

# Network Impact Report, Upgrade to CUDB 1.2

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## NETWORK IMPACT REPORT

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# 1 Introduction

The Network Impact Report (NIR) describes the new and changed functions implemented in the Ericsson Centralized User Database since CUDB 16A FD1 and indicates how these changes affect the product and the overall network used by operators.

To find the changes applicable to a specific upgrade path, apply the filters by using the funnel icon on the upper left side of the browser.

The document also describes changes that are introduced with the software upgrade, but are part of functions planned for coming releases, see Section 6 on page 23. Each of the changes is described in the corresponding referenced documents.

Refer to the “Functions” section of *CUDB Technical Product Description*, Reference [12] for more information on CUDB functions.

## 1.1 Revision Information

**Rev. A** Initial release.

**Rev. B** Other than editorial changes, this document has been revised as follows:

- **CUDB CLI Commands and Parameters:** Updated information on OAM Automation with NETCONF Support impacts.



## Rev. C

Other than editorial changes, this document has been revised as follows:

- Document structure rearranged.
- Section 2.1.1 on page 4: Updated Table 1, Table 2, and Table 3 with new capacity information.
- Section 5.1.3 on page 21: Updated with impact on notifications process.
- **CUDB CLI Commands:** Updated table with new, modified, and removed commands and command options.
- **Administrative Operations:** Added new section listing new administrative operations.
- **Parameters:** Updated table with new, modified, and removed classes and attributes.
- **Alarms:** Updated table section with alarms affected by Virtualized Network Function support.
- **Counters:** Updated with information on application counter installation.
- **Logging:** Updated with new and modified logging components.
- **Tools:** Added new section on executing Schema Update Tool dependency check.
- Updated Glossary.

**Rev. D**

Other than editorial changes, this document has been revised as follows for the CUDB 1.1 release:

- Section 1 on page 1: Added CUDB Key Performance Indicators (KPIs) to the list of enhancements.
- **Section 5.7.2. Impact:** Indicated KPI as enhancement impacting the function.
- **CUDB CLI Commands:** Updated table with new and modified command options.
- **Parameters:** Updated table with the new `cudbCounterPublishingPeriod` attribute.
- **Counters:** Updated section with list of new and modified counters.
- **Logging:** Updated list of new components with CUDB KPIs logging component.

**Rev. E**

Other than editorial changes, this document has been revised as follows for the CUDB 1.1 release:

- Complete restructure.
- Section 4.4 on page 17: Added information on the KpiCentral component.
- Section 6 on page 23: New section listing planned functions.



## Rev. F

Other than editorial changes, this document has been revised as follows for the CUDB 1.2 release:

- Complete restructure: Functions and their related changes can now be found in separate sections.
- Section 3.1 on page 9: Added LDAP FE to the list of new and modified logging events.
- Section 5.3 on page 22: Updated Table 21 as follows:
  - Changed command option `-b` | `--bc-status` and new command option `-B` | `--new-bc-status` for `cudbSystemStatus`.
  - Deprecated command option `-R` for `cudbSystemDataBackupAndRestore`.
- Section 4.5 on page 19: Added section to include the new command option `-v` for `cudbCheckLdapViewMapping`.
- Section 6.2 on page 24: Updated to reflect support of extended POSIX regular expressions.

## 2 General Impact

This section provides information about changes in the system that affect general areas, such as user capacity, network performance, memory consumption, and hardware.

### 2.1 Capacity and Performance

This section provides information about changes related to capacity and performance.

#### 2.1.1 Subscriber Capacity

The subscriber capacity of CUDB is mainly affected by the following factors:

- The size of the CUDB deployment.
- The individual subscriber memory size (also known as subscriber footprint).





- The processing capacity of the system, affected by the different traffic models and subscriber profiles used by the application Front Ends (FEs), such as the Home Location Register (HLR) and the Home Subscriber Server (HSS).
- The optional CUDB features.

The subscriber capacity values for this CUDB release are shown in Table 1, Table 2, and Table 3. The figures of these tables have been obtained by using the Advanced processing option of the Ericsson default profile tool. The figures were calculated with an IP backbone Quality of Service (QoS) of RTT=40 ms and PLR=10E-4, on a 1+1 CUDB configuration.

The detailed capacity information for default Ericsson profiles on Blade Server Platform (BSP) 8100 with Generic Ericsson Processor version 3 (GEP3) boards is shown in Table 1. Individual operator profile characteristics can vary significantly.

