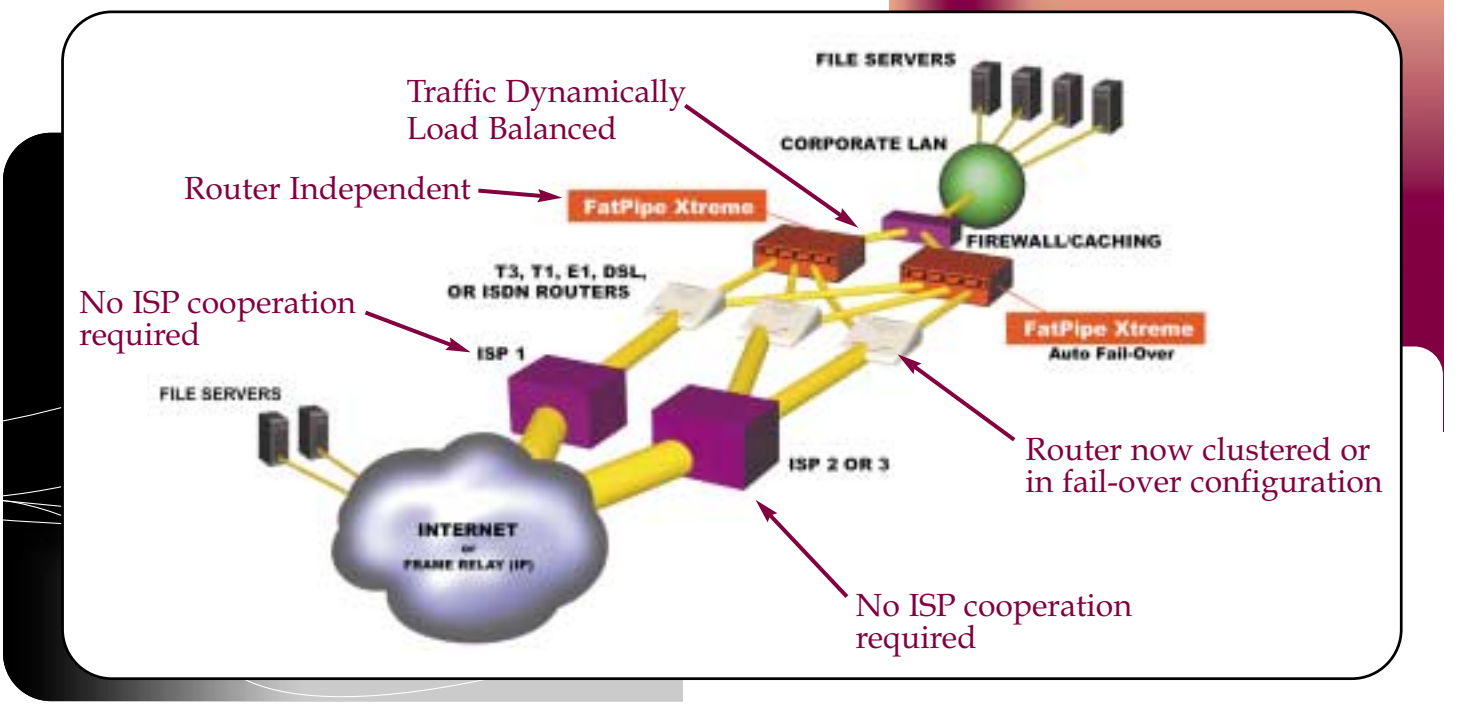

FAT Pipe
XTREME
WHITE PAPERS

Overview

The growing popularity of wide area networks (WANs), as a means by which companies transact vital information with clients, partners, and colleagues, is indisputable. The business world's growing confidence and acceptance of using new web based technologies as basic tools of communication is reflected in the increasingly common use of the Internet and other shared networks to conduct day-to-day business.

Companies small and large are implementing VPN, ASP, Thin Client models, and other web-based applications to enhance their productivity levels and better serve their customers. This fundamental change in how business is done has brought about the need for higher speed wide area connections, and more importantly, a reliable and redundant link to the outside world.



