ESDS MUMBAI DATACENTER SPECIFICATIONS

Abstract

High level specification of Uptime Institute certified Tier III datacenter focusing on high availability, reliability and performance of datacenter

Contents

1. Overview

ESDS is one of the largest cloud service provider across globe managing more than 15000 virtual machines and hosting more than 2 million websites. ESDS Mumbai datacenter is designed as per Uptime institute Tier III standard, and TIA 942 standard. This document will provide a brief technical information about the Uptime Tier III Certified ESDS Mumbai Data Center demonstrating its reliability, redundancy, scalability and performance.

2. Location of datacenter

The design phase of any datacenter involves location identification process. Location identification is one of the key factor in success of any datacenter. While selecting location, multiple important factors like IT market, geographical conditions, Government stability, civil society, infrastructure, taxation, needs to be considered.

a) Address of datacenter

ESDS Mumbai datacenter is located in Mahape, Mumbai area which is urban area of Mumbai city. The area, is an industrial area having very good infrastructure like roads, connectivity to national high ways, railway, and airport and sea route.

Being located in Navi Mumbai, the Mumbai Data Center resides on a Plateau spanning an area of 1.61 Hectare. The building covers 0.69 Hectare and 0.92 Hectare is the landscaped area.

> ESDS Software Solution Pvt. Ltd.,
> Plot No. Gen 71/1 & 71/1/1,
> Mahape Circle,
> Mahape MIDC,
> Navi Mumbai – 400710

b) Proximity Area

Proximity area from datacenter are as below.

- Bandra-Worli Sea Link – 35km
- Shree Siddhivinayak Temple - 30km
- Marine Drive – 40km
- Nariman Point – 38km
- Gateway of India – 38km

c) Emergency Response Support

- All emergency response services like hospital, fire mitigation department, police station are within 2 KM range so that can provide support within 15 minutes of time.
- Nearest Railroad facility is located at a distance of 2.48 Mi and easily accessible by Public and Private Transport
- Datacenter facility is 22.86 miles away from the nearest shipping port.

d) Geographical risks and mitigation

The site is under seismic zone 3 area which is moderate area from risk point of view. In last 20 years there is no history of earth quake in Mahape area. (Reference: https://en.wikipedia.org/wiki/List_of_earthquakes_in_India). Mumbai has seen flood in 2005 however during that time also Mahape area was not affected.

3. Building Specification

The foundation of the entire building is placed on a 50 Meter deep RCC Plate which is sufficient enough to sustain moderate Seismic waves. The building is enforced with RCC Columns using high quality M30 concrete with high loading capacity. Floor loading capacity is 1250 Kgs/Sq. Mtr. Moreover, the building is divided into four quadrants, each quadrant having its individual RCC base floor plate. The Data Center floor is also divided into four major quadrants with their individual plates. The data center area walls are built as dual walls having an air cavity of 3 Ft. in them for isolation and security purposes. Also, the walls have been constructed using a composition of Vermiculite along with mortar to increase the insulation strength and thermal insulation thus increasing the efficiency. Every floor plate has ducts present in between them so as to facilitate safe and standardized installation and transmission of cables for network and power. The structure also boasts three huge flood drains surrounding the periphery of the building so as to accumulate any amount of flood water. Sumps and sinks have also been provisioned to increase the ground water levels and mitigate floods.

4. Electrical System Specifications

The main incoming supply from the Utility is dual feed in nature. This incoming supply is brought to a VCB and then fed to the transformer.

From the Transformer and DG Set the electricity supply is channeled using high quality armored cables which are placed in the Main electrical trench. The main electrical trench then is split is two different paths for more redundancy, one path being the DG path and the second being the utility path.

This facility being an Uptime Tier III certified facility, every equipment installed has been configured in N+1 redundancy with automated switching.

DG Sets being the primary source of power, are installed as per the latest technology, being tested and tried to run for extreme conditions.

UPS systems, said to be the most critical part in a Data center, are of international make, abiding by the latest standards and technology to achieve maximum uptime and efficiency.

