AM-TR-NIS-000109

Ameritech Switch to Computer Application Interface (ASCAI)

To:	Telecommunications/Computing Industry
Effective Date:	10/30/92
Issue Date:	Issue 1, October 1992
Expires On:	N/A
Training Time:	1 Hour
Related Documents:	AM TR-NIS-000097
Canceled Documents:	N/A

Points of Contact:
Originators requiring additional support in their writing effort can contact their immediate supervisor or regional staff support person.
Tom Stevens, Technology Management - 708/248-5369&

Author(s):
Tom Stevens

Table of Contents

TECHNICAL REFERENCE NOTICE

This Technical Reference is published by Ameritech to provide a technical description of the Ameritech Switch to Computer Application Interface (ASCAI).

Ameritech reserves the right to revise this document for any reason including, but not limited to, conformity with standards promulgated by various agencies, 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.

AMERITECH MAKES NO REPRESENTATION OR WARRANTY, EXPRESS OR IMPLIED, WITH RESPECT TO THE SUFFICIENCY, ACCURACY, OR UTILITY OF ANY INFORMATION OR OPINION CONTAINED HEREIN. AMERITECH EXPRESSLY ADVISES THAT ANY USE OF OR RELIANCE UPON THIS TECHNICAL REFERENCE IS AT THE RISK OF THE USER AND THAT AMERITECH SHALL NOT BE LIABLE FOR ANY DAMAGE OR INJURY INCURRED BY ANY PERSON ARISING OUT OF THE SUFFICIENCY, ACCURACY, OR UTILITY OF ANY INFORMATION OR OPINION CONTAINED HEREIN.

This document is not to be construed as a suggestion to any manufacturer to modify or change any of its products, nor does this document represent any commitment by Ameritech, or any Ameritech operating company (AOC) to purchase any product whether or not it provides the described characteristics.

Ameritech does not recommend products, and nothing contained herein is intended as a recommendation of any product to anyone.

Nothing contained herein shall be construed as conferring by implication, estoppel, or otherwise any license or right under any patent, whether or not the use of any information herein necessarily employs an invention of any existing or later issued patent.

Ameritech reserves the right not to offer any or all of these services and to withdraw any or all of them at any future time.

With respect to services offered pursuant to tariff, however, the terms and conditions of the service offering are determined by the tariff itself and applicable laws and regulations.

Document may be ordered from Ameritech by contacting the Document Order Center at (847) 248-4324.

1. PURPOSE

This document provides a technical description of the network interface specification for Ameritech Switch to Computer Application Interface (ASCAI) service, which is based on Northern Telecom DMS-100 CompuCALL BCS34. It should be noted that Network Interface Specification, AM TR-NIS-000097, is based on CompuCALL BCS33.

2. GENERAL

The Ameritech Switch to Computer Application Interface (ASCAI) service supports applications that require the uniform exchange of application process information between the telecommunications network environment (i.e., digital telephone switching system) and a client's data processing environment (i.e., main frame/mini-computer).

the ASCAI service provides Telco administrable, client specific call event messages that are logically associated with the clients central office-based Automatic Call Distribution (ACD)/Centrex services. These switch-originated call event messages are processed by the client's computer and call management software to perform various data communications, telecommunications and/or administrative functions.

The ASCAI service also supports service request messages which are sent from the client's computer to the serving switch. These services request messages initiate switching functions within the digital switch that are associated with the client's ACD/Centrex service. These ASCAI call event and service request message sets offered by Ameritech, when used in conjunction with the appropriate client call management and business application software, facilitate the following enabled services:

- Coordinated Voice and Data
- Call Redirection
- Computer Assisted Call Transfer/Conference
- Computer Assisted Dialing

These enabled services are described in the referenced network interface specification.

With respect to the ISO/OSI model, ASCAI utilizes the Remote Operation Service Element (ROSE) Application Layer, ISO 9072-1/9072-2, which provides a method of transporting information between the serving switch application process and the client computer application process. This network interface specification will serve as the model to assist in the development of client call management and business application software, utilizing ROSE protocol.

The Northern Telecom Network Interface Specification NIS-Q218, Release 03.02, July 1992, *CompuCALL Interface Specification* (See Reference 1 of Section 6.1), as supplemented in Section 5 of this document, constitutes the definition of the ASCAI service and the generic requirements of the equipment supporting this service. It is anticipated over time that the ASCAI Network Interface Specification may evolve to reflect progress toward developing an industry standard.

