

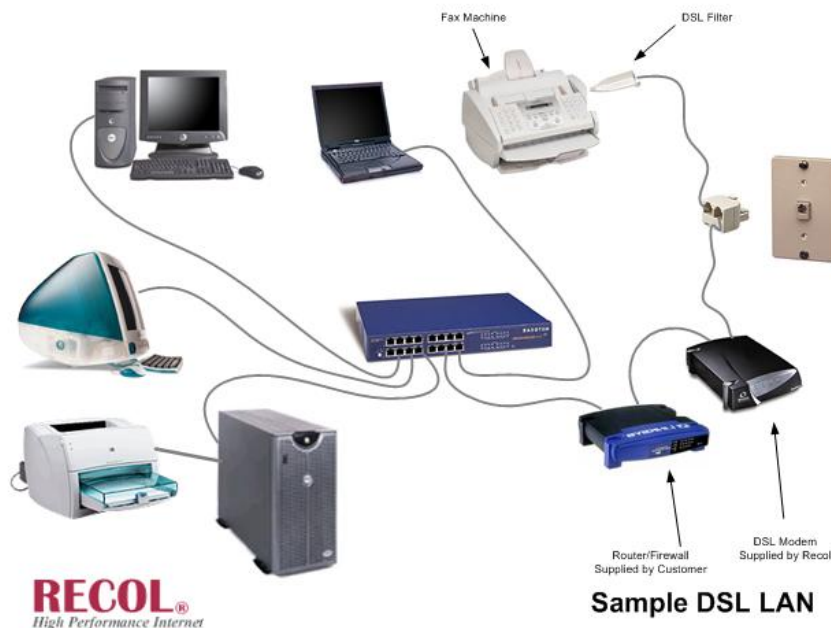
DSL Site Preparation and Implementation Notes

Overview

Thank you for selecting RECOL's DSL Service. To expedite a smooth procurement and provisioning process, please review the following notes. If you have questions, please do not hesitate to give us a call.

Throughout these notes, "**system integrator**" will refer to the entity responsible for implementing your solution. This could be your internal support staff and/or an outside vendor. **ATT** refers to the telco departments and divisions responsible for installing and servicing the DSL service over the phone lines. Also please note that our official contact with you for support and service issues is listed in your services agreement under "technical contact". This person may do your actual networking implementation and ongoing support, or may delegate this to others so "technical" does not always mean that the person does technical work but rather is a decision maker and our chief point of contact on technical issues.

The following diagram shows a typical DSL installation implemented with a DSL Modem and Router/Firewall appliance. More examples are available at <http://www.recol.net/adsl>.



Private DSL

Please note that this document is intended for implementation of Internet connected solutions. If you are implementing a Private DSL or another custom application then these notes will need to be supplemented. Please refer to your System Integrator or your RECOL representative for more information.

System Integration Support

These applications notes contain information that may not be understood by customers new to computer networking including Internet connectivity via DSL and other services. Most customers work with outside vendors for networking support and RECOL welcomes meeting and working with these professionals. Both customer and RECOL staff seem on average to have the smoothest installation and the most satisfactory long term operational experience when working with computer networking professionals.

If you do not have the required networking expertise and experience to design, install, secure and support an Internet access solution, RECOL can provide referrals to computer networking professionals. Note that you contract directly with these vendors and not through RECOL.

Phone Circuit

RECOL partners with ATT and thus the following conditions apply to the phone circuit used to provide DSL service.

- Line must be an ATT POTS (Plain old telephone system) or Centralink 1100 line.
- Other services such Centralink 2100 or 3100 will not work.
- Service purchased from a vendor other than ATT may not be eligible.
- Note that the ATT adds DSL support to a current voice line such as used for fax, voice or modem and thus the line provides both voice and data services.
- Some devices may not work with DSL. Examples include credit card machines, some fax machines and data modems. In such cases, a dedicated phone line may be required as determined during initial testing with a DSL modem.

IMPORTANT: Phone service issues are usually resolved during a loop qualification process that occurs when customers first work with RECOL sales representatives. Occasionally a service appears to be qualified for DSL via on line (WEB) tools when in fact, there is a conflict that is discovered during installation. For example conflicts can occur in some geographic areas with variants of Centralink Service. These issues will be

caught during the provisioning process and thus may cause delays in installation. So if your offices utilize specialized services such as Centralink, please inform RECOL so that we can check and offer alternative solutions such as installing a phone line dedicated to DSL service.