*Table 1 Capacity Summary for CUDB Systems Deployed on Native BSP 8100 GEP3 (1+1)*

BSP 8100 GEP3	HLR <sup>(1)</sup>	MNP <sup>(2)</sup>	IMS <sup>(3)</sup> <sub>(4)</sub>	EPC <sup>(3)(5)</sup>	SAPC <sup>(2)(6)</sup>	AAA <sup>(2)(7)</sup>	M2M <sup>(2)</sup>	EIR <sup>(2)(8)</sup>	ENUM <sup>(2)</sup>
Maximum system capacity <sup>(9)</sup>	160.4	167.1	89.2	177.1	219.8	221.4	179.8	289.5	273.5
Maximum node capacity <sup>(9)</sup>	33.6	98.8	7.1	39.3	94.3	28.0	34.0	127.2	86.2

(1) Default HLR profile.

(2) Estimated figures.

(3) Ericsson default profile.

(4) IMS-fixed BB users.

(5) AVG Authentication. No LDAP optimization.

(6) Usage Reporting and 1 Traffic\_ID. No subscriber groups.

(7) AAA-FE GPRS.

(8) IMEI only. All IMEIs used by the active subscribers are provisioned. BHCI=1.

(9) Million subscribers.

The detailed capacity information for default Ericsson profiles on BSP 8100 with Generic Ericsson Processor version 5 (GEP5) boards is shown in Table 2. Individual operator profile characteristics can vary significantly.

**Table 2 Capacity Summary for CUDB Systems Deployed on Native BSP 8100 GEP5 (1+1)**

BSP 8100 GEP5	HLR <sup>(1)</sup>	MNP <sup>(2)</sup>	IMS <sup>(3)</sup> <sub>(4)</sub>	EPC <sup>(3)(5)</sup>	SAPC <sup>(2)(6)</sup>	AAA <sup>(2)(7)</sup>	M2M <sup>(2)</sup>	EIR <sup>(2)(8)</sup>	ENUM <sup>(2)</sup>
Maximum system capacity <sup>(9)</sup>	514.3	536.1	286.1	568.1	704.8	710.1	576.7	928.3	877.0
Maximum node capacity <sup>(9)</sup>	104.9	206.1	18.0	67.9	182.7	87.3	77.1	270.3	169.8

(1) Default HLR profile.

(2) Estimated figures.

(3) Ericsson default profile.

(4) IMS-fixed BB users.

(5) AVG Authentication. No LDAP optimization.

(6) Usage Reporting and 1 Traffic\_ID. No subscriber groups.

(7) AAA-FE GPRS.

(8) IMEI only. All IMEIs used by the active subscribers are provisioned. BHCI=1.

(9) Million subscribers.

**Note:** In case of hybrid systems (that is mixing GEP3 and GEP5 nodes), consider the smaller capacity figures for maximum system capacity (whenever Processing Layer, or PL memory is the limit). To determine the maximum node capacity, use the Ericsson default profile tool.

The detailed capacity information for default Ericsson profiles on virtualized CUDB deployments over Cloud Execution Environment (CEE) on BSP 8100 hardware with GEP5 blades is shown in Table 3. Individual operator profile characteristics can vary significantly.

**Table 3 Capacity Summary for Virtualized CUDB over CEE on BSP 8100 GEP5 (1+1)**

Virtualized CUDB over CEE on BSP 8100 GEP5 (16 vCPUs)	HLR <sup>(1)</sup> <sub>(2)</sub>	MNP <sup>(1)</sup>	IMS <sup>(1)</sup> <sub>(3)</sub>	EPC <sup>(1)(4)</sup>	SAPC <sup>(1)(5)</sup>	AAA <sup>(1)(6)</sup>	M2M <sup>(1)</sup>	EIR <sup>(1)(7)</sup>	ENUM <sup>(1)</sup>
Maximum system capacity <sup>(8)</sup>	375.4	391.3	178.4	414.6	514.5	518.3	420.9	667.6	640.1
Maximum node capacity <sup>(8)</sup>	58.2	113.3	9.9	37.3	100.4	63.7	42.4	148.6	93.4

(1) Estimated figures.

(2) Default HLR profile.

(3) IMS-fixed BB users.

(4) AVG Authentication. No LDAP optimization.

(5) Usage Reporting and 1 Traffic\_ID. No subscriber groups.

(6) AAA-FE GPRS.

(7) IMEI only. All IMEIs used by the active subscribers are provisioned. BHCI=1.

(8) Million subscribers.

**Note:** The maximum node capacity has been calculated for a 1+1 configuration. Consider that system capacity does not scale linearly with the number of nodes.



**Note:** From CUDB 1 onwards, CUDB received improvements in LDAP-FE processing that are not clearly visible in the tables above, as the LDAP-FE processing capacity is not the limiting factor in such maximum configurations. The maximum system capacity is usually limited by the PL memory, but the maximum node capacity in these 1+1 configurations is limited instead by the Data Store (DS) memory in the Home Location Register (HLR), and by the DS processing in the IP Multimedia Subsystem (IMS). However, in most CUDB deployments, LDAP-FE capacity is usually the limiting factor, and they will therefore benefit from this improvement. In case of HLR in a 2+2 configuration deployed on BSP 8100 GEP5 hardware, the maximum capacity is increased from 158 million subscribers (or 79 million subscribers per node) on CUDB 16A FD1 to 168 million subscribers (or 84 million subscribers per node) on this CUDB release.

