



Customer Case Study

Energy Company Enhances Business Continuity with Satellite Links

Following the 2005 hurricane season, Valero Energy deployed a layered business continuity plan that will enable it to preserve vital communications, even in the face of disaster.

EXECUTIVE SUMMARY	
VALERO ENERGY CORPORATION	<ul style="list-style-type: none"> • Energy • San Antonio, Texas, United States
BUSINESS CHALLENGE	<ul style="list-style-type: none"> • Enhance the company’s business continuity strategy to help ensure that refinery communications remain operational during service disruptions or disasters
NETWORK SOLUTION	<ul style="list-style-type: none"> • Cisco Integrated Services Routers with Cisco Satellite WAN module deliver automatic failover capabilities in the event of an emergency or disaster that interrupts communications
BUSINESS RESULTS	<ul style="list-style-type: none"> • Deployed robust, layered failover strategy that enables communication continuity over satellite links • Improved WAN diversity in comparison with terrestrial WAN backup options such as dial-up and ISDN access • Improves business continuity and facilitates disaster recovery

BUSINESS CHALLENGE

The largest refiner in North America, Valero Energy Corporation is a Fortune 500 company based in San Antonio, Texas, with approximately 22,000 employees and assets valued at \$33 billion. Valero’s extensive refining system includes 18 plants with a throughput capacity of approximately 3.3 million barrels per day. In addition to its refining assets, Valero has approximately 5000 retail and branded wholesale locations in the United States, Canada, and the Caribbean.

Because the refineries operate around the clock, their communication network connectivity is paramount. In the past, each refinery was connected to corporate headquarters with point-to-point or Frame Relay T1 links. In 2005, Valero was planning to add redundant links to each refinery when hurricanes Katrina and Rita hit the U.S. Gulf Coast.

Hurricane Katrina destroyed a Verizon point-of-presence that provided long-distance and WAN connectivity services to two Valero refineries in Louisiana, and hurricane Rita significantly damaged another refinery a month later, disabling communications. Immediately following the hurricanes, Valero set up temporary satellite-based communications between the refineries and headquarters, but it took several weeks before normal communications were restored.

“Katrina and Rita added another dimension to our planning,” says Stewart Ogier, senior IS manager for Valero’s data network services. “Our original plan was to add additional vendor diverse T1 links to reduce downtime due to service provider fiber cuts. Post-Katrina, our plan changed to deploy three independent forms of connectivity to each refinery—T1, cable, and satellite.”

Valero already had a relationship with Spacenet, a provider of managed network satellite services, and relied on Spacenet for transporting proprietary credit transactions from Valero wholesale stores. Spacenet was also working with Cisco Systems® on a Very Small Aperture Terminal (VSAT) satellite integration module for Cisco® routers.

“To provide connectivity and additional business continuity capabilities to our refineries, we liked the concept of integrating broadband satellite connectivity with our routers,” says Ogier. “We chose Cisco 3845 Integrated Services Routers with the Cisco Satellite WAN module, which would enable us to control WAN traffic and failover in the event of a business disruption.”

NETWORK SOLUTION

Valero is completing implementation of its refinery WAN using Cisco 3845 Integrated Services Routers with the Cisco Satellite WAN module. During normal operations, the Cisco Integrated Services Routers carry business-critical data traffic between each refinery and San Antonio headquarters, including e-mail, SAP, and Internet applications. Voice calls are also carried over the WAN, using Cisco voice over IP (VoIP) technology, which includes a unique dedicated access scheme for voice traffic. This technology enables Valero to route voice calls from its Private Branch Exchange (PBX) systems over the IP network and achieve improved voice quality over high-latency satellite links. In the event of an emergency or disaster, the Cisco Satellite WAN module provides sophisticated failover and traffic prioritization capabilities, enabling Valero to preserve traffic transport of the most essential applications and continue vital business functions.

