ACME Cloud Solutions Case

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Business Case Identification

Business Case Name

ACME Cloud Solutions

Description

This case study is intended to explore the cloud solutions available to the ACME company. The company is an engineering firm in Orange County and has recently expanded to the San Diego area. The reason for the expansion is that ACME has recently acquired a competitor using Amazon Services. ACME currently has been using on site technology and is assessing whether cloud architecture can help it expand. The purpose of this case study is to find the best path forward for expansion. This is a practical case study intended to practice technical knowledge and decision making with regards to cloud computing technologies. In the case study are goals, requirements, models, candidates, technical issues and economic factors. This study is intended to simulate the real-world expansion capabilities.

Sponsor

This case study is being completed as a requirement for a graduate level course in cloud computing. The following recommendations fulfill course requirements and demonstrate proficiency in cloud computing technologies. The outline below is the culmination of the course studies and should provide substantial understanding of cloud technologies.

Business Needs

Background

Acme Engineering is a mid-sized firm. It has three locations in Orange County and has acquired two facilities in San Diego. It has strict needs for security and the proper handling of its intellectual property. Specializing in machinery and prototyping, it is necessary that the projects that they are working on do not have security leaks before the patents can be applied for. Cloud services are being considered to help the company expand and make it possible for all the locations to work together with support. Currently, the acquired facilities in San Diego are equipped with Amazon Services for infrastructure and storage. Acme needs to assess the use of these services and plan for the future.

Headquarters is located in Irvine over an hour and a half drive from the new facilities in San Diego. The distance between these offices is great and cloud solutions are being considered to bring the company together. Rather than close the facilities in San Diego, Acme wants to take advantage of the new locations for expansion and create a template for further expansion in Los Angeles and San Jose. The implementations in this case study should allow for easy expansion beyond San Diego. The CEO of the company would like to offer its prototyping services to Silicon Valley making it the most trusted name in product development. Recently, the company has expanded its services to offer substantial resources in electrical engineering and computer science while offering prototypes to technological projects. The company would like to move in this direction rather than expand in aeronautical engineering.

Business Goals

Looking to the future, Acme needs to position to expand. Its prototyping services are in demand and it would like to strategically be able to expand while at the same time keeping the company united and collaborating. Cloud services can help the company to maintain many locations while at the same time provide robust services. In the works, are deals to buy facilities in San Jose and Los Angeles. A long-term goal of the company is to offer its technological services to Silicon Valley and join the market in high tech design. Seeing how intellectual property is at the heart of the company's development security is of critical importance. It is necessary that the technologies they are developing are kept secure until patents are applied for. Their on-site engineers and machinists need to be able to communicate and share resources. Communication with the companies purchases their services is also critical. Looking to the future expansions and collaboration are key.

Business Requirements

Acme maintains certain requirements unique to its services. One requirement is collaboration. Since Acme subcontracts with other companies', collaboration is key to the health of the company. It is a requirement that the computer systems can link and share information with the companies they are contracting with. Also, in addition to external communication, there is the need to communicate internally. This means that all of facilities need to maintain communication over distance and multiple locations. There are five facilities that need to be kept in the loop and provide cohesive services.

Another requirement is security. Security is of the utmost importance when working with products that are entering the market. It is important the patent information not be leaked and that companies can share information without the threat of espionage. One key factor in providing security

is allowing for development in multiple locations to make sure that timelines are met even during outages. Providing fast services and reliable services will help to make patent deadlines.

Cost is an important requirement. Making sure that Acme's prices are competitive is important to the health and expansion of the company. It is necessary that the products come under budget and that its solutions are affordable. Cloud computing services can help to reduce costs in the wake of expansion. This case study will be doing a comparison of the costs to find the best solution for Acme.

Priorities

The priority of the company is expansion. Looking at long term goals and company positioning new facilities and markets are crucial to the longevity of the company. The company is willing to eat short term costs over long-term goals. Long term thinking means that the company is willing to invest in infrastructure and security. The planned expansion of the company is positioned to lead to new customers and geographic markets. The expansion to San Diego is meant to help create a plan for joining further markets. Cost is not as important as growth, however still a concern.

