Oracle® Communications
Network Charging and Control
CDMA U-CA-IS41 Technical Guide
Release 5.0.1

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About This Document

Scope
The scope of this document includes all the information required to install, configure and administer the U-CA-IS41 (CDMA) component. It does not include a detailed design of the service.

Audience
This guide was written primarily for system administrators and persons installing, configuring and administering the U-CA-IS41 (CDMA). However, sections of the document may be useful to anyone requiring an introduction to the application.

Prerequisites
A solid understanding of UNIX and a familiarity with IN concepts are an essential prerequisite for safely using the information contained in this technical guide. Attempting to install, remove, configure or otherwise alter the described system without the appropriate background skills, could cause damage to the system; including temporary or permanent incorrect operation, loss of service, and may render your system beyond recovery.

Although it is not a prerequisite to using this guide, familiarity with the target platform would be an advantage.

This manual describes system tasks that should only be carried out by suitably trained operators.

Related documents
The following documents are related to this document:

- Oracle Communications Network Charging and Control Service Logic Execution Environment Technical Guide
- Oracle Communications Network Charging and Control Service Management System Technical Guide
- Oracle Communications Network Charging and Control Service Management System User's Guide
- Oracle Communications Network Charging and Control Advanced Control Services Technical Guide
- Oracle Communications Network Charging and Control Advanced Control Services User's Guide
- Oracle Communications Network Charging and Control SIGTRAN Technical Guide
Document Conventions

Typographical Conventions

The following terms and typographical conventions are used in the Oracle Communications Network Charging and Control (NCC) documentation.

<table>
<thead>
<tr>
<th>Formatting convention</th>
<th>Type of information</th>
</tr>
</thead>
</table>
| **Special Bold**      | Items you must select, such as names of tabs.  
|                       | Names of database tables and fields. |
| **Italics**           | Name of a document, chapter, topic or other publication.  
|                       | Emphasis within text. |
| **Button**            | The name of a button to click or a key to press.  
|                       | **Example:** To close the window, either click **Close**, or press **Esc**. |
| **Key+Key**           | Key combinations for which the user must press and hold down one key and then press another.  
|                       | **Example:** Ctrl+P, or Alt+F4. |
| **Monospace**         | Examples of code or standard output. |
| **Monospace Bold**    | Text that you must enter. |
| **variable**          | Used to indicate variables or text that should be replaced. |
| **menu option > menu option >** | Used to indicate the cascading menu option to be selected, or the location path of a file.  
|                       | **Example:** Operator Functions > Report Functions  
|                       | Example: /IN/html/SMS/HelpText/ |
| **hypertext link**    | Used to indicate a hypertext link on an HTML page. |

Specialized terms and acronyms are defined in the **Glossary** at the end of this guide.
Chapter 1

System Overview

Overview

Introduction

This chapter provides a high-level overview of the application. It explains the basic functionality of the system and lists the main components.

It is not intended to advise on any specific Oracle Communications Network Charging and Control (NCC) network or service implications of the product.

In this chapter

This chapter contains the following topics.

What is CDMA? 1
Non-WinRoaming 3
Alarms, Statistics, Reports and EDRs 5

What is CDMA?

Introduction

The U-CA-IS41 (CDMA) enables operators to make use of the IS-41 protocol to provide telephone services to end users on CDMA networks.

CDMA exploits existing products and standard protocols in order to provide a cost-effective solution that potentially can be interfaced to a variety of service platforms.
Diagram

The diagram below illustrates the sub-system components that comprise the U-CA-IS41 (CDMA) service, including external interfaces.

![Diagram of sub-system components](image)

Component descriptions

This table describes the main components involved in the CDMA application.

<table>
<thead>
<tr>
<th>Component</th>
<th>Description</th>
<th>Further Information</th>
</tr>
</thead>
<tbody>
<tr>
<td>cdmagw</td>
<td>cdmagw is the main binary for the CDMA. It is responsible for handling CDMA interactions with MSCs and HLRs, and for triggering appropriate IN interactions to slee_acs. Supports SUA by soft linking to cdmagw_sua (on page 26). Supports M3UA by soft linking to cdmagw_m3ua (on page 26).</td>
<td>cdmagw (on page 25)</td>
</tr>
<tr>
<td>slee_acs</td>
<td>Provides the main call processing and service logic.</td>
<td>ACS Technical Guide</td>
</tr>
</tbody>
</table>
Possible processing stages

The following diagram illustrates the possible processing stages initiated by CDMA when an IS-41 message is received from the MSC, converted to INAP and forwarded to the SCF.

Non-WinRoaming

non-WinRoaming traffic

CDMA supports non-WinRoaming traffic, based on relaying pre-IS-826 calls (that is, IS-771 or earlier) from the HLR by informing the requester to retrigger to a local IS-826 capable MSC. The local MSC will then perform IS-826 interactions with the SLC, to permit real-time charging to occur.

CDMA supports real-time control of MO voice calls in a non-WIN capable VPLMN (foreign network). CDMA supports this by causing the calls in the non-WIN capable VPLMN (foreign network) to be re-routed back to the WIN-capable HPLMN (home network) for re-origination of an IS-826 controlled call.
Network element requirements

This table describes the standards compliance requirements for the network elements needed to support this solution.

<table>
<thead>
<tr>
<th>Network element</th>
<th>Requirement specification</th>
</tr>
</thead>
</table>
| Foreign MSC     | Must support ANSI-41 as per:  
|                 | - TIA/EIA ANSI-41D, Cellular Radiotelecommunications Intersystem Operations, December 1997  
|                 | - 6.4.2.30 OriginationRequest (ORREQ)  
|                 | - 6.5.2.90 OriginationTriggers  
|                 | - OriginationTriggers contains a value for All Origination) |
| Home HLR        | Must support the IS-771 ORREQ relay capability as per:  
| Home MSC        | Must be IS-826 WIN capable as per:  

Non-WinRoaming processing

This process describes how non-WinRoaming calls are handled.

<table>
<thead>
<tr>
<th>Stage</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>A new IS-771 call arrives at cdmagw (on page 25). If OriginationTriggers (ORIGTRIG) Value = All Origination, cdmagw attempts to apply the non-WinRoaming treatment. Otherwise cdmagw continues using the normal message flow (that is, it sends an empty (successful) ORREQ reply).</td>
</tr>
</tbody>
</table>
| 2     | cdmagw determines the GMSC to use, based on the MSID in the call via the MSID prefix to GMSC name mapping in the file specified by msidGmscFile (on page 17). The gmscName (on page 20) is later used to determine which TSAN range to use. If no msidGmscFile is specified, this lookup is not used. If no GMSC is found:  
|       | - The call will be assigned the default range specified in defaultTsanPool (on page 13).  
<p>|       | - If no default TSANs are available, AccessDeniedReason is set to noTsanDeniedReason (on page 18). |
| 3     | cdmagw allocates a TSAN for storing call data. cdmagw stores the IS-771 call data required for charging purposes by the following IS-826 call, indexed on TSAN. This data is globally available to all following calls, so it can be retrieved when the corresponding IS-826 call is retrigged. (Use nonWinRoamDataTimeout (on page 17) to timeout call data if no retrigged call arrives.) cdmagw uses the next available TSAN from one of the ranges of TSANs which corresponds to the GMSC. If no free TSAN can be allocated, it drops the call by sending back an orreq with AccessDeniedReason set to noTsanDeniedReason (on page 18). |
| 4     | cdmagw extracts relevant telephony data and sends back a modified orreq message containing the MSCID, and the TSAN in PSTN Termination-&gt;DestinationDigits. |
| 5     | cdmagw waits for a IS-826 ANLYZD originated by the IS-771 call. When an IS-826 ANYLZD arrives, cdmagw determines if data associated with a corresponding IS-771 call is available. |</p>
<table>
<thead>
<tr>
<th>Stage</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>6</td>
<td>If the IS-826 has TRIGTYPE=Specific_Called_Party_Digit_String, cdmagw extracts the TSAN from the Mobile Directory Number (MDN) field of the first ANLYZD message. cdmagw uses the TSAN as a key to check the call data for previously encountered IS-771 call data. This data is stored for triggering to slee_acs.</td>
</tr>
<tr>
<td>7</td>
<td>A second ANLYZD message may be received containing data (specifically the Original Calling Party number) which was not received in the first. If waitForCallingParty (on page 22) = true, cdmagw waits for the Original Calling Party number to be received in CallingPartyNumberDigits1 before the call progress. The second ANLYZD message doesn't include a TSAN, so cdmagw uses the BillingID to map to the call data instead. If a second ANLYZD is received and the call has already been authorized, an empty anlyzd response is sent back.</td>
</tr>
</tbody>
</table>
| 8     | cdmagw sends Analyzed Response (anlyzd) message with:  
- The original dialed number in the Digits (dialed) parameter  
- The full originating TriggerAddressList parameter |

