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Forked Ring Downs

Business Continuity Planning is near the top of every telecom and IT manager's list of concerns. There are numerous ways to implement solutions that protect the trading floor environment, but some of those options can be cumbersome to implement and manage. Carrier re-direct options within the POP are very useful, but circuit lists are often hard to keep updated and system wide testing can only be done outside of normal trading hours. New technologies such as forked ring downs can solve some of these problems and offer trading floor environments the resilient voice communications solutions that they need, regardless of the size of the firm.

In the past, one of the best ways to backup trader voice lines was to implement some sort of re-direct system. In this scenario, the carrier installs T1/T3 facilities to a primary site and to a backup site. ARDs, MRDs, etc. are delivered over the T1/T3 facility going into the primary site. In the event of a trading floor disruption, the trader voice lines can be re-directed off of the primary T1/T3 facilities onto the backup T1/T3 facilities. Once the primary trading floor is restored, the trader voice lines can be directed back along the primary path.

This solution does work. It can be tested on a quarterly basis to ensure the viability of the system and to ensure it meets the needs of the customer. However, it can be cumbersome to manage. In many cases,



only the high priority trader voice lines will be routed to the backup site. In the case where the customer has hundreds or thousands of lines, the simple determination of which lines should be re-routed can be an overwhelming task. With an ever-changing list, it is nearly impossible to make sure that the carrier has an up-to-date listing of circuits that need to be re-routed. Verification of the accuracy of the new mapping is even more worrisome because the backup is rarely, if ever, used. There is no simple and efficient way to test each trader voice line and to truly verify that each and every distant end location is correct. This is because most BCP testing is done after business hours or over a weekend when there is no one to answer the call at the distant end allowing for true verification that all lines are mapped correctly.

Forked ring downs offer the trading floor

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The Network Dilemma - So Many Choices

How do you Select the Right One?

Network needs have grown and changed dramatically over the last several years. The complexity of software applications now requires greater bandwidth to satisfy the increase in application and data size. Corporations are continually adding remote offices to better serve their clientele, but in so doing, increasing their need for solutions to handle the voice and data needs of those remote sites. Telecommuting from home has enabled companies to increase worker productivity and decrease other overhead expenses, but has also added to the challenges that the IT department faces in ensuring that all the tools of the trade are at the disposal of the worker at home. The networking options that are available to solve the IT needs of a company seem to be as numerous as the number of companies themselves.

So how do you determine the best solution for your environment? Do traditional point-to-point private lines meet all of your requirements? Or should you be looking into IP solutions such as MPLS, Ethernet, forked ring downs, or VOIP applications? Can you take advantage of these technologies in your network today? How do you know it is safe to use them? How do you integrate the new technology with your existing technology so that you don't have to phase out perfectly good equipment? These are common questions that telecommunications professionals face every day. IP technologies have matured beyond the "bleeding edge technology" phase into standards based technologies with numerous best practice implementation policies. This does not, by definition, mean that all

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Forked Ring Downs...

environment a new option that will solve some of these problems. Forked ring downs simultaneously deliver a call to multiple locations. In this scenario the customer has T1/T3 facilities installed from American Telesis to both their primary and backup sites. The customer then decides which trader voice lines are critical and notifies American Telesis. Those lines are then setup within the American Telesis network to be forked between both the primary and backup sites. When the distant end goes off-hook – the line rings at both the primary site and the backup site at the same time. The first to answer the line owns the call until both sides go back off-hook.

The customer is no longer forced to test or use the backup lines only in limited testing windows or under the worst-case scenario when the primary trading floor is unusable. Instead, verification of the usable lines can happen at any time. In fact, the backup trading floor can be a live trading floor, allowing the customer to split the traders/brokers between the two sites at any time. This not only presents a stronger trader voice line

backup option, but also allows the customer to productively use the backup site, gaining more return on their investment in the technology needed to run that backup site.

The American Telesis forked ring down application does not require additional equipment at the customer site. The T1/T3 facilities coming into the customer site can still terminate into a channel bank, a DLIC card or even a customer owned DACS. The forking is done within the American Telesis private network. This allows for a simpler design in the initial phase of deployment. In the future, American Telesis will provide an option that does require the installation of a router at the customer site. This will further enable the IP capabilities of the product. In particular, it will allow for more circuits to be put on a single T1, which will amount to cost savings into the customer backup sites.

American Telesis is excited about broadening our resiliency options for our customers. We know that telecommunications needs of the customer are not a one-size fits all scenario. We look forward to working with you to create a solution that meets your needs.

Case Study No. 1 Ethernet Private Line Solution replaces Frame Relay

Customer statistics:

- Healthcare industry
- Eight remote sites all needing connectivity back to a host site
- Host site is currently the central repository of data
- The sites are all within a 100-mile radius of each other
- The patient data being shared is highly sensitive and security is of utmost importance
- Uptime is critical from 8am to 6pm
- Customer currently is using frame relay with PVCs from remote sites pointing at the host site. The remote sites run at speeds of 256K.
- Customer has IT staff at the host site that must maintain the remote sites. There is no permanent IT staff at the remote sites.
- Customer budget is limited. They will not be able to add IT staff to support network applications.
- Customer needs to add additional data applications that are run over the new network

How did we arrive at the end proposal?

