

# Cloud Computing Standards Landscape

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## **Cloud Computing Seminar**

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Organization of  
American States

# Cloud Computing – Why Standardize?

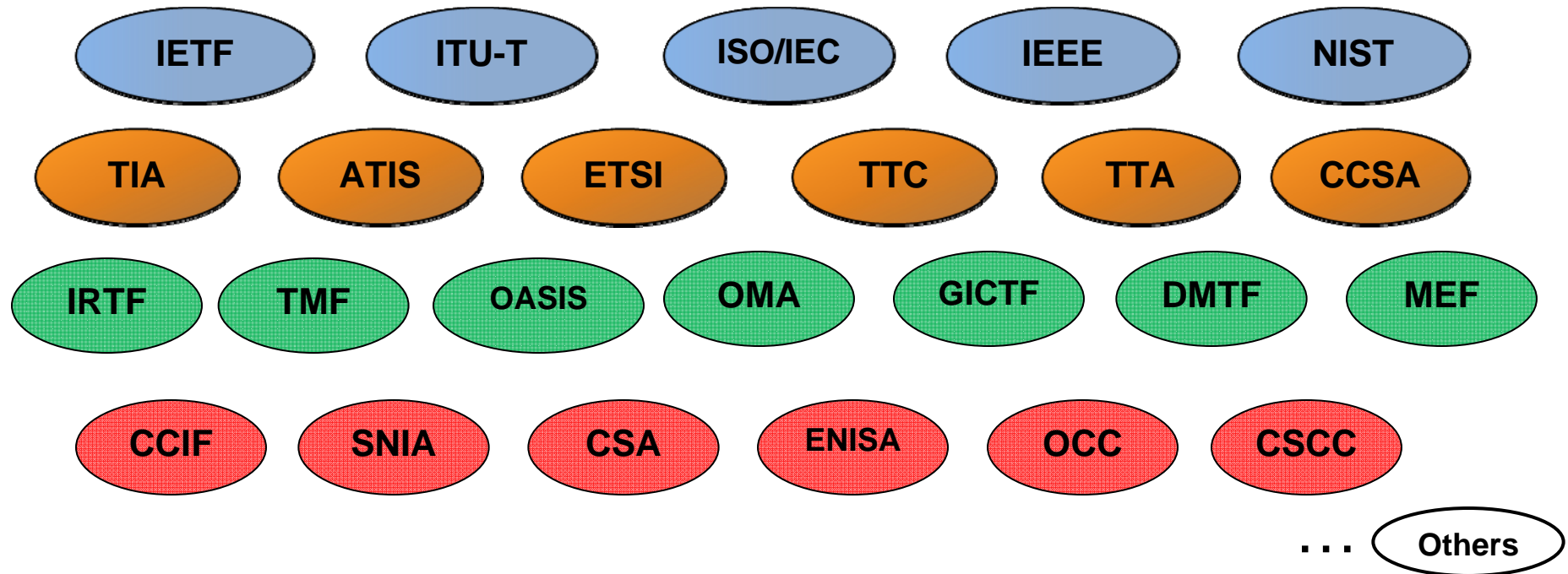
## **Cloud Computing Concerns**

- Security (Privacy, Trust, Data Security)
- Data Transfer Among Clouds in Multi-Provider Environment
- Data Storage and Structures
- Reliability/Performance
- Interoperability of Cloud Solutions
  - Interconnection of networks and Interoperability of Services

## **Expanding Cloud Computing Market**

- Market is Demanding Cloud Services
- Use Cases and Specialized Applications are being developed
  - Content Delivery, Telepresence, Test Environment aaS, Desktop aaS, Security aaS, etc

# Cloud Computing SDOs and Consortia



- ATIS – Alliance for Telecommunications Industry Solutions
- CCIF – Cloud Computing Interoperability Forum
- CSA – Cloud Security Alliance
- CSCC – Cloud Standards Customer Council
- DMTF – Distributed Management Task Force
- ENISA – European Network and Information Security Agency
- ETSI – European Telecommunications Standards Institute
- GICTF – Global Inter-Cloud Technology Forum
- IEEE – Institute of Electrical and Electronics Engineers
- IRTF – Internet Research Task Force
- ISO/IEC JTC1 – International Organization for Standardization
- ITU – International Telecommunication Union

- MEF – Metro Ethernet Forum
- NIST – National Institute of Standards and Technology (US)
- OASIS – Organization for the Administration of Structures Information Standards
- OCC – Open Cloud Consortium
- OGF – Open Gris Forum
- OMA – Open Mobile Alliance
- SNIA – Storage Networking Industry Association
- TIA – Telecommunications Industry Association
- TMF – TeleManagement Forum
- TTA – Telecommunications Technology Association (Korea)
- TTC – Telecommunication Technology Committee (Japan)