### 2.1.2 Network Performance

No impact.

## 2.2 Changes in Hardware Support

This section provides information about hardware-related impacts from CUDB 1 onwards.

CUDB supports BSP 8100 hardware with both GEP3 and GEP5 blade types, but maiden installations of this CUDB release support BSP 8100 hardware with GEP5 blades only.

CUDB also supports virtualized environments, but for maiden installations only. Virtualized CUDB is verified to run on the Ericsson Cloud Execution Environment (CEE), on BSP 8100 hardware with GEP5 blades. Support for other virtualized environments or hardware is possible, but they must be secured through an integration project.

CUDB supports the combination of nodes with different blade types (GEP3 or GEP5). Hybrid systems mixing GEP3 nodes and GEP5 nodes are allowed, except for maiden installations. However, mixed GEP3 and GEP5 blades within the same node is not supported.

The minimum number of Processing Layer Database (PLDB) blades supported by this release is 2, instead of the previous value of 4 blades. Refer to *CUDB Node Configuration Data Model Description*, Reference [1] for more information.

## 2.3 Changes in Software Handling

No impact.



## 2.4 Changes in Upgrade Procedure

The upgrade procedure has been improved by introducing the Installation Based Upgrade (IBU) method in CUDB 1, which is based on maiden installation.

The upgrade process received the following impacts in CUDB 1:

- The Electronic Software Licenses function is required to perform licensing-related activities during the upgrade, such as getting digital fingerprints on every node in the system and requesting License Key Files from Ericsson Sourcing and Supply.
- During the software upgrade process, the Hardware Monitoring function is disabled on the node currently being upgraded.

## 2.5 Changes in Tools

This section lists the changes affecting the tools used in the CUDB system.

### 2.5.1 Schema Update Tool

It is recommended (but not required) to run the Schema Update Tool on the SCs of the CUDB system. If the Schema Update Tool is executed elsewhere, check the version of the shared libraries required for the `slapd` process to determine if the Linux version of the current machine is sufficient for executing the tool.

## 2.6 Obsolete Functions

From CUDB 1 onwards, the Subscription Control function is obsolete.

## 2.7 Other Network Elements (Dependencies)

To achieve full capacity at User Data Consolidation (UDC) solution level of the Key Performance Indicators (KPIs) function introduced in CUDB 1.1, Operations Support System (OSS) and User Profile Gateway (UPG) support is needed.



## 3 New Functions

### 3.1 Virtualized Network Function Support

This function makes it possible to decouple software and hardware through virtualization, thereby enabling the harmonization of hardware across multiple products and vendors, and the optimization of hardware utilization.

The support of virtualization in CUDB covers the installation, configuration, and adaptation of CUDB OAM functions. A virtualized CUDB system provides the same functions and architecture as a native CUDB system.

#### 3.1.1 Changes in Operation

This section describes changes to commands and command options, configuration parameters, alarms, counters, logging, and tools.

##### 3.1.1.1 Alarms

The alarms impacted by new or modified functions are shown in Table 4. Refer to *CUDB Node Fault Management Configuration Guide*, Reference [5] and the related alarm Operating Instructions (OPIs) for detailed information about the alarms.

**Table 4** Summary of New and Modified Alarms

Alarm	Impact
Control, Blackboard Coordination Server Down	Modified alarm
LDAP Front End, Server Down	Modified alarm
Operating System, Disk Usage Too High	Modified alarm
Storage Engine, Automatic Handling of Network Isolation not Completed for DS	Modified alarm
Storage Engine, Automatic Handling of Network Isolation not Completed for PLDB	Modified alarm
Storage Engine, DS Cluster Node Down	Modified alarm
Storage Engine, PLDB Cluster Node Down	Modified alarm

##### 3.1.1.2 Logging

New and modified logging events are included due to impacts in the following components:

- Cluster Supervisor
- LDAP FE Monitor



Refer to *CUDB Node Logging Events*, Reference [11] for more information on logging.

## 3.2 Electronic Software License

The Electronic Software License function requires to perform licensing-related activities during the upgrade, such as getting digital fingerprints on every node in the system and requesting License Key Files from Ericsson Sourcing and Supply.

### 3.2.1 Changes in Operation

This section describes changes to commands and command options, configuration parameters, alarms, counters, logging, and tools.

