COMMON LANGUAGE® Location Codes (CLLI™ Codes) Description for Location Identification

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COMMON LANGUAGE® Location Codes (CLLI™ Codes) Description for Location Identification

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Target audience: Licensed Clients

This document replaces: *BR-795-100-100*, *Issue 27*, *May 2009*

Where material has been added, changed, or deleted, the location of the change is marked by a vertical bar (|) in the outer margin next to the change.

Related document: *JA-18*, *Issue 22*, *May 2010*

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1 Purpose and Scope

This document provides the basic rules and guidelines to use when assigning unique CLLI Codes to geographic locations and functional categories of equipment that are of interest primarily to the telecommunications industry. These rules and guidelines create an identification scheme used in manual and mechanized environments, and are an integral part of many centrally developed operations support systems and related applications. This document contains an overall description of the CLLI Code set formats and their associated elements. This document is directed to those who need to know these COMMON LANGUAGE codes for assignment, description, and application interface requirements.

2 Reason for Issue

This document revises and replaces *BR-795-100-100*, *Issue 27*, in its entirety, and supersedes all other documents alleged to provide CLLI Code definitions or descriptions. It includes the following specific changes:

- Added Long Term Evolution (LTE) related acronyms and descriptions to Appendix A.
- Added LTE Architecture drawing to section 16.
- Added new LTE Mobility Management Entity (MME) - LT(x) description to sections 11 and 17.
- Added updated description to Q(n)(n) section 12 and Q(n)(x)(x)(x) section 13 to support LTE.
- Added updated description to PN(x) to section 11 to support LTE.
- Added updated description to the router equipment reference in the Wireless Equipment Location Entity Code Guidelines to section 15.
- Added customer premise overflow entity code CP(x) to sections 12 and 17
- Added tandem switch overflow entity codes (n)BT and (n)CT to section 17.

3 General

The CLLI Code is a geographic identifier that uniquely identifies the location of sites within a geopolitical unit or unique location, e.g., high seas, satellites, etc. Its structure allows the CLLI Code to identify and pinpoint specific geographic locations that are of interest to a communications company or other type company where a need exists to uniquely associate inventories, work centers, customers, etc., to a CLLI Code location. For other details, the user must look beyond the CLLI Code set to other code sets or databases, e.g., facility and trunk identification. Understanding CLLI Code structure and applicability permits CLLI Code coordinators to ensure stability of codes and associated data in existing and future processes.

CLLI Codes provide the standard and consistency required for flow-through and network management. The CLLI Code development, administration, and maintenance process should include discussions with message-trunk forecasting, transmission engineering groups, planners, access service provisioners, and operational support system developers. CLLI Code changes should be avoided because of the widespread use of CLLI Codes. They are embedded in a variety of operation support systems used in the communications industry for databases required for

- Equipment and Facility Inventories, Investment, Forecasting and Planning
- Unique Client Interface Points
- Circuit and Facility Design, Routing and Restoration
- Tariff and Billing
- Work Force Administration
- FCC and PUC Inquiries
- Marketing and Sales.

CLLI Codes, used separately or with other COMMON LANGUAGE Codes, uniquely identify most of the elements of a communications network. Because they are mnemonic, COMMON LANGUAGE Codes are easy to use and to remember. Not only do they identify a particular network element, they also convey information about it. Although they are used by people, COMMON LANGUAGE Codes greatly aid in the mechanized transfer of information.

The CLLI Code assignment process should consider the requirements of the associated COMMON LANGUAGE Codes. For example, CLLI Codes identify specific locations that are used as terminal identities for facilities (CLFI™ Code Set) and message circuits (CLCI™ MSG Code Set), and are referenced by special service circuits (CLCI S/S Code Set). Refer to *BR-795-450-100*, *BR-795-400-100*, and *BR-795-402-100*, respectively, for descriptions of these codes and their usage. The CLLI Code satisfies ongoing requirements for identification of locations and certain entities at those locations. These codes are applicable in any manual or mechanized system. Therefore, no attempt should be made to embed operational information in the code.

CAUTION! Encoding schemes that reserve certain characters (or groups of characters) within the user assigned portion of the CLLI Code elements should be avoided. These schemes may lead to future coding problems such as exhaustion of the Geographical Code, necessitating additional Geographical Codes for a single place. Inconsistent client encoding schemes may hinder the automatic flow-through of orders between companies having different meanings of reserved characters. Considerable care should be taken in the selection of the proper CLLI Code format, including Geographical Code and Network Entity Code selection.

NOTE: It is not the intent of the CLLI Code to individually list, inventory, or identify every item of equipment, work group or person, or thing at a particular location with a separate CLLI Code, although it is left to the discretion of CLLI Code users to determine what needs to be identified. The CLLI Code should not be used to individually list or inventory all equipment, people, or things at a location.

All CLLI Codes are maintained in a secured on-line master location database (CLONES) by Telcordia COMMON LANGUAGE® Managed Information Services, Piscataway, New Jersey. This is essential to maintain the uniqueness, to prevent duplication, and to preserve the geographic and business data of CLLI Codes. For standard-level CLLI Code licensees, that company's CLLI Code coordinator is responsible for updating the Telcordia CLONES database using procedures defined in this document and in the system documentation. Descriptive information associated with the CLLI Code may also be found in *Job Aid JA-18*, CLLI Code Technical Advisory Group (TAG) meeting notes, COMMON LANGUAGE® Managed Information Services Seminar student binder, or specialized client training material.

Questions concerning the COMMON LANGUAGE CLLI Code information contained in this document, and requests for new CLLI Code formats and Network Entities, or Network Support Site Codes, should be directed through the Telcordia customer CLLI Code coordinator or the Telcordia COMMON LANGUAGE® Customer Service Center (CSC). Development of new codes and changes in coding procedures require approval of Telcordia and concurrence from Telcordia CLLI Code customers.

Telcordia COMMON LANGUAGE® Managed Information Services provides the technical expertise to maintain the CLLI Code set. Input to this procedure is provided by the Technical Advisory Group (TAG), in accordance with the procedure outlined in *BR-751-000-102*, *COMMON LANGUAGE® Code Set Request Procedures*.

4 Code Description, Purpose, and Structure

A CLLI Code is a standard COMMON LANGUAGE Code that uniquely identifies a specific geographic site of interest to a communications company or other type of company where a need exists to associate certain functional categories of equipment, inventories, work centers, customers, etc., to the site.

Code Purpose

CLLI Codes are used to identify existing and proposed building locations that contain or will contain, personnel, switching and nonswitching equipment (e.g., switching machines, switchboard and desk terminations, miscellaneous switching terminations, radio and carrier equipment, plant service centers, test rooms, frames), maintenance groups, customers, etc. CLLI Codes can also identify network support site locations, such as controlled environmental vaults, manholes, utility poles, pads, pedestals, mini- or max-huts containing communications equipment. These codes are also used to identify meet-point locations, such as cable or facility junctions, end points, international or state boundary locations. In addition, CLLI Codes identify customers and/or customer-site locations. Customer Site Codes are also used to identify terminations for network interconnection, cable, fiber, carrier, and span facilities, and circuits.

Code Structure

The CLLI Code is a composite 11-character alphanumeric code utilizing four formats comprised of either three or four elements. Each element, in its entirety, can be used separately or collectively in a hierarchical manner. The standard business names for each of the formats and associated elements are as follows:

CLLI Code - Network Site Format

1. COMMON LANGUAGE Geographical Code
2. COMMON LANGUAGE Geopolitical Code
3. CLLI Network Site Code

CLLI Code - Network Entity Format

1. COMMON LANGUAGE Geographical Code
2. COMMON LANGUAGE Geopolitical Code
3. CLLI Network Site Code
4. CLLI Network Entity Code

CLLI Code - Network Support Site Format

1. COMMON LANGUAGE Geographical Code
2. COMMON LANGUAGE Geopolitical Code
3. CLLI Network Support Site Code

CLLI Code - Customer Site Format

1. COMMON LANGUAGE Geographical Code
2. COMMON LANGUAGE Geopolitical Code
3. CLLI Customer Site Code

NOTE: The 8-character Network Site Code format may be used to identify facility terminations (e.g., cable, carrier, fiber, etc.) that are common to a building and are not dedicated to a customer or a switch. This would also apply to inventories of equipment that are not dedicated.

The following table depicts the CLLI Code elements and structure, character positions for each element, and the basic permitted character set for each element is represented by the lower case letters a, n, or x:

Code Element/Character Position	1	2	3	4	5	6	7	8	9	10	11
Geographical Code	a	a	a	a							
Geopolitical Code					a	a					
Network Site Code							n	n			
							a	a			
Network Entity Code									x	x	x
Network Support Site Code							a	n	x	x	x
Customer Site Code							n	a	x	x	x

Basic Notation Notes

Basic formats are prescribed throughout the following text for each code element. These formats are presented using a uniform system of notation, as follows:

- Parentheses enclose numbers and lower case letters, indicating user assigned values.
- Where specific alphas are not permitted in certain character positions, they are identified by a superscript, e.g., (a^1), (a^2), (x^1), (x^2), (x^3).
- (a) indicates any alpha A-Z may be used.
- (n) indicates any numeric 0-9 may be used.
- (x) indicates any alphanumeric A-Z or 0-9 may be used.
- (a^1) indicates alpha A-Z may be used, except alphas B, D, I, and O.
- (a^2) indicates alpha A-Z may be used, except alphas B, C, D, I, O, T, W, and Z.
- (a^3) indicates alpha A-Z may be used, except alpha B.
- (x^1) indicates alphanumeric A-Z or 0-9 may be used, except alphas B, D, I, and O.
- (x^2) indicates alphanumeric A-Z or 0-9 may be used, except alphas B and D.
- (x^3) indicates alphanumeric A-Z or 0-9 may be used, except alpha G.
- (x^4) indicates alphanumeric A-Z or 0-9 may be used, except alpha S.

- (x^5) indicates alphanumeric A-Z or 0-9 may be used, except alphas B, D, I, O, and T.
- (x^6) indicates alphanumeric A-Z or 0-9 may be used, except alphas B, D, I, O, and S.
- (x^7) indicates alphanumeric A-Z or 0-9 may be used, except alphas C, I, O, and P.

5 Geographical Code

A Geographical Code is a unique 4-character code that represents a valid locality (unique type location) within a country, state, or province in which it is located. A place name (along with county) is the criteria for the selection of the Geographical Code. A place name is not unique and may be duplicated within geographical areas. However, when the Geographical Code is used in conjunction with the second element (COMMON LANGUAGE Geopolitical Code - character position 5 and 6) of the CLLI Code, that 6-character code is unique worldwide.

Geographical Code Application

The COMMON LANGUAGE Geographical Code is the first element of each CLLI Code format. CLLI Codes must be created using the proper Geographical Code in the first element (character positions 1-4) of each of the CLLI Code formats. The address of the site to be coded will determine the proper Geographical Code to be used for coding a site and/or entity. The CLLI Network Site Code will identify the precise point within a place. Geographical Codes for Military Locations and International Airports are to be used if a site to be coded is located within the premises. Geographical Codes for Townships or Minor Civil Divisions (MCD) are to be used if the site to be coded lies within the township outside the boundaries of an incorporated place.

Place Description

A place is generally described as a municipal locality or similar type area in the world. Such a locality may be referred to as a city, town, suburb, village, hamlet, municipality, or other types of incorporated places. When a required location lies outside the boundaries of an incorporated area, a Geographical Code will be assigned to identify that area. Some of these areas are identified as, township or minor civil division, census designated place, department or territorial subdivision, prefecture or district, region, canton, etc., depending upon its country and/or state. A Geographical Code may also designate government complexes (i.e., military locations), major international airports, geographic features, e.g., mountains, bodies of water, etc., and satellites. If a metropolitan area includes a suburban area, each locality may require its own Geographical Code.

Telecommunications exchange areas, and rate center, are not considered to be valid locations for a CLLI Place (Geographical) Code.

NOTE: There can be multiple Geographical Codes within an exchange area. In addition, an exchange area can be a single wire center, or include multiple wire centers within a place, or have cross boundary capabilities into two rate center areas. All this indicates that a place, exchange area, and a rate center have a common bond. Although the CLLI Code Set does not prohibit such a plan, it is not a part of the CLLI Code definition that place is tied to any restriction such as an exchange area or rate center even though an exchange area or rate center may well fit the place description.

Geographical Code Format

The Geographical Code field is a 4-character code that accepts only alpha characters. If the place name contains fewer than four characters, Telcordia will assign a 4-character code by replicating the last letter(s) of the place name, if that code combination is available, e.g., ELY will become ELYY. An (a) indicates any letter A-Z may be used.

	Geographical Code (Positions 1-4)
Basic edits	(a) (a) (a) (a)

Geographical Code Assignment Examples

To help differentiate between places with the same normalized name, in the same Geopolitical Code, additional information, such as county, province, division, etc. may need to be considered.

- ***Geographical Codes.*** When a place name contains four or more characters, the Geographical Code will be four characters.

Place Name	**Geographical Code (Position 1-4)**	**Geopolitical**
Newark	NWRK	New Jersey
Jacksonville	JCVL	Florida

- ***Three- (or less) Character Geographical Codes.*** All Geographical Codes created after November 8, 1995 will be 4-alpha character to facilitate electronic bonding. Prior to that date, when a place name contained fewer than four characters, the Geographical Code was left-justified, and the unused positions were blank-filled.

  Geographical Codes marked with the word *Reserved* are not to be used as part of a CLLI Code. These codes are for internal use only by those companies that cannot use Geographical Codes having special characters in character position 4, created before November 8, 1995. They were marked *Reserved and made Inactive* to prevent new Geographical Code creation using that particular code combination.

Examples of codes first created for 3 character place name after November 8, 1995:

Place Name	Geographical Code (Positions 1-4)	Geopolitical Name
Eva	EVAA	Tennessee
Amo	AMOO	Indiana

Examples of existing codes for 3 character place name, created before November 8, 1995:

Place Name	Geographical Code (Positions 1-4)	Geopolitical Name	Remarks
Rio	RIO	Wisconsin	
Rye	RYE	New York	
Rio	RIOO	Wisconsin	RESERVED
Rye	RYEE	New York	RESERVED

- ***Same Place Names - Same Geographical Code, Different Geopolitical.*** Place names are not unique, and may appear in two or more states, provinces, and/or countries. For example, in the United States the same place names in different states should all have the same Geographical Code, if possible. In these cases, the geopolitical code is the discriminating factor between two or more Geographical Codes.

Place Name	Geographical Code (Positions 1-4)	Geopolitical Name
Plainville	PLNV	New York
Plainville	PLNV	Ohio
Paris	PARS	Texas
Paris	PARS	France

- ***Same Place Name - Different Geographical Codes.*** When geographical names are the same within the same geopolitical, code, a unique Geographical Code will be created for each place name that is separately located in a different county, province, division, etc.

Place Name	Geographical Code (Positions 1-4)	Geopolitical Name	County
Franklin	FRTP	Indiana	Montgomery
Franklin	FTPG	Indiana	Grant

- ***Same Place Name - Same Geographical Codes.*** For the case of a single place extending over several counties, provinces, divisions, etc., there will be only one Geographical Code, with each of the counties being applicable. This is in contrast

to the previous example where there were two different places with the same name located in two separate counties within the same geopolitical code.

Place Name	Geographical Code (Positions 1-4)	Geopolitical Name	County
Houston	HSTN	Texas	Fort Bend
Houston	HSTN	Texas	Harris
Houston	HSTN	Texas	Montgomery

- ***Same Geographical Code - Different Place Names.*** The same Geographical Code may represent different place names in different states, provinces, countries, etc. In this instance, the COMMON LANGUAGE Geopolitical Code is required to provide a unique combination to identify each Geographical Code location.

Place Name	Geographical Code (Positions 1-4)	Geopolitical Name
Laytonville	LYVL	California
Lynville	LYVL	Indiana

- ***Unique Geographical Codes.*** Unique Geographical Codes are provided to identify high seas locations (bodies of water) or to indicate a satellite in earth orbit as a valid place. See Table A under the heading Unique Locations for a complete listing of codes.

Place Name	Geographical Code (Positions 1-4)	Geopolitical Code (Positions 5-6)	Geopolitical Name
Satellite	STLT	EO	Earth Orbit
Atlantic Ocean	ATON	HS	High Seas

Geographical Code Assignment and Community Name Change

Geographical Codes are assigned to a valid locality or community (place). There are instances when a community boundary will change and street addresses formerly associated with one community are now encompassed in another community. CLLI Codes that have been created for an address will retain the original Geographical Code representing the first community name. The original place name, the current (new) community name will be displayed in CLONES.

Non-Licensee Guidelines for Requesting Geographical Codes

Non-licensees may request Geographical and Geopolitical Codes through the American National Standard Institute, Inc. (ANSI) by contacting the following:

Telcordia COMMON LANGUAGE® Customer Support Center (CSC)
One Telcordia Drive, RRC 6G-141
Piscataway, NJ 08854
Tel: +1 877.699.5577
Fax: +1 732.336.2778
Email: clcsc@telcordia.com

Licensee Guidelines for Requesting Geographical Codes

Licensees may either mail or submit a fax for Geographical and Geopolitical Codes to the Customer Support Center. All other requests should be made in accordance with procedures established in *BR-751-000-102* via the LS2 process. Geographical and Geopolitical Code requests should be addressed as shown above. Note that expedited requests should be faxed or emailed to the CSC.

Geographical Code Response

Telcordia will assign requested Geographical Code(s) the same day upon receipt of the mail, email or fax and will notify requestor via telephone or mail of assigned codes. Telcordia will assign requested Geographical Codes within two business hours upon receipt of a valid facsimile request during a normal work day (7:00 a.m. to 5:00 p.m. ET Monday - Friday). The following nine fixed holidays are observed annually at Telcordia:

New Year's Day (January 1)
Martin Luther King Day (Third Monday in January)
President's Day (Third Monday in February)
Memorial Day (Last Monday in May)
Independence Day (July 4)
Labor Day (First Monday in September)
Thanksgiving Day (Fourth Thursday in November)
Day after Thanksgiving (Friday Following Thanksgiving Day)
Christmas Day (December 25)

Within the two-hour time frame, Telcordia will notify the requester, **via telephone**, that processing of the request has been completed, or that a delay may be encountered.

Additionally,

- When a holiday occurs on a Saturday, then it is observed on the preceding Friday.
- When a holiday occurs on a Sunday, then it is observed on the following Monday.

Geographical Code Request Guidelines

The following criteria must be followed when requesting Geographical Codes:

- Requirements for Geographical Code requests vary according to country. The next subdivision based upon the country, state, or Geopolitical Code is required for creation of the CLLI Code. See the table below for additional information that may be required for a Geographical Code request:

Country Name	Geopolitical Type/ Code	Geopolitical Subdivision	LATA
United States	States and District of Columbia (see Table A)	County	Yes
US Outlying & Pacific Ocean Territories	Islands and Territories (see Table A)	No	No
Canada	Provinces and Territories (see Table A)	No	No
Mexico	States and the Federal District (see Table A)	No	No
Venezuela	VE	States, Territories and the Federal District	No
Spain	SP	Provinces	No
Netherlands	NL	Provinces	No
Italy	IT	Provinces (do not enter region)	No
Malaysia	ML	District or states	No

For all other countries reference *BR-751-100-055, COMMON LANGUAGE® Location Codes- Geopolitical Code Description and Listings* which contains a detailed description of Geopolitical Codes and listings of representations of the geopolitical areas, including unique locations such as high seas or satellites, by Geopolitical Code. On occasion, the following additional information may be required when requesting Geographical Codes:

- An official map showing where the place exists must be submitted upon request of Telcordia. Acceptable maps include Rand-McNally, county, state department of transportation, and geographical (topography) survey maps. In the United States, place names determined from the *LocateIt®* System must be verified to ensure that the requested place is proper, and that the postal place ZIP Code® area or greater metropolitan area is not selected.
- The map must indicate the geopolitical entity (state, province, country) and the geopolitical subdivision (county, parish, township, department, region, prefecture, canton, etc.) in which the place is located.
- A place name handwritten or typed on a map will not suffice.
- Exceptions to assignment of a Geographical Code to a location that does not appear on a map, e.g., settlements, wilderness areas, or other unincorporated and incorporated (found on the internet) areas may be made by Telcordia,

provided the requester has exhausted attempts to find a detailed map, and can provide the other characteristic traits of a place as outlined below.

- When requesting Geographical Codes, those countries that have geopolitical subdivisions should include this subdivision information on their request form.
- Telcordia will make the final determination for the assignment of a Geographical Code that may not appear on a valid map, i.e., settlements, wilderness areas, or other unincorporated areas, such as industrial parks, shopping centers, universities or colleges, county, federal, or state parks, prisons, hospitals, counties, and parishes.
- Geographic Codes may be assigned to geographical landmarks. Landmarks are prominent and identifiable locations or a feature of the landscape. Examples of Geographical landmarks are
  - — Body of water: lake, river, etc.
  - — Government Park: national, state, country, city, etc.
  - — Geographical feature: mountain, hill, bluff, valley, ridge, etc.
  - — Military base
  - — Mines
  - — Farms/ranch
  - — Civilian airport
- To help validate a place name
  - — For remote areas, other supporting information should be provided, e.g., latitude and longitude, nearest city, and/or direction from nearest crossroads, and/or geographical features such as near rivers, lakes, mountains, etc.
  - — For antenna, transmitter and/or receiver type locations, latitude and longitude should be provided.
- On occasion, Telcordia may request additional information, which will be used to validate a place name before a Geographical Code is assigned, or as a reference source for future requirements as follows:
  - — Postal information, e. g., ZIP Code.
  - — The address or direction from nearest crossroads for the required CLLI Code, and if other address information is available for that location, e.g., entrances facing onto another street, alias (highway name or number), or vanity type street names.

REFERENCES. The following sources can be used for reference:

- The *LocateIt*® System
- Vendor GIS software
- Rand-McNally Foreign Research Verification (1-800-333-0136)
- National Geographic Verification (1-800-638-4077)

- *BR-751-100-050* for additional information concerning Geographical Codes
- *BR-751-100-055* for additional information concerning Geopolitical Codes
- The internet non-commercial (government) websites that are the on-line equivalent of sources cited above.

6 Geopolitical Code

Geopolitical Name Description

Unless a need is demonstrated, all countries are not broken down into their political and/or subdivision. The geopolitical locations that have been subdivided are known as Geopolitical Codes. These include the states of the United States, (including the District of Columbia, U. S. outlying and Pacific Ocean territories), states of Mexico, provinces or territories of Canada, and unique locations, e.g., high seas and satellites. The remaining countries are identified by a code represented by their country name.

- **A State of the United States** is defined as one of the 50 states of the United States, the District of Columbia, or United States outlying and Pacific Ocean territories.
- **Province or Territory of Canada** is defined as one of the administrative subdivisions of Canada, or geographical territories (i.e., Yukon, Northwest, Nunavut) under jurisdiction of Canada.
- **A State of Mexico** is defined as one of the 31 states and the Federal District.
- **Country** is a territorial division usually defined as having independent national status, as well as a defined territory and government. In addition, some geographical areas such as provinces, territories, atolls, possessions, domains, or portions of a larger entity are also included in the listing of Geopolitical Codes. Additional information concerning the *COMMON LANGUAGE Products Geopolitical Codes* (and a complete listing of the codes) may be found in *BR-751-100-055*.

  Since the CLLI Code assignments were made before full code agreement between countries, These codes conflict with the International Standards Organization (ISO) - ISO 3166 standard. Listed below are two conflict examples. Consideration was given to adopting the American National Standards Institute (ANSI) Country Code Standard (Z39.27-1984) and/or ISO 3166 as a Telcordia standard; however, because of uniqueness requirements, neither the ANSI nor the ISO Standard could be adopted for use by Telcordia.

Telcordia Standard	ISO Standard
CO - Colorado	CO - Columbia
CL - Columbia	CL - Chile

Geopolitical Code

The Geopolitical Code is a unique code which represents a valid geographical entity as defined above. When the Geopolitical Code is used in conjunction with the geographical code (character positions 1-4), this 6-character code becomes a unique code worldwide.

Geopolitical Code Format and Application

The Geopolitical Code is a unique 2-character fixed length letter code that represents a valid geographical entity. When the Geopolitical Code is used in conjunction with the Geographical Code (character positions 1-4), this 6-character code becomes a unique code worldwide. The Geopolitical Code, when used in any of the CLLI Code formats, always occupies character positions 5 and 6 of an 11-character CLLI Code. The COMMON LANGUAGE Geopolitical Code is required to uniquely identify each COMMON LANGUAGE Geographical Code location.

Geographical Code (Positions 1-4)	Geopolitical Code (Positions 5-6)	Remarks
(a) (a) (a) (a)	**(a) (a)**	**< Basic Edits**
H R B G	P A	Harrisburg, Pennsylvania - (United States)
H L F X	N S	Halifax, Nova Scotia - (Canada)
A M S T	N L	Amsterdam, Netherlands
C E L Y	G J	Celaya, Guanajuato - (Mexico)

Geopolitical Code Requests

Requests to modify or expand this code set must be submitted by a COMMON LANGUAGE® Managed Information Services subscriber to Telcordia. Requests for Geopolitical Codes will be verified with either the United Nations or the USA State Department for validity as to country recognition.

See Geographical Code request instructions for Geopolitical Code requests.

Unique Locations

A unique location is defined as either a satellite in an earth orbit or body of water. Unique locations are assigned in the CLLI Code design system in the following way:

- *Earth Orbit***.** When it is necessary to encode satellites in earth orbit, the 4-character COMMON LANGUAGE Geographical Code field is assigned the mnemonic code “STLT” (satellite), and “EO” (earth orbit) is assigned in the 2-character COMMON LANGUAGE Geopolitical Code field.

Example:

Unique Name	Geographical Code	Geopolitical Code
Position >	**1 2 3 4**	**5 6**
Satellite	S T L T	E O

- *High Seas***.** High seas locations are off the land's edge without regard to the 3-, 12-, or 200-mile limit, etc., recognized by various countries. In assigning new codes, Telcordia will consider the international overseas regional coordinator (client input) to determine where the land ends and the body of water begins and the use of the high seas (HS) Code.

- *Ships at Sea*. When it is necessary to encode ships at sea, use the home port (port of registration) COMMON LANGUAGE Geographical and Geopolitical Code.
- U*nderseas Cable or Repeaters.* When it is necessary to encode underseas cable or branching repeaters associated with cable, a unique 4-character COMMON LANGUAGE Geographical Code field identifies the body of water, and the mnemonic code "HS" (high seas) is assigned in the 2-character COMMON LANGUAGE Geopolitical Code field. The composite 6-character code will uniquely identify bodies of water, such as seas, oceans, lakes, gulfs, straits, bays, etc.

Unique Name	Geographical Code	Geopolitical Code
Position >	**1 2 3 4**	**5 6**
Bearing Sea	B R G S	H S

NOTE: CLLI Network Entity Codes (for switching and/or nonswitching) or CLLI Network Support Site Codes may be assigned to a high seas or earth orbit location, as appropriate. For a complete list of unique COMMON LANGUAGE Geographical and Geopolitical Codes associated with satellites and bodies of water, see Table A.

7 Network Site Format

The Network Site Code format is a composite 8-character code comprised of three elements. The first two elements are for the Geographical and Geopolitical Codes that occupy character positions 1 through 4, and 5 and 6 respectively. The third element denotes the Network Site Code that occupies character position 7 and 8.

Network Site Code

The CLLI Network Site Code is a 2-character fixed-length field comprised of either 2 letters (a)(a) or 2 numbers (n)(n), e.g., RK or 32, and occupies character positions 7 and 8 of the 11-character CLLI Code. A Network Site Code never combines a number and a letter, e.g., H5 or 3M.

Network Site Code Development

Network Site Codes are developed, assigned, and managed by Telcordia customer CLLI Code coordinators unless they choose to delegate authority. They are assigned to the geographical and geopolitical location in which they are physically located. When a building is outside the boundaries of an identified place, a Geographical Code should be requested to identify that place.

Network Site Definition

A network site is defined for CLLI Code purposes as any existing or proposed building structure, enclosure, (roofed and walled), or location where there is a need to uniquely identify one or more functional entities as described in Tables B, C, D, and E. For a building to qualify for a Network Site Code, it must be large enough to allow a person to enter and move around inside. This includes central office buildings (exchange carrier and interexchange carrier) buildings, business and commercial offices (customer buildings), microwave radio relay buildings and earth stations (the radio tower is adjacent to or attached to the building), garages, headquarters buildings, sheds and small buildings, phone centers, controlled environmental vaults (may be underground and contain repeaters, pair gain terminals, integrated digital loop carriers, and/or remote switches, and building complexes). A building complex is defined as two or more buildings interconnected by walkways or tunnels, or sharing a common wall.

A building also has many names and labels. There is the label for each technology located within the building, a name for each application of service provided by the technology located within the building, industry pseudonyms and landmark names. In some cases, there is a name and address for each entrance into a building.

Network support site locations (e.g., repeaters, poles, manholes, etc.) are not to be identified through use of a Network Site and/or Network Entity Code. However, a structure on which or in which a non-building type location is located may be assigned a Network Site Code if it is absolutely necessary to identify Network Entities within it. Network Entities do not include those “things” that can or should be identified with Network Support Site Codes.

Network Site Code Rules

- A Network Site Code has a unique address within a geographical area.
- Only one Network Site Code can be created at a specific address.
- A Network Site Code must have only one primary address which is recorded in address field 1 in CLONES.
- Network sites having multiple addresses requiring only one 8-character Network Site Code, must have all addresses (including vanity-type address and highway numbers) recorded in address fields 1-4 in CLONES, as required.
- A single building, under a single roof, with multiple addresses (suites, rooms, shops, floors, etc.) must have only one Network Site Code. Network Entity Codes will be used to identify each suite, shop, room, floor, etc., using the indicated field (FL/STE/RM) in CLONES.

Building Complex Definition

A building complex is defined as two or more buildings interconnected by walkways or tunnels, or sharing a common wall.

- A building complex must be identified with a single Network Site Code if it has one street address. Do not use suites, rooms, shops, or floors as part of the address.

  Guidelines. When a single Network Site Code for the building complex is used, all network entity designations within the complex must be unique. When the equipment and facilities in two (or more) buildings share a common frame, the equipment, facilities, and frame for all the building complex entities must be identified as being in only one of the buildings.

  Limitations. Certain Network Entity Codes have limited power, e.g., RS(n), RL(n), because a complex may have more than ten buildings. Complex coding requires equipment sharing and interconnection by tie or house cable.

- A building complex (universities, hospitals, military bases, or other government complexes) may contain many buildings, but if the complex has only one address, it will have only one Network Site Code (see following bullet item).
- A building complex may qualify for unique Network Site Codes for each building if each building also has a unique street address or identification. If there is a requirement to code more than one building in a complex having only one address, building numbers or names, e.g., 444 HOES LN (BLDG 1) must be entered into the address field using parenthesis to provide a unique address for that particular building.

Guidelines. When the equipment and facilities in each building are unique, or future additions indicate separate requirements, it is proper to code each building separately.

Limitations. Geopolitical Code power is limited to 776 buildings for each place. When a company elects to code each building in a building complex using a separate building code for each building in the complex, all network entities common to two (or more) of the buildings must be assigned to only one of the Network Site Codes. Note: that a building with multiple addresses is not a complex.

NOTE: CLLI coders should follow procedures in this document and the Methods and Procedures document for validating a place or address to prevent duplicate network site assignments.

Coding Guidelines for Unknown Addresses

CLLI Codes can be created for network site, network support site, or customer site locations when the address of the site to be coded is unknown, e.g., for new subdivisions or locations where no address data is available due to new construction. To create any of the above CLLI Code formats, the Geographical and Geopolitical Codes must be known and used. The address field in CLONES should contain the following wording:

2000-1 Planning. (Anticipated year effective and site number — one for each location required within a specific geographical area marked on plat or survey for tracking purposes.)

The optional data field in CLONES should contain some type of information about that site, e.g., subdivision name. If the above guidelines are followed, a CLONES report can be used to update CLLI code address data when information becomes available.

Temporary Structure

When telephone equipment (including a switching machine) and/or personnel are temporarily located in a mobile trailer (or any temporary structure), the trailer must be identified only when in service. The trailer may be identified and coded as a separate network site, or it may be included as part of an existing network site with which it is associated while in service. If this trailer includes a switching machine and requires a CLLI Code, the Network Entity Code should be developed in accordance with Network Entity Code assignment procedures in the following paragraphs.

Duplicate Network Site Codes

This paragraph refers to duplicate codes created after October 30, 1988. Incorrect codes created prior to the conversion to CLONES, that represent embedded records too expensive to convert, will be retired.

On occasion, a duplicate Network Site Code will be created at a location where a code already exists. When a duplicate code is found to exist, the code with the oldest create date, as indicated in CLONES, will be considered the correct code (provided that the code is of correct CLLI Code format). The correct CLLI Code format implies the following:

- The assigned Geographical and Geopolitical Codes must be correct based upon the address of the site to be coded.
- Addressing conventions must follow standard procedures as defined in the Methods and Procedures document.

The incorrect code must be marked for deletion or put in an inactive status by the record creator within sixty days after receipt of a formal notification from the record creator or (Telcordia) having the proper code.

Non-Bell System Customer Building Code - (Grandfathered)

The retired definition for this code is that the alpha character "X" in character position 7 denotes central office buildings owned by non-Bell System customer local exchange carriers that are located in their franchise area and interconnect with Bell System customer facilities. Any location that has been coded with an "X" in character position 7 must not be changed.

Geographical Code Assignment and Community Name Change

Always verify that a code for the network site does not exist before developing a new Network Site Code. A Network Site Code may have an address where the community name has changed. There are instances when a community boundary will change and street addresses formerly associated with one community are now encompassed in another community. CLLI Codes that have been created for an address will retain the original Geographical Code representing the first community name. The original place name, the current (new) community name and the effective date of the change will all be displayed in CLONES. An address search in CLONES will provide a list of Network Site Codes for the street address whether the code was created using the original or current community name. Only one Network Site Code can be created at a specific address.

8 Network Entity Format

The network entity format is a composite 11-character code comprised of four elements. The first three elements are for the geographical, geopolitical, and network site codes that occupy character positions 1 through 4, 5 and 6, and 7 and 8, respectively. The fourth element denotes the Network Entity Code that occupies character positions 9 through 11.

Network Entity Code

A Network Entity Code is a 3-character alphanumeric fixed-length field that occupies positions 9 through 11 of the CLLI Code network entity format. A Network Entity Code is unique within a building. A building may have many entities assigned.

Network Entity Code Application

The Network Entity Code format uniquely identifies certain entities within a network site location. The CLLI Network Support Site and Customer Site Code formats are used to identify other types of locations for telecommunications purposes, including end-user locations. A Network Entity Code can be used to describe functionality, groupings, equipment, circuits and/or facility terminations. Network Entity Codes may consist of any of the combinations of characters described in the following paragraphs:

Encoding Guidelines, Network Entity Codes

Assignment of a CLLI Code to identify network entities is based on the function of that entity at its assigned location. An entity may have many switching functions, and each function should be identified.

See Switch definition in the Glossary to define a switching platform historically described as a “core” switch, i.e., a switch used in an exchange area for the purpose of connection from a telephony subscriber to the public switched telephone network (PSTN). We have attempted to specifically identify an integrated system (one physical system) versus a modular system, where one or more specific switching functions are contained in two or more physical systems interconnected by open interfaces, for determination of a switch.

Network elements that have been referred to as switches by equipment vendors, that do not contain all the basic switching functions as described in the Glossary, should not be identified with a Network Switching Entity Code.

The following set of sample CLLI Code Network Switching Entity Codes have been developed to reflect the various functions and switching capabilities of a hypothetical central office configuration composed of the following functions and NXX codes:

- Foreign Exchange 922
- Tandem Switch

- Switching Entity 233
- Switching Entity 232

Sample Codes:

Functions and Switching Capabilities	Entity Code	CLLI Code
922, 233, 232 Combined to MG1 from Marker Group No. 1 (All Units Trunked Together Less Tandem)	MG1	CITYSTBDMG1
233, 232 Originating and Terminating Locations	MGA	CITYSTBDMGA
922 Foreign Exchange Switch	MGE	CITYSTBDMGE
Tandem-Originating and Terminating - Tandem Traffic Only	01T	CITYSTBD01T
233 and 232 Plus Tandem, Grouped (Originating and Terminating)	02T	CITYSTBD02T
Terminating to 233 Only	233	CITYSTBD233
Terminating to 232 Only	232	CITYSTBD232

Network Entity Code Development

Network Entity Codes are developed and maintained by Telcordia. The CLLI Code Technical Advisory Group (TAG) provides input to the decision-making process. A new Network Entity Code may be requested by submitting a LS2 form to the company CLLI Code coordinator for review by the TAG.

Network Entity Code Definition

A network entity is defined as any unique and functional category of the telecommunications classifications. The Network Entity Code, when appended to the geographical, geopolitical, and Network Site Code will provide a unique identification of its location for use in the telecommunications industry.

Typical examples of an entity would define a maintenance group functioning in a unique role, an interface point between an interexchange carrier and an exchange carrier, a specialized unit of equipment associated with a specific function, or the identification of a unit in a multi-unit environment. Within a specific location, multiple entities may exist to identify multiple customers, different types of equipment, administrative areas, etc. A CLLI Code record using Network Entity Codes can be used to define unique customer premises, facility terminations, and circuit terminations. For convenience, refer to *Job Aid JA-18* or Section 16 of this document for a general reference list of Network Entity Codes. Network entities are assigned to the following categories:

- Table B is used as a reference for network switching entities.
- Table C is used as a reference for network switchboard and desk entities.
- Table D is used as a reference for miscellaneous network switching entities.
- Table E is used as a reference for nonswitching network entities.

