



FOUNDATION FOR  
RURAL SERVICE

# Glossary

of Telecommunications and Broadband Terms



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# Introduction

Over the decades, accessing the Internet has moved from a novel luxury to a true necessity for Americans. More and more, our daily lives and interactions with one another are happening “online.” This access is made possible by networks that transmit data worldwide, which we call broadband networks.

As these broadband networks have become more important than ever to commerce, productivity, education, health care, and several other social and economic interactions, there is an increased need to better understand the terms and concepts involved with broadband and telecommunications.

In publishing this glossary, our intent is to provide an overview of widely used terms in the broadband and telecommunications industry. This is not a comprehensive list of all the highly technical terms used in the industry, but a quick reference guide to help those who hear of or read about terms or concepts and need further background.



# Acronym List

<b>ACAM</b>	Alternative Connect America Cost Model
<b>ADSL</b>	Asymmetric Digital Subscriber Line
<b>AI</b>	Artificial Intelligence
<b>AK Plan</b>	Alaska Plan
<b>ARC</b>	Access Recovery Charge
<b>ARPU</b>	Average Revenue per Unit
<b>ATIS</b>	Alliance for Telecommunications Industry Solutions
<b>BCM</b>	Budget Control Mechanism
<b>BDC</b>	Broadband Data Collection
<b>BDS</b>	Business Data Services
<b>BEAD</b>	Broadband Equity Access and Deployment Program
<b>BGP</b>	Border Gateway Protocol
<b>BIAS</b>	Broadband Internet Access Service
<b>CABS</b>	Carrier Access Billing System
<b>CAF</b>	Connect America Fund
<b>CAF II Auction</b>	Connect America Fund Phase II Auction
<b>CAF-BLS</b>	Connect America Fund Broadband Loop Support
<b>CAF-ICC</b>	Connect America Fund Inter-carrier Compensation
<b>CALEA</b>	Communications Assistance for Law Enforcement Act
<b>CAM or CACM</b>	Connect America Cost Model
<b>CATV</b>	Cable Television
<b>CBOL</b>	Consumer Broadband Only Loop
<b>CBRS</b>	Citizens Band Radio Services
<b>CFR</b>	Code of Federal Regulations
<b>CIC</b>	Carrier Identification Code
<b>CISA</b>	Cybersecurity & Infrastructure Security Agency
<b>CLEC</b>	Competitive Local Exchange Carrier
<b>CLLI</b>	Common Language Location Identifier
<b>CMRS</b>	Commercial Mobile Radio Service
<b>CO</b>	Central Office
<b>COLR</b>	Carrier of Last Resort
<b>COS</b>	Class of Service
<b>CPE</b>	Customer Premise Equipment
<b>CPNI</b>	Customer Proprietary Network Information
<b>CSRIC</b>	Communications Security, Reliability, and Interoperability Council
<b>DBS</b>	Direct Broadcast Satellite

<b>DCSS</b>	Direct-to-Cellular Satellite Service
<b>DDOS</b>	Distributed Denial of Service
<b>DIRS</b>	Disaster Information Reporting System
<b>DOCSIS</b>	Data Over Cable Service Interface Specifications
<b>DODC</b>	Digital Opportunity Data Collection
<b>DOS</b>	Denial of Service
<b>DSL</b>	Digital Subscriber Line
<b>DSLAM</b>	Digital Subscriber Line Access Multiplexer
<b>DTV</b>	Digital Television
<b>DWDM</b>	Dense Wavelength Division Multiplexing
<b>E911</b>	Enhanced 911/Emergency 911
<b>EA</b>	Economic Area
<b>EACAM</b>	Enhanced ACAM
<b>EAS</b>	Emergency Alert System
<b>EAS</b>	Extended Area Service
<b>ECFS</b>	Electronic Comment Filing System
<b>ESC</b>	Environmental Sensing Capability
<b>ETB</b>	Enhanced Tribal Benefit
<b>ETC</b>	Eligible Telecommunications Carrier
<b>ETS</b>	Ethernet Transport Service
<b>EUCL</b>	End User Common Line Charge
<b>FCC</b>	Federal Communications Commission
<b>FDMA</b>	Frequency Division Multiple Access
<b>FNPRM</b>	Further Notice of Proposed Rulemaking
<b>FOIA</b>	Freedom of Information Act
<b>FTTC</b>	Fiber to the Curb
<b>FTTH</b>	Fiber to the Home
<b>FTTP</b>	Fiber to the Premise
<b>FTTx</b>	Fiber to the “x”
<b>FUSC</b>	Federal Universal Service Charge
<b>FWA</b>	Fixed Wireless Access
<b>Gbps</b>	Gigabit per Second
<b>GPS</b>	Global Positioning System
<b>GHz</b>	Gigahertz
<b>GPON</b>	Gigabit Passive Optical Networks
<b>GWAN</b>	Global Wide Area Network
<b>HCLS</b>	High Cost Loop Support
<b>HCP</b>	High Cost Program

<b>HDSL</b>	High bit-rate DSL
<b>HDTV</b>	High Definition Television
<b>HFC</b>	Hybrid Fiber Coaxial
<b>HUBB</b>	High Cost Universal Broadband Reporting Portal
<b>ICANN</b>	Internet Corporation for Assigned Names and Numbers
<b>ICT</b>	Information and Communications Technology
<b>IEEE</b>	Institute of Electrical and Electronics Engineers
<b>IETF</b>	Internet Engineering Task Force
<b>ILEC</b>	Incumbent Local Exchange Carrier
<b>IP</b>	Internet Protocol
<b>IPTV</b>	Internet Protocol Television
<b>ISP</b>	Internet Service Provider
<b>IVDS</b>	Interactive Video Data Service
<b>iVoIP</b>	Interconnected Voice over Internet Protocol (VoIP)
<b>IXC</b>	Interexchange Carrier
<b>kbps</b>	Kilobit per second
<b>LAN</b>	Local Area Network
<b>LATA</b>	Local Access Transport Area
<b>LCR</b>	Least Cost Routing
<b>LEC</b>	Local Exchange Carrier
<b>LEO</b>	Low Earth Orbit Satellite
<b>LERG</b>	Local Exchange Routing Guide
<b>LMDS</b>	Local Multipoint Distribution Services
<b>LNP</b>	Local Number Portability
<b>LOS</b>	Line of Sight
<b>LTE</b>	Long Term Evolution Wireless Technology
<b>Mb</b>	Megabits
<b>MB</b>	Megabytes
<b>Mbps</b>	Megabits per Second
<b>MHz</b>	Megahertz
<b>MMDS</b>	Multichannel Multipoint Distribution Service
<b>mmW</b>	Millimeter Wave Spectrum
<b>MOU</b>	Minutes of Use
<b>MPLS</b>	Multiprotocol Label Switching
<b>MSA</b>	Metropolitan Statistical Area
<b>MSO</b>	Multiple System Operator
<b>MTA</b>	Major Trading Area
<b>MTSO</b>	Mobile Telephone Switching Office

<b>MVNO</b>	Mobile Virtual Network Operator
<b>MVPD</b>	Multichannel Video Programming Distributor
<b>MWS</b>	Mobile Wireless Services
<b>NANP</b>	North American Numbering Plan
<b>NARUC</b>	National Association of Regulatory Utility Commissioners
<b>NECA</b>	National Exchange Carrier Association
<b>NG911</b>	Next Generation 911
<b>NIST</b>	National Institute of Standards and Technology
<b>NNP</b>	Nationwide Number Portability
<b>NOI</b>	Notice of Inquiry
<b>NORS</b>	Network Outage Reporting System
<b>NPA</b>	Number Plan Area
<b>NPRM</b>	Notice of Proposed Rulemaking
<b>NTIA</b>	National Telecommunications and Information Administration
<b>NV</b>	National Verifier
<b>OMB</b>	Office of Management and Budget
<b>OTT</b>	Over-the-Top
<b>PAL</b>	Priority Access License
<b>PBX</b>	Private Branch Exchange
<b>PEA</b>	Partial Economic Area
<b>PN</b>	Public Notice
<b>PON</b>	Passive Optical Network
<b>POP</b>	Point of Presence
<b>POPs</b>	Points of Presence
<b>POTS</b>	Plain Old Telephone Service
<b>PSAP</b>	Public Safety Answering Point
<b>PSTN</b>	Public Switched Telephone Network
<b>QoS</b>	Quality of Service
<b>POLR</b>	Provider of Last Resort
<b>RAN</b>	Radio Access Network
<b>RBOC</b>	Regional Bell Operating Company
<b>RDOF</b>	Rural Digital Opportunity Fund
<b>RF</b>	Radio Frequency
<b>RHC</b>	Rural Health Care Program
<b>RLEC</b>	Rural Local Exchange Carrier
<b>RMD</b>	Robocall Mitigation Database
<b>RoR</b>	Rate of Return
<b>RSA</b>	Rural Service Area

