CHAPTER 8

Congestion Detection and Protection

Revised: July 21, 2009, OL-4495-10

Introduction

This chapter describes the congestion detection and protection feature, which includes the following capabilities:

- The system detects internal messaging congestion caused by traffic overload or other extraordinary events, and takes preventive action to avoid system failure (including shedding of traffic)
- The system generates alarms when internal messaging congestion is detected, and clears the alarms when congestion abates
- When the internal call processing engine is congested, the system places the access control list (ACL) parameter (indicating congestion) into the release messages sent to the SS7 network.

This feature functions automatically, and is not provisionable via command line interface (CLI) commands.

Special Treatment for Emergency Messages

When the Cisco BTS 10200 Softswitch is in a congested state, emergency messages are given special treatment, and are allowed to pass through. The dialed digit strings for emergency calls are specific to each region. Up to ten digit strings can be specified (911 and 9911 are included by default). Your Cisco account team can provide additional information about how your Cisco BTS 10200 Softswitch is set up to detect dialed digit strings for emergency calls.

Tip The emergency.lst file is described in the following paragraph. Note that this file should be filled out prior to bringing your system into service. If you need to make changes to this file after your system is in service and carrying live traffic, it will be necessary to modify the list and then restart the CA. Do not attempt to make these modifications on your own. Instead, contact Cisco TAC for assistance.

Caution Do not modify the emergency.lst file on a live traffic-carrying system until you have an approved procedure, applicable to your specific installation, from Cisco TAC.

The Cisco BTS 10200 Softswitch uses emergency numbers stored in the emergency.lst file to determine which calls to force through to the destination. The emergency.lst file is stored in the **/opt/OptiCall/CA146/bin** directory. The default emergency.lst file, containing the default 911 and 9911 dialed digits, is shown below. Note that each digit pattern is listed on a separate line.

```
### Copyright (c) 2002, 2003 by Cisco Systems, Inc.
#
# This file contains the possible dialed digit-patterns
# for emergency calls.
# Each line should contain only one digit-pattern.
# Line started with '#' is considered as comment.
# There could be up to 10 (at most) digit-patterns included
# in this file.
# Each digit-pattern could have at most 15 digits.
911
9911
```

Billing Records

The following billing records are created when a call is rejected due to overload conditions:

- SS7 termination cause code 42
- Cable signaling stop event cause code “resource unavailable”

Note Calls rejected by the signaling adapter will not generate a billing record.

Events and Alarms

Table 8-1 lists the alarms and events the Cisco BTS 10200 Softswitch can generate for congestion detection and protection events.

See the *Cisco BTS 10200 Softswitch Troubleshooting Guide* for a complete description of all alarms and events generated by the Cisco BTS 10200 Softswitch.

Table 8-1 Alarms for Congestion Detection and Protection Events

Alarm	Severity	Comments
Maintenance(97)	Critical	The indicated thread is not able to process its IPC[1] input messages fast enough. The input queue has grown too large and is using up too much of the IPC memory pool resource.
Maintenance(98)	Minor	The indicated thread is not able to process its IPC input messages fast enough. The input queue has grown too large and is at 25% of the level at which it will enter the throttle state.

Maintenance(99)	Major	The indicated thread is not able to process its IPC input messages fast enough. The input queue has grown too large and is at 50% of the level at which it will enter the throttle state.
Maintenance(100)	Critical	The indicated thread is not able to process its IPC input messages fast enough. The input queue has grown too large and is at 75% of the level at which it will enter the throttle state.

1. IPC = Interprocess communications (an internal Cisco BTS 10200 Softswitch process)

Additional References

For additional information on the industry standard for this feature, refer to Telcordia LSSGR document GR-317-CORE /3.1.4.12, *Automatic Congestion Control Procedures.*

For additional information related to Cisco BTS 10200 Softswitch billing functions, refer to the following documents:

- *Cisco BTS 10200 Softswitch Release 4.5 Billing Interface Guide*—Management procedures and contents of the call detail blocks (CDBs) generated by the Call Agent for billing
- *Cisco BTS 10200 Softswitch Release 4.5 PacketCable Feature Guide*—Management procedures and contents of the event messages (EMs) generated by the Call Agent for billing (typically used in PacketCable-based networks)