

# The Difference Between Data Centers and Computer Rooms

By Peter Sacco

*Experts for Your Always Available Data Center*

White Paper #1



## **EXECUTIVE SUMMARY**

**The differences between a data center and a computer room are often misunderstood. Furthermore, the terms used to describe the location where companies provide a secure, power protected, and environmentally controlled space are often used inappropriately. This paper provides a basis for understanding the differences between these locations and how they relate to each other.**

## Data Center Function

The functional requirements of any data center space are fourfold:

1. To provide a safe and secure place to locate mission critical equipment
2. To provide sufficient power protection to maintain the critical load
3. To provide adequate environmental controls, including cooling and fire safety, to operate the space within the critical loads operating parameters
4. To provide communications connectivity both inside and outside the space

## Data Center Philosophy

The goal of any data center is to provide continuous availability of all network services. Therefore, whether discussing the network design strategy or the facility design strategy the overall philosophy remains the same:

- Keep it as simple as possible
- Design for scalability
- Utilize modularity wherever possible
- Be flexible and adaptable to change

## Data Center Description

The term 'data center' is used ubiquitously to describe the space(s) serving as the operating theatre for the enterprise's network service delivery. It has also been described by many other names including computer room, datacenter (spelled incorrectly), data centre (European), server room, network room, network closet, telecommunications room and so on.

The most common differentiator between describing your space as a data center and calling it a computer room tends to be scale. However, the official delineator is how the space's functional pieces are put together. The term 'data center' is the description given when the entire site and building shell are utilized exclusively as a data center site. Therefore, a data center can be described as a larger space composed of smaller spaces including:

- Computer Room(s)
- Telecommunications Room(s)
- Entrance Room(s)
- Network Operations Center
- Electrical Room(s)
- Mechanical Room(s)
- War Room / Conference Room(s)
- Staging Area, Storage, and Loading Dock
- People Spaces - Common Areas & General Office Spaces

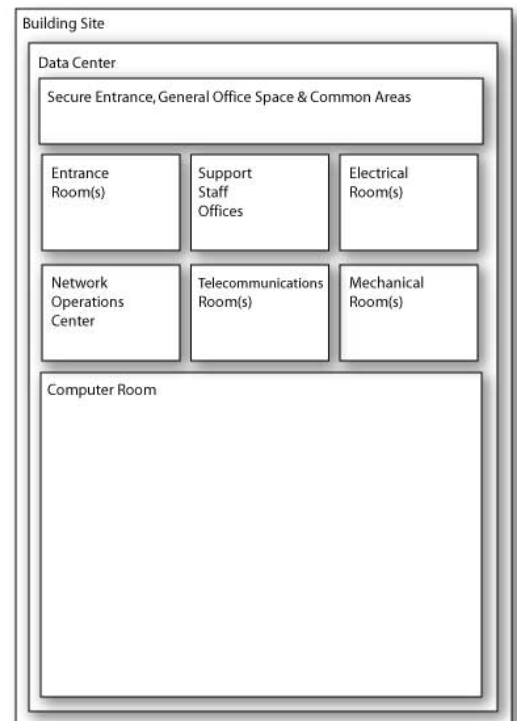


Figure 1: Relationship of spaces in a data center. TIA-942, April 2004

Typically, the ratio of IT space to support space has declined to about 1:1 as compaction has emerged and developed as a trend in the industry.

From this description it is obvious that a 'computer room' is a functional space within a 'data center'. Interestingly enough, both spaces are described as places to secure information systems, technology data, and infrastructure.

## Typical Data Center Topology

The typical data center includes a single entrance room, one or more telecommunications rooms, one main distribution area, and several horizontal distribution areas.

