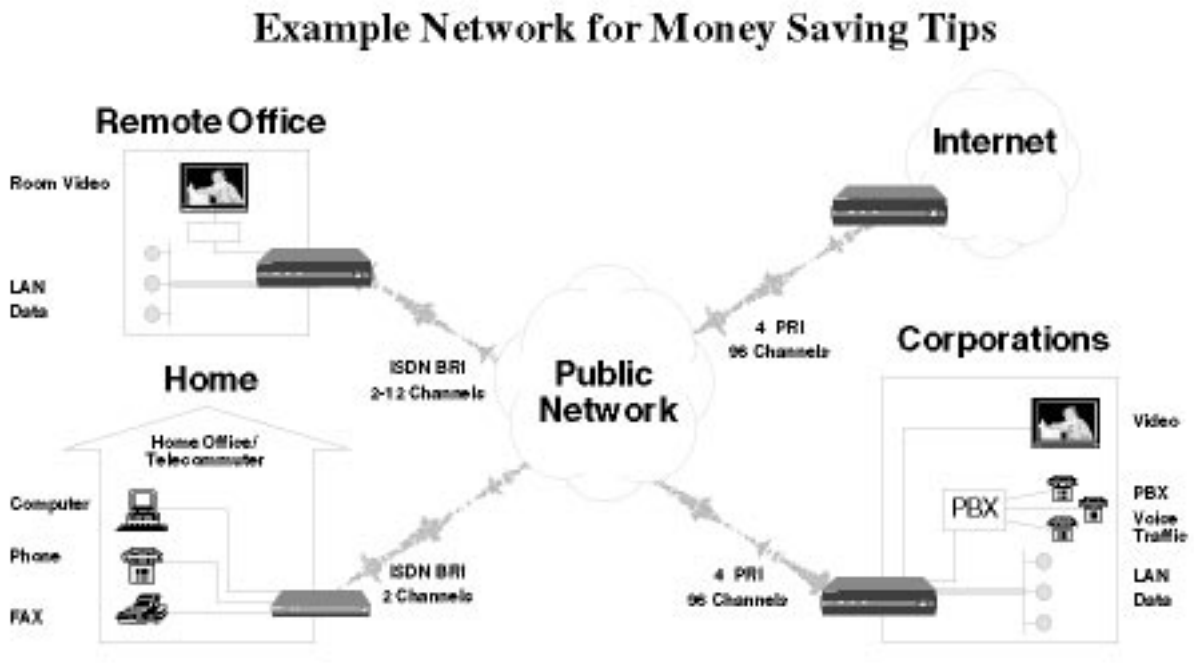
Save Money on Remote Access In All Areas of Your Network



Introduction

This guide presents 14 tips that can help your company save money on remote access, whether your remote access network links two buildings across town or connects thousands of users throughout the world. The tips address all the different areas of your network, including wide area network services, network management and remote and central site equipment. Areas where you can benefit substantially are in the selection of network services and the management of network resources. Long after your equipment invoices are paid off, the savings in ongoing line charges and labor costs will continue. Other areas ripe for savings are remote site and central site access equipment, where selecting the right equipment can mean substantially reduced network service charges, fewer administrative expenses and happier, more productive users.

1. Utilize ISDN to Consolidate Lines

ISDN Primary Rate Interface (PRI) is a digital service that combines 23 distinct 64-kbit/s channels into a single high-speed link. Each high-speed link is invariably less expensive than the equivalent bandwidth achieved with multiple low-speed links. In addition, the higher throughput of digital communications reduces connect times, resulting in shorter, less expensive sessions, and the pooling of lines permits up to 25 percent better utilization, allowing the 23 consolidated channels to replace about 30 individual modem lines.

One of the most powerful capabilities of PRI is its ability to integrate onto one line the traffic from a number of different network services, including analog, switched 56, frame relay and ISDN Basic Rate Interface (BRI).
To use this capability, make sure your central site equipment can identify and process these services on a per-channel basis.

If your network handles a large amount of traffic, you can use multiple ISDN PRI's to handle any number of concurrent circuits.

2. Implement Advanced Bandwidth Management Techniques

Bandwidth on demand, which offers advantages at both ends of the connection, must be supported by both remote site and central site equipment.
To take full advantage of bandwidth on demand technology, make sure the equipment you are using supports Multichannel Protocol Plus (MP+)*, a standard that allows equipment to add and drop channels in real time to accommodate increases and reductions in traffic flow.

At the users' end, the advantage of bandwidth on demand is readily apparent.Users can "demand" the amount of bandwidth they need for whatever application they are running, becoming more productive as a result.

