** in the **SEARCH QUEUE** widget. You can stop an active search by clicking **Cancel Search** in the **ACTIVE SEARCH** widget.

QRadar Network Packet Capture Query Language (NTQL)

Use the QRadar Network Packet Capture Query Language (NTQL) to retrieve data from packets that are captured.

For example, you can use NTQL for the following types of information:

- IPv4 host addresses, as source, destination or either
- IPv6 host addresses, as source, destination or either
- TCP or UDP port numbers, as source, destination or either
- Layer 3 protocol carried by Ethernet frames
- Layer 4 protocol carried by IP packages
- Combinations of these with logical and and `or`

Note: NTQL is case sensitive.

Matching everything

An empty NTQL string matches all packets, which is useful when the number of matches is limited.

Host address search

To search for packets sent to a specific host, enter the following string:

```
src host <IP address>
```

To search for packets sent from a host, enter the following string:

```
dst host <IP address>
```

Port number search

To search for packets that were sent to or from a TCP or UDP port, enter the following string:

```
port <number>
```

Packets that are sent by using protocols that have no port numbers are discarded by this search.

To narrow down the search results to packets that were sent from a specific port, enter the following string:

```
src port <number>
```

To search for packets that were sent to a specific port, enter the following string:

```
dst port <number>
```

Layer 3 protocol search

To search for packets that use a specific layer 3 protocol, enter the following string:

```
l3proto <protocol>
```

where `<protocol>` is either a protocol number or a name. These are the supported protocol names:

- `arp`
- `ip`
- `ip4`
- `ip6`
- `ipv4`
- `ipv6`
- `lldp`
- `ptp`

When `ip` is given as protocol, IPv4 is used.

Layer 4 protocol search

To search for packets that use a specific layer 4 protocol, enter the following string:

```
l4proto <protocol>
```

where `<protocol>` is either a protocol number or a name. These are the supported names:

- `3pc`
- `ah`

- argus
- aris
- ax.25
- bbn-rcc-mon
- bna
- br-sat-mon
- cbt
- cftp
- chaos
- compaq-peer
- cphb
- cpnx
- crtp
- crudp
- dccp
- dcn-meas
- ddp
- ddx
- dgp
- egp
- eigrp
- emcon
- encap
- esp
- etherip
- fc
- fire
- ggp
- gmtp
- gre
- hip
- hmp
- hopopt
- i-nlsp
- iatp
- icmp
- idpr
- idpr-cmtp
- idrp
- ifmp
- igmp
- igp
- il

- `ip-in-ip`
- `ipcomp`
- `ipcu`
- `ipip`
- `iplt`
- `ippc`
- `iptm`
- `ipv6`
- `ipv6-frag`
- `ipv6-icmp`
- `ipv6-nonxt`
- `ipv6-opts`
- `ipv6-route`
- `ipx-in-ip`
- `irtp`
- `iso-ip`
- `iso-tp4`
- `kryptolan`
- `l2tp`
- `larp`
- `leaf-1`
- `leaf-2`
- `manet`
- `merit-inp`
- `mfe-nsp`
- `mhrp`
- `micp`
- `mobile`
- `mobility-header`
- `mpls-in-ip`
- `mtp`
- `mux`
- `narp`
- `netblt`
- `nsfnet-igp`
- `nvp-ii`
- `ospf`
- `pgm`
- `pim`
- `pipe`
- `pnni`
- `prm`
- `ptp`

- `pup`
- `pvp`
- `qnx`
- `rdp`
- `rohc`
- `rsvp`
- `rsvp-e2e-ignore`
- `rvd`
- `sat-expak`
- `sat-mon`
- `scc-sp`
- `scps`
- `sctp`
- `sdrp`
- `secure-vmtp`
- `shim6`
- `skip`
- `sm`
- `smp`
- `snp`
- `sprite-rpc`
- `sps`
- `srp`
- `sscopmce`
- `st`
- `stp`
- `sun-nd`
- `swipe`
- `tcf`
- `tcp`
- `tlsp`
- `tp++`
- `trunk-1`
- `trunk-2`
- `ttp`
- `udp`
- `udplite`
- `uti`
- `vines`
- `visa`
- `vmtp`
- `vrrp`
- `wb-expak`

- wb-mon
- wesp
- wsn
- xnet
- xns-idp
- xtp

Combining search terms

These search terms can be combined into more complex expressions with and and or keywords. For example, to search for packets to or from 1.1.1.1 or 2.2.2.2, enter the following string:

```
host 1.1.1.1 or host 2.2.2.2
```

