CHAPTER 37

Billing Support

The following sections describe billing and its many aspects. It is critical to understand all Cisco Unified Border Element (SP Edition) billing features and capabilities before performing billing configurations.

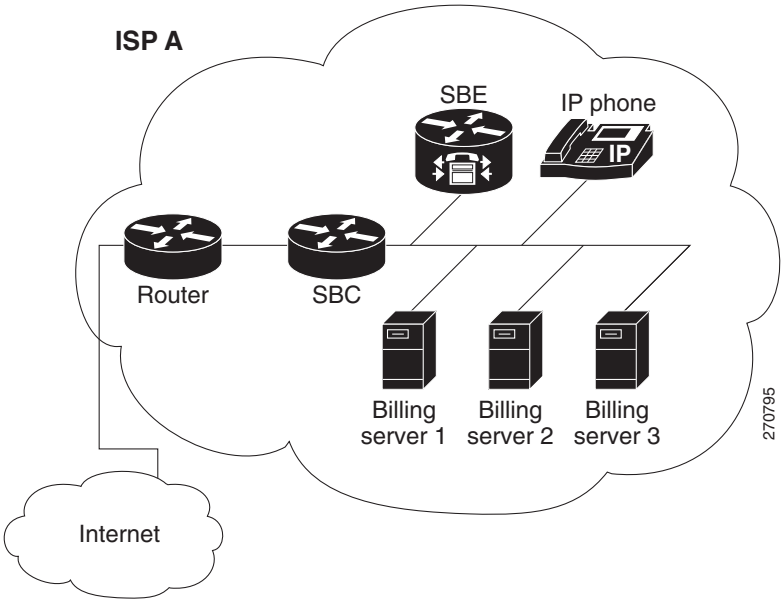
Integrated Billing Systems

Integrated billing is achieved through the PacketCable Event Messages architecture (see the *PacketCable 1.5 Event Messages Specification*; PKT-SP-EM1.5-I01-050128) as exemplified in Figure 37-1 where Cisco Unified Border Element (SP Edition) is integrated into this architecture. As shown, the billing server supports PacketCable Event Messages.

Cisco Unified Border Element (SP Edition) on the Cisco ASR 1000 Series Routers supports remote billing in the unified mode. Remote billing is call billing that is integrated with a third-party accounting server.

Figure 37-1 shows Cisco Unified Border Element (SP Edition) operating in a unified model where the billing system is being deployed with three billing servers. Cisco Unified Border Element (SP Edition) can be configured to send to these servers in a range of ways, such as to all three simultaneously, or to use one primary and two backups.

Figure 37-1 Integrated Billing Deployment



The system operates as follows:

- Cisco Unified Border Element (SP Edition) produces event messages (EMs). These event messages are for billable or other interesting events, such as call start, call end, and media-type changes.
- Cisco Unified Border Element (SP Edition) and other elements of the system, which produces EMs, sends them in real time (or batched up for network efficiency) using the RADIUS protocol to the billing server.

Note The *PacketCable 1.5 Event Messages Specification* discusses sending the identifying information (the BCID and FEID) on the outgoing INVITE and responding SDP so that correlation can be done between the two sets of billing data. Cisco Unified Border Element (SP Edition) does not support this mechanism for intra-domain or inter-domain transmission. The billing server must perform the correlation using an alternative method (for example, using the telephone numbers dialed and the time of the call).

Event Message Transmission

The generated event messages, as described in the ?$paranum>Event Messages Set Overview? section are sent using the RADIUS protocol to a preconfigured set of billing servers. Before getting into the actual detail of the event messages, review the event message transmission considerations described in the following sections:

- Multiple Server Support
- Event Message Batching
- Event Messages Set Overview

Multiple Server Support

Billing servers are configured at start-up, in SETs:

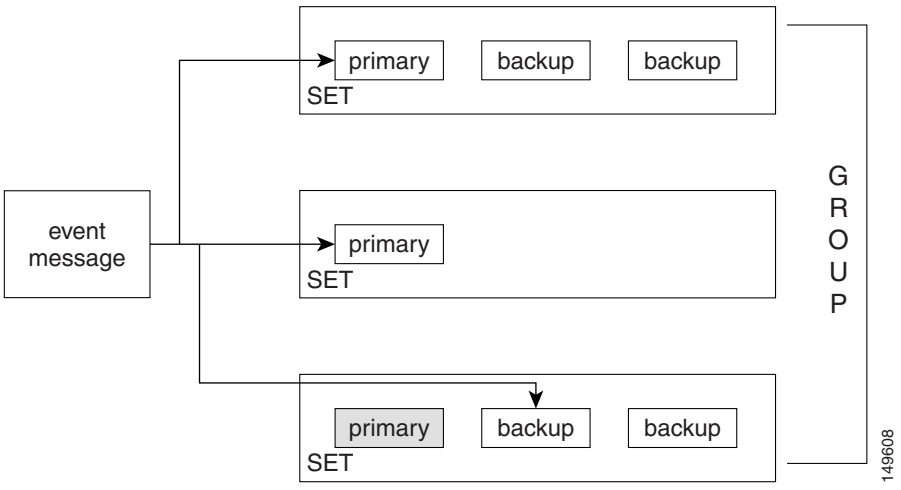
- Each SET contains a list of one or more billing servers, consisting of a single primary server and an ordered list of zero or more backup servers.
- The SBE can be configured with one or more sets of billing servers.

Each event message is sent to the entire collection of sets, but to only one machine within each set.

- For each set, the SBE sends the event message to the primary server within the set.
- If the primary server is unavailable, the message is sent to the first backup server (if present). If the first backup server is also unavailable, the message is sent to the second backup and so on until either a machine accepts the message or all the servers in the set have been tried.
- If there are no machines in a set accepting messages, the entire set is marked as unavailable.

Figure 37-2 shows the multiple server support.

Figure 37-2 Multiple Server Support



Event Message Batching

Because of the inefficiency of the RADIUS protocol, the SBE collates event messages into batches and sends them using a single RADIUS message to alleviate the burden on the transport mechanism.

Batching is possible only on a per-set basis. The batch size is not configurable, but is determined by the load on the billing component.

It is not possible to disable batching.

Event Messages Set Overview

This section specifies the set of event messages supported by Cisco Unified Border Element (SP Edition):

- Call-Specific Messages, page 37-5
- Out-of-Band Messages, page 37-5
- Unsupported Messages, page 37-5

Call-Specific Messages

The following table lists supported call event messages.

Event Message	Notes
Signaling_Start	Sent when signaling has begun (inbound) and when it is about to begin (outbound); for example, received INVITE on inbound and about to send INVITE on outbound for a SIP endpoint
QoS_Reserve	Sent when there is reserved QoS in the DBE. Sent for the inbound leg when the inbound QoS is reserved, and for the outbound leg when we reserve the outbound QoS is reserved.
Call_Answer	Indicates that the terminating party has answered and that media has started. This message is sent for both legs at the same time.
QoS_Commit	Sent when QoS is committed by the DBE. This message is sent for both legs at the same time.
Call_Disconnect	Sent when the call has been terminated and the media has ceased flowing. Sent for both legs at the same time.
QoS_Release	Sent when the QoS has been released by the DBE. Sent for both legs at the same time.
Signaling_Stop	Sent after all signaling is complete for each party in the call. (The event is generated once for each party, when the last signaling message has been sent.)
Media_Statistics	Media statistics for the call as reported by the DBE. This is sent for each leg when the media is released.
Media_Alive	Indicates that a long-duration call is still active. This is sent for each leg of the call, at a preconfigured time of day, every 24 hours.

Out-of-Band Messages

The following table lists event messages that are non-call-related, out-of-band event messages.

Event Message	Notes
Time_Change	Sent when changes of more than 200 ms occur in the time; also sent for daylight savings changes, and so on.

Unsupported Messages

The following table lists the event messages that are not supported.

Event Message	Notes	Why Not Supported?
Database_Query	Sent when querying external databases about toll-free carriers, LNP routing, and so on.	Cisco Unified Border Element (SP Edition) does not support database queries.

Event Message	Notes	Why Not Supported?
Service_Instance	Indicates an instance of a service.	Cisco Unified Border Element (SP Edition) does not support services. (Services are more applicable to softswitches and application servers.)
Service_Activation	Indicates service activation.	
Service_Deactivation	Indicates service deactivation.	
Interconnect_Start	Sent when interconnecting to PSTN.	Cisco Unified Border Element (SP Edition) does not interface directly to the PSTN.
Interconnect_Stop	Sent when terminating a connection to PSTN.	
Conference_Party_Change	Indicates a party state change in a multi-party call.	Cisco Unified Border Element (SP Edition) does not support multi-party calls.

Supported Event Message Detail

This section specifies the supported event messages and the attributes sent for each one.

Signaling_Start

This message is sent when signaling starts for a call; that is, when Cisco Unified Border Element (SP Edition) has ascertained that the destination is routable and the originating endpoint is allowed to make the call (that is, after the SLA has been checked).

The following table lists the attributes sent with this message.

Attribute Name	Comment
EM_Header	Common header attribute.
Direction_Indicator	Specifies if the device represents an originating or terminating part of the call. 1= originating 2 = terminating
MTA_Endpoint_Name	The string *MTA Endpoint* or the source endpoint information (adjacency name or addressing information). The value of this field is either set to *MTA Endpoint* or to the endpoint information. The source adjacency name is used if the SBC is configured to include the adjacency name in the billing records and if the message is from the originating device. The source addressing information—in the format *IP address,port,transport type, adjacency name*—is used if the SBC is configured to include the addressing information in the billing records and if the message is from the originating device.
Calling_Party_Number	The number of the calling party (if available).

Called_Party_Number	The number of the called party (always present).
Routing_Number	Indicates a routable number (always present).
Billing_Type	Included when the originating endpoint is a measured rate subscriber.

The following table lists the attributes not sent with this message.

Attribute Name	Comment
Location_Routing_Number	LNP not supported.
Carrier_Identification_Code	PSTN interfacing not supported (softswitch function).
Trunk_Group_ID	As above.
Intl_Code	Indicates the origin of an international call.
Dial_Around_Code	Carrier specification via dial-around codes not supported.
Jurisdiction_Information_Parameter	Ported-In billing not supported [transparent to Cisco Unified Border Element (SP Edition)].
Ported_In_Calling_Number	As above.
Ported_In_Called_Number	As above.
Called_Party_NP_source	LNP not supported.
Calling_Party_NP_source	As above.

QoS_Reserve

This message is generated when the SBE has reserved bandwidth (QoS) on the network through the DBE.

If this reserved bandwidth changes, this message (along with the partner QoS_Commit message) is generated anew.

Note If the SBE is managing multiple gates, this message is generated only for the gates to and from each MTA endpoint (and not the internal gates). There are no optional attributes not sent on this message.

The following table lists the attributes sent with this message.

Attribute Name	Comment
EM_Header	Common header attribute.
QoS_Descriptor	Description of the QoS reserved (see below).
MTA_UDP_Portnum	The UDP port number on the network element endpoint.
Flow_Direction	1 = upstream 2 = downstream
SF_ID	This is a required, DOCSIS-specific attribute, generated by the CMTS in a PacketCable architecture. Because Cisco Unified Border Element (SP Edition) does not support DOCSIS, this attribute is always 0.