NOTE: Specific entity code restrictions e.g., x^1 in the entity code DS(x^1) are indicated in Section 4, Basic Notation Notes. Entity code restrictions are not indicated in Section 9 through 12.

Network Entity Code Considerations

Tables B, C, and D describe switch terminations for switch functionality, switch fabric, or switch type and/or equipment required for network support. Therefore, one Entity Code is required for switch type listed in Tables B, C, and D.

The network nonswitching entity terminations listed in Table E can be divided into two categories as follows:

Multiple Entities	Single Entities
A, F, H, M, and N (one code for each customer, person, group, etc.)	D, K, L, and Q (one code for each category/grouping, etc. Same as for Tables B to E)

The various entity classifications, as described in the following paragraphs, will uniquely identify a telecommunications location based upon their requirements.

9 Network Switching Entity Codes (Table B)

Network Switching Entities: End-Office

The switching system in an end office may vary. It may have only end-office function or provide multiple functions. It can be identified as a complete switching system, a multi-unit switching machine, or a single-unit switching machine. An end office may be a host office or a remote switching office. It is the office providing dial tone and is considered the first line of switching. A variety of end-office coding possibilities exists.

Network switching category examples for end-office Network Entity Codes according to technology and/or local needs are as follows:

Entity Type	Code
NXX Entity (ANC/COC code)	(n)(n)(n/a)
Step-by-Step (sender group)	SG(n/a)
Crossbar (marker group)	MG(n/a)
Electronic Analog (control group)	CG(n/a)
Multi-function Switch (digital control)	DC(x)
Electronic Digital (digital switch)	DS(x)
Overflow Code	D(x)S
Analog/Digital Remote (remote switch)	RS(n/a)
Overflow Code	R(n)(n)

NOTE: Please see Glossary, section 18 for network switching entity definitions.

Network Switching Entity Code Considerations

Use the identification categories for network switching entities and procedures discussed in the following paragraphs for end-office coding. Table B summarizes the various switching system Network Entity Codes that are allowable.

Complete Network Switching Entity Method

The complete Network Switching Entity Codes are identified by a numeric character in position 11 [SG(n), MG(n), CG(n), DS(x), RS(n)] for an end office. This code represents all associated NXXs that are served by that particular switching machine. Complete switching systems that indicate technology are identified by using this method. This method of uniquely identifying complete network switching entities for end offices is recommended because fewer code changes are required.

NOTE: The general rule has been to use the group number of the switch. See below.

End-Office Switch Type	CLLI Code
Step-by-Step (SXS) Central Office, Sender Group 1 (NXX units 223, 224)	ALSTNHLRSG1
No. 5 Crossbar (5XB), Marker Group 400 (NXX units 542, 543, 671)	NWRKNJ23MG4
Electronic Switching System (ESS™), Control Group 0 (NXX units 621-6, 867, 284, 463-4)	MILWWI13CG0
Digital Switching System (NXX units 223, 265, 424, 523, 727)	NWRKNJBRDS0
Remote Switch (NXX unit 555)	ATLNGADTRS0

Single Network Switching Entity Method

Electro-mechanical, analog, and digital switching systems may be identified by using their associated numeric 3-character all-number calling (ANC) or central office code (COC). The ANC/COC code is the part of the North American Numbering Plan (NANP) architecture referred to as the 3-digit office code of form NXX.

The application of Network Entity Code (n)(n)(n) identifies a specific service termination. This method of identifying a single switching Network Entity Code (n)(n)(n) is not preferred for several reasons. It does not identify the type of switch technology employed, and secondly when additional NXXs are added to the switching machine, new Network Entity Codes will be required to identify these multiple NXX combinations. The preferred codes should be the appropriate SG, MG, CG, DS, and RS Network Switching Entity Codes.

NOTE: The general rule has been to use the NXX code — sometimes referred to as COC (Central Office Code) of the switch; see examples below.

End-Office Switch Type	CLLI Code
Step-by-Step (SXS) Central Office, Sender Group 1 (NXX unit 223)	ALSTNHLR223

Multiple Network Switching Entity Method

This method of uniquely identifying multiple network switching entities for end offices is identified by a letter in character position 11. The multiple network switching entity codes [SG(a), MG(a), CG(a), RS(a)] for an end office identify various combinations or variations of complete switching systems used in the CLCI MSG Code . The Network Entity Code (n)(n)(a) may also be used, but it is not recommended because the generic switch classification is not identified.

Example 1. This example provides guidelines for coding host/remote switching systems used in the CLCI MSG Code. When an end office becomes a host office for a remote switch, the CLLI Code coordinator may select the first two

characters of the host office code and add a letter (observing the restrictions applied to character position 11) to identify the combination. The host and remote offices would retain their original codes. The NXX codes identify the units used in translations for trunk termination.

End-Office Combinations (Host & Remote)	CLLI Code
Before Host/Remote Implementation (analog) Switch NXX units 223, 265, 424, 523, and 727	NWRKNJBRCG0
After Host/Remote Implementation (analog) Switch NXX units 223, 265, 424, 523, 727, and 555	NWRKNJBRCGA
Remote Switch (NXX Unit 555 Host (NWRKNJBRCG0)	NWRKNJDTRS0

Example 2. This example provides guidelines for coding switching systems used in the CLCI MSG Code when there is a requirement to create a code to represent an end office where not all the NXX codes are required for trunking applications. Use the following guidelines:

End-Office Code Variation	CLLI Code
Electronic Switching System (ESS), Control Group 0 (NXX units 623, 624, 625, 626, 867, 284, 463, 464)	MILWWI13CG0
Electronic Switch System (ESS), Control Group 0 (NXX units 623, 624, 625, 626)	MILWWI13CGA
Electronic Switching System, (ESS) Control Group 0 (NXX units 463, 464)	MILWWI13CGE
Electronic Switching System, Control Group 0 (NXX units 876, 284)	MILWWI13CGF
Digital Switching System (NXX units 223, 265, 424, 523, 727)	NWRKNJBRDS0

Network Switching Entities: Tandem Office

These Network Entity Codes may be used to identify local tandems, toll tandems, or access tandem offices. A tandem office is defined as an intermediate switching office for interconnecting end offices and/or toll offices. Note that tandems (and combinations) always have a “T” in character position 11. The tandem office entity codes are as follows:

Individual Tandem - (n)(n)T

This Network Entity Code identifies a stand-alone tandem. It may be used to identify an interLATA or intraLATA tandem.

Tandem Combinations - C(n)T

This Network Entity Code is used to identify tandem combinations, multiple tandems, or multiple tandem trunking terminations, i.e., tandems with common trunking.

Switchboard and Tandem Combination - B(n)T

This Network Entity Code identifies an interLATA or intraLATA tandem multipled to an associated switchboard. This code may be used to identify the combination of a tandem at one location and a switchboard at another location. The place, state, and building code of the tandem should be used in character position 1 through 8 of the CLLI Code.

Other Tandem Combinations - (n)GT

This Network Entity Code is used to identify combinations of a tandem and end-offices and tandem with operator services. It indicates that operator service capabilities are associated with the tandem portion of the switch. Typical examples of vendor products are 5ESS with operator service position system (OSPS), DMS®100/200 and DMS200 with traffic operator position system (TOPS™), or operator concentrator (OC). The operator system may or may not be collocated.

Guidelines for above Tandem Codes:

- When there is dedicated trunking into or out of this tandem combination (n)GT, the tandem identification (n)(n)T must be used. When the code is intended to include only the end-office function, use the appropriate end-office Network Entity Code [e.g., CG(n), DS(x)].
- When the code is intended to include only the tandem-office function, use the Network Entity Code (n)(n)T.
- When the code is intended to include the end-office function and the local tandem-office function, use the Network Entity Code (n)GT.
- When the code is intended to include the end-office function and the toll tandem-office function, use the Network Entity Code (n)GT.
- When the code is intended to include the tandem-office function and its associated operator system, use the Network Entity Code (n)GT.

Electronic Tandem Private Network - ET(n)

This Network Entity Code supports private network tandem functions in either a partitioned or stand-alone operation. This code identifies a corporate network switching machine for official use.

Packet Tandem Switch - G(x)T

A packet switch that functions as a tandem switch in a voice-over-packet (VoP) network. A packet backbone network is comprised of one or more core packet tandem switches. The packet-tandem switch supports a voice-over-packet network and is similar to a PSTN tandem switch in that all connections are done on a trunk-to-trunk basis with no direct connections to an end user. This tandem functionality can support packet-to-packet or TDM-to-packet switching fabric. This code can be used when identifying tandem protocols such as packet, cell relay, multi-frequency trunks, ATM, IP, ethernet,frame relay, X-25, BICC, ISUP, PRI, DTMF, DP, etc.

Other Network Switching Entities

Multifunction Combination Network Entity Code - DC(x)

The multifunction Network Entity Code DC(x) identifies a digital switching system that has end office and tandem functions. The DC(x) code was principally developed for use by companies who use the TIRKS® system and may only have applications as a location code for other companies where a facility terminates in a multifunction type switch. The DC(x) code serves as a master location code in the TIRKS system for the local (single, complete, or multiple Network Entity Codes) and tandem Network Entity Codes used in the central office. The DC(x) Network Entity Code should be used to identify terminations of integrated carrier facilities in a multi-function switch. In a TIRKS system environment, this code will also be used to maintain equipment inventories for those switches and mountings used for digital carrier facility plug-ins. *The DC(x) Network Entity Code is not to be used to identify message or special service circuits; the Network Entity Code will be used for the required function of the switch as appropriate, e.g., DS(x), (n)(n)T, (n)GT.*

Example:

Multifunction Digital Switch	CLLI Code
Digital Switching System, e.g., 5ESS®, DMS100/200 (NXX units 223, 265, 424, 523, 727)	NWRKNJBRDC0
Digital Switching System (NXX units 223, 265, 424, 727)	NWRKNJBRDS0

Digital Packet Device - (n)(x)W

Packet switching is a transmission method by which data messages are broken down into segments called packets. Packet switches provide routing and switching, with network paths established only when data is actually being transmitted. The following examples identify types of packet devices identified by the (n)(x)W Network Entity Code:

- Packet Switch (PS)
- Packet-Switch Node (PSN)

- Access Concentrator (AC)
- Packet Assembler/Disassembler (PAD)
- Signal Transfer Point (STP)
- Signal Relay Point (SRP), e.g., a link concentrator or consolidator
- Gateway/Protocol Converter. This includes all protocol conversion devices in a packet network, or a gateway in a voice over packet (VoP) network that is not controlled by a virtual switch or a call agent. For gateway devices that are controlled solely by a virtual switch or call agent, please see the gateway Network Entity Codes listed in Table D.
- Datakit® for CO-LAN
- Frame Relay, Routers, and Switched Multimegabit Data Service (SMDS)
- Synchronous/Asynchronous Multiplexers (SAMs)
- Interworking Function (IWF). The IWF acts as a gateway between the wireless network and the wireline packet data network. The IWF allows users to access e-mail, the internet, send and receive fax messages, and obtain access through secure connections to corporate intranets.

ATM Switch - BB(x)

ATM Switch overflow - B(a)(n)

The Network Switching Entity Code BB(x) identifies an asynchronous transfer mode (ATM) switching system. An ATM switch will provide the transfer of fixed size 53 octet cells, capable of mixing a wide variety of traffic such as, voice, video, fax, and data. This transfer occurs using static or dynamic ATM connections, e.g., permanent virtual circuits (PVCs), switched virtual circuits (SVCs), permanent virtual paths (PVPs), or switched virtual paths (SVPs). An ATM switch provides network functions, such as multiplexing a number of ATM connections onto a single physical connection, manages congestion and flow control, quality of service (QoS), and provides the management of signaling, routing and connectivity for point-to-point and point-to-multipoint connections.

Call Agent/Mobile Switching Center Server (MSC Server) - CA(x)

The call agent virtual switch provides program control and call control software to manage distributed high performance network gateway equipment (hardware) using, but not limited to, simple gateway control protocol (SGCP). The call control agent provides the intelligence to control call features, billing messaging and the overall node-to-node signaling for both on-net (IP) and off-net (PSTN) calls. Key features of this architecture include: open, standardized protocols to deliver broadband services including video, fax, voice (including VoIP) and data traffic. Traffic may be transported by any physical layer technology.

Mobile Switching Center Server (MSC Server)/Gateway MSC Server - This Network Entity may be used to identify a MSC Server and/or a Gateway MSC Server. The MSC server/ Gateway MSC Server are also referred to as Media Gateway Controllers, Call Agents, or Softswitches.

MSC Server - In 3G wireless networks such as CDMA 2000 3x and 3GPP r4, the traditional MSC functionality is split into two logical functions, which is provided by physically separate network elements - the MSC Server and the media gateways (line/trunk gateways). The MSC Server provides the call control functions and mobility management for the media gateways connected to a base station. Under the control of the MSC Server, the media gateways provide the bearer switching functions.

Gateway MSC Server - Controls media gateways that connect to other networks such as the PSTN.

For a pictorial representation please refer to supporting diagrams found in Section 16, Fgures 16-29 and 16-30.

Optical Switch - OS(x)

Photonic switch/optical switch is an all optical, fiber-optic switching device that operates at the granularity of a light wavelength (lambda) from the input to output connection with no electrical regeneration, interrogation or manipulation. The switch enables signals within the optical fibers to be selectively switched from one path to another within sub-millisecond or nanosecond performance levels. A photonic switch performs, but is not limited to the following functions at strictly an optical level: performance monitoring and management; restoration, re-routing and grooming enabled by inter-switch signaling protocols; wavelength translation; the establishment of end-to-end light paths. Photonic switches support both all formats and transmission speeds, since they are simply forwarding light, rather than processing bytes, required for electronic signals. Physical interfaces include support for all STS-N levels and up as well as gigabit ethernet. Examples of photonic switching protocols include multi-protocol label switching (MPLS), multi-protocol lambda switching (MPLS) and wavelength routing protocol (WaRP).

Packet End-Office - PS(x)

This Entity Code identifies multiple gateways that together function as an end-office switch in a voice-over-packet (VoP) network. It supports a VoP network that is comprised of both line/access and trunk gateway(s), and is associated with a call agent that provides the necessary call control functions.

Functionality is similar to a PSTN end-office switch in that all connections are done on a line-to-line, line-to-trunk, and trunk-to-line trunk-to-trunk basis. The gateway functionality can support packet-to-packet or TDM-to-packet switching fabric.

For additional information, please see Section 15 "Coding Guidelines for Voice Over Packet Gateways" and Section 16 "CLLI Code Set Exhibits/Figures."

Remote Packet-End-Office - RP(x)

The remote packet end office supports a voice-over-packet (VoP) network, and contains a line/access gateway(s) that is associated with a call agent (CA) which provides the necessary call control functions. It is similar to a PSTN remote end-office switch in that all connections are done on a line-to-line basis. This switching functionality can support packet-to-packet or TDM-to-packet switching fabric. A packet end office PS(x), or digital end office DS(x) can provide the remote packet end-office trunking services.

For additional information, please see Section 15 "Coding Guidelines for Voice Over Packet Gateways" and Section 16 "CLLI Code Set Exhibits/Figures."

Video Analog/Digital Switch - VS(n)

This Network Entity Code is used to identify an analog- or digital-video switch. Analog switches may switch a baseband or bandpass signal and remodulate an RF (radio frequency) signal. Digital switches will switch between ports of like bit rates, or variable bit rates with ATMs (asynchronous transfer mode).

- Television operations center (TOC) — video matrix
- Digitally controlled video switches
- Interactive video switching systems for conferencing, teaching, broadcasting, and surveillance

Wireless/Mobile Switch - CM(x)

A wireless/mobile switch manages the setup and teardown of calls to and from a wireless subscriber. Examples include

- Mobile switching center (MSC)/mobile telephone switching office (MTSO)
- Paging control terminal e.g., bellboy
- Radio common carrier terminal (RCC)

A wireless service provider (WSP) offers interconnection with the public switched telephone network (PSTN) for mobile telephone subscribers. Wireless service providers can establish connections to end offices and to other carriers connected through various interfaces, e.g., Type 1, Type 2A, and Type 2B.

Special Switching Applications

Special switching equipment is usually associated with services for a private network.

Common Control Switching Arrangements - Z(a)Z

This code is used to identify a common control switching arrangement (CCSA) and an enhanced private switched communications service (EPSCS), or signaling system 6 (SS6).

Teletypewriter Switching Systems - X(x)X (Retired)

This code was originally used to identify a teletypewriter switching system (TWX) used in the message network and/or having CCSA switching functions. *This code now serves as an overflow code for the (x)MD entity code.*

Access Circuit Termination in a LEC Centrex by an IC - (n)(n)C

This code is used to identify the interconnection of a customer through the local exchange carrier (LEC) provided central office (CO) Centrex by an interexchange carrier (IC).

10 Network Switchboard and Desk Entity Codes (Table C)

Network Switchboard and Desk Building Entity Codes are uniquely identified by the character “B” in position 11 of the CLLI Code format. Many of these specialized switching systems are associated with business customer services. If local requirements dictate that a PBX location must be identified with a Network Entity Code, this format may be used even if the PBX is located on customer premises. For large PBXs that may be serving the same function of a central office, or if the switching equipment is not located on the customer premises, then it’s advisable to code the PBX with its NXX number. A set of prescribed 3-character switchboard and desk building entity codes which may be assigned to character positions 9 through 11 are as follows:

(n)BB	Combined Toll, DSA, and CAMA Board
(n)DB	Dial Service Assistance (DSA) Board, e.g., #13C board
(n)IB	Directory Assistance (Information) and Completion Board, e.g., #23 board
(n)JB	Traffic Operator Position System (TOPS), Operator Service Position System (OSPS), or Operator Concentrator Board /Administrative Group
(n)MB	Manual Board
(n)PB	Telephone Company Private Branch Exchange (PBX) Board, e.g., #608A board, dimension
(n)QB	Combined Directory Assistance, Intercept, and Completion Board, e.g., #23 board
(n)UB	Universal Traffic Service Position (TSP) Board
(n)ZB	Auxiliary Board or other Switchboard and Desk Entities
(n)(n)B	Teleconference Board (special switching arrangement involving boards - Teleconference Network Services Complex

11 Miscellaneous Network Switching Entity Codes (Table D)

Miscellaneous Network Switching Entity Codes are described, generally, as the variety of mechanisms or systems that serve as the network terminating interface (NTI) or end-point for the switching network. The NTI is the point of demarcation within a customer-designated premises at which the service provider's responsibility for the provision of service ends. The end-point terminations include announcement or other miscellaneous terminations.

A set of prescribed 3-character miscellaneous Network Switching Entity Codes which may be assigned to character positions 9 through 11 are as follows:

Alphabetic Groupings of Miscellaneous Network Switching Entities

Announcement Machine - (x)AD

Announcement Machine Overflow - (x)BD

Examples of announcement machines include:

- Voice or Message Storage Systems
- Interactive Voice Systems
- Public Announcements
- Mass Calling Announcements
- Audio Response Systems
- Time and Weather
- Short Message Service Center (SMSC). The SMSC supports the storing and forwarding of short messages to and from mobile stations in a wireless network.
- Multimedia Messaging Service Center (MMSC). The MMSC provides a store and forward facility for multimedia messages such as images, audio, video, and text, sent across a mobile network. The MMSC may also provide a formatting role to enable messages to be optimized to the receiving handsets capability.

When identifying announcement systems, e.g., #7A, the announcement portion of the system should be coded (n)AD. When (n)AD exhausts at a location, the overflow code (a)AD may be used.

See Distributors for coding the distribution portion of an announcement system.

Central Office Centrex - (x)XD

Centrex is a hardware/software service whereby the switching and control functions are centralized (central exchange) in a part of the central office itself. This entity code does not identify a centrex customer, it identifies the functionality of the switch. The service originates in a central office rather than on-site like a PBX. Centrex allows the customer a large number of features and services that interface

with the customer premises equipment for voice and data applications, as well as LAN and ISDN features. Centrex permits station-to-station dialing, and allows direct inward dialing and station identification on outgoing calls.

Combined Operator, Trouble, and Machine Intercept - (n)ND

This code will identify a #6A desk.

Distributors

The following distributors are the main feed points for the various announcement systems. See Announcement Machine for coding the announcement portion of time, weather, and certain automatic distributors.

- **Time - (n)TD**
- **Weather - (n)WD**
- **Automatic - (n)CD**. Automatic call distributors (ACDs) are used to automatically switch large volumes of incoming calls through attendant (answering personnel) positions. ACDs are commonly used Telephone Company and commercial applications, such as airline reservations bureaus.
- **Other - (n)DD**. This category would include a sports results board.

Emergency (911 Service) - (n)ED

This code identifies the central office equipment required for E911.

Gateways

- **Line/Access Gateway - G(n)(x)**

  The line/access gateway provides an interface between PSTN line service devices and the voice over packet (VoP) core network. The line/access gateway is associated with a specific call agent.

  An line/access gateway supports the line side interface to the VoP network. Traditional phones and PBXs currently used for the PSTN can access the VoP network through this functional element. As such this functional element provides functions such as packetization, echo control, etc. It is associated with a specific call agent that provides the necessary call control instructions. On receiving the appropriate commands from the call agent, the line/access gateway also provides functions such as audible ringing, power ringing, miscellaneous tones, etc. It is assumed that the line/access gateway has the functionality to set up a transport connection through the core network when instructed by the call agent.

  The circuit-based physical interfaces supported by the line/access gateway include:

— Voice-grade analog lines (baseband voice frequency access)

— ISDN digital subscriber lines (basic rate ISDN (BRI))

— GR-303 integrated digital loop carrier (IDLC)

— Non-ISDN PBX trunk groups

— ISDN primary rate interface (PRI) Trunks.

For additional information, please see Section 15 "Coding Guidelines for Voice Over Packet Gateways" and Section 16 "CLLI Code Set Exhibits/Figures."

- **Trunk Gateway - GT(x)**
  Trunk Gateway Overflow- GR(x)

  A trunk gateway provides an interface between the PSTN digital trunk facility and the VoP core network. Each trunk gateway is associated with a specific call agent.

  A trunk gateway supports a trunk side interface to the PSTN. The trunk gateway terminates circuit-switched trunks in the PSTN and virtual circuits in the packet network (the core network) and, as such, provides functions such as packetization. Even though a trunk gateway terminates trunks in the PSTN, it does not provide the resource management functions for trunks that it terminates. However, the trunk gateway has the capability to set up and manage transport connections through the core network when instructed by the call agent CA(x). It is associated with a specific CA(x) that provides it with the necessary call control instructions.

  For additional information, please see Section 15 "Coding Guidelines for Voice Over Packet Gateways" and Section 16 "CLLI Code Set Exhibits/Figures".

- **Signaling Gateway - GS(n)**

  A signaling gateway provides signaling interconnection between the PSTN SS7 network and the voice-over-packet (VoP) network. Each signaling gateway is associated with a specific call agent.

  A signaling gateway interconnects the VoP network to the PSTN signaling network. It is responsible for receiving SS7 messages over a set of links from a signaling transfer point (STP) and encapsulating the information for delivery to the call agent. The signaling gateway is also responsible for receiving encapsulated information from the call agent and transferring the message to the interconnecting SS7 node. In this capacity, the signaling gateway is essentially performing an interworking function between the packet network interface protocols used in the (VoP) network and the PSTN interface protocols.

  For additional information, please see Section 15, "Coding Guidelines for Voice Over Packet Gateways" and Section 16 "CLLI Code Set Exhibits/Figures."

Intercept - (n)ID

This co

de is used to identify an automatic intercept system or a file access system (FAS).

LTE Mobility Management Entity (MME) - LT(x)

The MME is the control and signaling node for the Long Term Evolution (LTE) access network and the LTE Evolved Packet System (EPS). Its responsibilities include: managing and storing user equipment (UE) contexts, generating temporary identifiers to the UE, distributing paging messages to the eNBs, security control, EPS bearer control, lawful interception and S-GW and P-GW selection. The MME also provides control plane function for mobility between LTE and 2G/3G access networks.

Message Trunk Interface - (x)MD

Message Trunk Interface Overflow Codes - X(x)X, X(x)Y, X(x)Z, and (n)(n)Z, and Y(x)X

This network termination interface Entity Code is used to identify an authorized trunk-side switched service point of interface (POI) in conjunction with telecommunication services. This code represents the theoretical location where a customer gains access to a provider's network. It is associated with coding of message trunks carrying voice grade traffic.

- *Non-dial tone customers - e.g., IXC:*
  Customers of switched trunk services that do not require an NPA NXX assignment are referred to as non-dial tone customers. They usually connect to a provider via inter tandem switching to provide long distance services. It is recommended that one message trunk interface code be assigned to each non-dial tone customer at a particular Network Site Code location.
- *Dial tone customers - e.g., CLEC:*
  Customers of switched trunk services that require an NPA NXX assignment are referred to as dial tone customers. They may connect to a provider via a tandem switch or with direct trunks to provide local services. It is recommended that a message trunk interface code be assigned to each dial tone customer switch that is deriving access from the provider.

  In the United States, when a point of interface is in one LATA and the switch is in a different LATA, a unique (x)MD is required.

  In Canada, there is a need to distinguish each point of interface, per customer, per switch, per rate center.
- *Customers of both non-dial tone and dial tone services:*
  For a customer that offers both types of services, the assignment of the message trunk interface code for non-dial tone and dial tone services can be done separately. It is recommended that the dial tone customer not use the message trunk interface that is assigned to the non-dial tone customer, even if they are in the same location. The non-dial tone and dial tone service customers should be treated as two separate customers.

  Please see Sections 15 and 16 for POI code reference guidelines and diagrams.

Position Link Frame - (n)PD

This code is used to identify a position link frame for an operator terminal or desk associated with a traffic service position.

Rate and Quote System - (n)QD

TSPS Common Control Unit - (x)UD

This code is used to identify a TSPS control unit and its associated remote trunking arrangement (RTA) or tandem connection.

Wireless Packet Data Node - PN(x)

This Network Entity Code can be used to identify equipment found within the packet core network in a wireless network. It supports various wireless architectures such as CDMA2000, GSM, GPRS, EDGE, and WCDMA, HSDPA/HSUPA, LTE, WiMAX.

In a GSM/GPRS, GSM/EDGE, or WCDMA system this Network Entity Code can be used to identify the following equipment:

- *Serving GPRS Support Node (SGSN)*. The SGSN performs mobility management, security, and session management functions.
- *Gateway GPRS Support Node (GGSN)*. The GGSN is the point of interface with external packet data networks such as the internet.

In a CDMA2000 system, this Network Entity Code can be used to identify the following equipment:

- *Packet Data Serving Node (PDSN)*. Some of the functions of the PDSN include: establishes and maintains point-to-point protocol (PPP) sessions with the subscriber; supports simple and mobile IP packet services; initiates authentication, authorization, and accounting (AAA) for the mobile station client to the AAA server; and routes packets to and from the external packet data networks.
- *Home Agent (HA)*. The HA maintains current location information of a subscriber as he or she moves through the network ensuring that the packets are forwarded to the mobile handset.

In a LTE system, this Network Entity Code can be used to identify the following equipment functions:

- *Serving Gateway (S-GW)*. The S-GW routes and forwards user data packets and is responsible for anchoring the user plane for inter-eNB handover and inter-3GPP mobility. The SG-W interfaces with outside 2G/3G systems; for instance, the S-GW of a LTE network interfaces with a UMTS system through the UMTS SGSN.
- *PDN Gateway (P-GW)*. The P-GW functions as a default router to the User Equipment. It is also responsible for anchoring the user plane for mobility between 3GPP and non-3GPP access systems such as WiMAX systems. It

interfaces to trusted non-3GPP IP access systems and the internet. This device also provides support for charging, lawful interception, packet filtering, and packet screening, and policy enforcement.

- *Evolved Packet Data Gateway PDG (ePDG)*. The evolved PDG is responsible for providing basic security functions for connectivity to untrusted non-3GPP IP access systems.

12 Nonswitching Network Entity Codes (Table E)

Nonswitching Network Entity Description

Nonswitching network entities are defined as individual groupings of equipment, job functions, groups, or service centers that are directly related to the interconnection and transmission of messages and/or data between or at switching entity locations. When we use the term *Nonswitching Entity*, we are referring to an individual grouping of equipment performing the function, not individual pieces of equipment or property. For example, a frame is a single entity, even though there may be several bays of equipment. Nonswitching network entities are uniquely identified by suffixing an appropriate entity code to the CLLI Code building (network site) code describing their physical location and are categorized as follows:

- Administrative Group - A(x)(x)
- International Access Point - B(n)G
- Session Border Controller/Border Element - BS(n)
- Base Station Controller (BSC)/Radio Network Controller (RNC) - CR(x)
- Concentrator - CT(x)
- Processor/Server Grouping - D(n)n)
- Distribution Node - DN(n)
- Frames - F(x)(x)
- Miscellaneous Nonswitching Entity - H(x)(x)
  Miscellaneous Nonswitching Entity Overflow - I(n)(x) I(a)(x)
- Software Cross-Connectable Devices - K(x)(x)
- Pair Gain Central Office Terminals - L(n)(n)
  Pair Gain Central Office Overflow - LZ(x)
- Personnel Support Centers - Ordering, Administration, Maintenance and Provisioning (OAM&P) - M(x)(x)
- Customer Premises Equipment - N(x)(x)
  Customer Premises Equipment Overflow - CP(x)
- Passive Optical Network (PON) Optical Line Terminal (OLT) - OL(x^1)
- Miscellaneous Optical Equipment - O(n)(x)
- Wireless Access Point - PW(x)
- Base Transceiver Station/Radio Equipment - Q(n)(n)
- Remote Line Entity - RL(n) and RL(a)
- Repeaters/Regenerators - RG(x)
- Facility/Circuit Point Of Interface (POI) - W(x)(x)
- Facility/Circuit of Interface (POI) at an Outside Plant Location - J (x) (x).

Nonswitching Network Entity Format

Nonswitching network entities are uniquely identified by suffixing an appropriate Network Entity Code to the Network Site Code describing their physical location.

Nonswitching Network Entity Code

This entity code element occupies character positions 9, 10, and 11 of the Network Site Code. These codes should be assigned in accordance with the following categories:

Administrative Groups - A(x)(x)

This Network Entity Code identifies the location of administrative personnel within a network site location that primarily perform administrative functions, not (directly) associated with network support. Examples: mailroom, desktop support, motor pool, stock and tool rooms.

Example:

Description	CLLI Code
Network Administration Center	NWRKNJ23AU2

International Access Point - B(n)G

An international access point is a location that acts as a gateway between countries.

Session Border Controller/Border Element - BS(n)

Session Border controllers act as a demarcation point between two VoIP service providers, allowing them to manage signaling and control routing for VoIP traffic. SBCs allow for secure peering between VoIP networks at a high level of QoS.

For network-to-network interfacing, the following functions may be performed by a Session Border Controller/Border Control Element:

- Voice Firewall - firewalling of voice signaling and bearer traffic (voice traffic only and is not a substitute for a traditional data firewall)
- Network Address Translation and Network Address Port Translation (NAT/ NAPT) - allows the carrier deploying the border controller to hide its IP address space and topology from the other carrier.
- Signaling Interworking - interworks different VoIP signaling protocols. Helps interworking of VoIP equipment form different vendors.
- Message Scrubbing - ensures that privacy related user identity is not inadvertently passed across the interface.
- Bandwidth Management QoS Management - Manages a constant bandwidth per call intelligently tracks the bandwidth for a new call.

- QoS Enforcement - Forces Level agreements between administrative domains.
- Quality Monitoring - monitors voice quality e.g., delay, jitter, etc.
- Call Detail Records - helps carrier track call activity
- Lawful Intercept - May be a "tapping point" for lawful intercept functions.

Base Station Controller (BSC)/Radio Network Controller (RNC) - CR(x)

This Network Entity Code can be used to identify a base station controller (BSC) within the radio access network in a wireless network. The BSC maintains radio links from the handset to the core network. The BSC controls a set of cells and their associated base stations. It manages the handoff of calls from one base station to another as subscribers move from cell to cell. It can be located at or adjacent to buildings, towers, or other structures.

This Network Entity Code can be used to identify a Radio Network Controller (RNC) in a Wideband Code-Division Multiple Access (WCDMA)/ Universal Mobile Telecommunications System (UMTS) wireless network. The RNC controls the base station (node b). The RNC is functionally equivalent to a BSC. One exception is that multiple RNCs can interface with each other, where traditional BSCs typically do not.

Concentrator - CT(x)

This code identifies all types of concentrators, e.g., an intercept concentrator. It is also used to identify the data station selector/controller (DSS/DSC). Do not code an access concentrator (see digital packet device coding) using this Network Entity Code.

Processor/Server Grouping - D(n)(n)

This Network Entity Code identifies the location of groupings of physical hardware and data processors/servers, examples include:

- Processing equipment associated with ordering, administration, maintenance, and provisioning (OAM&P) - *for OAM&P personnel locations see Entity Code M(x)(x)*.
- Performance monitoring equipment
- Firewall equipment
- Service control point (SCP). The SCP is the AIN (advanced intelligent network) database that contains service-specific data that allows service providers and their customers to customize services, facilitate call processing, call routing, and network management, allowing carriers to change the routing of both inbound and outbound calls from moment to moment. There are countless AIN services. Some of these services include
  - — Three-digit services (800, 900, xxx, etc.)

— Local number portability (LNP)

— Line information data base (LIDB)

— Collect call timing device (CCTD)

— Alternate billing service

— Disaster recovery service, do not disturb service - calls are routed to alternate locations

— Other basic routing services (routing by day of week, time-of-day selective routing, work-at-home, etc.)

— Calling card verification

— Coin-to-collect verification

- Wireless network processing equipment. This Network Entity Code can be used to identify the location of physical hardware and systems that are associated with network management and subscriber information and services. Examples include:

  — Home location register (HLR). The HLR is the database repository for subscriber information, such as subscriber profile, location, activity, and supplementary subscriber services.

  — Authentication, authorization, and accounting (AAA) server. The AAA communicates with the packet data service node (PDSN) in the packet network to perform mobile client authentication associated with point-to-point protocol (PPP) and mobile IP connections, authorization of a mobile client, and accounting.

  — Authentication center (AuC). The AuC is a server in a wireless network that contains subscriber-specific authentication data.

  — Equipment identity register (EIR). In a GSM network, the EIR verifies that a particular handset or model is acceptable. It also restricts access to handsets known to be stolen.

  — Mobile positioning center (MPC) server. The MPC selects a position determining entity (PDE) to determine the position of a mobile station. The MPC may restrict access to position information (e.g., require that the mobile subscriber be engaged in an emergency call or only release position information to authorized network entities).

  — Position Determination Entity (PDE) - A network entity which calculates and manages the position or geographic location determination of a mobile subscriber for location based services, e.g., wireless E911 services. For wireless E911 services, the location data is forwarded to the requesting mobile positioning center (MPC) and ultimately routed to the associated public safety answering point (PSAP).

Distribution Node - DN(n)

This entity code is used to identify an analog cable TV distribution center usually located in a central office. This distribution node (DN) receives baseband signals from one or more head end locations. The distribution node converts the baseband signal to a specific radio frequency channel. This radio frequency channel is then converted to an optical signal which is transmitted over the fiber to the local node (LN). The distribution node may have interactive capabilities for video-on-demand.

Frames - F(x)(x)

This entity code is used to identify all hardwired distributing and cross-connect frames in central offices, customer premises, or remote switching and terminal locations that use centralized assignment computer systems for equipment and facilities. This includes frames such as main distributing, carrier line distributing, intermediate distributing, toll distributing, local or line distributing, wall distributing, protector, high frequency cabinets, loop test frame (LMOS-loop maintenance operation system), fiber distribution panel, digital signal cross-connect (DSX-0, DSX-1, etc.) frame locations. For example, each line-up of a COSMIC frame is considered a separate frame. In those cases where the transmit and receive frame terminations of analog and digital facilities are separated, a transmit frame and its receive counterpart are considered to be one frame even though they may be located in different line-ups. The general guidelines for DSX Bay or T-CXR repeater bays and COSMIC frames are illustrated as follows:

- If the bays are adjacent to each other and arranged for inter-bay jumper, only one F(x)(x) code is required.
- Individual F(x)(x) codes are required for all stand-alone bays, except transmit and receive bays that are separated in the same way vicinity.
- If a location has DSX-bays, a F(x)(x) code is not required for the T-CXR repeater bays because the DSX-bay acts as the cross-connect point. In locations where all the T-CXR systems do not terminate in the DSX-bay, a F(x)(x) code must be added for the T-CXR Repeater bay that is wired directly to the channel bank.
- Each line-up of a COSMIC distributing frame requires a separate F(x)(x) code.

Miscellaneous Nonswitching Network Entity - H(x)(x)

Miscellaneous Nonswitching Entity Overflow - I(n)(x), I(a)(x)

The Miscellaneous Nonswitching Entity Code has several different uses. It is used to identify the end-point of an end user (customer location) facility, e.g., hi cap, when it is necessary to inventory equipment at that location. At an end user location, this code will identify the network side of the network interface device (NID).

The H(x)(x) identifies a miscellaneous functional category that cannot be identified by any other non-switching entity.

This entity code is used at a central office to identify a collocation arrangement with specific customers. When used by an ILEC that has specific regulatory reporting requirements for collocation, the H(x)(x) may represent both the facility point of

interface (POI) as well as the collocation arrangement. Telecommunication carriers who do not have a regulatory requirement to identify collocation should not use the H(x)(x) code to identify a point of interface. Instead, the W(x)(x) entity code should be used to identify the facility (POI).