**Supported ANLYZD parameters**

The following parameters are supported in ANLYZD messages:
- BillingId
- Digits (Dialed)
- TriggerType
- CallingPartyNumberDigits1
- DestinationDigits
- MSCID
- MobileDirectoryNumber
- MSID (MIN or IMSI)

**Alarms, Statistics, Reports and EDRs**

**Alarms**

CDMA uses the SMS integrated alarms collection, viewing and forwarding system. The alarms generated by all components of CDMA are consolidated on the SMS and stored in a centralised alarm database.

The operator can:
- View the alarms through the alarm viewer built into the SMS screens
- Forward all alarms to an integrated external fault management system using SNMP v1 or v3.
Alarms can be automatically deleted from the SMF alarm database after a configurable period.

For more information about the:
- Specific alarms generated by CDMA, see *CDMA Alarms Guide*.
- SMS alarms subsystem, see *SMS User's Guide*. |
Statistics

The following table shows the statistics that will be generated by the cdmagw service if statistics are enabled. For more information about how cdmagw generates statistics, see Configuration (on page 7).

<table>
<thead>
<tr>
<th>Statistic ID</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>NUM_ORREQ_INVOKE</td>
<td>Total origination requests.</td>
</tr>
<tr>
<td>NUM_ORREQ_RESPONSE</td>
<td>Total origination responses.</td>
</tr>
<tr>
<td>NUM_ANLYZD_INVOKE</td>
<td>Total analyzed information requests.</td>
</tr>
<tr>
<td>NUM_ANLYZD_RESPONSE</td>
<td>Total analyzed information responses.</td>
</tr>
<tr>
<td>NUM_OANSWER_INVOKE</td>
<td>Total origination answer requests.</td>
</tr>
<tr>
<td>NUM_TANSWER_INVOKE</td>
<td>Total termination answer requests.</td>
</tr>
<tr>
<td>NUM_ODISCONNECT_INVOKE</td>
<td>Total origination disconnect requests.</td>
</tr>
<tr>
<td>NUM_ODISCONNECT_RESPONSE</td>
<td>Total origination disconnect responses.</td>
</tr>
<tr>
<td>NUM_TDISCONNECT_INVOKE</td>
<td>Total termination disconnect requests.</td>
</tr>
<tr>
<td>NUM_TDISCONNECT_RESPONSE</td>
<td>Total termination disconnect responses.</td>
</tr>
<tr>
<td>NUM_CCDIR_INVOKE</td>
<td>Total call control directive requests.</td>
</tr>
<tr>
<td>NUM_CCDIR_RESPONSE</td>
<td>Total call control responses.</td>
</tr>
<tr>
<td>NUM_SUCCESSFUL_CALLS</td>
<td>Total successfully completed call attempts.</td>
</tr>
<tr>
<td>NUM_FAILED_CALLS</td>
<td>Total failed call attempts.</td>
</tr>
<tr>
<td>NUM_CONNRES_INVOKE</td>
<td>Total connect to resource requests.</td>
</tr>
<tr>
<td>NUM_CONNRES_SUCCESS</td>
<td>Total connect to resource successful responses.</td>
</tr>
<tr>
<td>NUM_CONNRES_FAILED</td>
<td>Total connect to resource failed responses.</td>
</tr>
<tr>
<td>NUM_BULKDISCONN_INVOKE</td>
<td>Total bulk disconnect requests.</td>
</tr>
<tr>
<td>NUM_BULKDISCONN_RESPONSE</td>
<td>Total bulk disconnect responses.</td>
</tr>
</tbody>
</table>

Reports

CDMA does not install any specific SMS reports. However, you can report on any statistics which are recorded using the SMS Application report on the SMS Report Functions screen. For more information about running SMS reports, see SMS User’s Guide.

EDRs

CDMA does not write any EDRs itself. However messages sent from cdmagw to slee_acs will result in an EDR being written by slee_acs. For more information about what EDRs are written by slee_acs, see NCC Event Detail Record Reference Guide.
## Overview

### Introduction

This chapter explains how to configure the Oracle Communications Network Charging and Control (NCC) application.

### In this chapter

This chapter contains the following topics.

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</thead>
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<td>eserv.config Configuration</td>
<td>8</td>
</tr>
<tr>
<td>cdmagw.sh Configuration</td>
<td>22</td>
</tr>
</tbody>
</table>

## Configuration Overview

### Introduction

This topic provides a high level overview of how the CDMA component is configured.

### Configuration components

CDMA is configured by the following components:

<table>
<thead>
<tr>
<th>Component</th>
<th>Locations</th>
<th>Description</th>
<th>Further Information</th>
</tr>
</thead>
<tbody>
<tr>
<td>cdmagw.sh</td>
<td>All SLC machines</td>
<td>This shell script sets the command line parameters for the main cdmagw (on page 25) binary.</td>
<td>cdmagw.sh Configuration (on page 22)</td>
</tr>
<tr>
<td>eserv.config</td>
<td>All SLC machines</td>
<td>The CDMA is configured in the cdmagw section of the eserv.config file.</td>
<td>eserv.config Configuration (on page 8)</td>
</tr>
<tr>
<td>msidGmscFile</td>
<td>All SLCs</td>
<td>This file holds the MSID to GMSC mapping used to locate an available TSAN when supporting non-WinRoaming.</td>
<td>msidGmscFile (on page 8)</td>
</tr>
<tr>
<td>tdp.conf</td>
<td>All SLC machines</td>
<td>The tdp.conf file configures the IN Call Model in cdmagw.</td>
<td>IN Call Model configuration (on page 8)</td>
</tr>
<tr>
<td>SLEE.cfg</td>
<td>All SLC machines</td>
<td>The SLEE configuration must be altered to include the CDMA. The system is configured so that the CDMA and associated interfaces all start together. This is performed by the SLEE and is defined using SLEE.cfg.</td>
<td>SLEE Technical Guide</td>
</tr>
</tbody>
</table>
### Component Locations Description Further Information

<table>
<thead>
<tr>
<th>Component</th>
<th>Locations</th>
<th>Description</th>
<th>Further Information</th>
</tr>
</thead>
<tbody>
<tr>
<td>SMF database</td>
<td>SMS</td>
<td>Statistics and EFM alarms configuration for CDMA. Configured automatically when cdmaSms is installed.</td>
<td>NCC Installation Guide</td>
</tr>
</tbody>
</table>

### IN Call Model configuration

Configuration for the IN Call Model element of the U-CA-IS41 (CDMA) is contained in the `/IN/service_packages/SLEE/etc/tdp.conf` file. This text shows an example of the file.

```plaintext
# mandatory params:
CAMEL
ADDITIONALNUMS
IMSI QUAL=129

# optional params: (comment out if not required)
ACH WARN PERIOD=10
ACH TONE=20,0
ACH ANNOUNCE=156

# the trigger/service key definition
3 1 3 request all all
```

For more information about how to configure the `tdp.conf` file, see Configuring IN Call Model Triggers.