Call_Answer

This message indicates the earliest point at which non-early two-way media is established.

The SBE sends the message to the billing servers when it is notified that the called party has gone off-hook; that is, that they have answered the call.

The following table lists the attributes sent with this message.

Attribute Name	Comment
EM_Header	Common header attribute
Charge_Number	The charge number in the appropriate cases such as collect call, calling-card call, call billed to a third party, or others. For Cisco Unified Border Element (SP Edition), this number is always the calling number.
MTA_Endpoint_Name	The destination endpoint information—adjacency name or addressing information—is added to the message if the SBC is configured to include the endpoint information in the billing records and if the SBC is the terminating device. If the SBC is not configured to include the endpoint information in the message, this attribute is not included.

The following table lists the attributes not sent with this message.

Attribute Name	Comment
Related_Call_Billing_Correlation_ID	The BCID assigned to the leg from the terminating network element. Cisco Unified Border Element (SP Edition) does not share BCID and FEID information with other network elements.
FEID	Contains the FEID assigned to the network element at the other end of the leg. Cisco Unified Border Element (SP Edition) does not share BCID and FEID information with other network elements.

QoS_Commit

This message is sent by the SBE when the gate bandwidth is committed. This message is only sent if a QoS_Reserve has been previously sent.

The following table lists the attributes sent with this message.

Attribute Name	Comment
EM_Header	Common header attribute.
MTA_UDP_Portnum	The UDP port number on the network element endpoint.
Flow_Direction	1 = upstream 2 = downstream

SF_ID	Always 0 (Cisco Unified Border Element (SP Edition) does not support DOCSIS).
Total_Bandwidth (attribute ID 253)	The total bandwidth in use by the streams described in this QoS_Commit message. See Table B-11 for the structure of this attribute.
Media_Session_Desc (attribute ID 254)	Zero or more attributes describing the media committed in this Flow_Direction. If more than one flow is committed, multiple Media_Session_Desc attributes are differentiated by the Stream_IDs. See Table B-12 for the structure of this attribute.

The following table lists the attributes not sent with this message.

Attribute Name	Comment
QoS_Descriptor	Information is sent on the QoS_Reserve message and not duplicated on this message

The following table lists the structure of the Total_Bandwidth attribute (attribute ID 253).

Attribute Name	Length	Type	Comment
Total_Bandwidth (attribute ID 253)	8	unsigned integer	The total bandwidth in use by the streams described in this QoS_Commit message.

The following table lists the structure of the Media_Session_Desc attribute (attribute ID 254).

Attribute Name	Length	Type	Comment
Stream_ID	4	unsigned integer	Unique stream identifier within the scope of the call. A Stream_ID identifies two flows, one upstream and one downstream - this Media_Info attribute is for the flow identified by the Flow_Direction attribute on this message.
Local_address_type	1	Byte	1 = IPv4 address—of length 4. 2 = IPv6 address—of length 16.
Local_address	variable	byte array	The local address - length defined by the Local_address_type.
Local_port	2	unsigned integer	The local port.
Remote_address_type	1	Byte	1 = IPv4 address—of length 4. 2 = IPv6 address—of length 16.
Remote_address	variable	byte array	The remote address—length defined by the Remote_address_type.
Remote_port	2	unsigned integer	The remote port.

Transrated	1	Byte	0—Transrating is not in use on this stream. 1—Transrating is in use on this stream.
Truncated	1	Byte	0—The following SDP is not truncated. 1—The following SDP was truncated after the last complete a= line to prevent the RADIUS attribute from exceeding 247 bytes.
SDP_fragment_len	1	Byte	Length of the following SDP—can be equal to 0.
SDP_fragment	variable	ASCII character string	Optionally an SDP fragment describing this flow. The port numbers present in this fragment should be ignored, and the values above used instead.

Call_Disconnect

This message is generated by the SBE when 2-way media flow terminates—when sending a 200 OK response to a BYE from either party.

Usually, this message immediately precedes QoS_Release and Signaling_Stop.

This message is only sent if a Call_Answer has previously been sent.

The following table lists the attributes sent with this message.

Attribute Name	Comment
EM_Header	Common header attribute.
Call_Termination_Cause	Reason for termination of the call.

There are no optional attributes not sent for this message.

QoS_Release

This message is generated by the SBE when the reserved bandwidth has been released; that is, the gate on the DBE has been closed.

The following table lists the attributes sent with this message.

Attribute Name	Comment
EM_Header	Common header attribute.
Flow_Direction	1 = upstream. 2 = downstream.

SF_ID	A DOCSIS specific attribute, service flow ID, generated by the CMTS in a PacketCable architecture. Cisco Unified Border Element (SP Edition) does not support DOCSIS. Therefore this attribute is always set to 0.
Media_Session_Desc (attribute ID 254)	Zero or more attributes describing the media committed in this Flow_Direction. If more than one flow is committed, multiple Media_Session_Desc attributes are differentiated by the Stream_IDs. See Table B-12 for the structure of this attribute.

There are no optional attributes not sent for this message.

Signaling_Stop

This message is sent when:

- The terminating signaling request (for example, a SIP BYE) from the party terminating the call is acknowledged by the SBE
- The terminating signaling request for the party not terminating the call is sent by the SBE and acknowledged by that party.

This message is not sent if we have not sent a Signaling_Start for this call.

The following table lists the attributes sent with this message.

Attribute Name	Comment
EM_Header	The header attribute (must be first).
Related_Call_Billing_Correlation_ID	The BCID of the other leg (that is, if this is the caller, then the callee, and vice-versa).
Call_Termination_Cause	The reason the call was terminated.
MTA_Endpoint_Name	If the SBC is configured to include the endpoint information—adjacency name or addressing information—in the message, this attribute is added. The destination endpoint information is added to the terminating device message and the source endpoint information is added to the originating device message. If the SBC is not configured to include the endpoint information in the message, this attribute is not included.

The following table lists the attributes not sent with this message.

Attribute Name	Comment
FEID	The FEID of the terminating network element. Cisco Unified Border Element (SP Edition) does not transmit this between network elements.

Media_Statistics

When a call is terminated on the DBE (that is, the gate is closed), statistics are returned to the SBE. On receipt of these statistics, this message is generated.

When media QoS is renegotiated, the gate is closed and re-opened. In this case, statistics are logged for the first gate when it closes, and for the second gate when it closes (at the end of the call).

There may be multiple gates for each Media. The statistics are aggregated and result in only one Media_Statistics message per billing leg.

The following table lists the attributes sent with this message.

Attribute Name	Comment
EM_Header	Common header attribute.
RTCP_Data	The report data from the DBE on the gate statistics.

There are no optional attributes not sent for this message.

Media_Alive

This message is generated once a day, at a pre-configured time.

At the preconfigured time, the SBE audits the active calls, and determines which calls (if any) have been active for more than 24 hours. For each call satisfying this condition, a Media_Alive message is generated.

The following table lists the attributes sent with this message.

Attribute Name	Comment
EM_Header	Common header attribute.

There are no optional attributes not sent for this message.

Time_Change

This message is generated by the SBE either on its own behalf, or on the behalf of the DBE, when either the DBE or SBE experiences a time change of more than 200 ms (discounting slew adjustments via Network Time Protocol (NTP)). This includes step adjustments, manual time settings changes and daylight savings time adjustments.

The following table lists the attributes sent with this message.

Attribute Name	Comment
EM_Header	Common header attribute.
Time_Adjustment	Adjustment in milliseconds.

There are no optional attributes not sent for this message.

Administration and Configuration

Billing requires the following generic configuration:

Integrated Mode Configuration

If integrated mode is specified, then the following configuration information is required:

- The assigned element ID. This is an ID assigned by the Internet service provider (ISP). The ID must be unique across the set of SBEs, sending event messages to a particular set of billing servers.
- The minor, major, and critical threshold sizes for the event message cache file.
- The location of the event message cache file on disk.
- The time at which to generate the **Media_Alive** message.
- RADIUS client configuration information.

  Integrated mode requires the RADIUS client component of Cisco Unified Border Element (SP Edition). This has configuration requirements (such as the sets of billing servers). Each of these sets also has a state, which depends on the existence or absence of the event message cache file for that set. The administrator may change this state. The state may be disabled, active, failed, or resending.

Administering Cisco Unified Border Element (SP Edition) Billing

The billing component is administered using the Cisco Unified Border Element (SP Edition) command-line interface. See the applicable billing commands in *Cisco Unified Border Element (SP Edition) Command Reference: Unified Model* at*:* http://www.cisco.com/en/US/docs/ios/sbc/command/reference/sbcu_book.html.

Logging and Alarms

Alarms are tripped differently, based on how billing has been integrated, as described in the following table .

Billing System Type	Logging Conditions
Integrated Billing Alarms	Alarms are tripped under the following conditions: • Minor, major, and critical alarms are sent if the cache file size exceeds a preconfigured threshold. • Alarms are tripped when billing servers become unavailable, as follows. – A minor alarm is tripped if just one of the configured sets of billing servers is unavailable. – A major alarm is tripped if more than one of the billing server sets is unavailable. – A critical alarm is tripped if none of the billing servers is available. **Note** In this situation, it may be that the condition for more than one alarm is satisfied (for example, there is just one server set configured, which fails). The most severe alarm dominates.

Fault Tolerance

The Cisco Unified Border Element (SP Edition) billing system is fault tolerant on the following two levels:

- Warm Failover—Failover to a live backup (for example, a second card on the same machine).
- Cold Failover—Failover to a new machine with no software connection between the defunct machine and the new machine.

Warm Failover

During a failover to a backup system, warm failover mechanisms are supported. In the case of warm failover:

- No data is lost on the SBE.
- The value for media statistics for the call on the DBE is reset (this information is lost).

Cold Failover

During the failover to a cold, non-dedicated backup, some billing data is lost in the transition from the old, failed system to the new server. The number of billing records completely lost during this transition is less than 10,000 per failover. However, in such a situation, consider the following possibilities:

- The remaining billing records may be corrupted, and only partial billing records recovered. This is especially true with local CDR generation, because no logs are produced in a hard format until the call ends.
- If an event message cache exists on the failed machine, more billing events may be lost, because the disk record may be unrecoverable because of fire, hardware malfunction, or whatever the original cause of the total failure was. This, however, is an unlikely scenario, because it would require the billing server to be unavailable and unrecovered for a period preceding the cold failover.
- If the media to which the CDRs are written is lost, the entire store of CDRs not backed up (by extracting the records using FTP) is lost.
- It is not possible to detect long-duration calls following a cold failover. Data is only recoverable from the system only when an event occurs in the network, such as the media being terminated).

Example for Event Messages from Cisco Unified Border Element (SP Edition) to RADIUS Billing Server

This section contains the following examples:

- Example 1 shows two requests from the SBC to the RADIUS server for a single placed call.
- Example 2 shows requests from the SBC to RADIUS server where the SBC is configured to include the endpoint adjacency name in billing records.
- Example 3 shows requests from the SBC to RADIUS server where the SBC is configured to include the endpoint addressing information in billing records.

