

Assignment 1

by Shannon Louise Wallace

FILE	17882_SHANNON_LOUISE_WALLACE_ASSIGNMENT_1_314647_174500559 2.DOCX (50.9K)		
TIME SUBMITTED	06-JAN-2021 05:00PM (UTC+0000)	WORD COUNT	2334
SUBMISSION ID	141032865	CHARACTER COUNT	12260



NETWORK PROGRAM



shannon W
1901768 [Company address]

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Introduction

This report is about cloud computing, roles, rest web services. The report will also attempt to show an understanding of the evolving world of network programmability and how cloud computing will impact not only this industry but many industries as a whole. The report also tells you about the different types of models and services clouds. The report will also explain standards, why they are needed and the service they provide. Networking as a whole had never had such a great impact on the software industry and this report addresses that. This report also goes into depths of cloud computing and what it is about.

Cloud Computing

What is Cloud Computing?

[1]"In the simplest terms, cloud computing means storing and accessing data and programs over the internet instead of your computer's hard drive" [1]

You don't need a storage device to save your work you just need a good stable internet connection to save your information over the internet. You can manage and access your information by using a cloud such as OneDrive. There are different types of cloud computing. Cloud computing have a development model, and a service model. Which are listed below.

You have a development model which are:

Public Cloud

The public cloud is accessible to everyone. It is offered by third-party providers. Anyone can use or buy public cloud. It is more accessible, and backup of data is simpler. It is on the internet.

Hybrid Cloud

A hybrid cloud is a rent cloud which is a service you pay for once a year or once a month depending on the subscription you buy. It is a lot of traffic if the service is getting used. It is on the internet but also can be private for organization.

Private Cloud

A private cloud is owned by a user and used privately. Private cloud needs configuration but still good to use! It is inside the organization network.

You then have a service model which are IaaS, PaaS, and SaaS. Which are here:

Software as a service (SaaS) –

What is software as a service?

[2]Software as a service allows users to connect and use cloud-based apps over the internet. [2] It is focused on using the software. Examples would be email, Netflix, Disney+, OneDrive, and Cisco WebEx anything that has a cloud and is interactable by using a cloud.

SAAS is also a subscription (Most of the time) – Pay services such as Disney+, and Netflix. It is also accessible anywhere. It doesn't require hardware and platform-independent

It has its positives that can access anywhere and any platform but it has its negatives such as internet reliability.

The users for SaaS would-be customers who are paying or using the software application.

Infrastructure as a service (IaaS)

What is an infrastructure as a server?

Pay to use the cloud – examples would be website hosting, web apps, big data analysis, high-performance computing, storage, and test and development. The users would be mostly IT admins.

Platform as a service (Paas)

What is a platform as a service?

Platform as a service is different compared to others. Paas is based on programming languages. The operating system, a web server, and a database. It is platform-based.

PAAS manages data and the resources of the application. Examples of PAAS providers are amazon web services and google app engine. The users would be software developers.

Desktop as a Service (Daas)

DAAS allows you to use virtual apps and desktops. A service provider that provides a virtual desktop using a paid service where you must pay them for them to host. An example of DAAS is VMWARE Horizon cloud.

The image below shows how the services work, and what they work with:

	Data centre	Network/firewalls	services/storage	Operating systems	Developer tool	Hosted Applications
SAAS						
PAAS						
IAAS						

The cloud computing services/industry has impacted multiple industries such as banking, retail, education, manufacturing, and hospitals. They all use cloud computing for different reasons.

- **Server**
- **Storage**
- **Networking**
- **Software**
- **Databases**
- **Building applications**

It has impacted multiple industries for the good. It has made people's lives easier and has increased productivity. Cloud computing has made it more organized. It allows users to easily develop, test, maintain the infrastructure of IT. It is not a physical hardware change. It has allowed users to transfer data over the internet which created more jobs in engineers, cybersecurity in industry, and many other IT related jobs.

IAC which stands for infrastructure as code. IAC is based of code rather than physical hardware.

However, there are advantages and disadvantages to cloud computing.

The advantages are:

- **Cost** – Cloud computing saves money by not having to buy hardware, and software.
- **Speed** –Cloud computing also saves time. Easily transfer a file in minutes, and hours.
- **Global** – Cloud computing allows easy access the cloud anywhere that you may be.
- **Reliability** – Cloud computing also is reliable. Its backups data and recover data.
- **Productivity**- Productivity would be increased due to cloud computing can be access anywhere.
- **Security** - Cloud services offer policies, technologies, and controls. It is set up with a software and it helps prevent attacks, and data getting stolen.
- **Jobs** – Increased jobs in other related IT jobs such as cyber security

The disadvantages are

- **Hacking/security** - Even if the security is an advantage it is also a negative. Cloud computing is not that secure yet. The NHS has been affected multiple times in the last 2 years recently in 2020. The recent one was “Password Spraying”.

[3]Password spraying is a commonly used style of brute force attack in which the attacker tries a single and commonly used password against many accounts before moving on to try a second password, and so on [3]

Someone is basically guessing the same COMMON password but using different accounts to access it. So password like Password!1! is something someone would try and guess or like Mam194.

- **Technical Issues** -

[4]“Businesses should be aware of the fact that this technology is prone to outages and other technical issues” [4]

Cloud computing can have a lot of issues such as the cloud service provider going down if you're on a public.

