

**QWEST Communications
International Inc.
Technical Publication**

**Local Interconnect Service
(LIS)**

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1. Introduction

1.1 General

This publication provides technical information about Local Interconnection Service (LIS) available from Qwest. LIS is a finished service used to connect a facilities-based Competitive Local Exchange Carrier (CLEC) to Qwest's network for the exchange of local traffic.

1.2 Reason For Reissue

This publication is being reissued to update chapter 2 to align with the SGAT and include E911 Interconnect Requirements.

1.3 Scope of Document

This document provides a technical description of LIS, including available options. Network Channel and Network Channel Interface codes and valid combinations are included.

Ordering instructions and responsibilities are beyond the scope of this publication and may be found in the appropriate Resource Guide, Cost Docket or approved contract.

1.4 Document Organization

This document is organized as described in Table 1-1.

Table 1-1: Document Organization

Chapter	Title	Contents
1	Introduction	General information about this document.
2	Service Description	LIS Service Concept and Definition
3	Network Channel/Network Channel Interface Codes and Applications	Explanation of the codes and valid combinations. Includes illustrative application examples.
4	Technical Parameters	Technical issues and references.
5	Definitions	Acronyms and glossary of terms
6	References	List of references with ordering instructions and a list of Trademarks.

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2. Local Interconnect Service (LIS)

2.1 Service Concept

Local Interconnection Service (LIS) is a terminating, trunk-side service provided between the Point of Interconnection (POI) of a CLEC's network and a Qwest end office, local tandem switch, or access tandem switch, for the purpose of completing calls from the CLEC's end-user customers to Qwest's end-user customers. LIS trunking arrangements are usually 2-Way. They may have Clear Channel Capability and may be provisioned on DS1 or DS3 facilities. Trunking connections may exist between the CLEC Switch and Qwest's End Office Switches, Local Tandem Switches or Access Tandem Switches.

Local calls begin and end within a Local Calling Area (LCA) or Extended Area Service (EAS) boundary that has been defined by the state Public Utilities Commission (PUC). Traffic exchanged between retail customers in different local calling areas is not local traffic, and CLECs, like IXC's, must have trunks to each Qwest Access Tandem Switch in a LATA if a LATA contains more than one access tandem. While Qwest will provide the LIS trunking to carry intraLATA toll, this does not mean that Qwest is the underlying intraLATA toll carrier. LIS does not provide for the direct connection of a CLEC's network to an extended network other than Qwest's. Other interconnected networks could be traditional Independent Companies, Wireless Service Providers, Interexchange Carriers, or other Competitive Local Exchange Carriers. The completion of local calls which begin in one company's network, transit the Qwest network, and terminate to yet another company's network is defined as LIS Transit Traffic and is discussed later in this document.

2.2 Service Definition

This section describes the trunking between Qwest's network and a facility-based CLEC's network for the purpose of exchanging EAS/Local traffic. As a function of LIS, Qwest will provide interconnection at the trunk side of an end office switch (or in some cases a remote switch) and on the trunk connection points of a local or access tandem switch. Interconnection is as described in the Act and refers to the connection between networks for the purpose of transmission and routing of telephone exchange service traffic and exchange access traffic. LIS is provided for the purpose of connecting:

- CLEC end office switches to Qwest end office switches.
- CLEC end office switches to Qwest local tandem switches.
- CLEC end office switches to Qwest access tandem switches.

2.3 Trunking

2.3.1 General

The numbering of the Trunk Groups used in this chapter has no specific meaning outside of Qwest and this document. The numbers were selected for use with this publication and internal Qwest documents.

An overview of the LIS network is illustrated in Figure 2-1. All connections shown are switched voice grade circuits. Specific circuit type may vary by unique customer requirements. Some circuits or portion of circuits may be furnished or owned by companies other than Qwest. There may be other trunking connecting the indicated switching entities.

The Traffic Use Codes given are typical. Unique variations in specific applications may require the use of different codes. The Traffic Use Code modifier "JJ" as paired letters represents CLECs traffic. The national system standard for this modifier is a single "J". Since a single "J" can appear in a variety of modifiers having no relationship to a CLEC and its associated traffic, Qwest is requiring the use of the paired "JJ" modifier.

Further information about Traffic Use Codes may be found in SR-TAP-000191, *Trunk Traffic Engineering Concepts and Applications*.

Routing of calls on either side of the parties' Point of Interface must be worked cooperatively between Qwest and the CLEC. When routing is defined in TR-EOP-000090, *Local Exchange Routing Guide (LERG) - Volume 8 (Qwest)*, it must be followed.

