

3.2 Voice Services (C.2.2)

Verizon offers an unmatched portfolio of voice services in the NCR ranging from traditional Centrex to the most advanced VoIP services. Verizon's voice customers can be assured of reliable, high-quality, cost-effective and innovative services that meet their mission-critical needs. No other service provider can provide the density and reach of Verizon in the NCR.

3.2.1 Voice Access Services

Verizon's local access portfolio of services includes Centrex, ISDN BRI, PRI, and analog/digital trunking. Verizon also provides local voice access through IP Trunking, which is addressed in *Section 3.2.3.2 VoIP – Internet Protocol Trunking – Service Overview*.

The Verizon WITS 3 solution uses Verizon's local exchange network infrastructure, and therefore by its very nature, is interconnected, interoperable and diverse.

3.2.1.1 Analog Line - Service Overview

Analog line—the basis for residential and small business service connections to the telephone network—is a voice-grade telephone service. Analog service is the precursor to more advanced forms of telephony such as Integrated Services Digital Network (ISDN), mobile phones, and Voice over Internet Protocol (VoIP). Verizon's analog line services include the following functions:

- Bi-directional, or full duplex, voice path with limited frequency range of 300 to 3400 Hz (a signal to carry the sound of the human voice both ways at once)
- Call-progress tones such as dial tone and ringing signal
- Subscriber dialing
- Operator services, such as directory assistance, long distance, and conference calling assistance

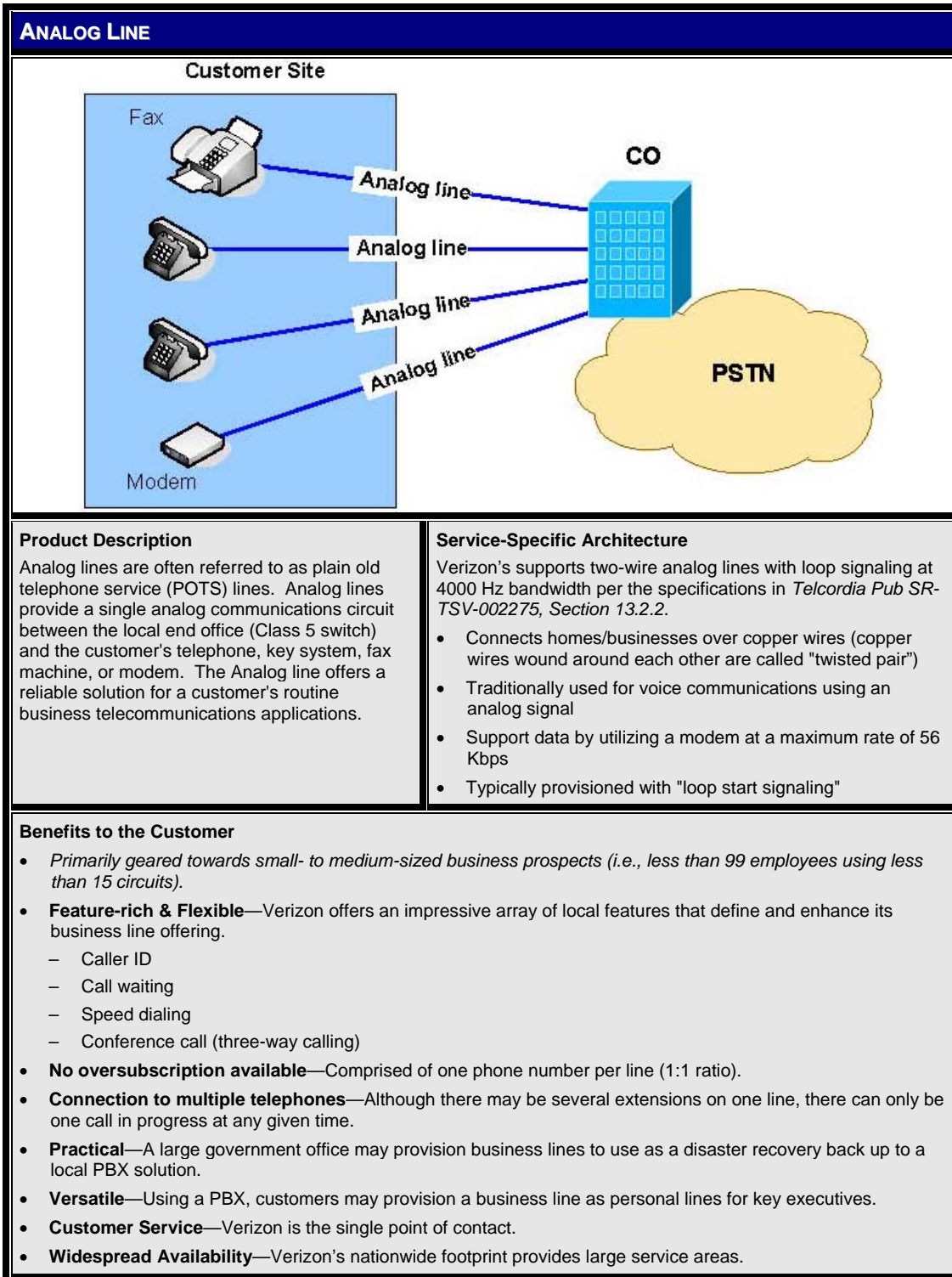
- Standards compliant analog telephone interface

Verizon offers the following features and services with its analog line:

- Voice mail
- Caller identification
- Call waiting
- Speed dialing
- Conference call (three-way calling)
- Enhanced 911

Verizon provides its analog Centrex line with the following standard features:

- Call transfer-all calls
- Consultation hold
- Three-way calling
- Touch tone
- Intercom
- Direct inward and outward dialing
- Access codes



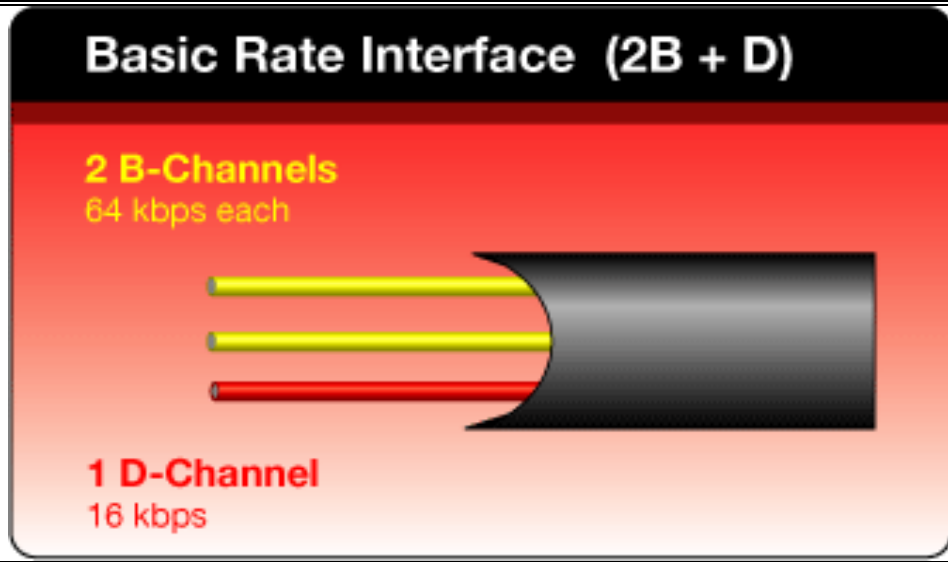
3.2.1.2 Integrated Services Digital Network Basic Rate Interface - Service Overview

ISDN provides high performance, fully digital access to the worldwide telecommunications network through standard copper telephone lines. This fast, digital transmission service is available virtually everywhere within the National Capitol Region (NCR). From offices, homes, and remote locations, ISDN allows employees to access resources and new business applications. Video images, data flow, fax transmissions, and phone conversations can occur simultaneously with ISDN.

ISDN Basic Rate Interface (BRI) supports a wide range of applications and emerging technologies by enabling a seamless exchange of information in any medium—voice, data, or video—at high speeds. The service is designed to meet immediate challenges by performing tasks more quickly using fewer resources. Using ISDN BRI enables customers to benefit from technologies shaping the workplace, including the support of teleworkers, dispersed project teams, and remote customer service. In addition, ISDN BRI enables customers to handle resource sharing and online connectivity more effectively.

ISDN BRI sends clear digital signals at high speeds over existing facilities. Without the need for a major network investment, ISDN BRI uses existing phone lines to carry voice, data, and video traffic at speeds more than four times faster than the fastest analog line. Voice calls can be made more quickly and with superior call quality because ISDN is digital. Combining ISDN BRI with Centrex provides additional power and improves productivity. Centrex ISDN BRI gives users control over allocating the bandwidth across desktops to take advantage of the classic benefit of Centrex with the enhanced call handling features of ISDN BRI. ISDN is available from all four major network switch types 5ESS, DMS, GTD5, and Siemens.

INTEGRATED SERVICES DIGITAL NETWORK (ISDN) BASIC RATE INTERFACE (BRI)



Product Description

ISDN BRI integrates service by allowing users to perform several digital functions at one time. ISDN BRI customers can research pertinent data on the Internet while participating in a conference call; fax important documents while e-mailing the recipients; and send large digital files (graphics or text) in a quarter of the time it would take with regular dial-up. All of this is accomplished with ordinary copper phone lines and an ISDN BRI card. A minimal investment compared with other services.

Service-Specific Architecture

ISDN BRI is a telecommunications standard specified by the International Telecommunication Union (ITU) that provides an all-digital, switched connection to support voice and data services. ISDN BRI is a two-wire digital subscriber line that provides the following features:

- Two 64 Kbps bearer (B) channels used for voice, data, and video; both B channels can be bonded providing a 128Kbps circuit
- One 16 Kbps data (D) channel used as the signaling channel for call set-up and call-completion messages to support enhanced features such as caller ID and to carry low-bandwidth, packet-switched data

Verizon supports both national (standard) and custom ISDN, though national is promoted and preferred. National ISDN is standards-based and supported by all switch suppliers to ensure switch interoperability.