3. TRANSPORT OF SERVICE

The ASCAI service is transported to the client's premise over a four-wire, private line facility which is suitable 9600 bps or 56 Kbps digital transmission. These interfaces are specified as follows:

- 04DU5-96 Interface type (See Reference 1 of Section 6.2)
- 04DU5-56 Interface type (See Reference 1 of Section 6.2)

4. DATA CIRCUIT-TERMINATING EQUIPMENT (DCE) SPECIFICATIONS

The ASCAI service is transmitted to the client's premises using a digital data service. The transmission rate for this service is not to exceed 56 Kbps. the client should terminate their four-wire, private line ASCAI facility on data circuit-terminating equipment (DCE) that supports the recommended transmission rate of 9600 bps. The DCE specifications for the ASCAI service is as follows:

- Digital Data Service Channel Interface @ 9600 bps* (* ASCAI service receives its synchronization from an external network Stratum 1 source. All client DCE equipment should be set to the slave timing mode, with respect to the network.) (See Reference 2 of Section 6.2)
- Digital Data Service Channel Interface @56 Kbps* (* ASCAI service receives its synchronization from an external network Stratum 1 source. All client DCE equipment should be set to the slave timing mode, with respect to the network.) (See Reference 2 of Section 6.2)

5. SUPPLEMENTAL INFORMATION

5.1. Clarifications

This section clarifies any notable discrepancies or inconsistencies of terms, definitions, and procedures between the referenced Northern Telecom (NT) Network Interface Specification (NIS) document and Ameritech's interpretation of the ASCAI service.

1. In the referenced NT NIS document, the term “CompuCALL” is synonymous with and should be referred to as Ameritech Switch to Computer Application Interface (ASCAI).

2. The following CompuCALL Application Services referenced in the NT NIS document are synonymous with and should be referred by their respective Ameritech SCAI Services also listed below.

CompuCALL Application Services	ASCAI Services
Coordinated Voice And Data Delivery	Coordinated Voice and Data
Call Redirection	Call Redirection
Computer Assisted Signaling	Computer Assisted Call Transfer/Conference
Computer Assisted Signaling	Computer Assisted Dialing

It should be noted that two ASCAI services listed above are offered by utilizing the service functionality of a single CompuCALL application service; Computer Assisted Signaling. Table 5.1 Illustrates the CompuCALL messages which are associated with ASCAI services, such as Computer Assisted Call Transfer/Conference and Computer Assisted Dialing.

Table 5.1 - CompuCALL/ASCAI Association

	ASCAI Services			
	Coordinated Voice and Data	Call Redirection	Computer Assisted Call Transfer/ Conference	Computer Assisted Dialing
CompuCALL Messages	DV-CALL-OFFERED-U DV-CALL-QUEUED-U DV-CALL-RELEASED-U DV-CALL-ANSWERED-U	DV-CALL-RECEIVED-C DV-CALL-REDIRECT DV-CALL-OFFERED-U* DV-CALL-QUEUED-U* DV-CALL-RELEASED-U* DV-CALL-ANSWERED-U*	DV-ADD-PARTY DV-TRANSFER-PARTY DV-DROP-PARTY DV-CONFERENCE-PARTY DV-CALL-OFFERED-U* DV-CALL-QUEUED-U* DV-CALL-RELEASED-U* DV-CALL-ANSWERED-U*	DV-MAKE-CALL DV-CALL-RELEASED-U*

3. ASCAI service is not offered over an interface from data unit to data unit, as shown in NT NIS-Q218, Volume 1, Chapter 2, Figure 1-2.1, *CompuCALL X.25 Switch Interface*. The ASCAI service is offered to the client’s premises over a dedicated, four-wire, private line facility and terminated to the client’s data unit. Figure 5.1, *ASCAI X.25 Switch Interface*, illustrates the manner in which this service will be transported and offered by Ameritech.

4. In reference to Volume 1, Chapter 1, Figure 1-1.1, OSI Reference Model used by CompuCALL, ASCAI Application Services reside in the OSI Application Layer (Layer 7)

exclusively. The Presentation Layer (Layer 6) is partially implemented since the ASCAI messages are encoded and decoded using internal switching system software whose implementation is based on ASN.1 Notation. The Session and Transport Layers are not currently used by ASCAI.

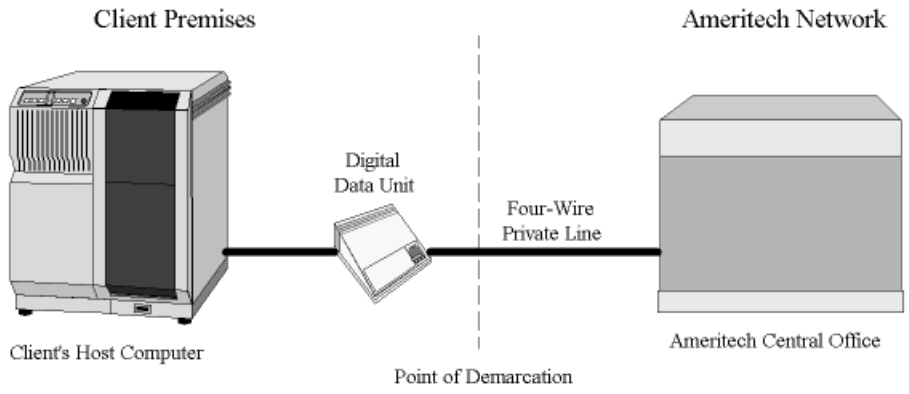

Figure 5.1 - ASCAI X.25 Switch Interface

5.2. X.25 Transport

This section clarifies or supplements reference discrepancies of NT NIS-Q218, Volume 2, Chapter 1. *X.25 Transport*, which differ from the way in which Ameritech interprets the ASCAI service. All references in this section are with respect to the NT NIS-Q218, Release 03.02, July 1992 document.

