

Implementing SBC Billing

The Session Border Controller (SBC) billing component includes the following core features:

- Compatibility with existing billing systems—To be able to fit the SBC billing system easily into a provider’s existing billing architecture is an important functional requirement. This requirement entails the use of mechanisms to obtain billing information in a similar fashion to those of the existing mechanisms.
- Integration with next-generation technologies and solutions—Equally important as compatibility with existing systems is the requirement to employ next-generation billing technologies, so that service information from SBC, softswitches, voicemail and unified messaging applications, and so on can be collated and billed in a distributed environment.
- High availability and fault tolerance.
- Flexible architecture.

The function of the billing component is:

- Third-party integrated, distributed Remote Authentication Dial-In User Service (RADIUS)-based call and event logging.



Note

This feature is supported in the unified model only.



Note

Before upgrading from Release ACE SBC 3.0.1 or ACE SBC Release 3.0.2 to ACE SBC Release 3.1.0, you must unconfigure billing. After the upgrade, you can reconfigure billing.

For a complete description of commands used in this chapter, refer to the [Cisco Session Border Controller Commands](#) chapter. To locate documentation for other commands that appear in this chapter, use the command reference master index, or search online.

Feature History for Implementing SBC Billing

Release	Modification
ACE SBC Release 3.1.00	Additional changes to SBC billing. Added support for media information in billing.
ACE SBC Release 3.0.00	This feature was introduced on the Cisco 7600 series router along with support for the SBC unified model.

Contents

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Prerequisites for Implementing Billing

The following prerequisites are required to implement SBC billing:

- On the Application Control Engine Module (ACE), you must be an Admin user to enter SBC commands. For more information, see the *Application Control Engine Module Administration Guide* at http://www.cisco.com/en/US/products/hw/modules/ps2706/products_configuration_guide_book09186a00806838f4.html.
- Before implementing interworking billing, the SBC must already be created. See the procedures described in [Chapter 2, “ACE Configuration Prerequisites for the SBC”](#).
- To implement billing on the signaling border element (SBE) you must obtain a unique network element ID for the SBE from your network administrator. In addition, you must perform the following tasks depending on what form of billing you require.
 - To implement integrated RADIUS-based call logging, you must first configure the RADIUS server and set up the RADIUS network infrastructure.

Information About Implementing Billing

The following sections describe SBC billing topologies. It is critical to understand all SBC billing features and capabilities before performing billing configurations for the SBC.

- [Integrated Billing Systems](#)

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 12-1](#) where the SBC is integrated into this architecture. As shown, the billing server and softswitch both support PacketCable Event Messages.

ISP-A shows SBC operating in a unified model where the billing system is being deployed as a distributed billing system consisting of three billing servers. The SBC 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.

In the unified model, the system operates as follows:

- The SBC produces event messages (EMs). These event messages are billable or other interesting events, such as call start, call end, and media-type changes.

- The SBC (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.
- The billing server collates EMs into call detail records (CDRs). For an example of a CDR, see [Example for Event Messages from SBC to RADIUS Billing Server, page B-12](#).
- Because the Cisco 7600 series routers do not have a local disk, local cache is not supported. In releases before ACE SBC Release 3.1.00, this meant that if a billing server was unavailable, the EMs are lost. With ACE SBC Release 3.1.00 two new commands are introduced to prevent losing the EMs:
 - The **server-retry disable** command disables the SBC from automatically retrying a failed RADIUS server.
 - The **service sbc sbe radius accounting** command reactivates connection between the SBC and a RADIUS server after connectivity is lost or to restart billing after connectivity is restored.

ISP-B shows SBC operating in a distributed model where the billing system is being deployed using a single billing server and a softswitch.

In the distributed model, the system operates as follows:

- Only the SBE communicates with the billing server. That is, no event messages are generated by the DBE. All media-specific information (for example: gate request information and media statistics) is sent by the DBE to the SBE, which then generates event messages as required to send to the billing servers.
- The billing server collates billing information both from the SBE and the softswitch to provide the ISP with a single billing point. The softswitch only interface to the billing service is one of the ways service providers could use to get billing information. It is outside the scope of SBC billing.