ISDN BRI lines are supported per the specifications found in ANSI/EIA T1.607 and 610. ISDN BRI lines can consist of one or two B channels of 64 Kbps each and one D channel of 16 Kbps.

- Benefits to the Customer**
- Increase productivity using ISDN BRI's higher speeds— ISDN BRI utilizes two separate 64 Kbps channels, which can be combined into one 128 Kbps channel.
 - Faster data transmission speeds can result in shorter connection times and lower usage costs.
 - Avoid the costs and inflexibility of dedicated lines—the same ISDN line can be used to carry both voice and data, so there's no need to wait for a fax to finish before making a call.
 - Take advantage of productivity enhancing applications such as remote Local Area Network (LAN) access, videoconferencing, pre-press graphics, postproduction editing, and digital broadcasting that can reduce travel costs and product development time.
 - Enjoy clear, digital transmission that results in fewer errors and re-transmissions and greater network reliability – all of which saves time and increases productivity.
 - ISDN can also be used to back up overflow-dedicated services, such as frame relay, to ensure against outages or to provide cost effective insurance against high-volume congestion for mission critical information.
 - In a large government office, ISDN may be provisioned for use as a disaster recovery backup.

3.2.1.3 Integrated Services Digital Network Primary Rate Interface - Service Overview

ISDN PRI is a local exchange access service that creates a direct digital connection to a Verizon central office to provide voice, data, image, and video services on a single circuit or line. ISDN PRI provides fast, flexible access to services such as direct inward and outward dialing, toll-free service, and circuit switched data. The call-by-call service selection and individual calling line identification capabilities offer a cost-effective, feature-rich method of local access for applications such as Private Branch Exchange (PBX) trunking, host computer access, Local Area Network (LAN)-to-LAN connections, and video-conferencing. ISDN PRI transmits large volumes of data, video, and enhanced voice communications requiring higher transmission capabilities such as videoconferencing, imaging, digital audio, and Computer-Aided Design (CAD)/Computer-Aided Manufacturing (CAM).

The Verizon WITS 3 solution uses Verizon's local exchange network infrastructure, and therefore by its very nature, is interconnected, interoperable and diverse.

ISDN PRI is comprised of a central office trunk port connection via a T1 (1.5 Mbps) facility. Its 24 channels are arranged into twenty-three 64 Kbps B channels for user information and one 64 Kbps D-channel for signaling and control functions. Out-of-band signaling from ISDN offers clear 64 Kbps channels for data communications. The 64 Kbps channels can be bundled to provide speeds up to 1.5 Mbps per line. PRI uses the ISDN architecture and has a bandwidth of 1.536 Mbps for communication from a Central Office (CO) to the customer's premises. Similar to ISDN-BRI, there are two types of channels in ISDN-PRI:

1. B Channels: full 64 Kbps, free of call set-up signaling, for use in voice and switched data transmission
2. D Channel: control signaling functions.

Based on agency requirements, users may select an appropriate PRI arrangement from the following options:

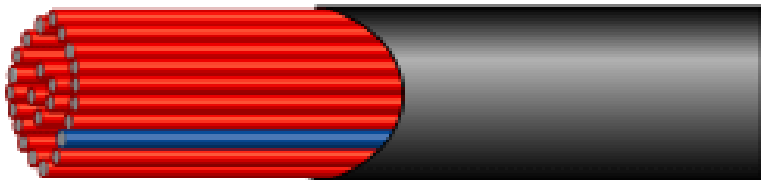
- 23 B Channels + 1 D Channel
- 23 B Channels + 1 Back-up D Channel
- 24 B Channels

Backup D Channel. This feature allows a D channel on a second interface at the same premises to be designated “standby” to carry signaling information for all the B channels on the first and subsequent interfaces. In the event of a failure of the ISDN primary service D channel (due to interface or equipment malfunction), the backup D channel assumes the signaling and control functions of the out of service D channel.

Shared D Channel. This feature allows the D channel of one ISDN primary rate service interface to provide signaling for the B channels of another interface, provided that they terminate on the same premises. One D channel can control up to twenty interfaces (up to 479 B channels).

The channels can carry several different services, depending on the Government’s requirements and equipment capabilities.

- Calling party default directory number
- Circuit switched data
- Circuit switched voice
- Dedicated B channel configuration
- Dedicated T1 line elimination
- Disaster recovery
- Host computer access
- LAN-to-LAN connection
- PBX trunking efficiency
- 23 B+D channel arrangements
- 23 B+ back-up D channel arrangements
- 24 B channel arrangements
- Video-conferencing

INTEGRATED SERVICES DIGITAL NETWORK (ISDN) PRIMARY RATE INTERFACE (PRI)	
<h2 style="margin: 0;">Primary Rate Interface (23B + D)</h2> <div style="display: flex; justify-content: space-around; align-items: center;"> <div style="text-align: center;"> <p style="color: red; font-weight: bold; margin: 0;">23 B-Channels</p> <p style="color: red; margin: 0;">64 kbps each</p> </div> <div style="text-align: center;">  </div> <div style="text-align: center;"> <p style="color: blue; font-weight: bold; margin: 0;">1 D-Channel</p> <p style="color: blue; margin: 0;">64 kbps</p> </div> </div>	
<p>Product Description</p> <p>ISDN PRI is a local exchange access service that creates a direct digital connection to a Verizon central office to provide voice, data, image, and video services on a single circuit or line.</p>	
<p>Service-Specific Architecture</p> <p>ISDN PRI (23B+D) is supported at an information payload data rate of 1.472 Mbps and ITU-TSS Q.931 signaling type. The D-channel cannot be shared by another ISDN PRI trunk. The following standards apply:</p> <ul style="list-style-type: none"> • ANSI/EIA T1.607 • 610/ NIUF National ISDN-1 (Telcordia Pub SR-NWT-001937) • NIUF National ISDN-2 (Telcordia Pub SR-NWT-002120) • NIUF National ISDN-3 (Telcordia Publication SR-NWT 002457) <p>ISDN PRI (24B+0D) is supported at an information payload data rate of 1.536 Mbps and ITU-TSS Q.931 signaling type and shares a D-channel with another ISDN PRI trunk. The following standards apply:</p> <ul style="list-style-type: none"> • ANSI/EIA T1.607 • 610/ NIUF National ISDN-1 (Telcordia Pub SR-NWT-001937) • NIUF National ISDN-2 (Telcordia Pub SR-NWT-002120) • NIUF National ISDN-3 (Telcordia Publication SR-NWT 002457) 	<p>Benefits to the Customer</p> <ul style="list-style-type: none"> • Digitally delivers Direct Inward Dialing (DID), Direct Outward Dialing (DOD), and toll-free service to the Government and allows a generous number of standard and optional features to work with the service (most compelling feature is caller ID, which allows information about the calling party to be passed to the called number) • Flexible call-by-call service greatly increases trunking efficiency • Eliminates cost of individual dedicated circuits • Increased call handling efficiency associated with calling line identification • Back-up configuration provides added protection and communications reliability • Clear digital transmission of voice and data communications • Rapid call set-up • Ability to provision bandwidth on demand (with compatible Customer Premises Equipment (CPE)) • Enhanced security for dial up connecting with call number configuration • Restricted number acceptance • Advanced call routing and call handling features • Widely available service • Video conferencing—large bandwidth increases video resolution, allows for faster screen refresh, and provides a sharper picture • Disaster recovery—circuit switched capability can provide alternate paths in the event of an emergency

3.2.1.4 Analog Trunking - Service Overview

The Verizon network supports analog trunks for incoming, outgoing, and two-way traffic and direct inward and outward dialing. Verizon's unbundled analog two-wire and four-wire loops provide four signaling options that are determined by point-of-termination characteristics. A two-wire analog loop will support loop-start, ground-start, loop reverse-battery, or customer-provided in-band signaling. A four-wire analog loop will support loop-start, ground-start, loop reverse-battery, customer-provided in-band, or duplex signaling.

Types of Analog Trunks

DID Trunks can only receive calls. A group of telephone numbers (DID numbers) are associated with a given trunk group; however, there is no one-to-one correspondence between the individual channels and these numbers. The PBX uses the DID number provided by the phone company to route the channel to the correct DID extension within the PBX extension. This allows some or all PBX stations to receive calls directly without going through an attendant (or auto attendant).

DOD Trunks are set up for outbound calling only.

Direct Inward/Direct Outward Dialing (DID/DOD) Trunks are two-way analog central-office trunks offering both inward (trunk-side) and outward (line-side dial tone) calling. DID/DOD trunks can replace a customer's existing DID and DOD trunks. DID/DOD trunks will cost the Government less because they distribute the calling load over fewer actual trunks, have fewer trunk termination requirements, and analyze high volumes and alter PBX trunks to fit traffic patterns more easily due to basic in-and-out calling being in one trunk group.

Types of Signaling for Analog Trunks

Loop-Start (LS) Signaling is a type of switch line signaling in which the network provides a battery source. To initiate a call, the end user's premises equipment provides a loop closure that causes Direct Current (DC) to flow, which the network detects.