Challenges Associated with WAN Computing

High Probability of Intermittent WAN Failure

Companies running mission critical applications over the Internet or over private WANs understand the importance of having stable, redundant and fast connections for their business needs. WAN failures bring companies to a complete stand still -- especially those who employ ASPs, VPNs, Thin Client technology, or other web-based applications that require access to remote servers. These companies simply cannot compute when WAN failures occur.

Although awareness about the need for redundancy and reliability for wide area networks has grown, the majority of today's companies have not prepared for a WAN outage. The following statistics illustrate this point:

- 64 percent of companies surveyed do not have sufficient disaster recovery plans for their WANs. *
- WANs fail or degrade on an average of 7.1 hours per month. **
- Network downtimes (LAN/WAN) among large companies cost $32.5 million in lost productivity and revenue per year. *

WAN failures are not just an inconvenience to the users, or an embarrassment to companies hosting servers, it costs the company money. An average corporation has the potential to lose $7.8 million per year because of WAN downtime. **

The study also broke down the hourly cost of downtime for specific industries. It is obvious that downtime is costly and an expense that ultimately subtracts from the bottom line.

- Brokerage houses: $6.4 million
- Credit card sales/authorization: $2.6 million
- Catalog sales: $90,000
- Package shipping: $28,000

Comdisco, BellSouth, Oracle Vulnerability study *a
Infonetics Research **

Even the best case scenario, where a system has a relatively high level of reliability, a company will still lose an average of 168 hours of normal business hours to WAN downtime.

August 19, 2000

Briefs

Internet service restored

About 800 Victoria customers of were without the Internet Thursday after the cable company's Internet service provider failed.

Tyler Internet Failure Slows Technology Flow

By GREG JUNEK
Business Editor

Outage leaves many users Net-less for 36 hours

Antony Adshead

Challenges Associated with WAN Computing

Inadequate WAN Bandwidth and Redundancy

Corporations are realizing that they need more than a single T1 or DSL connection to support their bandwidth needs, as well as harness reliability and redundancy for their WANs. The bandwidth crunch is happening at the edge of their networks—where bandwidth bottlenecks are affecting optimal performance. Reliability and quality service are urgent issues.

However, typical industry networks are not usually very efficient. These systems consist of a variety of leased lines and public data services running at various speeds. Multiple access circuits were installed to accommodate each service. For example, a T1 might be used exclusively for a redundant connection; an ISDN line to support Internet access, and another Frame Relay connection for point-to-point connection. In these cases, companies pay the costs in monthly services bills, WAN access equipment, and support for different service types. Alternatively, high bandwidth and redundancy can be achieved at a low cost by combining existing lines at the customer remises via FatPipe Xtreme.

According to a survey by The Yankee Group, a Boston-based information technology firm, over 60% of network service expenditures are spent on WAN technologies. The exploding growth in WAN infrastructures is only supported by a 10% growth in corporate IT budgets. (Source: IT Spending Forecast, S.G. Cowen, NYC). Thus, maximizing efficiency within budgetary limitations is critical.

Speed Without Redundancy

Corporations can obtain large bandwidth using a single fractional or full T3 line, but the question of redundancy still arises. Should the physical connection or the ISP go down, the company's vital link to the Internet also goes down.

High-Speed Line Prices May Be Too High

It is prudent for IT managers to seek cost-containment measures whenever possible. T3 prices have remained prohibitively high for years, costing thousands of dollars per month. Corporations experiencing an increase in their WAN traffic may need capacity greater than a 1.54 Mbps, but may not want to invest in a T3 line. When a T3 line is obtained from a single ISP, using a single backbone, the issue of redundancy and reliability still exists. If the ISP or backbone go down, then the connection goes down with it.

Current Solutions

To meet the challenges of gaining multi-megabit speed, corporations are implementing different types of solutions such as border gateway protocol (BGP) and NxT1. However, there are problems associated with using either alternative.