This entity code will also be used to identify locations that may contain the following type of terminations for circuits, facilities, or equipment at a given location:

- Network channel terminating equipment (NCTE)
- Channel banks, asynchronous multiplexer equipment, light terminating equipment (LTE), and other types of transmission equipment, Cell Site equipment
- "U" point in an ISDN application.

On January 28, 2002, Network Entity Code O(n)(x) was approved to identify Miscellaneous Optical Equipment locations. After an implementation date of April 1, 2002, H(x)(x) will no longer be used to identify new instances of miscellaneous optical equipment. Please see Network Entity Code O(n)(x).

Please see Sections 15 and 16 for POI code reference guidelines and diagrams.

Facility/Circuit Point of Interface (POI) at an Outside Plant Location - J(x)(x)

This Network Entity Code is used to identify a facility/circuit point of interface at an outside plant location in conjunction with telecommunications services. The J(x)(x) code is not used to identify a point of interface at a central office or a point of presence (POP). One J(x)(x) code will be assigned to each customer at an outside plant location. The J(x)(x) code will then be used by all providers to identify facility/circuit terminations for this customer.

The J(x)(x) code is not used to identify the facility/circuit termination to an end user.

Please see Sections 15 and 16 for POI code reference guidelines and diagrams.

Software Cross-Connectable Entities - K(x)(x)

This nonswitching entity code is used to identify software cross-connectable devices, such as digital cross-connect systems (DCS) that connect the digital carrier channels (DS0 level) at the bit rate, and at the higher DS1-DS3 rate for wideband and broadband applications. The DCS are administered by the telecommunications carrier network design and operations systems to serve the same purpose as a cross connection on a wire type cross-connect frame. DCS allows calls to be routed without having to be demultiplexed. The digital line terminating units associated with DCS, or statistical MUX are identified by the code K(x)(x).

A time slot arrangement (TSA-SLC2000) is used to identify software cross-connectable shelves in network elements other than DCS units.

NOTE: Network Entity Code K(x)(x) should be used to identify both electrical and optical DCS equipment.

Pair Gain Central Office Terminals - L(n)(n)

Pair Gain Central Office Terminals Overflow - LZ(x)

This nonswitching entity code may be used to identify stand-alone pair gain central office terminals (COT) at central office and building terminal locations that terminate on a mainframe.

An IDLC terminates in the switch via an integrated digital trunk (IDT) and on the far end RT, terminates in a remote digital trunk (RDT). (IDLC is coded RL(n) on the far end.) An RT has been traditionally coded as an U(n)(n)(n)(n).

NOTE: Network Entity Codes LZ(x) is used as the overflow code for code L(n)(n) to provide more code power.

Personnel Support Centers - OAM&P (Ordering, Administration, Maintenance and Provisioning) - M(x)(x)

This Network Entity Code identifies the location of the network personnel within a network site location that supports ordering, administration, maintenance and provisioning (OAM&P) functions of the network. Examples: network operations center (NOC), test centers, installation/repair centers, circuit provisioning centers. The E(x)(x), P(x)(x), S(x)(x) and T(x)(x) codes should no longer be used and have been placed in "**Appendix B - Retired CLLI™ Codes**."

REMINDER: The character "G" is not permitted in position 10; the combination "MG" in positions 9 and 10 identifies crossbar (marker groups).

Customer Premises Equipment - N(x)(x)

Customer Premises Equipment Overflow - CP(x)

This entity code may be used as a switching (e.g., to identify a PBX), or a nonswitching code. This code may be used to identify a unique entity that makes up part of a customer network. The actual equipment can be customer owned and/or leased from a vendor. This code is used on the customer side of the Network Interface (NI), and this code identifies equipment on the customer premises such as PBX, concentrators, centrex CU, channel banks, switch modules, DSX, data circuit, and facility termination equipment, or any combination thereof. Assignments to this Entity Code include LANS and nodal services located on customer premises. In ISDN this point is an NT1 point.

Passive Optical Network (PON) Optical Line Terminal (OLT) - OL(x)

Optical line terminal (OLT) is the unit that provides the electrical to optical conversion and supervisory functions for the transport between the user network interface (UNI) to the customer, and the service node interface (SNI) to the core network. In a PON network, an OLT is connected to one or more optical distribution networks (ODN). The optical distribution network spans from the OLT to the optical network unit (ONU) or the optical network terminal (ONT), which provides traditional interfaces to the customer. For example, the OLT can physically connect an ATM core network to the optical distribution network using ATM based PON or APON.

The OLT is typically located at a central office; however, it may also be located at an outside plant location.

For additional specifications reference *ITU-T Recommendation G.983.1*.

Miscellaneous Optical Equipment - O(n)(x)

This miscellaneous nonswitching Entity Code is used to identify locations for optical facility termination equipment such as SONET/SDH terminal and add drop multiplexers (ADM), Optical based DSLAM equipment such as Internet Protocol Digital Subscriber Line Access Multiplexer (IPDSLAM), and dense wave division multiplexing/coarse wave division multiplexing (DWDM/CWDM) equipment. This Entity Code should not be used to identify optical DCS equipment.

This code was approved on January 28, 2002. After an implementation date of April 1, 2002, all new instances of miscellaneous optical equipment should be coded under O(n)(x) instead of H(x)(x), which was previously used to identify miscellaneous optical equipment.

NOTE: To identify a facility point of interface at a SONET node, please refer to Network Entity Code (W)(x)(x).

Wireless Access Point - PW(x)

Wireless LAN (WLAN)/hotspot - This Entity Code may be used to identify Wireless LAN/Hotspot access point locations e.g., WiFi™.

A Wireless LAN/hotspot may be located at a retail location, airport, hotel, and other enterprise type locations. Wireless LAN utilizes unlicensed radio bands to allow end users to connect to a wireless or a wired LAN. It is defined by IEEE 802.11x standards.

Femtocell Access-Point Base Station - This Entity Code may be used to identify a femtocell base station at an enterprise customer location where other complex network functions exist. Femtocells are fully featured but very low power mobile phone base-stations, typically designed for use in residential or small business environments. A femtocell allows service providers to extend service coverage indoors, especially where access would otherwise be limited or unavailable.

Wi-Fi is a trademark of the Wi-Fi Alliance for certified products based on the IEEE 802.11 standards.

Base Transceiver Station/Radio Equipment - Q(n)(n)

This code can be used to identify the location of base transceiver station (BTS), node b, and e-node b equipment associated with the radio access network (RAN) of a wireless network. The wireless systems that utilize such base station equipment includes but is not limited to WCDMA/UMTS, GSM, CDMA, WiMAX™, HSDPA/HSUPA, LTE, etc.).

The RAN contains equipment that provides radio transmission and reception to/from the handset/user equipment over the radio interface. This RAN equipment may be dependent on a base station controller (BSC) or a radio network controller (RNC). This base station equipment may be located at buildings, towers, or other structures. The location of this equipment is commonly referred to as a cell site, base station, UTRAN, or e-UTRAN.

This Network Entity Code can be used to identify the location of radio and microwave equipment such as towers, antennas, microwave radio-relay repeater stations, mobile and coastal radio, earth stations, and other radio application sites. To identify remote stand-alone base station and radio locations, please refer to the Network Support Site Code Q(n)(x)(x)(x).

Repeater/Regenerator - RG(x)

The RG(x) nonswitching entity is used to identify a repeater or regenerator located at a network site.

A repeater is an opto/electronic device inserted at intervals along a circuit to boost/amplify an analog signal being transmitted. In optical fiber transport systems, an optical repeater is used in approximately the same way to amplify an analog optical signal, which has been attenuated by traveling along a fiber optical cable.

A regenerator is a receiver and transmitter combination used to reconstruct an original digital signal that consists of positive and negative pulses. Only digital signals can be regenerated. In an optical regenerator, the receiver converts incoming optical pulses to electrical pulses, decides whether the pulses are ones or zeros, generates “cleaned up” electrical pulses, and then converts them to squared off pulses for transmission.

See the Glossary definition for repeater/regenerator for further information.

Remote Line Entity - RL(n) and RL(a)

This is a remote line terminal (e.g., pair gain) that supports end office to customer functionality. This remote line terminal has no trunking capabilities or stand-alone features. This entity code supports both integrated and stand-alone digital loop carrier systems. The remote line terminal provides an extension of line-side functionality from a host office or distant wire center. For integrated digital loop carriers, the host office may be an analog or digital end office, or a remote switch. Entity code RL(a) supports coding of multiple remote line configurations, e.g., more than one remote termination in a building that may support POTS, ISDN, xDSL and other similar technologies.

Example:

Remote Line	CLLI Code
Off Premises Module (OPM)	NWRKNJ23RL0
Multiple Pair Gain Systems	NWRKNJ11RLA

Facility/Circuit Point of Interface (POI) - W(x)(x)

This Network Entity Code is used to identify a facility/circuit point of interface (POI) in conjunction with telecommunications services. The W(x)(x) code is used to identify the point of interface at an access POP or CO if the H(x)(x) is not used for regulatory reporting requirements.

It is recommended that one W(x)(x) code be assigned to each customer at a Network Site Code location. The W(x)(x) code will then be used by all providers to identify facility/circuit terminations for this customer.

The W(x)(x) code is not used to identify a point of interface at an outside plant location. The W(x)(x) code is not used to identify the facility/circuit termination to an end user.

Please see Sections 15 and 16 for POI code reference guidelines and diagrams.

13 Network Support Site Format (Table F)

The Network Support Site code format is a composite 11-character code comprised of three elements. The first two elements are for Geographical and Geopolitical Codes that occupy character positions 1 through 4, and 5 and 6, respectively. The third element denotes the Network Support Site Code element that occupies positions 7 through 11 of the CLLI Code, network support site format.

Network Support Site Code Element

The Network Support Site Code element is a 5-character field that occupies positions 7 through 11 of the CLLI Code, network support site format. The Network Support Site Code element consists of a fixed-alpha character in position 7, usually with a mnemonic value relating to the type of network support site location, followed by one numeric and three alphanumeric characters.

The following table depicts the network support site format structure, character positions, and the basic-permitted character set for each element:

Code Element/Character Position	1	2	3	4	5	6	7	8	9	10	11
Geographical Code	a	a	a	a							
Geopolitical Code					a	a					
Network Support Site Code							a	n	x	x	x

Network Support Site Code Classifications

The Network Support Site Code elements are classified according to the following categories or combinations of equipment as follows:

- B(n)(x)(x)(x) International boundary crossing points
- E(n)(x)(x)(x) End points
- F(n)(x)(x)(x) Fiber Node
- J(n)(x)(x)(x) Junctions
- M(n)(x)(x)(x) Manholes
- P(n)(x)(x)(x) Poles
- Q(n)(x)(x)(x) Base Transceiver Station/Radio Equipment
- R(n)(x)(x)(x) Repeater locations
- S(n)(x)(x)(x) Toll stations
- U(n)(x)(x)(x) Other network support site locations.
- W(n)(x)(x)(x) Wireless LAN Access Point

Network Support Site Code Element Development

Network Support Site Code elements are developed and maintained by Telcordia. The CLLI Code Technical Advisory Group (TAG) provides input to the decision-making process. A new Network Support Site Code element may be requested by submitting a LS2 form to the company CLLI Code coordinator for review by the TAG.

Network Support Site Format Considerations

One code may be assigned for each category, as required, at a particular location. Multiple Network Support Site Codes may be assigned to a specific site (same address), e. g., a manhole [M(n)(x)(x)(x)] can be assigned at the same location as one or more repeaters [R(n)(x)(x)(x)]. Network support site locations are always assigned to the geographical or geopolitical location in which they are physically located. If the network support site location is outside the boundaries of all identified places, a new geographical code should be requested. See guidelines for requesting geographical codes in Section 5 of this document. If there is a requirement to identify the structure in which, or on which, a transmitter or receiver is located, use the network site code format described in Section 7 of the document instead of the Network Support Site Code format.

Network Support Site Code Element Definitions

A network support site location is a location at which unique identification is required for any of the following:

International Boundary Crossing Points - B(n)(x)(x)(x)

An international boundary crossing point is a location on a border between two adjacent countries, e. g., a meet point, or a border interface point for facilities. The international boundary crossing point location should not be used to identify the manhole or pole where the crossing point is located. (Refer to the manhole or pole code for the network support site format.)

End-Point Locations - E(n)(x)(x)(x)

An end point is defined as a location in a network where 2 or more trunk facility routes converge or cross with no cross-connection capability. The end-point format may also be used to identify locations where facilities converge at state, province, LATA, or company boundaries. The end-point location should not be used to identify the manhole or pole where the junction is located. (Refer to the manhole or pole code for the network support site format.)

Fiber Node - F(n)(x)(x)(x)

This code is used to identify a location where Cable TV Fibers are terminated. The Fiber Node converts the optical signal to an electrical signal and retransmits this signal over coax towards the customer location. Customer set top boxes are connected to this coax line by way of a tap. These Fiber Nodes are usually located in a cabinet near the customer premises. It may also have interactive capabilities of video-on-demand.

Junction Location - J(n)(x)(x)(x)

A junction is defined as a location in a network where 2 or more facility routes converge or cross and has cross-connect capability. This location may or may not have cross-connect capabilities, i.e., fiber splice, Passive Optical Splitter, handhole, or a cross-connect type meet point. The junction should not be used to identify the manhole or pole where the junction is located. (Refer to the manhole or pole code for the network support site format.)

Manhole Locations - M(n)(x)(x)(x)

This code is used to identify manhole locations containing telecommunications equipment, such as repeaters or splice locations, etc.

Pole Locations - P(n)(x)(x)(x)

Pole locations are identified when the telephone pole is the location of the telephone company equipment.

Base Transceiver Station/Radio Equipment - Q(n)(x)(x)(x)

This code can be used to identify the location of base transceiver station (BTS), node b, and e-node b equipment associated with the radio access network (RAN) of a wireless network. The wireless systems that utilize such base station equipment includes but is not limited to WCDMA/UMTS, GSM, CDMA, WiMAX™, HSDPA/HSUPA, LTE, etc.).

The RAN contains equipment that provides radio transmission and reception to/from the handset/user equipment over the radio interface. This RAN equipment maybe dependent on a base station controller (BSC) or a radio network controller (RNC). The BTS may be located at, on, or adjacent to poles, towers, billboards, or other structures not normally considered to be buildings and may contain radio, multiplexing, towers or other structures. These sites are commonly referred to as cell sites, radio towers or microwave towers.

This Network Support Site Code can be used to identify the location of stand-alone radio and microwave equipment such as towers, antennas, microwave radio-relay repeater stations, mobile and coastal radio, earth stations, and other radio application sites.

See Network Entity Code for Non-Switching Network Entity - Q(n)(n) for Base Transceiver Station/Radio Equipment collocated with a building.

This code can be used to identify the location of fixed broadband wireless radio equipment. Fixed broadband wireless is defined by IEEE 802.16.

Satellites: A satellite in earth orbit is identified using the encoding guide for unique places found in Table A. The geographical and geopolitical codes "STLT" and "EO" may be entered in character positions 1 through 6 of the CLLI Code format, and the Radio Code may be entered in character positions 7 through 11.

Example:

Network Support Site Location	Network Support Site Code	CLLI Code
Early Bird Satellite	Q8232	STLTEOQ8232

Repeater Locations - R(n)(x)(x)(x)

This Network Support Site Code identifies the location of all types of repeaters (except microwave radio-relay repeaters) regardless of where they are positioned, i.e., on poles, pads, or pedestals, in manholes, etc.

Toll Station Locations - S(n)(x)(x)(x)

This Network Support Site Code identifies the location of toll stations that are not served from a local central office but are interconnected to a switchboard.

Other Network Support Site Locations - U(n)(x)(x)(x)

This Network Support Site Code can be used to identify location pair gain terminals, fiber terminals, and other type locations not described in the previous paragraphs. Remote pair gain locations may be remotely mounted subscriber terminals. They may be located on pads, pedestals, or in mini- or maxi-enclosures, vaults, etc. These pads, pedestals, etc., may be located on access roads, parking lots, vacant lots, etc.

Wireless LAN Access Point - W(n)(x)(x)(x)

This Network Support Site Code will be used to identify wireless LAN/hotspot equipment locations that are positioned i.e., on utility poles, light poles, or billboards etc. Wireless LAN utilizes unlicensed radio bands to allow end users to connect to a wireless or a wired LAN. It is defined as of 6/11/04 by IEEE 802.11a, 802.11b, and 802.11g.

See Non-Switching Network Entity Code PW(x) to identify wireless LAN/hotspot building Locations.

Non-Telcordia Customer Network Support Site Locations - X(n)(n)(n)(n) (Retired)

The use of "X" in the 7th position of this code set identifies a non-Telcordia customer network support site location that interconnects with Telcordia customer facilities. *In the past, "X" was required in character position 7 to denote any non-Telcordia customer, regardless of its interconnection. Existing records will not be changed.*

14 Customer Site Format (Table G)

The customer site format is a composite 11-character code comprised of 3 elements. The first 2 elements are for the Geographical and Geopolitical Codes that occupy character positions 1 through 4, and 5 and 6, respectively. The 3rd element denotes the Customer Site Code element that occupies positions 7 through 11 of the CLLI Code, customer site format.

Customer Site Code Element

The Customer Site Code element is a 5-character field that occupies positions 7 through 11 of the CLLI Code, customer site format. The Customer Site Code element consists of a numeric code in character position 7, an alpha in character position 8, followed by three alphanumeric characters in positions 9 through 11.

The following table depicts the customer site format structure, character positions, and the basic-permitted character set for each element:

Code Element/Character Position	1	2	3	4	5	6	7	8	9	10	11
Geographical Code	a	a	a	a							
Geopolitical Code					a	a					
Customer Site Code							n	a	x	x	x

Customer Site Code Element Development

Customer site code elements are developed and maintained by each Telcordia customer with CLONES on-line access and read and write capabilities. Schemes that reserve characters, or groups of characters within the customer code element, should be avoided.

Customer Site Code Format Definition

The CLLI Code, customer site format, is used to uniquely identify customer locations. These locations are required to identify customers, circuit terminations, facilities, or equipment for each specific customer for facility provisioning or other requirements. The Customer Site Code format may be used to develop a single code for a customer, or for multiple customers at the same location.

Customer Site Code Element Consideration

One code should be assigned for each customer, as required, at a specific location (same address). This code may be used to identify customer locations that include the following:

- Military installations, shopping malls, universities, etc.
- Customer locations associated with a switched service network

- Customer locations with (CU) centrex installations
- Customer locations that are required for trunk forecasting
- Customer locations that are required for design work
- Customer locations that terminate cable, carrier, or fiber
- Customer locations that contain NCTE, CPE, and PBX equipment.

NOTE: If there is requirement to identify a customer location using the building-code format when more than one entity code classification is required, a building code with its required entity codes should be created, e. g., F(x)(x) and N(x)(x), or H(x)(x).

In coding customer locations, one must consider the necessity of providing necessary information about the location with the need to protect proprietary information about the customer base. Revealing information about location of equipment and type of equipment (such as a PBX or Centrex equipment) makes customer sites vulnerable to competition. The Customer Site format record in CLONES can be marked proprietary.

The formats for both Customer Site and Network Site locations can be assigned to the same address.

Customer Code Examples

If the customer location has facilities (cable, carrier, fiber, etc.) to be shared by each customer at that location, a separate code is required to identify the facility termination. For example, the customer code entity **9F999** could be used to identify the facility termination; **1A111** could identify customer A; and **3D101** could identify customer B.

Examples:

Location	Code	CLLI Code
ABC Company South Street, Newark, NJ	3C461	NWRKNJ3C461
XYW Company South Street, Newark, NJ	2A146	NWRKNJ2A146
XYW Company Main Street, Newark, NJ	2K147	NWRKNJ2K147

The network site format should be used to identify a customer's location if there is a requirement for forecasting, planning, provisioning, or administrative needs. Another reason to use the network site format may be because there is a great deal of switching equipment, frames, administrative units, company computers, maintenance groups, or related entities on the premises.

15 General Guidelines for Assigning CLLI Codes

Encoding Guidelines - Fiber, IDLC (Integrated Digital Loop Carrier) and Passive Optical Networks

Currently, fiber is carried to a RT (remote terminal) before distribution to the premises. The interface at the customer premises can be at the RT, or hung on the customer premises before terminating directly to an optical network unit on a pedestal, or at the customer premises. Each scenario can be addressed with a different code format. The codes that apply to the precise location can identify the RT termination (RLn), carry a unique Network Support Site Code (anxxx), carry a customer code or service termination point (naxxx). If the Network Site Code format is adopted, it would require considerable code power to serve the potential community of users. There is not enough power to code every customer premises with a unique Network Site Code. The following coding is recommended:

- An RT located in a building (RLn)
- An RT not located within a building (Unxxx)
- An optical network unit at the customer premises (naxxx)
- A PON optical network terminal (ONT) at the customer premises (naxxx)
- An Optical Network Unit at a pedestal, hut, cabinet (Unxxx), or on a pole (Pnxxx), or in a manhole (Mnxxx).

The following coding is recommended to identify central office terminal equipment functions for IDLC and PON related networks:

- A PON optical line terminal (OLT) located in a central office - network entity code OL(x)
- A pair gain central office terminal - network entity codes L(n)(n), LZ(x)
- An optical Fiber Distribution Frame (FDF) located in a central office - network entity codes F(x)(x).

There may not be enough coding power in the network entity format to handle the large number of splitters associated with a PON network. The network support site format is appropriate to identify outside plant locations where PON splitters are installed. Network support site code J(n)(x)(x)(x) is recommended to identify optical splitters locations.

Encoding Guidelines - Interconnection/Point of Interface Entity Codes

The following guidelines address the requirements necessary for the specification of point-of-interface (POI) Network Entity Codes, which are used to identify a service provider's interface with a customer. The following guidelines are specifically for representing the customer, service provider relationship. It does not address the identification of end user interfaces.

Point-of-interface (POI) Network Entity Codes are used in any operation that requires the identification of one interface between a service provider and a customer.

This identifier works within the inventory and provisioning systems to identify these interface locations. The Network Entity Codes in conjunction with ANSI T1 standards are used to denote the A location or Z location interface of a customer's special service circuit, message trunk circuit, or facility interface with the service provider.

Following are the four currently active point-of-interface (POI) Network Entity Codes:

W(x)(x) - Facility/Circuit Point of Interface

This Network Entity Code is used to identify a facility/circuit point of interface (POI) in conjunction with telecommunications services. The W(x)(x) code is used to identify the point of interface at an access POP or CO if the H(x)(x) is not used for regulatory reporting requirements.

It is recommended that one W(x)(x) code be assigned to each customer at a Network Site Code location. The W(x)(x) code will then be used by all providers to identify facility/circuit terminations for this customer.

The W(x)(x) code is not used to identify a point of interface at an outside plant location. The W(x)(x) code is not used to identify the facility/circuit termination to an End User.

(x)MD - Message Trunk Interface

This network termination interface Entity Code is used to identify an authorized trunk-side switched service point of interface (POI) in conjunction with telecommunication services. This code represents the "theoretical" location where a customer gains access to a provider's network. It is associated with coding of message trunks carrying voice grade traffic.

- Non-dial tone customers e.g., IXC. Customers of switched trunk services that do not require an NPA/NXX assignment are referred to as non-dial tone customers. They usually connect to a provider via inter tandem switching to provide long distance services. It is recommended that one message trunk interface code be assigned to each non-dial tone customer at a particular Network Site Code location.
- Dial tone customers - e.g., CLEC. Customers of switched trunk services that require an NPA/NXX assignment are referred to as dial tone customers. They may connect to a provider via a tandem switch or with direct trunks to provide local services. It is recommended that a message trunk interface code be assigned to each dial tone customer switch that is deriving access from the provider.

  In the United States, when a point of interface is in one LATA and the switch is in a different LATA, a unique (x)MD is required.

In Canada, there is a need to distinguish each point of interface, per customer, per switch, per rate center.

- Customers of both non-dial tone and dial tone services. For a customer that offers both types of services, the assignment of the message trunk interface code for non-dial tone and dial tone services can be done separately. It is recommended that the dial tone customer not use the message trunk interface that is assigned to the non-dial tone customer, even if they are in the same location. The non-dial tone and dial tone service customers should be treated as two separate customers.

  NOTE: Network Entity codes X(x)X, X(x)Y, X(x)Z, (n)(n)Z, Y(x)X are used as overflow codes for code (x)MD to provide more code power.

J(x)(x) - Facility/Circuit Point of Interface (POI) at an Outside Plant Location

This Network Entity Code is used to identify a facility/circuit point of interface at an outside plant location in conjunction with telecommunications services. The J(x)(x) code is not used to identify a point of interface at a central office or a point of presence (POP). One J(x)(x) code will be assigned to each customer at an outside plant location. The J(x)(x) code will then be used by all providers to identify facility/circuit terminations for this customer.

The J(x)(x) code is not used to identify the facility/circuit termination to an end user.

B(n)G - International Access Point

An international access point is a location that acts as a gateway between countries. This Network Entity Code represents the point of interface between international boundaries.

Coding Guidelines for Voice Over Packet (VoP) Gateways

Figure 16-20 shows the main functional elements in the VoP architecture. There are four key functional gateway elements in the VoP architecture as defined in this section. Each gateway is controlled by a call agent or a virtual switch. For the identification of protocol converters or gateways that are not controlled by a call agent in a packet network, please see the digital packet device Network Entity Code (n)(x)W. There are four key functional gateway elements in the VoP architecture as follows:

Trunk Gateway GT(x), GR(x)

A trunk gateway supports a trunk side interface to the PSTN. The trunk gateway terminates circuit-switched trunks in the PSTN and virtual circuits in the packet network (the core network) and, as such, provides functions such as packetization. Even though a trunk gateway terminates trunks in the PSTN, it does not provide the resource management functions for trunks that it terminates. However, the trunk

gateway has the capability to set up and manage transport connections through the core network when instructed by the call agent CA(x). It is associated with a specific CA(x) that provides it with the necessary call control instructions.

Line/Access Gateway G(n)(x)

An line/access gateway supports the line side interface to the VoP network. Traditional phones and PBXs currently used for the PSTN can access the VoP network through this functional element. As such this functional element provides functions such as packetization, echo control, etc. It is associated with a specific call agent that provides the necessary call control instructions. On receiving the appropriate commands from the call agent, the line/access gateway also provides functions such as audible ringing, power ringing, miscellaneous tones, etc. It is assumed that the line/access gateway has the functionality to set up a transport connection through the core network when instructed by the call agent. The circuit-based physical interfaces supported by the line/access gateway include:

- Voice-Grade Analog Lines (baseband voice frequency access)
- ISDN Digital Subscriber Lines (Basic Rate ISDN (BRI))
- GR-303 Integrated Digital Loop Carrier (IDLC)
- Non-ISDN PBX Trunk Groups
- SDN Primary Rate Interface (PRI) Trunks.

Signalling Gateway - GS(n)

A signaling gateway interconnects the VoP network to the PSTN signaling network. It is responsible for receiving SS7 messages over a set of links from a signaling Transfer Point (STP) and encapsulating the information for delivery to the call agent. The signaling gateway is also responsible for receiving encapsulated information from the call agent and transferring the message to the interconnecting SS7 node. In this capacity, the signaling gateway is essentially performing an interworking function between the packet network interface protocols used in the (VoP) network and the PSTN interface protocols.

Customer Gateway (Not coded at the Network Entity Level)

A customer gateway provides access to the network for some of the non-traditional CPEs that could have an associated IP address, such as IP-phones, personal computers, etc. Although a customer gateway provides many of the functions associated with the line/access gateway, this functional element is associated with a particular customer (business or residence) and is located at a customer site location. The customer gateway is associated with a specific call agent that provides the necessary call control instructions.

The VoP architecture relies on a core network and an access network for providing the necessary connectivity and transport. The core network is the packet transport network that provides connectivity to the functional elements in the VoP network.

The access network represents the local loop network of the VoP. There are various ways of offering access to the VoP network. The access network could be based on the existing copper plant of local exchange carriers or could use other technical options such as hybrid fiber-coax (HFC), digital subscriber loop (xDSL), etc.

Packet End Office PS(x)

PS(x) is used to identify the location of multiple VoP gateways that function together as an end office switch. It is not a physical switch as identified by the DS(x) Network Entity Code. The multiple gateways include both line/access and trunk gateways at a particular location. The line/access gateways are associated with a call agent (CA), which provides the necessary call control functions.

Functionality is similar to a PSTN end-office switch in that all connections are done on a line-to-line, line-to-trunk, and trunk-to-line trunk-to-trunk basis. The gateway functionality can support packet-to-packet or TDM-to-packet switching fabric.

The line/access and trunk gateways that make up this functionality may be coded with the individual line/access G(n)(x) and trunk gateway GT(x) Network Entity Codes.

This code can be found in Table B. for Network Switching Entity Codes.

Remote Packet End Office - RP(x)

RP(x) is used to identify the location of multiple VoP gateways that function together as a remote end office switch. It is not a physical remote switch as identified by the RS(x) Network Entity Code. Line/access gateway(s) make up the remote packet end office and provide the remote end office switching functionality. The line/access gateways are associated with a call agent (CA), which provides the necessary call control functions.

It is similar to a PSTN remote end office switch in that all connections are done on a line-to-line basis. This switching functionality can support packet-to-packet or TDM-to-packet switching fabric.

The line/access gateway(s) that make up the remote packet end office may be coded with the individual line/access gateway Entity Code G(n)(x).

A packet end office PS(x) will provide the remote packet end office trunking services.

This code can be found in Table B. for Network Switching Entity Codes.

Additional information on next generation networks and voice-over-packet gateways can be found in the following documents:

- SR-4717 Voice Over Packet in Next Generation Networks: An Architectural Framework.
- Line/Access Gateway GR-3055-CORE
- Call Connection Agent GR-3051-CORE
- Generic Requirements for VoP GR-3060-CORE

- Signaling Gateway GR-3053-CORE
- Trunk Gateway GR-3054-CORE

Cell Site Coding Guidelines

Wireless Point-of-Interface (POI) at Mobile Switch Location

From a CLLI coding perspective, the mobile switch location is treated as the wireless provider's POI location. It is from this POI that transport service extends geographically to cell sites using dedicated facilities/circuits. Also, it is from this POI that voice/data traffic extends to the wireline network. The entire mobile switch location must be identified using a single eight-character Network Site Code. Specific Network Entity Codes are used to identify the wireless POI and wireless equipment functions. The CLLI Entity Code for the POI is W(x)(x) - Facility/Circuit POI. For specific equipment function Network Entity Codes, see the following Wireless Network Entity Code Guidelines Table.

Wireless End User (EU) Location/Function Identification at Cell Site

It is common for multiple wireless providers to be located at a given cell site location. Additionally, the wireline provider is present at the same location since it builds facilities/circuits for wireless providers to the cell site. Thus, both wireline and wireless providers require CLLI Codes for various aspects of cell site identification. They both must identify the location and their equipment functions at the cell site.

Also, wireline companies must identify facility/circuit terminations at the cell site. The entire cell site location (including the tower, structures, and equipment functions) should be identified using a single eight-character Network Site Code. No other enclosures or structures should be identified with different eight-character Network Site Codes. Use of a single Network Site Code for the location eliminates confusion among wireline and wireless companies regarding the correct code to use. Network Entity Codes are used to identify wireless facility/circuit terminations and equipment functions for each provider. The CLLI Entity Code to identify the facility/circuit termination (EU location) for the wireless provider at the cell site is H(x)(x) - Miscellaneous Non-switching Entity.

Note that this is Telcordia's recommendation for cell site location identification and should not be confused with the coding guidelines for building complexes as defined in the COMMON LANGUAGE Location Codes (CLLI Codes) Methods and Procedures.

NOTE: For corresponding cell site technical drawings, please see BR Section 16.

Wireless Equipment Location Entity Code Guidelines

The following table contains the CLLI coding guidelines for various Network Entity types. To view network diagrams that illustrate these coding strategies, please reference Sections 16.23 - 16.28.

Network Function	Explanation	CLLI Coding Strategy	Entity Code
AAA (Authentication, Authorization, and Accounting) server	The AAA communicates with the packet data service node (PDSN) in the packet network to perform mobile client authentication associated with PPP and mobile IP connections, authorization of a mobile client by managing and distributing security keys, and accounting.	Network Entity Code should be identified with the processor grouping Network Entity Code, D(n)(n)	D(n)(n)
Authentication Center (AuC)	Server that contains subscriber-specific authentication data, such as a secret authentication key called the Ki. The AuC contains sophisticated algorithms that are used to verify and validate a subscriber. The calculations on the AuC must match that of the subscriber's SIM card in order to authenticate that subscriber.	This functionality should be identified with the processor grouping Network Entity Code, D(n)(n)	D(n)(n)
BSC (Base Station Controller)	This Network Entity Code can be used to identify a base station controller (BSC) within the radio access network in a wireless network. The BSC maintains radio links from the handset to the core network. It controls a set of cells and their associated base stations. It manages the handoff of calls from one base station to another as subscribers move from cell to cell. It can be located at or adjacent to buildings, towers, or other structures. In a CDMA2000 network the BSC is responsible for routing packets between the BTS and the PDSN. In a GPRS/EDGE network the BSC routes packets between the BTS and the SGSN. A RNC (Radio Network Controller) in a WCDMA network is functionally equivalent to a BSC.	Network Entity Code CR(x) should be used to identify BSC locations.	CR(x)

Network Function	Explanation	CLLI Coding Strategy	Entity Code
BTS (Base Transceiver Station)	The BTS has physical radio equipment that is used for transmitting and receiving radio signals to and from the mobile subscriber's handset. The BTS also controls many aspects of the system that are directly related to the performance of the network. Some of these aspects include the control of multiple carriers that operate at that site and the assignment of Walsh codes. The BTS in a wireless network can be located at or adjacent to buildings, towers, or other structures. These sites are commonly referred to as cell sites. A Node B in a WCDMA network is functionally equivalent to a BTS.	If the BTS is located at a non-building location, (on, or adjacent to poles, towers, billboards, or other structures not normally considered to be buildings) Network Support Site Code Q(n)(x)(x)(x) should be used.	Q(n)(n) Q(n)(x)(x)(x)
EIR (Equipment Identity Register)	In a GSM network, the EIR verifies that a particular handset or model is acceptable. It also restricts access to handsets known to be stolen.	This entity should be identified with the processor grouping Network Entity Code, D(n)(n)	D(n)(n)
Femtocell	Femtocells are fully featured but very low power mobile phone access-point base-stations that operate within the licensed spectrum, typically designed for use in residential or small business environments. It connects to the service provider's network via broadband (such as DSL or cable). Current designs typically support 2 to 5 mobile phones in a residential setting. A femtocell allows service providers to extend service coverage indoors, especially where access would otherwise be limited or unavailable. Femtocell technology is applicable to all standards, including GSM, CDMA2000, WCDMA and WiMAX solutions. One approach for a femtocell is to use the traditional base station architecture. This approach is commonly called picocell. In this scenario, the femtocell base- station connects to the core network using a standard interface; for example, a WCDMA Node B connecting to a Radio Network Controller (RNC) via a backhaul connection carried over broadband.	When femtocells are provisioned at residential or small business locations, the customer site format may be used. The Network Entity format may be used if there is a need to identify a femtocell base station at an enterprise customer building location where other complex network functions exist.	Customer Site Format (n)(a)(x)(x)(x) Network Entity Code PWx - Wireless Access Point

Network Function	Explanation	CLLI Coding Strategy	Entity Code
Gateway MSC Server	In 3G wireless networks such as CDMA 2000 3x and 3GPP r4, the traditional MSC functionality is split into two logical functions, which is provided by physically separate network elements - the MSC/Gateway MSC (GMSC) Server and the media gateways (line/trunk gateways). The GMSC Server controls media gateways that connect to other networks such as the PSTN.	This equipment functions as a Call Agent/Softswitch and should be coded as such.	CA(x)
GGSN (Gateway GPRS Support Node)	Functions as the point of interface between external packet data networks such as the internet or an intranet. A given GGSN may interface with one or multiple SGSNs.	This entity should be identified with Network Entity Code PN(x) wireless packet data node.	PN(x)
GMSC (Gateway MSC)	In a GSM/GPRS/EDGE wireless network, the GMSC interfaces with external networks, such as the PSTN. Calls from the PSTN first arrive to the wireless network at the GMSC. The GMSC's main function is to query the HLR to determine the location of the subscriber; the call is then forwarded from the GMSC to the MSC/VLR serving that subscriber.	The GMSC is typically a function of the MSC and should be identified as such. The MSC Network Entity Code is CM(x).	CM(x)
HA (Home Agent)	Is a component in a CDMA2000 network. The HA maintains current location information of a subscriber as he or she moves through the network ensuring that the packets are forwarded to the mobile handset.	This entity should be identified with Network Entity Code PN(x), wireless packet data node.	PN(x)
HLR (Home Location Register)	The HLR contains subscriber specific data, such as subscriber profile, location, activity, and supplementary subscriber services.	This functionality should be identified with the processor grouping Network Entity Code, D(n)(n)	D(n)(n)
HSS (Home Subscriber Server)	Is functionally equivalent to the HLR except that the HSS uses packet-based transports such as IP, whereas the HLR uses standard SS7 interfaces.	This functionality should be identified with the processor grouping Network Entity Code, D(n)(n)	D(n)(n)

