CHAPTER 5

RESULT

5.1 Pricing

The pricing for the peripherals mentioned in sub chapter 4.4.2 are as follow:

Name	Quantity	Price
Main storage:		
HP MSA 1000 package, which include:		$10,830
- HP MSA 1000	1	
- HP Q200 FC HBAs	2	
- 2/8 8-Port SAN Switch	1	
- SFP SW Transceivers	4	
- 5m Fibre Channel cables	3	
- Small Business SAN Installation CD & documentation	1	
Hard disk 146GB, 10K @ $450	42	$18,900
Tape Drive:		
HP Ultrium 960 SCSI internal (capacity of 400-800 GB)	1	$2,321
HP Ultrium data cartridge 400GB	1	$40
Tape Autoloader:		
HP 1/8 Ultrium 960 SCSI Tape Autoloader	1	$3,450
Other options:		
HP MSA SAN Switch 2/8	1	$3,325
HP DL380 G5 SAN Base Storage Server	1	$9,977
5m Fibre Channel cable	1	$87

Table 5.1 SAN peripheral price list

The entire price is taken from PT Intikom Berlian Mustika, one of the Premium Business Partner of Hewlett-Packard based on price list on July 7th, 2008.

5.1.1 Price Comparison

As for the comparison to the other storage networking solution, i.e. Network Attached Storage, the price is as follows:

Components	NAS	SAN
Storage server	HP DL380 G5 Base Storage Server for NAS $8,410	HP DL380 G5 Storage Server for SAN $9,977
Storage array	HP MSA30 with 1TB storage $4,943	HP MSA1000 with 1TB storage $8,389
Hard drive	both can use the same type of hard drive	
Switch	8-Port 10/100/1000 Cisco LAN Switch $1,999	8-Port Fibre Channel SAN Switch $3,325
Cable	SW LC/LC 5m cable Ethernet cable $38	5m SW LC-/LC Fibre Channel cable $87
Tape	Tape drive varies based on amount of data, not network	

Table 5.2 NAS & SAN price comparison

The price of NAS peripherals is taken from PT Intikom Berlian Mustika based on price list on July 7th, 2008 and Bhinneka (http://www.bhinneka.com) based on price list on Aug 14th, 2008.

5.2 Case Study

5.2.1 AIG Life

AIG Life is a one of the biggest multi-national life insurance company with more than 25 years experience in Indonesia. It is the pioneer and one of the major bancassurance players in Indonesia. It has 6 branch offices in 5 major cities in Indonesia. AIG Life is a member company of part of the American International Group (AIG) Inc [37].

In 2006, AIG Life is the second biggest life insurance company in term of asset, with the asset of IDR 7.6 trillion and has the market share of 10.77%. For the Nett insurance premium, it is the third biggest with 2.4 trillion in 2006 [38].

IT infrastructure in AIG Life

AIG Life has used Storage Area Network as its storage solution for the past 7 years. They have approximately 90 servers in their infrastructure. Thus, IT Department in AIG consist of 60 personnel with only 1 personnel assigned as server administrator to monitor and maintain the server and storage system. For the operating system, they only use Windows family OS and Microsoft SQL Server and IBM DB2 for the database application.

In choosing a storage solution, the top main priority is the reliability of the system in means the system doesn't get easily damaged, scalable and can perform in high speed.

Currently, the company manages 15 TB of data, which divided into 2 systems. The old system consists of 2 storage units from EMC with the switch from Macdata. Each unit is able to store data up to 600 GB.

The newer system, which just only implemented 8 months ago, consists of 3 storage units from NetApp with the switch from Brocade. Each unit is able to store data up to 6TB. 1 unit is for adding the old system, 1 unit is allocated for digital imaging and 1 unit for disaster recovery. The reason for the adding the new system is because the old system is not sufficient for storing the data. According to the server administrator, no issue found during the addition of the new system to the old system and the deployment of the new system is relatively easy.

The storage resource consists of disk systems and magnetic optic for main storage and tape drives for back up.

Daily activities

The server only stores the operating system and application. All kind of data, namely log, customer data, financial data, is stored in the SAN. When a user

asks for data, it is retrieved from the SAN. For the back up activity, it is done daily. It only back up the difference. Full back up is conducted weekly.

