

# **ITM 315**

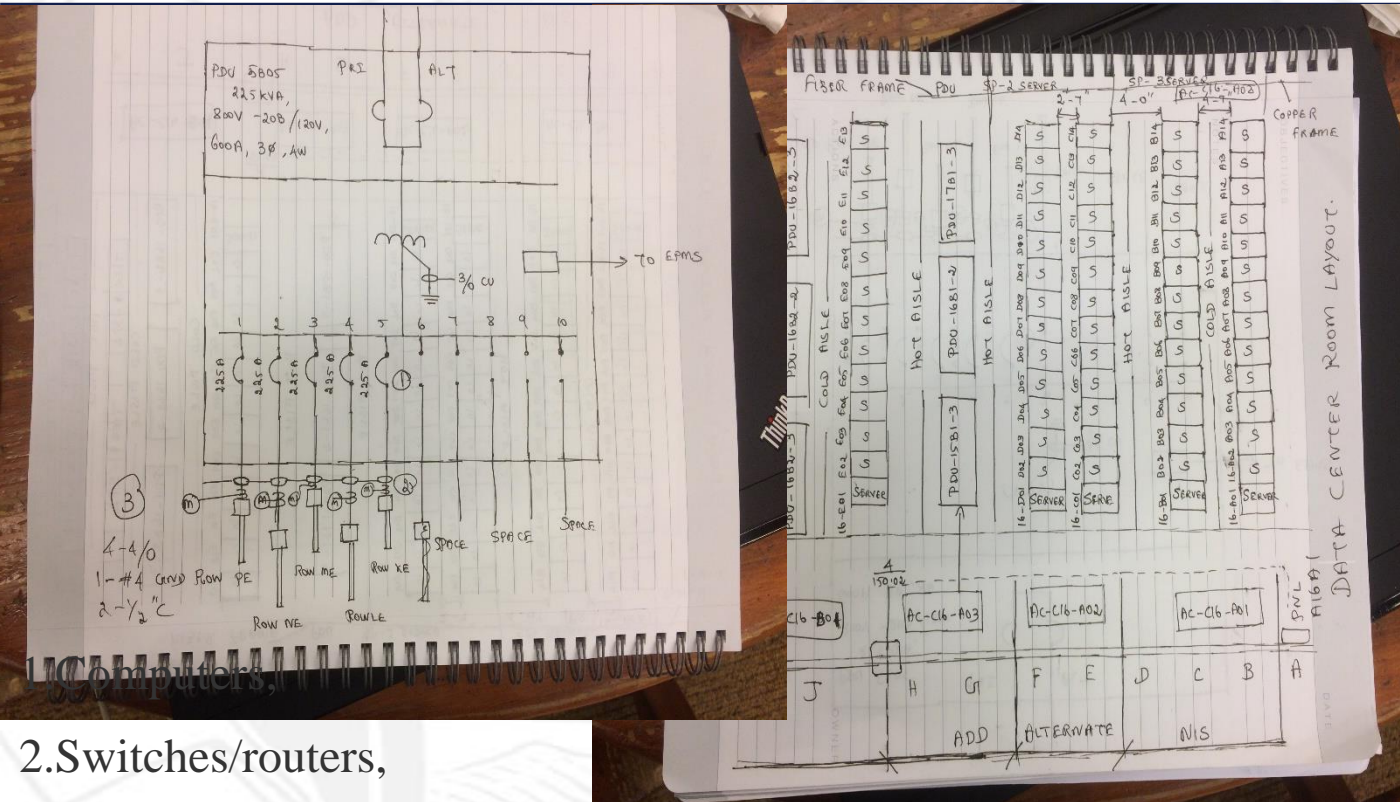
## **Infrastructure and Hosted Services**

---

AADHIPARASAKTHI UNIVERSITY DATA CENTER

PORRSELVI

# FLOOR LAYOUT , ELECTRICAL CIRCUIT AND JOB INFORMATION FOR MY AADHIPARAAKTHI DATA CENTER



JOB INFORMATION	
Project Name	Aadhiparasakthi Engineering College.
Job Code:	1
Account Manager:	Porrselvi
Project Manager:	Porrselvi
Location:	Nilgiris, Tamil Nadu, India.
Academic staff	~5800
Administrative staff	~750
Students	~23,000
<u>Undergraduates</u>	~15000
<u>Postgraduates</u>	~5000
<u>Doctoral students</u>	~3000

1.Computers,

2.Switches/routers,

3.Racks of servers (like web servers, application servers, database servers),

4.Load balancers, 5.Wire cages or closets, 6.Power distribution equipment, 7.Cooling and humidification system.