Network Function	Explanation	CLLI Coding Strategy	Entity Code
IWF (Interworking Function)	In the CDMAOne (IS-95) network, the IWF acts as a gateway/protocol converter between the wireless network and the wireline packet data network/PSTN. The IWF allows users to access e-mail, the internet, send and receive fax messages, and obtain access through secure connection to corporate intranets. In a GSM network, the IWF acts as a modem bank for circuit switched data and fax services. It allows analog data to transmit over a digital GSM network. Data and fax services are supported up to 9.6 kbps in GSM.	Previous generation IWFs that strictly interface with the PSTN and function as modem banks should be identified with the Misc. Non-switching Network Entity Code H(x)(x). An IWF that functions as a packet device and allows access to a packet network should be identified with the digital packet device Network Entity Code, (n)(x)W.	(n)(x)W H(x)(x)
MGW (Media Gateway)	Functions as a protocol converter between the PSTN and the wireless packet network. It contains the switching matrix; however, it is controlled by the MSC server or the MGCF (media gateway control function).	Should be identified with the digital packet device Network Entity Code, (n)(x)W.	(n)(x)W
MMSC (Multimedia Messaging Service Center)	The MMSC provides a store and forward facility for multimedia messages such as images, audio, video, and text, sent across a mobile network. The MMSC may also provide a formatting role to enable messages to be "optimized" to the receiving handset's capability. The MMSC is comprised of the MMS Server, which enables storage and delivery of messages. Second, is the MMS proxy-relay, which interacts with the application being run on the MMS enabled terminal and provides various messaging services. Last is the WAP (wireless application protocol) gateway, which allows users to surf the internet in a limited fashion and to send and receive e-mail messages.	This entity should be identified with the announcement machine/message system Network Entity Code, (x)AD	(x)AD

Network Function	Explanation	CLLI Coding Strategy	Entity Code
MPC (Mobile Positioning Center)	The MPC serves as the point of interface to the wireless network for the location network. The MPC serves as the entity which retrieves, forwards, stores and controls position data within the location network. It can select the position determining entity (PDE) to use in position determination and forwards the position to the requesting entity or stores it for subsequent retrieval. In the case of a PDE with autonomous determination capability, the MPC receives and stores the position estimation for subsequent retrieval. The MPC may restrict access to position information (e.g., require that the mobile station be engaged in an emergency services call or only release position information to authorized nodes). In the situation of an emergency call (e.g., 911), the MSC may hand off the radio control to another MSC, but the emergency call remains anchored with the MSC establishing the first radio contact.	Network Entity Code should be identified with the processor grouping Network Entity Code, D(n)(n)	D(n)(n)
MSC/MTSO (Mobile Switching Center/ Mobile Telephone Switching Office)	The MSC is also known as the MTSO, especially in earlier generation wireless networks. It is the switch that manages the setup and teardown of calls to and from the mobile subscribers. The MSC is very similar in functionality to a standard PSTN switch, however; it also contains logic that enables it to deal with the mobility of subscribers. Its interface with a home location register (HLR), where subscriber specific data is held, enables it do so.	Network Entity Code CM(x) should be used to identify MSC/MTSO locations.	CM(x)
MSC Server	In 3G wireless networks such as CDMA 2000 3x and 3GPP r4, the traditional MSC functionality is split into two logical functions, which is provided by physically separate network elements - the MSC/Gateway MSC (GMSC) Server and the media gateways (line/trunk gateways). The MSC Server provides the call control functions and mobility management for the media gateways connected to a base station. Under the control of the MSC Server, the media gateways provide the bearer switching functions.	This equipment functions as a Call Agent/Softswitch and should be coded as such	CA(x)

Network Function	Explanation	CLLI Coding Strategy	Entity Code
Node B	Is functionally equivalent to a BTS in a CDMA or GSM network.	When a BTS or a node b. is located at a building location it should be identified with Network Entity Code Q(n)(n). If the BTS or Node B. is located at a non-building location, (on, or adjacent to poles, towers, billboards, or other structures not normally considered to be buildings) Network Support Site Code Q(n)(x)(x)(x) could be used.	Q(n)(n) Q(n)(x)(x)(x)
PCU (Packet Control Unit)	Responsible for a number of GPRS-related functions such as the air interface access control, packet scheduling on the air interface, packet assembly and re-assembly. The PCU is considered part of the BSC. In most applications the PCU is physically integrated with the BSC.	This is typically part of the BSC functionality; Entity Code CR(x) should be used.	CR(x)
PDSN (Packet Data Serving Node)	The PDSN is a new component that is associated with the CDMA 2000 system. Just as the MSC supports the public switched voice services, the PDSN supports packet data services. It has similar functionality to the GPRS support nodes: GGSN and SGSN. It performs the following functions in order to support packet data services: Establishes maintains and terminates point-to-point protocol (PPP) sessions with the subscriber Supports both simple and mobile IP services Initiates authentication, authorization, and accounting for the mobile station client to the server Receives service parameters for the mobile client from the AAA server Collects usage data that is relayed to the AAA server.	This entity should be identified with Network Entity Code PN(x), wireless packet data node.	PN(x)
RNC (Radio Network Controller)	Is functionally equivalent to a BSC in a CDMA or GSM network except that RNCs can interface with each other, where BSCs cannot.	Network Entity Code CR(x) should be used to identify RNC locations.	CR(x)

Network Function	Explanation	CLLI Coding Strategy	Entity Code
Router	Within a wireless network, a packet router is used to route packets to and from various network elements. It is also used to route packets to and from external networks such as the internet or the intranet. It is also used to route packets to and from the BSCs.	This entity should be identified with Network Entity Code (n)(x)W, digital packet device.	(n)(x)W
SGSN (GPRS Support Node)	Performs mobility management, security control and access control functions. An SGSN may serve multiple BSCs, whereas a given BSC can only interface with one SGSN. The SGSN also interfaces with the HLR. It is this interface that allows the SGSN to provide subscriber location updates to the HLR. Furthermore, it also allows the SGSN to retrieve subscriber related data from the HLR. An SGSN may optionally interface with an MSC/VLR. This interface supports those who subscribe to both circuit switched services (voice) supported by the MSC/VLR and packet data services supported by the SGSN. An SGSN also interfaces with the SMSC which enables subscribers to send and receive short text messages over the GPRS network.	This entity should be identified with Network Entity Code PN(x), wireless packet data node.	PN(x)
SMSC (Short Message Service Center)	Supports the storing and forwarding of short messages to and from mobile stations. Typically, these short messages are text messages of up to 160 characters in length. The SMSC has three parts. First is the SC (service center), which stores the messages and interfaces with other systems such as voice-mail and e-mail. Second, the SMS-gateway MSC queries the HLR to determine the subscriber's location, and then it forwards the messages to the appropriate MSC, which forwards the message to the subscriber. Last is the SMS Interworking MSC, which receives short messages from the MSC serving the subscriber. These messages are sent to the SC before being sent to its final destination. Typically these elements are incorporated into one box called the SMSC. Enhancements to the SMSC allow messages to contain a combination text and simple pixel-image and/or melody.	This entity should be identified with the announcement machine/message system Network Entity Code - (x)AD	(x)AD

Network Function	Explanation	CLLI Coding Strategy	Entity Code
TRAU (transcoding and rate adaptation unit)	In a GSM network, in order for an MSC to communicate with the PSTN, it must transmit and receive coded speech at 64 kbps. The TRAU's function is to convert coded speech to and from 64 kbps.	The TRAU is typically a function of the BSC and should be identified as such. The BSC Network Entity Code is CR(x).	CR(x)
VLR (Visitor Location Register)	Is incorporated with the MSC. VLR functionality was never separated from the MSC. The VLR is the database that contains subscriber information for the duration that a subscriber is in the coverage area of an MSC.	This functionality is included with the MSC. MSCs are identified with Network Entity Code CM(x).	CM(x)

16 CLLI Code Set Exhibits/Figures

This section includes exhibits and figures that display CLLI Codes described in this document. These exhibits have been developed for use as encoding and job aids.

Exhibits and Figures:

1. CLLI Codes Assigned to Various Locations
2. Circuit and Facility Equipment Termination at Customer Premises
3. Multiple Entities Within a Single Building
4. EC, IC, and Customer Location Equipment
5. Host Office, Remote Switch, and Subscriber Line Carrier
6. Typical Types of Network Locations Requiring CLLI Codes
7. Central Office (CO) Entity Coding
8. Distribution Network-Digital Loop Carrier
9. Interconnection/Point of Interface Coding
10. Voice Over Packet (VoP) Network Architecture
11. Wireless Network Architectures
12. Location Coding
13. CLLI Code Structure

