BUSINESS IMPACT STUDY

AIS

Building Mobile Services Leadership While Doubling Market Value

Symantec™

AIS · G·ABLE · MFEC Public Company Limited

Executive Summary

To manage fast growth, Thai mobile services provider AIS needed to enhance the performance and availability of critical applications, streamline data protection, and control costs and storage growth. The company deployed data center availability, storage management, archiving, and data protection solutions from Symantec with support from Symantec Partners G-ABLE Company Limited and MFEC Public Company Limited. Results include an improvement in systems availability from 98 percent to 99.5 percent, a 75 percent reduction in annual application maintenance downtime, a 30 percent reduction in backup staff overhead, and millions of dollars in realized and projected savings and cost avoidance.

ORGANIZATION PROFILE
Website: www.ais.co.th
Industry: Communications
Headquarters: Bangkok, Thailand
Employees: 9,000

Table 1

Business Impact Area	How It Was Done	Total Realized and Projected Business Value (All figures in USD)
Server hardware and maintenance savings	Server and maintenance costs avoided by using 5x 6+1 server clusters vs. 30x 1+1 clusters (leveraging Veritas Cluster Server); includes initial hardware costs avoided and does not include potential hardware refresh costs	**$5,625,000** in realized and projected cost avoidance, 2004 – 2013
Availability and downtime cost avoidance	Annual uptime increased from 98% to 99.5% (using Veritas Cluster Server and Veritas Storage Foundation)	**$540,000,000** in realized and projected downtime cost avoidance, 2004 – 2013
Backup productivity	30% improvement in backup staff productivity (by standardizing on NetBackup, freeing up several thousand hours/year for more valuable tasks)	**$340,000** of IT staff time available for more valuable tasks, 1996 – 2013
Microsoft Exchange storage savings	4 terabyte email store on Fibre Channel disk reduced to 2 terabytes (using Symantec Enterprise Vault); assumes a 50% growth rate	**$30,000** in Fibre Channel disk space reclaimed and avoided, 2011 – 2013
End user productivity gains	Estimated 10 minutes saved per user per week because Symantec Enterprise Vault reduces mailbox management time due to larger mailbox quotas, and enables users to retrieve archived messages without IT help	**$780,000** in realized and projected reclaimed productivity, 2011 – 2013
Green IT savings	25 UNIX-based servers avoided and their corresponding energy consumption (via Veritas Cluster Server N+1 technology), reducing usage from 104 kWh to 50 kWh for savings of 54 kWh per year	**$1,500,000** in energy costs avoided, 2004 – 2013

Right time, right place

The youth culture in Thailand is booming. Over half of Thailand's workforce is under 30, and 20 percent of the country's 67 million people are under 15. Conditions are ideal for rapid growth in the use of mobile communications and services.

One of the providers battling for that lucrative market is Bangkok-based AIS, an affiliate of Shin Corporation. Over the last 15 years, AIS has emerged as the mobile services leader, growing from a few hundred thousand subscribers to more than 32 million active users today. The company now holds more than a 54 percent share of market revenue and has more than doubled its stock price between 2006 and 2011, from 57 to 130.[2]

"G-ABLE and MFEC have worked with us since day one, when we migrated from the main frame to UNIX. Their support is a big success factor in our operations."

— Suphot Punnachaiya
Vice President of IT and Business Support Systems

"Regardless of our success, the competition remains fierce," says Suphot Punnachaiya, vice president of IT and Business Support Systems at AIS. "The marketplace is now saturated. As subscriber growth slows, increasing our revenue depends on being able to launch new services to our existing subscriber base and support them successfully."

Ensuring the dial tone

Launching new services quickly and keeping them reliable and available are key objectives for Punnachaiya and the rest of the 145-person IT team at AIS.