Example 1

This example shows two requests from the SBC to the RADIUS server for a single placed call.

The first RADIUS event message has messages related to call setup:

- Event Message Type: Signaling_Start
- Event Message Type: QoS_Reserve
- Event Message Type: Call_Answer
- Event Message Type: QoS_Commit

The second RADIUS event message has messages related to call teardown:

- Event Message Type: QoS_Release
- Event Message Type: Call_Disconnect
- Event Message Type: Signaling_Stop

```
Radius Protocol
    Code: Accounting-Request (4)
    Packet identifier: 0x0 (0)
    Length: 1298
    Authenticator: 25CE1B487AE4AE70033D61E0EF540A4A
    [The response to this request is in frame 4]
    Attribute Value Pairs
        AVP: l=6  t=NAS-IP-Address(4): 77.111.1.51
            NAS-IP-Address: 77.111.1.51 (77.111.1.51)
        AVP: l=6  t=Acct-Status-Type(40): Interim-Update(3)
            Acct-Status-Type: Interim-Update (3)
        AVP: l=26  t=Acct-Session-Id(44): HDq]       01+000000\000\000\000\001
            Acct-Session-Id: HDq]       01+000000
        AVP: l=84  t=Vendor-Specific(26) v=CableLabs(4491)
            VSA: l=78 t=CableLabs-Event-Message(1):
                Event Message Version ID: 4
                BCID
                    Timestamp: 1212445021
                    Element ID:        0
                    Time Zone: DST: 1, Offset: +000000
                    Event Counter: 1
                Event Message Type: Signaling_Start (1)
                Element Type: CMS (1)
                Element ID:        0
                Time Zone: DST: 1, Offset: +000000
                Sequence Number: 0
                Event Time: 20080602221700.000
                Status: 0x00000008
                    .... .... .... .... .... .... .... ..00 = Status: No Error
(0x00000000)
                    .... .... .... .... .... .... .... .0.. = Event Origin: Trusted
Element (0x00000000)
                    .... .... .... .... .... .... .... 1... = Event Message Proxied:
Proxied (0x00000001)
                Priority: 128
                Attribute Count: 6
                Event Object: 0
        AVP: l=10  t=Vendor-Specific(26) v=CableLabs(4491)
            VSA: l=4 t=CableLabs-Direction-indicator(37): Originating(1)
                CableLabs-Direction-indicator: Originating (1)
        AVP: l=20  t=Vendor-Specific(26) v=CableLabs(4491)
            VSA: l=14 t=CableLabs-MTA-Endpoint-Name(3): MTA Endpoint
                CableLabs-MTA-Endpoint-Name: MTA Endpoint
```

```
            AVP: l=28  t=Vendor-Specific(26) v=CableLabs(4491)
                VSA: l=22 t=CableLabs-Calling-Party-Number(4):                  123
                    CableLabs-Calling-Party-Number:                  123
            AVP: l=28  t=Vendor-Specific(26) v=CableLabs(4491)
                VSA: l=22 t=CableLabs-Called-Party-Number(5):              service
                    CableLabs-Called-Party-Number:              service
            AVP: l=28  t=Vendor-Specific(26) v=CableLabs(4491)
                VSA: l=22 t=CableLabs-Routing-Number(25):              service
                    CableLabs-Routing-Number:              service
            AVP: l=10  t=Vendor-Specific(26) v=CableLabs(4491)
                VSA: l=4 t=CableLabs-Billing-Type(87): 3
                    CableLabs-Billing-Type: 3
            AVP: l=84  t=Vendor-Specific(26) v=CableLabs(4491)
                VSA: l=78 t=CableLabs-Event-Message(1):
                    Event Message Version ID: 4
                    BCID
                        Timestamp: 1212445021
                        Element ID:        0
                        Time Zone: DST: 1, Offset: +000000
                        Event Counter: 2
                    Event Message Type: Signaling_Start (1)
                    Element Type: CMS (1)
                    Element ID:        0
                    Time Zone: DST: 1, Offset: +000000
                    Sequence Number: 1
                    Event Time: 20080602221700.000
                    Status: 0x00000008
                        .... .... .... .... .... .... .... ..00 = Status: No Error
(0x00000000)
                        .... .... .... .... .... .... .... .0.. = Event Origin: Trusted
Element (0x00000000)
                        .... .... .... .... .... .... .... 1... = Event Message Proxied:
Proxied (0x00000001)
                    Priority: 128
                    Attribute Count: 6
                    Event Object: 0
            AVP: l=10  t=Vendor-Specific(26) v=CableLabs(4491)
                VSA: l=4 t=CableLabs-Direction-indicator(37): Terminating(2)
                    CableLabs-Direction-indicator: Terminating (2)
            AVP: l=20  t=Vendor-Specific(26) v=CableLabs(4491)
                VSA: l=14 t=CableLabs-MTA-Endpoint-Name(3): MTA Endpoint
                    CableLabs-MTA-Endpoint-Name: MTA Endpoint
            AVP: l=28  t=Vendor-Specific(26) v=CableLabs(4491)
                VSA: l=22 t=CableLabs-Calling-Party-Number(4):                  123
                    CableLabs-Calling-Party-Number:                  123
            AVP: l=28  t=Vendor-Specific(26) v=CableLabs(4491)
                VSA: l=22 t=CableLabs-Called-Party-Number(5):              service
                    CableLabs-Called-Party-Number:              service
            AVP: l=28  t=Vendor-Specific(26) v=CableLabs(4491)
                VSA: l=22 t=CableLabs-Routing-Number(25):              service
                    CableLabs-Routing-Number:              service
            AVP: l=10  t=Vendor-Specific(26) v=CableLabs(4491)
                VSA: l=4 t=CableLabs-Billing-Type(87): 3
                    CableLabs-Billing-Type: 3
            AVP: l=84  t=Vendor-Specific(26) v=CableLabs(4491)
                VSA: l=78 t=CableLabs-Event-Message(1):
                    Event Message Version ID: 4
                    BCID
                        Timestamp: 1212445021
                        Element ID:        0
                        Time Zone: DST: 1, Offset: +000000
                        Event Counter: 1
                    Event Message Type: QoS_Reserve (7)
                    Element Type: CMS (1)
```

```
                Element ID:        0
                Time Zone: DST: 1, Offset: +000000
                Sequence Number: 2
                Event Time: 20080602221700.000
                Status: 0x00000008
                    .... .... .... .... .... .... .... ..00 = Status: No Error
(0x00000000)
                    .... .... .... .... .... .... .... .0.. = Event Origin: Trusted
Element (0x00000000)
                    .... .... .... .... .... .... .... 1... = Event Message Proxied:
Proxied (0x00000001)
                Priority: 128
                Attribute Count: 4
                Event Object: 0
        AVP: l=32  t=Vendor-Specific(26) v=CableLabs(4491)
            VSA: l=26 t=CableLabs-QoS-Descriptor(32):
                QoS Status: 0x00000005
                    .... .... .... .... .... .... .... ..01 = Status Indication: Resource
Reserved but not Activated (1)
                    .... .... .... .... .... .... .... .1.. = Service Flow Scheduling
Type: 1
                    .... .... .... .... .... .... .... 0... = Grant Interval: 0
                    .... .... .... .... .... .... ...0 .... = Tolerated Grant Jitter: 0
                    .... .... .... .... .... .... ..0. .... = Grants Per Interval: 0
                    .... .... .... .... .... .... .0.. .... = Unsolicited Grant Size: 0
                    .... .... .... .... .... .... 0... .... = Traffic Priority: 0
                    .... .... .... .... .... ...0 .... .... = Maximum Sustained Rate: 0
                    .... .... .... .... .... ..0. .... .... = Maximum Traffic Burst: 0
                    .... .... .... .... .... .0.. .... .... = Minimum Reserved Traffic
Rate: 0
                    .... .... .... .... .... 0... .... .... = Minium Packet Size: 0
                    .... .... .... .... ...0 .... .... .... = Maximum Concatenated Burst:
0
                    .... .... .... .... ..0. .... .... .... = Status Request/Transmission
Policy: 0
                    .... .... .... .... .0.. .... .... .... = Nominal Polling Interval: 0
                    .... .... .... .... 0... .... .... .... = Tolerated Poll Jitter: 0
                    .... .... .... ...0 .... .... .... .... = Type of Service Override: 0
                    .... .... .... ..0. .... .... .... .... = Maximum Downstream Latency:
0
                Service Class Name:
                Service Flow Scheduling Type: 1
        AVP: l=12  t=Vendor-Specific(26) v=CableLabs(4491)
            VSA: l=6 t=CableLabs-MTA-UDP-Portnum(26): 0
                CableLabs-MTA-UDP-Portnum: 0
        AVP: l=12  t=Vendor-Specific(26) v=CableLabs(4491)
            VSA: l=6 t=CableLabs-SF-ID(30): 0
                CableLabs-SF-ID: 0
        AVP: l=10  t=Vendor-Specific(26) v=CableLabs(4491)
            VSA: l=4 t=CableLabs-Flow-Direction(50): Upstream(1)
                CableLabs-Flow-Direction: Upstream (1)
        AVP: l=84  t=Vendor-Specific(26) v=CableLabs(4491)
            VSA: l=78 t=CableLabs-Event-Message(1):
                Event Message Version ID: 4
                BCID
                    Timestamp: 1212445021
                    Element ID:        0
                    Time Zone: DST: 1, Offset: +000000
                    Event Counter: 2
                Event Message Type: QoS_Reserve (7)
                Element Type: CMS (1)
                Element ID:        0
                Time Zone: DST: 1, Offset: +000000
                Sequence Number: 3
```

```
                Event Time: 20080602221700.000
                Status: 0x00000008
                    .... .... .... .... .... .... .... ..00 = Status: No Error
(0x00000000)
                    .... .... .... .... .... .... .... .0.. = Event Origin: Trusted
Element (0x00000000)
                    .... .... .... .... .... .... .... 1... = Event Message Proxied:
Proxied (0x00000001)
                Priority: 128
                Attribute Count: 4
                Event Object: 0
        AVP: l=32  t=Vendor-Specific(26) v=CableLabs(4491)
            VSA: l=26 t=CableLabs-QoS-Descriptor(32):
                QoS Status: 0x00000005
                    .... .... .... .... .... .... .... ..01 = Status Indication: Resource
Reserved but not Activated (1)
                    .... .... .... .... .... .... .... .1.. = Service Flow Scheduling
Type: 1
