

# CUDB Glossary of Terms and Acronyms

## TERMINOLOGY

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# 1 Introduction

This glossary defines the terms, definitions, acronyms and abbreviations used in the Customer Product Information (CPI) of the Ericsson Centralized User Database (CUDB).

## 1.1 Scope

This document defines the terms, definitions, acronyms and abbreviations in alphabetical order. Some acronyms may have more than one definition. In such cases, all definitions are listed.

## 1.2 Revision Information

### **Rev. A**

This document is based on 0033-HDA 104 03/9 with the following changes:

- Terminology updates throughout the document because of virtualized deployment support.
- Added BFD, CEE, CMX, DHCP, DNS, ECIM, ECMP, HOT, LM, LM-SA, OSPF, PNF, UUID, VM, VNF, and VRRP to the list of acronyms.
- Updated Payload term.
- Removed obsolete information.

### **Rev. B**

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

- Removed obsolete items.

### **Rev. C**

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

- Removed obsolete items.

### **Rev. D**

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

- Updated Collision Detection Counter (CDC).
- Removed obsolete items.



### **Rev. E**

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

- Updated AuC.
- Added IoT, NETCONF and POSIX to the list of acronyms.
- Added Back End (BE) and Cluster Supervisor (CS) to, and removed Circuit Switch (CS) from the list of acronyms.

### **Rev. F**

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

- Removed obsolete items.

### **Rev. G**

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

- Added Virtualized CUDB (vCUDB), Virtualized Infrastructure Manager (VIM), and VNF Lifecycle Manager (VNF-LCM).
- Removed obsolete item.



## 2 Terms

### Association

Linking Multi Service Consumers (MSC) to each other. Associations are supported in CUDB with Lightweight Directory Access Protocol (LDAP) entries with the following structure used to contain information on a set of MSCs:

```
assocId=<assocId>,ou=associations,<CUDB base DN>
```

### Asymmetrical Partition Situation

A system split where the number of visible sites differs from the number of non-visible sites. There are two types of asymmetrical split situations for a group:

- Majority Situation if the number of visible sites is higher than the number of non-visible sites.
- Minority Situation if the number of non-visible sites is higher than the number of visible sites.

### Auto Removed Site

A site is marked as auto removed (AR) by the nodes of the sites part of a majority partition when it is considered non-reachable (that is, not being part of the majority).

This can occur either because all the nodes in the auto removed site have failed, or because the communication links towards it are down.

### Binary Large Object

Binary Large Objects (BLOBs) are collections of binary data stored as a single entity.

### CUDB Node

The CUDB node is the building unit by which the CUDB system is divided. A CUDB node holds one Processing Layer (PL) Database (PLDB), and one or several Data Store (DS) Units accessed through an LDAP resource layer.

### CUDB Site

A CUDB site is a set of CUDB nodes interconnected by a virtual network infrastructure. The nodes of a CUDB site share the same network components used to connect the Internet Protocol (IP) backbone (switches, routers, and so on) that links the CUDB site with other CUDB sites.



|                            |   |
|----------------------------|---|
| <b>CUDB System</b>         | The CUDB system is a system consisting of interconnected CUDB nodes. CUDB is a distributed database system exposed as an LDAP directory, and made up of network-connected CUDB nodes spread over the operator network. Logically and lengthwise, the CUDB system is divided to two internal tiers depending on the function: Processing Layer (PL) and Data Store (DS) Layer. |
| <b>Data Distribution</b>   | Data distribution means the distribution of subscriber data in different DSGs. CUDB stores all the information of a specific subscriber in just one DSG, but the data of different subscribers can be allocated to different DSGs.  |
| <b>Data Reconciliation</b> | Data reconciliation is a system-wide process that fixes potential inconsistencies between the PLDB and the DSGs. Such inconsistencies can occur, for example, after mastership changes in the PLDB or the DSG. During data reconciliation, offending data is deleted from the DSG where it was hosted in CUDB.  |
| <b>Data Store Layer</b>    | The Data Store Layer holds all subscriber information split in disjoint partitions, that is DSGs. Physically, DSGs are a set of replicated data repositories that can be accessed by the PLDB. DSGs can not be directly accessed by the CUDB clients.   |
| <b>Default Zone</b>        | The default zone is a configurable, optional zone assigned to subscribers that are provisioned without a zone in the provisioning request. If no specific default zone is configured in the CUDB system, the Implicit Zone will be used as the default zone.  |
| <b>Distributed Search</b>  | Distributed search is a search query that encompasses several (potentially all) distributed storage units.  |





## Distribution Entry

A Distribution Entry (DE) is an LDAP entry stored in the PLDB containing distribution information. Its first-level children entries and below are stored in DSGs. CUDB has two types of built-in DEs:

- Multi-Service Consumers that match the following DN pattern: `mscId=<mscId>, ou=multiSCs, <CUDB Root>`
- Associations that match the following DN pattern: `assocId=<assocId>, ou=associations, <CUDB Root>`.

