

Government Data Center Modernization Service Standards Focus Group Discussion

13 March 2017



Table of Contents



Welcome and Introduction

What are standards and their need

Key challenges

Standard functional areas

Standards adoption

Future operating model

Questionnaire Detailing

What are Standards
and why are they
used?

Standards play an important role in practices and performance requirements to enable effective management and provisioning of services in the dynamic environment



What are Standards?

- Standards are universally or widely accepted, agreed upon, or established means of determining what a product, service, facility or a concept is required to be or is required to behave.
- In Data Centers to develop a commitment to operate facilities that meet the rigorous guidelines and compliance needs of global businesses.
- Companies that develop industry standards work with several regulatory and standards organizations to ensure compliance—from operation of the data center to sustainability and environmental regulations.

Why are standards needed?



Advent of newer technologies like data analytics, big data, Internet-of-Things and technologies companies venturing into smart cities is going fuel the growth of data centers



The overall data center workloads are expected to increase exponentially approximately five Exabyte's of data online in 2002 rose to 750 EB in 2009; by 2021 it is expected to cross the 35 zettabytes level.

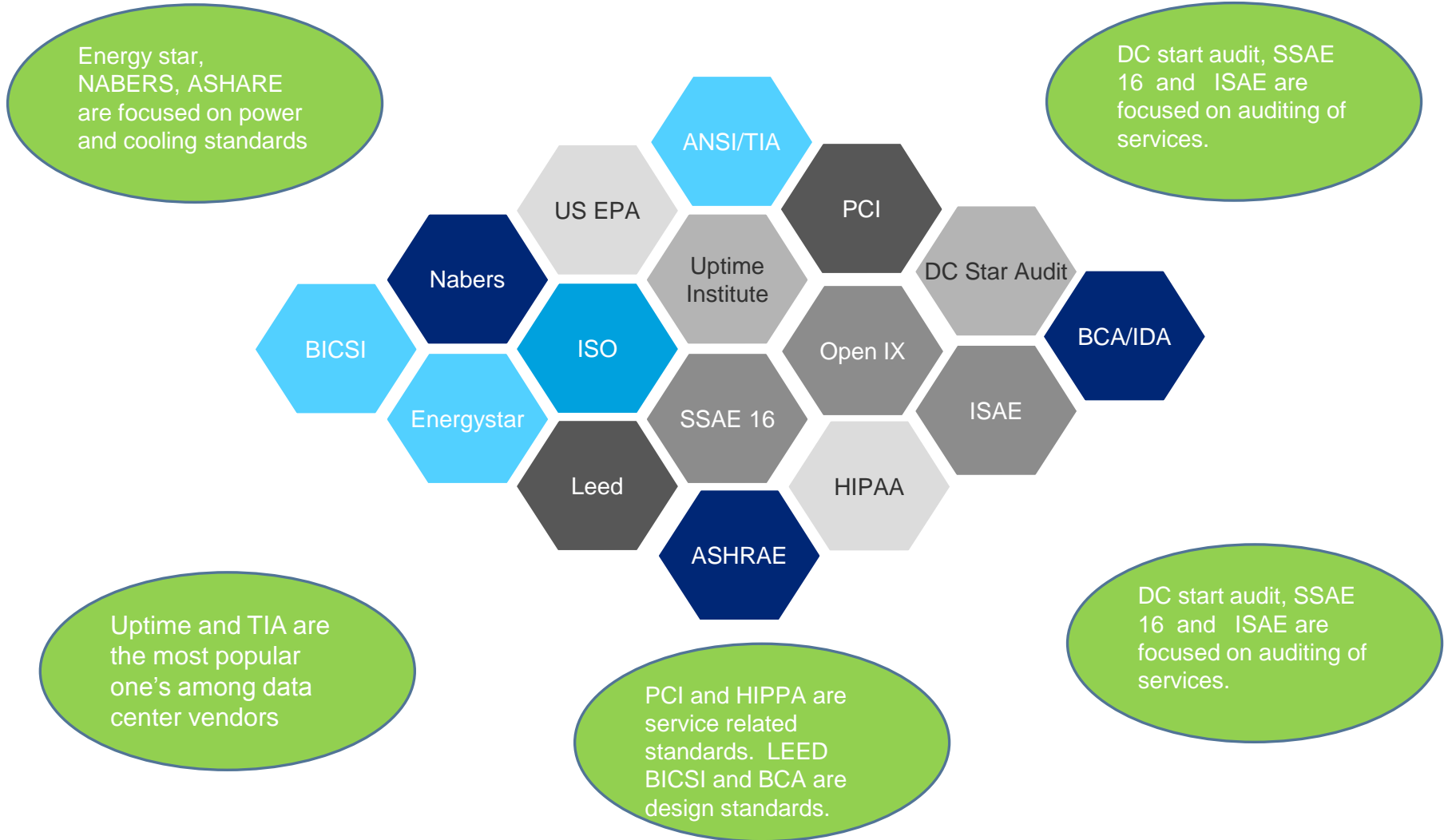


Data centers operate 24/7 and are highly energy intensive, the energy intensity of a data center may be 10 to 100 times of a typical commercial building.



Rising energy prices are also increasing the operating cost of data centers and it has been reported that global data center carbon emissions will grow 7% year-on-year through 2020.

Examples of Data Center International Standards



Key Challenges

Key Challenges – Data Center Standards



Expensive to adopt

One of the biggest challenges faced by the data center operators is that the standards are expensive to adopt. The standards offer guidelines for operating and maintaining the data center efficiently. Adopting these best practices comes at a big price tag



Long list for data center standards

Over the years, the number of standards have increased at very fast pace globally. It is challenging for data center operators to choose between which standards to use and which not to use.



Lack of people with standards knowledge

As the list of standards is quite long, there is lack of people with skills that have data center standards knowledge. As there is scarcity of such people, it is challenging for data centers to adopt standards.