<b>RUS</b>	Rural Utilities Service
<b>SAC</b>	Study Area Code
<b>SDN</b>	Software Defined Networking
<b>SDSL</b>	Symmetric Digital Subscriber Line
<b>SHAKEN</b>	Signature-based Handling of Asserted Information Using toKENS
<b>SIP</b>	Session Initiation Protocol
<b>SLA</b>	Service Level Agreement
<b>SLC</b>	Subscriber Line Charge
<b>SMS</b>	Short Messaging Service
<b>SNAP</b>	Supplemental Nutrition Assistance Program
<b>SONET</b>	Synchronous Optical Network
<b>SPIN</b>	Service Provider Identification Number
<b>SS7</b>	Signaling System 7
<b>STI</b>	Secure Telephone Identity
<b>STI-GA</b>	Secure Telephone Identity Governance Authority
<b>STIR</b>	Secure Telephone Identity Revisited STIR
<b>STIR/SHAKEN</b>	Call Authentication Framework using STIR and SHAKEN Standards
<b>TB</b>	Terabyte
<b>TCP</b>	Transport Control Protocol
<b>TDM</b>	Time Division Multiplexing
<b>TRS</b>	Telecommunications Relay Service
<b>USAC</b>	Universal Service Administrative Company
<b>USF</b>	Universal Service Fund
<b>UWB</b>	Ultra Wideband
<b>VDSL</b>	Very-high-bit-rate DSL
<b>VOD</b>	Video on Demand
<b>VoIP</b>	Voice over Internet Protocol
<b>VoLTE</b>	Voice over LTE (Long Term Evolution wireless technology)
<b>VPN</b>	Virtual Private Network
<b>VR</b>	Virtual Reality
<b>WAN</b>	Wide Area Network
<b>WEA</b>	Wireless Emergency Alert
<b>Wi-Fi</b>	Wireless Local Area Network
<b>WISP</b>	Wireless Internet Service Provider
<b>WLAN</b>	Wireless Local Area Network

# Glossary of Telecommunications and Broadband Terms

## 0-9

**4G:** The fourth generation of mobile communications standards providing high-speed Internet and transmissions of text, voice, video, and multimedia (see also Long Term Evolution).

**5G:** The next generation standard that is promised to be much faster than 4G, although it will require the deployment of Small Cells and more robust Backhaul network facilities to accommodate the increased data demands and enable such higher speeds.

**5G Fund:** A Universal Service Fund Program mechanism that has not yet been created but is intended to support mobile 5G deployment in rural, high-cost areas lacking certain levels of service.

**6G:** The designation for a future technical standard of a sixth-generation technology for wireless communications.

## A

**Access Charge:** A fee charged by local exchange carriers (LECs) for the use of local communications facilities by other service providers such as interexchange (or long distance) carriers.

**Access Point:** A hardware device or computer software that acts as a communication hub for users of a wireless device to connect to a wired local area network. Access points are important for providing heightened wireless security and for extending the physical range of service to which a wireless user has access.

**Access Recovery Charge (ARC):** A charge created by FCC Order that allows incumbent local exchange carriers to recover from end user customers some of the revenues lost through FCC required reductions to Access Charges that would otherwise have been imposed on other carriers. The remaining revenues that cannot be recovered through ARCs are recovered through the Connect America Fund Intercarrier Compensation (CAF-ICC) Universal Service Fund mechanism.

**Adware:** Software that automatically downloads or displays advertising information while a program is running. Some types of adware are considered privacy invasive and are termed as Spyware.

**Affordable Connectivity Program (ACP):** A program that was a successor to the COVID-era Emergency Broadband Benefit (EBB) program that aimed to subsidize the cost of broadband services for certain defined classes of low-income consumers. This program expired due to a lack of funding in May 2024.

**Alaska Plan (AK Plan):** A Universal Service Fund High Cost Program mechanism that provides frozen support to electing eligible telecommunications carriers (ETCs) in Alaska over a ten-year period. This program began in 2016 and continues through 2026.

**Alliance for Telecommunications Industry Solutions (ATIS):** A standards organization that develops and publishes technical and operational standards and solutions for the information and communications technology (ICT) industry. ATIS's goal is to advance the industry's business priorities by bringing together global ICT companies. The organization encompasses numerous industry committees and fora, which discuss, evaluate, and author guidelines concerning topics such as 5G, cybersecurity, network reliability, technological interoperability, emergency services, billing, network function virtualization, and others.

**Alternative Connect America Cost Model (ACAM):** A mechanism by which smaller rural local exchange carriers (or RLECs) may elect to receive support from the Universal Service Fund for delivering voice and broadband services in high-cost rural areas based on a cost model in lieu of receiving support based upon the provider's actual costs of investment and operations. This model was offered to RLECs in multiple phases with different criteria in each phase, so some participated in ACAM I, Revised ACAM I, ACAM II, and Enhanced ACAM phases of funding.

**Android:** A Linux-based operating system for mobile devices such as smartphones and tablets. Originally created by the Open Handset Alliance, it is now one of the largest smartphone platforms in the world.

**App or Application:** A computer software program designed to help the user perform specific tasks. Although most applied as software for smartphones, apps also are used on other wired and wireless broadband networks.

**Asymmetric Digital Subscriber Line:** An 'always on' technology designed to increase the bandwidth available over standard copper telephone wires. "Asymmetric" refers to the fact that the downstream speed is greater than the upstream. This technology works more effectively for one-way applications such as video on demand and graphics downloading, but is much less suitable for two-way applications, such as videoconferencing (see also Digital Subscriber Line). It is subject to speed limitations that are particularly affected by distance.

**Average Revenue per Unit (ARPU):** The average revenue generated per customer unit per month. ARPU is an indicator of the financial performance of a company.

## **B**

**Backhaul:** This term was originally used to describe the transmission of a telephone call or data beyond its normal destination point and then back again to utilize available personnel (operators, agents, etc.) or network equipment not available at the destination location. The term has evolved into a more generic reference to transmitting from a remote site or network to a central or main site. It implies a high-capacity line, for example, to backhaul from a wireless mesh network or Small Cell to the wired network means aggregating all the traffic on the wireless mesh over one or more high-speed lines to other aggregation points, a private network, or the Internet.

**Bandwidth:** The rate of data transfer, bit rate or throughput, typically measured in bits per second (bps).

**Bit:** Short for binary digit, a bit is the smallest unit of data in a computer and is used for storing information. A bit is a binary unit, which means it can have a value of a 1 or a 0. A byte is a capacity unit that contains eight bits. To distinguish between the two, a “b” represents “bit” and a “B” represents “byte.” While a bit is generally used to measure the rate of data transfer (e.g., when discussing bandwidth and broadband speeds; kbps, Mbps, Gbps, etc.), bytes are often used to describe data capacity (e.g., the size of hard drives or the total amount of data traversing a broadband network) (see also byte, kilobit, megabit, gigabit and gigabyte).

**Blocking:** Intentionally stopping certain content from crossing its network or stopping content from being downloaded.

**Bluetooth:** An open specification for seamless, wireless short-range communications of data and voice between mobile and stationary devices. For instance, it specifies how mobile phones, computers, and tablets interconnect with each other, with computers, and with office or home phones. The first generation of Bluetooth permits exchange of data up to a rate of 50 Mbps (for Bluetooth 5), even in areas with much electromagnetic disturbance. It transmits and receives via a short-range radio link using a globally available frequency band (2.4 GHz ISM band).

**Border Gateway Protocol:** A set of rules that determine the best network routes for data transmission on the Internet.

**Broadband:** A term used in evolving digital technologies in which multiple signals share the bandwidth of a medium, such as fiber-optic cable or higher-capacity spectrum. This allows the transmission of voice, data, and video signals over a single medium.

**Broadband Data Collection (BDC):** Mapping initiative established by the Broadband DATA Act. Providers report location-level data on broadband availability, the maximum speeds they offer to the location. This information is then published in the National Broadband Map maintained by the FCC.

**Broadband Deployment Accuracy and Technological Availability Act (Broadband DATA Act):** Signed into law on March 23, 2020, the Broadband DATA Act, among other things, requires the FCC to modify its mapping initiatives to provide location-level data on the availability of fixed and mobile broadband services and to ensure accuracy through processes to: (1) verify service providers' coverage data; (2) allow consumers and other third parties to challenge service providers' coverage data; and (3) crowdsource information from third parties.

**Broadband Internet Access Service (BIAS):** A mass-market retail service by wire or radio that provides the capability to transmit data to and receive data from all or substantially all Internet endpoints, including any capabilities that are incidental to and enable the operation of the communications service, but excluding dial-up Internet access service. This term also encompasses any service that the FCC finds to be providing a functional equivalent of the service described in the previous sentence. In effect, this is the FCC's regulatory definition for the offering of Broadband on a retail basis.

**Budget Control Mechanism (BCM):** A mechanism adopted by the FCC and implemented by the Universal Service Administrative Co. to reduce CAF-BLS and HCLS support for carriers if necessary to fit within an annual budget specified by the FCC. The BCM applies a flat percentage reduction to all such support received by rural local exchange carriers where needed to meet the FCC's annual budget for that support.

**Bundles:** Packages or bundles of services, such as combining Internet with paid TV. Packages or bundles may have a higher overall monthly cost than the standalone Internet service and may include benefits such as free or reduced cost devices, access to streaming platforms, or cloud services.

**Business Data Service (BDS):** Refers to the dedicated point-to-point transmission of data at certain guaranteed speeds and service levels using high-capacity connections.

