translates into having more time to enjoy the other pleasures in life.

Product FAQs

11) Do customers need to have voice service or is it included in the price of the MegaBit Services offering?

MegaBit Services are an enhancement to existing service. Customers must have one of these services to order MegaBit Services. The charges for MegaBit Services are incremental to the existing voice services the customer is paying.

12) Do customers get to keep their current voice features?

Yes. All features that are available on a voice line will be available on our MegaBit Services offering.

13) Is there a limit as to the number of phones in a home with this service?

No. There is no limit to the number of phones in the home for this service.

Product FAQs

14) Do I need another phone line to get MegaBit Services?

No. You do not need to purchase another phone line. MegaBit Services, based on DSL technology, uses an existing phone line to transmit data signals as well as analog voice signals. The customer must continue to pay the current charges for residential or business phone service. Phone service is not included in the price of MegaBit Services.

15) Can customers get MegaBit Services if their Internet Service Provider does not use MegaCentral?

No. The customer's MegaBit Services must be directed toward an Internet Service Provider or a host that is equipped with a MegaCentral connection from US WEST.

16) Can customers order MegaBit Services regardless of where they are located in the Phoenix metro area?

Check out the availability page to see if you may be in a service area.

Product FAQs

17) Where can I get updated information on your offerings?

We plan on regularly updating our information on the MegaBit Services home page. Please remember to check it out from time to time to get the most recent scoop on our service offering. The URL is http://www.interprise.com/dsl.

18) How can I contact someone about getting service?

If you are located in Phoenix, Arizona or Boise, Idaho, and want to find out if MegaBit Services may be accessible for you, please try our availability tool at http://www.interprise.com/dsl/availability.html.

If you are interested in other high speed access solutions, please call 1-888-MEGAUSW to find out about your options. If you are an Internet Service Provider seeking more information on MegaBit Services, please call 1-800-879-6300.

Product FAQs

19) **Can a customer use MegaBit Services for connecting to both the Internet and to a corporate LAN?**

No. MegaBit Services are offered in a point to point environment and therefore customers will choose whether to go from their home location to the Internet or to their corporate LAN. Future applications of MegaBit Services may include the option to connect to both the Internet and a LAN. If a subscriber connects to a corporate LAN that is also connected to the Internet, the subscriber may have access to the Internet. This is up to the corporate LAN administrator.

---

20) ***What ISPs are offering MegaBit Services?***

With bandwidth being in demand, several ISPs will be offering their customers high-speed MegaBit Services based on DSL technology. Please consult directly with your ISP or check your yellow pages for listing of ISPs to find out if it is offering this phenomenal service. For those in Phoenix, another alternative is to check into USWest.net, U S WEST's Internet service to get more information on its offering of MegaBit Services. USWest.net provides 256 Kbps access to the Internet. For further details on that service, see http://www.uswest.com/com/customers/uswestnet/index.html.

Product FAQs

Technical Information

For Product FAQs click here

1) What is DSL technology?

2) What are some examples of the different DSL technologies?

3) Why are there so many variations of DSL technologies?

4) What are some of the differences between HDSL technology and the other xDSL technology termed ADSL?

5) Which variation of xDSL technology is U S WEST offering?

6) What is RADSL?

7) Will the DSL circuit be used like a leased line, allowing mail and web servers to be connected to the Internet full time?

8) Everyone is very excited about this new service, but it seems just like ISDN. What's the big deal?

9) What are some of the differences between the DSL technologies and ISDN?

10) Is this DSL technology a better alternative than cable-modems or the new line of 56 Kbps analog modems?

11) What about cable modems?

12) Do customers need to be loop qualified (like ISDN requires)?

13) What if a location does not meet the loop qualification requirements?

14) Who is responsible for the IP addressing?

15) Does U S WEST assign and register the required addressing and domain conventions?

16) What is the line coding for RADSL?

17) Does MegaBit Service support Layer Two Tunneling Protocol (L2TP)?

18) What needs to be done to the customer's computer to use MegaBit Services?

19) Can customers plug their computer into their regular telephone jack to use MegaBit Services?

20) Is there a distance limit for MegaBit Services like there is for ISDN?

21) If customers are in a central office that is equipped for MegaBit Services and their addresses are within the 18,000 feet distance limitation, can they have the service?

22) Will the MegaBit Services user be able to access the worldwide Public Switched Telephone Network for standard voice calls to and from standard telephones?

23) What are the minimum PC requirements for using MegaBit Services?

24) Could I beta test your product?

25) Why can't I get service?

