Case Study – Green Technology Company
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1 Executive Summary

This case study is about a Green Technology company that has been a Stratogent customer for 5 years. Stratogent started the engagement with this customer by managing 4 servers that were located in a server room in the company’s offices in the San Francisco Bay Area. These servers were Dell Power Edge 2950s and hosted applications like Microsoft Exchange 2007, Active Directory 2003, Blackberry Enterprise Server, and File Server.

Over the course of a several years, Stratogent designed, implemented and continued to maintain the IT footprint of this company which grew to about 17 physical Dell servers, 50 virtual machines, redundant pairs of firewalls and switches, NetApp storage array and tape backup devices – most of them hosted in a SSAE16 certified colocation facility and completely managed by Stratogent.

Stratogent manages the entirety of this companies networking equipment, which is comprised of Cisco devices (a redundant pair of Cisco 5520 ASA, Cisco 3750, and 2960S catalyst switches). The Dell servers are a mix of different models: PowerEdge 2950, PowerEdge R710, and PowerEdge R715. The virtualization product used is VMware vSphere 4. The virtual machines are centrally managed in a highly available design using vCenter.

2 Customer Description

This customer is the leading global provider of electric car networks that enables the mass market adoption of electric cars through an innovative battery switch model that makes driving electric cars more affordable, convenient, and sustainable than today's petrol-based cars. This company owns and operates a network of battery switch stations and public/personal charge spots; along with the supply of batteries that power the cars, to provide drivers with instant range extension and the convenience to drive, switch, and go across an entire region. Where possible, this company uses renewable sources of energy to deliver fully zero emissions driving. This customer has users all over the globe: San Francisco Bay Area, Israel, Denmark, Australia, and Japan.

At the start of Stratogent’s engagement with this company, there were 4 servers that were located in their local offices. As the company grew, they were able to leverage Stratogent’s services to design, implement, and manage an IT footprint that included 17 physical servers and about 50 virtual machines.

Stratogent initially managed and stabilized the availability of the servers located in the company’s SF Bay Area headquarters. These servers were then seamlessly migrated to a colocation facility. As per design and to provide the best accessibility for users, Stratogent managed redundant domain controllers, file servers and backup infrastructure that were hosted in the company’s local headquarters. All new servers and projects were hosted at the colocation facility. As the company grew, Stratogent was able to aid in new infrastructure additions such as storage arrays, a redundant network, and a highly available messaging service.

After Stratogent’s successful performance in WAN management that included the company headquarters and the colocation facility, they engaged in managing the WAN and the perimeter firewalls of additional company offices in Denmark and Australia.
3 The Challenge

As typical of a startup, the company's Microsoft Exchange 2007 server was hosted on a single server with no options for high availability. The local office had intermittent power outages that caused mail outages for the entire company. The first challenge was to stabilize the mail system. The solution had to be one that would cause the least amount of downtime to users. Next, the mail system needed to be fortified with high availability and disaster recovery options.

This company has global offices in North America, Europe, Asia, and Australia. It was a challenge to find a maintenance window to patch and update the servers due to varying time zones. However, as Stratogent offers 24x7 support for the entire infrastructure managed, we were able to find a monthly maintenance window that would not affect any users in any of the international office locations. The client environment for this company included both Windows and Macintosh operating systems. This meant that every solution and all updates for these operating systems had to be tested for compatibility.

4 Possible Solutions

Some of the solutions considered by the customer were:
1. In-house IT team – Management overheads, expensive
2. Google Apps platform – Lack of integration with ERP systems, expensive to scale
3. Hosted Exchange – Offered services related to the mail system only
4. Stratogent – Breadth of services, larger pool of skill sets, 24x7 support

5 The Solution

Once it was clear that the solution to the problem hinged on the professional implementation of Microsoft Exchange 2007, the customer chose Stratogent due to the breadth of services offered. Stratogent was able to address this issue immediately by building a new Exchange server in a colocation facility and migrating users to this new Exchange server. Each user was migrated at a time of their choosing, as one of the primary goals was to minimize downtown for all users. After the mail system availability was stabilized, Stratogent designed and implemented a highly available Exchange environment which also included an upgrade to Microsoft Exchange 2010. This project is detailed in section 10 of this document.

6 Why Stratogent

This company chose Stratogent over a number of other vendors with proposals for managing their IT Infrastructure. Some of the reasons are:
1. This customer was looking for a Managed Services Provider that offered a large selection of services; not just Exchange or a mail system. Stratogent’s breadth of services stood out from rest of the competition.
2. Once the infrastructure in their local offices was stable, Stratogent’s plan included migrating their infrastructure into a SSAE16 certified colocation facility.
3. Stratogent was competent enough to manage the migration seamlessly from end-to-end, with no disruption to the users.
4. 24x7 support – In conjunction with a local presence, Stratogent teams in other global locations could ensure 24x7 support for this company’s IT infrastructure. Being a company with global offices, this played a major role in the vetting of a Managed Service Provider.