# LAYOUT, CABINATE, COOLING

---

**A. Cabling:** Fiber optic cable provides greater performance than copper.

**B. Space:** Allocate more floor space for the Data Center, make aisles wider between server rows, and not tightly pack equipment into server cabinets. Helps the heated air easily dissipate.

**C. Layout of the data center:** Positioning Air Handlers: To make hot and cold aisles in my Data Center most effective.

**D. Cooling Requirements:** In addition to supplying power and connectivity, my Data Center must cool the servers, networking devices, and other machines that it houses.

To limit the cooling cost I create the data center near Nilgiris, region. The interesting reason is the Nilgiris, so possible source of relatively cheap power and surrounding is cool for large parts of the year. So cold climate and that limits the cost to power and to cool those computers. Temperatures are relatively consistent throughout the year; with average high temperatures ranging from about 17–20 ° C (63–68 ° F) and average low temperatures between approximately 5–12 ° C (41–54 ° F).

The Kundah Hydro-electric Power Scheme is located in the Nilgiris, Tamil Nadu, India. It is the one of the biggest electricity generating schemes in Tamil Nadu State.

**E. Floor Tiles:** Vented tiles have dozens of tiny holes in them, enabling air to flow through (2 square feet).

**F. CEILING COMPONENTS:** AN overhead infrastructure system. Overhead installation is therefore less expensive, occupies less floor space, and fits more conveniently in shorter building spaces.



# ENTERPRISE LEVEL SYSTEMS

---

- **Energy efficient:** PDU with high efficiency transformers.
  - Power protection with N+1 UPS system.
  - Backup generator power for mission-critical University systems.
  - **Enterprise Level Systems**
  - The facilities provide an efficient, secure, and comprehensive administrative data processing environment for core systems supporting the business of the University, **allowing anytime/anywhere access to information across a variety of devices and platforms.**
1. Business Intelligence, 2.Student Enterprise System (SES), 3.Human Resources System (myHR), 4.Collaboration Services  
5.Alumni Relations and Development Systems (AIMS), 6.Financial Management System (NUFinancials), 7.InfoEd, 8.Canvas Learning Management System, 9.Facilities Management System (FMS),10.Research Administrative Systems.
- **Server Clustering Technique :** The goal of server clustering is to combine multiple servers so that they appear as a single unified system through special software and network interconnects. **High availability clusters** - This type of cluster uses two or more servers and provides redundancy in the case of a server failure. If one node fails, another node in the cluster takes over with little or no disruption.

# DATA CENTER DESIGN MODEL.

**A. Top of Rack approach** recommends Network Switches to be placed on every rack and all the computing devices present in the rack to be connected to them. In turn, these Network Switches can be connected to Aggregation Switches using one/few cables.