                    .... .... .... .... .... .... .... 0... = Grant Interval: 0
                    .... .... .... .... .... .... ...0 .... = Tolerated Grant Jitter: 0
                    .... .... .... .... .... .... ..0. .... = Grants Per Interval: 0
                    .... .... .... .... .... .... .0.. .... = Unsolicited Grant Size: 0
                    .... .... .... .... .... .... 0... .... = Traffic Priority: 0
                    .... .... .... .... .... ...0 .... .... = Maximum Sustained Rate: 0
                    .... .... .... .... .... ..0. .... .... = Maximum Traffic Burst: 0
                    .... .... .... .... .... .0.. .... .... = Minimum Reserved Traffic
Rate: 0
                    .... .... .... .... .... 0... .... .... = Minium Packet Size: 0
                    .... .... .... .... ...0 .... .... .... = Maximum Concatenated Burst:
0
                    .... .... .... .... ..0. .... .... .... = Status Request/Transmission
Policy: 0
                    .... .... .... .... .0.. .... .... .... = Nominal Polling Interval: 0
                    .... .... .... .... 0... .... .... .... = Tolerated Poll Jitter: 0
                    .... .... .... ...0 .... .... .... .... = Type of Service Override: 0
                    .... .... .... ..0. .... .... .... .... = Maximum Downstream Latency:
0
                Service Class Name:
                Service Flow Scheduling Type: 1
        AVP: l=12  t=Vendor-Specific(26) v=CableLabs(4491)
            VSA: l=6 t=CableLabs-MTA-UDP-Portnum(26): 0
                CableLabs-MTA-UDP-Portnum: 0
        AVP: l=12  t=Vendor-Specific(26) v=CableLabs(4491)
            VSA: l=6 t=CableLabs-SF-ID(30): 0
                CableLabs-SF-ID: 0
        AVP: l=10  t=Vendor-Specific(26) v=CableLabs(4491)
            VSA: l=4 t=CableLabs-Flow-Direction(50): Downstream(2)
                CableLabs-Flow-Direction: Downstream (2)
        AVP: l=84  t=Vendor-Specific(26) v=CableLabs(4491)
            VSA: l=78 t=CableLabs-Event-Message(1):
                Event Message Version ID: 4
                BCID
                    Timestamp: 1212445021
                    Element ID:        0
                    Time Zone: DST: 1, Offset: +000000
                    Event Counter: 1
                Event Message Type: Call_Answer (15)
                Element Type: CMS (1)
                Element ID:        0
                Time Zone: DST: 1, Offset: +000000
                Sequence Number: 4
                Event Time: 20080602221701.000
                Status: 0x00000008
```

```
                    .... .... .... .... .... .... .... ..00 = Status: No Error
(0x00000000)
                    .... .... .... .... .... .... .... .0.. = Event Origin: Trusted
Element (0x00000000)
                    .... .... .... .... .... .... .... 1... = Event Message Proxied:
Proxied (0x00000001)
                Priority: 128
                Attribute Count: 2
                Event Object: 0
        AVP: l=28  t=Vendor-Specific(26) v=CableLabs(4491)
            VSA: l=22 t=CableLabs-Charge-Number(16):                  123
                CableLabs-Charge-Number:                  123
        AVP: l=32  t=Vendor-Specific(26) v=CableLabs(4491)
            VSA: l=26 t=CableLabs-Related-Call-Billing-Correlation-ID(13):
                Timestamp: 1212445021
                Element ID:        0
                Time Zone: DST: 1, Offset: +000000
                Event Counter: 2
        AVP: l=84  t=Vendor-Specific(26) v=CableLabs(4491)
            VSA: l=78 t=CableLabs-Event-Message(1):
                Event Message Version ID: 4
                BCID
                    Timestamp: 1212445021
                    Element ID:        0
                    Time Zone: DST: 1, Offset: +000000
                    Event Counter: 2
                Event Message Type: Call_Answer (15)
                Element Type: CMS (1)
                Element ID:        0
                Time Zone: DST: 1, Offset: +000000
                Sequence Number: 5
                Event Time: 20080602221701.000
                Status: 0x00000008
                    .... .... .... .... .... .... .... ..00 = Status: No Error
(0x00000000)
                    .... .... .... .... .... .... .... .0.. = Event Origin: Trusted
Element (0x00000000)
                    .... .... .... .... .... .... .... 1... = Event Message Proxied:
Proxied (0x00000001)
                Priority: 128
                Attribute Count: 2
                Event Object: 0
        AVP: l=28  t=Vendor-Specific(26) v=CableLabs(4491)
            VSA: l=22 t=CableLabs-Charge-Number(16):              service
                CableLabs-Charge-Number:              service
        AVP: l=32  t=Vendor-Specific(26) v=CableLabs(4491)
            VSA: l=26 t=CableLabs-Related-Call-Billing-Correlation-ID(13):
                Timestamp: 1212445021
                Element ID:        0
                Time Zone: DST: 1, Offset: +000000
                Event Counter: 1
        AVP: l=84  t=Vendor-Specific(26) v=CableLabs(4491)
            VSA: l=78 t=CableLabs-Event-Message(1):
                Event Message Version ID: 4
                BCID
                    Timestamp: 1212445021
                    Element ID:        0
                    Time Zone: DST: 1, Offset: +000000
                    Event Counter: 1
                Event Message Type: QoS_Commit (19)
                Element Type: CMS (1)
                Element ID:        0
                Time Zone: DST: 1, Offset: +000000
                Sequence Number: 6
```

```
                Event Time: 20080602221701.000
                Status: 0x00000008
                    .... .... .... .... .... .... .... ..00 = Status: No Error
(0x00000000)
                    .... .... .... .... .... .... .... .0.. = Event Origin: Trusted
Element (0x00000000)
                    .... .... .... .... .... .... .... 1... = Event Message Proxied:
Proxied (0x00000001)
                Priority: 128
                Attribute Count: 3
                Event Object: 0
        AVP: l=12  t=Vendor-Specific(26) v=CableLabs(4491)
            VSA: l=6 t=CableLabs-MTA-UDP-Portnum(26): 0
                CableLabs-MTA-UDP-Portnum: 0
        AVP: l=12  t=Vendor-Specific(26) v=CableLabs(4491)
            VSA: l=6 t=CableLabs-SF-ID(30): 0
                CableLabs-SF-ID: 0
        AVP: l=10  t=Vendor-Specific(26) v=CableLabs(4491)
            VSA: l=4 t=CableLabs-Flow-Direction(50): Upstream(1)
                CableLabs-Flow-Direction: Upstream (1)
        AVP: l=84  t=Vendor-Specific(26) v=CableLabs(4491)
            VSA: l=78 t=CableLabs-Event-Message(1):
                Event Message Version ID: 4
                BCID
                    Timestamp: 1212445021
                    Element ID:        0
                    Time Zone: DST: 1, Offset: +000000
                    Event Counter: 2
                Event Message Type: QoS_Commit (19)
                Element Type: CMS (1)
                Element ID:        0
                Time Zone: DST: 1, Offset: +000000
                Sequence Number: 7
                Event Time: 20080602221701.000
                Status: 0x00000008
                    .... .... .... .... .... .... .... ..00 = Status: No Error
(0x00000000)
                    .... .... .... .... .... .... .... .0.. = Event Origin: Trusted
Element (0x00000000)
                    .... .... .... .... .... .... .... 1... = Event Message Proxied:
Proxied (0x00000001)
                Priority: 128
                Attribute Count: 3
                Event Object: 0
        AVP: l=12  t=Vendor-Specific(26) v=CableLabs(4491)
            VSA: l=6 t=CableLabs-MTA-UDP-Portnum(26): 0
                CableLabs-MTA-UDP-Portnum: 0
        AVP: l=12  t=Vendor-Specific(26) v=CableLabs(4491)
            VSA: l=6 t=CableLabs-SF-ID(30): 0
                CableLabs-SF-ID: 0
        AVP: l=10  t=Vendor-Specific(26) v=CableLabs(4491)
            VSA: l=4 t=CableLabs-Flow-Direction(50): Downstream(2)
                CableLabs-Flow-Direction: Downstream (2)



================================================================================================
==================


Radius Protocol
    Code: Accounting-Response (5)
    Packet identifier: 0x0 (0)
```

```
    Length: 20
    Authenticator: EB0BD7E187D3301CB7D73349761F9DE0
    [This is a response to a request in frame 1]
    [Time from request: 0.041131000 seconds]

No.     Time        Source                Destination           Protocol Info
      5 29.324537   77.111.1.51           200.200.1.2           RADIUS
Accounting-Request(4) (id=0, l=1162)

================================================================================================
==================

Radius Protocol
    Code: Accounting-Request (4)
    Packet identifier: 0x0 (0)
    Length: 1162
    Authenticator: 78D7DE7EA0162046A7936593F80048D5
    [The response to this request is in frame 6]
    Attribute Value Pairs
        AVP: l=6  t=NAS-IP-Address(4): 77.111.1.51
            NAS-IP-Address: 77.111.1.51 (77.111.1.51)
        AVP: l=6  t=Acct-Status-Type(40): Interim-Update(3)
            Acct-Status-Type: Interim-Update (3)
        AVP: l=26  t=Acct-Session-Id(44): HDq]       01+000000\000\000\000\001
            Acct-Session-Id: HDq]       01+000000
        AVP: l=84  t=Vendor-Specific(26) v=CableLabs(4491)
            VSA: l=78 t=CableLabs-Event-Message(1):
                Event Message Version ID: 4
                BCID
                    Timestamp: 1212445021
                    Element ID:        0
                    Time Zone: DST: 1, Offset: +000000
                    Event Counter: 1
                Event Message Type: Unknown (22)
                Element Type: CMS (1)
                Element ID:        0
                Time Zone: DST: 1, Offset: +000000
                Sequence Number: 8
                Event Time: 20080602221731.000
                Status: 0x00000008
                    .... .... .... .... .... .... .... ..00 = Status: No Error
(0x00000000)
                    .... .... .... .... .... .... .... .0.. = Event Origin: Trusted
Element (0x00000000)
                    .... .... .... .... .... .... .... 1... = Event Message Proxied:
Proxied (0x00000001)
                Priority: 128
                Attribute Count: 1
                Event Object: 0
        AVP: l=134  t=Vendor-Specific(26) v=CableLabs(4491)
            VSA: l=128 t=CableLabs-RTCP-Data(93): PS=0, OS=0, PR=0, OR=0, PD=0, OD=0,
