

Configuring Adaptive Paging

OPERATION DIRECTIONS

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1 Introduction

This document describes the handling and configuration of adaptive paging for the SGSN-MME for GSM and LTE Systems. Configuring paging and making it more adaptive to the operator's network can reduce the number of paging attempts necessary to locate the UE. This can reduce the load in the network and release resources in the SGSN-MME. Less paging also reduces the signalling in the radio access network.

For more information on the Paging procedure, see [GSM Mobility Management and LTE Mobility Management](#).

1.1 Scope

This document covers the following topics related to the configuration of adaptive paging:

- Prerequisites for the configuration
- Instructions for configuration of the paging profile table
- Instructions for configuration of the paging profile selection table
- Configuration processes for consistency checking, activating, and checkpointing the configuration
- Available operations

1.2 Target Groups

This document is intended for personnel performing the configuration of adaptive paging in the SGSN-MME.

2 Prerequisites

This section outlines the prerequisites for the configuration.



2.1 Planning

Consider the following issues when planning the configuration:

- Refer to *GSM Mobility Management and LTE Mobility Management* to understand the feature.
- Ensure that the license-key file containing the license for the Configurable and Adaptive Paging feature is loaded. For more information on the license for Configurable and Adaptive Paging, see *Installing Node-Based Licenses*. If network-based licenses are used, see *Activation of NeLS Client Licenses*.
- The necessary parameters for the CLI commands outlined in this document, which are listed in *Parameter Description*. See Section 6 on page 18 for information on available operations and CLI commands.
- Which criteria will be used in the paging profile selection table to define which paging profile rule will be used.

2.2 User

The person performing the configuration should have a solid knowledge of and training in the following areas:

- How to work in UNIX™
- Knowledge of packet-switching communication
- Operation of the SGSN-MME

2.3 Activation

Changes to the configuration are activated in runtime and do not require a restart.

3 Configuring Adaptive Paging for LTE

A paging profile specifies how many paging attempts are performed and the width of the paging attempt. Input selection criteria is used to determine which paging profile is used. The configuration must be evaluated after running the system for a time.



3.1 Configuring the Paging Profile Table

The paging profile table contains rows of paging profiles, see Table 1. A paging profile specifies the number of paging attempts that are performed with a certain paging width. A paging profile is selected based on the parameters in the paging profile selection table, see Table 2. When all paging attempts on one paging width have been performed the paging width is extended. The following four paging widths are defined:

- Narrowest** This is the narrowest paging width. The MME pages the eNodeB that was last visited by the UE. This can reduce the number of paging messages sent, as messages are sent to fewer eNodeBs.
- Narrow** This is the second narrowest paging width. The MME pages the list of eNodeBs that were most recently visited by the UE. This can reduce the number of paging messages sent, as messages are sent to a small number of eNodeBs. The number of eNodeBs that are added into the latest visited eNodeB list is configurable. For more information, see Section 3.3 on page 10.
- Medium** This is a medium paging width. The MME pages the eNodeBs in the tracking area last visited by the UE.
- Wide** This is the largest, or widest paging width. The MME pages all eNodeBs in all tracking areas in the TAI list.
- A wide paging profile is used if it is necessary to find the UE quickly. However, it should be noted that in this case, paging messages are sent to all eNodeBs in the TAI list.

Table 1 Example of a Paging Profile Table for LTE

Paging Profile	Last-Visited eNodeB	Latest-Visited eNodeB List	Last-Visited TA	TAI List	Paging Timer (T3413) ⁽¹⁾
1	0	0	0	4 ⁽²⁾	-
2	0	0	2	3	-
3	2	0	2	2	-
4	3 ⁽²⁾	2	3 ⁽²⁾	0 ⁽²⁾	1000 ms ⁽²⁾
...	... ⁽²⁾ ⁽²⁾	... ⁽²⁾	... ⁽²⁾
20	3 ⁽²⁾	2	2 ⁽²⁾	2 ⁽²⁾	- ⁽²⁾

(1) The Default Paging Timer Value of any Paging Profile is Defined by the S1T3413PagingTimer Parameter.

