

CA Final Paper 6 - ISCA

CH 8 Emerging Technologies

- 1. Read this to know the boundary of Chapter
2. go to main materials
3. keep on revising
- Concepts (images have been taken from various places) & expected Questions;
- Key / Headers Points according to PM;
- Reference & last min. Revision Purpose only & **in no way** substitute to main materials;

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Chapter Outline



1. Grid v/s Cloud; 2. Objectives of C/c; 3. C/C Architecture;
4. C/C Environment; 5. C/C Models (IaaS, PaaS, SaaS)



1. Mobile Computing Concept, Benefits, Disadvantages & Issues;
2. BYOD Concepts , Benefits & Threats



Social Networks Components, Types,
Advantages & Disadvantages



Green IT Practices

What is Cloud Computing?



Cloud Computing

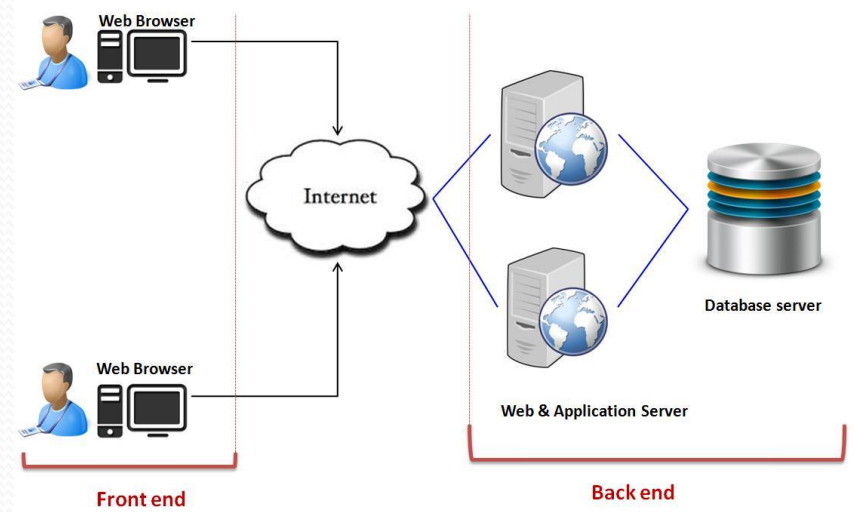
- Cloud computing refers to both the applications delivered as services over the Internet and the hardware and system software in the data centers that provide those services.
- Cloud is a type of parallel and distributed system consisting of a collection of interconnected and virtualized computers that are dynamically provisioned and presented as one or more unified computing resources based on service-level agreement.
- Extend of Grid Computing.



QUE.: Cloud computing Objectives / Goals

- i. Improve **Anywhere Access**
- ii. To provide Access of data & Services from **Anywhere Anytime**
- iii. Decrease / Reduce the cost related to **IT Power Consumption**
- iv. To **Consolidate IT Infrastructure** into integrated & manageable environment
- v. To Scale IT Systems **Cost Effectively, Quickly, Easily**
- vi. To Provide **Rapid Access** to data or services
- vii. To create Highly Efficient **IT Eco system**

