SNIA CSTI | CLOUD STORAGE TECHNOLOGIES

Cloud Standards: What They Are, Why You Should Care

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Today's Presenters

SNIA CSTI | CLOUD STORAGE TECHNOLOGIES

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About the Presenters

SNIA CSTI | CLOUD STORAGE TECHNOLOGIES

- Alex McDonald
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  - Vice Chair, SNIA Networking Storage Forum
  - Advisor, SNIA Technical Council
- Eric Hibbard, CISSP-ISSAP, ISSMP, ISSEP, CIPT, CISA, CCSP, CCSK
  - Chair, SNA Security TWG
  - Co-Chairman, Cloud Security Alliance International Standardization Council
  - ISO Editor, ISO/IEC 17788, ISO/IEC 27040, ISO/IEC 20648, ISO/IEC 22123, ISO/IEC 27050
  - Chairman, INCITS TC CS1 Cyber Security
  - Chairman, IEEE Cybersecurity & Privacy Standards Committee
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SNIA-At-A-Glance

SNIA CSTI | CLOUD STORAGE TECHNOLOGIES

185
industry leading organizations

2,000
active contributing members

50,000
IT end users & storage pros worldwide

SNIA CSTI | CLOUD STORAGE TECHNOLOGIES

What We Do

Educate vendors and users on cloud storage, data services and orchestration

Support & promote business models and architectures: OpenStack, Software Defined Storage, Kubernetes, Object Storage

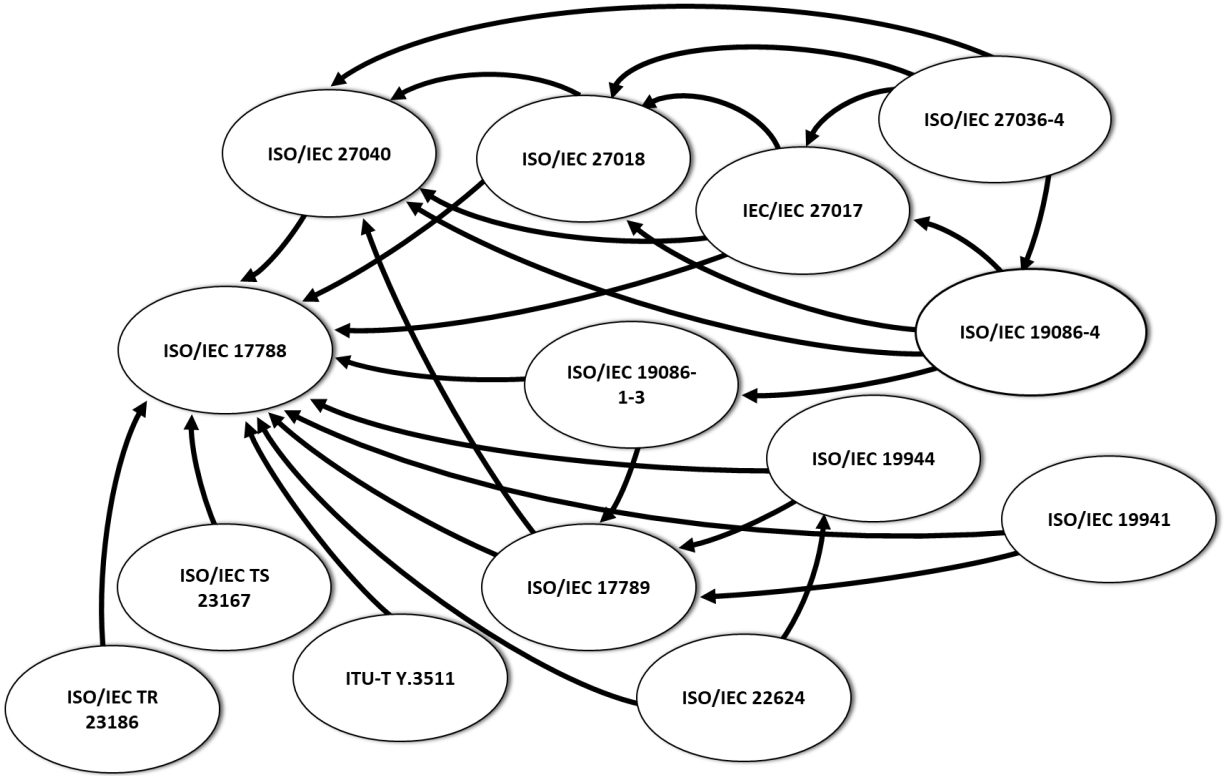
Understand Hyperscaler requirements Incorporate them into standards and programs

Collaborate with other industry associations

Does Cloud Standardization Have You Confused?