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. SBC 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).

Support for Media Information

Release 3.1.0 added support for media information to billing messages. Prior to Release 3.1.0, the PacketCable event message (EM) billing interface did not report any of the properties of the media streams associated with a call other than when the media stream begins and ends, the packets and octets transmitted, and lost latency and jitter statistics.

Now the Support for Media Information feature defines a new proprietary RADIUS Vendor-Specific Attribute that can be carried on the QoS_Commit and QoS_Release PacketCable messages.

Use the **cdr media-info** command to add this attribute to the billing messages to make stream creation information available to PacketCable billing.

This attribute contains the following information:

- The local IP address and port, and remote media endpoint IP address and port, used in the media stream.
- The direction of the media stream (that is, send-only, receive-only, send-and-receive or inactive).
- The codecs negotiated for that media stream.

- The bandwidth reserved for the media stream.

Restrictions for Media Information

The restrictions for Media Information are:

- If an endpoint is behind a NAT, then the endpoint IP address cannot be obtained from the Session Description Protocol (SDP) and instead is autodetected when the endpoint sends media packets. This means that the remote address and port may not be known at the point that the gate is committed; therefore, this information will not be available on the `Media_Session_Desc` attribute that is sent on the `QoS_Commit PacketCable` message. Instead, a zero address is specified.

In particular, in a normal call setup and teardown when an endpoint is behind a NAT, there is no remote address or port in the `Media_Session_Desc` sent on the `QoS_Commit` message, but the correct remote address and port is in the `Media_Session_Desc` sent in the `QoS_Release` message.

The only case in which the SBC would never report a remote address and port is when the call ends before any media packets have been sent so the remote address is never learnt by the MPF.

Figure 12-1 *Integrated Billing Deployment*



How to Implement Billing

The SBE can perform billing. The key objects to be configured for billing are the long duration checks and the physical location of the cache. You can configure up to eight packetcable-em billing instances (indexed 0-7).

follow the procedure in the following section:

- [Restrictions for Billing, page 12-6](#)
- [Configuring Billing, page 12-6](#)

Restrictions for Billing

The restrictions for configuring billing are:

- You may not modify any billing configuration items if billing is active.
- You may only modify the **batch-time** and **batch-size** commands when a method or the billing is active; all other commands are not allowed. However, those are blocked when more than one method exists.
- You may not modify the **ldr-check** command at billing level if any methods have been defined.
- You may not remove a RADIUS accounting client if it is currently assigned to a billing method.
- A RADIUS accounting client must be defined before it is selected in a billing method.
- A RADIUS accounting client can be assigned only to a single billing method.
- The billing cannot be removed when active or when methods are configured.
- The **method packetcable** command may not be removed while a packetcable-em configuration is in place.
- For PacketCable billing attributes, MTA-UDP_Port on QoS_Reserve, SF_ID, and QoS_Commit and MTA_Endpoint_name on Signaling_Start messages will always be reported as '0' and 'MTA Endpoint', respectively. These variables are not currently relevant to SBC processing.

Configuring Billing

This task defines how to configure billing configurations.

SUMMARY STEPS

1. **configure**
2. **sbc** *service-name*
3. **sbe**
4. **control address aaa ipv4** *IP_address*
5. **radius authentication**
6. **activate**
7. **server**
8. **address ipv4** *A.B.C.D.*
9. **exit**
10. **exit**
11. **radius accounting** *client-name*
12. **activate**
13. **concurrent-requests** *0-4294967295*
14. **retry-interval** *range*
15. **retry-limit** *range*
16. **server** *server-name*
17. **address ipv4** *A.B.C.D.*

18. **priority** *pri*
19. **key** *key*
20. **port** *port-num*
21. **exit**
22. **exit**
23. **billing**
24. **ldr-check** {*HH MM*}
25. **local-address ipv4** {*A.B.C.D.*}
26. **method packetcable-em**
27. **packetcable-em** *method-index* **transport radius** *RADIUS-client-name*
28. **batch-size** *number*
29. **batch-time** *number*
30. **attach**
31. **exit**
32. **activate**