To search for packets that are both to and from 1.1.1.1 or 2.2.2.2, enter the following string:

```
host 1.1.1.1 and host 2.2.2.2
```

These keywords are left associative. For example, consider the following syntax:

```
port 42 and host 1.1.1.1 or host 2.2.2.2
```

The expression evaluates to the following:

- sent to or from port 42 and to or from host 1.1.1.1, or
- to or from host 2.2.2.2 without regard for the port numbers

You can change the left association by using parentheses, as shown in the following example:

```
port 42 and (host 1.1.1.1 or host 2.2.2.2)
```

The expression evaluates to find packets to or from port 42 that are to or from host 1.1.1.1 or 2.2.2.2.

Chapter 5. Grouped QRadar Network Packet Capture appliances

Use the QRadar Network Packet Capture grouping feature to group multiple physical appliances together to form a single logical entity for administration and searching. By using the grouping feature, multiple tap points and multiple QRadar Network Packet Capture appliances can be accessed and operated as if they were one appliance.

A QRadar Network Packet Capture group can capture data from separate network taps. You must configure all the QRadar Network Packet Capture appliances to access all of the QRadar Network Packet Capture group members on the management network interface, and the network must have a DNS server.

When you group QRadar Network Packet Capture appliances, you can search all group members data with a single data query. The search result is a single PCAP file, that contains data merged from all group members.

You only need to log in to one of the members to access the entire group. From this single login, you can communicate by proxy with all other members of the QRadar Network Packet Capture group.

The proxy functionality is primarily intended for administration, configuration and debugging of remote appliances. If a search is initiated that spans the whole group, while the user is on a remote QRadar Network Packet Capture appliance through the proxy method, a significant amount of redundant traffic is transmitted across the management network. This impacts retrieval performance depending on the bandwidth and latency of the management network. Consequently, searches spanning a QRadar Network Packet Capture group must always be initiated on the primary or local machine, without any hub or proxying.

Related concepts

What's new in QRadar Network Packet Capture
This IBM QRadar Network Packet Capture release includes fixes for defects and security vulnerabilities.

Administering QRadar Network Packet Capture appliances

QRadar Network Packet Capture packet capture monitoring
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QRadar Network Packet Capture searches and queries
To look for specific packets within a specific time range, and from a specific port, use the **SEARCH** tab. When you specify any combination of source IP, destination IP, source port, destination port, or protocol fields a QRadar Network Packet Capture Query Language (NTQL) string is generated. You can modify the NTQL string, or you can create your own NTQL expression from scratch.

Stacked QRadar Network Packet Capture appliances
You can extend the storage available for capture data by connecting multiple QRadar Network Packet Capture appliances together in a ring topology to create a stack.

Troubleshooting issues with QRadar Network Packet Capture appliances
Use this information to troubleshoot issues with the QRadar Network Packet Capture appliance.

Group access

Some functionality works differently when you access an IBM QRadar Network Packet Capture appliance that is in a group.

Grouped appliances are different in the following ways:

- In the **GROUP VIEW** widget on the **DASHBOARD** tab, a number of QRadar Network Packet Capture appliances (the group) are visible.
- The **Switch To** button corresponds to the appliance switching in the GROUP VIEW on the DASHBOARD.

- When you modify user accounts and setup Active Directory, the updates are automatically propagated to all group members.

Group creation and modification

A grouping request is initiated on any QRadar Network Packet Capture appliance, either through the GUI or the REST API.

Initial peer-to-peer group

In the following example, the QRadar Network Packet Capture appliance that requests the formation of a group is referred to as Appliance A. The receiver appliance of the grouping request is referred to as Appliance B.

For example, a QRadar Network Packet Capture group is formed with two members. The following things happen:

- As part of the grouping request, a user name and password with admin level access rights must be provided for Appliance B.
- The list of local accounts and Active Directory configuration is exported from Appliance A to Appliance B. All previous configurations of accounts and Active Directory configuration on Appliance B are overwritten.
- All capture data is preserved on Appliance A as well as on Appliance B, and can be searched from either appliance.

Inclusion in existing group

The request for a stand-alone QRadar Network Packet Capture appliance to be included in an existing group can be initiated on the stand-alone appliance or a member of the group. In the following example, the stand-alone QRadar Network Packet Capture appliance to be included in the group is referred to as Appliance C.