- **Downtime** – reliable of a secure connection
[3]"cloud computing makes the small business dependent on the reliability of their internet connection." [3]
You would need a stable internet connection to be able to transfer large amount of data.
- **Support** – Issues with support that is offered from cloud computing

Network Professionals

Network professionals have evolved to meet the technical challenges of the cloud, and work together to be able to make it safer and reliable to use. Many jobs relating to IT play a part in cloud computing. Certain job roles would've needed training for cloud computing. They must learn certain aspects of cloud computing so they would have to adapt to cloud computing and learn new abilities, so they are able to keep up with the new businesses.

[5]"Infrastructure roles such as network administrator, database administrator and storage administrator must calibrate skills to cloud scale infrastructure." [5]

Software engineering and development also takes part in cloud computing as well as data engineering. IT roles must adapt to cloud transition. Cloud computing opened more jobs in these areas due to businesses needing them for security and managing it.

Cloud is big and it is separated into three categories. These categories below are important to cloud services and it tells you more about cloud computing. Hardware and software services. They are remote servers. They store, manage, and process data. This information should show how software engineers and database administrators collab together to be able to work on these services.

RESTful services

RESTFUL stands for representational state transfer application programming interface. It is an API which stands for an application programming interface. API is built up of definitions and protocols. Rather than **just** HTML. It is provided by one piece of software. REST works with cloud computing due to it is set up that it just required a stable internet connection. It gets data from an API to and gives it to the client but you can also get, create, update and delete.

Web servers /restful servers have made it easier for people to host websites and allow them to translate other programming languages rather than just HTML. It also allows the software-defined network to communicate.

It formats the request to the suitable adjustment, which is how the API works based upon HTML, image, XML, or JSON.

REST relies on a stateless, client-server protocol such as HTTP. It is an architecture style for designing networked applications. REST can be used in virtually any programming language.

REST web services URLs should be basic naming such as the below examples.

If you click a link – you are sending a **request** from a web server and then the web server **responds**. –

HTTPS would be a protocol – **website** would be a host and **dogs** would be the resource.

<https://website.com/img/dogs/dog.png>

This broken up into 3 categories so a web server can respond to this.
BUT how rest translate it is based on VERB + HTML and then responds with IMAGE, XML OR JSON

The HTTP verbs comprise a major portion of “uniform interface”

HTTP METHODS:

GET: requests web page or an object from server

PUT: sending documents to server

POST: data or information about client to server

DELETE: deletes an object

HEAD: requests for data about a web page or a document

OPTION: server capabilities

TRACE: trace proxies or tunnels from client to server

CONNECT: connect to see if connection between client and server

Software defined networking

What is software-defined networking?

Software-defined networking virtualizing the network. It gives you control and visibility of the network. You can build and change the network. You can program it instead of physically changing a network. You can change the traffic priority. The software-defined network allows the user to be in control of the network and can see where there are issues that need to be solved this allows the traffic to be more efficient. It will work better with the software that the company is providing.

SND:

- Traffic engineering
- Security
- QoS
- Routing
- Switching
- Virtualization
- Monitoring
- Load balancing
- New innovations

THE SDN has 3 layers which are:

Application Layer: business application
REST API V

Control Layer: network services – control software's

Infrastructure layer: network devices

Software defined networking has a programmable switch instead of a hardware switch. It also has a control plane, and data plane. The layout is different compared to the traditional network.

The traditional network requires hardware and software. SND has become heavily adapted by the industry because of software, and cloud computing. It has allowed data to communicate with each other easily. Traditional network has control plane, and data plane but they are using a switch.

Standards

JSON

What is JSON?

JSON stands for JavaScript object notation. It can be used with any programming language. JSON supports program languages such as PHP, Python, C#, C++, and Java. It is text-based, and humans can read the programming language easier. It is mostly used to exchange information between web clients and web servers. The language is better to use due to the fact it is simplistic terms, as well as readable, unlike some other code. For example, YouTube uses it. Google maps also use JSON. It supports strings and numbers.

JSON AND REST

Every industry will have some form of standards. JSON and REST are some of the standards that are selected for the programming industry. The reason why standards exist to ensure that multiple software can be used in conjunction. We didn't have standards for software. The software would require their own compiler/software. If you combine REST, and JSON together then it becomes RESTful API. It allows you to get data. Restful API communicates between client and a server.

What is an API?

An API is like an application. An example of an API being used is Apple Weather application, it uses a weather API which is from another user data. API allows to exchange data easily in software. Alexa is also another example of using API, you must configure your smart lights through another company data. APIs easily allow you to access data using another company/organisation data. It allows you to connect and see the data.

Conclusion

This report concludes that researching has helped me to understand how cloud computing has impacted the industry and learned about the different types and models of cloud computing. This research has also allowed me to see how network professionals have evolved to meet the technical issues of cloud computing as well as creating new jobs in cyber security. Cloud computing and RESTful services work together. It was great to learn about the HTTP methods as well as how RESTful services work compared to HTML. Software-defined networking which is short for SDN was interesting to learn about and how much has it changed from physical things to "virtual" or not face-to-face changes. The key point of this would be virtualization. Also, learn more about JSON and why it is better to work with instead of other languages.

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Assignment 1

GRADEMARK REPORT

FINAL GRADE

55/100

GENERAL COMMENTS

Instructor

Engagement with Literature Skills (40): 15

Knowledge and Understanding Skills (30): 20

Cognitive and Intellectual Skills (20): 12

Transferable Skills for Life and Professional Practice (10): 8

A reasonable report overall Shannon, if a little lacking in detail in a few key areas. The quantity and quality of sources could both use a little work - these are mostly non-authoritative web sources.

Overall a fairly well structured report.

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