Hardware Refresh Project Proposal

By: Connor Horning

Table of Contents

Executive Summary:

We are looking into doing a hardware refresh for our four racks of Dell equipment in the server room. These four racks are out of support from Dell and are no longer on our warranty. We have three options which are refreshing to newer on-prem gear, keeping the old gear, or migrating to a cloud provider. We are leaning towards migrating to a cloud provider because of scalability, flexibility, reduced maintenance, global accessibility, and resilience. Migrating would make it a lot cheaper to have all our servers in the cloud instead of spending a lot of money on on-prem servers. We can scale them up or down depending on the workload that we are doing, and we only pay for what we use. Our employees will be able to access their resources while out of the office. We would not need to upgrade the servers every few years, which would cost upwards of $80,000. The cloud provider would be handling all the upgrading and maintenance of the machines in the cloud. Lastly, they would be more resilient in the cloud meaning they can recover quickly and have significantly less downtime than if it were on-prem.

Introduction

Overview of current infrastructure

Currently, our server room consists of four racks of Dell equipment. Each rack consists of two servers per rack. All eight of our servers are out of date and should be replaced during the coming year. The six R720 servers and the two R620 servers are well out of support. This could lead to many challenges if we continue using them such as crashes, downtime, security vulnerabilities, and limited support.

Challenges of outdated hardware

As said prior, outdated equipment can lead to crashes, downtime, compatibility issues, security vulnerabilities, reduced efficiency, and limited support. These outdated servers can crash a lot more which will result in downtime. This downtime will then cost the company revenue which will add up over time. These servers can also be incompatible with newer software, browsers, and operating systems which could be a big issue in the future. These servers will stop receiving security updates which will increase the chance of a cyber-attack which could cause data breaches. Along with not receiving security updates, they will not be getting any feature updates or quality updates.

Why status quo is not viable

Risks of continuing with outdated software

As mentioned earlier, there are many risks if we keep the servers the way they are. These risks can be more expensive than if we spend the money to migrate them to the cloud or get new hardware. Risking a data leak and downtime just to “save money” will backfire on us later down the line. It is important that we investigate upgrading these as soon as possible.

Business impact of not modernizing

If we do not modernize our servers, it can impact customer experience and give us severe limitations on what we can do with them. Having outdated servers will give our users a slower experience. This will cost the business a lot of lost revenue since it is a bad customer experience. Since the servers are old, some new software will not be compatible.

Goals for modernization effort

Our goal for this modernization of our servers is to create a better user experience, make it more secure, and more reliable. It will improve the customer experience by having faster response times, it will reduce downtime and crashes and will be more secure, which will prevent data breaches. More security will be a crucial aspect because customers want

their data to be secure. Since these servers will not crash and cause downtime, it will gain the company more revenue over time.

Migrating to the cloud

Why migrate to the cloud?

The IT team has decided that the best option for the company is to migrate our servers to the cloud. This will save the company money, we will not have to purchase and maintain any physical servers, and it is scalable to meet the company's needs and demands.

Why we chose cloud migration

We decided to choose cloud migration because of price, scalability, etc. We do not see buying new servers as a viable option when we can have them in the cloud and scale them depending on traffic. This will make everything cheaper, and we will not be using our electricity for it. The cloud provider will be maintaining the servers for us, which will have redundant systems in place to prevent downtime.

Benefits of cloud migration

Some benefits of cloud migration include scalability, availability, cost-effectiveness, performance improvement, software modernization, and security. Scalability will adjust by either increasing or decreasing workloads depending on the demands to access a resource. The cloud uses a pay-as-you-go model which means that you only pay for what you use. This scalability will make sure that we are saving as much money as we can. This

scalability will also increase the availability during certain times. Such as if we were having a big sale, it would scale itself appropriately to make sure that our customers have a good and smooth experience while on the website. Switching from our legacy hardware to newer cloud servers, we can make our software more modern and efficient than if we kept using our old servers. Lastly, the cloud providers provide a lot of security measures such as advanced encryption, access controls, and security intelligence monitoring.

Cons of cloud migration

Some downsides of migrating to the cloud are some security concerns, data migration costs, potential downtime during migration, and network latency. The security concerns are because we will now be trusting a third-party provider with our data. We have been looking at a few options that have the best security measures in place to prevent it from happening. It can be expensive to migrate our servers to the cloud, but it will be a lot cheaper than investing more money in newer servers that we would just have to replace in five to seven years. Migrating our servers can sometimes cause downtime during the transition. We will be planning to migrate out of office hours to prevent any disruption to the company. Now that our servers are not in-house, there could be more network latency since there is a longer distance between our office and the cloud servers. We can minimize this effect by choosing a cloud region that is geographically closer to our office.