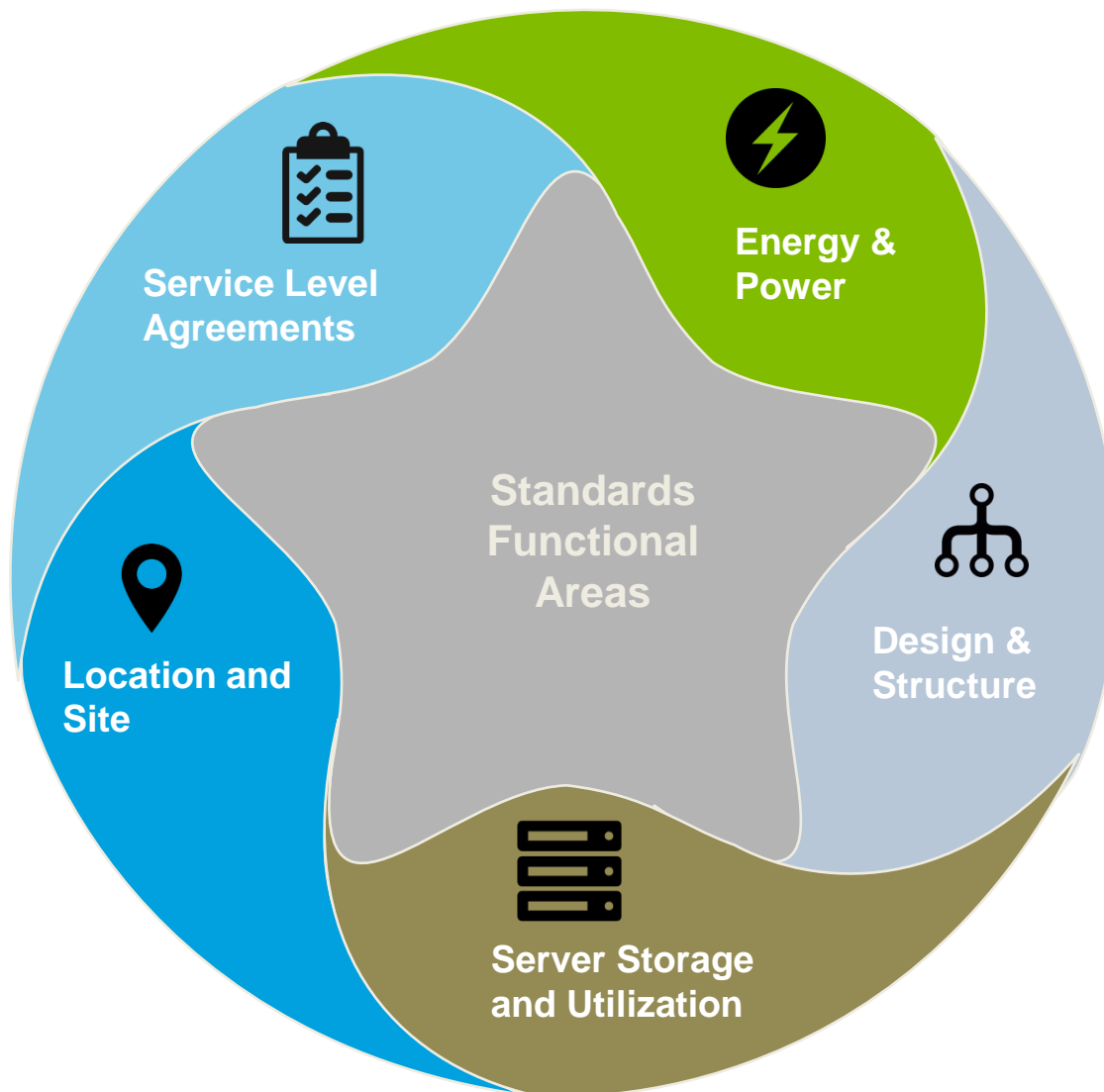


Lack of people with operational knowledge

Once the data center standards are adopted, another challenge that comes into place is maintaining the standards. There is lack of people who have knowledge on how to maintain the data center standards. This is also a big challenge for data center operators.

Standard functional areas

Data Center Standards by Functional Areas



Data Center Standards by Functional Areas

Energy & Power



- ✓ Energy is one of the most important components in data centers.
- ✓ Data Centers consume an immense amount of power to perform functions reliably and effectively.
- ✓ The electrical costs in Data Centers typically accounts for 40-60% of the total operating costs.
- ✓ Improving energy efficiency of a Data Center is extremely beneficial - it reduces the costs of operation and at the same time, lowers the environmental impact of the facility.

Design & Structure



- ✓ The data center is home to the computational power, storage, and applications necessary to support an enterprise business.
- ✓ The data center infrastructure is central to the IT architecture, from which all content is sourced or passes through.
- ✓ Proper planning of the data center infrastructure design is critical, and performance, resiliency, and scalability need to be carefully considered.
- ✓ Another important aspect of the data center design is flexibility in quickly deploying and supporting new services.
- ✓ Designing a flexible architecture that has the ability to support new applications in a short time frame can result in a significant competitive advantage.
- ✓ Such a design requires solid initial planning and thoughtful consideration in the areas of port density, access layer uplink bandwidth, true server capacity, and oversubscription, to name just a few.

Data Center Standards by Functional Areas

Server Storage & Utilization



- ✓ The data centers are equipped to host / co-locate systems (e.g. Web Servers, Application Servers, Database Servers, SAN, and NAS etc.) to host applications at the data center to use the centralized computing power.
- ✓ The centralized computers/Servers will be used to host multiple applications.