Installation Options

RECOL offers two options for DSL installation:

- Technician Install - ATT technician installs the DSL Modem and checks connectivity. This is a billable service. Please check with your sales representative for pricing. This can help save time and potentially cost in cases where system integration staff arrive on site and DSL lines are not working thus requiring a return visit after DSL troubles are resolved.
- Self Install – System integrator installs equipment. No charge.

DSL Equipment

Every DSL installation requires a DSL bridge modem to link internal equipment to RECOL services. The above diagram shows a modem connected to a router/appliance. This is the most common design in use at RECOL customers although products available from Cisco Systems and other vendors integrate the modem and routing functionality into one device.

IMPORTANT: In order to connect multiple personal computers to the Internet via DSL, you must install a router or firewall appliance that attaches your computers to the RECOL supplied DSL modem. You or your system integrator may visit <http://www.recol.net/adsl> for a list of currently certified devices and information on the design and implementation of a DSL supported LAN. Also, your computers must be networked and support TCP/IP, the Internet protocol. Nearly all Windows PC, Apple Macintosh and Unix/Linux computers and network peripherals sold over the past five years support this networking standard.

Although DSL can be installed by connecting computer equipment directly to a DSL modem, RECOL recommends that this solution is not implemented. The following is a list of the advantages of the router or firewall appliance approach:

1. Security and firewall features protect internal systems.
2. Multiple systems can share a single DSL Line.
3. Requirements for special driver software and configurations required by directly connected computers are eliminated.

4. The work required to connect current networks is minimized.
5. Remote applications such as email serving or internal WEB hosting are facilitated.

If you elect to use a RECOL supplied modem, you will also receive in-line filters for use with voice grade devices such as phone sets, fax and/or modem used on the DSL line. You simply disconnect the line from the device, plug in the filter and then plug the line back into the open jack on the filter. These filters are necessary to prevent interference between voice appliances and DSL equipment. They also filter out noise that prevents proper operation of fax and modem equipment and can distort voice communication on hand sets.

You may receive software with the ATT Modem Kit. This is not required and not supported for RECOL DSL solutions. So please ignore this software and directions on using it.

If you are using an ATT technician install, we find that an important step in assuring a smooth implementation is determining and preparing the location and configuration of the phone circuit. When the ATT technician arrives, staff should be aware of where the modem and filters are to be installed. The system integrator also needs to determine needs and prepare for connecting the equipment to the LAN.

IMPORTANT: When the ATT technician arrives, please have him/her contact RECOL at 203 776-4874 to co-ordinate testing of the circuit. We can do this with the modem thus the router appliance need not be installed at this time.

IMPORTANT: RECOL DSL services use a networking technology named Asynchronous Transfer Mode or ATM. ATM devices such as DSL modems supplied by RECOL and integrated router/modem from vendors such as Cisco support a diagnostic tool that we refer to as ATM ping. This allows RECOL staff to quickly test connectivity from our Network Operations Center, NOC, to your equipment. Some DSL equipment equipped with an integrated DSL modem does not support this diagnostic tool or must be specially configured. Thus it is important that this be implemented or installation and on going support will be hampered and trouble resolution delayed.

As part of our troubleshooting tool kit, RECOL utilizes management tools that discover and monitor customer DSL routers and firewall appliances via a TCP/IP ICMP (ping) monitoring process. This assists in troubleshooting network health and supporting customers. Many firewall/appliances such as models from Cisco/Linksys by default do not allow ICMP Ping. Blocking ICMP ping from the Internet is an IT Security

“Best Practice”. Your system integrator maybe able to open this exclusively to RECOL for monitoring purposes. Please have them call for more information.

Filters

DSL Filters are available at Radio Shack, Best Buy and other retail outlets. Simply locate or ask for ADSL Filters compatible with ATT DSL. RECOL can also supply spare filters.

DNS, Email and Internet Services

Some customers elect to implement external email at ISPs such as RECOL or provide email to users via internal servers connected to the Internet. In the majority cases, it is best that the ISP maintain and manage Domain Name Services (DNS) for the customer. DNS is the system that controls the flow of information over the Internet by converting domain names such as www.abc.com or user@abc.com to actual locations.

RECOL has years of experience working with DNS registration and management. An advantage when hosting at RECOL is that access to DNS managers is a simple phone call so that emergency changes can be implementing quickly. This is crucial during installation and upgrades especially when working with email.

IMPORTANT: If DNS plays a role for delivering email and other applications via DSL, then DNS related additions and changes must be planned well in advance of installation to expedite a smooth transition.

IMPORTANT: If you network is migrating to RECOL from another service provider, then your outgoing mail client services may stop working. Please call RECOL for a list of outgoing servers. These will need to be added to you email software configurations.

