JUNIPER NETWORKS

MAKING THE BUSINESS CASE

LEVERAGING DATA CENTER INTERCONNECT FOR BUSINESS CONTINUITY

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Introduction

As network-centric computing — both mobile and cloud-based — requires companies to rethink and re-engineer their WANs, it also presents an opportunity to enhance business continuity capabilities by leveraging improvements to the WAN infrastructure.

Using standards-based data center interconnect (DCI) technology, organizations can cut the cost of a business continuity strategies while significantly reducing — or possibly even eliminating — recovery time following a major outage. For instance, the transition to a private cloud environment may require an overhaul of the WAN infrastructure to ensure enough dynamic bandwidth for virtual applications and infrastructure to move between data centers at any moment. The resulting increased bandwidth between data centers provides a natural opportunity for DCI implementations to support a business continuity plan.

Several recent natural disasters and man-made outages have resulted in major business disruptions: the tsunami in Japan in March 2011, the RIM BlackBerry global service outage in October 2011, and Hurricane Sandy in October 2012 all caused major IT service outages and business disruptions. They also demonstrated why companies can no longer consider business continuity an afterthought or an underfunded IT luxury.

State-of-the-Art Business Continuity and DCI Strategies

DCI provides the ability to extend your LAN connections so that Layer 2, Layer 3 and storage traffic can flow freely between data centers as needed. The standards-based DCI opens up myriad possibilities to replicate data between sites and provides support for distributed clusters between data centers.

As part of an overall re-engineering of a WAN infrastructure, standards-based DCI can allow an organization to employ a self-protection business continuity model in lieu of third-party disaster recovery services. Be aware that many proprietary DCI solutions exist, but such products and services are typically more expensive to implement and maintain compared with using standards-based DCI. Also, many proprietary DCI solutions lack sufficient scalability to support a long-term strategy as your data center requirements grow.

Extension of the LAN between data centers typically utilizes encapsulation of IP and Ethernet traffic. A company may pay a WAN service provider to provide the underlying connections and DCI encapsulation, or it may utilize a WAN service provider to provide only the data connections while actively managing DCI encapsulation features and WAN infrastructure. WAN links remain relatively expensive, so WAN load balancing and dynamic bandwidth allocation are essential capabilities to keep DCI cost-effective

and resilient. Once you extend your storage network between distant data centers, you can achieve automated failover of storage data during a business continuity event with no user intervention. You can also use DCI to replicate data between geographically distributed storage nodes in lieu of — or in addition to — a traditional data backup and restore strategy.

Automation is an important consideration for business continuity processes in a DCI strategy. Human error and ensuing disruptions can be significant causes of recovery delays and failures. Utilizing network automation and scripting avoids the possible negative impact of human responses during a business continuity event. Thus, a business case can be made for the mission-critical nature of automating network management tasks, during both routine operations as well as during an unplanned event.

Another consideration for DCI-based business continuity plans is the need for sufficient bandwidth and response time in WAN connections to ensure minimum latency and jitter. Actions such as disk writes to storage in a distant data center are very sensitive to latency. Be sure to work closely with your network and storage vendors to ensure that the WAN you build provides the necessary network capabilities for your specific DCI implementation and meets performance requirements.

Real-World Business Continuity Challenges

Here's how companies fared as a result of recent man-made and natural disasters:

- **Hurricane Sandy:** The "superstorm" affected 24 states on the eastern seaboard of the U.S. in October 2012. Hardest hit was the New York and New Jersey area, home to some of the most densely populated IT facilities in the world. As power was knocked out and flooding hit the New York area, thousands of companies and millions of people were adversely affected by service outages. Companies that had tested business continuity plans in place weathered the storm with a minimum of disruption to their business. However, companies without a viable business continuity plan suffered tremendous loss of business revenue — total economic losses caused by Hurricane Sandy are estimated at around $72 billion — and customer goodwill in the weeks following the storm surge.[1]
- **RIM BlackBerry Global Service Outage:** The first of several major interruptions to RIM's global BlackBerry services occurred in October 2011. The outage — which lasted for almost an entire workweek — was reportedly caused by an isolated internal hardware failure. The situation cascaded as RIM's failover to redundant and disaster recovery systems also faced operational issues.[2]