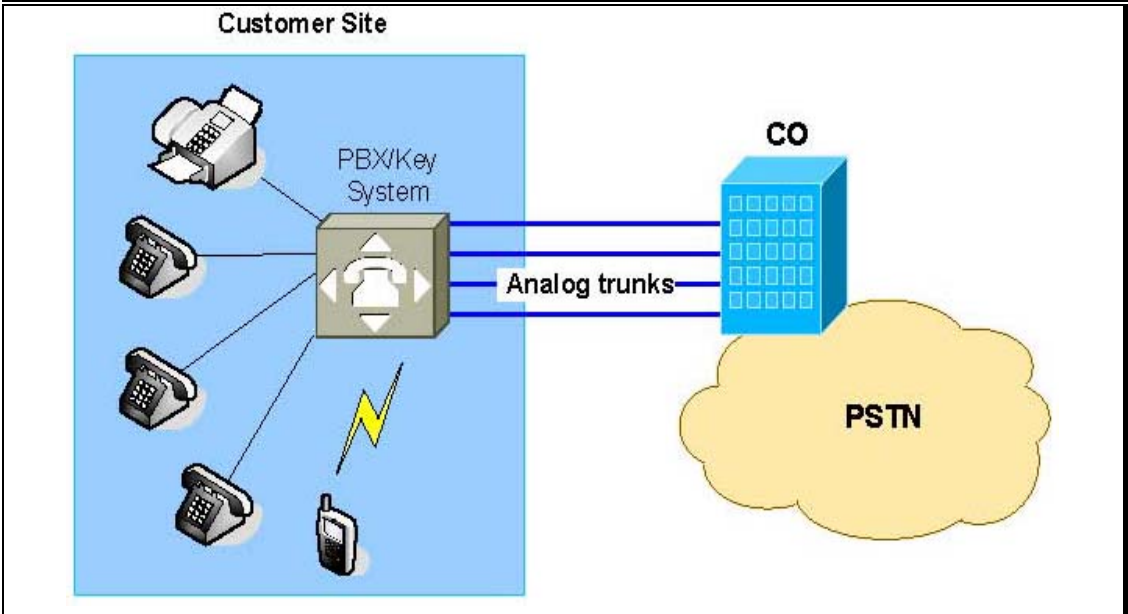
Ground-Start Signaling is a type of signaling in which one side of the two-wire loop is momentarily grounded to instantaneously obtain dial tone. Ground-start signaling is often used with PBXs.

Loop Reverse-Battery Signaling is a type of switch line DC signaling that uses loop-open and loop-closure signals to indicate on-hook and off-hook signals in one direction and normal battery polarity and reverse battery polarity to indicate on-hook and off-hook signals in the other direction. The originating end is the end of the service that generates loop-open and loop-closure signals. The other end—which generates the normal-battery polarity and reverse-battery polarity signals—is called the terminating end.

Duplex Signaling is a type of DC signaling that employs symmetrical and balanced signaling equipment at each end of the loop. One simplex conductor of the four-wire loop is used for signaling and the other simplex conductor is used for ground potential compensation. The open end is the end of a switch service that transmits ringing and dial tone and receives address signaling. The closed end is the end of a switch service that receives ringing and dial tone and transmits address signals.

Customer Specified Signaling provides an analog facility between a Verizon CO and an end user location that is capable of supporting specified signaling at the time the service is ordered.

ANALOG TRUNK



Product Description
Analog trunks are supported in the Verizon network for incoming, outgoing, and two-way traffic and direct inward and outward dialing.

- Benefits to the Customer**
- **Two-way calling:** DIOD trunks offer inward and outward calling.
 - **One trunk group:** Traffic studies are easier to evaluate in terms of traffic capacity/requirements.
 - **Direct station dialing:** Incoming calls are automatically directed to the station's user without attendant assistance. This feature reduces the requirement for attendant positions, reducing or eliminating attendant labor costs.
 - **Traffic efficiency:** There is only one trunk group needed for in- and out-dialing, so fewer trunks are needed to process the same number of calls. Fewer trunks and less trunk-termination equipment saves the customer money.
 - **Analog trunking:** No additional equipment is needed to replace existing DID trunks.

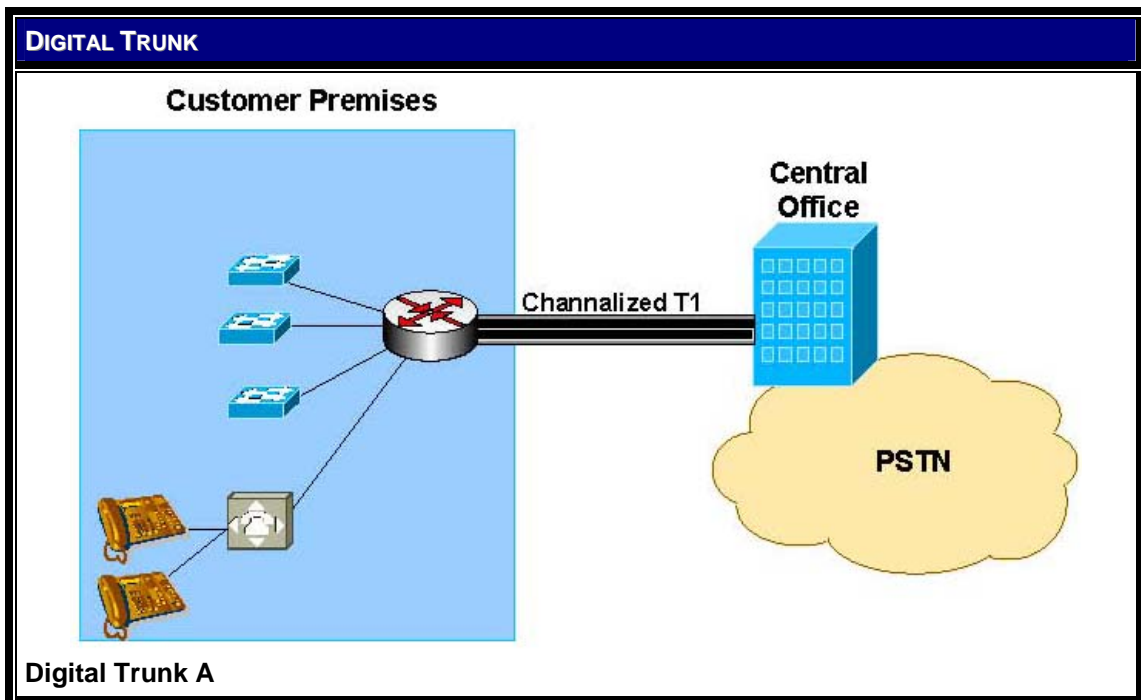
Service-Specific Architecture
Analog trunks are supported in the Verizon network for incoming, outgoing, and two-way traffic and direct inward and outward dialing. Verizon adheres to the ANSI standards for the analog trunks found in T1.102 and T1.403. Two-wire and four-wire access circuits are available from Verizon with DP/DTMF pulsing as specified in Telcordia BOC Notes on the LEC Networks, SR-TSV-0002275. The following signaling/supervision types are available:

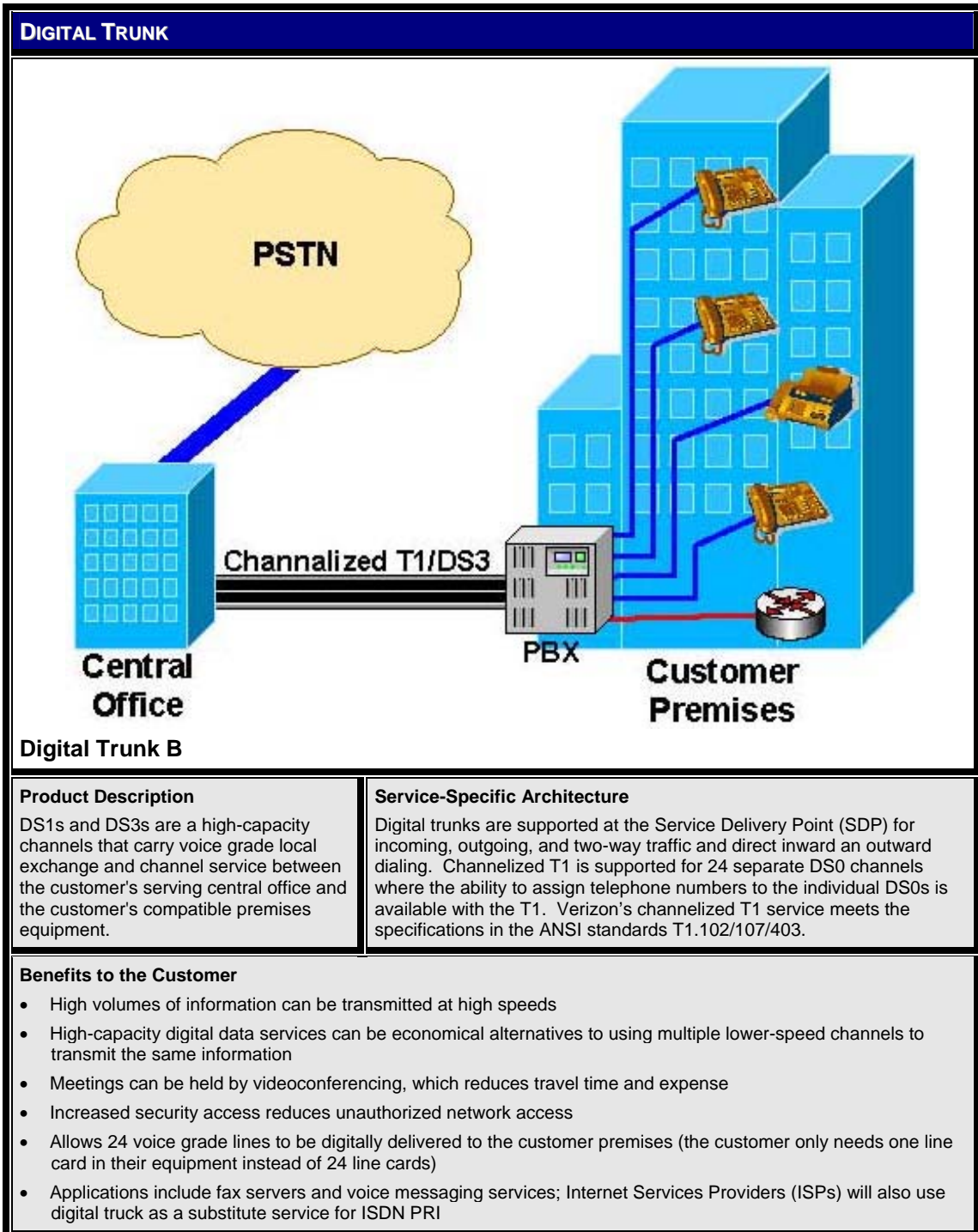
- Immediate start
- Ground start
- Loop start
- Wink start
- Delay dial with integrity check
- E&M types II, III, and IV

3.2.1.5 Digital Trunking - Service Overview

Digital trunks are a Verizon service offering that provides connectivity between the local end office and customer switch. Digital trunks provide digital connectivity from the local end office to the customer's PBX and are available as one-way in, one-way out, or two-way channelized service.