### msidGmscFile

The `msidGmscFile` file is only used for non-WIN roaming redirection to pick a GMSC TSAN pool to use. It contains multiple entries (one entry per line) in the form:

`MSID_Prefix,GMSC_Name`

**Notes:**

- Each MSID Prefix must be less than `maxMsidForGmscSelect` (on page 16) characters long.
- The GMSC name must exist in the `eserv.config` under `tsanPools` (on page 20).
- On configuration reload, the file specified in `msidGmscFile` (on page 17) is read. This can be triggered by a SIGHUP.
- Lines that begin with hashes (#), are ignored by `cdmagw` (on page 25).

**Example:** This text shows an example of a line from `msidGmscFile`.

```
189883,MSC1
```

### eserv.config Configuration

**Introduction**

The `eserv.config` file is a shared configuration file, from which many NCC applications read their configuration. Each NCC machine (SMS, SLC, and VWS) has its own version of this configuration file, containing configuration relevant to that machine. The `eserv.config` file contains different sections; each application reads the sections of the file that contains data relevant to it.

The `eserv.config` file is located in the `/IN/service_packages/` directory.

The `eserv.config` file format uses hierarchical groupings, and most applications make use of this to divide up the options into logical groupings.
Configuration file format

To organize the configuration data within the eserv.config file, some sections are nested within other sections. Configuration details are opened and closed using either { } or [ ].

- Groups of parameters are enclosed with curly brackets - { }
- An array of parameters is enclosed in square brackets - [ ]
- Comments are prefaced with a # at the beginning of the line

To list things within a group or an array, elements must be separated by at least one comma or at least one line break. Any of the following formats may be used, as in this example:

```plaintext
{ name="route6", id = 3, prefixes = [ "00000148", "0000473"] }
{ name="route7", id = 4, prefixes = [ "000001049" ] }
```

or

```plaintext
{ name="route6"
 id = 3
 prefixes = [ "00000148"
 "0000473"
 ]
}
{ name="route7"
 id = 4
 prefixes = [ "000001049"
 ]
}
```

or

```plaintext
{ name="route6"
 id = 3
 prefixes = [ "00000148", "0000473" ]
}
{ name="route7", id = 4
 prefixes = [ "000001049" ]
}
```

Editing the file

Open the configuration file on your system using a standard text editor. Do not use text editors, such as Microsoft Word, that attach control characters. These can be, for example, Microsoft DOS or Windows line termination characters (for example: ^M), which are not visible to the user, at the end of each row. This will cause file errors when the application tries to read the configuration file.

Always keep a backup of your file before making any changes to it. This will ensure you have a working copy to which you can return.

