



Internet and Wide Area Network Redundancy for Mid-Market Businesses
Planning for Service Interruption

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Executive Overview

Before the rise of E-commerce, the impact of network disruption did not threaten to cripple an organization. The stakes are much higher now that companies rely heavily on conducting business over the Internet. Network downtime translates into: immediate and long term revenue loss; customer loss; reduced productivity; and erosion of your brand.

“Customers continuously re-evaluate the experience they enjoy and the benefits they receive from interacting with their chosen suppliers, vendors and business partners. When that experience is interrupted or thwarted by a communications continuity issue, that experience is diminished. What began as an issue of deferred revenue can become a problem of depleting loyalty, to the extent that customers will, in the long run, take their value to the companies that provide them with seamless, trouble-free lines of communication.” Business Continuity and Customer Relationships: What’s Your Communications Strategy?, Peppers & Rogers Group a division of Carlson Marketing Worldwide, 2007

More and more, applications that were once resident on the PC have migrated to central servers to the extent that businesses are now network-dependent. While the advantages of centralized processing are attractive – lower hardware costs, lower staff costs, lower software licence fees – failure in the network will paralyze the organization.

The dependency on the communications infrastructure will continue, driven by the demand for the convergence of applications – voice, data and video – over a single Internet Protocol (IP) network.

Local Area Networks (LANs) – interconnectivity in a single location - and Wide Area Networks (WANs) – interconnectivity between geographic sites - are the central nervous system of the organization. Connectivity loss in the LAN/WAN network without a redundant service leaves the entire organization vulnerable and open to serious consequences and, at its worst, disaster.

The high availability of business systems is increasingly a key determinant of competitive ability in today’s business environment. Businesses that put in place measures to mitigate the risk of disrupted IT infrastructure performance are actively managing business continuity.

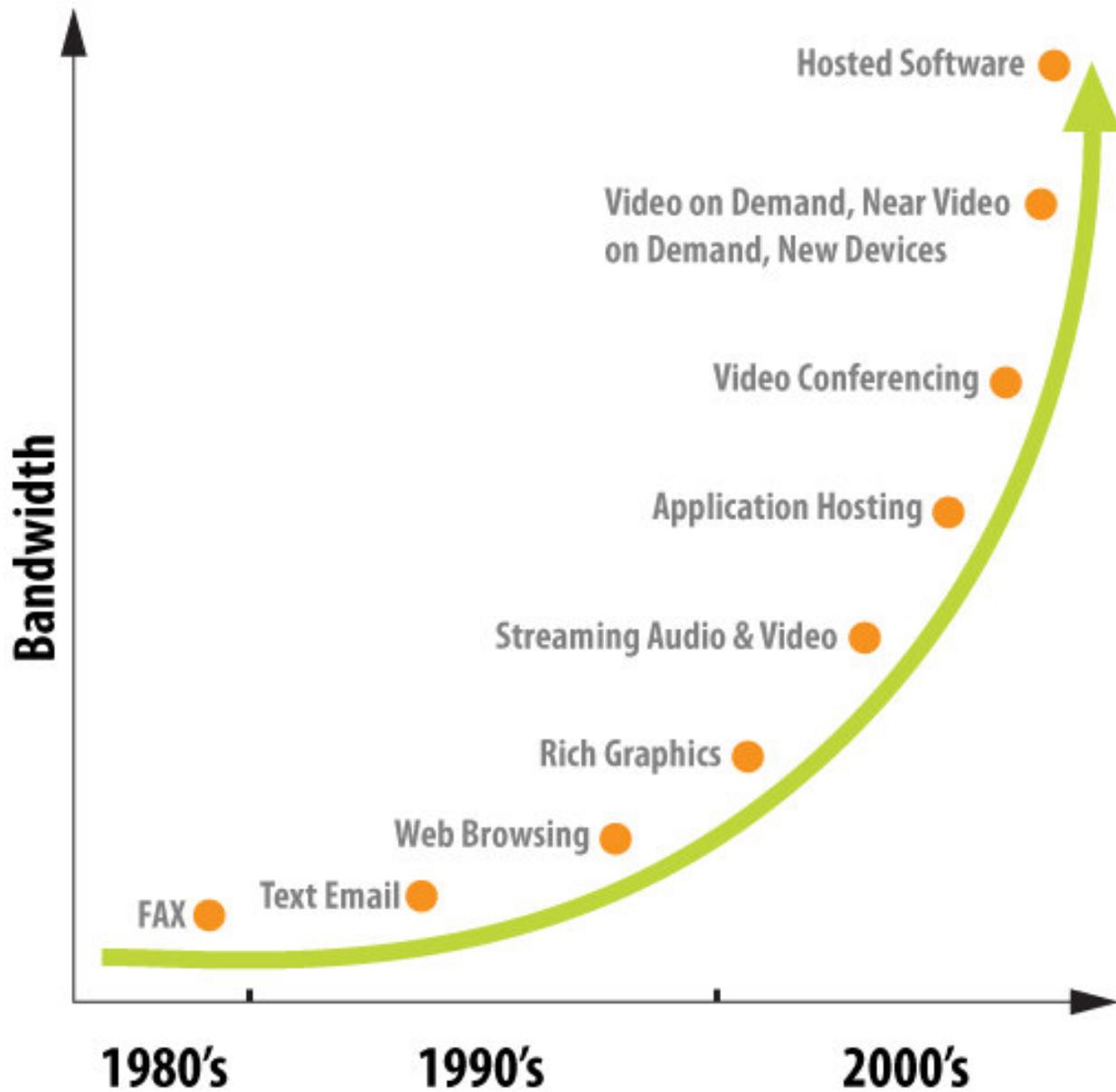
“Though large-business downtime gets the most press, medium businesses suffer crippling revenue and productivity loss due to downtime.” The Costs of Downtime: North American Medium Businesses, Infonetics Research 2006

