

Table of Contents

1 Introduction

1.1 Structure and Use of This Document	1-1
1.2 Definition	1-1
1.3 Background	1-1
1.4 High-Level Description	1-4
1.5 Changes from Issue 4 of TR-NWT-000317 to Issue 1 of GR-317-CORE	1-5
1.6 Changes from GR-317-CORE, Issue 1 to Issue 1, Revision 1	1-5
1.7 Changes from GR-317-CORE, Issue 1, Revision 1 to Issue 1, Revision 2	1-6
1.8 Changes from GR-317-CORE, Issue 1, Revision 2 to Issue 1, Revision 3	1-6
1.9 Changes from GR-317-CORE, Issue 1, Revision 3 to Issue 2	1-6
1.10 Changes from GR-317-CORE, Issue 2, to Issue 2, Revision 1	1-7
1.11 Changes from GR-317-CORE, Issue 2 to Issue 3	1-8
1.12 Changes from GR-317-CORE, Issue 3 to Issue 4	1-8
1.13 Changes from GR-317-CORE, Issue 4 to Issue 5	1-8
1.14 Changes from GR-317-CORE, Issue 5 to Issue 6	1-8
1.15 Changes from GR-317-CORE, Issue 6 to Issue 7	1-8
1.16 Changes from GR-317-CORE, Issue 7 to Issue 8	1-9
1.17 Changes from GR-317-CORE, Issue 8 to Issue 9	1-9
1.18 Changes from GR-317-CORE, Issue 9 to Issue 10	1-9
1.19 Requirements Terminology	1-9
1.20 Requirement Labeling Conventions	1-10
1.20.1 Numbering of Requirement and Related Objects	1-10
1.20.2 Requirement, Conditional Requirement, and Objective Identification	1-11

2 User Perspective

3 Feature Requirements

3.1 Feature Operations	3-1
3.1.1 Main Feature Operations	3-3
3.1.1.1 Call Origination - Actions At the Originating Exchange	3-3
3.1.1.2 Initial Address Message (IAM)	3-4
3.1.1.3 Circuit Continuity Check — Continuity Message (COT)	3-31
3.1.1.4 Completion of Transmission Path	3-37
3.1.1.5 The Address Complete Message (ACM) — Alerting	3-38
3.1.1.6 Answer Message (ANM)	3-41
3.1.1.7 Busy Indication	3-43
3.1.1.8 The Call Progress Message (CPG)	3-45
3.1.1.9 The Facility Message (FAC)	3-47
3.1.2 Other Feature Operations	3-48
3.1.2.1 Test Calls	3-48
3.1.2.2 Circuit Query	3-51
3.1.2.3 Circuit Validation Test	3-54
3.1.3 Release Treatment	3-56
3.1.3.1 General Release Procedures	3-56
3.1.3.2 Release Initiated by the Calling Subscriber	3-58

- 3.1.3.3 Release Initiated by a Non-ISDN Called Subscriber 3-59
- 3.1.4 Error Treatment and Abnormal Events 3-60
 - 3.1.4.1 Dual Seizure 3-60
 - 3.1.4.2 Tones and Announcements 3-61
 - 3.1.4.3 Blocking and Unblocking Messages 3-65
 - 3.1.4.4 Reset Circuit Messages 3-71
 - 3.1.4.5 Unequipped Circuit Identification Code (UCIC) 3-74
 - 3.1.4.6 Failure to Receive a Release Complete Message (RLC) 3-76
 - 3.1.4.7 Receipt of Unrecognized Messages or Parameters 3-77
 - 3.1.4.8 Receipt of Unexpected Messages 3-78
 - 3.1.4.9 Additional Failure Conditions 3-81
 - 3.1.4.10 ISDNUP Flow Control 3-82
 - 3.1.4.11 ISDNUP Reaction to TFC/Isolation 3-83
 - 3.1.4.12 Automatic Congestion Control (ACC) Procedures 3-89
- 3.2 Administration 3-92
- 3.3 Maintenance 3-95
- 3.4 Interactions 3-95
 - 3.4.1 SS7 Incoming Circuit, Inband Signaling on Outgoing Circuit 3-95
 - 3.4.1.1 Call Setup 3-95
 - 3.4.1.2 Connection Release 3-97
 - 3.4.2 Inband Signaling on Incoming Circuit, SS7 Outgoing Circuit 3-98
 - 3.4.2.1 Call Setup 3-98
 - 3.4.2.2 Connection Release 3-101
- 3.5 Timing and Tolerances 3-102
- 3.6 Performance 3-104

