The different cloud providement models are public private and hybrid. The pros of using the public cloud are that it offers lower cost to enter compared to the private and hybrid cloud. The public cloud also requires not as much maintenance since the cloud provider does the maintaining of the system. On the public cloud there is higher scalability. You can easily request more resources to be allocated on demand bc of the multitude of data centers around the world. Additionally in regions that are close to data centers there is higher reliability. The pros of using a private cloud is that you can easily customize the private cloud according to your needs. It is more likely for you to be able to optimize your resources in the private cloud as you can control what resources to keep. The private cloud is also better in terms of security. Higher security is possible on a private cloud as you have full control over the security policies that govern your data in your own private cloud (not shared with other users). In some cases, a hybrid cloud is preferred which utilizes resources from both the public and the private cloud. A use case of this model is when a business puts their private resources (things that they would not want to lose if a security breach occurs. For example bank account passwords) on the private cloud and the rest of the data goes on the public cloud. This model is very cost effective and secure. The only issues that comes into play is making sure your data infrastructure supports both models. Will your public cloud provider and private cloud be able to do hand off of data effectively and safely as previously public data can become private and vice versa. Additionally, using the hybrid cloud models allows IT managers to combine use of 1+ public cloud providers (i.e. Google Cloud and AWS COMBO). On the cloud there is a concept called cloud bursting which is heavily

practiced in this hybrid cloud model. When a workload (In cloud computing, a workload is the amount of work that the computer has been given to do at a given time) exceed the capacity of the private cloud the rest of the data is migrated to an external public cloud.In the future, if demand for computing and computing resources decreases these additional jobs can be put back into the private cloud servers. This goes hand in hand with autoscaling as well. Elasticity is one of the features any cloud must have (public or private, according to NIST). Specifically, Rapid Elasticity is referred to the ability to scale resources down or up as needed by the user. Although cloud providers are required to be elastic it is also highly advisable for them to have service level agreements. Auto-scaling also goes hand in hand with elasticity. Autoscaling enables cloud providers to automatically scale cloud services up or down based on predicted need. For example AWS uses autoscaling to automatically add new servers to support an existing service when more customers are using it and service may be slowing down. Generally, each cloud provider has a SLA (service level agreement), which is a contract between a customer and the service provider.

Chapter 4 also discuss the features of private and public cloud such as interoperability of cloud computing. Interoperability is the ability of different information technology systems and software applications to communicate, exchange data, and use the information that has been exchanged. Interoperability also gives the user the ability to decide where to go based on need. However, currently this is not 100% possible as

most cloud providers provide a lot of different features which leads to cloud vendor lock in and the mainstream user does not adopt the cloud.

Most cloud computing services fall into 3 different categories: Infrastructure as a Service (IAAS) , Platform as a Service (PaaS) , and Software as a Service (SaaS) as mentioned in chapter 3. SaaS allows users to use applications running on a cloud infrastructure. In this case the user does not need to worry about memory,storage, OS, and CPU types required to run the application they are trying to use. Another term also mentioned in chapter 3 is virtual machines. Sometimes, Virtual Machines are used to run SaaS applications. As I learned through my experience with Project 1 where we mass produced VMs. A virtual machine is an emulation of a computer system. For example an emulation of my laptop would be a Windows 10 Operating System with X amounts of memory,ram,etc,etc. To build on top of this concept we have a virtual machine monitor. A VMM (Virtual machine monitors) allows customers to simultaneously run multiple different Operating systems on a server. This is super helpful in the case of software developers wanting to roll out nwe updates for their applications. They now know immediately how their product will run on a multitude of operating systems (speedens the app deployment process).

Another part of the the cloud computing pyramid is Platform as a Service (PaaS, middle level of the cloud computing pyramid). Unlike IaaS (lowest level of the cloud computing pyramid) the user does not have to worry about underlying hardware,CPU, storage,and/or memory capabilities in platform as a service. They are able to obtain

applications using libraries, programming languages, and tools provided by their cloud provide or deploy onto the cloud infrastructure created by the consumers.Last but not least Infrastructure as a Service (IaaS) enable to user to oversee storage,networks, CPU processing and other computing resources (generally very low level aspect of computing) involved with the deployment of their software. SaaS , PaaS, and IaaS are hardware/software cloud services that are made available to small and medium businesses and the public by cloud service providers. These cloud deployment models have the ability to self service. Self serviving facilitates customer provision of applications,servers,storage, and application running without the help of an individual in IT.

You may be wondering what the difference between the internet and cloud computing is. I definitely was wondering that when I was reading through the perusall sections that were assigned to us. The internet simply put is a global network of interconnected computers. The cloud is much more fabulous than the internet as it uses the internet to deliver resources which are usually only available locally. However this doesn't mean the internet is lame and obsolete. The following concepts also intrigued me throughout my reads. I learned that HTTP (Hypertext Protocol) is the communication protocol used receive and send websites and/or files on the internet. HTTPS (Hypertext Protocol Secure) on the other hand is a secure version of HTTP. All websites are written in HTML which reminds me of one of our tasks in project 2 where we need to write a HTML file that is displayed on our tamu website.