ERICSSON

SACC Configuration

OPERATION DIRECTIONS

54/1543-AXB 250 12-V3 Uen AC

Contents

1 Introduction

This document describes Service Aware Charging and Control (SACC) configuration in the Evolved Packet Gateway (EPG).

1.1 Scope

This document describes how to configure service sets and rule spaces, how to configure SACC for an Access Point Name (APN), and how to disable packet inspection. The document also lists the mandatory steps for enabling SACC.

This document does not cover configuration specific to any of the SACC-related functionalities.

For an overview of the SACC solution, related concepts, and terminology, refer to SACC Overview.

1.2 Target Groups

This document is intended for personnel performing SACC-related configuration on the EPG. The document assumes a basic knowledge of data communication and telecommunication.

2 Enabling SACC

To enable SACC in the EPG, the following steps must be performed:

1. Configure a service set, as described in Section 3 on page 1.
2. Configure a rule space, as described in Section 4 on page 3.
3. Configure SACC for an APN, as described in Section 5 on page 7.

3 Configuring a Service Set

A service set is a collection of optional predefined filters that specify the conditions for Default Service Classification (DSC) or Packet Inspection and Service Classification (PISC). The following sections describe how to configure a service set.

The following steps must be performed:

1. Configure a service set name, as described in Section 3.1 on page 2.
2. Configure a default Service Data Flow (SDF) for the service set, as described in Section 3.2.1 on page 2.

A service set that only contains a default SDF automatically applies DSC. If filters and additional SDFs are configured for the service set, PISC is used.

3.1 Configuring a Service Set Name

To configure a service set name, include the following statement:

```
Ericsson(config)# epg pgw
   service-set <service-set-name>
```

3.2 Configuring SDFs for a Service Set

An SDF is a differentiated traffic category that forms the basis for service-aware charging and control of packet flows.

The Service Data Flow Identifier (SDF-ID), identifying an SDF, must be a integer between 0 and 2^{32}-1.

A service set must be assigned a default SDF, as described in Section 3.2.1 on page 2. For instructions on configuring additional SDFs for a service set, refer to PISC Configuration.

Note: Configuring additional SDFs for a service set immediately impacts EPG payload handling. To minimize the impact, configure and commit changes to a rule space before configuring and committing additional SDFs to a service set.

3.2.1 Configuring a Default SDF

The mandatory default SDF of a service set is used in case a packet flow cannot be classified by any other rule in the service set, or if packet inspection is disabled.

To configure the default SDF of a service set, include the following statement:

```
Ericsson(config)# epg pgw service-set <service-set-name> serv
ice-identification service-data-flow default
   payload <sdf-id>
```

3.2.2 Configuring the SDF Idle Time

A service is considered as stopped when no traffic has been detected within the SDF idle time window. The idle time defines the responsiveness for functions based on service inactivity. A short delay may result in excessive processing or signalling whereas a long delay may result in reservation of unused resources.

To configure the SDF idle time, include the following statement:

```
Ericsson(config)# epg pgw service-identification service-data-flow
   idle-time <seconds>
```

The range for the inactivity timer is 5–900, with a default value of 120.

Note: The SDF idle time configuration has considerable impact on EPG throughput and signalling. Changing the default idle time value is not recommended.

4 Configuring a Rule Space

A rule space defines the scope in which rules and relations specify the conditions for SACC. The following sections describe how to configure a rule space.

The following steps must be performed:

1. Configure a rule space name, as described in Section 4.1 on page 3.

2. Associate a default service set with the rule space, as described in Section 4.2.1 on page 4.

4.1 Configuring a Rule Space Name

To configure a rule space name, include the following statement:

```
Ericsson(config)# epg pgw
   rule-space <rule-space-name>
```

4.2 Associating Service Sets with a Rule Space

To associate a rule space with a mandatory default service set and optional alternative service sets, see the following sections.

4.2.1 Associating a Default Service Set

To associate a configured default service set with a rule space, include the following statement:

```
Ericsson(config)# epg pgw rule-space <rule-space-name>
   service-set <service-set-name>
```

To modify the default service set of a rule space, associate the rule space with a new default service set and remove the old default service set statement.

Do!

Ensure that the rule space is not active before reconfiguring the default service set of an existing rule space.

4.2.2 Mapping Alternative Service Sets to ACGs

To map a configured alternative service set to an Access Control Group (ACG), include the following statement:

```
Ericsson(config)# epg pgw rule-space <rule-space-name> serv
ice-set <service-set-name> selector
   access-control-group <acg-id>
```

A service set can only be mapped to one ACG and an ACG can only be mapped to one service set.

To set the relative precedence for an alternative service set in the selection procedure, include the following statement:

```
Ericsson(config)# epg pgw rule-space <rule-space-name> serv
ice-set <service-set-name> selector
   precedence <value>
```

The precedence value must be an integer between `0` and 2^{32}–1. A service set with a lower precedence value is selected before a service set with a higher or unspecified value. In case of equal precedence values, the service set mapped to the ACG with the lower identifier is selected.