Another priority is the provision of new technology and expanding the offerings of electrical engineering. The company wants to be acquiring projects in product development on the forefront of electronic projects. It wants to minimize the civil engineering projects that it takes and expand in software development. This means having more than mechanical facilities and being able to support programmers and electrical engineers.

A secondary priority is cost. Acme needs to make sure that its services are affordable for the companies that they are subcontracting for. Some of the projects that they acquire are bid for and the cost is a critical factor to the decisions of bids. However, costs on infrastructure that can be used long

term will be considered. Acme intends to position itself for a long future and short-term costs with long term gains will be considered.

Affected On-Premise Solutions

The current structure of the company is offering in house solutions for its services. There is an intranet servicing each individual facility, connectivity to the internet, purchased software licenses, on premise hard ware, inhouse security, and collaboration with the exchange of drives and email. All these services will be affected with a cloud upgrade. Cloud services will provide more secure ways of sharing files, software and security.

Performance Objectives

The goal of the company is to expand to 100 employees over five facilities by November of 2019. This means that there needs to be 25 stations added to the company over the next year. Upgrades of software need to be performed and less time needs to be spent on activities like rendering. Upgrading all these systems with new technologies will be stream lined with the use of cloud technologies. All systems can be upgraded and available by November including the addition of new employees. The goal is to have 50 high powered systems and 25 standard systems and 25 dedicated systems not networked. This with the upgrades will lead to better productivity and less down time. Performance will also be measured by increased customer satisfaction. This will be measured by a survey completed before and after the new upgrades. Over all company performance will be a key performance indicator for the project and company.

Target Cloud Environment

Cloud Deployment Model

The recommendation of this researcher is that cloud services be implemented to better facilitate collaboration and security. The recommended services are storage as a service, platform as a service and software as a service. All these models should be implemented as private cloud services to better enhance security. First, storage and access to servers need to be portable for this reason storage as a service has been recommended. When logged into a system a client or moving employee would have access to virtual servers that are backed up daily so that they could share files with other employees or clients outside the company. Clients outside of the company would have access to the virtual servers through a extranet that would allow them only to view certain files. Platforms as a service would be developed to streamline the set up of different facilities and make sure that all the facilities would be compatible. These platforms would be specialized by job function and allow for the collaboration between locations when utilizing the virtual servers. These platforms would manage and maintain the software as a services features making sure that SLAs are adhered to and that all software within the company has cross compatibility.