26) Are we dealing in a peer-to-peer environment when using MegaBit Services?

27) Can a subscriber have multiple machines at home all connecting to the Internet?

28) Can a customer run analog modems and fax machines on the same line as the MegaBit Service line?

29) Can subscribers have multiple voice lines along with MegaBit Services?

30) What is a Virtual Private Network (VPN)?

31) Can I use my Sun Ultra to connect to MegaBit Services?

32) Can I connect to AOL with my IP address?

33) Will my ISDN CPE work on MegaBit Services?

34) Do I need a CSU/DSU for MegaBit Services?

---

1) What is DSL technology?

DSL provides simultaneous voice and high-speed data services over a single pair of copper wires. DSL technology allows data transmission at speeds much faster than the best available analog and digital modems.

---

2) What are some examples of the different DSL technologies?

There are several variations of the DSL products that use copper cabling to move data between the end subscriber and the host location. Data is separated from voice traffic at the serving central office and then connected to a high-speed data network and delivered to the host destination. Some forms of DSL technologies include: HDSL (High Bit Rate DSL), SDSL (Single Line DSL), RADSL (Rate Adaptive DSL), ADSL (Asymmetric DSL), and VDSL (Very High Bit Rate DSL). These technologies may be incorporated into the network to deliver MegaBit Services as they become available and are evaluated for service delivery.

Technical FAQs

---

3) Why are there so many variations of DSL technologies?

Different applications require a variety of speeds in order to transmit data. Therefore, DSL based services offer the appropriate amount of bandwidth

to the user for his or her specific application. There are multiple line coding techniques used by the DSL vendors. Each of these techniques has strengths and weaknesses within a telephony network. Some DSL technology is intended for use in campus environments and others work well within a building. Technology for telephony must be compliant with certain standards to prevent interference and cross talk.

---

4) What are some of the differences between HDSL technology and the other xDSL technology termed ADSL?

HDSL is a technology using 2B1Q line coding and offering bi-directional data transmission with both upstream and downstream traffic traveling at the same rate.

ADSL also offers bi-directional data transmission but the downstream traffic travels faster than the upstream traffic. For example, the user's upstream connection may be at 128 Kbps while the downstream connection would be at 1.5 Mbps. In certain applications, such as surfing the Internet, the user needs more bandwidth while downloading information from the Internet and therefore the ADSL technology works well.

Technical FAQs

---

5) Which variation of xDSL technology is U S WEST offering?

Our initial offering was based on HDSL technology. While our HDSL based offering was beneficial to our customers since we were able to install an established technology, it was also limiting our ability to offer service to many customers who were located farther than 12,000 feet from their Central Office. With this in mind, we decided to deploy a RADSL solution that would increase our availability scope while also offering customers even higher speeds.

---

6) What is RADSL?

While one is transmitting data over the telephone wire or local loop, line conditions on the local loops vary all the time. Rate Adaptive Digital Subscriber Line (RADSL) is able to adapt to the changing line conditions on the local loops. In fact, RADSL is able to adapt to these changing conditions as they are happening.

Technical FAQs

---

7) Will the DSL circuit be used like a leased line, allowing mail and web servers to be connected to the Internet full time?

Yes. Our MegaBit Services are logical, point to point connections and you would be connected full time to an ISP or to a Corporate host. The connection from the Corporate host or ISP is a shared connection. Other MegaBit Services end users ride the same connection.

---

8) Everyone is very excited about this new service, but it seems just like ISDN. What's the big deal?

MegaBit Services do have some things in common with IDSN. However, each has a place in INTERPRISE's portfolio of services which is designed to fully meet its customer's expectations. Customers who require the switched, multi-point capability that ISDN provides, for applications such as videoconferencing, for example, will find ISDN an attractive solution. Future applications of DSL will offer a multi-point solution. We have tens-of-thousands of existing ISDN users today, and some of them may decide to change to our DSL offerings while others will continue to find ISDN perfectly matched to their applications.

Many customers needing the ability to access their corporate LAN or the Internet for long periods of time will find the always on and higher-bandwidth capabilities of the DSL technologies very attractive.

One of the greatest benefits of the MegaBit offerings is that the data avoids the contention of the voice network since it is transferred over a dedicated data network.

Technical FAQs

9) What are some of the differences between the DSL technologies and ISDN?

The DSL technologies offer a dedicated, point to point connection that is always on, while ISDN requires call set-up and dial access time in order to be activated. Also, with our MegaBit Services offering based on DSL technology, there is flat rate pricing whereas ISDN connections are usually priced at a per minute usage basis. Finally, the DSL based technologies are easier to provision at the Central Office than ISDN is.

