

3GPP2 S.R0015

Version 1.0.0

Date: December 13, 1999



ISDN Interworking (Stage 1)

Release A

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Revision History

Revision		Date
Rev. 0	Initial Publication	December 1999

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LIST OF FIGURES

FOREWORD

11 This specification contains recommendations for supporting the wireless
12 subscriber feature “ISDN Interworking”.
13 The *ANSI/TIA/EIA-41-D* recommendation upon which this specification builds is:
14 • *TIA/EIA-41-D Cellular Radiotelecommunications Intersystem*
15 *Operations; Telecommunications Industry Association;*
16 *1997.*

ASSUMPTIONS

20 The following items are basic understandings used during the development of
21 this document:

22
23 (For further study.)

1. INTRODUCTION

1.1 OBJECTIVE

This Document presents Stage-1 (new chapter TIA/EIA-664-B) recommendations for supporting the ISDN Interworking feature use in the Wireless Radiotelephone Service.

1.2 SCOPE

This Document specifies the wireless intersystem network operation enhancements required for supporting subscribers with the ISDN Interworking feature.

This document defines the functional characteristics for interconnecting to ISDN in circuit switched mode.

The interworking function in ISDN packet mode, i.e. B-channel Packet, is out of scope at present.

1.3 ORGANIZATION

This Document is organized as TIA/EIA-664-A.

2. REFERENCES

2.1 Normative References

ANSI T1 Standards:

- ANSI.T1. .

ITU:

- Recommendation Q.931 Digital Subscriber Signaling No.1. ; International Telecommunication Union.
- Recommendation Q.7xx Common Channel Signaling System No.7. ; International Telecommunication Union.
- Recommendation Q.850/Q.950 Cause value definition for SS7 & DSS1. ; International Telecommunication Union.

EIA/TIA:

- TIA/EIA/IS-664 Cellular Radiotelecommunications Intersystem Operations; Telecommunications Industry Association, December 1997.
- TIA/EIA/IS-737 Enhanced for Circuit Mode Services; Telecommunications Industry Association, December 1997

2.2 Informative References

TTC:

- TTC Standard JT-Q931/JT-Q931-a/JT-Q931-b Digital Subscriber Signaling No.1. ; Telecommunication Technology Committee.

- 1 • TTC Standard JT-Q.7xx Common Channel Signaling System No.7. ;
- 2 Telecommunication Technology Committee.
- 3 • TTC Standard JT-Q850/JT-Q950 Cause value definition for SS7 &
- 4 DSS1. ; Telecommunication Technology Committee.
- 5
- 6

1 ***TIA/EIA-664* MODIFICATIONS**

2 This section provides Stage 1 features descriptions for ISDN Interworking according to the
3 structure of *TIA/EIA-664*.
4

5 **3 Definitions and Concepts**

6 **3.1 Definitions**

(TIA/EIA-664, Page 4)

8 **ISDN IW ISDN Interworking**

9
10

X.1 ISDN Interworking (ISDN IW)

(New for TIA/EIA-664 Section 5)

ISDN Interworking is permits a wireless subscriber to interconnect to ISDN and to communicate to ISDN subscriber directly in circuit switched mode.

Followings are the items to be defined for the ISDN Interworking;

(1) Quality of Services

Quality of services is categorized by the error rate and the transmission delay.

- Category 1

Error rate : Not guaranteed. (Note 1)
(i.e. no re-transmission required in 3G Mobile NW)

Delay : Constant and minimum delay guaranteed.
(i.e. only delay on air and internal processing delay)

- Other Categories

(For Further Study Note 2)

(2) Data rate

In ISDN interworking, guaranteed constant data rate is mandatory.
3G Mobile network should support the “Information Transfer Rate” described in ITU-T DSS1 recommendations.

Required data rate is as following;

- 64k bit/s
- 128k bit/s (Note 3,4)

Supports of the higher data rate (i.e. 384k bit/s, 1536k bit/s, and 1920k bit/s) and Multi-rate based on 64k bit/s base rate are for further study.

(3) Basic Bearer

3G Mobile Network should support the “Information Transfer Capability” described in ITU-T DSS1 recommendations.

Initial required basic bearer is as following;

- Unrestricted Digital Information

Supports of other basic bearers described in DSS1 are for further study.

(Note 1) Desired error rate is the order of 1×10^{-6} on the air.

(Note 2) Other QoS categories, e.g. error rate guaranteed with appropriate delay for re-transmission permitted, are for further study.

(Note 3) Data rate is 128k bit/s at Um point, Ab and A interface and 64k bit/s X 2 at Interconnection point (i.e. POI) to ISDN.

(Note 4) Data rate of 128 kbit/s will be standardized in Release B or after.

Applicability to Telecommunications Services

ISDN Interworking is applicable to circuit-switched telecommunication services.

1 **X.1.1 Normal Procedures With Successful Outcome**

2 **Authorization**

3 ISDN Interworking may be generally available or may be provided after pre-arrangement
4 with the service provider.
5

6 **De-Authorization**

7 ISDN Interworking may be withdrawn at the subscriber's request or for administrative
8 reasons.
9

10 **Registration**

11 ISDN Interworking has no registration.
12

13 **De-Registration**

14 ISDN Interworking has no de-registration.
15

16 **Activation**

17 ISDN Interworking is activated upon authorization.
18
19

20 **De-Activation**

21 ISDN Interworking is de-activated upon de-authorization.
22

23 **Invocation**

24 ISDN Interworking invokes sending or receiving circuit switched unrestricted digital
25 information call of 64k bit/s or 128k bit/s.

