

IPWorks ERH and NPDB Interface-LDAP

INTERWORK DESCRIPTION

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1 Introduction

This document describes the LDAP interface between the IPWorks External Resolution Handler (ERH) and Number Portability Database (NPDB). This document provides the reference Directory Information Tree (DIT) for accessing the Number Portability Handler (NPH) data. It specifies the LDAP operations to access the NPDB.

Scope

This document covers the following topics:

- Interface Overview
- Interface Role
- Services
- Encapsulation and Addressing
- LDAP Directory Information Tree
- NPH Entries
- Procedures

1.1 Prerequisites

Not applicable.

1.2 Related Information

Trademark information, typographic conventions, definition and explanation of acronyms and terminology can be found in the following documents:

- *Trademark Information*, Reference [3]
- *Glossary of Terms and Acronyms*, Reference [1]
- *Typographic Conventions*, Reference [2]

For the standards related to this interface, see References.



2 Interface Overview

This section describes the LDAP interface between IPWorks ERH and NPDB. Figure 1 shows the interface entities.

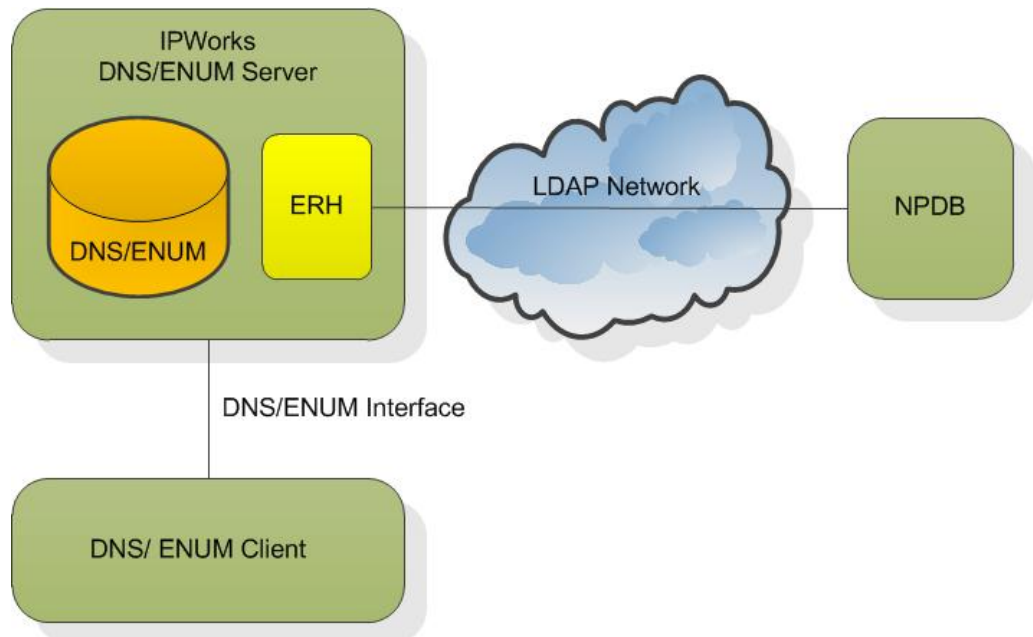


Figure 1 LDAP Interface between IPWorks ERH and NPDB

2.1 Interface Role

The interface between the IPWorks ERH and NPDB uses the LDAP protocol to access the NPDB and provides the reference DIT for accessing the NPH data. The interface also specifies the LDAP operations offered by the NPDB.

2.2 Services

The service offered by the IPWorks ERH and NPDB interface-LDAP is shown in Table 1.

Table 1 Offered Service

Offered Service	Description
Search	Specifies the LDAP offered by the NPDB.

2.3 Encapsulation and Addressing

This section describes what lower-level protocol the IPWorks ERH and NPDB interface-LDAP uses.

- TCP

Figure 2 shows the protocol stack used in 3GPP network.

