**Datacenter**

Standards

Official U.S. and Canadian standards for data center infrastructure:

• ANSI American National Standards Institute

• CSA Canadian Standards Association

• EIA Electronics Industries Alliance

• TIA Telecommunications Industry Association

Objective: provide standards for planning of data centers, computer rooms, colocation centers, trading floor equipment rooms, technology test labs, and similar spaces.

TIA 942 is the first official standard for data center infrastructure.

Computer Room/ Data Centre Elements

**Architectural**

•Location

•Ceiling Height

•Treatment

•Doors

•Floor Loading

•Raised floor systems

**Environmenta**l/**HVAC**

•Heating / Ventilation & Air Conditioning (HVAC)

•Contaminants

•Vibration

•Fire Protection

**Electrical**

•Power

•Standby Power

•Bonding & Grounding

**Additional Cabling / Connectivity Considerations**

• Cabling system meets standard specifications

• Carrier entrance facility diversity

• Carrier right of way diversity

• Redundant cabling

• Redundant routers and switches

• Labeling of patch panels and outlets

• Labeling of patch cords

• Cabling system documentation

**Servers & Consolidations**

Server upgrades:

* Rack densities may be increased by deploying blade servers and/or servers which feature multi-core processors to obtain more computing power per rack unit.
* Server virtualization: Virtualization technologies pool resources together in a single “virtual” environment to share processing efforts more evenly across fewer physical servers. This strategy also helps increase the availability of applications by sharing them across multiple virtual machines.
* I/O consolidation Parallel data streams may be consolidated over the same 10 Gb/s physical infrastructure by employing Converged Network Adapters. This reduces the need for separate switches, cabling, adapters, and transceivers for each class of traffic.

**Storage area optimization strategies**

* **Centralized architectures:** Consolidation of scattered Direct-Attach Storage (DAS), Network Attached Storage (NAS) units, and Storage Area Network (SAN) islands into a single physical fabric enables streamlined storage management and more efficient asset utilization. These simplified environments reduce operational costs as they are easier to manage, maintain, and scale.
* **Storage upgrades** Legacy storage drives can be upgraded to higher-density storage arrays.
* **Storage virtualization** Consolidate equipment and physical space, increase drive utilization, and eliminate redundant business applications.

**Principles of Availability**

• Scalability • Prioritization • Simplicity • Automatism • Autonomy • Fault tolerance • Redundancy • Separation • Robustness