DETAILED STEPS

	Command or Action	Purpose
Step 1	configure Example: host1/Admin# configure	Enables global configuration mode.
Step 2	sbc <i>service-name</i> Example: host1/Admin(config)# sbc mysbc	Enters the mode of an SBC service. Use the <i>service-name</i> argument to define the name of the service.
Step 3	sbe Example: host1/Admin(config-sbc)# sbe	Enters the mode of an SBE entity within an SBC service.
Step 4	control address aaa ipv4 <i>IP_address</i> Example: host1/Admin(config-sbc-sbe)# control address aaa ipv4 192.168.113.2	Configure an SBE to use a given IPv4 AAA control address when contacting an authentication or billing server. This address is a unique address within the signaling address.
Step 5	radius authentication Example: host1/Admin(config-sbc-sbe)# radius authentication	Configures a RADIUS client for authentication purpose.

	Command or Action	Purpose
Step 6	activate Example: host1/Admin/Admin(config-sbc-sbe-acc)# activate	Activates the RADIUS server.
Step 7	server Example: host1/Admin(config-sbc-sbe-acc)# server castor	Enters a submode for configuring ordered lists of RADIUS accounting servers.
Step 8	address ipv4 A.B.C.D. Example: host1/Admin(config-sbc-sbe-acc-ser)# address ipv4 10.0.0.1	Configures the address of the RADIUS server.
Step 9	exit Example: host1/Admin(config-sbc-sbe-acc-ser)# exit	Exits the current mode.
Step 10	exit Example: host1/Admin(config-sbc-sbe-acc)# exit	Exits the current mode.
Step 11	radius accounting client-name Example: host1/Admin(config-sbc-sbe)# radius accounting set1	Enters the mode for configuring a RADIUS client for accounting purposes.
Step 12	activate Example: host1/Admin(config-sbc-sbe-acc)# activate	Activates the RADIUS client.
Step 13	concurrent-requests 0-4294967295 Example: host1/Admin(config-sbc-sbe-acc)# concurrent-requests 34	Sets the maximum number of concurrent requests to the RADIUS server.
Step 14	retry-interval range Example: host1/Admin(config-sbc-sbe-acc)# retry-interval 2000	Sets. the interval for resending an accounting request to the RADIUS server.
Step 15	retry-limit range Example: host1/Admin(config-sbc-sbe-acc)# retry-limit 4	Sets the retry interval to the RADIUS server.

	Command or Action	Purpose
Step 16	<p>server <i>server-name</i></p> <p>Example: host1/Admin(config-sbc-sbe-acc)# server Cisco-AR1-PC</p>	Enters the mode for configuring an accounting server within this client.
Step 17	<p>address ipv4 <i>A.B.C.D.</i></p> <p>Example: host1/Admin(config-sbc-sbe-acc-ser)# address ipv4 200.200.200.153</p>	Configures the address of an accounting server.
Step 18	<p>priority <i>pri</i></p> <p>Example: host1/Admin(config-sbc-sbe-acc-ser)# priority 2</p>	Configures the priority of the accounting server. The <i>pri</i> argument must be in the range of 1 to 10 (highest to lowest).
Step 19	<p>key <i>key</i></p> <p>Example: host1/Admin(config-sbc-sbe-acc-ser)# key cisco</p>	Configures the RADIUS authentication key or shared secret to be used for this accounting server.
Step 20	<p>port <i>port-numb</i></p> <p>Example: host1/Admin(config-sbc-sbe-acc-ser)# port 2009</p>	Configures the port that the RADIUS server will use to receive Access-Request or Accounting-Request packets,.
Step 21	<p>exit</p> <p>Example: host1/Admin(config-sbc-sbe-acc)# exit</p>	Exits the current mode.
Step 22	<p>exit</p> <p>Example: host1/Admin(config-sbc-sbe)# exit</p>	Exits the current mode.
Step 23	<p>billing</p> <p>Example: host1/Admin(config-sbc-sbe)# billing</p>	Configures billing policies.
Step 24	<p>ldr-check <i>{HH MM}</i></p> <p>Example: host1/Admin(config-sbc-sbe-billing)# ldr-check 22 30</p>	Configures the time of day (local time) to run the Long Duration Check (LDR).
Step 25	<p>local-address ipv4 <i>A.B.C.D.</i></p> <p>Example: host1/Admin(config-sbc-sbe-billing)# local-address ipv4 10.20.1.1</p>	Configure the local IPv4 address that appears in the CDR.