(2) Configurable Value



The paging profile table consists of three predefined paging profiles and up to 17 configurable paging profiles. Paging profiles with configurable columns cannot be configured to contain zero paging attempts unless the Paging Suppression for Fixed Wireless Access is enabled. This feature is enabled by setting the feature parameter `paging_suppression_for_fwa` to `ACTIVATED`. For more information, see [LTE Mobility Management](#).

Paging profile 1 is predefined, but the TAI list column is configurable. Paging profile 1 is the default paging profile selected by the MME.

Paging profiles 2 and 3 are predefined.

Paging profiles 4 to 20 are configurable. For instructions on configuring paging profiles, see [Section 3.1.1](#) on page 5.

There is a situation in which the paging profile selection table is disregarded when selecting which paging profile to use:

- If a paging procedure is caused by CS fallback, the MME always selects paging profile 1.

General Advice on Configuring Adaptive Paging

This section describes some general advice for configuring adaptive paging.

- Determine, using counters, if narrowest pagings are successful by comparing the number of attempted pagings on the Last-visited eNodeB with the number of successful pagings on Last-visited eNodeB.
- Paging profiles starting with a narrowest paging which often fail, and requiring expansion to a wider paging should be avoided. Time can be lost in failed narrowest paging attempts.

Evaluate the adaptive paging configuration after running the system for a while. There are a number of counters available that can be used to monitor how pagings succeed:

VS.MM.AttLastVisitedEnodebPaging.E

Attempted pagings in the last-visited eNodeB

VS.MM.SuccLastVisitedEnodebPaging.E

Successful pagings in the last-visited aNodeB

VS.MM.AttEnodebListPaging.E

Attempted pagings in the latest visited eNodeB list.

VS.MM.SuccEnodebListPaging.E

Successful pagings in the latest visited eNodeB list.

VS.MM.AttLastVisitedTaPaging.E

Attempted pagings in the last-visited tracking area

**VS.MM.SuccLastVisitedTaPaging.E**

Successful pagings in the last-visited tracking area

VS.MM.AttTaListPaging.E

Attempted pagings in the TAI list.

VS.MM.SuccTaListPaging.E

Successful pagings in the TAI list.

VS.MM.AttPsPaging.E

Attempted pagings

VS.MM.SuccFirstPsPaging.E

Pagings successful with the first message to the eNodeB

VS.MM.SuccPsPaging.E

Successful Pagings

The relationship between the following counters can be helpful in determining configuring an effective paging profile:

- VS.MM.AttLastVisitedEnodebPaging.E and VS.MM.SuccLastVisitedEnodebPaging.E
- VS.MM.AttEnodebListPaging.E and VS.MM.SuccEnodebListPaging.E
- VS.MM.AttLastVisitedTaPaging.E and VS.MM.SuccLastVisitedTaPaging.E
- VS.MM.AttTaListPaging.E and VS.MM.SuccTaListPaging.E

See [Counter Description](#) for more information.

After running the system for a while, use the script to evaluate the setting of the `MaxPagedEnodebListLength` parameter. For more information on the script, see [Toolbox Description](#).

3.1.1 Creating a Row in the Paging Profile Table

This section describes how to create a paging profile in the paging profile table.

Instructions

1. Create a row in the paging profile table using the `create_paging_profile` CLI command.

Note: Arguments included in the command specify values for the number of paging attempts for each paging width.

Example



This example creates a paging profile, row number 20, with three paging attempts to the last-visited eNodeB, two paging attempts to the latest visited eNodeB list, two paging attempts to the last-visited tracking area, two paging attempts to the last-visited TAI list, with a T3413 paging timer value of 1000 ms.

```
create_paging_profile -id 20 -enb 3 -enbl 2 -ta 2 -talist 2 -ptpt 1000
```

3.1.2 Modifying a Row in the Paging Profile Table

This section describes how to configure a paging profile in the paging profile table.