One of the storage-consuming data in AIG Life is digital imaging data. All the policy and original documents from the client is scanned and stored in the SAN. When a user asks to view it, he/she can just simply retrieve the data.

SAN in AIG Life

SAN is used for the connection between server-storage and storage-storage. Server-storage connection is for storing and retrieving the data. Storage-storage connection is for back up activity. Therefore the back up activity is serverless and it is also LAN-free back up.

The SAN architecture also implements Fibre Channel with the speed up to 4 Gbps for the new system and 1 Gbps for the old system. Fibre Channel is used for the connection between server and storage while the LAN is still using Ethernet.

According to the server administrator during the interview, AIG Life needs to implement SAN because it needs a system that has fast and reliable system with high availability, scalable and also simple to maintain. One simple example is in the activity of transmitting the digital imaging data. User, especially customer service, often needs to retrieve the data. With SAN, user can retrieve a large block of digital imaging data in no time.

Another main benefit that AIG Life gained from implementing SAN, according to the server administrator is, with SAN, he has less work load and can use his time for other activity. SAN also enable the administrator to allocate storage capacity to each server / system easily. It is also easy to add and swap the disk drive from and to the storage array.

Conclusion

AIG Life feels satisfied with the SAN since SAN can meet their needs in a fast, high availability, reliable, scalable and simple system.

5.2.2 Great Eastern Life Indonesia

PT Great Eastern Life Indonesia (GELIndo) is a member company of The Great Eastern Life Assurance Co. Ltd, (GELS) the oldest well-known insurance company in Singapore. GELIndo has run its business in Indonesia since 1996 [39]. It has 13 branch offices in 13 cities all over Indonesia.

IT Infrastructure in GELIndo

Currently, the company manages the data of 3 TB with annual growth of 40% / year. The company use Microsoft Windows 2003 and Linux Red Hat for their system. For back up activity, it is conducted daily with the amount around 100 – 300 GB per back up.

Last year, GELIndo has just implemented Storage Area Network as its storage solution and the system has run for the last 1.5 years. They also implement

Fibre Channel in order to achieve high performance. They entrust their system to Hewlett-Packard (HP) products. According to the CIO, no issue found during the migration.

Before and after SAN

GELIndo consider IT as a very crucial system to run their business. Last year, the IT Department deployed data intensive application, i.e. Insurance Application System, Customer Data Warehouse and e-mail. Therefore, it needs a system that has high speed connection with high availability, scalable, flexible and can support multiplatform system.

The old system is felt can fulfill the requirement. The problems in the old system are:

- There are disparate islands of data that need to be managed. This cause complexity in managing those islands of data and it is also time-consuming.
- The disparate islands of data also cause complexity in scheduling back ups.
- Inefficient storage utilization. At many times, some servers are over utilized while other servers are under utilized.
- The speed performance also felt not sufficient to run the system efficiently.

That is when the idea of implementing SAN proposed to the higher management and get accepted.

In brief, below is the comparison before and after GELIndo implement SAN:

	Before implementing SAN	After implementing SAN
Speed performance	Max up to 160 Mbps.	With Fibre Channel, the speed can reach up to 1 - 2 Gbps.
Availability	Should have redundant server with the same size of disk to keep the business continuance.	When the server is down, storage can be easily assigned to the other server to ensure business continuance is still running with minimum downtime.
Scalability	Limited to the capacity of the server to handle the maximum disk capacity. When it reaches its maximum then everything must be changed.	Easy to add more disk as it is modular. In the future, this can support the growth on data demand.
Flexibility	Not flexible, depend on the server.	Very flexible. It can be assigned to different

		server with different OS, for example both Windows and Linux platform at the same time.
Ease management	It is more complex to manage several disk on different location.	Easy to manage on single point disk.
Storage consolidation and utilization	Data allocated in several disk and attached to each server. This cause some server are over utilized while other server is under utilized.	All disks are consolidate under the SAN and can be utilized according to the need.

Table 5.3 Before and after implementing SAN in GELIndo

Conclusion

GELIndo feels satisfied with the new system, i.e. SAN. With SAN, they can use their data intensive applications well.