- ✓ Data centers have high availability, centralized authenticating system to authenticate the users to access their respective systems depending on the authentication matrix.
- ✓ The entire infrastructure in the data center would require monitoring tools and security tools for efficient operation.

Location & Site



- ✓ Determining the location of a data center is one of the crucial decisions for a company as it is based on strategy and goals of a company or government.
- ✓ Site selection plays an important role for the same as it will have direct impact on cost and TCO.
- ✓ There are many factors which affect site selection.
- ✓ All these factors should be looked from strategic perspective as nowadays an industry changes its focus every 3 to 5 years and transforms/adopts new technology every 7 to 10 years.

Service Level Agreement



- ✓ End-to-end service availability of the data center and its independent monitoring is the prime requirement to have reliable, seamless, smooth delivery of the services to the citizens.
- ✓ It is, therefore, necessary that appropriate Service Level Agreements (SLAs) be worked out between government the and the Implementing Agency and that an independent Agency would be appointed to monitor the performance with reference to the SLA and related aspects.

Standard Adoption



Energy

- US government is trying to achieve a PUE of <1.5 for old data centers and <1.4 for new data centers.
- UK government used Green grid recommendation by using Rack PDU meters in data centers.
- ANSI TIA-942-A standard 3 recommends the use of LED and sensor based lighting fixtures in data centers for three
- Australian government recommends using ASHARE guideline for cooling systems which suggests raising the data center temperature to operate at between 23 and 28 degrees Celsius



Design and Structure

- US government uses TIA 942 and BICSI which Suggests that colours and naming must be applied to the cables in data center.
- Government of Singapore recommends to use threat assessment for data center s one a year.
- Australian government recommends Protective Security Policy Framework for data center security physical and technical security.
- US government recommends using LEED design standards when developing data center standards.



