

ENM Performance Management System Administrator Guide

Operating Instructions

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1 ENM Performance Management System Administrator Guide

This document describes the system administration tasks for the ENM Performance Management applications.

Target Group

- System Administrators
- Ccredit_Administrator

Typographic Conventions

1. This document contains commands that must be entered as defined and command examples that must be edited before being entered.
2. Review all procedures before entering the commands specified as examples.
3. Command examples can contain command variables which are indicated with `<>` .
4. Replace the content of these variables with relevant values that reflect specific deployment.
5. For more information on the typographic conventions used in this document, see ENM Library Typographic Conventions in CPI, Reference [\[1\]](#).



2 Performance Management Initiation and Collection Administration Tasks

This section contains the routine operation and maintenance tasks related to the administration of the Performance Management Initiation and Collection application.

The ability to

- update and read the PMIC parameters as described in sections "Configuring PIB Parameters on ENM on Cloud Deployment" and "Configuring PIB Parameters on a Physical ENM" in ENM System Administrator Guide in CPI, Reference [2]
- update and read the TLS protocol versions in ENM as described in section "16 Configuration of TLS for OAM Communication" in ENM Network Security Configuration System Administrator Guide, Reference [22]
- read and disable Weak Ciphers in ENM as described in section "20 Disable Weak Ciphers in ENM" in ENM Network Security Configuration System Administrator Guide, Reference [22]

are prerequisites for the correct execution of these tasks.

2.1 PmFunction

PmFunction controls how Network Elements (NE) are treated by PMIC applications.

PMIC is responsible for handling the PM features for all NEs in the Network according to the PmFunction configuration.

By default, PmFunction is disabled for Network Elements added to the ENM System.

2.1.1 PmFunction State

The attribute pmEnabled is used to set the status of PM. The default value is false.

The pmEnabled attribute is described in the table Description of ENM MOCs of *Dynamic CM Import/Export Interwork Description*, [Reference 12].



Note: For Network Elements of neType RadioNode, the Network Element must be cm synced and the technology domain must be populated correctly before PmFunction(s) is enabled.

For example, in the ENM CLI, the user can run the following commands:

- Check PmFunction state for a Network Element

```
cmedit get NetworkElement=<NetworkElement_Name>, PmFunction=1
```

- Set PmFunction for a Network element

```
cmedit set NetworkElement=<NetworkElement_Name>,PmFunction=1 pmEnabled=true →
```

- Set PmFunction in all the Network Elements

```
cmedit set * PmFunction.(PmFunctionId==1) pmEnabled=true
```

PMIC listens to attribute "pmEnabled" state changes to adapt PM features accordingly.

2.1.2

User Defined Subscriptions

Only NEs with PmFunction state enabled can be added to User Defined Subscriptions.

Since only NEs with PmFunction state enabled are part of a subscription, the Subscription activation results in activating all the NEs enabling the File Collection and Scanner Master where supported.

When PmFunction(s) is disabled, the NE is removed from the subscription(s). Before applying the command, a clear warning message is displayed confirming the impact on existing subscription(s). The Subscription(s) which remain without NE shall not be deleted.

Note that if the state of PmFunction is changed back to enabled there is no impact on existing User Defined Subscription(s) regardless of the configuration history.



2.1.3 Criteria Based Subscriptions

Criteria Based Subscription (CBS) is a User Defined subscription with a dynamic Network Element list that is populated by some criteria. The criteria used in a CBS are Saved Searches which the user can import from the Network Explorer Application.

If any of the following changes occur in the Network, the subscriptions are updated to include or delete the Network Element:

- Addition of a Network Element
- Deletion of a Network Element
- Upgrade of a Network Element
- Change in any of the MO attribute values mentioned in the Criteria

Only NEs with PmFunction state enabled can be added to CBS.

Since only NEs with PmFunction state enabled are part of a subscription, the Subscription activation results in activating all the NEs enabling the File Collection and Scanner Master where supported.

When PmFunction(s) are disabled, PM jobs are deactivated on the NE(s) and the NE(s) are removed from the subscription. The Subscription(s) which remain without NE shall not be deleted.

When the PmFunction(s) are enabled, PM jobs are activated on the NE(s) and the NEs are included in CBS according to the provided criteria.

Any new Network Element added to the ENM system is reflected in a CBS subscription only after the CBS Audit has been run which by default executes every 15 minutes.

Any Network Element deleted from the ENM system is instantly removed from the CBS Subscription without waiting for the Audit to complete.

The CBS feature is similar to the Plug and Play functionality in OSS-RC (PMS) but it gives more flexibility to the user by providing the control in creating the Criteria.

Valid values for <PARAMETER_NAME> are:

Table 1 Parameters used for CBS configuration

| Parameter Name | Default Value | Description |
|---------------------|---------------|---|
| cbsScheduleInterval | 15 | CBS Audit schedule interval time in minutes |
| maxNoOfCBSAllowed | 50 | maximum number of CBS allowed. |



Criteria-Based Subscriptions are audited periodically based on the value of the parameter `cbsScheduleInterval`. For example, the default is 15 minutes.

When the configurable `maxNoOfCBSAllowed` parameter is modified, it increases or restricts the maximum number of criteria-based subscriptions in ENM. The default value is 50.

Note: `maxNoOfCBSAllowed` supports a maximum value of 150

2.1.4 System Defined Subscriptions

System Defined Subscriptions are automatically created by PMIC for all the NEs that support this functionality.

System Defined Subscriptions can be either Active or Inactive by default.

Only NEs with `PmFunction` state enabled can be part of a System Defined Subscription.

When the `PmFunction(s)` are enabled, PM jobs on the NE(s) are activated enabling, where required, the File Collection and Scanner Master; the NE(s) are included in a subscription.

When `PmFunction(s)` are disabled, the NE is removed from the subscription(s). The Subscription(s) that remain without NE shall be deleted by Subscription Audit.

Valid values for `<PARAMETER_NAME>` are:

Table 2

| Parameter Name | Default Value | Description |
|--|---------------|--|
| <code>sysDefSubscriptionAuditInterval</code> | 15 | System defined subscription audit schedule interval time in minutes. |

When the configurable `sysDefSubscriptionAuditInterval` parameter is modified, the system defined subscriptions are audited periodically as per that value. For example, the default is 15 minutes.

The following types are supported:

[System Defined Statistical Subscription](#)

[CTUM Subscription](#)

[Continuous Cell Trace Subscription](#)



2.1.4.1 System Defined Statistical Subscription

A System Defined Statistical Subscription is created automatically (with Active state) when the first Network Element of the relevant type is added to ENM with PmFunction enabled.

Subscriptions are deleted when PmFunction is disabled on all Network Elements of the relevant type. The creation and deletion of System Defined Subscriptions and addition or removal of Network Elements in the subscription is based on a periodic audit.

For information on the list of all supported System Defined Statistical Subscriptions, see ENM Product Description in CPI, Reference [14].

2.1.4.2 CTUM Subscription

CTUM System defined subscription is automatically created with the INACTIVE state when a (v)SGSN-MME Network Element is added to ENM with PmFunction enabled, and is automatically deleted when PmFunction is disabled on all (v)SGSN-MME Network Elements. The creation and deletion of this Subscription and addition or removal of Network Elements in the subscription is based on a periodic audit.

2.1.4.3 Continuous Cell Trace Subscription

There are two types of Continuous Cell Trace subscription:

- 1.ContinuousCellTraceSubscription
- 2.Continuous Cell Trace NRAN

After the first eNode B is added to ENM and PmFunction(s) are enabled on that Network Element, an inactive ContinuousCellTraceSubscription is automatically created when the System Defined Subscription audit runs at the next scheduled interval.

Similarly, after the first gNodeB Baseband Radio Node is added to ENM and PmFunction(s) are enabled on that Network Element, an inactive Continuous Cell Trace NRAN subscription is automatically created when the System Defined Subscription audit runs.

Continuous Cell Trace Subscription is automatically deleted when PmFunction is disabled on all Network Elements of the relevant type. The creation and deletion of this Subscription and addition or removal of Network Elements in the subscription is based on a periodic audit.

The Continuous Cell Trace (CCTR) process is predefined on the Network Element (EventJobId = PREDEF.10005.CELLTRACE) and it includes predefined events to be traced (eventGroupId = CCTR).



2.1.5 Application Defined Subscriptions

NEs with either PmFunction enabled/disabled can be added to Application Defined Subscriptions. The Application as the owner of the subscription is responsible for adding/removing NEs from the subscription.

Activating subscription results in activating only those NEs with PmFunction enabled.

When PmFunction is disabled for NEs that are part of an active subscription, the NE(s) must be deactivated but not removed from the subscription(s). Any periodic flows such as File Collection and Scanner Master is stopped.

When PmFunction is enabled, the supported NE(s) that are already included in an activate subscription(s) are activated, enabling where required File Collection and Scanner Master.

The only actions that are available for Application Defined subscription types in PMIC UI are:

- View Subscription
- View Subscription Logs
- View PM Node Processes

PMIC supports the following Application-defined subscriptions:

- Analytic Session Record for LTE Radio (ASR-L)
- Analytic Session Record for NR (ASR-N)

2.1.6 Partial PM Support

For Network Elements that have partial PMIC support, for example only file collection from the Network Element is activated, PMIC does not configure the Network Element.

For some Network Elements where partial PM support is provided, it is necessary to manually configure the Network Element prior to enabling PmFunction and adding the Network Element to a User Defined Subscription.

If this is not done the user may have a successfully activated subscription but files will not be collected from the NE(s).

The following sub-chapters describe the manual configuration required for NE(s) where partial PM support is provided.



2.1.6.1 Configure AXE Network Elements for File Generation

The following AXE variants are supported:

- MSC-S DB
- IP-STP
- CTC DB
- Compact MSC-S
- Compact CTC
- Compact IP-STP
- Compact vMSC-S
- Compact vCTC
- Compact vIP-STP
- BSC (ECIM)
- HLR-FE (APZ)
- HLR-FE (BSP)
- HLR-FE (IS)
- vHLR-FE
- MSC-S BC (IS)
- CTC BC (IS)
- MSC-S BC (BSP)
- CTC BC (BSP)
- vMSC-S HC
- vCTC HC

2.1.6.1.1 Statistical Subscription

This task describes how to configure a PM job in AXE Network Elements to generate Statistical (STS) files.

For more information on statistical measurements, see Statistical Counter Management, 1553-CXA 117 0028/5 in Network Element CPI, Reference [\[17\]](#).



Prerequisites

- The user has access to ENM system and WinFIOL GUI or WinFIOL CLI with the following roles: WinFIOL_Operator, Ccredit_Administrator.
- The user is aware of the Network Element IP Address and user credentials, if connecting via WinFIOL CLI.
- The user has the following roles for the Network Element access: SystemAdministrator, SystemSecurityAdministrator, EricssonSupport, CpRole0.
- The user has to create a Standard Subscription in ENM. For more information regarding Statistical Subscription, see Online Help of PMIC application.

Procedure

Use the following steps to configure PM jobs on the Network Element:

Steps

1. Login to Network Element.
 - a. Log on the ENM
 - b. Navigate to Topology Browser from Application Launcher
 - c. Select the Network Element > Click on Actions Tab > Select option **Launch WinFIOL GUI / CLI**

OR

- a. Log on the ENM
- b. Open **WinFIOL CLI** application listed under Provisioning in Application Launcher Page
- c. Log on the Network Element with the following command:

```
open <I/P address of Network Element>
  user-name:
  password :
```

Note: [Step 2](#) to [Step 7](#) as follows needs to be executed on the Network Element. For detailed steps refer the Network Element documentation *Data Transfer Management*, 1553-CXA 117 0052/5 and *Statistical Counter Management*, 1553-CXA 117 0028/5.

2. Create a Responding DestinationSet and Destination entities on the Network Element.



Note: Set the PrimaryRespondingDestination value to CDHDEFAULT. Make sure that "ipNotificationAddress" and "portNotificationNumber" attributes are not assigned while creating PrimaryRespondingDestination.