- Plethora of sources…
  - ISO/IEC, ITU, IETF, NIST, OASIS, IEEE, etc.
  - Industry Association: Cloud Security Alliance, Open Commons Consortium, Cloud Standards Customer Council, etc.
- What do they specify?
  - Foundations, technology, and interoperability
  - Best practices
  - Risk, security, privacy

Inter-relationship of Cloud Computing Standards



Why Should You Care?

- For cloud providers
  - Some standards represent table stakes
  - Help address the “Cloud Bogeyman”
- For cloud customer/users
  - Consistency in terminology and offerings
  - Set reasonable expectations
  - Compliance/verification

cloud computing: 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.
NOTE – Examples of resources include servers, operating systems, networks, software, applications, and storage equipment.

Review of Specific ISO Cloud and Related Standards

Key Cloud Topics

Terminology & Concepts

ISO/IEC 17788 | ITU-T Y.3500
ISO/IEC 17789 | ITU-T Y.3502

ISO/IEC 22123

Cloud SLA Framework

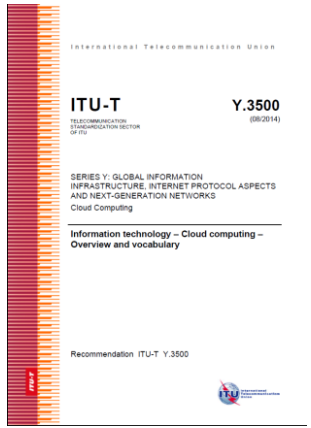
Outsourcing to the Cloud

Security & Privacy

ISO/IEC 17788 (ITU-T Y.3500)

- *Information technology – Cloud computing – Overview and vocabulary*

- Key Characteristics
  - Broad network access, measured service, multi-tenancy, on-demand self-service, rapid elasticity and scalability, resource pooling
- Cloud Roles and Activities
  - Customer (CSC), Provider (CSP), Partner (CSN)
- Cloud Service Categories
  - CaaS, CompaaS, DSaaS, **IaaS**, NaaS, **PaaS**, **SaaS**
- Cloud Deployment Models
  - Public, Private, Community, Hybrid



ISO/IEC 17788 (cont.)

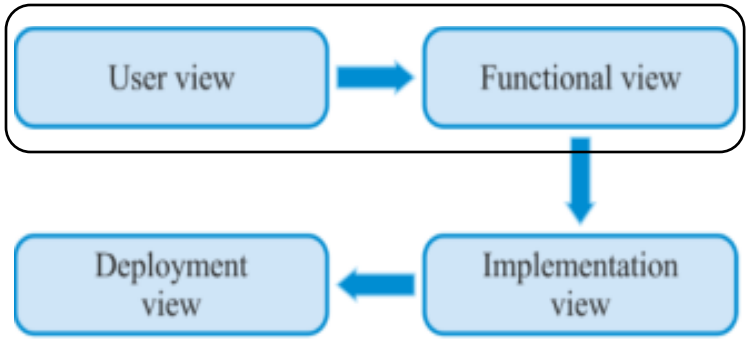
Cloud Cross-cutting Aspects

- Auditability
- Availability
- Governance
- Interoperability
- Maintenance & Versioning
- Performance
- Portability
- Protection of PII
- Regulatory
- Resiliency
- Reversibility
- Security
- Service Levels & SLAs

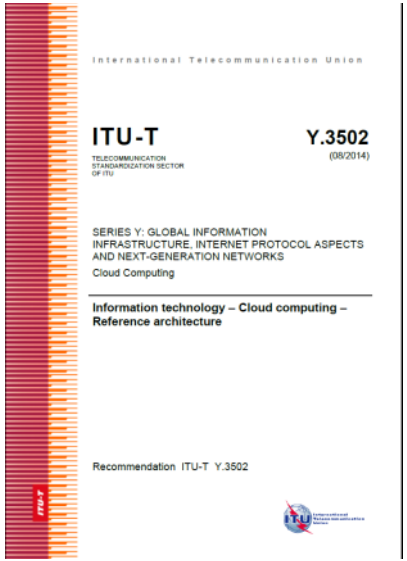
ISO/IEC 17789 (ITU-T Y.3502)