Server Storage & Utilization

- Singapore government recommend PTDCI standard for protecting consumer data in data centers.
- Indian government is using data center IT infrastructure monitoring tools to understand their usage and ultimately bring improvements
- Hong Kong government has setup an data center helpline desk for the data center customers.
- Australian government mandates that its agencies proper backup, storage, and handling of data is necessary for the Department to achieve its objectives efficiently



Location & Site

- Government of Canada mandates that appropriate selection of the facility site, and management of the Data Center, is critical if I&IT assets are to be protected.
- Government of India mandates that it is imperative for government data center are accessible enough so that fire and emergency services are able to respond quickly to incidents.
- US government mandates that data centers have ready access to electrical power is available from diverse sources
- Philippines government mandates that agency Data Center building structure is required to be in zone where it needs to be free from earthquake and flooding

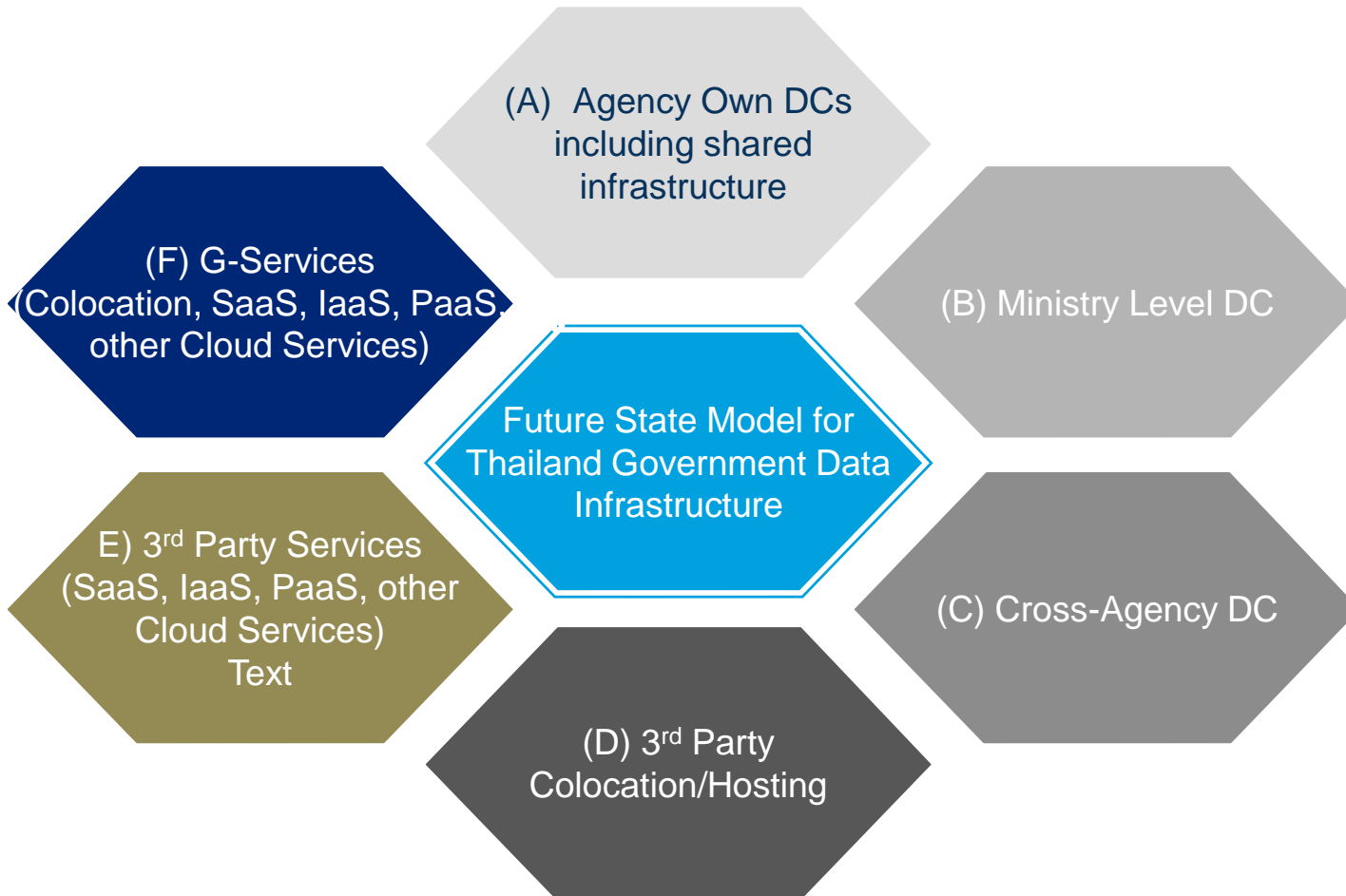


Service Level Agreement

- The Ministry of Electronics & Information Technology of India has mandated that state data centers (“SDC”) establish appropriate Disaster Recovery and Business Continuity Plan.
- In India, state government are asked to develop data center in their respective states. National Data Centers, managed by NIC, have been identified as DR Sites for the SDC. This is a country wide policy for states to choose National data centers as DR site.
- Multiple governments recommends using Uptime or TIA for reference when designing data center as per uptime requirements set by the agencies.

Future Operating Model

The Future State Model for Thailand Government Data Infrastructure is bucketed into 6 key areas



Please note that (E) 3rd party services does not include 3rd party colocation, which is captured as a separate service that's being also used currently as (D)

The Agency own DCs are the existing DCs while the ministry level DCs and cross agency DCs will be converted shared DCs to host and manage data for multiple agencies



A: Agency own DCs including Shared DCs

Definition

Internal agency setup, mostly existing. Usually the capex has been spent in development. Own DCs range from small server rooms to large DCs. Few agencies can opt for shared services depending on the type of own data stored, their location and utilization.

Who Manages

The agency own DCs will be managed by the agency and follow the agency structure.

Operations

Responsibility of operations will lie with the agency.

Current Condition: Existing

Future State: Will exist

B. Ministry Level DC

Definition

A larger DC converted into a ministry level DC to host multi-agency data belonging to same ministry.