Verizon's digital T1 data service provides 1.5 Mbps of transmission speed. Digital T3 data service uses the high-performance, reliable circuitry of fiber optic transmission facilities to provide the equivalent of 28 T1 channels or 672 regular voice grade channels in a 45 Mbps connection.





3.2.2 Voice Service Features

This section describes voice service features that can be procured in conjunction with the voice access services described in Section 3.2.1. The following voice features are described below:

The Verizon WITS 3 solution choosing Centex enables the Government to better manage its communications budget while continuing to advance its enterprise goals.

- Time Division Multiplexed (TDM) Multi-level Precedence and Preemption
- Centrex Basic Features
- Custom Redirect Service
- Voice Mail

3.2.2.1 TDM Multi-level Precedence and Preemption (L.30.1.3.1(c)) - Service Overview

Verizon will meet the Department of Defense (DoD)-specified Multi-level Precedence and Preemption (MLPP) requirements as identified in the Chairman of the Joint Chiefs of Staff Instruction (CJCSI) 6215.01B and DOD Instruction 8100.3, Department of Defense Voice Networks by implementing the MLPP features on the [REDACTED]

[REDACTED]. Verizon will implement MLPP functionality in accordance with requirements and specifications identified in the DoD Voice Networks Generic Switching Center Requirements (GSCR) Section 3 – Multi-Level Precedence and Preemption.

All switches supporting the DSN in the NCR [REDACTED]
[REDACTED]
[REDACTED]
[REDACTED]
[REDACTED]
[REDACTED]

Upon receipt of a Government order, the MLPP functionality will be implemented on the WITS 3 [REDACTED]

[REDACTED]

[REDACTED]

[REDACTED]

XXXX

[REDACTED]

[REDACTED]

- [REDACTED]
- [REDACTED]
- [REDACTED]

XXXX

- [Redacted]
- [Redacted]
- [Redacted]

[Redacted]

[Redacted]

- [Redacted]
- [Redacted]
- [Redacted]
- [Redacted]
- [Redacted]
- [Redacted]
- [Redacted]
- [Redacted]
- [Redacted]
- [Redacted]
- [Redacted]

- [Redacted]
- [Redacted]
- [Redacted]

- [Redacted]
- [Redacted]
- [Redacted]

- [Redacted]
- [Redacted]
- [Redacted]
- [Redacted]
- [Redacted]

- [Redacted]
- [Redacted]
- [Redacted]

- [Redacted]
- [Redacted]
- [Redacted]
- [Redacted]

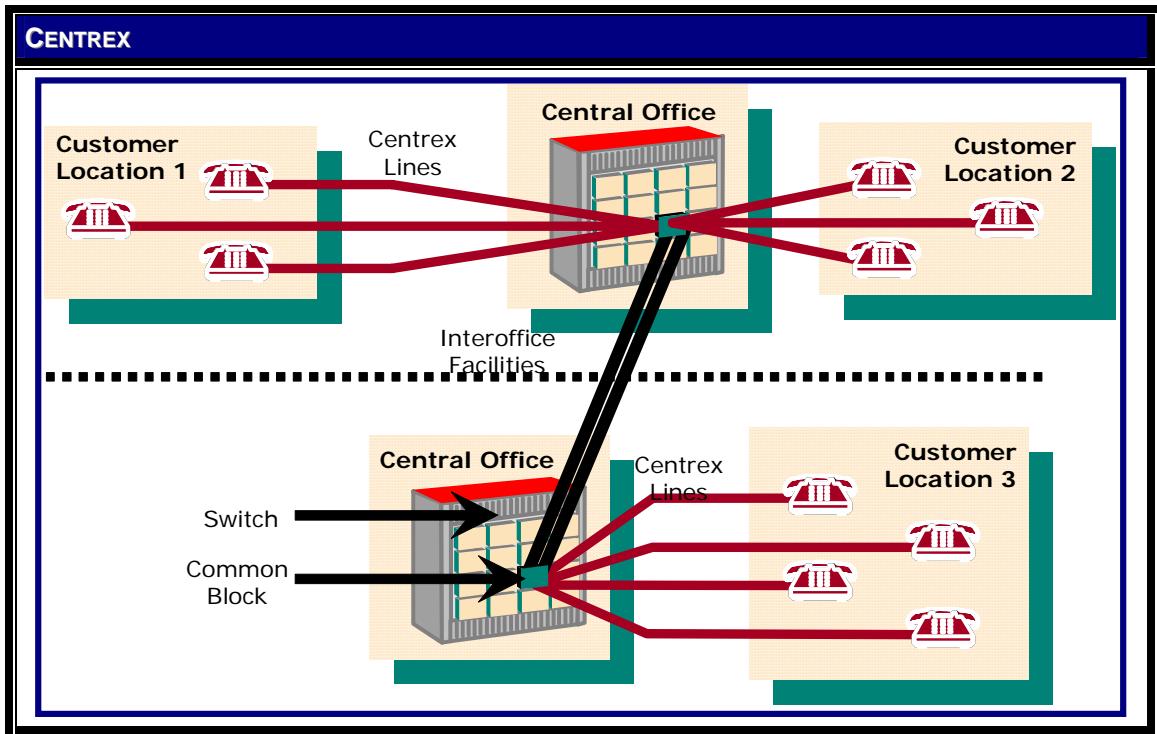


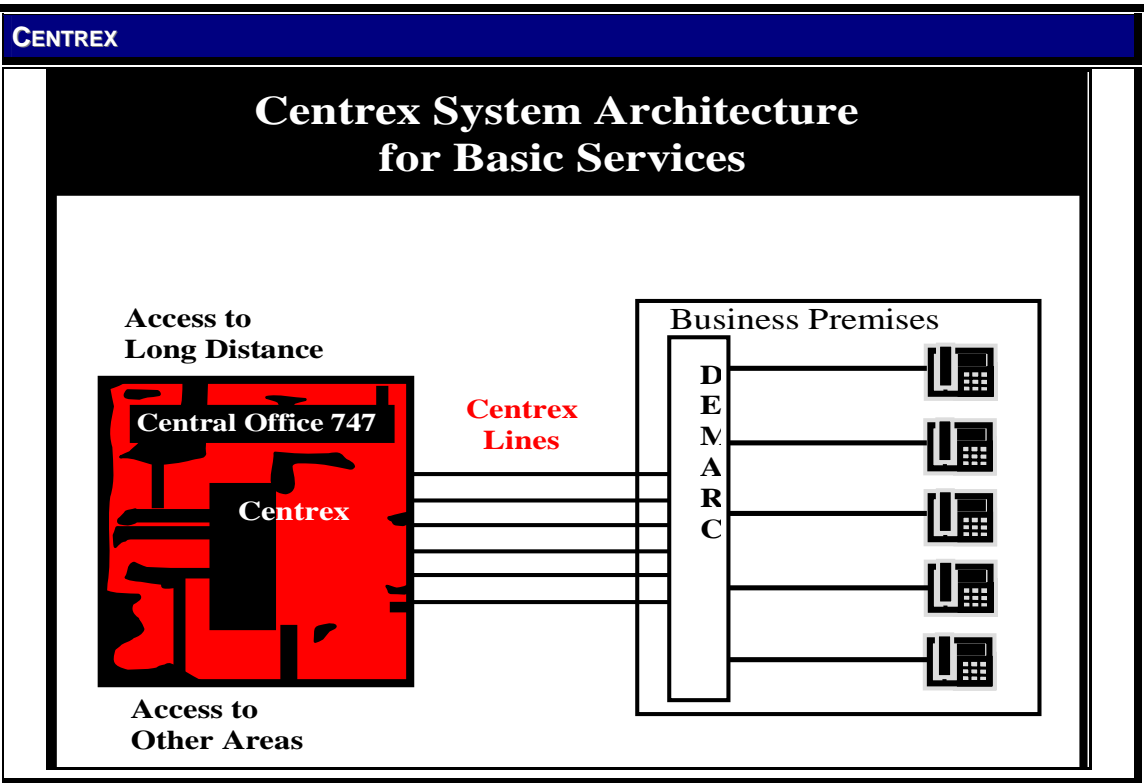
3.2.2.2 **Centrex - Service Overview**

Centrex is a fully-managed, network-hosted phone service that replicates most of the functionalities of an on-site PBX system. With Centrex, Verizon has mastered the most utilized, day-to-day voice features that customers use on a regular basis. Centrex technology is kept current, as it is a dedicated part of the embedded CO switch. The CO switch is updated regularly as an on-going natural evolution of Verizon's network. Centrex is a network-hosted voice solution allowing customers to broaden their internal communications access and distribution. Centrex products have the following advantages:

- Reliability consistent with a service provider network, engineered to support 99.99 percent availability—a benchmark in the industry
- Serves more than [REDACTED]
- Monitored 24x7 from the CO
- Reliability through the use of back-up architectures, spare inventories, and redundancy
- Low customer implementation costs
- Uses COs with dual back-up power grids (diesel and battery)

- Operates seamlessly with optional features like custom redirect which provide access to important incoming calls in the event of a power outage or disaster





Product Description

Centrex is a managed network-hosted communications service. Customers can outsource all the network maintenance and technology upgrades to Verizon, while receiving all the benefits of a world-class network. Centrex gives the customer the feature-rich service required for their business requirements today and provides the option to migrate to an integrated voice and data network that enables network flexibility and cost savings when the customer is ready to move forward.