#### 3.2.1.1 Alarms

The alarms impacted by new or modified functions are shown in Table 5. Refer to *CUDB Node Fault Management Configuration Guide*, Reference [5] and the related alarm Operating Instructions (OPIs) for detailed information about the alarms.

Table 5 Summary of New and Modified Alarms

Alarm	Impact
Licensing, Autonomous Mode Activated, License Management	New alarm
Licensing, Capacity Usage Threshold Reached, License Management, Major	New alarm
Licensing, Capacity Usage Threshold Reached, License Management, Warning	New alarm
Licensing, Emergency Unlock Reset Key Required, License Management	New alarm
Licensing, Key File Fault, License Management	New alarm
Licensing, License Key Not Available, License Management, Major	New alarm
Licensing, License Key Not Available, License Management, Minor	New alarm
Licensing, License Management Not Available, License Management	New alarm
Licensing, Number of Profile Subscriptions has Reached the Purchased Number, Subscriptions Control	Removed alarm

#### 3.2.1.2 Commands and Command Options

This section describes the new, modified, and removed Command Line Interface (CLI) commands and command options in CUDB.



### 3.2.1.2.1 CUDB CLI Commands and Command Options

The CUDB CLI command and command option changes are shown in Table 6. Refer to *CUDB Node Commands and Parameters*, Reference [6] for more information.

**Table 6** *Summary of New, Modified, and Removed CUDB CLI Commands and Command Options*

Command	Command Option	Impact
cudbLicensingTool	<ul style="list-style-type: none"> <li>• -h   --help</li> <li>• -c   --calculate-fingerprint</li> <li>• -u   --upgrade</li> <li>• -r   --restore-fingerprint</li> </ul>	New command and command options used to calculate unique fingerprint or restore saved fingerprint and store it in the License Manager during installation or upgrade.

### 3.2.1.3 Logging

The following new component writing on the logs has been included in the CUDB system:

- LDAP Counters

New and modified logging events are included due to impacts in the following components:

- DataBackupRestore
- Reconciliation

Refer to *CUDB Node Logging Events*, Reference [11] for more information on logging.

## 3.3 LDAP Data Views

This function makes it possible for applications to access the data stored in CUDB through a custom Directory Information Tree (DIT) and a custom schema. LDAP users can be configured to access CUDB either by using the "native" view and core DIT, or by using one of the defined LDAP data views.

### 3.3.1 Changes in Operation

This section describes changes to commands and command options, configuration parameters, alarms, counters, logging, and tools.



### 3.3.1.1 Data Model

The configuration object and attribute changes are shown in Table 7. Refer to *CUDB Node Configuration Data Model Description*, Reference [1] for detailed information about the configuration objects and their attributes.

Table 7 Summary of New and Modified Configuration Objects and Attributes

Class	Attribute	Impact
CudbLdapUser	cudbLdapViewId	New attribute used as the identifier of the LDAP view attached to the specific user for the <b>LDAP Data Views</b> function.
CudbLdapView		New class representing the LDAP views for the <b>LDAP Data Views</b> function.
CudbLdapViewsMgmt		New class representing the container of the LDAP views for the <b>LDAP Data Views</b> function.

## 4 Enhanced Functions

This section describes the enhanced functions of this CUDB release. Refer to the “Functions” section of *CUDB Technical Product Description*, Reference [12] for more information on these functions.

### 4.1 Flexible PL Deployment

This is an enhancement to the CUDB Global Access and the System and Node Architecture functions.

When activated, the enhancement requires a new network design, as nodes without a PLDB blade or VM cannot receive direct traffic from application FEs.

#### 4.1.1 Changes in Interfaces

##### 4.1.1.1 Inter-Node Interface

This section describes interface changes between the existing and new revisions of the product.





**Table 8** Summary of Inter-Node Interface Impacts

Interface, Protocol	Nodes	Impact
LDAP LDAP v3	CUDB-HLR CUDB-HSS CUDB-PG All Application FEs	The LDAP interface received new conditions and error messages for Error Code 52. Error 52 can also be raised when application FEs send direct traffic to a node without PLDB.

## 4.1.2 Changes in Operation

This section describes changes to commands and command options, configuration parameters, alarms, counters, logging, and tools.

### 4.1.2.1 Commands and Command Options

This section describes the new, modified, and removed CLI commands and command options in CUDB.

#### 4.1.2.1.1 CUDB CLI Commands and Command Options

The CUDB CLI command and command option changes are shown in Table 9. Refer to *CUDB Node Commands and Parameters*, Reference [6] for more information.