At the central site, bandwidth on demand allows channels to be released for use by others. For example, a user downloading a large file would be granted additional bandwidth automatically during the download in the form of an additional channel. When the download is complete, the channel would be released automatically, freeing it up for use by others.

3. Use ISDN BRI To Make Users More Productive and Lower Phone Bills

With increasing use of graphics and the proliferation of very large files, even 28.8 kbit/s analog modems with compression can seem painfully slow. An ISDN Basic Rate Interface line, which consists of two 64-kbit/s channels, can nearly quadruple the top end of analog modem performance. In addition, ISDN's digital nature provides error-free transmission and can set up connections with the network 5 to 10 times faster than analog modems.

Evaluate equipment carefully, though. Some ISDN equipment such as terminal adapters and internal PC card solutions do not offer compression or support multilink protocols (either MP or MP+). ISDN equipment with advanced multilink capabilities can combine both BRI channels into a 128 kbit/s data stream and compress it by as much as 4-to-1 for a total throughput of 512 kbit/s. At rates like this, users feel like they are connected directly to the LAN and phone bills can decrease by 75 percent or more. For example, downloading a 2 MB file at 28.8 kbit/s takes over nine minutes; at 512 kbit/s the same file downloads in just 30 seconds. The savings on download times will quickly add up and shorter connect times allow existing access lines to serve more users.

4. Use Dial-Up Bandwidth on Demand for Backup and Overflow Needs

Whether you use leased lines or frame relay as the primary method of connecting your major facilities, dial-up bandwidth on demand provides a cost-effective solution for backup and overflow. When your primary network is down or saturated, a parallel bandwidth-on-demand network will take over automatically. The main advantage of bandwidth on demand is that you are charged for it only when you use it — so you no longer pay for reserve bandwidth that sits idle most of the time.

5. Get Videoconferencing "Free" With Your Backup and Overflow Equipment

Companies need to provide backup and overflow bandwidth for times when a primary circuit fails or during peak network demand. But the equipment installed to handle such emergencies is rarely used. Why not put it to good use? Bandwidth management equipment with inverse multiplexing capabilities can be used to set up room-based videoconferencing systems that operate at speeds ranging from 112 to 384 kbit/s. To achieve high performance levels, make sure your equipment supports Ascend Inverse Multiplexing (AIM), a defacto standard utilized by 90 percent of video equipment codec manufacturers.

6. Make Sure Your Entire Remote Access Network Is Centrally Manageable

An obvious but often overlooked method of simplifying remote access network management is to make sure that both remote and central site equipment can be managed from a central location.

Is each board, box or rack-mounted device at your central site manageable from a central console? Can an off-site expert dial in to isolate, diagnose and fix a problem? If the answer to either question is "no" for any component of your network, that component should be upgraded or replaced.

Can your remote users' equipment be managed from a central site? Can configuration and software upgrades be performed remotely? If not, replace your remote equipment with something that can.

When evaluating remote site equipment, avoid the temptation to make price the determining factor. When you consider the real costs of support personnel and user down time, it takes only a few hard-to-solve problems — like a user inadvertently changing a configuration file — to wipe out the "savings" of inexpensive equipment. In the long run, you will save money by getting "intelligent" equipment that can be managed remotely, but not tampered with locally, even when the workstation is powered off.

7. Beef Up Remote Access Security to Head Off Expensive Piracy or Sabotage

Sooner or later it will happen. A hacker will plant a destructive virus or wipe out a disk drive before its scheduled backup. A disgruntled employee will sabotage a database or publish a list of executive salaries. Or a competitor will steal your customer list or the design to your next generation product. Whatever the damage, you can be sure it will be expensive to fix and will disrupt your business operations and productivity.

To make sure your remote access network is tamper-proof, install equipment that has sophisticated password, callback, caller ID, restricted access and other protections. To make security provisions easier to administer, and to minimize the chances of someone altering your security mechanisms, consider using a RADIUS management database server. RADIUS (Remote Authentication Dial-In User Service), the most robust security database standard in the industry, is being supported increasingly by equipment vendors.

8. Look for "Hidden" Labor Costs

Call a meeting of your staff to find out what tasks are consuming their time. At least one culprit is likely to emerge. It might be old, undocumented cabling, modem incompatibilities that demand extra support, interoperability problems among disparate devices or difficulties upgrading versions on multiple units. Other likely culprits are "dumb" devices, such as modems, that cannot be managed from a central console.

To solve these problems, install integrated access devices with advanced management capabilities that incorporate the functions of dumb devices such as modems and terminal adapters. The result will be a more productive staff that can manage a growing network with existing resources.