Example

```
>ManagedElement=<Network_Element> , SystemFunctions=1 , AxeFunctions=1 , DataOutputHandling=1 , DataTransferM=1 , FileTransferManager=1
(config-FileTransferManager=1)>configure
(config-FileTransferManager=1)>RespondingDestinationSet=<Destination_Name>

>ManagedElement=<Network_Element> , SystemFunctions=1 , AxeFunctions=1 , DataOutputHandling=1 , DataTransferM=1 , FileTransferManager=1 , RespondingDestinationSet=<Destination_Name>

(config-RespondingDestinationSet=<Destination_Name>)>AdvancedRespondingParameters=<AdvancedRespondingParameters>

>ManagedElement=<Network_Element> , SystemFunctions=1 , AxeFunctions=1 , DataOutputHandling=1 , DataTransferM=1 , FileTransferManager=1 , RespondingDestinationSet=<Destination_Name> , AdvancedRespondingParameters=<AdvancedRespondingParameters>

(config-AdvancedRespondingParameters=<AdvancedRespondingParameters>)>fileOverwrite=true
(config-AdvancedRespondingParameters=<AdvancedRespondingParameters>)up

>ManagedElement=<Network_Element> , SystemFunctions=1 , AxeFunctions=1 , DataOutputHandling=1 , DataTransferM=1 , FileTransferManager=1 , RespondingDestinationSet=<Destination_Name>
config-RespondingDestinationSet=<Destination_Name>>PrimaryRespondingDestination=<PrimaryRespondingDestinationName>
commit -s
config-RespondingDestinationSet=<Destination_Name>>show all

respActiveDestination="CDHDEFAULT"

AdvancedRespondingParameters=AdvancedBscStats

fileOverwrite=true

PrimaryRespondingDestination=CDHDEFAULT
```

3. Create a File Transfer Queue and associate it with RespondingDestinationSet.

Example

```
>ManagedElement=<Network_Element> , SystemFunctions=1 , AxeFunctions=1 , DataOutputHandling=1 , DataTransferM=1 , FileTransferManager=1
(config-FileTransferManager=1)>FileTransferQueue=<File_Transfer_Queue_Name>
>ManagedElement=<Network_Element> , SystemFunctions=1 , AxeFunctions=1 , DataOutputHandling=1 , DataTransferM=1 , FileTransferManager=1 , FileTransferQueue=<File_Transfer_Queue_Name>
(config-FileTransferQueue=<File_Transfer_Queue_Name>)
>respondingDestinationSet=<Destination_Name>
(config-FileTransferQueue=<File_Transfer_Queue_Name>)
>AdvancedFileTransferQueueInfo=<AdvancedFileTransferQueue>
(config-AdvancedFileTransferQueueInfo=<AdvancedFileTransferQueue>)
>commit -s
>ManagedElement=<Network_Element> , SystemFunctions=1 , AxeFunctions=1 , DataOutputHandling=1 , DataTransferM=1 , FileTransferManager=1 , FileTransferQueue=<File_Transfer_Queue_Name>
(config-FileTransferQueue=<File_Transfer_Queue_Name>)>show all

FileTransferQueue=<File_Transfer_Queue_Name>
respDestinationSetDn
"ManagedElement=<Network_Element> , SystemFunctions=1 , AxeFunctions=1 , DataOutputHandling=1 , DataTransferM=1 , FileTransferManager=1 , RespondingDestinationSet=<
```



```
Destination_Name>"
respondingDestinationSet
"<Destination_Name>"
AdvancedFileTransferQueueInfo=<AdvancedFileTransferQueue>
```

4. Activate the required ObjectTypes.

For all the required ObjectTypes the `isIncluded` attribute needs to be set to `true`.

Example

```
>ManagedElement=<Network_Element>,SystemFunctions=1,AxeFunctions=1,DataOutputHandling=1,StatisticalCounterM=1,ObjectTypes=1,ObjectType=VLRSUBS
(ObjectType=VLRSUBS)>show -v

ObjectType=VLRSUBS
brp=15 <default>
category=[] <empty> <read-only>
isAvailable=true <read-only>
isIncluded=true
numberOfCounters=12 <read-only>
objectTypeId="VLRSUBS"
Counter=TNDUALVLRFIXED
Counter=TNDUALVLRDET
Counter=TNSATSGS
Counter=CODCNTBPASS
Counter=CODCNT2BACT
Counter=CODCNTPPASS
Counter=CODCNT1PACT
Counter=TNSPRSEXOUTD
Counter=TNSATGS
Counter=TNSEXTP
Counter=TNSPEND
Counter=TNSVLR

In Case isIncluded parameter is false, set it to true:

(ObjectType=VLRSUBS)>configure
(config-ObjectType=VLRSUBS)>isIncluded=true
(config-ObjectType=VLRSUBS)>commit -s
```

5. Define a new Report to include the ObjectTypes.

Note: Select the ObjectTypes that are activated in [Step 4](#).

Example

```
>ManagedElement=<Network_Element>,SystemFunctions=1,AxeFunctions=1,DataOutputHandling=1,StatisticalCounterM=1,Reports=1
(config-Reports=1)>Report=<Report_instance>(e.g Report=2018)
(config-Reports=1)>Report=2018
(config-Report=2018)>name=<Report_Name>
(config-Report=2018)>objectTypeList=VLRSUBS
(config-Report=2018)>commit -s
>ManagedElement=<Network_Element>,SystemFunctions=1,AxeFunctions=1,DataOutputHandling=1,StatisticalCounterM=1,Reports=1
(config-Report=2018)>show all
Reports=1
Report=2018
name="test"
objectTypeDn
"ManagedElement=MSCSBC046AP2, SystemFunctions=1, AxeFunctions=1
```



```
,DataOutputHandling=1,StatisticalCounterM=1,ObjectTypes=1,ObjectType=VLRSUBS"
objectTypeList
"VLRSUBS"
```

- Define a Measurement Program to include the new report and connect it with the FileTransferQueue.

Note: For ENM the supported interval is 15 and outputFormat is ASN.1.

For a subset of Network Element types Flexible ROP is supported, see section "Flexible ROP for Statistical Subscriptions" in ENM Summary of External Interfaces, Reference [16].

ENM expects that the value of attribute beginTime ([[YYYY]MM]DD]hhmm) is defined, and minutes (mm) are specified to 00, 15, 30, or 45.

For 30min ROP, beginTime value must be 00 or 30, for 60min ROP it must be 00. It is not needed to set beginTime for 5min ROP.

While creating the Measurement program, do not provide any value to the Name attribute under the Measurement Program MO, which is by default set to MPxxx(Prefixed with "MP" followed by MP_id). See the following example:

Example

```
>ManagedElement=<Network_Element>,SystemFunctions=1,AxeFunctions=1,DataOutputHandling=1,StatisticalCounterM=1,MeasurementPrograms=1
(config-MeasurementPrograms=1)>MeasurementProgram=<mp_instance> (e.g MeasurementProgram=1000)
(config-MeasurementProgram=mp_instance)>interval=15
(config-MeasurementProgram=mp_instance)>date
ddd mmm hh:mm:ss UTC yyyy
ex: Tue Jan 23 09:13:50 UTC 2018
(config-MeasurementProgram=mp_instance)>beginTime=201801230930
(config-MeasurementProgram=mp_instance)>reportId=<Report_Instance>
(config-MeasurementProgram=mp_instance)>transferQueue=<File_Transfer_Queue_Name>
(config-MeasurementProgram=mp_instance)>commit -s
>ManagedElement=<Network_Element>,SystemFunctions=1,AxeFunctions=1,DataOutputHandling=1,StatisticalCounterM=1,MeasurementPrograms=1
(config-MeasurementPrograms=1)>show all
MeasurementPrograms=1
MeasurementProgram=1000
beginTime="201801230930"
interval=15
name="MP1001"
reportDn="ManagedElement=MSCSBC046AP2,SystemFunctions=1,AxeFuncMeasurementProgram=1000,ions=1,DataOutputHandling=1,StatisticalCounterM=1,Reports=1,Report=2018"
reportId="2018"
status="running"
transferQueue="ENMSTSTQ"
(config-MeasurementPrograms=1)>
```

- Start or stop collection.

To enable collection for ENM the attributes counterCollectionState and useUtcTimeStamps must be set to true in the StatisticalCounterM MO.



Note: When setting `useUtcTimeStamps` attribute to true, the time stamp format within the generated files and the timestamp used in the file name convention on the node is set to UTC. PMIC only supports the value true for the attribute `useUtcTimeStamps`. For example ENM attempts to collect a 15 min ROP file by name C20201025.0545-20201025.0600 at 11:00 hrs, from a node, where the Node and ENM timezone is set to UTC+5.

Example

```
>ManagedElement=<Network_Element>,SystemFunctions=1,AxeFunctions=1,DataOutputHandling=1,StatisticalCounterM=1
(StatisticalCounterM=1)>configure
(config-StatisticalCounterM=1)>counterCollectionState=true
(config-StatisticalCounterM=1)>useUtcTimeStamps=true
(config-StatisticalCounterM=1)>show -v
counterCollectionState=true
nmcForcesSuspectFlag=false <default>
statisticalCounterMId="1"
uniqueIdentityOfNode=[] <empty>
useUtcTimeStamps=true
vendorName="Ericsson" <default>
CapacityInfo=1
MeasurementPrograms=1
ObjectTypes=1
Reports=1
ScrFileManager=1
TranslationTable=1
```

Note: It is also possible to enable or disable file generation for a particular MeasurementProgram.

To stop collection of a particular MeasurementProgram use the *suspendMP* command. This sets the status attribute to suspended.

Example

```
(config-StatisticalCounterM=1)>MeasurementPrograms=1
(config-MeasurementPrograms=1)>MeasurementPrograms=<mp_instance> (e.g MeasurementProgram=1000)
(config-MeasurementPrograms=<mp_instance>)suspendMP
(config-MeasurementPrograms=<mp_instance>)show all
MeasurementProgram=1000
beginTime="201801230930"
interval=15
name="MP1001"
```



```
reportDn="ManagedElement=MSCSBC046AP2, SystemFunctions=1, AxeFunctions=1, Data
OutputHandling=1, StatisticalCounterM=1, Reports=1, Report=2018"
reportId="2018"
status="suspended"
transferQueue="ENMSTSTQ"
(config-MeasurementPrograms=<mp_instance>)>
```

To enable file generation for a particular MeasurementProgram use the *resumeMP* command. This sets the status attribute to running.

Example

```
(config-MeasurementPrograms=<mp_instance>)resumeMP
(config-MeasurementPrograms=<mp_instance>)show all
MeasurementProgram=1000
beginTime="201801230930"
interval=15
name="MP1001"
reportDn="ManagedElement=MSCSBC046AP2, SystemFunctions=1, AxeFunctions=1, Data
OutputHandling=1, StatisticalCounterM=1, Reports=1, Report=2018"
reportId="2018"
status="running"
transferQueue="ENMSTSTQ"
(config-MeasurementPrograms=<mp_instance>)>
```

8. Check File Collection in ENM

The Statistical(STS) files will be available on the NFS storage paths /ericsson/pmic1 and /ericsson/pmic2.

The file path for BSC Network Elements contains ManagedElement.

The file path for Classic HLR-FE Network Elements HLR-FE (APZ) contains NetworkElement and for Blade Cluster HLR-FE Network Elements HLR-FE (BSP), HLR-FE (IS), vHLR-FE contains ManagedElement.

The file path for Classic MSC Network Elements such as MSC-S DB, IP-STP, CTC DB, Compact MSC-S, Compact CTC, Compact IP-STP, Compact vMSC-S, Compact vCTC, Compact vIP-STP contains NetworkElement and for Blade Cluster MSC Network Elements such as MSC-S BC (IS), CTC BC (IS), MSC-S BC (BSP), CTC BC (BSP), vMSC-S HC, vCTC HC contains ManagedElement. See the following example:

Example

Path to check file collection for Classic MSC:-

```
/ericsson/pmic1/asn1/NetworkElement=<Network ElementName>/
<File>.
```



Path to check file collection for Blade Cluster MSC:-

```
/ericsson/pmic1/asn1/ManagedElement=<Network ElementName>/
<File>.
```

9. Exit WinFIOL.

Note: Exit WinFIOL by using the command:

```
exit
```

and close the browser tab.

2.1.6.1.2 BSC Recordings - BAR, CER, CTR, MRR, RIR

This task describes how to initiate BSC recording files (BAR, CER, CTR, MRR, RIR) on Network Elements.

Prerequisites

- The user has access to ENM system and WinFIOL GUI or WinFIOL CLI with the following roles: WinFIOL_Operator, Ccredit_Administrator.
- The user is aware of the Network Element IP Address and user credentials, if connecting via WinFIOL CLI.
- The user has the following roles for the Network Element access: SystemAdministrator, SystemSecurityAdministrator, EricssonSupport, CpRole0.
- The user has to create a BscRecordings Subscription in ENM. For more information regarding BSC Recordings, see Online Help of PMIC application.

Setting up BSC Recordings for PMIC involves two procedures:

Steps

1. Define the file names.
2. Initiate and Terminate the File generation for BSC Recordings (BAR, CER, CTR, MRR, and RIR).

NOTE:

- PMIC attempts to collect BSC Recordings files every 15minutes ROP. During an ENM upgrade, it is possible that file collection is attempted twice within a ROP duration; since the file names on the Network Element do not have a timestamp, any files available on the Network Elements will be collected and stored in ENM.



- It is possible that the MTR files are generated on the BSC after the subscription is deactivated. PMIC does not collect those files. The collection is only attempted for Network Element in an active subscription.

2.1.6.1.2.1 Define the File Names

This task describes the general procedure to be followed to define CP files for all of GSM BAR, CER, CTR, MRR and RIR features for the BSC Network Elements and associating them to transfer queues in APG43L to generate BAR, CER, CTR, MRR, RIR recording files.

Procedure

Steps

1. Login to Network Element.
 - a. Find the Network Element in ENM's Topology Browser
 - b. Select the Network Element > Click on Actions Tab > Select option **Launch WinFIOL GUI / CLI**

OR

- a. Log on the ENM
- b. Open **WinFIOL CLI** application listed under Provisioning in Application Launcher Page
- c. Log on the Network Element with the following command:

```
open <I/P address of Network Element>
  user-name:
  password :
```

2. Create a Responding Destination Set and Transfer Queue on the Network Element

Note: See Data Transfer Management, 1553-CXA 117 0052/5 in Network Element CPI, Reference [18] to execute the following steps:

- a. Create a Responding Destination Set. Set "inhibitTransferQueueNamePrefix " attribute to true while creating AdvancedRespondingParameters under RespondingDestinationSet MO. Set the PrimaryRespondingDestination value to CDHDEFAULT.



Make sure that "ipNotificationAddress" and "portNotificationNumber" attributes are not assigned while creating PrimaryRespondingDestination.

- b. Create a File Transfer Queue and associate it with RespondingDestinationSet MO.

