



Junos[®] OS

Diameter Base Protocol Feature Guide for Subscriber Management

Release

14.1



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Junos[®] OS Diameter Base Protocol Feature Guide for Subscriber Management

14.1

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About the Documentation

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Documentation and Release Notes

To obtain the most current version of all Juniper Networks® technical documentation, see the product documentation page on the Juniper Networks website at <http://www.juniper.net/techpubs/>.

If the information in the latest release notes differs from the information in the documentation, follow the product Release Notes.

Juniper Networks Books publishes books by Juniper Networks engineers and subject matter experts. These books go beyond the technical documentation to explore the nuances of network architecture, deployment, and administration. The current list can be viewed at <http://www.juniper.net/books>.

Supported Platforms

For the features described in this document, the following platforms are supported:

- MX Series

Using the Examples in This Manual

If you want to use the examples in this manual, you can use the **load merge** or the **load merge relative** command. These commands cause the software to merge the incoming configuration into the current candidate configuration. The example does not become active until you commit the candidate configuration.

If the example configuration contains the top level of the hierarchy (or multiple hierarchies), the example is a *full example*. In this case, use the **load merge** command.

If the example configuration does not start at the top level of the hierarchy, the example is a *snippet*. In this case, use the **load merge relative** command. These procedures are described in the following sections.

Merging a Full Example

To merge a full example, follow these steps:

1. From the HTML or PDF version of the manual, copy a configuration example into a text file, save the file with a name, and copy the file to a directory on your routing platform.

For example, copy the following configuration to a file and name the file **ex-script.conf**. Copy the **ex-script.conf** file to the **/var/tmp** directory on your routing platform.

```
system {
  scripts {
    commit {
      file ex-script.xml;
    }
  }
}
interfaces {
  fxp0 {
    disable;
    unit 0 {
      family inet {
        address 10.0.0.1/24;
      }
    }
  }
}
```

2. Merge the contents of the file into your routing platform configuration by issuing the **load merge** configuration mode command:

```
[edit]
user@host# load merge /var/tmp/ex-script.conf
load complete
```

Merging a Snippet

To merge a snippet, follow these steps:

1. From the HTML or PDF version of the manual, copy a configuration snippet into a text file, save the file with a name, and copy the file to a directory on your routing platform.

For example, copy the following snippet to a file and name the file **ex-script-snippet.conf**. Copy the **ex-script-snippet.conf** file to the **/var/tmp** directory on your routing platform.

```
commit {
  file ex-script-snippet.xml; }
```

2. Move to the hierarchy level that is relevant for this snippet by issuing the following configuration mode command:

```
[edit]
user@host# edit system scripts
[edit system scripts]
```

3. Merge the contents of the file into your routing platform configuration by issuing the **load merge relative** configuration mode command:

```
[edit system scripts]
user@host# load merge relative /var/tmp/ex-script-snippet.conf
load complete
```

For more information about the **load** command, see the *CLI User Guide*.

Documentation Conventions

Table 1 on page xi defines notice icons used in this guide.

Table 1: Notice Icons

Icon	Meaning	Description
	Informational note	Indicates important features or instructions.
	Caution	Indicates a situation that might result in loss of data or hardware damage.
	Warning	Alerts you to the risk of personal injury or death.
	Laser warning	Alerts you to the risk of personal injury from a laser.
	Tip	Indicates helpful information.
	Best practice	Alerts you to a recommended use or implementation.

Table 2 on page xi defines the text and syntax conventions used in this guide.

Table 2: Text and Syntax Conventions

Convention	Description	Examples
Bold text like this	Represents text that you type.	To enter configuration mode, type the configure command: user@host> configure

Table 2: Text and Syntax Conventions (*continued*)

Convention	Description	Examples
Fixed-width text like this	Represents output that appears on the terminal screen.	<pre>user@host> show chassis alarms</pre> <p>No alarms currently active</p>
<i>Italic text like this</i>	<ul style="list-style-type: none"> Introduces or emphasizes important new terms. Identifies guide names. Identifies RFC and Internet draft titles. 	<ul style="list-style-type: none"> A policy <i>term</i> is a named structure that defines match conditions and actions. <i>Junos OS CLI User Guide</i> RFC 1997, <i>BGP Communities Attribute</i>
<i>Italic text like this</i>	Represents variables (options for which you substitute a value) in commands or configuration statements.	<p>Configure the machine's domain name:</p> <pre>[edit] root@# set system domain-name domain-name</pre>
Text like this	Represents names of configuration statements, commands, files, and directories; configuration hierarchy levels; or labels on routing platform components.	<ul style="list-style-type: none"> To configure a stub area, include the stub statement at the [edit protocols ospf area area-id] hierarchy level. The console port is labeled CONSOLE.
< > (angle brackets)	Encloses optional keywords or variables.	stub <default-metric metric>;
(pipe symbol)	Indicates a choice between the mutually exclusive keywords or variables on either side of the symbol. The set of choices is often enclosed in parentheses for clarity.	broadcast multicast (string1 string2 string3)
# (pound sign)	Indicates a comment specified on the same line as the configuration statement to which it applies.	rsvp { # Required for dynamic MPLS only
[] (square brackets)	Encloses a variable for which you can substitute one or more values.	community name members [community-ids]
Indentation and braces ({ })	Identifies a level in the configuration hierarchy.	<pre>[edit] routing-options { static { route default { nexthop address; retain; } } }</pre>
;(semicolon)	Identifies a leaf statement at a configuration hierarchy level.	
GUI Conventions		
Bold text like this	Represents graphical user interface (GUI) items you click or select.	<ul style="list-style-type: none"> In the Logical Interfaces box, select All Interfaces. To cancel the configuration, click Cancel.

Table 2: Text and Syntax Conventions (*continued*)

Convention	Description	Examples
> (bold right angle bracket)	Separates levels in a hierarchy of menu selections.	In the configuration editor hierarchy, select Protocols>Ospf .

Documentation Feedback

We encourage you to provide feedback, comments, and suggestions so that we can improve the documentation. You can send your comments to techpubs-comments@juniper.net, or fill out the documentation feedback form at <https://www.juniper.net/cgi-bin/docbugreport/>. If you are using e-mail, be sure to include the following information with your comments:

- Document or topic name
- URL or page number
- Software release version (if applicable)

Requesting Technical Support

Technical product support is available through the Juniper Networks Technical Assistance Center (JTAC). If you are a customer with an active J-Care or JNASC support contract, or are covered under warranty, and need post-sales technical support, you can access our tools and resources online or open a case with JTAC.

- JTAC policies—For a complete understanding of our JTAC procedures and policies, review the *JTAC User Guide* located at <http://www.juniper.net/us/en/local/pdf/resource-guides/7100059-en.pdf>.
- Product warranties—For product warranty information, visit <http://www.juniper.net/support/warranty/>.
- JTAC hours of operation—The JTAC centers have resources available 24 hours a day, 7 days a week, 365 days a year.

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For quick and easy problem resolution, Juniper Networks has designed an online self-service portal called the Customer Support Center (CSC) that provides you with the following features:

- Find CSC offerings: <http://www.juniper.net/customers/support/>
- Search for known bugs: <http://www2.juniper.net/kb/>
- Find product documentation: <http://www.juniper.net/techpubs/>
- Find solutions and answer questions using our Knowledge Base: <http://kb.juniper.net/>
- Download the latest versions of software and review release notes: <http://www.juniper.net/customers/csc/software/>

- Search technical bulletins for relevant hardware and software notifications:
<http://kb.juniper.net/InfoCenter/>
- Join and participate in the Juniper Networks Community Forum:
<http://www.juniper.net/company/communities/>
- Open a case online in the CSC Case Management tool: <http://www.juniper.net/cm/>

To verify service entitlement by product serial number, use our Serial Number Entitlement (SNE) Tool: <https://tools.juniper.net/SerialNumberEntitlementSearch/>

Opening a Case with JTAC

You can open a case with JTAC on the Web or by telephone.

- Use the Case Management tool in the CSC at <http://www.juniper.net/cm/>.
- Call 1-888-314-JTAC (1-888-314-5822 toll-free in the USA, Canada, and Mexico).

For international or direct-dial options in countries without toll-free numbers, see <http://www.juniper.net/support/requesting-support.html>.

PART 1

Overview

- [Diameter Base Protocol in Subscriber Access Networks on page 3](#)

CHAPTER 1

Diameter Base Protocol in Subscriber Access Networks

- [Diameter Base Protocol Overview on page 3](#)
- [Messages Used by Diameter Applications on page 5](#)
- [Diameter AVPs and Diameter Applications on page 10](#)

Diameter Base Protocol Overview

The Diameter protocol is defined in *RFC 3588, Diameter Base Protocol*, and provides an alternative to RADIUS that is more flexible and extensible. The Diameter base protocol provides basic services to one or more applications (also called functions) that each runs in a different Diameter instance. The individual application provides the extended AAA functionality. Applications that use Diameter include Gx-Plus, JSRC, and PTSP.

Diameter peers communicate over a reliable TCP transport layer connection by exchanging Diameter messages that convey status, requests, and acknowledgments by means of standard Diameter AVPs and application-specific AVPs. The Diameter transport layer configuration is based on Diameter network elements (DNEs); multiple DNEs per Diameter instance are supported. Currently only the predefined *master* Diameter instance is supported, but you can configure alternative values for many of the master Diameter instance values.

Each DNE consists of a prioritized list of peers and a set of routes that define how traffic is forwarded. Each route associates a destination with a function, a function partition, and a metric. When an application sends a message to a routed destination, all routes within the Diameter instance are examined for a match. When the best route to the destination has been selected, the message is forwarded by means of the DNE that includes that route.

Multiple routes to the same destination can exist within a given DNE and in different DNEs. In the case of multiple routes that match a request for forwarding, the best route is selected as follows:

1. The route with the lowest metric is selected.
2. In the event of a tie, the route with the highest specification score is selected.

3. In the event of another tie, then the names of the DNEs are compared in lexicographical order. The route in the DNE with the lowest value is selected. For example, `dne-austin` has a lower value than `dne-boston`.
4. If the routes are tied within the same DNE, then the route names are compared in lexicographical order. The route with the lowest value is selected.

The specification score of a route is 0 by default. Points are added to the score as follows:

- If the destination realm matches the request, add 1.
- If the destination host matches the request, add 2.
- If the function matches the request, add 3.
- If the function partition matches the request, add 4.

When the state of any DNE changes, the route lookup for all destinations is reevaluated. All outstanding messages to routed destinations are rerouted as needed, or discarded.

To configure a Diameter network element, include the **network-element** statement at the **[edit diameter]** hierarchy level. Include the **route** statement at the **[edit diameter network-element element-name forwarding]** hierarchy level.

To configure a route for the DNE, include the **destination** (optional), **function** (optional), and **metric** statements at the **[edit diameter network-element element-name forwarding route dne-route-name]** hierarchy level.

Specify the Diameter peers associated with the DNE by including one or more **peer** statements at the **[edit diameter network-element element-name]** hierarchy level.

Set the priority for each peer with the **priority** statement at the **[edit diameter network-element element-name peer peer-name]** hierarchy level.

Diameter requires you to configure information about the origin node; this is the endpoint node that originates Diameter for the Diameter instance. Include the **host** and **realm** statements at the **[edit diameter]** hierarchy level to configure the Diameter origin.

You can optionally configure one or more *transports* to specify the source (local) address of the transport layer connection. To configure a Diameter transport, include the **transport** statement at the **[edit diameter]** hierarchy level. Then include the **address** statement at the **[edit diameter transport transport-name]** hierarchy level.

You can optionally specify a logical system and routing instance for the connection by including the **logical-system** and **routing-instance** statements at the **[edit diameter transport transport-name]** hierarchy level. By default, Diameter uses the *default* logical system and *master* routing instance. The logical system and routing instance for the transport connection must match that for the peer, or a configuration error is reported.

Each Diameter peer is specified by a name. Peer attributes include address and the destination TCP port used by active connections to this peer. To configure a Diameter peer, include the **peer** statement at the **[edit diameter]** hierarchy level, and then include the **address** and **connect-actively** statements at the **[edit diameter peer peer-name]** hierarchy level.

To configure the active connection, include the **port** and **transport** statements at the **[edit diameter peer *peer-name* connect-actively]** hierarchy level. The assigned transport identifies the transport layer source address used to establish active connections to the peers. **transport** statements.

Related Documentation

- [Configuring Diameter on page 21](#)
- [Messages Used by Diameter Applications on page 5](#)
- [Diameter AVPs and Diameter Applications on page 10](#)
- *Juniper Networks Session and Resource Control (SRC) and JSRC Overview*
- *Juniper Networks Session and Resource Control (SRC) and PTSP Overview*
- *Gx-Plus for Provisioning Subscribers Overview*

Messages Used by Diameter Applications

The following Diameter applications are supported by Junos OS:

- JSRC—A Juniper Networks Diameter application registered with the IANA (<http://www.iana.org>) as Juniper Policy-Control-JSRC, with an ID of 16777244. Communicates with the SAE (remote SRC peer).
- PTSP—A Juniper Networks Diameter application registered with the IANA (<http://www.iana.org>) as Juniper JGx, with an ID of 16777273. Communicates with the SAE (remote SRC peer).
- Gx-Plus—An application that extends the 3GPP Gx interface for wireline use cases. 3GPP Gx is registered with the IANA (<http://www.iana.org>). Communicates with a PCRF.

If data for a particular AVP included in a message is not available to the router, Gx-Plus simply omits the AVP from the message it sends to the PCRF. If the PCRF determines it has insufficient information to make a decision, it may deny the request. The Diameter answer messages include the Result-Code AVP (AVP 268); the values of this AVP convey success, failure, or errors to the requestor.

Juniper Networks has also registered the Juniper-Session-Recovery application (16777296) and two new command codes (8388628 for Juniper-Session-Events and 8388629 for Juniper-Session-Discovery) with the IANA (<http://www.iana.org>).

[Table 3 on page 5](#) describes Diameter messages the applications use.

Table 3: Diameter Messages and Diameter Applications

Diameter Message	Code	Application	Description
AA-Request (AAR)	265	JSRC, PTSP	Request from the application to the SAE at new subscriber login or during SAE-application synchronization. The request can be one of three types: address-authorization, provisioning-request, or synchronization.

Table 3: Diameter Messages and Diameter Applications (*continued*)

Diameter Message	Code	Application	Description
AA-Answer (AAA)	265	JSRC, PTSP	Response from the SAE to the application's AA-Request message.
Abort-Session-Request (ASR)	274	JSRC, PTSP	Request from the SAE to the application to log out a provisioned subscriber.
Abort-Session-Answer (ASA)	274	JSRC, PTSP	Response from the application to the SAE's ASR message. If the application sends the logout request to AAA, the ASA message includes a success notification (ACK). If the logout failed, the ASA message includes a failure notification (NAK).
Accounting-Request (ACR)	271	JSRC, PTSP	Request from the SAE to the application or from the application to the SAE for statistics.
Accounting-Answer (ACA)	271	JSRC, PTSP	Response to the ACR message to provide statistics for each installed policy (service).

