Ethical Hacking Group Proposal Draft:

Cloud Computing

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The Origins of cloud computing started in the early sixties where the idea of a computer network existing in an intangible world was introduced. The name is derived from this place where its accessibility is in a far distance, hence "cloud". In the 1960's, computer scientist J.C.R. Licklider had a huge influence in the achievement of cloud computing. His goal was to make it accessible to everyone from any location.. Around the same time a computer scientist by the name of John McCarthy pioneered the vision of "the intergalactic computer network" or "public utility". McCarthy is credited for developing the early stages of time sharing which are servers that ultimately lead to cloud computing. In the 1970's the first virtual operating system was released and later in the 90's hypervisor was released which further improved the functionality and capabilities of cloud computing. The increased rate of bandwidth paved the way for cloud computing to be implemented on a larger scale because of the internet. In 1999 salesfore.com pushed the online industry by providing enterprise applications delivery through a website potential of cloud computing. They implemented the delivery of computer services through the internet. However it wasn't until Amazon who came along and began to use cloud computing to modernize their data servers. In 2006 they launched Elastic Compute Cloud (EC2). This allowed individuals to rent computers where they can run their own computer applications. They introduced the first open source for deploying private cloud. In the year 2007 research on cloud computing was undertaken by companies like Google and IBM. Google introduced browser-based enterprise applications, making servicing reliable and easy to consume. Organizations slowly began switching from company-owned hardware to cloud services. This lead to 2010, where cloud computing was facilitating proficiency to various companies. Clouds versatility most essential features were voted on by many companies on a nationwide survey. Seventy seven percent said efficiency, sixty eight percent said it reduces the capitol of cost and sixty one

percent said it eases staffing issues. It was obvious then and still is now that cloud computing will be the formidable approach in the years to come.

Although the concept of cloud computing has been around for many decades, it is recently beginning to increase in popularity. Dropbox provides services to almost all the Fortune 500 companies. Companies that provide cloud services have become a major part in business operation, from large scale companies to mom-and-pop stores. One of the reasons for companies increase reliance in the cloud is that businesses are realizing the advantages of cloud computing which include reducing operational cost, increasing reliability, increasing storage capacity and great adaptation to growth.

Cloud computing can increase businesses profits by reducing a company's Information Technology related expenses. This cost effectiveness can be implemented both with software and hardware. Dropbox for example, is a cloud service that allows the user to store large amounts of data that can then be access through another computer. In a small scale, Dropbox eliminates the need of a USB flash drives, but on a larger scale it can save thousands of dollars by eliminating the need for a company to buy many hard drives. Decreasing the amount of hardware, such as servers, routers, or switches will also contribute to a lower consumption of energy for the company. Installing software suites in every computer can be a bit expensive for a company as well; with cloud computing software can be accessed from any computer eliminating the need to buy and install software for every computer. Microsoft Office Premium can cost up to 400 U.S. Dollars and can only be installed in one computer only. In the other hand, Microsoft offers a cloud version of the office suite for $150/year and can be install in up to 5 computers. Another way that cloud computing can reduce expenses is by eliminating the need for IT maintenance. Cloud services are maintained by the service provider eliminating the need for staff to fix and

maintain any IT related issues. Cloud computing also allows the flexibility to pay for services as the company needs them. Many companies would require extremely large storage capabilities as well as many servers to handle output spikes during seasonal events only. The cloud allows a business the flexibility to increase its bandwidth in order to handle seasonal spikes when the business requires it.

Using the cloud can add flexibility for a company that is expanding and increasing its workforce. Installing software on the computer of every new employee can be challenging and time consuming for a fast growing company. Cloud computing can minimize the time and the effort needed to equip every new employee as the software and storage capabilities are already available through the cloud. The cloud also dramatically increases the company's mobility. A company that uses cloud service can access any of its resources anywhere there is access to the internet. The cloud can be accessed through a phone, tablet, desktop or laptop therefore increasing the mobility of the business. A user can travel to another state or even another country and still access the same resources through the cloud as he or she would from her office. Another advantage that the cloud has over a "regular desktop setup" is an increase in space. Using the cloud will minimize the amount of hardware a company needs to operate its business therefore increasing the amount of space that can be utilized in a building for other aspects of the business.