All the power panels are in redundancy at feeder level as well. Cable paths are maintained different.

All the racks receive power through trunking systems, independent of single UPS failure, so this ensures uptime of both the PDU's at all times.

5. Data Center Cooling Specifications

Since cooling serves as the most critical part after electricity for Data center operations, they complete cooling system is designed as per the international standard to operate at maximum efficiency. We have PAC units installed in the datacenter responsible for primary cooling. The units available are R407 coolant based units. Each of the system is connected to a central BMS system. Moreover all the units are made to communicate with each other and similarly logic has been defined for the units to operate alternatively as per the cooling environment. Humidification happens using an internally connected water supply line. Present Data center is designed to handle high density equipment load easily and efficiently. The Direct expansion (DX) based Precision Air Conditioners (PAC) units are employed in data center facility, PAC unit pumps pressurized air in the false floor plenum to maintain a server inlet temperature within the proper temperature range. Data center inside conditions are maintained at 20+/-1°C temperature and 50+/-5% relative humidity (following Current ASHRAE recommendations), PAC systems are designed with N+1 configuration to maintain redundancy of cooling. A unique Cold Aisle Containment (CAC) approach established in data center. Along with CAC, fillers in all racks are used to provide better CFM for each rack. However, as mentioned earlier, we have the provision to provide separate water based chiller systems as per client requirement and the cooling will be maintained in the same fashion as mentioned in case of PAC's. The analysis for heat rejection and inlet air temperature is done on daily basis using manual as well as auto sensing methods. In Auto sensing methods, temperature monitoring sensors are placed at locations of inlet and outlet which provides a scenario of heat generated. This is also integrated with the BMS system, so that accurate monitoring and logs are maintained. Manual check is also done to cross verify for the same.

6. Fire detections and suppression System

Fire detection and suppression system have been installed considering all the possible event occurrences. Fire Detection is done using VESDA (Very early smoke detection appliance) and Fire detectors. The VESDA system is very essential since it continuously monitors the data center air for presence of any traces of smoke in the air. This is also achieved using light reflection technology. Air from various parts of the data center is sucked in and then is passed through a light reflection zone. Any changes in the output pattern of the reflection leads to an alarm for smoke presence in the air. Along with this, the detection is also done using the latest technology detectors that are mounted as per the standard and adhering to the data center norms. Once both the alarms i.e Fire detector alarm and the VESDA alarm gets activated and cross-zoned then, it actuates a trigger for release of Suppressant. For the purpose of fire suppression, NOVEC 1230 gas is used. This is the next generation gas to FM 200. This is ozone friendly and has more quick response to suppress the fire. The diffuser nozzles are used in the data center above and below the floor. This is also monitored and supervised using BMS.

7. Physical Security Specification

For perimeter patrol we have armed security guards round the clock. On main entrance Security Supervisor and two security guards are stationed round the clock. For Planned visit one of the Security guard accompanies and does the internal security clearance.

We have complete premises covered by high compound walls with barbed wire fencing over them. The main entrance of the building is guarded by two reinforced gates. Between the gates a boom barrier is there for added security. Another layer is of metal detectors. We have walk through metal detectors and then a layer of handheld metal detectors. Baggage Scanner has been installed to scan the luggage of the visitor. The critical areas like UPS room and Panel room are surrounded by Dual Authentication Biometrics, RFID's as well as mantraps. Data Center is on first floor, so the visitor will be escorted by a security guard from the entrance to the Server Room. Entry to the Server room area is through the mantrap. Mantrap facilitates entry of one single individual at one time thus minimizing tail gate. All the critical areas are under CCTV Cross surveillance and the feeds are recoded and viewed at the high security BMS Room. Non Critical areas are guarded by CCTV Surveillance.

8. Data center Network Specifications

We have got multiple fiber optic ducts in our datacenter building. One duct is at North side of building and other comes from East side of building. We have laid 18" cement pipes with civil constructions so that multiple fiber cables can be laid down. Drawing of same is attached for reference purpose. Ducts are connecting to Meet Me room (MDA).