We looked at the advantages and disadvantages of different network types and compared them to the needs of this customer. The list looked something like this:

Frame Relay Advantages

- Customer can reuse the routers that are in place at the remote sites.
- Customer is familiar with the technology.
- Customer will not have to pay for overlapping networks. Upgrades to the existing frame network should make billing simple.

Frame Relay Disadvantages

- Cost for the overall network increases dramatically when trying to achieve full T1 Port and CIR rates for each site.
- Additional equipment must be purchased for the host site to handle the additional bandwidth coming in.
- There is a single point of failure at the host. If primary access into host site goes down, all sites lose connectivity.

MPLS Advantages

- Customer will likely be able to reuse their existing routers.
- MPLS will allow any site to communicate directly with any other site.

MPLS Disadvantages

- MPLS port and loop rates were higher than expected. Had the network been more geographically diverse, this factor

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Network Dilemma...

of these technologies will work in your environment. However, with a complete network review and detailed network design, you will find that these technologies can be added to your infrastructure in a manner that is effective in upgrading your features and capabilities while at the same time maintaining a secure environment.

Each technology has its place depending on the unique business requirements. MPLS is a newer technology that can allow for tremendous growth and efficient use of network bandwidth. Ethernet solutions provide an environment where IT personnel feel comfortable. To help understand the numerous options, we have included a few case studies to show which network solution worked and how the client, their equipment vendor and the network provider came to that decision.

Case Study No. 2 MPLS Solution replaces existing Private Line Network

Customer statistics:

- Fortune 100 Company
- 20 domestic sites and 1 international site
- Domestic sites exist throughout the country
- 4 server locations – not one single host
- Data traffic 24 hours a day
- Current network configuration is a managed T1 network. They are looking for speed increases ranging from 6Mb to 45Mb each.
- The current network is far too slow. Customer is sending huge files between sites and downloads are taking as much as 15 hours to complete.

How did we arrive at the end proposal?

Again, we first looked at the advantages and disadvantages of different network types and compared them to the needs of this customer. The list looked something like this:

Frame Relay Advantages

- Can accommodate diverse geographic locations.
- Can be fully meshed so that all sites can talk to all other sites.

Frame Relay Disadvantages

- Monthly pricing is very high when delivering 6Mb, 12Mb or 45Mb pipes to each site.
- The equipment necessary to handle the multi-megabit pipes is cumbersome to manage.

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Case Study # 1...

would have been less noticeable, but for sites that were all close together, and yet some distance from the closest POP, the pricing was out of line.

- The host site required considerably greater bandwidth than a T1 in order to guarantee that the host would not be over-utilized. This again drove cost up.
- MPLS requires greater IT overhead to manage all of the routers at each site. The customer was looking to decrease the IT burden, not increase it. This obstacle can be easily dealt with by offering a fully managed network solution.

Internet VPN Advantages

- The pricing to deliver dedicated Internet T1s to each site was competitive.

Internet VPN Disadvantages

- Security concerns. While proper configuration with firewalls, routers and encryption might meet security requirements, this requires tremendous IT overhead.

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Case Study # 2...

MPLS Advantages

- The fully meshed environment allows all sites to send to all other sites as needed. This accommodates the multiple server sites easily, and allows the four server sites to share information easily.
- The equipment/routers necessary to handle the 6Mb, 12Mb or 45Mb speeds at each site are readily available and can easily fit into a managed service environment that the customer is accustomed to.
- Utilization reports on the overall network can be made available to the customer in real time so that bottlenecks can be spotted quickly and adjustments can be made.
- Additional network growth is easily accommodated. If a site needs to increase from 6Mb to 12Mb, or if a new site needs to be added in another region, MPLS allows for these upgrades with no interruption to the existing network.
- The backbone is a private network.

MPLS Disadvantages

- There is the potential to send more data to one site than it can handle at that moment. However, in a careful study of the customer's current traffic patterns, they feel that this potential problem can be avoided.

Internet VPN Advantages

- A fully meshed environment allows all sites to send to all other sites as needed.

- Potential speed issues because traffic would run over the Internet.

Private Line Advantages

- Full T1 pipes from host to each remote provide the bandwidth the customer needs without any bottleneck at the host.
- A pricing promotion in that geographic area made the network pricing very attractive.
- No single point of failure.
- Excellent Service Level Agreements (SLAs) are available for private line.

Private Line Disadvantages

- Routers with CSU/DSUs are still required at each site. To decrease IT overhead, the network needs to be in a fully managed environment, adding to the monthly costs.

Ethernet Private Line Advantages

- Full T1 pipes from host to each remote provide the bandwidth the customer needs without any bottleneck at the host.
- A pricing promotion in that geographic area made the network pricing very attractive.
- No single point of failure.
- No need for routers at all remote sites,

This accommodates the multiple server sites easily. This also allows the four server sites to share information easily.

