

CCS Trace



CCS Trace

Product Release MCD 5.0

Issue 3 – 17th May 2012

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CCS Trace

01

Objectives

When you finish this module, you will be able to:

- Interpret CCS traces



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CCS Trace

CCS refers to the messages that pass over a digital trunk on channel 16 (E1 digital trunk) and are used by the telephone systems at each end to send calling and clearing information about a call being made.

The messages can be read with maintenance commands on the Mitel SX2000 and 3300 ICP's and are a useful diagnostic tool to help fault find on digital trunks.

On the Mitel 3300 CCS trace can also be used to view the message used on IP trunks between 3300's and also on SIP trunks from/to a SIP service provider.

Interpreting the trace is not easy due to the amount of information available. This manual is designed to show you the most common situations. Detailed breakdowns of the messages are shown based on the technical specifications for CCS trace in a series of BTNR 188 publications in appendices at the end of this manual.

Maintenance commands



Caution

CCS trace should only be enabled during a fault finding session to gather information. It should then be disabled. Leaving CCS trace running may impact on the performance of the 3300/SX2000

CCS TRACE ENABLE - CCS Trace is enabled, monitoring the Signalling Channel. To view the results you must first disable CCS Trace and then use the 'CCS Trace show output' command.

CCS TRACE DISABLE - CCS Trace is disabled, monitoring stops.

CCS TRACE SHOW OUTPUT – The results of the CCS Trace are displayed on the screen.

CCS TRACE ENABLE CONTINUOUS - CCS Trace is enabled and continuously monitors the signalling channel; results are displayed in real time on the screen.

CCS TRACE SHOW CONTEXT - Displays which channels are active for CCS tracing.

CCS TRACE SET CONTEXT <PLID> - Activates the specific channel for testing.

CCS TRACE SET CONTEXT VIRTUAL <PLID> - Activates the specific virtual channel for testing

CCS TRACE CLEAR CONTINUOUS - Resets channels to ALL for tracing.

The most common command to use is **CCS TRACE ENABLE CONTINUOUS** which is then turned off after you've gathered the information you want with **CCS TRACE DISABLE**.

On a busy working system with many incoming and outgoing calls you may find there is a lot of information available which will be in what appears a mixed up order based on when calls started and ended. A useful tip when you have the results in the 3300 maintenance screen is to copy the text to Word or similar program so you can search the text for the call you made that you want to check on. In the 3300 Maintenance screen just select the text with your mouse (or CTRL+A) and copy it.

MITEL Alarm Status:
Message Board | About | Help | Logout

View by Category SDS Share
Maintenance Commands DN to search
Show form on Not Accessible Go

Clear Submit Favorites History

- Licenses
- LAN/WAN Configuration
- Voice Network
- System Properties
- Hardware
- Trunks
- Users and Devices
- Voice Mail
- Call Routing
- Music On Hold
- Emergency Services Management
- Property Management
- Maintenance and Diagnostics
 - Alarms
 - Logs
 - IP Telephone Inventory
 - Voice Quality
 - Bandwidth Statistics
 - SDS Shared Data Updates
 - Backup/Restore
 - Maintenance Commands**
 - Scheduler

Command:

ALARMS
 ARPSHOW
 BACKGROUND OFF
 BACKGROUND OFF <CEPT[...>
 BACKGROUND ON
 BACKGROUND ON <CEPT[...>

System Response:

```

14:04:21 RIX DPN PBX6 43 455 D** B** 26 ISRM_J ;10*1#50*63427#*100*P.Ramaden*1#19*Y#
14:04:21 RIX DPN PBX6 43 455 D** B** 22 SSRM_J *58*CW*chlg@@@*@*@*Zkp#58*C8*001#
14:04:21 RIX DPN PBX6 43 455 D** B** 28 SSRM_J *58*CL*E*14*63427*Q0146713*C#58*CQ*05#
14:04:21 RIX DPN PBX6 43 455 D** B** 27 SSRM_J *58*CE*A*63111*G.Free#58*C4*1*01*01#
14:04:21 RIX DPN PBX6 43 455 D** B** D SSRM_C 907809200136
14:04:21 RO8177 DPN 26 ISRM_J ;10*1#50*63427#*100*P.Ramaden*1#19*Y#
14:04:21 RO8177 DPN 22 SSRM_J *58*CW*chlg@@@*@*@*Zkp#58*C8*001#
14:04:21 RO8177 DPN 28 SSRM_J *58*CL*E*14*63427*Q0146713*C#58*CQ*05#
14:04:21 RO8177 DPN 27 SSRM_J *58*CE*A*63111*G.Free#58*C4*1*01*01#
14:04:21 RO8177 DPN G SSRM_C 07809200136
14:04:22 RI8177 DPN 1A NIM *51*3#*167*19901*65*1656#
14:04:22 ROX DPN PBX6 43 455 D** B** 1A NIM *51*3#*167*19901*65*1656#
14:04:22 RI8177 DPN 1B NAM *3*3 4#*167*19901*65*1656#
14:04:22 ROX DPN PBX6 43 455 D** B** 1B NAM *3*3 4#*167*19901*65*1656#
14:04:23 RI8177 DPN 1B CCM *3*3 4#*167*19901*65*1656#
14:04:23 ROX DPN PBX6 43 455 D** B** 1B CCM *3*3 4#*167*19901*65*1656#
        
```