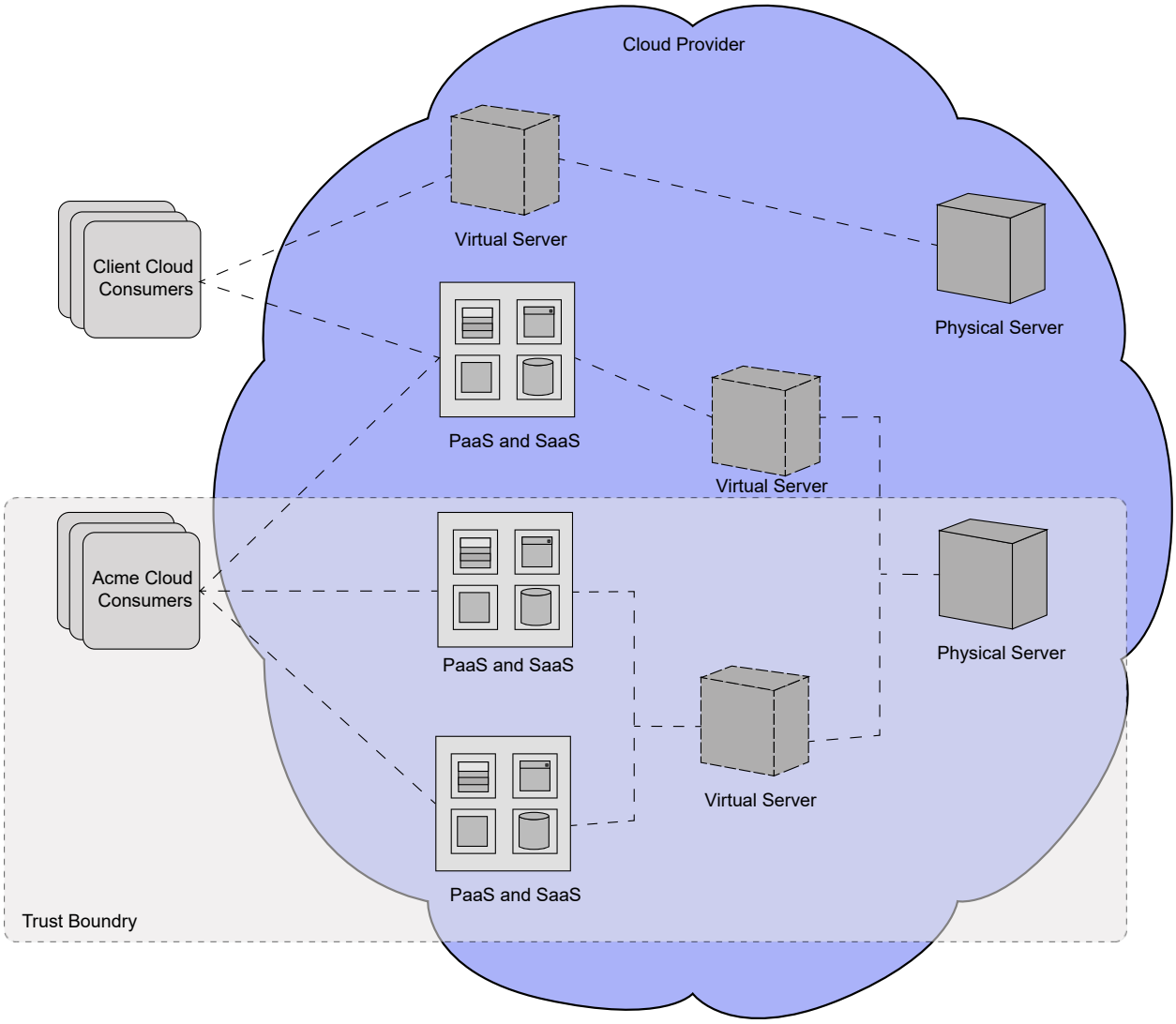

Figure 1.1: Cloud delivery model of a platform as a service.

Cloud Characteristics

To implement the plan above hardware will be provided by each facility. New stations will need to be provided in the case that a station is not compatible with the platform that is being installed. All machines will need to be wiped and then the new platforms will be installed. Platforms will be specialized for each job function making sure that the company is taking advantage of the best tools for each function. This takes advantage of in place technologies and updates and standardizes them. The

local servers will be moved to the cloud and the existing intranet will be used to create access points. The extranet will provide storage access to external clients, however, will only access the virtual servers not the platforms. Allocating the resources in this manner will allow the company to centralize maintenance instead of providing a lot of support at each individual location. If need be for a project a station owned and maintained by the company can be provided to a client if platform collaboration is needed, however, at the end of the project the station will be remotely wiped.

Cloud Service Candidates

The potential service candidates are storage a service and platform a service offerings. Storage as a service would be creating a virtual server that could be accessed externally that would allow the swapping of files and security administration. It is estimated that there would need to be about 1000 terabytes of storage. In the platform as a service offering for three years there is approximately 576,000 hours of use. This is for about 100 stations the approximate size of the company.

Cloud Provider Candidates

There are several candidates for the cloud service provider. One is amazon services. This is the cloud provider for the acquired company. The use of this services is affordable and offers what is set forth in the plan, however, is known for decreased security. The pricing for this is $.12 per hour which is $69,000 for one year (Amazon, 2018). Microsoft's azure is compatible with the systems in place and is less affordable than amazon with increased security. Microsoft virtual machine for 3 years is approximately $10,500 (Microsoft, 2018). Microsoft's strategies for price lead to a more fixed price option. Another option is for an in-house team to develop the clouds in house. The price for this is prohibitive because the labor costs are much more than the prices above.