CUDB also allows the definition of custom DEs.

## Double Geographical Redundancy (1+1 Redundancy)

Double geographical redundancy (also known as 1+1 redundancy) is an optional redundancy configuration where each piece of subscriber data is stored in two different database clusters, hosted in different CUDB nodes of the CUDB system.

Consistency among database cluster replicas is achieved through asynchronous replication in a master-slave setup.

### DS Data

DS data is the data stored in the Data Store Unit Groups (DSG).

### DS Entry

A DS entry is an LDAP entry stored in the DSGs.

### DSG Master Replica

The DSG master replica (or simply DS master) is a particular instance of a DSG which is processing all traffic. DSG masters are dynamically assigned in the CUDB system. Internally, CUDB reaches the appropriate master replica during any operation.

### DSG Slave Replica

Every instance of a DSG that is not the DSG master replica is a DSG slave replica (or simply DS slave). Slave replicas can process traffic related to massive search operations, subscriber-specific queries, dirty-reads in split situations, and can also perform counter collection. However, slave replicas do not receive regular subscriber traffic. DSG slave replicas are synchronized with the DSG master by replication.

### DS Unit

A DS Unit is a clustered database system in which all data in-memory store a replica of the data belonging to a subscriber partition.

**Degraded DS Unit**

A DS Unit is degraded if one of the two database processes in the DS Unit fails.

**DS Unit Group**

A DS Unit Group (DSG) is a subscriber partition, the basic distribution unit of subscriber data. It contains the DSG master replica, and optionally one or two DSG slave replica.

**Entry**

An entry is a piece of data stored in the databases of the CUDB system that comprises an entity.

**Fixed Entry**

A fixed entry is an LDAP entry provided by CUDB during installation as part of the basic Directory Information Tree (DIT) for CUDB.

For example, the CUDB root entry is a fixed entry of the system: `ou=associations,<CUDB Root Entry>`

**Geographical Redundancy**

Geographical redundancy is the level of DSG redundancy configured on a CUDB system. It specifies the number of DSG slaves replicas configured for each DSG. In terms of redundancy level, the following two configurations are supported:

- Double geographical redundancy (each DSG has 1 slave replica)
- Triple geographical redundancy (each DSG has 2 slave replicas)

**High Availability**

The High Availability feature ensures that the CUDB system is prepared to protect and recover data from interruptions or failures automatically, and in a short time.

**Identity**

Identity is the identifier of a subscriber. Identities in CUDB are supported by special LDAP alias entries located under the `ou=identities,<CUDB base DN>` branch that points to the corresponding subscriber entry.

Identities are optimized for efficient memory occupation and to provide fast access to the subscriber data.

**Implicit Zone**

An implicit zone is a reserved and non-configurable zone in a CUDB system. Implicit zones are assigned to CUDB nodes that are not assigned to any particular zone when created (or if they were created previously to feature activation).

**Inconsistency**

Inconsistency in CUDB means that a DSG has an orphan entry. An orphan entry is an entry that has no matching parent entry in the PLDB.

**LDAP Directory Information Tree**

The LDAP Directory Information Tree (also called directory tree, or DIT) is a hierarchically organized collection of LDAP entries.

Information in an LDAP directory is organized into one or several hierarchical structures. The top of the hierarchy contains the base entry, while the rest of the entries are organized beneath the base entry in a tree-like structure. Each node in the hierarchical structure is an entry, defined with a Distinguished Name (DN) and several attributes.

**LDAP Front End**

The LDAP Front End (FE) is an element in a CUDB node that provides LDAP processing. It is in charge of handling all LDAP requests received from application FEs, from the provisioning system, and from other CUDB nodes received through proxy.

**Majority Situation**

In a System Split situation, a CUDB site is in majority split situation if the number of visible sites from the affected CUDB site is greater than the half of the total number of CUDB sites in the CUDB system.

