Design Document

Group-1

1. Servers

Total servers - 188

Server name - HPE ProLiant DL380 Gen10 Server

94 servers -12 Compute Intensive and 16 Memory Intensive each (40 core,352GB RAM)

94 servers - 20 Compute intensive each (160GB RAM)

- **Calculation:**
  - Requirements
    - 3000 Compute Intensive Units
    - 1500 Memory Intensive Units

  - 1 Compute Intensive unit will need 2 Core (4 VCPUs are required) and 8GB RAM each.
  - 1 Memory Intensive unit will need 1 Core (2 VCPUs are required) and 16GB RAM each.

  - First set of 94 Servers
    - 12 CI AND 16 MI units each server.
    - CPU Core Required = (12*2 + 16*1) = 40 Core
    - RAM requirements = (12*8) + (16*16) = 352GB RAM.
    - Hence total 1128 CI and 1500 MI units will be in these servers .

  - Second Set of 94 Servers
    - 20 CI units per server.
    - CPU Core Required = (20*2)= 40 Core.

- RAM requirement = (20*8) = 160GB
- Hence Total of 1872 CI units will be in these Servers.

Choosing such configurations helped us to restrict the RAM requirement within 384GB for half of the servers and within 192GB for the rest of the servers , Also maintaining the constraint of maximum 512GB of RAM.

2. Processor

- Processor - Xeon Gold 6248
- Processor Base Frequency - 2.5 GHz
- Max Turbo Frequency - 3.9 GHz
- Number of Cores - 20
- Max number of memory channels - 6

3. Racks

Calculation:

- So for a total of 188 servers .
- 1 server heat dissipation = 500W
- For PAHU Cooling Assuming 7KW , We can fit 14 servers in each rack .
- Thus total racks required 188/14 that is 14 racks.
- 2 Racks for the storage requirements.

Thus total 16 Racks are required.

4. Storage

- SAN - HPE MSA 2052
- Required Storage = 135TB
- HP MSA2 SAS 1.8 TB
- 4 expansion drive enclosures with around 22 SFF SAS in each
- HPE MSA 2050 SFF Disk Enclosure

5. UPS

- **Calculation**
  - Energy consumption - 188 * 500W ~ 100KW (Considering the requirement for storage also)
  - 2 UPS 60 kVA each
  - 1 redundant UPS 60kVA
  - Total UPS requirement - 3

Hence Total 3 UPS are required 60 kVA each .

6. Cooling

- As total power is 100 KW , we need nearly 30 ton of AC.
- 2 AC’s 15 tonnes each
- 1 redundant AC 15 tonnes

Total AC requirement - 3

7. Fire suppression

- Novec 1230 Fire Protection Fluid

- Novec 1230 fluid offers unparalleled value. Whether you're looking to:
  - Replace a halon fire protection system
  - Find an environmentally sustainable and cost comparable alternative to FM-200™, ECARO-25® or other HFCs
  - Select a clean agent with a high margin of safety for occupied spaces

8. Rodent Repellent

- Varna Suraksha MX Model
- High frequency Ultrasonic Rat Repellent System

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Power Requirement Calculation Per server

- Xeon CPU requires 150 W
- 2 CPUs = 300 W
- Memory = 20/40 W

So total 400W ~ 500 W per Server including everything at the peak load .

Thus we are assuming a 500W power requirement for each server .