For example, when a QRadar Network Packet Capture appliance is included in an existing group, the following happens:

- Local accounts and Active Directory configuration of the group are exported to Appliance C.
- Previous accounts and Active Directory configuration on Appliance C are overwritten.

Leaving a group

The local accounts and the Active Directory configuration are left as a snapshot of the state when a QRadar Network Packet Capture appliance is removed from the group. No further synchronization with the group occurs.

Setting up a QRadar Network Packet Capture group

Configure multiple QRadar Network Packet Capture appliances into a group.

Before you begin

- To be sure that you understand the implications of grouping QRadar Network Packet Capture appliances, see Chapter 5, “Grouped QRadar Network Packet Capture appliances,” on page 29.
- You are logged into the QRadar Network Packet Capture appliance as an administrator.

About this task

You can search the entire group, selected members, or a single member. The search result is delivered in a single merged stream that is in timestamp order. Each packet is annotated with the source device UUID and receive port in PCAP-NG format.

Procedure

1. Click the **ADMIN** tab, and go to the **GROUP MEMBERSHIP** widget.
2. Enter the DNS or IP address of the remote QRadar Network Packet Capture appliance.
3. Enter the login information of an admin user on the remote QRadar Network Packet Capture appliance.
4. Click **Add Host**.

Results

The remote QRadar Network Packet Capture appliance is grouped with the appliance that you are currently logged into.

What to do next

Click **Remove** to remove a QRadar Network Packet Capture appliance from the group.

Chapter 6. Stacked QRadar Network Packet Capture appliances

You can extend the storage available for capture data by connecting multiple QRadar Network Packet Capture appliances together in a ring topology to create a stack.

The stack allows the distribution of capture data across each of the connected appliances. It can connect up to 16 devices, but appears and behaves like a single entity that captures data from one TAP of a single 10GB port.

Stack Controller
The Stack Controller is the appliance that receives the traffic that is being monitored, also known as the TAP point. The Stack Controller manages the overall configuration for the stack, therefore, there can be only one controller in each stack.

Stack Node
The Stack Node is the appliance that is used as storage for the capture data. You can have up to 15 nodes in a stack.

Related concepts

What's new in QRadar Network Packet Capture
This IBM QRadar Network Packet Capture release includes fixes for defects and security vulnerabilities.

Administering QRadar Network Packet Capture appliances

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Troubleshooting issues with QRadar Network Packet Capture appliances
Use this information to troubleshoot issues with the QRadar Network Packet Capture appliance.

Benefits of stacking appliances

Stacking gives you the ability to scale storage and expand retention time for capture data.

While the stack is actively capturing data, you can complete the following actions:

- Take an individual Stack Node offline, upgrade it, and reinsert it back into the stack.

  Note: This capability does not apply to the Stack Controller.
- Add an appliance to expand the capacity of a stack.

  The appliance hardware and storage size can vary. All available storage in the stack is used for data capture.

Data storage

The ring topology of the stack helps to protect the capture data. The capture data is stored in the stack by time frame; that is, an appliance holds all capture data for a certain time frame and overwrites the oldest data.

The time frame for the entire stack is established by concatenating all appliances in order. For example, in a stack with three appliances, Appliance A stores data from time frame 0-9, Appliance B stores data from time frame 10-19, and Appliance C stores data from time frame 20-29. As the appliances fill up with data, the oldest capture data is overwritten first. Appliance A now stores data from time frame 30 -39, overwriting data from time frame 0-9.

If an appliance goes offline, a gap in the capture data occurs, but the gap is limited to the time frame of the data that is held on the offline appliance. In the stack example, if Appliance B is offline, data from time frame 10-19 is not available, but all other capture data in the stack is available.

Performance considerations

The ring topology that is used to connect the stacked QRadar Network Packet Capture appliances is designed to achieve high availability for continuous capture of data.

Each packet that is transmitted between the appliances includes extra data about the status of the stack. For example, this includes information about which stack node is storing data, and the status of the stack nodes. Depending on your environment, the additional data that is transmitted with each packet might result in capture performance that is less than 10 Gbps under certain circumstances.

For example, network traffic that consists of a high proportion of small packets over time might result in a lower capture rate. While this situation is not typical for most deployments, if under these circumstances, your deployment requires full 10 Gbps capture, it is recommended that the QRadar Network Packet Capture appliances are deployed stand-alone instead of using a stack.

