

Cloud Computing: Everything is a Service

In the previous module, you were introduced to Utility Computing, one of the concepts that shape Cloud Computing. In this module, you will learn how Utility Computing is put to practical use in Cloud computing in the form of the Everything-as-a-Service model. Later in this module, you will also learn about the advantages and disadvantages of cloud computing.

By the end of this module, you should be able to:

04_Obj01: Define important terms such Everything as a Service, Product, Service, etc

04_Obj02: Identify the main categories of XaaS

04_Obj03: Identify the examples of each category of XaaS

04_Obj04: Identify the advantages and disadvantages of Cloud Computing

Everything as a Service

To recap from the previous module, service is any task that a server does for a client. This definition also applies to Cloud Computing. Everything-as-a-Service is the umbrella term for all Cloud-based computing resources that are made available to users in an on-demand basis. Everything-as-a-Service is commonly abbreviated as XaaS; in reference to Algebra where X is used as a placeholder.

These resources are provided as services instead of products. Here's the difference. A *product* is something that you purchase once, like a television. After the purchase, the manufacturer may provide you with some warranty or product support but you ultimately have full ownership. You can use it, not use it, sell it, or break it, because you own it. A service on the other hand, is like a movie theater. You don't purchase the whole thing; you just pay to use it for a certain amount

of time. You don't even have to pay for the entire facility. You just pay for the one seat that you use.

XaaS has three main categories: Software as a service (SaaS), Platform as a service (PaaS), and Infrastructure as a service (IaaS). You may encounter other terms like Storage as a Service (STaaS), Security as a service (SECaaS) or Network as a Service (Naas) but a closer look will reveal that they are just sub-categories that fall under the three main categories.

Software as a Service (SaaS)

Software as a Service is a model where applications are made available by vendors to users over the Internet. The users do not have to develop the software themselves. They don't even have to install the entire software in their computers. In many cases, they can just access the apps using a web browser like Google Chrome or Firefox. The following are examples of SaaS:

1. Microsoft Office 365

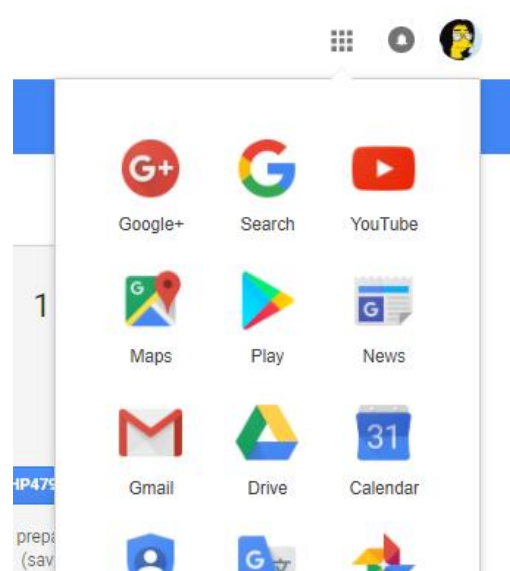


File:Office 365 2013.svg. (2017, May 22). Retrieved July 29, 2017, from https://en.wikipedia.org/wiki/File:Office_365_2013.svg

Microsoft Office 365 is the cloud-based version of Microsoft Office. It is available for both home and business use. Along with the familiar Microsoft productivity software such as Word, Excel, and Powerpoint, subscribers also gain access to Cloud storage. (Home package includes 1 terabyte) and Skype.

2. Google Apps

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Screenshot. Retrieved July 29, 2017, from <https://mail.google.com>

You may know Google for its Search Engine. What you may not know is that Google also offers several cloud-based apps. Anyone with a Google account (the one that you need to access Gmail and log in to Youtube) can access Google Apps for free. Here are some of the most useful Google Apps:

- Google Docs – word processor (like Microsoft Word)
- Google Sheets – spreadsheet (like Excel)
- Google Slides – presentation (like Powerpoint)
- Google Hangouts – chat, video call, voice call, etc.

G Suite is the name given to Google Apps for paid business use. G Suite has all the same apps available to free users plus excluding features such as custom email addresses ([@\[companyname\].com](#) instead of [@gmail.com](#)), bigger cloud storage, and better customization,

3. Zendesk



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Zendesk Logo. (n.d.). Retrieved July 20, 2017, from https://en.wikipedia.org/wiki/File:Zendesk_logo_RGB.png

Zendesk is a customer service software company. They provide a family of software applications that are designed to help businesses perform customer service tasks. This includes a ticketing system for documenting customer interactions such as emails and phonecalls. Zendesk also provides a live chat application tht can be attached to a company's website so customers can have real time conversations with company representatives.

4. Dropbox



Dropbox Logo. (n.d.). Retrieved July 20, 2017, from https://en.wikipedia.org/wiki/File:Dropbox_logo_2015.svg

Dropbox is a cloud based file hosting service. Its main feature is cloud storage. It lets you upload any file type. Dropbox can show previews of certain file types such as .docx, .pdf, .xls, .jpg, .png, etc. Another key feature is synchronization. You can access your dropbox account from multiple devices such as computers, phones, and tablets. This means that you will always have access to the latest versions of your files wherever you log in. Dropbox also allows you to publicaly and privately share your files with others. The basic dropbox account is free but only has 2 gigabytes of storage. Paid accounts currently range from 1 terabyte to unlimited space.

