

Implementing SBC QoS (Marking)

The Session Border Controller (SBC) supports quality of service (QoS) profiles that the integrator configures for IP packet marking on the data path. IP packet marking is used in the SBC in the following contexts:

- Configuring media packet real-time transport protocol (RTP) and real-time control protocol (RTCP) marking based on a per call scope.
- Supporting Differentiated Services Code Point (DSCP) marking as well as IP precedence/Type of Service (ToS) marking for voice service.
- Providing the ability to mark media packet differently depending on which branch of the call (either the caller or the callee) they are sent on.
- Supporting signaling and media packet marking based on Session Initiation Packet (SIP) resource priority header.



Note

For ACE SBC Release 3.0.00, this feature is supported in the unified model only.

For a complete description of commands used in this chapter, refer to the [Chapter 39, “Cisco Session Border Controller Commands”](#). 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 QoS

Release	Modification
ACE SBC Release 3.0.00	This feature was introduced on the Cisco7600 series router along with support for the SBC unified model.

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Prerequisites for Implementing QoS

The following prerequisites are required to implement QoS on the SBC:

- 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 QoS, the SBC must already be created. See the procedures described in Chapter 2, “ACE Configuration Prerequisites for the SBC”.

Information About Implementing QoS

To implement QoS marking on the SBC, the user configures the SBC with a number of QoS profiles, which are given unique names to identify them. These QoS profiles are used exclusively for marking packets.

Each QoS profile contains the following mutually exclusive parameters.

- A 6-bit DSCP value to mark packets that match the QoS.
- A 3-bit IP precedence value and a 4-bit ToS value to mark packets that match the QoS.



Note

A default QoS profile that cannot be modified or deleted is preconfigured on the SBC. If the user does not define a QoS profile, the default QoS profile is used for marking packets.

How to Implement QoS

To implement QoS marking on the SBC, follow the procedures in the following sections:

- [Configuring QoS Profiles](#)
- [Choosing a QoS Profile Using CAC](#)

Configuring QoS Profiles

This task configures a signaling QoS profile to use an IP precedence value of 1 and a ToS value of 12 to mark packets that match the QoS.

SUMMARY STEPS

1. **configure**
2. **sbc** *service-name*
3. **sbe**
4. **qos sig** *name*
5. **marking** *type*
6. **ip precedence** *value*

7. `ip tos value`

DETAILED STEPS

	Command or Action	Purpose
Step 1	configure Example: host1/Admin# configure	Enables global configuration mode.
Step 2	sbc service-name Example: host1/Admin(config)# sbc mysbc host1/Admin(config-sbc)#	Enters the mode of an SBC service. <ul style="list-style-type: none"> Use the <i>service-name</i> argument to define the name of the SBC.
Step 3	sbe Example: host1/Admin(config-sbc)# sbe host1/Admin(config-sbc-sbe)#	Enters the mode of an signaling border element (SBE) entity within a SBC service.
Step 4	qos sig name Example: host1/Admin(config-sbc-sbe)# qos sig residential host1/Admin(config-sbc-sbe-qos-sig)#	Enters the mode of configuring a QoS profile. The <i>name</i> parameter must be the name of an existing QoS profile. The string “default” is reserved.
Step 5	marking type Example: host1/Admin(config-sbc-sbe-qos-sig)# marking ip-precedence	Configures whether the QoS profile marks packets with a DSCP value or an IP precedence and ToS value. The <i>type</i> must be either: <ul style="list-style-type: none"> dscp ip-precedence The no version of this command configures the QoS profile to not mark packets.

	Command or Action	Purpose
Step 6	<p><code>ip precedence value</code></p> <p>Example: <pre>host1/Admin(config-sbc-sbe-qos-sig)# ip precedence 1</pre></p>	<p>Configures an IP precedence with which to mark IP packets belonging to the given QoS profile. The range of IP precedence values is 0 to 7.</p> <p>The no version of this command sets the default IP precedence value to 0.</p> <p>Note If the QoS profile is configured to mark packets DSCP value takes precedence.</p>
Step 7	<p><code>ip tos value</code></p> <p>Example: <pre>host1/Admin(config-sbc-sbe-qos-sig)# ip tos 12</pre></p>	<p>Configures an IP ToS with which to mark IP packets belonging to the given QoS profile. The <i>value</i> parameter is a bit field consisting of one or more of the following bits linked together using an arithmetic OR:</p> <ul style="list-style-type: none"> • 8—Minimize delay • 4—Maximize throughput • 2—Maximize reliability • 1—Minimize monetary cost

Analyzing the SIP Resource-Priority Header

Users can configure the SBC to map SIP packets with Resource-Priority header strings to the following SBC priority values:

- Routine
- Priority
- Immediate
- Flash
- Flash override
- Critical

The Call Admission Control (CAC) uses the assigned priority value to choose the QoS profile.

