Virtualization: Technological Driver of CC

Multicore Technology

- Two or more CPUs are working together on the same chip.
- In this type of architecture, a single physical processor contains the core logic of two or more processors. These processors are packaged into a single integrated circuit (IC).

Memory and Storage Technologies

The storage technology or solutions used in the cloud environment should meet the following requirements.

- Scalability
- High availability
- Constant performance
- High bandwidth
- Load balancing

Networking Technologies

Network requirements for cloud:

- Consolidate workloads and provide Infrastructure as a Service (IaaS)to various tenants
- Provide VM connectivity to physical and virtual networks
- Ensure connectivity and manage network bandwidth
- Speed application and server performance

Web 2.0

- It is the popular term given to the advanced Internet technology and applications that include blogs, wikis, really simple syndication

  (RSS), and social bookmarking.
- Characteristics:

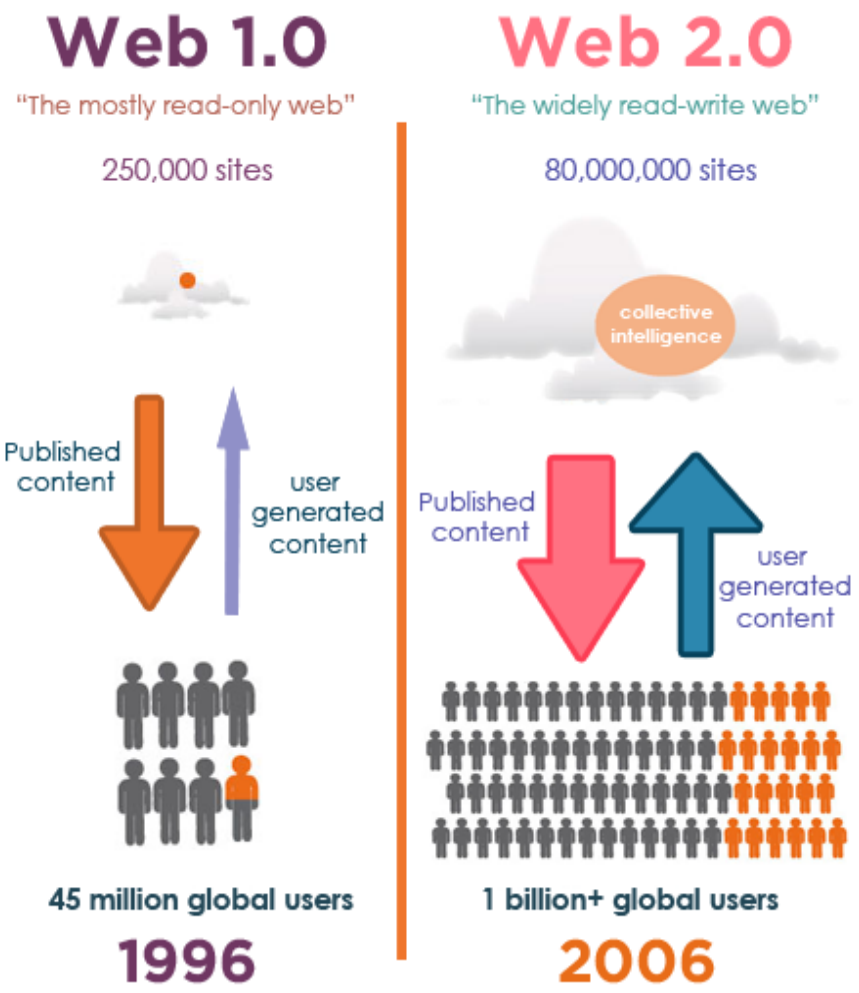
- instead of merely reading the contents from a web page, a user is allowed to write or contribute to the content available to everyone in an effective and user-friendly manner

Cont..

- Web 2.0 is also called network as a platform computing as it provides software, computing, and storage facilities to the user all through the browser.
- The major applications of Web 2.0 include social networking sites, self-publishing platforms, tagging, and social bookmarking.