Who Manages

Control of ministry DCs will be in the hand of specific ministry but the main agency will also have control.

Operations

Operations will be done by existing team. reporting into ministry.

Current Condition: No Existing as a separate entity

Future State: Will exist depending on outlook of government.

C: Cross-Agency DC

Definition

A larger DC converted into a multiple agency DC to host multi-ministry-multi-agency data including data for independent agencies.

Who Manages

There will be a regional team set up for this DC. The management team of current DC will need be a part of larger regional team.

Operations

Operations will be done by existing team. This team will now report into regional team.

Current Condition: Not Existing

Future State: Will exist based on government choice.

The 3rd party services include services provided by external companies while G-Services will be government provided and enabled services for cloud and colocation needs



D. 3rd Party Colocation/Physical Hosting

Definition

Hosting of physical servers at 3rd party companies to outsource the operations and day-to-day management, DC environment. This often comes at a higher cost and is preferred for agencies with lower requirements or low bandwidth for space and personnel.

Who Manages

Agency team will manage the data on 3rd party colocation.

Operations

3rd party provider as covered in contract.

Current Condition: Existing

Future State: Will reduce only on need be.

E: 3rd Party Services (Cloud, IaaS, SaaS, PaaS)

Definition

Hosting of data at 3rd party companies on the cloud without holding any physical infrastructure. Entire operations, hardware and day-to-day management is the responsibility of 3rd party operator, which comes at a higher cost, and security concerns. The services include Infra as service, Software as service, platform as service, storage, applications, database, integration etc.

Who Manages

Agency team will manage the data on 3rd party cloud.

Operations

3rd party provider as covered in contract

Current Condition: Existing

Future State: Will be re-looked from security angle.

F. G-Services (Cloud, IaaS, SaaS, PaaS and Colocation)

Definition

Governments own infrastructure that enables same benefits of that of 3rd party cloud operated at government level. This imparts higher security than 3rd party services and data resides at the government level. G-services include multitude of facilities including Infra as service, Colocation, Software as service, platform as service, storage, applications, database, integration etc.

Who Manages

Government owns and leads in the management of G-Cloud.

Operations

Internal provision or 3rd party support

Current Condition: Existing

Future State: Will increase based on security and other factors.

Questionnaire Detailing



Prepared by Frost & Sullivan (Thailand) Co., Ltd.