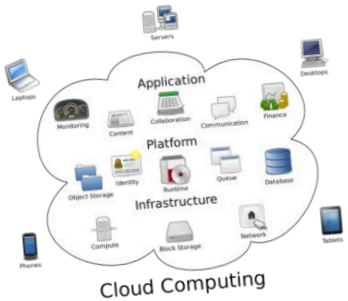
Ninth SG13 Regional Workshop for Africa on "Standardization of Future Networks and Emerging Network Technologies: African perspectives"

Cloud Computing

ITU standardization works



Soumaya Benbartaoui

SG13 Vice-chair / SG13 RG-AFR Vice-chair

Abidjan, Côte d'Ivoire, 19-20 September 2023

Cloud Computing

Past

Futur

Evolution of Cloud Computing

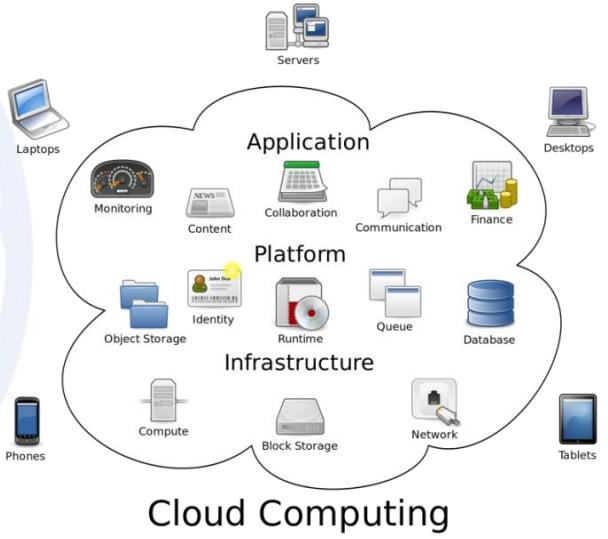
1960 → 1980 → 1990 → 2000 → 2005 → - - - - - - - - → 2010

Evolution of Cloud Computing

1960 → 1980 → 1990 → 2000 → 2005 → - - - - - - - - → 2010

What's the Cloud Computing

Cloud computing is a paradigm for enabling network access to a scalable and elastic pool of shareable physical or virtual resources with self-service provisioning and administration on-demand.