3. Define the filenames for BSC Recordings

Create an Infinite File connected to a File Transfer Queue. See ENM BSC Performance Events - Event Specification User Guide, 1553-CRA 119 2288, Reference [10]. Make sure while creating the InfiniteFile, these specific attributes value needs to be set as follows:

- recordLength=512
- overrideSubfileClosure =true
- transferQueue=xxxTRQ (eg: BARTRQ)

Note: The Infinite File name must follow a certain naming convention. For CTR, the naming convention is CTRFILE. For other Recordings, find as follows the respective Printout Descriptions:

| BSC Recordings | Printout Description |
|----------------|-----------------------|
| BAR | 5/190 83-CNT 248 1112 |
| CER | 4/190 83-CNT 248 1106 |
| MRR | 1/190 83-CNT 248 1121 |
| RIR | 1/190 83-CNT 248 1110 |

2.1.6.1.2.2 Initiate and Terminate the File generation for BSC Recordings (BAR, CER, CTR, MRR, and RIR)

1. Execute the following commands to Initiate/Terminate file generation for respective BSC Recordings:

Note: To find detailed Syntax for following commands refer the BSC Documentation GSM BSC EN/LZN7810314

BAR

Initiate File Generation

- a. Allocate a Recording Identity (RID), refer the BSC, Active BA-list Recording Definition, Initiate 12/154 31-ANT 248 08.
- b. Initiate the Active BA-list Recording, refer the BSC, Active BA-list Recording, Initiate 2/154 31-ANT 248 05.



- c. Initiate Active BA-list Recording Report, refer the BSC, Active BA-list Recording Report, Initiate 1/154 31-CRT 248 10.

Terminate File generation

- a. Terminate the active BA-list recording, refer the BSC, Active BA-list Recording Definition, End 4/154 31-ANT 248 05.

As follows an example to Initiate, Terminate and Print BAR Recording:

Example

Initiate BAR

```
! Allocate a RID !  
  
RABII;  
  
! Configure it by connecting cells and frequencies to it !  
RABDC:RID=BARIDxx,CELL=cell11&...&celln;  
RABDC:RID=BARIDxx,TMBCCHNO=tmbcchno1&...&tmbcchnon;  
  
! Check the configuration of the RID !  
  
RABDP:RID=BARIDxx;  
  
! Initiate the recording !  
RABRI:RID=BARIDxx,DTIME=dtime;
```

Example

Terminate BAR

```
! Terminate the recording !  
  
RABRE:RID=BARIDxx;  
  
! Initiate transfer of recorded data to the file for PMIC to collect !  
  
RABTI:RID=BARIDxx;
```



```
! Release the RID !
```

```
RABIE:RID=BARIDxx;
```

Note: It is recommended to terminate recordings only after DTIME has passed. If a recording gets terminated before DTIME is completed, it is recommended not to initiate the data transfer to file for that recording as this leads to inconsistent results in reporting applications.

Example

Print BAR

```
! Check currently active BAR Recordings on Network Element !
```

```
RABRP:RID=ALL;
```

CER

Initiate File generation

- a. Initiate Channel Event Recording, refer the BSC, Channel Event Recording, Initiate 14/154 31-CRT 248 10.

Terminate File generation

- a. End Channel Event Recording, refer the BSC, Channel Event Recording, End 13/154 31-CRT 248 10.

As follows an example to Initiate, Terminate and Print CER Recording:

Example

Initiate CER

```
! Initiate the recording !
```

```
RACEI:CELL=cell,DTIME=10;
```

Example

Terminate CER

```
! Terminate the recording !
```

```
RACEE:CELL=cell;
```



Example

Print CER

```
! Print out the recording data !  
RACEP;
```

CTR

Initiate File generation

- a. Initiate Cell Traffic Recording, refer the BSC, Cell Traffic Recording, Initiate 10/154 31-CRT 248 10.

Terminate File generation

- a. End Cell Traffic Recording, refer the BSC, Cell Traffic Recording, End 9/154 31-CRT 248 10.

As follows an example to Initiate, Terminate and Print CTR Recording:

Example

Initiate CTR

```
! Initiate the recording !  
RATRI:CELL=cell,EVENT=CR,DTIME=10,RTYPE=EV&ME,TIMEW=20;
```

Example

Terminate CTR

```
! Terminate the recording !  
RATRE;
```

Example

Print CTR

```
! Print out the recording data !  
RATRP;
```

MRR



Initiate File generation

- a. Allocate a Measurement Result Recording Identity (RID), refer the BSC, Measurement Result Recording Definition, Initiate 13/154 31-ANT 248 08.
- b. Initiate Measurement Result Recording, refer the BSC, Measurement Result Recording, Initiate 6/154 31-ANT 248 05.
- c. Initiate Measurement Result Recording Report, refer the BSC, Measurement Result Recording Report, Initiate 11/154 31-CRT 248 10.

Terminate File generation

- a. Terminate Measurement Result Recording, refer the BSC, Measurement Result Recording Definition, End 8/154 31-ANT 248 05.

As follows, an example to Initiate, Terminate and Print MRR Recording:

Example

Initiate MRR

```
! Allocate a RID !
RAMII;

! Connect cells to the RID !
RAMDC:RID=MRRIDxx,CELL=cell;

! Print out the details for the recording !
RAMDP:RID=rid;

! Initiate the recording !
RAMRI:RID=MRRIDxx,DTIME=dtime,RESET;
```

Note: When initiating MRR recordings, RESET must be specified in the RAMRI command to ensure that data is not cumulated. There is no indication of cumulated data in the BSC MRR file and this can lead to inconsistent MRR results in reporting applications.

Example

Terminate MRR



```
! Terminate the recording !  
  
RAMRE:RID=MRRIDxx;  
  
! Initiate data transfer to the file for PMIC to collect !  
  
RAMTI:RID=MRRIDxx;  
  
! Release the RID !  
  
RAMIE:RID=MRRIDxx;
```

Note: It is recommended to terminate recordings only after DTIME has passed. If a recording gets terminated before DTIME is completed, it is recommended not to initiate the data transfer to file for that recording as this leads to inconsistent results in reporting applications.

Example

Print MRR

```
! Check currently active MRR Recordings on Network Element !  
  
RAMRP:RID=ALL;
```

RIR

Initiate File generation

- a. Allocate Radio Interference Recording Identity (RID) and Initiate TRX configuration, refer the BSC, Radio Interference Recording Configuration, Initiate 9/154 31-ANT 248 05.
- b. Initiate Radio Interference Recording, refer the BSC, Radio Interference Recording, Initiate 10/154 31-ANT 248 05.
- c. Initiate Radio Interference Recording Report, refer the BSC, Radio Interference Recording Report, Initiate 12/154 31-CRT 248 10.

Terminate File generation

- a. Terminate Radio Interference Recording, refer the BSC, Radio Interference Recording Configuration, End 12/154 31-ANT 248 05.

Example

Initiate RIR



```
! Allocate a RID !
RARII;

! Connect cells to the RID !
RARDC:RID=riridxx,CELL=cell;

! Connect frequencies to the RID !
RARDC:RID=riridxx,ARFCN=arfcn;

! Configure the TRXs to match the requirements !
RARCI:RID=riridxx;

! Print out the configuration of the RID !
RARDP:RID=rid;

! Initiate the recording !
RARRI:RID=riridxx,DTIME=dtime,RESET;
```

Note: When initiating RIR recordings, RESET must be specified in the RARRI command to ensure that data is not cumulated. There is no indication of cumulated data in the BSC RIR file and this can lead to inconsistent RIR results in reporting applications.

Example

Terminate RIR

```
! Terminate the recording if necessary !
RARRE:RID=riridxx;

! Initiate data transfer to the file !
RARTI:RID=riridxx,PERCVAl=percval;

! Release the RID !
RARIE:RID=riridxx;
```



Note: It is recommended to terminate recordings only after DTIME has passed. If a recording gets terminated before DTIME is completed, it is recommended not to initiate the data transfer to file for that recording as this leads to inconsistent results in reporting applications.

Example

Print RIR

```
! Check currently active RIR Recordings on Network Element !  
RARRP:RID=ALL;
```

2. Exit WinFIOL

Exit WinFIOL by using the below command and close the browser tab:

```
exit
```

2.1.6.1.3

Mobile Traffic Recording (MTR) Subscription

This task describes the general procedure to be followed to define CP files for MTR feature for the BSC Network Elements and associating them to transfer queue in APG43L to generate MTR recording files.

Prerequisites

- The user has access to ENM system and WinFIOL GUI or WinFIOL CLI with the following roles: WinFIOL_Operator, Ccredit_Administrator.
- The user is aware of the Network Element IP Address and user credentials, if connecting via WinFIOL CLI.
- The user has the following roles for the Network Element access: SystemAdministrator, SystemSecurityAdministrator, EricssonSupport, CpRole0.
- The user has to create a MTR Subscription in ENM. For more information regarding MTR subscription see Online Help of PMIC application.
- The MSC(s) present in the MTR subscription and their associated BSC(s) need to be managed in same ENM application server.

Note: It is possible that the MTR files are generated on the BSC after the subscription is deactivated. PMIC does not collect those files. Collection is attempted only till the subscription is active process.



Procedure

Use the following steps:

Steps

1. Login to Network Element.
 - a. Find the Network Element in ENM's Topology Browser.
 - b. Select the Network Element > Click on Actions Tab > Select option **Launch WinFIOL GUI / CLI**

OR

- a. Log on the ENM
- b. Open **WinFIOL CLI** application listed under Provisioning in Application Launcher Page
- c. Log on the Network Element with the following command:

```
open <I/P address of Network Element>
  user-name:
  password :
```

2. Create a Responding DestinationSet and Transfer Queue on the Network Element.

Note: Refer the Network Element documentation Data Transfer Management, 1553-CXA 117 0052/5 to execute the following steps:

- a. Create a Responding Destination Set. Make sure that "inhibitTransferQueueNamePrefix " attribute is set as true while creating AdvancedRespondingParameters under RespondingDestinationSet MO. Set the PrimaryRespondingDestination value to CDHDEFAULT. Make sure that "ipNotificationAddress" and "portNotificationNumber" attributes are not assigned while creating PrimaryRespondingDestination
- b. Create a File Transfer Queue and associate it with RespondingDestinationSet MO.

3. Define the filenames for MTR Recording.

Create an Infinite File connected to a File Transfer Queue. Refer the BSC User Guide 1553-CXA 117 0019/5. Make sure while creating the InfiniteFile, these specific attributes value needs to be set as follows:

— recordLength=512,



- `overrideSubfileClosure =true,`
- `transferQueue=xxxTRQ` (eg: MTRTRQ).

Note: The Infinite File name must follow a certain naming convention. Refer Printout Description 1/190 83-CNT 248 1109 for naming convention details.

4. Exit WinFIOL

Exit WinFIOL by using the below command and close the browser tab.

```
exit
```

2.1.6.2

Configure BSC (ECIM) NEs to Stream BSC RPMO and RTT Events to ENM

This section describes how to configure each BSC (ECIM) Network Element to stream RPMO and RTT events towards GSM Event Based Applications (EBA) cluster in ENM. This procedure must be completed before activating BSC Performance Events and RTT subscriptions in PMIC.

Prerequisites

- The user has access to ENM system and WinFIOL GUI or WinFIOL CLI with the following roles: WinFIOL_Operator, Ccredit_Administrator.
- The user is aware of the IP Address for each BSC Network Element, if connecting via WinFIOL CLI.
- The user has the following roles for BSC Network Element access: SystemAdministrator, SystemSecurityAdministrator, EricssonSupport, CpRole0.
- The ENM Deployment variant includes the optional EBA cluster.

Note: ENM supports automatic configuration of the destination IP (DESTIP) address and Port (DESTPORT) on each BSC (ECIM) Network Element as part of BSC Performance Events and RTT subscription activation in PMIC.

The following procedure must be completed on each BSC Network Element before activating BSC Performance Events and RTT subscriptions in PMIC.

Steps

1. RPMO and RTT require the BSC Event Reporting function to be enabled on the BSC Network Element. Verify that the BSC Event Reporting function is enabled by executing the following MML commands:


MML Command: DBTSP for RPMO

```
DBTSP : TAB=AXEPARS , SETNAME=CME20BSCF , NAME=RPMO ;
```

Response: the RPMO feature must be enabled, indicated by the value "1" in the row containing RPMO as follows:

DBTSP Response for RPMO

```
<DBTSP : TAB=AXEPARS , SETNAME=CME20BSCF , NAME=RPMO ;
```

```
DATABASE TABLE
```

```
BLOCK TAB          TABLE          WRAPPED
```

```
PARA  AXEPARS          YES
```

```
NAME          SETNAME          PARID          VALUE UNIT CLASS
DISTRIB
```

```
RPMO          CME20BSCF          7830          1          FEATURE
IMMED
```

```
STATUS FCVSET FCVALUE DCINFO FCODE
```

```
UPDATED FALSE          1 UNDEF          0
```

```
END
```

MML Command: DBTSP for RTT

```
DBTSP : TAB=AXEPARS , SETNAME=CME20BSCF , NAME=RTTRACE ;
```

Response: the RTT feature must be enabled, indicated by the value "1" in the row containing RTTRACE as follows :

DBTSP Response for RTT

```
<DBTSP : TAB=AXEPARS , SETNAME=CME20BSCF , NAME=RTTRACE ;
```



| DBTSP Response for RTT | | | | | |
|------------------------|-----------|---------|--------|-------|---------|
| DATABASE TABLE | | | | | |
| BLOCK | TAB | TABLE | | | WRAPPED |
| PARA | AXEPARS | | | | YES |
| NAME | SETNAME | PARID | VALUE | UNIT | CLASS |
| DISTRIB | | | | | |
| RTTRACE | CME20BSCF | | 7287 | 1 | FEATURE |
| IMMED | | | | | |
| STATUS | FCVSET | FCVALUE | DCINFO | FCODE | |
| UPDATED | FALSE | 1 | UNDEF | | 0 |
| END | | | | | |

2. Check that the RPM and RTT applications are configured with a streaming IP address for PM job creation:
 - a. Check that the RPM and RTT applications are assigned an IP address by executing the following MML commands. For further details refer to BSC documentation, *BSC IP Application Set Up (7/198 17-APT 210 09 Uen)*.