Table 3: Diameter Messages and Diameter Applications (*continued*)

Diameter Message	Code	Application	Description
Credit-Control-Request (CCR)	272	Gx-Plus	<p>Request from Gx-Plus to the PCRF at subscriber login, logout, or update.</p> <p>An initial request (CCR-I) is sent when a subscriber logs in and AAA is requested to activate the subscriber's session. Gx-Plus retries the CCR-I message if a CCA-I message is not received from the PCRF within 10 seconds. The CCR-I message is retried up to 3 times.</p> <p>If no CCA-I is received after the 4 CCR-I messages have been sent—the first message plus 3 retries—then Gx-Plus starts sending CCR-N messages. CCR-N messages are retried forever until a success or failure response is received from the PCRF. CCR-N messages include the Juniper-Provisioning-Source AVP (AVP code 2101) set to local to notify the PCRF that the router has the authority to make a local decision regarding subscriber service activation.</p> <p>An update request (CCR-U) message is sent when a usage threshold is reached. The CCR-U reports the actual usage for all statistics. The PCRF may return a CCA-U message that includes new monitoring thresholds, service activations, service deactivations.</p> <p>A CCR-U is also sent to report the status of service activation or deactivation.</p> <p>A termination request (CCR-T) is sent at subscriber logout to inform the PCRF that a provisioned subscriber session is being terminated. CCR-T messages are retried forever until a success response is received from the PCRF.</p>

Table 3: Diameter Messages and Diameter Applications (*continued*)

Diameter Message	Code	Application	Description
Credit-Control-Answer (CCA)	272	Gx-Plus	<p>Reply from the PCRF to a CCR message.</p> <p>In response to a CCR-I, the PCRF returns a CCA-I message that indicates success (DIAMETER_SUCCESS) or failure (DIAMETER_AUTHORIZATION_REJECTED) depending on whether the subscriber has sufficient credit for the requested services. All other responses are ignored and the CCR-I is retried.</p> <p>In response to a CCR-T, the PCRF returns a CCA-T message that indicates a successful termination with a value of 2001 (DIAMETER_SUCCESS) in the Result-Code AVP. All other responses are ignored and the CCR-T is retried.</p> <p>A CCA-N is a response to a CCR-N.</p>
Juniper-Session-Discovery-Request (JSDR)	8388629	Gx-Plus	Discovery request from the PCRF to Gx-Plus to discover subscriber sessions on the router.
Juniper-Session-Discovery-Answer (JSDA)	8388629	Gx-Plus	<p>Reply from router to a JSDR message; describes session information. The Result-Code AVP includes one of the following values, or an error value:</p> <ul style="list-style-type: none"> • 2001—DIAMETER_SUCCESS; the end of the database was reached, meaning all information has been sent. • 2002—DIAMETER_LIMITED_SUCCESS; some of the session information was sent, but more remains to be sent.
Juniper-Session-Event-Request (JSER)	8388628	Gx-Plus	Request from router to PCRF regarding events that take place on the router. Notifies the PCRF of certain events on the router by including the Juniper-Event-Type AVP (AVP code 2103). Events reported include cold or warm boots, explicit discovery requests, substantial configuration changes, non-response or error response from PCRF, and exhaustion of fault-tolerant resources.
Juniper-Session-Event-Answer (JSEA)	8388628	Gx-Plus	Reply from PCRF to a JSER message.
Push-Profile-Request (PPR)	288	JSRC, PTSP	Request from the SAE to the router to activate or deactivate services for a subscriber.

Table 3: Diameter Messages and Diameter Applications (*continued*)

Diameter Message	Code	Application	Description
Push-Profile-Answer (PPA)	288	JSRC, PTSP	Response from the router to the SAE's PPR message. Includes success or failure notification for each of the service activation or deactivation commands in the request.
Re-Auth-Request (RAR)	258	Gx-Plus	Audit request from the PCRF to router to determine whether a specific subscriber is still present.
Re-Auth-Answer (RAA)	258	Gx-Plus	Reply from router to a RAR message; indicates whether the subscriber is active. The Result-Code AVP includes one of the following values: <ul style="list-style-type: none"> • 2001—DIAMETER_SUCCESS; subscriber entry was found. • 5002—DIAMETER_UNKNOWN_SESSION_ID; subscriber entry was not found. • 3002—DIAMETER_UNABLE_TO_DELIVER; Gx-Plus is not configured.
Session-Resource-Query (SRQ)	277	JSRC, PTSP	Request from the router to the SAE or from the SAE to the router to initiate synchronization between router and the SAE.
Session-Resource-Reply (SRR)	277	JSRC, PTSP	Response to the SRQ message to begin synchronization.
Session-Termination-Request (STR)	275	JSRC, PTSP	Notification from the router to the SAE that a provisioned subscriber has logged out.
Session-Termination-Answer (STA)	275	JSRC, PTSP	Response from the SAE to the router's STR message. Includes success or failure notification.

Related Documentation

- *Juniper Networks Session and Resource Control (SRC) and JSRC Overview*
- *Understanding JSRC-SAE Interactions*
- *Juniper Networks Session and Resource Control (SRC) and PTSP Overview*
- *Understanding PTSP-SAE Interactions*
- *Gx-Plus for Provisioning Subscribers Overview*
- *Understanding Gx-Plus Interactions Between the Router and the PCRF*

Diameter AVPs and Diameter Applications

Diameter conveys information by including various attribute-value pairs (AVPs) in Diameter messages. [Table 4 on page 10](#) lists the standard Diameter AVPs used in interactions with the supported Diameter applications. Diameter reserves AVP code numbers 0 through 255 for RADIUS AVPs that are implemented in Diameter.

Table 4: Standard Diameter AVPs

Attribute Number	Diameter AVP	Application	Description	Type
1	User-Name	Gx-Plus, JSRC	Specifies the username. For a subscriber managed by AAA, the value is the subscriber's login name. For a static interface, the value is the interface name, which is used as the subscriber's login name.	UTF8String
8	Framed-IP-Address	Gx-Plus, JSRC, PTSP	Identifies the IPv4 address configured for the subscriber. This is the same value as for RADIUS Framed-IP-Address attribute [8].	OctetString
55	Event-Timestamp	Gx-Plus, JSRC, PTSP	Specifies the time of the event that triggered the message in which this AVP is included. Time is indicated in seconds since January 1, 1900, 00:00 UTC.	Time
85	Acct-Interim-Interval	JSRC, PTSP	<p>Number of seconds between each interim accounting update for this session.</p> <p>The router uses the following guidelines for interim accounting:</p> <ul style="list-style-type: none"> Attribute value is within the acceptable range (600 through 86,400 seconds)—Accounting is updated at the specified interval. Attribute value is less than the minimum acceptable value—Accounting is updated at the minimum interval (600 seconds). Attribute value is greater than the maximum acceptable value—Accounting is updated at the maximum interval (86,400 seconds). 	Unsigned32
87	NAS-Port-Id	Gx-Plus, JSRC, PTSP	Identifies the port of the NAS that authenticates the user. This is the same value as for RADIUS NAS-Port-Id attribute [87].	UTF8String
263	Session-ID	Gx-Plus, JSRC, PTSP	Specifies the subscriber session identifier. The router assigns the value to uniquely identify a subscriber session.	UTF8String

Table 4: Standard Diameter AVPs (*continued*)

Attribute Number	Diameter AVP	Application	Description	Type
268	Result-Code	Gx-Plus, JSRC, PTSP	<p>Indicates whether a request completed successfully. Provides an error code if the request failed.</p> <p>The following classes are recognized by Diameter:</p> <ul style="list-style-type: none"> • 1xxx—Informational • 2xxx—Success • 3xxx—Protocol errors • 4xxx—Transient errors • 5xxx—Permanent failures <p>Unrecognized classes, which begin with numerals 6–9 or 0, are handled as permanent failures.</p> <p>JSRC and PTSP support the following values; all non-success values are treated as permanent failures:</p> <ul style="list-style-type: none"> • 1001—DIAMETER MULTI ROUND AUTH • 2001—DIAMETER SUCCESS • 5002—DIAMETER UNKNOWN SESSION ID • 5012—DIAMETER UNABLE TO COMPLY <p>JSRC also supports the following value, which is treated as a permanent failure:</p> <ul style="list-style-type: none"> • 3004—DIAMETER TOO BUSY; this is a transient condition, typically when the router already has a request in process for a specified subscriber. <p>Gx-Plus supports the following values for errors in a PCRF response; when these values are received or the response is malformed or unrecognizable, the request is retried.</p> <ul style="list-style-type: none"> • 3001—DIAMETER COMMAND NOT SUPPORTED; the application is not running or the command is not recognized. • 3004—DIAMETER TOO BUSY; the received message is above either the quota of downstream transactions or the outstanding message memory limit for messages from the network. • 5012—DIAMETER UNABLE TO COMPLY; the received message is greater than the local limit. 	Unsigned32

Table 4: Standard Diameter AVPs (*continued*)

Attribute Number	Diameter AVP	Application	Description	Type
277	Auth-Session-State	JSRC, PTSP	Indicates whether AAA session state is maintained. <ul style="list-style-type: none"> 0—STATE MAINTAINED 1—NO STATE MAINTAINED 	Enumerated
295	Termination-Cause	JSRC, PTSP	Indicates the reason why a session was terminated on the access device. <ul style="list-style-type: none"> 1—DIAMETER LOGOUT 2—DIAMETER SERVICE NOT PROVIDED 3—DIAMETER BAD ANSWER 4—DIAMETER ADMINISTRATIVE 5—DIAMETER LINK BROKEN 6—DIAMETER AUTH EXPIRED 7—DIAMETER USER MOVED 8—DIAMETER SESSION TIMEOUT 	Enumerated
415	CC-Request-Number	Gx-Plus	Identifies a request within a session. The combination of Session-Id and CC-Request-Type is globally unique. The number is incremented for each request during the course of a session. The number is reset when a router high availability event takes place.	Unsigned32
416	CC-Request-Type	Gx-Plus	Specifies the type of credit control request: <ul style="list-style-type: none"> INITIAL REQUEST (1) UPDATE REQUEST (2) TERMINATION_REQUEST (3) EVENT REQUEST (4) 	Enumerated
431	Granted-Service-Unit	Gx-Plus	Contains the amount that can be provided of one or more of the following requested units specified by the client: CC-Input-Octets, CC-Output-Octets, CC-Time, or CC-Total-Octets. Included in CCA-I messages, and may be included in CCA-U messages.	Grouped
446	Used-Service-Unit	Gx-Plus	Contains the amount of the requested units that have been actually used; measured from 4 when the service is activated. The units are one or more of the following requested units specified by the client: CC-Input-Octets, CC-Output-Octets, CC-Time, or CC-Total-Octets. Included in CCR-U messages.	Grouped

Table 4: Standard Diameter AVPs (*continued*)

Attribute Number	Diameter AVP	Application	Description	Type
480	Accounting-Record-Type	JSRC, PTSP	<p>Specifies the type of account record for service accounting:</p> <ul style="list-style-type: none"> • INTERIM_RECORD—Accounting record sent between the start and stop records, at intervals specified by the Acct-Interim-Interval AVP (AVP code 85). It contains cumulative accounting data for the existing accounting session. • START_RECORD—Accounting record sent when the service is activated to initiate the accounting session. It contains accounting data relevant to the initiation of that session. • STOP_RECORD—Accounting record sent when the service is deactivated to terminate the accounting session. It contains cumulative data relevant to that session. 	Enumerated
1001	Charging-Rule-Install	Gx-Plus	Requests the installation of the rule (activation of the service) designated by the included Charging-Rule-Name AVP (1005). This AVP has a vendor ID of 10415 (3GPP).	Grouped
1002	Charging-Rule-Remove	Gx-Plus	Requests the removal of the rule (deactivation of the service) designated by the included Charging-Rule-Name AVP (1005). This AVP has a vendor ID of 10415 (3GPP).	Grouped
1005	Charging-Rule-Name	Gx-Plus	Name of a specific rule that has been installed, modified, or removed.	OctetString
1066	Monitoring-Key	Gx-Plus	Specifies which of the monitoring structures to use. Included in Charging-Rule-Install AVP (1001). The MX router does not support aggregation of statistics across services, so the value of this AVP must be different for each service. This AVP has a vendor ID of 10415 (3GPP).	OctetString
1067	Usage-Monitoring-Information	Gx-Plus	Sets monitoring thresholds. When service statistics match at least one of the granted service values, the router sends a CCR-U report with the current statistics to the PCRF. Includes the Monitoring-Key AVP (1066) and the Granted-Service-Unit AVP (431). This AVP has a vendor ID of 10415 (3GPP).	Grouped

Juniper Networks AVPs are used in addition to the standard Diameter AVPs. These AVPs have an enterprise number of 2636. [Table 5 on page 14](#) lists the Juniper Networks AVPs that the supported Diameter applications use.

Table 5: Juniper Networks Diameter AVPs

Attribute Number	Diameter AVP	Application	Description	Type
2004	Juniper-Service-Bundle	JSRC	Specifies the name of the service bundle.	OctetString
2010	Juniper-DHCP-Options	JSRC	Specifies the client's DHCP options.	OctetString
2011	Juniper-DHCP-GI-Address	JSRC	Specifies the DHCP relay agent's IP address.	OctetString
2020	Juniper-Policy-Install	JSRC, PTSP	Specifies policies to be activated for the subscriber. Includes Juniper-Policy-Name and Juniper-Policy-Definition	Grouped
2021	Juniper-Policy-Name	JSRC, PTSP	Defines the name of a policy decision.	OctetString
2022	Juniper-Policy-Definition	JSRC, PTSP	Defines a policy decision. Includes Juniper-Policy-Name, Juniper-Template-Name, and Juniper-Substitution.	Grouped
2023	Juniper-Template-Name	JSRC, PTSP	Profile name defined by the router. PTSP supports only the <code>__svc_rule__</code> policy template.	UTF8String
2024	Juniper-Substitution	JSRC, PTSP	Defines the substitution attributes. Includes Juniper-Substitution-Name and Juniper-Substitution-Value.	OctetString
2025	Juniper-Substitution-Name	JSRC, PTSP	Defines the name of the variable to be replaced.	OctetString
2026	Juniper-Substitution-Value	JSRC, PTSP	Defines the value of the variable to be replaced.	OctetString
2027	Juniper-Policy-Remove	JSRC, PTSP	Specifies policies to be deactivated for the subscriber. Includes Juniper-Policy-Name.	Grouped
2035	Juniper-Policy-Failed	JSRC, PTSP	Specifies the name of the policy activation or deactivation that failed.	OctetString
2038	Juniper-Policy-Success	JSRC, PTSP	Specifies the name of the policy activation or deactivation that succeeded.	OctetString
2046	Juniper-Logical-System	JSRC, PTSP	Specifies the logical system.	UTF8String
2047	Juniper-Routing-Instance	JSRC, PTSP	Specifies the routing instance.	UTF8String
2048	Juniper-Jsrc-Partition	JSRC, PTSP	Specifies the logical system and routing instance for the subscriber or request. Includes Juniper-Logical-System and Juniper-Routing-Instance	Grouped

Table 5: Juniper Networks Diameter AVPs (*continued*)

Attribute Number	Diameter AVP	Application	Description	Type
2050	Juniper-Request-Type	JSRC, PTSP	Describes the type of request: <ul style="list-style-type: none"> 1—ADDRESS_AUTHORIZATION 2—PROVISIONING_REQUEST 3—SYNCHRONIZATION 	Enumerated
2051	Juniper-Synchronization-Type	JSRC, PTSP	Describes the type of synchronization: <ul style="list-style-type: none"> 1—FULL-SYNC 2—FAST-SYNC 3—NO-STATE-TO-SYNC 	Enumerated
2052	Juniper-Synchronization	JSRC, PTSP	Describes the state of synchronization: <ul style="list-style-type: none"> 1—NO-SYNC; this is the default state 2—SYNC-IN-PROGRESS 3—SYNC-COMPLETE 	Enumerated
2053	Juniper-Acct-Record	JSRC, PTSP	Statistics data for each policy installed for this subscriber. Includes Juniper-Policy-Name.	Grouped
2054	Juniper-Acct-Collect	JSRC, PTSP	Specifies whether to collect accounting data for the installed policy (service) when included in the Juniper-Policy-Install AVP: <ul style="list-style-type: none"> 1—COLLECT_ACCT 2—NOT_COLLECT_ACCT 	Enumerated
2058	Juniper-State-ID	JSRC, PTSP	Specifies the value assigned to each synchronization cycle for the purpose of identifying which messages to discard. All solicited requests containing the same Juniper-State-ID belong to the same Session-Resource-Query (SRQ) synchronization cycle. Messages from a previous synchronization cycle are discarded. When a new cycle begins, the value of the Juniper-State-ID AVP is increased by 1. NOTE: For solicited synchronization requests, the SRQ message contains the incremented Juniper-State-ID value. For unsolicited synchronization requests, the Session-Resource-Reply (SRR) message contains the incremented Juniper-State-ID value.	Unsigned32
2100	Juniper-Virtual-Router	Gx-Plus, JSRC	Specifies the name of the virtual router associated with the session.	UTF8String

Table 5: Juniper Networks Diameter AVPs (*continued*)

