

IP Header Compression

This chapter provides information on configuring an enhanced, or extended, service. The product administration guides provide examples and procedures for configuration of basic services on the system. It is recommended that you select the configuration example that best meets your service model, and configure the required elements for that model, as described in the respective product administration guide, before using the procedures in this chapter.

Important RoHC header compression is not applicable for SGSN and GGSN services.

- Overview, on page 1
- Configuring VJ Header Compression for PPP, on page 2
- Configuring RoHC Header Compression for PPP, on page 3
- Configuring Both RoHC and VJ Header Compression, on page 4
- Configuring RoHC for Use with SO67 in PDSN or HSGW Service, on page 6
- Using an RoHC Profile for Subscriber Sessions, on page 7
- Disabling VJ Header Compression Over PPP, on page 10
- Disabling RoHC Header Compression Over SO67, on page 11
- Checking IP Header Compression Statistics, on page 12
- RADIUS Attributes for IP Header Compression, on page 13

Overview

The system supports IP header compression on the PPP tunnels established over the EVDO-RevA A10 links and also over the GRE tunnel that is connected to the PCF to support EVDO-RevA Service Option 67 (SO67).

By default IP header compression using the VJ algorithm is enabled for subscribers using PPP.

Note that you can use the default VJ header compression algorithm alone, configure the use of RoHC header compression only, or use both VJ and RoHC IP header compression.

- **Van Jacobsen (VJ) -** The RFC 1144 (CTCP) header compression standard was developed by V. Jacobson in 1990. It is commonly known as VJ compression. It describes a basic method for compressing the headers of IPv4/TCP packets to improve performance over low speed serial links.
- **RObust Header Compression (RoHC)** - The RFC 3095 (RoHC) standard was developed in 2001. This standard can compress IP/UDP/RTP headers to just over one byte, even in the presence of severe channel

impairments. This compression scheme can also compress IP/UDP and IP/ESP packet flows. RoHC is intended for use in wireless radio network equipment and mobile terminals to decrease header overhead, reduce packet loss, improve interactive response, and increase security over low-speed, noisy wireless links.

Important The RoHC is a licensed Cisco feature. A separate feature license may be required. Contact your Cisco account representative for detailed information on specific licensing requirements. For information on installing and verifying licenses, refer to the *Managing License Keys* section of the *Software Management Operations* chapter in the *System Administration Guide*.

In addition, you can configure RoHC profiles that define RoHC Compressor and Decompressor parameters. These RoHC profiles can be applied to subscribers.

You can also turn off all IP header compression for a subscriber.

The procedures in this chapter describe how to configure the IP header compression methods used, but for RoHC over PPP the Internet Protocol Control Protocol (IPCP) negotiations determine when they are used.

Implementing IP header compression provides the following benefits:

- Improves interactive response time
- Allows the use of small packets for bulk data with good line efficiency
- Allows the use of small packets for delay sensitive low data-rate traffic
- Decreases header overhead.
- Reduces packet loss rate over lossy links.

Configuring VJ Header Compression for PPP

By default, VJ IP header compression is enabled for subscriber sessions. When VJ header compression is configured all IP headers are compressed using the VJ compression algorithm.

Note that procedure described in this section is applicable only when VJ header compression is disabled.

Important This section provides the minimum instruction set for configuring subscriber profile for header compression. For more information on commands that configure additional parameters and options, refer *Subscriber Configuration Mode Commands* chapter in *Command Line Interface Reference* .

To configure the system to enable VJ header compression to IP headers:

Step 1 Enable VJ header compression by applying the example configuration in Enabling VJ Header Compression, on page 3.

Step 2 Verify your VJ header compression configuration by following the steps in Verifying the VJ Header Compression Configuration, on page 11.

Step 3 Save your configuration to flash memory, an external memory device, and/or a network location using the Exec mode command **save configuration**. For additional information on how to verify and save configuration files, refer to the *System Administration Guide* and the *Command Line Interface Reference*.