BGP is a protocol for exchanging routing information between gateway hosts in a network of autonomous systems. BGP is often the protocol used between gateway hosts on the Internet. However, BGP installation and maintenance are difficult, requiring an expensive programmer. In addition, there are several limitations to using BGP programmed for load management or efficient routing. Since the Internet is a dynamically loaded network, static routing solutions are not efficient. Adding capacity to BGP programming systems requires several system changes as well as a need for additional equipment. Equipment and cooperation are required by the ISP, adding another inconvenience to the customer.

NxT1 hardware solutions are designed to combine multiple T1s. However, they requires the same vendor equipment at the backbone provider/ISP site and at the corporation's location. NxT1 cannot bond other types of lines, such as T3, wireless, DSL, or ISDN, which means higher costs for extra lines without the benefit of redundancy and reliability.

FatPipe's Solution

FatPipe Xtreme is a cost effective and technologically superior alternative to current technology. Xtreme is a patent-pending router-clustering device that aggregates multiple routers of any speed for highly reliable, redundant, and fast Internet access up to 50Mbps.

FatPipe Xtreme provides a solution for companies that want higher bandwidth for their computing needs coupled with redundancy and reliability. FatPipe Xtreme offers the following advantages:

- Aggregate inexpensive lines to achieve high bandwidth at a relatively low cost
- Combines connections of different speeds including DSL, T1, and Wireless
- Dynamically load balances lines
- Scalable bandwidth for increased usage
- Circuits bonded for redundancy and reliability
- Easy deployment and configuration
- Existing equipment and infrastructure can be used and optimized
- Multiple platforms and Operating Systems can be supported
- No BGP programming required

FatPipe Xtreme is a router clustering device for corporations and branch offices. Using patented technology, FatPipe Xtreme aggregates any combination of multiple T1, T3, E1, E3, DSL, Wireless and/or ISDN routers for fast Internet access. FatPipe Xtreme provides a simple, cost-effective way to double or triple access speeds to the Internet while providing the highest level of redundancy.

FatPipe Xtreme technology transparently combines the data stream from two to three T1, DSL, Wireless, or ISDN routers into a single connection, without changing the infrastructure of the existing network. FatPipe Xtreme differs from other web access technologies in that it permits seamless, high-speed data transfer using existing routers and communications equipment.

FatPipe Xtreme is well suited for applications that require high bandwidth, and a high degree of reliability and redundancy such as VPNs, Intranets and e-commerce. It is a plug and play solution, compatible with existing hardware and applications and wiring systems.

FatPipe Xtreme in auto fail-over mode

Figure 1: FatPipe Xtreme combines multiple routers into a single, high-speed Internet connection. In this diagram, two Xtreme units are used (called Dual Xtreme) for ultimate reliability.

FatPipe Xtreme in a Thin Client Environment

Figure 2: FatPipe Xtreme combines multiple routers into a single, high-speed Internet connection, while WARP provides high Wan avalibility for the server.