MML Command: RRAPP

```
RRAPP:IPADDR=ALL;
```

Response: RPM and RTT applications should be listed as applications with an IP address.

RRAPP Response

```
RADIO TRANSMISSION IP APPLICATION DATA
```

```
IPADDR  
10.77.199.171
```

```
APM  
RPM  
RTT
```



RRAPP Response

```
END
```

- b. Alternatively, the following commands can be used to check that the RPM and RTT applications are configured with an IP address:

MML Command: RRIPP for RPMO

```
RRIPP:APL=RPM;
```

RRIPP Response for RPMO

```
RADIO TRANSMISSION IP PARAMETER DATA
```

| IPADDR | MASK | IPDEVTYPE | IPDEVNO |
|---------------|-----------------|-----------|---------|
| 10.77.199.171 | 255.255.255.240 | RTIPGPH | 1 |

```

IPDEV2NO  TYPE
RECONF

```

| GW | GWSTAT | GWUSED | RP | RP2 |
|------|--------|--------|-----|-----|
| NOGW | ACTIVE | GW1 | 101 | |

```

APL
RPM
GML
RTT

```

```
END
```

MML Command: RRIPP for RTT

```
RRIPP:APL=RTT;
```

RRIPP Response for RTT

```
RADIO TRANSMISSION IP PARAMETER DATA
```

| IPADDR | MASK | IPDEVTYPE | IPDEVNO |
|---------------|-----------------|-----------|---------|
| 10.77.199.171 | 255.255.255.240 | RTIPGPH | 1 |

```

IPDEV2NO  TYPE
RECONF

```

| GW | GWSTAT | GWUSED | RP | RP2 |
|------|--------|--------|-----|-----|
| NOGW | ACTIVE | GW1 | 101 | |

```

APL

```



| RRIPP Response for RTT | |
|------------------------|-----|
| | RPM |
| | GML |
| | RTT |
| END | |

3. Check that all events are authorized on the BSC Network Element for Performance Monitoring by executing the following command:

| MML Command: RAPMP |
|--------------------|
| RAPMP ; |

| RAPMP Response | | | |
|----------------|-----|--------------|------------|
| AID | EID | SUBSCRIPTION | AUTHORISED |
| 0 | 0 | INACTIVE | YES |
| | 1 | INACTIVE | YES |
| | 2 | INACTIVE | YES |
| | 3 | INACTIVE | YES |
| | 5 | INACTIVE | YES |
| ... | | | |

If any events (EID) are not Authorized, indicated by "NO" in the command response, then execute the following command to authorize all events:

| MML Command: RAPMI |
|--------------------|
| RAPMI : EID=ALL ; |

| RAPMI Response |
|----------------|
| EXECUTED |



2.1.6.3 Configure SBG-IS Network Elements for File Generation

This task describes how to configure a PM job in SBG-IS Network Elements to generate Statistical (STS) files.

Prerequisites

- The user has access to ENM system and ISM GUI with the following roles: SECURITY_ADMIN ,Element_Manager_Operator and Ccredit_Operator role.
- The user is aware of the Network Element credentials, if connecting via ISM GUI.
- System Defined Subscription with SBG-IS Network Elements should be available in ENM. For more information regarding System Defined Subscription see Online Help of PMIC application.
- m2m-sbg-is-pm user should be available which is used for machine to machine communication.

Procedure

Use the following steps to configure PM jobs on the Network Element:

Steps

1. Login to ISM GUI.
 - a. Log on the ENM.
 - b. Navigate to Topology Browser from Application Launcher.
 - c. Select the Network Element > Click on Actions Tab > Select option **Launch Element Manager**
 - d. Once you launch ISM GUI, a window appears prompting for username and password. Enter Network Element credentials in the fields.
2. Once ISM GUI is launched, navigate to the corresponding Network Element component for which monitoring has to be started for PM job creation.

Example

To create PM job for Ethernet Interfaces object, navigate to the following path: Management-> Session Border Gateway --> Equipment --> Ethernet Interfaces --> Traffic Management Statistics

3. Create PM Measurement job using ISM GUI with the following details:
 - a. **Host:** Host name to be fetched from SMRS VIP address .



- b. **User:** m2m-sbg-is-pm user is created after subscription is activated successfully in ENM.
 - c. **Password:** Password for the user can be retrieved using this command through ENM CLI: `secadm ftp get --netype SBG-IS`.
 - d. **Remote directory:** When subscription is activated successfully in ENM, directory is created in SMRS at `/home/smrs/smrsroot/pm/SBG-IS/<Network ElementName>`
 - e. **Administrative State:** This is set to On by default (when you create new job)
 4. After PM measurement job is created on Network Element, files are pushed to configured remote directory.
 5. To suspend a PM measurement job, follow the steps:
 - a. Navigate to the following path : Management--> Session Border Gateway --> Equipment --> Ethernet Interfaces --> Traffic Management Statistics
 - b. Select a job and set its Administrative State to Off
- Note:** While deactivating the subscription or disabling the PM function in ENM, ensure that the existing PM measurement jobs on the node are suspended.

2.1.6.4 Configure TSP Based Network Elements for File Generation

The following TSP Variants are supported:

- CSCF-TSP
- MTAS-TSP
- HSSF-E-TSP
- cSAPC-TSP

This task describes how to configure a PM job in TSP Based network elements to generate Statistical (STS) files.

Prerequisites

Refer to prerequisites in section *Create Measurement Collection Job* in document *Create Measurement Collection Job*, Reference [\[11\]](#).



Procedure

Use the following steps to configure PM jobs on the Network Element:

Steps

1. Configure PM measurement job on network element, see the steps mentioned in section *Create Measurement Collection Job* in document *Create Measurement Collection Job*, Reference [\[11\]](#).
2. After PM measurement job is created on network element, configure following steps to push files from network element to SMRS(ENM) as per section *Configuration of SSH keys for File Transfer* in the *Network Element Preliminary Configuration Guide*, [\[12\]](#).

2.1.6.5

Configure vAFG Network Elements for File Generation

This task describes how to configure a PM job in vAFG network element to generate Statistical (STS) files.

Prerequisites

Refer to prerequisites mentioned in section *Setup of ESA XML Push* in document *Performance Management User Guide Authentication Federation Gateway*, Reference [\[13\]](#).

Procedure

Steps

1. Configure PM measurement job on network element, see the steps mentioned in section *Activation of ESA XML Push* in document *Performance Management User Guide Authentication Federation Gateway*, Reference [\[13\]](#).
2. After PM measurement job is created on network element, configure the steps to push files from network element to SMRS(ENM) as per section *Configuration of SSH keys for File Transfer* in the *Node Preliminary Configuration Guide*, [\[12\]](#).



2.1.6.6 Configure ESA based nodes (GenericESA) for File Generation

This task describes how to configure a PM job in ESA Based nodes to generate Statistical (STS) files.

Prerequisites

Refer to prerequisites mentioned in document ESA Performance Management Ericsson SNMP Agent 18.0, Reference [\[19\]](#).

Procedure

Steps

1. Configure PM measurement job on network element, see the steps mentioned in section *Define a Job* in document ESA Performance Management Ericsson SNMP Agent 18.0, Reference [\[19\]](#).

2.1.6.7 Configure CUDB/vCUDB Network Element for File Generation

This task describes how to configure a PM job in CUDB/vCUDB Network Element to generate Statistical (STS) files.

Prerequisites

Refer to prerequisites mentioned in document CUDB Performance Guide, Reference [\[20\]](#).

Procedure

Steps

1. Configure PM measurement job on network element, see the steps mentioned in section *Configure Jobs to Generate Output Files* in document CUDB Application Counters, Reference [\[21\]](#).

2.2 File Collection

File Collection can be controlled for a Network Elements (NE) that is part of an Active Subscription.

By default, File Collection is On.



2.2.1 File Collection State

The attribute fileCollectionState is used to set the status of PM file collection.

This attribute must be used during migration to temporarily disable the File Collection for a faulted NE or during troubleshooting.

It is an enumeration (ENABLED/DISABLED). The default value is ENABLED.

For example, in the ENM CLI, user can run the following commands:

- Check fileCollectionState for all Network Elements

```
cmedit get *PmFunction.fileCollectionState -t
```

- Set fileCollectionState in single Network Element

```
cmedit setNetworkElement=<Network Element_name>,PmFunction=1 fileCollectionState=ENABLED →
```

- Set fileCollectionState in all Network Elements

```
cmedit set *PmFunction.(PmFunctionId==1) fileCollectionState=ENABLED →
```

PMIC is responsible to check the fileCollectionState and listen and respond to changes in the fileCollectionState.

2.2.2 LAG period

The lag period is the time between ROP end and when the file is available for transfer to ENM. It can be different depending on ROP periods. The following parameters govern the lag period of different granularity. The value is in seconds.

Valid values for <PARAMETER_NAME> are:

| <PARAMETER_NAME> | Default Value | Default Value Description |
|----------------------------------|---------------|---|
| pmicLagPeriodInSecondsFor1MinROP | 60 | The period of time between 1-min ROP end and when the file is available for transfer to ENM |
| pmicLagPeriodInSecondsFor5MinROP | 60 | The period of time between 5-min ROP end and when the file is available for transfer to ENM |



| <PARAMETER_NAME> | Default Value | Default Value Description |
|---|---------------|--|
| pmicLagPeriodInSecondsFor15MinAndAboveROP | 300 | The period of time between 15-min (or higher) ROP end and when the file is available for transfer to ENM |

- Note:**
- Any modification to the above parameters affects all active PM file collection, for the relevant ROP period. Reducing the LAG period results in file collection failure for network elements where the file is not yet available for collection. For each network element type (involved in active PMIC subscriptions for the ROP period), the user must understand the time it takes to complete the file after the end of the ROP, before changing the relevant lag parameter.
 - The pmicLagPeriodInSecondsFor5MinROP parameter does not apply to network elements of type MGW. The lag period for MGW network elements is 250 seconds for all supported ROP periods, this is not configurable.

2.2.3

System Limits

Performance management data is generated on a periodic basis by the Network Element and is stored in the form of files in a central location from where they can be accessed by external systems. PMIC File Collection and Recovery collects the files from the Network Elements by accessing these paths.

2.2.3.1

Statistical Collection Limits

ENM supports different levels of granularity for Counters/Statistics. This is applicable for a subset of Network Element types and for limited number of Network Elements across the network.

Parameter `maxNumberOfNodesForFlexRop` controls the max number of Network Elements on which the following ROP can be enabled concurrently: 1-min, 5-min, 30-min, 1-hour, 12-hours. When more than one ROP is enabled for the same Network Element, the max number of supported Network Elements is reduced accordingly.

The max allowed value for `maxNumberOfNodesForFlexRop` is 100.

Valid values for <PARAMETER_NAME> are:



Table 3

| <PARAMETER_NAME> | Default Value | Description |
|----------------------------|---------------|--|
| maxNumberOfNodesForFlexRop | 100 | Max number of Network Elements for which 1-min, 5-min, 30-min, 1-hour and 12-hours can be enabled. |

2.2.3.2

Celltrace Collection Limits

Network bandwidth of the connection between ENM and Network Element (ENM and Network Element O&M interface) plays an important role during the file collection and recovery.

The bandwidth decides how long it can take for a file of particular size to be collected. The size of the files increase as more events are activated from PMIC. If this link between ENM and Network Element does not have sufficient bandwidth and the size of the files per ROP is significant, file collection can choke the link impacting Network Element O&M activities. A control has been introduced in ENM to set a maximum size for the files, beyond which no file collection can be attempted. This is applicable for CELLTRACE files in ENM.

- The parameter `pmicCelltraceFileSizeLimitInKB` controls the file size limit. The PMIC File Collection module collects CELLTRACE files up to the limit defined by this parameter.
- Default value for `pmicCelltraceFileSizeLimitInKB` parameter is ZERO, that means by default PMIC File Collection module collects CELLTRACE files without size limit.
- For customers having limited bandwidth in the O&M link for Network Element, it is useful to set this parameter to a value higher than ZERO.
- If a file is not collected because of system file size limit violation, PMIC does not attempt file collection again during the recovery cycle.
- On a Network Element reconnection, an attempt is made to recover the files that are generated by the Network Element.

The parameters used during file collection and the valid values for <PARAMETER_NAME> are listed in the following table:

| <PARAMETER_NAME> | Default Value | Description |
|---|---------------|---|
| <code>pmicCelltraceFileSizeLimitInKB</code> | 0 | Celltrace Collection Limit. This is applied only when the value is greater than ZERO. |



2.2.4 Scheduled File Recovery

PMIC attempts to recover statistical files in a scheduled recovery in case collection fails during the current and subsequent ROP. Statistical files are recovered up to a configurable recovery period not exceeding 24 hours.

When a Network Element reconnects which is included in an active subscription, PMIC attempts to recover files up to the recovery period. When a Network Element is added to an active subscription, PMIC attempts to recover statistical files up to the recovery period or the subscription start date and time which ever is shortest. At ENM restart PMIC attempts to collect all missed statistical files since the last known successful collection. The parameters controls the time and frequency of scheduled recovery and the Valid values for <PARAMETER_NAME> are listed in the following table:

Valid values for <PARAMETER_NAME> are:

Table 4

| <PARAMETER_NAME> | Default Value | Description |
|------------------------------------|---------------|---|
| fileRecoveryHoursInfo | 24 | The scheduled recovery time in hours to recover missed statistical files. The maximum hours to recover statistical files is 24 and minimum is 3 |
| intermediateScheduledRecovery Time | 6 | The intermediate scheduled recovery time in hours to recover statistical files of 5-min ROP and 15-min ROP for a set of Network Element types. Allowed values: 1,2,3,6,8,12,24 |
| scheduledRecoveryTime | 00:00:00 | Scheduled recovery time 00:00:00 AM each day (midnight). The format to set a new value is HH:mm:ss. |

Note: The max value for `intermediateScheduledRecoveryTime` (24 hours) can be used to disable intermediate scheduled recovery.