10) Is this DSL technology a better alternative than cable-modems or the new line of 56 Kbps analog modems?

These technologies are quite complementary. We see cable-modems and the 56 Kbps modem technology as attractive solutions for the more infrequent business and consumer Internet access users where a shared capability with others is acceptable. The DSL technologies will provide a dedicated networking solution to large and small businesses and the power-user-at-home marketplace.

Technical FAQs

11) What about cable modems?

No discussion of DSL technologies would be complete without a review of cable modems. These modems use cable TV companies' coaxial networks as the transport medium. DSL technologies use the Regional Bell Operating Companies' (RBOC) twisted wire pair network.

There are two major issues that impact the deployment and use of cable modems. The first is that only about 7% of existing coaxial distribution systems are capable of two-way traffic. The cable industry is investing heavily to upgrade their facilities to a hybrid fiber/coax based network. Most coaxial networks are designed for one-way downstream distribution only, requiring the expensive replacement of distribution nodes. The second is that all subscribers on a distribution network (from 500 to several thousand homes) share the bandwidth, which can reduce an individual's throughput to analog modem dial-up speeds.

Another cable modem topic of discussion is that un-terminated cable TV jacks (no TV connected and no terminating resistor cap screwed on) act as antennas on the distribution node. Any RFI-generating (radio frequency interference) equipment near an un-terminated jack injects noise into the entire distribution network. AC motors (vacuum cleaners), computer monitors, fluorescent lights, and a host of other household items generate RFI. This is not critical for TV viewing, but can adversely affect modem throughput.

Technical FAQs

12) Do customers need to be loop qualified (like ISDN requires)?

Yes, loop qualification is required. The process will be similar to the one for ISDN only quicker since less information is necessary in order to be qualified.

13) What if a location does not meet the loop qualification requirements?

Unfortunately, if a location does not meet the loop qualification requirements, the subscriber cannot get MegaBit Services. We are working with various vendors to develop a more robust solution for customers in order to provide service to those locations where access is denied at present. In the interim, if a subscriber is interested in more

information on U S WEST's suite of Internet services, please check into Consumer Internet Services. You may also be interested in other data transport products that U S WEST offers. Please visit our Other Internet Solutions page for those options.

Technical FAQs

---

14) Who is responsible for the IP addressing?

The subscriber's host site or MegaCentral location is responsible for the address.

---

15) Does U S WEST assign and register the required addressing and domain conventions?

No. All of the registration of addresses and domain conventions must be assigned, administered and managed by the subscriber's host location.

---

16) What is the line coding for RADSL?

Rate Adaptive Carrierless Amplitude/Phase modulation line coding.

Technical FAQs

---

17) Does MegaBit Service support Layer Two Tunneling Protocol (L2TP)?

MegaBit Service is a bridged Layer 2 service. If L2TP is supported on the end points and can be transported across the network, then it should work.

---

18) What needs to be done to the customer's computer to use MegaBit Services?

An Ethernet card must be installed in the customer's computer.

---

19) Can customers plug their computer into their regular telephone jack to use MegaBit Services?

Yes. On one end the MegaBit modem plugs into an RJ11 jack (a regular telephone jack) and on the other end the modem plugs into a RJ45 jack with a 10Base T interface Network Interface Card (NIC).

---

20) Is there a distance limit for MegaBit Services like there is for ISDN?

Yes. At this time the customer must be within 18,000 feet from a serving Central Office.

Technical FAQs

---

21) If customers are in a central office that is equipped for MegaBit Services and their addresses are within the 18,000 feet distance limitation, can they have the service?

Probably. However, we need to go through the pre-qualification process to ensure that there aren't any other technical issues.

---

22) Will the MegaBit Services user be able to access the worldwide Public Switched Telephone Network for standard voice calls to and from standard telephones?

We intend to deliver standard voice services with switched access anywhere you can call today.

Technical FAQs

23) What are the minimum PC requirements for using MegaBit Services?

The minimum configuration for a PC is a 486 with a certain amount of RAM and available hard disk space. Please visit our technical requirements section for more information.

24) Could I beta test your product?

While we appreciate your offer to test our products, we have already tested our services extensively in our labs located in Minneapolis, Minnesota and Denver, Colorado. Additional tests have been performed on U S WEST facilities to the residences of company employees. However, we will maintain your offer on file, and should the need for beta testing arise in the future, we will contact you.

Technical FAQs

25) Why can't I get service?