FatPipe Xtreme in a Corporate Environment

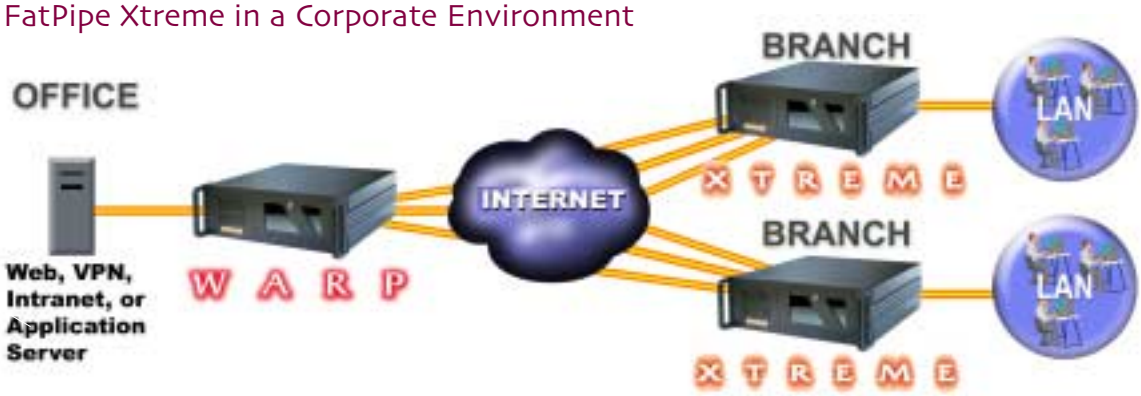


Figure 3: FatPipe Xtreme combines multiple routers into a single, high-speed Internet connection. In this diagram, two Xtreme units are used (called Dual Xtreme) for ultimate reliability.

FatPipe Xtreme Technology: Benefits and Features

FatPipe Xtreme has several features that allow the IS manager to take a more hands off approach to network connectivity issues.

Highest Level of Redundancy and Reliability

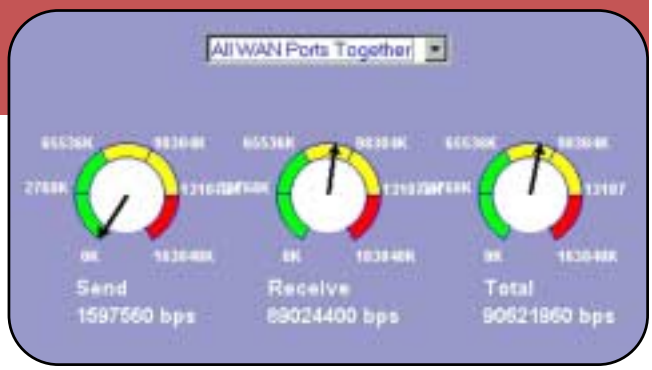
FatPipe Xtreme is easy to install and use. Companies effortlessly obtain redundancy without having to replace existing routers or re-configure networks to make more than one router work on a LAN. The IS manager does not have to keep programming machines and will save the time and expense of maintaining router tables or implementing BGP programming.

Maximum Redundancy and Reliability of Current Internet Connections

Backup or redundant T1 lines can now be turned from an expense into a productive investment by using a Xtreme to bond the primary connection with the backup T1 for redundancy. Alternatively, a less expensive line, such as a DSL, can be leased and combined with the primary connection to provide redundancy at a low cost. A T3 line combined with one or two T1 lines provides for a highly reliable and redundant system.

High Bandwidth at a Low Cost

FatPipe Xtreme brings dramatic savings to your corporation or branch office. Your office can obtain up to 50 Mbps for its Internet or WAN connections by bonding any combination of high-speed lines. For example, in places where a DS3/T3 is hard to get or too expensive, FatPipe combines up to three T1 connections at only a fraction of the cost of installing a T3. FatPipe Xtreme can also combine low cost DSL lines with T1 lines to get fractional T3 speeds, without the high cost of T3 lines or expensive T3 equipment.



Web-based Management Tools

FatPipe Xtreme's web-based management tools allow Administrators to monitor router speeds (shown above), connection status, and make changes to user access rights and settings from any location worldwide. Its graphical user interface makes it so easy to administer and make changes.

Easy Installation and a Seamless, Maintenance Free Solution

FatPipe Xtreme is a plug and play solution. A typical setup takes about 30 minutes. FatPipe Xtreme is specifically designed to operate transparently with existing routers and access equipment.

A Solution That Does Not Require ISP or TELCO Involvement

Bandwidth aggregation using FatPipe Xtreme does not require Internet Service Providers (ISPs) or telephone companies (TELCOs) to make changes to their existing equipment or software. FatPipe Xtreme works with all existing ISP setups worldwide, including managed service providers whose routers cannot be programmed by the customer. This means corporations and branch offices can apply the same technology in all of their offices worldwide.

Support for Multi-Homed T1 Connections

FatPipe Xtreme will seamlessly combine multi-homed T1 lines into a single, high-speed connection. There is no need for additional expensive equipment or BGP programming.