Creating a stack

Create a new physical QRadar Network Packet Capture stack to increase the storage space that is available for your capture data.

Before you begin

Prepare your environment before you create the stack.

- You can stack a maximum of 16 appliances, including the Stack Controller. The maximum physical cabling distance between any two appliances is ten meters.
- Ensure that all appliances in the stack are running the same version of the QRadar Network Packet Capture software.
- Ensure that all appliances are in a group. For more information, see Grouped appliances.
- Connect the appliances to form a ring so that all appliances can communicate with each other. To see an example cabling diagram, see Stacking topology.

  Note: Routing and switching are not allowed. Only peer-to-peer connections are allowed.

Procedure

1. On the Stack Controller, connect Port 2 to the switch or SPAN port that is being monitored; this is the TAP point.
2. Optional. On the Stack Controller, connect Port 3 to a QRadar QNI appliance.

   Port 3 is used to retransmit all capture data to the QNI appliance. The data is retransmitted in a special format with a high-precision data capture timestamp embedded in the frame.
3. On the Stack Nodes, connect port 0 and port 1 to form a ring.

Note: For the Stack Nodes, Ports 2 and 3 must not be used.

Example

The following diagram shows a sample topology with a Stack Controller (Appliance A) and three Stack Nodes (Appliances B, C, and P).

The NT40E3-4 ports are connected by using ports 0 and 1 to form a ring.

1. Appliance A, Port 0 connects to Appliance B, Port 1.
2. Appliance B, Port 0 connects to Appliance C, Port 1.
3. Appliance C, Port 0 connects to Appliance A, Port 1.

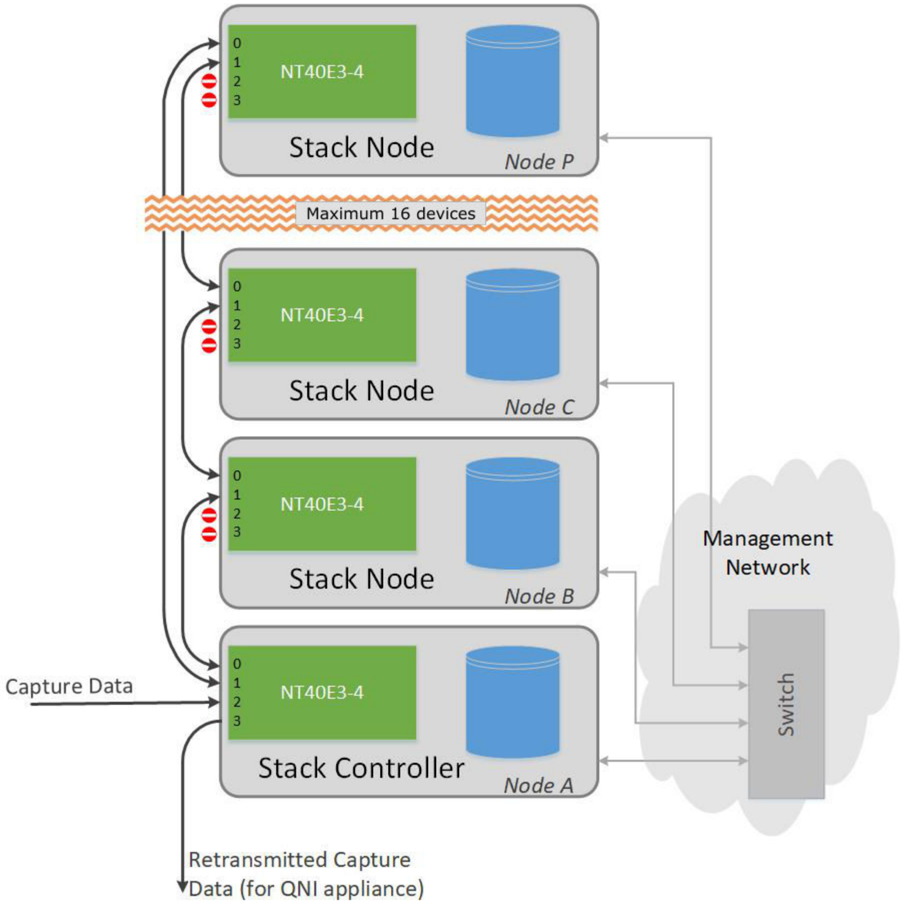


Figure 7. QRadar Network Packet Capture sample topology.