Average Downtime Statistics For Medium Businesses:

Average hard downtime per month.....	1.7 outages
Average duration per hard downtime.....	67 minutes
Average total hard downtime per year	23 hours
Average percent of employees affected	28% of employees

Source: Infonetics Research 2006

Applications Driving Increased Demand for Bandwidth



Source: Canaccord Adams

The Proactive Approach To Network Disruption

Enterprise organizations have the resources to identify and implement network redundancy as part of their overall Disaster Recovery Plan. Smaller organizations with limited or no IT resources may have identified the redundancy gap but are often uncertain how to proceed or may believe that redundancy is a cost to protect their business they cannot afford.

Mitigating IT Infrastructure Risk Factors

In addition to unforeseen disruptions, planned network outages also have a negative impact on your business. There are a number of steps you can take to safeguard your IT infrastructure functions:

Electrical Power

One of the most frequent causes of network and system failures is directly related to power failures. Each LAN should be equipped with an uninterruptible power supply (UPS) connected to an emergency power source to provide continuous connection to external sites and public networks.

Edge Devices

Approximately 20% of service interruption is caused by a faulty router (software/hardware faults; denial of service attack); over 35% of outages is due to router maintenance (software and hardware upgrade; configuration errors). Without a router edge device, your business cannot access public networks.

If you do not have a maintenance agreement with a supplier that can quickly provide a replacement, your business should have a spare router in working order available to swap in if needed. Otherwise, you may have to wait days or weeks until a replacement can be purchased.

The Proactive Approach To Redundancy

Avoiding the Single Point of Failure Strategy

Using a single provider and single link puts your business and branch office locations at risk. A second connection actively running in parallel with your primary connection, or available as a failover back-up, ensures that your network downtime will be minimized to seconds or minutes instead of hours or days.

Carrier Diversity

If your connections are from the same provider, they may not be diverse. If you have two wireline connections, you do not have truly redundant service. A truly redundant Internet access service is provided by a carrier network independent from your primary connection.

Central Office Diversity

Traditional telcos do not typically install separate networks to manage redundancy at their Central Office. Again, only an independent network can provide true redundancy.

Conduit Diversity

Does your building have conduit diversity? For example, the following access methods would usually enter a building from the same conduit:

- T1
- E10
- ADSL
- Cable

One cut to the building's conduit will take down all of these services. Buildings with an additional wireline conduit entry point are extremely rare due to the costs to install an additional conduit and run the fibre.

Redundancy: Can You Afford To Ignore It?