Instructions

1. Display the paging profile table using the `list_paging_profile` CLI command.
2. Display the first row of the Paging Profile Table using the `get_paging_profile` CLI command and the `PagingProfileId` parameter with the value 1.
3. Configure the number of paging attempts using a certain paging width using the `modify_paging_profile`.

Example

This example modifies the number of paging attempts on the TAI List in the paging profile number 1. The number of paging attempts can be between 0-4. Default value is 4.

```
modify_paging_profile -id 1 -talist 2
```

Note: If a TAI list is not configured, the default TAI list sent to the UE list contains only the current TAI. See [Configuring Session and Mobility Management](#) for more information on how to configure TAI list options in order to optimize the TAI List paging option.

3.2 Configuring the Paging Profile Selection Table

The MME begins the paging procedure by going through the paging profile selection table one at a time, starting from the row with the lowest priority value, in order to find the first match to the input selection criteria. The first row where all criteria match those of the UE and its bearers determines which paging profile to use. The paging profile selection table can be used to select a paging profile starting with a narrowest paging width for certain UE, so that the amount of paging messages and consequently the load on the radio network is minimized.

The following criteria is used in the paging profile selection table to determine which paging profile is used :

Priority The value in this column determines the priority of a row and its placement in the paging profile selection table.

**Time Since UE location reported**

These columns contains the minimum and maximum values of the time range, in seconds, since the UE last reported its location.

A paging profile with a narrowest paging width can be used in many cases, if only a short time has elapsed since the location of the UE was last reported.

ARPMIn, ARPMax

These columns contain the minimum and maximum Allocation/Retention Priority (ARP) priority level values.

A wide paging width can be used for UE with a bearer with a high ARP value, for example, an emergency bearer.

QCIMin, QCIMax

These columns contain the minimum and maximum values of the QoS Class Identifier (QCI) range.

A specific paging profile can be configured for paging that concerns UE within a specified QCI range, perhaps in order to provide a quick establishment of service.

The SGSN-MME supports QCI values from 1 to 255.

APN

This column contains the Access Point Name (APN) to be used. The entire APN, for example, `internet.mnc015.mcc234.gprs` will be matched. Matching is done label by label, from right to left.

A paging profile can be configured for UEs connected to a specified APN, for example, if UE with a voice APN is required to be paged more quickly.

IMSI Number Series

This column contains the International Mobile Subscriber Identities (IMSI) number series to be used.

Home subscribers can be paged more quickly by starting with a wider paging than roaming subscribers.



IMEI Number Series

This column contains the International Mobile Equipment Identities (IMEI) number series to be used.

For stationary equipment, wide paging is not necessary. A narrowest paging width can be used for UE with an IMEI number series that is reserved for stationary equipment, or if it is known that the location of the UE seldom changes. In paging profile 3, a narrowest paging is tried first. The criteria *Time since UE location reported* and *IMEI Number Series* are likely to be used in paging selection rules indicating a narrowest paging.

Geographical Area Name

The value in this column specifies a Geographical Area.

A paging profile can be configured for UEs based on Geographical Area Name.

Comment

This column can contain a comment of up to 150 characters.

The Paging Profile Selection table is used to select the most appropriate paging profile in order to ensure more efficient paging.

Table 2 Example of a Paging Profile Selection Table for LTE

Priority	Time since UE location reportedMin	Time since UE location reportedMax	ARPM in	ARPM ax	QCIMin	QCIMax	APN	IMSI Number Series	IMEI Number Series	GAN	Comment	Paging Profile
1	NULL	NULL	NULL	NULL	NULL	NULL	NULL	NULL	NULL	Ga1	High-speed railway	1
2	NULL	NULL	NULL	NULL	NULL	NULL	NULL	NULL	NULL	Ga2	High-speed railway	2
5	0	300	NULL	NULL	NULL	NULL	NULL	NULL	NULL	undefined	NULL	3
10	NULL	NULL	4	4	NULL	NULL	ericsson.se.mnc015.mcc234.gprs	NULL	NULL	undefined	NULL	2
15	NULL	NULL	NULL	NULL	NULL	NULL	ericsson.se.mnc015.mcc234.gprs	NULL	NULL	undefined	NULL	3
20	NULL	NULL	NULL	NULL	NULL	NULL	NULL	123456	NULL	undefined	NULL	2