	Command or Action	Purpose
Step 26	method packetcable-em Example: host1/Admin(config-sbc-sbe-billing)# method packetcable-em	Enables the packet-cable billing method.
Step 27	packetcable-em method-index transport radius RADIUS-client-name Example: host1/Admin(config-sbc-sbe-billing)# packetcable-em 4 transport radius test	Configures a packet-cable billing instance.
Step 28	batch-size number Example: host1/Admin(config-sbc-sbe-billing-packetcable-em)# batch-size 256	Configures the maximum size of a batch when the batch must be set immediately.
Step 29	batch-time number Example: host1/Admin(config-sbc-sbe-billing-packetcable-em)# batch-time 22	Configures the maximum number of milliseconds for which any record is held before the batch is sent.
Step 30	attach Example: host1/Admin(config-sbc-sbe-billing-packetcable-em)# attach	Activates the billing for a RADIUS client.
Step 31	exit Example: host1/Admin(config-sbc-sbe-billing-packetcable-em)# exit	Exits the current mode.
Step 32	activate Example: host1/Admin(config-sbc-sbe-billing)# activate	Activates the billing instance after configuration is committed.

Configuration Example of Implementing Billing

The following example shows how to configure billing:

```

host1/Admin# configure
host1/Admin(config)# sbc mysbc
host1/Admin(config-sbc)# sbe
host1/Admin(config-sbc-sbe)# control address aaa ipv4 10.10.10.1 vrf default
host1/Admin(config-sbc-sbe)# radius authentication
host1/Admin/Admin(config-sbc-sbe-acc)# activate
host1/Admin/Admin(config-sbc-sbe-acc)# server cisco-auth
host1/Admin/Admin(config-sbc-sbe-acc-ser)# address ipv4 10.10.10.10

```

```
host1/Admin(config-sbc-sbe-acc-ser) # exit
host1/Admin(config-sbc-sbe-acc) # exit
host1/Admin(config-sbc-sbe) # radius accounting mars
host1/Admin(config-sbc-sbe-acc) # activate
host1/Admin(config-sbc-sbe-acc) # retry-interval 1000
host1/Admin(config-sbc-sbe-acc) # retry-limit 6
host1/Admin(config-sbc-sbe-acc) # server test
host1/Admin(config-sbc-sbe-acc-ser) # address ipv4 10.20.1.1
host1/Admin(config-sbc-sbe-acc-ser) # priority 4
host1/Admin(config-sbc-sbe-acc-ser) # key test
host1/Admin(config-sbc-sbe-acc-ser) # port 3
host1/Admin(config-sbc-sbe-acc-ser) # exit
host1/Admin(config-sbc-sbe-acc) # exit
host1/Admin(config-sbc-sbe) # billing
host1/Admin(config-sbc-sbe-billing) # ldr-check 22 30
host1/Admin(config-sbc-sbe-billing) # local-address ipv4 10.20.1.1
host1/Admin(config-sbc-sbe-billing) # method packetcable-em
host1/Admin(config-sbc-sbe-billing) # packetcable-em 3 transport radius test
host1/Admin(config-sbc-sbe-billing-packetcable-em) # batch-size 256
host1/Admin(config-sbc-sbe-billing-packetcable-em) # batch-time 22
host1/Admin(config-sbc-sbe-billing-packetcable-em) # attach
host1/Admin(config-sbc-sbe-billing-packetcable-em) # exit
host1/Admin(config-sbc-sbe-billing) # activate
```