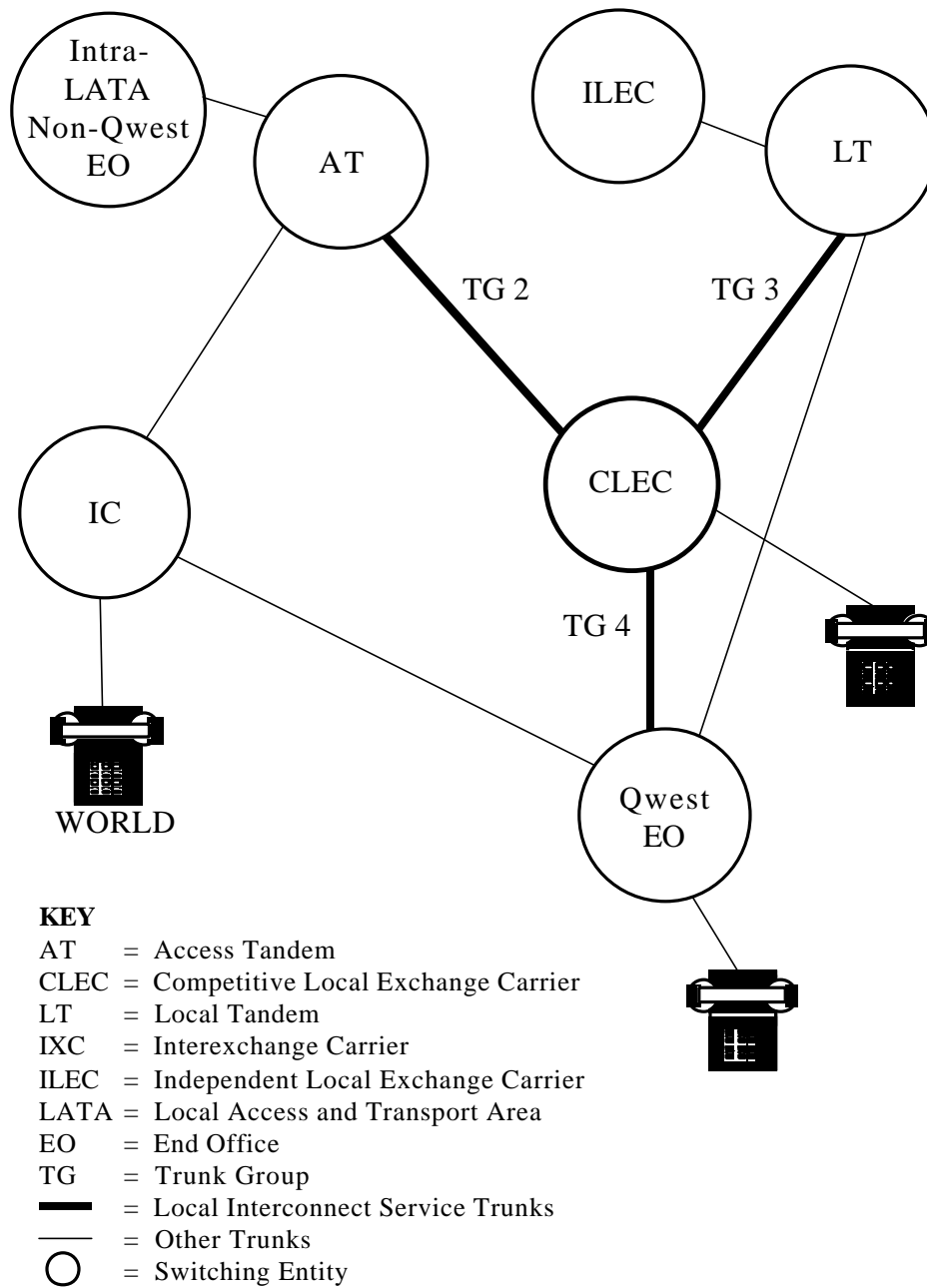


Figure 2-1: LIS Network Overview

2.3.2 Trunk Group 2 (TG2)

The primary traffic to be served by this trunk group is Exchange Access (intraLATA toll non-IXC) and Jointly Provided Switched Access (intraLATA/interLATA toll IXC) between a CLEC End Office Switch and the Qwest Access Tandem Switch. If the CLEC orders Single Point of Presence (SPOP), local EAS traffic may also be routed over this trunk group. This is a 2-way trunking arrangement. Data collection for verifying terminating Minutes of Use (MOU) will be established for this trunk group by Qwest.