Unfortunately, even when you input the first three digits of your phone number, and you get a message that MegaBit Services are available in your exchange, , there still may be hurdles to obtaining service. Most of the inhibitors to receiving MegaBit Services are technical in nature. We, at U S WEST, are developing solutions to make access to MegaBit Services more easily attainable by all. However, the following obstacles to receiving service do exist in some areas:

- If your phone wire is served by Digital Loop Carrier (DLC) equipment, you will not be able to receive MegaBit Services. A DLC is a multiplexing device in the telephone network used to provide economical voice service to high growth and suburban areas. A solution to provide xDSL based data services will be available in prototype 2Q98. Extensive network testing and evaluation is required to provide service out of DLC devices.

- If the telephone wires to your location from the U S WEST Central Office exceed the distance limit of 18,000 feet, you will not be able to receive MegaBit Services. Other factors such as temperature, wire gauge and condition of the wire may raise or lower the effective distance at which the service can be offered

- If bridge taps, wire gauge changes and/or load coils incorporate part of your phone wire, there may be delays in receiving service. We need to identify and deal with them before you are able to receive MegaBit Services.

Finally, please keep in mind that even though some customers may not be able to access MegaBit Services, they may be eligible for another of U S WEST's transport services. For more details please visit our Other Internet Solutions page at www.megaspeed.com.

If you would like to speak to a U S WEST representative for more information about alternative high-speed solutions, please call 1-888-MEGAUSW.

Technical FAQs

26) Are we dealing in a peer-to-peer environment when using MegaBit Services?

No. MegaBit Services are provisioned for a dedicated, point to point connection between a host and a subscriber location. The connection is a virtual private network and does not support peer-to-peer communication.

27) Can a subscriber have multiple machines at home all connecting

to the Internet?

Yes, but under very controlled circumstances. If the customer has a router working in conjunction with the 10 BaseT connection and can capture an IP address, then they can subnet behind the router.

Some ISPs or Corporate Hosts may assign a statically mapped or fixed IP address to the MegaSubscriber. This scenario, when used in conjunction with a router can allow a number of other users access by subnetting the IP address. We are providing a Layer Two service and if the ISP or MegaCentral location assigns the address we cannot control how the end devices use the address.

If the MegaCentral host assigns a dynamically assigned IP address and provides an "always on" service, the end users, if they terminate the 10 BaseT connection in a router, may be able to configure subnets after determining what the IP address is. Again, this is an issue how the host end and the subscriber ends are configured.

In most cases, the connection is a single user to a single host.

---

28) **Can a customer run analog modems and fax machines on the same line as the MegaBit Service line?**

Yes, the voice line supported by MegaBit Service is just like any other POTS line. You can connect the voice line to any device registered with the FCC to support either voice or data transmission.

Technical FAQs

---

29) **Can subscribers have multiple voice lines along with MegaBit Services?**

MegaBit Services support only one voice line on the same pair of wires carrying data to the subscriber.

---

30) **What is a Virtual Private Network (VPN)?**

A VPN creates the effect of a private, leased line network, but without the associated design, deployment, cost and vulnerability issues. Dedicated circuits are established between the host location, the closest Central Office and the subscriber location. Dedicated circuits are not established between various subscriber locations. Routing tables are established to route the data traffic over the high speed DSL facilities on a priority basis in order to ensure that the level of service provided is similar to that offered by a true private network.

Technical FAQs

---

31) Can I use my Sun Ultra to connect to MegaBit Services?

Yes. You can use any computer that has an Ethernet interface to connect with an external modem. Additionally, if you have a PC with a PCIA bus, you may purchase an internal card instead of the external modem, eliminating the need for an Ethernet connection.

---

32) **Can I connect to AOL with my IP address?**

Most ISPs assign IP addresses using either RADIUS or DHCP servers. It is up to your ISP if they will allow you to connect with an IP address that has been assigned to you.

---

33) **Will my ISDN CPE work on MegaBit Services?**

ISDN CPE is not compatible with MegaBit Services. The only hardware compatible at this time is hardware that has been tested and recommended by U S WEST. If you have routers, bridges or hubs on the LAN side of

your ISDN line, you may transfer those to your MegaBit connection and again use them as your LAN interface. However, the DSL connection must be terminated with CO compatible equipment.

---

34) **Do I need a CSU/DSU for MegaBit Services?**

No. There is CPE needed at the MegaSubscriber location. The device is commonly called a modem but it is not "officially" a modem. The technical term for the device is an ADSL Termination Unit-Remote or ATU-R. This device must be connected with a similar device in the serving Central Office. The customer is required to purchase and maintain this device.