The following task configures the SBC to assign priority value “flash” to a SIP packet with Resource-Priority header string “dsn.flash.”

SUMMARY STEPS

1. **configure**
2. **sbc** *service name*
3. **sbe**
4. **resource-priority-set** *name*
5. **resource-priority** *string value*
6. **priority** *priority-value*

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. <ul style="list-style-type: none"> • Use the <i>service-name</i> argument to define the name of the SBC.
Step 3	sbe Example: host1/Admin(config-sbc)# sbe	Enters the mode of an SBE entity within a SBC service.
Step 4	resource-priority-set <i>name</i> Example: host1/Admin(config-sbc-sbe)# resource-priority-set dsn	Enters the mode to map SIP Resource-Priority header string to SBC priority values.
Step 5	resource-priority <i>string value</i> Example: host1/Admin(config-sbc-sbe-rsrc-pri-set)# resource-priority dsn.flash	Enters the mode to configure the priority of the Resource-Priority header string.
Step 6	priority <i>priority-value</i> Example: host1/Admin(config-sbc-sbe-rsrc-pri)# priority flash	Sets the SBC priority value of the Resource-Priority header string. The SBC priority value must be one of the following: <ul style="list-style-type: none"> • routine • priority • immediate • flash • flash-override • critical

Configuring a Resource Priority Set on a SIP Adjacency

The following task configures the SIP adjacency “SipToIsp42” to use resource-priority-set “dsn.”

SUMMARY STEPS

1. **configure**
2. **sb** *service name*
3. **sbe**
4. **adjacency sip** *adjacency-name*
5. **resource-priority-set** *name*

DETAILED STEPS

	Command or Action	Purpose
Step 1	configure Example: host1/Admin# configure	Enables global configuration mode.
Step 2	sb <i>service-name</i> Example: host1/Admin(config)# sb mysbc	Enters the mode of an SBC service. <ul style="list-style-type: none"> • Use the <i>service-name</i> argument to define the name of the SBC.
Step 3	sbe Example: host1/Admin(config-sbc)# sbe	Enters the mode of an SBE entity within a SBC service.
Step 4	adjacency sip <i>adjacency-name</i> Example: host1/Admin(config-sbc-sbe)# adjacency sip SipToIsp42	Configures the SIP adjacency to use with the specified resource priority set.
Step 5	resource-priority-set <i>name</i> Example: host1/Admin(config-sbc-sbe-adj-sip)# resource-priority-set dsn	Sets the SIP adjacency to use with the specified resource priority set.

Choosing a QoS Profile Using CAC

This task configures calls from the account “cisco” to use the voice QoS profile “enterprise” for packets sent from the SBC to the original caller.



Note

This command can only be executed at the per-call scope. The CAC policy does not activate if this command is configured at any other scope.

SUMMARY STEPS

1. **configure**
2. **sbc** *service-name*
3. **sbe**
4. **cac-policy-set** *policy-set-id*
5. **first-cac-scope** *scope-name*
6. **first-cac-table** *table-name*
7. **cac-table** *table-name*
8. **match-type** *table-type*
9. **entry** *entry-id*
10. **match-value** *key*
11. **caller-voice-qos-profile** *profile-name*
12. **caller-video-qos-profile** *profile-name*
13. **caller-sig-qos-profile** *profile name*

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. <ul style="list-style-type: none"> • 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.

	Command or Action	Purpose
Step 4	<p>cac-policy-set <i>policy-set-id</i></p> <p>Example: host1/Admin(config-sbc-sbe)# cac-policy-set 1</p>	Enters the mode of Call Admission Control (CAC) policy set configuration within an SBE entity, creating a new policy set, if necessary.
Step 5	<p>first-cac-scope <i>scope-name</i></p> <p>Example: host1/Admin(config-sbc-sbe-cacpolicy)# first-cac-scope call</p>	<p>Configures the scope at which to begin defining limits when performing the admission control stage of policy.</p> <p>The <i>scope-name</i> argument configures the scope at which limits should be initially defined. Possible values are:</p> <ul style="list-style-type: none"> • adj-group • call • dst-account • dst-adj-group • dst-adjacency • dst-number • global • src-account • src-adj-group • arc-adjacency
Step 6	<p>first-cac-table <i>table-name</i></p> <p>Example: host1/Admin(config-sbc-sbe-cacpolicy)# first-cac-table MyCacTable</p>	Configures the name of the first policy table to process when performing the admission control stage of policy.
Step 7	<p>cac-table <i>table-name</i></p> <p>Example: host1/Admin(config-sbc-sbe-cacpolicy)# cac-table MyCacTable</p>	Enters the mode for configuration of an admission control table (creating one, if necessary) within the context of an SBE policy set.