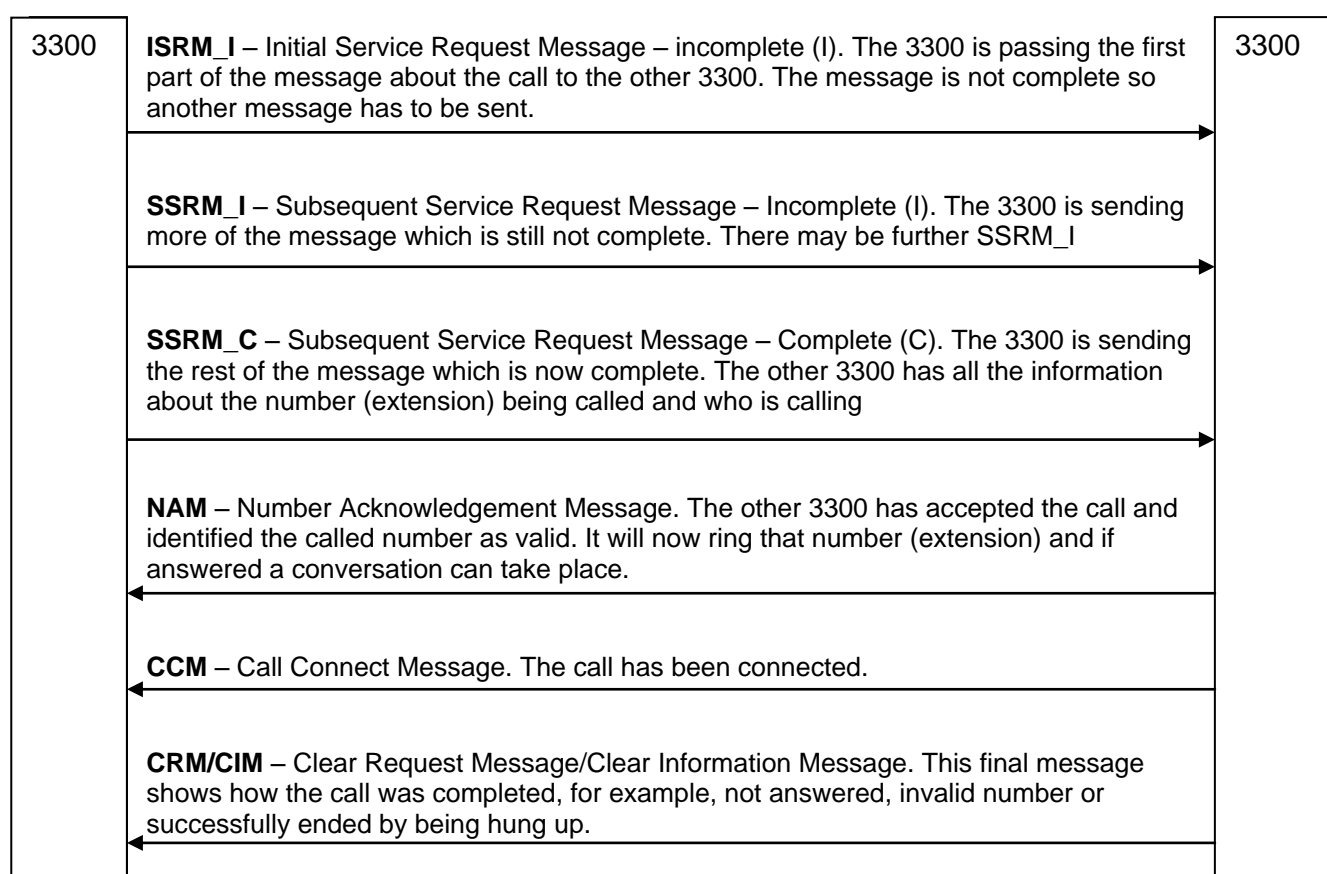

CCS Trace Message Structure

This is an example CCS trace from a DPNSS trunk between two 3300/MCD systems. Outgoing call from ext 1102, John Digby to ext 1750, Dan Dare which was answered.

```

11:46:45 RO6000 DPN 23 ISRM_I ;10;*1#*50*1102#*100*J.Digby*1#*19*Z#
11:46:45 RO6000 DPN 2D SSRM_I *58*CW*IOpj@@@@@lpF]p#*58*C6*001#*58*C4*4*1#
11:46:45 RO6000 DPN 5 SSRM_C 1750
11:46:46 RI6000 DPN 1B NAM *1#*50*1750#*100*D.Dare*1#
11:46:48 RI6000 DPN 1 CCM
11:46:53 RO6000 DPN 2 CRM/CIM ;30;
11:46:53 RI6000 DPN 2 CRM/CIM ;30;
    
```

This is how the messages breakdown. Please note, there may be other messages in a trace and a full list is provided in Appendix A1 - CCS Trace Message Descriptions. The example shown is typical of a digital trunk call.



Additional CCS trace messages are in Appendix 3.

CCS Trace Message Details

This is a detailed breakdown of a message explaining what each part of it means and how to interpret it. Further details appendices. Several examples of calls are provided on both public and private digital trunks, IP trunks and SIP trunks including examples of failed calls.

Using the same example above of a CCS trace for this DPNSS call, this is the basic information provided. Outgoing call from ext 1102, John Digby to ext 1750 Dan Dare which was answered and then hung up. The CCS trace is being run on the MCD that 1102 is connected to.

```
11:46:45 RO6000 DPN 23 ISRM_I ;10;*1#*50*1102#*100*J.Digby*1#*19*Z#
11:46:45 RO6000 DPN 2D SSRM_I *58*CW*IOpj@@@ @lpF]p#*58*C6*001#*58*C4*4*1#
11:46:45 RO6000 DPN 5 SSRM_C 1750
11:46:46 RI6000 DPN 1B NAM *1#*50*1750#*100*D.Dare*1#
11:46:48 RI6000 DPN 1 CCM
11:46:53 RO6000 DPN 2 CRM/CIM ;30;
11:46:53 RI6000 DPN 2 CRM/CIM ;30;
```

Taking each line in turn, this is how the message is interpreted.

```
11:46:45 RO6000 DPN 23 ISRM_I ;10; *1# *50*1102# *100*J.Digby*1# *19*Z#
 1         2         3         4         5         6         7         8         9         10
```

1. Time the call was made
2. **RO6000** - R = real trunk (digital trunk not IP or SIP). O = Outgoing. Call is outgoing from the 3300 recording the trace and is on trunk number 6000 (as programmed in the Digital Trunk form).
3. **DPN** – DPNSS protocol being used. Note: DPNSS and PRI digital trunk calls on CCS traces on the 3300 show the protocol as DPN because of the way calls are handled within the software. DASSII trunks show DAS.
4. **23** – length of the following message in hexadecimal
5. **ISRM_I** - Initial Service Request Message Incomplete. This is the information about the call sent from the calling 3300 to the other 3300. I (incomplete) means it is longer than 45 characters so there will be an ISRM_I (incomplete) instead which will be followed by SSRM – Subsequent Service Request Messages until the message has been sent.
6. **;10;** - Service Indicator Code. The semicolons enclosing the number means it is a binary encoded message. The value 10 means speech. Other values could be A0 for 64K data.
7. ***1#** - Supplementary Information String Identifier. The * shows the beginning of the string, 1 is the value. If it was followed by a # that would indicate the end of that string and another string may follow. If it is followed by another * (instead of #) this indicates it is a Supplementary Information String Parameter. The parameter should end with a #. If the parameter ends with a * it means a second parameter applies.

The Supplementary Information String Identifiers and parameters are explained in Appendix 1.

In this example *1# is a single string meaning an Ordinary call. There is no parameter. This extract from the Supplementary String Identifier Appendix 1 shows how to read the value 1.

| Code | Meaning | Parameters |
|------|---|--|
| 1 | Calling/called line category - ordinary | 1 - PSTN barred 2 - Emergency phone 3 - Hunt group 4 - Distribution group 5 - Extraordinary extension (PSTN) |

8. ***50*1102#** - This is another Supplementary String Identifier (*50) which means Originating Line Identity (who is calling). The value 1102# is the extension number, the # indicates the end of that string.

| Code | Meaning | Parameters |
|------|--|-------------------------------------|
| 50 | Originating line identity, or Called line identity | A party address, or B party address |

9. ***100*J.Digby*1#** - *100 Supplementary String Identifier - Textual Display meaning text information. The *100 is followed by another * which means there is a parameter in this case the name J.Digby (Test String). Looking up 100 in the table for the Supplementary Information String the Meaning column tells us it is Textual Display and the Parameter column tells us it is a Text String. The parameter in the trace J.Digby is followed by another * and value 1. This tells us the parameter also has a parameter. So the Text String can be 1, 2 or 3. In this case it is 1 meaning it is a Name.

| Code | Meaning | Parameters |
|------|-----------------|--|
| 100 | Textual display | Text string (24 characters max.), text type: 1 - Name 2 - Message 3 - Reason for call failure |

10. ***19*Z#** - This is the last string in the ISRM_I message. *19 means 'Loop Avoidance' or the number of network hops allowed as the call transits multiple systems to reach the destination. The string (*19) is followed by another * (parameter) with the value of Z which means 25 hops allowed. The string ends with a # closing it. There are no more strings in this message.