Enabling VJ Header Compression

Use the following example to enable the VJ header compression over PPP:

```
configure
     context <ctxt_name>
          subscriber name <subs_name>
               ip header-compression vj
               end
```

Notes:

- <*ctxt_name*> is the system context in which you wish to configure the subscriber profile. Typically this is an AAA context.
- <*subs_name*> is the name of the subscriber in the current context that you want to enable VJ IP header compression for.

Verifying the VJ Header Compression Configuration

These instructions are used to verify the VJ header compression configuration.

Verify that your header compression configurations for subscriber by entering the following command in Exec Mode in specific context:

```
show subscriber configuration username subs_name
```

The output of this command is a concise listing of subscriber parameter settings as configured.

Configuring RoHC Header Compression for PPP

RoHC IP header compression can be configured for all IP traffic, uplink traffic only, or downlink traffic only. When RoHC is configured for all traffic, you can specify the mode in which RoHC is applied.



Important This section provides the minimum instruction set for configuring subscriber profile for header compression. For more information on commands that configure additional parameters and options, refer *Subscriber Configuration Mode Commands* chapter in the *Command Line Interface Reference*.

To configure the system to enable RoHC header compression to IP headers:

- Enable RoHC header compression by applying the example configuration in Enabling RoHC Header Compression for PPP, on page 4.
- Verify your RoHC header compression configuration by following the steps in Verifying the Header Compression Configuration, on page 4.
- Save your configuration to flash memory, an external memory device, and/or a network location using the Exec mode command **save configuration**. For additional information on how to verify and save configuration files, refer to the *System Administration Guide* and the *Command Line Interface Reference*.

Enabling RoHC Header Compression for PPP

Use the following example to enable the RoHC over PPP:

```
configure
     context <ctxt_name>
          subscriber name <subs_name>
               ip header-compression RoHC [ any [ mode { optimistic |
reliable | unidirectional } ] | cid-mode { { large | small } [
marked-flows-only | max-cid | max-hdr <value> | mrru <value> ] } | marked
flows-only | max-hdr <value> | mrru <value> | downlink | uplink ] }+
               end
```

Notes:

- <*ctxt_name*> is the system context in which you wish to configure the subscriber profile. Typically this is an AAA context.
- <*subs_name*> is the name of the subscriber in the current context that you want to enable RoHC header compression for.
- Refer to the *Subscriber Configuration Mode Commands* chapter in *Command Line Interface Reference* for more details on this command and its options.

Verifying the Header Compression Configuration

These instructions are used to verify the header compression configuration.

Verify that your header compression configurations for subscriber by entering the following command in Exec Mode in specific context:

show subscriber configuration username *subs_name*

The output of this command is a concise listing of subscriber parameter settings as configured.

Configuring Both RoHC and VJ Header Compression

You can configure the system to use both VJ and RoHC IP header compression. When both VJ and RoHC are specified, the optimum header compression algorithm for the type of data being transferred is used for data in the downlink direction.

Important If both RoHC and VJ header compression are specified, the optimum header compression algorithm for the type of data being transferred is used for data in the downlink direction.

Important This section provides the minimum instruction set for configuring subscriber profile for header compression. For more information on commands that configure additional parameters and options, refer *Subscriber Configuration Mode Commands* chapter in th *Command Line Interface Reference*.

To configure the system to enable both RoHC and VJ header compression to IP headers:

- Enable the RoHC and VJ header compression by applying the example configuration in Enabling RoHC and VJ Header Compression for PPP, on page 5.
- Verify your RoHC and VJ header compression configuration by following the steps in Verifying the Header Compression Configuration, on page 5.
- Save your configuration to flash memory, an external memory device, and/or a network location using the Exec mode command **save configuration**. For additional information on how to verify and save configuration files, refer to the *System Administration Guide* and the *Command Line Interface Reference*.

Enabling RoHC and VJ Header Compression for PPP

Use the following example to enable the header compression over PPP:

```
configure
     context <ctxt_name>
          subscriber name <subs_name>
               ip header-compression vj RoHC [ any [ mode { optimistic |
reliable | unidirectional } ] | cid-mode { { large | small } [
marked-flows-only | max-cid | max-hdr <value> | mrru <value> ] } | marked
flows-only | max-hdr <value> | mrru <value> | downlink | uplink ] }+
               end
```

Notes:

- <*ctxt_name*> is the system context in which you wish to configure the subscriber profile. Typically this is an AAA context.
- <*subs_name*> is the name of the subscriber in the current context that you want to enable RoHC header compression for.
- Refer to the Subscriber Configuration Mode Commands chapter in Command Line Interface Reference for more details on this command and its options.

