



**SPECIFIC AIN
SS7 TCAP PROTOCOL**

BID-0026

March 2005

Network-to-Network Interface

This document may not be reproduced without the express permission of Bell Canada
Any reproduction, without authorization, is an infringement of Bell Canada's copyright.

**Copyright ©
Bell Canada
2005
All Rights Reserved**

DOCUMENT HISTORY

1	March 1999	Initial issue
---	------------	---------------

2	May 1999	Includes TAT Trigger
---	----------	----------------------

3	June 1999	Removes exclusions on selected Non-Call Associated Messages
---	-----------	---

4	April 2003	Includes Custom Dial Plan, Off-Hook Delay and Off-Hook Immediate Triggers and updates of Telcordia documentation for AIN
---	------------	--

5	March 2005	Includes N11 Trigger
---	------------	----------------------

DISCLAIMER

Bell Canada reserves the right to modify the interface described in this document for any reason including, but not limited to, ensuring that it conforms with standards promulgated by various agencies from time to time, utilization of advances in the state of the technical arts, or the reflection of changes in the design of any equipment, techniques or procedures described or referred to herein.

BELL CANADA SHALL NOT BE LIABLE FOR ANY DAMAGES OR INJURIES INCURRED BY ANY LEGAL PERSON OR PERSONS, INCLUDING BUT NOT LIMITED TO CORPORATIONS, ARISING DIRECTLY OR INDIRECTLY FROM A DESIGN INCOMPATIBILITY WITH THE NETWORK, OR ANY CAUSE WHATSOEVER.

Readers are specially advised that the technical requirements contained herein may change.

If further information is required, please contact:

BELL CANADA

Disclosure

700 de La Gauchetière Street West
18th Floor North 2
Montreal, Quebec
H3B 4L1

In Canada:	1-877-77-TELCO (83526)
Worldwide:	514-870-2168
Fax:	514-391-4033
E-mail:	redouane.zidane@bell.ca
Web-site:	bell.cdn-telco.com

ACKNOWLEDGMENT

In order to remain consistent with accepted industry standards and definitions, substantial portions of this document are based on publications of the American National Standards Institute (ANSI), and other industry sources as noted herein. The documents referred to herein shall be interpreted in the context of the Canadian regulatory framework.

TABLE OF CONTENTS

1. Introduction.....	1
1.1 Background	1
1.2 Scope	1
2. Interface	2
2.1 Signalling Connection Control Part.....	2
2.2 Transaction Capabilities Application Part.....	2
2.2.1 Advanced Intelligent Network Application Protocol	2
3. References	5
4. Acronyms.....	6

1. Introduction

This Document specifies the technical requirements for interfacing an AIN Service Provider (ASP) network with the network of Bell Canada to provide the interconnection required for specific Advanced Intelligent Network (AIN) functionalities using the facilities of Signalling System Number 7 (SS7). The term AIN in this document refers to the AIN 0.1 and beyond. Conformance to the requirements specified in this document is intended to ensure acceptable interoperability. Interoperability is the ability of an ASP AIN Service Control Point (SCP) to exchange AIN messages with a Bell Canada AIN Service Switching Point (SSP), and control the operation of the SSP within the limits made possible by the AIN protocol as further qualified by this interface specification.

This Document describes a common channel signalling interface at the Signalling Point of Interconnection (SPOI) between the ASP network and the network of the Bell Canada. The interface described herein uses industry standard signalling and physical interfaces¹. Network-to-network signalling interfaces have been defined in other documents and have to be interpreted in the context of the Canadian regulatory environment.

This Document does not specify all possible Bell Canada–ASP interfaces.

1.1 Background

Advanced Intelligent Network, is a generic functional description which describes the SSP functionality and interactions between the AIN SSP and the AIN SCP. An AIN switch has the capability to recognize a call requiring processing by an AIN server or SCP.

1.2 Scope

This Document describes specific interface definitions for the Signalling Connection Control Part (SCCP) and the Transaction Capabilities Application Part (TCAP) of SS7 as defined by ANSI T1S1 to enable communications between Bell Canada's AIN SSP and the AIN Service Provider (ASP) AIN SCP. The Document also focuses on the AIN Application Protocol as defined by Telcordia.

The signalling interface defined here may support a number of telecommunications services. This Document describes telecommunications services in generic terms only. This Document shall not be interpreted as a commitment by Bell Canada to offer a specific service, or as a description of specific service offerings. Bell Canada offers services only on the basis of publicly filed tariff descriptions. These tariffs provide the only description of services offered by Bell Canada.

¹ Bell Canada will employ gateway screening to control network access and reserves the right to augment gateway screening with mediation.

2. Interface

There are three SS7 protocol parts relevant to the services described in this Document, the Message Transfer Part (MTP), the Signalling Connection Control Part (SCCP) and the Transaction Capabilities Application Part (TCAP). One application protocol is relevant to the services described in this document, the Advanced Intelligent Network Application Protocol, defined by Telcordia.

Any use of other SS7 protocol parts, in particular the ISDN User Part (ANSI Standard T1.113), is outside the scope of this Document.

2.1 Signalling Connection Control Part

The SS7 Signalling Connection Control Part, specified in ANSI T1.112, provides additional functions to the MTP to transfer non-circuit related signalling information. GR-1432-CORE, *CCSNIS Supporting SCCP and TCAP*, Issue 1, March 1994, together with the following clarification, specifies the use of the SCCP at the interface;

All AIN messages are encoded in Class 0 (connectionless with no special options) Unit Data (UDT) messages only.