| Code | Meaning | Parameters |
|------|----------------|--|
| 19 | Loop avoidance | Number of further transits allowed, number of further alternative routes allowed. A=0, Z=24 |

Taking the next line in the trace

```
11:46:45 RO6000 DPN 23 ISRM_I ;10;*1#*50*1102#*100*J.Digby*1#*19*Z#
11:46:45 RO6000 DPN 2D SSRM_I *58*CW*IOpj@@@@@lpF]p#*58*C6*001#*58*C4*4*1#
11:46:45 RO6000 DPN 5 SSRM_C 1750
11:46:46 RI6000 DPN 1B NAM *1#*50*1750#*100*D.Dare*1#
11:46:48 RI6000 DPN 1 CCM
11:46:53 RO6000 DPN 2 CRM/CIM ;30;
11:46:53 RI6000 DPN 2 CRM/CIM ;30;
```

11:46:45 RO6000 DPN 2D SSRM_I *58*CW*IOpj@@@lpF]p# *58*C6*001# *58*C4*4*1#

 1 2 3 4 5 6 7 8

- 5. **SSRM_I** – Subsequent Service Request Message Incomplete. Continuation of the ISRM in the first line.
- 6. ***58*CW*IOpj@@@lpF]p#** - *58*CW* This NON-SPECIFIED INFORMATION string is for Global Call ID.. The additional parameter of IOpj@@@lpF]p is unclear without reference to Mitel design but it usually means additional information about the caller. This information is Mitel specific.
- 7. ***58*C6*001#** - The string *58 again means NON-SPECIFIED INFORMATION. There is a parameter which in this case means AS DEFINED BY USER. The precise meaning of this parameter is unclear without reference to Mitel design but it usually means additional information about the caller.
- 8. ***58*C4*4*1#** - as for 7 and 6 above.

Taking the next line in the trace

11:46:45 RO6000 DPN 23 ISRM_I ;10;*1#*50*1102#*100*J.Digby*1#*19*Z#
 11:46:45 RO6000 DPN 2D SSRM_I *58*CW*IOpj@@@lpF]p#*58*C6*001#*58*C4*4*1#
11:46:45 RO6000 DPN 5 SSRM_C 1750
 11:46:46 RI6000 DPN 1B NAM *1#*50*1750#*100*D.Dare*1#
 11:46:48 RI6000 DPN 1 CCM
 11:46:53 RO6000 DPN 2 CRM/CIM ;30;
 11:46:53 RI6000 DPN 2 CRM/CIM ;30;

11:46:45 RO6000 DPN 5 SSRM_C 1750

 1 2 3 4 5 6

- 5. **SSRM_C** – Subsequent Service Request Message Complete. The message started with the ISRM is now complete. All the call information is sent to the other 3300.
- 6. **1750** – the called party number

Taking the next line in the trace

11:46:45 RO6000 DPN 23 ISRM_I ;10;*1#*50*1102#*100*J.Digby*1#*19*Z#
 11:46:45 RO6000 DPN 2D SSRM_I *58*CW*IOpj@@@lpF]p#*58*C6*001#*58*C4*4*1#
 11:46:45 RO6000 DPN 5 SSRM_C 1750
11:46:46 RI6000 DPN 1B NAM *1#*50*1750#*100*D.Dare*1#
 11:46:48 RI6000 DPN 1 CCM
 11:46:53 RO6000 DPN 2 CRM/CIM ;30;
 11:46:53 RI6000 DPN 2 CRM/CIM ;30;

11:46:46 RI6000 DPN 1B NAM *1# *50*1750# *100*D.Dare*1#

 1 2 3 4 5 6 7 8

- 5. **NAM** – Number Acknowledgement Message.
- 6. ***1#** - String, Calling/Called Line Ordinary (a normal call). The string ends with a # so there is no parameter.

- *50*1750#** - String *50 meaning Originating Line Identity /Called Line Identity with a parameter of A/B Party Address. The value of the parameter here is 1750 which is the called party. As this NAM is INCOMING to the 3300 being traced it is the Called Line Identity And B Party Address. The other 3300 is acknowledging the original message from the 3300 calling 1750 by verifying the number is valid.

| Code | Meaning | Parameters |
|------|--|-------------------------------------|
| 50 | Originating line identity, or Called line identity | A party address, or B party address |

- *100*D.Dare*1#** - Textual Display with parameter. The actual name followed by another parameter (*1). The text display string is the other 3300 telling the originator what to display on the calling phone.

| Code | Meaning | Parameters |
|------|-----------------|--|
| 100 | Textual display | Text string (24 characters max.), text type: 1 - Name 2 - Message 3 - Reason for call failure |

Taking the next line in the trace

```
11:46:45 RO6000 DPN 23 ISRM_I ;10;*1#*50*1102#*100*J.Digby*1#*19*Z#
11:46:45 RO6000 DPN 2D SSRM_I *58*CW*IOpj@@@ @|pF]p#*58*C6*001#*58*C4*4*1#
11:46:45 RO6000 DPN 5 SSRM_C 1750
11:46:46 RI6000 DPN 1B NAM *1#*50*1750#*100*D.Dare*1#
11:46:48 RI6000 DPN 1 CCM
11:46:53 RO6000 DPN 2 CRM/CIM ;30;
11:46:53 RI6000 DPN 2 CRM/CIM ;30;
```

```
11:46:48 RI6000 DPN 1 CCM
-----
  1      2      3  4      5
```

- CCM** – Call Connected Message. The call has been connected and a conversation can now take place over a voice channel

Taking the next 2 lines in the trace

```
11:46:45 RO6000 DPN 23 ISRM_I ;10;*1#*50*1102#*100*J.Digby*1#*19*Z#
11:46:45 RO6000 DPN 2D SSRM_I *58*CW*IOpj@@@ @|pF]p#*58*C6*001#*58*C4*4*1#
11:46:45 RO6000 DPN 5 SSRM_C 1750
11:46:46 RI6000 DPN 1B NAM *1#*50*1750#*100*D.Dare*1#
11:46:48 RI6000 DPN 1 CCM
11:46:53 RO6000 DPN 2 CRM/CIM ;30;
11:46:53 RI6000 DPN 2 CRM/CIM ;30;
```

```
11:46:48 RO6000 DPN 2 CRM/CIM ;30;
-----
  1      2      3  4      5
```

- CRM/CIM ;30;** – Clear Request Message/Clear Information Message. The CRM is being sent from one 3300 to the other (outgoing – RO6000) saying the call has been cleared down. In the last line of the trace the CRM/CIM is from the other 3300 (RI6000). This is in fact the CIM acknowledging the CRM. The value 30 means the call completed normally. Refer to Appendix 2 CRM/CIM codes.