PL=0, JI=0, LA=0, PC/RPS=0, PC/ROS=0, PC/RPR=0, PC/RPL=0,
PC/RJI=0\000\000\000\000\000\000\000\000\000\000\000\000\000\000\000\000\000\000\000\000\0
00\000\000\000
               CableLabs-RTCP-Data: PS=0, OS=0, PR=0, OR=0, PD=0, OD=0, PL=0, JI=0, LA=0,
PC/RPS=0, PC/ROS=0, PC/RPR=0, PC/RPL=0, PC/RJI=0
        AVP: l=84  t=Vendor-Specific(26) v=CableLabs(4491)
            VSA: l=78 t=CableLabs-Event-Message(1):
                Event Message Version ID: 4
                BCID
                    Timestamp: 1212445021
                    Element ID:        0
                    Time Zone: DST: 1, Offset: +000000
                    Event Counter: 2
```

```
                Event Message Type: Unknown (22)
                Element Type: CMS (1)
                Element ID:        0
                Time Zone: DST: 1, Offset: +000000
                Sequence Number: 9
                Event Time: 20080602221731.000
                Status: 0x00000008
                    .... .... .... .... .... .... .... ..00 = Status: No Error
(0x00000000)
                    .... .... .... .... .... .... .... .0.. = Event Origin: Trusted
Element (0x00000000)
                    .... .... .... .... .... .... .... 1... = Event Message Proxied:
Proxied (0x00000001)
                Priority: 128
                Attribute Count: 1
                Event Object: 0
        AVP: l=134  t=Vendor-Specific(26) v=CableLabs(4491)
            VSA: l=128 t=CableLabs-RTCP-Data(93): PS=0, OS=0, PR=0, OR=0, PD=0, OD=0,
PL=0, JI=0, LA=0, PC/RPS=0, PC/ROS=0, PC/RPR=0, PC/RPL=0,
PC/RJI=0\000\000\000\000\000\000\000\000\000\000\000\000\000\000\000\000\000\000\000\0
00\000\000\000
               CableLabs-RTCP-Data: PS=0, OS=0, PR=0, OR=0, PD=0, OD=0, PL=0, JI=0, LA=0,
PC/RPS=0, PC/ROS=0, PC/RPR=0, PC/RPL=0, PC/RJI=0
        AVP: l=84  t=Vendor-Specific(26) v=CableLabs(4491)
            VSA: l=78 t=CableLabs-Event-Message(1):
                Event Message Version ID: 4
                BCID
                    Timestamp: 1212445021
                    Element ID:        0
                    Time Zone: DST: 1, Offset: +000000
                    Event Counter: 1
                Event Message Type: QoS_Release (8)
                Element Type: CMS (1)
                Element ID:        0
                Time Zone: DST: 1, Offset: +000000
                Sequence Number: 10
                Event Time: 20080602221731.000
                Status: 0x00000008
                    .... .... .... .... .... .... .... ..00 = Status: No Error
(0x00000000)
                    .... .... .... .... .... .... .... .0.. = Event Origin: Trusted
Element (0x00000000)
                    .... .... .... .... .... .... .... 1... = Event Message Proxied:
Proxied (0x00000001)
                Priority: 128
                Attribute Count: 2
                Event Object: 0
        AVP: l=12  t=Vendor-Specific(26) v=CableLabs(4491)
            VSA: l=6 t=CableLabs-SF-ID(30): 0
                CableLabs-SF-ID: 0
        AVP: l=10  t=Vendor-Specific(26) v=CableLabs(4491)
            VSA: l=4 t=CableLabs-Flow-Direction(50): Upstream(1)
                CableLabs-Flow-Direction: Upstream (1)
        AVP: l=84  t=Vendor-Specific(26) v=CableLabs(4491)
            VSA: l=78 t=CableLabs-Event-Message(1):
                Event Message Version ID: 4
                BCID
                    Timestamp: 1212445021
                    Element ID:        0
                    Time Zone: DST: 1, Offset: +000000
                    Event Counter: 2
                Event Message Type: QoS_Release (8)
                Element Type: CMS (1)
                Element ID:        0
```

```
                Time Zone: DST: 1, Offset: +000000
                Sequence Number: 11
                Event Time: 20080602221731.000
                Status: 0x00000008
                    .... .... .... .... .... .... .... ..00 = Status: No Error
(0x00000000)
                    .... .... .... .... .... .... .... .0.. = Event Origin: Trusted
Element (0x00000000)
                    .... .... .... .... .... .... .... 1... = Event Message Proxied:
Proxied (0x00000001)
                Priority: 128
                Attribute Count: 2
                Event Object: 0
        AVP: l=12  t=Vendor-Specific(26) v=CableLabs(4491)
            VSA: l=6 t=CableLabs-SF-ID(30): 0
                CableLabs-SF-ID: 0
        AVP: l=10  t=Vendor-Specific(26) v=CableLabs(4491)
            VSA: l=4 t=CableLabs-Flow-Direction(50): Downstream(2)
                CableLabs-Flow-Direction: Downstream (2)
        AVP: l=84  t=Vendor-Specific(26) v=CableLabs(4491)
            VSA: l=78 t=CableLabs-Event-Message(1):
                Event Message Version ID: 4
                BCID
                    Timestamp: 1212445021
                    Element ID:        0
                    Time Zone: DST: 1, Offset: +000000
                    Event Counter: 1
                Event Message Type: Call_Disconnect (16)
                Element Type: CMS (1)
                Element ID:        0
                Time Zone: DST: 1, Offset: +000000
                Sequence Number: 12
                Event Time: 20080602221731.000
                Status: 0x00000008
                    .... .... .... .... .... .... .... ..00 = Status: No Error
(0x00000000)
                    .... .... .... .... .... .... .... .0.. = Event Origin: Trusted
Element (0x00000000)
                    .... .... .... .... .... .... .... 1... = Event Message Proxied:
Proxied (0x00000001)
                Priority: 128
                Attribute Count: 1
                Event Object: 0
        AVP: l=14  t=Vendor-Specific(26) v=CableLabs(4491)
            VSA: l=8 t=CableLabs-Call-Termination-Cause(11):
                Source Document: BAF (0x0001)
                Event Object: 16
        AVP: l=84  t=Vendor-Specific(26) v=CableLabs(4491)
            VSA: l=78 t=CableLabs-Event-Message(1):
                Event Message Version ID: 4
                BCID
                    Timestamp: 1212445021
                    Element ID:        0
                    Time Zone: DST: 1, Offset: +000000
                    Event Counter: 1
                Event Message Type: Signaling_Stop (2)
                Element Type: CMS (1)
                Element ID:        0
                Time Zone: DST: 1, Offset: +000000
                Sequence Number: 13
                Event Time: 20080602221731.000
                Status: 0x00000008
                    .... .... .... .... .... .... .... ..00 = Status: No Error
(0x00000000)
```

```
                    .... .... .... .... .... .... .... .0.. = Event Origin: Trusted
Element (0x00000000)
                    .... .... .... .... .... .... .... 1... = Event Message Proxied:
Proxied (0x00000001)
                Priority: 128
                Attribute Count: 2
                Event Object: 0
        AVP: l=32  t=Vendor-Specific(26) v=CableLabs(4491)
            VSA: l=26 t=CableLabs-Related-Call-Billing-Correlation-ID(13):
                Timestamp: 1212445021
                Element ID:        0
                Time Zone: DST: 1, Offset: +000000
                Event Counter: 2
        AVP: l=14  t=Vendor-Specific(26) v=CableLabs(4491)
            VSA: l=8 t=CableLabs-Call-Termination-Cause(11):
                Source Document: BAF (0x0001)
                Event Object: 16
        AVP: l=84  t=Vendor-Specific(26) v=CableLabs(4491)
            VSA: l=78 t=CableLabs-Event-Message(1):
                Event Message Version ID: 4
                BCID
                    Timestamp: 1212445021
                    Element ID:        0
                    Time Zone: DST: 1, Offset: +000000
                    Event Counter: 2
                Event Message Type: Call_Disconnect (16)
                Element Type: CMS (1)
                Element ID:        0
                Time Zone: DST: 1, Offset: +000000
                Sequence Number: 14
                Event Time: 20080602221731.000
                Status: 0x00000008
                    .... .... .... .... .... .... .... ..00 = Status: No Error
(0x00000000)
                    .... .... .... .... .... .... .... .0.. = Event Origin: Trusted
Element (0x00000000)
                    .... .... .... .... .... .... .... 1... = Event Message Proxied:
Proxied (0x00000001)
                Priority: 128
                Attribute Count: 1
                Event Object: 0
        AVP: l=14  t=Vendor-Specific(26) v=CableLabs(4491)
            VSA: l=8 t=CableLabs-Call-Termination-Cause(11):
                Source Document: BAF (0x0001)
                Event Object: 16
        AVP: l=84  t=Vendor-Specific(26) v=CableLabs(4491)
            VSA: l=78 t=CableLabs-Event-Message(1):
                Event Message Version ID: 4
                BCID
                    Timestamp: 1212445021
                    Element ID:        0
                    Time Zone: DST: 1, Offset: +000000
                    Event Counter: 2
                Event Message Type: Signaling_Stop (2)
                Element Type: CMS (1)
                Element ID:        0
                Time Zone: DST: 1, Offset: +000000
                Sequence Number: 15
                Event Time: 20080602221731.000
                Status: 0x00000008
                    .... .... .... .... .... .... .... ..00 = Status: No Error
(0x00000000)
                    .... .... .... .... .... .... .... .0.. = Event Origin: Trusted
Element (0x00000000)
```

```
                    .... .... .... .... .... .... .... 1... = Event Message Proxied:
Proxied (0x00000001)
                Priority: 128
                Attribute Count: 2
                Event Object: 0
        AVP: l=32  t=Vendor-Specific(26) v=CableLabs(4491)
            VSA: l=26 t=CableLabs-Related-Call-Billing-Correlation-ID(13):
                Timestamp: 1212445021
                Element ID:        0
                Time Zone: DST: 1, Offset: +000000
                Event Counter: 1
        AVP: l=14  t=Vendor-Specific(26) v=CableLabs(4491)
            VSA: l=8 t=CableLabs-Call-Termination-Cause(11):
                Source Document: BAF (0x0001)
                Event Object: 16

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Radius Protocol
    Code: Accounting-Response (5)
    Packet identifier: 0x0 (0)
    Length: 20
    Authenticator: 663449DAB02BF4CC5480672195DFFFE0
    [This is a response to a request in frame 5]
    [Time from request: 0.063580000 seconds]
```