4.3 Configuring ACRs for a Rule Space

The following section describes the mapping between SDFs and ACRs.

The Access Control Rule Identifier (ACR-ID), identifying an ACR, must be an integer between 0 and 2^{32}-1.

For instructions on configuring bandwidth control for an ACR, refer to Quality of Service Configuration.

For instructions on configuring a list of always allowed ACRs, refer to Policy Control Configuration.

For instructions on configuring an ACG, refer to Policy Control Configuration.

4.3.1 Mapping SDFs to ACRs

By default, the SDF-ID of a classified service is used as the ACR-ID. To map an SDF to an ACR or a consecutive range of ACRs separated by -, include the following statement:

```
Ericsson(config)# epg pgw rule-space <rule-space-name
> service-data-flow map <sdf-id>
   access-control-rule (<acr-id> | <acr-id>-<acr-id>)
```

Note: The configured order in which ACRs are mapped to an SDF defines the order of precedence in which ACRs are evaluated for that SDF. The mapping configured first has highest precedence. A mapping of a consecutive range of ACRs is evaluated in incremental order.

Currently, using the `insert` command to insert an ACR before another ACR is not supported in the CLI. Instead, the configuration can be done using NETCONF.

An SDF can be mapped to several ACRs, and an ACR can be mapped to several SDFs.

4.4 Configuring RGs for a Rule Space

To configure a default Rating Group (RG), mapping between ACRs and RGs, and local blacklisting of RGs, see the following sections.

The Rating Group Identifier (RG-ID), identifying an RG, must be an integer between 0 and 2^{32}-1.

For instructions on configuring charging methods for an RG, refer to Charging Methods Configuration.

4.4.1 Mapping RGs to ACRs

By default, the ACR-ID of a service is used as RG-ID. To map an RG to an ACR or a consecutive range of ACRs separated by -, include the following statement:

```
Ericsson(config)# epg pgw rule-space <rule-space-name
> rating-group map <rg-id>
   access-control-rule (<acr-id> | <acr-id>-<acr-id>)
```

An RG can be mapped to several ACRs, but an ACR can only be mapped to one RG.

4.4.2 Configuring a Default RG

The RG to use for ACRs that are not mapped to any RG can be configured in either of the following ways per rule space:

— Use ACR. The ACR-ID is used as RG-ID. This is the default if nothing is configured.

— Default RG-ID.

To configure the default RG of a rule space, include the following statement:

```
Ericsson(config)# epg pgw rule-space <rule-space
-name> rating-group
   default (use-access-control-rule | default-ra
ting-group <rg-id>)
```

4.4.3 Configuring Local Blacklisting of RGs

To configure local blacklisting of an RG or a consecutive range of RGs separated by -, include the following statement:

```
Ericsson(config)# epg pgw rule-space <rule-space
-name> rating-group
   not-allowed (<rg-id> | <rg-id>-<rg-id>)
```

4.5 Configuring SIs for a Rule Space

The following section describes the mapping between SDFs, ACRs, and SIs.

The SI Identifier (SI-ID), identifying a service, must be an integer between 0 and $2^{32}-1$.

4.5.1 Mapping SIs to ACRs

By default, the SDF-ID of a classified service is used as SI-ID. To map an SI to an ACR or a consecutive range of ACRs separated by -, include the following statement:

```
Ericsson(config)# epg pgw rule-space <rule-space-name
> service-id map <si-id>
   access-control-rule (<acr-id> | <acr-id>-<acr-id>)
```

An SI can be mapped to several ACRs, but an ACR can only be mapped to one SI.

4.5.2 Configuring Default SI

The SI to use for ACRs that are not mapped to any SI can be configured in either of the following ways per rule space:

— Use SDF-ID. The SDF-ID is used as SI-ID. This is the default if nothing is configured.

— Default SI-ID.

— Disabled. The ACR is not associated with any SI.

To configure the default SI of a rule space, include the following statement:

```
Ericsson(config)# epg pgw rule-space <rule-space-name> service-id
   default (use-service-data-flow | default-service-id
<service-id> | disabled)
```

5 Configuring SACC for an APN

By default, SACC is disabled for an APN. The following sections describe how to configure SACC for an APN.

The following steps must be performed:

1. Configure an APN, as described in APN Configuration.
2. Configure the control context for the APN, as described in Section 5.1 on page 7.
3. Authorize a rule space for the APN, as described in Section 5.2 on page 8.
4. Configure a default user category for the APN, as described in Section 5.3.1 on page 9.

5.1 Configuring the Control Context for an APN

The SACC functionality can be enabled for an APN. This is controlled through configuration of the control context.

Do!

Block bearer creation before modifying previously configured control context configuration.

For detailed instructions for performing configuration that requires blocking bearer creation, refer to Deleting and Modifying APNs.