Attribute Number	Diameter AVP	Application	Description	Type
2101	Juniper-Provisioning-Source	Gx-Plus	Specifies the provisioning source for the session in CCR-N and JSDA messages: <ul style="list-style-type: none"> 1—Local 2—Remote 	Enumerated
2102	Juniper-Provisioning-Descriptor	Gx-Plus	Defines the group used in JSDA messages that includes the session ID, and optionally Juniper-Provisioning-Source and subscriber data.	Grouped
2103	Juniper-Event-Type	Gx-Plus	Communicates the event type in JSER messages: <ul style="list-style-type: none"> 1—Cold boot; all sessions are lost 2—Warm boot; sessions are preserved 3—Discovery requested by the operator 4—<i>Are you there?</i> (AYT); application level ping sent when the notification is due to no response or an erroneous response from the PCRF, or due to a configuration change. 5—AWD; application-level watchdog sent by the router when there has been no other activity for 15 seconds. The watchdog is sent every 5 seconds unless preempted by higher-priority synchronization event. 	Enumerated
2104	Juniper-Discovery-Descriptor	Gx-Plus	Defines the group used in JSDR and JSDA messages that includes parameters of a discovery request: discovery type, request string, verbosity, max results.	Grouped
2105	Juniper-Discovery-Type	Gx-Plus	Specifies the discovery subcommand for JSDR and JSDA messages: <ul style="list-style-type: none"> 1—Exact: look up the data for the specified session. 2—Bulk: Provide get-bulk kinds of information after the specified string. 3—Done: Stop retries for all sessions up to the specified session. 	Enumerated

Table 5: Juniper Networks Diameter AVPs (*continued*)

Attribute Number	Diameter AVP	Application	Description	Type
2106	Juniper-Verbosity-Level	Gx-Plus	Specifies the verbosity level for JSDR and JSDA messages: <ul style="list-style-type: none"> 1—Summary; include only the Session-Id AVP. 2—Brief; include the Session-Id, Juniper-Virtual-Router, and Framed-IP-Address AVPs. 3—Detail; include the Session-Id, Juniper-Provisioning-Source, Juniper-Virtual-Router, Framed-IP-Address, and Event-Timestamp AVPs. 4—Extensive; include all available session information. 	Enumerated
2107	Juniper-String-A	Gx-Plus	Specifies a generic string that is interpreted according to the context.	UTF8String
2108	Juniper-String-B	Gx-Plus	Specifies a generic string that is interpreted according to the context.	UTF8String
2109	Juniper-String-C	Gx-Plus	Specifies a generic string that is interpreted according to the context.	UTF8String
2110	Juniper-Unsigned32-A	Gx-Plus	Specifies a generic, unsigned 32-bit integer that is interpreted according to the context.	Unsigned32
2111	Juniper-Unsigned32-B	Gx-Plus	Specifies a generic, unsigned 32-bit integer that is interpreted according to the context.	Unsigned32
2112	Juniper-Unsigned32-C	Gx-Plus	Specifies a generic, unsigned 32-bit integer that is interpreted according to the context.	Unsigned32

Tekelec AVPs are used only for Gx-Plus. These AVPs have an enterprise number of 21274. [Table 6 on page 17](#) lists the Tekelec AVPs. These four variables are used to provide substitution values for user-defined CoS service variables.

Table 6: Tekelec Diameter AVPs

Attribute Number	Diameter AVP	Application	Description	Type
5555	Tekelec-Charging-Rule-Argument-Name	Gx-Plus	Defines the name of the service variable to be replaced.	OctetString
5556	Tekelec-Charging-Rule-Argument-Value	Gx-Plus	Defines the value of the service variable to be replaced.	OctetString

Table 6: Tekelec Diameter AVPs (*continued*)

Attribute Number	Diameter AVP	Application	Description	Type
5557	Tekelec-Charging-Rule-Argument	Gx-Plus	Defines the substitution attributes used to replace service variables. Includes Tekelec-Charging-Rule-Argument-Name AVP (5555) and Tekelec-Charging-Rule-Argument-Value AVP (5556).	Grouped
5558	Tekelec-Charging-Rule-With-Arguments	Gx-Plus	Requests the installation of the rule (activation of the service) designated by the included Charging-Rule-Name AVP (1005). Requested service variable substitutions are provided by the optionally included Tekelec-Charging-Rule-Argument AVP (5557).	Grouped

**Related
Documentation**

- *Understanding JSRC-SAE Interactions*
- *Understanding PTSP-SAE Interactions*
- *Understanding Gx-Plus Interactions Between the Router and the PCRF*
- [Diameter Base Protocol Overview on page 3](#)
- *Juniper Networks Session and Resource Control (SRC) and JSRC Overview*
- *Juniper Networks Session and Resource Control (SRC) and PTSP Overview*
- *Gx-Plus for Provisioning Subscribers Overview*

PART 2

Configuration

- [Configuration Overview on page 21](#)
- [Configuration Tasks for Diameter Base Protocol on page 23](#)
- [Configuration Statements on page 27](#)

CHAPTER 2

Configuration Overview

- [Configuring Diameter on page 21](#)

Configuring Diameter

You configure Diameter by specifying the endpoint origin, the remote peers, the transport layer connection, and network elements that associate routes with peers. Only the master Diameter instance is currently supported. You can configure alternative values for the master instance only in the context of the master routing instance

To configure Diameter base protocol:

1. Configure the origin realm and origin host of the Diameter master instance.
See [“Configuring the Origin Attributes of the Diameter Instance” on page 23](#)
2. Configure the Diameter peers.
See [“Configuring Diameter Peers” on page 24](#)
3. (Optional) Configure the Diameter transport layer elements.
See [“Configuring the Diameter Transport” on page 24](#)
4. (Optional) Configure the Diameter network elements.
See [“Configuring Diameter Network Elements” on page 25](#)
5. (Optional) Configure trace options for troubleshooting the configuration.
See [“Tracing Diameter Base Protocol Processes for Subscriber Access” on page 93](#).

Related Documentation

- [Diameter Base Protocol Overview on page 3](#)

CHAPTER 3

Configuration Tasks for Diameter Base Protocol

- [Configuring the Origin Attributes of the Diameter Instance on page 23](#)
- [Configuring Diameter Peers on page 24](#)
- [Configuring the Diameter Transport on page 24](#)
- [Configuring Diameter Network Elements on page 25](#)

Configuring the Origin Attributes of the Diameter Instance

You can configure the identifying characteristics of the endpoint node that originates Diameter messages for the Diameter instance. The hostname is supplied as the value for the Origin-Host AVP by the Diameter instance. The realm is supplied as the value for the Origin-Realm AVP by the Diameter instance.

To configure the origin attributes for a Diameter instance:

1. Specify the name of the host that originates the Diameter message.

```
[edit diameter origin]  
user@host# set host host14
```

2. Specify the realm of the host that originates the Diameter message.

```
[edit diameter origin]  
user@host# set realm example.com
```

- Related Documentation**
- [Configuring Diameter on page 21](#)
 - [origin on page 38](#)

Configuring Diameter Peers

You can configure the peers to which Diameter sends messages. By default, logical system *default* and routing instance *master* are used. Port 3868 is used for active connections to peers by default.

To configure a remote peer for a Diameter instance:

1. Specify the name of the Diameter peer.

```
[edit diameter]
user@host# set peer p3
```

2. Specify the address of the Diameter peer.

```
[edit diameter peer p3]
user@host# set address 192.168.23.10
```

3. (Optional) Specify a routing instance, a logical system, or a logical system and routing instance for the Diameter peer.

```
[edit diameter peer p3]
user@host# set routing-instance ri8
```

```
[edit diameter peer p3]
user@host# set logical-system ls10
```

```
[edit diameter peer p3]
user@host# set logical-system ls10 routing-instance ri8
```

4. (Optional) Specify the port that Diameter uses for active connections to the peer.

```
[edit diameter peer p3]
user@host# set connect-actively port 49152
```

5. Specify the transport that Diameter uses for active connections to the peer.

```
[edit diameter peer p3]
user@host# set connect-actively transport t6
```

Related Documentation

- [Configuring Diameter on page 21](#)

Configuring the Diameter Transport

You can configure one or more transports for a Diameter instance to set the IP address for the local connection, and optionally configure a logical system or routing instance context. By default, the logical system *default* and the routing instance *master* are used. The logical system and routing instance for the transport connection must match that for the peer, or a configuration error is reported. Multiple peers can share the same transport.

To configure a transport for a Diameter instance:

1. Configure the transport name.

```
[edit diameter]
```

```
user@host# set transport t1
```

2. Configure the local IP address for the Diameter local transport connection.

```
[edit diameter transport t1]
user@host# set address 10.9.20.0
```

3. (Optional) Configure a logical system and optionally a routing instance for the transport.

```
[edit diameter transport t1]
user@host# set logical-system ls5
```

4. (Optional) Configure a routing instance for the transport.

```
[edit diameter transport t1]
user@host# set routing-instance ri10
```

Related Documentation

- [Configuring Diameter on page 21](#)

Configuring Diameter Network Elements

A Diameter network element (DNE) consists of associated functions, a list of prioritized peers, and a set of forwarding rules. The forwarding rules define individual routes through a set of associated destinations, functions, and metrics.

Before you configure Diameter network elements, perform the following task:

- Define the Diameter peers. See [“Configuring Diameter Peers” on page 24](#).

To configure a Diameter network element:

1. Specify the name of the network element.

```
[edit diameter]
user@host# set network-element dne25
```

2. (Optional) Associate one or more functions with the network element. All functions are associated by default.

```
[edit diameter network-element dne25]
user@host# set function jsr
```

3. Associate a Diameter peer with the network element and set the priority for the peer.

```
[edit diameter network-element dne25]
user@host# set peer peer1 priority 1
```

4. Specify a route that is reachable through the network element based on the forwarding rules that you define.

```
[edit diameter network-element dne25]
user@host# set forwarding route dne-route2
```

5. Specify a metric for the route.

```
[edit diameter network-element dne25 forwarding route dne-route2]
user@host# set metric 15
```

6. (Optional) Associate the route with a destination host and realm.

```
[edit diameter network-element dne25 forwarding route dne-route2]  
user@host# set destination host host5 realm example.com
```

7. (Optional) Specify a function (application) associated with the route.

```
[edit diameter network-element dne25 forwarding route dne-route2]  
user@host# set function jsr
```

Related Documentation

- [Configuring Diameter on page 21](#)

CHAPTER 4

Configuration Statements

- [\[edit diameter\] Hierarchy Level](#) on page 28
- [address \(Diameter Peer\)](#) on page 29
- [address \(Diameter Transport\)](#) on page 29
- [connect-actively](#) on page 30
- [destination \(Diameter Network Element\)](#) on page 30
- [diameter](#) on page 31
- [forwarding \(Diameter Network Element\)](#) on page 32
- [function \(Diameter Network Element\)](#) on page 32
- [function \(Diameter Route\)](#) on page 33
- [host \(Diameter Origin\)](#) on page 33
- [logical-system \(Diameter Peer\)](#) on page 34
- [logical-system \(Diameter Transport\)](#) on page 35
- [metric \(Diameter Route\)](#) on page 36
- [network-element \(Diameter Base Protocol\)](#) on page 37
- [origin \(Diameter Base Protocol\)](#) on page 38
- [peer \(Diameter Base Protocol\)](#) on page 38
- [peer \(Diameter Network Element\)](#) on page 39
- [port \(Diameter Peer\)](#) on page 39
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- [routing-instance \(Diameter Peer\)](#) on page 41
- [routing-instance \(Diameter Transport\)](#) on page 42
- [traceoptions \(Diameter Base Protocol\)](#) on page 43
- [transport \(Diameter Base Protocol\)](#) on page 45
- [transport \(Diameter Peer\)](#) on page 45

[edit diameter] Hierarchy Level

```
diameter {
  network-element element-name {
    forwarding {
      route dne-route-name {
        destination realm realm-name <host hostname>;
        function function-name <partition partition-name>;
        metric route-metric;
      }
    }
    function function-name;
    peer peer-name {
      priority priority-number;
    }
  }
  origin {
    host hostname;
    realm realm-name;
  }
  peer peer-name {
    address ip-address;
    connect-actively {
      port port-number;
      transport transport-name;
    }
    logical-system logical-system-name <routing-instance routing-instance-name >;
    routing-instance routing-instance-name;
  }
  transport transport-name {
    address;
    logical-system logical-system-name <routing-instance routing-instance-name>;
    routing-instance routing-instance-name;
  }
}
```

- Related Documentation**
- [Diameter Base Protocol Overview on page 3](#)
 - [Configuring Diameter on page 21](#)

address (Diameter Peer)

Syntax	<code>address <i>ip-address</i>;</code>
Hierarchy Level	[edit diameter peer <i>peer-name</i>]
Release Information	Statement introduced in Junos OS Release 9.6.
Description	Configure the IP address for a Diameter remote peer.
Options	<i>ip-address</i> —IP address of remote Diameter peer.
Required Privilege Level	admin—To view this statement in the configuration. admin-control—To add this statement to the configuration.
Related Documentation	<ul style="list-style-type: none"> • Configuring Diameter on page 21 • Configuring Diameter Peers on page 24

address (Diameter Transport)

Syntax	<code>address <i>ip-address</i>;</code>
Hierarchy Level	[edit diameter transport <i>transport-name</i>]
Release Information	Statement introduced in Junos OS Release 11.2.
Description	Configure the source (local) IP address for the Diameter local transport connection.
Options	<i>ip-address</i> —IP address of remote Diameter peer.
Required Privilege Level	admin—To view this statement in the configuration. admin-control—To add this statement to the configuration.
Related Documentation	<ul style="list-style-type: none"> • Configuring Diameter on page 21

connect-actively

Syntax	<code>connect-actively { port <i>port-number</i>; transport <i>transport-name</i>; }</code>
Hierarchy Level	[edit diameter peer <i>peer-name</i>]
Release Information	Statement introduced in Junos OS Release 9.6.
Description	<p>Define the destination port and transport connection used to establish active connections to Diameter peer.</p> <p>The remaining statements are explained separately.</p>
Default	Port 3868 and an automatically assigned local address are used to establish active connections to a peer.
Required Privilege Level	admin—To view this statement in the configuration. admin-control—To add this statement to the configuration.
Related Documentation	<ul style="list-style-type: none">• Configuring Diameter on page 21• Configuring Diameter Peers on page 24

destination (Diameter Network Element)

Syntax	<code>destination realm <i>realm-name</i> <host <i>hostname</i>>;</code>
Hierarchy Level	[edit diameter network-element <i>element-name</i> forwarding route <i>dne-route-name</i>]
Release Information	Statement introduced in Junos OS Release 9.6.
Description	Associate the route with all hosts of the specified realm or with a specific host of the specified realm. Together with the function and metric, defines a route reachable through a Diameter network element.
Options	<p>host <i>hostname</i>—(Optional) Name of the destination host associated with the route.</p> <p>realm <i>realm-name</i>—Name of the destination realm associated with the route.</p>
Required Privilege Level	admin—To view this statement in the configuration. admin-control—To add this statement to the configuration.
Related Documentation	<ul style="list-style-type: none">• Configuring Diameter on page 21• Configuring Diameter Network Elements on page 25

diameter

```
Syntax diameter {
    network-element element-name {
        forwarding {
            route dne-route-name {
                destination realm realm-name <host hostname>;
                function function-name <partition partition-name>;
                metric route-metric;
            }
        }
        function function-name;
        peer peer-name {
            priority priority-number;
        }
    }
    origin {
        host hostname;
        realm realm-name;
    }
    peer peer-name {
        address ip-address;
        connect-actively {
            port port-number;
            transport transport-name;
        }
        logical-system logical-system-name <routing-instance routing-instance-name>;
        routing-instance routing-instance-name;
    }
    transport transport-name {
        address;
        logical-system logical-system-name <routing-instance routing-instance-name>;
        routing-instance routing-instance-name;
    }
}
```

Hierarchy Level [\[edit\]](#)

Release Information Statement introduced in Junos OS Release 9.6.

Description Configure the Diameter base protocol for subscriber management.

The remaining statements are explained separately.

Required Privilege Level admin—To view this statement in the configuration.
admin-control—To add this statement to the configuration.