These challenges became most acute about 15 years ago: AIS had grown so fast that performance was degrading its critical billing, CRM, and enterprise application integration (EAI) systems. The applications were generating vast amounts of data, and the expense of storing and managing that data was escalating too quickly. Worst of all,

SOLUTIONS AT A GLANCE

Key Challenges
- Maximize availability
- Control storage growth and streamline management
- Improve application performance
- Increase the ability to scale cost-efficiently
- Enhance data protection
- Build customer trust

Symantec Products
- Veritas Storage Foundation™
- Veritas Storage Foundation™ Cluster File System
- Veritas Dynamic Multi-Pathing
- Veritas Storage Foundation™ for Oracle RAC
- Veritas™ Cluster Server
- Symantec NetBackup™
  – Shared Storage option
  – Microsoft Office SharePoint Server, Microsoft Exchange Server, and Oracle agents
- Symantec Enterprise Vault™ with
  – Microsoft Exchange Mailbox Archiving
- VeriSign™ Secure Sockets Layer (SSL) certificates
- VeriSign™ Managed Public Key Infrastructure (PKI) Service

Symantec Services
- Symantec Essential Support Services
- Symantec Education Services

Symantec Partners
- Gold Partner: G-ABLE Company Limited (www.g-able.com)
- Platinum Partner: MFEC Public Company Limited (www.mfec.co.th)

Technology Environment
- Server platform: Sun M9000, M5000, Sun Fire 25K, 6900, and about 80 other mid-range servers running the Solaris Operating System; more than 200 HP ProLiant servers running Microsoft Windows 2000 and 2003
- Applications: Oracle WebLogic, Geneva 5.0, Siebel CRM
- Databases: Oracle 9i and 10g, 11g Microsoft SQL 2005, 2008
- Storage: Hitachi Data Systems Lightning V 9990 system; Sun StorEdge 9985 system;
- IBM DS8300 disk array; EMC Centera disk array, CX3; HP 12000, HP 20000 disk array

any downtime for the three applications would severely damage AIS operations, customer service, and profitability.

It was the task of the IT team to improve performance of these key applications, manage the vast amount of data they were generating more effectively, and find a way to ensure their availability.

Bridging multiple platforms

"Data from the three applications and many others are stored on hardware from Hitachi Data Systems, IBM, HP, EMC, and Oracle-Sun," Punnachaiya explains. "We were determined to find a single solution that could help us manage diverse server and storage platforms." An analysis of

competitive options quickly pointed to software solutions from Symantec. In 2002, AIS chose Veritas Storage Foundation™, and Storage Foundation™ for Oracle RAC.

"Because Veritas Storage Foundation software supports multiple platforms, it is highly cost-efficient for us," Punnachaiya says. "With it, we don't have to add another subsystem or additional staff. It gives us one, unified storage management platform, streamlining our staff training. We have Storage Foundation running on all servers for those three critical applications."

Pooling storage

Looking to reduce their recovery time objective (RTO), Punnachaiya and his team added Veritas Storage Foundation Cluster File System to their IT infrastructure in 2010. "We were incurring downtime when failing over between systems," he says. "We had direct attached storage and had to remount in the event of failover. With Storage Foundation Cluster File System, this is no longer necessary. We have a dedicated storage pool and have reduced failover time to a few minutes."

"Veritas Cluster Server and Storage Foundation increased availability from 98 percent to 99.5 percent while decreasing annual application downtime from maintenance by 75 percent."

— Suphot Punnachaiya

And while AIS does not experience much unplanned downtime, about two events annually according to Punnachaiya, it does have a dramatic impact on customer experience and revenue. "Each event is typically one hour or more in length and affects a minimum of one million customers," Punnachaiya explains. "This is lost revenue, not to mention a bad customer experience. And this doesn't account for the productivity impact to internal staff."