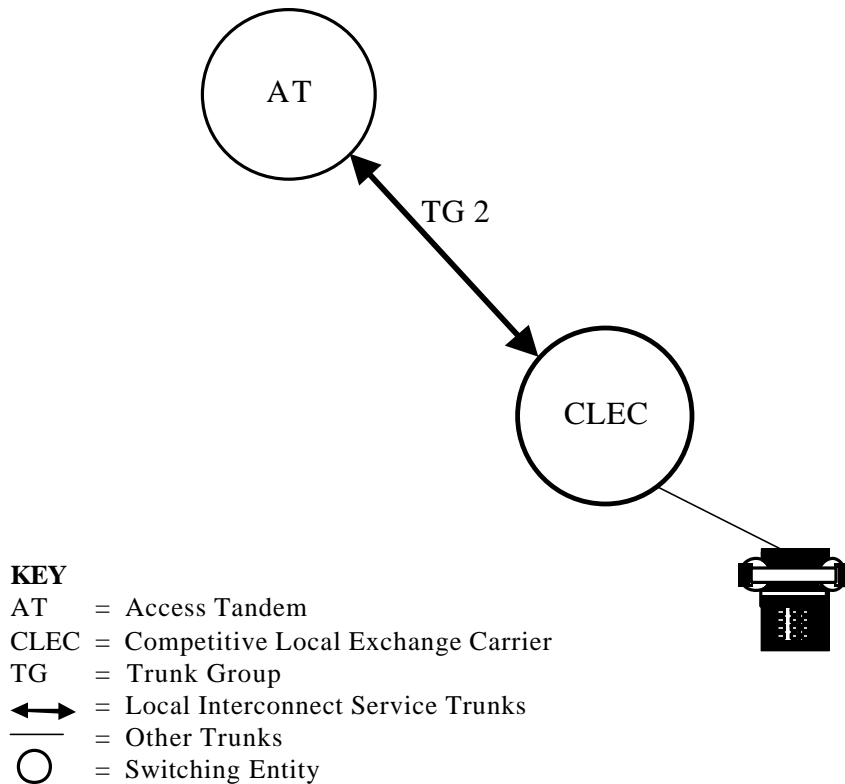


Figure 2-2: TG2 - 2-way Between a CLEC Switch and a Qwest Access Tandem Switch

2.3.3 Trunk Group 3 (TG3)

The primary traffic to be served by this trunk group is local EAS between a CLEC End Office Switch and the Qwest Local Tandem Switch. This is a 2-way trunking arrangement. This is a LIS trunking arrangement with supporting facilities available based on CLEC trunk forecasts. Data collection for verifying terminating Minutes of Use will be established for this trunk group by Qwest.

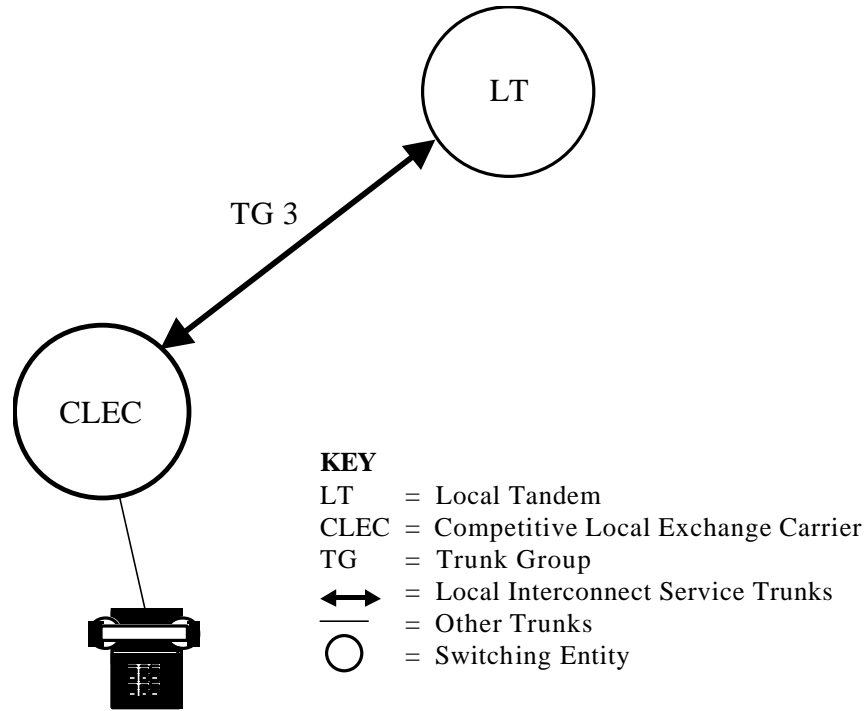


Figure 2-3: TG3 - 2-way Between a CLEC Switch and a Qwest Local Tandem Switch

2.3.4 Trunk Group 4 (TG4)

The primary traffic to be served by this trunk group is local EAS between a CLEC End Office Switch and the Qwest End Office Switch. This is a 2-way trunking arrangement. This is a LIS trunking arrangement with supporting facilities available based on CLEC trunk forecasts. Data collection for verifying terminating Minutes of Use will be established for this trunk group by Qwest.