Cloud Delivery Model

To provide delivery of this model machines will be wiped and installed with the necessary system to provide the virtual systems. First, there needs to be a backup made of all the systems. Then, at each location a new cloud compatible system will be installed that can be administered remotely. Then the new machines attached to the cloud can be changed from a home location. There will be an administration access point at every location so that the system is resilient.

Technical Issues

Solution Architecture

The architecture of the cloud is that there will be a private cloud and a community cloud. The private cloud will be available to the company and the community cloud will be made available to clients. Little of the platform will be made available to the clients. In the community cloud most of what will be available will be storage.

SLA

The SLA will be different depending on the service acquired. If amazon services are used, then the agreement is by hour. If Microsoft services are used, then the agreement is by a time lease. There will be a different SLA for employees of the company and clients that are using the storage services. There should be agreements between the company and the provider, and then agreements between the company and the client. Part of this agreement will restrict for security purposes access to the cloud technologies after a contract has been terminated.

Security Requirements

The security requirements of the cloud are extensive due to the sensitive nature of Acme's projects. Their needs to be extensive encryption on storage using PKI technology. The provisioning of access to the storage needs to be allocated by project. This is done on an administrative level. Administration of the systems is restricted to authorized personnel only. The cloud services allowing for the centralization of administration will strengthen security issues. Cloud services will not be offered at home and employees are required to do all work at authorized facilities. An intrusion detection system needs to be in place, and a demilitarized zone created at each location. Login remotely to storage will have two-point authentication technologies and logins will only be created for authorized personnel. To decrease outages there will be a bare metal cold site prepared in Arizona storing backups to the company work. This will eliminate down time and provide assurance in case of disaster.

Governance Requirements

The administration of the cloud needs to be done at Acme. All data and technologies created in the cloud are included in licensing agreements. Access to the storage will be administered by Acme as well. Because of the reduced cost the offering of the cloud services will be controlled by Microsoft. Microsoft will ensure that the cloud platform and server are maintained and running. They will work as a partner with Acme to make sure that the facility is running and up to date. No client of Acme will maintain ownership or administration of an of the cloud technologies deployed.

Interoperability Requirements

The interoperability requirements are to facilitate communication between facilities and clients. Because of the geographic separation of Acme's facilities, many separated facilities need to be able to

exchange information and storage. By making all of the systems run on controlled platforms with cloud storage, these facilities should be able to collaborate easily. In addition to the need to communicate between facilities, there is a need to communicate with clients. The extranet access to certain cloud storage folders will help facilitate this communication. If need be a station with the platform could be installed at client facilities.

Portability Requirements

Because of the geographic distance systems need to be moved from place to the next. Allowing the platform services to be administered remotely, the cloud allows for great portability. A project can move location easily and be set up quickly. This allows all the facilities to be able to collaborate on projects. A person working in San Diego can hand off a project to someone working in Irvine with less than a days set up. For this reason, cloud services are preferable to in house services. In house services with out cloud technologies would hinder projects from being moved from facility to facility. The use of cloud technology would allow the facilities to have greater productivity and teamwork. The cloud also allows a facility to set up a station at a client facility for work with the company team. This kind of partnership will set Acme apart from its competitors making the prototyping process streamlined.

Regulatory Compliance Requirements

Regulations will be somewhat standard to American laws and restrictions. All the cloud facilities are on US soil and subject to US law. This should uncomplicate the licensing of the technology. There are regulatory requirements between Microsoft and the company. There are also regulatory requirements between the company and the client. All these requirements need to be managed with SLAs. The administrative department needs to read the SLAs strictly and come to recommendations as to whether the agreements satisfy their needs. Ownership of the information in cloud storage needs to

be negotiated with client with restrictions as to payment and use. Clients may come to different agreements as to ownership of information on the drives. As the company owns the drives anything on the drives is viewable by administration and nothing in the cloud considered strictly personal. Using the cloud for personal use is prohibited and employees will be subject to discipline with misuse. The company will have a technology use policy and everyone that is an employee will need to agree upon hire.