A jump in application efficiency

Punnachaiya's team got the performance improvement it was seeking by adding Veritas Dynamic Multi-Pathing to seamlessly manage data between storage systems and devices. "This allowed us to spread I/O across multiple paths and increase the performance and speed of our applications," he says. Storage Foundation for Oracle RAC is used by Punnachaiya's team to reconfigure their storage topology while their Oracle RAC application is up and running.
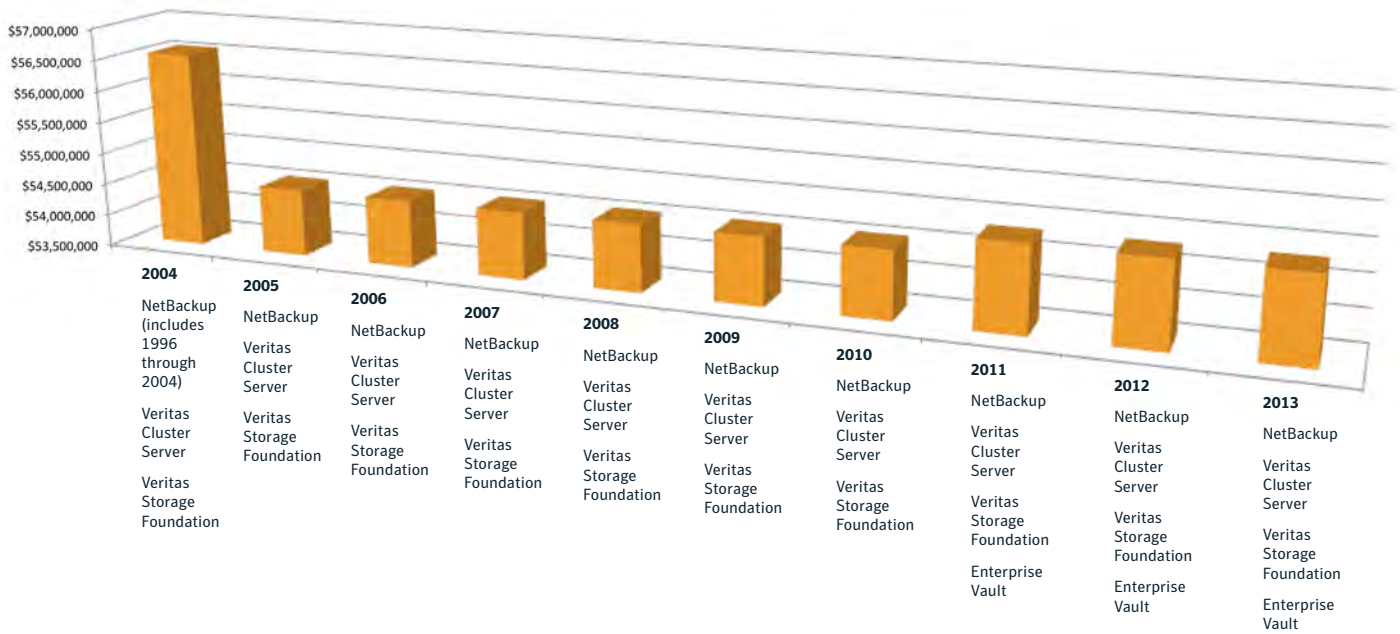
"Veritas Storage Foundation and Veritas Dynamic Multi-Pathing have increased critical application performance by 30 percent."

— Suphot Punnachaiya

"We also wanted to optimize our Oracle 9i, 10g, and 11g databases," Punnachaiya says. Storage Foundation includes special database accelerators that provide raw device database performance with the manageability of a file system, enabling AIS storage administrators to perform, in minutes, reallocation steps that would previously take hours.

"Veritas Storage Foundation and Veritas Dynamic Multi-Pathing have increased critical application performance by 30 percent," Punnachaiya quips. "We have realized 100 percent payback in the first two years."