The migration process

We decided the cloud provider we will use will be Microsoft Azure. We decided on Azure because of their pay-as-you-go payment model which I covered earlier, it will work well with other apps in the Microsoft Office 365 platform, and good security implementations. Azure recommends using the Azure Migrate service which its main purpose is for server migration. We can migrate any of our VMs and physical servers to the Azure cloud. To migrate we will have to do the following:

1. Create an Azure Migrate project
2. Create an Azure network
3. Install the mobility service agent for the replication appliance to run
4. Use the replication appliance to copy the server(s) we will be migrating

The period of migrating all eight of our servers to Azure will be about one to two months.

Alternatives considered

Refreshing on-prem hardware

Another route we could take is getting new servers for our on-prem data center. If we decide to go this route, we have a few replacement server models in mind. Two of the server models we are looking at are the Dell PowerEdge R760 and R660. Both models were released in 2023 and are expected to be supported until 2028 to 2030. These will give us four to seven years of this new equipment until we refresh it. The plan would be to get six

R760 servers and two R660 servers. The R760 servers cost $13,104.67 and the R660 costs $4,596.90. This will total out to $87,821.82. Some of the advantages of this is that we are familiar with having on-prem servers and we will have full control over our servers instead of another company managing them. However, it has a high expense as stated earlier and it has limited scalability.

Staying with outdated hardware

Another option we have is to avoid upgrading anything all together and just keep what we have now. This is the worst option of the two because of the security risks that this option poses. It will be very inefficient and will only be getting worse from here on. The only advantage is there are no upfront costs.

Cost analysis

Comparing on-prem and cloud migration costs

Cloud Migration Cost		**On-Prem Cost**
$0.00	**Upfront Cost**	$87,821.82
$3,573.02	**Monthly Cost**	$3,874*
$42,876.24 (fluctuates)	**Yearly Cost**	$46,488 (fluctuates)
$42,876.24	**First Year Total**	$134,309.82

*This monthly cost includes Electricity and cooling, maintenance and support, networking, security, and backup and recovery.

Long term cost benefits of cloud services

The long-term cost benefits of these cloud services include lower capital costs which include no hardware costs (except for switches and routers), and lower datacenter costs. Since the cloud provider manages hardware upgrades, replacements, and maintenance that will save us a lot of money in the long run. That will also eliminate the need to buy new servers every five to eight years. There will be a lower risk of downtime which will make the company more money overtime.

Conclusion and recommendations

In conclusion, the IT team believes that we should migrate our servers to the cloud rather than upgrade them or just stay with our old servers. This will be cheaper in the long term. The IT team will fully support whichever decision you decide to make. We will make sure that it is done as smoothly and as fast as possible. We look forward to hearing back from you.

Sources

"8 Key Benefits of Cloud Migration." *Mertech*, www.mertech.com/blog/benefits-of-cloud-migration. Accessed 5 Dec. 2024.

Calum EdwardsAs the Digital Marketing Lead at Excellence IT. "Microsoft Azure for Small Business: Top 5 Benefits." *Excellence IT*, excellence-it.co.uk/insights/microsoft-azure-smart-choice-for business/#:~:text=MS%20Azure%20provides%20a%20secure%20cloud%20infrastructure,network%20security%20groups%2C%20and%20Azure%20Active%20Directory. Accessed 5 Dec. 2024.

Lane, John, et al. "Cloud Network Latency: 5 Factors to Consider." *Logical Front, LLC*, 31 Aug. 2023, logicalfront.com/cloud-network-latency-5-factors-to-consider/#:~:text=%E2%80%93%20Factors%20affecting%20network%20latency%20in,network%20latency%20and%20identify%20bottlenecks.

Legacy Systems in Digital Transformation: Risks & Challenges, www.impactmybiz.com/blog/blog-legacy-systems-digital-transformation-risks-challenges/. Accessed 5 Dec. 2024.

Privacy Ninja. "Risks of Having Outdated Servers and Best Practices to Date." *Privacy Ninja*, 23 Oct. 2023, www.privacy.com.sg/resources/risks-of-having-outdated-servers-and-best-practices-to-date/.

PowerEdge R660 Rack Server | Dell USA

Dell PowerEdge R760 Rack Server | Dell USA