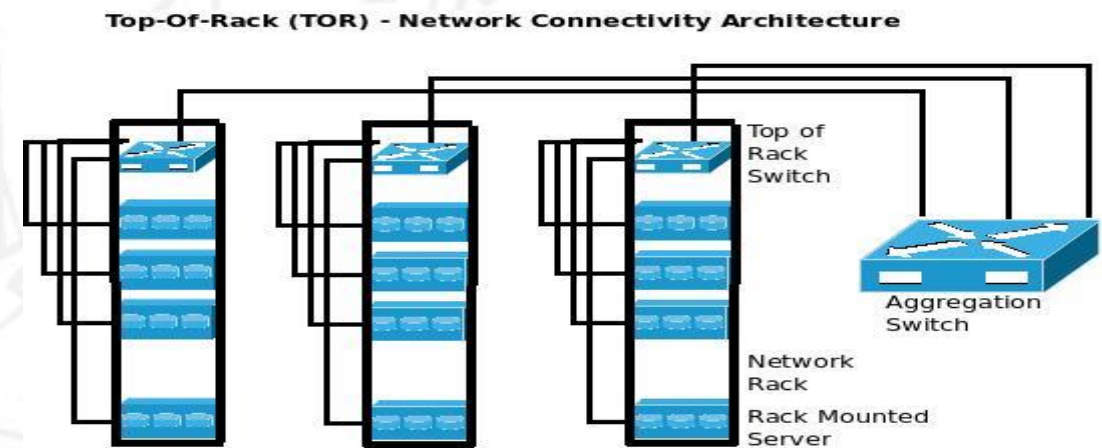
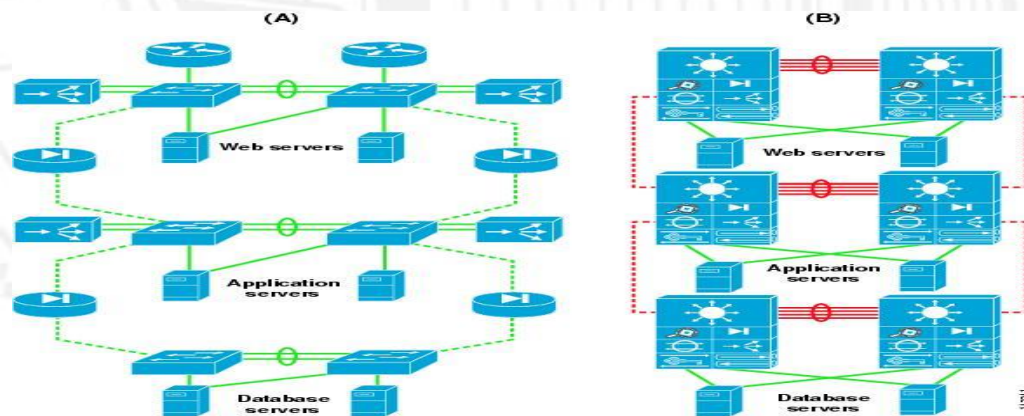
**B. Multi-tier model.** It is based on the web, application, and database layered architecture design.

**C. Number of servers:**

**Over subscription:** The **web servers** in a multi-tier design can be optimized at a **15:1 ratio**, **Application servers** at **6:1**, **Database servers** at **4:1**.

**D. Determining Maximum Number of VLANs:** 1. Spanning tree processing. 2. Default Gateway Redundancy Protocol.

**E. Security:** 1. Multifactor identification and multi level security zones, 2. Digital pan-tilt cameras that monitor all secure area, parking lots, entrances, roof monitored at all times by 24\*7\*365 security staff.



# AADIPARASAKTHI DATA CENTER FACILITY BENEFITS

- The STANFORD RESEARCH COMPUTING CENTER (SRCC) uses nearly 40 percent less energy per square foot than the national median, prevents more than 1,300 metric tons of greenhouse gas emissions per year and outperforms 100 percent of similar buildings nationwide.
- I follow the same strategy in Aadhiparasakthi University Data Center.

## The Data Center facility benefits:

- **Secure data networks**—ensures the confidentiality, integrity, and availability.
- **Disaster recovery/business continuity**—proactive plan to protect the University community and secure the continuity of its campus systems, programs, and services
- **Load balancing**—provide continuous availability of University-wide applications and services across campuses
- **Reliable and scalable**—service design includes serviceability of infrastructure components as well as ease of expansion to accommodate future growth.



# CONCLUSION

---

- FLOOR LAYOUT , ELECTRICAL CIRCUIT AND JOB INFORMATION FOR MY AADHIPARAAKTHI DATA CENTER.
- LAYOUT, CABINATE,COOLING:
  - Space, fiber optic cable, cooling system
- ENTERPRISE LEVEL SYSTEMS:
  - Student Enterprise System, HR.
- DATA CENTER DESIGN MODEL:
  - Multi-Tier model
- AADIPARASAKTHI DATA CENTER FACILITY BENEFITS:
  - Secure data center networks, Load balancing.