- *Information technology – Cloud computing – Reference architecture*

- Roles and sub-roles in cloud computing
- Expanded descriptions of cross-cutting aspects
- Layer Framework
  - User, access, service, resource
  - Multi-layer functions
- Functional components



ISO/IEC 17789 (cont.)


International Telecommunication Union

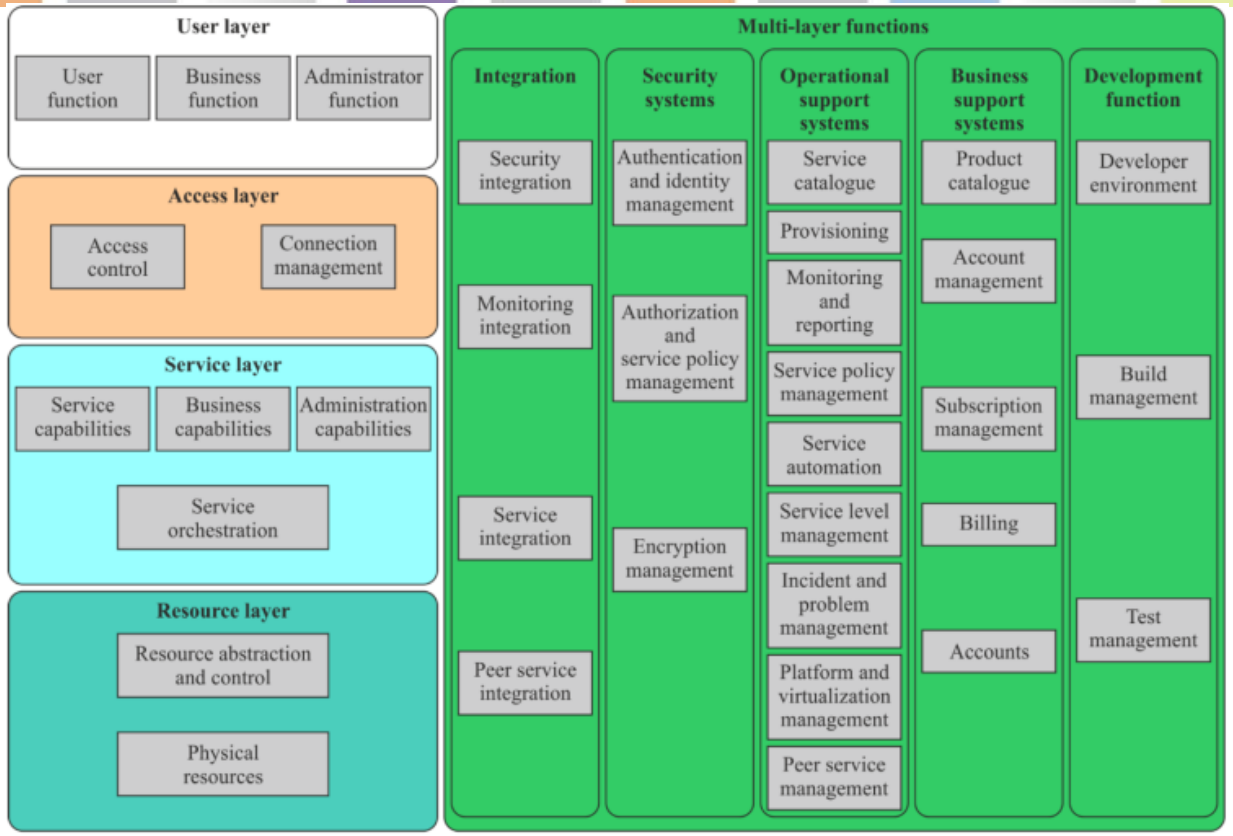
ITU-T Y.3502
(08/2014)