Recovery is not supported for 1-min ROP File Collection.

`fileRecoveryHoursInfo` and `intermediateScheduledRecoveryTime` are applicable to different ROPs and Network Element types with the following criteria:

1. For all ROPs and Network Element types: `fileRecoveryHoursInfo` (except for combinations mentioned in 2).
2. For 5-min and 15-min ROP intervals and a set of Network Element types (*): `intermediateScheduledRecoveryTime`.

The values of `fileRecoveryHoursInfo` and `intermediateScheduledRecoveryTime` are optimized for best performance.



A reduction in the `intermediateScheduledRecoveryTime` or `fileRecoveryHoursInfo` affects all the Network Elements and increases the load on the system which can impact the overall PM file collection. Refer to Ericsson Local Support if it is required to change either of these parameters.

If `intermediateScheduledRecoveryTime` is incorrectly valued, the system automatically sets it to the nearest allowed value or, if it is equidistant to two allowed values, to the lower allowed one.

| |
|--|
| (*) |
| MGW |
| eNodeB DU Radio Node |
| NodeB DU Radio Node |
| RNC |
| eNodeB Baseband Radio Node |
| NodeB Baseband Radio |
| SGSN-MME, vSGSN-MME |
| vSAPC |
| CSCF(ECIM), vCSCF(ECIM) |
| MTAS(ECIM), vMTAS(ECIM) |
| Baseband T605, C608 |
| SBG(ECIM), vSBG(ECIM) |
| eNodeB Pico Radio Node |
| NodeB Pico Radio Node |
| EPG, vEPG |
| vPP(ECIM) |
| DSC(ECIM), vDSC(ECIM) |
| HSS-FE(ECIM), vHSS-FE(ECIM) |
| IPWorks(ECIM), vIPWorks(ECIM) |
| UPG(ECIM), vUPG(ECIM) |
| MRF(ECIM), vMRF(ECIM) |
| BGF(ECIM), vBGF(ECIM) |
| vWCG WA(ECIM), vWA(ECIM) |
| WMG(ECIM), vWMG(ECIM) |
| NSDS(ECIM), vNSDS(ECIM) |
| EME(ECIM), vEME(ECIM) |
| VTFRadioNode |
| MRS |
| Router6672, Router6675, Router6x71, Router6274, Router6273 |
| EPG-OI, vEPG-OI |
| vRC(ECIM) |
| vPP(ECIM) |
| vMSC-S HC |
| MSC-S BC (BSP) |
| MSC-S BC (IS) |
| vMSC-S Compact |



| |
|--------------|
| (*) |
| vCTC Compact |
| vHLR-FE |
| HLR-FE (BSP) |
| HLR-FE (IS) |
| BSC(ECIM) |

2.2.5

UE Trace

User Equipment Trace (UE Trace) enables signaling of messages to be traced over the specified interfaces for specific UEs.

PMIC subscriptions are used to configure and activate UE Trace sessions. Activation and deactivation of UE Trace is done via the (v)SGSN-MME Network Elements, which then uses signaling-based activation to activate UE Trace sessions in the following Network Element types:

- eNodeB DU Radio Node
- eNodeB Baseband Radio Node
- VTFRadioNode
- gNodeB Baseband Radio Node

ENM collects UE Trace log files from the SGSN-MME and UE Trace session log files from Radio Nodes. Files are only generated on the Network Element when the UE is active within the Network Element. Each Radio Node UE Trace file includes a trace reference in the name, allowing correlation of UE Trace files collected across different ENM or OSS-RC systems.

UE Trace Handling for Radio Nodes

For Radio Nodes, the following two behaviors are supported in ENM:

1. UE Trace subscription is initiated by ENM

When the UE Trace is initiated by PMIC in the ENM system collecting the files, then PMIC recognizes the Trace Reference and finds the IMSI/IMEI/IMEISV associated with the Trace Reference. PMIC adds the IMSI/IMEI/IMEISV to the UE Trace file name and stores the file in a subdirectory named as the Trace Reference.

2. UE Trace is initiated by another Network Management System

By default, a given ENM system only collects UE Trace files related to its subscriptions. However, it is possible to configure ENM to collect all UE Trace files from all Network Elements managed by the ENM, even if UE Trace has been initiated by another management system (for example, OSS-RC or



another ENM). To collect UE Trace log files initiated outside of the ENM, set the parameter `ueTraceCollectionEnabled` to true.

There is no communication from one ENM to another ENM or OSS-RC to coordinate Radio Node UE Trace file naming. In this case, PMIC does not recognize the Trace Reference and cannot determine the IMSI/IMEI/IMEISV associated with the Trace Reference. PMIC cannot add the IMSI/IMEI/IMEISV to the UE Trace file name, so adds UNKNOWN in the place of IMSI/IMEI/IMEISV to the UE Trace file name. These files are stored in a subdirectory named UNKNOWN.

Valid values for `<PARAMETER_NAME>` are as follows:

| <code><PARAMETER_NAME></code> | Default Value | Description |
|---------------------------------------|---------------|--|
| <code>ueTraceCollectionEnabled</code> | false | Global parameter that switches UE Trace collection on and off for all Network Elements in the network. |

Changing the `ueTraceCollectionEnabled` parameter to true forces PMIC to attempt file collection on all Network Elements in the network supported for UE Trace, where `pmFunction(s)` are enabled, including any newly added Network Elements.

UE Trace Handling for SGSN-MME Network Elements

PMIC collects the UE Trace log files from the SGSN-MME Network Elements and stores them in the ENM System, only when a UE Trace subscription is active in ENM.

For more information about the UE Trace feature, refer to the Network Element documentation:

- Performance Management Description, 246/1551-LZA 701 6004/1, Reference [4] for LTE DU RadioNode;
- Manage Performance User Guide, 14/1553-lza7016014/1, Reference [5] for Baseband RadioNode,
- Manage Performance User Guide, 3/1553-LZA 701 6017/1, Reference [6] for NR Baseband RadioNode,
- UE Tracer Technical Product Description, 54/22101-axb25005/8-v2, Reference [7] for SGSN-MME Network Elements.

2.3 Scanner Master

Scanner Master can be controlled for a Network Element (NE).

By default, Scanner Master is On.



Scanner master uses the output of scanner polling to actively manage the PM scanners/jobs on the Network Element by comparing the output of scanner polling against the Network Element with the expected status as stored in the ENM database.

Scanner polling runs at regular intervals to fetch the PM scanners/jobs from Network Elements that are controlled based on parameter `scannerPollingIntervalMinutes`.

Valid values for `<PARAMETER_NAME>` are as follows:

Table 5

| Parameter Name | Default Value | Description |
|--|---------------|--|
| <code>scannerPollingIntervalMinutes</code> | 15 | The interval in minutes at which scanner polling occurs. |

Value for `scannerPollingIntervalMinutes` can be increased or decreased. However, the impact of each should be understood to make an informed decision.

Reducing the value from the default of 15 minutes means that Scanner Polling now runs at a higher frequency. For example, if the value is set to 5 minutes, Scanner Polling run every 5 minutes. Depending on the number of Network Elements connected to the ENM system and the time it takes for the polling to complete on every Network Element, scanner polling may not be completed on all Network Elements in 5 minutes before the next poll is scheduled again.

Increasing the value above 15 minutes can delay the scanner polling operations. PMIC can now sync PM scanners/jobs at a reduced frequency.

2.3.1

Scanner Master State

The attribute `scannerMasterState` is used to set the status of PM Scanner Master.

This attribute should be mainly used during migration, to temporary disable Scanner Master for a faulted NE or during troubleshooting.

It is an enumeration (ENABLED/DISABLED). The default value must be ENABLED.

When the attribute is set to ENABLED, scanner polling is triggered immediately for the NE.

When the attribute is set to DISABLED, the NE is removed from the scope of scanner master activities.

For example, in the ENM CLI, user can run the following commands:

- Check `scannerMasterState` for all Network Elements



```
cmedit get * PmFunction.scannerMasterState -t
```

— Set scannerMasterState in single Network Element

```
cmedit set NetworkElement=<Network Element_name>,PmFunction=1
scannerMasterState=ENABLED
```

— Set scannerMasterState in all Network Elements

```
cmedit set * PmFunction.(PmFunctionId==1)
scannerMasterState=ENABLED
```

During Migration, scanner polling/master functionality for all NEs can be disabled by setting the PIB parameter pmMigrationEnabled to true.

Valid value for parameter pmMigrationEnabled is as follows:

Table 6

| Parameter Name | Default Value | Description |
|--------------------|---------------|--|
| pmMigrationEnabled | false | Flag to indicate if PM migration is enabled or not |

2.3.2

Scanner Master Supported Network Elements

PMIC supports Scanner Master for all the Network Elements except for the following:

| |
|-----------------|
| MSC-S DB |
| IP-STP |
| CTC DB |
| Compact MSC-S |
| Compact CTC |
| Compact IP-STP |
| vMSC-S Compact |
| vCTC Compact |
| vIP-STP Compact |
| MSC-S BC (IS) |
| CTC BC (IS) |
| MSC-S BC (BSP) |
| CTC BC (BSP) |



| |
|---------------------|
| vMSC-S HC |
| vCTC HC |
| HLR-FE (APZ) |
| HLR-FE (BSP) |
| HLR-FE (IS) |
| vHLR-FE |
| (v)CUDB |
| ESA Based nodes |
| PCC |
| PCG |
| vAFG |
| MINI-LINK 6351 |
| MINI-LINK 6352 |
| MINI-LINK PT 2020 |
| MINI-LINK 6251 |
| MINI-LINK 6252 |
| MINI-LINK 6262 |
| MINI-LINK CN210 |
| MINI-LINK CN510R1 |
| MINI-LINK CN810R1 |
| MINI-LINK CN810R2 |
| Fronthaul 6392 |
| Switch-6391 |
| JUNIPER-MX series |
| JUNIPER-PTX series |
| JUNIPER-SRX series |
| JUNIPER-vMX series |
| JUNIPER-vSRX series |
| CISCO-ASR900 series |
| CCPC |
| CCRC |
| CCSM |
| CCDM |
| SC |
| SBG-IS |



| |
|-------------------|
| MINI-LINK TN |
| MINI-LINK CN510R2 |
| MINI-LINK 6691 |
| MINI-LINK 6692 |
| MINI-LINK 6693 |
| MINI-LINK 6651 |
| MINI-LINK 6654 |
| MINI-LINK 6655 |
| MINI-LINK 6366 |
| MINI-LINK 6694 |
| MINI-LINK 6291 |
| MINI-LINK LH |
| (v)EIR-FE |
| (v)EPG |
| cSAPC-TSP |
| CSCF-TSP |
| HSS-FE-TSP |
| MTAS-TSP |

2.4 NE Configuration Manager

Configuration management of PM data on a Network Element (NE)

By default, Configuration is On.

2.4.1 NE Configuration Manager State

The attribute `neConfigurationManagerState` is used to set the status of PM configuration interface towards mediation.

`neConfigurationManagerState` controls if any configuration task such as Activating/Deactivating of PM Jobs are allowed on the Network Element.

Any non intrusive activities such as the periodic task for File collection & scanner polling continues to run.

This attribute must be used during migration, to prevent the configuration of already configured Network Elements.



Once the subscription is Activated/Deactivated, neConfigurationManagerState should be set back to ENABLED.

It is an enumeration (ENABLED/DISABLED). The default value must be ENABLED.

For example, in the ENM CLI, user can run the following commands:

- Check neConfigurationManagerState for all Network Elements

```
cmcredit get * PmFunction.neConfigurationManagerState -t
```

- Set neConfigurationManagerState in single Network Element

```
cmcredit set NetworkElement=<Network Element_name>,PmFunction=1  
neConfigurationManagerState=ENABLED
```

- Set neConfigurationManagerState in all Network Elements

```
cmcredit set * PmFunction.(PmFunctionId==1)  
neConfigurationManagerState=ENABLED
```

PMIC listens and responds to changes in neConfigurationManagerState.

2.5 Configure the PMIC Interface to Ericsson NetworkIQ

PMIC supports an Ericsson internal interface to the Ericsson NetworkIQ products.

This task is only applicable where Ericsson NetworkIQ products are used with ENM, it describes the parameters that can be configured for this interface.

For information on the activation of the interface, see *OSS Configuration for ENIQ Statistics*, [Reference 3]. PM data files are presented to NetworkIQ as symbolic links which are parsed and processed by Ericsson NetworkIQ.

Note: Any changes applied to the parameters described here do not have effect until the next Report Output Period (ROP).

2.5.1 Handle of Symbolic Link Subdirectories

This section describes how to configure the optimal number of sub-directories for storing the symbolic links.

Symbolic links for statistical files are created within the sub-directories. Sub-directories are named in the format dir1, dir2,dir3 and so on, the maximum number of sub-directories created is limited by the parameters explained in the following tables. Once all the sub-directories are traversed by PMIC, new



symbolic links are created from the first sub-directory. The maximum number of symbolic links to be created within the sub-directory is not configurable. The default values used ensure that Ericsson NetworkIQ can process the data in a highly efficient manner. In general, the default values provided are dimensioned correctly for the network volumes supported by ENM.

Note: Maximum number of symbolic links that can be created per sub directory is up to 10,000.

2.5.2 Statistics File Symbolic Link Parameters

Parameters for the management of statistical file symbolic links are described in the following tables. Some parameters are common regardless of the PM data type and some are specific to a particular data type.