[1] "$72 billion in total economic loss from Hurricane Sandy: Aon Benfield," CanadianUnderwriter.ca, May 14, 2013

[2] "With Apologies, Officials Say BlackBerry Service Is Restored," *The New York Times*, Oct. 13, 2011

The outage occurred at a critically competitive moment for RIM, and the company continues to lose customers to other mobile providers. In this case, the failure of RIM's business continuity plan contributed to a significant reduction of public trust in its services and was a major blow to the company. In June 2012, RIM reported revenue of $2.8 billion for the first quarter of 2013, a 33% decline from the previous quarter and a 43% drop from its first fiscal quarter 2012.[3]

- **Japanese Tsunami:** The earthquake and accompanying tsunami that hit the northeast shore of Japan in March 2011 was a catastrophe for humans as well as businesses located in that region. But the ramifications of the disaster reverberated in Tokyo and around the world. The poster child for poor disaster planning highlighted by the tsunami was the TEPCO-owned Fukushima Daiichi Nuclear Power Plant. Though located in a well-known earthquake zone, the power plant placed its backup power generators in the basement of the facility and installed the diesel fuel tanks for those generators above ground. The tsunami flooded the generators and swept away most of the diesel fuel tanks, leaving the plant without power to cool its reactors. The resulting near-meltdown caused a second radioactive disaster in the region that will take decades to clean up. TEPCO continues to struggle financially as a result of lawsuits and clean-up costs. What started as a natural disaster also turned into a business disaster for TEPCO.

Making the Business Case: BC Plans Must Support the Business

As shown in the examples above, the case for a comprehensive business continuity plan is that the business may fail without one. Can your company afford to operate, sell widgets and make money without one — or perhaps all — of its key IT systems working? Most companies cannot. Utilizing the opportunity provided by re-engineering the WAN infrastructure, your company can design and implement a robust business continuity plan utilizing standards-based DCI as the transport mechanism to make it all work. Your competitors likely have a business continuity plan in place that will allow them to continue to operate in the face of a disaster. Can your company afford to not have the same plans in place?

Virtual Private LAN Service: Standards-Based DCI

Virtual private LAN service (VPLS) enables fast, reliable, high-capacity and highly scalable data center interconnection. VPLS is a virtual private network technology that enables the connection of multiple sites in a single bridged domain over an IP or Multiprotocol Label Switching (MPLS) network.

[3] "RIM CEO Apologizes For Yet Another Outage, Up To 4.7M BlackBerry Users Affected," TechCrunch, Sept. 21, 2012

VPLS presents an Ethernet interface (or interfaces, for greater capacity and resiliency) to multiple data centers, which removes the LAN/WAN boundary and results in the virtual extension of one or more virtual LANs, allowing for rapid and flexible service provisioning. VPLS enables multiple data centers to be seamlessly interconnected to provide applications and data mobility between physical sites.

By virtualizing the network path with VPLS, customers can collapse the number of physical links among data centers and replace them with virtual circuits. This reduces operating expenses while maintaining compliance.

Taking advantage of MPLS capabilities, enterprises can implement traffic engineering, sub-second failovers and end-to-end quality of service to ensure that their key business applications are appropriately prioritized and protected against disruptions with built-in network resiliency and fault containment.

Juniper Networks' MX Series routers support VPLS data center interconnection over both IP and MPLS networks. The company's heritage is providing flexible, high-performance, carrier-class connectivity solutions that are easy to deploy and operate. The unique architecture of the MX Series easily scales from the low end to the highest capacity on the market today, providing leading automation and network programmability capabilities upon which enterprises can innovate.

For more information, please visit www.juniper.net/datacenter.