2.2 Transaction Capabilities Application Part

The SS7 Transaction Capabilities Application Part specified in ANSI Standard T1.114, *Transaction Capabilities Application Part (TCAP)* controls non-circuit related information exchanged between signalling nodes. GR-1432-CORE, *CCSNIS Supporting SCCP and TCAP*, Issue 1, March 1994, together with the following clarification, specifies the use of the TCAP for AIN at the interface;

- Within the context of this Document, the only TCAP messages that may be seen at the SPOI are those having a TCAP Package Type of: Query with Permission, Response or Conversation with Permission, and Unidirectional, and have a minimum of one of the following TCAP Components: Invoke (Last), Invoke (Not Last), Return Result (Last), Return Error or Reject.

2.2.1 Advanced Intelligent Network Application Protocol

The Advanced Intelligent Network, specified in Telcordia TR-NWT-001285, *Advanced Intelligent Network (AIN) 0.1 Switch–Service Control Point (SCP) Application Protocol Interface Generic Requirements*, Issue 1, August 1992 has been superseded by GR-1299-CORE, *AINGR: Switch-Service Control Point (SCP)/Adjunct Interface*, Issue 5, November 1999, is used at the SPOI. GR-1299-CORE, together with the following clarifications, specifies the use of the AIN at the interface;

- 1) TCAP packages may be exchanged between an ASP AIN SCP and a Bell Canada AIN SSP only when a customer terminated on that SSP is involved with a call which the SSP recognizes as requiring processing by the ASP's SCP.

2) The Transaction Capabilities Signalling Procedures for AIN, as described in Telcordia GR-1299-CORE are supported with the following exceptions;

- Section 5.2.1 Switch Call Related Messages (Events),
 - Subsection 5.2.1.1 Call_Info_From_Resource
 - Subsection 5.2.1.3 CTR_Clear
 - Subsection 5.2.1.4 Failure_Outcome
 - Subsection 5.2.1.8 O_Abandon
 - Subsection 5.2.1.11 O_Disconnect
 - Subsection 5.2.1.12 O_DTMF_Entered
 - Subsection 5.2.1.13 O_Mid_Call
 - Subsection 5.2.1.15 O_Suspended
 - Subsection 5.2.1.16 O_Term_Seized
 - Subsection 5.2.1.19 Success_Outcome
 - Subsection 5.2.1.20 T_Answer
 - Subsection 5.2.1.21 T_Busy
 - Subsection 5.2.1.22 T_Disconnect
 - Subsection 5.2.1.23 T_Mid_Call
 - Subsection 5.2.1.24 T_No_Answer
 - Subsection 5.2.1.26 Term_Resource_Available
 - Subsection 5.2.2.1 Acknowledge
 - Subsection 5.2.2.4 Call_Info_To_Resource
 - Subsection 5.2.2.6 Collect_Information
 - Subsection 5.2.2.7 Connect_To_Resource
 - Subsection 5.2.2.9 Create_Call
 - Subsection 5.2.2.11 Disconnect_Leg
 - Subsection 5.2.2.13 Merge_Call
 - Subsection 5.2.2.14 Move_Leg
 - Subsection 5.2.2.15 Offer_Call
 - Subsection 5.2.2.16 Originate_Call
 - Subsection 5.2.2.17 Reconnect
 - Subsection 5.2.2.19 Split_Leg

are not supported.

- Section 5.3 Non-Call Related Messages
 - Subsection 5.3.2 ACG_Global_Ctrl_Restore
 - Subsection 5.3.3 ACG_Global_Ctrl_Restore_Success
 - Subsection 5.3.4 ACG_Overflow
 - Subsection 5.3.5 Control_Request
 - Subsection 5.3.6 Echo_Reply
 - Subsection 5.3.7 Echo_Request
 - Subsection 5.3.8 Furnish_AMA_Information
 - Subsection 5.3.9 Monitor_For_Change
 - Subsection 5.3.10 Monitor_Success
 - Subsection 5.3.11 NCA_Data

Subsection 5.3.12	NCA_Request
Subsection 5.3.13	NCA_Response
Subsection 5.3.14	Query_Request
Subsection 5.3.15	Query_Response
Subsection 5.3.18	Status_Reported
Subsection 5.3.20	Update
Subsection 5.3.23	Update_Success

are not supported.

- Section 5.4 Abnormal Messages
 - Subsection 5.4.1.3 Failure_Reportis not supported.

The related data elements and requirements in the rest of GR-1299-CORE used in the context of these exceptions are also not supported.

- 3) Messages supported over this interface will only be generated as a result of specific switch events-determined through the analysis of the received dialled number, which must conform to the North American Numbering Plan and off-hook events. These triggering events are generally identified as the “3/6/10 Digit Public Office Dialling Plan”, “Terminating Attempt”, “Custom Dial Plan”, “Off-Hook Delay”, “Off-Hook Immediate” and N11 Triggers.

3. References

Cases

ANSI Standard T1.114–2000, <i>Transaction Capabilities Application Part (TCAP)</i>	2
GR-1432-CORE, <i>CCSNIS Supporting SCCP and TCAP</i> , Issue 1, March 1994	2
GR-1299-CORE, <i>AINGR: Switch-Service Control Point (SCP)/Adjunct Interface</i> , Issue 5, November 1999	2

4. Acronyms

ACG	Automatic Call Gapping
AIN	Advanced Intelligent Network
ASP	AIN Service Provider
Bellcore	Bell Communications Research
CCS7	See SS7
MTP	Message Transfer Part (of SS7)
SCCP	Signalling Connection Control Part (of SS7)
SCP	Service Control Point
SS7	Signalling System Number 7
SSP	Service Switching Point
STP	Signalling Transfer Point
TCAP	Transaction Capabilities Application Part (of SS7)