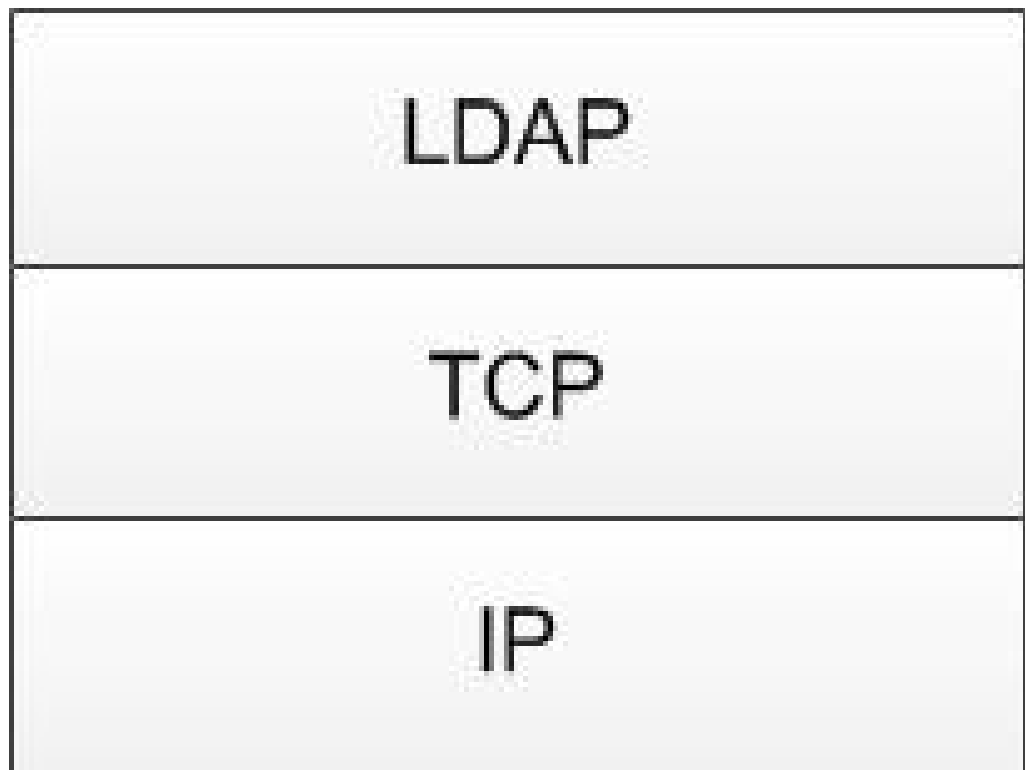


Figure 2 Protocol Stack



3 LDAP Directory Information Tree

The LDAP hierarchy is a tree pattern. This tree is called the Directory Information Tree (DIT) and it is composed of entries that have one or more attributes. Those attributes names and its value form the Relative Distinguished Name (RDN) of an object. The concatenation of the RDNs of the sequence of entries from a particular object to the root entry of the tree forms the Distinguished Name (DN). This DN uniquely identifies an object inside the tree.

According to the previous explanation, each entry in the DIT has one or more attributes, and a set of attributes characterizing that entry.

Figure 3 shows the container data levels distribution offered by the NPDB for NPH.

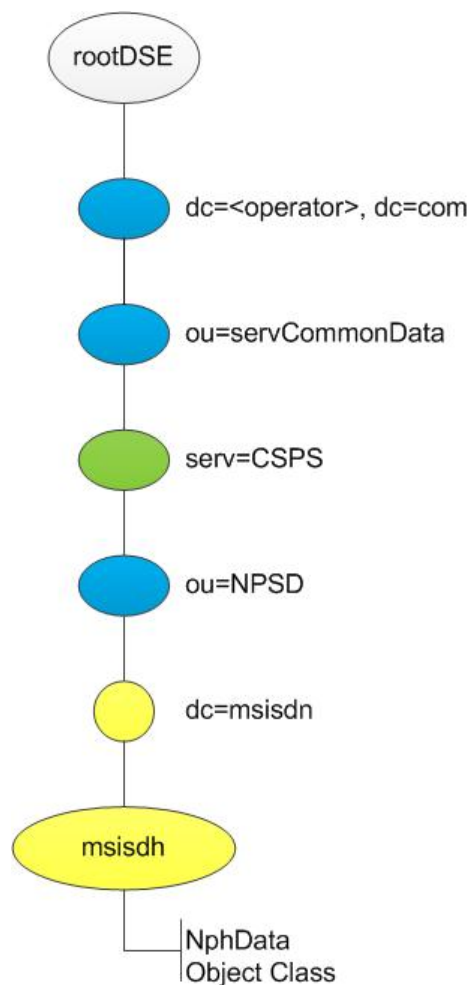


Figure 3 NPH Directory Information Tree



3.1 Number Portability Service Data

As shown in Figure 3, the Number Portability Service data is placed under container level "servCommonData" branch as a child under "serv=CSPS", the CSPPS services. Under this level, the number portability data is placed under container level "ou=NPSD". The key data to identify a subscriber in the NPH DIT is the **MSISDN**. Both provisioning and traffic operation are performed through the "servCommonData" branch.

An example that the DN gets access to the number portability data entries is as follows:

"MSISDN=<MSISDNnumber>, dc=msisdn, ou=NPSD, serv=CSPPS, ou=servCommonData, <CUDB root entry>"

4 NPH Entries

The tables in the following chapters specify all the entries for the NPH application as shown in Figure 3.

The format of the tables has a header and three different columns with the following information:

Entry name ⁽¹⁾		
Attributes ⁽²⁾	Format, Remarks ⁽³⁾	Examples

(1) For more details, see RFC4511.

(2) Brief description of the entry and the OIDs of the entry.

(3) Description of the LDAP syntax characteristics of the entry.

According to LDAP standard RFC 4512, an entry can be initiated with attributes corresponding to several object classes.

For more information of object classes and the corresponding attributes for number portability data, see Reference [4].

4.1 CSPA Service Common Data Entry

The entry **CSPA** is the container for the service common data, the NPH application data, in the NPDB. Table 2 specifies this entry.