**Byte:** Distinguished from bit. One byte is equal to eight bits. Bytes are often used to describe data capacity. For example, broadband speeds are typically described in bits, while the amount of data that traverses a broadband network is typically described in bytes.

## C

**Carrier:** A provider of telecommunications services.

**Carrier Access Billing:** The process of determining which carriers have used an LEC's network and how much they owe for that usage.

**Carrier of Last Resort (COLR):** A telecommunications carrier that commits (or is required by state law) to provide service to any customer in a service area that requests it, even if serving that customer would not be economically viable at prevailing rates. A COLR may also be referred to as a Provider of Last Resort (POLR) depending upon the operator's regulatory status and/or the scope of regulation by local or state law.

**CATV (Community Antenna Television, Community Access Television):** A system of distributing television programs to subscribers via radio frequency. It is more commonly referred to as cable television.

**Cell Site:** The central radio transmitter/receiver that maintains communications with a mobile telephone within a given range. A cellular network is made up of many cell sites, all connected back to the mobile telephone switching office via landline or microwave.

**Cellular Technology:** This term, typically used for all cellular phones regardless of the technology use, derives from cellular base stations that receive and transmit calls. Both cellular and personal communications service phones use cellular technology.

**Central Office (CO):** A switching center where trunks and loops are terminated and switched for the purpose of delivering traditional voice telephony services. The central office contains the associated inside plant network elements required to perform this function, such as distribution frames, interoffice facility termination points, etc.

**Class of Service (COS):** A method of managing traffic on a network by grouping like traffic together and giving each type a different priority level. COS differs from quality of service in that it does not guarantee a certain level of service, but instead offers a "best effort" delivery. Retail broadband services (BIAS) are typically provided on a "best effort" basis rather than with a committed level of service.

**Cloud Computing (the cloud, cloud backup, cloud drive):** The use of computing resources such as hardware and software over a network (the Internet). A cloud drive is a storage or backup of resources using an online network.

**Colocation:** The placement of switches, routers, or other equipment by one provider within or on the premises or facilities of another provider to facilitate the offering of communications services or transmission of data. For example, it can refer to the placement of equipment by competitive local exchange carriers in an incumbent's central office for the provision of competitive telecommunications services, or it can refer to the placement of caching servers that hold the content of edge providers (such as Netflix or Google) at Internet service provider (ISP) facilities in order to allow Internet customers to retrieve data more quickly and lower transport costs for ISPs. Colocation also applies to locating antennas and other equipment of multiple wireless carriers on towers or other facilities to deploy service more efficiently and lower costs.

**Commercial Leased Access:** The manner through which independent video producers can access cable capacity for a fee.

**Commercial Mobile Radio Service (CMRS):** Mobile wireless services made available to the public.

**Common Carrier:** A supplier of non-private telecommunications services. Under the common carrier principle, companies must offer service to the public without discrimination, within a territory approved by a governmental agency, and with the companies held strictly accountable to the public through government regulation.

**Common Language Location Identifier (CLLI):** An 11-digit alphanumeric code used to identify physical locations and equipment within telecommunications networks.

**Communications Assistance for Law Enforcement Act (CALEA):** A law enacted in October 1994 that defines the statutory obligation of telecommunications carriers to assist law enforcement in executing electronic surveillance.

**Communications Security, Reliability, and Interoperability Council (CSRIC):** An advisory committee of the FCC that provides recommendations on ways to promote the security, reliability, and resiliency of the nation's communications systems. CSRIC also provides recommendations on industry best practices to prevent and remediate cybersecurity attacks, alerts during natural disasters, and rapid restoration of communications during other disruptive events.

**Competitive Local Exchange Carrier (CLEC):** A carrier that competes with other already established carriers (often the incumbent local exchange carrier or ILEC) in the provision of regulated telecommunications services, such as local voice telephony.

**Connect America Cost Model (CAM or CACM):** A model that identifies the costs of providing voice and broadband services in rural areas. The model has been used in the past for distribution of Universal Service Fund support to certain larger local exchange carriers under the Connect America Fund Phase II program, and was also used to set the initial levels for bidding for Universal Service Support in the FCC’s Connect America Fund and Rural Digital Opportunity Fund auctions. It was also the initial basis for development of the Alternative Connect America Cost Model (ACAM) that distributes support to smaller operators.

**Connect America Fund (CAF):** The CAF refers to a series of reforms to Universal Service Fund High Cost Programs undertaken by the FCC since 2010. These reforms have applied to many different components of the High Cost Universal Service Fund, including CAF Phase II model support, CAF Phase II auction support, and CAF-Broadband Loop Support. At times, some may refer to the entire High Cost Universal Service Fund as the “Connect America Fund,” but the High Cost Program in fact contains other components beyond programs expressly labeled as CAF initiatives, including Alternative Connect America Model, the Rural Digital Opportunity Fund, the Mobility Fund, the 5G Fund, Alaska Plan, and High Cost Loop Support.

**Connect America Fund Broadband Loop Support (CAF-BLS):** Previously known as Interstate Common Line Support (ICLS), CAF-BLS provides Universal Service support to smaller rural local exchange carriers (RLECs) based on their actual costs for deployment of broadband-capable networks and the ongoing delivery of voice and/or broadband services, including Consumer Broadband Only Loops, subject to certain caps and limitations.

**Connect America Fund Intercarrier Compensation (CAF-ICC):** A Universal Service Fund mechanism that was adopted to provide incumbent local exchange carriers with recovery of FCC-mandated reductions in Access Charges that would otherwise have been imposed on other carriers and which cannot be recovered through Access Recovery Charges on end user customers permitted by the FCC.

**Connect America Fund Phase II Auction (CAF Phase II or CAF II):** An auction (also known as Auction 903) conducted by the FCC in 2018 to distribute Universal Service Fund support in high-cost rural areas where larger local exchange carriers had declined to receive CAF Phase II model support through the Connect America

**Model.** Providers placed competitive bids to deliver voice and broadband services in these areas, and winners were determined by the amounts of support they were willing to receive to serve an area adjusted by a formula recognizing the speed and latency levels of broadband performance each bidder was willing to provide.

**Consumer Broadband Label:** Easy-to-understand labels designed to provide clear, accurate information about the cost and performance of Internet services to assist consumers when comparison shopping for broadband services.

**Consumer Broadband Only Loop (CBOL):** A network component used to deliver wireline broadband Internet access service to an end user customer where the customer does not also purchase regulated voice telephony service from the provider. Prior to the creation of the Universal Service Fund CAF-BLS High Cost Program, such facilities were not supported through the Universal Service Fund in rural areas.

**Covered Equipment and Services:** In general, this term refers to communications equipment and services identified as posing an unacceptable risk to national security under the Secure and Trusted Communications Networks Act.

**Covered List:** The list of Covered Equipment and Services published and maintained by the FCC Public Safety and Homeland Security Bureau.

**Cramming:** The addition of charges to a subscriber's bill for services neither ordered nor desired by the customer, or for fees for calls or services that were not properly disclosed to the customer.

**Customer Premises Equipment (CPE):** The terminal, equipment and/or inside wiring located at a subscriber's premises, which are connected to a carrier's communication channel(s) at an interconnection point.

**Customer Proprietary Network Information (CPNI):** Any information about customers that is obtained by a telecommunications carrier through the provision of the service that is personal such as call detail. CPNI requirements are found in Section 222(c) of the Communications Act and Part 64 of the FCC rules.

## **D**

**Dark Fiber:** Fiber connection sold alone without any technology that sends information signals over the fiber strands (i.e., light). The customer can connect their own electronics to these strands of fiber.

**Denial of Service (DOS) Attack:** An attack on a computer system or network that causes a loss of service to users, typically the loss of network connectivity and services, by consuming the bandwidth of the victim's network or overloading the computational resources of the victim's system. A distributed DOS attack, or DDOS attack, is where the perpetrator attacks a network using more than one, and often thousands of IP addresses.

**Dense Wavelength Division Multiplexing (DWDM):** Puts data from various sources together on an optical fiber, with each signal carried at the same time on its own separate light wavelength. Using DWDM, up to 80 separate wavelengths or channels of data can be multiplexed into a light stream transmitted on a single optical fiber. Each channel carries a time division multiplexed signal. In a system with each channel carrying 2.5 Gbps, up to 200 billion bits can be delivered per second by optical fiber.

**Detariffing:** The removal of regulations requiring that a common carrier service be offered under a tariff approved by the regulatory agency. Detariffing affects direct price controls.

**Digital Divide:** A policy term that refers to the difference in broadband access between areas in the U.S. that have access to high-speed broadband services and areas lacking such access.

**Digital Opportunity Data Collection (DODC):** A broadband mapping initiative at the FCC, subsequently renamed the Broadband Data Collection which provides location-level data on broadband availability, which includes providers who serve a location and the maximum speeds they offer to the location.

**Digital Subscriber Line (DSL):** A technology for transmitting high-bandwidth information to and from homes and small businesses over copper telephone lines. xDSL refers to different variations of DSL, such as ADSL (asymmetric DSL), SDSL (symmetrical DSL), HDSL (high bit-rate DSL) and VDSL (very-high-bit-rate DSL).

**Digital Subscriber Line Access Multiplexer:** A network device, generally located within a company's central office, that receives signals from multiple customer DSL connections and puts the signals on a high-speed backbone line using multiplexing techniques.