In a separate deployment, Valero also chose Cisco 2801 Integrated Services Routers for deployment at its nearly 1000 company-operated retail locations. The new Integrated Services Routers provide high performance for concurrent applications, such as data, voice, and security. Each company-operated retail location transfers credit transactions, fuel volume data, sales and inventory data, and time card data over the WAN. Employees also have access to a wide range of intranet applications over the network. In addition, the Cisco Integrated Services Routers deliver VoIP capabilities to each retail location, reducing the company's long-distance charges.

“Now our refinery routers can automatically route services during failover, and when those services return, automatically return to normal routing operations. We can retain the most critical communication services, such as e-mail and some VoIP services, during an emergency to facilitate continuity and recovery.”

—Stewart Ogier, Senior IS Manager for Valero's Data Network Services

BUSINESS RESULTS

“Now our refinery routers can automatically route services during failover, and when those services return, automatically return to normal routing operations,” says Ogier. “We can retain the most critical communication services, such as e-mail and some VoIP services, during an emergency to facilitate continuity and recovery.”

The Cisco Satellite WAN module also provides high visibility into traffic being routed over a network link or satellite connection. Ogier's team can see how much traffic is traveling over satellite, check signal strength, and monitor delay. Statistics generated by the router help staff diagnose application performance problems, interpret high traffic volumes, and troubleshoot configurations. The combined Integrated Services Router with Cisco Satellite WAN module enables fast time to resolution for application performance issues over the satellite link.

PRODUCT LIST

- Cisco 3845 Integrated Services Routers with Cisco Satellite WAN module
- Cisco 2801 Integrated Services Routers with VoIP capabilities
- Cisco 7200 Series Routers
- Cisco Catalyst 6500 Series Switches

“I was impressed with the functionality, ease of programming, and security features of the satellite module,” says Joseph Mlodzianowski, lead technical specialist for Valero. “I like the fact that they are password protected and I like the added visibility that they provide. If you are in the middle of recovering, it is much easier to identify what is not working and what needs to be done. These modules give us greater control over how we manage the failover process.”

Hopefully Valero will not experience devastating hurricanes again soon, but if any emergency occurs that could affect refinery operations, the company is prepared.

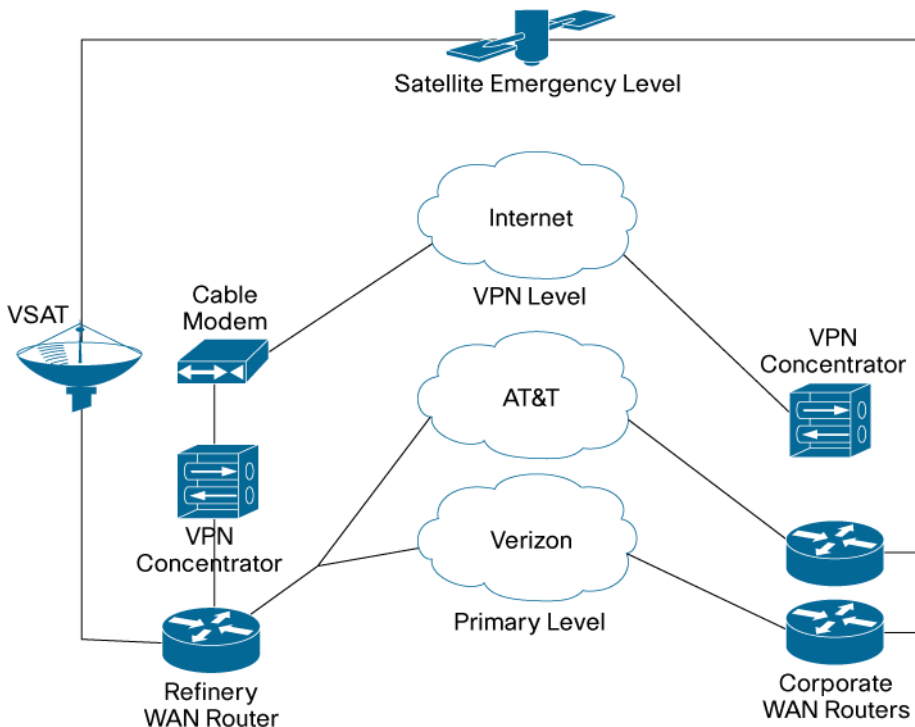
As long as there is power or a generator, there will be a path for vital communications.