Example 2

The following example shows the requests from the SBC to RADIUS server where SBC is configured to include the endpoint adjacency name in billing records:

```
Mon May 24 10:43:02 2010
    NAS-IP-Address = 172.18.53.179
    Acct-Status-Type = Interim-Update
    Acct-Session-Id = "K\372Ds   326311+030000\000\000\000\t"
    CableLabs-Event-Message =
0x00044bfa447320202033332363331312b303330303030000000090001000120202033332363331312b30333030
303000000040323031303035323431323134834332e343037000000088000060 0
        Version_ID = 4
        Timestamp = 1274692723
        Element_ID =    32631
        Time_Zone = 1+030000
        Event_Counter = 9
        Event_Message_Type = Signaling-Start
        Element_Type = 1
        Element_ID =    32631
        Time_Zone = 1+030000
        Sequence_Number = 64
        Event_Time = 20100524121843.407
        Status = 8
        Priority = 128
        Attribute_Count = 6
        Event_Object = 0
    CableLabs-Direction-indicator = 0x0001
        Originating
    CableLabs-MTA-Endpoint-Name = "SIPPB"
    CableLabs-Calling-Party-Number = "               sipp"
    CableLabs-Called-Party-Number = "            service"
    CableLabs-Routing-Number = "            service"
    CableLabs-Attr-87 = 0x0003
```

```
        Billing type -
         flat rate
    CableLabs-Event-Message =
0x00044bfa44732020203332363331312b3033303030300000000a000100012020203332363331312b30333030
3030000000413230313030353234313231383434332e343037000000088000060 0
        Version_ID = 4
        Timestamp = 1274692723
        Element_ID =    32631
        Time_Zone = 1+030000
        Event_Counter = 10
        Event_Message_Type = Signaling-Start
        Element_Type = 1
        Element_ID =    32631
        Time_Zone = 1+030000
        Sequence_Number = 65
        Event_Time = 20100524121843.407
        Status = 8
        Priority = 128
        Attribute_Count = 6
        Event_Object = 0
    CableLabs-Direction-indicator = 0x0002
        Terminating
    CableLabs-MTA-Endpoint-Name = "MTA Endpoint"
    CableLabs-Calling-Party-Number = "                sipp"
    CableLabs-Called-Party-Number = "             service"
    CableLabs-Routing-Number = "             service"
    CableLabs-Attr-87 = 0x0003
        Billing type -
         flat rate
    Acct-Unique-Session-Id = "3479bc93d50898b5"
    Timestamp = 1274712182
    Request-Authenticator = Verified

Mon May 24 10:43:02 2010
    NAS-IP-Address = 172.18.53.179
    Acct-Status-Type = Interim-Update
    Acct-Session-Id = "K\372Ds   326311+030000\000\000\000\t"
    CableLabs-Event-Message =
0x00044bfa44732020203332363331312b3033303030300000000900070001202020333263331312b30333030
3030000000423230313030353234313231383434332e343037000000088000040 0
        Version_ID = 4
        Timestamp = 1274692723
        Element_ID =    32631
        Time_Zone = 1+030000
        Event_Counter = 9
        Event_Message_Type = QoS-Reserve
        Element_Type = 1
        Element_ID =    32631
        Time_Zone = 1+030000
        Sequence_Number = 66
        Event_Time = 20100524121843.407
        Status = 8
        Priority = 128
        Attribute_Count = 4
        Event_Object = 0
    CableLabs-QoS-Descriptor = 0x0000000520202020202020202020202020202020000000001
        Status_Bitmask = 5
        Service_Class_Name =
        QoS_Parameter_Array = 1
            resource reserved but not committed
    CableLabs-MTA-UDP-Portnum = 0
    CableLabs-SF-ID = 0
    CableLabs-Flow-Direction = 0x0001
        Upstream
```

```
    CableLabs-Event-Message =
0x00044bfa44732020203332363331312b3033303030300000000a000700012020203332363331312b30333030
303000000043323031303035323431323134332e343037000000088000040 0
        Version_ID = 4
        Timestamp = 1274692723
        Element_ID =    32631
        Time_Zone = 1+030000
        Event_Counter = 10
        Event_Message_Type = QoS-Reserve
        Element_Type = 1
        Element_ID =    32631
        Time_Zone = 1+030000
        Sequence_Number = 67
        Event_Time = 20100524121843.407
        Status = 8
        Priority = 128
        Attribute_Count = 4
        Event_Object = 0
    CableLabs-QoS-Descriptor = 0x00000005202020202020202020202020202020202000000001
        Status_Bitmask = 5
        Service_Class_Name =
        QoS_Parameter_Array = 1
            resource reserved but not committed
    CableLabs-MTA-UDP-Portnum = 0
    CableLabs-SF-ID = 0
    CableLabs-Flow-Direction = 0x0002
        Downstream
    Acct-Unique-Session-Id = "3479bc93d50898b5"
    Timestamp = 1274712182
    Request-Authenticator = Verified

Mon May 24 10:43:02 2010
    NAS-IP-Address = 172.18.53.179
    Acct-Status-Type = Interim-Update
    Acct-Session-Id = "K\372Ds   326311+030000\000\000\000\t"
    CableLabs-Event-Message =
0x00044bfa44732020203332363331312b3033303030300000000900f000120202033323633312b30333030
303000000044323031303035323431323134332e343037000000088000020 0
        Version_ID = 4
        Timestamp = 1274692723
        Element_ID =    32631
        Time_Zone = 1+030000
        Event_Counter = 9
        Event_Message_Type = Call-Answer
        Element_Type = 1
        Element_ID =    32631
        Time_Zone = 1+030000
        Sequence_Number = 68
        Event_Time = 20100524121843.407
        Status = 8
        Priority = 128
        Attribute_Count = 2
        Event_Object = 0
    CableLabs-Charge-Number = "                sipp"
    CableLabs-Related-Call-Billing-Crl-ID =
0x4bfa44732020203332363331312b3033303030300000000a
        Timestamp = 1274692723
        Element_ID =    32631
        Time_Zone = 1+030000
        Event_Counter = 10
    CableLabs-Event-Message =
0x00044bfa44732020203332363331312b3033303030300000000a000f000120202033323633312b30333030
303000000045323031303035323431323134332e343037000000088000030 0
        Version_ID = 4
```

```
        Timestamp = 1274692723
        Element_ID =    32631
        Time_Zone = 1+030000
        Event_Counter = 10
        Event_Message_Type = Call-Answer
        Element_Type = 1
        Element_ID =    32631
        Time_Zone = 1+030000
        Sequence_Number = 69
        Event_Time = 20100524121843.407
        Status = 8
        Priority = 128
        Attribute_Count = 3
        Event_Object = 0
    CableLabs-Charge-Number = "             service"
    CableLabs-Related-Call-Billing-Crl-ID = 
0x4bfa44732020203332363331312b30333030303000000009
        Timestamp = 1274692723
        Element_ID =    32631
        Time_Zone = 1+030000
        Event_Counter = 9
    CableLabs-MTA-Endpoint-Name = "SIPPA"
    Acct-Unique-Session-Id = "3479bc93d50898b5"
    Timestamp = 1274712182
    Request-Authenticator = Verified

Mon May 24 10:43:02 2010
    NAS-IP-Address = 172.18.53.179
    Acct-Status-Type = Interim-Update
    Acct-Session-Id = "K\372Ds   326311+030000\000\000\000\t"
    CableLabs-Event-Message = 
0x00044bfa44732020203332363331312b303330303030000000090013000120202033323633331312b30333030
30300000000463230313030353234313231383433 2e3430370000000880000300
        Version_ID = 4
        Timestamp = 1274692723
        Element_ID =    32631
        Time_Zone = 1+030000
        Event_Counter = 9
        Event_Message_Type = QoS-Commit
        Element_Type = 1
        Element_ID =    32631
        Time_Zone = 1+030000
        Sequence_Number = 70
        Event_Time = 20100524121843.407
        Status = 8
        Priority = 128
        Attribute_Count = 3
        Event_Object = 0
    CableLabs-MTA-UDP-Portnum = 0
    CableLabs-SF-ID = 0
    CableLabs-Flow-Direction = 0x0001
        Upstream
    CableLabs-Event-Message = 
0x00044bfa44732020203332363331312b3033303030300000000a0013000120202033323633331312b30333030
30300000000473230313030353234313231383433 2e3430370000000880000300
        Version_ID = 4
        Timestamp = 1274692723
        Element_ID =    32631
        Time_Zone = 1+030000
        Event_Counter = 10
        Event_Message_Type = QoS-Commit
        Element_Type = 1
        Element_ID =    32631
        Time_Zone = 1+030000
```

```
        Sequence_Number = 71
        Event_Time = 20100524121843.407
        Status = 8
        Priority = 128
        Attribute_Count = 3
        Event_Object = 0
    CableLabs-MTA-UDP-Portnum = 0
    CableLabs-SF-ID = 0
    CableLabs-Flow-Direction = 0x0002
        Downstream
    Acct-Unique-Session-Id = "3479bc93d50898b5"
    Timestamp = 1274712182
    Request-Authenticator = Verified

Mon May 24 10:43:02 2010
    NAS-IP-Address = 172.18.53.179
    Acct-Status-Type = Interim-Update
    Acct-Session-Id = "K\372Ds   326311+030000\000\000\000\t"
    CableLabs-Event-Message =
0x00044bfa44732020203332363331312b303330303030000000090016000120202033323633312b30333030
303000000048323031303035323431323138343332e343037000000088000010 0
        Version_ID = 4
        Timestamp = 1274692723
        Element_ID =    32631
        Time_Zone = 1+030000
        Event_Counter = 9
        Event_Message_Type = Media-Statistics
        Element_Type = 1
        Element_ID =    32631
        Time_Zone = 1+030000
        Sequence_Number = 72
        Event_Time = 20100524121843.407
        Status = 8
        Priority = 128
        Attribute_Count = 1
        Event_Object = 0
    CableLabs-Attr-93 =
0x50533d302c204f533d302c2050523d302c204f523d302c2050443d302c204f443d302c20504c3d302c204a49
3d302c204c413d302c2050432f5250533d302c2050432f524f533d302c2050432f5250523d302c2050432f5250
4c3d302c2050432f524a493d30
        RTCP Data:
        PS=0, OS=0, PR=0, OR=0, PD=0, OD=0, PL=0, JI=0, LA=0, PC/RPS=0, PC/ROS=0,
PC/RPR=0, PC/RPL=0, PC/RJI=0
    CableLabs-Event-Message =
0x00044bfa44732020203332363331312b303330303030000000a0016000120202033323633312b30333030
303000000049323031303035323431323138343332e343037000000088000010 0
        Version_ID = 4
        Timestamp = 1274692723
        Element_ID =    32631
        Time_Zone = 1+030000
        Event_Counter = 10
        Event_Message_Type = Media-Statistics
        Element_Type = 1
        Element_ID =    32631
        Time_Zone = 1+030000
        Sequence_Number = 73
        Event_Time = 20100524121843.407
        Status = 8
        Priority = 128
        Attribute_Count = 1
        Event_Object = 0
```

```
    CableLabs-Attr-93 =
0x50533d302c204f533d302c2050523d302c204f523d302c2050443d302c204f443d302c20504c3d302c204a49
3d302c204c413d302c2050432f5250533d302c2050432f524f533d302c2050432f5250523d302c2050432f5250
4c3d302c2050432f524a493d30
        RTCP Data:
        PS=0, OS=0, PR=0, OR=0, PD=0, OD=0, PL=0, JI=0, LA=0, PC/RPS=0, PC/ROS=0,
PC/RPR=0, PC/RPL=0, PC/RJI=0
    Acct-Unique-Session-Id = "3479bc93d50898b5"
    Timestamp = 1274712182
    Request-Authenticator = Verified

Mon May 24 10:43:02 2010
    NAS-IP-Address = 172.18.53.179
    Acct-Status-Type = Interim-Update
    Acct-Session-Id = "K\372Ds   326311+030000\000\000\000\t"
    CableLabs-Event-Message =
0x00044bfa44732020203332363331312b303330303030000000090008000120202033332363331312b30333030
30300000004a32303130303532343132313834332e343037000000088000020 0
        Version_ID = 4
        Timestamp = 1274692723
        Element_ID =    32631
        Time_Zone = 1+030000
        Event_Counter = 9
        Event_Message_Type = QoS-Release
        Element_Type = 1
        Element_ID =    32631
        Time_Zone = 1+030000
        Sequence_Number = 74
        Event_Time = 20100524121843.407
        Status = 8
        Priority = 128
        Attribute_Count = 2
        Event_Object = 0
    CableLabs-SF-ID = 0
    CableLabs-Flow-Direction = 0x0001
        Upstream
    CableLabs-Event-Message =
0x00044bfa44732020203332363331312b303330303030000000a0008000120202033332363331312b30333030
30300000004b32303130303532343132313834332e343037000000088000020 0
        Version_ID = 4
        Timestamp = 1274692723
        Element_ID =    32631
        Time_Zone = 1+030000
        Event_Counter = 10
        Event_Message_Type = QoS-Release
        Element_Type = 1
        Element_ID =    32631
        Time_Zone = 1+030000
        Sequence_Number = 75
        Event_Time = 20100524121843.407
        Status = 8
        Priority = 128
        Attribute_Count = 2
        Event_Object = 0
    CableLabs-SF-ID = 0
    CableLabs-Flow-Direction = 0x0002
        Downstream
    Acct-Unique-Session-Id = "3479bc93d50898b5"
    Timestamp = 1274712182
    Request-Authenticator = Verified

Mon May 24 10:43:02 2010
    NAS-IP-Address = 172.18.53.179
    Acct-Status-Type = Interim-Update
```

```
    Acct-Session-Id = "K\372Ds   326311+030000\000\000\000\t"
    CableLabs-Event-Message =
0x00044bfa44732020203332363331312b3033303030300000000900100001202020333236333131 2b3033303030300000004c32303130303532343132313834332e343037000000088000010 0
        Version_ID = 4
        Timestamp = 1274692723
        Element_ID =    32631
        Time_Zone = 1+030000
        Event_Counter = 9
        Event_Message_Type = Call-Disconnect
        Element_Type = 1
        Element_ID =    32631
        Time_Zone = 1+030000
        Sequence_Number = 76
        Event_Time = 20100524121843.407
        Status = 8
        Priority = 128
        Attribute_Count = 1
        Event_Object = 0
    CableLabs-Call-Termination-Cause = 0x000100000010
        Cause: Normal call clearing
    CableLabs-Event-Message =
0x00044bfa44732020203332363331312b3033303030300000000900020001202020333236333131 2b3033303030300000004d32303130303532343132313834332e343037000000088000030 0
        Version_ID = 4
        Timestamp = 1274692723
        Element_ID =    32631
        Time_Zone = 1+030000
        Event_Counter = 9
        Event_Message_Type = Signaling-Stop
        Element_Type = 1
        Element_ID =    32631
        Time_Zone = 1+030000
        Sequence_Number = 77
        Event_Time = 20100524121843.407
        Status = 8
        Priority = 128
        Attribute_Count = 3
        Event_Object = 0
    CableLabs-Related-Call-Billing-Crl-ID =
0x4bfa44732020203332363331312b3033303030300000000a
        Timestamp = 1274692723
        Element_ID =    32631
        Time_Zone = 1+030000
        Event_Counter = 10
    CableLabs-Call-Termination-Cause = 0x000100000010
        Cause: Normal call clearing
    CableLabs-MTA-Endpoint-Name = "SIPPB"
    CableLabs-Event-Message =
0x00044bfa44732020203332363331312b3033303030300000000a001000012020203332363331312b3033303030300000004e32303130303532343132313834332e343037000000088000010 0
        Version_ID = 4
        Timestamp = 1274692723
        Element_ID =    32631
        Time_Zone = 1+030000
        Event_Counter = 10
        Event_Message_Type = Call-Disconnect
        Element_Type = 1
        Element_ID =    32631
        Time_Zone = 1+030000
        Sequence_Number = 78
        Event_Time = 20100524121843.407
        Status = 8
        Priority = 128
```

```
        Attribute_Count = 1
        Event_Object = 0
    CableLabs-Call-Termination-Cause = 0x000100000010
        Cause: Normal call clearing
    CableLabs-Event-Message =
0x00044bfa447320202033332363331312b303330303030000000000a000200012020203332363331312b30333030
30300000004f32303130303532343132313834332e343037000000000880000300
        Version_ID = 4
        Timestamp = 1274692723
        Element_ID =    32631
        Time_Zone = 1+030000
        Event_Counter = 10
        Event_Message_Type = Signaling-Stop
        Element_Type = 1
        Element_ID =    32631
        Time_Zone = 1+030000
        Sequence_Number = 79
        Event_Time = 20100524121843.407
        Status = 8
        Priority = 128
        Attribute_Count = 3
        Event_Object = 0
    CableLabs-Related-Call-Billing-Crl-ID =
0x4bfa447320202033332363331312b30333030303000000009
        Timestamp = 1274692723
        Element_ID =    32631
        Time_Zone = 1+030000
        Event_Counter = 9
    CableLabs-Call-Termination-Cause = 0x000100000010
        Cause: Normal call clearing
    CableLabs-MTA-Endpoint-Name = "SIPPA"
    Acct-Unique-Session-Id = "3479bc93d50898b5"
    Timestamp = 1274712182
    Request-Authenticator = Verified
```