Related Documentation

- [Configuring Diameter on page 21](#)

forwarding (Diameter Network Element)

Syntax	<pre>forwarding { route <i>dne-route-name</i> { destination realm <i>realm-name</i> <host <i>hostname</i>>; function <i>function-name</i> <partition <i>partition-name</i>>; metric <i>route-metric</i>; } }</pre>
Hierarchy Level	[edit diameter network-element <i>element-name</i>]
Release Information	Statement introduced in Junos OS Release 9.6.
Description	<p>Define the criteria that specify which destinations are reachable through the Diameter network element.</p> <p>The remaining statements are explained separately.</p>
Required Privilege Level	admin—To view this statement in the configuration. admin-control—To add this statement to the configuration.
Related Documentation	<ul style="list-style-type: none">• Configuring Diameter on page 21• Configuring Diameter Network Elements on page 25

function (Diameter Network Element)

Syntax	<pre>function <i>function-name</i>;</pre>
Hierarchy Level	[edit diameter network-element <i>element-name</i>]
Release Information	Statement introduced in Junos OS Release 10.1. Support for PTSP introduced in Junos OS Release 10.2. Support for Gx-Plus introduced in Junos OS Release 11.2.
Description	Specify the application (function) associated with a Diameter network element.
Default	By default, all functions are associated with (supported by) the network element.
Options	<i>function-name</i> —Application (function) associated with the route. Gx-Plus, JSRC, and packet-triggered subscribers are the applications currently supported.
Required Privilege Level	admin—To view this statement in the configuration. admin-control—To add this statement to the configuration.
Related Documentation	<ul style="list-style-type: none">• Configuring Diameter on page 21• Configuring Diameter Network Elements on page 25

function (Diameter Route)

Syntax	<code>function <i>function-name</i> <partition <i>partition-name</i>>;</code>
Hierarchy Level	[edit diameter network-element <i>element-name</i> forwarding route <i>dne-route-name</i>]
Release Information	Statement introduced in Junos OS Release 9.6. Support for PTSP introduced in Junos OS Release 10.2. Support for Gx-Plus introduced in Junos OS Release 11.2.
Description	Specify the application (function) associated with a destination and metric. Together, these three elements define a route reachable through a Diameter network element.
Default	All functions are associated with the route.
Options	<i>function-name</i> —Application (function) associated with the route. Gx-Plus, JSRC, and packet-triggered-subscribers are the applications currently supported. <i>partition partition-name</i> —(Optional) Partition associated with the application (function).
Required Privilege Level	admin—To view this statement in the configuration. admin-control—To add this statement to the configuration.
Related Documentation	<ul style="list-style-type: none"> • Configuring Diameter on page 21 • Configuring Diameter Network Elements on page 25

host (Diameter Origin)

Syntax	<code>host <i>hostname</i>;</code>
Hierarchy Level	[edit diameter origin]
Release Information	Statement introduced in Junos OS Release 9.6.
Description	Specify the name of the host that originates the Diameter message.
Options	<i>hostname</i> —Name of the message origin host. Supplied as the value of Origin-Host AVP for all messages sent by the Diameter master instance.
Required Privilege Level	admin—To view this statement in the configuration. admin-control—To add this statement to the configuration.
Related Documentation	<ul style="list-style-type: none"> • Configuring Diameter on page 21 • Configuring the Origin Attributes of the Diameter Instance on page 23

logical-system (Diameter Peer)

Syntax	<code>logical-system <i>logical-system-name</i> [<routing-instance <i>routing-instance-name</i> > ;</code>
Hierarchy Level	[edit diameter peer <i>peer-name</i>]
Release Information	Statement introduced in Junos OS Release 9.6.
Description	Specify a logical system and optionally a routing instance for a Diameter peer. Alternatively, you can include the routing-instance statement at the [edit diameter peer <i>peer-name</i>] hierarchy level to configure only a routing instance.
Options	<p><i>logical-system-name</i>— Name of the logical system.</p> <p>Default: Default logical system</p> <p><i>routing-instance routing-instance-name</i>—(Optional) Name of the routing instance.</p> <p>Default: Master routing instance</p>
Required Privilege Level	<p>admin—To view this statement in the configuration.</p> <p>admin-control—To add this statement to the configuration.</p>
Related Documentation	<ul style="list-style-type: none">• Configuring Diameter on page 21• Configuring Diameter Peers on page 24

logical-system (Diameter Transport)

Syntax	<code>logical-system <i>logical-system-name</i> <routing-instance <i>routing-instance-name</i> >;</code>
Hierarchy Level	[edit diameter transport <i>transport-name</i>]
Release Information	Statement introduced in Junos OS Release 11.2.
Description	Specify a logical system and optionally a routing instance for the transport layer connection.



NOTE: The logical system and routing instance must match that for the peer or a configuration error is reported.

Options	<p><i>logical-system-name</i>—Name of the logical system.</p> <p>Default: Default logical system</p> <p><i>routing-instance <i>routing-instance-name</i></i>—(Optional) Name of the routing instance.</p> <p>Default: Master routing instance</p>
Required Privilege Level	<p>admin—To view this statement in the configuration.</p> <p>admin-control—To add this statement to the configuration.</p>
Related Documentation	<ul style="list-style-type: none"> • Configuring Diameter on page 21 • Configuring the Diameter Transport on page 24

metric (Diameter Route)

Syntax	<code>metric route-metric;</code>
Hierarchy Level	[edit diameter network-statement <i>element-name</i> forwarding route <i>dne-route-name</i>]
Release Information	Statement introduced in Junos OS Release 9.6.
Description	Specify the metric associated with a destination and function. Together, these three elements define a route reachable through a Diameter network element. A lower metric makes a route more preferred.
Options	route-metric —Metric assigned to the route. Range: 0 through 255
Required Privilege Level	admin—To view this statement in the configuration. admin-control—To add this statement to the configuration.
Related Documentation	<ul style="list-style-type: none">• Configuring Diameter on page 21• Configuring Diameter Network Elements on page 25

network-element (Diameter Base Protocol)

```
Syntax  network-element element-name {
        forwarding {
            route dne-route-name {
                destination realm realm-name <host hostname> ;
                function function-name <partition partition-name>;
                metric route-metric;
            }
        }
        function function-name;
        peer peer-name {
            priority priority-number;
        }
    }
```

Hierarchy Level [edit [diameter](#)]

Release Information Statement introduced in Junos OS Release 9.6.

Description Specify the transport layer Diameter configuration. The Diameter network element includes a list of routes reachable through the Diameter instance, associated functions, and prioritized Diameter peers.

Options *element-name*—Name of the network element.
The remaining statements are explained separately.

Required Privilege Level admin—To view this statement in the configuration.
admin-control—To add this statement to the configuration.

Related Documentation

- [Configuring Diameter on page 21](#)
- [Configuring Diameter Network Elements on page 25](#)

origin (Diameter Base Protocol)

Syntax	<pre>origin { host hostname; realm realm-name; }</pre>
Hierarchy Level	[edit diameter]
Release Information	Statement introduced in Junos OS Release 9.6.
Description	<p>Specify values of Origin-Realm-AVP and Origin-Host-AVP used in all messages sent by the Diameter instance.</p> <p>The remaining statements are explained separately.</p>
Required Privilege Level	admin—To view this statement in the configuration. admin-control—To add this statement to the configuration.
Related Documentation	<ul style="list-style-type: none">• Configuring Diameter on page 21• Configuring the Origin Attributes of the Diameter Instance on page 23

peer (Diameter Base Protocol)

Syntax	<pre>peer peer-name { address ip-address; connect-actively { port port-number; transport transport-name; } logical-system logical-system-name <routing-instance routing-instance-name>; routing-instance routing-instance-name; }</pre>
Hierarchy Level	[edit diameter]
Release Information	Statement introduced in Junos OS Release 9.6.
Description	Configure a remote peer for the Diameter instance.
Options	<p><i>peer-name</i>—Name of the peer.</p> <p>The remaining statements are explained separately.</p>
Required Privilege Level	admin—To view this statement in the configuration. admin-control—To add this statement to the configuration.
Related Documentation	<ul style="list-style-type: none">• Configuring Diameter on page 21• Configuring Diameter Peers on page 24

peer (Diameter Network Element)

Syntax	<code>peer <i>peer-name</i> { <i>priority</i> <i>priority-value</i>; }</code>
Hierarchy Level	[edit diameter <code>network-element</code> <i>element-name</i>]
Release Information	Statement introduced in Junos OS Release 9.6.
Description	Define and prioritize a peer associated with a Diameter network element.
Options	<p><i>peer-name</i>—Name of the peer.</p> <p>The remaining statement is explained separately.</p>
Required Privilege Level	<p>admin—To view this statement in the configuration.</p> <p>admin-control—To add this statement to the configuration.</p>
Related Documentation	<ul style="list-style-type: none"> • Configuring Diameter on page 21 • Configuring Diameter Network Elements on page 25

port (Diameter Peer)

Syntax	<code>port <i>port-number</i>;</code>
Hierarchy Level	[edit diameter peer <i>peer-name</i> <code>connect-actively</code>]
Release Information	Statement introduced in Junos OS Release 9.6.
Description	Specify the destination TCP port used by the active connection to peer.
Options	<p><i>port-number</i>—Number of the TCP port.</p> <p>Default: 3868</p>
Required Privilege Level	<p>admin—To view this statement in the configuration.</p> <p>admin-control—To add this statement to the configuration.</p>
Related Documentation	<ul style="list-style-type: none"> • Configuring Diameter on page 21 • Configuring Diameter Peers on page 24

priority (Diameter Peer)

Syntax	<code>priority <i>priority-value</i>;</code>
Hierarchy Level	[edit diameter network-element <i>element-name</i> peer <i>peer-name</i>]
Release Information	Statement introduced in Junos OS Release 9.6.
Description	Set the priority for a peer within a Diameter network element. A peer with a lower number has a higher priority.
Options	<i>priority-value</i> —Priority for the peer within the network element. Range: 1 through 65535
Required Privilege Level	admin—To view this statement in the configuration. admin-control—To add this statement to the configuration.
Related Documentation	<ul style="list-style-type: none">• Configuring Diameter on page 21• Configuring Diameter Network Elements on page 25

realm (Diameter Origin)

Syntax	<code>realm <i>realm-name</i>;</code>
Hierarchy Level	[edit diameter origin]
Release Information	Statement introduced in Junos OS Release 9.6.
Description	Specify the realm of the host that originates the Diameter message.
Options	<i>realm-name</i> —Name of the message origin realm. Supplied as the value of Origin-Realm AVP for all messages sent by the Diameter master instance.
Required Privilege Level	admin—To view this statement in the configuration. admin-control—To add this statement to the configuration.
Related Documentation	<ul style="list-style-type: none">• Configuring Diameter on page 21• Configuring the Origin Attributes of the Diameter Instance on page 23

route (Diameter Network Element)

Syntax	<pre>route <i>dne-route-name</i> { destination realm <i>realm-name</i> <host <i>hostname</i>>; function <i>function-name</i> <partition <i>partition-name</i>>; metric <i>route-metric</i>; }</pre>
Hierarchy Level	[edit diameter network-element <i>element-name</i> forwarding]
Release Information	Statement introduced in Junos OS Release 9.6.
Description	Define a route reachable through the Diameter network element by associating a metric with a combination of destination and function partition.
Options	<p><i>dne-route-name</i>—Route name defined for the Diameter network element.</p> <p>The remaining statements are explained separately.</p>
Required Privilege Level	<p>admin—To view this statement in the configuration.</p> <p>admin-control—To add this statement to the configuration.</p>
Related Documentation	<ul style="list-style-type: none"> • Configuring Diameter on page 21 • Configuring Diameter Network Elements on page 25

routing-instance (Diameter Peer)

Syntax	routing-instance <i>routing-instance-name</i> ;
Hierarchy Level	[edit diameter peer <i>peer-name</i>]
Release Information	Statement introduced in Junos OS Release 9.6.
Description	Specify a routing instance for a Diameter peer. Alternatively, you can include the logical-system statement at the [edit diameter peer <i>peer-name</i>] hierarchy level to configure a logical and routing instance.
Options	<p><i>routing-instance-name</i>—Name of the routing instance.</p> <p>Default: Master routing instance</p>
Required Privilege Level	<p>admin—To view this statement in the configuration.</p> <p>admin-control—To add this statement to the configuration.</p>
Related Documentation	<ul style="list-style-type: none"> • Configuring Diameter on page 21 • Configuring Diameter Peers on page 24

routing-instance (Diameter Transport)

Syntax	<code>routing-instance <i>routing-instance-name</i> ;</code>
Hierarchy Level	[edit diameter transport <i>transport-name</i>]
Release Information	Statement introduced in Junos OS Release 11.2.
Description	Specify a routing instance for the Diameter transport layer connection.
Options	<i>routing-instance-name</i> —Name of the routing instance. Default: Master routing instance
Required Privilege Level	admin—To view this statement in the configuration. admin-control—To add this statement to the configuration.
Related Documentation	<ul style="list-style-type: none">• Configuring the Diameter Transport on page 24

traceoptions (Diameter Base Protocol)

Syntax	<pre> traceoptions { file <i>filename</i> <files <i>number</i>> <match <i>regular-expression</i> > <size <i>maximum-file-size</i>> <world-readable no-world-readable>; flag <i>flag</i>; level (all error info notice verbose warning); no-remote-trace; } </pre>
Hierarchy Level	[edit system processes diameter-service]
Release Information	Statement introduced in Junos OS Release 9.6.
Description	Define tracing options for Diameter processes.
Options	<p>file <i>filename</i>—Name of the file to receive the output of the tracing operation. Enclose the filename within quotation marks. All files are placed in the directory /var/log.</p> <p>files <i>number</i>—(Optional) Maximum number of trace files to create before overwriting the oldest one. If you specify a maximum number of files, you also must specify a maximum file size with the size option.</p> <p>Range: 2 through 1000</p> <p>Default: 3 files</p> <p>flag <i>flag</i>—Tracing operation to perform. To specify more than one tracing operation, include multiple flag statements. You can include the following flags:</p> <ul style="list-style-type: none"> • all—Trace all operations • application—Trace Diameter application interface events • configuration—Trace configuration events • daemon—Trace Diameter daemon level events • diameter-instance—Trace Diameter instance events • dne—Trace Diameter network element events • framework—Trace Diameter framework events • memory-management—Trace memory management events • messages—Trace Diameter messages • node—Trace Diameter node events • peer—Trace Diameter peer events <p>level—Level of tracing to perform. You can specify any of the following levels:</p> <ul style="list-style-type: none"> • all—Match all levels. • error—Match error conditions.

- **info**—Match informational messages.
- **notice**—Match notice messages about conditions requiring special handling.
- **verbose**—Match verbose messages.
- **warning**—Match warning messages.

match *regular-expression*—(Optional) Refine the output to include lines that contain the regular expression.

no-remote-trace—Disable remote tracing.

no-world-readable—(Optional) Disable unrestricted file access.

size *maximum-file-size*—(Optional) Maximum size of each trace file. By default, the number entered is treated as bytes. Alternatively, you can include a suffix to the number to indicate kilobytes (KB), megabytes (MB), or gigabytes (GB). If you specify a maximum file size, you also must specify a maximum number of trace files with the **files** option.

Syntax: *sizek* to specify KB, *sizem* to specify MB, or *sizeg* to specify GB

Range: 10240 through 1073741824

Default: 128 KB

world-readable—(Optional) Enable unrestricted file access.