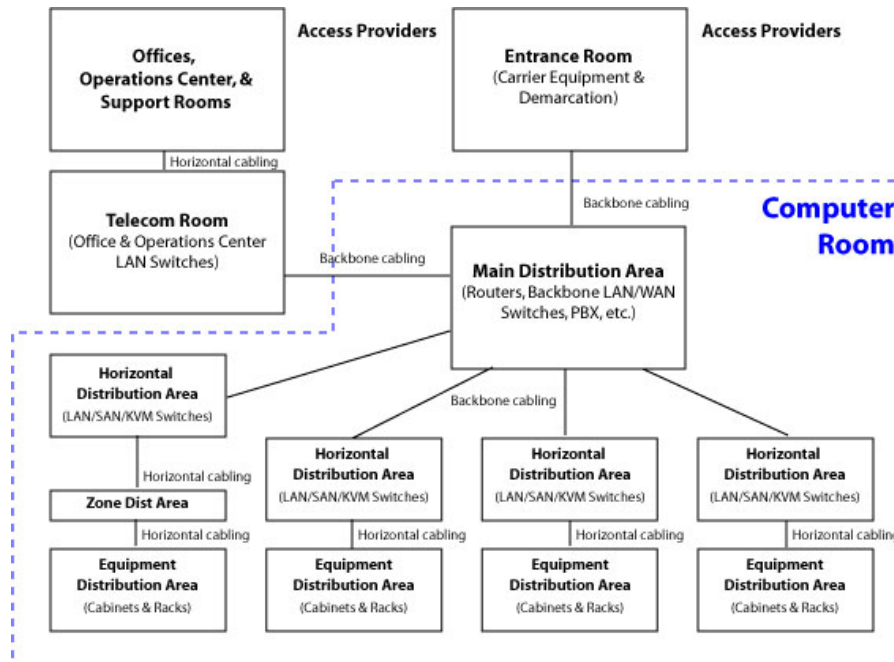


Figure 2: Example of a basic data center topology  
TIA-942, April 2004

## Data Center Systems and Sub-Systems

The following are just some of the major systems and sub-systems that make up any data center location:

### Information Technology (IT) Infrastructure

- Network & Network Security Equipment
- Voice & Data Communications Equipment
- Server & Data Storage Equipment

### Support Infrastructure

- Switchgear & Power Distribution
- Generator / ATS
- Uninterruptible Power Supply (UPS) & Energy Storage
- Computer Room Air Conditioners (CRAC)
- Heat Exchangers
- Fire Detection
- Fire Suppression
- Lighting
- Leak detection

### Structured Cabling

- Backbone Cabling
- Horizontal Cabling
- Main Cross-connect (MC)
- Horizontal Cross-connect (HC)
- Zone ports or consolidation points
- Equipment ports
- Station ports

### Architectural Elements

- Raised Floor
- Suspended Ceiling
- Surface Treatments
- Vapor Barrier
- Doors and Hardware
- Cabinets & Racks

## Computer Room Description

The best description for a Computer Room however is a Collapsed Data Center where the entrance room is contained within the computer room space.

The computer room is the space that serves the purpose of providing a secure environment for the equipment and cabling directly related to the critical load.

Since this is the principle location for network and server infrastructure special considerations must be given to:

- Power protection
- Power distribution
- Cooling
- Humidity control
- Air distribution
- Fire Safety
- Floor layout
- Floor loading
- Service clearances
- Cable pathway
- Physical security
- Signage

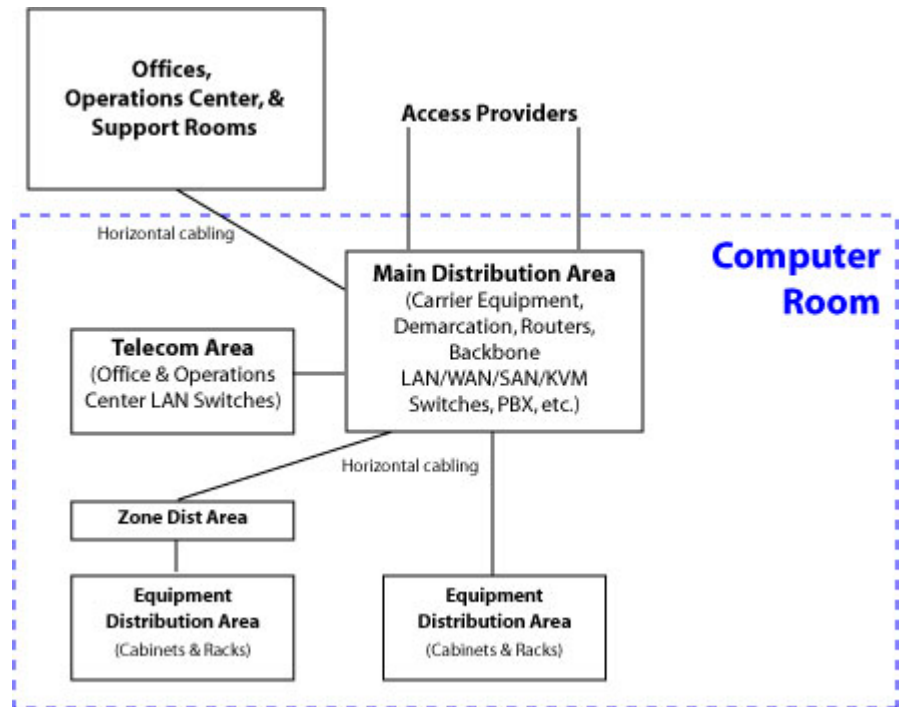


Figure 3: Example of a collapsed data center topology  
TIA-942, April 2004

## Data Center Design Criteria

Rob Sneevly, in his book, *Enterprise Data Center Design and Methodology*, correctly defines the criterion for a data center design as, "...the requirement that must be met to provide the system capacities and availability necessary to run the business."