Table 2 Example of a Paging Profile Selection Table for LTE

Priority	Time since UE location reportedMin	Time since UE location reportedMax	ARPM in	ARPM ax	QCIMin	QCIMax	APN	IMSI Number Series	IMEI Number Series	GAN	Comment	Paging Profile
25	NULL	NULL	1	3	5	5	ericsson2.se.mnc015.mcc234.gprs	654321	654323	undefined	EXAMPLE	3
30	NULL	NULL	NULL	NULL	1	1	NULL	NULL	NULL	undefined	NULL	1
35	NULL	NULL	NULL	NULL	2	2	NULL	NULL	NULL	undefined	NULL	1
40	NULL	NULL	NULL	NULL	5	5	NULL	NULL	NULL	undefined	NULL	2
45	NULL	NULL	NULL	NULL	9	9	NULL	NULL	NULL	undefined	NULL	3

3.2.1 Creating a Row in the Paging Profile Selection Table

Create a row for a paging rule in the paging profile selection table using the `create_paging_selection` CLI command. Arguments included in the command specify which selection criteria in the columns contain a value. See the configuration example in Section 3.2.2 on page 9.

3.2.2 Modifying a Row in the Paging Profile Selection Table

Instructions

1. View an existing paging profile selection table using the `list_paging_selection` CLI command.
2. Display a row in the paging profile selection table using the `get_paging_selection` CLI command and the `RulePrio` parameter with the priority number of the row as the key.
3. Configure a row in an existing paging profile selection table using the `modify_paging_selection` CLI command.

Example

The following example shows the configuration for row 30 in the paging profile selection table in Table 2.

```
modify_paging_selection -prio 30 -arpn 1 -arpx 3 -qcin 5 -qcix 5
-apn ericsson2.se.mnc015.mcc234.gprs -imsi 654321 -imei 654323 -c
EXAMPLE -id 3
```



To simplify the addition of more rules to a paging profile selection table, paging profile selection table rows should have intervals between the priority values.

3.2.3 Configuring a Default Rule in the Paging Profile Selection Table

The priority of the selection criteria is determined by the position of the row in the paging profile selection table. 1 is the highest priority and 100 the lowest. If no match can be made to the input selection criteria, row 100 in the paging profile selection table is selected and defaults to paging profile 1. Row 100 is included in default configuration, so there is always one row in the paging profile selection table. This row cannot be altered.

To override the default paging profile with a new default paging profile, create a new rule with no selection criteria defined, with a priority between 1–99 and a paging profile defined. Since this rule will always match, no rules with lower priority will be used.

3.3 Configuring the Latest Visited eNB List

There are two ways to configure the latest visited eNB list:

- Modifying the MaxPagedEnodeBListLength Parameter
- Allowing paging outside the TAI list

3.3.1 Modifying the MaxPagedEnodeBListLength Parameter

The MaxPagedEnodeBListLength parameter specifies the maximum number of eNodeBs that can be included in the latest visited eNodeB list.

Instructions

1. Modify the MaxPagedEnodeBListLength parameter using the `modify_s1_mme` CLI command.

Example

The following example modifies the MaxPagedEnodeBListLength parameter to 5.

```
modify_s1_mme -s1 s1 -menb 5
```

3.3.2 Allowing Paging outside the TAI List

The `allow_paging_outside_tai_list` parameter allows the SGSN-MME to include eNodeBs outside the TAI list, when paging the latest visited eNodeB list. The `allow_paging_outside_tai_list` parameter is only applicable if the Adaptive Paging feature is turned on, and the paging width narrow (`-enb1` parameter in the paging profile) is used.