Cont..

- The key features:
- Folksonomy – digital tagging
- Rich user experience
- User as a contributor
- User participation
- Dispersion



Web 3.0

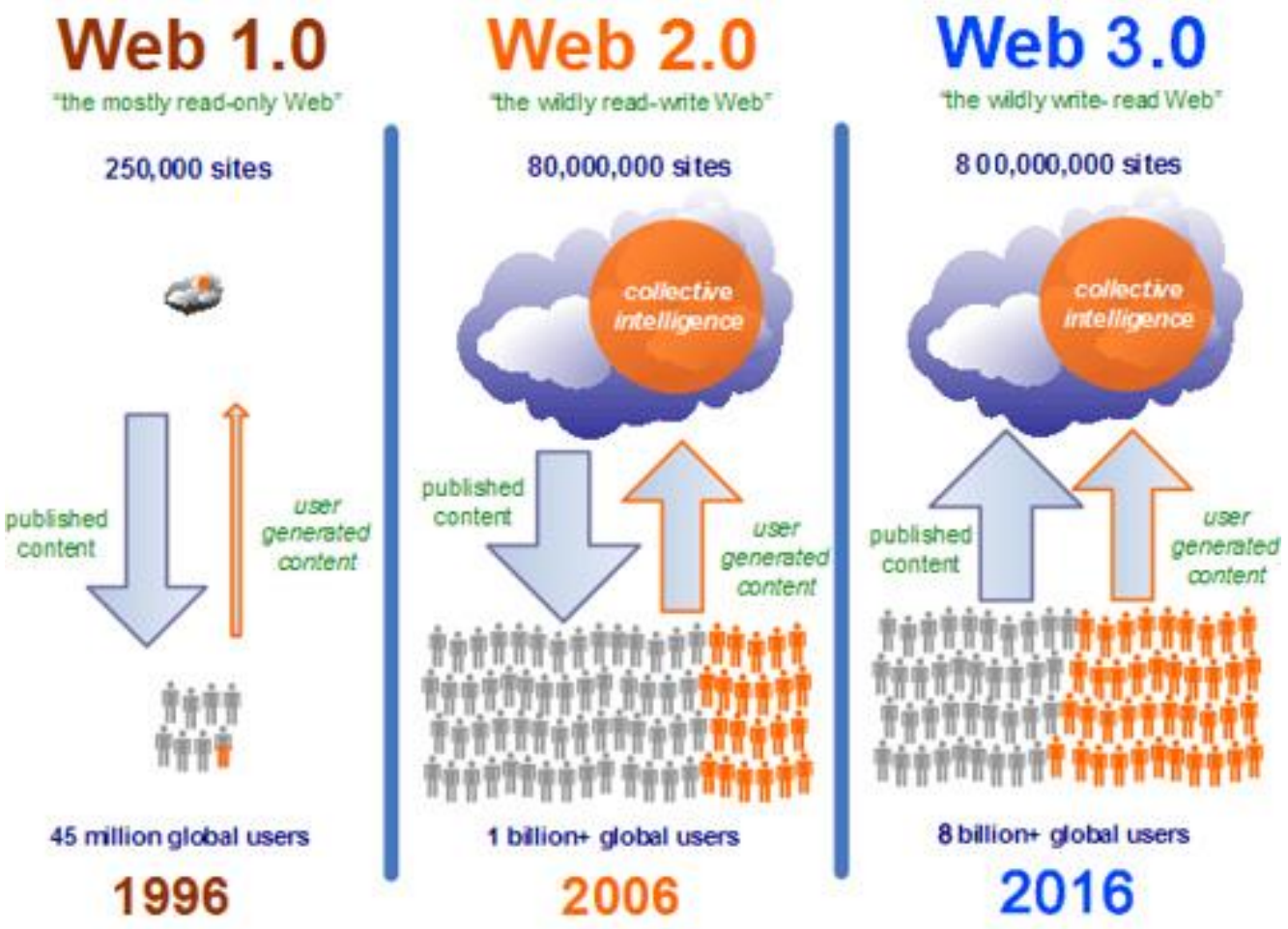
The two major components forming the basis of Web 3.0 are :

1. Semantic web - The semantic web provides the web user a common framework that could be used to share and reuse the data across various applications, enterprises, and community boundaries. The semantic web is a vision of IT that allows the data and information to be readily interpreted by machines, so that the machines are able to take contextual decisions on their own by finding, combining, and acting upon relevant information on the web.
2. Web services - A web service is a software system that supports computer-to-computer interaction over the Internet. Web services are usually represented as APIs.