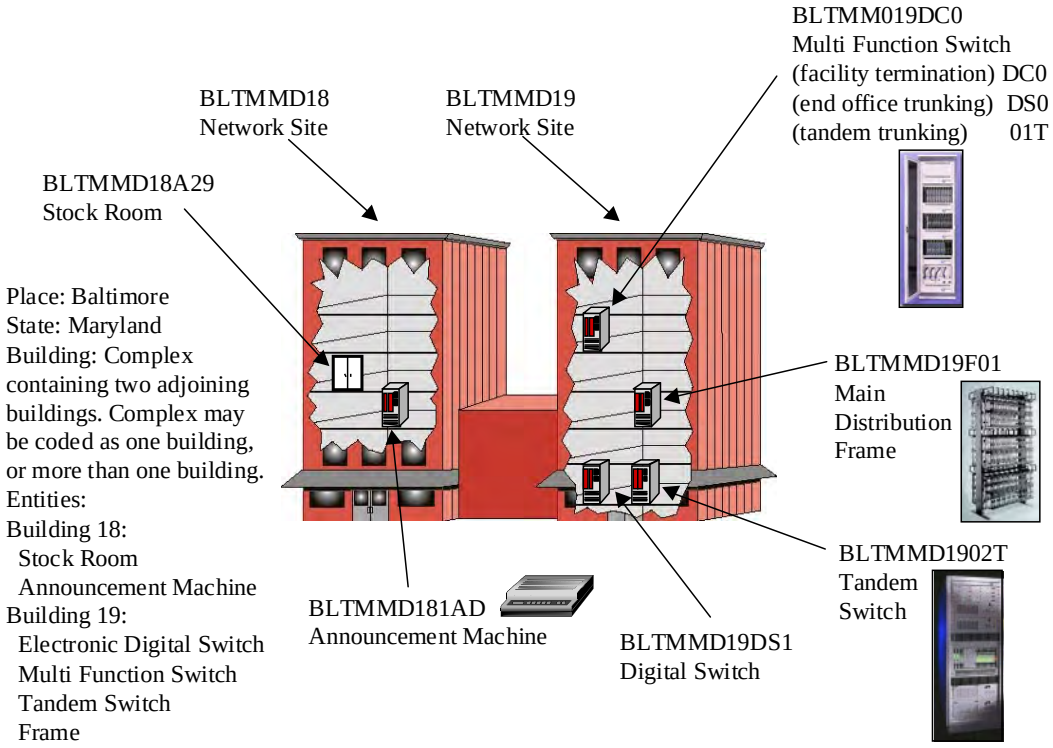


Figure 1 CLLI Codes Assigned to Various Locations

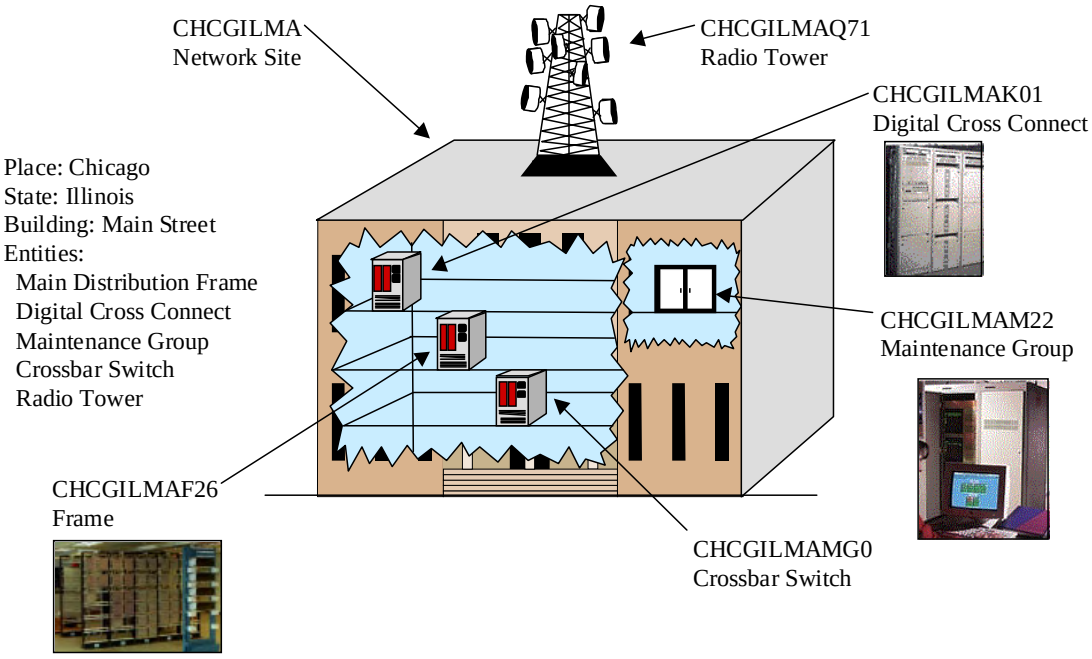


Figure 2 CLLI Codes Assigned to Various Locations

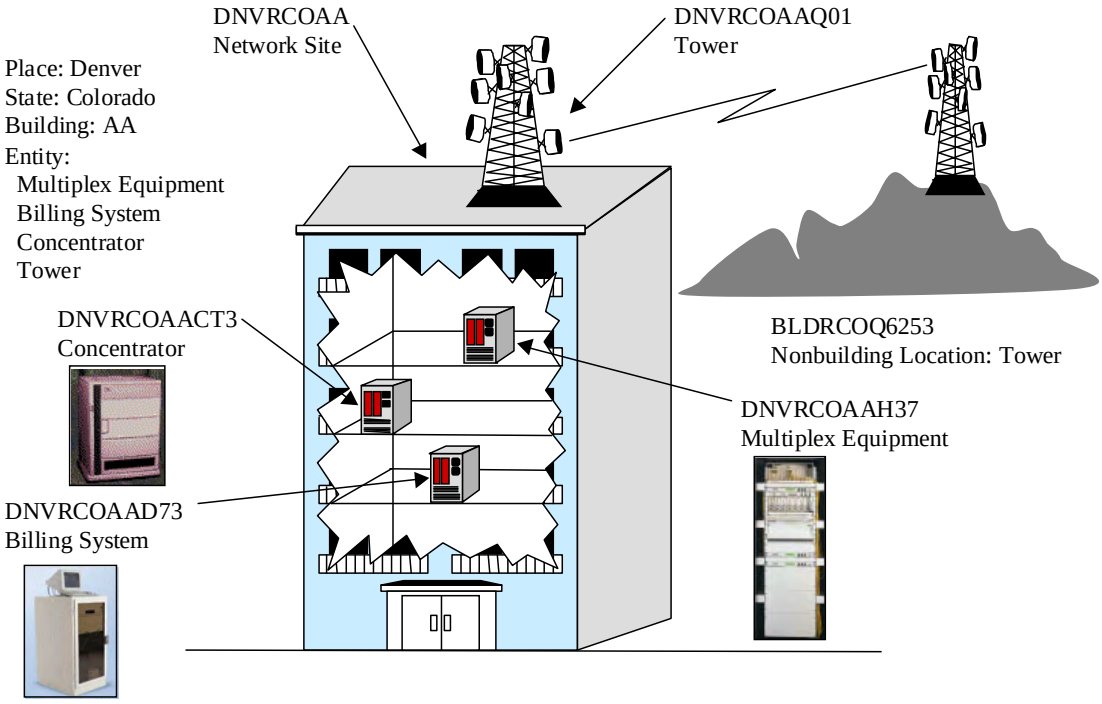


Figure 3 CLLI Codes Assigned to Various Locations

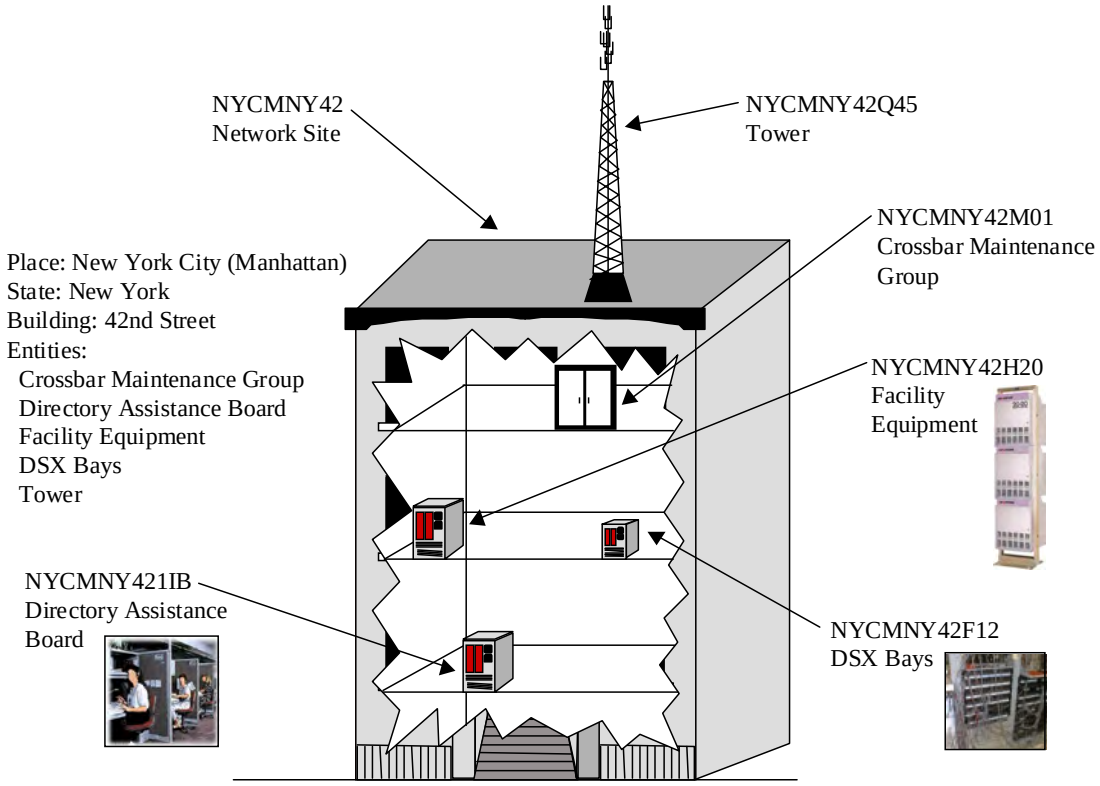


Figure 4 CLLI Codes Assigned to Various Locations

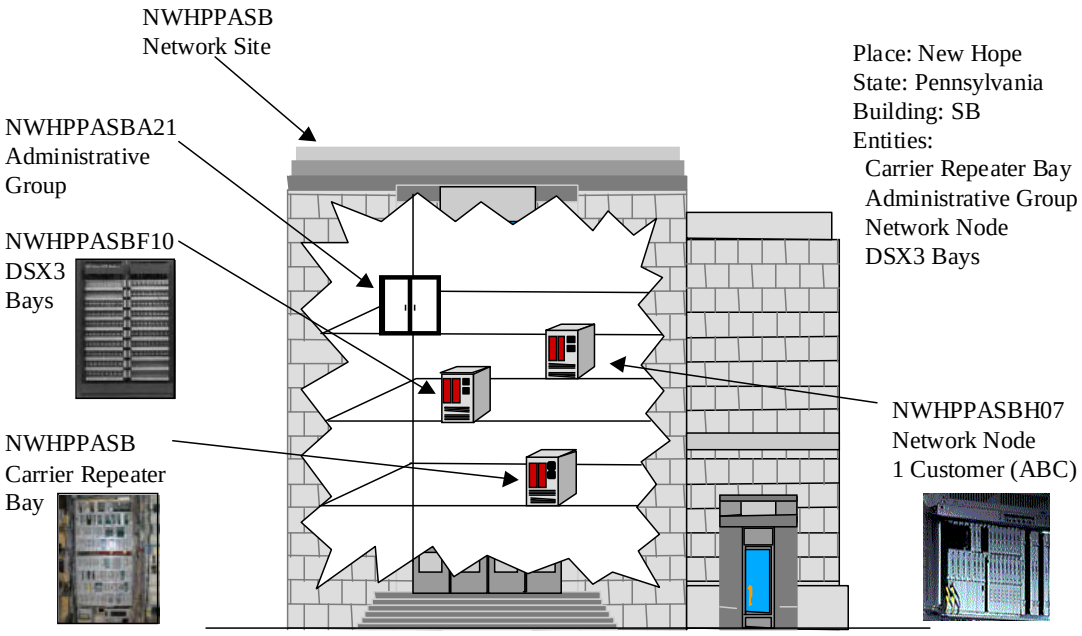


Figure 5 CLLI Codes Assigned to Various Locations

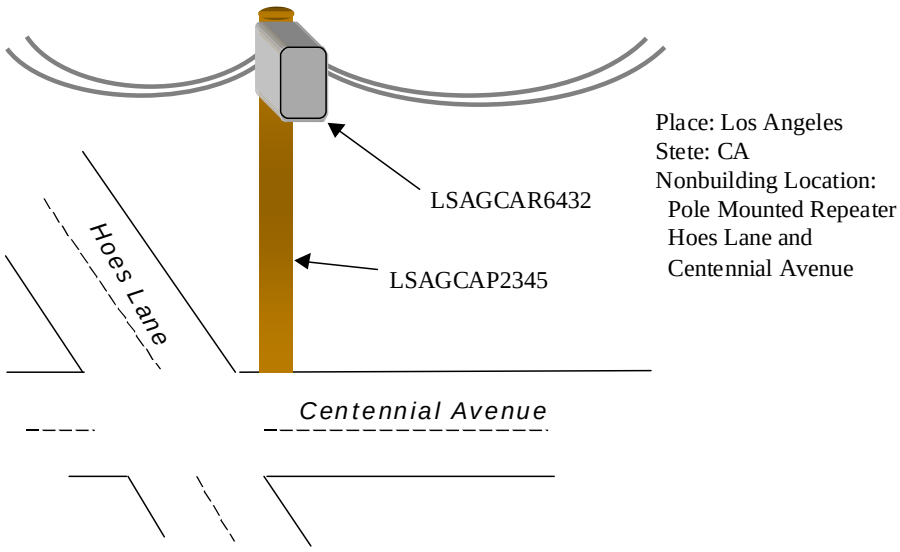


Figure 6 CLLI Codes Assigned to Various Locations

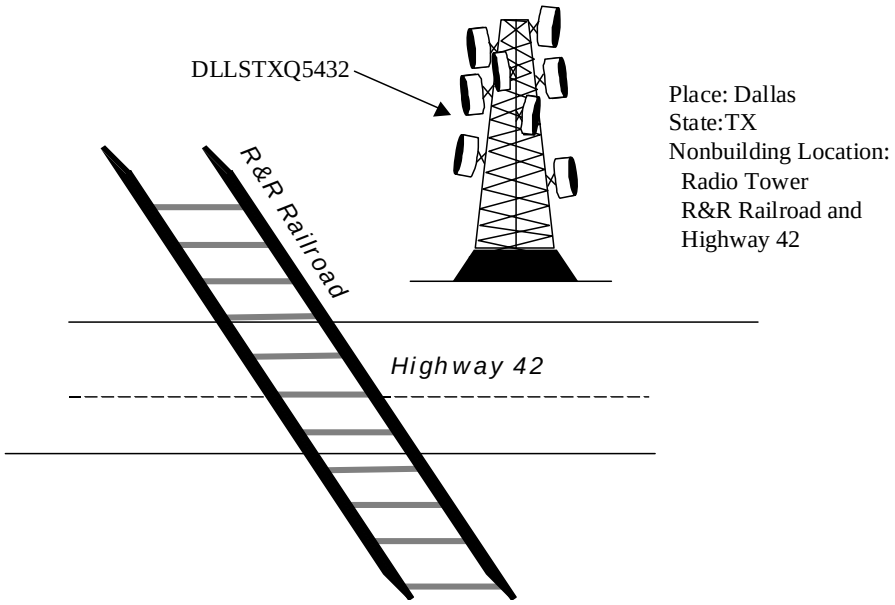


Figure 7 CLLI Codes Assigned to Various Locations

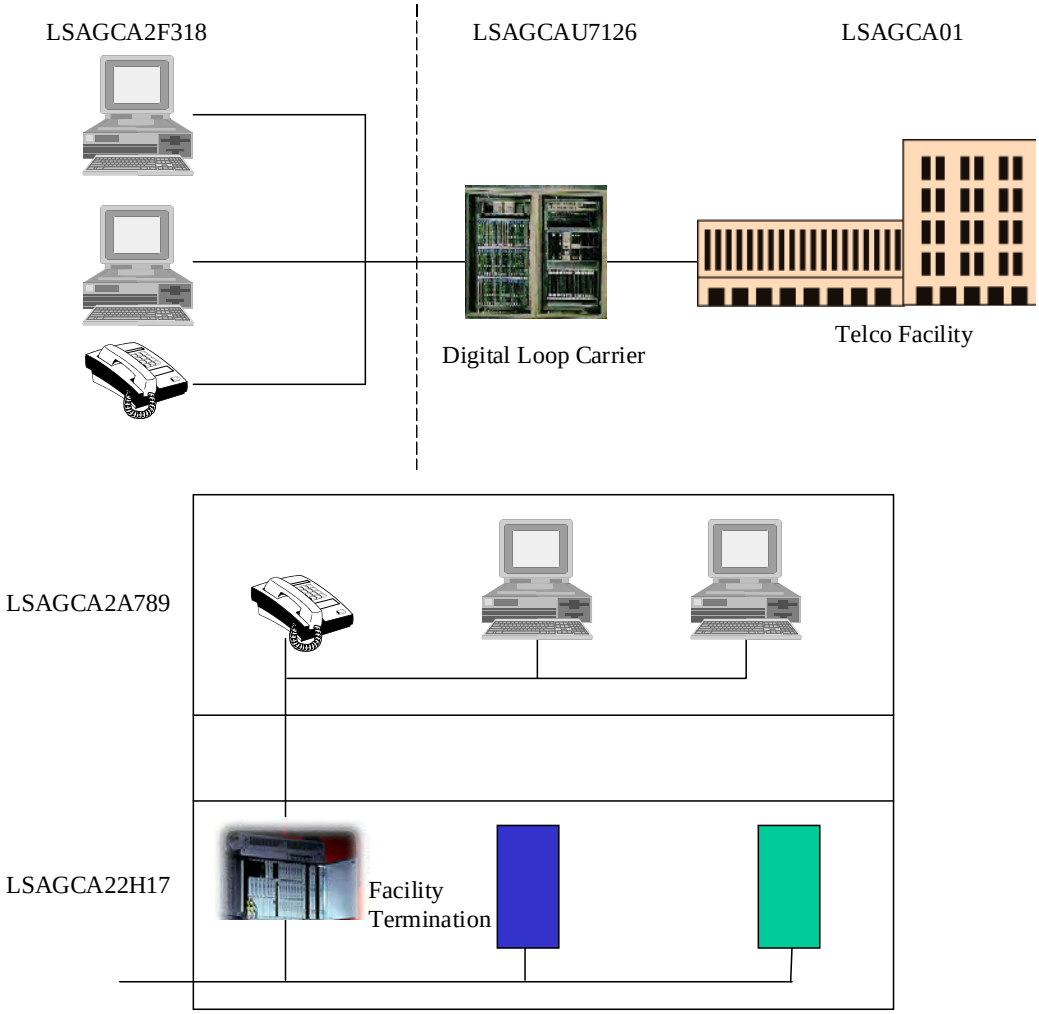


Figure 8 Circuit, Facility, and Equipment Termination at Customer Premises

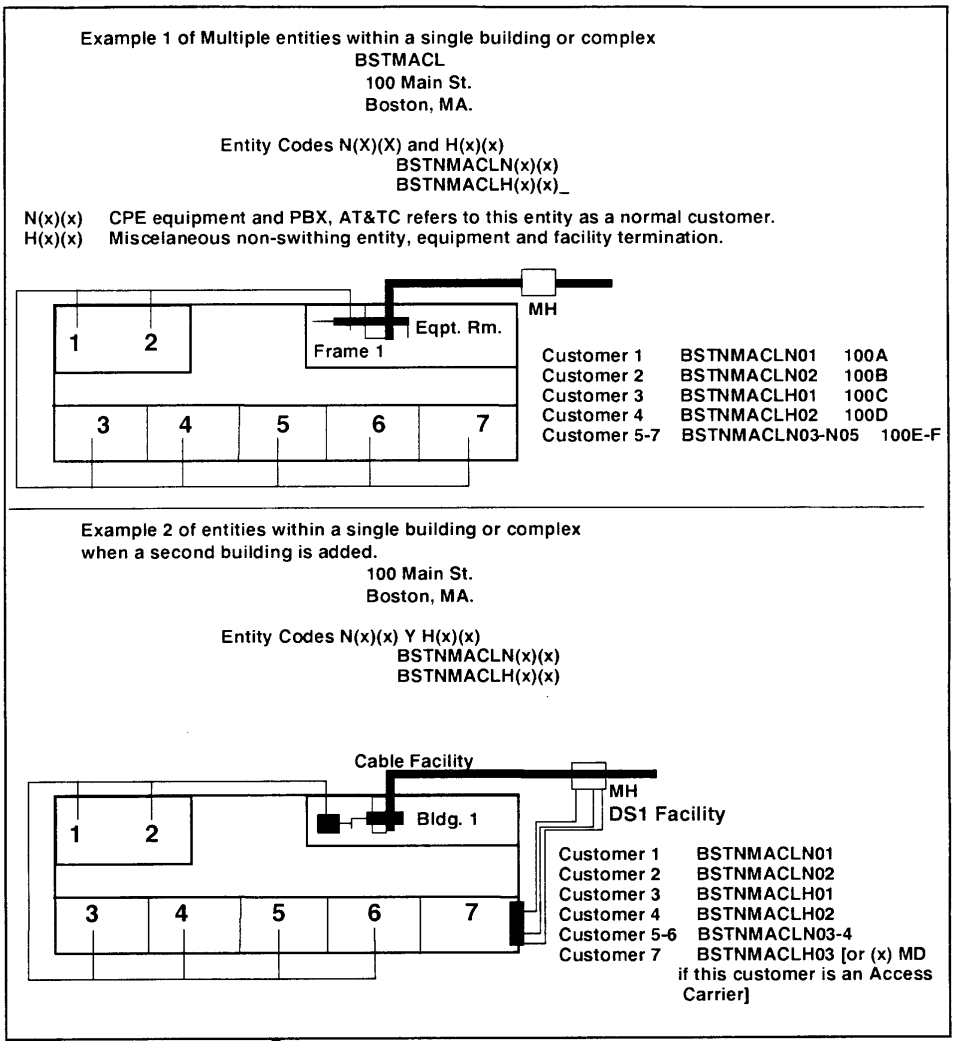


Figure 9 Multiple Entities Within a Single Building

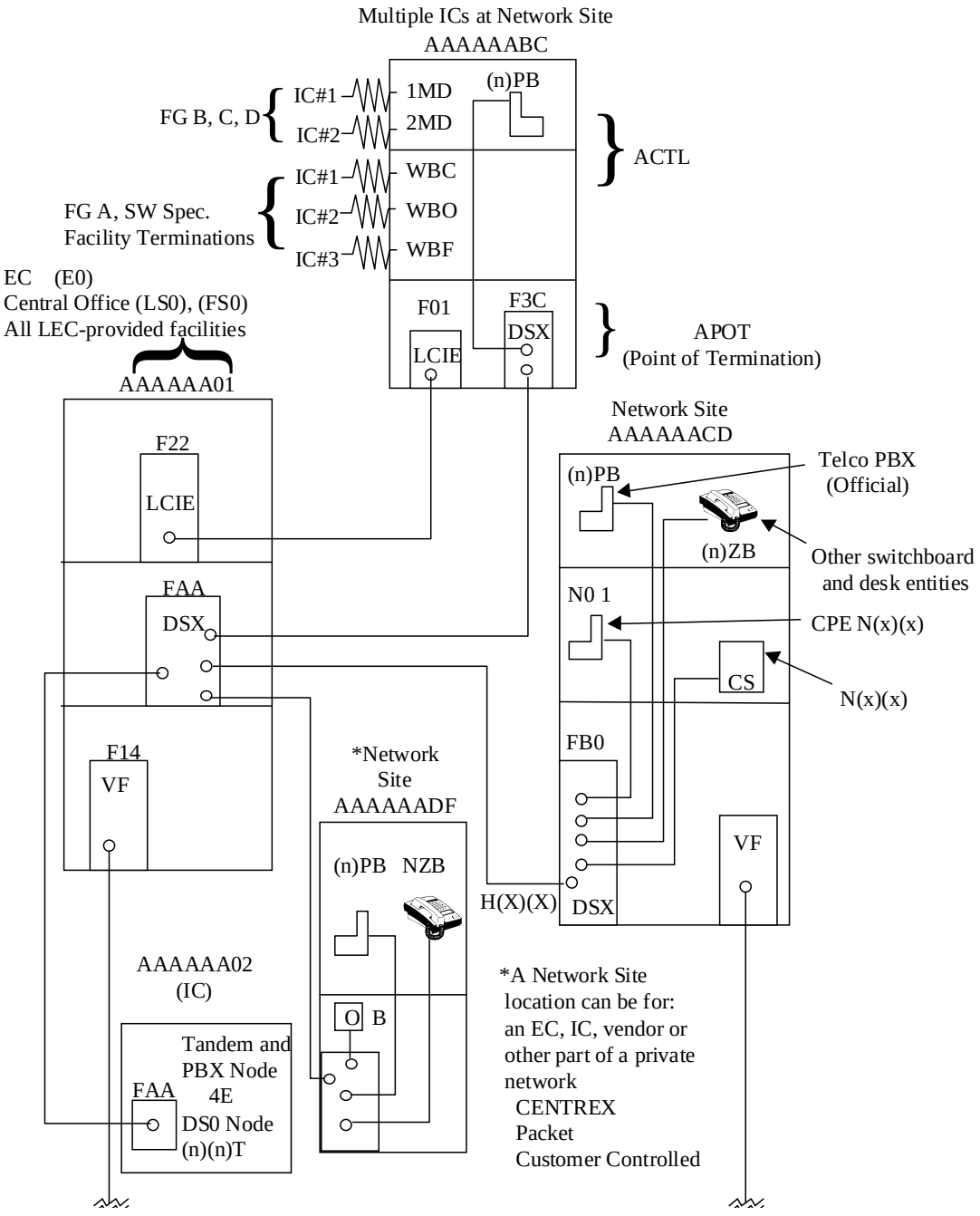


Figure 10 EC, IC, and Customer Location

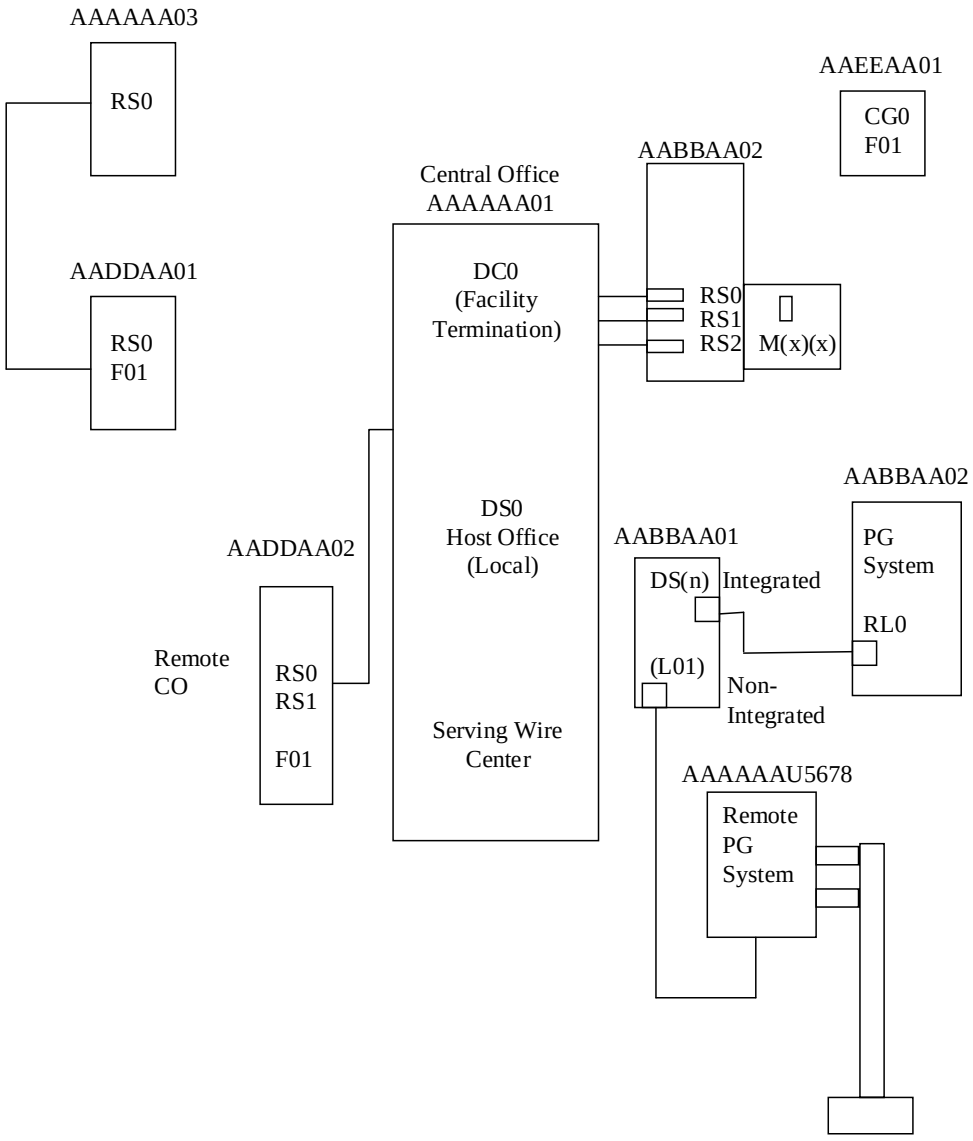


Figure 11 Host Office, Remote Switch, and Subscriber Line Carrier

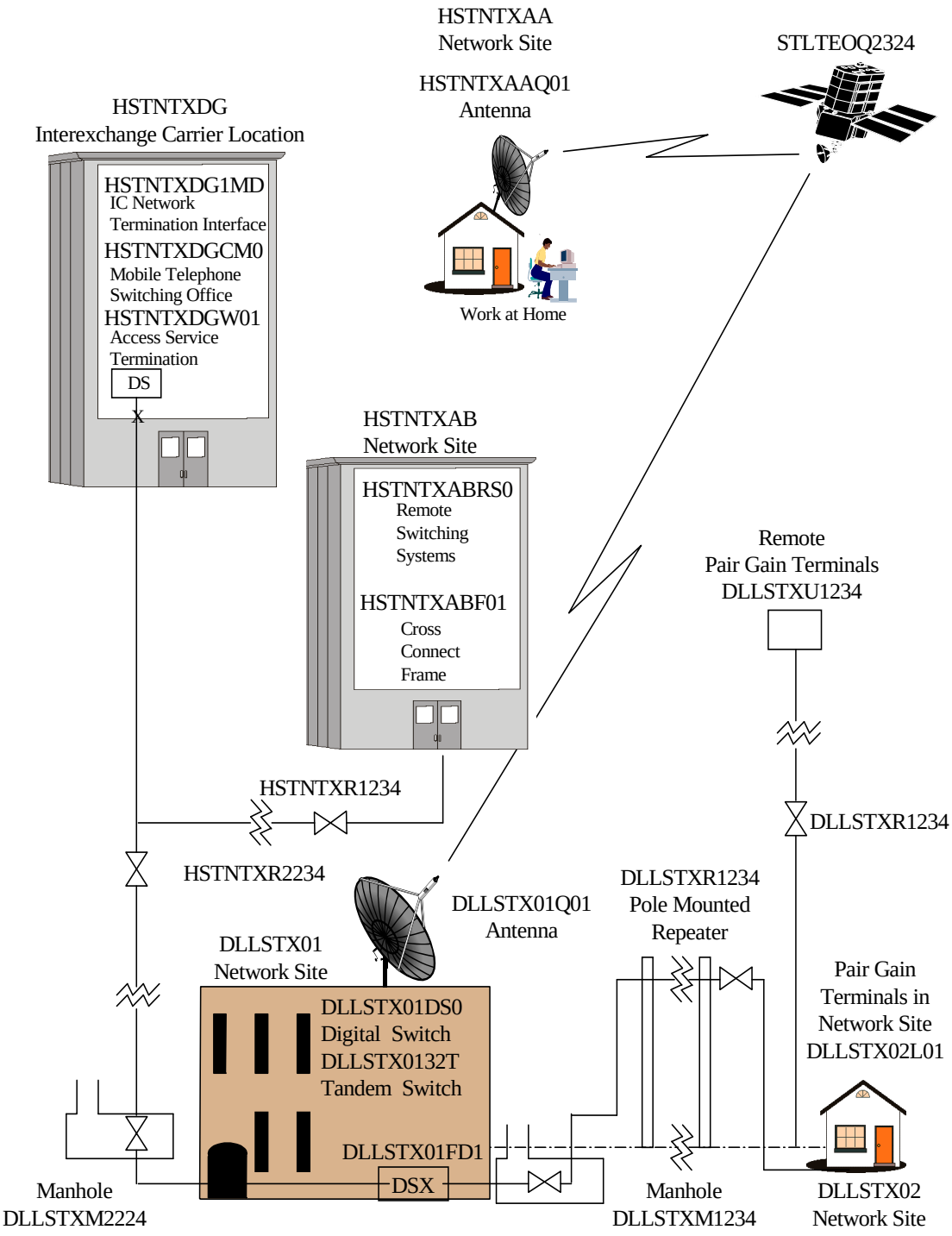


Figure 12 Typical Types of Network Locations Requiring CLLI Codes

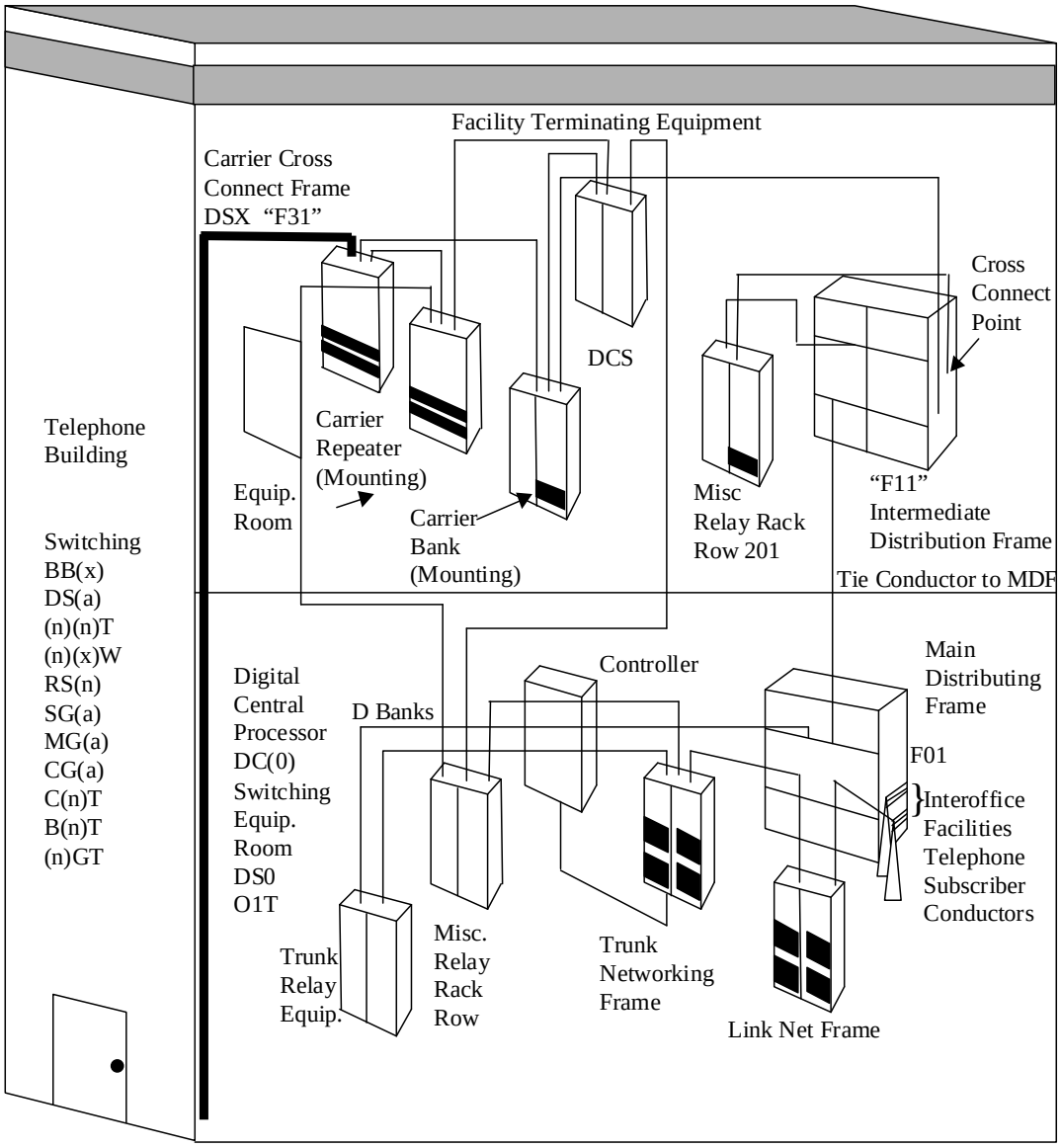


Figure 13 Central Office (CO) Network Entity Coding

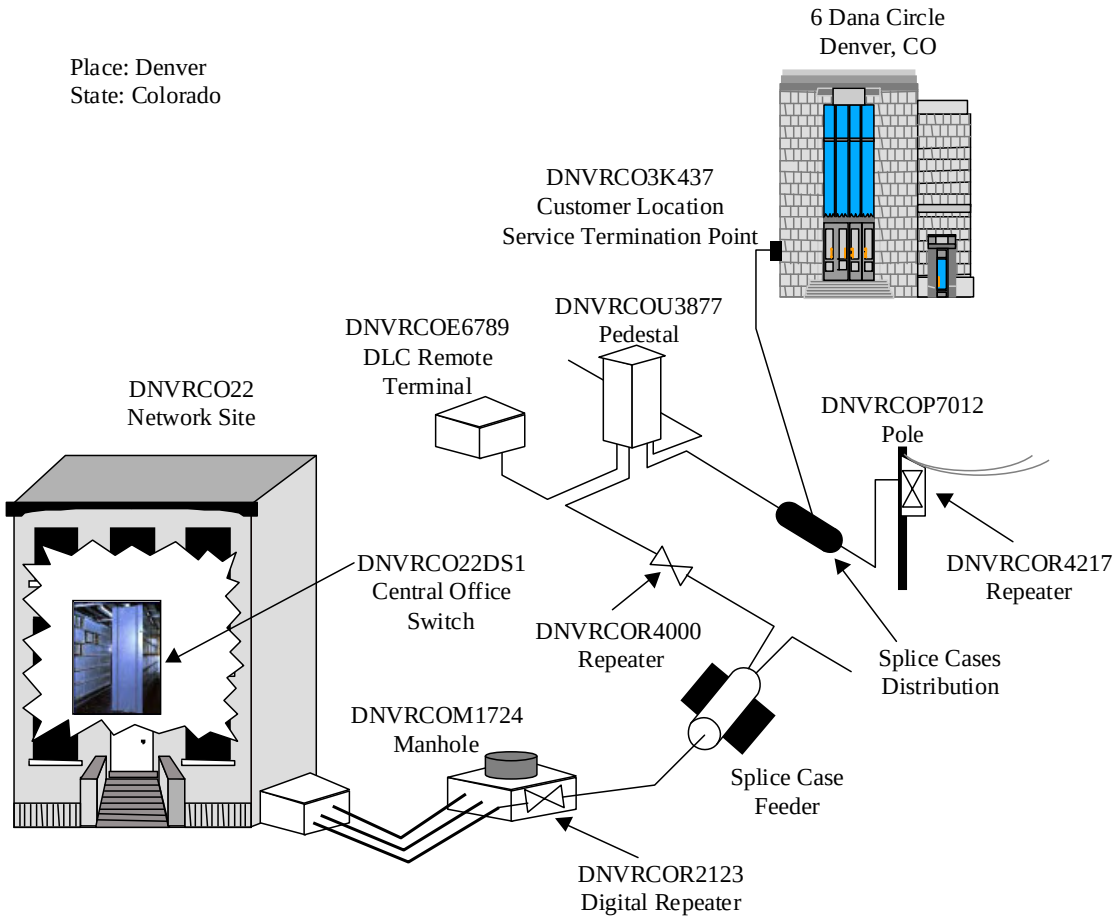


Figure 14 Distribution Network - Digital Loop Carrier

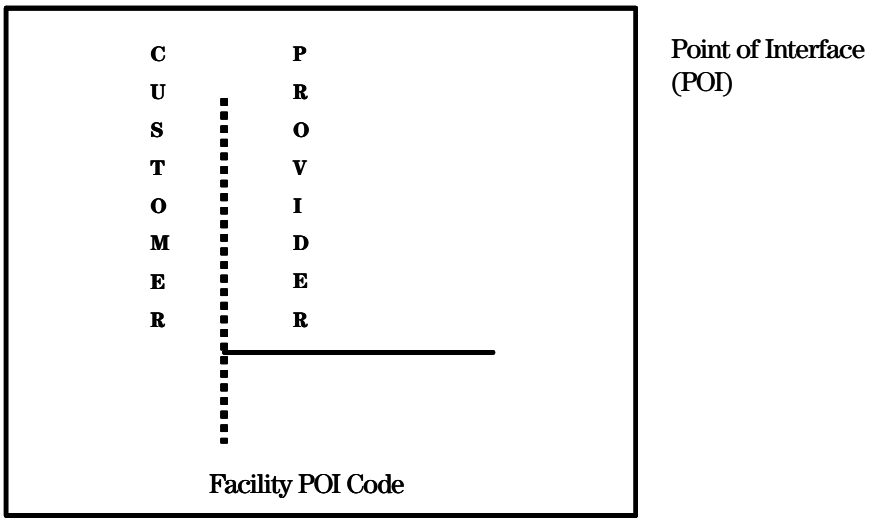


Figure 15 Interconnection/Point of Interface Coding – Customer Provider Facility Connection

A POI between a provider and its customer may occur at several different types of locations (e.g., customer switch location, ILEC central office, mid-span meet-point location, IXC POP, etc.). The physical locality of a POI is determined by various means including a tariff, or an interconnection agreement or contract between a provider and its customer.

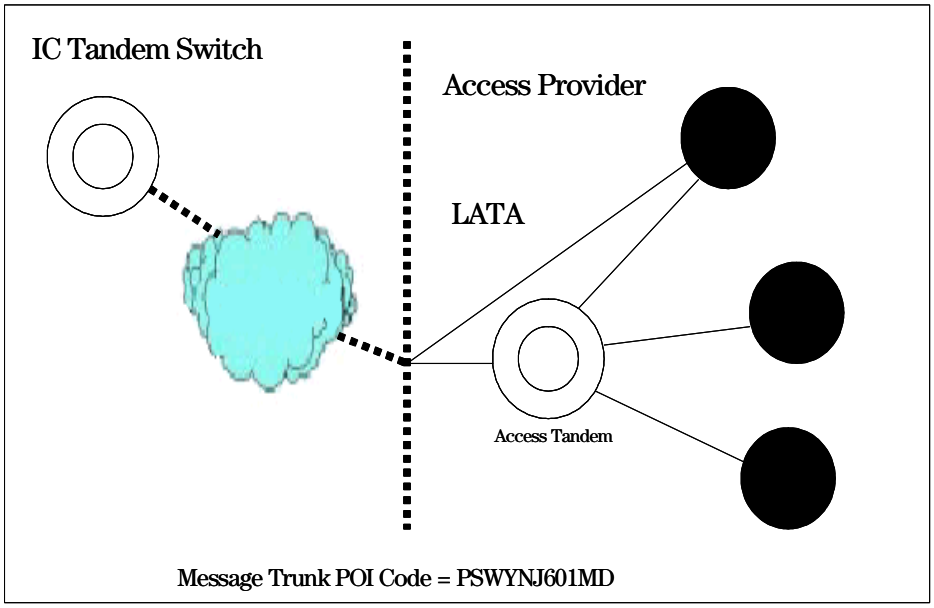


Figure 16 Interconnection/Point of Interface Coding – Non Dial Tone Customer Interconnection with Access Service Provider

In Figure 16-16, the non-dial tone customer requires the Service Provider to provision trunks to a Point of Interface (POI) Code. One Point of Interface (POI) Code is assigned to this customer at the network site (identifying the customer's name) to associate the trunks that are provisioned with the name of the customer.

A POI between a provider and its customer may occur at several different types of locations (e.g., customer switch location, ILEC central office, mid-span meet-point location, IXC POP, etc.). The physical locality of a POI is determined by various means including a tariff, or an interconnection agreement or contract between a provider and its customer.

= End Office Switch = Tandem Switch

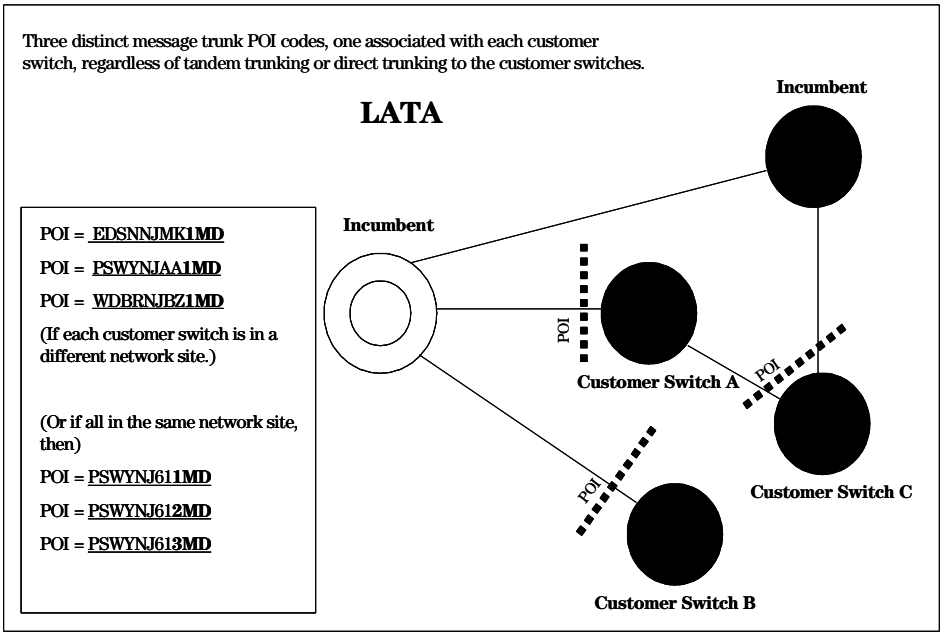


Figure 17 Interconnection/Point of Interface Coding

Point of Interface Code requirements for dial tone customer with Direct Trunking to incumbent former Bell Company Service Provider.

A POI between a provider and its customer may occur at several different types of locations (e.g., customer switch location, ILEC central office, mid-span meet-point location, IXC POP, etc.). The physical locality of a POI is determined by various means including a tariff, or an interconnection agreement or contract between a provider and its customer.

= End Office Switch = Tandem Switch

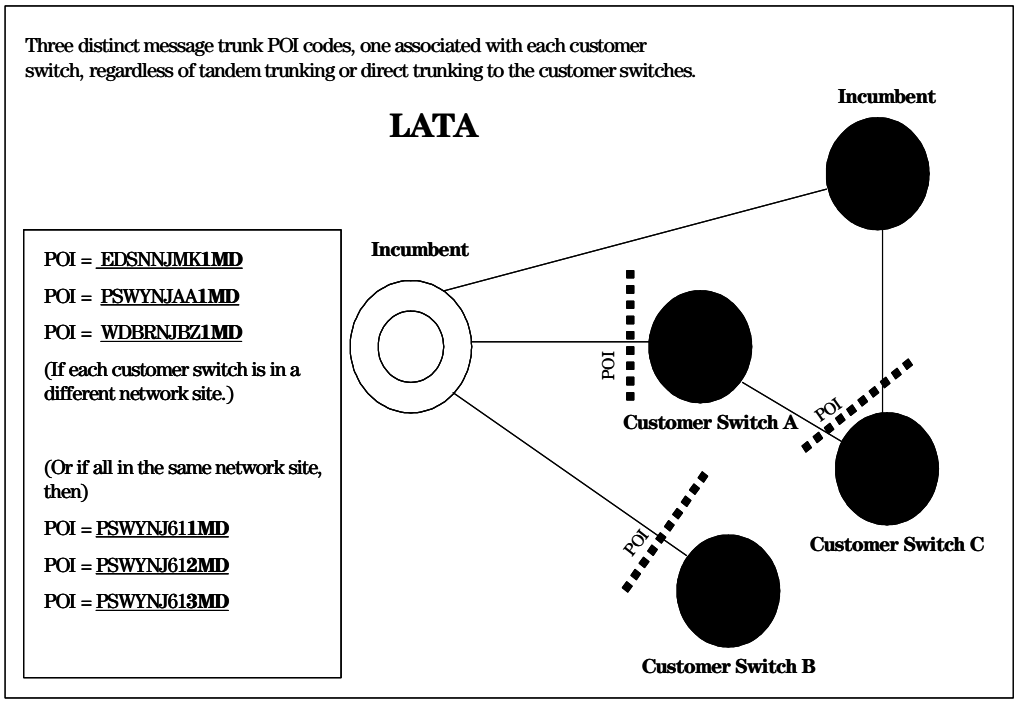


Figure 18 Interconnection/Point of Interface Coding – Dial Tone Customer Interconnection with Service Provider

A POI between a provider and its customer may occur at several different types of locations (e.g., customer switch location, ILEC central office, mid-span meet-point location, IXC POP, etc.). The physical locality of a POI is determined by various means including a tariff, or an interconnection agreement or contract between a provider and its customer.

CSL – Customer Switch Location = End Office Switch = Tandem Switch

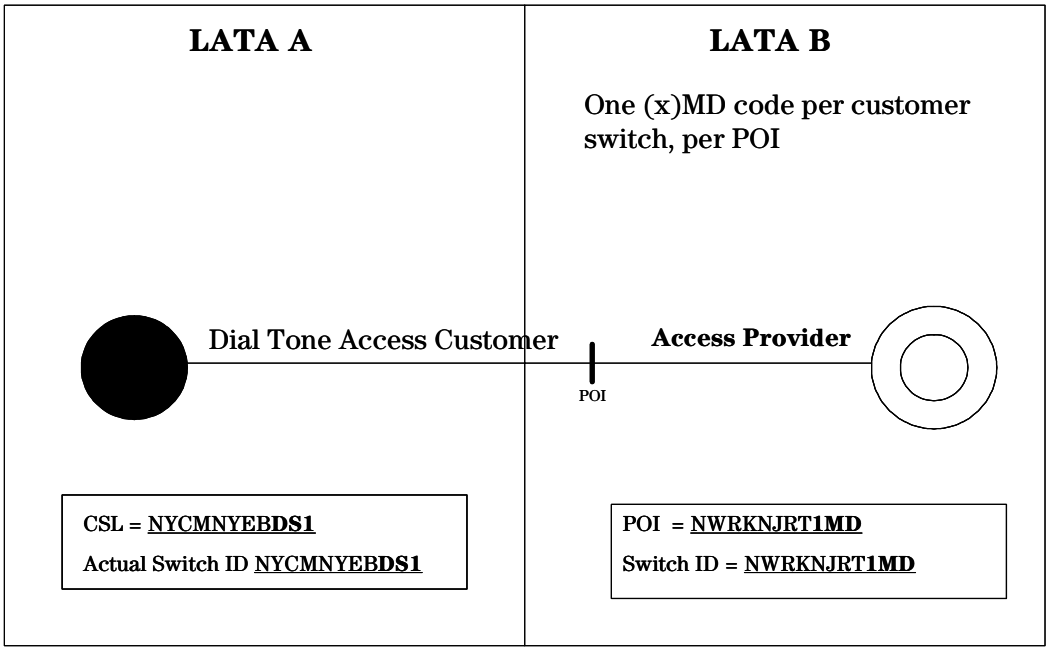


Figure 19 Dial Tone Customer Interconnection with MFJ-Restricted Service Provider in Different LATAs

A POI between a provider and its customer may occur at several different types of locations (e.g., customer switch location, ILEC central office, mid-span meet-point location, IXC POP, etc.). The physical locality of a POI is determined by various means including a tariff, or an interconnection agreement or contract between a provider and its customer.

CSL – Customer Switch Location = End Office Switch = Tandem Switch

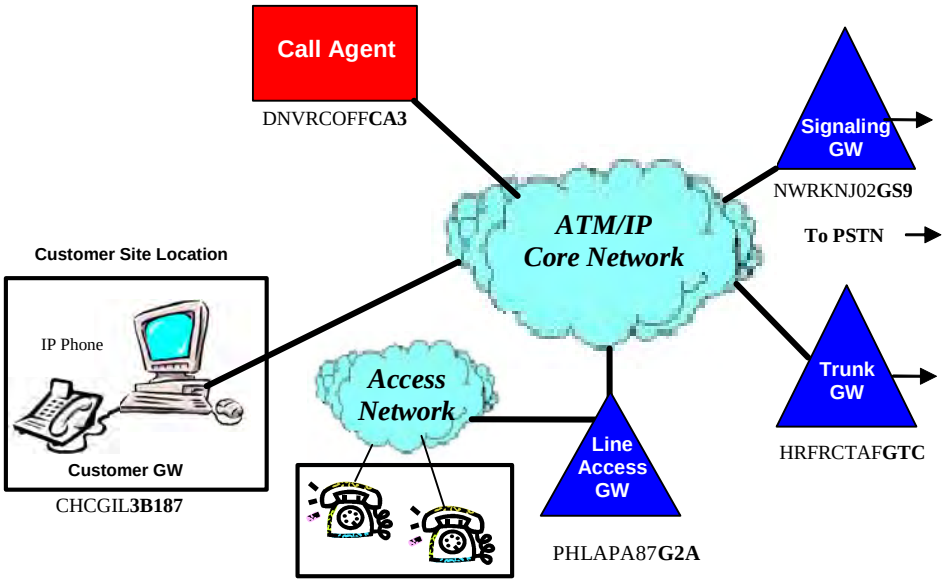


Figure 20 VoIP Packet End Office Network Architecture

Figure 16-20 shows the main functional elements in the VoP architecture. The VoP architecture relies on a core network and an access network for providing the necessary connectivity and transport. The core network is the packet transport network that provides connectivity to the functional elements in the VoP network. The access network represents the local loop network of the VoP. There are various ways of offering access to the VoP network. The access network could be based on the existing copper plant of local exchange carriers or could use other technical options such as hybrid fiber-coax (HFC), digital subscriber loop (xDSL), etc.

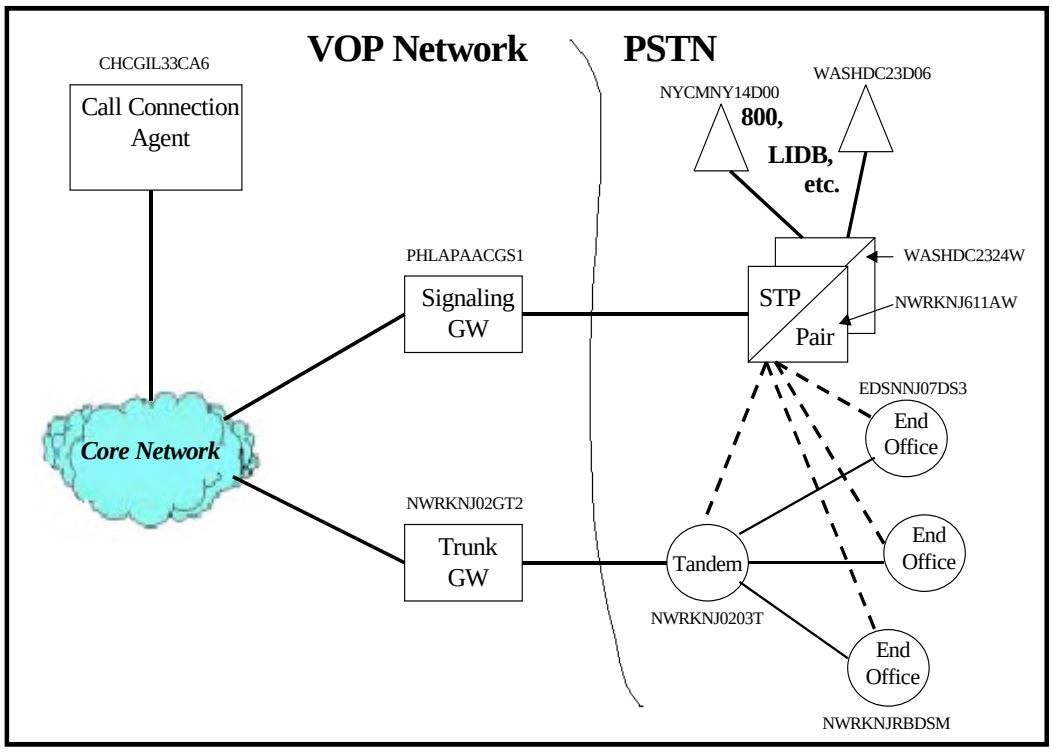


Figure 21 Interconnection to PSTN

Figure 16-21 presents the interconnection of the VoP network to the PSTN. Such an interconnection would be used to interconnect the VoP network to the PSTN of an Incumbent local exchange carrier or an interexchange carrier. The key network elements involved in this interconnection are the signaling gateway GS(n) and the trunk gateway GT(x), GR(x). The signaling gateway provides the interconnection to the PSTN signaling network and thus interconnects to STPs in the PSTN. The trunk gateway provides the trunk-side interface by interconnecting with the PSTN tandem.

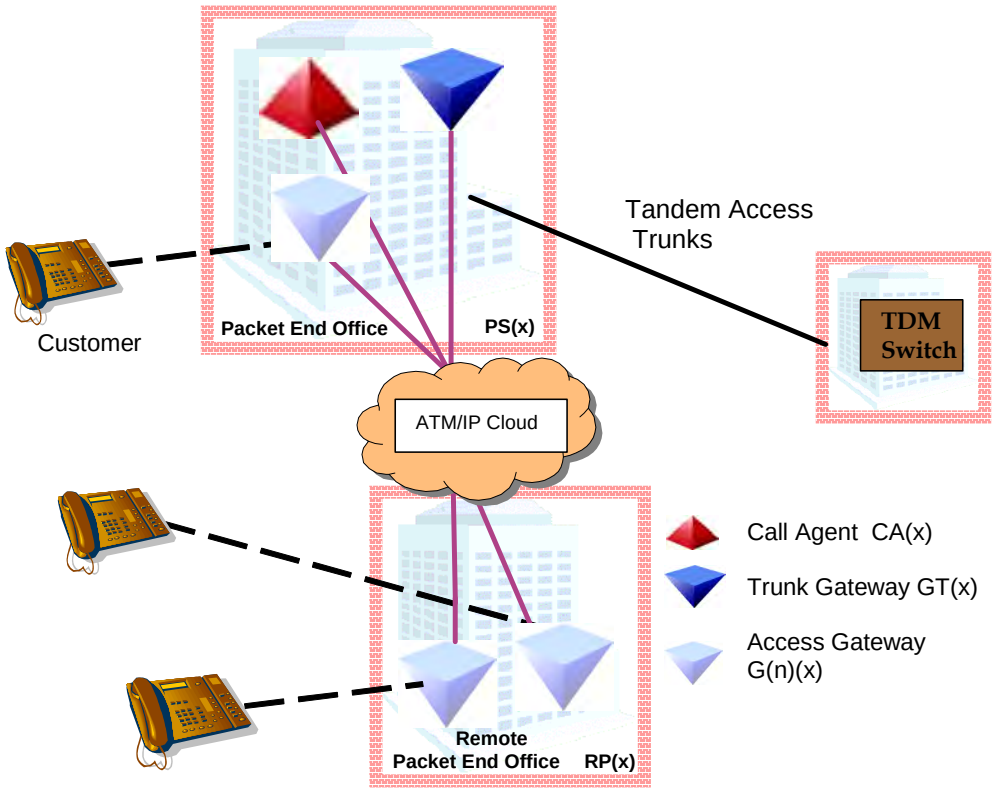


Figure 22 NGN Packet End Office

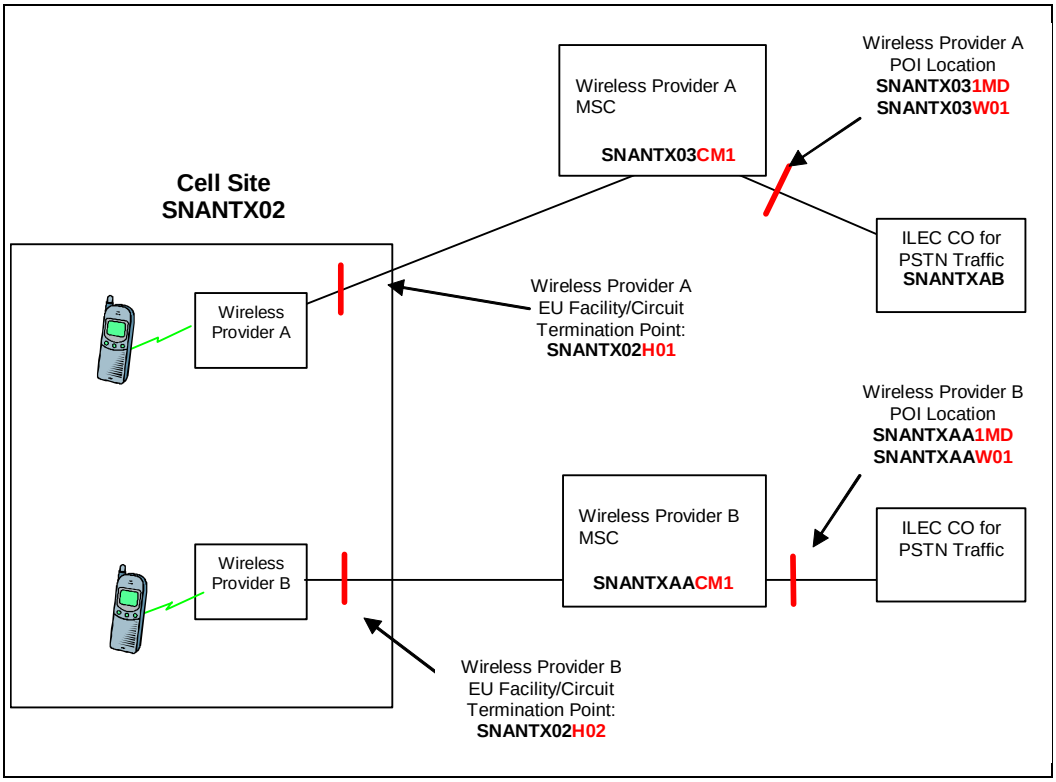


Figure 23 Cell Site CLLI Coding Guidelines

Wireless provider A and B mobile switching center (MSC) and facility/message trunk point-of-interfaces (POIs) are located at the MSC location. End-user facility/ circuit terminations are located at cell site location. Only one Network Site Code is assigned per cell site. Multiple H(x)(x) Entity Codes are used to identify each end-user facility/circuit termination point.

All cell sites consist of base transceiver (BTS) equipment; therefore it is recommended that the BTS equipment be coded with the appropriate Q(n)(n) Network Entity Code. This code identifies the BTS functionality and also acts as a cell site indicator for that location.

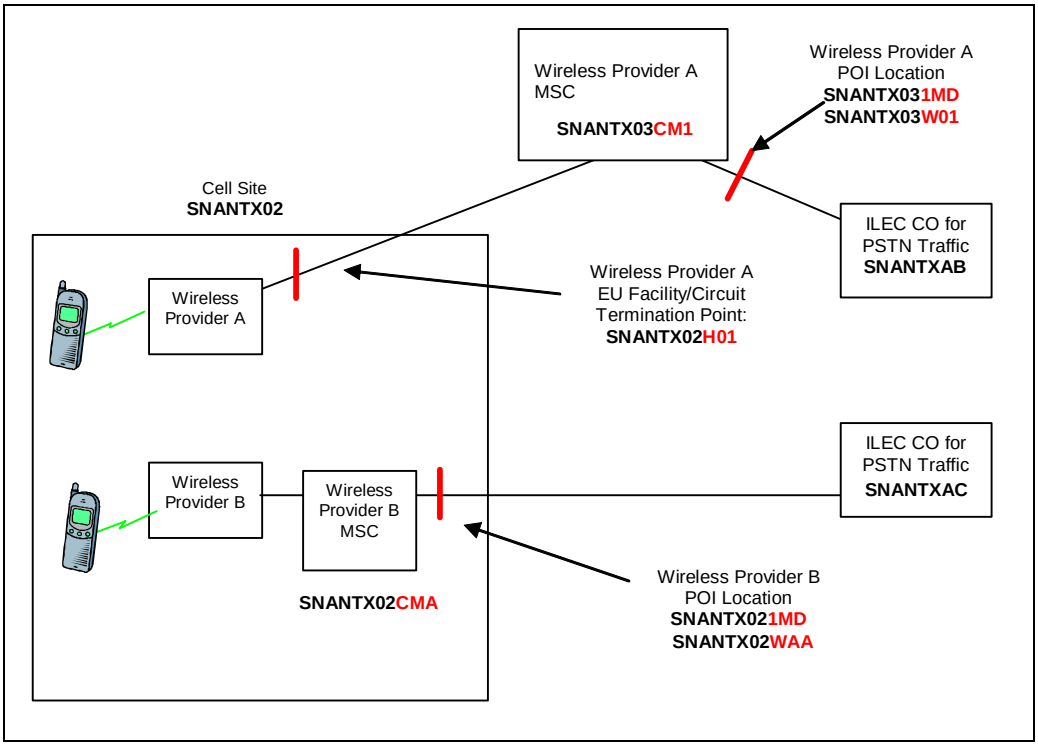


Figure 24 Cell Site CLLI Coding Guidelines

Top scenario- wireless provider A mobile switching center and facility/message trunk point-of-interfaces (POIs) are located at the MSC location.

Bottom scenario -wireless provider B mobile switching center and facility/message trunk POIs are located at a cell site location. Wireless provider B switch is originally provisioned at the cell site location or on a rare occasion, is moved from its central office location to a cell site and is treated as a disconnect/reconnect.

All cell sites consist of base transceiver (BTS) equipment; therefore it is recommended that the BTS equipment be coded with the appropriate Q(n)(n) Network Entity Code. This code identifies the BTS functionality and also acts as a cell site indicator for that location.

