ERICSSON

Traffic Optimization Configuration

OPERATION DIRECTIONS

77/1543-AXB 250 12-V3 Uen U

Contents

1 Introduction

This document describes traffic optimization configuration in the EPG in the GSM, WCDMA, and LTE networks.

1.1 Scope

The current scope of traffic optimization is only TCP optimization.

TCP optimization depends on PISC. For information on how to enable PISC, refer to PISC Configuration.

The bit rate enforcement setting in the QoS configuration can negatively affect the throughput gain with TCP optimization. For more information, refer to Traffic Optimization.

1.2 Target Groups

This document is intended for personnel optimizing traffic in the network. The document assumes a basic knowledge of data communication and telecommunication.

2 Enable TCP Optimization

To enable TCP optimization in the EPG, associate a predefined traffic optimization profile with a service set. For more information, see Section 3 on page 1.

To select specific TCP traffic for optimization based on shallow traffic inspection and classification, do the following:

1. Configure a TCP selection. See Section 5 on page 4.
2. Associate the TCP selection with the service set. See Section 6 on page 6.

TCP optimization can be configured on a live EPG node.

Once TCP optimization is enabled, it applies to all existing and new TCP flows.

3 Associate a Traffic Optimization Profile with a Service Set

To associate a predefined traffic optimization profile with a service set, include the following statement:

```
Ericsson(config)# epg pgw service-set <service-set-name>
   traffic-optimization-preset-profile (1 | 2 | 3 | 4)
```

Where:

— The preset profile 1 is for general purpose. It is designed for standard 4G networks, and the maximum achievable peak throughput is around 280 Mbps under ideal radio conditions.

— The preset profile 2 is designed for scenarios with high packet loss probability in radio access. The optimization is less aggressive, so the maximum achievable peak throughput is reduced to 200 Mbps under ideal radio conditions.

— The preset profile 3 is designed for the same radio conditions as preset profile 1, but preset profile 3 provides quicker initial throughput ramp-up on the internet side (Gi side). For better optimization even for small flows, preset profile 3 is used if high-speed and low packet loss internet connection is available in the EPG.

— The preset profile 4 is designed for the same radio conditions as preset profile 2, but preset profile 4 provides quicker initial throughput ramp-up on the internet side (Gi side). For better optimization even for small flows, preset profile 4 is used if high-speed and low packet loss internet connection is available in the EPG.

Only one traffic optimization profile can be configured under a service set. Select preset profile 3 by default. To select other profiles, refer to Troubleshooting the EPG Software.

Note: If only a default SDF-ID is configured under the service set, TCP optimization is not enabled.

To associate a profile selection based on Maximum Bit Rate (MBR) bearer with a service set, include the following statement:

```
Ericsson(config)# epg pgw service-set <service-set-name>
   traffic-optimization-profile-select <profile-id>
```

4 Configure Profile Selection Based on MBR Bearer

The association of a predefined traffic optimization profile with a service set can be done dynamically based on the MBR of the default bearer.

The EPG applies a profile when the MBR of the default bearer is less than or equal to the configured MBR threshold. If no traffic optimization profile is associated with the MBR of the default bearer, traffic optimization is disabled when the MBR is less than or equal to the configured MBR threshold.

To configure a profile selection, include the following statement:

```
Ericsson(config)# epg pgw traffic-optimization
   profile-selection <profile-selection-id>
```

4.1 Configure an MBR Bearer Threshold

To associate different traffic optimization profiles with the MBR of the default bearer, include the following statement:

```
Ericsson(config)# epg pgw traffic-optimization profile-selection
<profile-selection-id> maximum-bit-rate-dl-upper-limit-kb <value>
   traffic-optimization-preset-profile (1 | 2 | 3 | 4)
```

4.2 Configure a Default Traffic Optimization Profile

To configure a default traffic optimization profile, include the following statement:

```
Ericsson(config)# epg pgw traffic-optimization profile-selection
<profile-selection-id> maximum-bit-rate-dl-no-limit
   traffic-optimization-preset-profile (1 | 2 | 3 | 4)
```

4.3 Example

Example 1 shows the following configuration:

— Traffic optimization as disabled for MBR equal or less than 7.2 Mbps

— Predefined traffic optimization profile 1 for MBR equal or less than 42 Mbps

— Predefined traffic optimization profile 2 as default

```
Ericsson(config)# epg pgw traffic-optimization profile-selection 1 maximum-bit-
Ericsson(config)# epg pgw traffic-optimization profile-selection 1 maximum-bit-
Ericsson(config)# epg pgw traffic-optimization profile-selection 1 maximum-bit-
```

Example 1 Example of Configuring Profile Selection Based on MBR Bearer

5 Configure a TCP Selection

The TCP traffic subject to optimization can be selected based on certain conditions such as IP range and domain.