**Digital Television (DTV):** A technology for transmitting and receiving broadcast television signals. DTV provides clearer resolution and improved sound quality. Since June 2009, full- power television stations nationwide have been broadcasting exclusively in a digital format.

**Direct Broadcast Satellite (DBS):** TV programming or other content transmitted via high-powered satellite to a dish mounted outdoors whether on a residence or a business (e.g., DIRECTV and DISH Network).

**Disaster Information Reporting System (DIRS):** A web-based system through which the FCC collects operational status and restoration information from communications providers during major disasters and subsequent recovery efforts.

**DOCSIS (Data Over Cable Service Interface Specifications):** A set of communications and interface specifications for cable modems.

## E

**E-911:** Short for Enhanced 911, it enables mobile or cellular phones to process 911 emergency calls and enables emergency services to locate the geographic position of the caller.

**Economic Area:** A geographic area used by the FCC for issuing wireless licenses.

**Eligible Telecommunications Carrier (ETC):** A voice (and usually broadband) service provider that is eligible to participate in the Universal Service Fund High Cost and Low-Income programs. ETCs are designated either by a state commission or the FCC, and they must provide services to any requesting customer within their designated geographic area.

**Emergency Alert System (EAS):** A national system in the U.S. put into place in 1994, superseding the Emergency Broadcast System. The system is jointly coordinated by the FCC, FEMA (Federal Emergency Management Agency) and the National Weather Service.

**End User Common Line Charge (EUCL):** Also called the Subscriber Line Charge (SLC). A monthly access charge that telephone subscribers pay to compensate the local telephone company for a portion of its costs to install and maintain telephone wires, poles, and all other facilities.

**End User:** Customers who directly use telecommunications or information services provided by an LEC. Usually, a business or residence located in the LEC's serving territory.

**Enhanced ACAM:** See "ACAM."

**E-Rate:** Also Called the Schools and Libraries Program. Funding from the Universal Service Fund provides discounts for telecommunications, Internet access, and internal connections to eligible schools and libraries.

**Ethernet:** A frame-based, computer networking technology for local area networks. The name comes from the physical concept of ether. It defines wiring and signaling for the physical layer, and frame formats and protocols for the media access control/data link layer of operating such a network.

**Ethernet Transport Service (ETS):** A private, dedicated point to point connection between two locations, including business locations or data centers, and/or local area networks.

**Extended Area Service (EAS):** An extension of a service provider's local calling service area, allowing customers to call other parties within this area without incurring long-distance charges.

## **F**

**Fabric:** Also referred to as the "Broadband Serviceable Location Fabric," this is a database maintained by the FCC that purports to reflect every location in the United States that could be served by broadband networks. Providers submit their Broadband Data Collection reports to show which of these locations can be served by their respective networks.

**Federal Communications Commission (FCC):** The federal agency that regulates all interstate and international communications by radio, television, wire, satellite, and cable in all 50 states, the District of Columbia, and U.S. territories. An independent U.S. government agency overseen by Congress, the FCC was established under the Communications Act of 1934 and is responsible for implementing and enforcing America's communications law and regulations .

**Federal-State Joint Board:** An advisory panel established by statute and comprised of commissioners representing state and federal jurisdictions addressing various topics such as separations of costs between jurisdictions and shared responsibilities in furtherance of Universal Service.

**Federal Universal Service Charge (FUSC):** The Federal Universal Service Charge recovers a carrier's or other provider's contribution to the federal Universal Service Fund programs as required by the FCC.

**Fiber/Fiber Optics:** Communications technology that uses thin filaments of glass or other transparent materials. Fiber-optic technology offers extremely high transmission speeds, allowing for data-intensive services such as video on demand.

**Fiber to the “x”:** A general term for any broadband network using optical fiber to replace the regular subscriber line. The term was generalized for several different configurations of fiber deployment, including fiber to the home (FTTH), fiber to the premises (FTTP), fiber to the curb (FTTC), etc.

**FirstNet (First Responder Network Authority):** An independent authority charged with establishing a single nationwide, interoperable public safety broadband network. FirstNet was created by the Middle-Class Tax Relief and Job Creation Act of 2012.

**Fixed Broadband:** Fixed broadband services provided to one’s home, business, or other individual location. These include cable, fiber optic, DSL, and fixed wireless Internet services.

**Fixed Wireless:** The operation of wireless devices or systems to provide high-speed data transmission to and from fixed locations such as homes and offices. Fixed wireless devices usually derive their electrical power from the utility mains, unlike mobile wireless or portable wireless that tend to be battery-powered. Although mobile and portable systems can be used in fixed locations, efficiency and bandwidth are compromised compared to fixed systems. Mobile or portable battery-powered wireless systems can serve as emergency backups for fixed systems in case of a power outage or natural disaster.

**Flat Rate:** A type of service pricing charged on a monthly or other stated billing period that does not vary according to usage.

**Form 477:** A biannual report filed with the FCC by all providers of broadband and voice services detailing the availability and number of subscribers to these services. This form is no longer filed independently, but the information is included in the Broadband Data Collection filings.

**Frequency Division Multiple Access (FDMA):** The division of the frequency band allocated for wireless communication into individual channels, each of which can carry a voice conversation or, with digital service, digital data. FDMA is a basic technology for analog AMPS, which divides the cellular spectrum into 832 channels each with 30 kHz bandwidth. With FDMA, each channel can be assigned to only one user at a time. D-AMPS also uses FDMA but adds TDMA to get three channels for each FDMA channel, tripling the number of calls that can be handled on a channel.

**Further Notice of Proposed Rulemaking (FNPRM):** Issued by the FCC when it proposes additional rule changes to existing regulations. Before any changes to regulations can be made, interested parties are given a period during which they can comment on the proposed changes.

## G

**Gigabit (Gb):** 1 billion bits (see also bit).

**Gigabit Passive Optical Networks (GPON):** Point-to-multipoint communications architecture in which unpowered fiber optic splitters are used to enable a single optical fiber to serve multiple customers without having to provision individual fibers between the hub and customer.

**Gigabit per Second:** A unit of data transfer equal to 1,000 megabits per second (see “bit”).

**Gigabyte (GB):** A gigabyte is a unit of measurement for computer memory. One gigabyte is 1,073,741,824 bytes or  $2^{30}$ . Gigabytes are a common storage measurement for computers and smartphones (see also byte). Gigabytes are also a common measurement for broadband usage, measuring the volume of data downloaded or uploaded by a device and/or customer. Some providers limit the amount of data customers can download and upload each month and will list these limits in terms of megabytes (MB), gigabytes (GB) or terabytes (TB).

**Gigahertz (GHz):** A unit of frequency equal to one billion hertz or cycles per second.

**Global Positioning System (GPS):** A satellite-based navigation system that allows people using small, hand-held receivers to pinpoint their geographic location within 10 to 100 meters. GPS consists of a “constellation” of 24 satellites that orbit the Earth at a height of 10,900 miles. The satellites use mathematical calculations to broadcast information that is translated by hand-held receivers as longitude, latitude, and altitude. GPS is owned and operated by the U.S. Department of Defense but is available for widespread use around the world.

**Global Wide Area Network (GWAN/backbone network):** A GWAN is a telecommunications network that covers a large area.

## H

**High-band Spectrum:** Spectrum with wavelengths between 24GHz and 100GHz used for 5G wireless services because its high capacity allows it to transmit substantial amounts of data. Also called Millimeter Wave Spectrum.

**High Cost Loop Support (HCLS):** A mechanism that provides support to certain rural Local Exchange Carriers based on their actual costs of deploying networks and delivering services in very high-cost rural areas, subject to certain caps and limits.

**High Cost Program (or High Cost Fund):** A program under the Universal Service Fund aimed specifically at fulfilling the statutory mandate that certain communications services must be reasonably comparable in price and quality as between rural and urban areas. Sub-parts of the High Cost Program include CAF Phase II Model Support, CAF Phase II Auction Support, and CAF-Broadband Loop Support, Alternative Connect America Model Support, the Rural Digital Opportunity Fund, the Mobility Fund, the 5G Fund, the Alaska Plan, and High Cost Loop Support (HCLS), each of which has been designed to address distinct challenges in rural areas. At times, some may refer to the entire High Cost Program as the “Connect America Fund” despite the inclusion of numerous other initiatives within the program. The High Cost Programs do not themselves finance network construction, but they enable the availability of networks and the affordability of services by distributing funds over a series of years to supplement recovery of costs from end user rates.

**High-Definition Television:** A digital (as opposed to traditional analog) television broadcasting format that provides widescreen pictures with image resolution that is significantly higher than standard-definition television.

**Hot Spot:** (1) a portable device that provides an Internet access point for nearby mobile wireless devices or computers with Wi-Fi capability. (2) A specific geographic location in which an access point provides public wireless broadband network services to mobile visitors through a wireless local area network. Geographic hot spots are often in heavily populated places like airports, train stations, libraries, convention centers, and hotels. Hot spots typically have a short range of access.

**HUBB:** A portal used by participants in Universal Service Fund High Cost Program mechanisms to report progress towards meeting their broadband deployment obligations. These broadband providers submit location-level information on newly available broadband deployment.