Connecting users to the Internet

A common question concerns estimating installation times. Usually the ATT technician can be in an out in about an hour on a Technician Installation. Occasionally they do find problems with lines and may need to return. We have found by experience that our worst case scenario required about a week from installation date for the ATT work to be completed.

There are several options for router appliances. The most common solution usually requires about a 30 minute installation for connection to the DSL modem, testing and attachment to the LAN. Then simple changes

of network configurations on those system needing access to the Internet needs to be accomplished. If a customer already has Internet access equipment and software or if special security issues need to be implemented, then time may increase or decrease based on implementation. Application configuration such email also will require time. So if LAN implementation is a concern, please confer with your system integrator and also give us a call if more input is required.

Advanced Applications requiring multiple public IP Addresses

One static public IP address is supplied with each DSL service. Some customers, however, elect to implement advanced services requiring multiple public IP addresses. RECOL provides blocks of 4, 8 and 16 addresses for use with DSL to support applications such as email, WEB, Terminal Services, dedicated firewalls, VPN appliances and application servers.

IMPORTANT: RECOL charges for additional IP so please contact sales at RECOL for pricing.

Support Services

Once your system is up and running, support is available via phone at 203 776-4974, fax at 203 776-4943 or email at support@recol.com. When you have a problem, call RECOL and our staff will work with you to troubleshoot problems. If problems are related to DSL troubles, we will manage getting the problem resolved with ATT. If we determine that you are having a Local Area Networking hardware or application problem, then we must defer to your system integrator.

Occasionally, customers will call ATT directly and not RECOL for support. These customer requests will often be directed to the ATT ISP and will cause delays in obtaining support. Note that ATT can not assist with DSL services from RECOL.

IMPORTANT: Whether for initial installation or on site visits to trouble shoot DSL problems, RECOL can not predict or guarantee arrival time by ATT technicians. We find if they are scheduled for a visit on a specific date, they will arrive that day but times could range from 8:00am to 5:00pm depending on the dispatch load. When the technician is on site, it is critical to have them call RECOL to confirm connectivity or to discuss problems. A customer representative must be available at the DSL location and be able to direct the technician to the location where equipment is connected.

IMPORTANT: You as the customer are responsible for the voice service component of the phone line supporting DSL. If the line is physically cut or disconnected, then you are responsible for managing the repair. The best way to test for this is to listen for dial-tone via a fax handset or a phone set. If the DSL line does not support a fax or phone, we advise purchasing a simple analog phone from Radio Shack or another source for testing purposes.

IMPORTANT: A note for system integrators. If the customer elects to implement an integrated modem/router device such as Cisco DSL Routers, then stocking a modem for backup and troubleshooting will expedite repairs related to hardware problems.

Backup Services During DSL Outages

Occasionally, DSL service may be interrupted and in the case of telco line and central office problems, be down for one or more days. RECOL offers several services including free of charge dial-up during DSL outages. Use of these services, however, must be planned in advance especially if technical support is not readily available during the outage.

Please visit <http://www.recol.com/adsl> for information on DSL dial-up or ISDN backup services.

Implementation Schedule

We have found to date that the process from receipt of the signed services contract to the installation of DSL equipment requires on average 5 business days to two weeks. Note that this does not include the time to configure user systems. The most common cause of the longer time are based on problems with circuits discovered during the ATT installation. The following is an overview of the steps required to implement a solution.

1. Sign and return the services contract.
2. RECOL will order the service and then notify you with the installation date.
3. Your support organization prepares the site. (see above)
4. RECOL technician will prepare and email or fax a connection information sheet. This will contain configuration settings needed to configure equipment. It will also contain an install date. See an important note on installation date below.
5. Service/Modem Installation
 - a) Technician Installation. ATT technician arrives. Will install line splitter and DSL Modem. Note that in some implementations, the DSL modem may not be required.

Note that office staff will need to direct the ATT technician to the location of the DSL phone circuit.

- b) Self Installation: Customer or system integrator installs filters and modem and calls RECOL to test.
6. **IMPORTANT:** When the ATT technician for a technician installation arrives, please have him/her contact RECOL at 203 776-4874 to co-ordinate testing of the circuit. We can do this with the modem thus the router appliance need not be installed at this time.
7. System integrator installs the router appliance and tests connection with RECOL staff.
8. Support organization connects systems and configures software required to access Internet applications.

IMPORTANT: Although the DSL installation date has been on average a dependable date, occasionally ATT will change the date and not always update our staff. Thus the best plan is to have the modem and filters connected to the phone circuit so that RECOL staff can check on the service on the day after the install date which is when service will be available given no technical problems are experienced with the phone lines and networking equipment.

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