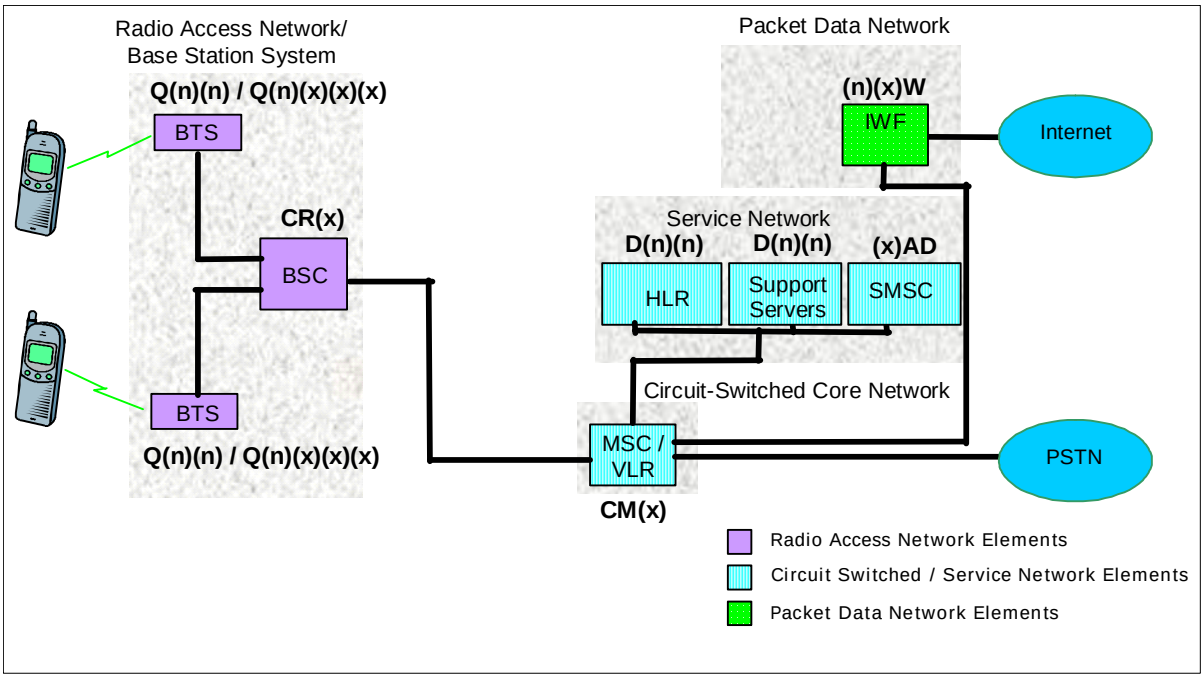


Figure 25 CDMAOne Network Architecture

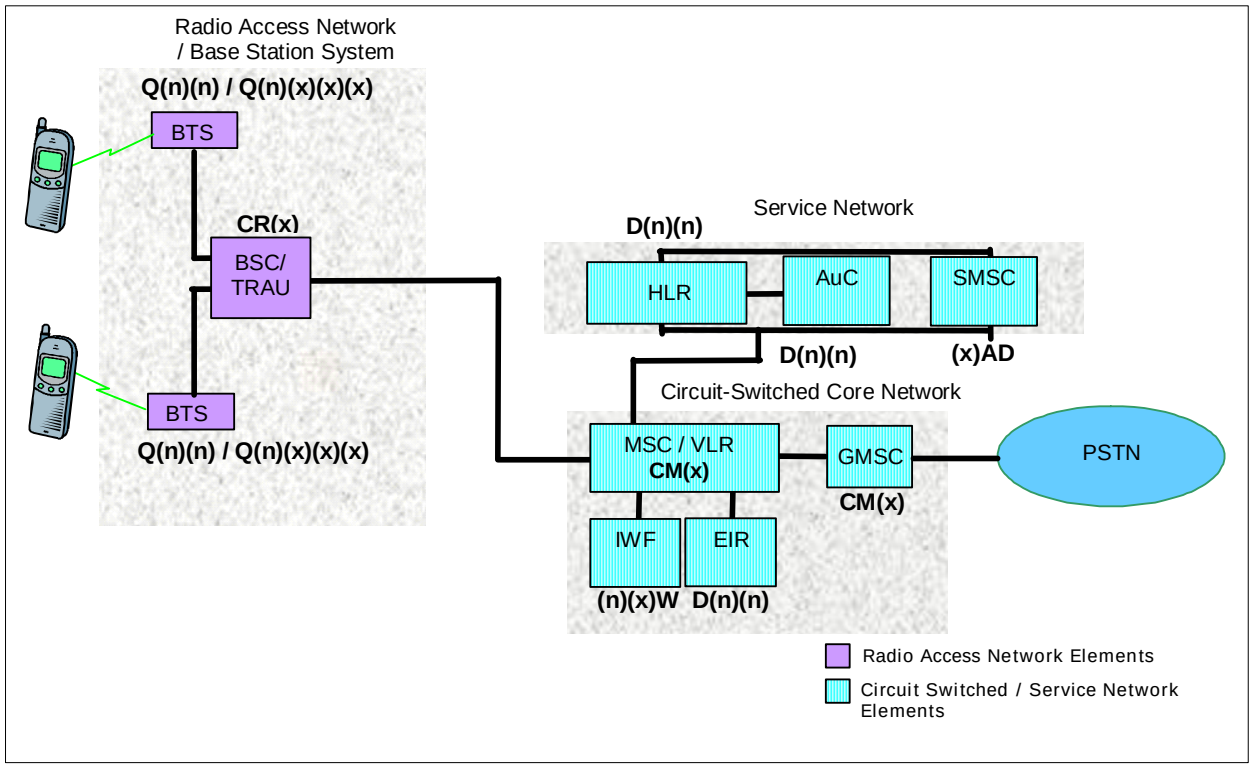


Figure 26 GSM Network

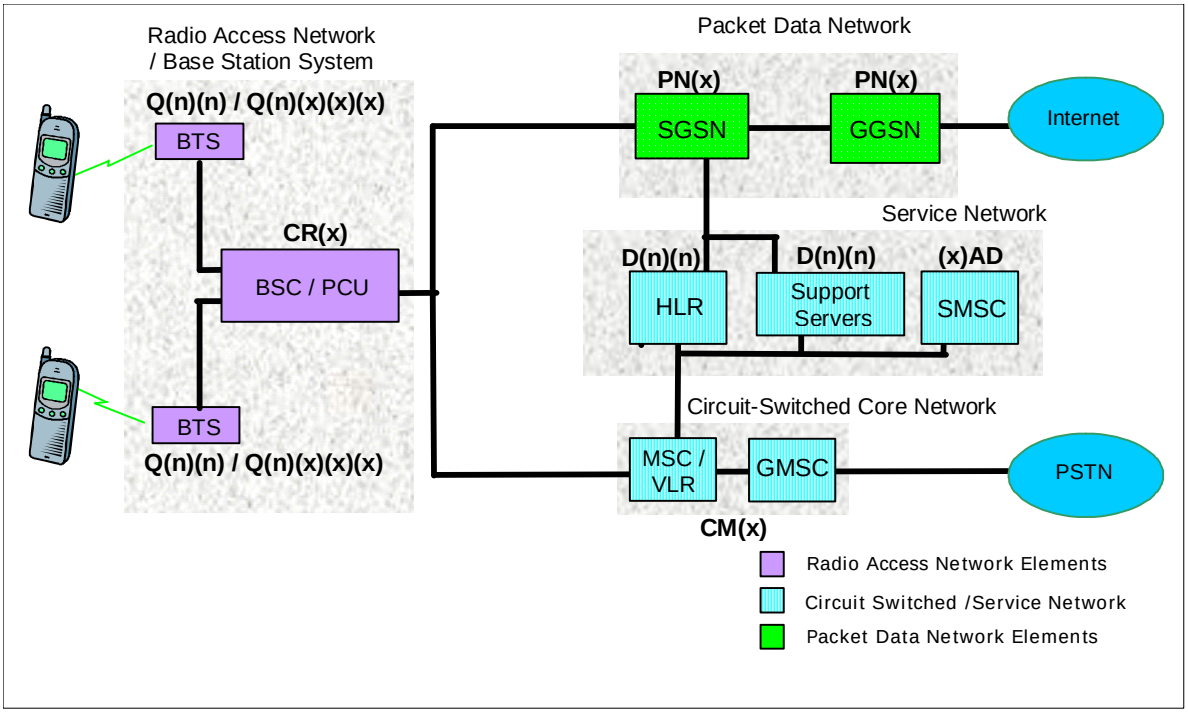


Figure 27 GPRS/EDGE Network

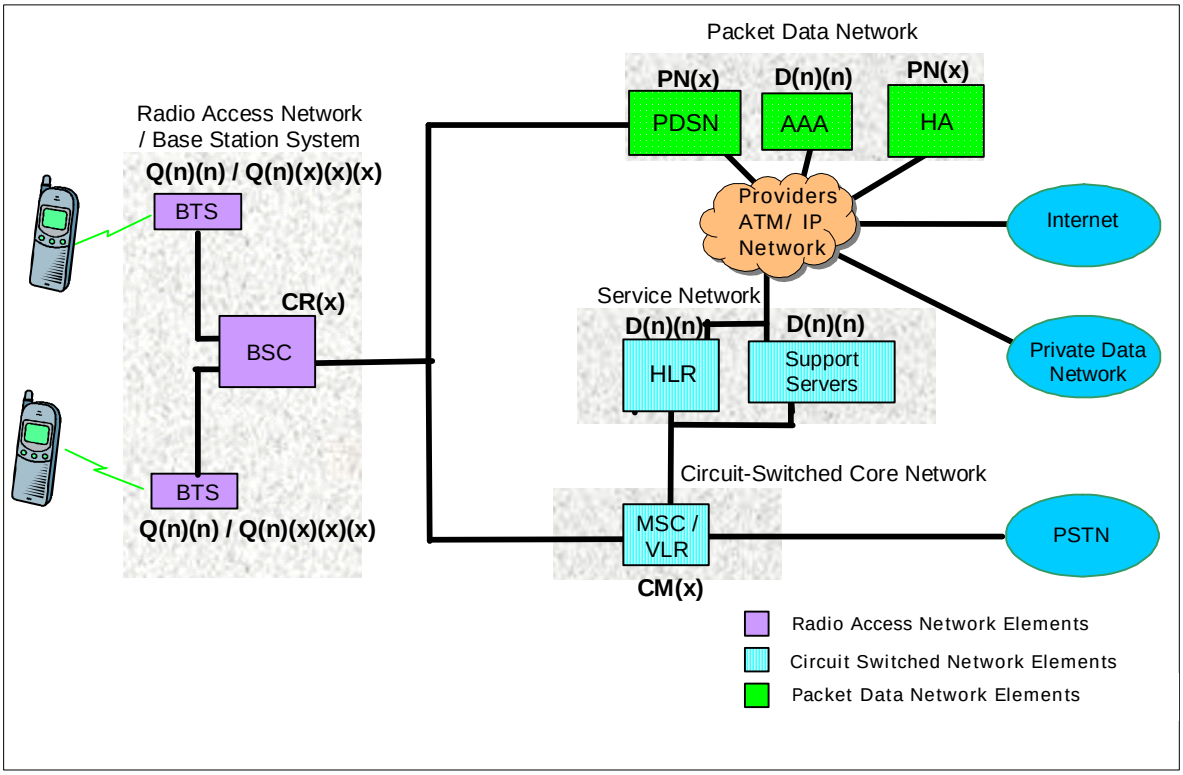


Figure 28 CDMA2000 1x Architecture

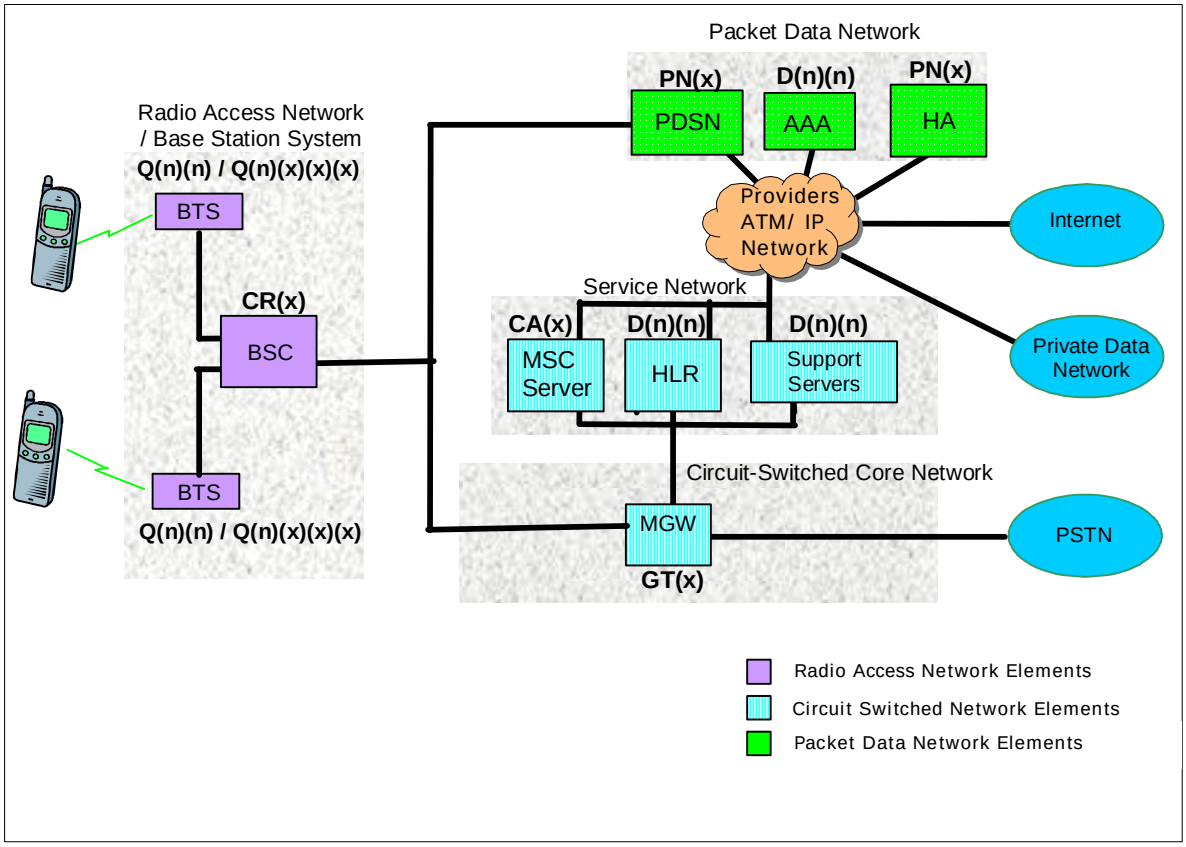


Figure 29 CDMA2000 3x Architecture

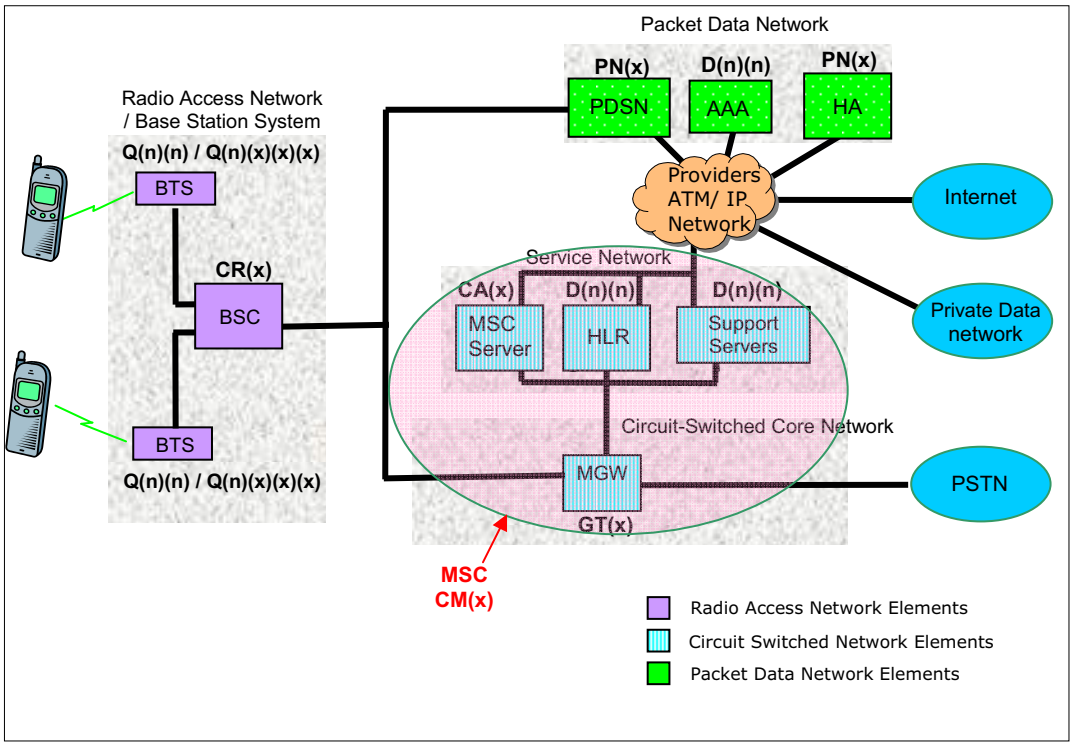


Figure 30 CDMA2000 3x Architecture - CM(x) Entity Code Idenitifies MSC Function of a Distributed MSC Architecture

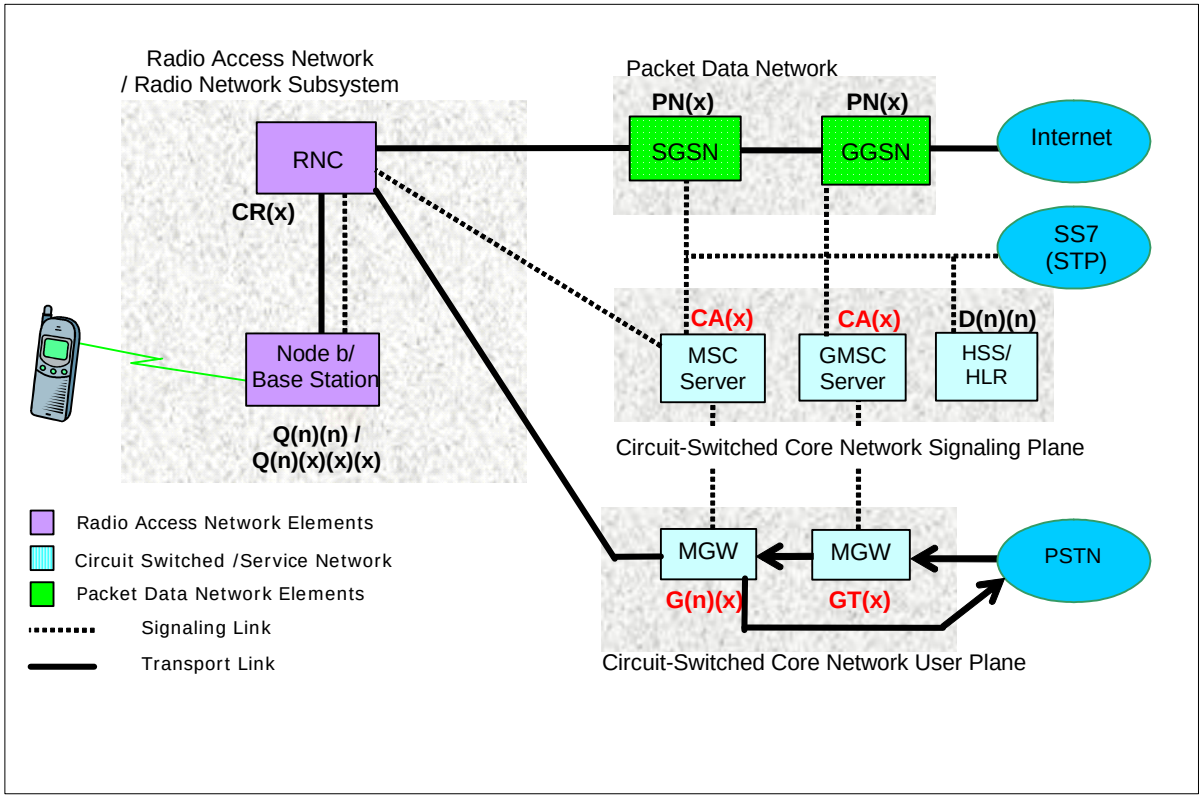
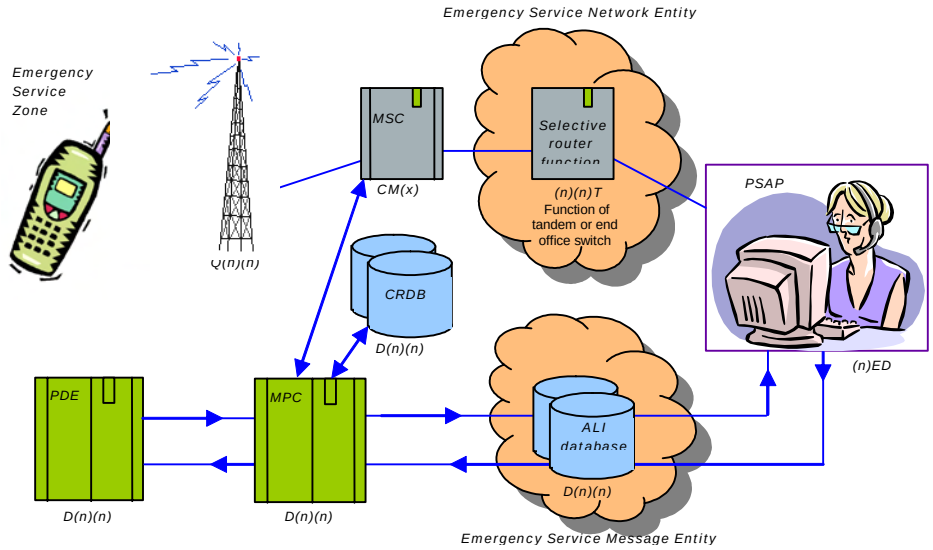


Figure 31 WCDMA Network Architecture 3GPP Release 4



ALI *Automatic Location Information*
CRDB *Coordinate Routing Database*
MPC *Mobile Positioning Center*

Figure 32 Location Based Services - Phase II Non-Call-Associated Signaling Wireless E911

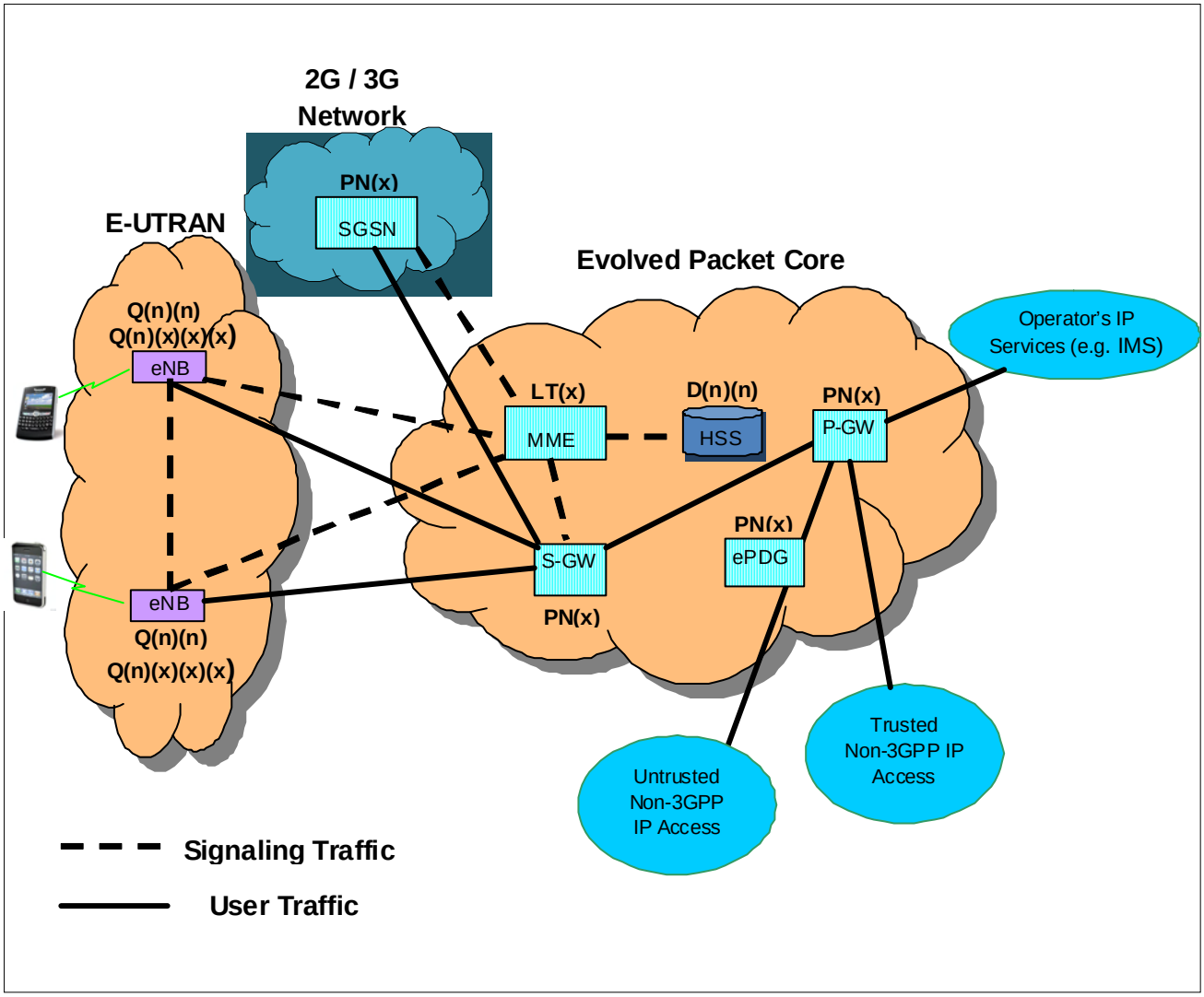


Figure 33 Long Term Evolution Network Architecture

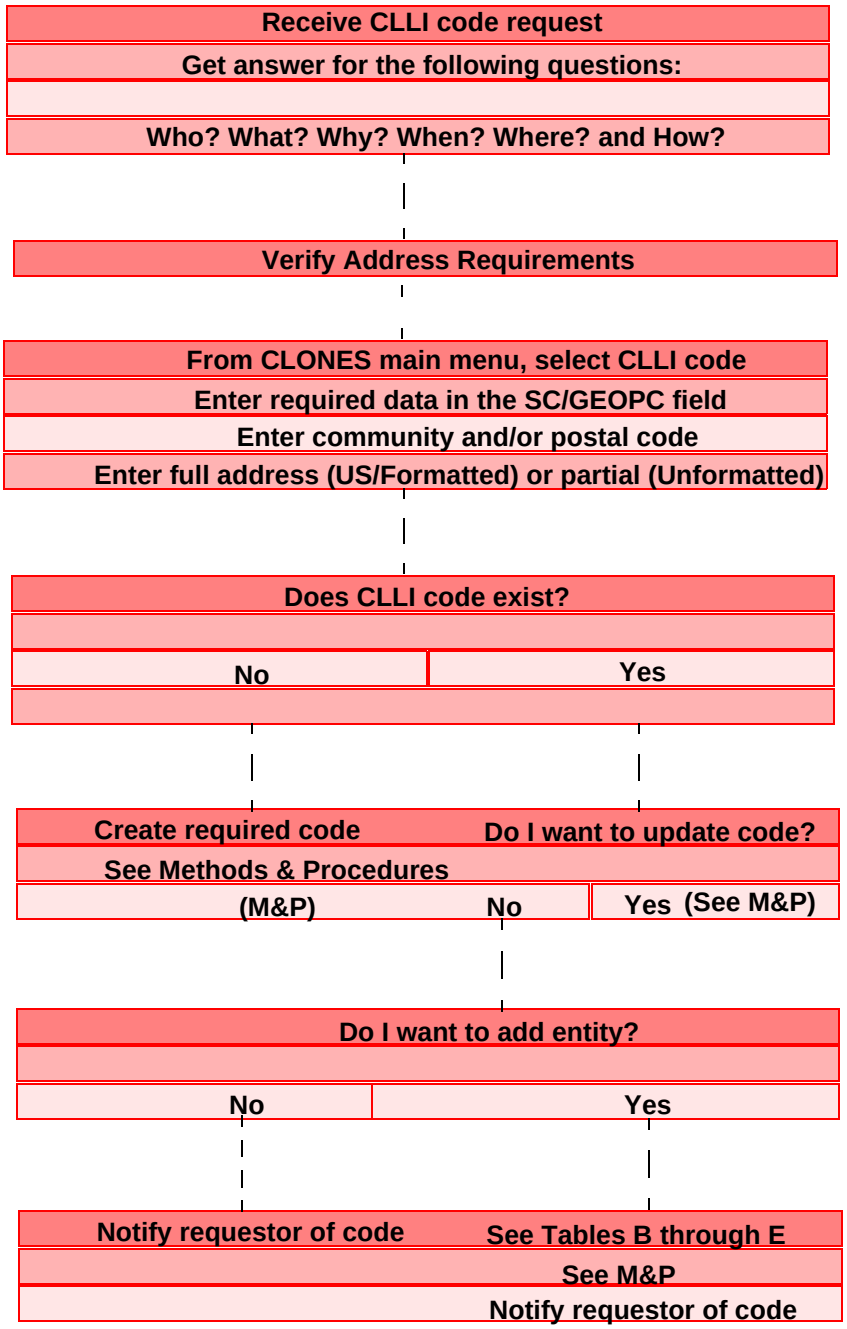


Figure 34 Location Coding Decision Flowchart

Code Structure	Character Position and Permitted Character Set				Refer to BR-795-100-100
	1-4	5-6	7-8	9-11	
Geographical Code	aaaa				Section 5
Geopolitical Code		aa			Section 6
Network Site Code			aa or nn		Section 7
Network Entity Codes				xxx	Section 8
Switching					Section 9
Switchboard/Desk					Section 10
Miscellaneous					Section 11
Nonswitching					Section 12
Network Support Site Code			anxxx		Section 13
Customer Site Code			naxxx		Section 14

Figure 35 CLLI Code Set Structure

17 CLLI Code Set Encoding Guide Tables

The following Telcordia documents provide additional reference information:

- BR-751-000-102, *COMMON LANGUAGE® Code Set Request Procedures*
- BR-751-100-050, *COMMON LANGUAGE® Geographical Code Description*
- BR-751-100-055, *COMMON LANGUAGE® Geopolitical Code Description and Listings*

Table A. Geopolitical Codes

States of the United States Codes			
Name	**Code**	**Name**	**Code**
Alabama	AL	Montana	MT
Alaska	AK	Nebraska	NE
Arizona	AZ	Nevada	NV
Arkansas	AR	New Hampshire	NH
California	CA	New Jersey	NJ
Colorado	CO	New Mexico	NM
Connecticut	CT	New York	NY
Delaware	DE	North Carolina	NC
District of Columbia	DC	North Dakota	ND
Florida	FL	Ohio	OH
Georgia	GA	Oklahoma	OK
Hawaii	HI	Oregon	OR
Idaho	ID	Pennsylvania	PA
Illinois	IL	Rhode Island	RI
Indiana	IN	South Carolina	SC
Iowa	IA	South Dakota	SD
Kansas	KS	Tennessee	TN
Kentucky	KY	Texas	TX
Louisiana	LA	Utah	UT
Maine	ME	Vermont	VT
Maryland	MD	Virginia	VA
Massachusetts	MA	Washington	WA
Michigan	MI	West Virginia	WV
Minnesota	MN	Wisconsin	WI
Mississippi	MS	Wyoming	WY
Missouri	MO		

U. S. Outlying and Pacific Ocean Territory Codes			
Name	**Code**	**Name**	**Code**
American Samoa	AM	Northern Mariana Islands	NN
Guam	GU	Puerto Rico, Commonwealth of	PR
Johnston Atoll	JH	Virgin Islands, of the U. S.	VI
Midway Island (Pacific)	MY	Wake Island (Pacific Ocean)	WK

Table A. Geopolitical Codes (Continued)

Federal District and States of Mexico Codes			
Name	**Code**	**Name**	**Code**
Aguascalientes	XA	Morelos	XO
Baja California	XB	Nayarit	XN
Baja California Sur	XQ	Nuevo Leon	XL
Campeche	XC	Oaxaca	OA
Chiapas	XP	Puebla	PB
Chihuahua	XH	Queretaro De Arteaga	QR
Coahuila	XD	Quintana Roo	QO
Colima	XK	San Luis Potosi	XU
Distrito Federal	DF	Sinaloa	XS
Durango	DU	Sonora	XR
Guanajuato	GJ	Tabasco	TA
Guerrero	XG	Tamaulipas	XT
Hidalgo	HG	Tlaxcala	XX
Jalisco	JA	Veracruz	VR
Mexico, Estado	XM	Yucatan	YU
Michoacan	XI	Zacatecas	ZC

Provinces and Territories of Canada Codes			
Name	**Code**	**Name**	**Code**
Alberta	AB	Nunavut	VU
British Columbia	BC	Ontario	ON
Manitoba	MB	Prince Edward Island	PE
New Brunswick	NB	(Province of) Quebec	PQ
Newfoundland and Labrador	NF	Saskatchewan	SK
Northwest Territory	NT	Yukon Territory	YT
Nova Scotia	NS		

Table A. Geopolitical Codes (Continued)

Unique Location Codes					
Unique Name	**Geographical Code**	**Geopolitical Code**	**Unique Name**	**Geographical Code**	**Geopolitical Code**
Satellite	STLT	EO	Mediterranean Sea	MDTS	HS
Arctic Ocean	ARON	HS	North Sea	NRHS	HS
Atlantic Ocean	ATON	HS	Pacific Ocean	PCON	HS
Bering Sea	BRGS	HS	Red Sea	RDSE	HS
Caribbean Sea	CRBS	HS	South China Sea	SCHS	HS
Gulf of Mexico	GLMX	HS	Tyrrhenian Sea	TRNS	HS
Indian Ocean	INON	HS			

Country Codes	
Country Name	**Code**
Italy	IT
Malaysia	ML
Netherlands	NL
Other Countries	*
Spain	SP
Venezuela	VE

For all other countries, please reference BR-751-100-055.

Table B. Network Switching Entity Codes

Entity Type (BR Section 9)	Entity Code - Single/ Complete	Entity Code - Multiple
Switch/End Office		
Crossbar	MG(n)	MG(a[1])
Step-By-Step	SG(n)	SG(a[1])
Electronic Analog	CG(n)	CG(a[1])
Electronic Digital *Overflow Code*	DS(x[1]) D(x[4])S	
Remote Switching System *Overflow Code*	RS(n) R(n)(n)	RS(a[1])
End Office - NXX Code	(n)(n)(n)	(n)(n)(a[2])
Tandem Office		
Individual Tandem *Overflow Code*	(n)(n)T (n)TT (n)AT (n)BT (n)CT	
Tandem/Tandem		C(n)T
Tandem/Switchboard		B(n)T
Tandem/Operator Services/End Office		(n)GT
Electronic Tandem Private Network	ET(n)	
Packet Tandem Switch	G(x)T	
Multi Function-Combination Switch	DC(x[6])	
Digital Packet Device	(n)(x)W	
ATM Switch *Overflow code*	BB(x[1]) B(a[3])(n)	
Call Agent/Mobile Switching Center Server (MSC Server)	CA(x[1])	
Packet End Office - comprised of both line/ access and trunk gateway(s), and is associated with a call agent	PS(x[7])	
Remote Packet End Office - comprised of line/access gateway(s) and is associated with a call agent	RP(x)	
Video - Analog/Digital	VS(n)	
Wireless/Mobile Switch • Mobile Switching Center (MSC)/Mobile Telephone Switching Office (MTSO) • Paging Control Terminal e.g., Bellboy • Radio Common Carrier (RCC) terminal	CM(x[1])	
Special Switching Applications		
CCSA/SS6/EPSCS	Z(a)Z	
Access Circuit in LEC by an IC	(n)(n)C	
Optical Switch	OS(x[1])	

Table Notes - See Page 17-10.

Table C. Network Switchboard and Desk Entity Codes

Entity Type (BR Section 10)	Code
Combined Toll, DSA, and CAMA Board	(n)BB
Dial Service Assistance (DSA) board, e.g., #13C Board	(n)DB
Directory Assistance (Information) and Completion Board e.g., #23 board	(n)IB
Traffic Operator Position System (TOPS), Operator Service Position System (OSPS), or Operator Concentrator board	(n)JB
Manual Board	(n)MB
Telephone Company Private Branch Exchange (PBX) Board, e.g., #608A board	(n)PB
Combined Director Assistance, Intercept, and Completion Board, e.g., #23 board	(n)QB
Universal Traffic Service Position (TSP) Board	(n)UB
Auxiliary Board or other Switchboard and Desk Entities	(n)ZB
Teleconference Board	(n)(n)B

Note: Network switchboard and desk entities are always identified by the alpha B in character position 11.

Table Notes - See Page 17-10.