Migration Approach

The migration of the company from in house services to cloud services will take place is phases. First the home location will be completed in a month. Then, the following month the other two locations in Irvine will be done. Last, San Diego will be added to the cloud services. In the provisioning of the cloud services in house computers will be converted and upgraded. There will be standard software used with the company. This will have a timeline of 3 months.

Economic Factors

Economics is a key factor to the recommendations of this case study. After pricing Amazon's services with preliminary calculations Microsoft's technologies are inherently more affordable. Both services are more affordable than hiring staff to create cloud technologies for the business. To give you an example Amazon's services are priced at about $80,000, Microsoft's at $20,000 and in-house development at $200,000 including salaries and equipment. It seems as if an Amazon migration would cost $100,000, while Microsoft's would be about $30,000. In house at $200,000 is more expensive than all three. For this reason, it is the recommendation of this case that Microsoft products should be used with a migration using azure. Amazon estimates were created calculating an average work week for 100

employees. Its metrics are employed by the hour making it more expensive than the Microsoft lease for three years. Calculations were made to make the pricing comparable and you will see that the Microsoft offerings are clearly more affordable.

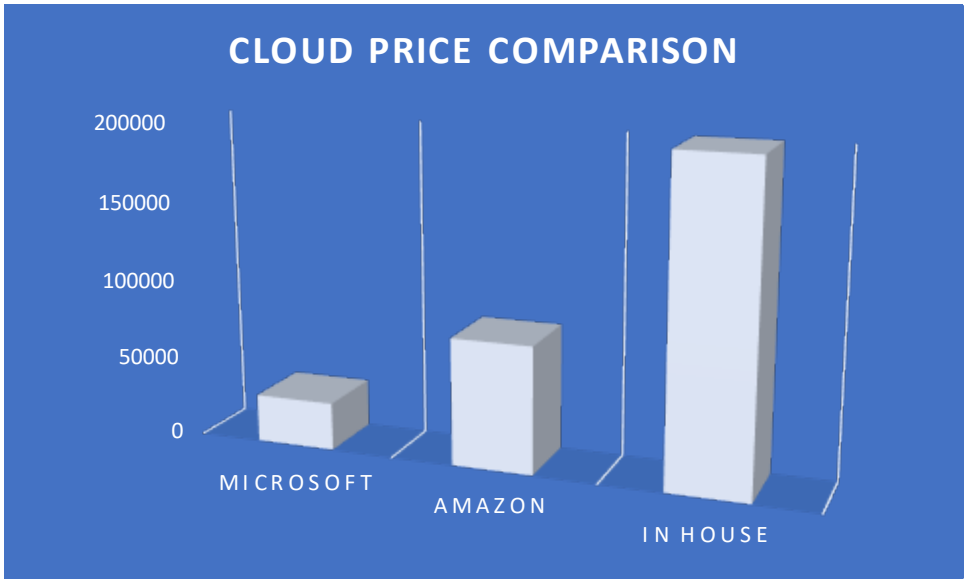

Figure 1.2: Graph of Price Comparison

Conclusion

In conclusion, Acme can provide more technology to its company using Microsoft services. This is in comparison to Amazon services and in-house services. This will reduce support costs and help the company communicate with its clients. It is the recommendation of this case that two solutions be sought after. First, a platform as a service to help upgrade and support infrastructure. Then, storage as a service used to make files portable and secure. Encryption technologies should be used to ensure security and careful consideration should be taken in creating the user license. The use of cloud technologies can reduce costs and provide much needed upgrades making sure that collaboration is not held back by technology. The added benefit to following this direction is that expanding will be quick.

Switching to cloud technology will make Acme's plans of expanding to San Jose and Los Angeles an affordable reality.

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