Valid values for <PARAMETER_NAME> are as follows:

Table 7

| <PARAMETER_NAME> | Default Value | Description |
|---|-----------------|---|
| pmicSymbolicLinkRetentionPeriodInMinutes | 1440 | Symbolic link retention in minutes (for all ROPS except 1-min). |
| pmicSymbolicLinkDeletionIntervalInMinutes | 360 | The interval between running the symbolic link cleanup in minutes (for all ROPS except 1-min). |
| pmicSymbolicLinkRetentionPeriodInMinutesFor1MinROP | 180 | Symbolic link retention in minutes used only for 1-min ROP. |
| pmicSymbolicLinkDeletionIntervalInMinutesFor1MinROP | 15 | The interval between running the symbolic link cleanup in minutes used only for 1-min ROP. |
| maxSymbolicLinksAllowed | 9000 | Maximum number of symbolic links that can be created in a directory. Note: This parameter is used for all the Network Elements unless they have their specific parameters defined in the list. |
| maxSymbolicLinkSubdirs | 334 | Maximum number of sub directories that are created automatically to store the symbolic links. Note: This parameter is used for all the Network Elements unless they have their specific parameters defined in the list. |
| pmicRbsStatisticalSymbolicLinkBaseDir | rbs | Base directory (relative to symbolicLinkVolume) for storing symbolic links for RBS. |
| pmic5GRadioNodeSymbolicLinkBaseDir | "5GRadioNodet/" | Base directory (relative to symbolicLinkVolume) for storing symbolic links for 5GRadioNode. |
| pmicRbsStatisticalMaxSymbolicLinksAllowed | 10000 | Maximum number of symbolic links that can be created for RBS. |
| pmicRbsStatisticalMaxSymbolicLinkSubdirs | 48 | Maximum symbolic link sub directories allowed for RBS. |



| <PARAMETER_NAME> | Default Value | Description |
|---|---|--|
| pmicRncStatisticalSymbolicLinkBaseDir | rnc | Base directory (relative to symbolicLinkVolume) for storing symbolic links for RNC. |
| pmicRncStatisticalMaxSymbolicLinksAllowed | 10000 | Maximum number of symbolic links that can be created for RNC. |
| pmicRncStatisticalMaxSymbolicLinkSubdirs | 2 | Maximum symbolic link sub directories allowed for RNC. |
| pmicSapcStatsSymbolicLinkBaseDir | sapc-ecim | Base directory for storing symbolic links for vSAPC. Base directory for storing symbolic links for vSAPC. It is relative to symbolicLinkVolume for 15min files. Relative to symbolicLinkVolume/<ROP_FOLDER>/ for all others ROPS. |
| pmicSapcMaxSymbolicLinksAllowed | 9000 | Maximum number of symbolic links that can be created in a directory for vSAPC. |
| pmicSapcMaxSymbolicLinkSubdirs | 3 | Maximum symbolic link sub directories allowed for vSAPC. It is relative to symbolicLinkVolume for 15min files. It is relative to symbolicLinkVolume/<ROP_FOLDER>/ for all others ROPS. |
| pmicEpgVepgStatisticalSymbolicLinkBaseDir | ggsn-mpg-xml | Base directory (relative to symbolicLinkVolume) for storing symbolic links for EPG/vEPG. |
| pmicEpgVepgStatisticalMaxSymbolicLinksAllowed | 9000 | Maximum number of symbolic links that can be created in a directory for EPG/vEPG. |
| pmicEpgVepgStatisticalMaxSymbolicLinkSubdirs | 3 | Maximum symbolic link sub directories allowed for EPG/vEPG. |
| pmicSsrEvrStatisticalSymbolicLinkBaseDir | redback/edge | Base directory (relative to symbolicLinkVolume) for storing symbolic links for SSR/EVR. |
| pmicSsrEvrStatisticalMaxSymbolicLinksAllowed | 9000 | Maximum number of symbolic links that can be created for SSR/EVR. |
| pmicSsrEvrStatisticalMaxSymbolicLinkSubdirs | 36 | Maximum symbolic link sub directories allowed for SSR/EVR. |
| pmicBscStatisticalSymbolicLinkBaseDir | bsc-apg | Base directory for storing symbolic links for BSC. It is relative to symbolicLinkVolume for 15min files. It is relative to symbolicLinkVolume/<ROP_FOLDER>/ for all others ROPS. |
| pmicBscStatisticalMaxSymbolicLinkSubdirs | 6 | Maximum symbolic link sub directories allowed for BSC. |
| pmicBscStatisticalMaxSymbolicLinksAllowed | 9000 | Maximum number of symbolic links that can be created for BSC. |
| pmicRadioNodeSymbolicLinkBaseDir | EPS:RadioNode/LRAT/ UMTS:RadioNode/WRAT/ GSM:RadioNode/GRAT/ MIXED:RadioNode/MIXED/ 5GS:RadioNode/NRAT/ | Base directory (relative to symbolicLinkVolume) for storing symbolic links for RadioNode. |
| pmicEsaStatisticalSymbolicLinkBaseDir | GenericESA | Base directory (relative to symbolicLinkVolume) for storing symbolic links in ESA based Network Elements. |



| <PARAMETER_NAME> | Default Value | Description |
|---|---------------|--|
| pmicPccStatisticalSymbolicLinkBaseDir | pcc/ | Base directory (relative to symbolicLinkVolume) for storing symbolic links for PCC Network Elements. |
| pmicPccStatisticalMaxSymbolicLinksAllowed | 9000 | Maximum number of symbolic links that can be created for PCC Network Elements. |
| pmicPccStatisticalMaxSymbolicLinkSubdirs | 112 | Maximum symbolic link sub directories allowed for PCC Network Elements. |
| pmicPcgStatisticalSymbolicLinkBaseDir | pcg/ | Base directory (relative to symbolicLinkVolume) for storing symbolic links for PCG Network Elements. |
| pmicPcgStatisticalMaxSymbolicLinksAllowed | 9000 | Maximum number of symbolic links that can be created for PCG Network Elements. |
| pmicPcgStatisticalMaxSymbolicLinkSubdirs | 112 | Maximum symbolic link sub directories allowed for PCG Network Elements. |
| pmicCcrcStatisticalMaxSymbolicLinksAllowed | 9000 | Maximum number of symbolic links that can be created for CCRC Network Elements. |
| pmicCcrcStatisticalMaxSymbolicLinkSubdirs | 112 | Maximum symbolic link sub directories allowed for CCRC Network Elements. |
| pmicCcpcStatisticalMaxSymbolicLinksAllowed | 9000 | Maximum number of symbolic links that can be created for CCPC Network Elements. |
| pmicCcpcStatisticalMaxSymbolicLinkSubdirs | 112 | Maximum symbolic link sub directories allowed for CCPC Network Elements. |
| pmicCesmStatisticalMaxSymbolicLinksAllowed | 9000 | Maximum number of symbolic links that can be created for CCSM Network Elements. |
| pmicCesmStatisticalMaxSymbolicLinkSubdirs | 112 | Maximum symbolic link sub directories allowed for CCSM Network Elements. |
| pmicCcdmStatisticalMaxSymbolicLinksAllowed | 9000 | Maximum number of symbolic links that can be created for CCDM Network Elements. |
| pmicCcdmStatisticalMaxSymbolicLinkSubdirs | 112 | Maximum symbolic link sub directories allowed for CCDM Network Elements. |
| pmicScStatisticalMaxSymbolicLinksAllowed | 9000 | Maximum number of symbolic links that can be created for SC Network Elements. |
| pmicScStatisticalMaxSymbolicLinkSubdirs | 112 | Maximum symbolic link sub directories allowed for SC Network Elements. |
| pmicStatsSymbolicLinkErssnBaseDir | ESC | Base directory (relative to symbolicLinkVolume) for storing symbolic links for ESC/SCU. |
| pmicBSPStatisticalSymbolicLinkBaseDir | BSP | Base directory (relative to symbolicLinkVolume) for storing symbolic links for BSP Network Elements. |
| pmicAfgStatsSymbolicLinkBaseDir | AFG_ECIM | Base directory for storing symbolic links for AFG Network Elements. |
| pmicStatsSymbolicLinkMiniLinkOutdoorBaseDir | MINI-LINK-AOD | Base directory (relative to symbolicLinkVolume) for storing symbolic links for PM files for |



| <PARAMETER_NAME> | Default Value | Description |
|---|------------------|--|
| | | MINI-LINK Outdoor Network Elements. (MINI-LINK 6351,MINI-LINK 6352,MINI-LINK PT 2020, Fronthaul 6392,Switch 6391). |
| pmicCcpcStatisticalSymbolicLinkBaseDir | ccpc/ | Base directory (relative to symbolicLinkVolume) for storing symbolic links for CCPC Network Elements. |
| pmicCcrcStatisticalSymbolicLinkBaseDir | ccrc/ | Base directory (relative to symbolicLinkVolume) for storing symbolic links for CCRC Network Elements. |
| pmicCcsmStatisticalSymbolicLinkBaseDir | ccsm/ | Base directory (relative to symbolicLinkVolume) for storing symbolic links for CCSM Network Elements. |
| pmicCcdmStatisticalSymbolicLinkBaseDir | ccdm/ | Base directory (relative to symbolicLinkVolume) for storing symbolic links for CCDM Network Elements. |
| pmicScStatisticalSymbolicLinkBaseDir | sc/ | Base directory (relative to symbolicLinkVolume) for storing symbolic links for SC Network Elements. |
| pmicSbgIsStatisticalSymbolicLinkBaseDir | SBG/ | Base directory for storing symbolic links for SBG-IS Network Elements. |
| pmicMgwStatisticalMaxSymbolicLinksAllowed | 9000 | Maximum number of symbolic links that can be created for MGW. |
| pmicMgwStatisticalMaxSymbolicLinkSubdirs | 5 | Maximum symbolic link sub directories allowed for MGW. |
| pmicMrsStatisticalMaxSymbolicLinksAllowed | 9000 | Maximum number of symbolic links that can be created for MRS. |
| pmicMrsStatisticalMaxSymbolicLinkSubdirs | 3 | Maximum symbolic link sub directories allowed for MRS. |
| pmicHlrFeStatisticalMaxSymbolicLinksAllowed | 9000 | Maximum number of symbolic links that can be created for HLR-FE Statistical Network Elements. |
| pmicHlrFeStatisticalMaxSymbolicLinkSubdirs | 3 | Maximum symbolic link sub directories allowed for HLR-FE Statistical Network Elements. |
| pmicApgNonClusteredStatisticalMaxSymbolicLinksAllowed | 9000 | Maximum number of symbolic links that can be created for APG Non Clustered Statistical Network Elements. |
| pmicApgNonClusteredStatisticalMaxSymbolicLinkSubdirs | 3 | Maximum symbolic link sub directories allowed for APG Non Clustered Statistical Network Elements. |
| pmicApgClusteredStatisticalMaxSymbolicLinksAllowed | 9000 | Maximum number of symbolic links that can be created for APG Clustered Statistical Network Elements. |
| pmicApgClusteredStatisticalMaxSymbolicLinkSubdirs | 3 | Maximum symbolic link sub directories allowed for APG Clustered Statistical Network Elements. |
| pmicStatsSymbolicLinkMiniLinkIndoorBaseDir | MINI-LINK | Base directory (relative to symbolicLinkVolume) for storing symbolic links for MINI-LINK-Indoor Ethernet and SOEM files. |
| pmicSnpStatsSymbolicLinkMiniLinkIndoorBaseDir | MINI-LINK-INDOOR | Base directory (relative to symbolicLinkVolume) for storing |



| <PARAMETER_NAME> | Default Value | Description |
|---|---------------|--|
| | | symbolic links for MINI-LINK-Indoor Historical and Continuous files. |
| pmicStatsSymbolicLinkJunosBaseDir | JUNOS_XML | Base directory (relative to symbolicLinkVolume) for storing symbolic links for JUNIPER Network Elements. |
| pmicEirfeStatisticalSymbolicLinkBaseDir | "eir-fe/" | Base directory for storing symbolic links for EIR-FE Network Elements. |
| pmicvTIFStatsSymbolicLinkBaseDir | vtif/ | Base directory for storing symbolic links for vTIF Network Elements. |
| pmicVppStatsSymbolicLinkBaseDir | vPP/LRAT | Base directory (relative to symbolicLinkVolume) for storing symbolic links for vPP Network Elements. |
| pmicVrcStatsSymbolicLinkBaseDir | vRC/LRAT | Base directory (relative to symbolicLinkVolume) for storing symbolic links for vRC Network Elements. |
| pmicVduStatisticalSymbolicLinkBaseDir | vdu/ | Base directory (relative to symbolicLinkVolume) for storing symbolic links for vDU Network Elements. |
| pmicCcesStatisticalSymbolicLinkBaseDir | cces/ | Base directory (relative to symbolicLinkVolume) for storing symbolic links for CCES Network Elements. |
| pmicCcesStatisticalMaxSymbolicLinkSubdirs | 10 | Maximum symbolic link sub directories allowed for CCES Network Elements. |
| pmicCcesStatisticalMaxSymbolicLinksAllowed | 9000 | Maximum number of symbolic links that can be created for CCES Network Elements. |
| pmicVduStatisticalMaxSymbolicLinkSubdir | 11 | Maximum Symbolic Links SubDirectories Allowed for vDU Network Elements. |
| pmicApgClusteredStatisticalSymbolicLinkBaseDir | msscuster-sts | Base directory (relative to symbolicLinkVolume) for storing symbolic links for MSC-S BC(IS), MSC-S BC(BSP), CTC BC(BSP), CTC BC(IS), vMSC-S HC, vCTC HC Statistical Network Elements. It is relative to symbolicLinkVolume for 15min files. It is relative to symbolicLinkVolume/<ROP_FOLDER>/ for all others ROPS. |
| pmicApgNonClusteredStatisticalSymbolicLinkBaseDir | mssc-apg | Base directory (relative to symbolicLinkVolume) for storing symbolic links for MSC-S DB, IP-STP, CTC DB, Compact MSC-S, Compact CTC, Compact IP-STP, Compact vMSC-S, Compact vCTC, Compact vIP-STP Statistical Network Elements. It is relative to symbolicLinkVolume for 15min files. It is relative to symbolicLinkVolume/<ROP_FOLDER>/ for all others ROPS. |
| pmicHlrFeStatisticalSymbolicLinkBaseDir | mssc-apg | Base directory (relative to symbolicLinkVolume) for storing symbolic links for HLR-FE Network Elements. It is relative to symbolicLinkVolume for 15min files. It is relative to symbolicLinkVolume/ |