Table 2: Total Realized and Projected Cost/Avoidance Savings at AIS from Symantec Solutions, 2004 — 2013

2004
NetBackup (includes 1996 through 2004)
Veritas Cluster Server
Veritas Storage Foundation

2005
NetBackup
Veritas Cluster Server
Veritas Storage Foundation

2006
NetBackup
Veritas Cluster Server
Veritas Storage Foundation

2007
NetBackup
Veritas Cluster Server
Veritas Storage Foundation

2008
NetBackup
Veritas Cluster Server
Veritas Storage Foundation

2009
NetBackup
Veritas Cluster Server
Veritas Storage Foundation

2010
NetBackup
Veritas Cluster Server
Veritas Storage Foundation

2011
NetBackup
Veritas Cluster Server
Veritas Storage Foundation
Enterprise Vault

2012
NetBackup
Veritas Cluster Server
Veritas Storage Foundation
Enterprise Vault

2013
NetBackup
Veritas Cluster Server
Veritas Storage Foundation
Enterprise Vault

■ Total Realized and Projected Cost Savings/Avoidance in USD

Avoiding $2.25 million USD in clustering costs

Impressed with Storage Foundation software, AIS decided to integrate Veritas™ Cluster Server software to enhance availability of key applications at AIS. The two solutions together enable the IT team to set up two-node clusters for the company's Geneva 5.0 billing, Siebel CRM, and custom Enterprise Application Integration (EAI) application servers, allowing them to failover if needed.

Off-the-shelf support in Veritas Cluster Server enables the solution to monitor Oracle, Sybase, and DB2 data bases, enabling AIS to ensure that they are highly available and always online, automatically restarting downed database instances and detecting any faults that occur.

For non-database related applications, Veritas Cluster Server enables the IT team to support six-plus-one cluster architecture instead of a classic one-plus-one architecture. Because it has deployed six-plus-one architecture in five clusters, AIS has avoided the purchase of 25 additional standby servers. The estimated cost of each UNIX-based server is about $75,000 USD, totaling $1.875 million USD. Annual maintenance is about 20 percent, adding $375,000 USD. Therefore, year one savings in avoiding the purchase of 25 servers is $2.25 million USD **(see table 3, category 1).**

Veritas Cluster Server also enables the IT team to monitor, manage, and report on its 20 active-active clusters and five six-plus-one clusters from a single Web-based console, despite the fact that the clusters are on different platforms and in four different data centers.

Uptime protects growth and leadership

The overall result of clustering at AIS is an enhancement in availability, which pleases Punnachaiya. "Veritas Cluster Server and Storage Foundation software increased availability from 98 percent to 99.5 percent," he says, "while decreasing annual application downtime from maintenance by 75 percent. That's from two hours to just a half hour. Those are important gains for us."

AIS 2010 revenue was 111.3 million TBH ($3.6 billion USD). Divided by 8,760 hours in a year, that translates to $411,000 USD in revenue earned per hour, which can be used to estimate the scale of loss possible with downtime. By improving uptime from 98 percent to 99.5 percent, AIS is reducing exposure to lost revenue by as much as $54 million USD **(see table 3, category 2).**

Meanwhile, the improved ability to failover has reduced the recovery point objective (RPO) at AIS from a half hour to 15 minutes and the recovery time objective (RTO) from four hours to 10 minutes. With this in mind, Punnachaiya notes: "Veritas Cluster Server has delivered 100 percent payback in only three years."

Streamlining data protection

Happy with the performance of Cluster Server and Storage Foundation software, AIS turned to Symantec to solve another problem: how to back up its growing data store from its Geneva 5.0 billing application. Data was increasing at 20 percent annually and was already at two terabytes. After a technical evaluation, the staff chose Symantec NetBackup™.

"Thanks to Symantec NetBackup," explains Punnachaiya, "we're able to accommodate a 20 percent annual growth in storage with no increase in backup staff, while reducing our backup window from 16 to 14 hours."

Why Symantec?

· Streamlined management of diverse platforms

· Solutions that increase application performance and availability

· Cost-efficient clustering and disaster recovery capabilities

· Transparent email archiving with self-service retrieval

"We leverage Symantec Education Services courses and certification for internal development and it has helped us retain employees over time."