Wide Area Network:

- Internet peering with all major internet service providers. BGP4 Protocol for best routing path. Default path selection for minimum latency.
- Dark Fiber pairing with NIXI promotes domestic bandwidth.
- Domestic Traffic routed through NIXI to provide minimum latency.
- IPv6 network availability.
- Commitment of less than 50 ms latency across India.
- Multiple ISP network like Tata, Bharti, Vodafone and Reliance available at ESDS datacenter

LAN Features:

- High speed 40 Gbps network connectivity for East to West traffic.
- Racks with 10/40 Gbps mesh uplink network.
- Multiple dark fibers with redundancy for internal DC connectivity
- Isolated traffic using VLAN & VRF for every individual customer provides highest security.
- SDN: Next generation Software Defined Network across datacenter and eNlight Cloud.

- Switching infrastructure to provide nano second latency.

Inter DC Connectivity:
- 10 Gbps full mesh connectivity between Mumbai and Nashik Datacenter.
- Storage to Storage replication using High Speed Fiber Network between datacenters.
- Less than 5 ms latency between datacenters to delivery less than 1 minute RPO.
- MPLS based L2 & L3 network between datacenters for VM to VM communication.
- Network designed to delivery Disaster recovery service without changing IP addresses.

Meet Me Room:
- Presence of all major telecom providers.
- P2P, MPLS and PRI lines available on demand from major telecom players.
- Fiber and CAT6 structured cabling from Meet me room to every datacenter rack.
- Mesh network from Meet me room to rack.
- Certified structured cabling from meet me room to racks to delivery best performance.

9. Data center Network Security Specification

Perimeter Firewall

- ESDS has partnered with OEMs like CISCO and JUNIPER to install and manage a powerful perimeter firewall.
- ESDS perimeter Firewalls allow only specific and known traffic inside the data center hence keeping the malicious elements out of the network.
- Perimeter firewalls works as NAT gateway for eNlight cloud and enterprise customers.
- Firewalls to deliver 10 and 40 Gbps throughput.
- Perimeter firewalls work as a shield for inside network against the outside threats.
- In line as well as off-line mode of deployment to handle any amount of traffic.

Network intrusion detection

- Multiple levels of intrusion detection systems with heterogeneous platform.
- Nearly real-time update of anomaly signatures in order to protect from recent threats.
- Integration with core devices in order to null router traffic from malicious sources.
- Deep inspection of traffic and different criteria and automated actions for violations of rule sets.
- Zero day vulnerability assessment by using IPS and MTVscan.

ESDS along with its technology partners have set up various level scrubbing farms to counter the Multi Giga bit attacks.

- Under normal circumstances all the customer traffic is cleanly routed from the ISP network to ESDS DC and to the customer's servers.
- When any server is under attack, ESDS detects malicious network packets and DDOS signature patterns and notifies user.
- When a state of attack is declared ESDS NOC engineer with the help of ISP partners injects a route into BGP router and diverts all the traffic to Scrubbing farms.
- Scrubbing farms with state of the art cutting edge technology analyze the network packets and their attack type and drop those packets hence stopping the malicious traffic to hit the customer servers.
- DDoS prevention without any major latency change.

10. Data center Operations control Specification

Separate Network Operations Center teams are available which take care of IT Equipment Control and Electrical Mechanical System Control. There are 10 Engineers for IT Equipment control and 6 qualified and trained engineers for BMS. Both these teams work round the clock in shifts to ensure smooth functioning and operation of the complete setup. The similar fashion Manpower and setup is available at Nasik Datacenter.

11. Data center Maintenance Specification

Preventive Maintenance Schedule is carried out on Daily, Weekly, Quarterly and Half Yearly basis depending on the type of component under maintenance. Attached are the preventive maintenance reports. Our datacenter being a Tier III certified, redundancy is maintained at every level or equipment and material. Moreover apart from this, we have maintained a minimum stock level of components depending on the failure possibility rate. Basic electrical components are in high availability zone in the Stores. Rest of the components have minimum availability.