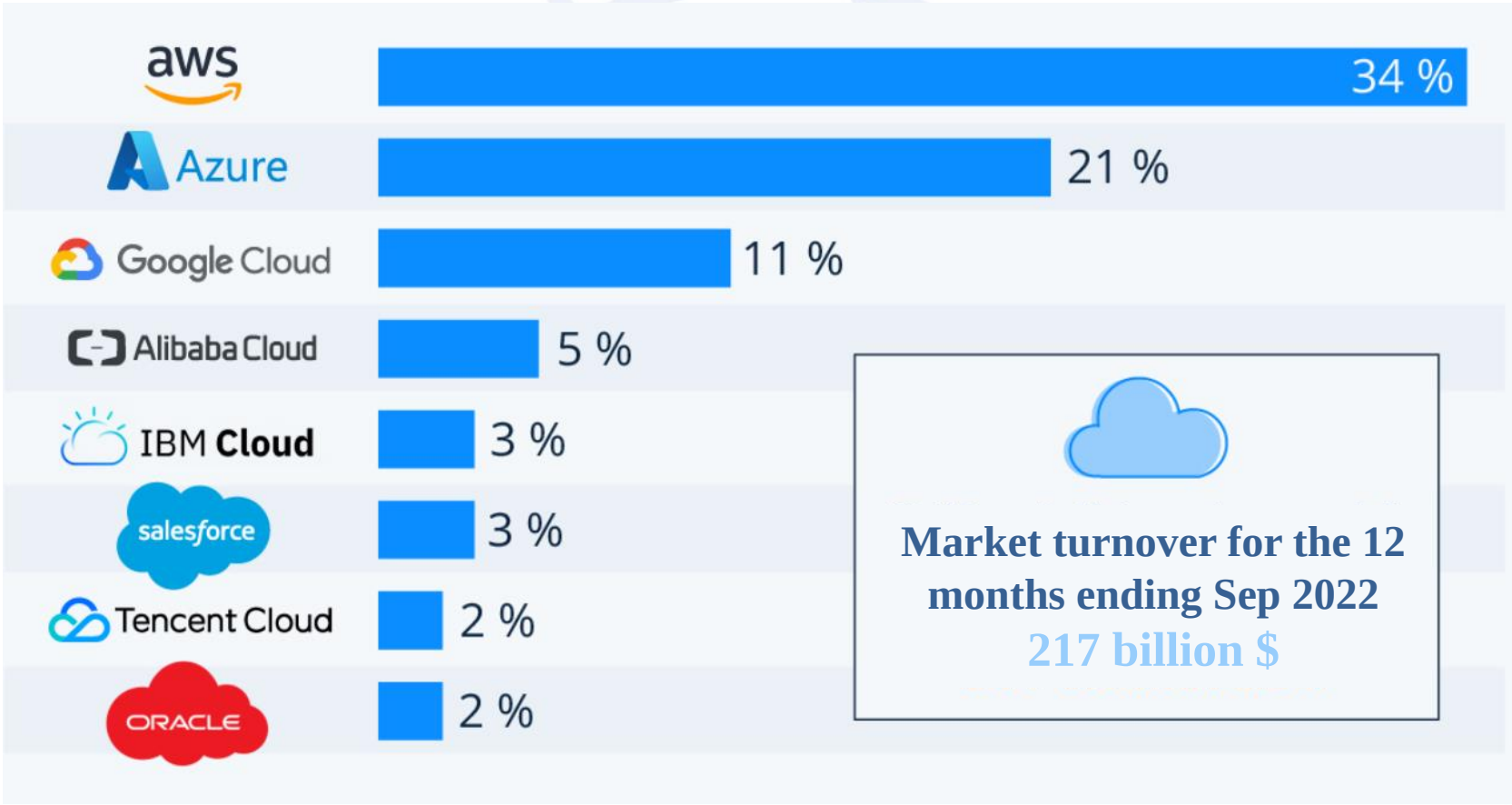


(Source : ISO/IEC 17788 | Recommendation ITU-T Y.3500 "Information technology - Cloud computing - Overview and vocabulary")

Cloud Computing service's

	On- Premises	Infrastructure (as a Service)	Platform (as a Service)	Software (as a Service)
Applications	You manage	You manage	You manage	Manage by vendor
Data	You manage	You manage	You manage	Manage by vendor
Runtime	You manage	You manage	Manage by vendor	Manage by vendor
Middleware	You manage	You manage	Manage by vendor	Manage by vendor
O/S	You manage	You manage	Manage by vendor	Manage by vendor
Virtualization	You manage	Manage by vendor	Manage by vendor	Manage by vendor
Servers	You manage	Manage by vendor	Manage by vendor	Manage by vendor
Storage	You manage	Manage by vendor	Manage by vendor	Manage by vendor
Networking	You manage	Manage by vendor	Manage by vendor	Manage by vendor

Cloud Computing by number



Market turnover for the 12 months ending Sep 2022

217 billion $

Standardization Work on Cloud Computing

Cloud Computing standardization

The basic goal of cloud computing standardization is to make applications more scalable, interoperable, and secure in the cloud.

This involves: a cloud computing interoperability and integration standard. This refers to interoperability between different clouds and an integrated interface standard

Cloud Computing standardization

Cloud Computing standardization

Since cloud computing involves a wide range of technical and business elements, the targets of cloud computing standardization

are diverse and many standards organizations are studying cloud computing focusing on their respective areas of expertise.

Cloud Computing standardization

The study areas can be broadly classified into:

1. Framework development, terminology definition, use cases, and requirements identification,
2. Cloud configuration management, and
3. Inter-cloud federation.


ITU
Standardization Work on
Cloud Computing
ITU

ITU Works on Cloud Computing

2024

Working Party

Study Group

Focus Group

2010

Focus Group Cloud Computing

Established further to *TSAG* agreement at Geneva meeting, *8-11 February 2010*

Objective

Collect and document information and concepts that would be helpful for developing Recommendations to support cloud computing services/applications from a telecommunication/ICT perspective

Focus Group concluded in December 2011 with the publication of technical report in 7 parts

Focus Group Cloud Computing

Focus Group AC

The focus group on Aviation Applications of Cloud Computing for Flight Data Monitoring (FG AC) was established further to *TSAG agreement* in *June 2014*

Objective

Identify the requirements for telecommunication standards for an aviation cloud for real-time monitoring of flight data (protection and security, data ownership and access to flight data,…)

Focus Group concluded in February 2016 with the publication of technical report in 4 parts

Focus Group AC

Study Group 13

Study Group 13 (SG13) was designed by *TSAG agreement in January 2012* as lead study group on Cloud Computing

Study Group 13

Creating of working party with three (03) classified questions in the area of :

- Requirements, ecosystem, Terminology…;
- Architecture ;
- Inter-cloud and management.