Command or Action	Purpose
<p>Step 8 <code>match-type table-type</code></p> <p>Example: <pre>host1/Admin(config-sbc-sbe-cacpolicy- cactable)# match-type src-account</pre></p>	<p>The type of the table. This parameter governs the syntax of the match-value fields of the entries in the table. The entries in the table then all correspond to different values of call priority, which must be one of the following strings:</p> <ul style="list-style-type: none"> • <i>account</i>—Compare the name of the account. • <i>adj-group</i>—Compare the name of the adjacency group. • <i>adjacency</i>—Compare the name of the adjacency. • <i>all</i>—No comparison type. All events match this type. • <i>call-priority</i>—Compare with call priority. • <i>category</i>—Compare the number analysis assigned category. • <i>dst-account</i>—Compare the name of the destination account. • <i>dst-adj-group</i>—Compare the name of the destination adjacency group. • <i>dst-adjacency</i>—Compare the name of the destination adjacency. • <i>dst-prefix</i>—Compare the beginning of the dialed digit string. • <i>event-type</i>—Compare with CAC policy event types. • <i>policy-set</i>—The match-type is a cac-policy-table. • <i>src-account</i>—Compare the name of the source account. • <i>src-adj-group</i>—Compare the name of the source adjacency group. • <i>src-adjacency</i>—Compare the name of the source adjacency. • <i>src-prefix</i>—Compare the beginning of the calling number string. • <i>sub-category</i>—Match based on subscriber category. • <i>sub-category-pfx</i>—Match based on subscriber category IP prefix • The match-type parameter must be supplied when creating a table.
<p>Step 9 <code>entry entry-id</code></p> <p>Example: <pre>host1/Admin(config-sbc-sbe-cacpolicy- cactable)# entry 1</pre></p>	<p>Enters the mode for configuring an entry in an admission control table, creating the entry, if necessary.</p>

	Command or Action	Purpose
Step 10	match-value <i>key</i> Example: host1/Admin(config-sbc-sbe-cacpolicy-cac-table-ent)# match-value cisco	Configures the match value of an entry in an admission control table.
Step 11	caller-voice-qos-profile <i>profile-name</i> Example: host1/Admin(config-sbc-sbe-cacpolicy-cac-table-ent)# caller-voice-qos-profile enterprise	Configures the QoS profile to use for voice media packets sent to the original caller.
Step 12	caller-video-qos-profile <i>profile-name</i> Example: host1/Admin(config-sbc-sbe-cacpolicy-cac-table-ent)# caller-video-qos-profile enterprise	Configures the QoS profile to use for packets sent to the original caller.
Step 13	caller-sig-qos-profile <i>profile-name</i> Example: host1/Admin(config-sbc-sbe-cacpolicy-cac-table-ent)# caller-sig-qos-profile enterprise	Configures the QoS profile to use for signaling packets sent to the original caller.

Configuration Examples of QoS Profiles

This section provides the following configuration examples:

- [Configuring a QoS Voice Profile Using IP Precedence Marking: Example](#)
- [Configuring a QoS Voice Profile Using DSCP Marking: Example](#)
- [Choosing a QoS Profile Using CAC: Example](#)
- [Configuration of a SIP Adjacency Using Resource- Priority-Set: Example](#)

Configuring a QoS Voice Profile Using IP Precedence Marking: Example

This task configures a QoS voice profile to use an IP precedence value of 1 and a ToS value of 12 to mark packets that match the QoS.

```
configure
sbc mysbc
sbe
  qos voice residential
  marking ip-precedence
  ip precedence 1
  ip tos 12
```

Configuring a QoS Voice Profile Using DSCP Marking: Example

This task configures a QoS voice profile to use an IP precedence value of 1 and a ToS value of 12 to mark packets that match the QoS.

```
configure
sbc mysbc
sbe
  qos voice residential
  marking dscp
  dscp 10
```

Choosing a QoS Profile Using CAC: Example

This task configures calls from the account “cisco” to use the voice QoS profile “enterprise” for packets sent from the SBC to the original caller.

```
configure
sbc mysbc
sbe
  cac-policy-set 1
  first-cac-scope call
  first-cac-table MyCacTable
  cac-table MyCacTable
  match-type src-account
  entry 1
  match-value cisco
  caller-voice-qos-profile enterprise
  caller-video-qos-profile enterprise
```

```
sbc mysbc
sbe
  cac-policy-set 1
  first-cac-scope call
  first-cac-table MyCacTable
  cac-table MyCacTable
  match-type src-account
  entry 1
  match-value cisco
  caller-video-qos-profile enterprise
  caller-voice-qos-profile enterprise
  !
  !
  !
```

Configuration of a SIP Adjacency Using Resource- Priority-Set: Example

This section provides the following configuration example:

```
configure
sbc mysbc
sbe
  adjacency sip SipToIsp42
  resource-priority-set dsn
```