Instructions

1. Modify the `allow_paging_outside_tai_list` parameter using the `modify_node_function` CLI command.

Example

The following example turns the `allow_paging_outside_tai_list` parameter on.

```
modify_node_function -name allow_paging_outside_tai_list -state on
```

4 Configuring Adaptive Paging for GSM

A paging profile specifies how many paging attempts are performed and the paging area of the paging attempt. Input selection criteria is used to determine which paging profile is used. The configuration should be evaluated after running the system.

4.1 Configuring the Paging Profile Table

The paging profile table contains rows of paging profiles, see Page 12. A paging profile specifies the number of paging attempts that are performed with a certain paging area. A paging profile is selected based on the parameters in the paging profile selection table, see Table 4. When all paging attempts on one paging area have been performed the paging area is extended. Two paging areas are defined:

Narrow	<p>The paging area of a narrow paging is a cell.</p> <p>The SGSN pages the BSC that was last visited by the MS, and provides an indication of the BSSGP Virtual Connection Identifier (BVCI), such as a cell, to the BSC. The BSC then pages the MS within the cell. This can reduce the number of paging messages sent by the SGSN and BSC.</p>
Wide	<p>The paging area of a wide paging is a Routing Area (RA).</p> <p>The SGSN pages all the BSCs within an RA, and provides an indication of all cells to the BSCs. The BSCs then page the MS within all the cells.</p>



Table 3 Example of a Paging Profile Table for GSM

Paging Profile	Last-Visited Cell	RA
1	0	3 ⁽¹⁾
2	2	2
3	3 ⁽¹⁾	1 ⁽¹⁾
...	... ⁽¹⁾	... ⁽¹⁾
10	3 ⁽¹⁾	2 ⁽¹⁾

(1) Configurable value

The paging profile table consists of two predefined paging profiles and up to eight configurable paging profiles. Paging profiles with configurable columns cannot be configured to contain zero paging attempts.

Paging profile 1 is predefined, but the RA column is configurable. Paging profile 1 is the default paging profile selected by the SGSN.

Paging profile 2 is also predefined.

Paging profile 3 to 10 are configurable. For instructions on configuring paging profiles, see Section 4.1.1 on page 13.

General Advice on Configuring Adaptive Paging

This section describes some general advice for configuring adaptive paging.

- Determine, using counters, if narrow pagings are successful by comparing the number of attempted pagings on the last-visited cell with the number of successful pagings on last-visited cell.
- Paging profiles that start with a narrow paging that often fail, and require expansion to a wide paging should be avoided. Time can be lost in failed narrow paging attempts.

Evaluate the adaptive paging configuration after running the system for a while. There are a number of counters available that can be used to monitor how pagings succeed:

VS.MM.AttLastVisitedCellPaging.G

Attempted pagings in the last-visited cell

VS.MM.SuccLastVisitedCellPaging.G

Successful pagings in the last-visited cell

VS.MM.AttRaPaging.G

Attempted pagings in the RA

VS.MM.SuccRaPaging.G

Successful pagings in the RA



The relationship between the following counters can be helpful in determining how to configure an effective paging profile:

- VS.MM.AttLastVisitedCellPaging.G and VS.MM.SuccLastVisitedCellPaging.G
- VS.MM.AttRaPaging.G and VS.MM.SuccRaPaging.G

See [Counter Description](#) for more information.

4.1.1 Creating a Row in the Paging Profile Table

This section describes how to create a paging profile in the paging profile table.

Instructions

1. Create a row in the paging profile table using the `create_paging_profile_wg` CLI command. Arguments included in the command specify values for the number of paging attempts for each paging area.

Example

This example creates a paging profile, id 3, with 3 paging attempts to the last-visited cell, 2 paging attempts to the RA.

```
create_paging_profile_wg -id 3 -cell 3 -ra 2
```

4.1.2 Modifying a Row in the Paging Profile Table

This section describes how to configure a paging profile in the paging profile table.