Systems Failure Alerts

The system can be remotely monitored using an easy to use web browser based interface. In the case of a system failure, a page and e-mail is sent to the systems administrator to insure fast and prompt attention. SNMP traps are provided for systems that use SNMP.

Easy Rack Mountable Hardware

FatPipe Xtreme comes in a 19" rack mountable chassis. Units with dual hot swapable power supply and dual fan systems are available for additional reliability.

Applications

FatPipe Xtreme is a versatile product that can be used for situations where high speed, reliable and redundant Internet or WAN access is important. The following scenarios present situations in which FatPipe Xtreme would be very suitable.

- Information Dependent Businesses: Any business, such as media firms or financial institutions, that are dependent on Internet or WAN connections for critical interaction with clients and colleagues require reliable Internet access. "Downtime" results in a loss of real time communication -- the consequence is expensive.

- Low Cost, High Bandwidth Needs: The cost and availability of digital lines is still an issue within the United States. In some areas, high bandwidth lines are unavailable. It is easier to bond multiple low-cost, low bandwidth lines to create one *fatpipe* to the Internet or for WAN access using FatPipe Xtreme.

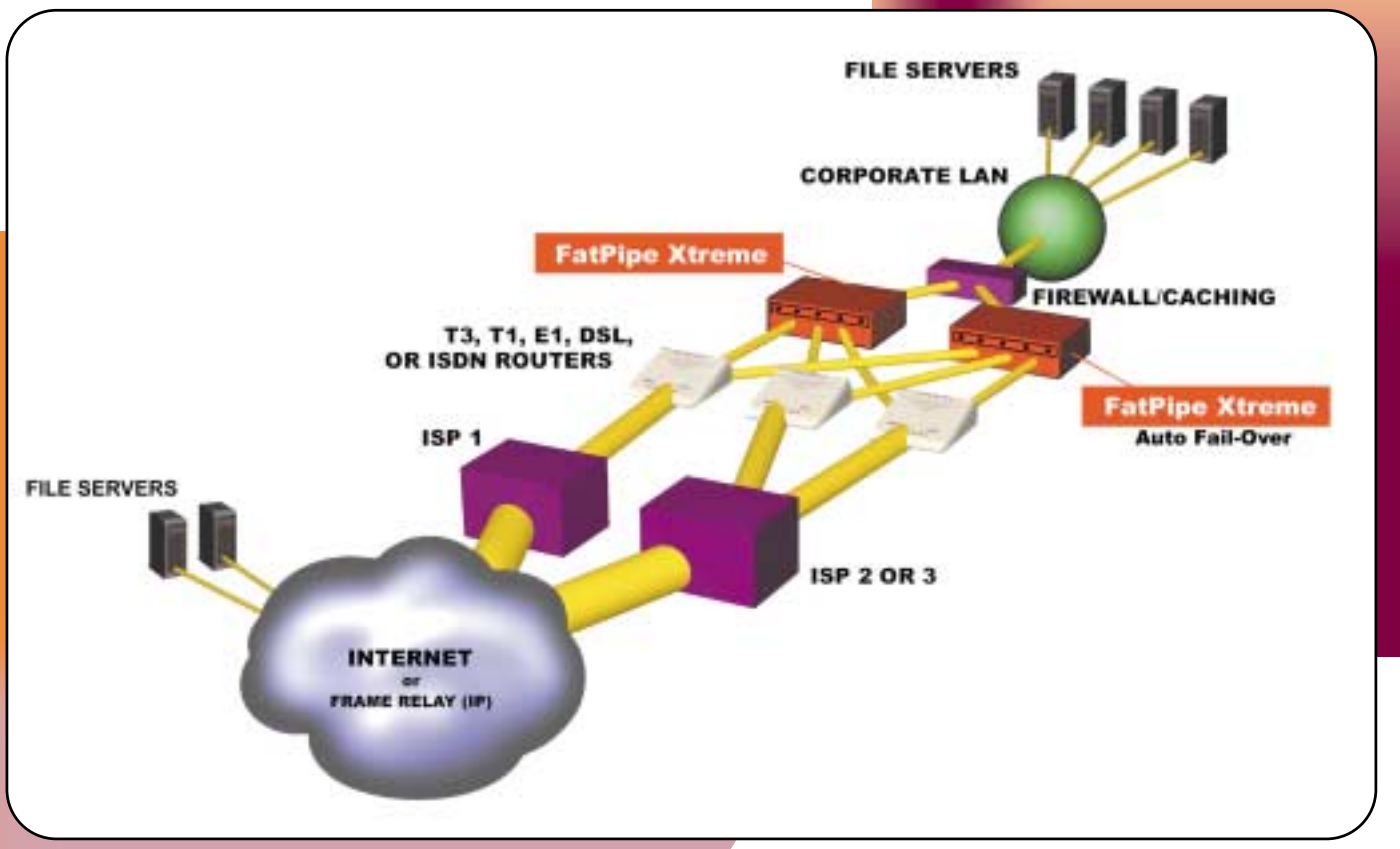
- Mix and Match Access Technology: Companies can use a combination of T1, T3 and less expensive technologies such as DSL, ISDN or wireless connections to create a virtual high-bandwidth pipe at a low cost. Medium to large sized companies can bond multiple T1s or two T1s to a T3 for bandwidth and redundancy. Regardless of which lines are combined, FatPipe Xtreme will work with any router or technology worldwide -- compatibility is never an issue.