**Table 9** Summary of New, Modified, and Removed CUDB CLI Commands and Command Options

Command	Command Option	Impact
<code>cudbClusterConfConverter</code>		New restricted command.
<code>cudbEvipConfigExtension</code>	<code>-r</code>   <code>--removePLDB</code>	New restricted command option.
<code>cudbPrepareStore</code>		Modified command to also support nodes without PLDB.
<code>cudbReallocate</code>		Updated command output.
<code>cudbSystemStatus</code>		Modified command output. PLDB sections now missing from output if the node contains no PLDB.
<code>cudbSwBackup</code>	<code>-f</code>   <code>--force</code>	Modified command option to allow SW restore also when the CUDB node does not have a defined PLDB cluster.

#### 4.1.2.2 Data Model

The configuration object and attribute changes are shown in Table 10. Refer to *CUDB Node Configuration Data Model Description*, Reference [1] for detailed information about the configuration objects and their attributes.

**Table 10** Summary of New and Modified Configuration Objects and Attributes

Class	Attribute	Impact
CudbLocalDS	cudbLocalDsId	Modified attribute. The value range of cudbLocalDsId is 1-17 if the CudbLocalNode class containing the CudbLocalDS object has no CudbLocalPl object created.
CudbLocalPL		Modified class. The CudbLocalPL class is now optional.
CudbRemoteDs	cudbRemoteDsId	Modified attribute. The value range of cudbRemoteDsId is 1-17 if the CudbLocalNode class containing the CudbRemoteDs object has no CudbRemotePl object created.
CudbRemotePl		Modified class. The CudbRemotePl class is now optional.

#### 4.1.2.3 Logging

The following new component writing on the logs has been included in the CUDB system:

- License Manager

New and modified logging events are included due to impacts in the following components:

- Configuration Management

Refer to *CUDB Node Logging Events*, Reference [11] for more information on logging.

## 4.2 OAM Automation with NETCONF Support

This is an enhancement to the OAM CUDB function.

### 4.2.1 Changes in Operation

This section describes changes to commands and command options, configuration parameters, alarms, counters, logging, and tools.

#### 4.2.1.1 Commands and Command Options

This section describes the new, modified, and removed CLI commands and command options in CUDB.

##### 4.2.1.1.1 CUDB CLI Commands and Command Options

The CUDB CLI command and command option changes are shown in Table 11. Refer to *CUDB Node Commands and Parameters*, Reference [6] for more information.



**Table 11** Summary of New, Modified, and Removed CUDB CLI Commands and Command Options

Command	Command Option	Impact
cudbApplyConfig	-n   --noimmsave	Removed command option.
	-s   --scope all	Deprecated command and command option, replaced by the applyConfig administrative operation of the CudbLocalNode class.
cudbUpdateUserInfo		Deprecated command, replaced by the updateUserInfo administrative operation of the CudbLocalNode class. Also modified to support refreshing CUDB LDAP users from a remote PLDB.

#### 4.2.1.1.2 Administrative Operations

The administrative operations of the CUDB system are shown in Table 12. Refer to the “Administrative Operations” section of *CUDB Node Configuration Data Model Description*, Reference [1] for more information about administrative operations.

**Table 12** Summary of New, Modified, and Removed Administrative Operations

Class	Administrative Operation	Impact
CudbLocalNode	applyConfig	New administrative operation replacing the deprecated cudbApplyConfig command, used to activate configuration changes.
CudbLocalNode	updateUserInfo	New administrative operation replacing the deprecated cudbUpdateUserInfo command, used to update user information in the node.
CudbLocalNode	cancelApplyConfig	New restricted administrative operation.

#### 4.2.1.2 Data Model

The configuration object and attribute changes are shown in Table 13. Refer to *CUDB Node Configuration Data Model Description*, Reference [1] for detailed information about the configuration objects and their attributes.

**Table 13** *Summary of New and Modified Configuration Objects and Attributes*

Class	Attribute	Impact
CudbLocalNode	applyConfigStatus	<p>New read-only attribute that stores the following information about the progress of the asynchronous applyConfig administrative action:</p> <ul style="list-style-type: none"><li>• actionId</li><li>• actionName</li><li>• additionalInfo</li><li>• progressInfo</li><li>• progressPercentage</li><li>• result</li><li>• resultInfo</li><li>• state</li><li>• timeActionStarted</li><li>• timeActionCompleted</li><li>• timeOfLastStatusUpdate</li></ul>
CudbLocalNode	updateUserInfoStatus	<p>New read-only attribute that stores the following information about the progress of the asynchronous updateUserInfo administrative action:</p> <ul style="list-style-type: none"><li>• actionId</li><li>• actionName</li><li>• additionalInfo</li><li>• progressInfo</li><li>• progressPercentage</li><li>• result</li><li>• resultInfo</li><li>• state</li><li>• timeActionStarted</li><li>• timeActionCompleted</li><li>• timeOfLastStatusUpdate</li></ul>

## 4.3 Increment Alert Key Command

This is an enhancement to the CUDB Global Access and the System and Node Architecture functions.