However, the design criterion for a data center project differs slightly from that of a computer room project.

In either case, data center design and/or computer room design are accomplished by identifying the key design criteria for the two (2) main areas of the project focus, the Technology Infrastructure & Services (IT) and the Support Infrastructure & Services (the Facility). The key design criteria are:

- Business Objectives (Scope)
- Availability Requirement
- Power & Cooling Density

Since a data center project typically involves base-building design, Site Selection, must also be included as a criterion placed on the overall design.

A computer room project, on the other hand, can be as involved as a project within a bigger base-building project or as simple as a relocation and/or upgrade of an existing computer room within an established building space.

Additionally, the space requirements for a computer room project are, unfortunately, often previously dictated by Management and/or the project architect. This complicates the design by restricting the power & cooling density strategy utilized as a criterion. Inevitably, this also increases the overall cost of the project.

Establishing the design criteria to be utilized within the project will lead to the determination of:

- Space requirements
- Budget requirement
- Time requirements

## **Conclusion**

Understanding the proper nomenclature is only one small step in the road to delivering a successful data center and/or computer room project. A computer room is just one of the components that make up a data center environment whose goal is to provide continuous availability of network services. Ultimately, both spaces rely on the integration of the IT and facility infrastructure necessary to deliver a space that meets the company's business objectives.

### **About the Author:**

Pete Sacco is the founder and President of PTS Data Center Solutions, Inc. (PTS). Pete has a BSEE and has been involved in the data center / computer room for over 10 years.

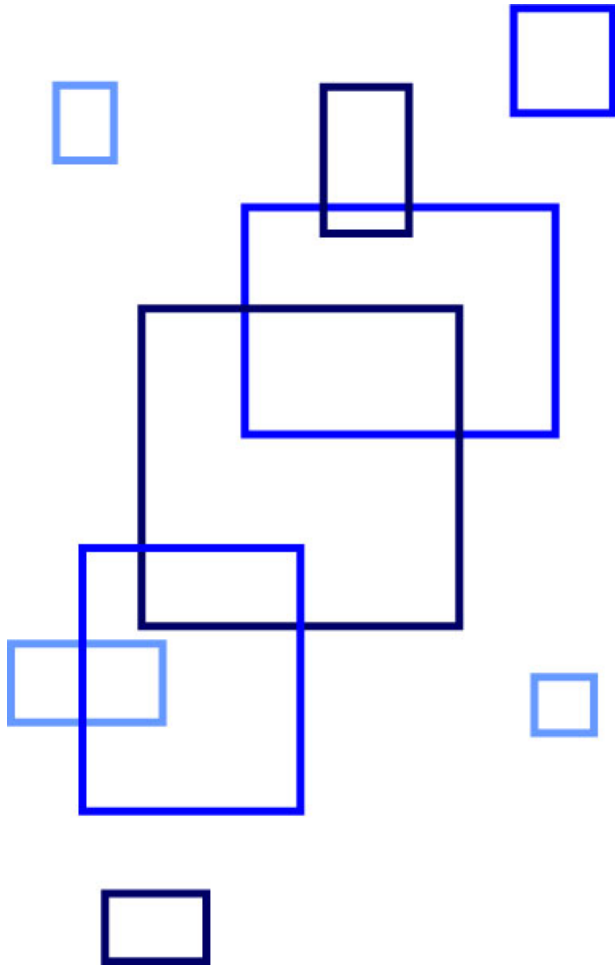
### **About PTS Data Center Solutions:**

PTS Data Center Solutions is a data center consulting services firm and turnkey solutions provider.

We offer a broad range of project expertise. We specialize in planning, designing, constructing, monitoring, and maintaining computer rooms that integrate, 'best-of-breed', critical infrastructure technologies. The result is an in always available, scalable, redundant, fault-tolerant, manageable, and maintainable data center environment.

In today's hyper-competitive markets, where you measure network downtime in lost profits, PTS protects against some of the leading causes of downtime, hardware damage, data loss and decreased productivity. PTS sets the standard for 'always available' solutions for data centers, computer rooms, server room, network closets, telecommunications rooms, network operations centers, and other mission critical facilities.

From our corporate headquarters in Franklin Lakes, New Jersey, and our office in Orange County, California, PTS works to fulfill our mission of creating satisfied customers by emphasizing pre-design & planning services to provide the optimal solution to meet our clients' needs. This results in an early & accurate alignment between scope, schedule and budget.



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