TELECOMMUNICATION STANDARDIZATION SECTOR OF ITU

SERIES Y: GLOBAL INFORMATION INFRASTRUCTURE, INTERNET PROTOCOL ASPECTS AND NEXT-GENERATION NETWORKS
Cloud Computing

Information technology – Cloud computing – Reference architecture

Recommendation ITU-T Y.3502



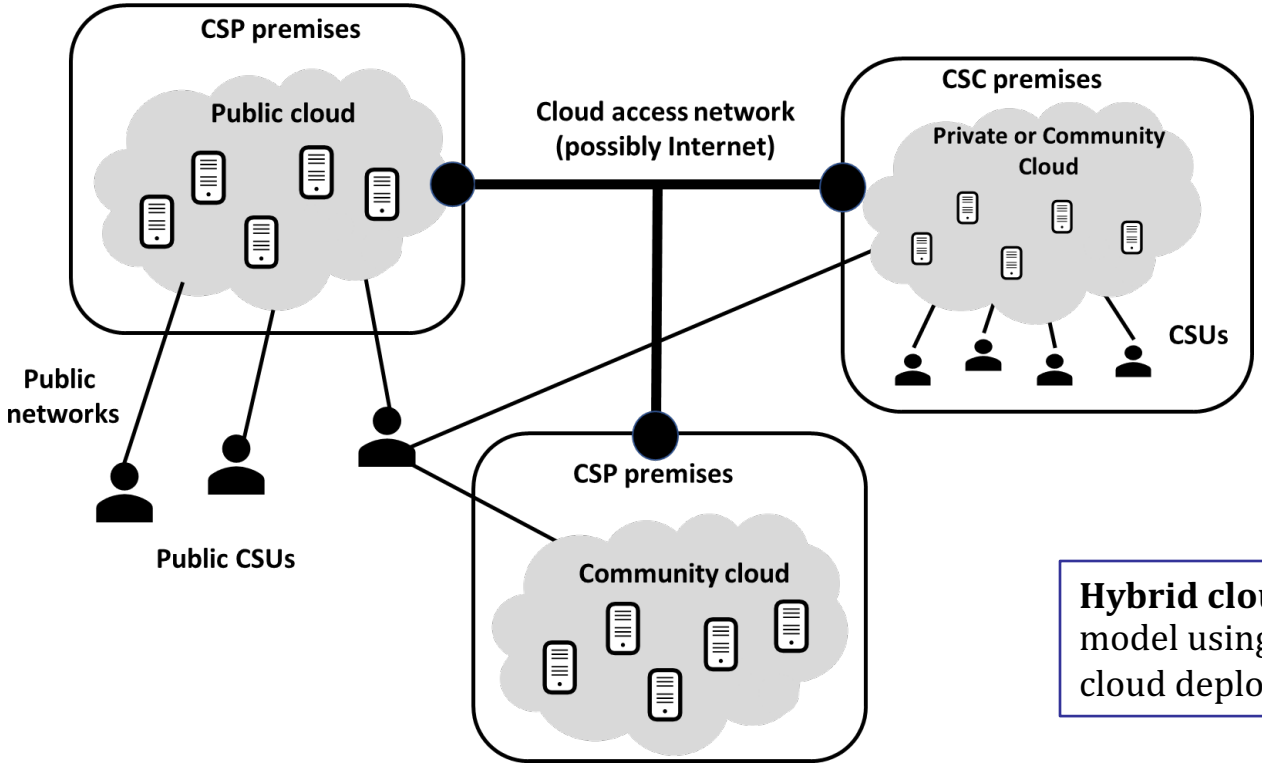
ISO/IEC 22123 (draft)