### 4.3.1 Changes in Operation

This section describes changes to commands and command options, configuration parameters, alarms, counters, logging, and tools.



### 4.3.1.1 Commands and Command Options

This section describes the new, modified, and removed CLI commands and command options in CUDB.

#### 4.3.1.1.1 CUDB CLI Commands and Command Options

The CUDB CLI command and command option changes are shown in Table 14. Refer to *CUDB Node Commands and Parameters*, Reference [6] for more information.

**Table 14** Summary of New, Modified, and Removed CUDB CLI Commands and Command Options

Command	Command Option	Impact
cudbLdapFeRestart	--with-monitor	Deprecated command option.
	--no-prompt	New restricted command option.
cudbManageStore	--no-prompt	New restricted command option.
cudbSetDsgMaster	--no-prompt	New restricted command option.
cudbSystemDataBackupAndRestore	--no-prompt	New restricted command option.
	-r	Deprecated command option.
cudbSwBackup	--no-prompt	New restricted command option.
	-r	Deprecated command option.
cudbUnitDataBackupAndRestore	--no-prompt	New restricted command option.

## 4.4 CUDB Key Performance Indicators

This is an enhancement to the OAM CUDB function.

CUDB KPIs are a special set of CUDB counters, for CUDB systems deployed on native BSP 8100, that help the users evaluate and quantify the usage of the processing and memory capacity of certain CUDB resources.

### 4.4.1 Changes in Operation

This section describes changes to commands and command options, configuration parameters, alarms, counters, logging, and tools.

#### 4.4.1.1 Commands and Command Options

This section describes the new, modified, and removed CLI commands and command options in CUDB.



#### 4.4.1.1.1 CUDB CLI Commands and Command Options

The CUDB CLI command and command option changes are shown in Table 15. Refer to *CUDB Node Commands and Parameters*, Reference [6] for more information.

**Table 15** Summary of New, Modified, and Removed CUDB CLI Commands and Command Options

Command	Command Option	Impact
cudbHaState		Additional printouts were included due to the introduction of KpiCentral process.  Example:  saAmfSISUHASState."safSu=SC-2,safSg=2N,safApp=ERIC-CUDB_KPICENTRAL"."safSi=2N-1": active(1)
cudbSystemStatus	-p   --check-cudbprocess	KpiCentral process was added to the output when listing processes running on OAM blades.  Example:  KpiCentral process..... Running in: OAM2

#### 4.4.1.2 Data Model

The configuration object and attribute changes are shown in Table 16. Refer to *CUDB Node Configuration Data Model Description*, Reference [1] for detailed information about the configuration objects and their attributes.

**Table 16** Summary of New and Modified Configuration Objects and Attributes

Class	Attribute	Impact
CudbLocalNode	cudbCounterPublishingPeriod	New attribute used to change the frequency of PM report file generation.

#### 4.4.1.3 Counters

The following new counters have been introduced:

- kpiClusterLoad
- kpiRatioDroppedCluster
- kpiLdapFeLoad
- kpiRatioDroppedLdap

Refer to *CUDB Counters List*, Reference [9] for more information.



#### 4.4.1.4 Logging

The following new component writing on the logs has been included in the CUDB system:

- CUDB KPIs

Refer to *CUDB Node Logging Events*, Reference [11] for more information on logging.

## 4.5 LDAP Data Views

This is an enhancement to the LDAP Data Views CUDB function.

### 4.5.1 Changes in Operation

This section describes changes to commands and command options, configuration parameters, alarms, counters, logging, and tools.

#### 4.5.1.1 Commands and Command Options

This section describes the new, modified, and removed CLI commands and command options in CUDB.

##### 4.5.1.1.1 CUDB CLI Commands and Command Options

The CUDB CLI command and command option changes are shown in Table 17. Refer to *CUDB Node Commands and Parameters*, Reference [6] for more information.

*Table 17 Summary of New, Modified, and Removed CUDB CLI Commands and Command Options*

Command	Command Option	Impact
cudbCheckLdapViewMapping	-v	New command option to get verbose error messages.



## 5 System Improvements

### 5.1 Improvements in CUDB 1

This section describes updates to the CUDB system that are not released as part of a specific function.

#### 5.1.1 Interface Improvements

*Table 18 Summary of New, Modified, and Removed CUDB Interfaces*

Type	Interface, Protocol	Nodes	Impact
Inter-node Interface	LDAP LDAP v3	CUDB-HLR CUDB-HSS CUDB-PG All Application FEs	Deleting parent entries of Distribution Entries (DEs) is not allowed and will result in Error Code 53 with the text message: Deleting parent of distribution entry is not allowed.
Other Interface	LDAP LDAP v3	CUDB	Implemented new LDAP Control  TimestampBasedConditionaUpdate for extended LDAP modify and delete operations, used internally by the Data Repair process.