QUE.: Cloud computing Architecture

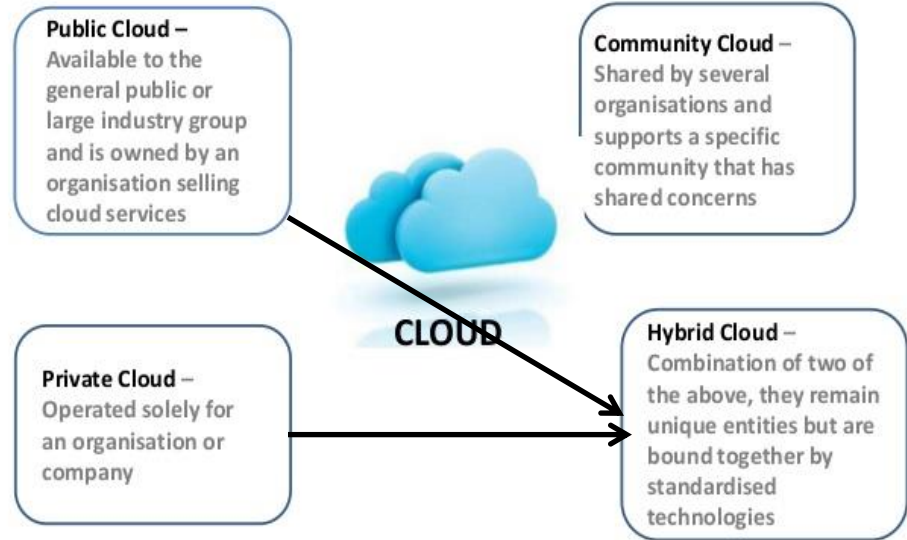


Cloud Computing Environment



- **Public Cloud**
= Public owned
(e.g. Railways)
- **Private Cloud**
Private ownership
(e.g. Your own Car)
- **Hybrid Cloud**
= Private + Public
(e.g. Mumbai Metro...
Relaince Grp. + MH Govt.)
- **Community Cloud**
= Private + Private **or**
= Shared Private
(e.g. Sharing based Auto rickshaws)

Types of Clouds



Que.: Cloud Computing Environment: Advantages & Disadvantages

Types	Advantages (A)	Characteristics (A+D)	Disadvantages (D)
Private Clouds	- Increased Control; - Increased Automation, decreased overheads	- Tight Security; - Well Controlled; - Loose SLA	- Higher Costs are involved; - Weak / Loose SLA
Public Clouds	- Affordable Cost; - Scalable Services; - Strict SLA; - Need not to invest in Infrastructure	- High Availability; - High Scalability; - Affordable Cost; - Strengthen SLA; - Less Secured comparatively	- Less Secured compared to Private; - Organization Autonomy not possible
Hybrid Clouds	- Highly Scalable; - Better Security than Public Cloud	- Scalable; - Partially Secured; - SLA is better than Private - Complex To manage	- Security features not tight as Private has; - Complex To manage
Community Clouds	- Collaborative Work; - Sharing of Responsibility; - Low Cost Private Clouds; - Better security than Public Clouds	- Collaborative Maintenance; - Partially Secured; - Cost Effective	- Security is not good as private cloud; - Organization autonomy not possible

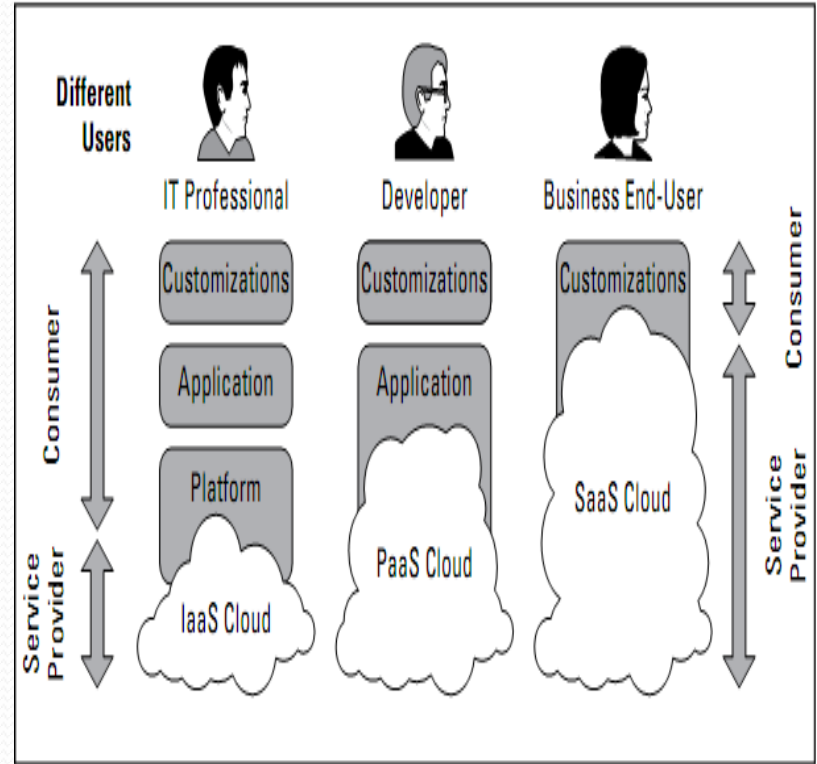
Cloud Computing Services / Models

Cloud computing provides basically three kinds of service:

SaaS: Software as a Service. Example service providers are [Salesforce](#), Customer Relationships Management(CRM) system and [Google Apps](#), [MS Office Online](#).