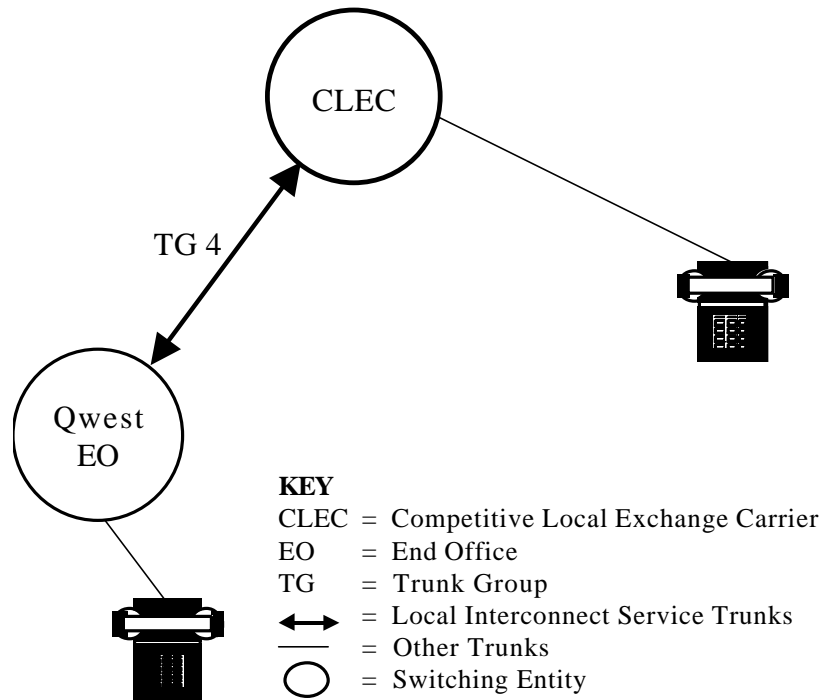


Figure 2-4: TG4 - 2-way between a CLEC Switch and a Qwest End Office Switch

2.4 Signaling System 7 Network Interconnection For Call Setup

When connecting to the Common Channel Signaling/Signaling System 7 (CCS/SS7) network, the CLEC may optionally connect either directly to Qwest's Local Signal Transfer Point (STP) pair or through their own network provider's STPs to Qwest's local STPs. The combination of direct connection and a third party STP is not allowed.

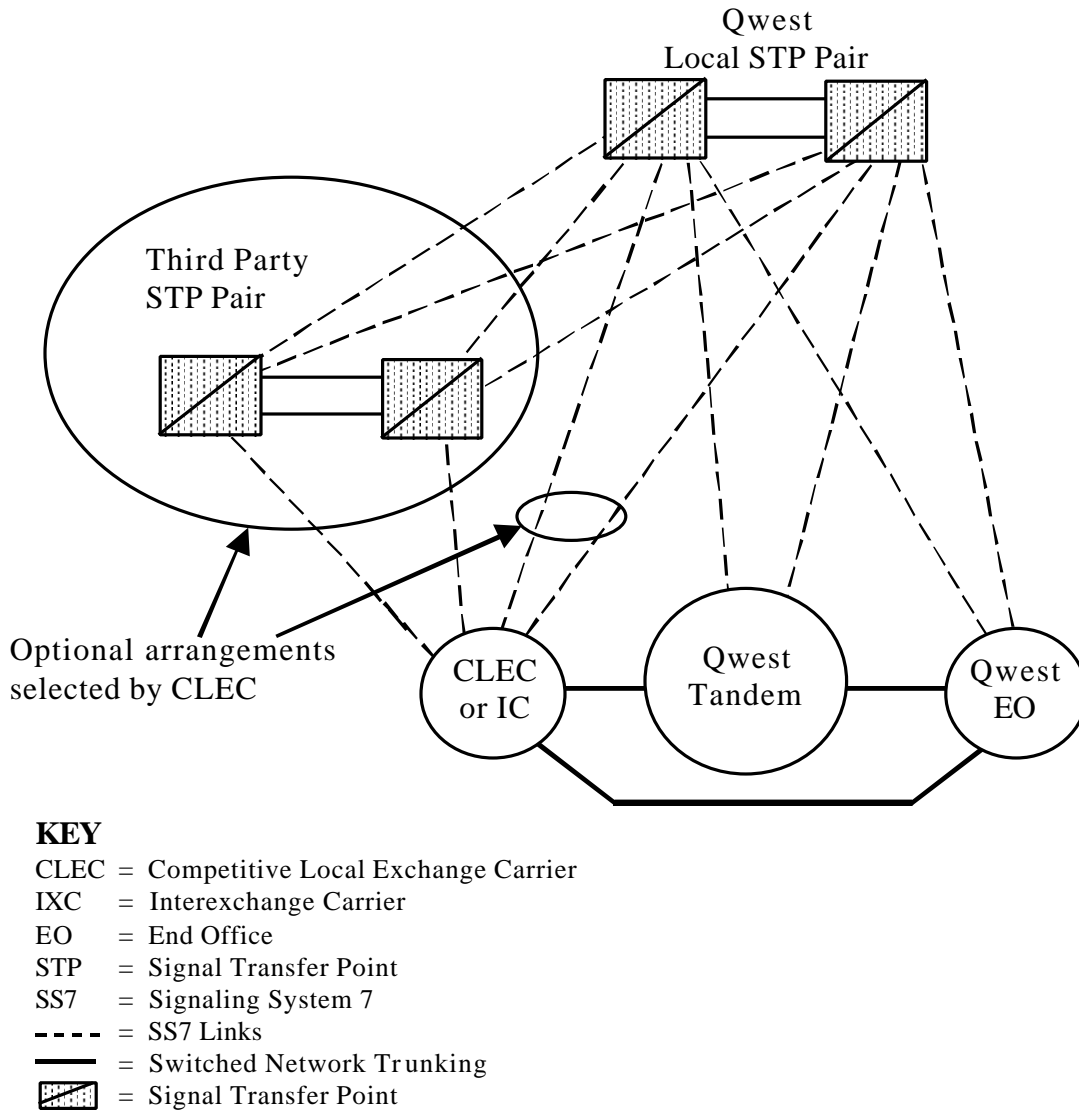


Figure 2-5: Signaling System 7 Network Interconnection

2.5 E911 Interconnect Requirements

2.5.1 General

911 service is an exchange service that routes a 911 dialed call to a Public Safety Answering Point (PSAP) for purposes of dispatching the appropriate agency for safety. The service includes facilities and equipment needed to switch and transport emergency calls to the designated PSAP. Prior to ordering 911 service, the CLEC must have an effective Interconnection Agreement or Amendment that contain the CLEC's end offices and NXXs involved in the 911 service.