- Benefits to the Customer**
- Feature-rich platform designed for ease of use and enhanced productivity
 - Flexible network access in numerous transport modes to accommodate a host of applications
 - Scalable and flexible solution
 - Infinite number of lines support business efforts to grow and change
 - Ability to manage features for more control
 - Predictable pricing structure
 - Access to Verizon AIN features, which allow businesses to tailor their communications network
 - Connect to remote locations, teleworkers, suppliers, and customers through the Verizon public telephone network
 - Consistent standards and quality across the entire system
 - Access and ability to take advantage of powerful technology quickly and cost effectively
 - Local/long-distance access for connectivity to the Public Switched Telephone Network (PSTN)
 - Management systems to monitor system performance and make changes
 - Call accounting to track usage, near real-time, or monthly with rated detail
 - Multi-site networks over virtual connections that simplify use and aggregate volume
 - ISDN for greater bandwidth and functionality using inexpensive wiring

CENTREX

- Customer-Premises Equipment (CPE) with several telephones to suit any need
- Disaster planning that keep customers operational even when the power is out
- Inside wiring or premises-based wiring that will
- Voice mail to answer calls when a line is busy or there is no answer
- Business drivers
 - Financial flexibility and predictability
 - Minimal capital outlay
 - Scalability
 - Consistent monthly expense
 - Reduced operation costs
 - Reduced risk
 - Avoid technology obsolescence
 - Buy and keep only the features required
 - Reliability
 - Verizon reliability and availability
 - [REDACTED]
 - CO management and redundancy

Service-Specific Architecture

- A portion of the CO is reserved for Centrex use—the combination of the common block, the outside facilities, and the demarcation comprise the customer’s Centrex.
- The customer or Verizon can provide CPE.

A network-based product like Centrex is ideal for customers who have multiple locations within the same or different central office serving areas. The Centrex common block provides a common telephone system for all locations. To make a call between locations, employees can use a three or four digit extension number. There is no charge for these extension to extension calls.

Centrex also works as a unified telephone system even when multiple Verizon central offices are involved. In the scenario diagram (top figure), the top two locations (customer locations 1 and 2) are served by the same central office. For communications to customer location 3 (served out of a different Verizon central office), interoffice facilities are used. Interoffice tie lines allow these two central office systems to function as one.

Denial rate or blocked calls are a measurement of the number of calls per 100 attempts that will get a busy tone. It is also referred to as P grade of service.

3.2.2.3 Custom Redirect Service - Service Overview

Custom Redirect Service (CRS) is a group-based call routing service that utilizes Verizon’s Advanced Intelligent Network (AIN). CRS provides subscribers the capability to immediately redirect incoming calls as needed without a service order. Customers customize the redirection routing of incoming calls for one or more Directory Numbers (DNs) by grouping their DNs and then defining redirection options that will affect all DNs within each group. The customer uses Dual-Tone Multi-Frequency (DTMF) update

capabilities via an intelligent peripheral device to activate the redirection options. The customer can redirect voice calls to pre-selected numbers based on customer defined criteria which may include, but are not limited to:

- Call destination selection based on time of day, day of week, or day of year
- Routing through an auto attendant
- Call destination may be split on a percentage basis between destination numbers
- Calling party's number may be reviewed for special redirection based on the NXX or the ten digit telephone number of the caller
- Super-group based redirect
- Single destination option
- Enhanced configurable table look-ups

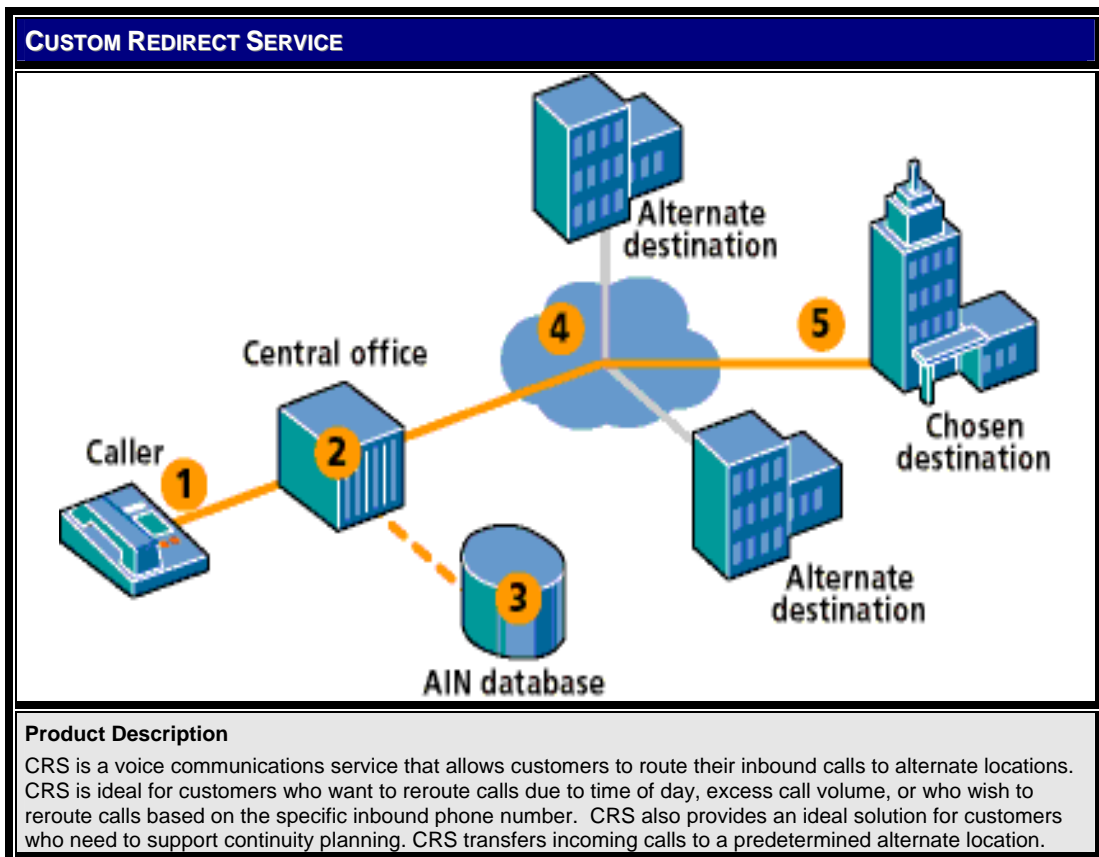
The customer may predefine up to nine calling patterns for redirection. The customer may change the active option on a demand basis by using "play and collect" prompts. CRS enables customers to control where incoming calls are handled. This will allow the customer to continue handling incoming calls in the event of a communications failure (not a total terminating central office failure), cable cut, fire, flood, loss of DID trunk group, or other business affecting event. CRS may be used as a business enhancement tool and can improve service to end customers as well as provide efficiency enhancements.

CRS allows customers to redirect incoming calls to alternative pre-selected locations in seconds. This service is especially critical in light of the many natural disasters seen over the past years such as ice storms, hurricanes, tornadoes, and floods. Compounding the disaster is the loss of revenues and productivity. CRS is a crucial component of the Government's COOP planning by redirecting calls in the event of an emergency. It can also

be used by customers who need to reroute calls on a more permanent basis such as nights, weekends, and holidays.

The figure below displays the following CRS operational steps:

- CO receives a call
- Ten-digit trigger is detected within the CO
- Each incoming call into a CRS-equipped number results in an inquiry to the AIN to determine how the call is completed
- Routing criteria are applied to the number (The customer determines this information in advance. Up to three sets of criteria can be programmed but only one set is active at a time. The customer may modify the criteria by requesting a change with the AIN center.)
- Call is forwarded to the number(s) specified



CUSTOM REDIRECT SERVICE

The desired number is identified using criteria determined by the customer. Up to three sets of calling criteria can be preprogrammed and the customer may change between the three criteria by requesting a change with Verizon.

Benefits to the Customer

- Almost instantaneous redirection.
- Virtual 24X7 access to customer database for redirection instructions.
- 24X7 AIN single point of contact.
- Redirection to any dial-able number in the world.
- Fully customizable to customer traffic and business continuity needs.
- Uniform pricing and feature set throughout the Verizon footprint.
- Minimize/eliminate call loss in any type of service effecting/building access emergency.