Appendix A: SS7 Messages

Appendix B: SS7 Parameters

- B.1 Backward Call Indicators B-1
- B.2 User Service Information (Bearer Capability) B-3
- B.3 Called Party Number B-4
- B.4 Calling Party Number B-6
- B.5 Calling Party's Category B-7
- B.6 Cause Indicators B-8
- B.7 Circuit Group Supervision Message Type Indicator B-10
- B.8 Circuit State Indicator B-11
- B.9 Continuity Indicators B-12
- B.10 Forward Call Indicators B-12
- B.11 Message Type B-13
- B.12 Nature of Connection Indicators B-14
- B.13 Range and Status B-15
- B.14 Suspend/Resume Indicators B-16
- B.15 Circuit Validation Response Indicator B-17
- B.16 Circuit Group Characteristics Indicator B-17
- B.17 Circuit Identification Name B-18
- B.18 CLLI Code B-19
- B.19 Event Information Indicators B-19
- B.20 Optional Backward Call Indicators B-20
- B.21 Hop Counter B-20



B.22 Automatic Congestion Level	B-21
B.23 Charge Number	B-22
B.24 Originating Line Information	B-23
B.25 Carrier Identification Parameter	B-25
B.26 Jurisdiction Information Parameter	B-26
B.27 Original Called Number Parameter	B-27
B.28 Redirecting Number Parameter	B-29
B.29 Access Transport Parameter	B-29
B.30 Generic Address Parameter	B-30
B.31 Generic Name Parameter	B-32
B.32 Redirection Information Parameter	B-34
B.33 Redirect Capability Parameter	B-35
B.34 Redirect Counter Parameter	B-35
B.35 Redirection Number Parameter	B-36
B.36 Carrier Service Provider Identification Parameter	B-38
B.37 Circuit Assignment Map	B-39

Appendix C: Bearer Independent Call Control (BICC)

C.1 Introduction	C-1
C.2 Motivation	C-1
C.3 BICC Architecture	C-2
C.3.1 BICC Network Architecture	C-2
C.3.2 BICC Protocol	C-3
C.3.3 BICC Messages and Parameters	C-5
C.4 BICC Protocol Industry Status	C-6
C.4.1 ITU-T Study Group 11	C-6
C.4.2 T1S1	C-7
C.5 Summary	C-8

Appendix D: Session Initiation Protocol (SIP)

D.1 Introduction	D-1
D.2 Motivation	D-1
D.3 SIP Architecture	D-2
D.3.1 SIP Network Architecture	D-2
D.3.1.1 Clients	D-3
D.3.1.2 Servers	D-4
D.3.2 SIP Protocol	D-5
D.3.3 SIP Messages and Parameters	D-6
D.3.3.1 SIP Request Messages	D-6
D.3.3.2 SIP Response Messages	D-7
D.3.3.3 SIP Message Headers	D-8
D.3.4 SIP Call Flows	D-9
D.3.4.1 ISUP to SIP Interworking	D-11
D.3.4.2 SIP to ISUP Interworking	D-12
D.3.4.3 SIP to ISUP Interworking with Preconditions	D-14
D.3.4.4 ISUP to SIP and ISUP Interworking (SIP Bridging)	D-16
D.4 Summary	D-19

Appendix E: IMS and SS7 Interconnection

- E.1 Introduction E-1
 - E.1.1 IMS Overview E-1
 - E.1.2 IMS Functional Architecture E-2
- E.2 IMS and SS7 Interconnection E-3
 - E.2.1 IMS - PSTN Call Flow Overview E-4
 - E.2.1.1 IMS Origination to the PSTN E-4
 - E.2.1.2 PSTN Origination to IMS E-5
 - E.2.2 Protocol Interworking E-5
 - E.2.2.1 Lower-Layer Interworking E-5
 - E.2.2.2 SIP - ISUP Interworking E-6