Technical FAQs

©1998 U S WEST INTERPRISE

Fast Facts [redacted]

Glossary

DSL Glossary

MORE INFO
FAQs
Glossary
Other Internet Solutions

Access Network
That portion of a public switched network that connects access nodes to individual subscribers. The Access Network today is predominantly passive twisted pair copper wiring.

Access Nodes
Points on the edge of the Access Network that concentrate individual access lines into a smaller number of feeder lines. Access Nodes may also perform various forms of protocol conversion. Typical Access Nodes are Digital Loop Carrier systems concentrating individual voice lines to T1 lines, cellular antenna sites, PBXs, and Optical Network Units.

ADSL
Asymmetric Digital Subscriber Line: Modems attached to twisted pair copper wiring that transmit from 1.5 Mbps to 9 Mbps downstream (to the subscriber) and from 16 kbps to 640 kbps upstream, depending on line distance.

BDSL
Same as VDSL.

B-ISDN
Broadband Integrated Digital Network: A digital network with ATM switching operating at data rates in excess of 1.544 or 2.048 Mbps. ATM enable transport and switching of voice, data, image, and video over the same infrastructure.

Core Network
Combination of switching offices and transmission plant connecting switching offices together. In the U.S. local exchange Core Networks are linked by several competing Interexchange networks; in the rest of the world (now) the Core Network extends to national boundaries. CSA Carrier Serving Area.

DS0
Digital Signal 0: 64 kbps digital representation of voice.

DS1
Digital Signal 1: Twenty four voice channels packed into a 193 bit frame and transmitted at 1.544 Mbps. The unframed version, or payload, is 192 bits at a rate of 1.536 Mbps.

DS2
Digital Signal 2: Four T1 frames packed into a higher level frame transmitted at 6.312 Mbps.

DSL
Digital Subscriber Line: Modems on either end of a single twisted pair wire that delivers ISDN Basic Rate Access.

E1
European basic multiplex rate which packs thirty voice channels into a 256 bit frame and transmitted at 2.048 Mbps.

Feeder Network
That part of a public switched network which connects access nodes to the core network.

HDSL
High data rate Digital Subscribe Line: Modems on either end of one or more twisted pair wires that deliver T1 or E1 speeds. At present T1 requires two lines and E1 requires three. See SDSL for one line HDSL.

ISDN
Integrated Services Digital Network: A digital network with circuit and packet switching for voice and data communications at data rates up to 1.544 or 2.048 Mbps. Basic Rate Access (BRA) provides two B channels at 64 kbps each and a D channel at 16 kbps. Primary Rate Access (PRI) provides twenty three (U.S.) or thirty (Europe) B channels and a single D channel at 64 kbps.

N-ISDN

Narrowband ISDN: same as ISDN.

ONU

Optical Network Unit: A form of Access Node that converts optical signals transmitted via fiber to electrical signals that can be transmitted via coaxial cable or twisted pair copper wiring to individual subscribers.

POTS

Plain Old Telephone Service: The only name recognized around the world for basic analog telephone service. POTS takes the lowest 4 kHz of bandwidth on twisted pair wiring. Any service sharing a line with POTS must either use frequencies above POTS or convert POTS to digital and interleave with other data signals.

RADSL

While one is transmitting data over the telephone wire or local loop, line conditions on the local loops vary all the time. Rate Adaptive Digital Subscriber Line (RADSL) is able to adapt to the changing line conditions on the local loops. In fact, RADSL is able to adapt to these changing conditions as they are happening.

SDSL

Single line Digital Subscriber Line: HDSL over a single telephone line. This name has been adopted by a single manufacturer, not a standards group, and may not stick. It important to distinguish, however, as SDSL operates over POTS and would be suitable for symmetric services to premises of individual customers.

STS-1

SONET basic transmission rate of 51.84 Mbps.

T1

Same as DS1.

VADSL

Very high-speed ADSL: same as VDSL (or a subset of VDSL, if VDSL includes symmetric mode transmission)

VDSL

Very-high data-rate Digital Subscriber Line: Modem for twisted-pair access operating at data rates from 12.9 to 52.8 Mbps with corresponding maximum reach ranging from 4500 feet to 1000 feet of 24 gauge twisted pair.

WAN

Wide Area Network: Private network facilities, usually offered by public telephone companies but increasingly available from alternative access providers (sometimes called Competitive Access Providers, or CAPs), that link business network nodes.

xDSL

Generic term referring to the various flavors of the DSL technology.

©1998 U S WEST INTERPRISE