— Suphot Punnachaiya

Now the total data being backed up is almost a petabyte. AIS had special performance objectives for NetBackup, and achieves these objectives using NetBackup options and agents. The IT team chose NetBackup Shared Storage Option because it enables dynamic sharing of individual tape drives by NetBackup Media Servers. This maximizes utilization and lowers the number of drives required, reducing tape operational costs and increasing fault tolerance.

To enhance backup efficiency, AIS chose NetBackup agents for Microsoft Office SharePoint Server, Microsoft Exchange Server, and Oracle. These agents ensure "hot" backups, meaning that services and data from these applications continue to be available during backup. "That's critical to us," says Punnachaiya.

"The overall result," says Punnachaiya, "is that NetBackup has automated, streamlined, and centralized the backup process effectively. It has reduced backup staff overhead by 30 percent, and enabled us to recover our investment in two years." $20,000 USD in staff time per year is available for more valuable tasks **(see table 3, category 3).**

In addition, Symantec NetBackup may help enable a new service, points out Punnachaiya. "Customers with smartphones need to have their data backed up and that can be as much as 32 gigabytes per user," he notes. "If AIS offers the ability to backup and recover smartphone data, we will further differentiate ourselves from the competition." Veritas Storage Foundation will enable AIS to measure and charge back for storage usage by data owner, supporting a new revenue stream.

Doubling mailbox quotas

One of the most important forms of data at AIS that requires protection is email. "We cannot do business without it," notes Punnachaiya. "If email is shut down for a few hours, users panic."

To maintain email performance, the IT team sought to reduce the volume of messages on email servers by using an archiving solution. "We initially deployed one from EMC, but it did not meet requirements," Punnachaiya reports, "so we switched to Symantec Enterprise Vault™. It fits our roadmap better because we wanted to expand mailbox storage quotas for our users. And we wanted to enable users to retrieve their own archived email messages without IT help."

"Our expectations are very high, and Symantec solutions have met them. They are critical to the reliability and availability of our services, and that is critical to our success."

— Suphot Punnachaiya

Using Symantec Enterprise Vault, the IT team has been able to double mailbox storage limits from 150 megabytes to 300 megabytes per user. And because Enterprise Vault compresses and deduplicates messages as it archives them, AIS is experiencing a 50 percent reduction in email storage requirements. It reduced a four terabyte volume of email messages to two terabytes— reclaiming $20,000 USD of Fibre Channel disk space for more productive uses **(see table 3, category 4)**.

With a 50 percent annual email growth rate, AIS could expect to add about a terabyte a year of email messages. Enterprise Vault will reduce that requirement by 50 percent, saving 500 gigabytes per year of Fibre Channel disk space worth $5,000 USD per year.

The team also plans to use Symantec Enterprise Vault to automate the migration of archived messages from high performance Fibre Channel storage to high capacity, more cost-efficient SATA storage, which costs as much as 60 percent less per terabyte than Fibre Channel.

Reclaiming 35,000 hours in annual productivity

Users can now easily search archived messages and recover them without IT help. Archived messages appear alongside current messages in the user's email client, and open with just a double-click. Notes Punnachaiya: "Since deploying Symantec Enterprise Vault, help desk tickets regarding email archiving and message recovery have dropped by 20 percent, making about 50 hours per week in help desk time available for more useful tasks," he says.

If the larger mailbox storage quotas reduce mailbox management time for 4,000 employees by 10 minutes a week, AIS is reclaiming a projected 35,000 hours a year of employee productivity **(see table 3, category 5)**.

With these savings in mind, Punnachaiya observes that "Symantec Enterprise Vault has paid for itself in 18 months."

Symantec Enterprise Vault may also support a new revenue opportunity. "AIS has the largest IT operations and data center in Thailand," Punnachaiya points out. "Enterprise Vault may enable us to offer email hosting as a new cloud service for customers. We are studying this possibility."

