



The TIA/EIA-942 Data Center Standard was published in April 2005. The purpose of the standard is to establish a guideline for the various design and construction elements of both a large and small scale Data Center.

Below is the excerpt from the standard:

“The purpose of this Standard is to provide requirements and guidelines for the design and installation of a data center or computer room. It is intended for use by designers who need a comprehensive understanding of the data center design including the facility planning, the cabling system, and the network design. The standard will enable the data center design to be considered early in the building development process, contributing to the architectural considerations, by providing information that cuts across the multidisciplinary design efforts; promoting cooperation in the design and construction phases. Adequate planning during building construction or renovation is significantly less expensive and less disruptive than after the facility is operational. Data centers in particular can benefit from infrastructure that is planned in advance to support growth and changes in the computer systems that the data centers are designed to support.”¹

The data center standard takes into consideration that multiple utilities, such as electrical systems, HVAC, fire detection and suppression and security must co-exist and work in tandem with the communications infrastructure within the in the facility/room. These utilities plus the decentralization of the mainframe based services to a more distributed server based approach have created new challenges for data center design and implementation. By providing both design requirements and in depth informational annexes the standard defines many “best practices” associated with the building of a modern day data center.

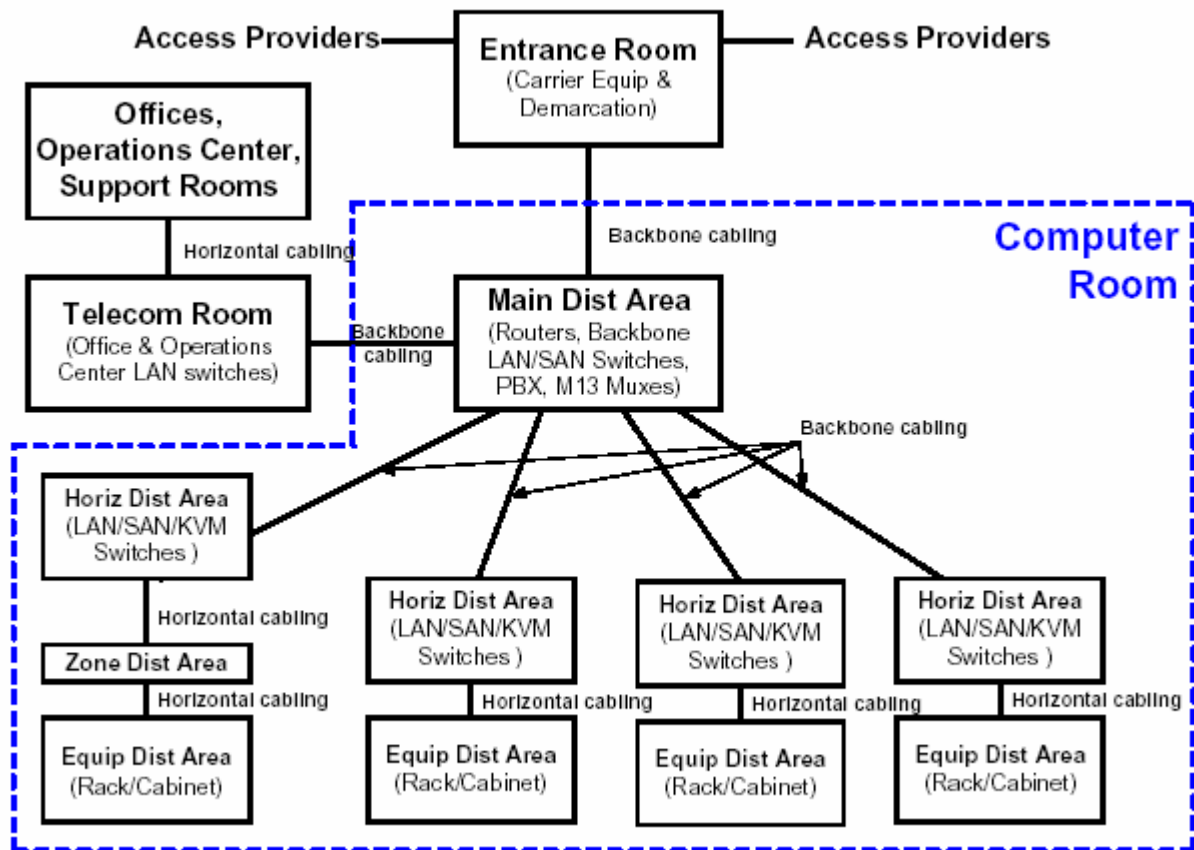
General design elements identified in the standard for consideration that could apply to the majority of data centers would include:

- . Standards based open systems
- . High performance and high bandwidth with growth factors incorporated
- . Support for 10G or higher speed technologies
- . Support for storage devices (i.e. Fiber channel, SCSI or NAS)
- . Support convergence of new IP applications
- . High quality, reliability and scalability
- . Redundancy
- . High capacity and density
- . Flexibility and expandability with easy access for moves, adds and changes

The TIA/EIA-942 standard defines new terms, addresses media selection, physical environment, and equipment placement.

These new terms are a major component of the TIA/EIA-942. This diagram shows the relationship between the various defined elements and how they are configured to create the total system.

¹ TIA - 942



A star cabling topology is recommended. The standard recognizes multiple media but recommends the highest capacity cabling media be used for new installations.

• **Horizontal Cabling Recognized Media**

- 100-ohm twisted-pair cable (ANSI/TIA/EIA-568-B.2), Category 6 recommended (ANSI/TIA/EIA-568-B.2-1)
- Multimode optical fiber 62.5/125 or 50/125 micron (ANSI/TIA/EIA-568-B.3) 50/125 micron 850 nm laser optimized multimode fiber is recommended (ANSI/TIA/EIA-568-B.3-1)
- Singlemode optical fiber (ANSI/TIA/EIA-568-B.3)
- Recognized coaxial media are 75-ohm (734 and 735 type), coaxial cable (Telcordia GR-139-CORE), and coaxial connector (ANSI T1.404)

In summary, the TIA/EIA-942 Standard specifies data center planning and design procedures. Establishes and provides guidelines and recommendations for data centers implementation and embraces much more than telecommunications infrastructure. Over 50% of the TIA/EIA-942 Standard handles building construction specifications (power, pathways, fire protection, doors, walls treatment, among others).

Equally important the standard also considers and draws on other TIA/EIA standards - '568-B, '569-B, '606-A and '607 for the cabling, pathways and spaces, administration and earthing design, installations and other procedures.

One important Annex to note is the reference to the four tiers for data center redundancy. This Tier system developed by the Uptime Institute is quickly becoming an important benchmarking tool for designers and end users.

2 TIA/EIA-942