Examples of other CCS Traces

DPNSS call which is diverted to voicemail

DPNSS incoming call from 1750 to 1102 - not answered, and 1102 diverts to VM which does answers

```

11:51:34 RI6000 DPN 22 ISRM_I ;10;*1#*50*1750#*100*D.Dare*1#*19*Z#
11:51:34 RI6000 DPN 2D SSRM_I *58*CW*SJXC@@@J@f}P#*58*C6*001#*58*C4*4*1#
11:51:34 RI6000 DPN 5 SSRM_I 1102
11:51:34 RO6000 DPN 1C NAM *1#*50*1102#*100*J.Digby*1#
11:51:51 RO6000 DPN B NSIM ;1C;*100*;7F;*1#
11:51:51 RO6000 DPN 16 CCM *1*3#*50*2503#*166*6#
11:51:58 RI6000 DPN 2 CRM/CIM ;30;
    
```

The trace is as before but there is an NSIM – Non-Standard Information Message of:

```
11:51:51 RO6000 DPN B NSIM ;1C;*100*;7F;*1#
```

The ;1C;*100*;7F;*1# breaks down as follows:

1C is a Mitel specific message, ***100** a supplementary string parameter for Text display (name) and **7F** meaning no name is available – in this case the call was answered by a voicemail port with no name programmed.

```
11:51:51 RO6000 DPN 16 CCM *1*3#*50*2503#*166*6#
```

***1** Supplementary String Identifier - calling/called party and 3 is the parameter meaning it is a Hunt Group – the called went to the Voicemail hunt group.

| Code | Meaning | Parameters |
|------|---|--|
| 1 | Calling/called line category - ordinary | 1 - PSTN barred 2 - Emergency phone 3 - Hunt group 4 - Distribution group 5 - Extraordinary extension (PSTN) |

***50** Supplementary String Identifier - Originating line ID/Called Line ID, parameter 2503 is the voicemail port used.

| Code | Meaning | Parameters |
|------|--|-------------------------------------|
| 50 | Originating line identity, or Called line identity | A party address, or B party address |

PRI call – called number is busy

Incoming call on channel 102 from mobile 07530198766 to extension 431430.

12:54:07 RI102 DPN 2C ISRM_C 10;*3#*50*07530198766#*100*410*1#*19*Z#431430
 12:54:07 RO102 DPN B CRM/CIM ;8;*166*2 3#
 12:54:07 RI102 DPN B CRM/CIM ;8;*166*2 3#

The CRM/CIM value of 8 indicates called number busy. The called extension number 1430 is shown as 431430. This is the complete number sent from the BT exchange (6 digits). The 3300 Trunk Attribute programming will remove the 43.

*3#*50*07530198766

Calling/called line category - DASS2 which is a bit confusing as it's PRI.

| Code | Meaning | Parameters |
|------|--------------------------------------|--|
| 3 | Calling/called line category - DASS2 | 1 - Non-DDI 2 - No release at any point 3 - Release only after answer 4 - Outgoing None - DDI |

12:54:07 RO102 DPN B CRM/CIM ;8;*166*2 3#

The *166 means Service Information and the parameter of 2 3 means:

| Code | Meaning | Parameters |
|------|---------------------|---|
| 166 | Service information | 1 - Call offer not possible 2 - Executive intrusion not possible 3 - Call back when free not possible 4 - Call back messaging not possible 5 - Hold not possible 6 - Call back when next used not possible |

PRI call – called number is invalid (not recognised by the 3300)

Incoming call on channel 1001 from 01216412100 to extension 1190 (which does not exist).

12:00:32 RI1001 DPN 2B ISRM_I 10;*3#*50*01216412100#*100*410*1#*19*Z#
 12:00:32 RI1001 DPN 1A SSRM_I *238*dXD#*50*01216412100#
 12:00:32 RI1001 DPN 19 SSRM_C *235*HX@*1216412100#1190
 12:00:32 RO1001 DPN 2 CRM/CIM ;0;
 12:00:32 RI1001 DPN 2 CRM/CIM ;0;

The CRM/CIM value of 0 indicates called number invalid. The SSRM_C shows the CLI of the calling number (note there is no 0, this is removed by the BT exchange). The called number 1190 is sent as 4 digits from the BT exchange. The 3300 Trunk Attributes will absorb 0 digits.

IP and SIP Trunk Traces

CCS Trace can be used with both SIP and IP trunks. The information recorded is the same although there will be some NSIM – Non-Standard Information Message which are Mitel specific and whose values are not known without reference to Mitel Design and Support.

Below are some examples of calls.

IP Trunks

IP Trunk channels are ‘virtual’ so the trunk number always shows as X, either incoming or outgoing (RIX or ROX)

The protocol is always DPNSS (DPN) and the PBX number the trace is running on is also shown, PBX2 in this example (from the IP Trunk programming forms on the 3300). There is also a call identifier of 2 2 (after the PBX 2 number). On the example further down the page this is 3 3. This call identifier allows you to follow a particular call through a CCS trace that may contain many different types of calls.

Outgoing from ext 1102 to 1750 - answered

```
09:34:19 ROX DPN PBX2 2 2 D** B** 23 ISRM_I ;10;*1#*50*1102#*100*J.Digby*1#*19*Z#
09:34:19 ROX DPN PBX2 2 2 D** B** 2D SSRM_I 58*CW*IOpj@@@@@KOvt`#*58* C6*001#
*58*C4*4*1#
09:34:19 ROX DPN PBX2 2 2 D** B** 5 SSRM_C 1750
09:34:19 RIX DPN PBX2 2 2 D** B** 1B NAM *1#*50*1750#*100*D.Dare*1#
09:34:21 RIX DPN PBX2 2 2 D** B** 1 CCM
09:34:22 RIX DPN PBX2 2 2 D** B** 2 CRM/CIM ;30;
```

Outgoing from ext 1102 to 1750. 1750 diverts to VM which answers

```
09:35:39 ROX DPN PBX2 3 3 D** B** 23 ISRM_I ;10;*1#*50*1102#*100*J.Digby*1#*19*Z#
09:35:39 ROX DPN PBX2 3 3 D** B** 2D SSRM_I *58*CW*IOpj@@@@@KO}E`#*58*C6*001#
*58*C4*4*1#
09:35:39 ROX DPN PBX2 3 3 D** B** 5 SSRM_C 1750
09:35:39 RIX DPN PBX2 3 3 D** B** 1B NAM *1#*50*1750#*100*D.Dare*1#
09:35:55 RIX DPN PBX2 3 3 D** B** B NSIM ;1C;*100*;7F;*1#
09:35:56 RIX DPN PBX2 3 3 D** B** 18 CCM *1*1 3#*50*2522#*166*6#
09:36:02 RIX DPN PBX2 3 3 D** B** D EEM_C *58*CM*ME09#
09:36:02 RIX DPN PBX2 3 3 D** B** D EEM_C *58*CM*MB00#
09:36:03 ROX DPN PBX2 3 3 D** B** 2 CRM/CIM ;30;
09:36:03 RIX DPN PBX2 3 3 D** B** 2 CRM/CIM ;30;
```

There is also an EEM_C and EEM_I message in this example. This is an End to End Message and is providing additional information after the call has connected. It is usually seen if a call is put on hold or transferred. The *58 Supplementary String Identifier means it is vendor specific information Mitel specific in this case.

SIP Trunks

The protocol is always DPNSS (DPN) and the SIP Peer being used is shown (from the SIP Trunk programming forms on the 3300). Please note that with SIP trunks the service providers may just send the extension number into the 3300 or the whole number. It varies.

On each trace a call identifier number is shown, in the first example below this is 552 and in the second it is 691. This allows you to identify each line of the trace when there are other traces also being recorded.