#### 5.1.2 OAM Improvements

*Table 19 Summary of New, Modified, and Removed CUDB CLI Commands and Command Options, Parameters, and Logging Components*

Type	Command	Command Option	Impact
CLI Command option	cuDbCheckConsistency	-o   --object-tables	New command option used to check and report any difference between the OBJECT_CLASSES and MULTI_VALUE_OBJECTS tables.
CLI Command option	cuDbConsistencyMgr	--max-replica-lag	Modified command option, default value changed to 10000.
CLI Command	cuDbDsgMastershipChange		Modified the mastership change logic of the command. In case the destination node has a PLDB slave that is unable to synchronize with its master, then the mastership change request will be rejected. The --force option overrides this behavior.





**Table 19** Summary of New, Modified, and Removed CUDB CLI Commands and Command Options, Parameters, and Logging Components

Type	Command	Command Option	Impact
CLI Command option	cudbManageBCServer	-help	Removed command option.
CLI Command option	cudbRemoteTrust	-b   --banner	New command option used to disable the legal warning banner for internal CUDB logins.
Type	Class	Attribute	Impact
Class	CudbTrafficControlManager		New class serving as the container of the traffic blocking rules.
Class	CudbTrafficBlockingRule		New class used to block access to certain CUDB VIPs or services running on certain CUDB VIP ports. It is used to replace the existing procedure for node isolation.
Type	Logging component		
Logging component	CountersFw		
Logging component	Fault Management		
Logging component	Security		

Refer to *CUDB Node Commands and Parameters*, Reference [6] for more information on CLI commands and command options.

Refer to *CUDB Node Configuration Data Model Description*, Reference [1] for detailed information about the configuration objects and attributes.

Refer to *CUDB Node Logging Events*, Reference [11] for more information on logging.

**Note:** Consider the following changes related to logging:

- All application-related logging events in CUDB are reported using Linux `rsyslog` instead of `syslog-ng`. Refer to [RFC 3195: Reliable Delivery for syslog](#), Reference [16] for more information.

### 5.1.3 Notification Support Improvements

CUDB supports outbound notifications, so whenever a piece of data is modified in a subscriber profile, CUDB can send Simple Object Access Protocol (SOAP) based notifications towards the corresponding application FE.

#### 5.1.3.1 Impact

The `notifications` process now runs on all blades of the node.



## 5.2 OAM Improvements in CUDB 1.1

This section describes updates to the CUDB system that are not released as part of specific function.

**Table 20** Summary of New, Modified, and Removed CUDB CLI Commands and Command Options

Type	Command	Command Option	Impact
CLI Command	<code>cudbInstall</code>		Modified restricted command options.
CLI Command	<code>cudbMpStat</code>		This command is now restricted and can only be used by Ericsson personnel. The CPU load information it provided can now be retrieved by analyzing the appropriate KPI load counters. For more information about these counters, refer to <i>CUDB Performance Guide</i> , Reference [7].
CLI Command	<code>cudbReplicaRepair</code>		Modified command to execute extended LDAP modify or delete operations with the TimestampBaseConditionalUpdate LDAP Control during the Data Repair process.
CLI Command Option	<code>cudbSystemStatus</code>	<code>-p   --check-cudbprocess</code>	Error status of Cluster Supervisor process has additional output related to CS reporting in BC Cluster  Example:  [-W-] Cluster Supervisor..... .....Not running in: (Not reporting in BC Cluster) OAM1  or  [-W-] Cluster Supervisor..... .....Not running in: (Not reporting in BC Cluster) OAM1

Refer to *CUDB Node Commands and Parameters*, Reference [6] for more information on CLI commands and command options.

## 5.3 OAM Improvements in CUDB 1.2

This section describes updates to the CUDB system that are not released as part of a specific function.



**Table 21** Summary of New, Modified, and Removed CUDB CLI Commands and Command Options

Change Type	Command	Command Option	Impact
CLI Command	cudbSystemDataBackupAndRestore	-R	Deprecated command option.
CLI Command	cudbSystemStatus	-b   --bc-status	This command option is now restricted and can only be used by Ericsson personnel.
		-B   --new-bc-status	<p>New command option to print the status of the BC process. The output is the Node ID and application designations (OAM1, OAM2, and DS2_0IDS1_0IPL2, depending on PLDB deployment) instead of Node CUDB VIP address and LOTC designations.</p> <p>Example:</p> <pre>[Site 1] SM leader: Node 10 OAM1 Node 10 BC server in OAM1 ..... running BC server in OAM2 ..... running (Leader) BC server in PL2 ..... running</pre> <p>This is a default command option, that is, if no other command option is supplied for cudbSystemStatus, the command runs with -v -B -s -C -R -a -m -p options.</p> <p>If the node is disabled, the output will be Disabled instead of the BC server status.</p>

Refer to *CUDB Node Commands and Parameters*, Reference [6] for more information on CLI commands and command options.