Study Group 13
Study Period 2022 - 2024

SG13 - Future networks and emerging network technologies

- Lead study group on future networks such as IMT-2020 networks and beyond Lead study group on fixed-mobile convergence
- Lead study group on cloud computing
- Lead study group on machine learning

ITU ITU-T SG13

Working Party 2022 - 2024

The SG13 questions on cloud computing are under

WP2 - Cloud Computing & Data Handling

Q17/13	Future Networks: Requirements and capabilities for computing including cloud computing and data handling
Q18/13	Future Networks: Functional architecture for computing including cloud computing and data handling
Q19/13	Future Networks: End-to-end management, governance, and security for computing including cloud computing and data handling

Working Party/13 - 2022 - 2024

Q17/13 : Future Networks: Requirements and capabilities for computing including cloud computing and data handling

- Developing Recommendations for

- Future computing (including cloud computing and data handling) definitions, overview, ecosystem, use cases, business roles and benefits from telecommunication perspectives ;
- Future computing requirements and capabilities ;
- Future computing interoperability and data portability as well as the applications of future computing in vertical domains ;
- Providing the necessary collaboration for the work in the Question with relevant SDOs, consortia and for a ;

Maintenance and enhancement of the Recommendations for which the Question is responsible.

Working Party/13 - 2022 - 2024

Q18 : Future Networks: Functional architecture for computing including cloud computing and data handling

Developing Recommendations for

- Future computing functional architectures, covering the identification of architectural functions, functional components, and their inter-relation required to provide future computing based services.
- Future computing infrastructures and networking aspects, covering the identification of functions, functional components for computing, storage and networking.
- Future computing based data handling functional architecture, data exchange and interoperation functional architecture.
- The functional architectures of future computing in vertical domains. providing the necessary collaboration with external SDOs, consortia and forums maintenance and enhancement of the Recommendations for which the Question is responsible.

Working Party/13 - 2022 - 2024

Q19 : Future Networks: End-to-end management, governance, and security for computing including cloud computing and data handling

Developing Recommendations for

- End-to-end service management and orchestration of future computing (including cloud computing and data handling) ;
- End-to-end resource (including software infrastructure) management and orchestration of future computing ;
- Data management of future computing ;
- Security mechanisms and methods of future computing.

Others Questions 2022 - 2024

Q5/13: Applying Future Networks and innovation in developing countries

The activities of this question are to focus on Recommendations, Technical Papers and Supplements which study the needs of the eco-system as a whole of developing country telecom networks in terms of applying IMT-2020, cloud computing, big data, trust and other emerging technologies as they deal with the shift towards convergence of previously discrete areas, namely telecoms, data and entertainment under their own specific circumstances.

Others Questions 2022 - 2024

Question 8/17 – Cloud computing and big data infrastructure security

The activities of this question are to focus on developing Recommendations or other type of documents to :

- advance cloud computing security, to identify security requirements and threats to secure cloud computing services
- define security architecture and to organize security functions and a strong, flexible, and elastic security architecture and implementation for cloud computing systems.
- to identify assurance mechanisms, audit technologies, risk assessment with the objective of achieving trustworthy relationships within the cloud computing ecosystem.

based on the general requirements of cloud computing specified by ITU-T Study Group 13

Cloud Computing Recommendations under study

Cloud Recommandations under study

Y series : Global information infrastructure, internet protocol aspects and next-generation networks

Y.ccabom-reqts : Cloud computing - Requirements for **AI based cloud service** development and operation management

Y.cra-reqts : Cloud computing - Functional requirements of computing resource abstraction

Y.ecloud-reqts : Cloud computing - Functional requirements of **edge cloud**

YY.cro-reqts : Cloud computing - Functional requirements of cloud resource optimization

https://www.itu.int/ITU-T/workprog/wp_search.aspx?sg=13&q=17

https://www.itu.int/ITU-T/workprog/wp_search.aspx?sg=13&q=19

Cloud Recommandations under study

Y series : Global information infrastructure, internet protocol aspects and next-generation networks

Y.CCDCFA : Cloud computing - Distributed cloud functional architecture

Y.ccm-arch : Cloud Computing - Functional architecture for container and container management