Configuring a stack

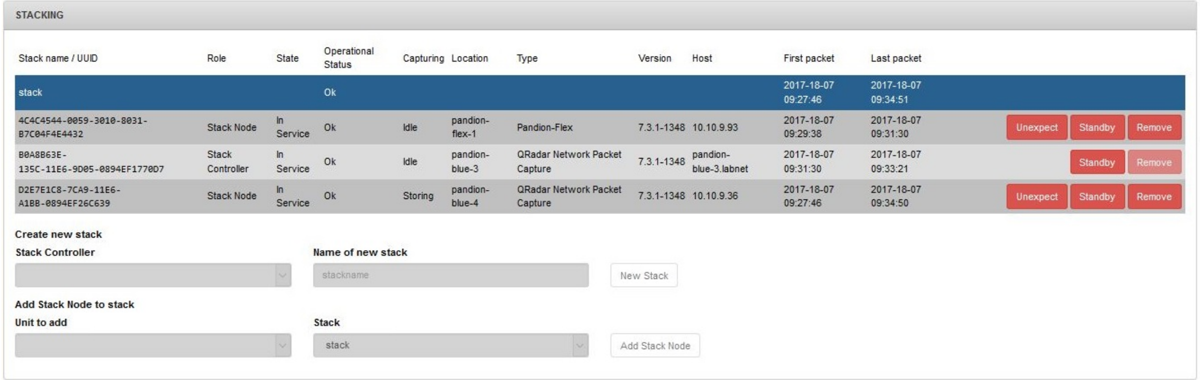
Use the **STACKING** widget to configure the stack.

Before you begin

If an appliance contains capture data that is not relevant to the stack that you are adding it to, remove the captured data from the appliance before adding it to the stack.

About this task

The **STACKING** widget displays the configuration of the stack. The following image shows a stack that is fully configured and capturing data:



STACKING

Stack name / UUID	Role	State	Operational Status	Capturing	Location	Type	Version	Host	First packet	Last packet	
stack			Ok						2017-18-07 09:27:46	2017-18-07 09:34:51	
4C4C4544-0059-3010-8031-B7C04F4E4432	Stack Node	In Service	Ok	Idle	pandion-flex-1	Pandion-Flex	7.3.1-1348	10.10.9.93	2017-18-07 09:29:38	2017-18-07 09:31:30	Unexpect Standby Remove
B0A8B63E-135C-11E6-9D05-0894EF1770D7	Stack Controller	In Service	Ok	Idle	pandion-blue-3	QRadar Network Packet Capture	7.3.1-1348	pandion-blue-3.labnet	2017-18-07 09:31:30	2017-18-07 09:33:21	Standby Remove
D2E7E1C8-7CA9-11E6-A1BB-0894EF26C639	Stack Node	In Service	Ok	Storing	pandion-blue-4	QRadar Network Packet Capture	7.3.1-1348	10.10.9.36	2017-18-07 09:27:46	2017-18-07 09:34:50	Unexpect Standby Remove

Create new stack

Stack Controller

Name of new stack: stackname

Add Stack Node to stack

Unit to add

Stack: stack

Figure 8. Configuring a stack

Only one appliance at a time is capturing data. As the appliance fills up with capture data, a different appliance in the stack becomes the **Storing** appliance.

The order in which appliances are enabled for capture is random. Neither the order of devices in the **STACKING** widget view or the physical cabling influences the selection order. However, when all appliances in the stack hold capture data, the next capturing device is always the appliance that holds capture data with the oldest timestamp.

Procedure

1. Click the **ADMIN** tab and go to the **GROUP MEMBERSHIP** widget. Verify that all appliances for the stack are correctly grouped.
2. Assign a Stack Controller and create the stack:
    a) In the **STACKING** widget, in the **Stack Controller** list, select the appliance that you want to be the Stack Controller.

    The stack name is used only to uniquely identify the stack, and is not used anywhere else in the configuration.

    b) In the **Name of new stack** field, type a descriptive name for the Stack Controller, and then click **New Stack**.

    The new stack is created and appears as a new entry in the **STACKING** widget.
3. Add stack nodes to the stack:
    a) In the **Unit to add** list box, select the appliance that you want to add to the stack.

    b) In the **Stack** list, select the name of the stack that you want to add the appliance to, and click **Add Stack Node**.

    If a group contains multiple stacks, ensure that you select the correct stack name from the menu.

    c) Repeat these steps for each appliance that you want to add to the stack.