26 **Normal Operation With Successful Outcome**

27 The user sends or receives a circuit-switched unrestricted digital information call of 64k bps
28 or 128k bps (Note 1). The network determines that achieving interworking function listed
29 below;

30 (1) NNI protocol conversion between mobile network and ISDN

31 The network should convert the layer 2 and layer 3 protocols from/to Mobile Network
32 to/from ISDN NNI protocols, i.e. Q.7xx.

33 (2) Protocol conversion for end to end negotiation and compatibility checking

34 The network should achieve the protocol conversion of the layer 3 information from/to
35 Mobile Network to/from DSS1.

36 This function is used if the ISDN call control message includes type 1 information
37 described in DSS1 recommendation, i.e. information to check the capability of TE, or the
38 Low layer compatibility negotiation is requested by ISDN user.

39 (3) Transparent data transfer

1 The network should transfer UBD transparently at interconnection point to ISDN. (e.g.
2 Bit transparency is guaranteed at end-to-end level.)

3 (4) Channel construction (Note 2)

4 The network should divide data on RAN (Um, Ab and A Interface point) into several 64k
5 bit/s based ISDN B-channels if the rate is higher than 64k bit/s, e.g. divide into two ISDN
6 B-channels if the data rate on RAN is 128k bit/s.

7 Also, Constructing the data on RAN from several ISDN B-channels of 64k bit/s data, e.g.
8 construct 128k bit/s data on RAN from two ISDN B-channel of 64k bit/s.

9

10

11

12 (Note 1) Data rate of 128 kbit/s will be standardized in Release B or after.

13 (Note 2) This function is not required for data rate of 64 kbit/s. Therefore release A
14 system need not this function.

15

16 **Call Detail Record**

17 The call detail record information for the ISDN Interworking should be treated as same
18 as other circuit-switched calls.

19

20 **X.1.2 Exception Procedures or Unsuccessful Outcome**

21 **Registration**

22 None identified.

23 **De-Registration**

24 None identified.

25 **Activation**

26 None identified.

27 **De-Activation**

28 None identified.

29 **Invocation**

30 None identified.

31 **Exceptions While Roaming**

32 None identified.

33 **Exceptions During Intersystem Handoff**

34 None identified.

35 **X.1.3 Alternate Procedures**

36 None identified.

1	X.1.4 Interactions With Other Cellular Services
2	
3	Asynchronous Data Service (ADS)
4	None identified.
5	Call Delivery (CD)
6	None identified.
7	Call Forwarding - Busy (CFB)
8	ISDN Interworking takes precedence over CFB. If CFB is active, an incoming call using multiple
9	ISDN B-channel cannot be achieved, i.e. data rate is restricted as 64k bit/s.
10	Call Forwarding - Default (CFD)
11	None identified.
12	Call Forwarding - No Answer (CFNA)
13	None identified.
14	Call Forwarding - Unconditional (CFU)
15	None identified.
16	Call Transfer (CT)
17	None identified.
18	Call Waiting (CW)
19	ISDN Interworking takes precedence over CW. If CW is active, an incoming call using multiple
20	ISDN B-channel cannot be achieved, i.e. data rate is restricted as 64k bit/s
21	Calling Name Presentation (CNAP)
22	None identified.
23	Calling Name Restriction (CNAR)
24	None identified.
25	Calling Number Identification Presentation (CNIP)
26	None identified.
27	Calling Number Identification Restriction (CNIR)
28	None identified.
29	Conference Calling (CC)
30	None identified.
31	Data Privacy (DP)
32	None identified.
33	Do Not Disturb (DND)
34	None identified.
35	Emergency Services (9-1-1)
36	None identified.
37	Flexible Alerting (FA)
38	None identified.
39	Group 3 Facsimile (G3 Fax)
40	None identified.
41	Incoming Call Screening (ICS)
42	None identified.
43	Message Waiting Notification (MWN)
44	None identified.
45	Mobile Access Hunting (MAH)
46	None identified.
47	Network Directed System Selection (NDSS)
48	None identified.
49	Non-Public Mode Service (NP)
50	None identified.

1	Over-the-Air Service Provisioning (OTASP)
2	None identified.
3	Password Call Acceptance (PCA)
4	None identified.
5	Preferred Language (PL)
6	None identified.
7	Priority Access and Channel Assignment (PACA)
8	None identified.
9	Remote Feature Control (RFC)
10	None identified.
11	Rejection of Undesired Annoying Calls (RUAC)
12	None identified.
13	Selective Call Acceptance (SCA)
14	None identified.
15	Speech Option Selection (SOS)
16	None identified.
17	Subscriber PIN Access (SPINA)
18	None identified.
19	Subscriber PIN Intercept (SPINI)
20	None identified.
21	Three-Way Calling (3WC)
22	None identified.
23	User Group ID (UGID)
24	None identified.
25	Voice-based User Identification (VUI)
26	Not applicable.
27	Voice Controlled Dialing (VCD)
28	Not applicable.
29	Voice Controlled Feature Control (VCFC)
30	Not applicable.
31	Voice Message Retrieval (VMR)
32	Not applicable.
33	Voice Privacy (VP)
34	Not applicable.
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