To configure an APN with SACC functionality, include the following statement:

```
Ericsson(config)# epg pgw apn <apn-name> service-based-charging
   control-context 3gpp
```

5.2 Authorizing a Rule Space for an APN

Rule spaces must be authorized to be used in an APN.

To authorize a configured rule space for an APN, include the following statement:

```
Ericsson(config)# epg pgw apn <apn-name>
   allow-rule-space <rule-space-name>
```

Do!

Block bearer creation before removing a rule space from the authorized list.

For detailed instructions for performing configuration that requires blocking bearer creation, refer to Deleting and Modifying APNs.

5.3 Configuring a User Category

A user category defines the conditions for SACC for a group of users. The user category determines the default rule space and applicable profiles for a user session. A default user category, and up to 63 additional user categories, can be configured.

For instructions on configuring credit control profiles, refer to Credit Control Configuration.

For instructions on configuring policy control profiles, refer to Policy Control Configuration.

For instructions on configuring Quality of Service (QoS) control profiles, refer to Quality of Service Configuration.

For instructions on configuring S6b or S6bAuth profiles, refer to Diameter AAA Interface Configuration.

For instructions on configuring service chaining profiles, refer to Service Chaining Configuration.

Do!

Block bearer creation before modifying previously configured user category configuration.

For detailed instructions for performing configuration that requires blocking bearer creation, refer to Deleting and Modifying APNs.

5.3.1 Configuring a Default User Category

The default user category is used for users that do not match any other defined category. The default user category contains a mandatory default rule space and optional profiles.

5.3.1.1 Configuring a Default Rule Space

To configure the mandatory default rule space of the default user category, include the following statement:

```
Ericsson(config)# epg pgw apn <apn-name> user-categ
ory default rule-space
   default <rule-space-name>
```

5.3.2 Configuring an Additional User Category

To configure an additional user category, the following actions are mandatory:

— Configure user category selection criteria.

— Configure a default rule space.

A charging characteristics mask can optionally be configured for the user category.

5.3.2.1 Configuring User Category Selection Criteria

The choice of user category is based on the User Equipment (UE) charging characteristics, roaming class, Mobile Subscriber ISDN Number (MSISDN), or International Mobile Subscriber Identity (IMSI). It is possible to configure one or more parameters for each user category. When selecting the user category, the parameters are matched in the following order:

1 Roaming class + charging characteristics + IMSI

2 Roaming class + charging characteristics

3 Roaming class + IMSI

4 Roaming class

5 Charging characteristics + MSISDN

6 Charging characteristics + IMSI

7 Charging characteristics

8 MSISDN

9 IMSI

The charging characteristics defined in the user category are matched with the charging characteristics of the user session after the charging characteristics mask has been applied. The MSISDN and IMSI of the UE are matched against lists of MSISDN and IMSI regular expressions defined in the user category. The EPG accepts basic regular expressions as defined in POSIX 1003.2. The roaming class defined in the user category is matched against the roaming class selected for the user session, which is based on Public Land Mobile Network Identity (PLMN ID) or Radio Access Technology (RAT) type. For information on user category selection, refer to SACC Overview.

To configure user category selection criteria, include the following statement:

```
Ericsson(config)# epg pgw apn <apn-name> user-categ
ory category <number>
   roaming-class <number>
   cc-values <value>
   imsi <regexp>
   msisdn <regexp>
```

To enable user category selection based on roaming class, roaming awareness must be configured, as described in APN Configuration. For instructions on configuring charging characteristics, refer to Offline Charging Configuartion.

5.3.2.2 Configuring a Default Rule Space

To configure the mandatory default rule space of a user category, include the following statement:

```
Ericsson(config)# epg pgw apn <apn-name> user-categor
y category <number> rule-space
   default <rule-space-name>
```

5.3.3 Configuring Default Rule Space per IMEI Class

The choice of default rule space within a user category can be based on the IMEI, which identifies the type of terminal used. An IMEI class is identified by a list of configured Type Allocation Code (TAC) values. Each configured user category can define a default rule space per IMEI class. The EPG matches the IMEI of the UE against the IMEI classes configured for the user category. If no IMEI class is matched, the EPG uses the default rule space of the user category.

The TAC value is the first 6–8 digits of the IMEI or IMEISV, depending on format version.

To add a TAC value to an IMEI class, include the following statement:

```
Ericsson(config)# epg pgw apn <apn-name> user-category
imei-class <class-id>
   imei-value <tac-value>
```

5.3.3.1 Configuring Default Rule Space per IMEI Class of the Default User Category

To configure the default rule space for an IMEI class of the default user category, include the following statement:

```
Ericsson(config)# epg pgw apn <apn-name> user-category
default rule-space imei-class <class-id>
   default <rule-space-name>
```

5.3.3.2 Configuring Default Rule Space per IMEI Class of an Additional User Category

To configure the default rule space for an IMEI class of an additional user category, include the following statement:

```
Ericsson(config)# epg pgw apn <apn-name> user-category category
<number> rule-space imei-class <class-id>
   default <rule-space-name>
```