With all the advantages and services that cloud computing can bring to a company, it is still advisable that a knowledgeable IT staff and company executives determine if the cloud is appropriate for the what the company is trying to achieve. There is no perfect network infrastructure. Determinations need to be made with regards to implementing the cloud and to what extent the cloud will be used. Different cloud providers offer different services at different costs therefore, companies need to select a provider that matched their needs. But before making

the decision to join a public cloud, the company needs to be aware of the disadvantages that come with implementing the cloud in a business. Examples include no control over maintenance operations, and security concerns.

Companies that utilize cloud service lack maintenance control, or in other words, the reliability of your business is on someone else. This can create issues when outages or other technical difficulties arise with the cloud service provider. Some companies have tried to circumvent these control issues by creating private clouds but these can be very expensive.

Another major disadvantage with the cloud is its security. Companies lack security visibility and risk awareness. But what is lack of security visibility? As with any general term, lack of visibility translates into a lack of understanding, awareness, and a questionable comprehension of risks and factors that could potentially harm the benefactor. This is the case for many companies namely in the private sector of the modern era. In light of the transition to the cloud, organizations must be aware and able to recognize this so called lack of visibility. By doing so they can gain an insight on how to leverage controls based on the information they rely on. Simply put, companies must design an infrastructure in which controls and warnings are set at many different levels of data logging to discriminate areas that may not be affected from a data compromise. This in result leads to more efficient responses to data leakage, malware attacks, breaches, data corruption and/or other forms of compromise of the system's integrity. In specific terms, when files are modified more frequently, resource usage is higher than normal, etc. There should be a way to log information in all applications and perhaps even set systems up to generate alerts when suspecting an intrusion.

Nonetheless, some software companies are trying to distinguish themselves by implementing an extra level of security feature in their services. Google in this case has invested millions of dollars into moving data into the cloud and states that security is a fundamental area at the core of its products. Such is also the case for other large companies such as Amazon, IBM, and SAP to name a few. There exist some issues in the standardization of cloud security though. Companies like IBM, Cisco, SAP, and EMC have previously announced that they had all taken part in the creation of an "Open Cloud Manifesto" stating the need for a more consistent method of cloud security and monitoring of its services. However, being rooted in a nation of capitalism and competition, other companies like Microsoft, Amazon, and even Google which prides itself in its security as previously mentioned, opted out of the agreement saying that this "Manifesto" is only a way to further the author companies' agendas. Another concern to take into mind is that standardization of security protocol in the cloud could do more harm than good in these early stages of the service, causing restrictions that would hinder the development of this new technology. It is obviously not a light issue speaking about security, but if private companies want to take advantage of all the cloud has to offer, then they must amplify their security policies.

Cloud Computing can be used for many different applications. The applications of Cloud Computing are limitless. Cloud Computing allows for a computer terminal to access any data from anywhere on the globe. This means that software could be saved on the cloud computing system and the user accesses the software from a terminal. Because the terminal for the system can be used from anywhere in the globe it allows the user to take the software with them in a sense. What makes this even better is that any data that would be saved with that software can be saved to the Cloud Computing System allowing the user to access the software and the data he or

she has saved with that software. As an example a user could access Microsoft Word through the Cloud and after making a new document they could save the document they created to the Cloud. They could then access and modify the document from any computer terminal that can access the cloud.

Cloud Computing can also be used to centralize all of the IT work for a company. By making all of the employees work through computer terminals it will allow the company to consolidate all of its hardware in one location. This means that the company would require fewer employees to run all of the hardware necessary and all of the data that employees work on would be consolidated in one location as well.

With all of the hardware in one location it makes it easier to hold virtual meetings and contact everyone on the system. It also allows for a business to outsource their IT department. This would mean that their data is held by another company who does all of the work for them.

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