Appendix F: References

- F.1 Telcordia Documents F-1
- F.2 Non-Telcordia Documents F-2

Appendix G: Acronyms

Requirement-Object Index



List of Figures

Figure 1-1	Telcordia GR Diagram	1-2
Figure 3-1	Multiple Point Codes Example	3-50
Figure 3-2	Alternate Routing in Voice Network During SS7 Congestion Example	3-84
Figure B-1	Backward Call Indicators Parameter	B-1
Figure B-2	User Service Information (for Non-ISDN Calling Party) Parameter	B-3
Figure B-3	Called Party Number Parameter	B-4
Figure B-4	Calling Party Number Parameter	B-6
Figure B-5	Calling Party's Category Parameter	B-7
Figure B-6	Cause Indicators Parameter	B-8
Figure B-7	Circuit Group Supervision Message Type Indicator Parameter	B-10
Figure B-8	Circuit State Indicator Parameter	B-11
Figure B-9	Continuity Indicators Parameter	B-12
Figure B-10	Forward Call Indicators Parameter	B-12
Figure B-11	Message Type Parameter	B-13
Figure B-12	Nature of Connection Indicators Parameter	B-14
Figure B-13	Range and Status Parameter	B-15
Figure B-14	Suspend/Resume Indicators Parameter	B-16
Figure B-15	Circuit Validation Response Indicator Parameter	B-17
Figure B-16	Circuit Group Characteristics Indicator Parameter	B-17
Figure B-17	Circuit Identification Name Parameter	B-18
Figure B-18	CLLI™ Code Parameter	B-19
Figure B-19	Event Information Indicators Parameter	B-19
Figure B-20	Optional Backward Call Indicators Parameter	B-20
Figure B-21	Hop Counter Parameter	B-20
Figure B-22	Automatic Congestion Level Parameter	B-21
Figure B-23	Charge Number Parameter	B-22
Figure B-24	Originating Line Information Parameter	B-23
Figure B-25	Carrier Identification Parameter	B-25
Figure B-26	Jurisdiction Information Parameter	B-26
Figure B-27	Original Called Number Parameter	B-27
Figure B-28	Access Transport Parameter	B-29
Figure B-29	Generic Address Parameter	B-30
Figure B-30	Generic Name Parameter	B-32
Figure B-31	Redirection Information Parameter	B-34
Figure B-32	Redirect Capability Parameter	B-35
Figure B-33	Redirect Counter Parameter	B-35
Figure B-34	Redirection Number Parameter	B-36
Figure B-35	Carrier Service Provider Identification Parameter	B-38
Figure B-36	Circuit Assignment Map Parameter	B-39
Figure C-1	Initial BICC Architecture	C-2
Figure C-2	BICC Network Model	C-3
Figure C-3	Backward Bearer Connection Setup with COT	C-4
Figure D-1	Generic SIP-based Network Architecture	D-3
Figure D-2	SIP Stack	D-6
Figure D-3	ISUP to SIP Interworking	D-11
Figure D-4	SIP and ISUP Interworking	D-13

Figure D-5	SIP ISUP Interworking with Preconditions	D-15
Figure D-6	SIP-ISUP-SIP Interworking	D-17
Figure E-1	IMS Architecture Framework	E-2
Figure E-2	Interconnection Architecture	E-4
Figure E-3	Protocol Interworking	E-6
Figure E-4	IMS Call Origination	E-7
Figure E-5	PSTN Call Origination	E-8

List of Tables

Table 3-1	Message Priorities	3-1
Table 3-2	Nature of Address Codes	3-9
Table 3-3	I and II Digits and Originating Line Information	3-13
Table 3-4	Hop Counter Parameter	3-26
Table 3-5	Circuit Query Actions - Transient and Unequipped States	3-52
Table 3-6	Circuit Query Actions - Blocking States	3-53
Table 3-7	Circuit Query Actions - Busy/Idle States	3-54
Table 3-8	Events Resulting in Unsuccessful Call	3-62
Table 3-9	Coding of Backward Call Indicators Parameter	3-64
Table 3-10	Timer Values	3-103
Table 3-11	Switch Processing Time Requirements	3-106
Table A-1	Address Complete Message	A-1
Table A-2	Answer Message	A-2
Table A-3	Continuity Message	A-2
Table A-4	Initial Address Message	A-2
Table A-5	Release Message	A-3
Table A-6	Single Octet Messages	A-3
Table A-7	Suspend and Resume Message	A-4
Table A-8	Group Blocking Messages	A-4
Table A-9	Circuit Group Reset and Circuit Group Reset Acknowledgment Message	A-4
Table A-10	Circuit Query Message	A-5
Table A-11	Circuit Query Response Message	A-5
Table A-12	Circuit Validation Response Message	A-5
Table A-13	Call Progress Message	A-6
Table A-14	Confusion Message	A-6