Characteristics of Web 3.0:

- Ubiquitous connectivity
- Network computing
- Open technologies
- Open identity
- The intelligent web

Comparison


Web 1.0
"the mostly read-only Web"
250,000 sites
published content
user generated content
45 million global users
1996
Web 2.0
"the wildly read-write Web"
80,000,000 sites
collective intelligence
published content
user generated content
1 billion+ global users
2006
Web 3.0
"the wildly write- read Web"
800,000,000 sites
collective intelligence
published content
user generated content
8 billion+ global users
2016

Web 1.0	Web 2.0	Web 3.0
Content- destination sites and personal portals.	Speedy- more timely information and more efficient tools to find information.	Ubiquitous- available at any time, anywhere and through any channel or device.
Search- critical mass of content derives need for search engines.	Collaborative- actions of users a mass, police, and prioritize content.	Efficient- relevant and contextual information find-able instantly.
Commerce- goes mainstream; digital good rise.	Trust Worthy- users establish trust networks and home trust radars.	Individualized- filtered and shared by friends or trust networks.

Process models for cloud

- Waterfall
- V model
- Incremental
- RAD
- Agile
- Iterative
- Spiral

Agile SDLC for Cloud

- Existing software process models and framework activities are not adequate unless interaction with cloud providers is included.
- Requirements gathering phase so far included customers, users, and software engineers.
- Now, it has to include the cloud providers as well, as they will be providing the computing infrastructure and its maintenance.
- As only the cloud providers will know the size, architectural details, virtualization strategy, and resource utilization of the infrastructure, they should also be included in the planning and design phases of software development.
- Coding and testing can be done on the cloud platform, which is a huge benefit as everybody will have easy access to the software being built.
- This will reduce the cost and time for testing and validation.

Cont..

- In the cloud environment, software developers can use the web services and open-source software freely available from the cloud instead of procuring them.
- Software developers build software from readily available components rather than writing it all and building a monolithic application.
- Refactoring of existing application is required to best utilize the cloud infrastructure architecture in a cost-effective way.
- In the latest hardware technology, the computers are multicore and networked and the software engineers should train themselves in parallel and distributed computing to complement these advances of hardware and network technology.
- Cloud providers will insist that software should be as modular as possible for occasional migration from one server to another for LB as required by the cloud provider.

Cont..

- Most widely used agile frameworks:
- Agile Scrum Methodology
- Lean Software Development
- Kanban
- Extreme Programming (XP)
- Crystal
- Dynamic Systems Development Method (DSDM)
- Feature Driven Development (FDD)

Features of Cloud SDLC

- SDLC for cloud computing is different from the traditional SDLC in the following ways:

1. Inclination toward agile methodologies
2. Customizable SDLC framework for different stages: Cloud computing SDLC must have the capabilities to be customized according to the requirements of the project. In other words, the elasticity and robustness of cloud computing environment can be best utilized if the SDLCs for cloud are customizable.
3. Installation and configuration guidelines: SDLC for cloud must provide implementation approach and guidelines for installation and configuration of the cloud depending on its size. The guidelines must ensure that installation and configuration of infrastructure and application environment are completed appropriately for different stages of SDLC including operations and maintenance. These guidelines are the key to differentiating SDLC for cloud from traditional SDLC.

Advantages of Agile model

1. Faster time to market
2. Quick ROI
3. Shorter release cycles
4. Better quality
5. Better adaptability and responsiveness to business changing requirements
6. Early detection of failure/failing projects