Required Privilege Level	trace—To view this statement in the configuration. trace-control—To add this statement to the configuration.
---------------------------------	---

Related Documentation	<ul style="list-style-type: none">• Tracing Diameter Base Protocol Processes for Subscriber Access on page 93
------------------------------	---

transport (Diameter Base Protocol)

Syntax	<pre>transport transport-name { address; logical-system logical-system-name <routing-instance routing-instance-name >; routing-instance routing-instance-name }</pre>
Hierarchy Level	[edit diameter]
Release Information	Statement introduced in Junos OS Release 11.2.
Description	Configure the Diameter instance and the local IP address for the Diameter local transport connection.
Options	<p><i>transport-name</i>—Name of the transport.</p> <p>The remaining statements are explained separately.</p>
Required Privilege Level	<p>admin—To view this statement in the configuration.</p> <p>admin-control—To add this statement to the configuration.</p>
Related Documentation	<ul style="list-style-type: none"> • Configuring Diameter on page 21 • Configuring the Diameter Transport on page 24

transport (Diameter Peer)

Syntax	transport <i>transport-name</i> ;
Hierarchy Level	[edit diameter peer peer-name connect-actively]
Release Information	Statement introduced in Junos OS Release 11.2.
Description	Specify the transport layer connection to be used for establishing active connections to the peer.
Default	The transport is defined in the default logical system and master routing instance.
Options	<i>transport-name</i> —Name of the transport.
Required Privilege Level	<p>admin—To view this statement in the configuration.</p> <p>admin-control—To add this statement to the configuration.</p>
Related Documentation	<ul style="list-style-type: none"> • Configuring Diameter on page 21 • Configuring Diameter Peers on page 24

PART 3

Administration

- [Monitoring Diameter Base Protocol for Subscriber Access on page 49](#)
- [Monitoring Commands on page 53](#)

CHAPTER 5

Monitoring Diameter Base Protocol for Subscriber Access

- [Verifying Diameter Node, Instance, and Route Information on page 49](#)
- [Verifying and Managing Diameter Function Information on page 50](#)
- [Verifying and Managing Diameter Peer Information on page 51](#)
- [Verifying Diameter Network Element Information on page 52](#)

Verifying Diameter Node, Instance, and Route Information

Purpose View Diameter node information:

Action • To display summary information about all Diameter nodes:

`user@host> show diameter`

- To display summary information about all Diameter nodes and add information about Diameter functions, instances, network elements, and peers:

`user@host> show diameter brief`

- To display brief information about all Diameter nodes and add information about Diameter routes:

`user@host> show diameter detail`

- To display summary information about all Diameter instances:

`user@host> show diameter instance`

- To display detailed information about all Diameter instances:

`user@host> show diameter instance detail`

- To display information about a specific Diameter instance, add the instance name to the command:

`user@host> show diameter instance master`

`user@host> show diameter instance detail master`

- To display summary information about all Diameter routes:

`user@host> show diameter route`

- To display detailed information about all Diameter routes:

```
user@host> show diameter route detail
```

- To display information about a specific Diameter route, add the route name to the command:

```
user@host> show diameter route dne-route2
```

```
user@host> show diameter route detail dne-route2
```

**Related
Documentation**

- [Configuring Diameter on page 21](#)
- [Configuring Gx-Plus](#)
- [CLI Explorer](#)

Verifying and Managing Diameter Function Information

Purpose View or clear Diameter function information:

Action

- To display summary information about all functions associated with Diameter:

```
user@host> show diameter function
```
- To display detailed information about all functions associated with Diameter:

```
user@host> show diameter function detail
```
- To display information about a specific function associated with Diameter, add the function name to the command:

```
user@host> show diameter function jsrc
```

```
user@host> show diameter function detail ptsp
```
- To display summary statistics about all functions associated with Diameter:

```
user@host> show diameter function statistics
```
- To display detailed statistics about all functions associated with Diameter:

```
user@host> show diameter function statistics detail
```
- To display statistics about a specific function associated with Diameter, add the function name to the command:

```
user@host> show diameter function statistics gx-plus
```

```
user@host> show diameter function statistics detail jsrc
```
- To delete current statistics for all functions associated with Diameter:

```
user@host>clear diameter function statistics
```
- To delete current statistics for a specific function associated with Diameter:

```
user@host>clear diameter function gx-plus statistics
```

**Related
Documentation**

- [Configuring Diameter on page 21](#)
- [Configuring Gx-Plus](#)

- [CLI Explorer](#)

Verifying and Managing Diameter Peer Information

Purpose View or clear Diameter peer information:

- Action**
- To display summary information about all Diameter peers:
`user@host> show diameter peer`
 - To display detailed information about all Diameter peers:
`user@host> show diameter peer detail`
 - To display information about a specific Diameter peer, add the peer name to the command:
`user@host> show diameter peer peer235`
`user@host> show diameter peer detail peer235`
 - To display summary information about Diameter peer-to-network-element mapping for all peers:
`user@host> show diameter peer map`
 - To display detailed information about Diameter peer-to-network-element mapping for all peers:
`user@host> show diameter peer map detail`
 - To display information about Diameter peer-to-network-element mapping for a specified peer, add the peer name to the command:
`user@host> show diameter peer map peer235`
`user@host> show diameter peer map detail peer235`
 - To display summary statistics about all Diameter peers:
`user@host> show diameter peer statistics`
 - To display detailed statistics about all Diameter peers:
`user@host> show diameter peer statistics detail`
 - To display summary statistics about a specified Diameter peer:
`user@host> show diameter peer statistics peer235`
 - To display detailed statistics about a specified Diameter peer:
`user@host> show diameter peer statistics detail peer235`
 - To delete the specified Diameter peer and all of its statistics.
`user@host> clear diameter peer peer5 connection`
 - To delete the specified Diameter peer and its current statistics:
`user@host> clear diameter peer peer5 statistics`

- Related Documentation**
- [Configuring Diameter on page 21](#)
 - [CLI Explorer](#)

Verifying Diameter Network Element Information

Purpose View Diameter network element information:

- Action**
- To display summary information about Diameter network elements:
`user@host> show diameter network-element`
 - To display detailed information about Diameter network elements:
`user@host> show diameter network-element detail`
 - To display information about Diameter network elements for a specified network element, include the element name in the command:
`user@host> show diameter network-element dne-1`
`user@host> show diameter network-element detail dne-1`
 - To display summary information about Diameter network-element-to-peer mapping for all network elements:
`user@host> show diameter network-element map`
 - To display detailed information about Diameter network-element-to-peer mapping for all network elements:
`user@host> show diameter network-element map detail`

- Related Documentation**
- [Configuring Diameter on page 21](#)
 - [CLI Explorer](#)

CHAPTER 6

Monitoring Commands

- clear diameter function statistics
- clear diameter peer
- show diameter
- show diameter function
- show diameter function statistics
- show diameter instance
- show diameter network-element
- show diameter network-element map
- show diameter peer
- show diameter peer map
- show diameter peer statistics
- show diameter route

clear diameter function statistics

Syntax	clear diameter function < <i>function-name</i> > statistics
Release Information	Command introduced in Junos OS Release 9.6. Support for PTSP introduced in Junos OS Release 10.2. Support for Gx-Plus introduced in Junos OS Release 11.2.
Description	Clear current statistics accumulated for a specified function (application) or for all functions associated with the Diameter instance.
Options	<i>function-name</i> —(Optional) Clear statistics for the specified function. Currently, Gx-Plus, JSRC, and packet-triggered-subscribers are supported functions.
Required Privilege Level	clear
Related Documentation	<ul style="list-style-type: none">• <i>Gx-Plus for Provisioning Subscribers Overview</i>• <i>Juniper Networks Session and Resource Control (SRC) and JSRC Overview</i>• <i>PTSP Overview</i>• show diameter on page 56• show diameter function on page 62• show diameter function statistics on page 66
List of Sample Output	clear diameter function statistics on page 54
Output Fields	When you enter this command, you are provided feedback on the status of your request.

Sample Output

clear diameter function statistics

```
user@host> clear diameter function jsrc statistics
```

clear diameter peer

Syntax	<code>clear diameter peer <i>peer-name</i></code> <code><connection statistics></code>
Release Information	Command introduced in Junos OS Release 9.6.
Description	Delete the specified Diameter peer and clear all statistics or only current statistics for the specified peer.
Options	<p><i>peer-name</i>—Delete the Diameter peer.</p> <p><i>connection</i>—(Optional) Clear all peer statistics and restart the peer state machine for the specified Diameter peer. This is the default action.</p> <p><i>statistics</i>—(Optional) Clear current statistics for the specified Diameter peer.</p>
Required Privilege Level	clear
Related Documentation	<ul style="list-style-type: none"> • show diameter on page 56 • show diameter peer on page 77 • show diameter peer map on page 82 • show diameter peer statistics on page 85
List of Sample Output	clear diameter peer on page 55
Output Fields	When you enter this command, you are provided feedback on the status of your request.

Sample Output

clear diameter peer

```
user@host> clear diameter peer peer5 connection
```

show diameter

Syntax	show diameter <brief detail summary>
Release Information	Command introduced in Junos OS Release 9.6.
Description	Display information about the Diameter node.
Options	brief detail summary —(Optional) Display the specified level of output. The summary output is displayed by default and includes Diameter node status. The brief output adds summary information about functions, instances, network elements, and peers. The detail output adds summary information about routes.
Required Privilege Level	view
Related Documentation	<ul style="list-style-type: none"> • clear diameter function statistics on page 54 • clear diameter peer on page 55 • show diameter function on page 62 • show diameter instance on page 69 • show diameter network-element on page 71 • show diameter peer on page 77 • show diameter route on page 89
List of Sample Output	show diameter brief on page 59 show diameter detail on page 60 show diameter summary on page 60
Output Fields	Table 7 on page 56 lists the output fields for the show diameter command. Output fields are listed in the approximate order in which they appear.

Table 7: show diameter Output Fields

Field Name	Field Description	Level of Output
Diameter process id	ID number of the Diameter process.	All levels
Functions	Number of functions associated with Diameter.	All levels
Connected functions	Number of functions with active Diameter connections.	All levels
Instances	Number of configured Diameter instances.	All levels

Table 7: show diameter Output Fields (*continued*)

Field Name	Field Description	Level of Output
Network elements (NEs)	Number of configured Diameter network elements.	All levels
Connected NEs	Number of Diameter network elements with active connections.	All levels
Peers	Number of Diameter peer nodes.	All levels
Activated peers	Number of Diameter peers with active connections.	All levels
Open peers	Number of peers in the open state, without active network element connections but available for a connection.	All levels
Transports	Number of transports configured.	All levels
Requests queued for network transmit	Number of requests waiting to be sent to the Diameter peers.	All levels
Answers queued for network transmit	Number of replies waiting to be sent to the Diameter peers.	All levels
Expected answers from network	Number of replies expected to be received from the Diameter peers.	All levels
Requests queued for function transmit	Number of requests waiting to be sent to the functions associated with Diameter.	All levels
Answers queued for function transmit	Number of replies waiting to be sent to the functions associated with Diameter.	All levels
Expected answers from functions	Number of replies expected to be received from the functions associated with Diameter.	All levels
Memory used by network transmit queues	Amount of memory consumed by network transmit queues.	All levels
Memory used by function transmit queues	Amount of memory consumed by function transmit queues.	All levels
Origin-state-id	Value of the Origin-State-ID AVP.	All levels
Function	Name of the function for which information is displayed.	brief detail
State	State of the Diameter connection with the function: Connected or Disconnec (disconnected).	brief detail

Table 7: show diameter Output Fields (*continued*)

Field Name	Field Description	Level of Output
Upstream Transaction Utilization	Percent of upstream traffic used for this function.	brief detail
Downstream Transaction Utilization	Percent of downstream traffic used for this function.	brief detail
Net Queue Buffer Utilization	Percent of network transmission buffer used for this function.	brief detail
Func Queue Buffer Utilization	Percent of function transmission buffer used for this function.	brief detail
Routed Dests	Number of destinations that have this function associated with their routes.	brief detail
Name	Name of the Diameter instance.	brief detail
Origin-Realm	Value of Origin-Realm attribute-value pair (AVP).	brief detail
Origin Host	Value of Origin-Host AVP.	brief detail
NE-Total	Number of configured network elements.	brief detail
NE-Connected	Number of network elements with active Diameter connections.	brief detail
Name	Name of the Diameter network element.	brief detail
Instance	Name of the Diameter instance in which the network element is configured.	brief detail
State	State of the network element: <ul style="list-style-type: none"> Connecting—None of the network element peers are in the open state and available for connection. Selecting—One network element peer is connected and the network element is waiting for another peer to reach the open state so that it can be connected. Partially-Connected—One network element peer is in the open state and connected. Post-selection-delay—Three or more peers are in the open state and the network element is waiting to deactivate the peers in excess of two. Fully-connected—Two network element peers are in the open state and connected. 	brief detail
Primary Peer	Primary peer for the network element, based on the configured peer priority.	brief detail
Secondary Peer	Secondary peer for the network element, based on the configured peer priority.	brief detail
Peer	Name of the peer.	brief detail

Table 7: show diameter Output Fields (*continued*)

Field Name	Field Description	Level of Output
Instance	Name of the Diameter instance in which the peer is configured.	brief detail
State	State of the peer: <ul style="list-style-type: none"> • Bad-Config—Misconfiguration. • Bad-Remote—Remote side does not conform to one of the decisions or is sending malformed messages. • Closed—Normal disconnect due to a request from the remote site or due to excessive watchdog timeouts. • Destructing—Peer to be deleted on the next timer tick. Until then, it performs no actions. • Disabled—Peer is administratively disabled. • Internal-error—Internal error has been detected and the peer is in the process of restarting. • No-Activation—Peer is not used by any Diameter network element. • Rejected—Connection was rejected by remote side of the connection. • Suspended—All other reasons to be suspended. 	brief detail
NE-Count	Number of network elements associated with the peer.	brief detail
Activated Count	Activation status of the peer: <ul style="list-style-type: none"> • 1—Peer is activated. • 0—Peer is not activated. 	brief detail
Primary Count	Status of the peer: primary (1) or secondary (0).	brief detail
Secondary Count	Status of the peer: secondary (0) or primary (1).	brief detail
Route	Name of the Diameter route.	detail
NE	Name of the Diameter network element in which the route is configured	detail
Instance	Name of the Diameter instance in which the route is configured.	detail
Valid	Determination of whether the route is valid: yes or no .	detail
Up	State of the route: yes for an active route, no for an inactive route.	detail

Sample Output

show diameter brief

```
user@host> show diameter brief
```

```
Diameter node:
  Diameter process id      :    1446
  Functions                 :      4
  Connected functions      :      2
```

```

Instances                               : 1
Network elements(NEs)                  : 1
Connected NEs                           : 0
Peers                                   : 2
Activated peers                         : 1
Open peers                             : 0
Transports                             : 1
Requests queued for network transmit   : 0
Answers queued for network transmit    : 0
Expected answers from network          : 0
Requests queued for function transmit  : 0
Answers queued for function transmit    : 0
Expected answers from functions        : 0
Memory used by network transmit queues : 0
Memory used by function transmit queues : 0
Origin-state-id                        : 0

```

Diameter function list:

Function	State	Upstream Transaction Utilization %	Downstream Transaction Utilization %	Net Queue Buffer Utilization %	Func Queue Buffer Utilization %	Routed Dests
charging-	Disconnec	0	0	0	0	0
gx-plus	Connected	0	0	0	0	1
jsrc	Connected	0	0	0	0	0
packet-tr	Disconnec	0	0	0	0	0

Diameter instances:

Name	Origin-Realm	Origin-Host	NE-Total	NE-Connected
master	orrr	ohhh	1	0

Diameter network-elements:

Name	Instance	State	Primary Peer	Secondary Peer
n0	master	Connecting	<NONE>	<NONE>

Diameter peer list:

Peer	Instance	State	NE-Count	Activated Count	Primary Count	Secondary Count
p0	master	Suspended	1	1	0	0
p100	master	No-Activation	0	0	0	0

show diameter detail

```
user@host> show diameter detail
```

```
...
```

Diameter routes:

Route	NE	Instance	Valid	Up
dne-route1	dne1	master	yes	no

show diameter summary

```
user@host> show diameter summary
```

Diameter node:

```

Diameter process id      : 1446
Functions                 : 4
Connected functions      : 2
Instances                : 1
Network elements(NEs)    : 1
Connected NEs            : 0
Peers                    : 2

```

```
Activated peers           : 1
Open peers                : 0
Transports                : 1
Requests queued for network transmit : 0
Answers queued for network transmit : 0
Expected answers from network : 0
Requests queued for function transmit : 0
Answers queued for function transmit : 0
Expected answers from functions : 0
Memory used by network transmit queues : 0
Memory used by function transmit queues : 0
Origin-state-id          : 0
```

show diameter function

Syntax	show diameter function <brief detail summary> <function-name>
Release Information	Command introduced in Junos OS Release 9.6. Support for PTSP introduced in Junos OS Release 10.2. Support for Gx-Plus introduced in Junos OS Release 11.2.
Description	Display information about all functions associated with Diameter instances or only the specified function.
Options	brief detail summary —(Optional) Display the specified level of output. The summary output is displayed by default and includes basic function information. The brief output displays the summary information in a different format. The detail output adds information to the brief output. function-name —(Optional) Display information for only the specified function. Currently, Gx-Plus, JSRC, and packet-triggered-subscribers are supported functions.
Required Privilege Level	view
Related Documentation	<ul style="list-style-type: none"> • clear diameter function statistics on page 54 • show diameter on page 56 • show diameter function statistics on page 66
List of Sample Output	show diameter function on page 64 show diameter function brief on page 64 show diameter function detail (JSRC) on page 64 show diameter function detail (Gx-Plus) on page 65
Output Fields	Table 8 on page 62 lists the output fields for the show diameter function command. Output fields are listed in the approximate order in which they appear.