    When all appliances are added, the stack should appear healthy and ready to enable data capture.

    Note: When you add Stack Nodes, the operational status of the **STACKING** widget might show temporary Operational Status errors. This happens because connectivity in the stack ring is incomplete until all Stack Nodes are added.
4. Verify the stack configuration:
    a) Select the stack and verify that the list of appliances is as expected for the stack.

    b) Check that each appliance in the stack has the same version number and displays the following values:

    - **Operational Status** = OK
    - **State** = In Service

You are now ready to enable data capture.

5. Turn on data capture:

   a) Click **Expect** next to each Stack Node in the stack to enable the appliance for data capture.

   Note: By default, all Stack Nodes are set to **Unexpect** when they are first added to the stack to prevent an appliance storing captured data until it is physically enabled.

   b) Go to the **GROUP MEMBERSHIP** widget, and click **Switch To** for the relevant Stack Controller.

   c) Go to **Traffic Capture** in the **CONTROL** widget, and click **Turn On** to start capturing data.

   d) Click the **DASHBOARD** tab for the Stack Controller to check for ingress traffic.

   Port 2 of the Stack Controller is the TAP port for the stack. If there is ingress traffic on this port, you see:

   i) The traffic pattern matches the ingress traffic.

   ii) The traffic pattern on the Stack Controller dashboard for all Stack Nodes is twice the size of the ingress traffic (plus a number of 64-127 bytes unicast packets).

   Note: The ingress traffic is transmitted to all appliances in the stack, but in both directions (clockwise and counterclockwise) on port 0 and port 1. At the same time, a proprietary stack protocol is running that continuously carries several small frames across the ring.

6. Check the capture data in the **STACKING** widget:

   a) Check the appliances in your stack, and find the appliance whose **Capturing** column shows a value of **Storing**.

   Only one appliance at a time is capturing data, therefore, only one appliance shows **Storing** and all other appliances are idle.

   b) On the appliance that is capturing data, check that the **First packet** and **Last packet** columns show valid timestamp values.

   As the appliance fills up with capture data, a different appliance in the stack becomes the Storing appliance, and the **First packet** and **Last packet** timestamps for the new appliance are updated.

Adding an appliance to an active stack

You can expand the capacity of a stack by adding appliances while the stack is actively capturing data.

Procedure

1. Install a QRadar Network Packet Capture appliance with the same version of software as the appliances in the stack that you want to expand.
2. Complete the physical installation of the appliance.

   This process includes attaching the appliance to the common management network, breaking up the stack ring, and cabling the new appliance into the ring. You can put the new appliance in any physical location in the stack. For more information, see “Creating a stack” on page 34.

   Note: During this process, connectivity in the stack ring is incomplete, and the operational status of the **STACKING** widget might show temporary cabling errors.
3. Include the new appliance in the group, and add it to the stack as described in Add a Stack Node (Step 3).
4. Check the **STACKING** widget to view the status of the new appliance.

   The appliance is fully operational when the **Operational Status** shows **OK**, the **First packet** and **Last packet** settings show **N/A**, and no cabling errors remain.

   When the appliance that is capturing data is full, the stack switches to the newly inserted appliance for data capture.

Removing an appliance from a stack

When you remove an appliance from the stack, the capture data on the appliance is retained. You can run local searches on the appliance to access the data.

Procedure

To permanently remove an appliance from a stack, select the appliance and click **Remove** in the **STACKING** widget.

Note: You cannot remove the Stack Controller until all Stack Nodes are removed from a stack.

What to do next

Physically remove the cabling from the appliance, and re-cable the stack ring. You may see temporary cabling errors while stack connectivity is re-established.

Maintaining existing stack nodes

You can put a Stack Node in standby mode to allow for upgrades and maintenance while the remaining stack is active. With this capability, you can upgrade each of your Stack Nodes, while the in-service appliances continue to capture data. Before you can upgrade the Stack Controller, you must disable data capture and take the entire stack offline.

Before you begin

Ensure that you update all Stack Nodes before you update the Stack Controller.

About this task

When an appliance is in standby mode, you can upgrade the operating system and application software of the appliance. If the appliance does not need to be restarted, connectivity between the appliance and the stack ring is maintained. If the appliance is actively capturing data when standby mode is enabled, the stack switches immediately to another appliance for active capture.