Example cdmagw Configuration Section

Here is an example of the cdmagw section in the eserv.config file, showing the CDMA configuration.

```plaintext
cdmagw = {
    ImsiIdpQualifier=129
    CallStatusTimeout=30
    ResetSrfTimeout=30
    ConnresTimeout=10
    DisconnectTimeout=30
    BusyStatusTimeout=10
    CcdirTimeout=30
    CallFailedTimeout=1
}```
DisconnectWarningType='T'
DisconnectWarningID=24
LowCreditWarningType='T'
LowCreditWarningID=24
TestInterfaceEnabled=false
TestInterfacePort=14875
SoakTestInterfaceEnabled=false
SoakTestInterfacePort=14876
EnableDisConnRes=true
ANLYZDActionCodeRequired=false
ThrottlingCallRate=0
EnableStats=false
AnnouncementsUseCCDIR=true
MaxStatusCheckFailures=1
LocationIdIncludesMSCID=false
SoakTestCalledNumber="1234567890"
SoakTestCallingNumber="1234567890"
CompareDestinationDigits=false
AllowInitialTermination=false
Dynamic_DMHServiceID=false
DMHServiceID_ANLYZD_OnRelease=false
DMHServiceID_ANLYZD=""
DMHServiceID_ORREQ=""
DMHServiceID_ODISCONNECT=""
DMHServiceID_TDISCONNECT=""
DMHServiceID_DynamicPrefix="1.1"
waitForCallingParty = false
abortOnCallFail = false
forceCorrelationID = false
dummyMDNForCallLookup="0000"
msidGmScFile=""
maxMsidForGmScSelect=6
msidRequiredDeniedReason= 0
cfnaOnRedirectionIndicators = [3,17]
nonWinRoamDataTimeout = 30
noTsanDeniedReason = 3
keepTsanLocal = true
dummyMsid = "989123"
deaultTsanPool = "MSC1"
tsanAnlyzdField = "Digits"
tsanPools = [
  {
    gmscName="MSC1"
    tsanNature = 4
    ranges = [
      {
        rangeStart = "8049096367"
        rangeEnd = "8049096417"
      }
    ]
  }
  {
    gmscName="MSC2"
    ranges = [
      {
        rangeStart = "9876540850"
        rangeEnd = "9876540890"
      }
    ]
  }
]
Parameters

The following parameters are supported.

abortOnCallFail

Syntax: \( \text{abortOnCallFail} = \text{true}|\text{false} \)

Description: Indicates if an abort message should be sent to slee_acs on call failure. That is, CCDIR failure response.

Type: Boolean

Optionality: Optional (default used if not set).

Allowed: true or false

Default: false

Notes: 

Example: \( \text{abortOnCallFail} = \text{false} \)

AllowInitialTermination

Syntax: \( \text{AllowInitialTermination} = \text{false}|\text{true} \)

Description: Flag to control whether to allow InitialTermination triggers to create a call.

Type: Boolean

Optionality: Optional (default used if not set).

Allowed: false Wait for the CalledRoutingAddressAvailable trigger in the second ANLYZD message.

true Create a call instance when a InitialTermination trigger arrives.

Default: false

Notes: This trigger does not contain the Called Number (DestinationDigits), so the IDP CalledPartyNumber field contains the Dialed Digits.

For more information about message flow, see Possible processing stages (on page 3).

Example:

ANLYZDActionCodeRequired

Flag to enable sending an ActionCode in an ANLYZD result (success or failure).

Default: true

Allowed: true or false
Announcements Use CCDIR
Flag to control whether switch-based announcements use CCDIR or ANLYZD/ODISCONNECT responses.
Default: false
Allowed: true or false

BusyStatusTimeout
A periodic timer that sets the number of seconds to wait before checking whether the called party was busy before a call has been answered.
Default: 30 seconds
Allowed: Integer

CallFailedTimeout
The amount of time between verifying a call failure and releasing a call.
Default: 1 second
Allowed: Integer, minimum value 1 second.
Note: Cannot be disabled.

CallStatusTimeout
A periodic timer that checks the status of the call to make sure no calls have been dropped by the MSC without notifying the Cdma Gateway.
Default: 30 seconds
Allowed: Integer

CcdirTimeout
A periodic timer that sets the number of seconds to wait before assuming that the CCDIR invoke operation failed.
Default: 30 seconds
Allowed: Integer

cfnaOnRedirectionIndicators
Syntax: cfnaOnRedirectionIndicators = [array]
Description: The value specified indicates the DMH_RedirectionIndicator that will be used when handling Call Forward No Answer (CFNA) scenarios.
Type: Array
Optionality: Optional (default used if not set).
Allowed: [3]
Default: [3]
Notes: Specifying 0 means the indicator will not be checked. It overrides all values.
Example: cfnaOnRedirectionIndicators = [3,17]

CompareDestinationDigits
Syntax: CompareDestinationDigits = false|true
Description: Which digits to use to determine whether the Called Party number has changed on receipt of a Connect operation from slee_acs.
Type: Boolean
Optionality:  Optional (default used if not set).
Allowed:  true  Compare destination digits.
false  Compare dialed digits.
Default:  false
Notes:
Example:

ConnresTimeout
A periodic timer that sets the number of seconds to wait before assuming that the CONNRES was successful.
Default:  10 seconds
Allowed:  Integer
Note:  The timer can be disabled if the MSC is configured to send TC_CANCEL (0 = disabled)

defaultTsanPool
Syntax:  defaultTsanPool = "name"
Description:  The name of the default GMSC TSAN pool to use if a MSID isn't available or it's not found in msidGmscFile (on page 8).
Type:  String
Optionality:  Optional (default used if not set).
Mandatory for IS-826 retriggering.
Allowed:  This must exist in the tsanPools section.
Default:  none (No default pool)
Notes:  For more information about TSANs, see Non-WinRoaming processing (on page 4).
Example:  defaultTsanPool = "MSC1"

DisconnectTimeout
A periodic timer that sets the number of seconds to wait before assuming that the forced release (using a CCDIR) has failed.
Default:  30 seconds
Allowed:  Integer

DisconnectWarningID
The ID of the tone to be played when a call is disconnected using CCDIR.
Default:  PPCDisconnectTone (24)
Allowed:  Integer
Note:  This is ignored if the type is set to 'N'.

DisconnectWarningType
Playas a tone, or announcement, or nothing when about to disconnect.
Default:  T
Allowed:  T = Tone, A = Announcement, N = None
DMHServiceID_ANLYZD
The DMH_ServiceID to send to the MSC as part of an ANLYZD result. If this is set to an empty value no DMH_ServiceID is sent in the result.
Default: ""
Allowed: String
Note: The format is “marketID.marketSegmentId.ServiceIdValue”

DMHServiceID_ANLYZD_OnRelease
Flag to enable sending a DMH_ServiceID in an ANLYZD response that releases a call.
Default: true
Allowed: true or false

DMHServiceID_DynamicPrefix
The prefix to add to the dynamic DMH_ServiceID. Only used when dynamic dmh_service ids are enabled, this should be set to an empty value. If this is set to an empty value no DMH_ServiceID is sent in the ANLYZD result.
Default: 1.1
Allowed: String
Note: The format is “marketID.marketSegmentId”

DMHServiceID_ODISCONNECT
The DMH_ServiceID to send to the MSC as part of an ODISCONNECT result. If this is set to an empty value no DMH_ServiceID is sent in the result.
Default: ""
Allowed: String
Note: The format is “marketID.marketSegmentId.ServiceIdValue”

DMHServiceID_ORREQ
The DMH_ServiceID to send to the MSC as part of an ORREQ result. If this is set to an empty value no DMH_ServiceID is sent in the result.
Default: ""
Allowed: String
Note: The format is “marketID.marketSegmentId.ServiceIdValue”

DMHServiceID_TDISCONNECT
The DMH_ServiceID to send to the MSC as part of an TDISCONNECT result. If this is set to an empty value no DMH_ServiceID is sent in the result.
Default: ""
Allowed: String
Note: The format is “marketID.marketSegmentId.ServiceIdValue”

dummyMDNForCallLookup
Syntax: dummyMDNForCallLookup = "number"
Description: The dummy MDN number to use as part of look up key for call lookup.
Type: String
Optionality: Optional (default used if not set).
Allowed: none (no default pool)
Notes: This is used because the key for call lookup for a second ANLYZD message, consists of both billing ID and MDN. Setting this effectively means that MDN is not used. For more information about how this is used, see Non-WinRoaming processing (on page 4).

Example: dummyMDNForCallLookup = "0000"

dummyMsid
Syntax: dummyMsid = "number"
Description: This is used to set the MSID internally when no MIN is received in the ANLYZD message.
Type: String
Optionality: Optional (default used if not set).
Allowed: 
Default: "0"
Notes: However, if a MIN is received in the ANLYZD, that will be used to set the MSID internally instead.
Example: dummyMsid = "989123"

Dynamic_DMHSERVICEID
Flag to enable dynamic DMH_ServiceIDs, set by the SCP using FCI. Enabling this overrides the static ANLYZD DMH_ServiceID.
Default: false
Allowed: true or false

EnableDisConnRes
Flag to enable or disable whether the CdmaGateway should send a DISCONNRES before sending an ANLYZD or ODISCONNECT result to an MSC following a CONNRES announcement.
Default: true
Allowed: true or false

EnableStats
Flag to enable the reporting of statistics.
Default: false
Allowed: true or false

forceCorrelationID
Syntax: forceCorrelationID = true|false
Description: Indicates whether to force the correlation ID to be set for the following operations:
- Connect to Resource
- ResetTimer
- Disconnect Resource
Type: Boolean
Optionality: Optional (default used if not set).
Allowed: true or false
Default: false
Notes:

Example:  forceCorrelationID = false

ImsiIdpQualifier
The identifier that is used when sending the IMSI in an IDP.
Default:  129 (Binary: 10000001)
Allowed:  Integer
Note:   This value MUST be the same as specified in the ‘tdp.conf’ file.

keepTsanLocal
Syntax:  keepTsanLocal = true|false
Description:  If this parameter is set to true, the gateway checks if the Digits or DestinationDigits in a received ANLYZD message match a non-WIN roaming TSAN record.
If yes, it will replace these fields with stored values from a previous origination request, preventing the TSAN from being sent to the service.
Type:  Boolean
Optionality:  Optional (default used if not set).
Allowed:  true or false
Default:  true
Notes:
Example:  keepTsanLocal = true

LocationIdIncludesMSCID
Flag to enable including the MSCID in the Location Area ID (MSCID is prepended to the ServingCellID).
Default:  false
Allowed:  true or false

LowCreditWarningID
The ID of the tone to be played when a call has reached its low credit threshold.
Default:  PPCDisconnectTone (24)
Allowed:  Integer
Note:   This is ignored if the type is set to ’N’.

LowCreditWarningType
Plays a tone, announcement or nothing when credit balance is low.
Default:  T
Allowed:  T = Tone, A = Announcement, N = None

maxMsidForGmscSelect
Syntax:  maxMsidForGmscSelect = len
Description:  The maximum length of an acceptable MSID prefix within the file specified by msidGmscFile (on page 17) for GMSC lookup.
Type:  Integer
Optionality:  Optional (default used if not set).
Allowed:
Default:  6
Notes: If an entry in the msidGmscFile is more than this limit, a WARNING alarm is logged and the row is ignored.

Example: maxMsidForGmscSelect = 6

MaxStatusCheckFailures
How may CCDIR failures to allow before assuming that the call has failed.
Default: 1
Allowed: Integer
Note: Setting this to 1 means that the first failure will cause the call to fail.

msidGmscFile
Syntax: msidGmscFile = "path/file"
Description: The name and location of file which defines the mapping of MSIDs with to GMSCs.
Type: String
Optionality: Optional (default used if not set).
Allowed: Default: none (that is, no mapping file)
Notes: For more information about the file, see msidGmscFile (on page 8).
On configuration reload, the file specified in msidGmscFile (on page 17) is read. This can be triggered by a SIGHUP.
For more information about how this mapping is used, see Non-WinRoaming processing (on page 4).
Example: msidGmscFile = "/IN/service_packages/IS41/etc/msidtogmsc.mapping"

msidRequiredDeniedReason
Syntax: msidRequiredDeniedReason = reason
Description: The AccessDeniedReason returned if no MSID is available in ORREQ for roaming calls.
Type: Integer
Optionality: Optional (default used if not set).
Allowed: Default: 0 (MSID not required, TSAN will be allocated from the default TSAN pool)
Notes: For more information about how roaming calls are handled, see Non-WinRoaming processing (on page 4).
Example: msidRequiredDeniedReason = 0

nonWinRoamDataTimeout
Syntax: nonWinRoamDataTimeout = seconds
Description: The number of seconds to retain call data for non-WinRoaming calls.
Type: Integer
Optionality: Optional (default used if not set).
Allowed: Default: 30
Notes: For more information about how roaming calls are handled, see Non-WinRoaming processing (on page 4).
Example: nonWinRoamDataTimeout = 30

noTsanDeniedReason

Syntax: noTsanDeniedReason = reason
Description: The AccessDeniedReason to send back if all TSANs are in use.
Type: Integer
Optionality: Optional (default used if not set).
Allowed: 0 Not used.
1 Unassigned directory number (the MS is not served by the accessed system).
2 Inactive (the MS is not active in the accessed system and the HLR pointer to the MSs VLR should be maintained).
3 Busy (the MS is busy in the accessed system and cannot accept additional calls).
4 Termination Denied (terminations to this MS are not allowed).
5 No Page Response (the MS was paged by the accessed system but did not respond).
6 Unavailable (the MS is currently not available and the HLR pointer to the MSs VLR should be maintained and the MS shall remain in the same state).
Default: 3
Notes: For more information about TSANs, see Non-WinRoaming processing (on page 4).
Example: noTsanDeniedReason = 3

ResetSrfTimeout
A periodic timer that resets the ‘SSFT’ MSC timer.
Default: 30 seconds
Allowed: Integer
Note: This must be sent during an IP interaction, initiated by a CONNRES.

SoakTestCalledNumber
The default value for called numbers when using the SoakTestInterface.
Used for DEST and CALLED numbers.
Default: “1234567890”
Allowed: String

SoakTestCallingNumber
The default value for calling numbers when using the SoakTestInterface.
Used for MDN and CALLING numbers.
Default: “1234567890”
Allowed: String
SoakTestInterfaceEnabled
Flag to enable or disable the soak test interface. In a production system this can be disabled by default but enabled so that a soak test can be run on the system.
Default: false
Allowed: true or false
Note: Enabling this interface overrides the normal test interface.

SoakTestInterfacePort
The tcp network port that the soak test interface will listen on (if it is enabled).
Default: 14876
Allowed: Integer

TestInterfaceEnabled
Flag to enable or disable the test interface. In a production system this can be disabled by default but enabled so that a test can be run on the system.
Default: false
Allowed: true or false
Note: Enabling the soak test interface overrides this interface.

TestInterfacePort
The tcp network port that the test interface will listen on (if it is enabled).
Default: 14875
Allowed: Integer

ThrottlingCallRate
Limits (throttles) how much traffic the cdmagw will process per second.
Default: 0 (disabled)
Allowed: Integer

tsanAnlyzdField
Syntax: tsanAnlyzdField = "field"
Description: The number field containing the TSAN for nonWinRoaming.
Type: String
Optionality: Optional (default used if not set).
Allowed: DestinationDigits, Digits, MDN
Default: "Digits"
Notes: 
Example: tsanAnlyzdField = "Digits"
tsanPools

Syntax:  

