

# PHYSICS PRACTICAL SHEETS

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Chapter 6

1. What is Web service? Differentiate SOAP and RESTful.

Web service is structured method for distributing client-server communication over a network. A web service is a SW module that performs a variety of tasks. A webservice is a SW system that supports interoperable machine to machine interaction over a network.

Key differences of SOAP and REST

- Soap stands for simple object Access protocol whereas REST stands for Representational State transfer.
- SOAP is a protocol whereas REST is an architectural pattern.
- SOAP uses Service interfaces to expose its functionality to client applications while REST uses Uniform Service locators to access to the components or services.
- SOAP needs more bandwidth for its usage whereas REST doesn't need much bandwidth.
- SOAP only works with XML formats whereas REST works with plain text, XML, JSON.
- SOAP cannot make use of REST whereas REST can make use of SOAP.

2. What is Amazon web services?

Amazon web services (AWS) is a platform that allows the development of flexible applications by providing solutions for elastic infrastructure scalability, messaging and data storage. The platform is accessible through SOAP

or RESTful web service interfaces and provides a web-based console whereas users can handle administration and monitoring of resources required, as well as their expenses computed on a pay-as-you-go basis. It is known for its own-demand services namely Elastic compute cloud (EC2) and Simple storage service (S3).

EC2:-

EC2 instances represent virtual machines. They are created using AMIs as templates, which are specialized by selecting the no of cores, their computing power and installed memory. The processing power is expressed in terms of virtual cores and EC2 compute units (ECUs). The ECU is a measure of the computing power of a virtual core.

S3:-

AWS provides a collection of services for data storage and information mngt. The core service in this area is represented by Amazon Simple storage service (S3). The core component of S3 are two buckets and objects. Bucket represent virtual container in which to store objects. Object represent the content that is actually stored. Objects can also be enriched with metadata that can be used to tag stored the stored content with additional information.

### 3. How can you Resource naming/Addressing.

Bucket, objects and attached metadata are made accessible through a REST interface. Therefore, they are represented by uniform resource identifiers (URL) under to s3.amazonaws.com domain. All the operations are then performed by expressing the entity they are directed to in the form of a request for URL.

Amazon offers three different ways of addressing a bucket.

- canonical form:  $\text{http://s3.amazonaws.com/bucket-name/object-name}$
- subdomain form:  $\text{http://bucket-name.s3.amazonaws.com/object-name}$
- virtual hosting form:  $\text{http://bucket-name.com/object-name}$

### 4. What is Google App engine? Why it is necessary?

Google App Engine is an example of platform as service (PaaS). Google App Engine provides web app developers and enterprise with access to google's scalable hosting. It provides a scalable runtime based on the java and python. Applications in google app engine uses & stores data in google Bigtable. If applications are non compatible to google app engine, then application needed to be make compatible with google appengine.

Reasons to use Google App Engine:

- i) Google app engine allows you to build web applications on the same stable and extendable platform which having support facility of google's large no of applications
- ii) It gives facility to use and run applications in Google's data center.
- iii) Easy to understand and implement
- iv) Using google accounts you can use google app engine's services
- v) Google also provides marketing facility to our app.

5. What is Azure platform? What does it include?

To enable .NET developers to extend their applications into cloud. Microsoft has created a set of .NET services which at now refers to as windows platform. Azure is Microsoft's Infrastructure as a service (IaaS) web hosting service and platform as a service both.

Azure includes:-

- i) Azure App Fabric :- A virtualization service. That creates an application hosting environment
- ii) storage :- A high capacity non relational storage facility
- iii) compute :- A set of virtual machine instances
- iv) SQL Azure database :- A cloud enabled on SQL version of SQL Server.

v) sharepoint services:- A document and collaboration service based on SharePoint.

6. What is Aneka. How can it Aneka container is classified?

Aneka is the product of manysoft. Aneka is used for developing, deploying and managing cloud applications. Aneka can be integrated with existing cloud technologies. Aneka includes extensible set of APIs associated with programming models like mapreduce. It also supports clouds like private public and hybrid cloud.

Aneka container can be classified into three major categories:

1. Fabric Services:-

Fabric services define the lowest level of s/w stack representing the Aneka Container. They provide access to the resource-provisioning subsystem and to the monitoring facilities implemented in Aneka.

2. Foundation Services:-

Fabric services are fundamental services of the Aneka cloud and define the basic infrastructure mgmt feature of system. Foundation services are related to the logical mgmt of the distribution system built on top of the infrastructure and providing supporting services for the execution of distributed applications.

3. Application Services:-

Application services manage the execution and constitute a layer that differentiates according to the specific

programming model used for developing distributed applications on top of Aneka.

## 7. List out the open challenges of cloud.

### a. cloud definition:-

There are several attempts to define cloud computing and to proactively propose a classification of all services and technologies identified as such. The NIST working definition of cloud computing characterizes cloud computing as on-demand self-service, broad network access, resource pooling and measure service.

### b. cloud interoperability and standards

The current state of standards and interoperability in cloud computing resembles the early been made, and a few org are leading the path. cloud computing is a service-based model for delivering IT infrastructure and applications which allows interoperability between solutions.

### c. scalable and fault tolerance

The ability to scale on demand constitutes one of the most attractive features of cloud computing. cloud middleware has to be designed with the principle of scalability along different dimension. Designing highly scalable and fault tolerant systems that are easy to manage and at the same time provide competitive performance.

#### 4. Security, Trust and privacy:

Security, trust and privacy issues are major obstacles for massive adoption of application cloud. New way of using existing technologies create new opportunities threat to the security of applications. Lack of control over their own data and processes also poses severe problems for the trust we give to the cloud service providers.

#### 5. Organizational aspects:-

The role of the IT department in an enterprise that completely or significantly relies on the cloud poses a number of challenges from org: point of view that must be faced. One of the major advantages of moving IT infrastructure and services to cloud is to reduce or completely remove the cost related to maintenance and support.

#### 8. Write down the different scientific applications

##### i) Healthcare: ECG analysis in cloud:-

Cloud computing allows the remote monitoring of a patient's heartbeat and data analysis in minimal time and the notification of first-aid personnel and doctor should the data reveal potentially dangerous conditions.

##### ii) Biology: protein structure prediction:-

Biology applications have made extensive use of super computing and cluster computing infrastructures. The computational power required for protein structure prediction

can now be acquired on demand, without owning a cluster. The prediction task uses machine learning techniques for determining secondary structure of protein.

iii) Biology: gene expression data analysis for cancer diagnosis.

Gene expression profiling is the measurement of expression level of thousands of genes at a cellular level. It allows scientist to identify the effects of specific treatments. Gene expression profiling can be used to provide a more accurate classification of tumors.

iv) Geoscience: satellite image processing:-

Satellite remote sensing generates hundreds of gigabytes of raw images that need to be further proceed to become basis of several different GIS products.

g. List out the Business and consumer applications.

CRM and ERP :-

Cloud CRM applications constitute a great opportunities for small enterprises and start-ups to have fully functional CRM software without large up-front costs and by paying subscription.

ERP solution on cloud are less mature and have to compete with well-established in-house solutions.

productivity:-

productivity applications replicate in cloud some of the most common tools that we are used to performing

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on our desktop from document storage to office automation and complete desktop environments hosted in cloud.

Social Networking :-

To sustain this traffic and serve millions of users seamlessly, services such as twitter and facebook have leveraged cloud computing technologies

Media application:-

Video processing operations such as encoding, transcoding composition and rendering are good candidates of cloud based environment

Multplayer online gaming -

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