**Note:** Auto removed sites are not counted as part of the total number of CUDB sites.

**Massive Search**

Massive searches are search queries to the CUDB system that return multiple (potentially a multitude of) entries from a single, several, or potentially all database units.

**Minority Situation**

In a System Split situation, a CUDB site is in minority split situation if the number of visible sites from the affected CUDB site is less than the half of the total number of CUDB sites in the CUDB system.

**Note:** Auto removed sites are not counted as part of the total number of CUDB sites.



### **Multi Service Consumer**

The Multi Service Consumer (MSC) is a network entity that contains a set of services from the network. The MSC is identified by one or several identities for each service. In some cases, these identities are shared to contain more than one service, or linked by a specific relation. MSCs are supported with LDAP Subscriber Entries with the following structure: `mscId=<assocId>,ou=multiSCs,<CUDB base DN>`.

### **NETCONF**

The Network Configuration Protocol (NETCONF) is a network management protocol developed and standardized by the IETF. NETCONF provides mechanisms to install, manipulate, and delete the configuration of network devices.

### **Notification**

Notifications are messages sent from the CUDB system to another system whenever a monitored data element stored in CUDB has changed.

### **Optimized Search**

Optimized search is a search query that spans several (potentially all) distributed storage units.

### **Payload Blade**

In native deployments on BSP 8100, blades that provide storage capacity for PLDB and DSG, as well as LDAP processing in a CUDB node. They boot over the network and depend on the services provided by the System Controllers (SCs).

Every blade in a CUDB system that runs unit SW processes (as opposed to the SCs) is considered a payload blade.

### **Payload Virtual Machine**

In cloud deployments, Virtual Machines (VMs) that provide storage capacity for PLDB and DSG, as well as LDAP processing in a CUDB node. They boot over the network and depend on the services provided by the System Controllers (SCs).

Every VM in a CUDB system that runs unit SW processes (as opposed to the SCs) is considered a payload VM.



## **Processing Layer**

Logically, the Processing Layer (PL) is the northbound CUDB layer, processing client LDAP requests with the ability to locate and retrieve any subscriber information requested over the entire Data Store Layer. The Processing Layer on each CUDB node contains LDAP protocol handling information and a replicated copy of the PLDB storing the relationship of all subscriber identities, and the physical location of application FE profiles across the CUDB Data Store Layer.

## **Processing Layer Database**

The Processing Layer Database (PLDB) is a clustered database replicated in all CUDB nodes containing the indexing information for the data stored in the DSGs. It also stores the complete set of subscriber identities and can be used to store common subscriber or application FE data, as well as any other data.

## **PLDB Data**

PLDB data is the data stored in the PLDB. Such data includes the DEs, administrative data, and the common data of all CUDB nodes.

## **PLDB Entry**

PLDB entries are LDAP entries stored in the PLDB.

## **Reallocation**

Reallocation is the process of moving stored data from one DSG to another DSG to provide administrative management of the location of subscriber or resource data. Reallocation is also known as geographical subscription and resource management.

## **Redundancy Level**

The redundancy level is defined as the number of LDAP FEs that can be taken down without the CUDB node losing its required level of performance.

## **Replication Channel**

Replication channels are the communication lines established between the replication servers in each DSG. Master and slave replicas have their own replication channels.

## **RESTful**

In computing, Representational State Transfer (REST) is the software architectural style of the World Wide Web. To the extent that systems conform to the constraints of REST they can be called RESTful.

## **Safekeeping**

Safekeeping means that data is stored in such a physical or logical way (or both) that minimizes the chance of unexpected events resulting in data corruption or the complete loss of data.