Instructions

1. Display the paging profile table using the `list_paging_profile_wg` CLI command.
2. Display the first row of the paging profile table using the `get_paging_profile_wg` CLI command and the `PagingProfileId` parameter with the value 1.
3. Configure the number of paging attempts using a certain paging area using the `modify_paging_profile_wg`.

Example

This example modifies the number of paging attempts on last-visited cell in the paging profile 3.

```
modify_paging_profile_wg -id 3 -cell 2
```



4.2 Configuring the Paging Profile Selection Table

The SGSN begins the paging procedure by going through the paging profile selection table one at a time, starting from the row with the lowest priority value, in order to find the first match to the input selection criteria. The first row where all criteria match those of the MS and its bearers or PDP contexts determines which paging profile to use. The paging profile selection table can be used to select a paging profile starting with a narrow paging for certain UE, so that the amount of paging messages, and consequently, the load on the radio network is minimized.

The following criteria is used in the paging profile selection table to determine which paging profile is used:

Priority	The value in this column determines the priority of a row and its placement in the paging profile selection table.
RAT	The value in this column indicates the Radio Access Type.
Time since last location reported	<p>These columns contains the minimum and maximum values of the time range, in seconds, since the MS last reported its location.</p> <p>A paging profile with a narrow paging can be used in many cases, if only a short time has elapsed since the location of the MS was last reported.</p>
Traffic class	<p>The value in the column is related to the PDP context of the MS.</p> <p>Note: The traffic class criteria is used for PDP contexts.</p>
ARPMIn, ARPMax	<p>These columns contain the minimum and maximum Allocation/Retention Priority (ARP) priority level values.</p> <p>A wide paging can be used for MS with a bearer with a high ARP value, for example, an emergency bearer.</p>
QCIMin, QCIMax	<p>These columns contain the minimum and maximum values of the QoS Class Identifier (QCI) range.</p> <p>A specific paging profile can be configured for paging that concerns MS within a specified QCI range, perhaps in order to provide a quick establishment of service.</p> <p>The SGSN-MME supports QCI values from 1 to 255.</p> <p>Note: The QCI criteria is used for bearers.</p>



APN

This column contains the APN to be used. The entire APN, for example, `internet.mnc015.mcc234.gprs` will be matched. Matching is done label by label, from right to left.

A paging profile can be configured for UEs connected to a specified APN, for example, if UE with a voice APN is required to be paged more quickly.

IMSI Number Series

This column contains the IMSI number series to be used.

Home subscribers can be paged more quickly by starting with a wider paging than roaming subscribers.

IMEI Number Series

This column contains the IMEI number series to be used.

For stationary equipment, wide paging is not necessary. A wide paging can be used for an MS with an IMEI number series that is reserved for stationary equipment, or if it is known that the location of the MS seldom changes. In paging profile 3, a narrow paging is tried first. The criteria `Time since last location reported` and `IMEI Number Series` are likely to be used in paging selection rules indicating a narrow paging.

Service class indicator

The value in this column indicates the IP-CAN application for which the downlink data is sent.

Paging profile

The value in this column determines the paging profile number in paging profile table.

The paging profile selection table is used to select the most appropriate paging profile in order to ensure more efficient paging.

Table 4 Example of Paging Profile Selection Table for GSM

Priority	RAT	Time since last location reported MIN	Time since last location reported MAX	Traffic class	QCI MIN	QCI MAX	ARP MIN	ARP MAX	APN	IMSI NS	IMEI NS	Service class indicator	Paging profile
5	G	0	60	null	null	null	null	null	null	null	null	null	2
10	G	null	null	null	null	null	null	null	null	null	null	5	2
15	G	null	null	null	null	null	null	null	M2M APN	null	null	null	2
20	G	null	null	null	1	3	null	null	null	null	null	null	1



Table 4 Example of Paging Profile Selection Table for GSM

Priority	RAT	Time since last location reported MIN	Time since last location reported MAX	Traffic class	QCI MIN	QCI MAX	ARP MIN	ARP MAX	APN	IMSI NS	IMEI NS	Service class indicator	Paging profile
25	G	null	null	null	null	null	null	null	null	12345	null	null	2
100	G	null	null	null	null	null	null	null	null	null	null	null	1

4.2.1 Creating a Row in the Paging Profile Selection Table

Create a row for a paging rule in the paging profile selection table using the `create_paging_selection_wg` CLI command. Arguments included in the command specify which selection criteria in the columns contain a value. See the configuration example in Section 4.2.2 on page 16.

