Intro to Cybersecurity Week 4

Q: General discussion on server hardware redundancy issues. Should we have software redundancy?  
  
A: Some server hardware redundancy issues stem from the idea of how much it costs to have redundancy, and it is beneficial to have redundancy along with the cost of downtime. The general best practice says that we should have a lot of redundancy measures to combat any form of failure. The exact cost of IT downtime for organizations who work with large numbers of servers is expected to be more per minute than it takes to maintain some form of redundancy. Considering this, we should have some form of software redundancy to ensure that our application remains accessible, but also implemented in a way that does not incur any additional costs or load on the system.

Q: List and discuss additional features of server hardware that may justify the cost

A:

* Better capabilities:

Server hardware must work with a large amount of data on a day-to-day basis, thus requiring more computational power to process all the data within a certain speed requirement

* Modularity and security:

Servers must be modular due to different requirements of the company’s focus in terms of hardware. Some of the servers might have similar capabilities to the average desktop, but some others will have much higher capabilities than others. Another point of concern is security, since the data is often sensitive and could potentially impact the organization if leaked, they are built with high levels of security measures.

* Reliability:

These servers store data for multiple services at once which could be critical data. In the case of error or failure, the data loss could be detrimental to said organization. Thus, these parts will often have RAID technology or error checking algorithm to prevent failure during operation.

Q: Compare the pros and cons of running RAID as hardware (controllers) or software (OS modules)

Hardware RAID:

* RAID which uses dedicated controller cards to manage the disk array without relying on the host’s CPU or memory.
* They are faster, more reliable, and easier to set up than software RAID
* However, they have a higher cost due to the need to buy a controller, lower compatibility and vendor lock-in contract

Software RAID:

* An application which uses the host’s software to manage the disk array and perform the operation using the host’s CPU and memory
* They are often cheaper, flexible and more compatible
* However, they have lower performance, higher resource consumption and more complex

Q: General discussion on hot backup issues with busy servers

A: During a hot backup, the server remains operational while the components are being swapped out, meaning no downtime in the service. With busy servers which process more data, the hot backup is more costly to maintain and requires extra caution from the mechanic who performs the backup. If during the backup process anything was to fail, the data is lost and cannot be recovered and data that is already backed up will not be recovered with point-level recovery. They are also more fault tolerant and susceptible to failure with the slightest error.

Q: What are hot swappable devices and how do they contribute to the availability of a server system?  
A: Hot swappable devices are devices that allow the addition of peripheral hardware without shutting down the system. This means that when a component fails, the redundant unit automatically takes over. The inclusion of these devices allows the server to remain operational if it has some form of redundancy and the components are replaced, ensuring that the server does not shut down and result in data loss.

Q: How do maintenance contracts and spare parts contribute to the reliability of a server?  
A: The presence of maintenance contracts and spare parts allow the server to remain operational and have redundant measures in case of failure.