**Hybrid Fiber Coaxial:** A broadband network, commonly used by cable companies, that combines optical fiber and coaxial cable. The technology is used in different portions of a network to carry broadband content such as video, data, and voice.

## I

**Incentive Auctions:** A voluntary, market-based means of repurposing spectrum by encouraging licensees to voluntarily relinquish spectrum usage rights in exchange for a share of the proceeds from an auction of new licenses to use the repurposed spectrum.

**Incumbent Local Exchange Carrier (ILEC):** A telephone company that was providing local service when the Telecommunications Act of 1996 was enacted. ILECs are in contradistinction to CLECs (although ILECs may have CLEC affiliates that have expanded into other ILECs' areas and compete with those other ILECs).

**Institute of Electrical and Electronics Engineers (IEEE):** An international technical professional association composed of engineers, scientists, and students that fosters the development of standards that often become national and international standards. The institute is best known for developing standards for the computer and electronics industry. In particular, the IEEE 802 standards for local area networks are widely followed.

**Interactive Video Data Service:** A communications system operating over a short distance that allows nearly instantaneous, two-way responses by using hand-held devices at a fixed location. Examples include viewer participation in game shows, distance learning, and email on computer network.

**Interconnected VoIP Service:** An interconnected Voice over Internet Protocol (VoIP) service is a service that: (1) enables real-time, two-way voice communications; (2) requires a broadband connection from the user's location; (3) requires Internet protocol compatible customer premises equipment (CPE); and (4) permits users generally to receive calls that originate on the public switched telephone network and to terminate calls to the public switched telephone network.

**Interconnection:** The physical linking of a network with equipment or facilities not belonging to that network. The term may refer to a connection between a network owner's facilities and the equipment belonging to its customer, or to a connection between two (or more) network operators.

**Interexchange Carrier:** A common carrier that interconnects with and uses services and facilities provided by LECs to provide services to the public between local exchanges on a long-distance basis in compliance with local or federal regulatory requirements.

**Internet:** A global wide area network (WAN), also described as a network of interconnected computer networks, linked by a wide spectrum of networking technologies including wireless and optical. This network includes numerous high-speed, high-bandwidth data networks that constitute the Internet "backbone." The "backbone" connects major Internet hubs that distribute data to web servers, regional and local ISPs, and other locations.

**Internet Corporation for Assigned Names and Numbers (ICANN):** A global organization responsible for coordinating the maintenance and procedures of several databases related to the namespace of the Internet and ensuring the network's stable and secure operation.

**Internet Engineering Task Force:** A standards body that regulates the technical standards of the Internet.

**Internet Protocol (IP):** The method by which data is transmitted from one computer (or host) to another over the Internet using a system of addresses and gateways.

**Internet Protocol Television:** A system where a digital television service is delivered to subscribing consumers using IP over a broadband connection. Often provided in conjunction with video on demand (VOD), the service also may include Internet services such as web access. In those cases, it may be called triple play and would typically be supplied by a broadband operator using the same infrastructure. A simpler definition would be television content received by the viewer through technologies used for the web.

**Internet Service Provider (ISP):** A company that provides customers with access to the Internet, web hosting, and/or other related services for a fee. Most ISPs today deliver their services via broadband Internet access service.

**Interoperability:** The ability of a network to coordinate and communicate with other networks, such as two systems based on different protocols or technologies.

## **J**

**Jitter:** An undesired variation or delay in packet delivery often found in electronics and telecommunications.

## **K**

**Kilobit:** 1,000 bits (see bit).

## **L**

**Landline:** Wired telephone service.

**Last Mile:** A phrase used by the telecommunications industry to refer to the technologies and processes used to connect the customer to the larger communications network.

**Latency:** A measure of time delay experienced in a network.

**Least Cost Routing (LCR):** The process of selecting the path of communications traffic based on cost. Within a carrier's operations, an LCR team might periodically (monthly, weekly, or even daily) choose between routes from several or even hundreds of operators for destinations across the world based upon prices offered by those operators. This function might also be automated by a device or software program.

**Legacy Support:** Certain federal High Cost Program support mechanisms that predate the use of models or auctions to distribute Universal Service support and that instead reimburse actual costs incurred by providers to deliver Universal Service have been called Legacy Support despite such costs being incurred for the deployment of advanced networks and delivery of affordable voice and high-speed broadband services; typically, for rural local exchange carriers, some use Legacy Support to refer to the Connect America Fund-Broadband Loop Support and High Cost Loop Support mechanisms.

**Lifeline Service:** A Universal Service Fund Low Income program that provides a monthly benefit on home or wireless phone and broadband service to eligible low-income households.

**Line of Sight:** The term used to describe an unobstructed path between the location of the signal transmitter and the location of the receiver in the context of wireless services and signals. Obstacles that can cause an obstruction in the line of sight include trees, buildings, mountains, hills, and other natural or manufactured structures or objects.

**Local Area Network (LAN):** A computer network limited to the immediate area, usually the same building or floor of a building.

**Local Exchange Carrier (LEC):** A local wireline telephone company (compared to a long-distance carrier or mobile wireless provider) that operates within a local area and provides telecommunication services within that area.

**Local Exchange Routing Guide (LERG):** A routing guide that lists the telephone carrier end offices (or central offices) and their association with Tandem switches. This guide is used to route telecommunications calls within the public switched telephone network (PSTN).

**Local Loop:** The physical connection, also called the subscriber line, from a telephone company's central office to a customer's telephone. This is an example of a last mile connection.

**Local Number Portability (LNP):** Also called number portability. A term used to describe the ability of individuals, businesses, and organizations to maintain their existing telephone number(s) and the same quality service when switching to a new local service provider.

**Long Term Evolution (LTE):** A standard for high-speed wireless for mobile phones and data terminals commonly used to refer to 4G wireless service capability.

**Low Band Spectrum:** The spectrum below 3Ghz often used for wireless networks because it has better propagation (it travels farther) than mid-band or millimeter wave spectrum.

**Low Earth Orbit Satellites (LEOs):** Satellite communications technology that uses satellites in low earth orbit, allowing for lower latency and faster connection speeds than traditional satellite communications networks.

## **M**

**Major Trading Area (MTA):** An area consisting of two or more Basic Trading Areas as defined by Rand McNally & Co. These large areas are used by the FCC to determine service areas for some wireless licenses. The United States is divided into 51 MTAs.

**Megabit:** 1 million bits (see “bit”).

**Megabits per second (Mbps):** A measure of data transfer speed, particularly network transmissions (see “bit”).

**Megabyte (MB):** 1 million bytes (see “byte”).

**Megahertz (MHz):** A unit of frequency equal to one million hertz or cycles per second.

**Mesh:** A type of Internet infrastructure that is decentralized, relatively inexpensive, and very reliable and resilient. Wireless mesh networking is mesh networking implemented over a wireless local area network. With this type of networking, each node must not only capture and disseminate its own data, but also serve as a relay for other nodes and collaborate to propagate the data in the network.

**Metropolitan Statistical Area (MSA):** One of the 305 areas as determined by the federal Office of Management and Budget (OMB) and upon the basis of which the FCC defines urban cellular telephone service areas. When the FCC began issuing cellular radio licenses, it divided the United States into Rural Service Area and MSA markets.

**Microwave:** A form of wireless communication that uses frequencies between 300 MHz and 300 GHz to transmit radio waves.

**Mid-Band Spectrum:** The spectrum between 3.0 -24GHz. The characteristics of these spectrum bands tend to have higher capacity than low-band spectrum and further propagation than millimeter wave spectrum.

**Middle-Mile Networks:** Network facilities that connect a local ISP access network with the rest of the Internet or web.

**Millimeter Wave Spectrum (mmW):** Spectrum with wavelengths between 24GHz and 100GHz used for 5G wireless services because its high capacity allows it to transmit substantial amounts of data. Also called High-Band Spectrum.

**Mobile Broadband Services:** Wireless Internet access via mobile or device-based networks. Services available throughout the provider's cellular coverage area and include 3G, 4G, and 5G services offered by mobile, or cellular providers.

**Mobile Telephone Switching Office (MTSO):** The central computer that connects a wireless phone call to the public telephone network. The MTSO controls the entire system's operations, including monitoring calls, billing, and handoffs.

**Mobile Virtual Network Operator (MVNO):** A mobile service operator that does not have its own licensed spectrum and does not have the infrastructure to provide mobile service to its customers. Instead, MVNOs lease wireless capacity from pre-existing mobile service providers and establish their own brand names different from the providers.

**Multichannel Multipoint Distribution Service (MMDS):** A broadcasting and communications service that operates between 2.1-2.7 GHz. MMDS, also known as wireless cable, was originally conceived as a substitute for conventional cable TV.

**Multichannel Video Programming Distributor (MVPD):** A service provider that makes multiple channels of video programming available for purchase to subscribers or customers. Cable and IPTV providers are common forms of MVPDs.

**Multiple System Operator (MSO):** A company that operates more than one cable TV system.

**Multiprotocol Label Switching (MPLS):** A technology designed to accelerate network traffic and manage flow. Each packet is given a label that designates its network path. This helps to unclog networks because routers simply pass the packet on, instead of determining a route. MPLS is called multiprotocol because it works with multiple standards.