## 6 Functions Planned for Coming Releases

This section provides changes in the product that are part of functions planned for coming releases.



## 6.1 Local Reads

This function allows data to be read from the closest DS replica. It is activated by setting `readModeInDS=LP`, only if the Deployment Flexibility Value Package is available. These modifications must not be used until the feature is complete. Legacy behavior is unchanged.

### 6.1.1 Changes in Interfaces

Table 22 Summary of New, Modified, and Removed CUDB Interfaces

Interface, Protocol	Nodes	Impact
LDAP LDAP v3	CUDB	Implemented a new LDAP Control "ReadMode" applicable only for search operations to override the default read mode in PL and DS.

## 6.2 SOAP Notifications Improvements

This feature enables the configuration of notification events for a set of entries in a single notification event through configuring the `dn` attribute of `monitor` or `monitorAll` type `CudbNotificationObjectClass` classes with Portable Operating System Interface (POSIX) extended regular expressions. The `dn` attribute can be configured with the full Distinguished Name (DN) or the partial DN of the entry. These modifications must not be used until the feature is complete. Legacy behavior is unchanged.

### 6.2.1 Changes in Operation

This section describes changes to commands and command options, parameters, alarms, counters, logging, and tools.

#### 6.2.1.1 Data Model

This section describes the new, modified, and removed parameters in CUDB. Refer to *CUDB Node Configuration Data Model Description*, Reference [1] for more information.

Table 23 Summary of New, Modified, and Removed CUDB Parameters

Object	Attribute	Impact
<code>CudbNotificationObjectClass</code>	<code>dn</code>	<ul style="list-style-type: none"><li>Modified attribute. The <code>dn</code> attribute can now contain the partial or full DN of the attribute or object to be monitored.</li><li>The full or partial DN can be configured using POSIX extended regular expressions.</li></ul>
<code>CudbNotificationEvent</code>	<code>numberOfSoapThreads</code>	New restricted attribute defining the number of SOAP threads to start for a specific notification event.



# Glossary

**BSP**

Blade Server Platform

**CEE**

Cloud Execution Environment

**CLI**

Command Line Interface

**DE**

Distribution Entry

**DIT**

Directory Information Tree

**DN**

Distinguished Name

**DS**

Data Store

**FEs**

Front Ends

**GA**

General Availability

**GEP3**

Generic Ericsson Processor version 3

**GEP5**

Generic Ericsson Processor version 5

**HLR**

Home Location Register

**HSS**

Home Subscriber Server

**IBU**

Installation Based Upgrade

**IMS**

IP Multimedia Subsystem

**KPI**

Key Performance Indicator

**NIR**

Network Impact Report

**OPI**

Operating Instruction

**OSS**

Operations Support System

**PLDB**

Processing Layer Database

**POSIX**

Portable Operating System Interface

**QoS**

Quality of Service

**SOAP**

Simple Object Access Protocol

**UDC**

User Data Consolidation

**UPG**

User Profile Gateway





## Reference List

### CUDB Documents

- [1] *CUDB Node Configuration Data Model Description*, 1/192 02-CSH 109 067/10
- [2] *CUDB SOAP Interwork Description*, 3/155 19-HDA 104 03/9
- [3] *CUDB LDAP Data Access*, 5/155 34-HDA 10403/10
- [4] *CUDB LDAP Interwork Description*, 1/155 19-HDA 104 03/10
- [5] *CUDB Node Fault Management Configuration Guide*, 3/1553-CSH 109 067/10
- [6] *CUDB Node Commands and Parameters*, 1/1553-CSH 109 067/10
- [7] *CUDB Performance Guide*, 4/1553-HDA 104 03/10
- [8] *CUDB Import and Export Procedures*, 6/1553-HDA 104 03/10
- [9] *CUDB Counters List*, 1/006 51-CSH 109 067/10
- [10] *CUDB Application Counters*, 10/155 34-HDA 104 03/10
- [11] *CUDB Node Logging Events*, 4/1553-CSH 109 067/10
- [12] *CUDB Technical Product Description*, 221 02-FGC 101 3147
- [13] *CUDB High Availability*, 7/155 34-HDA 104 03/10

### Other Ericsson Documents

- [14] *ESA Performance Management*, 3/1543-CSH 109 532
- [15] *ESA Fault Management*, 2/1543-CSH 109 532

### Other Documents and Online References

- [16] *Reliable Delivery for syslog* <https://www.ietf.org/rfc/rfc3195.txt>