5. Slack

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Slack provides collaboration tools and services for businesses. Slack's main feature is team collaboration. It allows users to create groups called channels where members can send chat messages, share files, and have voice and video calls. Slack also automatically creates an archive of all interactions which can be easily searched by the user.

Platform as a Service (PaaS)

To create a software application, you need to have a platform. In computing, a platform is an environment where a program can run. The components of a platform include but are not limited to infrastructure, operating system, and database. Once you have all the required components, then you can build and test your application. Once you're done, your platform can also host your application; keeping it running so that it will be available to users.

Platform as a Service packages these components and offers them to users in an on-demand basis. It provides users with a single environment where they can create, test, manage, and host their applications. PaaS providers manage the platform. The users only have to worry about managing their application.

Infrastructure as a Service (IaaS)

In Information Technology, *infrastructure* refers to the collection of hardware resources that are needed to run an organization or a system. It includes physical assets such as servers, storage, networking and even the facilities that house them.

Infrastructure as a Service gives users access to virtual versions of these resources. This is made possible through virtualization, which was discussed in the last module. IaaS enables users to create cloud based virtual structures that mimic real-world infrastructure.

SaaS Vs PaaS Vs IaaS

It may be hard to differentiate SaaS, PaaS, and IaaS. The “as a Service” part is easy to understand. Just take Utility Computing into consideration. Now, to better understand the differences between infrastructure, platform, and software, let’s use a house analogy:

Infrastructure is like buying materials to build a house. You need to buy wood, cement, etc. from different vendors. After you purchase the materials, you still have to build the actual house.

Platform is like buying a house. You don’t have to build it yourself. Someone already built that for you. You may have a complete house but it’s still an empty house. You still have to decorate, arrange furniture, etc. Eventually, if something breaks, you have to repair it.

Software is like checking in to a hotel. You don’t have to worry about design, construction, and maintenance. You get to enjoy all the features minus all the effort.

In reality, the XaaS categories are normally interconnected and in many cases, they even overlap. Here are popular examples of vendors that provide all three XaaS categories.

1. Amazon Web Services (AWS)



File:AmazonWebservices Logo.svg (n.d.). Retrieved July 20, 2017, from https://en.wikipedia.org/wiki/File:AmazonWebservices_Logo.svg

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Amazon Web Services is a company that is a subsidiary of Amazon.com that offers many cloud based services. AWS is mainly an IaaS provider but many of its services fall under the PaaS category. They also offer tools that fall under SaaS

2. Microsoft Azure

Microsoft Azure

File:Microsoft Azure Logo.svg (n.d.). Retrieved July 20, 2017, from https://en.wikipedia.org/wiki/File:Microsoft_Azure_Logo.svg

Microsoft Azure is a cloud computing service provider owned and operated by Microsoft. Microsoft Azure currently offers more than one hundred services that fall into different XaaS categories.

3. Google App Engine



File:Google App Engine.svg (n.d.). Retrieved July 20, 2017, from https://en.wikipedia.org/wiki/File:Google_App_Engine.svg

Google App Engine is a cloud based platform for developing web applications. While Google App Engine is marketed mainly as PaaS, it also has some IaaS features.

Advantages of Cloud Computing

Now that you have a good understanding of how cloud computing works and how it is used, let's take a look at its effects. The following are the major advantages of cloud computing:

Cost Savings

Subscribing to cloud services is usually cheaper than purchasing resources and employing people to build and maintain these resources.

Scalability

Cloud based infrastructures are easier to upgrade and downgrade. Traditionally, if a company wants to reduce its operation, it's going to be stuck with hardware that it doesn't need anymore. With cloud infrastructure, the company just has to downgrade its subscription.

Reliability

Cloud services can be more reliable than in-house resources. Major vendors have facilities in different countries so even if one location goes down, there are usually several backups that are ready to go.

Manageability

Cloud resources are usually well-organized because they are offered as service packages. Some complex services such as platform and infrastructure can be accessed using Internet browsers.

Strategic Edge

All these benefits of cloud computing can give a business a competitive advantage.

Disadvantages of Cloud Computing

Of course, with the benefits come the challenges. Here are some disadvantages of cloud computing:

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Internet dependence

Cloud computing relies completely on the Internet. When your Internet connection gets interrupted, you will lose control of your resources. On the other hand, with in-house resources can still maintain some measure of control through local networks.

Security

Cloud computing requires organizations to give vendors access to their data. This is a major concern for businesses that deal with highly sensitive information.

Vendor Lock-In

It can be hard to switch vendors especially for users that develop their applications on commercial cloud platforms. If a developer has to move to a different vendor, then they might need to make extensive alterations in their code.

Limited Control

Even if cloud services are highly scalable, there are still limits to the the level of control that is granted to users. On the other hand, having your own resources gives you full control.

Technical Issues

Even if reliability is one of the major benefits of cloud computing, technical issues still can't be avoided. Furthermore, having a 3rd party provider means that you have to rely on them to solve the issues on their side.

Glossary of Terms

PRODUCT – is something that you purchase once

INFRASTRUCTURE – refers to the collection of hardware resources that are needed to run an organization or a system

SERVICE – is any task that a server does for a client

EVERYTHING-AS-A-SERVICE – is the umbrella term for all Cloud-based computing resources that are made available to users in an on-demand basis

SOFTWARE AS A SERVICE – is a model where applications are made available by vendors to users over the Internet

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