Outgoing call on SIP Peer CandW_SIP from L.Long extension 101144 to 07971256790

```
14:50:02 ROL DPN PEER CandW_SIP 552 26 ISRM_I ;10;*1#*50*1011444# *100*L.Long*1#
*19*Z#
14:50:02 ROL DPN PEER CandW_SIP 552 22 SSRM_I *58*CW*@@@@@@@@@YwoOP#
*58*C6*001#
14:50:02 ROL DPN PEER CandW_SIP 552 2B SSRM_C *58*CL*E*1*1011444*U0015485*A#
907971256790
14:50:02 RIL DPN PEER CandW_SIP 552 7 NIM *51*3#
14:50:02 RIL DPN PEER CandW_SIP 552 11 NAM *3#*166*1 2 3 4#
14:50:21 RIL DPN PEER CandW_SIP 552 1 CCM
14:50:23 ROL DPN PEER CandW_SIP 552 2 CRM/CIM ;30;
```

Incoming call on SIP Peer CandW_SIP from 8706095050 to 1011817 P.Waters

```
14:50:00 RIL DPN PEER CandW_SIP 691 26 ISRM_I ;10;*3#*19*S# *58*Ca*1*S#
*100*8706095050#
14:50:00 RIL DPN PEER CandW_SIP 691 26 SSRM_I*58*CW*@@@@@@@@@YwoHp#
*50*8706095050#
14:50:00 RIL DPN PEER CandW_SIP 691 B SSRM_C 1173221817
14:50:00 ROL DPN PEER CandW_SIP 691 28 NAM *1#*50*1011817# *166*6#
*100*P.Waters*1#
14:50:05 ROL DPN PEER CandW_SIP 691 2 CRM/CIM ;30;
```

Using CCS Trace as a Diagnostic Tool

The large amount of information about a call allows you to use CCS Trace to diagnose trunk problems. For example you can see the incoming and outgoing numbers being dialled; what the BT exchange is actually sending you and what your MCD ARS is actually dialling out. The CCM/CIM messages let you see the status of the completed or failed call.

Basic Call Interpretation

You can look at a CCS Trace and gather basic call information.

Example: PRI call incoming to a 3300. The references are highlighted in the trace in bold.

Trunk 1001 incoming. Calling number 01216412100. Calling number CLI ID 1216412100 (note the 0 is removed by the exchange). Called number 1102. Called number verified as valid (NAM). Call was connected (CCM) and cleared down normally (CRM/CIM 30;)

```
11:59:39 RI1001 DPN 2B ISRM_I ;10;*3#*19*Z#*58*Ca*1*Z#*233`IBc#*58*CI*W6a#
11:59:39 RI1001 DPN 1A SSRM_I *238*dXD#*50*01216412100#
11:59:39 RI1001 DPN 19 SSRM_C *235*HX@*1216412100#1102
11:59:39 RO1001 DPN 23 NAM *1#*50*1102#*166*6#*100*J.Digby*1#
11:59:40 RO1001 DPN 1 CCM
11:59:43 RO1001 DPN 2 CRM/CIM ;30;
11:59:43 RI1001 DPN 2 CRM/CIM ;30;
```

Example: PRI call outgoing from a 3300

Trunk 1001 Outgoing. Calling party 1102. Called number 01216412100. Call connected (CCM) and call cleared normally (CRM/CIM 30;)

```
11:58:10 RO1001 DPN 23 ISRM_I ;10;*1#*50*1102#*100*J.Digby*1#*19*Z#
11:58:10 RO1001 DPN 2D SSRM_I *58*CW*IOpj@@@ @lp{}P#*58*C6*001#*58*C4*4*1#
11:58:10 RO1001 DPN C SSRM_C 01216412100
11:58:10 RI1001 DPN 7 NIM *51*3#
11:58:10 RI1001 DPN 13 NAM *4*4#*166*1 2 3 4#
11:58:11 RI1001 DPN A CCM *58*CP*G#
11:58:13 RO1001 DPN 2 CRM/CIM ;30;
11:58:14 RI1001 DPN 2 CRM/CIM ;30;
```

Example: a failed call due to invalid digits not recognised by the 3300

In this example the 3300 trunk attributes are set to absorb 0 digits and expects the exchange to send a 4 digit number which it does, 1190:

```
12:00:32 RI1001 DPN 19 SSRM_C *235*HX@*1216412100#1190
```

However the 3300 has still rejected the call with the CRM/CIM of 0. This is because the number 1190 does not exist in the 3300 database (you would have to check this yourself).

```
12:00:32 RI1001 DPN 2B ISRM_I 10;*3#*50*01216412100#*100*410*1#*19*Z#
12:00:32 RI1001 DPN 1A SSRM_I *238*dXD#*50*01216412100#
12:00:32 RI1001 DPN 19 SSRM_C *235*HX@*1216412100#1190
12:00:32 RO1001 DPN 2 CRM/CIM ;0;
12:00:32 RI1001 DPN 2 CRM/CIM ;0;
```

Example: a failed call due to the wrong digit length from the exchange

In this example the 3300 trunk attributes are set to absorb 0 digits and expects the exchange to send in just 4 digits. In fact the exchange is sending 6 digits, 652119:

```
14:00:12 RI1001 DPN 19 SSRM_C *235*HX@*1216412100#652119
```

Therefore the 3300 is trying to process 652119 which is not recognised so it rejects the call with the CRM/CIM message of 0.

```
14:00:12 RI1001 DPN 2B ISRM_I 10;*3#*50*02073511100#*100*410*1#*19*Z#
14:00:12 RI1001 DPN 1A SSRM_I *238*dXD#*50*02073511100#
14:00:12 RI1001 DPN 19 SSRM_C *235*HX@*2073511100#652119
14:00:12 RO1001 DPN 2 CRM/CIM ;0;
14:00:12 RI1001 DPN 2 CRM/CIM ;0;
```

In both of the above examples you can see exactly what the exchange is sending in before any processing by the 3300 trunk attribute form.

Example: multiple SSRM messages. ARS not programmed correctly.

In this example the Initial Service Request Message for this outgoing call is from extension 87772 which has dialled 07768048168. The ISRM_I only shows the first 3 digits of the number. The rest of the number is sent digit by digit with SSRM's until complete. This is caused by the ARS Route being set to default '4 digits before outpulsing'. Therefore the extension has dialled 9077 (4 digits) which triggers the first ISRM_I. Each digit after that is treated as a separate message. For digital trunks the ARS Route for should be set to Blank digits before outpulsing.

12:58:16 RO179 DAS F ISRM_I/ ;10;*86*87772#077
12:58:17 RO179 DAS 2 SSRM_I/ 6
12:58:17 RO179 DAS 2 SSRM_I/ 8
12:58:17 RO179 DAS 2 SSRM_I/ 0
12:58:17 RO179 DAS 2 SSRM_I/ 4
12:58:17 RO179 DAS 2 SSRM_I/ 8
12:58:18 RO179 DAS 2 SSRM_I/ 1
12:58:18 RO179 DAS 2 SSRM_I/ 6
12:58:18 RO179 DAS 2 SSRM_C/ 8
12:58:25 RI179 DAS 7 CAM/NAM *86*X#
12:58:36 RO179 DAS 2 CRM/CIM ;30;
12:58:36 RI179 DAS E CRM/CIM ;30;*AA*CLEARED#

**Supplementary Information
String Identifiers & Parameters**

A1



Supplementary Information String Identifiers

These are the strings that follow a CCS Trace Message. The String may be followed by a parameter which in turn may have a parameter.