Verifying the Header Compression Configuration

These instructions are used to verify the header compression configuration.

Verify that your header compression configurations for subscriber by entering the following command in Exec Mode in specific context:

show subscriber configuration username *subs_name*

The output of this command is a concise listing of subscriber parameter settings as configured.

Configuring RoHC for Use with SO67 in PDSN or HSGW Service

This section explains how to set RoHC settings in the PDSN or HSGW Service configuration mode. These settings are transferred to the PCF during the initial A11 setup and are used for the GRE tunnel that is connected to the PCF to support EVDO-RevA Service Option 67 (SO67). RoHC is enabled through an auxiliary SO67 A10 connection and the PCF signals this information when the auxiliary A10 is connected.



Important This section provides the minimum instruction set for configuring subscriber profile for header compression. For more information on commands that configure additional parameters and options, refer P*DSN Service Configuration Mode Commands* or *HSGW Service Configuration Mode Commands* chapter in *Command Line Interface Reference*.

To configure the system to enable the RoHC header compression feature at the PDSN or HSGW Service over SO67:

Step 1 Enable header compression by applying the example configuration in Enabling RoHC Header Compression with PDSN, on page 6 or Enabling ROHC Header Compression with HSGW section.

Step 2 Verify your RoHC configuration by following the steps in Verifying the Header Compression Configuration, on page 7.

Step 3 Save your configuration to flash memory, an external memory device, and/or a network location using the Exec mode command **save configuration**. For additional information on how to verify and save configuration files, refer to the *System Administration Guide* and the *Command Line Interface Reference*.

Enabling RoHC Header Compression with PDSN

Use the following example to enable the RoHC header compression with PDSN over SO67:

```
configure
     context <ctxt_name>
          pdsn-service <svc_name>
               ip header-compression rohc
               cid-mode {large | small} max-cid integer
               mrru <num_octets>
               profile { [esp-ip] [rtp-udp] [udp-ip] [uncompressed-ip] }
               end
```

Notes:

- *<ctxt_name>* is the system context in which PDSN service is configured and you wish to configure the service profile.

- <*svc_name*> is the name of the PDSN service in which you want to enable RoHC over SO67.
- Refer to the *PDSN Service RoHC Configuration Mode Commands* chapter in *Command Line Interface Reference* for more details on this command and its options.

Enabling RoHC Header Compression with HSGW

Use the following example to enable the RoHC header compression with HSGW over SO67:

```
configure
     context <ctxt_name>
          hsgw-service <svc_name>
               ip header-compression rohc
                    cid-mode {large | small} max-cid integer
                    mrru <num_octets>
                  profile { [esp-ip] [rtp-udp] [udp-ip] [uncompressed-ip]
 }
                    end
```

Notes:

- <*ctxt_name*> is the system context in which HSGW service is configured and you wish to configure the service profile.
- <*svc_name*> is the name of the HSGW service in which you want to enable RoHC over SO67.
- Refer to the *HSGW Service RoHC Configuration Mode Commands* chapter in *Command Line Interface Reference* for more details on this command and its options.

Verifying the Header Compression Configuration

These instructions are used to verify the header compression configuration.

Verify that your header compression configurations for subscriber by entering the following command in Exec Mode in specific context:

show configuration context *ctxt_name*

The output of this command is a concise listing of subscriber parameter settings as configured.

Using an RoHC Profile for Subscriber Sessions

You can configure RoHC profiles that specify numerous compressor and decompressor settings. These profiles can in turn be applied to a specific subscriber or the default subscriber. RoHC profiles are used for both RoHC over PPP and for RoHC over SO67.

Important This section provides the minimum instruction set for configuring subscriber profile for header compression. For more information on commands that configure additional parameters and options, refer *Subscriber Configuration Mode Commands* chapter in *Command Line Interface Reference*.