Table 8: show diameter function Output Fields

Field Name	Field Description	Level of Output
Function name	Name of the function for which information is displayed.	All levels
State	State of the Diameter connection with the function.	All levels
Upstream transaction utilization	Percent of upstream traffic used for this function.	All levels

Table 8: show diameter function Output Fields (*continued*)

Field Name	Field Description	Level of Output
Downstream transaction utilization	Percent of downstream traffic used for this function.	All levels
Network transmit buffer utilization	Percent of network transmission buffer used for this function.	All levels
Function transmit buffer utilization	Percent of function transmission buffer used for this function.	All levels
Routed destinations	Number of destinations that have this function associated with their routes.	All levels
Requests queued for network tx	Number of requests waiting to be sent to the Diameter peers for this function.	detail
Pending answers from network	Number of replies expected from the Diameter peers for this function.	detail
Answers queued for function tx	Number of replies waiting to be sent to this function.	detail
Total upstream transactions pending	Total number of messages queued for this function.	detail
Upstream transactions limit	Total number of messages queued for this function.	detail
Requests queued for function tx	Number of requests waiting to be sent to this function.	detail
Pending answers from function	Number of replies expected to be received from this function.	detail
Answers queued for network tx	Number of replies waiting to be sent to this function.	detail
Total downstream transactions pending	Total number of messages queued for the Diameter peers.	detail
Downstream transactions limit	Maximum number of messages that can be queued for the Diameter peers.	detail
Buffers used by network tx queue	Number of buffers used by messages queued for the Diameter peers.	detail
Limit on network tx queue buffers	Maximum buffer capacity available for messages queued for the Diameter peers.	detail

Table 8: show diameter function Output Fields (*continued*)

Field Name	Field Description	Level of Output
Buffers used by function tx queue	Number of buffers used by messages queued for this function.	detail
Limit on function tx queue buffers	Maximum buffer capacity available for messages queued for this function.	detail
Origin-state-id	Value of the Origin-State-ID AVP.	detail

Sample Output

show diameter function

```
user@host> show diameter function
```

```
Diameter function list:
```

Function	State	Upstream Transaction Utilization %	Downstream Transaction Utilization %	Net Queue Buffer Utilization %	Func Queue Buffer Utilization %	Routed Dests
jsrc	Disconnect	0	0	0	0	0

show diameter function brief

```
user@host> show diameter function brief
```

```
Diameter function:
```

```
Function name           : gx-plus
State                   : Connected
Upstream transaction utilization : 0 %
Downstream transaction utilization : 0 %
Network transmit buffer utilization : 0 %
Function transmit buffer utilization : 0 %
Routed destinations     : 1

Function name           : jsrc
State                   : Disconnected
Upstream transaction utilization : 0 %
Downstream transaction utilization : 0 %
Network transmit buffer utilization : 0 %
Function transmit buffer utilization : 0 %
Routed destinations     : 0
```

show diameter function detail (JSRC)

```
user@host> show diameter function detail
```

```
Diameter function:
```

```
Function name           : jsrc
State                   : Disconnected
Upstream transaction utilization : 0 %
Downstream transaction utilization : 0 %
Network transmit buffer utilization : 0 %
```

```

Function transmit buffer utilization : 0 %
Routed destinations                 : 0
Requests queued for network tx      : 0
Pending answers from network        : 0
Answers queued for function tx       : 0
Total upstream transactions pending  : 0
Upstream transactions limit          : 1024
Requests queued for function tx      : 0
Pending answers from function        : 0
Answers queued for network tx        : 0
Total downstream transactions pending : 0
Downstream transactions limit        : 1024
Buffers used by network tx queue     : 0
Limit on network tx queue buffers    : 10485760
Buffers used by function tx queue     : 0
Limit on function tx queue buffers    : 10485760

```

show diameter function detail (Gx-Plus)

```
user@host> show diameter function gx-plus detail
```

```

Diameter function:
Function name           : gx-plus
State                   : Connected
Upstream transaction utilization : 0 %
Downstream transaction utilization : 0 %
Network transmit buffer utilization : 0 %
Function transmit buffer utilization : 0 %
Routed destinations     : 1
Requests queued for network tx : 0
Pending answers from network : 0
Answers queued for function tx : 0
Total upstream transactions pending : 0
Upstream transactions limit : 1024
Requests queued for function tx : 0
Pending answers from function : 0
Answers queued for network tx : 0
Total downstream transactions pending : 0
Downstream transactions limit : 1024
Buffers used by network tx queue : 0
Limit on network tx queue buffers : 10485760
Buffers used by function tx queue : 0
Limit on function tx queue buffers : 10485760
Origin-state-id         : 0

```

show diameter function statistics

Syntax	show diameter function statistics <brief detail summary> <function-name>
Release Information	Command introduced in Junos OS Release 9.6. Support for PTSP introduced in Junos OS Release 10.2. Support for Gx-Plus introduced in Junos OS Release 11.2.
Description	Display statistics about all functions associated with Diameter instances or only the specified function.
Options	<p>brief detail summary—(Optional) Display the specified level of output. The summary output is displayed by default and includes basic function statistics. The brief output displays the summary information in a different format and adds numbers accumulated since the Diameter node was started. The detail output adds information to the brief output.</p> <p>function-name—(Optional) Display information for only the specified function. Currently, Gx-Plus, JSRC, and packet-triggered-subscribers are supported functions. When you specify a function, the brief output is displayed by default, even when you explicitly specify summary.</p>
Required Privilege Level	view
Related Documentation	<ul style="list-style-type: none"> • clear diameter function statistics on page 54 • show diameter on page 56 • show diameter function on page 62
List of Sample Output	show diameter function statistics on page 68 show diameter function statistics brief on page 68 show diameter function statistics detail on page 68
Output Fields	Table 9 on page 66 lists the output fields for the show diameter function statistics command. Output fields are listed in the approximate order in which they appear.

Table 9: show diameter function statistics Output Fields

Field Name	Field Description	Level of Output
Function	Name of the function for which information is displayed.	All levels
Delivered Requests	Number of requests delivered by Diameter to the application.	All levels
Delivered Answers	Number of answers delivered by Diameter to the application.	All levels
Delivered Messages	Total number of messages delivered by Diameter to the application.	All levels

Table 9: show diameter function statistics Output Fields (*continued*)

Field Name	Field Description	Level of Output
Forwarded Requests	Number of requests sent by Diameter to the network.	All levels
Forwarded Answers	Number of answers sent by Diameter to the network.	All levels
Forwarded Messages	Number of messages sent by Diameter to the network.	All levels
Function name	Name of the function for which information is displayed.	All levels
Over-limit network requests	Number of requests sent to Diameter peers that exceeded the limit on the network transmit queue.	detail
Over-limit network answers	Number of answers sent to Diameter peers that exceeded the limit on the network transmit queue.	detail
Over-limit network messages	Total number of messages sent to Diameter peers that exceeded the limit on the network transmit queue.	detail
Failed to deliver requests	Number of requests sent by Diameter to its application that were not successfully delivered.	detail
Failed to deliver answers	Number of answers sent by Diameter to its application that were not successfully delivered.	detail
Failed to deliver messages	Total number of messages sent by Diameter to its application that were not successfully delivered.	detail
Over-limit function requests	Number of requests sent to Diameter peers that exceeded the limit on the function transmit queue.	detail
Over-limit function answers	Number of answers sent to Diameter peers that exceeded the limit on the function transmit queue.	detail
Over-limit function messages	Total number of messages sent to Diameter peers that exceeded the limit on the function transmit queue.	detail
Failed to forward requests	Number of requests that were not successfully sent by Diameter to the network.	detail
Failed to forward answers	Number of answers that were not successfully sent by Diameter to the network.	detail
Failed to forward messages	Total number of messages that were not successfully sent by Diameter to the network.	detail

Sample Output

show diameter function statistics

```
user@host> show diameter function statistics
Diameter function statistics:
      Delivered Delivered Delivered Forwarded Forwarded Forwarded
Function Requests Answers Messages Requests Answers Messages
jsrc           0         0         0         0         0         0
```

show diameter function statistics brief

```
user@host> show diameter function statistics brief

Diameter function statistics:
Function name           : jsrc

Delivered requests      :          0          0
Delivered answers       :          0          0
Delivered messages      :          0          0
Forwarded requests      :          0          0
Forwarded answers       :          0          0
Forwarded messages      :          0          0
```

show diameter function statistics detail

```
user@host> show diameter function statistics detail

Diameter function statistics:
Function name           : jsrc

Delivered requests      :          0          0
Delivered answers       :          0          0
Delivered messages      :          0          0
Forwarded requests      :          0          0
Forwarded answers       :          0          0
Forwarded messages      :          0          0
Over-limit network requests :          0          0
Over-limit network answers :          0          0
Over-limit network messages :          0          0
Failed to deliver requests :          0          0
Failed to deliver answers  :          0          0
Failed to deliver messages :          0          0
Over-limit function requests :          0          0
Over-limit function answers :          0          0
Over-limit function messages :          0          0
Failed to forward requests :          0          0
Failed to forward answers  :          0          0
Failed to forward messages :          0          0
```

show diameter instance

Syntax	show diameter instance <brief detail summary> <instance-name>
Release Information	Command introduced in Junos OS Release 9.6.
Description	Display information about all Diameter instances or only the specified instance.
Options	<p>brief detail summary—(Optional) Display the specified level of output. The summary output is displayed by default and includes basic instance information. The brief output displays the summary information in a different format. The detail output is the same as the brief output.</p> <p>instance-name—(Optional) Display information for only the specified Diameter instance.</p>
Required Privilege Level	view
Related Documentation	<ul style="list-style-type: none"> • show diameter on page 56
List of Sample Output	show diameter instance on page 70 show diameter instance detail on page 70
Output Fields	Table 10 on page 69 lists the output fields for the show diameter instance command. Output fields are listed in the approximate order in which they appear.

Table 10: show diameter instance Output Fields

Field Name	Field Description	Level of Output
name	Name of the Diameter instance.	summary
Origin-realm	Value of Origin-Realm AVP.	summary
Origin-host	Value of Origin-Host AVP.	summary
NE-total	Total number of network elements configured for this instance.	summary
NE-connected	Number of network elements with active Diameter connections.	summary
Instance name	Name of the Diameter instance.	brief detail
Origin realm	Value of Origin-Realm AVP.	brief detail
Origin host	Value of Origin-Host AVP.	brief detail
NEs	Total number of network elements configured for this instance.	brief detail

Table 10: show diameter instance Output Fields (*continued*)

Field Name	Field Description	Level of Output
Connected NEs	Number of network elements with active Diameter connections.	brief detail

Sample Output

show diameter instance

```
user@host> show diameter instance
```

```
Diameter instances:
  Name      Origin-Realm  Origin-Host  NE-Total  NE-Connected
  master    rrrr         hhhh        1         1
```

show diameter instance detail

```
user@host> show diameter instance detail
```

```
Diameter instance:
  Instance name : master

  Origin realm  : rrrr

  Origin host   : hhhh

  NEs           : 1
  Connected NEs : 1
```

show diameter network-element

Syntax	show diameter network-element <brief detail summary> <element-name>
Release Information	Command introduced in Junos OS Release 9.6.
Description	Display information about all Diameter network elements or only the specified network element.
Options	<p>brief detail summary—(Optional) Display the specified level of output. The summary output is displayed by default and includes basic network element information. The brief output displays the summary information in a different format. The detail output adds information to the brief output.</p> <p>element-name—(Optional) Display information for only the specified network element.</p>
Required Privilege Level	view
Related Documentation	<ul style="list-style-type: none"> • show diameter on page 56 • show diameter function on page 62 • show diameter network-element map on page 74 • show diameter peer on page 77 • show diameter route on page 89
List of Sample Output	<p>show diameter network-element on page 72</p> <p>show diameter network-element detail on page 73</p>
Output Fields	Table 11 on page 71 lists the output fields for the show diameter network-element command. Output fields are listed in the approximate order in which they appear.

Table 11: show diameter network-element Output Fields

Field Name	Field Description	Level of Output
Name	Name of the Diameter network element.	summary
Instance	Name of the Diameter instance in which the network element is configured.	summary

Table 11: show diameter network-element Output Fields (*continued*)

Field Name	Field Description	Level of Output
State	State of the network element: <ul style="list-style-type: none"> Connecting—None of the network element peers are in the open state and available for connection. Selecting—One network element peer is connected and the network element is waiting for another peer to reach the open state so that it can be connected. Partially-Connected—One network element peer is in the open state and connected. Post-selection-delay—Three or more peers are in the open state and the network element is waiting to deactivate the peers in excess of two. Fully-connected—Two network element peers are in the open state and connected. 	All levels
Primary peer	Primary peer for the network element, based on the configured peer priority.	All levels
Secondary peer	Secondary peer for the network element, based on the configured peer priority.	All levels
NE name	Name of the Diameter network element.	brief detail
Instance name	Name of the Diameter instance in which the network element is configured.	brief detail
Peers	Number of configured peers.	brief detail
Activated peers	Number of peers that have been activated.	brief detail
Open peers	Number of peers in the open state, without active network element connections but available for a connection.	brief detail
Routes	Number of routes configured for the network element.	brief detail
Invalid routes	Number of routes that are invalid because they lack one or more of the following: application and partition, Diameter instance, or destination realm.	brief detail
Activation delay	Period in milliseconds between peer activations by the network element.	brief detail
First selection delay	Period in milliseconds that the network element waited after connecting to the first peer to allow other peers to reach the open state.	brief detail
Postselection delay	Period in milliseconds that the network element waited after having two peers in the open state before deactivating all lower-priority peers.	brief detail

Sample Output

show diameter network-element

```
user@host> show diameter network-element
```

```
Diameter network-elements:
```

```
Primary      Secondary
```

Name	Instance	State	Peer	Peer
ne0	master	Fully-connected	p0	p1

show diameter network-element detail

```
user@host> show diameter network-element detail
```

Diameter network-element:

NE name : ne0

Instance name : master

State : Fully-connected

Primary peer : p0

Secondary peer : p1

Peers : 5

Activated peers : 4

Open peers : 2

Routes : 1

Invalid routes : 0

Activation delay : 10000 ms

First selection delay : 0 ms

Post selection delay : 30000 ms

show diameter network-element map

Syntax	show diameter network-element map <brief detail summary> <element-name>
Release Information	Command introduced in Junos OS Release 9.6.
Description	Display network-element-to-peer mapping information for all Diameter network elements or only the specified network element.
Options	<p>brief detail summary—(Optional) Display the specified level of output. The summary output is displayed by default. The brief output and detail output display the summary information in a different format.</p> <p>element-name—(Optional) Display information for only the specified network element.</p>
Required Privilege Level	view
Related Documentation	<ul style="list-style-type: none"> • show diameter on page 56 • show diameter network-element on page 71
List of Sample Output	<p>show diameter network-element map on page 75</p> <p>show diameter network-element map detail on page 75</p>
Output Fields	Table 12 on page 74 lists the output fields for the show diameter network-element map command. Output fields are listed in the approximate order in which they appear.