CODING OF SUPPLEMENTARY INFORMATION STRING IDENTIFIERS

| Code | Meaning | Parameters |
|------|---|--|
| 1 | Calling/called line category - ordinary | 1 - PSTN barred 2 - Emergency phone 3 - Hunt group 4 - Distribution group 5 - Extraordinary extension (PSTN) |
| 2 | Calling/called line category - decadic | 1 - Non-DDI 2 - No release at any point 3 - Release only after answer 4 - Outgoing None - DDI |
| 3 | Calling/called line category - DASS2 | 1 - Non-DDI 2 - No release at any point 3 - Release only after answer 4 - Outgoing None - DDI |
| 4 | Calling/called line category - PSTN | 1 - Non-DDI 2 - No release at any point 3 - Release only after answer 4 - Outgoing None - DDI |
| 6 | Calling/called line category - operator | None |
| 7 | Calling/called line category - network | None |
| 8 | Calling/called line category - conference | None |
| 10 | Call back when free - request | None |
| 11 | Call back when free - free notification | None |
| 12 | Call back when free - call set-up (immediate) | None |
| 13 | Call back when free - cancel | None |
| 14 | Ring out | None |
| 15 | Call back complete | None |
| 16 | Call back when free - call set-up (delayed) | None |
| 17 | Call back when next used - request | None |
| 18 | Class of Service | Route restriction class, call barring group, feature code |
| 19 | Loop avoidance | Number of further transits allowed, number of further alternative routes allowed. A=0, Z=24 |
| 20 | Executive intrusion - prior validation | Intrusion capability level 0-3. Note: Intrusion is allowed if intrusion capability level of intruder is higher than intrusion protection level of all other parties in call. |
| 21 | Executive intrusion - request | Intrusion capability level 0-3 |
| 22 | Intrusion protection level - request | None |
| 23 | Intrusion protection level - response | Intrusion protection level 0-3 |
| 24 | Executive intrusion - convert | Intrusion capability level 0-3 |
| 25 | Intruded | None |

| | | |
|----|--|---|
| 26 | Call waiting | None |
| 27 | Call offer | None |
| 28 | Send next - request | None |
| 29 | Hunt group forwarded | Nesting level (number of hunt groups passed through) |
| 30 | Diversion - validation | None |
| 31 | Diversion - follow me | C party address |
| 32 | Diversion - bypass | None |
| 33 | Diversion cancel - immediate | None |
| 34 | Diversion cancel - on no reply | None |
| 35 | Diversion cancel - on busy | None |
| 36 | Diversion cancel - all | None |
| 37 | Diverting - immediate | B party address |
| 38 | Diverting on busy | B party address |
| 39 | Diverting on no reply | B party address |
| 40 | Divert immediate | C party address |
| 41 | Divert on busy | C party address |
| 42 | Diverted immediate | C party address |
| 43 | Diverted on busy | C party address |
| 44 | Diverted on no reply | C party address |
| 45 | Divert on no reply | C party address |
| 46 | Service Indicator Code | Service Indicator Code |
| 47 | Bearer supplementary service - mandatory | Service Indicator Code |
| 48 | Bearer supplementary service - preferred | Service Indicator Code |
| 49 | Bearer supplementary service - notification | Service Indicator Code |
| 50 | Originating line identity, or Called line identity | A party address, or B party address |
| 51 | Routing information | 1 - Alternative route 3 - DASS2 4 - PSTN 5 - Inter-PBX trunk type 6 - MFC 7 - Tandem |
| 53 | Diverted - externally | Diversion type |
| 54 | Reject | None |
| 55 | Acknowledge | None |
| 56 | Send next | None |
| 57 | DASS2 Service Indicator Code | Service Indicator Code |
| 58 | Non-specified information (NSI) | Vendor specific |
| 60 | Hold request | None |
| 61 | Reconnected | None |
| 62 | Holding | None |
| 63 | Call distribution - queue | None |
| 64 | Text message | Text (24 characters maximum) |
| 65 | State of destination - busy | None |
| 66 | State of destination - free | None |
| 67 | Call distribution - do not queue | None |
| 69 | Call distribution - linked | Call index |
| 70 | Operator set diversion - immediate | C party address |

Supplementary Information String Identifiers & Parameters

| | | |
|-----|---|--|
| 71 | Operator set diversion - on busy | C party address |
| 72 | Operator set diversion - on no reply | C party address |
| 73 | Operator cancel diversion - immediate | None |
| 74 | Operator cancel diversion - on busy | None |
| 75 | Operator cancel diversion - on no reply | None |
| 76 | Operator cancel diversion - all | None |
| 78 | Split | None |
| 79 | Two party | O - Originating HiPath/iSDX T - Terminating HiPath/iSDX |
| 80 | Enquiry call | Called/calling line category of held party |
| 81 | Single channel enquiry | Called/calling line category of held party |
| 82 | Transferred | O - Originating HiPath/iSDX T - Terminating HiPath/iSDX |
| 83 | Shuttle | None |
| 84 | Connected call | None |
| 85 | Transfer | None |
| 86 | Call distribution - free notify | Call index |
| 87 | Intercom - call | None |
| 88 | Add-on request | None |
| 89 | Add-on validation | None |
| 90 | Added-on | None |
| 93 | Call distribution - unlinked | Call index |
| 94 | Signal not understood | SIS identifier plus: A - Unrecognised maintenance action S - Unrecognised Service Indicator Code E - Syntax error R - Recall not supported M - Missing information F - Selection block capacity exceeded |
| 95 | Service unavailable | SIS identifier plus: F - Selection block capacity exceeded |
| 96 | Recall rejected - signal not understood | As 94 above |
| 97 | Call distribution - call set up | Call index |
| 98 | Ignored - signal not understood | One or more SIS identifiers separated by spaces, plus: F - Selection block capacity exceeded |
| 99 | Ignored - service unavailable | One or more SIS identifiers separated by spaces, plus: F - Selection block capacity exceeded |
| 100 | Textual display | Text string (24 characters max.), text type: 1 - Name 2 - Message 3 - Reason for call failure |
| 101 | Simulated answer | None |
| 102 | Activate | None |
| 103 | Deactivate | None |

| | | |
|-----|----------------------------------|---|
| 104 | Traffic channel status | 1 - Free 2 - Busy 3 - Not equipped 4 - Back busy by me 5 - Back busy by you 6 - Looped back by me 7 - Looped back by you 8 - Out of service |
| 105 | Channel identity | Channel number |
| 106 | Forced release - request | None |
| 107 | Priority break-down protection | 0 to 15 (BPL) |
| 108 | Priority break-down request | 0 to 15 (BCL) |
| 110 | Route optimisation - request | Call reference number (i.e. digit sequence which, if used as destination address, causes routing back to HiPath/iSDX which requested route optimisation and, on arrival at that HiPath/iSDX, identifies the call being optimised) |
| 111 | Route optimisation - call set-up | None |
| 112 | Route optimisation - connected | None |
| 113 | Do not disturb | B - Destination busy F - Destination free |
| 114 | Do not disturb - override | None |
| 115 | Do not disturb - set | None |
| 116 | Do not disturb - cancel | None |
| 118 | Extension status call | None |
| 119 | Controlled diversion | None |
| 120 | Redirecting | State of call before redirection: A - Awaiting answer H - Held W - Waiting on busy Followed by: E - Transferred by extension N - Not transferred O - Transferred by operator R - Transferred by the party to which the call is being redirected |
| 121 | Redirecting on call failure | Clearing cause and B party address |
| 122 | Takeover request | None |
| 123 | Takeover validation | None |
| 124 | Series call - request | Reconnect address (digits sequence used as destination address, causes call to be routed to party to whom reconnection is required) |
| 125 | Series call - cancel | None |
| 126 | Series call - establishment | None |
| 127 | Night service - notification | State of operator: N - Night mode D - Day mode |
| 128 | Night service - divert | Night service address, HiPath/iSDX flag: S - on same HiPath/iSDX |
| 129 | Night service - diverting | None |
| 130 | Night service - diverted | C party address |
| 131 | Night service - redivert | C party address |
| 132 | Night service - rediverting | None |