- Information technology – Cloud computing

Part 1: *Terminology*	Part 2: *Concepts*

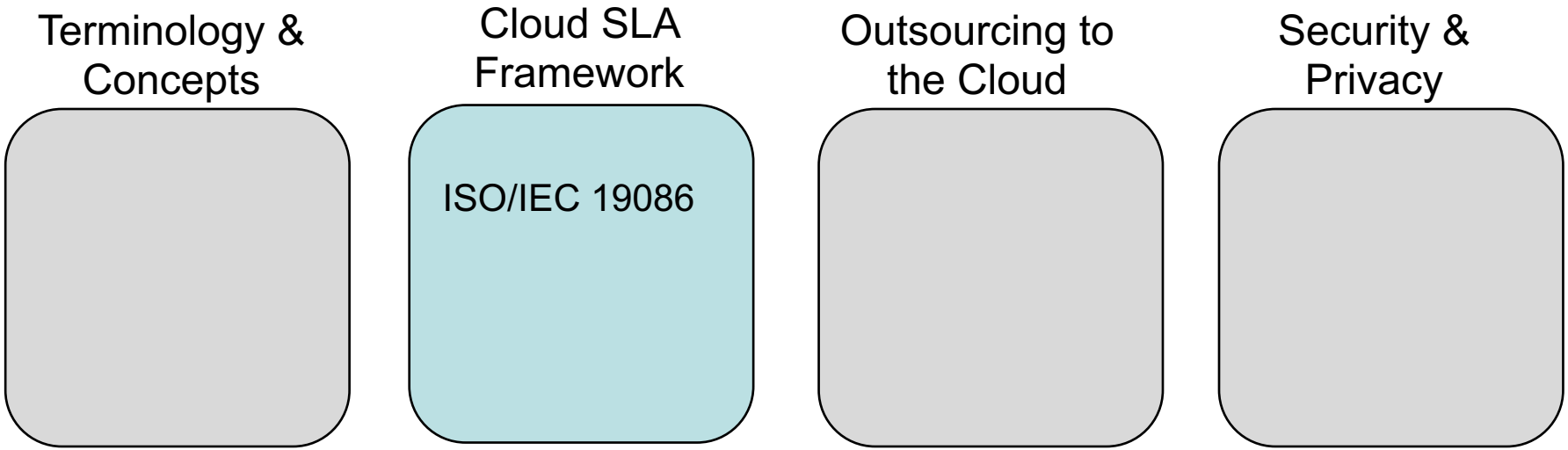
- Builds upon ISO/IEC 17788 & ISO/IEC 17789
- Introductory materials on cloud federation/multi-cloud
- Introductory materials on virtualization, which is a key technology that underpins cloud computing
- Trying to address hybrid cloud problems/issues

Clarifying Hybrid Cloud



Hybrid cloud. Cloud deployment model using at least two different cloud deployment models.

Key Cloud Topics



ISO/IEC 19086 [Multi-part]

- Information technology – Cloud computing – Service level agreement (SLA) framework

Part 1: ***Overview and concepts***	**Part 2:** ***Metric Model****
Part 3: ***Core Conformance Requirements***	**Part 4:** ***Components of Security and Protection of PII****

**Cloud computing – Service level agreement (SLA) framework

ISO/IEC 19086-1

- Applicable to CSC and CSP
- Identifies cloud service level objectives (SLOs)
- Cloud service qualitative objectives (SQOs)
- Cloud SLA components
  - Covered services
  - Cloud SLA definitions
  - Service monitoring
  - Roles and responsibilities


INTERNATIONAL STANDARD

ISO/IEC 19086-1

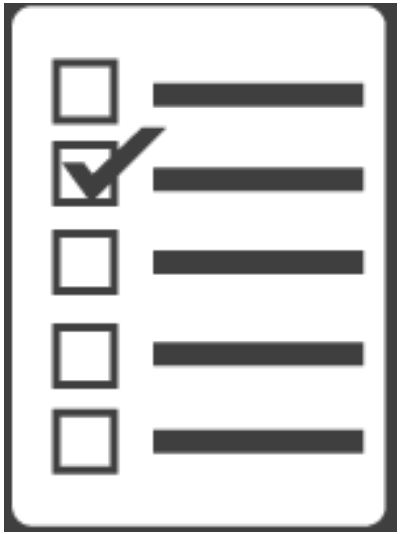
Information technology — Cloud computing — Service level agreement (SLA) framework —

Part 1:

Overview and concepts

ISO/IEC 19086-1 (cont.)