NEXT STEPS

Valero is continuing to deploy Cisco Integrated Services Routers at its retail locations and will complete deployment at its refineries by mid 2006.

“Our refineries are our primary revenue source, so we cannot afford to take any chances,” says Ogier. “With multiple types of connectivity media, we’re confident that communications can be maintained at all times.”

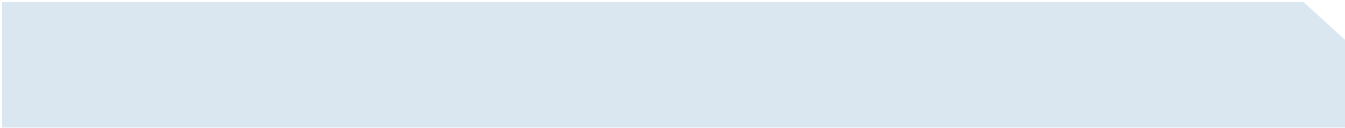
TECHNICAL IMPLEMENTATION



The new Valero refinery WAN is deployed with three levels of transport for each refinery. The first level is comprised of two T1 circuits—each one provided by a different carrier’s managed Multiprotocol Label Switching (MPLS) managed service. The MPLS service provides improved network stability through its mesh architecture, and simultaneously allows refineries to communicate directly without having to backhaul network traffic through San Antonio headquarters.

The second level of transport is based on cable access. Cable infrastructures operate independently of each area’s telecommunication infrastructure, and immediately following Katrina and Rita, Mlodzianowski observed instances in which local cable infrastructures continued to function even though the telecommunications infrastructure had been destroyed. The third level—or disaster recovery level—is based on Cisco 3845 Integrated Services Routers with Cisco Satellite WAN modules and Spacenet’s satellite backup service. Each refinery deploys two Cisco 3845 Integrated Services Routers—one is operational and the other is used as a cold standby, adding another layer of redundancy if the first router fails.

In the event of a disaster, each transport level will fail over to the next. For example, during normal operations, each Cisco 3845 Integrated Services Router is configured using Border Gateway protocol for load sharing between the two different carrier-managed services. If one carrier fails, traffic is automatically routed over the remaining service. If the second service fails, all traffic fails over to the cable modem. While application performance may be reduced, users still have the complete range of applications that they normally use. If broadband transport fails, the routers send traffic from selected applications over the satellite link. According to Mlodzianowski, Valero has configured the failover parameters on each of the 3845 routers to handle many of the potential service interruption issues. By the use



of object tracking, access control lists, QoS, route-map statements, GRE VPN tunnels over IPSec, Valero can automatically fail over and prioritize which types of traffic will be allowed during each type of media failure.

“We learned during Katrina and Rita that the best results were derived from limited traffic over the satellite link,” says Mlodzianowski. “In an emergency situation, we found that e-mail was the most important application for our users.”

All three connections from the refineries are aggregated at headquarters using Cisco 7206 Routers with NPE-G1, which provide WAN services aggregation with the industry’s widest range of connectivity options, high scalability, and support for integrated services such as advanced quality of service and security.

For the company-operated retail locations, Valero deployed Cisco 2801 Integrated Services Routers with the Cisco IOS® Software Firewall Feature Set, which allows a separate logical network that is firewalled from the corporate network. These locations are connected to headquarters using a fractional Frame Relay link. The corporate core network operates using redundant Cisco Catalyst® 6513 Switches with redundant Supervisor Engine 720 “running in high availability mode” using HSRP. “The features and ability of the Cisco Network Analysis Modules in two cores make monitoring, capturing, managing traffic and baselines a real necessity,” says Mlodzianowski. “We also use the Cisco Intrusion Detection System module to provide integrated multivector threat identification and prevention capabilities to further enhance business continuity.”

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To learn more about Valero Energy Corporation, visit: <http://www.valero.com>

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