Supplementary Information String Identifiers & Parameters

| | | |
|-----|--|---|
| 133 | Night service - rediverted | C party address |
| 134 | Night service - deactivated | None |
| 135 | Queue information | Number of calls, number of free agents |
| 136 | Queue priority | Priority level |
| 137 | Swap - validation | None |
| 138 | Swap - rejected | T - Other terminal P - Call path E - Equipment needed to make the connection I - Incompatible due to clash of service |
| 151 | Call back when free - call back | None |
| 152 | Divert | C party address |
| 153 | State of destination - indeterminable | None |
| 154 | Diverting | B party address |
| 155 | State of destination - request | None |
| 156 | Call back when free - call back request | None |
| 157 | Network address extension - destination complete | Sub-address |
| 158 | Supplementary facilities inhibited | None |
| 159 | Network address extension - destination incomplete | Sub-address |
| 160 | Direct route select | None |
| 161 | Alarm status | 0 - None 1 - Low 2 - Medium 3 - High 4 - Inhibited 5 - Power fail |
| 162 | Alarm status - request | None |
| 163 | Time and date request | None |
| 164 | Time and date | Year, month, day, hour, minute, second |
| 166 | Service information | 1 - Call offer not possible 2 - Executive intrusion not possible 3 - Call back when free not possible 4 - Call back messaging not possible 5 - Hold not possible 6 - Call back when next used not possible |
| 167 | Trunk identity | HiPath/iSDX reference number, trunk main group, trunk number |
| 168 | Park request | None |
| 169 | Parked | None |
| 170 | Conference - no add-on currently available | None |
| 171 | Call back messaging - request | None |
| 172 | Call back messaging - cancel | None |
| 173 | Network address extension - calling/called identity complete | Sub-address |
| 174 | Network address extension - calling/called identity incomplete | Sub-address |
| 176 | Conference - clear down conference | None |
| 177 | Conference - party index | Conference party index |
| 179 | Conference - details request | None |
| 180 | Conference - party details | Conference party details |
| 181 | Conference - conference bridge identity | Conference bridge address |

| | | |
|------|---|--|
| 182 | Charge reporting - account code | Account code |
| 183 | Charge reporting - account code request | None |
| 184 | Charge reporting - active | None |
| 185 | Charge reporting - clear | None |
| 186 | Charge reporting - cost request | None |
| 187 | Charge reporting - cost | Currency unit, cost qualifier: 0 - VAT not included 1 - Supplementary charges not included currency indication (e.g. A = Pence) |
| 188 | Charge reporting - time rate | Currency unit, time interval, cost qualifier (as 187 above) |
| 189 | Charge reporting - unit rate | Currency unit, cost qualifier (as 187 above) |
| 190 | Charge reporting - units used | Units |
| 191 | Output digits | Remote address |
| 192 | Output digits - request | None |
| 193 | Internal re-routeing disabled | None |
| 194 | External re-routeing disabled | None |
| 195 | Non-looped-back test - perform test | Test index |
| 196 | Non-looped-back test - request | None |
| 197 | Non-looped-back test - sequence complete | None |
| 198 | Non-looped-back test - result | 0 - Pass 1 - Fail 2 - Aborted |
| 199 | Autoanswer | None |
| 200 | Handsfree - activated | None |
| 201 | Handsfree - deactivated | None |
| 202 | Executive intrusion - withdraw | None |
| 203 | Divert-redirection | 1 - Reason for re-directing 2 - C party address |
| 204 | Divert-call failure | C party address |
| 205 | Assistance information | Type of assistance |
| 206 | Redirection bypass | None |
| 208 | VPN initiated clear | None |
| 209 | Number presentation on restriction A party | Restriction domain |
| 210 | Number presentation on restriction B party | Restriction domain |
| 211 | Auxiliary route restriction class | Route restriction class |
| 212 | Wait on busy | None |
| 213 | Group pick-up request | Group pick-up code |
| 214 | Pick-up divert | 1 - C party address 2 - Time interval |
| 215 | Pick-up diverting | Time interval |
| 216 | Directed pick-up request | Pick-up type |
| 217 | Route capacity control - capacity available | None |
| 219 | Route capacity control - override invoked | None |
| 220 | Pick-up diverted | None |
| 221 | Number presentation | Restriction domain |
| 222K | Malicious call indication | Malicious call |
| 223 | Network signalling limit | None |

| | | |
|-----|--|--|
| 226 | Travelling class of service | 1- Route restriction class 2 - Call barring group 3 - Feature code |
| 227 | Travelling class of service | None |
| 228 | Diversion remote set combined | C party address |
| 229 | Diversion remote cancel combined | None |
| 230 | Redirection control | Timer value |
| 231 | Clearing cause | Clearing cause |
| 232 | Call proceeding | None |
| 233 | ISDN bearer capability | Bearer capability |
| 234 | ISDN clearing cause | Clearing cause |
| 235 | ISDN calling party/connected number | 1 - ISDN number attributes 2 - ISDN number digits |
| 236 | ISDN calling party/connected subaddress | ISDN subaddress |
| 237 | ISDN destination (called party) subaddress | ISDN subaddress |
| 238 | ISDN High-layer compatibility | High-layer compatibility |
| 239 | ISDN Low-layer compatibility | Low-layer compatibility |
| 240 | ISDN progress | Progress indicator |
| 241 | Interworking via a private ISDN | None |
| 242 | Save | None |
| 243 | VPN nodal identity | VPN access reference number |
| 244 | Message index | Index number |

CRM/CIM Codes

A2



Clear Request Message/Clear Rejection Message (CRM/CIM)

| Code | Clear Cause | Explanation |
|------|---|--|
| 0 | Number unobtainable | Used when the Destination Address is invalid (i.e. spare or not programmed). |
| 1 | Address incomplete | Used when insufficient address digits have been received to achieve a valid address, unless conflict dialing is permitted. Where conflict dialing is permitted, NU shall be used. |
| 2 | Network termination | Used when the call is released by the network for any reason (eg due to a timeout expiring, or service interactions). |
| 3 | Service unavailable | Used when the requested Service is supported by the PBX but not by the called party. This Clearing Cause is accompanied by the String SU which identifies the Service being rejected. |
| 4 | Subscribers incompatible | Used when the called party does not conform to the requested SIC. |
| 5 | Subscriber changed number | User has changed number |
| 6 | Invalid request for supplementary service | |
| 7 | Congestion | Used when PBX equipment or suitable routes are busy. |
| 8 | Subscriber engaged | Used when the called party is engaged on a call. |
| 9 | Subscriber out of service | Used when the called party is out of service. |
| 10 | Incoming calls barred | Used when the called party is barred to incoming calls. |
| 11 | Outgoing calls barred | ACCESS BARRED |
| 13 | Service Unavailable | Used when the route available does not conform to the required SIC. |
| 14 | Acknowledgement | Used to inform the Requesting PBX that the Supplementary Service has been (or is being) carried out. |
| 15 | Service Unavailable | Used when rejecting message contents which have not been understood. This CC is accompanied by the string SNU. SNU either identifies a String which has not been understood or indicates another reason for not understanding the message (e.g. syntax error). |
| 16 | Service Unavailable | Used only when a PBX working to Issue 1 of DPNSS 1 rejects a String that is invalid. |
| 17 | Service Unavailable | Used when the requested Service is available on the PBX but cannot be provided at the moment. |