Table 12: show diameter network-element map Output Fields

Field Name	Field Description	Level of Output
Name	Name of the Diameter network element.	summary
Instance	Name of the Diameter instance in which the network element is configured.	summary
Peer	Name of the peer.	All levels
Priority	Priority configured for the peer. A lower number indicates a higher priority.	All levels
State	State of the peer: <ul style="list-style-type: none"> • Activated—Peer has been activated (selected) by the network element. • Not-Activated—Peer has not been selected by the network element. • Primary—Peer that is connected to the network element and has the higher priority of the two connected peers. • Secondary—Peer that is connected to the network element and has the lower priority of the two connected peers. 	summary
NE name	Name of the Diameter network element.	brief detail

Table 12: show diameter network-element map Output Fields (*continued*)

Field Name	Field Description	Level of Output
Instance name	Name of the Diameter instance in which the network element is configured.	brief detail
Usage	State of the peer: <ul style="list-style-type: none"> Activated—Peer has been activated (selected) by the network element. Not-Activated—Peer has not been selected by the network element. Primary—Peer that is connected to the network element and has the higher priority of the two connected peers. Secondary—Peer that is connected to the network element and has the lower priority of the two connected peers. 	brief detail

Sample Output

show diameter network-element map

```
user@host> show diameter network-element map
```

```
Diameter network-element peers:
  Name      Instance  Peer      Priority  State
  ne0       master    p288      30       Activated
  ne0       master    p0        20       Primary
  ne0       master    pA        15       Activated
  ne0       master    p1        10       Secondary
  ne0       master    pB        5       Not-Activated
```

show diameter network-element map detail

```
user@host> show diameter network-element map detail
```

```
Diameter network-element peers:
  NE name      : ne0

  Instance name : master

  Peer          : p288

  Priority      :      30
  Usage        : Activated

  NE name      : ne0

  Instance name : master

  Peer          : p0

  Priority      :      20
  Usage        : Primary

  NE name      : ne0

  Instance name : master

  Peer          : pA
```

Priority	:	15
Usage	:	Activated
NE name	:	ne0
Instance name	:	master
Peer	:	p1
Priority	:	10
Usage	:	Secondary
NE name	:	ne0
Instance name	:	master
Peer	:	pB
Priority	:	5
Usage	:	Not-Activated

show diameter peer

Syntax	show diameter peer <brief detail summary> <peer-name>
Release Information	Command introduced in Junos OS Release 9.6.
Description	Display information about all peers associated with Diameter instances or only the specified peer.
Options	<p>brief detail summary—(Optional) Display the specified level of output. The summary output is displayed by default and includes basic peer information. The brief output displays the summary information in a different format. The detail output adds information to the brief output.</p> <p>peer-name—(Optional) Display information for only the specified peer.</p>
Required Privilege Level	view
Related Documentation	<ul style="list-style-type: none"> • clear diameter peer on page 55 • show diameter on page 56 • show diameter peer map on page 82 • show diameter peer statistics on page 85
List of Sample Output	<p>show diameter peer on page 79</p> <p>show diameter peer detail on page 80</p>
Output Fields	Table 13 on page 77 lists the output fields for the show diameter peer command. Output fields are listed in the approximate order in which they appear.

Table 13: show diameter peer Output Fields

Field Name	Field Description	Level of Output
Peer	Name of the peer.	brief summary
Instance	Name of the Diameter instance in which the peer is configured.	brief summary

Table 13: show diameter peer Output Fields (*continued*)

Field Name	Field Description	Level of Output
State	State of the peer: <ul style="list-style-type: none"> • Bad-Config—Misconfiguration. • Bad-Remote—Remote side does not conform to one of the decisions or is sending malformed messages. • Closed—Normal disconnect due to a request from the remote site or due to excessive watchdog timeouts. • Destructing—Peer to be deleted on the next timer tick; until then, it performs no actions. • Disabled—Peer is administratively disabled. • Internal-error—Internal error has been detected and the peer is in the process of restarting. • No-Activation—Peer is not used by any Diameter network element. • Rejected—Connection was rejected by remote side of the connection. • Reopen—Connection has been unexpectedly closed and Diameter is attempting to reopen the connection. • Suspended—All other reasons to be suspended. 	All levels
NE-Count	Number of network elements associated with the peer.	brief summary
Activated Count	Activation status of the peer: <ul style="list-style-type: none"> • 1—Peer is activated. • 0—Peer is not activated. 	All levels
Primary Count	Status of the peer, primary (1) or secondary (0).	All levels
Secondary Count	Secondary (0) versus Primary (1) status of the peer.	All levels
Peer name	Name of the peer.	detail
NEs	Number of network elements associated with the peer.	detail
Vrf	Logical system:routing instance of the configuration.	detail
Remote address	Remote IP address of the peer.	detail
Remote port	Remote port on the peer on which the connection is made.	detail
Remote end origin realm	Name of the realm of the Diameter node that originates messages to the peer.	detail
Remote end origin host	Name of the host of the Diameter node that originates messages to the peer.	detail
Local address	Local IP address on the Diameter origin node.	detail
Local port	Local port on the Diameter origin node.	detail

Table 13: show diameter peer Output Fields (*continued*)

Field Name	Field Description	Level of Output
Local transport	Number of transports configured.	detail
Time since last enable	Period since peer was enabled in <i>hh:mm:ss</i> format.	detail
In state time	Period that peer has been in present state in <i>hh:mm:ss</i> format.	detail
Remaining in state time	Period that peer will remain in present state in <i>hh:mm:ss</i> format.	detail
Missing wd events	Number of missed watchdog events.	detail
Tx queue length	Number of messages in the transmit queue.	detail
Answer waiting count	Number of answers on which the peer is waiting.	detail
Time since last rx	Number of milliseconds since the last message was received by the peer.	detail
Time until wd timeout	Time remaining until next watchdog event.	detail
Operation timeout	Watchdog timeout period.	detail
Suspended timeout base	Base timeout period in suspended states (suspended, rejected, bad-remonte, bad-config). This timeout doubles after each consecutive suspension, until the maximum value of 600 seconds is reached.	detail
Closed timeout	Timeout period in normal closed state, such as when an external peer requested a disconnect.	detail
Connection timeout	Timeout period for establishing a connection.	detail
Waiting origin state id	Whether the peer is waiting for the Origin-State-Id AVP, yes or no .	detail

Sample Output

show diameter peer

```
user@host> show diameter peer
```

```
Diameter peer list:
```

Peer	Instance	State	NE-Count	Activated Count	Primary Count	Secondary Count
p0	master	I-Open	1	1	1	0
p1	master	I-Open	1	1	0	1
p288	master	Suspended	1	1	0	0
pA	master	Suspended	1	1	0	0
pB	master	No-Activation	1	0	0	0

pc	master	No-Activation	0	0	0	0
pd	master	No-Activation	0	0	0	0

show diameter peer detail

```
user@host> show diameter peer detail
```

```
Diameter peer:
Peer name       : p0
State           : I-Open
NEs             : 1
Activated count : 1
Primary count   : 1
Secondary count : 0
Vrf             : default:master
Remote address  : 10.10.5.28
Remote port     : 62917
Remote end origin realm : rrrrA
Remote end origin host : hhhhA
Local address   : 10.6.128.155
Local port      : 57095
Local transport : <NO-TRANSPORT>
Time since last enable : 08:56.200
In state time   : 08:56.200
Remaining in state time : no limit
Missed wd events : 0
Tx queue length : 0
Answer waiting count : 0
Time since last rx : 2200 ms
Time until wd timeout : 3800 ms
Operation timeout : 6000 ms
Suspended timeout base : 30000 ms
Closed timeout   : 30000 ms
Connection timeout : 6000 ms
Waiting origin state id : no

Peer name       : p1
State           : I-Open
NEs             : 1
Activated count : 1
Primary count   : 0
Secondary count : 1
Vrf             : default:master
Remote address  : 10.10.5.28
Remote port     : 58490
Remote end origin realm : rrrrA
Remote end origin host : hhhhB
Local address   : 10.6.128.155
Local port      : 49293
Local transport : <NO-TRANSPORT>
Time since last enable : 08:56.200
In state time   : 08:36.000
Remaining in state time : no limit
Missed wd events : 0
Tx queue length : 0
Answer waiting count : 0
Time since last rx : 0 ms
Time until wd timeout : 6000 ms
Operation timeout : 6000 ms
Suspended timeout base : 30000 ms
```

```
Closed timeout      :    30000 ms
Connection timeout  :     6000 ms
Waiting origin state id : no
```

show diameter peer map

Syntax	show diameter peer map <brief detail summary> <peer-name>
Release Information	Command introduced in Junos OS Release 9.6.
Description	Display peer-to-network-element mapping information for all peers associated with Diameter instances or with the specified peer.
Options	<p>brief detail summary—(Optional) Display the specified level of output. The summary output is displayed by default and includes basic peer information. The brief output displays the summary information in a different format. The detail output adds information to the brief output.</p> <p>peer-name—(Optional) Display mapping information for only the specified peer.</p>
Required Privilege Level	view
Related Documentation	<ul style="list-style-type: none"> • clear diameter peer on page 55 • show diameter on page 56 • show diameter peer on page 77 • show diameter peer statistics on page 85
List of Sample Output	<p>show diameter peer map on page 83</p> <p>show diameter peer map detail on page 83</p>
Output Fields	Table 14 on page 82 lists the output fields for the show diameter peer map command. Output fields are listed in the approximate order in which they appear.

Table 14: show diameter peer map Output Fields

Field Name	Field Description	Level of Output
Peer	Name of the peer.	All levels
Instance	Name of the Diameter instance in which the network element is configured.	All levels
NE	Name of the Diameter network element.	All levels
Priority	Priority configured for the peer. A lower number indicates a higher priority.	All levels

Table 14: show diameter peer map Output Fields (*continued*)

Field Name	Field Description	Level of Output
State	State of the peer: <ul style="list-style-type: none"> Activated—Peer has been activated (selected) by the network element. Not-Activated—Peer has not been selected by the network element. Primary—Peer that is connected to the network element and has the higher priority of the two connected peers. Secondary—Peer that is connected to the network element and has the lower priority of the two connected peers. 	All levels
Instance name	Name of the Diameter instance in which the network element is configured.	brief detail
NE name	Name of the Diameter network element.	brief detail
Usage	Role of the peer for the network element, Primary or Secondary .	brief detail

Sample Output

show diameter peer map

```
user@host> show diameter peer map
```

```
Diameter peer usage by network elements:
```

Peer	Instance	NE	Priority	State
p0	master	ne0	20	Primary
p1	master	ne0	10	Secondary
p288	master	ne0	30	Activated
pA	master	ne0	15	Activated
pB	master	ne0	5	Not-Activated

show diameter peer map detail

```
user@host> show diameter peer map detail
```

```
Diameter network-element peers:
```

```
Peer                : p0

Instance name       : master

NE name             : ne0

Priority             :      20
Usage               : Primary

Peer                : p1

Instance name       : master

NE name             : ne0

Priority             :      10
Usage               : Secondary

Peer                : p288
```

Instance name	:	master
NE name	:	ne0
Priority	:	30
Usage	:	Activated
Peer	:	pA
Instance name	:	master
NE name	:	ne0
Priority	:	15
Usage	:	Activated
Peer	:	pB
Instance name	:	master
NE name	:	ne0
Priority	:	5
Usage	:	Not-Activated

show diameter peer statistics

Syntax	show diameter peer statistics <brief detail summary> <peer-name>
Release Information	Command introduced in Junos OS Release 9.6.
Description	Display statistics about all peers associated with Diameter instances or only the specified peer.
Options	<p>brief detail summary—(Optional) Display the specified level of output. The summary output is displayed by default and includes basic function statistics. The brief output displays the summary information in a different format and adds numbers accumulated since the peer was connected. The detail output adds information to the brief output.</p> <p>peer-name—(Optional) Display information for only the specified peer. When you specify a peer, the brief output is displayed by default, even when you explicitly specify summary.</p>
Required Privilege Level	view
Related Documentation	<ul style="list-style-type: none"> • clear diameter peer on page 55 • show diameter on page 56 • show diameter peer on page 77 • show diameter peer map on page 82
List of Sample Output	show diameter peer statistics on page 86 show diameter peer statistics detail on page 86
Output Fields	Table 15 on page 85 lists the output fields for the show diameter peer statistics command. Output fields are listed in the approximate order in which they appear.

Table 15: show diameter peer statistics Output Fields

Field Name	Field Description	Level of Output
Peer	Name of the peer.	summary brief
Instance	Name of the Diameter instance in which the network element is configured.	summary brief
Rx	Total number of messages received.	summary brief
Rx-Peer	Number of messages received by the peer.	summary brief
Rx-node	Number of messages received by the Diameter node.	summary brief

Table 15: show diameter peer statistics Output Fields (*continued*)

Field Name	Field Description	Level of Output
Forw	Total number of forwarded messages.	summary brief
Tx-Peer	Number of messages transmitted by the peer.	summary brief
Tx	Total number of transmitted messages.	summary brief
Peer name	Name of the peer.	detail
Instance name	Name of the Diameter instance in which the network element is configured.	detail

Sample Output

show diameter peer statistics

```
user@host> show diameter peer statistics
```

```
Diameter peer statistics:
```

Peer	Instance	Rx	Rx-Peer	Rx-Node	Forw	Tx-Peer	Tx
p0	master	113	113	0	0	113	
113							
p1	master	110	110	0	0	110	
110							
p288	master	0	0	0	0	0	
0							
pA	master	0	0	0	0	0	
0							
pB	master	0	0	0	0	0	
0							
pc	master	0	0	0	0	0	
0							
pd	master	0	0	0	0	0	
0							

show diameter peer statistics detail

```
user@host> show diameter peer statistics detail
```

```
Diameter peer statistics:
```

Peer name	:	p0	
Instance name	:	master	
		Current	Since last enable
Rx errors	:	0	0
Rx messages	:	114	114
Rx handled by peer	:	114	114
Rx dropped msgs	:	0	0
Rx unmatched answers	:	0	0
Rx answers	:	0	0
Rx requests	:	0	0
Rx total	:	0	0
Forw to connection	:	0	0
Forw to peer	:	0	0

Forw to routed dest	:	0	0		
Total forwarding	:	0	0		
Forwarding failures	:	0	0		
Forwarding success	:	0	0		
Moved-in messages	:	0	0		
Moved-out messages	:	0	0		
Rerouted messages	:	0	0		
Dropped tx messages	:	0	0		
Tx by peer	:	114	114		
Tx errors	:	0	0		
Tx total	:	114	114		
Connection attempts	:	0	1		
Connection fails	:	0	0		
Connections	:	0	1		
Passive terminations	:	0	0		
Active terminations	:	0	0		
Passive disconnects	:	0	0		
Active disconnects	:	0	0		
Rx block requests	:	0	0		
Rx block timeoutss	:	0	0		
Connection management messages					
		Rx current	Rx since last enable	Tx current	Tx since last enable
CER	:	0	0	1	1
CEA	:	1	1	0	0
DWR	:	0	0	113	113
DWA	:	113	113	0	0
DPR	:	0	0	0	0
DPA	:	0	0	0	0
Peer name : p1					
Instance name : master					
		Current	Since last enable		
Rx errors	:	0	0		
Rx messages	:	110	110		
Rx handled by peer	:	110	110		
Rx dropped msgs	:	0	0		
Rx unmatched answers	:	0	0		
Rx answers	:	0	0		
Rx requests	:	0	0		
Rx total	:	0	0		
Forw to connection	:	0	0		
Forw to peer	:	0	0		
Forw to routed dest	:	0	0		
Total forwarding	:	0	0		
Forwarding failures	:	0	0		
Forwarding success	:	0	0		
Moved-in messages	:	0	0		
Moved-out messages	:	0	0		
Rerouted messages	:	0	0		
Dropped tx messages	:	0	0		
Tx by peer	:	110	110		
Tx errors	:	0	0		
Tx total	:	110	110		
Connection attempts	:	0	1		
Connection fails	:	0	0		
Connections	:	0	1		
Passive terminations	:	0	0		
Active terminations	:	0	0		
Passive disconnects	:	0	0		

Active disconnects	:	0	0		
Rx block requests	:	0	0		
Rx block timeoutss	:	0	0		
Connection management messages					
		Rx current	Rx since last enable	Tx current	Tx since last enable
CER	:	0	0	1	1
CEA	:	1	1	0	0
DWR	:	0	0	109	109
DWA	:	109	109	0	0
DPR	:	0	0	0	0
DPA	:	0	0	0	0

show diameter route

Syntax	show diameter route <brief detail summary> <route-name>
Release Information	Command introduced in Junos OS Release 9.6.
Description	Display information about all routes associated with Diameter instances or only the specified route.
Options	<p>brief detail summary—(Optional) Display the specified level of output. The summary output is displayed by default and includes basic function information. The brief output displays the summary information in a different format. The detail output adds information to the brief output.</p> <p>route-name—(Optional) Display information for only the specified route.</p>
Required Privilege Level	view
Related Documentation	<ul style="list-style-type: none"> • show diameter on page 56 • show diameter network-element on page 71
List of Sample Output	<p>show diameter route on page 90</p> <p>show diameter route detail on page 90</p>
Output Fields	Table 16 on page 89 lists the output fields for the show diameter route command. Output fields are listed in the approximate order in which they appear.