E911 service ensures that CLECs are provided non-discriminatory access to the Qwest 911 services, databases and associated signaling necessary for call routing and completion to all PSAPs.

2.5.2 E911

E911 service is an expanded 911 service with features such as Selective Routing of 911 calls to a specific PSAP within the 911 service area. With a more competitive environment and the unbundling of 911 tariffs, 911 vendors/third party providers are offering alternatives to the bundled SR/ANI/ALI (Selective Routing/ Automatic Number Identification/Automatic Location Identification) solution by offering Selective Routing on-premises databases and local transport.

2.5.3 E911 Service Features

E911 has four primary features that can be combined to form different service feature offerings. The features are:

- Selective Routing (SR)
- Automatic Number Identification (ANI)
- Automatic Location identification (ALI)
- Private Switch/Automatic Location Identification (PS/ALI).

2.5.4 E911 Database

When a caller dials 911, the call is routed over the 911 network to a Selective Routing Switch (SRS) (AKA Control Office or 911 Tandem) for processing. In a metro area, several SRSs may exist. In these situations, the CLEC will need trunks from their end office to each SRS. With a full featured system (SR/ANI/ALI), the Selective Routing capability performs a series of look-up translations relating the calling party's telephone number to an Emergency Service Number (ESN) which ties the caller to a pre-designated PSAP. The call is then routed over the 911 network to that designated PSAP.

At the PSAP, the originator's telephone number is displayed on an ANI Display/Selector console. This console is equipped with function keys providing the various types of central office transfers offered by E911. Simultaneously, the ANI information is sent over a data link to the ALI database. The retrieved data is returned over the data link to the PSAP. An ALI Display Unit provides a readout of the calling party's name, address, city, state, telephone number, and class of service; it then lists the police, fire and emergency medical agencies that should respond. Some PSAP equipment combines the ANI Display/Selector console and the ALI Display into a single unit.

The CLEC will be responsible for ordering the DS1 for the E911 trunks. The DS1 can be combined with 911 and non-911 trunks.

To connect the CLEC to the E911 system, ES (Emergency Service Enhanced) Trunks must be installed between the CLEC's end office and the E911 Selective Routing Switch. ES Trunks are interoffice facilities that link each end office to the Selective Routing Switch. The CLEC provides the ES Trunk from their end office to the Meet Point. Qwest provides the remaining portion of the ES Trunks from the Meet Point to the Selective Routing Switch. These trunks are not provisioned and designed from regular service orders at this time; rather they are designed by Capacity Provisioning from information provided to Qwest. A minimum of two ES Trunks is required from each CLEC end office to the Selective Routing Switch.

The Meet Point can be outside either the CLEC end office or the Qwest Selective Routing Switch. However, it must be the first available access point outside of either office.

2.6 Interconnect Requirements

The CLEC shall establish a Point of Interconnection (POI) in each Qwest local calling area, or if the Single Point of Presence (SPOP) or InterLCA option is utilized, the CLEC will establish a minimum of one physical point of presence in the LATA. The following alternatives are most common: (1) a DS1 or DS3 Entrance Facility; (2) Collocation; (3) Negotiated Mid-Span Meet POI. Other configurations are possible.

2.6.1 Entrance Facility

Interconnection may be accomplished through the provision of a DS1 or DS3 entrance facility. An entrance facility extends from the Qwest Serving Wire Center to the CLEC's switch location or POI. Entrance facilities may not extend beyond the area served by the Qwest Serving Wire Center. Qwest's Private Line Transport service is available as an alternative to entrance facilities.

2.6.2 Collocation

Interconnection may be accomplished through the Collocation arrangements offered by Qwest. The terms and conditions under which Collocation will be available are described in the Collocation Section of this Agreement.

2.6.3 Mid-Span Meet POI

A Mid-Span Meet Point of Interface is a negotiated POI, limited to the interconnection of facilities between one party's switch and the other party's switch. The actual physical POI and facilities used will be subject to negotiations between the parties. Each party will be responsible for its portion of the build to the Mid-Span Meet POI.

2.7 Operational Support Requirements

2.7.1 Test Access

Qwest will provide the same test access for LIS as provided with any other trunking arrangement. Qwest and the CLEC must furnish each other the contact names and numbers of the technical personnel and locations that will be responsible for conducting joint testing.

Terminating LIS testing is provided where equipment is available, with the following test lines: seven-digit access to balance (100 type), milliwatt (102 type), nonsynchronous or synchronous, automatic transmission (105 type), data transmission (107 type), loop-around, short circuit, open circuit, and non-inverting digital loopback (108 type).