4.2.2 Modifying a Row in the Paging Profile Selection Table

Instructions

1. View an existing paging profile selection table using the `list_paging_selection_wg` CLI command.
2. Display a row in the paging profile selection table using the `get_paging_selection_wg` CLI command and the `RulePrio` and `PagingRat` parameters with the priority number of the row as the key.
3. Configure a row in an existing paging profile selection table using the `modify_paging_selection_wg` CLI command.

Example

The following example shows the configuration for row 20 in the paging profile selection table in Table 4.

```
modify_paging_selection_wg -prio 20 -tn 50 -tm 80 -sci  
5 -tc interactive -arpn 1 -arpx 3 -qcin 5 -qcix 5 -apn  
ericsson2.se.mnc015.mcc234.gprs -imsi 654321 -imei 654323 -id 3
```

To simplify the addition of more rules to a paging profile selection table, paging profile selection table rows should have intervals between the priority values.

4.2.3 Configuring a Default Rule in the Paging Profile Selection Table

The priority of the selection criteria is determined by the position of the row in the paging profile selection table. The value 1 is the highest priority and 100 the lowest. If no match can be made to the input selection criteria, row 100 in the



paging profile selection table is selected and defaults to paging profile 1. Row 100 is included in default configuration, so there is always one row in the paging profile selection table. This row cannot be altered.

To override the default paging profile with a new default paging profile, create a new rule with no selection criteria defined, with a priority between 1–99 and a paging profile defined. Since this rule will always match, no rules with lower priority is used.

5 Consistency Checking, Activating, and Checkpointing

This section describes procedures for consistency checking, and for activating and checkpointing the configuration.

5.1 Checking the Consistency of the Configuration

A consistency check must always be performed before activating the pending configuration. It is performed to guarantee that an inconsistent configuration is not activated. A consistency check is performed on the configuration that will be active after an activation, that is, the active configuration combined with the changes in the pending configuration.

A consistency check displays warnings, such as variables not within the recommended ranges or missing from the paging profile table and paging profile selection table.

Instructions

1. Run a consistency check on the active configurations with pending configurations, using the `check_config` CLI command.

To list the pending configuration, use the `list_config_pending` CLI command.

To cancel the pending configuration, use the `undo_config_pending` CLI command.

The consistency check does not guarantee full coverage in all situations. For a further description of the consistency rules and expected coverage, see the `check_config` CLI command. In a troubleshooting situation, it can be beneficial to run a consistency check with an empty pending configuration.



5.2 Activating the Configuration

The pending configuration must be activated for the configuration to take effect.

Instructions

1. Activate the pending configuration, by using the `activate_config_pending` CLI command.

5.3 Checkpointing the SC

To persistently store the Software Configuration (SC) in the SGSN-MME, a checkpoint must be performed.

Instructions

1. Checkpoint the SC, by using the `checkpoint` CLI command.

6 Available Operations

The term available operations refers to operations such as creating, deleting, displaying, and modifying a configuration.

6.1 Adaptive Paging

For more information on available operations for adaptive paging, see [Adaptive Paging \(CLI\)](#).

To display the configuration classes and parameters related to Adaptive Paging, use the `get_config_area -can AdaptivePaging` CLI command.



Reference List

Network License Server (NeLS) CPI Library References

- [1] Activation of NeLS Client Licenses
USER GUIDE, 6/1553-AVA 901 45/1