**Municipal Wi-Fi:** Wireless Internet provided by a municipal government entity or community.

## **N**

**N11 code:** A three-digit code used in abbreviated dialing in the North American Numbering Plan (NANP). N stands for digits 2 through 9. Provides access to special local services, such as 911 for emergencies. 211: Community services & info; 311: Municipal government services, non-emergency #; 411: Directory assistance; 511: Traffic info; 611: Phone company customer svc and repair; 711: TDD & Relay; 811: Underground utility location; 911: Emergency services.

**National Association of Regulatory Utility Commissioners (NARUC):** An association of state and local utility commissioners that regulates intrastate utility services such as electric, power, gas, transportation, and telecommunications.

**National Exchange Carrier Association (NECA):** Established by the Federal Communications Commission, NECA prepares common tariffs and administers the revenue pool among its members for access provided to interexchange long-distance carriers. LECs can choose to participate in NECA's cost recovery mechanisms or to file their own tariffs for cost recovery for other carriers.

**Net Neutrality:** A principle applied to broadband networks that aims to ensure networks are free of certain restrictions on the kinds of equipment that may be attached to them or the kinds of devices that may be used to access them and to enable consumers' choice in terms of access to and use of content and applications over them. The term "open internet" is often used from time to time to refer to similar principles.

**Network:** Any connection between two or more computers that enables them to communicate. Networks may include transmission devices, servers, cables, routers, and satellites.

**Network Management:** How an Internet service provider manages the data that moves across its networks.

**Network Outage Reporting System (NORS):** The system that requires qualifying communication providers (wireline, cable, satellite, wireless, interconnected VoIP, and Signaling System 7 providers) to report network outages that meet the FCC's thresholds.

**Network slicing:** A wireless network technology that is enabled by 5G to share virtualized subnetworks.

**Next Generation 911 (NG911):** A digital, internet protocol-based system that will replace the analog 911 infrastructure that has been in place for decades.

**NIST (National Institute of Standards and Technology):** A nonregulatory agency within the U.S. Department of Commerce that promotes and maintains measurement standards. NIST is also one of the nation's oldest physical science laboratories.

**NIST Cybersecurity Framework:** A resource published by NIST to assist critical infrastructure operators with managing and reducing cybersecurity risks.

**North American Numbering Plan (NANP):** The telephone numbering system used in 25 distinct regions in 20 countries primarily in North America, including the United States and its territories, Canada, and the Caribbean. NANP format stipulates a 10-digit telephone number, comprised of a three-digit numbering plan area code (more commonly referred to as an area code), followed by a three-digit central office code, and ending with a four-digit line number.

**Notice of Inquiry (NOI):** Issued by the FCC when it is seeking information or ideas on a given topic. Time periods are specified during which all interested parties should submit comments.

**Notice of Proposed Rulemaking (NPRM):** Issued by the FCC when it proposes a new body of regulations or changes to existing regulations. Before any changes to regulations can be made, interested parties are given a period during which they can comment on the proposed changes. If the FCC decides to make substantial alterations to the proposed rules, an additional comment period may be allotted (see also Further Notice of Proposed Rulemaking (FNPRM)).

**NPA-NXX:** A six-digit numeric code that consists of the three-digit area code (NPA) and NXX central office code.

**Number Portability:** A term used to describe the ability of individuals, businesses, and organizations to maintain their existing telephone number(s) and the same quality service when switching to a new local service provider. Also, sometimes referred to as local number portability.

**Numbering Plan Area (NPA):** A geographic area identified in the North American Numbering Plan by a unique, three-digit area code.

**NXX Code:** A code normally used as a central office code. It also may be used as an NPA code or special NPA code.

## O

**Open Radio Access Network (ORAN or Open RAN):** A radio access network (RAN) that uses open interfacing software and hardware specifications that allow interoperability between different vendor equipment within a single network. Traditional RANs use proprietary hardware and software elements requiring the network operator to purchase all elements from a single vendor. Open RAN specifications allow network elements to work together even if they are from different vendors.

**Over-the-Top (OTT):** A general term for service utilizing a network that is not offered by that network operator such as over-the-top video over-the-Internet video (e.g., Netflix). Often referred to as “over-the-top” because these services travel on top of and rely upon the broadband service to which a user subscribes.

## P

**Packet:** In data communication, a sequence of binary digits, including data and control signals, which is transmitted and switched as a composite whole.

**Packet Loss:** When one or more packets of data traveling across a computer network fail to reach their destination. Packet loss is either caused by errors in data transmission, typically across wireless networks, or network congestion.

**Packet-Switching:** Technique whereby the information (voice or data) to be sent is broken up into packets of a few kilobits each (at most), which are then routed by the network between different destinations based on addressing data within each packet. The packets are typically split up and reordered during transmission, then reassembled upon reaching their destination. Use of network resources is optimized, as resources are needed only during the handling of each packet. This is an ideal model for ad hoc data communication, and works well for voice, video, and other streamed data.

**Paid Prioritization:** To provide faster download and upload speeds for certain content whether the prioritization is linked to a higher-cost subscription or a deal with content providers.

**Partial Economic Areas (PEA):** 406 geographic areas used for wireless spectrum bidding areas and licensing. PEAs were created leading up to the TV Whitespaces Incentive Auction (600Mhz) as a compromise between large and small stakeholders and have been used in the 600Mhz, 2.4GHz, C-Band (3.7GHz), and 3.45GHz spectrum bands.

**“Pass Through” Fees:** Fees related to government programs that providers may choose to “pass through” to consumers, such as fees related to universal service or regulatory fees. Service providers opting to pass through such fees must itemize the fees they add to customers’ base monthly prices and include them in this section.

**Passive Optical Network (PON):** A system that brings optical fiber cabling and signals all or most of the way to the end-user. Depending on where the PON terminates, the system can be described as fiber to the curb (FTTC), fiber to the building (FTTB) or fiber to the home (FTTH).

**Performance Measures Testing:** Network performance testing required of Universal Service Fund High Cost Program participants to demonstrate delivery of broadband that meets the speed and latency of their broadband deployment obligations. Up to 50 locations that are reported to HUBB may be tested on quarterly basis for two years to show that the deliverable speeds at the customer’s location meet the standards established under the program (also called “Performance Testing” or “Network Performance Testing”).

**Plain Old Telephone Service (POTS):** The most basic form of residential and small business telephone connections still used in many parts of the world.

**Point(s) of Presence (POP):** For “landline” communications, POPs define the physical interconnection points between the two networks. For wireless, POPs generally refer to the number of people in a specific area where wireless services are available (the population).

**Price Cap:** An alternative to rate-of-return regulation in which a ceiling price is set for tele- communications services. The regulated company can move rates below the ceiling level without prior approval of the regulatory agency.

**Private Branch Exchange (PBX):** A telephone switching system that interconnects in-house telephone extensions to each other, as well as to the outside telephone network. IP PBX is a PBX with Internet protocol connectivity and may provide additional audio, video, or instant messaging communication utilizing the Transmission Control /Internet Protocol (TCP/IP protocol) stack.

**Propagation:** Typically refers to how far a wireless signal can reach and how well that signal can move through interference (e.g., buildings, trees). Low-band spectrum tends to have better propagation than mid-band or high-band spectrum.

**Public Safety Answering Point (PSAP):** The dispatch office that receives 911 calls from the public. May be a local fire or police department, an ambulance service, or a regional office covering all services.

**Public Switched Telephone Network (PSTN):** The system of interconnected networks that provide primarily voice telephony service.

## Q

**Quality of Service (QoS):** The probability of the telecommunication network meeting a given traffic contract. Or in many cases, the term is used informally to refer to the probability of a packet succeeding in passing between two points in the network. In telephony, QoS refers to lack of noise and tones on the circuit, appropriate loudness levels, etc., and includes grade of service.

## R

**Radio Access Network (RAN):** Wireless network elements, including antennas and base stations that connect individual devices to the backhaul (often fiber) network and core network.

**Radio Frequency (RF):** Any of the electromagnetic wave frequencies that lie in the range extending from around 3 kHz to 300 GHz, which include those frequencies used for communications or radar signals.

**Ransomware:** A type of malicious software (malware) designed to block access to a computer system until a sum of money is paid.

**Rate of Return (RoR):** The percentage that a regulated telephone company, an interexchange carrier, or a public utility company is authorized to earn on its capital investment for services provided.

**ReConnect:** The U.S. Department of Agriculture's (USDA) ReConnect Loan and Grant Program furnishes loans and grants to provide funds for the costs of construction, improvement, or acquisition of facilities, and equipment needed to provide broadband service in eligible rural areas.

**Regional Bell Operating Company (RBOC):** Any of the ILECs that were created at the AT&T/Bell telephone system breakup in the 1980s.

**Retransmission Consent:** A provision of the 1992 U.S. Cable Television and Competition Act requiring cable operators and other MVPDs to obtain permission from broadcasters before carrying their programming.

**Reverse Auction:** A type of auction in which the roles of buyer and seller are reversed. In an ordinary auction (also known as a forward auction), buyers compete to obtain a good or service by offering increasingly higher prices. In a reverse auction, the sellers compete to obtain business from the buyer, and prices

will typically decrease as the sellers undercut each other. The FCC has used reverse auctions to distribute Connect America Fund Phase II and Rural Digital Opportunities Fund support to areas unserved with broadband service by the Price Cap Incumbent Local Exchange Carrier.