- Relationship between Cloud Service Agreements (CSAs) and Cloud SLAs
- Examples of common parts of CSAs:
  - Cloud Service Level Agreement (cloud SLA)
  - Acceptable Use Policy
  - Security Policy
  - Data Protection Policy
  - Business Continuity Policy
  - Upgrade Policy
  - Termination Policy



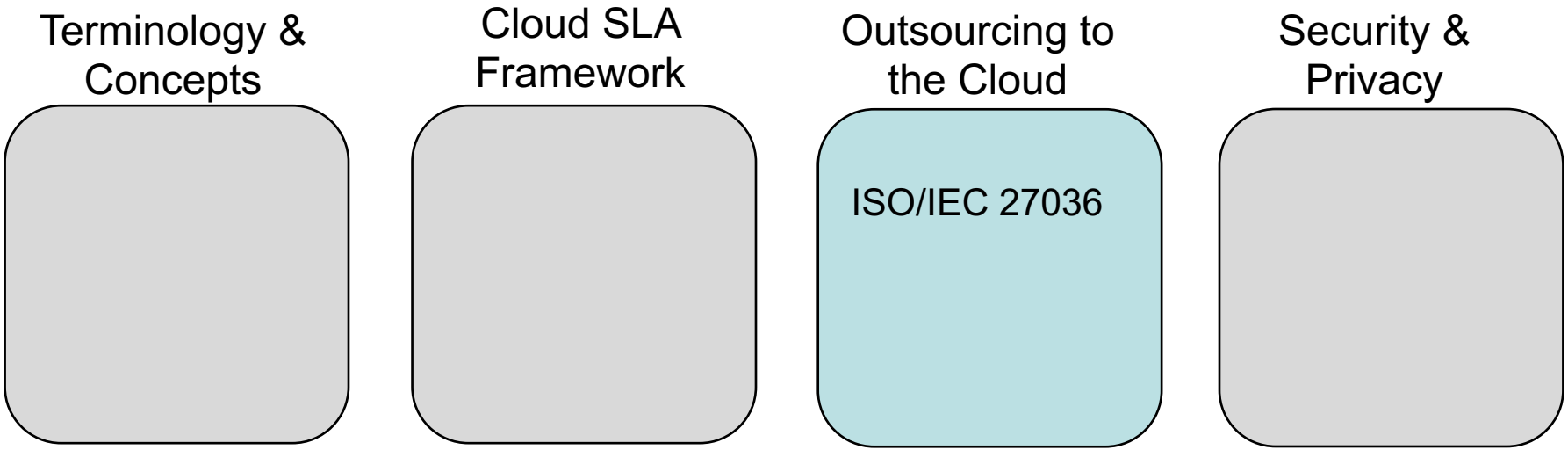
Cloud SLA Content Areas and their Components

- Accessibility
- Availability
- Cloud service performance
- Protection of PII
- Information security
- Termination of service
- Cloud service support
- Governance
- Changes to the cloud service features and functionality
- Service reliability
- Data management
- Attestations, certifications and audits

ISO/IEC 19086-3

- Specifies the core conformance requirements for SLAs for cloud services based on ISO/IEC 19086-1 and guidance on the core requirements
- SLA that conform must include: “Covered Services” and “Cloud SLA definitions”
- Sample language (termination of service):
  - A termination of service component shall specify one or more SLOs or SQOs for termination of service

Key Cloud Topics



ISO/IEC 19086 [Multi-part]

