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Low Level Design Specification

# ACI/LLD Interface % CSSD - Supplementary Service Diagnostic

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## 0.2 Document History

Date	Version	Status	Author
2004-10-01	001	Draft	Marc Droste-Franke
Initial version.			

## 0.3 References, Abbreviations, Terms

[1] 3GPP TS 24.008 V3.19.0 (2004-06)

[TI 7010.801] 7010.801, References and Vocabulary, Texas Instruments.

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# 1 Overview

## 1.1 Introduction

This document is a Low Level Design (LLD) document, which describes the implementation of the supplementary service diagnostic feature in ACI.

The cause information element may also contain diagnostic bytes<sup>1</sup>. These bytes allow to substantiate the meaning of the given cause value. Diagnostic bytes are not supported for every specified cause value. Additionally, the specification for the diagnostic byte differs for the causes that can be enhanced with this kind of additional information.

3 GPP TS 24.008 section 10.5.4.11 Note 1 describes the handling of diagnostic bytes for supplementary service. These supplementary service diagnostic bytes are can be part of cause information elements with the following cause values:

- User busy
- Facility rejected
- No circuit/channel available
- Requested facility not subscribed
- Incoming calls barred within the CUG
- Requested facility not implemented
- User not member of CUG

## 1.2 Detailed description

The introduced command %CSSD provides the SS diagnostic to the user if this has been delivered within the last call disconnect process. The SS diagnostic is always defined in the first byte of the diagnostic bytes array. For this command, additional bytes given in the diagnostic bytes array are ignored.

The SS diagnostic value given during the last call disconnection is stored. The user has to call the command %CSSD actively to retrieve the information from ACI.

## 1.3 Command syntax: Supplementary Service Diagnostic %CSSD

Command	Possible response(s)
%CSSD	%CSSD: <ss_diagnostic> ERROR

### Description

The aim of this command is to provide the information of the supplementary service byte sent by the network to the user <ss\_diagnostic>. This byte provides a deeper analysis of the cause of the disconnection of the last call.

<sup>1</sup> Refer to Figure 10.5.95/3GPP TS 24.008.

This byte is only set in for special disconnect causes. Please refer to 3GPP TS 24.008 V3.19.0 section 10.5.4.11 (2004-06) specification for further details.

In the cases that there has no diagnostic value been delivered by the network the ss diagnostic value will be set to default 255 (0xFF).

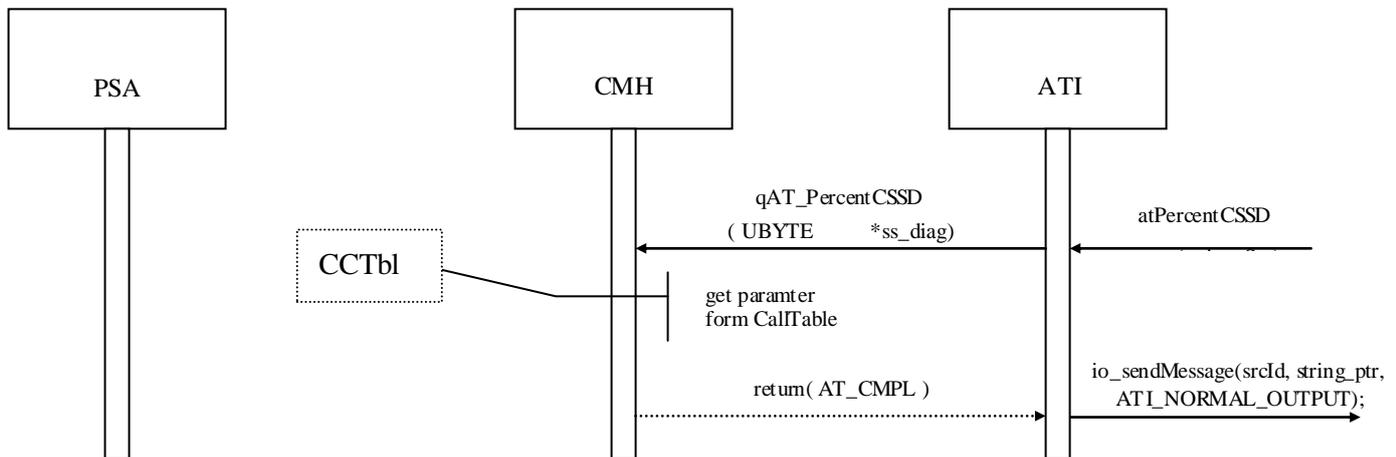
#### Defined values

<ss\_diagnostic> :