| <PARAMETER_NAME> | Default Value | Description |
|--|----------------|---|
| | | <ROP_FOLDER>/ for all others ROPS. |
| pmicHlrFeBcStatisticalSymbolicLinkBaseDir | hlrcluster-sts | Base directory (relative to symbolicLinkVolume) for storing symbolic links for HLR-FE-BC Network Elements. It is relative to symbolicLinkVolume for 15min files. It is relative to symbolicLinkVolume/ <ROP_FOLDER>/ for all others ROPS. |
| pmicHlrFeBcStatisticalMaxSymbolicLinkSubdirs | 26 | Maximum symbolic link sub directories allowed for HLR-FE-BC Network Elements. |
| pmicHlrFeBcStatisticalMaxSymbolicLinksAllowed | 10000 | Maximum number of symbolic links that can be created for HLR-FE-BC Network Elements. |
| pmicMrsStatisticalSymbolicLinkBaseDir | EMRS/ | Base directory for storing symbolic links for MRS Network Elements. |
| pmicMgwStatisticalSymbolicLinkBaseDir | mgw/ | Base directory for storing symbolic links for MGW Network Elements. |
| pmicHlrFeStatisticalSymbolicLinkBaseDir | mhc-apg/ | Base directory for storing symbolic links for HLR-FE Network Elements. |
| pmicBspStatisticalMaxSymbolicLinkSubdirs | 1 | Maximum symbolic link sub directories allowed for BSP Network Elements. |
| pmicEirfeStatisticalMaxSymbolicLinkSubdirs | 3 | Maximum symbolic link sub directories allowed for EIR-FE Network Elements. |
| pmicEsaStatisticalMaxSymbolicLinkSubdirs | 20 | Maximum symbolic link sub directories allowed for ESA based Network Elements. |
| pmicSbgIsStatisticalMaxSymbolicLinkSubdirs | 20 | Maximum symbolic link sub directories allowed for SBG-IS Network Elements. |
| pmicvTIFStatisticalMaxSymbolicLinkSubdirs | 1 | Maximum symbolic link sub directories allowed for vTIF Network Elements. |
| pmicRadionodeStatisticalMaxSymbolicLinkSubdirs | 267 | Maximum symbolic link sub directories allowed for RadioNode. |

2.5.3

Determine an Alternative Configuration for the Maximum Number of Symbolic Link Sub Directories

The following logic can be used to determine an alternative configuration (to the Default values) for the maximum number of symbolic link sub directories based on number of Network Elements supported by ENM:

```
maxSymbolicLinkSubdirs = ceil(((pmicSymbolicLinkRetentionPeriodInMinutes + pmicSymbolicLinkDeletionIntervalInMinutes)/60) * (60/ROP_Period) * (Number of Files per ROP/maxSymbolicLinksAllowed))
```

Note: Number of files per ROP is number of Network Elements * number of files per ROP per Network Element.



For example, consider a case of 25000 Network Elements (currently supported by Extra Large ENM):

```
maxSymbolicLinkSubdirs = (((1440 + 360)/60) * (60/15) * (25000/ 9000))
maxSymbolicLinkSubdirs = (30) * (4) * (25000/ 9000)
maxSymbolicLinkSubdirs = 120 * 2.777
maxSymbolicLinkSubdirs = 334
```

Large ENM:

ENM is capable of managing a Maximum of 15,500

```
maxSymbolicLinkSubdirs = (((1440 + 360)/60) * (60/15) * (15500/ 9000))
maxSymbolicLinkSubdirs = (30) * (4) * (15500/ 9000)
maxSymbolicLinkSubdirs = 120 * 1.7222
maxSymbolicLinkSubdirs = 207
```

Medium ENM :

ENM is capable of managing a Maximum of 5,900

```
maxSymbolicLinkSubdirs = (((1440 + 360)/60) * (60/15) * (5900/ 9000))
maxSymbolicLinkSubdirs = (30) * (4) * (5900/ 9000)
maxSymbolicLinkSubdirs = 120 * 0.655
maxSymbolicLinkSubdirs = 79
```

Small ENM on Openstack Cloud:

ENM is capable of managing a Maximum of 1,880

```
maxSymbolicLinkSubdirs = (((1440 + 360)/60) * (60/15) * (1880/ 9000))
maxSymbolicLinkSubdirs = (30) * (4) * (1880/ 9000)
maxSymbolicLinkSubdirs = 120 * 0.21
maxSymbolicLinkSubdirs = 26
```

2.5.4

ENIQ Integration Related Parameters

ENM has a set of parameters which are related to the ENIQ ENM Integration.

This section describes the list of parameters which are used to trigger ENIQ Topology export and create the files.

The following table reports the name of these parameters and the associated <PIB_service_identifier>:



| <parameter_name> | <PIB_service_identifier> | Default Value | Description |
|---|-------------------------------------|-----------------------|--|
| topologyExportCreationEnabled | eniq-topology-service-impl | false | Flag to indicate whether topology export is enabled or not. |
| topologyExportCreationEnabledStats | eniq-topology-service-impl | false | Flag to indicate whether topology export is enabled or not for ENIQ Statistics. |
| ENIQTopologyService_scheduleHour | eniq-topology-service-impl | 3 | Schedule Hour for ENIQ Daily export to run. |
| ENIQTopologyService_scheduleMinute | eniq-topology-service-impl | 0 | Schedule Minute for ENIQ Daily export to run. |
| pmicSymbolicLinkCreationEnabled | pm-service | false | Flag to indicate if pmic symbolic link creation is enabled or not for ENIQ Statistics. |
| symbolicLinkCreationEnabled | eniq-export-transformation-provider | false | Flag to indicate if topology symbolic link creation is enabled or not. |
| useStatsSymlinks | GLOBAL | true | Flag to indicate if topology symbolic link creation is enabled or not for ENIQ Statistics. |
| ENIQTopologyService_root_location | eniq-export-transformation-provider | /ericsson/pmic1 | Root location where topology files will be created. |
| symbolicLinkTargetFilePrefix | GLOBAL | /eniq/data/importdata | Prefix to the target file of topology and pmic that is linked for ENIQ Statistics. |
| ETS_HistoricalCMExport_schedulerDayOfWeek | GLOBAL | * | Schedule Day of Week for Historical CM Export to run |



| <parameter_name> | <PIB_service_identifier> | Default Value | Description |
|--|----------------------------|-----------------------|---|
| ETS_HistoricalCMEExport_schedulerHour | GLOBAL | 0 | Schedule Hour for Historical CM Export to run. |
| ETS_HistoricalCMEExport_schedulerMinute | GLOBAL | 0 | Schedule Minute for Historical CM Export to run. |
| ENIQTOPOLOGYSERVICE_CM_RUNAT_STARTUP_THRESHOLD | eniq-topology-service-impl | 12 | The number of Hours that the next Schedule needs to be away for the historical CM Export to run on Integration. |
| ENIQTOPOLOGYSERVICE_CM_SYMLINK_TARGET_PREFIX | eniq-topology-service-impl | /eniq/data/importdata | Prefix to the historical CM export target file that is linked. |
| ETS_InventoryModuleExportEnabled | GLOBAL | false | Flag to indicate whether inventory export is enabled or not. Applicable only for ENIQ Statistics. |

2.6 PMIC NBI Settings

This section describes the PMIC specific parameters which are relevant to North Bound systems.

PM Data are generated by Network Elements periodically and stored in the form of files. PMIC File Collection module collects these files and places them in a central location where they can be accessed by external systems (by using File Lookup service).

2.6.1 PM Files Parameters

Valid values for <PARAMETER_NAME> are as follows:

| <PARAMETER_NAME> | Default Value | Description |
|------------------|------------------------------------|---|
| pmicNfsShareList | /ericsson/pmic1/, /ericsson/pmic2/ | All available locations where PM data files are stored. |



| <PARAMETER_NAME> | Default Value | Description |
|--|---------------|---|
| pmicStatisticalFileRetentionPeriodInMinutes | 4320 | Statistical file retention period in minutes for 15-min or higher ROP intervals. It applies to both files collected from Network Elements and Event Based Statistics (EBS) files. |
| pmicStatisticalFileRetentionPeriodInMinutesFor1MinROP | 180 | Statistical file retention period in minutes for 1-min ROP. |
| pmicStatisticalFileRetentionPeriodInMinutesFor5MinROP | 2160 | Statistical file retention period in minutes for 5-min ROP. |
| pmicStatisticalFileRetentionRopCount | 288 | File retention period measured in number of ROPs applicable to stream based EBS-L and EBS-N. Note: This parameter overrides the pmicStatisticalFileRetentionPeriodInMinutes setting when pmicEbs1RopInMinutes is set to 5 for 5 minute ROP Interval. The retention period measured in minutes is the value of pmicStatisticalFileRetentionRopCount multiplied by 5. |
| pmicEbs1RopInMinutes | 15 | ROP Interval in Minutes applicable to stream based EBS-L and EBS-N. Supported values are 5 and 15 to set either a 5 minute or 15 minute ROP interval. When set to 15, the retention period of the files is controlled by the parameter pmicStatisticalFileRetentionPeriodInMinutes. When set to 5, the retention period of the files is controlled by the parameter pmicStatisticalFileRetentionRopCount. Note: Note: It is not recommended to change from 5 minute to 15 minute intervals as this has an impact on the NFS storage paths (/ericsson/pmic1 and /ericsson/pmic2) utilization. Refer to Ericsson Local Support if changing from 5 minute to 15 minute ROP is required. |
| pmicStatisticalFileDeletionIntervalInMinutes | 360 | The interval for performing cleanup of statistical files. It applies to 15-min or higher ROP files. |
| pmicStatisticalFileDeletionIntervalInMinutesFor1MinROP | 15 | The interval for performing cleanup of statistical files. It applies to 1-min ROP files. |
| pmicStatisticalFileDeletionIntervalInMinutesFor5MinROP | 360 | The interval for performing cleanup of statistical files. It applies to 5-min ROP files. |
| pmicCelltraceFileRetentionPeriodInMinutes | 180 | Cell Trace file retention period in minutes. |
| pmicCelltraceFileDeletionIntervalInMinutes | 15 | The interval for performing cleanup of Cell Trace files. |
| pmicEbmFileRetentionPeriodInMinutes | 180 | EBM file retention period in minutes. |



| <PARAMETER_NAME> | Default Value | Description |
|---|---------------|--|
| pmicEbmFileDeletionIntervalInMinutes | 15 | The interval for performing cleanup of EBM files. |
| pmicCtumFileRetentionPeriodInMinutes | 360 | CTUM file retention period in minutes. |
| pmicCtumFileDeletionIntervalInMinutes | 30 | The interval for performing cleanup of CTUM files. |
| pmicUeTraceFileRetentionPeriodInMinutes | 360 | UE Trace file retention period in minutes. |
| pmicUeTraceFileDeletionIntervalInMinutes | 30 | The interval for performing cleanup of UE Trace files. |
| pmicCellTrafficFileRetentionPeriodInMinutes | 180 | CTR file retention period in minutes. |
| pmicCellTrafficFileDeletionIntervalInMinutes | 15 | The interval for performing cleanup of CTR files. |
| pmicUetrFileRetentionPeriodInMinutes | 180 | UETR file retention period in minutes. |
| pmicUetrFileDeletionIntervalInMinutes | 15 | The interval for performing cleanup of UETR files. |
| pmicGpehFileRetentionPeriodInMinutes | 180 | GPEH file retention period in minutes. |
| pmicGpehFileDeletionIntervalInMinutes | 15 | The interval for performing cleanup of GPEH files. |
| pmicFileCollectionTimeZoneOffset | ENM | Configuration parameter to define the TimeZone offset appended to the name of the PMIC files stored in the PM file system. If ENM, PMIC appends the timezone offset between ENM system time and UTC. If Network Element, PMIC appends the timezone offset between Network Element local time and UTC. If UTC, PMIC appends +0000 as timezone offset from UTC. |
| isAsn1RawFileToBeRemoved | True | Flag to indicate if collected STS ASN.1 RAW files for Statistical Subscriptions have to be retained in NBI. |
| isAsn1FileToBeProcessed | True | Flag to indicate if STS ASN.1 processed (decoded) files for Statistical Subscriptions have to be retained in NBI. |
| isBscRecordingsRawFileToBeRemoved | True | Flag to indicate if collected RAW files for BscRecordings Subscriptions have to be retained in NBI. |
| isBscRecordingsFileToBeProcessed | True | Flag to indicate if processed (decoded) files for BscRecordings Subscriptions have to be retained in NBI. |
| pmicBscRecordingsFileRetentionPeriodInMinutes | 4320 | BSC Recording file retention period in minutes. |
| pmicBscRecordingsDeletionIntervalInMinutes | 360 | The interval for performing cleanup of BSC Recording files. |
| pmicBSCPerfEventStatisticsEnabled | true | Parameter to enable/disable BSC Performance Event Statistics file generation and output. It is enabled by default. |
| pmicBSCPerfEventsFileFormat | TEXT | Parameter to set BSC Performance Events file format to tab-separated text or binary |



| <PARAMETER_NAME> | Default Value | Description |
|--------------------------------------|---------------|--|
| | | format. Tab-separated text files contain decoded event data, while binary text files contain encoded event data. Note: Changing this parameter may result in partial data loss for one ROP in BSC Performance Events files. |
| pmicBSCPerfEventMonitorsEnabled | true | Parameter to enable/disable BSC Performance Event Monitors file generation and output. It is enabled by default. |
| pmicMtrFileDeletionIntervalInMinutes | 360 | The interval for performing cleanup of MTR files. |
| pmicMtrFileRetentionPeriodInMinutes | 4320 | MTR file retention period in minutes. |
| isMtrRawFileToBeRemoved | True | Flag to indicate if collected RAW files for MTR subscriptions have to be retained in NBI. |
| isMtrFileToBeProcessed | True | Flag to indicate if processed (decoded) files for MTR. Subscriptions have to be retained in NBI. |

Note: Parameters dealing with File Retention and File Deletion Interval are open-ended. The values can be set higher or lower than their defaults depending on the requirement. Before taking any action, consider these points: [PMIC File Retention](#) on page 58 and [PMIC File Deletion Interval](#) on page 58.