If an update affects communications with the Stack Controller, for example an update to protocols, the Stack Nodes can handle this during the update process because they are backward compatible with protocols and commands that are sent from the Stack Controller.

A Stack Node in standby mode has the following characteristics:

- Continues to appear in the stack list in the **STACKING** widget.
- Maintains stack ring connectivity.
- Maintains group membership.
- Includes capture data in searches.
- Is not used as an active capture device in the stack; new data is not captured to this appliance.

You cannot put the Stack Controller into standby mode without a service interruption because it is the only appliance that has the TAP port, and it distributes the data to all appliances in the stack.

Procedure

1. In the **STACKING** widget, select the appliance that you want to work with, and then click **Standby**.

   Note: To allow the maximum time to apply updates to the appliance, select the stack node that has the newest **First packet** and **Last packet** timestamp, but that is not currently capturing data.
2. Apply the updates to the standby appliance.
3. When the maintenance is complete, in the **STACKING** widget, select the appliance and then click **In Service** to re-enable it.

Chapter 7. Troubleshooting issues with QRadar Network Packet Capture appliances

Use this information to troubleshoot issues with the QRadar Network Packet Capture appliance.

Slow response rate on simultaneous searches

If you submit five or more searches in quick succession, with auto-download enabled, you might see the following message:

```
Slow Response: High round-trip time detected for connection to device
```

In this situation, the user interface can take up to a minute to respond. This is a web browser limitation due to the number of simultaneous connections.

New installation on a Lenovo appliance shows excessive syslog messages

After completing a new installation of IBM QRadar Network Packet Capture on a Lenovo appliance, the following syslog message appears repeatedly in the `/var/log/messages` file:

```
Unable to sync network configuration: Network configuration with more than 1 active connection
not allowed.
```

This message might indicate that the installation process enabled a second Ethernet interface. The warning message is benign and does not impact the packet capture process, but you might want to stop the message from appearing in the log file.

To stop the messages from appearing in your log file, follow these steps:

1. Log in to the PCAP server as the root user.
2. On the command line, type `nmtui` to run the **Network Manager Text User Interface Tool**.
3. Select **Activate a connection** to view the connections list.
4. If the **USB Ethernet** connection is active, select the interface and press `Enter` to deactivate it.

   An active interface is indicated by a ***** beside the interface name.
5. Select **Back** and then select **Quit** to exit.

Related concepts

What's new in QRadar Network Packet Capture
This IBM QRadar Network Packet Capture release includes fixes for defects and security vulnerabilities.

Administering QRadar Network Packet Capture appliances

QRadar Network Packet Capture packet capture monitoring
Use the Monitoring widgets on the Dashboard to view the overall status of one or more QRadar Network Packet Capture appliances in a group.

QRadar Network Packet Capture searches and queries
To look for specific packets within a specific time range, and from a specific port, use the **SEARCH** tab. When you specify any combination of source IP, destination IP, source port, destination port, or protocol fields a QRadar Network Packet Capture Query Language (NTQL) string is generated. You can modify the NTQL string, or you can create your own NTQL expression from scratch.

Grouped QRadar Network Packet Capture appliances
Use the QRadar Network Packet Capture grouping feature to group multiple physical appliances together to form a single logical entity for administration and searching. By using the grouping feature, multiple tap points and multiple QRadar Network Packet Capture appliances can be accessed and operated as if they were one appliance.

Stacked QRadar Network Packet Capture appliances

You can extend the storage available for capture data by connecting multiple QRadar Network Packet Capture appliances together in a ring topology to create a stack.

Verify that the QRadar Network Packet Capture appliance is working

Check the user interface, or view the SmartNIC LEDs on the back of the appliance to verify that the appliance is functioning correctly.

If you are checking the LEDs, see "Troubleshooting with external LEDs" on page 41 for more information.

Capture port verification

On the **Dashboard** tab in the **Unit View** widget, check the SmartNIC health data. The link status is shown, as well as the link speed for each port that is functioning.

Note: Link status and health of the system is visible even though data capture has not been started. This information is also available in the **SMARTNIC Setup** widget on the **Admin** tab.

Time Sync Verification

You can verify the time synchronization source and status in the **SYSLOGS** widget on the **Admin** tab. If there are issue, multiple messages might appear in the syslog entries; for example, if there are issues on the lock status of the SmartNIC.