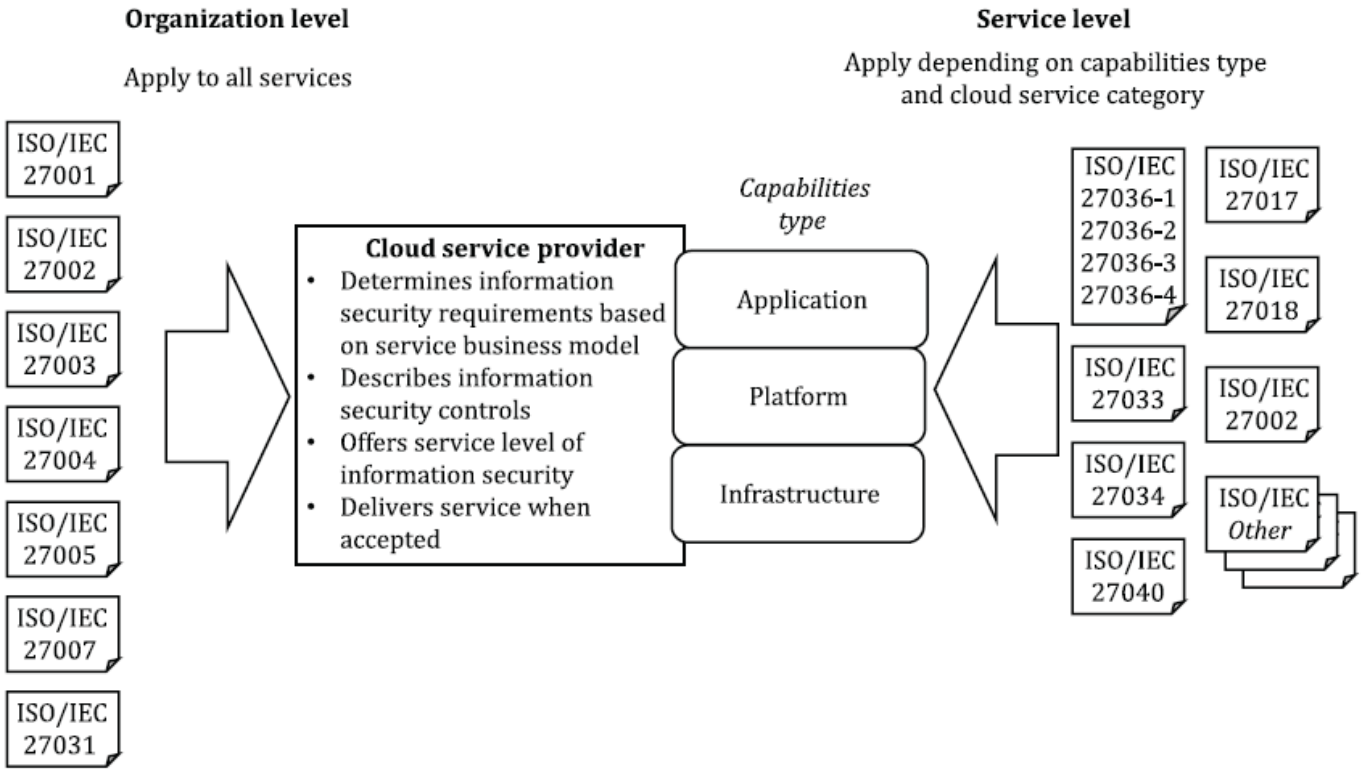
- *Information technology – Security techniques – Information security for supplier relationships*

Part 1: ***Overview and concepts***	**Part 2:** ***Requirements***
Part 3: ***Guidelines for ICT supply chain security***	**Part 4:** ***Guidelines for security of cloud services***

ISO/IEC 27036 [Part 4]

- Differences and similarities between ICT outsourcing and public cloud deployment models
- Cloud service threats and associated risks for public cloud
- Information security controls in cloud service acquisition lifecycle
- Information security controls in cloud service providers

Outsourcing to the Cloud
(ISO/IEC 27036)



Key Cloud Topics

Terminology & Concepts	Cloud SLA Framework	Outsourcing to the Cloud	Security & Privacy
			ISO/IEC 27017 | ITU-T X.1631 ISO/IEC 27018 ISO/IEC 27040 ISO/IEC 27701*

*Not a standard specific to cloud.

ISO/IEC 27017

- *Code of practice for information security controls based on ISO/IEC 27002 for cloud services*
- Additional implementation guidance for relevant controls specified in ISO/IEC 27002
- Additional controls with implementation guidance that specifically relate to cloud services
- Provides an extended control set cloud service

ISO/IEC 27040

- *Storage security*

- Data/media sanitization
- Cloud storage security – General & CDMI
- Secure multitenancy
- Secure autonomous data movement
- Data retention

ISO/IEC 27018

- *Code of practice for protection of personally identifiable information (PII) in public clouds acting as PII processors*

- Focuses on protecting PII in accordance with the privacy principles in ISO/IEC 29100 for the public cloud computing environment
- Provides a Public cloud PII processor extended control set for PII protection

ISO/IEC 27701

- *Extension to ISO/IEC 27001 and ISO/IEC 27002 for privacy management — Requirements and guidelines*

- Not specific to cloud, but likely to have an impact; ISO/IEC 27018 will probably be updated
- Similar to ISO/IEC 27001, organization could seek certification (e.g., GDPR)
- Covers both PII controllers and processors