To configure the system to apply RoHC profile to a subscriber session:

Step 1 Create RoHC profile using decompression mode or decompression mode. If you want to use compression mode go to step a else follow step b:

a) Configure RoHC profile by applying the example configuration in the Creating RoHC Profile for Subscriber using Compression Mode, on page 8 using compression mode.

b) Alternatively configure RoHC profile by applying the example configuration in the Creating RoHC Profile for Subscriber using Decompression Mode, on page 9 using compression mode.

Step 2 Apply existing RoHC profile to a subscriber by applying the example configuration in the Applying RoHC Profile to a Subscriber, on page 9.

Step 3 Verify your RoHC header compression configuration by following the steps in the Verifying the Header Compression Configuration, on page 10.

Step 4 Save your configuration to flash memory, an external memory device, and/or a network location using the Exec mode command **save configuration**. For additional information on how to verify and save configuration files, refer to the *System Administration Guide* and the *Command Line Interface Reference*.

Creating RoHC Profile for Subscriber using Compression Mode

Use the following example to create RoHC profile for a subscriber using compression mode:

```
configure
     RoHC-profile profile-name <RoHC_comp_profile_name>
          decompression-options
               [no] multiple-ts-stride
               rtp-sn-p <p_value>
               [no] use-ipid-override
               [no] use-optimized-talkspurt
               [no] use-optimized-transience
               [no] use-timer-based-compression
               end
```

Notes:

- *<RoHC_comp_profile_name>* is the name of the RoHC profile with compression mode which you want to apply to a subscriber.
- System configured most of the parameters by default. For more information on other options and parameters and details, refer to the *RoHC Profile Compression Configuration Mode Commands* chapter in *Command Line Interface Reference*.

Creating RoHC Profile for Subscriber using Decompression Mode

Use the following example to create RoHC profile for a subscriber using decompression mode:

```
configure
     RoHC-profile profile-name <RoHC_decomp_profile_name>
          decompression-options
               context-timeout <dur>
               max-jitter-cd <dur_ms>
               nak-limit <limit>
               optimistic-mode-ack
               optimistic-mode-ack-limit <num_pkts>
               piggyback-wait-time <dur_ms>
               preferred-feedback-mode { bidirectional-optimistic |
bidirectional-reliable | unidirectional }
               rtp-sn-p <p_value>
               [no] rtp-sn-p-override
               [no] use-clock-option
               [no] use-crc-option
               [no] use-feedback
               [no] use-jitter-option
               [no] use-reject-option
               [no] use-sn-option
               end
```

Notes:

- <*RoHC_profile_name*> is the name of the RoHC profile with decompression mode which you want to apply to a subscriber.
- System configured most of the parameters by default. For more information on other options and parameters and details, refer to the *RoHC Profile Decompression Configuration Mode Commands* chapter in *Command Line Interface Reference*.

Applying RoHC Profile to a Subscriber

Once an RoHC profile has been created that profile can be specified to be used for a specific subscribers. Use the following example to apply the RoHC profile to a subscriber:

```
configure
     context <ctxt_name>
          subscriber name <subs_name>
               RoHC-profile-name <RoHC_profile_name>
               end
```

Notes:

- <*ctxt_name*> is the system context in which you wish to configure the subscriber profile. Typically this is an AAA context.
- <*subs_name*> is the name of the subscriber in the current context that you want to enable RoHC header compression for.

- *<RoHC_profile_name>* is the name of the existing RoHC profile (created with compressed or decompressed mode) which you want to apply to a subscriber in the current context.
- Refer to the *Subscriber Configuration Mode Commands* chapter in *Command Line Interface Reference* for more details on this command and its options.

Verifying the Header Compression Configuration

These instructions are used to verify the header compression configuration.

Verify that your header compression configurations for subscriber by entering the following command in Exec Mode in specific context:

show subscriber configuration username *subs_name*

The output of this command is a concise listing of subscriber parameter settings as configured.

Disabling VJ Header Compression Over PPP

By default, VJ IP header compression is enabled for subscriber sessions. When VJ header compression is configured all IP headers are compressed using the VJ compression algorithm.