```
    tsanPools = [
        {
            gmscName = "name"
            ranges = [
                {
                    rangeStart = "tsan"
                    rangeEnd = "tsan"
                }
                ...
            ]
        }
        ...
    ]
```

Description:  The list of permissible TSANs per GMSC.
Type:  Array
Optionality:  Optional (not used if not set)
Mandatory for IS-826 retriggering

Allowed:
Default:
Notes:  For more information about IS-826 and TSANs, see Non-WinRoaming processing (on page 4).
Example:  

```
    tsanPools = [
        {
            gmscName = "MSC1"
            ranges = [
                {
                    rangeStart = "8049096367"
                    rangeEnd = "8049096417"
                }
                {
                    rangeStart = "9876540850"
                    rangeEnd = "9876540890"
                }
            ]
        }
        {
            gmscName = "MSC2"
            ranges = [
                {
                    rangeStart = "0987650990"
                    rangeEnd = "0987650150"
                }
                {
                    rangeStart = "5402946949"
                    rangeEnd = "5402946999"
                }
            ]
        }
    ]
```

gmscName

Syntax:  

```
gmscName = "name"
```

Description:  The name of the Gateway MSC for the range of TSANs defined by the corresponding range parameter.
Type:  String
Optionality: Optional (ranges not used if not set)
Mandatory for IS-826 retriggering
Allowed: A string up to 50 characters long
Default: 
Notes: For more information about TSANs, see Non-WinRoaming processing (on page 4).
Example: gmscName = "MSC1"

ranges
Syntax: ranges = [
    {}
    ...
]
Description: The TSAN pools which can be used with this Gateway MSC.
Type: Array
Optionality: Optional (not used if not set)
Mandatory for IS-826 retriggering
Allowed: 
Default: none
Notes: For more information about TSANs, see Non-WinRoaming processing (on page 4).
Example: For an example of this parameter used in context, see tsanPools (on page 20).

rangeEnd
Syntax: rangeEnd = "tsan"
Description: The last TSAN in a range in a TSAN pool.
Type: String
Optionality: Mandatory if ranges (on page 21) is used.
Allowed: 
Default: 
Notes: For more information about TSANs, see Non-WinRoaming processing (on page 4).
Example: For an example of this parameter used in context, see tsanPools (on page 20).

rangeStart
Syntax: rangeStart = "tsan"
Description: The first TSAN in a range in a TSAN pool.
Type: String
Optionality: Mandatory if ranges (on page 21) is used.
Allowed: 
Default: 
Notes: For more information about TSANs, see Non-WinRoaming processing (on page 4).
Example: For an example of this parameter used in context, see tsanPools (on page 20).
Chapter 2

tsanNature
Syntax: tsanNature = noa
Description: This is the NoA (nature of address) of the TSAN which is sent in the orreq (Origination Request Result) in both the DialedDigits and the DestinationDigits fields (See Notes below).
Type: Integer
Optionality: Optional (default used if not set)
Allowed: 3 Sets national for the INAP representation of NOA for the TSAN.
        4 Sets international for the INAP representation of the TSAN.
Default: 3 (national)
Notes: ● These values will be converted into an IS41 Nature of Address in the OriginationRequest return result. i.e. 0 for national and 1 for international.
       ● The DestinationDigits field is derived from TerminationList -> PSTN Termination -> DestinationDigits.
Example: tsanNature = 4

waitForCallingParty
Syntax: waitForCallingParty = false|true
Description: How long to wait for a calling party value in a message before sending an IDP.
Type: Boolean
Optionality: Optional (default used if not set).
Allowed: true If there is no calling party number in the first ANLYZD message, wait until the second ANLYZD message is received.
        false If there is not a calling party number in the first or second ANLYZD messages use the MDN.
Default: false
Notes: For more information about message flows and ANLYZD messages, see Non-WinRoaming processing (on page 4).
Example:

SIGTRAN configuration
cdmagw also supports the configuration for sua_if and m3ua_if from the SIGTRAN TCAP Interface in the cdmagw section. The SIGTRAN parameters are used as if they were inside the a sigtran section. For more information about the available parameters, see SIGTRAN TCAP IF Technical Guide.

cdmagw.sh Configuration

About cdmagw.sh configuration
The CDMA startup shell script /IN/service_packages/IS41/bin/cdmagw.sh contains additional configuration for the ANSI TCAP Interface.
This setting states where the tdp.conf file is located (this file is installed during setup):
TDP_DEFINITONS=/IN/service_packages/SLEE/etc/tdp.conf
export TDP_DEFINITONS
# the following settings should be configured to reflect your system
# setup:
# -ssns   = subsystem numbers - default = 19
# -autoac = auto app context set - default = yes
# -defoutac = Specify object identifier to use for TCAP Interface Application context
# -stps   = comma seperated list of STPs
# -monitorperiod = the period over which to monitor call attempts for throttling - default = 1000
# -retssn = return SSN address
# -retpc  = return PC address
# -retgt  = return GT address
# -retri  = return RI
# -asidbase = application server id base

**Note:** The start up option `-retpc` can also be expressed as either an existing single integer, or as an ANSI network-cluster-member point code representation.

**For example:**

- `retpc 2193`
- `retpc 10-20-42`

**cdmagw.sh example**

This text shows an example `cdmagw.sh`:

```
TDP_DEFINITIONS=/IN/service_packages/SLEE/etc/tdp.conf
export TDP_DEFINITIONS

exec /IN/service_packages/IS41/bin/cdmagw \
    -ssns 11,146 \
    -stps 2596 \
>> /IN/service_packages/IS41/tmp/cdmagw.log 2>&1
```
Overview

Introduction

This chapter explains the processes which run automatically as part of the application. These processes are started automatically by one of the following:

- inittab
- crontab
- Service Logic Execution Environment SLEE

Note: This chapter also includes some plug-ins to background processes which do not run independently.

In this chapter

This chapter contains the following topics.

- cdmagw
- cdmagw_sua
- cdmagw_m3ua

**cdmagw**

Purpose

cdmagw is the main binary for the CDMA. It is responsible for handling CDMA interactions with MSCs and HLRs, and for triggering appropriate IN interactions to slee_acs. Uses the IN call model.

Note: cdmagw is usually a link to one of cdmagw_sua (on page 26) or cdmagw_m3ua (on page 26). The binary linked to it defines which version of the SIGTRAN stack is being used.

Location

This binary is located on SLCs.

Startup

This task is started by the SLEE by the following line in SLEE.cfg:

```
INTERFACE=cdmagw cdmagw.sh /IN/service_packages/IS41/bin EVENT
```

Notes:

- **cdmagw.sh** is a shell script which starts cdmagw. For more information about the configuration which must be set in this file, see cdmagw.sh Configuration (on page 22).
- The above are defaults and may vary.
cdmagw_sua

Purpose

cdmagw_sua provides the cdmagw binary compiled against the sua_if version of the SIGTRAN stack. It provides CDMA voice over SCCP over SUA.

For more information about sua_if, see SIGTRAN TCAP IF Technical Guide.

Location

This binary is located on SLCs.

Startup

If this binary is linked to from cdmagw, it will be started in the way described in Startup (on page 25).

Configuration

cdmagw_sua is configured using eserv.config and cdmagw.sh. For more information about the available parameters, see Configuration (on page 7).

cdmagw_m3ua

Purpose

cdmagw_m3ua provides the cdmagw binary compiled against the m3ua_if version of the SIGTRAN stack. It provides CDMA voice over SCCP over M3UA.

For more information about m3ua_if, see SIGTRAN TCAP IF Technical Guide.

Location

This binary is located on SLCs.

Startup

If this binary is linked to from cdmagw, it will be started in the way described in Startup (on page 25).

Configuration

cdmagw_m3ua is configured using eserv.config and cdmagw.sh. For more information about the available parameters, see Configuration (on page 7).
Overview

Introduction
This chapter provides the procedures for administering the U-CA-IS41 (CDMA) application.

In this chapter

This chapter contains the following topics.
Starting and Stopping the U-CA-IS41 (CDMA) 27
Backing up the U-CA-IS41 (CDMA) Service 28

Starting and Stopping the U-CA-IS41 (CDMA)

Introduction
This topic explains how to start or stop the U-CA-IS41 (CDMA) application.

Starting the U-CA-IS41 (CDMA) service
To start the automated shell script, which in turn starts the U-CA-IS41 (CDMA) service, as the user acs_oper, enter:

/IN/service_packages/SLEE/bin/slee.sh

Result: This shell script starts the slee_acs and the associated interfaces cdmagw, timer IF and cdrIF. The stdout and stderr from slee.sh will appear on the screen, so if this screen is closed the output will no longer be viewable. If this information is required then redirect output to a file, for example slee.sh to sleeout.log.

Startup output
When the SLEE service starts various information is presented on stdout and the syslog.

Stopping the U-CA-IS41 (CDMA) service
To stop the automated shell script, which in turn stops the U-CA-IS41 (CDMA) service, as the user acs_oper, enter:

/IN/service_packages/SLEE/bin/stop.sh

Note: It also recommended to run a .clean following the stop.

If the SLEE_FILE variable is being used it must be visible to the stop program. If it is not visible, the program will not be able to clear the shared memory and will exit with error 3005.
Note: If the service has stopped for any abnormal reasons a manual cleanup should be performed, that is, `ps -fu acs_oper` to find the remaining processes, then `kill pid` each one. You should check the shared memory using `ipcs | grep acs`, then remove `acs_oper` owned ones using `ipcrm` and `clean`.

**Backing up the U-CA-IS41 (CDMA) Service**

**Introduction**

The filesystem areas that should be backed up for the U-CA-IS41 (CDMA) service are `/IN/service_packages/IS41/`.

The standard UNIX restore utilities can then be used.
Overview

Introduction

This chapter explains the important processes on each of the server components in the NCC, and a number of example troubleshooting methods which will help aid the troubleshooting process before raising a support ticket.

In this chapter

This chapter contains the following topics.

Common Troubleshooting Procedures

Common Troubleshooting Procedures

Introduction

Refer to NCC System Administrator's Guide for troubleshooting procedures common to all NCC components.

Debug output

Debugging output is available. Do not enable debugging under production call loads. Enable debugging only when advised to do so by Oracle support.

To switch the debug level, send cdmagw (on page 25) a SIGUSR1.
To turn on SCCP logging, send cdmagw a SIGUSR2.
Overview

Introduction
This chapter provides details of the installation and removal process for the application.

In this chapter

This chapter contains the following topics.
Installation and Removal Overview

Installation and Removal Overview

Introduction
For information about the following requirements and tasks, see *NCC Installation Guide*:

- NCC system requirements
- Pre-installation tasks
- Installing and removing NCC packages

**CDMA (U-CA-IS41) packages**
An installation of CDMA (U-CA-IS41) includes the following packages:

- cdmaSms on the SMS
- cdmagw on the SLC
Appendix A

Configuring IN Call Model Triggers

Overview

This introduces the generic configuration requirements of the NCC IN Call Model.

The NCC IN Call Model is not a separate product, rather it is a set of libraries that is bound into a final usable interface (such as the UCA-ISUP).

Environment variables

This table describes the UNIX shell environment variables to be configured.

<table>
<thead>
<tr>
<th>Environment Variable Name</th>
<th>Description</th>
<th>Example Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>TDP_DEFINITIONS</td>
<td>Defines the full path name of the Trigger Detection Point definition file.</td>
<td>/IN/service_packages/SLEE/etc/tdp.conf</td>
</tr>
</tbody>
</table>

Trigger detection point (TDP) definition file

The tdp.conf file has two sections:

1. A number of configuration parameters.
2. The trigger tables used to determine when to trigger a call to the SCF.

Example: This text shows an example tdp.conf file:

```bash
# A comment
KEEP SD
ETC RULES=6 3
3 1 3 request all 123 6
4 2 4 notify all 222 keep
3 1 3 request 2:122 3:222 5 keep
```

Note: All lines starting with # are treated as comments. If no TDP definition file is defined, a default action is taken where:

- ALL calls are triggered to the SCF with a service key of 1 (one) and a trigger point of 3 (analyzedInformation).
- None of the global configuration parameters are considered set.

Global configuration parameters

The following configuration parameters may be set once on individual lines in the TDP definition file.

<table>
<thead>
<tr>
<th>Global Parameter</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>KEEP SD</td>
<td>If defined ALL all stop digits (defined by the BCD digit 'F') on the end of called party numbers are kept in the called party number. By default the stop digit is stripped from ALL triggered numbers.</td>
</tr>
<tr>
<td>CAMEL</td>
<td>This parameter is intended for CAMEL testing purposes only and should not be defined under normal usage. If defined, the called party number is also copied into the intialDP's</td>
</tr>
<tr>
<td>Global Parameter</td>
<td>Description</td>
</tr>
<tr>
<td>---------------------</td>
<td>-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------</td>
</tr>
<tr>
<td></td>
<td>calledPartyBCDNumber CAMEL parameter. The NOA of the called party number becomes the BCD number type.</td>
</tr>
</tbody>
</table>
| ADDITIONALNUMS      | If defined, the IN Call Model will request all additional numbers available from the underlying protocol and insert them into the InitialDP message sent to the SLC.  
All these additional numbers are placed into a G8 extension in the InitialDP except any additional calling party number that is placed in the additionalCallingPartyNumber field. |
| ETC RULES= c         | If defined then additional EstablishTemporaryConnection (ETC) rules are used.                                                                                                                                  |
| or ETC RULES= c s    | If the integer c is defined, the correlationID in all ETC messages from the SCF are appended on to the end of the assistingSSSPIPRoutingAddress that is used, the digits are padded to a width of c digits.       |
|                     | If s is also defined, then the scfID of the ETC is also appended on afterwards in the same way.                                                                                                            |
|                     | For example:                                                                                                                |
|                     | With "ETC RULES=6 4" and an ETC message with:                                                                             |
|                     | assistingSSSPIPRoutingAddress =1111, correlationID =55, scfID =0x42                                                        |
|                     | Then the actual assistingSSSPIPRoutingAddress used will be "11110000550042"                                               |
| USER LIB = library   | If defined the call model will use the user written shared object library specified by the full pathname library when dealing with ApplyCharging operations.                                                          |
| AC=a,b,c,...         | Sets the TCAP application context used by the call model to the comma separated list of OIDs supplied.                                                                                  |
| ORIG_PC= pc          | If defined, all InitialDPs will be sent with an SCCP calling party (origination) address that includes a Point Code defined by the integer pc.                                                                 |
| See note 1           | Note: This value may be defined in hex using a prefix of 0x.                                                                  |
| ORIG_SSN= ssn        | If defined, all initialDPs will be sent with an SCCP calling party (origination) address that includes a subsystem number defined by the integer ssn.                                                      |
| See note 1           |                                                                                                                                                  |
| ORIG_GT=1, n, addr or ORIG_GT=2, t, addr or ORIG_GT=3, t, p, addr or ORIG_GT=4, t, p, n, addr See note 1 | If defined, all initialDPs will be sent with an SCCP calling party (origination) address that includes a Global Title defined by the integers n, t, p and the number string addr.  
The initial value (1 to 4) identifies the Global Title type:  
  • n is the NOA  
  • t is the translation type  
  • p is the numbering plan  
  • addr is the address digits (0 to 9, A to F) |
| DEST_PC= pc          | If defined, all initialDPs will be sent with an SCCP called party (destination) address that includes a Point Code defined by the integer pc.                                                                    |
| See note 2           | Note: This value may be defined in hex using a prefix of 0x.                                                                  |
| DEST_SSN= ssn        | If defined, all initialDPs will be sent with an SCCP called party (destination) address that includes a subsystem number defined by the integer ssn.                                                      |
| See note 2           |                                                                                                                                                  |
### Global Parameter

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Description</th>
</tr>
</thead>
</table>
| DEST_GT=1, n, addr | If defined all initialDPs will be sent with an SCCP called party (destination) address that includes a Global Title defined by the integers n, t, p and the number string addr. The initial value (1 to 4) identifies the Global Title type:  
- n is the NOA  
- t is the translation type  
- p is the numbering plan  
- addr is the address digits (0 to 9, A to F) |
| DEST_GT=2, t, addr | See note 2                                                                 |
| DEST_GT=3, t, p, addr |                                                                                       |
| DEST_GT=4, t, p, n, addr |                                                                                       |

### Trigger detection point definitions

After any global parameters have been set, the configuration file may take one or more trigger detection point (TDP) definitions.

Each line defines a single trigger; its trigger parameter values that get sent and the conditions under which it gets sent.

Each line takes the following form:

```
tdp svcKey eventType msgType cgPn cdPn [wild] [keep]
```

The table below defines the meanings and forms of these parameters.

<table>
<thead>
<tr>
<th>Global Parameter Value</th>
<th>Type</th>
<th>Description</th>
</tr>
</thead>
</table>
| `tdp`                  | integer | This integer value defines the point that the TDP is triggered at.  
Together with `cgPn`, `cdPn` and `wild` it defines the condition that the trigger will fire on.  
See the TDP event type table for a list of valid values and meanings. |
<p>| <code>svcKey</code>               | integer | This parameter defines the serviceKey value that will be |</p>
<table>
<thead>
<tr>
<th>Global Parameter Value</th>
<th>Type</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>inserted into the initialDP message when this trigger fires.</td>
</tr>
<tr>
<td>eventType</td>
<td>integer</td>
<td>This parameter defines the eventTypeBCSM value that will be inserted into the InitialDP message when this trigger fires. See the TDP event type table for a list of valid values and meanings. Generally this will be the same value as tdp.</td>
</tr>
<tr>
<td>msgType</td>
<td>request or notify</td>
<td>This parameter defines whether the TDP is sent as a TDP-R (request) or TDP-N(notify). Generally request is used here.</td>
</tr>
</tbody>
</table>
| cgPn                   | num or nat:num or all | This parameter defines the calling party numbers that will trigger the TDP. Together with tdp, cdPn and wild it defines the condition that the trigger will fire on.  
  - num defines the prefix of the calling party digits, numbers must begin with these digits for the trigger to fire.  
  - nat is optional and defines additionally a nature of address (NOA) of the calling party that must match for the trigger to fire. If not provided a nature of 2 (unknown) is assumed. If all is defined then ALL calling party numbers will match. |
| cdPn                   | num or nat:num or all | This parameter defines the called party numbers that will trigger the TDP. Together with tdp, cgPn and wild it defines the condition that the trigger will fire on.  
  - num defines the prefix of the called party digits, numbers must begin with the se digits for the trigger to fire.  
  - nat is optional and defines additionally a nature of address (NOA) of the called party that must match for the trigger to fire. If not provided a nature of 2 (unknown) is assumed. If all is defined then ALL called party numbers will match. |
| wild                   | integer   | This optional parameter defines the number of digits that must be present in the called party numbers before the TDP will trigger. Together with tdp, cgPn and cdPn it defines the condition that the trigger will fire on. If set the trigger will not fire until the called party number has this number of digits.  
  Note: The wild parameter can be set to a special value of "stop". If it is set to this value, then the trigger will only fire when a stop digit is received. |
| keep                   | -         | If this optional flag is defined then all numbers triggered by this TDP will keep their stop digits (if they have one).                                                                                     |
## TDP event type values

The following table defines the list of TDPs as defined by the CS-1 standard. It also defines the point at which the trigger will be instantiated by the NCC IN Call Model.

<table>
<thead>
<tr>
<th>TDP</th>
<th>CS-1 Trigger Name</th>
<th>Call Model TDP Creation Point</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>origAttemptAuthorized</td>
<td>digitsReceived</td>
</tr>
<tr>
<td>2</td>
<td>collectedInfo</td>
<td>digitsReceived</td>
</tr>
<tr>
<td>3</td>
<td>analyzedInformation</td>
<td>digitsReceived</td>
</tr>
<tr>
<td>4</td>
<td>routeSelectFailure</td>
<td>released (cause ! 16, 17, 18, 19 or 21)</td>
</tr>
<tr>
<td>5</td>
<td>oCalledPartyBusy</td>
<td>released (Aparty, cause==17)</td>
</tr>
<tr>
<td>6</td>
<td>oNoAnswer</td>
<td>released (Aparty, cause==18, 19 or 21)</td>
</tr>
<tr>
<td>7</td>
<td>oAnswer</td>
<td>answered(Aparty)</td>
</tr>
<tr>
<td>8</td>
<td>oMidCall</td>
<td>not supported</td>
</tr>
<tr>
<td>9</td>
<td>oDisconnect</td>
<td>released (Aparty, cause==16 or 31)</td>
</tr>
<tr>
<td>10</td>
<td>oAbandon</td>
<td>released (Aparty, cause==16 or 31)</td>
</tr>
<tr>
<td>12</td>
<td>termAttemptAuthorized</td>
<td>digitsReceived</td>
</tr>
<tr>
<td>13</td>
<td>tCalledPartyBusy</td>
<td>released (Bparty, cause==17)</td>
</tr>
<tr>
<td>14</td>
<td>tNoAnswer</td>
<td>released (Bparty, cause==18, 19 or 21)</td>
</tr>
<tr>
<td>15</td>
<td>tAnswer</td>
<td>answered(Bparty)</td>
</tr>
<tr>
<td>16</td>
<td>tMidCall</td>
<td>not supported</td>
</tr>
<tr>
<td>17</td>
<td>tDisconnect</td>
<td>released (Bparty, cause==16 or 31)</td>
</tr>
<tr>
<td>18</td>
<td>tAbandon</td>
<td>released (Bparty, cause==16 or 31)</td>
</tr>
<tr>
<td>100</td>
<td>n/a</td>
<td>ringing (Aparty)</td>
</tr>
<tr>
<td>101</td>
<td>n/a</td>
<td>ringing (Bparty)</td>
</tr>
</tbody>
</table>
NCC Glossary of Terms

AC
Application Context. A parameter in a TCAP message which indicates what protocol is conveyed. May indicate, for example, MAP, CAMEL, or INAP. Also usually specifies the particular version of the conveyed protocol, for example, which CAMEL Phase.

ACS
Advanced Control Services configuration platform.

CAMEL
Customized Applications for Mobile network Enhanced Logic
This is a 3GPP (Third Generation Partnership Project) initiative to extend traditional IN services found in fixed networks into mobile networks. The architecture is similar to that of traditional IN, in that the control functions and switching functions are remote. Unlike the fixed IN environment, in mobile networks the subscriber may roam into another PLMN (Public Land Mobile Network), consequently the controlling function must interact with a switching function in a foreign network. CAMEL specifies the agreed information flows that may be passed between these networks.

CC
Country Code. Prefix identifying the country for a numeric international address.

CDMA
Code Division Multiple Access is a method for describing physical radio channels. Data intended for a specific channel is modulated with that channel's code. These are typically pseudo-random in nature, and possess favourable correlation properties to ensure physical channels are not confused with one another.

Connection
Transport level link between two peers, providing for multiple sessions.

cron
Unix utility for scheduling tasks.

crontab
File used by cron.

DP
Detection Point

DTMF
Dual Tone Multi-Frequency - system used by touch tone telephones where one high and one low frequency, or tone, is assigned to each touch tone button on the phone.
EDR

Event Detail Record

Note: Previously CDR. The industry standard for CDR is EDR (Event Detail Record). Over time EDR will replace CDR in the NCC documentation.

FCI

Furnish Charging Information. An INAP operation sent from ACS to the SSP to control the contents of EDRs produced by the SSP.

FDA

First Delivery Attempt - the delivery of a short message directly to the SME rather than relaying it through the MC.

GMSC

Gateway MSC. The first MSC which handles a call. For a MOC, this is the caller’s attached MSC. For an MTC, this is the first non-transit MSC in the subscriber’s network that receives the inbound call.

GPRS

General Packet Radio Service - employed to connect mobile cellular users to PDN (Public Data Network- for example the Internet).

GSM

Global System for Mobile communication.

It is a second generation cellular telecommunication system. Unlike first generation systems, GSM is digital and thus introduced greater enhancements such as security, capacity, quality and the ability to support integrated services.

GT

Global Title.

The GT may be defined in any of the following formats:

- Type 1: String in the form "1,<noa>,<BCD address digits>"
- Type 2: String in the form "2,<trans type><BCD address digits>"
- Type 3: String in the form "3,<trans type>,<num plan>,<BCD address digits>"
- Type 4: String in the form "4,<trans type>,<num plan>,<noa>,<BCD address digits>"

The contents of the Global Title are defined in the Q713 specification, please refer to section 3.4.2.3 for further details on defining Global Title.

HLR

The Home Location Register is a database within the HPLMN (Home Public Land Mobile Network). It provides routing information for MT calls and SMS. It is also responsible for the maintenance of user subscription information. This is distributed to the relevant VLR, or SGSN (Serving GPRS Support Node) through the attach process and mobility management procedures such as Location Area and Routing Area updates.

HPLMN

Home PLMN

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**HTML**

HyperText Markup Language, a small application of SGML used on the World Wide Web. It defines a very simple class of report-style documents, with section headings, paragraphs, lists, tables, and illustrations, with a few informational and presentational items, and some hypertext and multimedia.

**IDP**

INAP message: Initial DP (Initial Detection Point)

**IMSI**

International Mobile Subscriber Identifier. A unique identifier allocated to each mobile subscriber in a GSM and UMTS network. It consists of a MCC (Mobile Country Code), a MNC (Mobile Network Code) and a MSIN (Mobile Station Identification Number).

The IMSI is returned by the HLR query (SRI-SM) when doing FDA. This tells the MSC exactly who the subscriber is that the message is to be sent to.

**IN**

Intelligent Network

**INAP**

Intelligent Network Application Part - a protocol offering real time communication between IN elements.

**Initial DP**

Initial Detection Point - INAP Operation. This is the operation that is sent when the switch reaches a trigger detection point.

**IP**

1) Internet Protocol
2) Intelligent Peripheral - This is a node in an Intelligent Network containing a Specialized Resource Function (SRF).

**IS-41**

Interim Standard 41 is a signaling protocol used in cellular telecommunications systems. It deals with the signalling between the MSC and other network elements for the purpose of handovers and roaming etc.

**ISDN**

Integrated Services Digital Network - set of protocols for connecting ISDN stations.

**ISUP**

ISDN User Part - part of the SS7 protocol layer and used in the setting up, management, and release of trunks that carry voice and data between calling and called parties.

**ITU**

International Telecommunication Union
M3UA
MTP3 User Adaptation. The equivalent of MTP in the SIGTRAN suite.

MAP
Mobile Application Part - a protocol which enables real time communication between nodes in a mobile cellular network. A typical usage of the protocol would be for the transfer of location information from the VLR to the HLR.

MC
Message Centre. Also known as SMSC.

MCC
Mobile Country Code. In the location information context, this is padded to three digits with leading zeros. Refer to ITU E.212 (“Land Mobile Numbering Plan”) documentation for a list of codes.

MDN
Mobile Directory Number

MIN
Mobile Identification Number, also known as an MSID.

MNC
Mobile Network Code. The part of an international address following the mobile country code (MCC), or at the start of a national format address. This specifies the mobile network code, that is, the operator owning the address. In the location information context, this is padded to two digits with a leading zero. Refer to ITU E.212 (“Land Mobile Numbering Plan”) documentation for a list of codes.

MO
Mobile Originated

MOC
Managed Object Class

MS
Mobile Station

MSC
Mobile Switching Centre. Also known as a switch.

MSID
Mobile Subscriber Identification, also known as an MIN.

MSIN
Mobile Station Identification Number.
MT
Mobile Terminated

MTC
Mobile Terminated Call. The part of the call associated with a subscriber receiving an inbound call.

MTP
Message Transfer Part (part of the SS7 protocol stack).

MTP3
Message Transfer Part - Level 3.

NOA
Nature Of Address - a classification to determine in what realm (Local, National or International) a given phone number resides, for the purposes of routing and billing.

Oracle
Oracle Corporation

PC
Point Code. The Point Code is the address of a switching point.

PLMN
Public Land Mobile Network

SCCP
Signalling Connection Control Part (part of the SS7 protocol stack).

SCF
Service Control Function - this is the application of service logic to control functional entities in providing Intelligent Network services.

SCP
Service Control Point. Also known as SLC.

SGML

SGSN
Serving GPRS Support Node
SLC
Service Logic Controller (formerly UAS).

SLEE
Service Logic Execution Environment

SME
Short Message Entity - an entity which may send or receive Short Messages. It may be located in a fixed network, a mobile, or an SMSC.

SMS
Depending on context, can be:
- Short Message Service
- Service Management System platform
- NCC Service Management System application

SNMP

SRF
Specialized Resource Function - This is a node on an IN which can connect to both the SSP and the SLC and delivers additional special resources into the call, mostly related to voice data, for example play voice announcements or collect DTMF tones from the user. Can be present on an SSP or an Intelligent Peripheral (IP).

SRI
Send Routing Information - This process is used on a GSM network to interrogate the HLR for subscriber routing information.

SS7
A Common Channel Signalling system used in many modern telecoms networks that provides a suite of protocols which enables circuit and non circuit related information to be routed about and between networks. The main protocols include MTP, SCCP and ISUP.

SSN
Subsystem Number. An integer identifying applications on the SCCP layer.
For values, refer to 3GPP TS 23.003.

SSP
Service Switching Point

SUA
Signalling Connection Control Part User Adaptation Layer
**System Administrator**
The person(s) responsible for the overall set-up and maintenance of the IN.

**TCAP**
Transaction Capabilities Application Part – layer in protocol stack, message protocol.

**TDP**
Trigger Detection Point.

**TSAN**
Temporary Service Access Number

**VLR**
Visitor Location Register - contains all subscriber data required for call handling and mobility management for mobile subscribers currently located in the area controlled by the VLR.

**VWS**
Oracle Voucher and Wallet Server (formerly UBE).
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