Application Drivers

- Disaster recovery sites
- Business continuity
- Call centers
- Facility control
- Traffic control
- Multi-location customers with critical inbound traffic
- Need to disseminate information during a service

Value Proposition

- Disaster recovery/income protection
- Improved customer service
- Improve cost-effectiveness of call centers
- Supports flexible work arrangements, such as telecommuting
- Reduces risk of liability
- Changes routing criteria as your needs change

Service-Specific Architecture

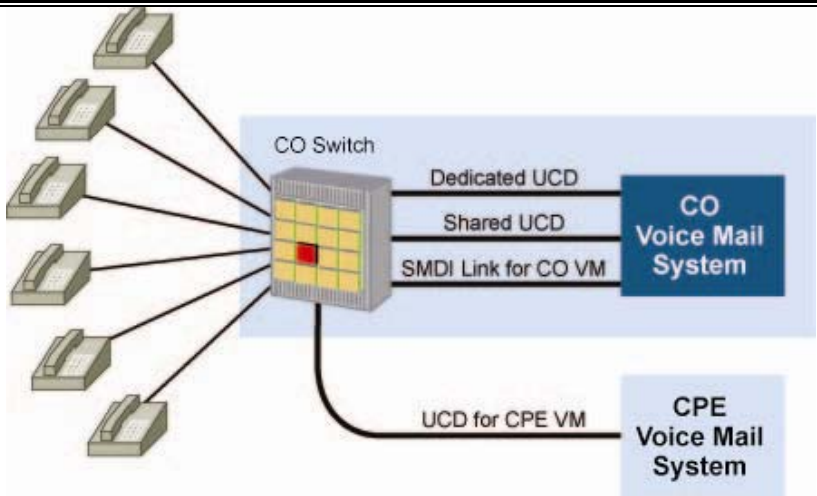
CRS uses AIN triggers in the central office to intercept calls to identified telephone numbers and then uses call processing information in the AIN network to determine where the calls should be delivered. The service is placed on telephone numbers, not facilities. There are no restrictions regarding type of service required to order CRS. In fact, with redirecting telephone numbers, a number may be provisioned with CRS yet not have any additional services associated with it. AIN is a telephone network architecture that adds advanced computer intelligence to the phone system for processing and tailoring advanced features to customers' needs.

3.2.2.4 Voice Mail - Service Overview

Verizon's voice mail service is a Verizon network feature that provides customers individual mailboxes. Voice mail service allows users to tailor individual announcements to alert callers when they are not available to answer their phone. Voice mail allows callers to leave detailed messages to inform the user of the information that is required by the caller, which

increases productivity and eliminates “telephone tag.” The service is accessible from any telephone with a standard push button tone pad.

Customers can use voice mail while out of the office, in meetings, or on travel to interact with colleagues and customers. Voice mail can also electronically store documents using the fax feature, which allows users to print faxes at a remote location. Voice mail allows users to accomplish more in less time. Verizon offers voice mail for Centrex and non-Centrex lines.

VOICE MAIL

<p>Product Description</p> <p>Voice mail is a central office-based voice messaging service that provides automated 24-hour answering service when combined with a call forwarding arrangement. Multiple, simultaneous calls forward to the mailbox when the line is busy or unanswered.</p>
<p>Benefits to the Customer</p> <ul style="list-style-type: none"> • Work remotely and stay in communications contact with co-workers and customers • Receive important faxed documents anywhere • Send important group messages by using the voice broadcast feature • Increase productivity by eliminating “telephone tag” • Decrease long distance expenses when traveling by sending messages through the voice mail network • Provides personalized announcements that notifies callers of absence from the office for travel or vacation • Answers calls when the phone is in use or the call cannot be answered • Most economical mailbox for customers who want call answering capability and expect higher volume of mailbox messaging (T-Mail) than with answer call • Mailbox can be accessed from any touch tone or tone-signaling telephone anywhere • Mailbox messaging (T-Mail) capability to other Verizon mailboxes within the regional calling area

VOICE MAIL

Service-Specific Architecture

Voice messaging is an off-premises-based solution located within Verizon's central office

- With dedicated access, the customer is restricted to the number of lines in the hunt group they ordered
- With shared access, the users share a larger hunt group with other business and residential subscribers
- With shared access, the customer pays for usage on all calls forwarded to their mailboxes and for users' calls to the access number to retrieve messages
- Available with 30 or 45 minutes of storage. A combination voice and fax mailbox - voice mail w/fax - is also available.
- Voice mail can be provisioned as a messaging only mailbox if the customer does not have a telephone number to associate with the mailbox.

3.2.3 Voice over Internet Protocol (VoIP)

In addition to traditional Centrex-based hosted voice services, Verizon provides a suite of advanced VoIP services that will meet agencies' evolving needs for convergence at their own pace.

Verizon's VoIP solutions are scalable and flexible, so government agencies can migrate to a total VoIP environment, while providing their investments and meeting agency mandates.

3.2.3.1 VoIP - Hosted IP Centrex - Service Overview

Hosted IP Centrex (HIPC) is Verizon's fully managed VoIP solution.

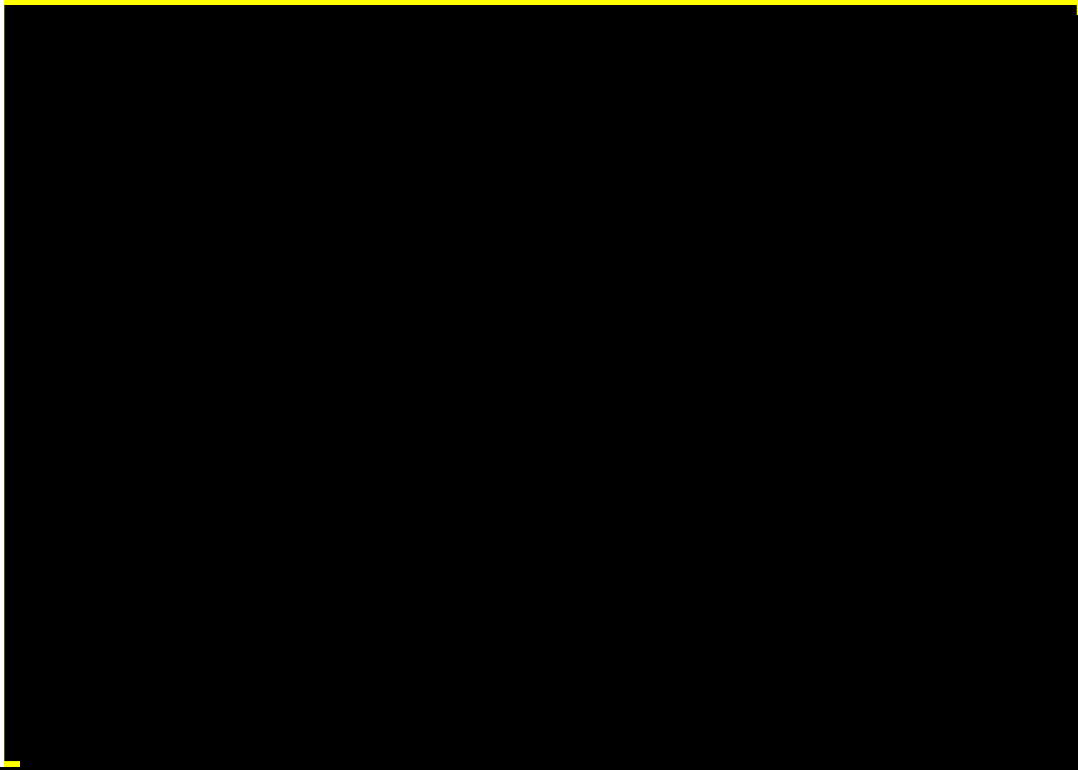
During the first quarter of 2007, Forrester Research's "Forrester Wave: US Enterprise-Class VoIP Services Study" ranked Verizon #1 and best in class on overall VoIP strategy, leading the competition on technology, strategy, planned performance enhancements, customer service enhancements, and price.

HIPC provides a migration path from traditional solutions, such as Centrex to advanced IP capabilities. HIPC is the service offering for Government agencies that want all the features of a PBX or key system without the associated capital, lease, or maintenance costs. HIPC provides unlimited local calling, domestic long distance calling, and full Internet access, making better use of

the Government's resources, controlling costs, and leveraging leading-edge business applications. HIPC uses a standards-based, quality-of-service

scheme based on the Institute of Electrical and Electronic Engineers (IEEE) 802.1 p/q standards to ensure a high-quality of service while mitigating call quality issues. Verizon guarantees the quality of service by offering a leading-edge performance Service Level Agreement (SLA). Along with an availability of [REDACTED], Verizon provides SLA on mean opinion score, jitter, and packet delivery. HIPC also provides Government agencies a number of security safeguards to minimize susceptibility to security threats and to prevent unauthorized access. This includes an [REDACTED] [REDACTED] ([REDACTED]), [REDACTED], [REDACTED], [REDACTED], [REDACTED], [REDACTED], [REDACTED], [REDACTED], [REDACTED], [REDACTED], [REDACTED], [REDACTED], [REDACTED]. Web-based administrative tools can reduce expenses for moves, changes, and user administration. HIPC is an ideal choice for Government agencies that are moving to or establishing a new location, or simply looking to replace an outdated PBX, key, or TDM Centrex system. As a complete turnkey solution, the HIPC package includes design, installation, and ongoing maintenance. Subscriber can successfully establish and receive telephone calls between on-net locations and establish and receive calls between on-net and off-net locations by interoperating with the Public Switched Telephone Network (PSTN) as required. Verizon's HIPC will bring the Government's voice and data together. [REDACTED], [REDACTED], [REDACTED], [REDACTED].