Table D. Miscellaneous Network Switching Network Entity Codes

Entity Type (BR Section 11)	Code
Announcement Machine - *See Notes* *Overflow Code* Voice or Message Storage Systems Interactive Voice Systems Public Announcements Mass Calling Announcements Audio Response Systems Time and Weather Short Message Service Center (SMSC) Multimedia Messaging Service Center (MMSC)	(x)AD (x)BD
Central Office Centrex	(x)XD
Combined Operator, Trouble, and Machine Intercept (e.g., #6A desk)	(n)ND
Distributors - See Notes Time Weather Automatic Other, e.g., sports results board	 (n)TD (n)WD (n)CD (n)DD
Emergency (911 Service)	(n)ED
Gateways **Line/Access Gateway -** Interface between PSTN line service and VoP network, associated with a specific Call Agent. **Signaling Gateway** - Interconnection between PSTN SS7 and VoP network, associated with a specific Call Agent. **Trunk Gateway** - Interface between PSTN trunk facility and VoP network, associated with a specific Call Agent. Overflow Code	 G(n)(x^5) GS(n) GT(x^5) GR(x^5)
Intercept, e.g., File Access System (FAS)	(n)ID
LTE Mobility Management Entity (MME)	LT(x^1)
Message Trunk Interface *Overflow Code* *Overflow Code* *Overflow Code* *Overflow Code* *Overflow Code*	(x)MD X(x)X X(x)Y X(x)Z (n)(n)Z Y(x)X
Position Link Frame	(n)PD
Rate and Quote System	(n)QD
TSPS Common Control Unit and associated Remote Trunking Arrangement (RTA) or Tandem Connection	(x)UD
Wireless Packet Data Node Serving GPRS Support Node (SGSN) Gateway GPRS Support Node (GGSN) Packet Data Serving Node (PDSN) Home Agent (HA)	PN(x^4)

Table Notes - See Page 17-10.

Table E. Nonswitching Network Entity Codes

Entity Type (BR Section 12)	Code
Administrative Group	A(x)(x^2)
International Access Point, gateway between countries.	B(n)G
Session Border Controller/Border Element	BS(n)
Base Station Controller (BSC)/Radio Network Controller (RNC)	CR(x)
Concentrator, e.g., DSS/DSC, Intercept Concentrator	CT(x^1)
Processor/Server Grouping ● OAM&P Processing Equipment ● Performance monitoring Equipment ● Service Control Point. (SCP) ● Firewall Equipment ● Wireless Processing Equipment —Home Location Register (HLR) —Authentication, Authorization, and Accounting (AAA) Server —Authentication Center (AuC) —Equipment Identity Register (EIR) —Mobile Positioning Center (MPC) Server —Position Determiniation Entity (PDE)	D(n)(n)
Distribution Node (Cable TV)	DN(n)
Frames, e.g., Distributing Frames (DF) ● Main (MDF), Intermediate (IDF), Toll (TDF), Line (LDF), Wall (WDF), etc. ● High Frequency Cabinets ● Digital Signal Cross-Connect, e.g., DSX-0, DSX-1, etc. ● Fiber Distribution Panel (FDP)	F(x)(x^2)
Miscellaneous Nonswitching Entity ***Overflow*** ● Collocation ● Network Channel Terminating Equipment (NCTE) ● Channel Banks or Multiplexer Equipment ● Cellular Carrier Cell Site Equipment ● "U" point in an ISDN Application ● HICAP Facility Terminations, e.g., fiber, cable	H(x)(x^2) I(n)(x^2) I(a)(x^2)
Facility/Circuit Point of Interface at an Outside Plant Location	J(x)(x^1)
Software Cross-Connectable Entities, e.g., DCS	K(x)(x^2)
Pair Gain Central Office Terminals *Overflow Code*	L(n)(n) LZ(x^1)
Personnel Support Centers - OAM&P (Ordering, Administrtation, Maintenance and Provisioning)	M(x^3)(x^2)

Table E. Nonswitching Network Entity Codes (Continued)

Entity Type (BR Section 12)	Code
Customer Premises Equipment (CPE) *Overflow Code*	N(x)(x^2) CP(x^1)
Passive Optical Network (PON) Optical Line Terminal (OLT)	OL(x^1)
Miscellaneous Optical Equipment	O(n)(x^2)
Wireless LAN Access Point	PW(x^1)
Base Transceiver Station/Radio Equipment	Q(n)(n)
Repeaters/Regenerators	RG(x)
Remote Line Termination	RL(n), RL(a)
Facility/Circuit Point of Interface (POI)	W(x)(x^2)

Table Notes - See Page 17-10.

Table F. Network Support Site Code

Location Type (BR Section 13)	Code
International Boundary or Crossing Points	B(n)(x)(x)(x)
End points	E(n)(x)(x)(x)
Fiber Node	F(n)(x)(x)(x)
Junctions	J(n)(x)(x)(x)
Manholes	M(n)(x)(x)(x)
Poles	P(n)(x)(x)(x)
Base Transceiver Station/Radio Equipment	Q(n)(x)(x)(x)
Repeater Locations	R(n)(x)(x)(x)
Toll Stations	S(n)(x)(x)(x)
Other Nonbuilding Locations	U(n)(x)(x)(x)
Wireless Access Point	W(n)(x)(x)(x)

Table Notes - See Page 17-10.

Table G. Customer Site Code

Location Type (BR Section 14)	Code
Customer Site	(n)(a)(x)(x)(x)

Table Notes - See Page 17-10.

Table Notes

- Upper case alphas are required wherever indicated.
- Parentheses enclosing lower case alphas indicate that user assignment is required.
- Where specific alphas are not permitted in certain character positions, they are identified by a superscript, e.g., (a^1), (a^2), (x^1), (x^2), (x^3).
- (a) indicates any alpha A-Z may be used.
- (n) indicates any numeric 0-9 may be used.
- (x) indicates any alphanumeric A-Z or 0-9 may be used.
- (a^1) indicates alpha A-Z may be used, except alphas B, D, I, and O.
- (a^2) indicates alpha A-Z may be used, except alphas B, C, D, I, O, T, W, and Z.
- (a^3) indicates alpha A-Z may be used, except alpha B.
- (x^1) indicates alphanumeric A-Z or 0-9 may be used, except alphas B, D, I, and O.
- (x^2) indicates alphanumeric A-Z or 0-9 may be used, except alphas B and D.
- (x^3) indicates alphanumeric A-Z or 0-9 may be used, except alpha G.
- (x^4) indicates alphanumeric A-Z or 0-9 may be used, except alpha S.
- (x^5) indicates alphanumeric A-Z or 0-9 may be used, except alphas B, D, I, O, and T.
- (x^6) indicates alphanumeric A-Z or 0-9 may be used, except alphas B, D, I, O, and S.
- (x^7) indicates alphanumeric A-Z or 0-9 may be used, except alphas C, I, O, and P.
- For Tables F and G, values 0-9 should be exhaused before using A-Z.

18 Glossary

Access Customer (AC) - H(x)(x) or W(x)(x) — AC applies to all customers of an access provider that order services from the access tariff, includes all carriers (ICs, ISPs, OSPs, etc.) licensed to provide private line voice, data, and video.

Access Customer Terminal Location (ACTL) - (x)MD or W(x)(x) — Identifies the COMMON LANGUAGE location where an interexchange carrier (IC) interLATA facilities are terminated for connection to an exchange carrier (EC) for access services.

Access Provider (AP) see EC, LEC — A telecommunications carrier that provides access services.

Access Service (Table D or E) — The ability to enter or exit a local exchange network to originate or complete an interLATA, interstate, or international call.

Access Services - (x)MD or W(x)(x) — Fundamental services provided by an *Access Provider (AP)* to an *Interexchange Carrier (IC)* for AC customers. The FCC ruled that both message and private line interstate interLATA toll traffic are access service. Access rates apply and are under FCC jurisdiction. Two categories of access services are as follows:

- Switched access services are those services identified as feature group B, C, or D. (Trunk-side termination from an AP switch to an IC point of termination.)
- Nonswitched access services include special access or private line, feature group A, HICAP (a high capacity facility configuration), switched special services, or switched WATS.

Access Tandem - (n)(n)T — A switching machine that enables local exchange carriers (LECs) to provide interexchange carrier switched access. Access tandems also provide equal access for nonconforming end offices. The access tandem provides the interexchange carrier with access to more than one end office within a LATA.

Access Tariff — A service tariff for LECs to offer premises-to-premises service within the LATA where intervening facilities are not specified. It gives the LEC rearrangement rights to substitute wire and carrier facilities for each other as long as overall transmission limits are met. Access tariffs are filed with the FCC to cover services to be used for interstate traffic with state commissions to provide services to be employed for intrastate applications.

Advanced Intelligent Network (AIN) - D(n)(n) — A service-independent architecture that allows a LEC and LEC customers to quickly and economically create and modify telecommunications services for its subscribers. The AIN architecture includes functionality for network systems, network elements, and operation systems.

Alternate Access Provider (AAP) — A telecommunication carrier that provides access services which are alternate to (or which bypass) a local exchange carrier.

Analog Switch - CG(n) — The electronic analog switching system is common control, and the incoming register temporarily stores the pulses for call routing. The data in the register is used by the common control processor to complete the call to subscribers, to outgoing trunks, and/or to service terminations.

Asynchronous Transfer Mode (ATM) - BB(x) — ATM enables voice, data, and video information to be transmitted over telephone wires at extremely rapid speeds. Allows companies to offer customized and inexpensive

communications to corporate customers. Used to carry user information within a broadband channel. ATM provides a method of formatting, multiplexing, cross-connecting, and switching information in 53-byte cells or packets. ATM switching is being developed that matches switch capabilities to service demands. Cells can carry voice, video, image, or bursty data. ATM can switch combinations of low or high bandwidth, long or short duration calls. It is best suited for switching bursty, high bandwidth, and continuous low bandwidth signals. (See STM.)

Automatic Intercept System (AIS) - (n)NB — A mechanized intercept service is provided by the recorded, voice-answer feature of the Automatic intercept system (AIS). Routine announcements are provided at the remote automatic intercept center (AIC). A customer requiring further information can then be connected to an operator at the home AIC.

Bandwidth — Narrowband -Services that operate between 64 kbps and the T1 speed of 1.544 mbps, voice, ISDN basic rate interface, and 64 kbps increments like 384 kbps.

Wideband - Services that operate between 1.544 mbps and the DS-3 speed of 45 mbps, including ISDN primary rate interface, frame relay, and SMDS.

Broadband - Services that operate at rates higher than 45 mbps, including SONET, broadband ISDN, video, and ATM.

Cable Entrance Facility - CLFI (CLLI 8 or 11 characters) — Area in a building for both subscriber and interoffice outside plant cables. It is typically an underground vault and runs the length of the building under the main distributing frame.

Call Control Agent CA(x) — A Call control agent is an instance of software that instructs hardware to provide path interconnections for calls between elements in an enterprise IP network and/or the traditional telephone network. The call control agent provides the intelligence to control call set-up and call take-down features, announcement messaging, billing messaging and the overall node-to-node signaling for both on-net (IP) and off-net (PSTN) calls. Traffic will be delivered over common packet and/or ATM based infrastructure to private and public switched networks.

Carrier Identification Code (CIC) — A CIC code is assigned by the NANP administrator to identify the entity who purchases FGB and/or FGD access services. This code is primarily used for billing and routing from the local exchange network to the access purchaser.

Carrier System - CLFI (CLLI 8 or 11 characters) — A transmission system where multiple channels of information are converted to a form suitable for transmission on a single line facility. Digital carrier systems use time division multiplexing; each information channel uses assigned time intervals. Analog carrier systems use frequency division multiplexing; each information channel occupies an assigned portion of the frequency spectrum.

Cell Relay - BB(x) — Cell relay technology is a combination of circuit and packet switching technologies. Broadband cell relay switching utilizes small fixed length packets (48 bytes of payload plus 5 bytes of addressing and control information) as opposed to variable length packets like frame relay to segment information for efficient switching of mixed integrated voice, data, image, and video applications. (See ATM/STM.)

Cellular Geographic Service Area (CGSA) — The geographic area served by the cellular system within which a CMC is authorized to operate.

Cellular Mobile Carrier (CMC) - CM(x) or H(x)(x) — A carrier who is authorized to provide cellular communications exchange services. For electrical interconnection between telcos and CMCs, see TA-NPL-000145, and for transmission parameters for trunking, see TA-TSY-000352.

Cellular Mobile Service — There are only two fundamental differences between cellular mobile service and wireline. Cellular serves mobile subscribers via radio loops; wireline serves fixed locations via wire loops. The fundamental similarities are much more relevant. A cellular system looks identical to the trunk side of any stored program control (SPC) end office, and both cellular and wireline are exchange services.

Cellular System - CLFI — A high capacity land mobile radio system where the territory to be served is divided into geographic cells. The available radio frequencies are used simultaneously in different cells without mutual interference. When a caller moves between cells, the exiting call is switched to the radio site handling the new cell. A cellular office (mobile telephone switching office - MTSO) provides originating and terminating service for cellular mobile carrier (CMC) phone subscribers. The CMC can establish connections to end offices and to other carriers interconnected through the following type interfaces.

- Type 1 interface is at the point of termination of a trunk between mobile system and an end office (a modified PBX DID arrangement).
- Type 2A provides for the direct interconnection of the MTSO with a LEC tandem office. If desired, the Type 2A interface may be used on an intraLATA basis only.
- Type 2B provides for the direct interconnection of the MTSO with a LEC end office.
- CGSA 736 markets two carriers per market within county boundary
  305 metropolitan statistical areas
  428 rural service areas
  Each carrier has 416 channels to use IMT 23 available channels 15-20 mile radius.

Central Office (See End Office) — The building in which telephone companies, etc., locate their switching equipment and terminate their circuits.

(Central Office) Centrex - (x)XD — Centrex is a hardware/software service whereby the switching and control functions are “centralized” (central exchange) in a part of the central office itself. This entity code does not identify a centrex customer, it identifies the functionality of the switch. The service originates in a central office rather than on-site like a PBX. Centrex allows the customer a large number of features and services that interface with the customer premises equipment for voice and data applications, as well as LAN and ISDN feature enhancements. This is a line side connection served via a “host” relationship between the switch and the customer.

Channel (CLFI) — An electrical or photonic communications path between two or more points of termination. Usually the smallest subdivision of a transmission system where a single type of communication service is provided, i.e., voice channel or data channel.

Channel Bank (CLFI) — The terminal equipment component of a carrier system that is used to multiplex (combine or demultiplex) a number of voice frequency (VF) channels on a frequency-division or time-division basis into a single stream for use on analog or

digital carriers systems. The voice channels can be combined into channel groups, e.g., 12, 24, 48, or 96.

Circuit (CLCI, CLFI) — A complete communications path between two or more points. The sum of line-to-line, line-to-trunk, and trunk-to-line connections is required to complete a single communications connection. A circuit may have both terminations within the same switching system (as in a station-to-station call and/or between two switching systems in different LATAs, states or countries as for a message or special service circuit).

CLLI Code — An 11-character geographic identifier that uniquely identifies the geographic location of places and certain functional categories unique to the telecommunications industry.

Coaxial Cable (CLFI) — A cable consisting of an outer conductor concentric to an inner conductor, separated from each other by insulating material. The bandwidth is much higher than a wire pair, but less than fiber facilities.

Common Channel Signaling (CCS)
System for exchanging trunk signaling (out of band) and other information between processor-equipped signaling systems over a network of signaling links.

Common Control Switching Arrangement (CCSA) - Z(a)Z
An AT&T offering for very big companies to create their own private networks and dial anywhere on them by dialing a standard seven-digit number. The corporate subscriber rents private dedicated lines, (i.e., Signaling System #6) and then shares central office switches. CCSA uses special software at the central office.

Competitive Access Provider (CAP) see (AAP) — A telecommunications carrier that provides access services in competition with a local exchange carrier.

Concentrator (Remote Terminal) - CT(x), RL(n), or RL(a) (FCC RAO Letter 21 - 9/8/92) — A concentrator consolidates subscriber lines, thereby facilitates the use of lesser amounts of loop plant to serve a greater amount of end users, e.g., an intercept concentrator. A concentrator has a terminal located at a central office and a remote terminal. All calls are switched by the central office switch to which the concentrator is connected. The voice path will always extend to the host switch even for calls between subscribers served by the same remote terminal of a concentrator. If the voice path or control link between the remote terminal and the central office fails, service will be interrupted even for calls served by the same remote terminal.

A distinguishing attribute between a **remote switch RS(n)** and a remote terminal of a concentrator is that a remote switch can provide the switched path for calls between its directly connected local subscribers and a remote terminal if a concentrator cannot. A remote terminal of a concentrator depends on the host switch to switch all calls and the voice path extends to the host switch.

COSMIC Frame - F(x)(x) — *CO*mmon *S*ystems *M*ain *I*nter*C*onnection Modular Frame System

County — Primary political subdivision of every state except Alaska (Census Divisions), and Louisiana (Parishes).

- District of Columbia (no counties).
- Duplicated names in each state must show county of each place.
- Connecticut and Rhode Island - no county functions.
- Minor civil division is name for subdivision of counties.
- Independent cities have separate county seats. Baltimore, MD, St. Louis, MO and Carson City, NV have county seats separate from county

status.
41 cities in VA.

- Municipios in Puerto Rico.

Crossbar Switch - MG(n) — An electromechanical switch with common control or marker groups. The switch has incoming registers that temporarily store the impulses. Routing determination is made by the markers for call set-up to subscribers, to outgoing trunks, and/or to service terminations.

Customer Premises Equipment (CPE) - H(x)(x) N(x)(x) — Equipment deployed on the premises of a customer (other than an IC) to originate, route, or terminate telecommunications.

Dark Fiber (CLFI) — Fiber optic facilities between customer locations consisting of non-repeatered fiber pairs without telephone company supplied electro-optical terminals. See passive fiber.

Demarcation Point - H(x)(x), N(x)(x), J(n)(x)(x)(x), E(n)(x)(x)(x) — The physical and electrical boundary between equipment or facilities provided by a customer and equipment, or facilities provided by the telephone company.

Digital Carrier Trunk (DCT) CLFI — An equipment option that combines the functions of a channel bank and a set of trunk relay units, thus allowing termination of carrier trunks directly on the switch in 24-channel modules.

Digital Connectivity — Achieved by augmenting existing networks with modified and/or new transport and switch equipment. DS1 signals sent over digital carrier facilities to interface with another digital terminal, a digital cross-connect device, and a digital trunk termination (DLTU) provide umbilicals to remote switching modules, or provide transport to a high speed digital multiplex system (M12, M13) where individual services or channels are added or terminated. The interface point is within the switch where the service and transport facilities terminate.

Digital Cross-Connect System (DCS) - K(x)(x) — A generic term that refers to a centrally controlled, non-blocking terminal capable of cross-connecting the individual channels of the digital signals that terminate on it. Properly configured DCSs can terminate T1 carrier systems while providing subrate cross-connects for DDS services, or T3 systems while providing DS1 cross-connects. Additionally, a DCS can provide multipoint bridging capabilities for private lines according to available technology.

NOTE: Network Entity Code K(x)(x) should be used to identify both electrical and optical DCS equipment.

Digital Loop Carrier (DLC) (CLFI) — Digital facilities that transmit digitized voice, digital data, and other special services in the local loop. DLC uses time division multiplexing, deriving a 24-channel digroup per carrier signal. The number of digroups can vary according to manufacture and use. The line protocol used in some DLC systems is not consistent with that used for interoffice T-carrier, requiring a converter device when loop carrier spans are integrated with interoffice facilities or equipment.

Digital Switch (See End Office definition) - DS(x) — Has central processors designed to perform multiple functions. A solid state device that routes a signal in digital format (i.e., a signal that changes from one state to another in discrete steps, TDM, DS0, 56 and 64 Kb/s). Digital switching is a process in which connections are established by digital signal interfaces. A digital signal interface may connect to a line facility, to a trunk facility, directly to a digital facility, or to other equipment such as a digital cross-connect (DCS). Some

analog switches carry digital signals (e.g., ESS) and normally operate on a circuit switch basis.

Dim Fiber — Fiber facilities without telephone company equipment but long enough to require telephone company regenerators. Since a clock frequency is present in the regenerator, the operating bit rate is fixed and known as passive fiber. See passive fiber.

Distributing Frame - F(x)(x) — A cross-connect point within a building or structure that is used to interconnect network elements (outside plant cables, switching, transmission equipment, etc.) to provide telecommunications services.

Electronic (Analog) Switching Systems - CG(n) — The electronic analog switching system is common control, and the incoming register temporarily stores the pulses for call routing. The data in the register is used by the common control processor to complete to the subscriber, outgoing trunk and/or service termination

End Office (Table B) — An end office is a switch which is located within the local network area and is used to terminate customer station loops for purposes of interconnection to each other and to trunks. An end office (also known as a central office, serving wire center, local serving office) is an assembly of switching equipment in a local switching office in the message network that establishes line-to-line, line-to-trunk, and trunk-to-line connections and provides the first line of switching [dial tone to end users (customers)] in a switching system.

Enhanced Private Switching Communications Service (EPSCS) - Z(a)Z — An AT&T private line network offering that provides functions similar to CCSA for very big companies. The corporate subscriber rents private dedicated lines (i.e., Signaling System #6) and then shares central office switches. EPSCS uses special software at the central offices.

Enhanced Service — Any service that includes computer manipulation of data. For example, a customer wishes to communicate through a synchronous network from an asynchronous terminal. This protocol conversion from an asynchronous to a synchronous signal is enhanced service. Such services as voice storage are also considered enhanced services.

Equal Access (EA) — Exchange access provided to an IC that is equal in type and quality to that provided to AT&T.

Exchange Area (Central Office) — A geographical area within which there is a single uniform set of charges for telephone services. An exchange area may be served by a number central offices (wire centers). An exchange area can have cross-boundary capabilities into two rate centers. There can be multiple geographical codes within an exchange area. Therefore, a common bond exists between a place, exchange, rate center, and wire center.

Exchange Carrier (EC) or Local Exchange Carrier (LEC) — A company that provides intraLATA telecommunications within a franchised territory and furnishes exchange-access for the origination and termination of interLATA calls. Exchange-access requires an access connection from the end office to the interexchange carrier point of termination (POT).

Exchange Service — Exchange (LATA) services are provided by an access provider (AP).

Facility (CLFI) — As in transmission facility, a facility is a physical or derived communications path between two locations that support lower level entities known as channels or circuits. The transmission signal can be analog, digital, or photonic (optical).

Feature Group (FG) - (x)MD — Tariff designations for the various classes of switched access services that include the following feature groups:
FGA - Line side with loop or ground start (NXX-XXXX).
FGB - Trunk side with E&M, SF, or DX signaling (950-0/1XXX).
FGC - Trunk side (AT&T embedded only for MTS and WATS).
FGD - Trunk side (MF signaling) and "equal access" features (10XXX or customer presubscribes to an IC).

Federal Communications Commission (FCC) — The federal agency that was established under the Communications Act of 1934 to regulate all interstate and foreign radio, and wire services originating in the United States, including radio, television facsimile, telegraph, and telephone service.

Fiber Distributed Data Interface (FDDI) - (n)(x)W — A 100 megabit-per-second LAN using a fiber-based token ring technology. It will provide LAN intrapremises and intracampus high-speed communications capabilities. FDDI uses a dual, counter-rotating ring protocol. Attached devices are connected to each other in series through duplex fiber optic cables forming a dual fiber optic ring. Data is transmitted in frames, on both rings in opposite directions, which is why FDDI is called "counter-rotating." Each frame contains a maximum of 4,500 8-bit bytes. FDDI's dual-ring design is self-healing; if one of the ring segments fails (e. g., breaks), FDDI automatically "wraps" the rest of the ring together so that the FDDI LAN continues to function, bypassing the failed segment.

Fiber Optic System (also see Smart Glass) — A method of transmitting digital data and voice via optical signals through transparent fibers usually of high quality glass. A fiber optic system consists of (1) an optical transmitter, (2) a fiber optic communication channel, and (3) an optical receiver. The transmission/multiplex equipment transmits electrical signals that the optical source converts to light signals through fiber. At the far end, the optical signal is converted back to electrical signals. Typical systems use two fibers for transmission, one for transmit, and one for receive.

Frame Relay - (n)(x)W — A fast-packet switching technique using frame lengths (packets) that are variable (up to 4,096 octets for some implementations) and are transported point-to-point (hence the term "relay"). It is best suited for statistical sharing of bandwidth for bursty data.

Global Positioning System - GPS — NAVASTAR GPS utilizes 21 satellites (+ 3 spare) with a 10,900 mile orbit. The standard positioning system (SPS) is for civilian use and the precise positioning system (PPS) is for military use. Each satellite broadcasts the 10.23 MHz reference signal generated by an onboard atomic clock. A timing error is added to the SPS.

High Capacity (HICAP) - W(x)(x) — A service that may be ordered from the customer's point of termination (POT) to an EC multiplexing location resulting in multiple channels. The customer can use and assign these channels for individual access services like voice grade special services or switched access trunks. Services can also extend directly between points of termination without multiplexing by the EC.

Host Switch (Table B) - DS(x) CG(n) — An end office with an internal controller or intelligent processor used to complete calls to a subscriber telephone number, to a trunk, or to a service termination, e.g., the mainframe computer at a customer's data center. A **host switch** controls the functions of a remote switch via a central "control" or "processor" resident within the **host.** The host switch provides switching control functions to the remote switch.

Hub — A piece of equipment that provides a major flexibility point for the network.

Information Service Providers (ISP) - H(x)(x) — An entity that offers information services to the public over telecommunications facilities, e.g., stock market quotations, library information, transportation schedules.

Integrated Digital Loop Carrier (IDLC) CLFI — A method of integrating DLC and the local digital switch in a wire center. The RT in the carrier serving area connects directly, on a DS1 basis, into the switch.

Integrated Services Architecture — Allows the cross-connection of mixed-usage (switched and non-locally switched) channels within higher level facilities. The possible architectures are:

Nail-Up - An architecture that provides a permanent path through the switch fabric for a non-locally switched circuit.
Hair-Pin - An architecture that provides cross connection of channels of incoming and outgoing DLC systems within a Digital Interface UNIT (DIU).
Side-Door-Port - An architecture that provides for cross connection of the channels of a DLC system on a DIU with either the interoffice network or the channels of another DLC system on another DLC.
Mixed-Use - DLC systems can be terminated on a local DCS with POTS and locally switched services being routed to a digital switch.

Intelligent Network - D(n)(n) — A service control software architecture that allows the ECs flexibility to control their individual networks, and customer controlled networks (POTS, data, etc.) in response to technology, regulatory, and marketing changes. (Includes 800 and alternate billing services.)

Interexchange Carrier (IC, IEC) - W(x)(x) or (x)MD — By tariff definition, any individual, partnership, association, joint-stock company, trust, governmental entity, or corporation registered with the FCC and engaged for hire to provide interLATA, interstate, or foreign communications (or if approved by a state public utility commission on an intrastate-interLATA basis in compliance with local or Federal regulatory agencies) over its own or other IC facilities for its own use, or for the use of its customers to provide telecommunications services. An IC is not an end user of the services provided. Interexchange access is not limited to such carriers; however, as other entities can qualify, e.g., other common carriers include specialized common carriers, domestic and international record carriers, and domestic satellite carriers licensed to provide private line, voice, data, and video services through the access tariff.

Interexchange Service — Provided by other than an access provider (AP) from the access tariff.

Integrated Services Digital Network (ISDN) — A network architecture that supports end-to-end digital connectivity over existing transmission facilities, supports a wide range of services through integrated access arrangements, including voice and data, to which users have access by a limited set of standard, multipurpose user network interfaces.

ISDN Access Rates —
Primary - 23B+D - 23-64 Kb/s "B" channels and 1-64 KB/s "D" channel.
Basic - 2B+D - 2-64 Kb/s "B" channels and 1-16 KB /s "D" channel.
B Channel - A 64 Kb/s channel that can carry voice or data and can be circuit switched or semi-permanently connected.
D Channel - The 16 Kb/s packet-switched channel that carries signaling messages and packet-switched user data.

Line Information Database (LIDB) - D(n)(n) — This database may contain alternately billed services such as calling

card, collect, and third party billed intraLATA calls. In the future, LIDB might be used to support other intelligent network services, such as calling name delivery. Carriers may use their individual CCS network to access centralized databases during call processing. The LIDBs contain detailed information about working telephone lines, calling card numbers, and other billing information. When a customer seeks to bill a local call to a calling card, or to another number (such as on a collect or third party billed call), a query is automatically sent over high-speed packet-switched networks using CCS to the LIDB of the local telephone company that issued the calling cord or the billing number. Customer-validation information stored in the LIDB is sent back almost instantaneously to the network switch processing the call.

Line Side Connection — A connection of a transmission path to the line side of a local exchange switching system, i.e., the side that provides dial-tone (originating) and ringing (terminating) connections. It is from the end office to the end user (customer).

Local Access and Transport Area (LATA) — A three-digit number which represents a geographical area that encompasses one or more contiguous local exchange areas serving common social and economic purposes. **InterLATA transmissions are transported by an IC, except for EC internal (official) business. IntraLATA transmissions may be provided by the EC or a competitor, depending on local regulation.**

Local Exchange Carrier (LEC) — Any company or corporation engaged for hire in intraLATA communication.

LERG™ Routing Guide — The LERG contains information about routing data obtained from the routing data base system (RDBS). This information reflects the current network configuration and scheduled network changes for originating and terminating PSTN calls within the NANP.

Local Serving Office (LSO) (See End Office) (Table B) — An arrangement of switching systems and interconnecting trunks.

LocateIt System — The *LocateIt* System is a nationwide industry reference database system that provides precise geographic information for addresses/ intersections using a powerful address analyzer. It can be used by customers to prevent bad address data from getting into corporate databases as well as to support cleanup of existing data.

Minor Civil Division (See County) —

Mobile Service Providers (MSP) - H(x)(x) —
A generic term used to describe entities providing mobile service. Such entities include, but are limited to, cellular carriers, radio common carriers, private carriers.

Mobile Telephone Switching Office (MTSO) - CM(x) — A cellular office or mobile telephone switching office that provides originating and terminating service for cellular mobile carrier (CMC) phone subscribers.

Modification of Final Judgment (MFJ) — MFJ called for the separation of exchange and interexchange telecommunications functions. MFJ defines *exchange* as *LATA*. Exchange or LATA services are to be provided by the BOCs. Interexchange services are to be provided by other than BOC entities from the Access Tariff. LATAs provide a means of delineating the area within which the BOCs may offer services, thus these may be called service areas.

Network Channel Interface (NCI) — Defines the electrical and physical requirements of a channel at the point of termination. The customer must specify

the NCI codes when ordering access services.

Network Channel Terminating Equipment (NCTE) - H(x)(x) — Operating company equipment located on the customer's premises and attached to the telephone network facility. It is on the company side of the regulatory boundary between the network and the customer equipment.

Network Interface (NI) (See Demarcation Point) —

Network Terminating Interface (NTI) - W(x)(x), H(x)(x), N(x)(x), (x)MD — The point of demarcation within a customer-designated premises where the service provider's responsibility for service begins or ends.

NXX - See Table B - End Office — Electro-mechanical, analog and digital switching systems may be identified by using their associated 3-character all number calling code (ANC) **or Central Ofice Code (COC) or NXX Code**. The ANC/COC code is the part of the North American Numbering Plan (NANP) architecture referred to as the 3-digit central office code of form **NXX, where N represents a numeric value from 2 to 9, and X is a numeric value from 0 to 9**.

Operator Service Providers (OSP) - H(x)(x) — Offers call-processing assistance to end-user customers, including but not limited to, directory assistance, call-completion assistance, and specialized call-processing, such as person-to-person calls.

Passive Fiber — Fiber pairs that are not terminated in the telephone company equipment, and may or may not use regenerators. Passive fiber may also be referred to as "dry," "dark," or "dim" fiber.

Point of Presence (POP) (CLLI 8) — A term used for a brief period of time to designate the premises of an IC. The use of this term is discouraged by the FCC. The preferred term is customer premises.

Point of Termination (POT) - W(x)(x)(x)MD — A POT is the point of demarcation within a customer-designated premises at which the telephone company's responsibility for the provision of access service ends. The physical telecommunications interface that establishes the technical interface, the test point and the points of operational responsibility is the hand-off point between an EC and an IC. Same as point of interface (POI). The point at which exchange carrier's responsibility for access service ends. Transmission between termination points is an IC's responsibility.

Remote Line - RL(n), U(n)(n)(n)(n) — A remote terminal that supports line side (end office to customer) functionality only, under the control of a host switch via an integrated digital umbilical link. It is also known as a generic IDLC that has a direct termination onto a switch module (IDT) with a time slot interface to the IDLC (RDT).

Remote Switch - RS(n) (FCC RAO Letter 21 - 9/8/92) — A unit that performs some, but not necessarily all, the basic switching functions. (See Basic Switching Functions.) A remote switch may be wholly or partially controlled by a control unit or processor located in another switch, i.e., the host switch, but it is classified as a switch if the capability to provide a switched path is at the remote location. The remote switch may depend on the host switch for such functions as routing, billing, traffic measurement, and custom calling. Calls between subscribers served by the same remote switching unit can be switched in the remote unit. When this occurs, the voice path does not extend to the host switch; however, a link to the host switch may be required for call control purposes.

The remote switch serves as an extension of the host and receives command information from the host. Command information is always required in the analog environment to qualify it as a remote switch. A digital switch may contain a processor that permits it to control some of its own functions but may not qualify it as an independent switch. A switching module (processor) at the remote location is connected to the host via an umbilical. If isolation from the host occurs, emergency stand alone (ESA) options provide remote switches with the intelligence to allow continued internal POTS calling for intraswitched calls and some remote off remote or remote trunking applications to continue. Whenever communications with the host is lost, intraswitching will allow calls that both originate and terminate within a remote switch serving area. The host switch processes any call going to a destination not directly connected to the remote unit.

Remote switching modules collocated with the host are coded RS(n) on an individual basis (CRSM/CRIM). In any other configuration, such as multiple RS(n)s that share an NXX (common control) the RS(n)s in unity are considered as RS(n) (just as those collocated with the host switch). Remotes not collocated with the host (nor with any other remote) which share a host common control, comprise a RS(n) entity.

Remote Switching Unit (RSU) - RS(n) — A small remotely controlled electronic end office switch that obtains its call processing capability from an electronic type host office. A typical RSU cannot accommodate direct trunks to an IC.

Remote Terminal (RT) - U(n)(x)(x)(x), RL(n), CT(x) — That part of a digital loop carrier placed at a site distant from the central office and connected to the central office terminal by transmission media carrying multiplexed signals. It is a line side connection between the host switch and the remote. The equipment demultiplexes the carrier signals and places each baseband signal on a physical wire pair. A remote terminal serves end users and has no switching control functions. It is driven by the host switching module. In some cases, it may continue to function as a "virtual" switch within a limited serving area when isolation from the host occurs. It can be a concentrator, an integrated digital line carrier (IDLC), or an office that has only lines. In the digital environment such switch extensions termed "side door, nailups and time slot interchanges" are used to extend digital switch functionality to provide special services to extended areas.

Repeater/Regenerator RG(x) — A repeater is an optoelectronic device inserted at intervals along a circuit to boost and amplify an analog signal being transmitted. It is located at a place in an analog circuit before the transmitted analog signal has been degraded to the point where the repeater cannot distinguish it from accumulated circuit noise.

A repeater amplifies the entire analog incoming signal including any distortions that may have been picked up along the transmission path which have combined with the original signal, thereby limiting the distance an analog signal can be transmitted. Correctional techniques can extend the distance an analog signal can travel through the use of more complicated methods such as pre or post-equalization.

In optical fiber transport systems, an optical repeater is used in approximately the same way to amplify an analog optical signal, which has been attenuated by traveling along a fiber optical cable.

A regenerator is a receiver and transmitter combination used to reconstruct an original digital signal (e.g., DS1, DS3), that consists of positive and negative pulses. The digital pulses start out as nearly perfect square waves, but become rounded an reduced in amplitude after being transmitted through a length of copper wire (T1) or coaxial cable (T3). As long as the regenerator is placed before the digital pulses can no longer be distinguishable (usually 6,000 feet for T1 circuits), the original pulse can be regenerated to their original square shape, making digital transmission systems better for longer distances than analog.

A repeatered line is a full-duplex transmission facility that carries one DS1 signal in each direction and comprised of two twisted metallic pairs and regenerators. Only digital signals can be regenerated.

In an optical regenerator, the receiver converts incoming optical pulses to electrical pulses, decides whether the pulses are ones or zeros, generated "cleaned up" electrical pulses, and then converts them to squared off pulses for transmission.

Fiber optic amplifiers uses special fiber doped with erbium to act as the amplifier. The light signal does not need to be converted to electrical impulses as in an optical regenerator. The fiber optic amplifier has become the dominant method for long-haul lightwave systems, and is especially convenient for an underwater cable of several thousand miles.

SEAS (Signaling System Engineering and Administration System) - A(x)(x) — The primary operation and administration system for CCS. It is usually installed on a regional basis. It supports network provisioning processes, maintenance functions, administration, and planning.

Service Control Point (SCP) - D(n)(n) — A transaction processor system (A Telcordia TELEGATE™ product) that provides a network interface to various database services. Provides routing information for every 800 number in the U. S. The SCPs also validate all operator-assisted calls, supporting alternate billing services such as calling card, third-party billing, and collect calls.

Service Switching Point (SSP) - DS(n) CG(n) DC(n) (n)(n)T — An end office or tandem equipped with signaling link hardware and software that can perform the signal point functions. In addition, SSPs can identify the need for application software in processing instructions issued by a SCP.

Session Border Controller/Border Element - BS(n) — Session Border controllers act as a demarcation point between two VoIP service providers, allowing them to manage signaling and control routing for VoIP traffic. SBCs allow for secure peering between VoIP networks at a high level of QoS.

For network-to-network interfacing, the following functions may be performed by a Session Border Controller/Border Control Element:

- Voice Firewall - firewalling of voice signaling and bearer traffic (voice traffic only and is not a substitute for a traditional data firewall)
- Network Address Translation and Network Address Port Translation (NAT/NAPT) - allows the carrier deploying the border controller to hide its IP address space and topology from the other carrier.
- Signaling Interworking - interworks different VoIP signaling protocols. Helps interworking of VoIP equipment form different vendors.