# Cloud Computing Standards

**There is neither a shortage of SDOs working on Cloud Computing nor proposed solutions. The challenge is in coordinating standardization activities and converging toward optimal solutions.**

## **Standards Coordination**

- Overlaps exist among the standardization activities of SDOs and Consortia. Increased collaboration among SDOs is desirable.
- Multiple, inconsistent cloud service approaches will slow the pace of adoption
- Industry and User organizations are working with SDOs to develop Cloud Service priorities and solutions (e.g., Telepresence)
- Network providers and vendors are working with SDOs to address Cloud performance and deployment issues (e.g., Interoperability, Security and Privacy, Data Structures)
- Standards coordination is difficult with the large number of SDOs and issues involved. To begin, a framework of definitions and architecture standards is needed to organize and streamline the process. This enables the comparison of requirements, services, and solutions from different sources.

# Cloud Computing Standards

## **Focus Areas of Cloud Computing Standardization**

- **Cloud Ecosystem, Use Cases, Scenarios**
- **Functional Requirements and Reference Architecture**
- **Security, Privacy, Network/Business Continuity**
- **Resource Management, Platform, Middleware**
- **Infrastructure and Network-enabled Cloud**
- **Inter-Cloud Procedures and Interfaces**
- **User Accessibility and Virtual Terminals**

Source: ITU-T Cloud Computing FG Report

# Cloud Computing Standards Activity

## Focus Areas of Cloud Computing Standardization

- **Cloud ecosystem, use cases, scenarios**
  - ITU-T (SG2), ISO/IEC JTC1 SC38, NIST, ETSI, GICTF, DMTF
- **Functional Requirements and Reference Architecture**
  - ITU-T (SG13), GICTF, NIST, DMTF, ETSI
- **Security, Privacy, Network/Business Continuity**
  - ITU-T (SG17), CSA, ISO/IEC JTC1 SC27, DMTF, ENISA, OASIS
- **Resource Management, Platform, Middleware**
  - ITU-T (SG13, SG9), DMTF, TMF, OGF, SNIA, GICTF, ITU-T (SG16), The Open Group

Source: ITU-T Cloud Computing FG Report

# Cloud Computing Standards Activity

## Focus Areas of Cloud Computing Standardization (2)

- **Infrastructure and Network-enabled Cloud**
  - ITU-T (SG13), DMTF, IEEE, IETF, IRTF
- **Inter-Cloud Procedures and Interfaces**
  - ATIS, IEEE
- **User Accessibility and Virtual Terminals**
  - ITU-T (SG5, SG16)

Source: ITU-T Cloud Computing FG Report

# Cloud Computing Standards

Each focus area of Cloud Computing standards has a number of associated issues to be addressed. The standards community needs to coordinate similar efforts to produce timely and useful deliverables (standards, guidelines, best practices, etc).

## Example

### Dimensions of Cloud Security Standards

- Physical Security
- Network Security
- Application Security
- Internal Systems Security
- Data Privacy and Protection
- Identity Management
- Secure Data-backup; Disaster Recovery
- Trust Management; Third-party Certification



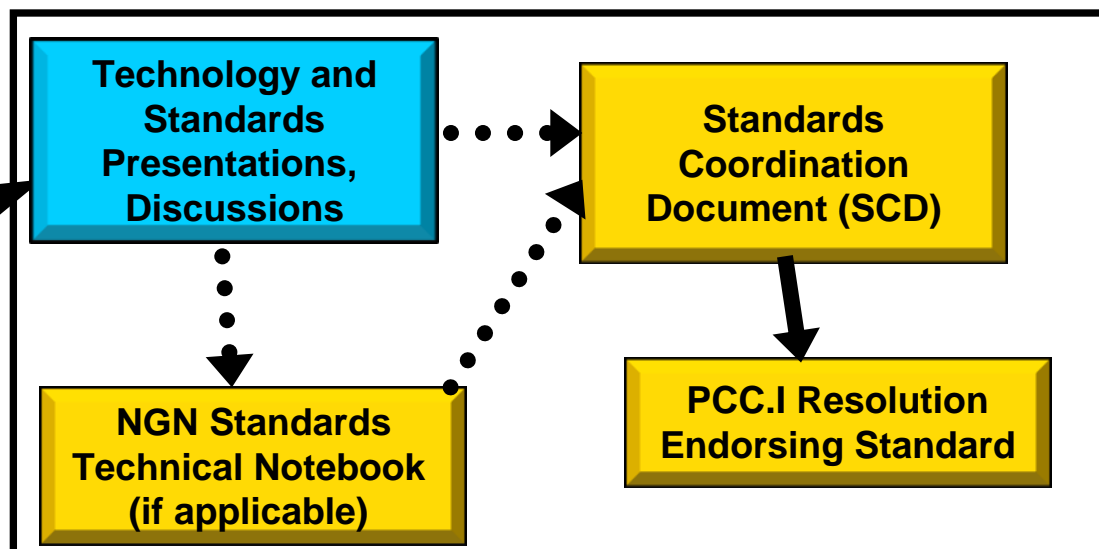
# Standards Coordination - CITEI

**CITEI does not  
develop standards.**

CITEI identifies relevant standards and endorses their use in the Americas Region.