PaaS: Platform as a Service. Some example service providers are [Google's App Engine](#), [Microsoft Azure](#), RightScale and Salesforce.

IaaS: Infrastructure as a Service. Some of the IaaS providers are AWS, [Eucalyptus](#), Open Stack, [GoGrid](#) and Flexiscale.



Que.: Cloud Computing Servicing / Models

National Institute of Technology (NIT) defines Three models – IaaS, PaaS, SaaS

Models	User & Examples	Services Offered	Characteristics	Instances
IaaS (Infrastructure as service) (It is a virtualization of Physical Hardware)	• System Admin • E.g. vcloud, Amazon E2C	• Network • Storage • Computational • Load Balancing	• Web Access • Scalable • Centralized Control • Shared Infrastructure • Metered Services	• NaaS (Network) • STaaS (Storage) • DBaaS (Database) • Baas (Backend) • DTaaS (Desktop)
PaaS (Platform as a Service)	• Application / Software Developers • E.g. Google Apps engine,	• Programming Language • Application Framework • Database • Other Tools	• Web Access • Scalable • Offline • All in One • Collaborative	• NA
SaaS (Software as service)	• End User / Customer • E.g. google docs, gmail	• Business Services • Social Networks • Document Management • Mail Services	• Web Access • Scalable • High Availability • One to many Relationship • Centralized Control • Multi Device Support • API (Application Program Interface)	• Taas (Testing) • APIaaS • E-mail-aaS

Que.: Characteristics Of Cloud Computing

(Hint: same point as covered in C/c Service / models)

- **High Availability:**
Anytime Anywhere Access
- **High Reliability**
- **High Scalability:**
Large no. of resources pooled together
- **Performance:**
C/c are Highly Efficient
- **Maintenance:**
Centralized maintenance
- **Pay Per Use Mode:**
Pay only for what you use
- **Multi sharing:**
Also works in distributed mode like Grid Computing
- **Agility:**
Highly Responsive servers, Pooling of resources
- **Virtualization:**
No geographical locations are concerned

Que.: Advantages Of Cloud Computing (ABCDE)

- **Easy Access:**
Anywhere Anytime Access
- **Cost Efficient:**
Available at Cheaper Rates
- **(Easy) Back & Restore:**
Centralized Control
- **Almost Unlimited Storage**
- **Quick Deployment:**
Software can be downloaded
- **Automatic Integration:**
No Need to follow manual process

Que: Challenges in Cloud Computing

Security Prospective

(from **Service Provider** view point)

- i. Confidentiality
- ii. Integrity
- iii. Availability
- iv. Governance
- v. Trust
- vi. Audit
- vii. Prone To Attacks
- viii. Application Security

Adaption / Implementation Prospective

(from **End User** view point)(2 +ve & 4 -ve)

- i. **Threshold Policy:**
unused & additional required storage capacity
- ii. **Hidden Costs:**
only Fixed cost are being informed in the beginning
- iii. **Unexpected Behavior:**
- iv. **Inter-Operability**
- v. **Software development on Cloud**
- vi. **Environment friendly Cloud**

Que.: Mobile Computing

Components	How it Works	Benefits
• Portable Devices • Mobile Software • Communication	• Data Input • Server to Mobile communication • Computations on Server • Synchronization	• Access to workplace details • Update work order details • Access to Corporate Information • Job / Remote Location • Decision Making
Limitations	Issues	
• Portable Devices • Mobile Software • Communication	• Confidentiality • Integrity • Availability • Bandwidth	• Lack of Location Intelligence • Power Banks or alternate power resources • Integration of Mainframe • Business Challenge

Que.: Web 2.0 / 3.0 & Social Networks

Web1.0 : Informative / Communicative

Web 2.0 : Interactive

Web 3.0 :

Social Networks (Defined similar to "System")



Components of WEB 2.0 For Social Networks	Types / Behavior based Social Network (SN)	Advantages & Disadvantages	
- File Sharing - Communities - Blogging - Wikis - Folksonomy / Tagging - Mash-ups - RSS - Ajax 	- Social Contact Network - SN for specialist group - Study Circles - Police & Military - Sports related - SN for Fine Arts - Mixed Network	Advantages - Affordable Costs - Technological knowledge not required as such - Easy Adaption - No Geographical boundary	Disadvantages - Privacy Issues - SN are offline - Basic facilities are not available equally round the world

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