Example 3

The following example shows requests from the SBC to RADIUS server where SBC is configured to include endpoint addressing information in billing records:

```
Tue May 11 13:26:00 2010
    NAS-IP-Address = 172.18.53.179
    Acct-Status-Type = Interim-Update
    Acct-Session-Id = "K\351GA   326311+030000\000\000\000\001"
    CableLabs-Event-Message =
0x00044be947412020203332363331312b303330303030000000010001000120202033326331312b30333030
303000000000323031303035313131353032303 82e393634000000880000600
        Version_ID = 4
        Timestamp = 1273579329
        Element_ID =    32631
        Time_Zone = 1+030000
        Event_Counter = 1
        Event_Message_Type = Signaling-Start
        Element_Type = 1
        Element_ID =    32631
        Time_Zone = 1+030000
        Sequence_Number = 0
        Event_Time = 20100511150208.964
        Status = 8
        Priority = 128
        Attribute_Count = 6
```

```
        Event_Object = 0
    CableLabs-Direction-indicator = 0x0001
        Originating
    CableLabs-MTA-Endpoint-Name = "2.0.0.36,5078,UDP,SIPPB"
    CableLabs-Calling-Party-Number = "                sipp"
    CableLabs-Called-Party-Number = "             service"
    CableLabs-Routing-Number = "             service"
    CableLabs-Attr-87 = 0x0003
        Billing type -
         flat rate
    CableLabs-Event-Message =
0x00044be9474120202033323633313312b30333030303000000002000100012020203332363331312b30333030
3030000000013230313030353131313530323038 2e39363400000008800006 00
        Version_ID = 4
        Timestamp = 1273579329
        Element_ID =    32631
        Time_Zone = 1+030000
        Event_Counter = 2
        Event_Message_Type = Signaling-Start
        Element_Type = 1
        Element_ID =    32631
        Time_Zone = 1+030000
        Sequence_Number = 1
        Event_Time = 20100511150208.964
        Status = 8
        Priority = 128
        Attribute_Count = 6
        Event_Object = 0
    CableLabs-Direction-indicator = 0x0002
        Terminating
    CableLabs-MTA-Endpoint-Name = "MTA Endpoint"
    CableLabs-Calling-Party-Number = "                sipp"
    CableLabs-Called-Party-Number = "             service"
    CableLabs-Routing-Number = "             service"
    CableLabs-Attr-87 = 0x0003
        Billing type -
         flat rate
    Acct-Unique-Session-Id = "95a26a97e3e08c3c"
    Timestamp = 1273598760
    Request-Authenticator = Verified


Tue May 11 13:25:59 2010
    NAS-IP-Address = 172.18.53.179
    Acct-Status-Type = Interim-Update
    Acct-Session-Id = "K\351GA   326311+030000\000\000\000\001"
    CableLabs-Event-Message =
0x00044be9474120202033323633313312b30333030303000000001000700012020203332363331312b30333030
3030000000023230313030353131313530323039 2e30373300000008800004 00
        Version_ID = 4
        Timestamp = 1273579329
        Element_ID =    32631
        Time_Zone = 1+030000
        Event_Counter = 1
        Event_Message_Type = QoS-Reserve
        Element_Type = 1
        Element_ID =    32631
        Time_Zone = 1+030000
        Sequence_Number = 2
        Event_Time = 20100511150209.073
        Status = 8
        Priority = 128
        Attribute_Count = 4
        Event_Object = 0
```

```
    CableLabs-QoS-Descriptor = 0x00000005202020202020202020202020202020202000000001
        Status_Bitmask = 5
        Service_Class_Name =
        QoS_Parameter_Array = 1
            resource reserved but not committed
    CableLabs-MTA-UDP-Portnum = 0
    CableLabs-SF-ID = 0
    CableLabs-Flow-Direction = 0x0001
        Upstream
    CableLabs-Event-Message =
0x00044be9474120202033323633313 12b3033303030300000000200070001202020333236333131 2b30333030
303000000003323031303035313131353032303 92e3037330000000880000400
        Version_ID = 4
        Timestamp = 1273579329
        Element_ID =    32631
        Time_Zone = 1+030000
        Event_Counter = 2
        Event_Message_Type = QoS-Reserve
        Element_Type = 1
        Element_ID =    32631
        Time_Zone = 1+030000
        Sequence_Number = 3
        Event_Time = 20100511150209.073
        Status = 8
        Priority = 128
        Attribute_Count = 4
        Event_Object = 0
    CableLabs-QoS-Descriptor = 0x00000005202020202020202020202020202020202000000001
        Status_Bitmask = 5
        Service_Class_Name =
        QoS_Parameter_Array = 1
            resource reserved but not committed
    CableLabs-MTA-UDP-Portnum = 0
    CableLabs-SF-ID = 0
    CableLabs-Flow-Direction = 0x0002
        Downstream
    Acct-Unique-Session-Id = "95a26a97e3e08c3c"
    Timestamp = 1273598759
    Request-Authenticator = Verified

Tue May 11 13:26:00 2010
    NAS-IP-Address = 172.18.53.179
    Acct-Status-Type = Interim-Update
    Acct-Session-Id = "K\351GA   326311+030000\000\000\000\001"
    CableLabs-Event-Message =
0x00044be9474120202033323633313 12b3033303030300000000 1000f0001202020333236333131 2b30333030
303000000004323031303035313131353032303 92e3537330000000880000200
        Version_ID = 4
        Timestamp = 1273579329
        Element_ID =    32631
        Time_Zone = 1+030000
        Event_Counter = 1
        Event_Message_Type = Call-Answer
        Element_Type = 1
        Element_ID =    32631
        Time_Zone = 1+030000
        Sequence_Number = 4
        Event_Time = 20100511150209.573
        Status = 8
        Priority = 128
        Attribute_Count = 2
        Event_Object = 0
    CableLabs-Charge-Number = "               sipp"
```

```
    CableLabs-Related-Call-Billing-Crl-ID =
0x4be9474120202033323633313312b30333030303000000002
        Timestamp = 1273579329
        Element_ID =    32631
        Time_Zone = 1+030000
        Event_Counter = 2
    CableLabs-Event-Message =
0x00044be9474120202033323633313312b303330303030000000002000f000120202033323633313312b30333030
303000000005323031303035313131353032303 92e3537330000000880000300
        Version_ID = 4
        Timestamp = 1273579329
        Element_ID =    32631
        Time_Zone = 1+030000
        Event_Counter = 2
        Event_Message_Type = Call-Answer
        Element_Type = 1
        Element_ID =    32631
        Time_Zone = 1+030000
        Sequence_Number = 5
        Event_Time = 20100511150209.573
        Status = 8
        Priority = 128
        Attribute_Count = 3
        Event_Object = 0
    CableLabs-Charge-Number = "             service"
    CableLabs-Related-Call-Billing-Crl-ID =
0x4be9474120202033323633313312b30333030303000000001
        Timestamp = 1273579329
        Element_ID =    32631
        Time_Zone = 1+030000
        Event_Counter = 1
    CableLabs-MTA-Endpoint-Name = "1.0.0.36,5068,UDP,SIPPA"
    Acct-Unique-Session-Id = "95a26a97e3e08c3c"
    Timestamp = 1273598760
    Request-Authenticator = Verified

Tue May 11 13:26:00 2010
    NAS-IP-Address = 172.18.53.179
    Acct-Status-Type = Interim-Update
    Acct-Session-Id = "K\351GA   326311+030000\000\000\000\001"
    CableLabs-Event-Message =
0x00044be9474120202033323633313312b303330303030000000010013000120202033323633313312b30333030
303000000006323031303035313131353032303 92e3537330000000880000300
        Version_ID = 4
        Timestamp = 1273579329
        Element_ID =    32631
        Time_Zone = 1+030000
        Event_Counter = 1
        Event_Message_Type = QoS-Commit
        Element_Type = 1
        Element_ID =    32631
        Time_Zone = 1+030000
        Sequence_Number = 6
        Event_Time = 20100511150209.573
        Status = 8
        Priority = 128
        Attribute_Count = 3
        Event_Object = 0
    CableLabs-MTA-UDP-Portnum = 0
    CableLabs-SF-ID = 0
    CableLabs-Flow-Direction = 0x0001
        Upstream
```

```
    CableLabs-Event-Message =
0x00044be9474120202033332363331312b303330303030000000020013000120202033323633331312b30333030
303000000007323031303035313131353032303 92e353733000000880000300
        Version_ID = 4
        Timestamp = 1273579329
        Element_ID =    32631
        Time_Zone = 1+030000
        Event_Counter = 2
        Event_Message_Type = QoS-Commit
        Element_Type = 1
        Element_ID =    32631
        Time_Zone = 1+030000
        Sequence_Number = 7
        Event_Time = 20100511150209.573
        Status = 8
        Priority = 128
