Using Store and Forward with Universal Watchdog

Model	Chameleon gateways
Revision	Rev 1.2

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Revision Control

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Contents

1 Overview

For Chameleon gateways used in automatic vehicle location (AVL) or GPS tracking applications, store and Forward (SNF) should be enabled in areas where there are gaps in cellular coverage. SNF will detect out of coverage conditions and store the report data in non-volatile memory until coverage resumes, at which point the stored data will be forwarded.

For SNF operation, the Chameleon gateway requires a mechanism to determine whether it still has network connectivity. For wireless data devices that do not provide network diagnostic information, network connectivity is determined on the gateway using a universal watchdog feature, a timer mechanism for maintaining connectivity when using phone cards that have limited diagnostic support.

In addition to setting the Store and Forward setting associated with a report, the universal watchdog must be configured separately.

This application note describes how to enable SNF and to enable the universal watchdog feature on Chameleon gateways using wireless data devices with limited diagnostic support.

2 Chameleon gateway configuration

There are two steps to enabling SNF on Chameleon gateways using wireless data devices that have limited diagnostic support:

1. Enable SNF setting associated with the report
2. Enable the settings for the universal watchdog feature

2.1 Store and Forward Settings

By default, SNF settings for all reports are configured “Off”.

Configuring the SNF setting to “On” will store GPS reports in non-volatile memory only when the Chameleon gateway is out of coverage or not connected to the network. With this setting configured, the gateway will forward these stored reports when it gets back into coverage or gets reconnected to the network.

Configuring the SNF setting to “Always” will always store GPS reports in non-volatile memory regardless of the signal strength or network connectivity. This setting allows local logging of GPS reports to the gateway itself.

It is also possible to configure the delay time in seconds that the gateway must have a good quality RF connection, after returning back into cellular coverage, before stored messages are forwarded. By default, the SNF delay time is 20 seconds.

2.2 Universal Watchdog Settings

By default, the universal watchdog is disabled.

The universal watchdog feature (**cmd univwd**) relies on one of the following modes:

1. Mode 1: Detecting increase in received packets for use when a server regularly accesses the Chameleon gateway
2. Mode 2: Pinging a specified URL
3. Mode 3: Sending a specified report as a ping

For most AVL/GPS tracking applications, either universal watchdog modes 2 or 3 would work.

The default settings for the universal watchdog timer are:

- Watchdog Timer: 300
- Watchdog Ping Interval: 10

The operation of the SNF feature when used with the universal watchdog with the above default settings is as follows:

- For **univwd** modes 2 and 3 only: Every 10 s the gateway will send a ping request (**univwd 2**) or a report (**univwd 3**) to the specified server
- After 300 s of not receiving any data, the gateway will attempt to disconnect and reconnect the WAN connection

- GPS data will be stored in the SNF system when the gateway loses its WAN IP (out of coverage case)
- When pings become successful, the gateway will forward the stored data and change the GPS validity flag to B for stored data (back in coverage case)

2.3 Store and Forward using Universal Watchdog with Received Packet Detection Only

The Chameleon gateway can be configured to enable SNF using the universal watchdog in a mode where it detects the increase in packets received from the WAN connection. This gateway configuration requires a server or external application to access, ping, or send packets to the gateway at regular intervals.

Use the following commands to enable SNF using the universal watchdog feature with received packet detection only:

cmd gpsrep 1 0 3 1
cmd univwd 1
cmd save

The above sample configuration sets SNF to "On" for GPS Report #1. To set SNF to "Always", use the command **cmd gpsrep 1 0 3 2**. It is assumed GPS Report #1 has already been configured.

Use **cmd snfdelay** to configure the forwarding delay time.

These settings can be also configured via the gateway's web page under the reports and watchdogs web pages.

After saving the desired settings, a **power cycle** is required for the universal watchdog feature or SNF delay time change to take effect.

2.4 Store and Forward using Universal Watchdog with ICMP Ping

Enabling SNF has an ICMP ping traffic overhead (default 10 s interval) to generate packet receive traffic used by the universal watchdog to detect the state of the WAN connection.

Use the following commands to enable SNF using the universal watchdog feature and ICMP pings to your GPS tracking server (e.g. 1.2.3.4 below):

cmd gpsrep 1 0 3 1
cmd univwd 2 1.2.3.4
cmd univwdtimer 300 10
cmd save

The above sample configuration sets SNF to "On" for GPS Report #1. To set SNF to "Always", use the command **cmd gpsrep 1 0 3 2**. It is assumed GPS Report #1 has already been configured.

Use **cmd snfdelay** to configure the forwarding delay time.

These settings can be also configured via the gateway's web page under the reports and watchdogs web pages.

After saving the desired settings, a **power cycle** is required for the universal watchdog feature or SNF delay time change to take effect.

2.5 Store and Forward using Universal Watchdog with a gateway Report

When SNF is used with a report, there is an overhead of this additional report (default 10 s interval) to check that the status of the WAN connection. Operation is similar to using the universal watchdog with ICMP pings, except reports are sent instead of ICMP ping requests.

When using this universal watchdog mode, an additional requirement is that the server receiving the report must send a reply to the Chameleon gateway in response to the report like the operation for ICMP ping requests.

- This reply received by the gateway is essential for detecting the state of the WAN connection
- Depending on the delivery type of the report, this server functionality can be achieved by a TCP or UDP echo application, or a custom application.

Use the following commands to enable SNF using the universal watchdog feature with a UDP report (e.g. General Report #1 containing message type 3 below) sent to your GPS tracking server (e.g. 1.2.3.4 below):

cmd gpsrep 1 0 3 1
cmd univwd 3 1
cmd repremip 1 1.2.3.4
cmd repremport 1 9999
cmd reptype 1 0 3
cmd repaddmes 3
cmd save

The above sample configuration sets SNF to "On" for GPS Report #1. To set SNF to "Always", use the command **cmd gpsrep 1 0 3 2**. It is assumed GPS Report #1 has already been configured.

Use **cmd snfdelay** to configure the forwarding delay time.

These settings can be also configured via the gateway's web page under the reports and watchdogs web pages.

After saving the desired settings, a **power cycle** is required for the universal watchdog feature or SNF delay time change to take effect.

3 References

Command Reference
http://www.cypress.bc.ca/command_reference.html

4 Technical Support/Warranty

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