2.7.2 Alarming Requirements

Alarming for LIS is the same as for any other trunking arrangement. Qwest and the CLEC must furnish each other the contact names and numbers of the technical personnel and locations that will be responsible for alarm resolution.

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3. Network Channel/Network Channel Interface Codes And Applications

3.1 Network Channel (NC) Codes

3.1.1 General

Network Channel (NC) codes are a part of the Telcordia COMMON LANGUAGE[®] code set. The NC code is used to identify a channel used with the service. This section identifies the available channels and their NC codes.

3.1.2 Format

An NC code is a four-character code with two data elements:

- Channel Code
- Optional Feature Code

The format is illustrated in Figure 3-1.

Network Channel Code				
Data Element	Channel Code		Optional Feature Code	
Character Position	1	2	3	4
Character Key	X	X	X or -	X or -

X = Alphanumeric
 - = Hyphen

Figure 3-1: Format Structure for NC Codes

The **Channel Code** (character positions 1 and 2) is a two character alpha or alphanumeric code that describes the channel service in an abbreviated form. The channel code will frequently, but not always, be specified as the service code of the special service circuits or the transmission grade of the message trunk circuit. The NC channel code field is always filled.

The **Optional Feature Code** (character positions 3 and 4) is a two character alpha or alphanumeric or hyphen code that represents the option codes available for each channel code. Varying combinations of this code will allow the customer to enhance the technical performance of the requested channel, or to further identify the type of service. It is also used to specify options such as conditioning, effective 4-wire, multiplexing, etc. The NC optional code field is always filled.

Further information about NC Codes may be found in ANSI T1.223-1991, *Information Interchange — Structure and Representation of Network Channel (NC) and Network Channel Interface (NCI) Codes for the North American Telecommunications System.*

3.1.3 Available Network Channel Codes

Table 3-1 lists the available Network Channel (NC) codes for LIS-Trunking. The description “Local Transmission Parameters” denotes the technical parameters in this publication and in the referenced documents.

Table 3-1: Available LIS-Trunking Network Channel Codes

Network Channel	Option Code	Char 3	Option Code	Char 4
SB	Inter LEC* Trunking	U	End Office to End Office 2-wire	A
			End Office to Local Tandem 2-wire	B
			End Office to E911 Local Tandem 2-wire	C
			End Office to Access Tandem 2-wire	F
			End Office to Access Tandem 2-wire with SS7	H
			End Office to End Office 2-wire with SS7	K
			End Office to Local Tandem 2-wire with SS7	M
			End Office to Local Tandem 2-wire with SS7 and CCC	N
			End Office to Access Tandem 2-wire with SS7 and CCC	P
			End Office to End Office 2-wire with SS7 and CCC	R
			End Office to E911 Tandem 2-wire with SS7	V
SD	Inter LEC* Trunking	U	End Office to End Office 4 wire	A
			End Office to Local Tandem 4 wire	B
			End Office to E911 Local Tandem 4 wire	C
			End Office to Access Tandem 4 wire	F
			End Office to Access Tandem 4-wire with SS7	H
			End Office to End Office 4-wire with SS7	K
			End Office to Local Tandem 4-wire with SS7	M
			End Office to Local Tandem 4-wire with SS7 and CCC	N
			End Office to Access Tandem 4-wire with SS7 and CCC	P
			End Office to End Office 4-wire with SS7 and CCC	R
			End Office to E911 Tandem 4-wire with SS7	V

* LEC represents CLEC, ALEC, AAP, and CAP.

- LEC = Local Exchange Carrier
- CLEC = Competitive Local Exchange Carrier
- ALEC = Alternate Local Exchange Carrier
- AAP = Alternative Access Provider
- CAP = Competitive Access Provider

3.2 Network Channel Interface (NCI) Codes

3.2.1 General

Network Channel Interface (NCI) codes are a part of the COMMON LANGUAGE[®] code set. The NCI code is used to identify a network interface of a service in our mechanized systems. This chapter defines the NCI codes used with voice grade services.

3.2.2 Format

An NCI code is a maximum twelve-character code that consists of five (5) data elements:

- Total Conductors
- Protocol
- Impedance
- Protocol Options
- Transmission Level Point(s) (TLP)

The first three fields are required, the last two may be optional depending of on the service. The format is illustrated in Figure 3-2.

Network Channel Interface Code

Total Conductors		Protocol		I m p e d a n c e	D e l i m e n t e r	Protocol Options			D e l i m i t e r	TLP Level	
										T r a n s m i t	R e c e i v e
1	2	3	4	5	6	7	8	9	10	11	12
N	N	A	A	X	•	X	X	X	•	X or -	X or -

- A = Alpha
- N = Numeric
- X = Alphanumeric
- = Delimiter (normally a period)
- = Hyphen

Figure 3-2: Format Structure for NCI Codes

Total Conductors (character positions 1 and 2) is a two-character numeric code that represents the total number of physical conductors (e.g., wires or fibers) required at the interface.

Protocol (character position 3 and 4) is a two-character alpha code that defines requirements for the interface regarding signaling/transmission.

Impedance (character position 5) is a one-character alpha or numeric code representing the nominal reference impedance that will terminate the channel for the purpose of evaluating transmission performance.