- Utilization reports on the overall network can be made available to the customer in real time.
- The equipment/routers necessary to handle the 6Mb, 12Mb or 45Mb speeds at each site are readily available and can easily fit into a managed service environment that the customer is accustomed to.
- Additional network growth is easily accommodated. If a site needs to increase from 6Mb to 12Mb, or if a new site needs to be added in another region, MPLS allows for these upgrades with no interruption to the existing network.

Internet VPN Disadvantages

- Traffic is sent over the public Internet infrastructure. The file sizes being sent out by the customer are very large. Using the Internet dramatically increases the potential for added latency in the network. The customer cannot be guaranteed that file transfer speeds will always be as fast as they would like.

Private Line Advantages

- Excellent Service Level Agreements (SLAs) are available for private line, guaranteeing the customer the speed increases they need.
- American Telesis can provide the managed network service options that the customer is requesting.

which allows the customer to reduce IT overhead.

- Ethernet conversion boxes at each site allow American Telesis another means to test and manage the network with very minimal monthly costs in the network.
- Ethernet allowed customer to use a simple IP scheme so that all sites can easily communicate with all of the other sites without additional burden at the host site.
- Excellent Service Level Agreements (SLAs) are available for private line.

When we compared all the options, Ethernet Private Line gave the customer the most bang for their buck with the fewest concerns. The new Ethernet Private Line network provided 6 times the bandwidth (256Kb*6 = 1,544Kb) into each site with excellent SLAs, no single point of failure and for the same price they were paying for their existing frame relay network. The one concern the customer had, in moving from their existing frame network to a new Ethernet Private Line network from American Telesis, was the potential for duplicate billing on two networks while the transition was completed. American Telesis was able to work with the customer to mitigate this concern.

Private Line Disadvantages

- The customer requires large bandwidth into four server sites, not just one server site, adding to the number of private lines necessary to support the network architecture and thus driving up the costs of the network.

Ethernet Private Line Advantages

- Excellent Service Level Agreements (SLAs) are available for Ethernet Private Line, guaranteeing the customer the speed increases they require.
- Offering Ethernet hand-offs at each site reduces the customer equipment costs.
- American Telesis can provide the managed network service options that the customer is requesting.

Ethernet Private Line Disadvantages

- The customer requires large bandwidth into four server sites, not just one server site, adding to the number of private lines necessary to support the network architecture and thus driving up the costs of the network.

When we compared all of the options, MPLS fit the customer environment most closely. The new MPLS network provided from 4 to 28 times the bandwidth into each site and accommodated the requirement for many sites to communicate with many other sites. MPLS also allowed the customer to easily make adjustments to their network as needs at each site changed.

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Case Study No. 3 New Private Line Network Implementation

Customer statistics:

- Financial Markets
- Fortune 500 Company
- 25 domestic sites
- The 25 sites are spread throughout the northeast
- 2 primary locations feed data to 23 remote sites
- Traffic is very latency sensitive
- Redundancy into each remote site is critical – each remote site needs 1.5Mb of traffic from each host site.

Frame Relay Advantages

- The long haul portions of the network would be protected in the frame environment, maximizing uptime for the customer.

Frame Relay Disadvantages

- Frame relay was not built for latency sensitive applications; but for intermittent bursty traffic.
- Frame implementation at the speeds required is expensive.

MPLS Advantages

- The ability to redirect traffic delivery from one primary location to the other primary location in the event of a failure.
- The ability to easily add new remote sites.

MPLS Disadvantages

- The overhead necessary to make the routing work in an MPLS network will slow the traffic down a little bit. This creates latency concerns for the customer.

Internet VPN

- Latency and security concerns rule out Internet-based solutions as an option.

Private Line Advantages

- Excellent environment for latency sensitive data – strong SLAs to meet the customer needs.
- The ability to control multiple local access vendors and IXC routes provides customer with the diversity in paths that they require.
- Private line pricing has come down dramatically in the past few years and the network pricing is very competitive.

Private Line Disadvantages

- Requirement of CSU/DSU and router on each endpoint. While this is often a disadvantage, for this customer it gives them the tools to monitor, manage and test the network in the way they would like.

Ethernet Private Line Advantages

- Excellent environment for latency sensitive data – strong SLAs to meet the customer needs.
- The ability to control multiple local access vendors and IXC routes provides customer with the diversity in paths that they require.
- Private line pricing (the backbone for our Ethernet Private Line option) has come down dramatically in the past few years and the network pricing is very cost competitive.
- Reduced equipment expenditure at remote

sites because the Ethernet can connect directly to the Local Area Network (LAN) at each remote.

Ethernet Private Line Disadvantages

- Customer requires extra monitoring and testing capabilities at each remote site to watch for any latency issues or errors in the circuits. They would need to put routers into each remote, regardless of the handoff at the customer, so the addition of a conversion box at the remote sites is simply an extra piece of equipment to manage.

In this case, the traditional private line network works most efficiently for the customer. The ability to select multiple IXC routes, the availability of multiple local vendors, and the existence of SLA guarantees afforded a private line SONET backbone to best meet the customer's needs.



Events

SIFMA Technology Management Conference
June 19-21, The Hilton New York, Booth #1427

WSTA Summer Magic, July 19
The Lighthouse at Chelsea Piers,
Pier 61, New York

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