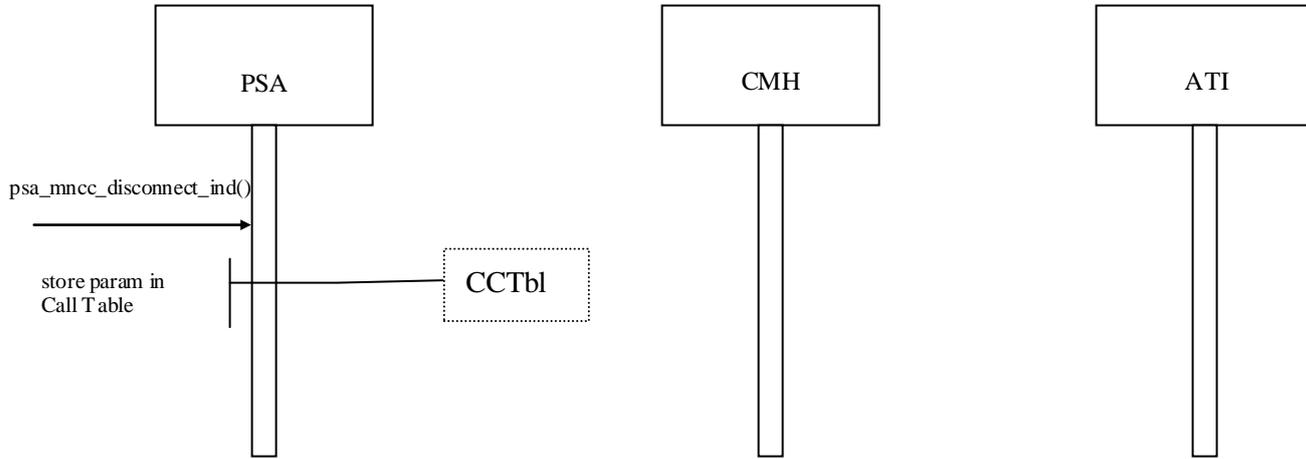
- 1 Outgoing call bared within CUG
- 2 No CUG selected
- 3 Unknown CUG index
- 4 CUG index incompatible with requested basic service
- 5 CUG call failure, unspecified
- 6 CLIR not subscribed
- 7 CCBS possible
- 8 CCBS not possible
- 255 No information provided

### 1.4 Internal behavior (MSC's)

### 1.5 Calling %CSSD from Terminal outside



## 1.6 Storing of SS diagnostic during call disconnection



## 2 Modifications in ACI

### 2.1 Interface Changes

The new command %CSSD is defined as described above.

### 2.2 Modifications in ATI

#### 2.2.1 Module `ati_cmd.c`

- Additional prototypes
  - `EXTERN T_ATI_RSLT atPercentCSSD (CHAR *cl, UBYTE srcId);`
- Additional row in

```
LOCAL const ATCommand cmds [] = {
```

```
:  
{"%CSSD", AT_CMD_CSSD, atPercentCSSD, test_gen, 0, 0},  
:  
}
```

#### 2.2.2 Module `ati_err.c`

- Implemented new function
  - `GLOBAL T_ATI_RSLT atPercentCSSD(char *cl, UBYTE srcId){`  
:  
`qAT_PercentCSSD(srcId, &ss_diag);`  
:  
}

### 2.3 Modification in CMH

#### 2.3.1 Module `aci_cmh.h`

- New command id added
  - `typedef enum`  
{  
:  
`AT_CMD_CSSD = 222, /* %CSSD command id */`  
`AT_CMD_MAX /* maximum command id */`  
}T\_ACI\_AT\_CMD;
- New prototypes for command handler control functions
  - `EXTERN T_ACI_RETURN qAT_PercentCSSD ( T_ACI_CMD_SRC srcId`  
`UBYTE *ss_diag);`

#### 2.3.2 Module `cmh_ccq.c`

- Implementation of functional counterpart for AT command

- GLOBAL T\_ACI\_RETURN qAT\_PercentCSSD ( T\_ACI\_CMD\_SRC srcId  
UBYTE \*ss\_diag)

## 2.4 Modification in PSA

### 2.4.1 Module psa\_cc.h

- Added a new parameter in call table structure
  - typedef struct CCCallTabl  
{  
:  
UBYTE ssDiag; /\* SS diagnostic (CQ 23619 - % DIAG) \*/  
:  
}

### 2.4.2 Module psa\_ccf.c

- Added line into function for proper initialization of SS diagnostic byte
  - GLOBAL void psaCC\_InitCtbNtry ( SHORT idx )  
{  
:  
ccShrdPrm.ctb[idx].ssDiag = SS\_DIAG\_NOT\_PROVIDED;  
:  
}

### 2.4.3 Module psa\_ccp.c

- Copied SS diagnostic delivered by MNCC\_DISCONNECT\_IND to respective field in call table
  - GLOBAL const void psa\_mncc\_disconnect\_ind  
( T\_MNCC\_DISCONNECT\_IND \*mncc\_disconnect\_ind )  
{  
:  
pCtbNtry->ssDiag = mncc\_disconnect\_ind->ss\_diag;  
:  
}

### **3 Test**

#### **3.1 Simulation Test**

The test cases ACI350A-I have been written to test %CSSD.

#### **3.2 Target Test**

Functional tests of the command have been done.

## A Modifications in CC

### A.1 SAP MNCC

- Added new parameter SS diagnostic parameter to MNCC\_DISCONNECT\_IND
  - **U8 ss\_diag;**
- Added respective values
  - **VAL\_ss\_diag**

### A.2 CC Sources

#### A.2.1 Module cc.h

- Added prototype for function that extracts the SS diagnostic value from primitive
  - **EXTERN UBYTE cc\_get\_ss\_diag ( USHORT curr\_cause,  
T\_D\_DISCONNECT \* disc);**

#### A.2.2 Module cc\_cfk.c

- Implemented function that extracts the SS diagnostic value from primitive
  - **GLOBAL UBYTE cc\_get\_ss\_diag ( USHORT curr\_cause,  
T\_D\_DISCONNECT \* disc) {...}**

#### A.2.3 Module cc\_relc

- Added handling to forward SS diagnostic byte to ACI within MNCC\_DISCONNECT\_IND
  - **GLOBAL void cc\_disconnect (T\_CC\_DATA \* cc\_data,  
T\_D\_DISCONNECT \* disconnect)**

```
{
:
disc_ind->ss_diag = SS_DIAG_NOT_PROVIDED;
:
disc_ind->ss_diag = cc_get_ss_diag(curr_cause, disconnect);
:
}
```