7 Relationship Timeline

Year 1
Start of engagement—Stabilized infrastructure at HQ
Moved critical infrastructure to colocation
New Exchange server and user migrations
WAN setup and management of Australian offices
Office communications server implementation
WAN management of Denmark offices
Creation of R&D server environment at colocation
Migration from Stratogent’s shared firewall to customer’s dedicated firewall at colocation

Year 2
SharePoint POC
Exchange re-design for high availability and disaster recovery
BES version upgrade
Network infrastructure redundancy

Year 3
Creation of solution environment at colocation
Firewall redundancy at Denmark location
Active Directory upgrade

8 Ongoing Services

Listed below are some of the services Stratogent provides for this customer:
• Hosting
• Equipment Rental
• Monitoring Operations
• Backup Operations
• Periodic Patching
• Hardware Administration
• System Administration
• Virtualization Administration
• Directory Administration
• Network Administration
• Security Administration
• Storage Administration
• Database Administration
• Exchange Administration
• Backup and Monitoring Station Administration
Stratogent continues to provide 24 x 7 IT infrastructure support for this company and looks forward to implementing the projects that this company has in the pipeline.

The breadth of services we offer to this customer is depicted in the diagram below.
9 System Diagram

WAN Architecture

WAN

- SF Bay Area HQ
- US Data Center
- Australia Office
- Denmark Office
- Remote Users: US, Japan, Australia, DK
- Remote Users: Israel, DK, Europe
- Israel Office

Site 2 Site VPN
Client 2 site VPN
Server Layout

SF Bay Area Office

- Local AD, DNS (batterplace.local)
- Dell 2950, W2k3 R2 Std Terminal Server
- Dell N500, W2k3 Storage Server
- Dell 2950, W2k3 R2 Std AD & DNS
- HP DL385 E5M6
- Demo App

Colocation facility

- Dell 2950, Win 2008 Std Sharepoint
- Dell 2950, Windows 2003 R2 Std 64b AD, DNS, BackupExec, SMTP, Certificate Authority
- Dell 2950, OCS
- Dell R710, Windows 2008 R2 Std 64b Exchange 2007

VirtWare Virtualized Servers
10 Project Example: Microsoft Exchange Implementation

Highly Available and Scalable Exchange Environment

Within the colocation facility, the companies architecture consisted of a pair of Exchange clustered mailbox servers. Each cluster mailbox server was designed to house up to 2,000 users. Two servers with client access and hub transport roles were required for redundancy and load balancing for requests from end users. These requests could be HTTPS, IMAP4, and any other protocol depending on business needs. The client access services were configured using Microsoft’s network load balance (NLB) to distribute these requests over SSL between the two CAS servers. The Hub Transport servers were fronted with a virtual IP address that allowed a spam filtration system, such as Postini, to deliver messages.

- Exchange mailbox server clusters are configured as follows:
  - 1 active/1 passive nodes

- Client Access Server and Hub Transport roles coexists on each load balanced server = 2 CAS/HTs

- Client Access Servers and Hub Transport servers have redundant nodes which also load balances incoming traffic

- One database is used for public folders

- Databases are created as needed in order to maintain an average of 100GB per database

- Logs are stored on LUNs that do not contain databases

EXCHANGE DESIGN AT THE COLOCATION FACILITY
HA and Scalability of Access
This means that the access paths via OWA, mobile, IMAP, etc. does not suffer from downtime due to the failure of one CAS server. Also, the design is easily extended to scale up for more end users by adding more CAS servers.

HA and Scalability of Mailboxes
This means that the user’s data (mailbox) does not suffer from downtime due to the failure of one physical server. Exchange mailbox clusters provide high levels of availability so that messaging will still function in the event of a failure on one of the Exchange servers. This design employs a pair of servers in clustered configuration (using continuous cluster replication (CCR) for Exchange 2007 or DAG for Exchange 2010). Also, the design is easily extended to scale up to more end users by adding more pairs of clustered mailbox servers.

Ability to Work Without Shared Storage
The clustering and replication technique that is proposed does not have a hard dependency on shared storage (SAN). However, a SAN is highly recommended for the Exchange architecture.

Forward Compatibility with Disaster Recovery Strategy
The proposed design allows for the entire environment to be mirrored at a remote site. Should a new data center with sufficient bandwidth and acceptable network latency be brought online, the global Exchange setup gains disaster recovery capabilities by extending the replication to a remote site.

Accommodates Location Changes
This architecture is very tolerant to changes in the physical location of the Exchange server and can be easily migrated at any time.
Adding Redundancy and High Availability to Blackberry Enterprise Server and Office Communicator Server

This architecture can be leveraged to significantly improve not just Exchange, but also BlackBerry and OCS services. Similar to Microsoft Exchange, BlackBerry Enterprise Server, and Office Communicator Server can be made more robust and available. This calls for a backend SQL Server Cluster going to a shared storage. Given enough resources, BES and OCS services can be run on the same server. This design will reduce the number of servers required for the redundant setup at the colocation facility.