Standards  
Development  
(ITU, IETF, ...)

## PCC.I Standards Coordination



Raising awareness by socializing technology standardization activities/progress. Archiving standards descriptions in anticipation of future endorsement.

# Standards Coordination - CITE

## Cloud Computing Standards (ATIS)

- CITE PCC.I began discussions related to Cloud Computing in 2010 with input on ATIS' SON (Service Oriented Networks) standards work
- ATIS' Cloud Services Forum was created in 2011 to utilize the SON standards work and address Cloud Services issues directly
- Key Initiatives:
  - Content Distribution Network Interconnection (CDN I)
  - Inter-Carrier Telepresence
  - Trusted Information Exchange (TIE) Architecture
- CDN-I Use Cases and Requirements and Telepresence Framework already published

# Cloud Computing Standards Coordination - CITEI

## ATIS Cloud Services Forum:

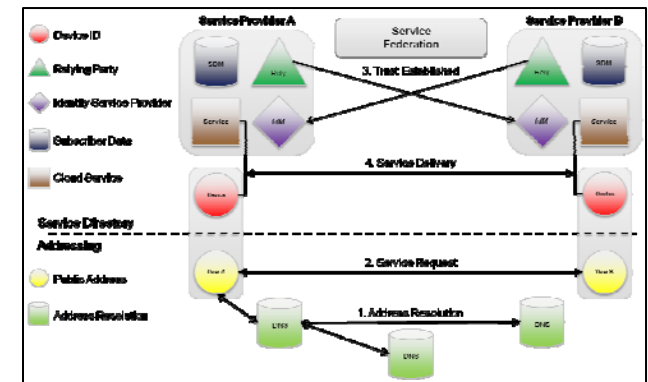
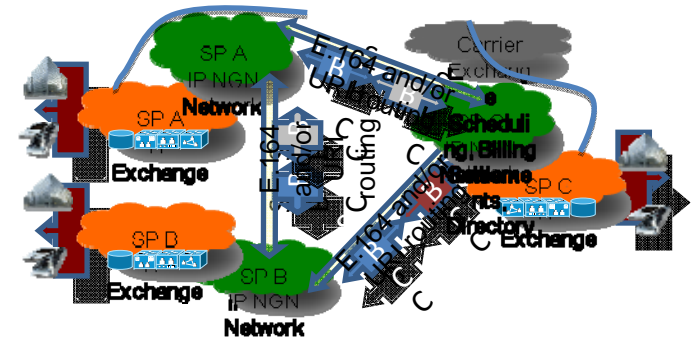
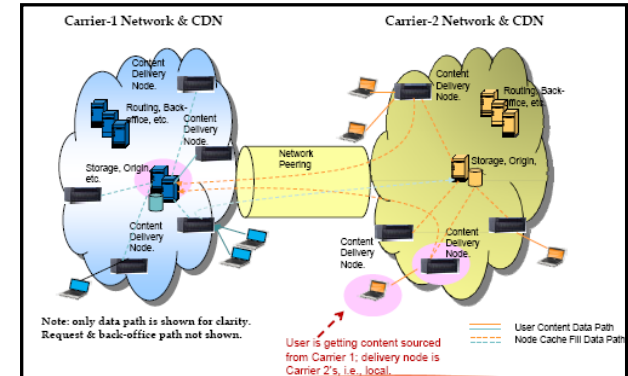
- **Content Distribution Network Interconnection (CDN I)**
  - Use cases and requirements for multicast-based content distribution

(NGN Standards Technical Notebook, CITEI PCC.I)

- **Inter-Carrier Telepresence**
  - Develop video service specifications as a component of a unified communications framework

(NGN Standards Technical Notebook, CITEI PCC.I)

- **Trusted Information Exchange (TIE) Architecture**
  - Identifying policy, system controls and enforcement mechanisms to address TIE issues.



# Summary

- A large number of SDOs and consortia are developing Cloud related standards. It is desirable to coordinate these efforts and provide a framework for future Cloud standards development.
- The ITU-T Cloud Focus Group has provided an identification of Cloud standardization topics and has identified sets of SDOs currently engaged in developing solutions
- CITELE continues to address standards development and deployment issues and has been reviewing Cloud-related standards for the past three years
- Contributions are encouraged that highlight Cloud standards from a broad range of SDOs that are of significance to Regional networks as well as Cloud standards/service deployments



*Thank You!*

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**ATIS**

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