| | | |
|-------|---|---|
| 18 | Facility Not Registered | Used when a PBX receives a request relating to a service where previous knowledge of its existence is necessary, but that knowledge does not exist (e.g. a Call Back When Free call made to a PBX with no record of the original registration). |
| 19 | Reject | Used when the requesting or requested party of a Supplementary Service rejects the service (e.g. Wanted party rejects a Call Offer request). |
| 20 | Acknowledge (DPNSS) | |
| 21 | Signal not understood | |
| 22 | Invalid signal (DPNSS) | |
| 23 | Channel Out of Service | Used to reject a call received on a channel which is out of service or uninstalled. |
| 24 | Priority Forced Release | Used when an authorised intruding party forces the release of an unwanted party, e.g. an operator or a party with the required Breakdown Capability |
| 25 | Supplementary service rejected | |
| 26 | Message not understood | Used when rejecting an unrecognised message on an idle channel. Note that the channel on which MNU was received may not be the one on which the unrecognised message was detected because Transit PBXs pass on Clearing Causes unchanged. |
| 27 | Used when the requested Service is not supported by the route available and there is no other suitable route. | |
| 28 | Route Out of Service | Used when all suitable routes are out of service. |
| 29 | Access Barred | Used when a particular caller is barred access to outgoing routes. |
| 30 | Call termination | Used when the call cleared down normally |
| 31 | No reply from subscriber | |
| 32 | Service termination | |
| 33-34 | Reserved | |
| 35 | Out of service Reserved (DASS2) | |
| 36 | Priority forced release Reserved (DASS2) | Pre-empted |
| 37-40 | Reserved | |
| 41 | Access barred | |
| 42-44 | Reserved | |
| 45 | DTE controlled not ready | Used when the called X.21 terminal is in the "Controlled Not Ready" state. |
| 46 | Used when the called X.21 terminal is in the "Uncontrolled | |

| | | |
|--------|-----------------------------|--|
| | Not Ready" state. | |
| 47 | Reserved | |
| 48 | Subscriber call termination | |
| 49 | Reserved | |
| 50 | ET isolated | |
| 51 | Local procedure error | |
| 52-255 | Reserved | |

CCS Trace Message Descriptions

A3



CCS Trace Message Descriptions

Additional CCS trace messages

| | | |
|------------------|--|---|
| EEM(C) | End-to-End Message (Complete) | This message is used only after completion of the routing phase to carry end to end information between Originating, Terminating and Branching PBXs in the forward or backward direction. The message may be used both before and after answer. This message contains supplementary information and is a complete request. This message is also used to indicate the completion of an end-to-end sequence which was started with an EEM(I). The Indication Field contains supplementary information. |
| EEM(I) | End-to-End Message (Incomplete) | This message is used only after completion of the routing phase to carry end-to-end information between Originating, Terminating and Branching PBXs in the forward or backward direction. The message may be used both before and after answer. It is used when the 45 octets of an EEM(C) are not enough to hold the supplementary information. The sequence started by an EEM(I) will be completed by an EEM(C) unless the call is cleared in between. The Indication Field contains supplementary information. |
| ERM(C) | End-to-End Recall Message (Complete) | This message is used, only after completion of the routing phase, by certain Supplementary Services to establish a second call, via the same channel as an existing call, as far as the existing call's End PBX. It contains the complete recall request and should not be followed by any Subsequent Service Request Messages. The Service Indicator Code (SIC) and Selection Field are used in the same way as in the ISRM. |
| ERM(I) | End-to-End Recall Message (Incomplete) | This message is used, only after completion of the routing phase, by certain Supplementary Services to establish a second call via the same channel as an existing call, as far as the existing call's End PBX. It is used in place of an ERM(C) under the same circumstances as an ISRM(I) is used in place of an ISRM(C). It is normally followed by at least one SSRM containing further selection information, eg Destination Address digits. |
| LLM(C) LLM(I) | Link-by-Link Message (Complete) Link-by-Link Message (Incomplete) | This message is used only after completion of the routing phase to carry information between adjacent PBXs. It is also used to indicate the completion of a link-by-link sequence which was started with an LLM(I). The Indication Field contains supplementary information |
| LLRM | Link-by-Link Reject Message | This message is used to reject an unrecognised or invalid message in the Link-by-Link message group (0100). The Rejection Cause field is coded in the same way as the Clearing Cause field. |

| | | |
|----------------|--|---|
| LMM | Link Maintenance Message | This message is used to request, or respond to a request for, maintenance actions to be performed. The Maintenance Action field identifies the action required or the response being made. The message may be sent independently of the state of any call in progress on the channel. The Indication Field contains supplementary information. |
| LMRM | Link Maintenance Reject Message | This message is used to respond to a request for maintenance actions to be performed, when the request has been rejected. The Indication Field contains supplementary information. |
| NIM | Network Indication Message | This message is used only during the routing phase of a call to notify PBXs along the route of its progress, eg Alternative Routing. The message can be used only in the backward direction and cannot be used after a NAM. |
| RM(C) RM(I) | Recall Message (Complete) Recall Message (Incomplete) | This message is used, only after completion of the routing phase, by certain Supplementary Services to establish a second call via the same channel as an existing call. It contains the complete call request and should not be followed by any SUBSEQUENT SERVICE REQUEST Messages. The Service Indicator Code (SIC) and Selection Field are used in the same way as in the ISRM. This message is used, only after completion of the routing phase, by certain Supplementary Services to establish a second call via the same channel as an existing call. It is used in place of an RM(C) under the same circumstances as an ISRM(I) is used in place of an ISRM(C). It is normally followed by at least one SSRM containing further selection information, eg Destination Address digits. |
| RRM | Recall Rejection Message | This message is used to indicate that a Recall Request has not succeeded. An Indication Field can be provided for additional information that is not contained within the Rejection Cause field. The Rejection Cause field is coded in the same way as the Clearing Cause field. SM Swap Message This message is used during a call to request a change from the current service mode to a new mode as shown by the Service Indicator Code. The message is also used to acknowledge a SWAP. The Indication Field contains supplementary information. |
| SCIM | Single-Channel Clear Indication Message | This message is used to acknowledge an SCRM. The coding of the Clearing Cause field normally contains the same Clearing Cause as was received in the SCRM. The Indication Field contains supplementary information. |

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| SCRM | Single-Channel Clear Request Message | This message is used to initiate the clearing sequence of one of the calls on a channel in dual use. The particular call of the two which is to be released is indicated by a Supplementary Information String within the Indication Field of the message. On receipt of an SCRM, a PBX releases the indicated call and returns an SCIM to confirm that the channel is now in single use. In the case of a Transit PBX, the SCRM is then repeated to the next link. The Indication Field contains supplementary information. |
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