Two types of messages

Two types of messages are logged as shown in the following examples:

- A general entry, whenever the time synchronization source changes, or when the SmartNIC obtains or releases a lock against the time source.
- A PTP entry, containing more detailed information about the exact status, if synchronizing against a PTP primary.

General Entry

Here is the syntax for a general entry:

```
Adapter < number > time-sync status:
In-Sync: < Yes | No >
Current time-sync reference: < OsTime | PTP >
Skew (ns): < number >
Clock rate adjustment (ns): < number >
Clock Hard Reset: < Yes | No >
```

Here is an example of a general entry:

```
Adapter 0 time-sync status:
In-Sync: Yes
Current time-sync reference: OsTime
Skew (ns): -1
Clock rate adjustment (ns): 503
Clock Hard Reset: No
```

PTP Entry

When an adapter is in PTP mode, there is an additional log entry that contains PTP relevant information. Here is the syntax for a PTP entry:

```
Adapter < number > PTP time-sync status:
PTP Time: "--" | < PTP clock time > [ "(TAI)" ]
Port: < IPv4_address > | < IPv6_address > | "IEEE 802.3"
Link Status: < Down | 10M | 100M >
IPv4 Subnet Mask: < IPv4_address >
IPv4 Gateway: < IPv4_address >
DHCP Enabled: "Yes" | "No"
Profile Id: < six_times_2_hex digits >
Profile: < Default | Telecom | Power >
Clock Id: < six_times_2_hex digits >
Domain: < number > | "--"
VLAN: < number >
Delay Mechanism: "E2E", "P2P", "N/A"
PTP Filter: "Min", "PDV", "None", "N/A"
DelayAssemetry: < number >
Clock State: "Faulty" | "INACTIVE" | "SLAVE" | "--"
Mean Path Delay: <number>
GM Clock Identity: < 16_hex_digits >
```

Here is an example of a PTP entry:

```
Adapter 0 time-sync status:
Adapter 0 PTP time-sync status:
PTP Time: Thu 26-May-2016 12:44:03.123456789 (TAI)
Port: 192.168.3.77
Link Status: 100M
IPv4 Subnet Mask: 192.168.3.0
IPv4 Gateway: 192.168.3.1
DHCP Enabled: Yes
Profile Id: 00:1b:19:00:01:00
Profile: Default
Clock Id: 00:0d:e9:03:a2:aa
Domain: 0
VLAN: 0
Delay Mechanism: E2E
PTP Filter: None
Delay Assemetry: 0
Clock State: SLAVE
Mean Path Delay: 0
GM Clock Identity: 000de9fffe03a2aa
```

Troubleshooting with external LEDs

Use the state, location and color of the external LEDs to help you to troubleshoot your QRadar Network Packet Capture appliance.

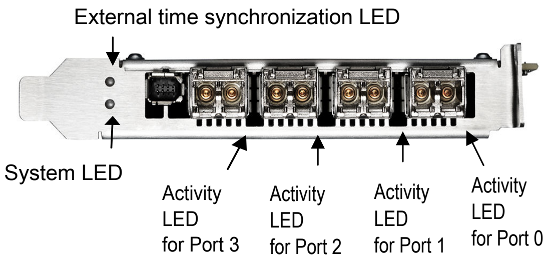


Figure 9. Location of the external LEDs

Activity LEDs

The following table describes the typical states that are indicated by the color of the Activity LEDs.

Table 4. Activity LEDs and operating status of the appliance

State and color	Condition
Off	The driver is not loaded, the Ethernet link is down, or the port is disconnected.
Constant green	The driver is loaded and the Ethernet link is up, but there is no traffic.
Flashing green	The driver is loaded and there is traffic on the ethernet link.

System LED

The following table describes the typical states that are indicated by the color of the System LED.

Table 5. System LED and operating status of the appliance

State and color	Condition
Off	The power is off.
Constant red	During start-up and the power is on, the SmartNIC is checking the power supplies.
Flashing red	After start-up and the power is on, there is an unrecoverable hardware error.
Constant yellow	During start-up and the power is on, and the power supplies are working.
Flashing yellow	There is a new entry in the hardware log.
Constant green	The FPGA is loaded, and the system is running.

External time synchronization LED

The following table describes the typical states that are indicated by the color of the external time synchronization LED.

Table 6. External time synchronization LED and the operating status of the appliance

State and color	Condition
Off	No driver is loaded or the Ethernet link on the Precision Time Protocol (PTP) port is down.
Constant yellow	The Ethernet link on the PTP port is up.

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