9. Consolidate Remote Access Equipment

It used to take quite a collection of different equipment to construct a remote access network: modem banks, terminal servers, bridges, routers, gateways, inverse multiplexers, data compression units, line adapters and so forth. The collective cost of buying this equipment is bad enough, but the bill for managing it all is even worse.

State-of-the-art equipment can consolidate the many functions performed by these individual components and eliminate the need for entire racks of equipment. Consolidation also heads off the long-term problem of running out of space in your equipment room. Too many pieces of equipment can overwhelm available power, air conditioning or physical limitations and force costly upgrades that do nothing to enhance the network, itself.

10. Eliminate Modem Banks

Thanks to new digital modem technology, modem banks are no longer a necessary evil. Central site devices equipped with digital modems offer traditional analog modem users compatibility with digital access lines and equipment.

Digital modem technology is transparent, so analog modem users can continue to dial the same phone numbers and perceive absolutely no differences — except for better performance. The enhanced performance results from fewer analog-to-digital conversions, the error-free nature of digital transmissions and the lessened chance that a high-speed modem will need to throttle back to 9.6 kbit/s because of line noise.

11. Install Integrated Access Devices at Remote Sites

The typical home office has two lines: one for personal cal,s and one for business calls. More and more home office users are finding they now need more lines for data traffic. Why? Because they must choose between missing either voice calls or incoming faxes if they are running a remote session.

Many users are finding this situation increasingly unacceptable and ordering an additional phone line — only to learn that the telephone company must install expensive new wiring from the telephone pole on their street all the way into their house. To avoid this expense, install ISDN BRI on one of the lines and an ISDN integrated access device (IAD), instead. An ISDN IAD allows a single BRI line to behave like three separate lines. Multiplex both ISDN channels to set up a remote access session at 128 kbit/s and you still can receive incoming voice or fax calls on the same twisted pair wire. Or simultaneously hold a voice call on one BRI channel and a data call on the other. The IAD you select must be able to handle voice, data, and fax video interchangeably and allow the two BRI channels to operate separately or in combination.

Multichannel Protocol Plus (MP+)

MP+ is an emerging standard developed by Ascend Communications. MP+ also perform dynamic bandwidth allocation, a feature which allows the bandwidth of a call to be increased automatically during times of increased data traffic and decreased during times of reduced traffic flow. MP+ also reduces the bandwidth of the data connection on an ISDN BRI line from 128 kbit/s to 64 kbit/s to allow an incoming or outgoing voice, fax or modem call to take place on the newly-released B channel. At the conclusion of the voice, fax or modem call MP+ allows the data equipment at both ends of the connection to increase the end-to-end bandwidth back to 128 kbit/s.

MP+ operates as an extension to Internet Engineering Task Force RFC 1717 Multichannel Protocol (MP), which defines a standard method for equipment to inverse multiplex data streams. In order to enjoy the benefits of MP+, the equipment on both ends of the transmission must support the protocol.

12. Integrate Data, Voice and Video in Branch Offices

You can realize substantial savings by integrating all of the data, voice and video traffic from your branch offices onto a single access line. There are two options for this raffic: a multiplexer with a leased-line connection or an integrated access device (IAD) that supports bandwidth on demand. If your branches in your local calling area and your local carrier charges low leased-line rates, a multiplexer solution will be more economical. For branch offices out of your local calling area, an IAD will be more cost-effective. Make sure the IAD you use is compatible with your remote access, videoconferencing and PBX equipment, incorporates drop-and-insert capabilities and supports MP+ and AIM.

13. Use Bandwidth On Demand for Internet Access

The Internet has become an essential business tool. If your company already has an Internet gateway, you are probably using a high-speed leased line with adequate capacity for peak loads. But during non-peaks periods that line probably sits idle and wastes you money. A more economical approach is to install a lower-speed dedicated line and supplement it with additional channels for times of peak traffic. The dedicated connection to your Internet Service Provider (ISP) will give your employees access to the Internet and let outsiders access to your Web server. As your incoming or outgoing traffic needs increase, dial-up bandwidth is added automatically in 64 kbit/s chunks. When the extra bandwidth is no longer needed, the dial-up circuits are dropped, so you pay only for the bandwidth you need, when you need it. Make sure your ISP supports MP+ so you can take full advantage of bandwidth on demand.

14. Consider A Major Overhaul

Most remote access networks have evolved from urgent departmental needs that left little opportunity for planning and are growing rapidly as lifestyles change to favor work-at-home situations and the workforce becomes increasingly mobile. If your remote access network provides an inadequate foundation for the future, now may be a good time for an overhaul. A complete or even a partial overhaul lets you take advantage of most or all of the above money-saving ideas. With advances in digital services and systems, the payback for a complete overhaul can be as short as one year. Factor in future savings of anticipated expansion and the payback may well be immediate.

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