2.6.2 PMIC File Deletion Interval

- Increasing the File Deletion Interval parameters impacts the NFS storage paths since the system runs deletion functions at longer intervals. Analysis for file system current and expected utilization must be done prior to deciding a specific value.
- Decreasing the File Deletion Interval parameters means that PMIC attempts to delete any files older than retention interval at increased frequency. The default value is decided to have an optimal system performance: if possible, avoid setting the values for these parameters lower than the default.

2.6.3 PMIC File Retention

- Increasing the value for File Retention parameters has a direct impact on the NFS storage. The higher retention period results PM files being stored for a longer period of time in NFS storage. The value to be set must be decided after analyzing file system current and expected utilization: since this would differ from customer to customer, no generic maximum value is provided.
- Decreasing the value of File Retention parameters means that PM files are retained for less time on the ENM system. If these parameters are decreased,



the corresponding symbolic link parameters must be decreased, too, so that symbolic links do not persist longer than the files they point at. While decreasing the values, considerations for the NBI system using these files must be kept in mind.

2.7 Manage PMIC Features

PMIC features are organized as follows:

2.7.1 Control GPEH Data Levels on RNC

This section contains the routine operation and maintenance tasks related to the Control GPEH Data levels on RNC.

By default the GPEH data level is set to "HEADER_DATA_ONLY" which provides information for high level troubleshooting. This can be changed to "ALL_DATA" when more information is required for detailed troubleshooting.

The attribute `gpehDataLevel` under the MO Class `RncFunction` is controlling this recording content.

Steps

1. Check the `gpehDataLevel` Status.

For example, in the ENM CLI, run the following command to check the current status of `gpehDataLevel` for one RNC Network Element in ENM>

```
ccredit get
```

```
MeContext=RNC02,ManagedElement=1,RncFunction=1
```

2. Change the GPEH Data level:

The GPEH Data level can be changed on setting the value `ALL_DATA` for `gpehDataLevel` attribute through the standard ENM CLI CM commands.

For example, in the ENM CLI, run the following command to change the `gpehDataLevel` for one RNC Network Element in ENM:

```
ccredit set MeContext=RNC02,ManagedElement=1,RncFunction=1
```

```
gpehDataLevel="ALL_DATA"
```

Valid values for `<PARAMETER_NAME>` are as follows:



Table 8

| PARAMETER_NAME | Default Value | Description |
|----------------|------------------|---|
| gpehDataLevel | HEADER_DATA_ONLY | provides information for high level troubleshooting |

2.7.2 Manage Flexible PM Statistics Feature on RNC

This section describes the procedure to activate or deactivate the "Flexible PM Statistics" feature on RNC Network Elements. The steps include updating the "featureState" attribute under the "RncFeature" MO.

Flexible PM Statistics feature enables support for flexible ROPs other than 15 min for Statistical Subscription.

For more information on Flexible PM Statistics feature, see Flexible PM Statistics User Guide, 1/1553-hsd 101 02/1, Reference [9].

Steps

1. Check the Flexible PM Statistics feature Status

For example, in the ENM CLI, run the following command to check the current status of Flexible PM Statistics feature for one RNC Network Element in ENM:

```
cmedit get
MeContext=RNC207,ManagedElement=1,SystemFunctions=1,Licensing=
1,RncFeature=FlexPmStats
```

2. Activate Flexible PM Statistics feature

The FeatureState is activated on setting the featureState attribute through the standard ENM CLI CM commands.

For example, in the ENM CLI, run the following command to activate the Flexible PM Statistics feature for one RNC Network Element in ENM:

```
cmedit set
MeContext=RNC207,ManagedElement=1,SystemFunctions=1,Licensing=
1,RncFeature=FlexPmStats featureState=ACTIVATED
```

3. Deactivate Flexible PM Statistics feature.

The FeatureState is deactivated on setting the featureState attribute through the standard ENM CLI CM commands.

For example, in the ENM CLI, run the following command to deactivate the Flexible PM Statistics feature for one RNC Network Element in ENM:



```
cmedit set  
MeContext=RNC207,ManagedElement=1,SystemFunctions=1,Licensing=  
1,RncFeature=FlexPmStats featureState=DEACTIVATED
```

2.8 PMIC Privacy Features

This section describes how IMSI/IMEI/IMEI(SV) information in trace file names is pseudonymized.

The name of the files collected by ENM which contain IMSI/IMEI/IMEI(SV) information is obfuscated to meet privacy criteria. For information on how to locate a file from a given IMSI/IMEI/IMEI(SV) value, refer to IMSI/IMEI Pseudonymization in Trace File Names in *ENM Privacy User Guide*, [Reference 8].

IMSI/IMEI Pseudonymization in Trace File Names is supported for the following subscriptions:

- RTT
- UETRACE



3 Uplink Spectrum File Collection Administration Tasks

This section contains the routine operation and maintenance tasks related to the administration of the Uplink Spectrum File Collection application.

The ability to update and read the Uplink Spectrum File Collection parameters as described in sections "Configuring PIB Parameters on ENM on Cloud Deployment" and "Configuring PIB Parameters on a Physical ENM" in ENM System Administrator Guide in CPI, Reference [2] is a prerequisite for the correct execution of these tasks.

3.1 Uplink Spectrum File Collection NBI Settings

This section describes Uplink Spectrum File Collection parameters.

Uplink Spectrum data is generated by Network Elements and stored in the form of files. Uplink Spectrum File Collection collects these files and places them in a central location `/ericsson/ul_spectrum_files` in the NFS share where they can be accessed by external systems. No processing is done on the file name, nor on file content. The retention period of these files is configurable through Platform Integration Bridge (PIB).

3.1.1 Valid Parameters for Uplink Spectrum File Collection

Valid values for `<PARAMETER_NAME>` are as follows:

| <code><PARAMETER_NAME></code> | Min value | Max Value | Default Value | Description |
|--|-----------|-----------|---------------|--|
| <code>pmulFileRetentionPeriodInMinutes</code> | 60 | 1440 | 720 | The retention period in minutes for uplink spectrum files |
| <code>pmulFileDeletionIntervalInMinutes</code> | 1 | 1440 | 10 | The interval in minutes between running uplink spectrum file cleanup |
| <code>pmulJobRetentionPeriodInMinutes</code> | 1 | 1440 | 1440 | The retention period in minutes for spectrum analyzer activities placeholder |
| <code>pmulJobDeletionIntervalInMinutes</code> | 1 | 1440 | 10 | The interval in minutes between running spectrum analyzer activities |



| <PARAMETER_NAME> | Min value | Max Value | Default Value | Description |
|--|-----------|-----------|---------------|--|
| | | | | placeholder cleanup |
| pmulScheduledJobLimiter | - | - | 500 | Max number of concurrent scheduled measurements allowed |
| pmulWebSocketSessions | 1 | 20 | 10 | Max number of concurrent Spectrum Monitoring sessions |
| pmulMaxNumOfFilesForDisturbanceDetection | 1200 | 100000 | 24000 | Max number of measurements supported for Disturbance Detection |

- Note:**
- Consider the following points before taking any action on File retention and File Deletion parameters: [PMUL File Retention Parameter](#) on page 63 and [PMUL File Deletion Interval Parameters](#) on page 63.
 - pmulScheduledJobLimiter - 500 is the recommended value based on default retention period and minimum allowed sampling interval. Setting this parameter over the default value affects Spectrum Analyzer resources (for example: storage for NBI) and measurement collection could be impacted.

3.1.1.1 PMUL File Retention Parameter

- Increasing the value for a File Retention parameter has a direct impact on the SFS storage path `/ericsson/ul_spectrum_files` utilization.

The higher the retention is set, higher is the utilization of this directory path. The value to be set is decided after analyzing file system current and expected utilization. The dimensioning of the shared file system for Uplink Spectrum file storage is based on the default value for retention period with the maximum load (10 ongoing samplings with a file of size 320K generated every 2 seconds).

- Decreasing the value of File Retention parameter means that files from the Network Elements are retained for less time on the ENM system. While decreasing the values, consider that NBI system uses these files.

3.1.1.2 PMUL File Deletion Interval Parameters

- Increasing the File Deletion Interval parameters impacts the SFS storage path since the system runs deletion functions at increased intervals now or at a slower rate. Analysis for File system current and expected utilization must be done prior to decide a specific value.



- Decreasing the File Deletion Interval parameters means that the application attempts to delete any files older than retention interval at increased frequency.



4 PM Event File Decoder Administration Tasks

This section contains the routine operation and maintenance tasks related to the administration of the PM Event File Decoder application.

The ability to update and read the PM Event File Decoder parameters as described in sections "Configuring PIB Parameters on ENM on Cloud Deployment" and "Configuring PIB Parameters on a Physical ENM" in ENM System Administrator Guide in CPI, Reference [2] is a prerequisite for the correct execution of these tasks.

PM Event File Decoder – Retention Time of Decoded Files

PM Event File Decoder periodically removes the decoded output files that have exceeded the retention time. The retention time is configurable using parameter `decodedPmEventFileRetentionPeriodInMinutes`.

Note: PM Event File Decoder performs the cleanup of files that have exceeded the retention time every hour. There can be situations in which the deletion of the files occur up to one hour after the configured retention expires.

Example: assume the retention time set at 3 hours, meaning that decoded files existing for more than 3 hours must be removed. As the removal occurs each hour, this means that decoded files can be deleted after almost 4 hours.

Prerequisites

Physical: administrator access to the ENM management server.

Cloud: User is connected to the EMP VM as per section "Connect to a Virtual Machine on an ENM on Cloud Deployment" of ENM System Administration Guide, 1/1543-AOM901151, Reference [2].

Expected Result

The retention time of the PM Event File Decoder output files is modified and the output files are cleaned up based on the new value.

Valid values for `<PARAMETER_NAME>` are as follows:

Table 9

| Property | Default Value | Description |
|---|---------------|---|
| <code>decodedPmEventFileRetentionPeriodInMinutes</code> | 180 | The retention period in minutes for decoded files |



Reference List

- [1] *ENM Library Typographic Conventions*, 10/1551-aom 901131 Uen
- [2] *ENM System Administrator Guide*, 1/1543-aom 901 151 Uen
- [3] *OSS Configuration for ENIQ Statistics*, 1/1546-AOM 901076, 2/1546-AOM 901076 (Available from Ericsson Network IQ Statistics CPI Library)
- [4] *Performance Management Description*, 246/1551-lza 701 6004/1 Uen
- [5] *Manage Performance User Guide*, 14/1553-lza7016014/1 (Available from Ericsson LTE RAN CPI Library)
- [6] *Manage Performance User Guide*, 3/1553-LZA 701 6017/1 (Available from Ericsson NR RAN CPI Library)
- [7] *UE Tracer Technical Product Description*, 54/22101-axb25005/8-v2 (Available from Ericsson SGSN-MME CPI Library)
- [8] *ENM Privacy User Guide*, 2/1553-aom 901 151 Uen
- [9] *Flexible PM Statistics User Guide*, 1/1553-hsd 101 02/1 Uen
- [10] *ENM BSC Performance Events - Event Specification*, 1553-cra 119 2288 Uen
- [11] *Create Measurement Collection Job*, 32/1543-caa 901 2624 Uen
- [12] *Node Preliminary Configuration Guide*, 2/127 01-cra 119 2183 Uen
- [13] *Performance Management User Guide Authentication Federation Gateway*, 10/1553-ava 901 50/2 Uen
- [14] *ENM Product Description* ,
1/1551-aom 901 151 Uen
- [15] *Dynamic CM Import/Export Interwork Description*, 3/15519-cna 403 Uen
- [16] *ENM Summary of External Interfaces*, 2/15519-aom 901 151 Uen
- [17] *Statistical Counter Management* , 1553-CXA 117 0028/5 (Available from Ericsson Network Element CPI Library)
- [18] *Data Transfer Management*, 1553-CXA 117 0052/5 (Available from Ericsson Network Element CPI Library)
- [19] *ESA Performance Management Ericsson SNMP Agent 18.0*, 3/1543-CSH 109 654 (Available from Ericsson Network Element CPI Library)
- [20] *CUDB Performance Guide*, 4/1553-HDA 104 03/10 (Available from Ericsson Network Element CPI Library)
- [21] *CUDB Application Counters*, 10/155 34-HDA 104 03/10 (Available from Ericsson Network Element CPI Library)
- [22] *ENM Network Security Configuration System Administrator Guide* ,
2/1543-aom 901 151-2 Uen