Table 2 CSPA Service Common Data Entry

CSPA		
Attributes	Format, Remarks	Examples
serv This attribute identifies the container entry for the CSPA data.	Type: IA5 String Value range 1 - 32 characters Value = "CSPA" Required: mandatory	"CSPA"

4.2 NPSP Data Entry

The entry **NPSP** is the container for the number portability service data in the NPDB. Table 3 specifies this entry.

*Table 3 NPSD Data Entry*

NPSD		
Attributes	Format, Remarks	Examples
ou This attribute identifies the container entry for the NPSD data.	Type: IA5 String Value range 1 - 32 characters Value = "NPSD" Required: mandatory	"NPSD"

4.3 msisdn Entry

The entry **msisdn** is the container for the number portability service data entries accessing by **MSISDN** in the NPDB. Table 4 specifies this entry.

Table 4 msisdn Entry

msisdn		
Attributes	Format, Remarks	Examples
dc This attribute identifies the container entry for NPSD data.	Type: IA5 String Value range 1 - 32 characters Value = "msisdn" Required: mandatory	"msisdn"

4.4 Number Portability Identity Entry

The entry **MSISDN** is the container for all number portability identity based on **MSISDN** in the NPDB. Table 5 specifies this entry.



Table 5 Number Portability Identity Entry

MSISDN		
Attributes	Format, Remarks	Examples
MSISDN This attribute identifies the mobile number portability subscriber identifier and corresponds to the Mobile Subscriber ISDN Number.	Type: Numeric String Value range: 5 - 15 digits (each digit is 0-9) Required: mandatory	See Table 6.

Table 6 Example of Numeric String

<p>The MSISDN number (which store the following value represented in decimal format: 34913378) is carried in the LDAP interface as a sequence of 8 bytes (each digit is Numeric String encoded).</p> <p>octet 1 = 0011 0011 octet 2 = 0011 0100 octet 3 = 0011 1001 octet 4 = 0011 0001 octet 5 = 0011 0011 octet 6 = 0011 0011 octet 7 = 0011 0111 octet 8 = 0011 1000</p>
--

Table 7 shows the subscription network prefix.

Table 7 NPREFIX

The number of octets and digits must be within the following ranges: 1 - 5 Octets 1-10 Digits (each digit is 0 - 9 or h'A - h'E) F is used as filler when the digit is not present.								
B7	B6	B5	B4	B3	B2	B1	B0	
digit 2 (if present)				digit 1				octet1
digit 4 (if present)				digit 3 (if present)				octet2
digit 6 (if present)				digit 5 (if present)				octet3
digit 8 (if present)				digit 7 (if present)				octet4
digit 10 (if present)				digit 9 (if present)				octet5

The subscription network prefix is carried as shown in Table 8.



Table 8 NPREFIX Example

The subscription network prefix (which store the following value represented in hexadecimal format: 1234B) is carried in the LDAP interface as a sequence of 3 octets:

octet 1 = 0010 0001

octet 2 = 0100 0011

octet 3 = 1111 1011

5 Procedures

This section describes the procedure used by the LDAP interfaces between IPWorks ERH and NPDB.

The following LDAP operation is used:

- Search operation

5.1 Number Portability Data Search

Search allows operation to request a server to return a set of entries matching a complex search criterion. This operation can be used to read attributes from:

- A single entry
- Entries immediately subordinate to a particular entry
- A whole subtree of entries

For details, refer to RFC 4511.

To search the number portability subscriber data which is an entry of **NphData**, an LDAP search operation must be performed. This **NphData** is a structural object class.

Searching operation searches a specific or a set of number portability data for a specific number portability identity. This operation can be done from entry **MSISDN** with:

- *scope* sets to *wholeSubtree*.
- *attributevalueassertion* sets to the specific attribute or attributes what the search applies for.

Table 9 shows an example, searching the subscription network of a specific mobile number portability subscriber.

Table 9 Example of Searching Request

SearchRequest	
baseObject	dn: MSISDN:<msisdnNumber>, dc = msisdn, ou = NPSD, serv = CSPS, ou = servCommonData, <CUDB root entry>
scope	wholeSubtree
derefAliases	neverDerefAliases



filter	(objectclass=*)
attributes	NPREFIX



6 Formal Syntax

Not applicable.





7 Related Standards

This section states the related standards and explains any deviations from them.

- Lightweight Directory Access Protocol (LDAP): The Protocol
- Lightweight Directory Access Protocol (LDAP): Directory Information Models





Reference List

IPWorks Library Documents

- [1] *Glossary of Terms and Acronyms*
- [2] *Typographic Conventions*
- [3] *Trademark Information*

PCAT and Other Ericsson Documents

- [4] *NPH LDAP Data Schema*, 3/155 19-APR 101 58/3

Standards

- [5] [Lightweight Directory Access Protocol \(LDAP\): The Protocol RFC4511](#)
- [6] [Lightweight Directory Access Protocol \(LDAP\): Directory Information Models RFC4512](#)