- Intranets: Corporations that depends on an Intranet to maintain files cannot afford to experience failure of Internet access at the host or branch office locations. FatPipe Xtreme can be used at the host site to maintain a highly reliable connection, while the branch offices can use Xtreme to ensure their WAN connections are redundant and reliable.

- Web Based Application Servers: For companies that have web based centralized servers using a thin client model, it is important to maintain web connections that are highly reliable and redundant. FatPipe Xtreme can be used at the branch offices to ensure reliable Internet and WAN connections.

Conclusion

FatPipe Xtreme is the world's first multi-router aggregator that is simple to install, and supports multi-homing for redundancy. Neither router programming, including BGP, nor router table maintenance is needed to operate Xtreme. It is easy to install and use so the Network Administrator is free to focus on other activities. The combination of enterprise grade hardware and innovative software design lowers maintenance costs and increases customer satisfaction.



Feature	Benefit
Higher Internet Access Speed	Combines three routers to get up to 50 Mbps Internet throughput
Multiple Routing Paths up to 3 Different ISPs	Maximum possible redundancy of Internet connection and maximum reliability due to multiple paths and ISPs
Low Cost Bonding of Dissimilar Routers	Combine routers (e.g. DSL and T1 or multiple T1s) to get fractional T3 speeds with redundancy
Allows Enterprise-Wide Internet Sharing	Combine T1s or any other type connection from separate subnets; no need to subnet networks
Auto Routing over Available Routers	No BGP programming; no need to maintain router tables, no programmers needed. Saves time and money
Auto Load Balancing Among all Internet or WAN Connections	Keeps traffic at peak performance between all available connections. No need to do in-efficient routing with BGP
Uses Existing ISP and T1 Equipment; Works with any router	No new router equipment or specialized, expensive routing equipment needed. Preserves existing investment
Combines T3, T1, ISDN, Wireless and/or DSL Routers	Saves money by allowing incremental increases in band-width with maximum possible reliability and redundancy
Supports Multi-Homing	Use same or different ISP without special hardware setup
Plug and Play	A typical setup takes about 30 minutes - Saves time and money
Utilizes Redundant T1 Connection	Automatically reroutes information to second or third routers
Utilizes Existing T1 Routers and Termination Equipment	No hefty equipment, setup, or maintenance of new equipment
Works with any ISP in the World	Plug and play. Can be used worldwide, without any special equipment
No Additional Training Required	Requires no personnel training on software or hardware
Transparent Operation	Works with any firewall, proxy server, or authentication equipment
Supports Multiple Client Platforms	Works with Mac, UNIX, Windows on LAN and other TCP/IP enabled systems

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