1. The standard X.25 Call Request packet format is used to set up a Switched Virtual Circuit (SVC) for ASCAI. A field breakdown of the packet layout can be found in ISO/IEC 8208, 1984. The serving switch requires this Call Request packet from the client's host to contain a call User Data field with the first four octets of information identified as the PROTOCOL subfield. The value associated with the octets in the PROTOCOL subfield are defined by Ameritech in negotiation with the client.

These values are then data-filled in the serving switch. Each octet value in the PROTOCOL subfield may range from 0 to 255. The first four octets of the call User Data in the Call Request packet from the client host must be identical to the negotiated PROTOCOL subfield octet values for the call to be accepted by the serving switch. If not identical, the call request will be rejected.

2. In reference to Volume 2, Chapter 1, Section 1.6, *User facility Options for Compu-CALL*, since Ameritech does not plan to offer ASCAI as a packet switched service at this time, options such as Delivery Confirmation, Extended Packet Sequence Numbering and End-to-End Transit Delay Negotiation will not be used.

3. In reference to Volume 2, Chapter 1, Section 1.7, *Normal Procedures* (first bullet item), if the first data packet is not a DV-APPL-LOGON ASCAI message, the serving switch will return a REJECT with a reason of "unrecognized operation." If the first ASCAI message is a DV-APPL-LOGOFF, a RETURN-ERROR message with a reason of "Not-Logged-On" will be returned by the serving switch. In either of these cases, the serving switch will not send a Clear-Request message (i.e., existing X.25 connection is not terminated).

Another notable point, with respect to *Normal Procedures* (third bullet item), is if the client host does not release the SVC after logoff, the serving switch will take no action.

4. In reference to Volume 2, Chapter 1, Section 1.7, *Abnormal Procedures* (fourth bullet item), just prior to a serving switch routine maintenance busy function, a Clear-Request message is sent to the client host switch which takes down the SVC, thus terminating the X.25 connection and the application session if it is active. Until the serving switch is restored to service, Layer 3 will not be established to receive messages.

Also in reference to *Abnormal Procedures* (fifth bullet item), the following information provides responses to various Application session anomalies:

- A **Reset** will cause all data and interrupt packets in each direction of the network to be removed. All subsequent data packet sequence numbers transmitted across the ASCAI interface in either direction will start from "0", in order to keep Layer 2 in synchronization.

- A **Restart** will cause Layer 2 to be dropped and then brought up again. All layers reestablish the session.

- A **REJECT** occurring on Layers 2 and 3 will cause the serving switch to clear or retransmit up to the number of times specified in the datafill.

- An **LAPB** link failure will clear Layers 3 and higher. The client must reestablish the session.

One last point with respect to **Abnormal Procedures** (sixth bullet item), if a Clear-Indication X.25 message is received by the serving switch during

an active Application session, the serving switch will then confirm the clear and terminate the X.25 connection and Application session.

5.3. Application Services

This section clarifies or supplements reference discrepancies of the NT NIS-Q812, Volume 3, *Common Application Services* and Volume 4, *Application Service Functions*. All references in this section are with respect to the NT-NIS-Q812, Release 03.02, July 1992 document.

1. In references to Volume 3, Chapter 1, Section 1.0, *Session Management*, Ameritech will negotiate the ASCAI message set and Service Profile subscription with the client, to satisfy their requirements.

2. In reference to Volume 3, Chapter 1, Section 1.1.1.1, *DV-APPL-LOGON*, the values of the following attributes of the logon message, *DV-APPL-LOGON* will be provided to the client by Ameritech at the time of service order negotiation:

    - NetworkNodeID
    - ServiceID
    - ServiceVersion
    - BusinessGroupID

    The client must provide the Password and Application ID attributes to Ameritech. However, it should be noted that the Password can only be assigned and changed by Ameritech via service order.

3. In reference to Volume 4, Chapter 2, Section 2.2, *Interactions, Restrictions and Limitations*, only messages which are contained in the client's Service Profile subscription are sent for the session. In the case where an Ameritech client Service Profile consists of DV-MAKE-CALL but does not include DV-CALL-RELEASED-U, then DV-CALL-RELEASED-U will not be sent when the call established by the DV-MAKE-CALL for that session has been released.

6. REFERENCES

6.1. Primary References

1. Northern Telecom NT NIS-Q218 *CompuCALL Interface Specification*, Release 03.02, July 1992. (Cost = $350.00)

6.2. Secondary References

1. Telcordia (formerly Bellcore) TR-NPL-000341 - Digital Data Special Access Service, *Transmission Parameter Limits and Interface Combinations*, Issue 1, March 1989.

2. AT&T PUB 62310, Digital Data System, *Channel Interface Specification*, November 1987.

To order Secondary Reference documents, contact:

Customer Information Center, AT&T, 2855 N. Franklin Rd., Indianapolis, IN 46219-1999, (800) 432-6600

Any questions regarding this document, please contact the APEx Help Desk at 847-248-4328.