Protocol Options (character positions 7, 8, and 9) is a one to three character alpha, numeric, or alphanumeric code that describes additional features (e.g., bit rate or bandwidth) on the Protocol to be used. It is an optional field that is always left justified when less than three characters are specified.

Transmission Level Point(s) (character positions 8 through 12) is assigned one or two character alpha code corresponding to a value for Transmission Level Point(s) (TLPs) from either the Exchange Carrier/service provider or customer end. This field should be left blank for LIS-Port.

Further information about NCI Codes may be found in ANSI T1.223-1991, *Information Interchange — Structure and Representation of Network Channel (NC) and Network Channel Interface (NCI) Codes for the North American Telecommunications System*.

3.2.3 Available Network Channel Interface Codes

Table 3-2 lists the NCI codes available for LIS-Trunking.

Table 3-2: Available LIS-Trunking NCI Codes

Protocol		Definition
Code	Option	
3 4	7 8 9	
DS	15	Digital Hierarchy Interface, 1.544mbps DS1, Superframe Format and AMI per TR-TSY-000342
	44	Digital Hierarchy Interface, 44.736 mbps DS3, M2/3 Format

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4. Technical Parameters

4.1 General

The LIS-Trunking includes the functions and features described in Chapters 2 and 3.

These services are intended to work with a loop loss not to exceed 8.5 dB at 1004 Hz.

Loops require sufficient dc loop current to ensure proper operation of telephone sets and other equipment. In no case should the loop current be less than 23 milliamperes. Qwest's central office batteries operate at a nominal value of 48 to 52 volts dc with an internal resistance in the range of 400 to 500 ohms. Interconnectors may obtain specific values for a given Central Office from Qwest during the negotiation process if needed.

Long loops not meeting these requirements will require additional loop treatment. This treatment is the responsibility of the loop provider.

4.2 Applicable Technical References

Requirements contained in the following publications would apply unless specific exception is made in a Qwest publication or tariff. See Chapter 11 for issue dates and ordering information.

- ANSI T1.401-1993, Interface Between Carriers and Customer Installations - Analog Voicegrade Switched Access Lines Using Loop-Start and Ground-Start Signaling.
- ANSI/IEEE Std 820-1984, Standard Telephone Loop Performance Characteristics. This publication has recently been reaffirmed.
- FR-64, LATA Switching Systems Generic Requirements (LSSGR).
- SR-TSV-002275, BOC Notes on the LEC Networks - 1994.

4.3 Interference

Any loops connected to Unbundled Network Elements must not physically, electrically, or inductively interfere with other Qwest services or those of Qwest's other customers.

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5. Definitions

5.1 Acronyms

AMA	Automatic Message Accounting
ANSI	America National Standards Institute
CLEC	Competitive Local Exchange Carrier
CO	Central Office
DTMF	Dual Tone Multifrequency
EICT	Expanded Interconnection Channel Termination
EU	End-User
Hz	1 Hertz (formerly 1 cycle per second)
IntraLATA	IntraLocal Access and Transport Area
kHz	Kilohertz (1,000 Cycles Per Second)
LIS	Local Interconnect Service
LATA	Local Access and Transport Area
NC	Network Channel
NCI	Network Channel Interface
NI	Network Interface
POTS	Plain Old Telephone Service
SWC	Serving Wire Center
Telcordia	Telcordia Technologies (formerly Bellcore)
TLP	Transmission Level Point

5.2 Glossary

American National Standards Institute (ANSI)

An organization supported by the telecommunications industry to establish performance and interface standards.

Carrier

An organization whose function is to provide telecommunications services. Examples are: Local Exchange Carriers, Interexchange Carriers, Cellular Carriers, etc.

Central Office (CO)

A local switching system (or a portion thereof) and its associated equipment located at a wire center.

Channel

An electrical or photonic, in the case of fiber optic based transmission systems, communications path between two or more points of termination.

Closed End

The end of a switched service which transmits address signals.

Customers

Denotes any individual, partnership or corporation who subscribes to the services provided by Qwest. Customers are divided into two distinct and separate categories: (1) carriers, who provide services for hire for others, and (2) End-Users, who request services only for their own use.

Dial Pulse (DP)

A means of signaling consisting of regular momentary interruptions of a direct or alternating current path at the sending end in which the number or interruptions corresponds to the value of a digit or character. The interruptions are usually produced by a rotary telephone dial, but may be produced by a sender switching system.

Dual tone Multifrequency Signaling (DTMF)

A signaling method that employs signals consisting of two sinusoidal voice frequency components, one from a group of four low frequencies and the other from a group of four high frequencies.

End Office

A designation of a Qwest switching system that occupies the lowest level of the public switched network hierarchy. It is the designation of a switching system that connects lines to lines, and lines to trunks (a local switching system).

End Office Switch

The term "End Office Switch" denotes a Qwest switching system where local exchange services are terminated for purposes of interconnection to other exchange services or trunks. Included are Remote Switching modules and Remote Switching Systems served by a host office in a different wire center. See also "Local Switching System".