|  |  |
|--|--|
| <b>Scale-out</b>   | In distributed database terms, scale-out refers to increasing the overall data storage capacity of a database by adding new infrastructure components.   |
| <b>Search Index</b>                                      | Search indexes are indexes used to facilitate massive search queries.  |
| <b>Symmetrical Split Situation</b>                       | <p>Also known as split brain situation. In a System Split situation, a CUDB site is in symmetrical split situation if the number of visible sites and non-visible sites from the affected CUDB site is the same.</p> <p><b>Note:</b> Auto removed sites are not counted as part of the total number of CUDB sites.</p>   |
| <b>System Controller</b>                                 | The System Controllers (SCs) centralize the management functions of the Linux cluster in each CUDB node as well as Operation and Maintenance (OAM) and other auxiliary software processes. Each node contains two SCs for redundancy purposes. The SCs boot from the disk storage system and run services to support the payloads in the CUDB node.  |
| <b>System Split Situation</b>                            | A CUDB system can suffer either network, node, or site failures that can split the system in different subdivisions or partitions, or cause single site failures. All the CUDB nodes are associated with a site. A site is considered visible from other sites as long as other sites can connect and report to the site. Site visibility is always perceived from one of the CUDB nodes of a site which is the site leader. Whenever there is one or a group of sites which is not visible, the leader considers to be in a Split Situation. Once the split situation is detected, the number of sites in the group is compared with the number of sites in the group of non-visible sites and the type of split situation of the visible group is determined depending on this comparison. |
| <b>Triple Geographical Redundancy (1+1+1 Redundancy)</b> | <p>Triple geographical redundancy (also known as 1+1+1 redundancy) is an optional redundancy configuration where three copies of the same data partition are replicated to different CUDB nodes in the CUDB system.</p> <p>One of these copies is considered the master replica and receives all read and write operations. The other two copies are considered slave replicas, and are replicated asynchronously in case the master replica is updated.</p>   |

**Visibility**

A CUDB node located in one site has visibility of another site if it can communicate with at least one CUDB node located in this other site.

**Zone**

The zone is a geographical area in which a set of CUDB nodes are physically located.