**Roaming:** Using a wireless phone outside of your service provider's local coverage area or home calling. Roaming arrangements between service providers expand the potential area for phone use. Service providers typically charge a higher per-minute fee for calls placed outside their home calling or coverage area. International roaming means that you can use networks other than your own when traveling abroad.

**Robocall(s):** The use of auto dialers to call consumers often providing them with a recorded message. Robocalls have legal and legitimate uses (e.g., schools notifying parents of a snow day) and illegal and illegitimate uses (e.g., targeting vulnerable populations with scams and fraud).

**Robocall Mitigation Database:** An FCC-mandated database through which all voice service providers must file certifications regarding their efforts to fight illegal robocalls on their networks.

**Routers:** Devices that connect autonomous networks of like architecture at the network layer (layer 3), based on IEEE 802 local area network standards.

**Rural Call Completion:** Problems affecting the transmission and completion of a long-distance call placed to consumers in rural areas. Issue results from originating providers utilizing "least cost routers" to terminate calls (see least cost routing).

**Rural Digital Opportunity Fund (RDOF):** An auction (also known as Auction 904) conducted by the FCC in 2020 to distribute Universal Service Fund support in high-cost rural areas where larger local exchange carriers (or other providers) had not deployed broadband services at speeds of 25Mbps downstream and 3Mbps upstream, or faster. Providers placed bids to deliver voice and broadband services in these areas, with winners determined based upon the amounts of support they were willing to receive to serve an area adjusted by a formula recognizing the speed and latency levels of broadband performance each bidder was willing to provide.

**Rural Health Care Program (RHC):** A Universal Service Fund program aimed at making telecommunications and broadband service affordable for rural health care clinics and other eligible health care providers. Rural Health Care USF contains two programs: (1) Healthcare Connect Fund Program, which provides a 65% discount on eligible broadband connectivity, and (2) the Telecommunications

Program, which provides reduced rates for telecommunications and voice services for telemedicine and telehealth.

**Rural Local Exchange Carrier (RLEC):** A smaller company that historically served as the incumbent provider of local telephone service (ILEC) in rural areas that larger ILECs such as those in the Bell telephone system (subsequently known as Regional Bell Operating Companies or RBOCs) had declined to serve. Today, all RLECs provide Internet access services, and many provide other kinds of services as well, such as video and mobile wireless.

**Rural Service Area (RSA):** Areas not included in Metropolitan Statistical Areas (MSAs) are divided into RSAs. Generally, these are the rural regions of the United States. The FCC used RSAs to license cellular carriers in areas not included in MSAs. There are 428 RSAs in the United States.

**Rural Utilities Service (RUS):** A rural lending system within the U.S. Department of Agriculture made up of the Rural Electrification Administration and other similar programs.

## **S**

**Satellite:** Device located in geostationary or low earth orbit (LEO) above the earth that receives transmissions from separate points and retransmits them to cable systems, direct broadcast satellite (DBS) dishes, and others over a wide area.

**Secure Telephone Identity Governance Authority (STI-GA):** A critical, industry-led body that helps the telecommunications industry to mitigate the problem of unwanted robocalls. The organization ensures the integrity of the issuance, management, security, and use of Secure Telephone Identity (STI) certificates issued in compliance with the Signature-based Handling of Asserted Information Using toKENs (SHAKEN) specification. Working with the IETF's STIR (Secure Telephone Identity Revisited) protocol, the STI-GA is operated under the Alliance for Telecommunications Industry Solutions's (ATIS) auspices.

**Secured and Trusted Network Act of 2019:** Laws that require the FCC to publish a list (Covered List) of communications equipment and services that are deemed to pose a risk to national security (Covered Equipment and Services) and prohibit the use of federal funding for the purchase, acquisition, maintenance, improvement, or modification of equipment and services on the Covered List. Certain small providers may be eligible to receive reimbursement for replacing covered equipment.

**Service Level Agreement (SLA):** A contract between a network service provider and a customer that specifies, usually in measurable terms, what performance specifications—quality, availability, responsibilities—the network service provider will guarantee.

**Session Initiation Protocol (SIP):** A standard protocol for initiating an interactive user session that involves multimedia elements such as video, voice, chat, gaming, and virtual reality.

**Short Messaging Service (SMS):** Popularly known as text messaging. With SMS, subscribers can send short text messages (usually, about 160 characters) to and from wireless handsets.

**Signaling System 7 (SS7):** A specific network control system made up of protocols for the interpretation and use of an array of network control and operation signals. The system puts the information required to set up and manage telephone calls in a separate network, rather than within the same network that the telephone call is made.

**SIM Swap Fraud (or Port Out Scam):** When a phone number is transferred to another device without the owner's authorization.

**Slamming:** The unauthorized switching of a customer's long-distance phone service from one carrier to another without the customer's permission. Slamming violates FCC regulations.

**Small Cell:** Small radio antennas used for the central radio transmitter/receiver that maintains communications with a mobile telephone within a given range. Small cells are used for 5G deployment in densely populated areas for transmitting information over high capacity, low propagation spectrum.

**Smart Grid:** An electrical grid that uses information and communications technology to gather and act on information, such as the behaviors of suppliers and consumers, in an automated fashion to improve the efficiency, reliability, economics, and sustainability of the production and distribution of electricity. Smart grid technology is being used to bring utility electricity delivery systems into the 21st century, using computer-based remote control and automation.

**Smart Rural Community Program:** A program created by NTCA—The Rural Broadband Association to recognize “best practice” models for broadband deployment and applications in rural America, as well as collaboration across various sectors.

**Soft Switch:** A central device in a telecommunications network that connects voice calls from one phone line to another, across a telecommunication network or the Internet, entirely via software running on a general-purpose computer system.

**Software Defined Networking (SDN):** An umbrella term referring to various kinds of network technology focused on making the network more agile and flexible. SDN allows cloud and network engineers and administrators to respond quickly to changes via a central control console.

**Special Access:** An older term used for business data services. Business data services are dedicated point-to-point transmission of data at certain guaranteed speeds and service levels using high-capacity connections.

**Spectrum:** The range of electromagnetic radio frequencies used in the transmission of voice, data, and television.

**Spectrum Allocation:** Federal government designation of a range of frequencies for a category of uses.

**Spectrum Cap:** A limit to the allocated spectrum designated for a specific service.

**Spoofing:** The practice of causing the telephone network to display a number on the recipient's caller ID display that is not the actual originating station; the term is commonly used to describe situations in which the motivation is considered nefarious by the caller. Just as email spoofing can make it appear that a message came from any email address the sender chooses, caller ID spoofing can make a call appear to have come from any phone number the caller wishes.

**Stand Alone Broadband:** Broadband service without a voice component.

**STIR/SHAKEN Framework:** A process of authenticating traffic on networks to ensure calls match their caller ID information provided over Internet Protocol. This framework was mandated to help customers and service providers determine how likely it is that the call is legitimate to mitigate illegal robocalling and spoofing.

**Study Area:** The geographic area in which a service provider is designated as an eligible telecommunications carrier. Each study area is assigned a number, called a Study Area Code (SAC).

**Study Area Code (SAC):** The number assigned by the Universal Service Administrative Company (USAC) to an eligible telecommunications carrier's study area.

**Subscriber Line:** Also called Local Loop, a subscriber line is the physical connection from a telephone company's central office to a customer's telephone. This is an example of a last mile connection.

**Subscriber Line Charge (SLC):** A monthly access charge that telephone subscribers pay to compensate the local telephone company for a portion of its costs to install and maintain telephone wires, poles, and all other facilities.

**Symmetric Digital Subscriber Line:** A version of DSL technology where the upload and download speeds are the same from the subscriber to the network.

**Synchronous Optical Network (SONET):** An ultra-high-speed, fiber-optic transmission standard developed for large-scale, fiber-based digital transmission networks that use equipment from many different manufacturers.

## **T**

**Tandem Office:** A switching office that connects end office switches with other Tandem Offices and other Class 5 end office switches. Tandem switches provide interconnection for voice traffic between carriers operating within the public switched telephone network (PSTN).

**Telco:** An abbreviated term referring to a telecommunications or telephone company.

**Telecommunications:** The transmission, between or among points specified by the user, of information of the user's choosing, without change in the form or content of the information as sent and received.

**Telecommunications Act of 1996:** Enacted and signed into law by President Bill Clinton on February 8, 1996, this act provided a comprehensive reform of the Communications Act of 1934. It was designed to promote competition between and among wireless and wireline carriers.

**Telecommunications Carrier:** Any provider of telecommunications services, except that such term does not include aggregators of telecommunications services. A telecommunications carrier shall be treated as a common carrier by law only to the extent that it is engaged in providing telecommunications services.

**Telecommunications Relay Service (TRS):** TRS provides access to communications services for people with hearing or speech disabilities. TRS can include text to voice, speech to speech relay, captioned telephone service, Internet protocol relay services, video relay services, etc. TRS is funded through fees on telephone customers' bills.

**Telecommunications Service:** The offering of telecommunications for a fee directly to the public, or to such classes of users as to be effectively available directly to the public, regardless of the facilities used.