If you do not want to apply compression to any IP headers for a subscriber session you can disable the IP header compression feature.

Important This section provides the minimum instruction set for configuring subscriber profile for header compression. For more information on commands that configure additional parameters and options, refer *Subscriber Configuration Mode Commands* chapter in *Command Line Interface Reference*.

To configure the system to disable VJ header compression to IP headers:

Step 1 Disable header compression by appling the example configuration in Disabling VJ Header Compression, on page 10.

Step 2 Verify your VJ header compression configuration by following the steps in Verifying the VJ Header Compression Configuration, on page 11.

Step 3 Save your configuration to flash memory, an external memory device, and/or a network location using the Exec mode command **save configuration**. For additional information on how to verify and save configuration files, refer to the *System Administration Guide* and the *Command Line Interface Reference*.

Disabling VJ Header Compression

Use the following example to disable the VJ header compression over PPP:

```
configure
     context <ctxt_name>
          subscriber name <subs_name>
               no ip header-compression
               end
```

Notes:

- <*ctxt_name*> is the system context in which you wish to configure the subscriber profile. Typically this is an AAA context.
- <*subs_name*> is the name of the subscriber in the current context that you want to disable IP header compression for.

Verifying the VJ Header Compression Configuration

These instructions are used to verify the VJ header compression configuration.

Verify that your header compression configurations for subscriber by entering the following command in Exec Mode in specific context:

show subscriber configuration username <*subs_name*>

The output of this command is a concise listing of subscriber parameter settings as configured.

Disabling RoHC Header Compression Over SO67

If you do not want to apply compression to any IP headers for a subscriber sessions using the EVDO-RevA SO67 feature, you can disable the IP header compression feature at the PDSN or HSGW Service.



Important This section provides the minimum instruction set for configuring subscriber profile for header compression. For more information on commands that configure additional parameters and options, refer *PDSN Service Configuration Mode Commands* or *HSGW Service Configuration Mode Commands* chapter in *Command Line Interface Reference*.

To configure the system to disable the IP header compression feature at the PDSN or HSGW Service:

Step 1 Disable header compression by applying the example configuration in Disabling RoHC Header Compression, on page 12.

Step 2 Verify your RoHC configuration by following the steps in Verifying the Header Compression Configuration, on page 12.

Step 3 Save your configuration to flash memory, an external memory device, and/or a network location using the Exec mode command **save configuration**. For additional information on how to verify and save configuration files, refer to the *System Administration Guide* and the *Command Line Interface Reference*.

Disabling RoHC Header Compression

Use the following example to disable the header compression over SO67:

```
configure
     context <ctxt_name>
          pdsn/hsgw-service <svc_name>
               no ip header-compression RoHC
               end
```

Notes:

- <*ctxt_name*> is the system context in which PDSN or HSGW service is configured and you wish to configure the service profile.
- <*svc_name*> is the name of the PDSN or HSGW service in which you want to disable RoHC over SO67.

Verifying the Header Compression Configuration

These instructions are used to verify the header compression configuration.

Verify that your header compression configurations for subscriber by entering the following command in Exec Mode in specific context:

```
show configuration context <ctxt_name>
```

The output of this command is a concise listing of subscriber parameter settings as configured.

Checking IP Header Compression Statistics

This section commands to use to retrieve statistics that include IP header compression information.

The following Exec mode commands can be used to retrieve IP header compression statistics:

- monitor protocol ppp
- show ppp
- show ppp statistics
- show RoHC statistics
- show RoHC statistics pdsn-service
- show subscriber full username

For more information on these commands, refer to the *Command Line Interface Reference*.

RADIUS Attributes for IP Header Compression

This section lists the names of the RADIUS attributes to use for RoHC header compression. For more information on these attributes, refer to the AAA Interface Administration and Reference.

One of the following attributes can be used to specify the name of the RoHC profile to use for the subscriber session:

- SN-RoHC-Profile-Name
- SN1-RoHC-Profile-Name

Any RoHC parameters not specified in the RoHC profile are set to their default values.