VoIP – HOSTED IP CENTREX

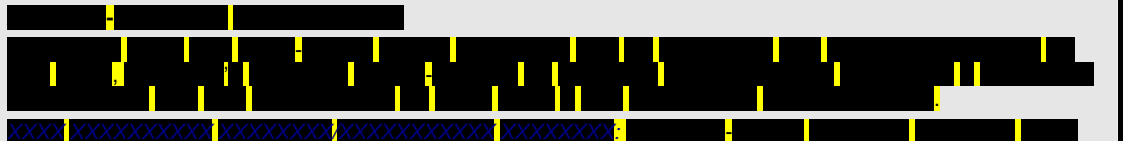


Benefits to the Customer

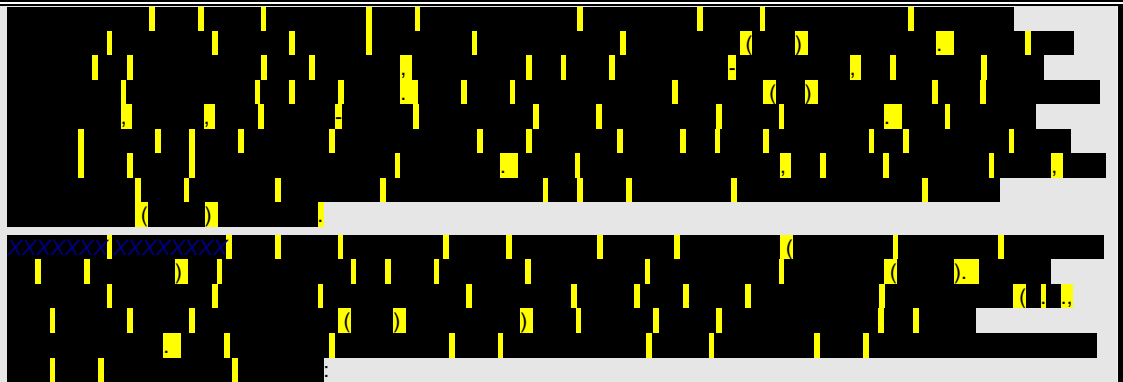
- Enables the government to take full advantage of their existing investment in telephony equipment and Centrex service capabilities, while also delivering a platform for new productivity enhancing applications hosted by Verizon
- Eliminates the need for infrastructure investments or monthly maintenance costs
- Delivers a high quality, highly reliable, yet easy to manage and use telephony system
- Provides telecom managers with a desktop interface (Web browser) to manage everyday functions such as Moves, Adds, Changes, and Deletes (MACDs) as well as network applications

Product Description

Verizon's HIPC solution is the winner of a 2006 Internet Telephony Excellence Award. The award, from Technology Marketing Corp.'s Internet Telephony Magazine, honors IP communications solutions that deliver innovation to customers. Verizon's converged VoIP network allows customers to streamline voice, data, and Internet connections over one network, making it an ideal solution for Government agencies in improving productivity. Verizon's HIPC offers Government agencies flexibility, efficiency, and affordability in an IP environment. In addition, HIPC delivers seamless and real-time telephony services and business continuity capabilities. HIPC also offers all of the features of a PBX or key system without the associated capital, lease, or maintenance costs. Like traditional Centrex, all PBX functionality resides within the Verizon network, eliminating the need for PBX infrastructure investments. In addition, this converged access, coupled with the dynamic bandwidth allocation feature, provides the capability to accommodate high-traffic periods—without the expense associated with excess capacity during non-peak times making it an ideal solution for seasonal, dynamic operations.



VoIP – HOSTED IP CENTREX



Symmetrical Digital Subscriber Line (SDSL) at the following speeds:

- 384 Kbps
- 768Kbps

Internet Dedicated Access (IDA) at the following speeds:

- T1
- T3
- Shadow (redundant) T1
- Shadow(redundant) T3

Private IP at the following speeds:

- 384 Kbps
- 512 Kbps
- 768 Kbps
- T1
- MLPP/NxT1
- T3


Verizon is developing support for additional HIPC interfaces in the future to allow the Government additional options and flexibility.

3.2.3.2 VoIP – Internet Protocol Trunking - Service Overview

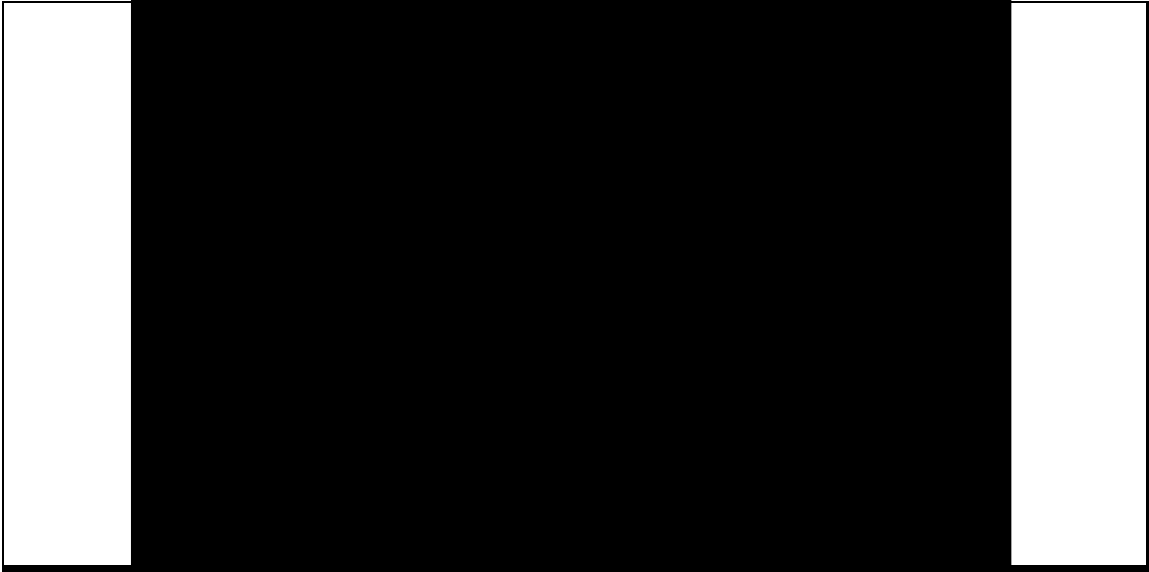
Verizon's IP trunking technology delivers on the promise of convergence by merging Government agencies' voice and data together onto a single network. Verizon's state-of-the-art approach provides unlimited local calling, domestic long distance calling, and full Internet access making better use of the Government's resources and controlling costs. IP trunking is primarily designed for Government agencies with deployed IP PBX and Session Initiation Protocol (SIP) phones. Service is delivered via a standards-based SIP trunk directly to the agencies IP PBX. This streamlined approach eliminates the need for expensive TDM enterprise gateways or TDM cards and the associated maintenance costs. Locations using the IP trunking service have the benefit of end-to-end network-based Quality of Service (QoS). IP trunking uses Multi-Protocol Label Switching (MPLS) technology to provide a simple network configuration and the ability to prioritize network traffic. IP trunking offers various levels of QoS and provides a single standard IP interface for each location. [REDACTED]

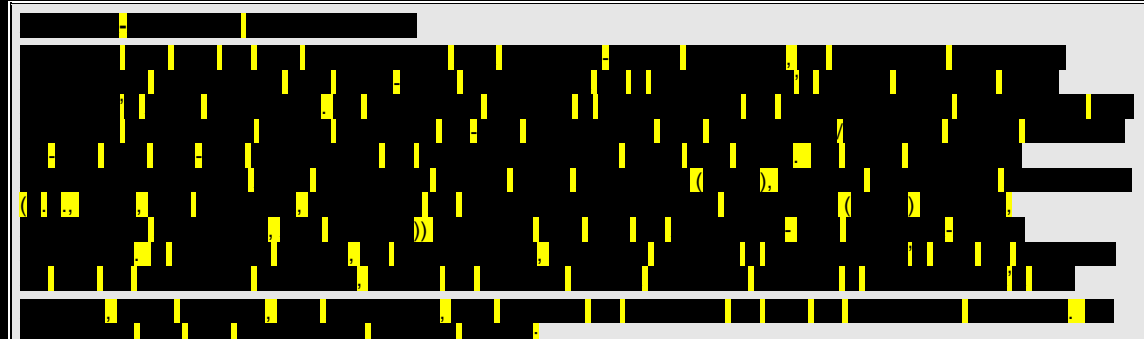
Verizon's VoIP solutions are scalable and flexible, so Government agencies can migrate to a total VoIP environment at their own pace.

[REDACTED]
[REDACTED]
[REDACTED]
[REDACTED]. Verizon's network availability [REDACTED] () [REDACTED] of the time as measured on a monthly basis by trouble ticket time. Verizon's VoIP data centers use industry-leading session border controller technology and follows "best practices" management to ensure Verizon network integrity. For security

reasons and customer protection, Verizon does not publish any details pertaining to the IP trunking network design. 



VoIP – IP TRUNKING	
	
Benefits to the Customer <ul style="list-style-type: none">• Leverages Verizon’s private IP or Internet backbone to route calls to and from the Public Switched Telephone Network (PSTN) via the SIP trunk(s)• Supports a network-based private dial plan for enterprise on-net calls• Provides Government agencies with the option to gradually replace TDM voice circuits and fully optimize their converged WAN network• Retains all the current IP PBX features• No need to retrain employees on any of the calling features or functions• No need for equipment changeover or disruption to services	Product Description <p>Verizon’s IP trunking is a standards-based SIP interface trunk designed to work with any IP PBX that supports SIP-based trunking. However, given variations in vendor implementation and the possible effects on quality and performance, Verizon requires successful completion of certification testing of an IP PBX platform. This involves careful analysis to identify and resolve potential interoperability/support issues prior to attesting that the platform works with Verizon’s VoIP IP trunking service. Verizon is the only carrier that can support SIP trunking on multiple providers through access methods such as IP trunking. No other carrier offers the flexibility and breadth of Verizon’s VoIP services.</p>



- **Internet Dedicated Access (IDA)** at the following speeds T1, T3, shadow (redundant) T1, and shadow (redundant) T3.
- **Private IP** at the following speed 384 Kbps, 512 Kbps, 768 Kbps, T1, MLPP/NxT1, and T3.