**Telemedicine (also Telehealth or e-health):** A method of using communications technology to bring health care patients and professionals together regardless of geographic location to provide consultations and ongoing care. Telemedicine applications include videoconferencing, remote health monitoring, email, and general web use for medical-related issues.

**Telephony:** A term used to describe the science of transmitting voice over a telecommunications network.

**Terabyte (TB):** A terabyte is a common unit of measurement for broadband data usage, measuring the volume of data downloaded or uploaded by a device and/or customer. One terabyte is 1,024 gigabytes or  $2^{40}$  bytes. Some providers limit the amount of data customers can download and upload each month and will list these limits in terms of megabytes (MB), gigabytes (GB), or terabytes (TB).

**Throttling:** Intentionally slowing network speeds for certain content or subscription levels.

**Time Division Multiplexing (TDM):** Transmits data by breaking the signal down into multiple segments, which are transmitted separately over a single signal. Data is then reconstructed at the receiving end using a method based on the timing of the transmissions.

**Traffic-Sensitive Costs:** Voice telecommunications costs that vary according to usage.

**Transport Control Protocol:** A widely used network protocol that supports communication across interconnected networks and between computers with diverse hardware architectures and various operating systems.

**Trunking:** A method for a system to provide network access to many clients by sharing a set of lines or frequencies instead of providing them individually.

## **U**

**Ultra Wideband (UWB):** Also known as digital pulse wireless, a wireless technology for transmitting large amounts of digital data over a wide spectrum of frequency bands with extremely low power for a short distance. UWB radio not only can carry a huge amount of data over a distance up to 230 feet at extremely low power (less than 0.5 milliwatts) but can carry signals through doors and other obstacles that tend to reflect signals at more limited bandwidths and at a higher power. Both UWB and Bluetooth are considered personal area network technologies.

**Universal Service:** The government's aim, as stated in the Communications Act of 1934, of providing phone service to everyone, regardless of their location or ability to pay. Expanded under the Telecommunications Act of 1996, Universal Service also encompasses a subsidy to public schools, libraries, and rural health care facilities for telecom services. Over the past decade, the concept of Universal Service has been updated to promote the availability and affordability of broadband services and traditional telecom services.

**Universal Service Administrative Company (USAC):** An independent not-for-profit company designated by the FCC to implement its Universal Service Fund programs.

**Universal Service Fund (USF):** A series of mechanisms created pursuant to the Telecommunications Act of 1996 to promote Universal Service – that is, the availability and affordability of certain communications services, including both traditional telecommunications services and, in more recent years, broadband services. The Universal Service Fund is made up of four programs: High Cost (often called Connect America Fund), Low Income (also called Lifeline), Schools and Libraries (also called E-Rate), and Rural Healthcare.

## **V**

**Voice over Internet Protocol (VoIP):** The technology used to transmit voice conversations over a data network using IP. This is done by digitizing voice into discrete packets that are transferred independently over the network, instead of traditional circuit-committed protocols of the public switched telephone network (PSTN).

**Voice over LTE:** The standards and procedures for delivering voice communication and data over LTE networks.

**VPN (Virtual Private Network):** An extension of a private network across a public network, such as the Internet, using encryption to protect data—making the network “virtually” private. The VPN allows users to send and receive information across a shared or public network as if their devices were directly connected to a private network, increasing security and functionality of the private network.

**W**

**White Space:** Broadcasting services, which are assigned different frequencies for specific uses and the license to broadcast over these frequencies, are also assigned white spaces between frequencies to avoid technical interferences. White Space refers to the unused broadcasting frequencies in the wireless spectrum.

**Wide Area Network (WAN):** An Internet or network that covers an area larger than a single building or campus.

**Wi-Fi (Wireless Fidelity):** A term promulgated by the Wi-Fi Alliance that is meant to be used generically when referring to any type of 802.11 network. There are many variations of Wi-Fi using various spectrum bands. Originally, Wi-Fi devices operated in both the 2.4 GHz (802.11b and 802.11g) and 5 GHz bands (802.11a), but as access to other unlicensed spectrum bands grew, such as access to White Space spectrum, additional variations of Wi-Fi became available (such as 802.11ac, 802.11ad, 802.11af, 802.11ah, and 802.11ax). Wi-Fi is the most common method of connecting multiple Internet-capable devices to a local area network.

**Wireless Internet Service Provider:** An Internet service provider (ISP) that allows users to connect to a server through a wireless connection like Wi-Fi.

**Wireless Local Access Network (WLAN):** One in which a mobile user can connect to a local area network through a wireless connection. IEEE 802.11 is a popular standard for wireless local access networks.

**Wireless Local Loop:** A system that connects subscribers to the public switched telephone network (PSTN) using radio signals as a substitute for copper for all or part of the connection between the subscriber and the switch. This includes cordless access systems, proprietary fixed radio access, and fixed cellular systems. Sometimes called radio in the loop (RITL) or fixed-radio access (FRA).

**X**

No X words

**Y**

No Y words

**Z**

No Z words

## Website addresses of referenced organizations

**ACE** (Association of Communication Engineers): [www.ace-engineers.org](http://www.ace-engineers.org)

**ATIS** (Alliance for Telecommunications Industry Solutions): [www.atis.org](http://www.atis.org)

**FCC** (Federal Communications Commission): [www.fcc.gov](http://www.fcc.gov)

**Federal Register**: [www/federalregister.gov](http://www/federalregister.gov)

**FirstNet** (First Responder Network Authority): [www.firstnet.gov](http://www.firstnet.gov)

**FRS** (Foundation for Rural Service): [www.frs.org](http://www.frs.org)

**IANA** (Internet Assigned Numbers Authority): [www.iana.org](http://www.iana.org)

**ICANN** (Internet Corporation for Assigned Names and Numbers): [www.icann.org](http://www.icann.org)

**IEEE** (Institute of Electrical and Electronics Engineers): [www.ieee.org](http://www.ieee.org)

**IETF** (Internet Engineering Task Force): [www.ietf.org](http://www.ietf.org)

**NARUC** (National Association of Regulatory Utility Commissioners): [www.naruc.org](http://www.naruc.org)

**NECA** (National Exchange Carrier Association): [www.neca.org](http://www.neca.org)

**NIST** (National Institute of Standards and Technology): [www.NIST.gov](http://www.NIST.gov)

**NREDA** (National Rural Economic Developers Association): [www.nreda.org](http://www.nreda.org)

**NRTC** (National Rural Telecommunications Cooperative): [www.nrtc.coop](http://www.nrtc.coop)

**NTCA** (NTCA—The Rural Broadband Association): [www.ntca.org](http://www.ntca.org)

**NTIA** (National Telecommunications and Information Administration): [www.ntia.doc.gov](http://www.ntia.doc.gov)

**RTFC** (Rural Telephone Finance Cooperative): [www.rtfc.coop](http://www.rtfc.coop)

**RUS** (Rural Utilities Service): [www.usda.gov/rus](http://www.usda.gov/rus)

**STI-GA** (Secure Telephone Identity Governance Authority): [www.sti-ga.atis.org](http://www.sti-ga.atis.org)

**USAC** (Universal Service Administrative Company): [www.usac.org](http://www.usac.org)

**USDA** (U.S. Department of Agriculture): [www.usda.gov](http://www.usda.gov)

# About the Foundation for Rural Service



FOUNDATION FOR  
RURAL SERVICE

The Foundation for Rural Service (FRS) was established in 1994 as a non-profit 501(c)(3) by NTCA—The Rural Broadband Association. The organization plays a unique role within the telecommunications industry by supporting rural telecom companies, consumers and policymakers with educational information, products, and programming. The FRS mission is to sustain and enhance the quality of life in America by advancing an understanding of rural issues. The vision of FRS is to harness the power of the rural communications industry to enrich lives in America.

Through scholarships, grants, and a variety of educational programs, FRS focuses on educating rural youth, encouraging community development, and introducing policymakers and the public to challenges unique to rural communities.

For more information about FRS, visit [www.frs.org](http://www.frs.org).

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## About TCA



TCA partners with rural telecommunications and broadband companies across the United States to drive growth, innovation, and operational excellence. Through financial, regulatory, marketing, mergers and acquisitions, network, HR, strategic planning, and grant assistance services, we deliver actionable insight and support that empowers our clients to stay competitive in an ever-evolving landscape. Our commitment is to help telecommunications and broadband companies achieve sustainable success through strategic guidance and hands-on expertise.

For more information about TCA visit [www.tcatel.com](http://www.tcatel.com).

## About JSI



This project was developed in conjunction with JSI, a consulting firm that provides financial, engineering, management, regulatory, strategic planning, training, and operational support services to ILECs, CLECs, broadband providers, and other telecom companies. Established in 1962, JSI assists clients with forecasting, broadband build-out projects, network management, competitive pricing/bundling, operational reform, strategic partnerships, mergers/acquisitions and more.

For more information about JSI, visit [www.jsitel.com](http://www.jsitel.com).

## About NCSC



This project was generously supported by the National Cooperative Services Corporation (NCSC), a privately funded, member-owned cooperative that began operation in 1981. Today, the organization provides specialized financing services to electric cooperatives and telecommunications providers. NCSC is an affiliate of the National Rural Utilities Cooperative Finance Corporation (CFC).

For more information, visit [www.ncsc.coop](http://www.ncsc.coop).



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