Y.cmi-arch : Cloud computing - Functional architecture of container management in **inter - cloud**

Y.mc-arch : Cloud computing – Functional architecture for **multi-cloud**

https://www.itu.int/ITU-T/workprog/wp_search.aspx?sg=13&q=18

Cloud Recommandations under study

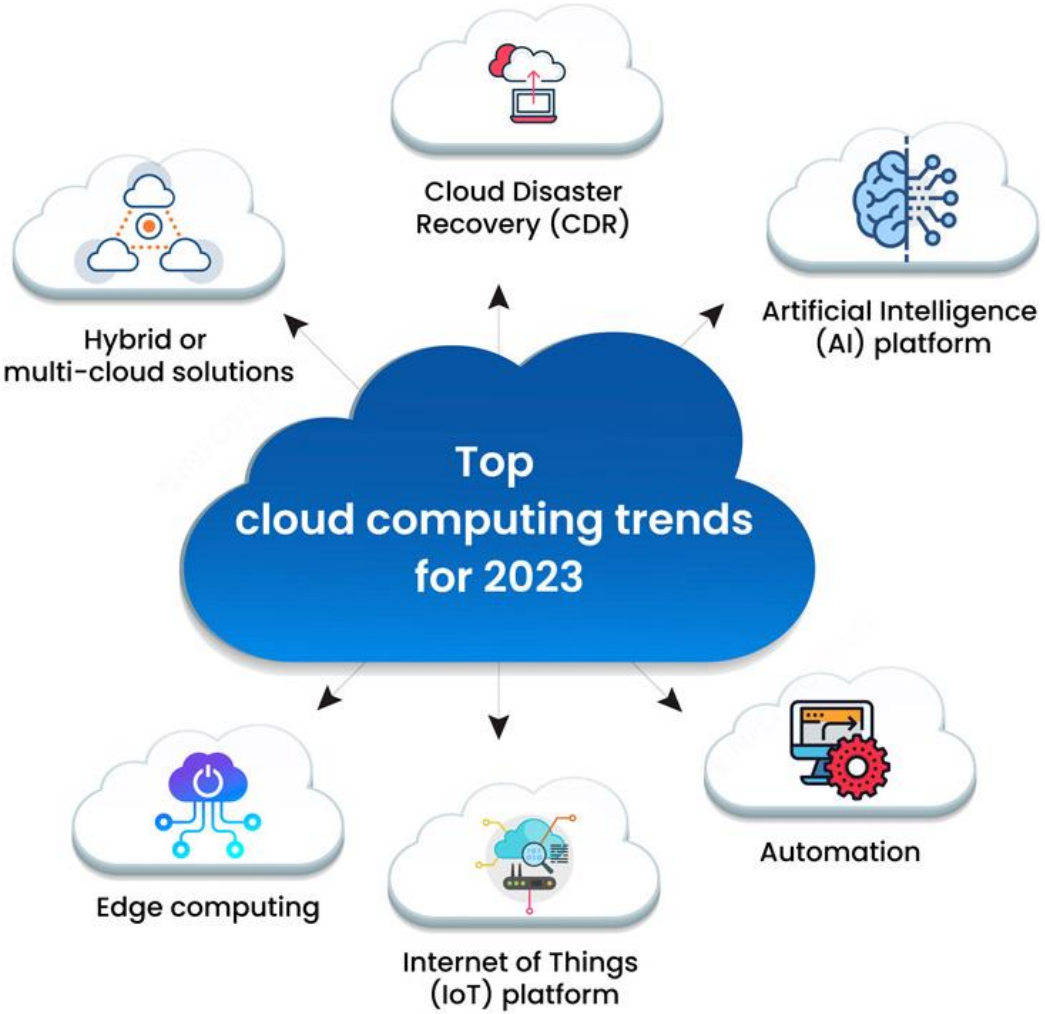
X series : Data networks, open system communications and security

X.asm-cc : Requirements of attack surface management for cloud computing
X.sa-ec : Security architecture of **edge cloud**
X.Sgmc : Security guidelines for **multi-cloud**
X.sg-scmr : Security guidelines for selecting computing methods and resources from Cloud Service Providers