Avoiding $150,000 USD in energy costs

Sustainability is an important component of AIS' corporate responsibility program, and Symantec solutions are helping the team increase the efficiency of its energy usage. They've enabled the AIS team to avoid the purchase of 25 UNIX-based servers and

reclaim or save terabytes in storage space. The estimated total value of kWh saved per year is $150,000 USD **(see table 3, category 6).**

Building customer trust

The IT team is using other Symantec solutions to help build customer trust at the AIS online store. "We've been using VeriSign™ Secure Sockets Layer (SSL) certificates and displaying the VeriSign trust symbol on our site for a decade," notes Punnachaiya. "It helps our customers and end users have confidence in our online identity and security standards."

AIS has also been using two-factor hard-token based VeriSign Managed Public Key Infrastructure (PKI) Service. It's a cloud-based service enabling the company to deploy certificates to devices and desktops, strongly authenticating employees and partners to VPN and wireless networks.

Support makes the difference

Because AIS is growing fast, the company counts closely on the support of two Bangkok-based Symantec Partners for technical support and education on Symantec solutions, as well as other solutions. One is G-ABLE Company Limited, a Symantec Gold Partner, and the other is MFEC Public Company Limited, a Symantec Platinum Partner.

"They are enormously valuable to us and basically on site all the time," Punnachaiya says. "Twice a year, I have them tune NetBackup to compensate for environment changes, and that has proven to be a very productive step. To supplement these two companies, we can call on Symantec Essential Support Services 24×7 when we need to do so, and that's a comfort."

Notes Punnachaiya: "G-ABLE and MFEC have worked with us since day one, when we migrated from the main frame to UNIX. They bring new solution ideas such as Veritas

Storage Foundation Cluster File System to us. Their support is a big success factor in our operations."

The IT team at AIS also turns to Symantec for training help. "We have a plan to build our internal competencies," says Punnachaiya. "We are the largest IT installation and operation in Thailand. As a leading provider of IT services, we need to be able to do our own support and troubleshoot our systems quickly. We leverage Symantec Education Services courses and certification for internal development, and it has helped us retain employees over time."

Doubling market value in five years

The marketplace is validating the effectiveness of the AIS philosophy of continuous improvement. Cost management is a competitive advantage. "For the past three years, we have used Storage Foundation twice a year to charge back storage as part of reporting the cost per subscriber of services," says Punnachaiya. "This is global cost benchmarking, or GCB."

Good visibility on costs has enabled AIS to maintain the lowest costs of more than 100 mobile service operators in 2009, as measured in an independent survey.[2] Factors such as these have helped the AIS stock price to more than double between 2006 and 2011.[3]

Availability, performance, and cost efficiency from IT applications are making a difference. "Have Symantec solutions performed?" reflects Punnachaiya. "I'd put it this way— our expectations are very high, and Symantec solutions have met them. They are critical to the reliability and availability of our services, and that is critical to our success."