End-User (EU)

The term "End-User" denotes any customer of telecommunications service that is not a carrier, except that a carrier shall be deemed to be an "End-User" to the extent that such carrier uses a telecommunications service for administrative purposes without making such service available to others, directly or indirectly. The term is frequently used to denote the difference between a Carrier interface and an interface subject to unique regulatory requirements at non-Carrier customer premises (FCC Part 68, etc.)

Facilities

Facilities are the transmission paths between the demarcation points serving customer locations, a demarcation point serving a customer location and a Qwest Central Office, or two Qwest offices.

Impedance

The total opposition offered by an electric circuit to the flow of an alternating current of a single frequency. It is a combination of resistance and reactance and is measured in ohms.

Interconnectors

Customers who have transmission equipment in a Qwest wire center through some type of collocation agreement for interconnection to Qwest's Private Line Transport or Switched Access Services, will be termed "Interconnectors."

Line-Side Connection

Denotes a connection of a transmission path to the dial tone side of a switching system.

Local Access and Transport Area (LATA)

A geographic area for the provision and administration of communications service. It encompasses designated exchanges that are grouped to serve common social, economic and other purposes.

Local Exchange Carrier (LEC)

Any company or corporation engaged for hire in providing Access and intraLATA communications services.

Local Wire Center

The Wire Center which normally provides service to a customer.

Loop

The facility which connects the Local Wire Center to the customer's location.

Loop Signaling

Loop signaling uses a DC path, or loop, to convey address and supervisory signaling information.

Network

The interconnected telecommunications equipment and facilities.

Network Channel (NC) Code

The Network Channel (NC) code is an encoded representation used to identify both switched and non-switched channel services. Included in this code set are customer options associated with individual channel services, or feature groups and other switched services.

Network Channel Interface (NCI) Code

The Network Channel Interface (NCI) code is an encoded representation used to identify five (5) interface elements located at a Point of Termination (POT) at a central office or at the Network Interface at a customer location. The Interface code elements are: Total Conductors, Protocol, Impedance, Protocol Options, and Transmission Level Points (TLP). (At a digital interface, the TLP element of the NCI code is not used.)

Network Interface (NI)

The point of demarcation on the customer's premises at which Qwest's responsibility for the provision of service ends.

Ohm

The unit of electric resistance.

Off-Hook

The supervisory state indicative of the active (in use) condition.

On-Hook

The supervisory state indicative of the idle condition.

Open End

The end of a switched service from which dial tone is drawn.

Premises

Denotes a building or portion(s) of a building occupied by a single customer or End-User either as a place of business or residence.

Serving Wire Center

The term "Serving Wire Center" denotes a Qwest Central Office from which dial tone for the local Exchange Service would normally be provided to the demarcation point on the property at which the customer is served.

Signaling

The transmission of information to establish, monitor, or release connections and/or provide Network Control.

Stored Program Control (SPC)

A switching system comprised of a set of instructions within computer memory specifying operations to be performed which expands the capability of the system to selectively route traffic.

Transmission Level Point (TLP)

A point in a transmission system at which the ratio, usually expressed in decibels, of the power of a test signal at that point to the power of the test signal at a reference point, is specified. For example, a zero transmission level point (OTLP) is an arbitrarily established point in a communication circuit to which all relative levels at other points in the circuit are referred.

Transmission Path

Denotes a path capable of transporting signals within the range of the service offering. A transmission path is comprised of physical or derived facilities consisting of any form or configuration of plant typically used in the telecommunications industry.

Voice Band

Relating to the frequency spectrum from 300 to 3000 Hz.

Wire Center

A building in which one or more central offices, used for the provision of local exchange services, are located.

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6. References

6.1 American National Standards Institute Documents

ANSI T1.223-1991 *Information Interchange — Structure and Representation of Network Channel (NC) and Network Channel Interface (NCI) Codes for the North American Telecommunications System.*

6.2 Telcordia Documents

GR-499-CORE *Transport Systems Generic Requirements (TSGR): Common Requirements, Issue 1, December 1995.*

SR-ST5-000307 *NC/NCI Code Dictionary. Issue 8, April 1997 (issued yearly).*

6.3 Qwest Technical Publications

PUB 77200 *Qwest DSI Service and Qwest DSI Rate Synchronization Service. Issue E, December 1998.*

PUB 77375 *1.544 Mbit/s Channel Interfaces. Issue D, October 1995.*

6.4 Ordering Information

All documents are subject to change and their citation in this document reflects the most current information available at the time of printing. Readers are advised to check status and availability of all documents.

Those who are not Qwest employees may order;

American National Standards Institute (ANSI) documents from:

American National Standards Institute
Attn: Customer Service
11 West 42nd Street
New York, NY 10036
Phone: (212) 642-4900
Fax: (212) 302-1286

ANSI has a catalog available which describes their publications.

Telcordia documents from:

Telcordia Customer Relations
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Piscataway, NJ 08854-4156
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Phone: (800) 521-CORE (2673) (U.S. and Canada)
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International Telecommunications Union documents may be ordered from:

International Telecommunications Union
General Secretariat
Place des Nations, CH-1211
Geneva 20, SWITZERLAND

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