To configure a TCP selection, include the following statement:

```
Ericsson(config)# epg pgw traffic-optimization tcp-se
lection <tcp-selection-id>
   type (whitelist | blacklist)
```

— `whitelist`: The selected TCP traffic is optimized. Any unselected traffic is not optimized.

— `blacklist`: The selected TCP traffic is not optimized. Any unselected traffic is optimized.

5.1 Configure a Header Rule

A shallow inspection can be carried out by configuring a header rule with the following matching conditions:

— UE address

— UE port

— UE prefix

— Network address

— Network port

— Network prefix

— Domain

Incoming packets are identified by UE IP address (expressed as UE address or UE prefix), UE communication port, network IP address (expressed as network address or network prefix), network communication port, and domain (expressed

as URL or URI). These match conditions are used to select the TCP traffic for optimization.

To configure a header rule, include the following statement:

```
Ericsson(config)# epg pgw traffic-optimization tcp-selection
<tcp-selection-id> header-rule <header-rule-name>
   ms-address <ip-address>
   ms-port (1–65535)
   ms-prefix <ip-address-range>
   network-address <ip-address>
   network-port (1–65535)
   network-prefix <ip-address-range>
```

To configure a domain, include the following statement:

```
Ericsson(config)# epg pgw traffic-optimization tcp-selection
<tcp-selection-id> header-rule <header-rule-name> domain
   is <string>
   starts-with <string>
   contains <string>
   ends-with <string>
```

At least one header rule must be created under `tcp-selection`. A maximum of 256 header rules can be configured under `tcp-selection`.

Note: All configuration under `epg pgw service-identification dns-monitoring` applies to the domain configuration for traffic optimization.

Table 1 shows allowed combinations of the attributes for the header rule and domain configuration.

Table 1 Allowed Attribute Combination for Header Rule and Domain Configuration

	network-address	network-prefix	network-port	ms-address	ms-prefix	ms-port	domain
network-address			x	x	x	x	
network-prefix			x	x	x	x	
network-port	x	x		x	x	x	x
ms-address	x	x	x			x	

ms-prefix	x	x	x			x	
ms-port	x	x	x	x	x		
domain			x				

The following applies to the modification under `tcp-selection`:

— Adding, modifying, or deleting a header rule affects existing and new TCP flows.

The following applies to the modification under `dns-monitoring`:

— New or updated dynamic header rules that are generated for DNS queries during DNS monitoring affect only new TCP flows.

— Automatic clearing of dynamic header rules because of IP expiry affects only new TCP flows.

6 Associate a TCP Selection with a Service Set

To associate a TCP selection with a service set, include the following statement:

```
Ericsson(config)# epg pgw service-set <service-set-name>
   traffic-optimization-tcp-selection <tcp-selection-id>
```

Note: A TCP selection can only be associated with a service set that has been associated with a predefined traffic optimization profile or a configured traffic optimization profile.

7 Configure Memory Limit per User Plane vSFO

A limit of the memory usage per user plane vSFO associated with traffic optimization can be configured.

To configure the memory limit per user plane vSFO, include the following statement:

```
Ericsson(config)# epg pgw traffic-optimization
```

```
   memory-limit <value>
```

`memory-limit` is configured in a percentage of available memory in the user plane vSFO. The default value is 85, meaning the limit is 85% of available memory in the user plane vSFO.

When the memory usage on a user plane vSFO reaches the configured limit, all new TCP connections are not optimized in the user plane vSFO.

When the memory usage on the user plane vSFO returns to 85% of the configured limit, all new TCP connections are optimized.

8 Configure CPU Limit per Thread

A limit of the CPU usage per thread associated with traffic optimization can be configured.

To configure the CPU limit per thread, include the following statement:

```
Ericsson(config)# epg pgw traffic-optimization
   cpu-limit <value>
```

`cpu-limit` is configured in a percentage of available CPU capacity per thread in the user plane vSFO. The default value is 85, meaning the limit is 85% of available CPU capacity per thread in the user plane vSFO.

Each thread handles a group of users. TCP connections for the same group of users are always handled in the same thread.

When the CPU usage on a thread reaches the configured limit, all new TCP connections are not optimized in the thread.

When the CPU usage on the thread returns to 85% of the configured limit, all new TCP connections are optimized.

9 Disable TCP Optimization

To disable TCP optimization at the service set level, remove the traffic optimization profile under the service set.

To disable TCP optimization at the node level, remove traffic optimization profiles under all the service sets.

If TCP optimization is disabled successfully at the node level, the following output fields of the `statistics` action command show the value of `0`:

```
Ericsson(config)# epg pgw traffic-optimization
   statistics
traffic-optimization-tb-statistics-information:
    traffic-optimization-tb-active-flows: 0
    ...
    traffic-optimization-tb-buffer-size: 0
    ...
```

To release all resources related to TCP optimization, remove `traffic-optimization` and all configuration statements under it by entering the following:

```
Ericsson(config)# no epg pgw traffic-optimization
```