“An IDC Canada study released in August found only one quarter of Canadian organizations has a tested business continuity plan.” ComputerWorld Canada, October 12, 2007.

For the following organizations, the cost of not having a rapid recovery plan was significant:

A computer crash in the Customs office of a major North American airport caused hours of delay for more than 17,000 airline passengers. Customs officials found that a malfunctioning network card caused Customs to lose access to their national systems and databases and their local area network. This connectivity failure created a ‘domino’ effect leading to a total system failure that caused massive wait times at the airport, stranding some passengers. It took technicians over ten hours to diagnose the problem, halting screening operations until it could be resolved. Dr. Jim Kennedy, Business Continuity Practice Lead, Business Continuity Services, Alcatel-Lucent.

In another case, a major North American medical centre relied heavily upon its networked advanced clinical computing system. With this system, clinicians throughout the medical centre and other affiliated hospitals could gain access to laboratory results, radiographs, and electrocardiograms electronically, using a secure Internet access. Patients also had secure access to their test results over the Internet. The outage lasted almost a week, during which time the hospital staff had to scramble to utilize hand-carried patient records, test results and countless other documents in order to maintain clinical operations. Dr. Jim Kennedy, Business Continuity Practice Lead, Business Continuity Services, Alcatel-Lucent

The Threat From Growing Dependence On E-commerce:

A Canadian-based, mid-sized technology company in a highly competitive market provides goods and services to customers across North America. While the organization has a small, dedicated sales force and an inbound call centre, the majority of its revenue is derived from online sales. In fact, the amount of revenue from online sales continues to grow with the company investing heavily in Search Engine Marketing and other online marketing programs to reach its target market. Due to a fibre cut in the area, the result of construction activity by the

company's telco, the company's Internet service went down for several days. The impact to the company's bottom line was immediate as customers unable to place online orders looked to the company's competitors to provide for their needs. Future revenues and brand reputation were threatened by one construction mishap that brought the company to its knees.

Without network redundancy, a Canadian manufacturer with a virtual private network connecting multiple facilities experienced a complete shutdown of its operations. All of the production equipment depended on wide area network connectivity to complete product builds and ship products. When the company's network went down for several days, operations came to a standstill.

Over the last several years, high profile organizations in Canada such as the Royal Bank of Canada and Research in Motion (RIM), manufacturer of the wireless BlackBerry™ communications device, have felt the sting of customer wrath when their networks failed for hours at a time. Bank customers were left stranded unable to use debit cards to pay for purchases. Two thirds of RIM's 12 million BlackBerry™ subscribers in Canada and the United States were cut off for several hours without backup service.

A 2006 survey conducted by Continuity Central on business continuity practices across the world reported the following statistics on downtime tolerance: For many respondents, downtime would become a critical problem very quickly, with 32 percent of all respondents saying that just four hours downtime, or less, could be fatal for their organization. The vast majority, 72.9 percent, said that 24 hours of downtime could result in the demise of their organization.

Recommendation

The cost of lost business productivity due to network interruption has spawned an entire industry devoted to assisting companies with disaster recovery planning. So great is our dependence on broadband connectivity, business has no viability without it.

A high end Internet access service or WAN service may cost you \$1,000 per month. A \$12,000 annual investment in a redundant service represents a fraction of the cost of lost revenue, lost employee productivity and unhappy customers.

Using alternative technologies, such as broadband wireless, to provide the second, redundant Internet or WAN access addresses the key requirements for true redundancy:

1. Carrier diversity;
2. Central Office diversity; and
3. Conduit diversity.

Purchasing a managed redundancy service that ensures router health is proactively managed and spared minimizes edge device failure.

Following these recommendations can guarantee businesses additional uptime and application availability.

About TeraGo Networks

TeraGo Networks has been providing businesses in Canada with carrier-grade wireless broadband and data communications services since 2001. The national broadband service provider owns and manages its wireless IP network in 40 major markets across Canada, serving more than 4,000 customer locations.

TeraGo's network is independent from other carrier networks and uses the most advanced and proven wireless technologies to offer customers true network diversity.

TeraGo Networks is a wholly owned subsidiary of TeraGo Inc. (TSX:TGO). For more information, visit www.terago.ca