# Glossary

**3GPP**

Third Generation Partnership Project

**3PP**

Third Party Product

**AAA**

Authentication, Authorization and Accounting

**ACL**

Access Control List

**ADL**

Active DS List

**ALB**

Abstract Load Balancer

**AMC**

Automatic Mastership Change

**AMF**

Availability Management Framework

**aPBF**

Advanced Policy-Based Forwarding

**API**

Application Programming Interface

**AR**

Auto Removed

**ARP**

Address Resolution Protocol

**ASCII**

American Standard Code for Information Interchange

**AuC**

Authentication Center

**BC**

Blackboard Coordination

**BE**

Back End

**BFD**

Bidirectional Forwarding Detection

**BIOS**

Basic Input/Output System

**BLOB**

Binary Large Object

**BSP**

Blade Server Platform

**CA**

Certification Authority

**CAS**

Customer Administration System

**CBA**

Component Based Architecture

**CDC**

Collision Detection Counter

**CEE**

Cloud Execution Environment

**CLI**

Command Line Interface

**CLM**

Cluster Management

**CM**

Configuration Management

**CMW**

Core Middleware

**CMX**

Component Main Switch

**CMXB**

Component Main Switch Board

**CMXB3**

Component Main Switch Board, version 3

**CPI**

Customer Product Information

**CS**

Cluster Supervisor

**CSN**

Change Sequence Number

**CUDB**

Ericsson Centralized User Database

**DAC**

Data Availability Coordination

**DB**

Database

**DE**

Distribution Entry

**DHCP**

Dynamic Host Configuration Protocol

**DIT**

Directory Information Tree

**DL**

Data Layer

**DLA**

Data Layered Architecture

**DM**

Data Model

**DN**

Distinguished Name

**DNS**

Domain Name System

**DS**

Data Store

**DSCP**

Differentiated Services Code Point

**DSG**

DS Unit Group

**ECIM**

Ericsson Common Information Model

**ECMP**

Equal-Cost Multipath

**EGEM2**

Enhanced Generic Ericsson Magazine version 2

**EIR**

Equipment Identity Register

**ENUM**

E.164 Number Mapping

**EPC**

Evolved Packet Core

**ESA**

Ericsson SNMP Agent

**ETSI**

European Telecommunication Standard Institute

**eVIP**

Evolved Virtual IP

**FC**

Fault Code

**FE**

Front End

**FM**

Fault Management

**FQDN**

Fully Qualified Domain Name

**FTP**

File Transport Protocol

**GbE**

Gigabit Ethernet

**GEP**

Generic Ericsson Processor board

**GEP3**

Generic Ericsson Processor version 3

**GEP5**

Generic Ericsson Processor version 5

**GPRS**

General Packet Radio Service

**GUI**

Graphical User Interface

**HA**

High Availability

**HLR**

Home Location Register

**HLR-FE**

HLR Front End

**HOT**

Heat Orchestration Template

**HSS**

Home Subscriber Server

**HTTP**

Hypertext Transfer Protocol

**HTTPS**

Hypertext Transfer Protocol Secure

**HW**

Hardware

**IANA**

Internet Assigned Numbers Authority

**ICMP**

Internet Control Message Protocol

**IETF**

Internet Engineering Task Force

**IMS**

IP Multimedia Subsystem

**IMSI**

International Mobile Subscriber Identity

**IoT**

Internet of Things

**IP**

Internet Protocol

**IPMI**

Intelligent Platform Management Interface

**IPSec**

IP Security

**ISDN**

Integrated Services Digital Network

**ISP**

In-Service Performance

**ITU**

International Telecommunication Union

**JMX**

Java Management Extension

**KPI**

Key Performance Indicator

**L3**

Layer 3

**LAG**

Link Aggregation

**LAN**

Local Area Network

**LAND**

Local Area Network Denial

**LDAP**

Lightweight Directory Access Protocol

**LDAP FE**

LDAP Front End

**LDAPS**

LDAP over SSL

**LDE**

Linux® Distribution Extension (This component can also appear in the documentation as LOTC and LDEwS.)

**LDEwS**

Linux® Distribution Extension with SLES (This component can also appear in the documentation as LOTC and LDE.)

**LDIF**

LDAP Data Interchangeable Format

**LOTC**

Linux Open Telecom Cluster (This component can also appear in the documentation as LDE and LDEwS.)

**LM**

License Manager

**M2M**

Machine-to-Machine

**MAC**

Media Access Control

**MNP**

Mobile Number Portability

**MSC**

Multi Service Consumer

**MSISDN**

Mobile Station ISDN Number

**MW**

Middleware

**NBI**

North Bound Interface

**NDB**

Network Database

**NE**

Network Element

**NETCONF**

Network Configuration Protocol

**NFS**

Network File System

**NIR**

Network Impact Report

**NMS**

Network Management System

**NTP**

Network Time Protocol

**OAM**

Operation and Maintenance

**OID**

Object Identifier

**OPI**

Operating Instruction

**OS**

Operating System

**OSPF**

Open Shortest Path First

**OU**

Organizational Unit

**PBIST**

Programmable Built-In Self-Test

**PCRF**

Policy and Charging Rules Function

**PDU**

Power Distribution Unit

**PG**

Provisioning Gateway

**PL**

Processing Layer

**PLDB**

Processing Layer Database

**PM**

Performance Management

**POSIX**

Portable Operating System Interface

**PS**

Packet Switch

**PXE**

Preboot eXecution Environment

**QoS**

Quality Of Service

**RAID**

Redundant Arrays of Inexpensive Disks



**RDBMS**  
Relational Data Base Management System

**RDN**  
Relative Distinguished Name

**RFC**  
Request For Comments

**RMI**  
Remote Method Interface

**RPI**  
Replication Progress Information

**RPM**  
Red Hat Package Manager

**SA**  
Service Availability

**SAF**  
Service Availability Forum

**SAPC**  
Service-Aware Policy Controller

**SASL**  
Simple Authentication and Security Layer

**SC**  
System Controller

**SCP**  
Secure Copy Protocol

**SCXB3**  
System Control Switch Board version 3

**SDL**  
System DS List

**SDP**  
Software Delivery Package

**SFTP**  
Secure File Transfer Protocol

**SG**  
Security Gateway

**SGSN**  
Serving GPRS Support Node

**SLF**  
Subscription Locator Function

**SLF4J**  
Simple Logging Facade for Java

**SM**  
System Monitor

**SNMP**  
Simple Network Management Protocol

**SOAP**  
Simple Object Access Protocol

**SPoA**  
Single Point of Access

**SQL**  
Structured Query Language

**SSH**  
Secure Shell

**SSL**  
Secure Socket Layer

**SU**  
Service Unit

**SW**  
Software

**TAM**  
Take-All-Masters

**TC**  
Transaction Coordinator

**TFTP**  
Trivial File Transfer Protocol

**TLS**  
Transport Layer Security

**TPS**  
Transactions Per Second

**UDC**  
User Data Consolidation

**UDP**  
User Datagram Protocol



**UPG**

User Profile Gateway

**URI**

Uniform Resource Identifier

**UUID**

Universally Unique Identifier

**vCUDB**

Virtualized CUDB

**VIM**

Virtualized Infrastructure Manager

**VIP**

Virtual IP Address

**VLAN**

Virtual Local Area Network

**VM**

Virtual Machine

**VNF**

Virtualized Network Function

**VNF-LCM**

VNF Lifecycle Manager

**VPN**

Virtual Private Network

**VRRP**

Virtual Router Redundancy Protocol

**VS**

Virtual Server

**WRR**

Weighted Round Robin

**XML**

eXtensible Markup Language