- Message Scrubbing - ensures that privacy related user identity is not inadvertently passed across the interface.
- Bandwidth Management QoS Management - Manages a constant bandwidth per call intelligently tracks the bandwidth for a new call.
- QoS Enforcement - Forces Level agreements between administrative domains.
- Quality Monitoring - monitors voice quality e.g., delay, jitter, etc.
- Call Detail Records - helps carrier track call activity
- Lawful Intercept - May be a "tapping point" for lawful intercept functions.

Signal Point (SP) (Table B) — An end office or tandem equipped with signaling link hardware and software that can perform trunk signaling (call set up).

Signal Transfer Point (STP) - (n)(x)W — Provides the transport functions required to transport the signaling messages to and from a customer-designated premises and the telephone company SCP or STP. Provides common channel signaling (CCS) network access and CCS message routing. An STP switches messages between signaling points (SPs) in a CCS network. SPs are switching offices [including service switching points (SSPs)], other STPs, databases such as those used for 800 service, and operator systems, etc.

Signaling Links — Signaling links are used to connect all the CCS network nodes together. Each link is administered (labeled) based on the nodes it connects to, e.g., A-links provide connectivity between signaling points (CCSSOs and SSPs) and service control points (SCPs) to the STPs. For other link information, see signal transfer point (STP) Links.

Signaling Point Code — A network address that identifies a physical signaling point (e.g., end office, SCP, STP, etc.) within a CCS network. Each signaling point in a CCS network is assigned a unique signaling point code composed of a set of three numerics, each with a value between 000 and 255. The point code sets are network identification, network cluster, and network cluster member. For this network, the following CLLI Network Entity Codes should be assigned:

- Service switching point (SSP) use end office or Tandem Entity Codes
- Service control point (SCP) use D(n)(n). See Table E.
- Signal transfer point (STP) use (n)(x)W.

Signaling System 7 (SS7) - (n)(x)W — Signaling over a physically separate network was referred to as common channel interoffice signaling (CCIS). This was implemented as a packet switch network using the SS6 protocol for transmission with toll applications using 4ESS office. Signaling on the interoffice message network using a new protocol (SS7) is referred to as common channel signaling (CCS). Signaling system 7 (SS7) provides signaling for circuit related services (e.g., call control, CLASS, PVN, LIDB, ISDN access) and non-circuit related services (e.g., 800 service, alternate billing services). CCS trunks carry voice and data. **The signaling associated with these trunks is transmitted over signaling links.**

A-Link (Access) Data Transmission Path — A-Links provide connectivity between signaling points, e. g. CCSSOs, SSPs, SCPs to STPs of the network. A signaling point may be a switching office, database, or any other signaling entity except a STP. A-Links will always be installed in pairs from signaling points, with one link to each mate STP.

B-Links (Bridge) Data Transmission Path — B-Links connect STP pairs to other mated STP pairs at the same hierarchical level. B-Links are implemented in groups of four quads.

C-Link (Cross) Data Transmission Path — STPs are joined together by signaling links called C-Links, to form mated STP pairs. C-Links are implemented in pairs.

D-Links (Diagonal) Data Transmission Path — D-Links refer to the quads which connect pairs at different hierarchical levels.

E-Links (Extended) Data Transmission Path — In addition to A-Link access to a signaling point home STP pair, a signaling point may also have a pair of link sets to any other STP pair in the signaling network. These extended accesses are called E-Links and must be provided on diverse routes to both STPs in the target STP pairs. These links may be used to alleviate the traffic load in the regional STPs.

F-Links (Fully Associated) Data Transmission Path — Associated signaling links between any two signaling points are referred to as F-Links. Provision for alternate routing of F-Link traffic into the network upon link failure, is a network option.

Single Mode Fiber (CLFI) — A step-index type fiber with a very small core diameter, that allows a very high circuit capacity because it allows only one mode of transmission, thus avoiding broadening of the light pulses. Step-index means that the index of refraction of the glass changes abruptly between the fiber core and its cladding. Major advantages of single mode fibers over multimode fibers are the distances the light can travel before a regenerator is required and the greater information carrying capacities. Single fibers are more difficult to splice and have more complex cable restoration procedures.

Smart Glass (CLFI) — An advanced fiber that has a central core surrounded by a glass cladding - 8 microns in diameter (1/10 size of human hair). Lasers emit light at invisible infrared wavelengths. The light is guided by internal reflection - the glass cladding reflects the light into the core. Optical/electrical amplifiers are replaced by an optical amplifier. The fibers are spliced with an optical fiber doped with erbium. The light beams can be transmitted with different colors (wavelengths).

Special Access - W(x)(x) — Special access service includes all access arrangements that do not use EC end office switching systems. It provides the IC with the capability to provide a variety of specialized end-to-end services.

Step-By-Step Switch - SG(n) — Step-By-Step (SXS) (SGn) is an electromechanical system without a common control (memory). As each digit is dialed into the switch, a designated segment responds. The call is completed to a subscriber telephone number, or directed to an outgoing trunk and/or service termination.

Switch - See Table B. — A mechanical, electro-mechanical, electronic or photonic device which provides call control, connection control, and switching fabric functionality within one physical system. The switch establishes a communications path between two or more circuits, services, or communications systems. This path provides a transmission conduit for communications or customer payload information and/or signaling. The (switching) device must be able to transmit (originate) and/or receive (terminate) an address/addressed signal. Switching equipment routes communications traffic among transmission paths connected to that equipment.

Basic Switching Functions - (FCC RAO Letter 21 - 9/8/92)

1. **Attending** - Monitors for off-hook signals.
2. **Control** - Determines call destination and assigns call to available line or trunk.
3. **Busy testing** - Determines whether the called line or trunk is busy.
4. **Information Receiving** - Receives control and busy test results.
5. **Information Transmitting** - Transmits control and busy test results to tell alerting and interconnection functions whether to complete the call.
6. **Interconnection** - Connects subscriber line to subscriber line or to trunk.
7. **Alerting** - Rings the called subscriber's line or other signaling means if the call is destined for another exchange.
8. **Supervising** - Monitors call for termination so the line can be released.

Switched Access - (x)MD — A service offering that includes voice grade trunking to the EC's Central Office switches to gain dialed access to the ECs' intraLATA message network. The most common use of switched access is end-to-end telephone service, including special interLATA cases like WATS and 800 service.

Switching System (Table B) — An assembly of equipment arranged for automatic switching in which each call is extended through the CO to the desired termination to establish connections between lines (customer loops) and/or trunks. End offices and tandems are the primary switching systems comprising the telecommunications network.

Switched Multi-Megabit Data Service (SMDS) - (n)(x)W — A high speed, public packet switched data communications service. It is aimed at local area network (LAN) interconnections and other data communications applications (distributed computing and image transfer) requiring LAN-like performance and features across a wide geographic area. SMDS, based on the IEEE 803.6 MAN standard, is considered a basic service like voice. SMDS will be available in throughput speeds of 1.2, 4, 10, 16, 25, and 34 Mbps. SMDS will transmit data at speeds ranging from 1.544 Mbps to 45 Mbps and eventually provide 155 Mbps SONET Access. SMDS is based on **cell relay** technology as opposed to **frame relay** technique, another fast-packet switching technology designed to operate at speeds up to 1.544 Mbs and below. Cell relay packages data from LANs in 50 byte blocks. FDDI (fiber distributed data interface) is another technique.

Synchronous Transfer Mode (STM) - BB(x) — Synchronous transfer mode cells are used to carry user information within a broadband channel. STM switching is being developed that matches switch capabilities to service demands. STM can switch combinations of low or high bandwidth, long or short duration calls. It is best suited for switching non-bursty, high bandwidth signals. (See ATM.)

Tandem (Table B) — A switching system in the message network that establishes trunk-to-trunk connections. A method of interconnecting central offices (COs) by trunks to a tandem office when the end offices do not have trunks directly to each other, or as a alternate route if direct trunks are busy. There are local tandems, LATA tandems, access tandems, and packet tandems.

Tandem Office (Table B) — A central office that functions as a hub for message traffic.

Tariff — Federal and State published rates, regulations, and descriptions that govern the provision of communications services.

Telcordia Customers — Telcordia clients who fund technical analysis or licensees of Telcordia intellectual property.

Toll Office (Table B) — A central office or switching equipment in an office that connects trunks in the toll (long distance) network.

Trunk (CLCI) — A communications path connecting two switching systems in a network, used in the establishment of an end-to-end connection. A trunk may have both terminations in the same switching system.

Trunk Gateway GT(x) — The trunk gateway serves as a gateway between traditional, circuit-based telephony networks and packet-based multimedia networks, converting circuit voice traffic to cells/packets. The call agent CA(x) provides the call control, address translation, and routing functions necessary for switching voice-over-packet (VoP)calls to their destinations. The call agent provides a seamless signaling interface, which translates the route information between the circuit SS7 signaling network and the server based packet network.

Trunk Side Connection — Connection from one switching system to another switching system.

Umbilical (CLFI) — A "life support" connection from a **host** office to a **remote** office to provide functions not available at the physical location. The host augments the remote by providing functional support that a remote lacks.

Vertical and Horizontal Coordinate (V&H) — A four or five digit number used to pinpoint either a rate center or switching entity location. The V and H coordinates are used to measure the airline mileage between like-entities (rate center or switching entity to switching entity). CLONES contains the site or switching entity V and H coordinates. LERG contains both rate center and switching entity V and H coordinates.

Virtual Circuit — A logical association of sequential links in each direction of transmission between data terminal equipment. As each packet is transmitted, the packet switch assigns a physical path (trunk) to the next switch. Transmission occurs on a link-by-link basis from the sending to the receiving data terminal equipment. No permanent physical circuit is maintained between the terminations.

Wireless Service Providers (WSP) - H(x)(x) or CM(x) — A carrier who is authorized to provide wireless communications exchange services, e.g., a cellular carrier or a paging services carrier.

Wire Center — A building where one or more central offices used for the provision of telephone exchange services are located. The wire center is normally the centroid (weighted average location) of all telephone stations that it serves. It is a location at which customer loops converge.

ZIP Code — A numerical five digit code that identifies areas within the United States and its territories for purposes of simplifying the distribution of mail by the U. S. Postal Service. It should appear on the last line of the destination return addresses of mail, following the name of the city and state. ZIP code alignments do not necessarily adhere to boundaries of cities, counties, states, or other jurisdictions.

800 Service — A service that allows a customer, for a monthly fee, to receive telephone calls that have been placed without charge to the originating party from within specified areas (formerly called INWATS).

900 Service - National (DIAL-IT service) — A network service that provides a variety of announcement-related services on a national or local

basis (local uses regular NPA plus 976). There are two general categories of this service: Public announcement services (PASs) such as weather, sports, horoscope, etc., and Media Stimulated Calling (MSC) such as telephone voting radio station call-ins, etc.

Appendix A: Acronyms

For a complete list of trademarks, acronyms and abbreviations, see SR-CPS-000138

2B1Q	ANSI approved BRI line coding (2 Binary bits encoded in 1 Quarternary)
AAA	Authentication, Authorization, and Accounting server
AAI	ATM Access Interface
AAP	Alternate Access Provider
ABS	Alternate Billing Services
AC	Access Customer
ACD	Automatic Call Distributor
ACIS	Ameritech Customer Information Service
ACNA	Access Customer Name Abbreviation (ASR)
ACS	Advanced Communications Service (Axx) Work Center
ACTL	Access Customer Terminal Location (ASR)
ADM	Add Drop Multiplexer
ADML	Asymmetric Digital Microcell Link
ADSL	Asymmetric Digital Subscriber Line
AI	Artificial Intelligence
AIN	Advanced Intelligent Network
AIS	Automatic Intercept System
ALI	Automatic Location Information
ALIT	Automatic Line Insulation Test
AMI	Alternate Mark Inversion (predecessor to 2B1Q line code)
AML	Actual Measured Loss
ANC	All Number Calling
ANI	Automatic Number Identification
ANSI	American National Standards Institute (ANSI)
AOCN	Administrative Operating Company Number (Lockheed Martin)
AP	Access Provider
APOT	ACTL Point of Termination (ASR)
ASCII	American Standard Code for Information Interchange
ASR	Access Service Request (ASR)
AT	Access Tandem
ATIS	Alliance for Telecommunications Industry Solutions
ATM	Automatic Teller Machines
ATM	Asynchronous Transfer Mode
AuC	Authentication Center
b/s	bit per second
B8ZS	Bipolar with 8-Zero Substitution Line Code

BIRRDS	Business Integrated Routing and Rating Database System
BISDN	Broadband Integrated Services Digital Network
BNI	Broadband Network Interface
BnZS	ANSI, T1X1.4/BR STD 3, 6, and 8-Zero Substitution Line Code
BOPZS	Bit-Oriented-Protocol Zero Suppression (64 CCC, NON-STD)
BPV	Bi-Polar Violation
BRA	Basic Rate Access
BRI	Basic Rate Interface
BSC	Base Station Controller
BSC	Business Service Center
BSS	Broadband Switching System
BTA	Basic Trading Area
BTS	Base Transceiver Station
CABS	Carrier Access Billing System
CAC	Carrier Access Code
CADETT	Computer Assisted DEsign for Trunk Translations (SWITCH)
CAM	Closest Address Match (neural net)
CAP	Competitive Access Provider
CARE	Customer Account Record Exchange (OBF Subscription Comm.)
CATV	Community Antenna Television
CCB	Common Carrier Bureau (Div of FCC)
CCIR	International Radio Consultative Committee
CCITT	Comite Consultatif International Telegraphque et Telephonique (or) International Telegraph and Telephone Consultative Committee
CCNA	Customer Carrier Name Abbreviation
CCR	Customer Control & Reconfiguration
CCS	Common Channel Signaling
CCSA	Common Control Switching Arrangement (ZaZ)
CD	Compact Disc
CD-ROM	Compact Disc-Read Only Memory
CD-V	Compact Disc-Video
CDMA	Code Division Multiple Access
CDS	Circuit Design System (module of TIRKS System)
CGSA	Cellular Geographic Service Area
CESAR	Carrier Enhanced System for Access Request
CEV	Controlled Environmental Vault
CFA	Customer Facility Arrangement (for T-Mux)
ChSS	Channel Switched Service (ISDN)
CIC	Carrier Identification Code (4 digits)

CID	Catalog Item Database (BCR)
CIGRR	Concerned Interested Group for Rating & Routing
CIMAP	Circuit Installation & Maintenance Assistance Package
CLF	Svc Ord Usage - COMMON LANGUAGE, Facility (CLFI) Format
CKLT	CLLI of EC Bridging Location
CLS	Svc Ord Usage - COMMON LANGUAGE, Spl Svc Serial Format
CLT	Svc Ord Usage - COMMON LANGUAGE, Spl Svc Telephone Format
CLASS	Custom Local Area Signaling Service
CLCI™ MSG	COMMON LANGUAGE Coding for Message Trunks
CLCI™ S/S	COMMON LANGUAGE Coding for Special Service Circuits
CLEC	Competitive Local Exchange Carrier
CLEI™	COMMON LANGUAGE Coding for Equipment
CLFI™	COMMON LANGUAGE Coding for Facilities
CLLI™	COMMON LANGUAGE Coding for Locations
CLO	Circuit Layout Order
CLONES	Central Location On-Line Entry System
CLR	Circuit Layout Record
CMI	Coded Mark Inversion
CNI	CNI Ring Assoc/w CCS7
CO	Central Office
COC	Central Office Code
CODES	Coder-Decoder
CO LAN	Central Office Based Local Area Network
COMADS	Computerized Mail Address System
COSMIC	Common Sessions Main Interconnection Modular Frame System
COSMOS	Computer System for Mainframe Operations
COT	Central Office Termination
CPC	Circuit Provisioning Center
CPE	Customer Premises Equipment
CPN	Customer Premises Network
CPR	Continuing Property Record
CPU	Central Processing Unit
CRDB	Coordinate Routing Database
CRIS	Customer Record Information System
CSA	Carrier Serving Area
CSDC	Circuit Switched Digital Capability
CSR	Customer Station Rearrangement
CSU	Channel Service Unit

CSV	Circuit Switched Voice
CTIA	Carrier Telecommunications Industry Association
CTX	Centrex
DA	Directory Assistance
DACS	Digital Access Cross-connect System (requires demux and conversion to analog)
DAL	Dedicated Access Line
db	decibel
DCS	Digital Cross-connect System (Generic)
DCT	Digital Carrier Trunk
DDD	Direct Distance Dialing
DDL	Digital Data Loop
DDOV	Digital Data Over Voice (service)
DDS	Digital Data System
DFG	Demand Forecast Group Data Layer Building Block (BCR)
DID	Direct Inward Dial
DIG	Data Integrity Group
DIU	Digital Interface Unit
DLBB	Data Layer Building Block (BCR)
DLC	Digital Loop Carrier
DLR	Design Layout Record
DLTU	Digital Line Transmission Unit
DOD	Direct Outward Dial
DOV	Data Over Voice
DPC	Destination Point Code
DRC	Design Routing Code
DRI	Design Related Information (TIRKS format screen)
DS0	Digital Signal rate 0 or 64 kb/s - 1 channel
DS1	Digital Signal rate 1 or 1.544 mb/s - 24 channel
DS1C	Digital Signal rate 1C or 32.154 mb/s - 48 channel
DS2	Digital Signal rate 2 or 6.312 mb/s, 4 DS1s - 96 channel
DS3	Digital Signal rate 3 or 44.736 mb/s, 28 DS1s - 672 channel
DSL	Digital Subscriber Line
DSU	Data Service Unit (Digital Line Interface Unit)
DSX-0A	Digital System Cross-connect - DDS or DS0A signals
DSX-0B	Digital System Cross-connect - DDS - DS0 signals
DSX-#	Digital System Cross-connect - DS1, 1C, 2, 3, 4 signals
DTE	Digital Terminating Equipment
EA	Equal Access

EAEO	Equal Access End Office
EAS	Extended Area Service
EC	Exchange Carrier
ECS	Equipment Catalog System
EDAS/NM	Engrg & Adm Data Acquisition System/Network Management
EIR	Equipment Identity Register
EML	Expected Measured Loss
EMR	Enhanced Maintenance Request
eNB	E-UTRAN Node B
EPC	Evolved Packet Core
ePDG	Evolved Packet Data Gateway
EPSCS	Enhanced Private Switch Communications Service (each customer can configure and control their own private network. (ZaZ)
ESF	Extended Superframe Format
ESP	Enhanced Service Providers
ESS™	Electronic Switching System (AT&T)
ETS	Electronic Tandem Switching
E-UTRA	Evolved UMTS Terrestrial Radio Access
E-UTRAN	Evolved UMTS Terrestrial Radio Access Network
FACS	Facilities Assignment and Control System
FCC	Federal Communications Commission
FCM	Fractionally-Controlled Multiplexing (64CCC, NON-STD)
FDDI	Fiber Distributed Data Interface
FG*	Feature Group *A, B, C, or D
FID	Field IDentifier (Service Order applications)
FITL	Fiber In the Loop
FO	Fiber Optic
FTTC	Fiber To The Curb
gb/s	Giga bits per second
GGSN	Gateway GPRS Support Node
gHz	Giga Hertz
GIS	Geographic Information System
GMSC	Gateway MSC
GOC	Generic Order Control (module of the TIRKS System)
GPS	Global Positioning System
GMS	Global Standard for Mobile Communications
GTAS	Generic Trunk Administration System
GUI	Graphical User Interface
HA	Home Agent

HCDS	High Capacity Digital Service
HDT	Host Digital Terminal
HFC	Hybrid Fiber/Coax (all fiber network - see ADSL)
HICAP	High Capacity (Digital Service)
HLR	Home Location Register
HSDPA	High Speed Downlink Packet Access
HSS	Home Subscriber Server
HSUPA	High Speed Uplink Packet Access
HTML	HyperText Markup Language
Hz	Hertz ('H' ALWAYS in caps.)
IAC	Interexchange Access Customer
IAL	IntrA-LATA
IAS	IntrA-State
IC	Interexchange Carrier (or IEC or IXC)
ICCF	Industry Carriers Compatibility Forum
ICL	Inserting Connection Loss
ICSC	Interexchange Customer Service Center
IDDD	International Direct Distance Dialing
IDLC	Integrated Digital Loop Carrier
IEC	Interexchange Carrier (or IC)
IEEE	Institute of Electrical and Electronics Engineers
IES	Integrated Equipment System (BCR)
IFCPC	Interoffice Facility Circuit Provisioning Center
ILEC	Incumbent Local Exchange Carrier
IMPS	Improve Mobile Telephone Service
IMS	Information Management System
IN	Intelligent Network
INA	Information Network Architecture
INE	Intelligent Network Equipment
INPLANS	Integrated Network PLANning System
IP	Intelligent Peripheral
IPLS	InterLATA Private Line Service
IPS	Integrated Provisioning System
IRL	InteR-LATA
IRS	InteR-State
ISCP	Integrated Service Control Point
ISDN	Integrated Services Digital Network
ISI	Industry Support Interface - Advisory Group
ISI	Intelligent Services Interface (related to NTI's DMS-100)

ISO	International Standards Organization
ISP	Information Service Provider
ISP	Internet Service Provider
ITE	Integrated Traffic Engineering (module of INPLANS)
ITP	Integrated Technology Planning (module of INPLANS)
ITU-TSS	International Telecommunications Union - Telecommunications Standardization Sector
IWF	Interworking Function
IXC	Interexchange Carrier (or IC)
kb/s	kilobits per second
kHz	kiloHertz
LAC	Loop Assignment Center
LADT	Local Area Data Transport
LAN	Local Area Network
LAPD	Link Access Protocol for the D channel
LASER	Light Amplification by Stimulated Emission of Radiation
LASS	Local Area Signaling Services
LATA	Local Access and Transport Area
LCIE	Lightguide (AT&T) Cable Interconnection Equipment
LEC	Local Exchange Carrier
LED	Light Emitting Diode
LEN	Local Exchange Network
LEN	Line Equipment Number (ESS)
LEIM	Loop Electronics Inventory Module (LEIS system)
LEIS™	Loop Engineering Information System
LFACS	Loop Facilities Assignment and Control System
LIDB	Line Identification Database
LIU	Line Interface Unit
LMDS	Local Multipoint Distribution Services
LMOS	Loop Maintenance Operations System (AT&T) (see WFA/NSDB BCR)
LNP	Local Number Portability
LOC	Location (BCR)
LRN	Local Routing Number
LTE	Long Term Evolution
MAN	Metropolitan Area Network
mb/s	Megabit Per Second
MDS	Message Design System (module of the TIRKS system)
MDSC	MDS Switching Machine Code
MFJ	Modification of Final Judgment

MGW	Media Gateway
MIC	Machine Interface Code
MLHG	Multi Line Hunt Group
MME	Mobility Management Entity
MMSC	Multimedia Messaging Service Center
MOBE™	Model Builders Environment (BCR)
MPC	Mobile Positioning Center
MSA	Metropolitan Statistical Area
MSC/MTSO	Mobile Switching Center/ Mobile Telephone Switching Office
MSP	Mobile Service Provider
MTSO	Mobile Telephone Switching Office
NAC	Network Assignment Center
NANP	North American Numbering Plan
NC	Network Cluster (reference to NTI's DMS-10 cluster)
NC	Network Channel
NCI	Network Channel Interface
NCTE	Network Channel Terminating Equipment
NE	Network Element
NECA	National Exchange Carrier Association
NEXT	Near End Cross Talk
NI	Network Interface
NMA	Network Monitoring & Analysis
NMC	Network Management Center
NNI	Network Node Interface
NOAP	Network Operations and Architecture Product Support Group
NODE	Processor and electronic switch associated with a RNAC (ZaZ)
NPA	Numbering Plan Area
NPS-F	Network Planning System - Facilities
NRRIC	Network Rating and Routing Informing Committee
NSEP	National Security Emergency Preparedness
NT	Network Termination
NT1	Network Termination 1
NT2	Network Termination 2
NTI	Northern Telecom, Inc.
NXX	Network Terminating Interface Central Office Code
OBF	Ordering & Billing Forum
OCU	Office Channel Unit
OCN	Operating Carrier Number (in RDBS, assigned by NECA)
OC48	Optical Carrier with (48x28x24=32.256 voice channels)

OIU	Office Interface Unit
ONA	Open Network Architecture
ONU	Optical Network Unit
OPC	Origination Point Code
OPS	Operations Provisioning System
ORB	Office Repeater Bay
OSCA	Operating System Computing Architecture (Telcordia)
OSI	Open System Interconnection
OSMINE	Operations Systems Modifications for the Integration of Network Elements
OSN	Open System Network
OSP	Operator Service Provider
OSS	Operations Support Systems
PAD	Packet Assembler and Disassembler
PAS	Public Announcement Service
PBX	Public Branch Exchange
PCM	Pulse Code Modulation
PCN	Personal Communication Network
PCS	Personal Communication Services
PCU	Packet Control Unit
PDE	Position Determination Entity
PDSN	Packet Data Serving Node
P-GW	Packet Data Network Gateway
PICS	Plug-in Inventory Control System
PIN	Personal Identification Number
PLID	Primary Line Identifier (Service Order)
POI	Point of Interface/Interconnection
PON	Passive Optical Network
POP	Point of Presence
POT	Point of Termination
POTS	Plain Old Telephone Service
PPP	Point-to-Point Protocol
PPSN	Public Packet Switched Network
PRA	Primary Rate Access
PREMIS	PREMises Information System
PRI LOC	Primary ACTL Location (ASR)
PRO-CDS	PROgrammable Circuit Design System (Module of TIRKS System)
PSC	Public Service Commission
PSDS	Public Switched Digital Service

PSS	Packet Switching System
PUC	Public Utility Commission
PVC	Private Virtual Connection
PVI	Planning View of Inventory Data Layer Building Block (BCR)
QOS	Quality of Service
RAM	Random Access Memory
RBOC	Regional Bell Operating Company
RCC	Radio Common Carrier
RCMAC	Recent Change Memory Adm Center
RDBS	Routing Database System (LERG)
RHC	Regional Holding Company
RISLU	Remote Integrated Services Line Unit (assoc/w ISDN, 5ESS)
RMAS	Remote Memory Administration System
RMN	Remote Network
RNAC	Remote Network Access Circuits (ZaZ)
RNC	Radio Network Controller
RSC	Remote Switching Center
RSS	Remote Switching System
RSU	Remote Switching Unit
RT	Remote Terminal
RTAD	Remote Test Access Data
RTAP	Remote Test Access Placer
SAC	Special Access Code (a non-geographic NPA code)
SAM	Sub-Assembly Model (BCR)
SAM	System Administration Module (FTTC product-Raynet)
SARTS	Switched Access Remote Test System (AT&T)
SASER	Sound Amplification by Stimulated Emission of Radiation
SCC	Switching Control Center
SCP	Signal (Service) Control Point
SDM	Subrate Data Multiplexing
SEAS	Signaling System Engineering & Administration System (SSP)
SEC LOC	Secondary Location (ASR)
SGSN	GPRS Support Node
S-GW	Serving Gateway
SIF	SONET Interoperability Forum
SIU	Subscriber Interface Unit
SLC	Subscriber Loop Carrier (AT&Ts Digital Loop Carrier System)
SMDS	Switched Multi-megabit Data Service
SME	Subject Matter Expert

SMS	Service Maintenance System (SSP)
SMSC	Short Message Service Center
SNI	Subscriber To Network Interface
SOAC	Service Order Analysis and Control
SOE	Standard Operating Environment
SONET	Synchronous Optical Network
SOP	Service Order Processor
SP	Signaling Point (end office for CCS)
SPC	Stored Program Control
SPCS	Stored Program Control Switch
SPOT	SEC LOC Point of Termination (ASR)
SR	Special Reports
SSC	Special Service Center
SSP	Special Service Protection (of circuits, facilities, etc.)
SSP	Service Switching Point (SSP)
SS7	Signaling System 7 (an out-of-band signaling - Feature Group D Access Service)
STAT	Standard Trunking Termination Code
STM	Synchronous Transfer Mode
STTC	Switch Transmission Termination Code
STP	Signal Transfer Point
SVC	Switched Virtual Connection
SWC	Serving Wire Center (where local loops converge)
SYNTRAN	SYNchronous TRANsmission
"T"	"T" Customer Interface
T1	T Carrier System Multiplexing for 24 Channels
T3	T Carrier System Multiplexing for 28 T1 Systems (24x28=672 voice channels)
T1AG	T1 Advisory Group
T1M1	Telecommunications - Internetwork Planning & Engineering
TA	Technical Advisory
TAG	Technical Advisory Group
TAMP	Traffic Administrative Measurement Plan
TCAP	Transaction Capabilities Application Part
TCIF	TeleCommunications Industry Forum
TCM	Time Compression Multiplexing
TCP-IP	Transmission Control Protocol-Internet Protocol
TD	Test Details
TDM	Time Division Multiplex

TDMA	Time Division Multiple Access
TGSN	Trunk Group Serial Number (BR-795-100-195)
TIRKS®	Trunks Integrated Record Keeping System
TLP	Transmission Level Point
TLPA	Transmission Level Point, in the Z to A direction
TLPZ	Transmission Level Point, in the A to Z direction
TMM	Technology Management Module
TNDS	Total Network Data System
TOPS	Traffic Operator Position System
TR	Technical Reference
TRAU	Transcoding and rate adaptation unit
TRIF	Technical Requirements Industry Forum
TSC	Two Six Code
TSGR	Transport Systems Generic Requirements
TSI	Time Slot Interchange
TSP	Telecommunications Service Priority
TSPS	Traffic Service Position System
TSS	TNDS/TK Service Subsystem
TSSI	Time Slot Sequence Integrity
TTS	TIRKS Table System
TWLT	Trunk With Line Treatment
"U"	"U" Customer Interface
UI	Unit Inventory Data Layer Building Block (BCR)
UL	Underwriters Laboratories
ULBB	User Layer Building Block (BCR)
UNI	User to Network Interface
UNIX®	Unix is a registered trademark of Novell, Inc.
URL	Universal Resource Locator
USO	Universal Service Order
USOC	Uniform Service Order Code
VBR	Variable Bit Rate
VC	Virtual Channel
VF	Voice Frequency
VICI	Visual Integrated Communication Interface
VLR	Visitor Location Register
VLSI	Very Large Scale Integration
VP	Virtual Path
WA	Work Authorization
WAN	Wide Area Network

WATS	Wide Area Telecommunications Service
WDM	Wave Division Multiplexing
WG	Working Group
WP	Working Party
WORD	Work Order Record and Details
WSP	Wireless Service Provider
WWW	World Wide Web
ZBS	Zero Byte Substitution
ZBTSI	Zero Byte Time Slot Interchange line code

Appendix B: Retired CLLI™ Codes

CLLI Codes	Type	Date Retired	Reason
E(x)(x^2)	Exchange Switchroom - Nonswitching Network Entity Code - Table E	10/13/99	The definition of the Nonswitching Network Entity Code M(x)(x) (Table E) to include the substance of the E(x)(x) code
P(x)(x^2)	Test or Service Positions - Nonswitching Network Entity Code - Table E	10/13/99	The definition of the Nonswitching Network Entity Code M(x)(x) (Table E) to include the substance of the P(x)(x) code
S(x^3x^2)	Service Centers Nonswitching Network Entity Code - Table E	10/13/99	The definition of the Nonswitching Network Entity Code M(x)(x) (Table E) to include the substance of the S(x)(x) code
T(x)(x^2)	Toll Test Room or Test Board Nonswitching Network Entity Code - Table E	10/13/99	The definition of the Nonswitching Network Entity Code M(x)(x) (Table E) to include the substance of the T(x)(x) code
(x)KD	LEC Consortium Point of Interconnection - Miscellaneous Network Switching Network Entity Code - Table D	02/04/97	It is not necessary to differential between IntraLATA and InterLATA Points of Interfaces (POI). The (x)MD code replaces it.
(n)DT	International DDI to PBX - Network Switching Entity Code - Table B	01/26/2000	International Switches do not require different Switching Entity Codes than North America.
(n)TT	International Local Transit Office - Network Switching Entity Code - Table B	01/26/2000	International Switches do not require different Switching Entity Codes than North America.
(n)KT	International DDI to Local Transit Office - Network Switching Entity Code - Table B	01/26/2000	International Switches do not require different Switching Entity Codes than North America.
(n)HT	International Combined Local Transit and End Office - Network Switching Entity Code - Table B	01/26/2000	International Switches do not require different Switching Entity Codes than North America.

CLLI Codes	Type	Date Retired	Reason
(n)FT	International 1 Way Incoming to Paging - Network Switching Entity Code - Table B	01/26/2000	International Switches do not require different Switching Entity Codes than North America.
(n)RT	International Individual Remote Tandem - Network Switching Entity Code - Table B	01/26/2000	International Switches do not require different Switching Entity Codes than North America.
(n)CB	Centralized Automatic Message Accounting (CAMA) board - Table C	04/22/02	Technology deemed obsolete per TAG consensus.
(n)EB	Traffic Service Position System (TSPS) board (electronic) - Table C	04/22/02	Technology deemed obsolete per TAG consensus.
(n)LB	Special boards [Conference, Mobile, Marine, or Switchboard Converted to Special Operation Service Traffic (SOST)] - Table C	04/22/02	Technology deemed obsolete per TAG consensus.
(n)NB	Intercept Board, e.g., #2A board - Table C	04/22/02	Technology deemed obsolete per TAG consensus.
(n)OB	Service Observing Switchboard, Service Evaluation Center, and Signal Converter Allotter for Service Evaluation System, e.g., #10 SOB	04/22/02	Technology deemed obsolete per TAG consensus.
(n)RB	Rate and Route Desk - Table C	04/22/02	Technology deemed obsolete per TAG consensus.
(n)TB	Toll Board (Through and Outward) - Table C	04/22/02	Technology deemed obsolete per TAG consensus.
(n)VB	Overseas Toll Board - Table C	04/22/02	Technology deemed obsolete per TAG consensus.
(n)WB	Inward Toll Board - Table C	04/22/02	Technology deemed obsolete per TAG consensus.

Appendix C: History of Amendments to Active Network Entity Code Definitions

Network Entity Code Revisions for Session Border Controller Location Identification.

On August 15, 2005 an IAB LS2 Escalation Conference Call took place that approved Network Entity Code BS(n) for the identification of Session Border Controller (SBC) equipment functions. Prior to this decision, SBCs were identified with Network Entity Code D(n)(n). The August 15th IAB Conference Call participants recommended that BS(n) be exclusively used for the location identification of SBC equipment functions. All references to SBC equipment in the D(n)(n) Entity Code definition were removed.

The POI Network Entity Code definitions were amended at the first quarter 2001 TAG Meeting.

The definitions preceding the 2001 TAG are as follows:

- **Network Termination Interface - (x)MD**
  This network termination interface entity code is used to identify an authorized trunk-side switched service termination in conjunction with telecommunication services. This code represents the “meet point” or “hand off” of responsibilities. It is associated with coding of message trunks ordered under one of the switched access tariffs. Only one (x)MD code is required per customer, per switch, per building.
- **Miscellaneous Nonswitching Network Entity - H(x)(x)**
  The Miscellaneous Nonswitching Entity Code is used to identify the end point of a facility or network interface with customers or end-users. Examples include a facility termination, a location where equipment may be inventoried, or a miscellaneous functional category that cannot be identified by any other nonswitching entity. At an end user (customer location), this code will identify the central office side of a demarcation point or network interface (NI).
- This Entity code is used at a central office for collocation or as a hub type location to provide unique identification of specific customers.
- This Entity Code will also be used to identify customer premises, Network Interface terminations at remote network site locations, or to identify locations that may contain the following type of terminations for circuits, facilities, or equipment at a given location:
  - — Network Channel Terminating Equipment (NCTE)
  - — Channel Banks, Asynchronous Multiplexer Equipment, Light Terminating Equipment (LTE), and other types of transmission equipment.
  - — SONET Nodes - Equipment used for facility termination (nodes may be referred to as Network Elements or Terminals, Add Drop Multiplexer (ADM) (locations, etc.)
  - — “U” Point in an ISDN Application

— HICAP Facility Terminations (Network Interface) such as fiber, cable, carrier for non-IC customers in the following applications:

Terminations At	Type Interface
An End User	CLEC to CLEC
CLEC/WSP (MTSO)	CLEC to ILEC
Cellular Carrier Cell Sites	CLEC to End User
Collocation Site	ILEC to End User
As a Network Site Termination point for End User to End User	CLEC/ILEC to WSP

- **Access Termination - W(x)(x)**
  This Network Entity Code is used to identify authorized access service termination (point of interface) in conjunction with telecommunication services for a specific interexchange carrier, radio common carrier, or competitive access provider on the following types of access service tariffs:

  Special Access Services (Circuits and Facilities)

  — High Capacity (HICAP) Facilities

  — Special access is a dedicated private line from an End User to an access customer terminal location. It includes narrowband, voice grade, program audio, television, wideband digital, and digital access.

  Switched Access Services (Circuits)

  — Feature Group A (FGA) - line side switched access services

  — Switched special service circuits, e.g., DID or DOD

  — Switched WATS access line or like-type access offering

  — Switched Access Service provides a two-point communications path between the access customer terminal location and the telephone exchange service location.

Other Switching Termination (x)MD Retired Definition. Please note, the original use of this entity code identified the following:

Improved Mobile Telephone System (IMTS) - See Network Entity Code CM(n).
Mobile Control Terminals - See Network Entity Code CM(n).
Dial Tone Speed - See Network Entity Code A(x)(x).