SE ZG522: Big Data Systems

11 Cloud Computing

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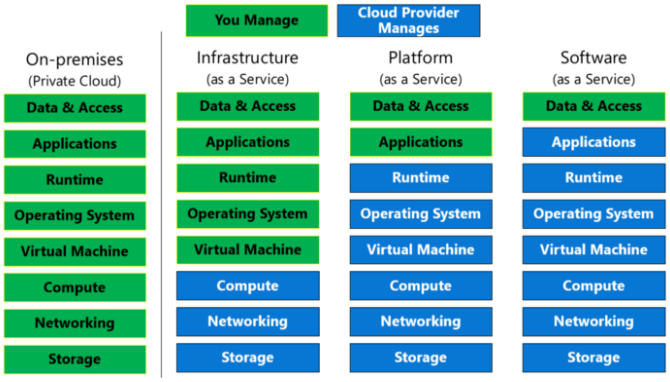
Cloud Computing

- Access data-centers and manage from remote
- AWS, MS-Azure, Google-Cloud, IBM-Cloud, iCloud ...
- On-demond services over the internet
- Pay as you go (could lower operating cost?)
- Security/Reliability comes for free?
- Service Models: Infrastructure as service (IaaS), Platform as service (PaaS), or Sofware as service (SaaS)
- Virtual machines, Web Apps service, Azure SQL Database, Outlook email, calendar, and office tools
- Deployment could be public/private/hybrid or community

Definition [NIST]

A template for providing the suitable and when needed access to the internet, to a collective pool of programmable grids, storage, servers, software, and amenities that can be rapidly emancipated, with little communication and supervision from the provider

Service Models



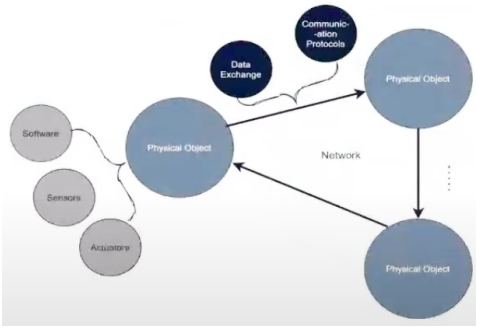
Characteristics of Cloud

- Self service provisioning
- Elasticity
- Hypervisor as middle man provides illusion of having many resources
- Pay per use
- Workload resilience
- Migration Friendly
- Ubiquetus Computing, Broad network access
- Multi-tenancy and resource pooling
- Desaster recovery. Avoids single point of failure

Storage as a Service (STaaS)

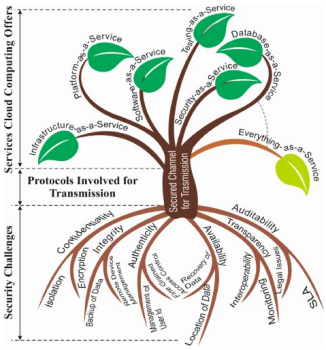
- Backup on cloud
- hosting, securing, maintaining and managing servers
- Forms of storage on the cloud, databases on the cloud
- Cloud database (relational or noSQL), can provide SQL and data security by managing resources

Connected Devices



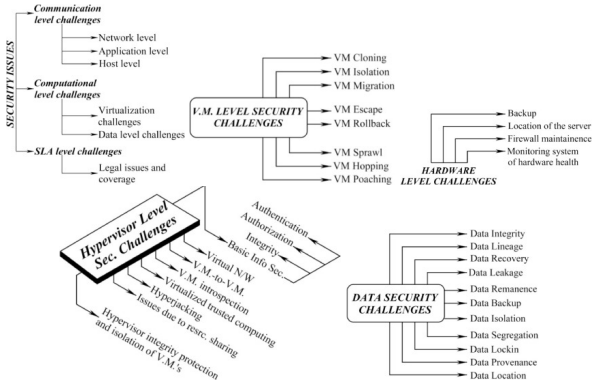
- Software, Actuators and Sensors
- Cloud friendly devices

Security challenges in cloud



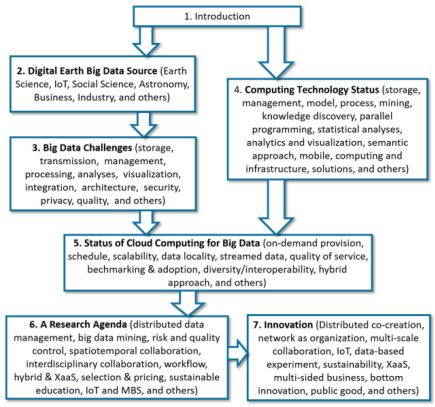
Sharing of pooled computing resources brings basic security requirements. TLS, and SSL are used for the secure transmission of data depicted as trunk of the tree.

Security challenges in cloud [1]



[1] Nalini Subramanian, Andrews Jeyaraj, **Recent security challenges in cloud computing**, Computers & Electrical Engineering, Volume 71, 2018, Pages 28-42, ISSN 0045-7906

Challenges with cloud computing [2]



[2] Chaowei Yang, Qunying Huang, Zhenlong Li, Kai Liu & Fei Hu (2017) **Big Data and cloud computing: innovation opportunities and challenges**, International Journal of Digital Earth

Example

Let a company A does a contract with cloud provider B at the rate of Rs 50 per day. A uses cloud services for 12 hour/day. Let in a month he noticed down time of B four times for 5h+30min, 1h+30min, 15min, and 2h+25min. Determine availability?

- Service needed: $12 * 30 = 260h = 15600$
- Downtime: 9h+40min = 580min
- Availability

$$1 - \frac{580}{15600} = 96.24\%$$

- If SLA says discount of 25% if availability is between 95 -to- 99% then what is effetive cost?

$$Rs.\ 50 * (3/4)$$

Thank You!

Thank you very much for your attention!

Queries ?