Summary

Terminology & Concepts	Cloud SLA Framework	Outsourcing to the Cloud	Security & Privacy
ISO/IEC 17788 | ITU-T Y.3500 ISO/IEC 22123	ISO/IEC 19086	ISO/IEC 27036	ISO/IEC 27017 | ITU-T X.1631 ISO/IEC 27018 ISO/IEC 27040 ISO/IEC 27701

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- This webcast and a PDF of the slides will be posted to the SNIA Cloud Storage Technologies Initiative website and available on-demand at https://www.snia.org/forum/csti/knowledge/webcasts
- A full Q&A from this webcast will be posted to the SNIA Cloud blog: www.sniacloud.com/
- Follow us on Twitter @SNIACloud

Thank You

Standards (1)

- ISO/IEC 17788 | ITU-T Rec. Y.3500, *Information technology — Cloud computing — Overview and vocabulary*
- ISO/IEC 17998 | ITU-T Rec. Y.3502, *Information technology — Cloud computing — Reference architecture*
- ISO/IEC 17826, *Information technology — Cloud Data Management Interface (CDMI)*
- ISO/IEC 19086-1,*Information technology — Cloud computing — Service level agreement (SLA) framework — Part 1: Overview and concepts*
- ISO/IEC 19086-2,*Information technology — Cloud computing — Service level agreement (SLA) framework — Part 2: Metrics*
- ISO/IEC 19086-3,*Information technology — Cloud computing — Service level agreement (SLA) framework — Part 3: Core conformance requirements*
- ISO/IEC 19086-4,*Information technology — Cloud computing — Service level agreement (SLA) framework — Part 4: Components of security and of protection of PII*
- ISO/IEC 19941, *Information technology — Cloud computing — Interoperability and portability*
- ISO/IEC 19944, *Information technology — Cloud computing — Cloud services and devices: data flow, data categories and data use*

Standards (2)

- ISO/IEC AWI TR 3445, *Information technology — Cloud computing — Guidance and best practices for cloud audits*
- ISO/IEC 22123-1, *Information technology — Cloud computing — Part 1: Terminology*
- ISO/IEC 22123-2, *Information technology — Cloud computing — Part 2: Concepts*
- ISO/IEC 22624, *Information Technology — Cloud Computing — Taxonomy based data handling for cloud services*
- ISO/IEC TR 22678:2019, *Information Technology — Cloud Computing — Guidance for policy development*
- ISO/IEC TS 23167:2018, *Information Technology — Cloud Computing — Common technologies and techniques*
- ISO/IEC TR 23186:2018, *Information Technology — Cloud Computing — Framework of trust for processing of multi-sourced data*
- ISO/IEC TR 23187, *Information Technology — Cloud Computing — Interacting with cloud service partners (CSNs)*
- ISO/IEC TR 23188, *Information Technology — Cloud Computing — Edge computing landscape*
- ISO/IEC 23613, *Information Technology — Cloud Computing — Cloud service metering elements and billing modes*
- ISO/IEC 23751, *Information Technology — Cloud Computing and distributed platforms — Data sharing agreement (DSA) framework*
- ISO/IEC 23951, *Information Technology — Cloud Computing — Guidance for using the cloud SLA metric model*

Standards (3)

- ISO/IEC 27001, *Information technology — Security techniques — Information security management systems — Requirements*
- ISO/IEC 27002, *Information technology — Security techniques — Code of practice for information security controls*
- ISO/IEC 27017 | ITU-T Rec. X.1631, *Information technology — Security techniques — Code of practice for information security controls based on ISO/IEC 27002 for cloud services*
- ISO/IEC 27018, *Information technology — Security techniques — Code of practice for protection of personally identifiable information (PII) in public clouds acting as PII processors*
- ISO/IEC 27036-1, *Information technology — Security techniques — Information security in supplier relationships — Part 1: Overview and concepts*
- ISO/IEC 27036-2, *Information technology — Security techniques — Information security in supplier relationships — Part 2: Requirements*
- ISO/IEC 27036-3, *Information technology — Security techniques — Information security in supplier relationships — Part 3: Guidelines for information and communication technology supply chain security*
- ISO/IEC 27040, *Information technology — Security techniques — Storage security*