1. AIS. 2010 Annual Report, p. 28

2. AIS stock price (Symbol ADVANC on Stock Exchange of Thailand) of 130.50 as of 11/1/2011.

3. AIS stock price more than doubled between 57 in 2006 and and 130.5 on 11/1/2011

Table 3: Detailed Business Impact Calculations

Business Value Category	Data	Assumptions	Calculations	1st Year Results	Total Realized and Projected Results
Category 1: Server hardware and maintenance savings	Server and maintenance costs avoided by using 5x 6+1 server clusters vs. 30x 1+1 clusters (leveraging Veritas Cluster Server)	Estimated $75,000 USD cost for UNIX-based servers. Maintenance estimated at 20% annually.	35 servers used instead of 60 = 25 servers avoided 25 × $75,000 USD = $1.875 million USD acquisition 20% annual maintenance × $1.875 million USD = $375,000 USD annual maintenance $1.875 million USD acquisition +$375,000 USD maintenance = $2.25 million USD in 2004 Years 2005 to 2013 = 9 × $375,000 USD per year maintenance = $3.375 USD million maintenance saved; possible hardware refresh cycles not included. $2.25 million USD + $3.375 million USD = $5.625 million USD	$2.25 million USD in server hardware and maintenance savings	**$5.625 million USD** in cost avoidance, 2004 – 2013
Category 2: Availability and downtime avoidance	Annual uptime increased from 98% to 99.5% (using Veritas Cluster Server and Veritas Storage Foundation)	Annual downtime equivalence: 98% = 7.3 days 99.5% = 1.83 days AIS 2010 annual revenue = 111.3 million TBH ($3.6 billion USD)	$3,600,000,000 USD annual revenue for 2010 / 8760 hours per year = $411,000 USD per hour of potential loss exposure 7.3 days - 1.83 days = 5.47 days of uptime saved 5.47 days × 24 hours/day = 131.3 hours in downtime avoided 131.3 hours × $411,000 USD/hour= $54,000,000 USD in downtime avoided per year. $54 million USD per year × 10 years (2004 – 2013) = $540 million USD	$54 million USD in estimated downtime avoided	**$540 million USD** in downtime cost avoidance, 2004 – 2013
Category 3: Backup productivity	30% improvement in backup staff productivity (by standardizing on NetBackup, freeing up several thousand hours/year for more valuable tasks)	Average estimated annual salary for Thai IT administrator (www.payscale.com) = 600,000 BHT or $20,000 USD/year $20,000 USD year ÷ 2,000 working hours per year = $10 USD/hour	2,000 hours per year saved (conservative estimate) × $10 USD/hr = $20,000 USD of IT time per year available for more valuable tasks 1996 – 2013 = 17 years × $20,000 USD/year = $340,000 USD/year	$20,000 USD of IT staff time available for more valuable tasks	**$340,000 USD** of IT staff time available for more valuable tasks, 1996 – 2013
Category 4: Microsoft Exchange storage savings	4 terabyte email store on Fibre Channel disk reduced to 2 terabytes (using Symantec Enterprise Vault); assumes a 50% growth rate	Fibre Channel disk estimated at $10,000 USD/terabyte 50% email growth rate = 1 terabyte per year added	2 terabytes of Fibre Channel disk saved = $20,000 USD in disk reclaimed in 2011 with Enterprise Vault deployment 1 terabyte/year added in email storage, equating to .5 terabyte avoided due to 50% deduplication/compression .5 terabyte/year avoided = $5,000 USD total avoided in 2012 and 2013 $20,000 USD reclaimed + $10,000 USD avoided = $30,000 USD	$20,000 USD of Fibre Channel disk reclaimed	**$30,000 USD** in Fibre Channel disk reclaimed and avoided, 2011 – 2013
Category 5: End user productivity gains	End users can retrieve archived messages without IT help using Symantec Enterprise Vault. Users also spend less time managing mailbox size due to larger quotas.	Estimated 10 minutes saved per user per week Estimated annual salary for telecom worker = 480,000 TBH/year ($15,000 USD) $15,000 USD/year divided by 2,000 working hours/year = $7.50 USD/hour	10 minutes/week × 4,000 employees x 52 weeks per year = 2,080,000 minutes per year ÷ 60mins per hour = 34,666 hours per year of reclaimed productivity × $7.50 USD/hour = $260,000 USD of reclaimed user productivity per year	$260,000 USD of reclaimed user productivity per year	**$780,000 USD** in realized and projected reclaimed productivity, 2011 – 2013
Category 6: Green IT savings	25 UNIX-based servers avoided and their corresponding energy consumption (via Veritas Cluster Server N+1 technology), reducing usage from 104 kWh to 50 kWh for savings of 54 kWh per year, 2014 - 2013	54 kWh saved per year = $150,000 USD/year savings	$150,000 USD per year savings × 10 years (2004 — 2013) = $1,500,000 USD	$150,000 USD in energy costs avoided	**$1,500,000 USD** in energy costs avoided 2004 – 2013