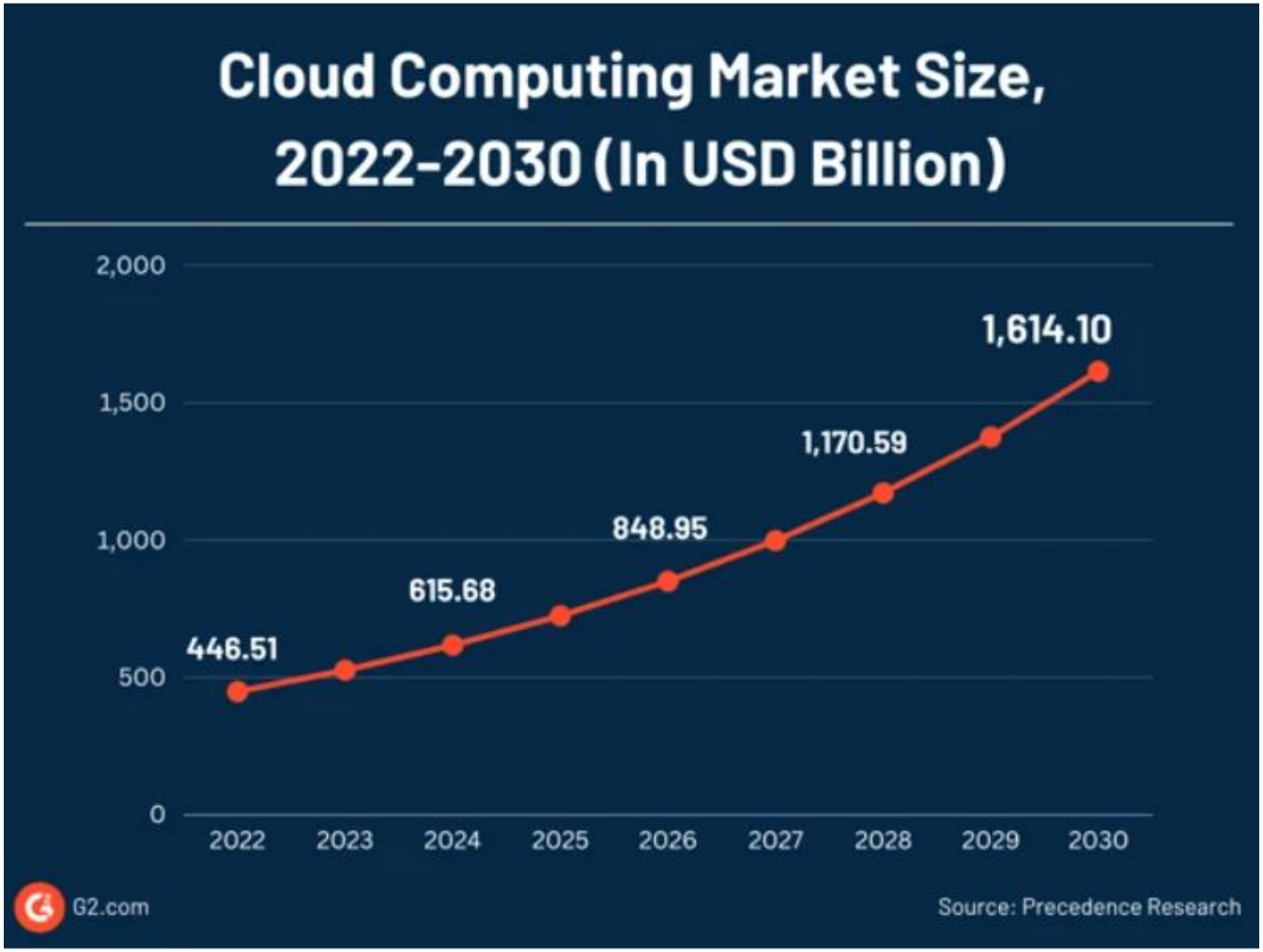
https://www.itu.int/ITU-T/workprog/wp_search.aspx?sg=17&q=8

Cloud Computing trends 2023

New evolution of Cloud Computing



Previsonal evolution of Cloud Computing market size



Conclusion

Conclusion

WORK WITH US

The standardization is one of the fundamental key to develop the new technology, without standards several problems happen (interoperability, security,…).

The SG13 as leader group on cloud computing provide serious efforts, in collaboration with (government, regulator, provider, standards institutions….), in order to develop the cloud computing standards.

Conclusion

WORK WITH US

SG13 work very closely in the Africain region in order to bridge the standardization gaps and enable developing countries to reap the benefits of the technology revolution.

Thank you for your attention

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