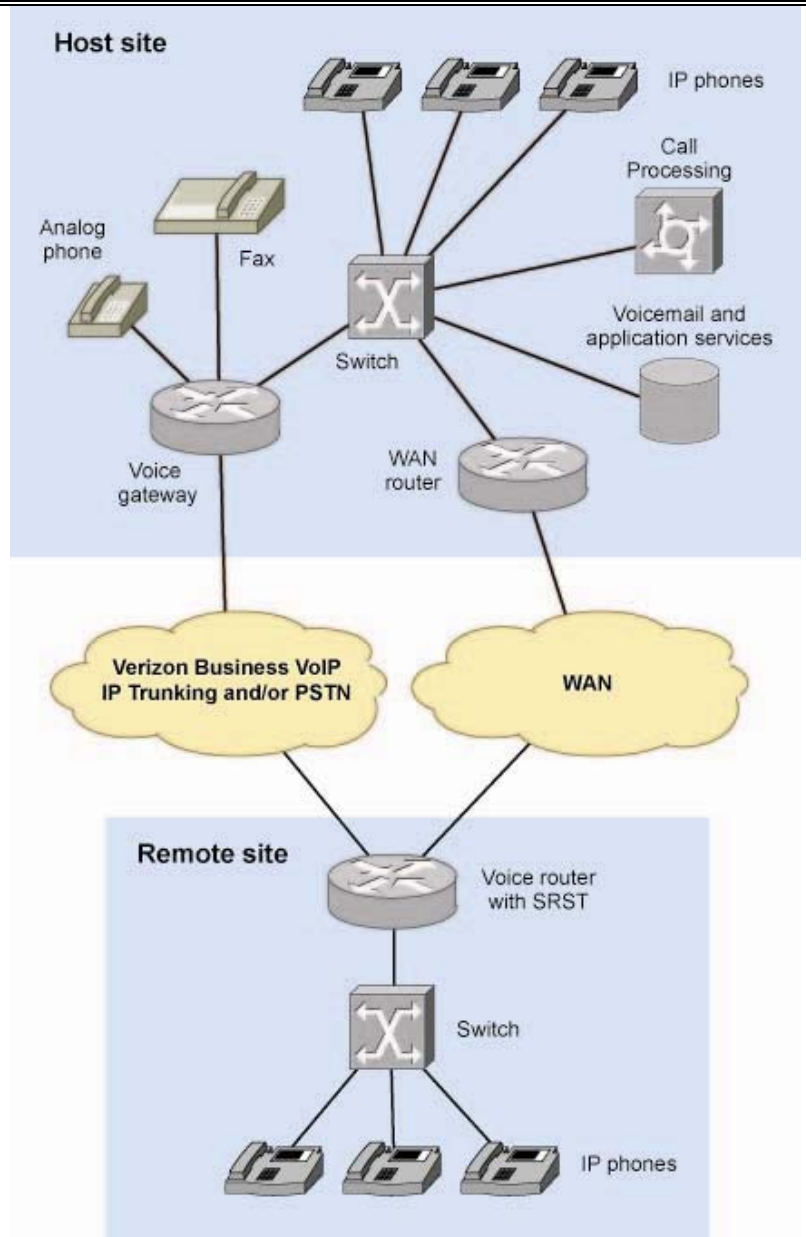
IP trunking uses a standards-based quality-of-service scheme based on the IEEE 802.1 p/q standards to ensure a high-quality of service while mitigating call quality issues. It guarantees the quality of service by offering a leading-edge performance SLA that includes Mean Opinion Score (MOS), jitter, packet delivery, network availability, and Denial of Service (DoS).

3.2.3.3 VoIP - Managed Internet Protocol Private Branch Exchange - Service Overview

Verizon’s managed Internet Protocol (IP) PBX service provides Government agencies support and management of their IP communications infrastructure. It is designed for agencies that demand advanced PBX features and are ready to transition to IP facilities at their own pace. Utilizing Verizon as a managed service provider, Government agencies can reduce productivity losses and have guaranteed response times. Managed IP PBX service provides reliability to the Government with the following optional features:

- **Fault management:** detection, correlation, isolation, recovery, and reporting
- **Configuration management:** provision, changes management, backup/restore, and asset
- **Account management:** usage tracking and service cost allocation
- **Performance management:** collection, reporting, analysis, and capacity planning

VoIP – MANAGED IP PBX



Benefits to the Customer	Product Description
<ul style="list-style-type: none"> Managed IP PBX architecture improves system availability and scalability Government agencies will benefit from operating efficiencies through one point of accountability – streamlining the number of vendors and points of accountability and 	<p>Verizon's managed IP PBX provides Government agencies a premises-based, managed IP telephony solution. Verizon's solution provides the Government with the following IP Communications (IPC) service packages:</p> <ul style="list-style-type: none"> IPC Assessment

VOIP – MANAGED IP PBX

- potential failure
- Lowering infrastructure cost and the expense of bandwidth
- Provides feature-rich data and voice services such as unified messaging, conferencing, and contact centers interact through open telephony Application Program Interface (API)
- Managed voice Quality of Service (QoS) across links
- Automatic diversions to alternate PSTN routes or trunks when WAN bandwidth is not available

- IPC Planning
- IPC Implementation
- IPC Management

Verizon's managed software-based, call-processing components extends telephony features and functions to packet telephony network devices such as IP phones, media processing devices, and VoIP gateways. Productivity features such as unified messaging interact through Verizon's CPE-based hardware platforms and open telephony API. Distribution of call processing servers, IP phones, gateways, and applications across an IP network provides customers with a distributed, virtual telephony network. This architecture improves system availability and scalability. Call admission control ensures that voice QoS is maintained across a constricted WAN link and automatically diverts calls to alternate PSTN routes or SIP trunks/gateways when WAN bandwidth is not available.

[Redacted]

- **User Interface.** The user community interfaces to the IP PBX network via IP-phones or soft phones. Traditional analog sets are also supported through analog gateways. Managed IP PBX does not support Basic Rate Interface (BRI) sets.

[Redacted]

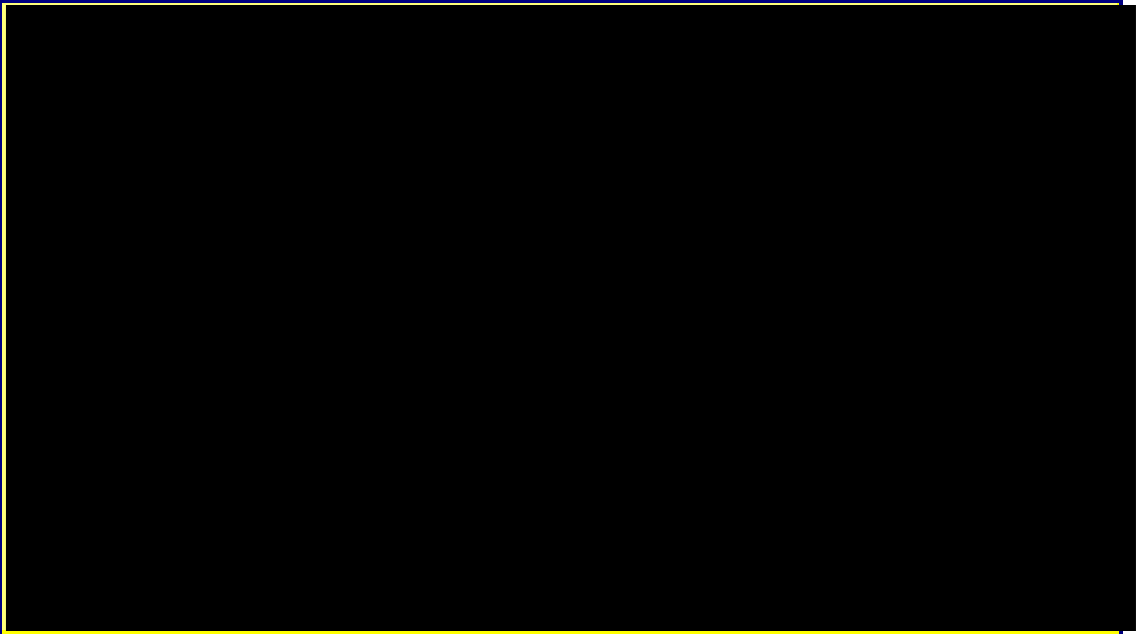
[Redacted]

[Redacted]

[Redacted]

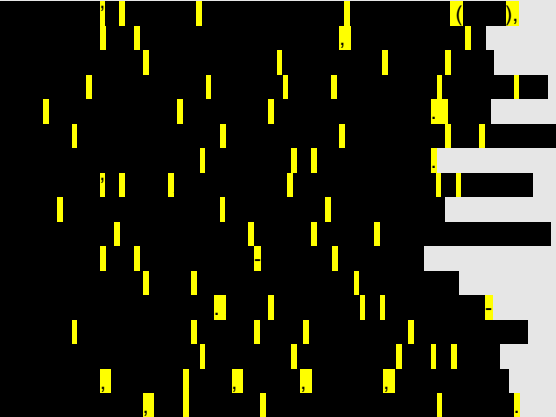
[Redacted text block containing multiple lines of obscured content]

XXXXXX|XXXXXXXXXXXX|XXXXXXXXXX(XXX)



[Redacted text]

- [Redacted list item]
- [Redacted list item]
- [Redacted list item]
- [Redacted list item]
- [Redacted list item]
- [Redacted list item]
- [Redacted list item]
- [Redacted list item]
- [Redacted list item]
- [Redacted list item]
- [Redacted list item]



[Redacted text]

<p>[Redacted text]</p>	<p>[Redacted text]</p>
<p>[Redacted text]</p>	

[Redacted]

[Redacted]

[Redacted]	
[Redacted]	[Redacted]
[Redacted]	[Redacted]
[Redacted]	[Redacted]
[Redacted]	[Redacted]
[Redacted]	[Redacted]
[Redacted]	[Redacted]
[Redacted]	[Redacted]

<p>[Redacted]</p>	<p>[Redacted]</p>
<p>[Redacted]</p>	