        Attribute_Count = 3
        Event_Object = 0
    CableLabs-MTA-UDP-Portnum = 0
    CableLabs-SF-ID = 0
    CableLabs-Flow-Direction = 0x0002
        Downstream
    Acct-Unique-Session-Id = "95a26a97e3e08c3c"
    Timestamp = 1273598760
    Request-Authenticator = Verified

Tue May 11 13:26:00 2010
    NAS-IP-Address = 172.18.53.179
    Acct-Status-Type = Interim-Update
    Acct-Session-Id = "K\351GA   326311+030000\000\000\000\001"
    CableLabs-Event-Message =
0x00044be9474120202033332363331312b303330303030000000010016000120202033323633331312b30333030
303000000008323031303035313131353032303 92e353733000000880000100
        Version_ID = 4
        Timestamp = 1273579329
        Element_ID =    32631
        Time_Zone = 1+030000
        Event_Counter = 1
        Event_Message_Type = Media-Statistics
        Element_Type = 1
        Element_ID =    32631
        Time_Zone = 1+030000
        Sequence_Number = 8
        Event_Time = 20100511150209.573
        Status = 8
        Priority = 128
        Attribute_Count = 1
        Event_Object = 0
    CableLabs-Attr-93 =
0x50533d302c204f533d302c2050523d302c204f523d302c2050443d302c204f443d302c20504c3d302c204a49
3d302c204c413d302c2050432f5250533d302c2050432f524f533d302c2050432f5250523d302c2050432f5250
4c3d302c2050432f524a493d30
        RTCP Data:
        PS=0, OS=0, PR=0, OR=0, PD=0, OD=0, PL=0, JI=0, LA=0, PC/RPS=0, PC/ROS=0,
PC/RPR=0, PC/RPL=0, PC/RJI=0
    CableLabs-Event-Message =
0x00044be9474120202033332363331312b303330303030000000020016000120202033323633331312b30333030
303000000009323031303035313131353032303 92e353733000000880000100
        Version_ID = 4
        Timestamp = 1273579329
        Element_ID =    32631
        Time_Zone = 1+030000
        Event_Counter = 2
        Event_Message_Type = Media-Statistics
```

```
        Element_Type = 1
        Element_ID =    32631
        Time_Zone = 1+030000
        Sequence_Number = 9
        Event_Time = 20100511150209.573
        Status = 8
        Priority = 128
        Attribute_Count = 1
        Event_Object = 0
    CableLabs-Attr-93 =
0x50533d302c204f533d302c2050523d302c204f523d302c2050443d302c204f443d302c20504c3d302c204a49
3d302c204c413d302c2050432f5250533d302c2050432f524f533d302c2050432f5250523d302c2050432f5250
4c3d302c2050432f524a493d30
        RTCP Data:
        PS=0, OS=0, PR=0, OR=0, PD=0, OD=0, PL=0, JI=0, LA=0, PC/RPS=0, PC/ROS=0,
PC/RPR=0, PC/RPL=0, PC/RJI=0
    Acct-Unique-Session-Id = "95a26a97e3e08c3c"
    Timestamp = 1273598760
    Request-Authenticator = Verified

Tue May 11 13:26:00 2010
    NAS-IP-Address = 172.18.53.179
    Acct-Status-Type = Interim-Update
    Acct-Session-Id = "K\351GA   326311+030000\000\000\000\001"
    CableLabs-Event-Message =
0x00044be9474120202033323633313 12b303330303030000000010008000120202033323633313 12b30333030
30300000000a32303130303531313135303230392e3537330000000880000200
        Version_ID = 4
        Timestamp = 1273579329
        Element_ID =    32631
        Time_Zone = 1+030000
        Event_Counter = 1
        Event_Message_Type = QoS-Release
        Element_Type = 1
        Element_ID =    32631
        Time_Zone = 1+030000
        Sequence_Number = 10
        Event_Time = 20100511150209.573
        Status = 8
        Priority = 128
        Attribute_Count = 2
        Event_Object = 0
    CableLabs-SF-ID = 0
    CableLabs-Flow-Direction = 0x0001
        Upstream
    CableLabs-Event-Message =
0x00044be9474120202033323633313 12b303330303030000000020008000120202033323633313 12b30333030
30300000000b32303130303531313135303230392e3537330000000880000200
        Version_ID = 4
        Timestamp = 1273579329
        Element_ID =    32631
        Time_Zone = 1+030000
        Event_Counter = 2
        Event_Message_Type = QoS-Release
        Element_Type = 1
        Element_ID =    32631
        Time_Zone = 1+030000
        Sequence_Number = 11
        Event_Time = 20100511150209.573
        Status = 8
        Priority = 128
        Attribute_Count = 2
        Event_Object = 0
    CableLabs-SF-ID = 0
```

```
    CableLabs-Flow-Direction = 0x0002
        Downstream
    Acct-Unique-Session-Id = "95a26a97e3e08c3c"
    Timestamp = 1273598760
    Request-Authenticator = Verified

Tue May 11 13:26:00 2010
    NAS-IP-Address = 172.18.53.179
    Acct-Status-Type = Interim-Update
    Acct-Session-Id = "K\351GA   326311+030000\000\000\000\001"
    CableLabs-Event-Message =
0x00044be9474120202033332363331312b3033303030300000000100100001202020333236333131 2b30333030
30300000000c32303130303531313135303230392e3537330000000880000100
        Version_ID = 4
        Timestamp = 1273579329
        Element_ID =    32631
        Time_Zone = 1+030000
        Event_Counter = 1
        Event_Message_Type = Call-Disconnect
        Element_Type = 1
        Element_ID =    32631
        Time_Zone = 1+030000
        Sequence_Number = 12
        Event_Time = 20100511150209.573
        Status = 8
        Priority = 128
        Attribute_Count = 1
        Event_Object = 0
    CableLabs-Call-Termination-Cause = 0x000100000010
        Cause: Normal call clearing
    CableLabs-Event-Message =
0x00044be9474120202033332363331312b3033303030300000000100020001202020333236333131 2b30333030
30300000000d32303130303531313135303230392e3537330000000880000300
        Version_ID = 4
        Timestamp = 1273579329
        Element_ID =    32631
        Time_Zone = 1+030000
        Event_Counter = 1
        Event_Message_Type = Signaling-Stop
        Element_Type = 1
        Element_ID =    32631
        Time_Zone = 1+030000
        Sequence_Number = 13
        Event_Time = 20100511150209.573
        Status = 8
        Priority = 128
        Attribute_Count = 3
        Event_Object = 0
    CableLabs-Related-Call-Billing-Crl-ID =
0x4be9474120202033332363331312b30333030303000000002
        Timestamp = 1273579329
        Element_ID =    32631
        Time_Zone = 1+030000
        Event_Counter = 2
    CableLabs-Call-Termination-Cause = 0x000100000010
        Cause: Normal call clearing
    CableLabs-MTA-Endpoint-Name = "2.0.0.36,5078,UDP,SIPPB"
    CableLabs-Event-Message =
0x00044be9474120202033332363331312b3033303030300000000200100001202020333236333131 2b30333030
30300000000e32303130303531313135303230392e3537330000000880000100
        Version_ID = 4
        Timestamp = 1273579329
        Element_ID =    32631
        Time_Zone = 1+030000
```

```
        Event_Counter = 2
        Event_Message_Type = Call-Disconnect
        Element_Type = 1
        Element_ID =    32631
        Time_Zone = 1+030000
        Sequence_Number = 14
        Event_Time = 20100511150209.573
        Status = 8
        Priority = 128
        Attribute_Count = 1
        Event_Object = 0
    CableLabs-Call-Termination-Cause = 0x000100000010
        Cause: Normal call clearing
    CableLabs-Event-Message =
0x00044be9474120202033323633313312b303330303030000000020002000120202033323633313312b30333030
30300000000f32303130303531313135303230392e3537330000000880000300
        Version_ID = 4
        Timestamp = 1273579329
        Element_ID =    32631
        Time_Zone = 1+030000
        Event_Counter = 2
        Event_Message_Type = Signaling-Stop
        Element_Type = 1
        Element_ID =    32631
        Time_Zone = 1+030000
        Sequence_Number = 15
        Event_Time = 20100511150209.573
        Status = 8
        Priority = 128
        Attribute_Count = 3
        Event_Object = 0
    CableLabs-Related-Call-Billing-Crl-ID =
0x4be9474120202033323633313312b30333030303000000001
        Timestamp = 1273579329
        Element_ID =    32631
        Time_Zone = 1+030000
        Event_Counter = 1
    CableLabs-Call-Termination-Cause = 0x000100000010
        Cause: Normal call clearing
    CableLabs-MTA-Endpoint-Name = "1.0.0.36,5068,UDP,SIPPA"
    Acct-Unique-Session-Id = "95a26a97e3e08c3c"
    Timestamp = 1273598760
    Request-Authenticator = Verified
```

Security

The *PacketCable 1.5 Event Messages Specification* mandates that the billing messages are sent using the RADIUS protocol and IPSec for security.

Note In ACE SBC Release 3.0.00, only the RADIUS security mechanism, based on its own Request Authenticator, is supported.