Table 16: show diameter route Output Fields

Field Name	Field Description	Level of Output
Route	Name of the route.	summary brief
NE	Name of the network element associated with the route.	summary brief
Instance	Name of the Diameter instance in which the route is configured.	summary brief
NE name	Name of the network element associated with the route.	brief detail
Instance name	Name of the Diameter instance in which the route is configured.	brief detail
Valid	Determination whether the route is valid, yes or no .	All levels
Up	State of the route, yes (up) or no (down).	All levels
Function	Name of the function associated with the route.	brief detail

Table 16: show diameter route Output Fields (*continued*)

Field Name	Field Description	Level of Output
Partition	Partition associated with the function.	brief detail
Dest-realm	Destination realm configured for the route.	brief detail
Dest-host	Destination hostname configured for the route.	brief detail
Metric	Metric associated with the destination and function to create the route.	brief detail
Score	<p>Value that represents how a route is configured. The basic score is 0. Points are added according to the following scheme:</p> <ul style="list-style-type: none"> • Function is specified—Add 3. • Function partition is specified—Add 1. • Destination realm is specified—Add 1. • Destination host is specified—Add 1. 	brief detail

Sample Output

show diameter route

```
user@host> show diameter route
```

```
Diameter routes:
```

```
Route      NE          Instance  Valid Up
rA         ne0         master    yes  yes
```

show diameter route detail

```
user@host> show diameter route detail
```

```
Diameter route:
```

```
Route name      : rA
NE name         : ne0
Instance name   : master
Valid           : yes
Up              : yes
Function        : jsrc
Partition       : jsrc-a
Dest-realm      : outer-realm
Dest-host       : outer-host
Metric          :      50
Score           :      6
```


PART 4

Troubleshooting

- [Acquiring Troubleshooting Information on page 93](#)
- [Troubleshooting Diameter Networks on page 99](#)
- [Troubleshooting Configuration Statement on page 101](#)

CHAPTER 7

Acquiring Troubleshooting Information

- [Tracing Diameter Base Protocol Processes for Subscriber Access on page 93](#)
- [Configuring the Diameter Base Protocol Trace Log Filename on page 94](#)
- [Configuring the Number and Size of Diameter Base Protocol Log Files on page 94](#)
- [Configuring Access to the Diameter Base Protocol Log File on page 95](#)
- [Configuring a Regular Expression for Diameter Base Protocol Messages to Be Logged on page 95](#)
- [Configuring the Diameter Base Protocol Tracing Flags on page 96](#)
- [Configuring the Severity Level to Filter Which Diameter Base Protocol Messages Are Logged on page 96](#)
- [Collecting Subscriber Access Logs Before Contacting Juniper Technical Support on page 96](#)

Tracing Diameter Base Protocol Processes for Subscriber Access

The Junos OS trace feature tracks Diameter base protocol operations and records events in a log file. The error descriptions captured in the log file provide detailed information to help you solve problems.

By default, nothing is traced. When you enable the tracing operation, the default tracing behavior is as follows:

1. Important events are logged in a file located in the **/var/log** directory. By default, the router uses the filename **jdiameterd**. You can specify a different filename, but you cannot change the directory in which trace files are located.
2. When the trace log file **filename** reaches 128 kilobytes (KB), it is compressed and renamed **filename.0.gz**. Subsequent events are logged in a new file called **filename**, until it reaches capacity again. At this point, **filename.0.gz** is renamed **filename.1.gz** and **filename** is compressed and renamed **filename.0.gz**. This process repeats until the number of archived files reaches the maximum file number. Then the oldest trace file—the one with the highest number—is overwritten.

You can optionally specify the number of trace files to be from 2 through 1000. You can also configure the maximum file size to be from 10 KB through 1 gigabyte (GB). For more information about how log files are created, see the *Junos OS System Log Messages Reference*.

By default, only the user who configures the tracing operation can access log files. You can optionally configure read-only access for all users.

To configure Diameter base protocol tracing operations:

1. (Optional) Configure a trace log filename.
See [“Configuring the Diameter Base Protocol Trace Log Filename” on page 94.](#)
2. (Optional) Configure the number and size of trace logs.
See [“Configuring the Number and Size of Diameter Base Protocol Log Files” on page 94.](#)
3. (Optional) Configure user access to trace logs.
See [“Configuring Access to the Diameter Base Protocol Log File” on page 95.](#)
4. (Optional) Configure a regular expression to filter the information to be included in the trace log.
See [“Configuring a Regular Expression for Diameter Base Protocol Messages to Be Logged” on page 95.](#)
5. (Optional) Configure flags to specify which events are logged.
See [“Configuring the Diameter Base Protocol Tracing Flags” on page 96.](#)
6. (Optional) Configure a severity level for messages to specify which event messages are logged.
See [“Configuring the Severity Level to Filter Which Diameter Base Protocol Messages Are Logged” on page 96.](#)

Configuring the Diameter Base Protocol Trace Log Filename

By default, the name of the file that records trace output for Diameter base protocol is **jdiameterd**. You can specify a different name with the **file** option.

To configure the filename for Diameter base protocol tracing operations:

- Specify the name of the file used for the trace output.

```
[edit system processes diameter-service traceoptions]  
user@host# set file diam_logfile_1
```

Related Documentation

- [Tracing Diameter Base Protocol Processes for Subscriber Access on page 93](#)

Configuring the Number and Size of Diameter Base Protocol Log Files

You can optionally specify the number of compressed, archived trace log files to be from 2 through 1000. You can also configure the maximum file size to be from 10 KB through 1 gigabyte (GB); the default size is 128 kilobytes (KB).

The archived files are differentiated by a suffix in the format **.number.gz**. The newest archived file is **.0.gz** and the oldest archived file is **.(maximum number)-1.gz**. When the

current trace log file reaches the maximum size, it is compressed and renamed, and any existing archived files are renamed. This process repeats until the maximum number of archived files is reached, at which point the oldest file is overwritten.

For example, you can set the maximum file size to 2 MB, and the maximum number of files to 20. When the file that receives the output of the tracing operation, *filename*, reaches 2 MB, *filename* is compressed and renamed *filename.0.gz*, and a new file called *filename* is created. When the new *filename* reaches 2 MB, *filename.0.gz* is renamed *filename.1.gz* and *filename* is compressed and renamed *filename.0.gz*. This process repeats until there are 20 trace files. Then the oldest file, *filename.19.gz*, is simply overwritten when the next oldest file, *filename.18.gz* is compressed and renamed to *filename.19.gz*.

To configure the number and size of trace files:

- Specify the name, number, and size of the file used for the trace output. (Diameter base protocol supports the **files** and **size** options for the **traceoptions** statement.)

```
[edit system processes diameter-service traceoptions]
user@host# set file diam_1 _logfile_1 files 20 size 2097152
```

Related Documentation

- [Tracing Diameter Base Protocol Processes for Subscriber Access on page 93](#)

Configuring Access to the Diameter Base Protocol Log File

By default, only the user who configures the tracing operation can access the log files. You can enable all users to read the log file and you can explicitly set the default behavior of the log file.

To specify that all users can read the log file:

- Configure the log file to be world-readable.

```
[edit system processes diameter-service traceoptions]
user@host# set file diam_1 _logfile_1 world-readable
```

To explicitly set the default behavior, only the user who configured tracing can read the log file:

- Configure the log file to be no-world-readable.

```
[edit system processes diameter-service traceoptions]
user@host# set file diam_1 _logfile_1 no-world-readable
```

Related Documentation

- [Tracing Diameter Base Protocol Processes for Subscriber Access on page 93](#)

Configuring a Regular Expression for Diameter Base Protocol Messages to Be Logged

By default, the trace operation output includes all messages relevant to the logged events.

You can refine the output by including regular expressions to be matched.

To configure regular expressions to be matched:

- Configure the regular expression.

```
[edit system processes diameter-service traceoptions]  
user@host# set file diam_1 _logfile_1 match regex
```

**Related
Documentation**

- [Tracing Diameter Base Protocol Processes for Subscriber Access on page 93](#)

Configuring the Diameter Base Protocol Tracing Flags

By default, only important events are logged. You can specify which events and operations are logged by specifying one or more tracing flags.

To configure the flags for the events to be logged:

- Configure the flags.

```
[edit system processes diameter-service traceoptions]  
user@host# set flag dne
```

**Related
Documentation**

- [Tracing Diameter Base Protocol Processes for Subscriber Access on page 93](#)

Configuring the Severity Level to Filter Which Diameter Base Protocol Messages Are Logged

The messages associated with a logged event are categorized according to severity level. You can use the severity level to determine which messages are logged for the event type. The severity level that you configure depends on the issue that you are trying to resolve. In some cases you might be interested in seeing all messages relevant to the logged event, so you specify **all** or **verbose**. Either choice generates a large amount of output. You can specify a more restrictive severity level, such as **notice** or **info** to filter the messages. By default, the trace operation output includes only messages with a severity level of **error**.

To configure the type of messages to be logged:

- Configure the message severity level.

```
[edit system processes diameter-service traceoptions]  
user@host# set level severity
```

**Related
Documentation**

- [Tracing Diameter Base Protocol Processes for Subscriber Access on page 93](#)

Collecting Subscriber Access Logs Before Contacting Juniper Technical Support

Problem When you experience a subscriber access problem in your network, we recommend that you collect certain logs before you contact Juniper Technical Support. This topic shows you the most useful logs for a variety of network implementations. In addition to the

relevant log information, you must also collect standard troubleshooting information and send it to Juniper Technical Support in your request for assistance.

Solution To collect standard troubleshooting information:

- Redirect the command output to a file.

```
user@host> request support information | save rsi-1
```

To configure logging to assist Juniper Technical Support:

1. Review the following blocks of statements to determine which apply to your configuration.

```
[edit]
set system syslog archive size 100m files 25
set system auto-configuration traceoptions file filename
set system auto-configuration traceoptions file filename size 100m files 25
set protocols ppp-service traceoptions file filename size 100m files 25
set protocols ppp-service traceoptions level all
set protocols ppp-service traceoptions flag all
set protocols ppp traceoptions file filename size 100m files 25
set protocols ppp traceoptions level all
set protocols ppp traceoptions flag all
set protocols ppp monitor-session all
set interfaces pp0 traceoptions flag all
set demux traceoptions file filename size 100m files 25
set demux traceoptions level all
set demux traceoptions flag all
set system processes dhcp-service traceoptions file filename
set system processes dhcp-service traceoptions file size 100m
set system processes dhcp-service traceoptions file files 25
set system processes dhcp-service traceoptions flag all
set class-of-service traceoptions file filename
set class-of-service traceoptions file size 100m
set class-of-service traceoptions flag all
set class-of-service traceoptions file files 25
set routing-options traceoptions file filename
set routing-options traceoptions file size 100m
set routing-options traceoptions flag all
set routing-options traceoptions file files 25
set interfaces traceoptions file filename
set interfaces traceoptions file size 100m
set interfaces traceoptions flag all
set interfaces traceoptions file files 25
set system processes general-authentication-service traceoptions file filename
set system processes general-authentication-service traceoptions file size 100m
set system processes general-authentication-service traceoptions flag all
set system processes general-authentication-service traceoptions file files 25
```

2. Copy the relevant statements into a text file and modify the log filenames as you want.
3. Copy the statements from the text file and paste them into the CLI on your router to configure logging.
4. Commit the logging configuration to begin collecting information.



.....

NOTE: The maximum file size for DHCP local server and DHCP relay log files is 1 GB. The maximum number of log files for DHCP local server and DHCP relay is 1000.

.....



.....

BEST PRACTICE: Enable these logs only to collect information when troubleshooting specific problems. Enabling these logs during normal operations can result in reduced system performance.

.....

**Related
Documentation**

- *Compressing Troubleshooting Logs from /var/logs to Send to Juniper Technical Support*

CHAPTER 8

Troubleshooting Diameter Networks

- [Troubleshooting Diameter Network Configuration on page 99](#)
- [Troubleshooting Diameter Network Connectivity on page 99](#)

Troubleshooting Diameter Network Configuration

Problem A misconfiguration of the network can prevent Diameter from functioning properly. Configuration options for the Diameter base protocol are simple in the current release, simplifying discovery of a misconfiguration.

The output of the **show diameter peer** command indicates a peer is in the no-activation state. In this case issue the **show diameter peer map** and **show diameter network-element map** commands to determine which network elements use the peer. The output of these commands can indicate why the peer is not activated. For example, all the associated network elements might have higher-priority peers in the open state.

The failed-to-forward counters are increasing in the output of the **show diameter function statistics detail** command. This can indicate that the routes to the peer are incorrectly configured. Check the network connectivity, then use the **show diameter routes** command to determine whether application traffic is being correctly forwarded.

Cause Typical misconfigurations appear in the routes, peers, and network element configurations.

Solution Use the appropriate statements to correct the misconfiguration.

- Related Documentation**
- [show diameter function statistics on page 66](#)
 - [show diameter network-element map on page 74](#)
 - [show diameter peer on page 77](#)
 - [show diameter peer map on page 82](#)
 - [show diameter route on page 89](#)

Troubleshooting Diameter Network Connectivity

Problem In some circumstances, problems can arise with network connectivity to Diameter peers. The problem may originate with the peer or the peer host.

The output of the **show diameter peer** command indicates a peer is in the suspended, rejected, or bad-peer state.

Cause The suspended state indicates that the peer is not responding or has some other malfunction, or the network path to the peer does not exist.

The rejected state indicates that the network connection has been rejected by the peer.

The bad-peer state indicates that the network connection has been rejected by the router on which the peer resides.

Solution Determine how persistent the problem is by issuing the **show diameter peer statistics peer-name brief** command to check the connectivity statistics.

Related Documentation

- [show diameter peer on page 77](#)
- [show diameter peer statistics on page 85](#)

CHAPTER 9

Troubleshooting Configuration Statement

- [traceoptions \(Diameter Base Protocol\) on page 102](#)

traceoptions (Diameter Base Protocol)

Syntax	<pre>traceoptions { file <i>filename</i> <files <i>number</i>> <match <i>regular-expression</i> > <size <i>maximum-file-size</i>> <world-readable no-world-readable>; flag <i>flag</i>; level (all error info notice verbose warning); no-remote-trace; }</pre>
Hierarchy Level	[edit system processes diameter-service]
Release Information	Statement introduced in Junos OS Release 9.6.
Description	Define tracing options for Diameter processes.
Options	<p>file <i>filename</i>—Name of the file to receive the output of the tracing operation. Enclose the filename within quotation marks. All files are placed in the directory /var/log.</p> <p>files <i>number</i>—(Optional) Maximum number of trace files to create before overwriting the oldest one. If you specify a maximum number of files, you also must specify a maximum file size with the size option.</p> <p>Range: 2 through 1000</p> <p>Default: 3 files</p> <p>flag <i>flag</i>—Tracing operation to perform. To specify more than one tracing operation, include multiple flag statements. You can include the following flags:</p> <ul style="list-style-type: none">• all—Trace all operations• application—Trace Diameter application interface events• configuration—Trace configuration events• daemon—Trace Diameter daemon level events• diameter-instance—Trace Diameter instance events• dne—Trace Diameter network element events• framework—Trace Diameter framework events• memory-management—Trace memory management events• messages—Trace Diameter messages• node—Trace Diameter node events• peer—Trace Diameter peer events <p>level—Level of tracing to perform. You can specify any of the following levels:</p> <ul style="list-style-type: none">• all—Match all levels.• error—Match error conditions.

- **info**—Match informational messages.
- **notice**—Match notice messages about conditions requiring special handling.
- **verbose**—Match verbose messages.
- **warning**—Match warning messages.

match *regular-expression*—(Optional) Refine the output to include lines that contain the regular expression.

no-remote-trace—Disable remote tracing.

no-world-readable—(Optional) Disable unrestricted file access.

size *maximum-file-size*—(Optional) Maximum size of each trace file. By default, the number entered is treated as bytes. Alternatively, you can include a suffix to the number to indicate kilobytes (KB), megabytes (MB), or gigabytes (GB). If you specify a maximum file size, you also must specify a maximum number of trace files with the **files** option.

Syntax: *sizek* to specify KB, *sizem* to specify MB, or *sizeg* to specify GB

Range: 10240 through 1073741824

Default: 128 KB

world-readable—(Optional) Enable unrestricted file access.

Required Privilege Level

trace—To view this statement in the configuration.
trace-control—To add this statement to the configuration.

Related Documentation

- [Tracing Diameter Base Protocol Processes for Subscriber Access on page 93](#)

PART 5

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- [Index on page 107](#)

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