



EVALUATE DATA CENTERS WITH CONFIDENCE

**THE COMPLETE GUIDE
TO DATA CENTER RATINGS**



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DATA CENTERS POWERING A DIGITAL FIRST WORLD

SUNIL GUPTA
Co-founder & CEO, Yotta



Data Centers are the nervous system of the digital economy. All businesses, large or small, rely on data centers for their operations. Data Centers have come a long way; today, they are not just a brick-and-mortar building housing IT equipment. Data Centers store, analyse, deliver, protect and compute your data/workloads.

The data center or the colocation provider you select is as equally important as the hardware you choose to run your applications on. You will not want to host or run your apps on hardware that is obsolete or offers sub-par performance. Similarly, to meet the growing demands of business, you do not want to be stuck with a colocation provider of yesteryear.

There are various other essential factors that you should look in to. With 5G knocking our doors, cloud computing and remote collaborative working becoming the new norm, making the right choice of a data center is more important than ever. With companies turning to cloud-based solutions for their remote workforce, big-time content consumption via OTT

platforms and online learning/schooling are giving impetus to data centers.

This whitepaper aims to guide you on various types of data center Tier ratings, how the performance of data center is measured, what to look in for while selecting the colocation provider, and what are Tier levels and Institutes that rate data centers.

This whitepaper also highlights the concepts of **MTDCs** or **Data Colocation providers** and lastly, gives insight into **Asia's largest and World's second-largest Uptime Institute Certified Tier IV** data center.

Happy Reading!

A handwritten signature in blue ink, appearing to be 'Sunil Gupta', written over a faint background of a data center building.

Sunil Gupta

DATA CENTERS – THE CORE NERVE CENTER FOR YOUR DIGITAL JOURNEY

IT infrastructure plays an important role to ensure business continuity. Amidst crisis, we have seen how Data Centers have ensured cloud services, remote connectivity and data accessibility to enterprises and customers. Most organisations are now adopting cloud and are looking to focus on their core services instead of

managing their IT, in-house. Data Centers are the first step for businesses who are starting their digital transformation journey. The need for always available and scalable IT infrastructure is crucial for businesses to function. As the reliance on technology has increased, one has to select a data center provider with utmost evaluation.

GROWING ADOPTION OF MULTI-TENANT DATA CENTERS

You would have come across the terms, **Multi-Tenant Data Center (MTDC)** or Third-Party colocation providers quite often. As the name suggests, **multi-tenant** means where your servers, IT equipment reside with other enterprises, sharing the real-estate of the data center provider. Besides, a **multi-tenant data center** offers enterprises with multiple internet connectivity options and has significantly lower power cost as compared to a captive data center. As per 451 Research, **Asia-Pacific leads with the fastest leased data center market growth of 9% from 2016-2022.**

Enterprises are continuing to shift from the captive or self-built data center to third party colocation providers. Reasoning the need to move to the cloud as one of the most critical IT strategies, enterprises are leveraging colocation services to ramp up their cloud journey. At the same time, **Hyperscalers and Cloud Service Providers** are looking to lease custom build **MTDC** facilities that provide them long term scalability without having to invest heavily upfront.



COLOCATION TYPES AT A MTDC

Rack space:

Dedicated Racks of various sizes like 42U/45U/48U/52U are available along with Unit (1U, 2U and more).

Server rack cage:

Need additional security and compliance? Ask for server rack cage that is completely customised and configured as per your requirement.

Dedicated server hall/suite:

Data centers also provide exclusive suites or rooms to house your servers and IT equipment.

Dedicated server floor space:

With a dedicated floor space, get full customisation and control on security, cabling, and power.

HYPERSCALE DATA CENTER PARKS

Hyperscale means enormous scalability. Everything about **hyperscale data centers** is virtually unlimited. Space, Power, Connectivity, and Availability are the crucial factors that are found aplenty at hyperscale data centers. **Hyperscale data center parks**, instead of a data center building have multiple buildings on the same campus. This makes it easy for businesses to

expand at the same site, thus offering them longevity in terms of their IT investments and can scale up and down as per their need. **Hyperscale data center** operators have better resources and provide multiple and massive bandwidth to support cloud service providers, who generally look for high-volume data transfers and storage.



ADVANTAGES OF MTDCs OVER ON-PREMISE CAPTIVE DCs



Scalability & Agility - an integrated and cost-effective IT infrastructure, scalability as per your needs and agility to adapt to new requirements or technology upgrade.



Faster Go to Market - As compared to a captive data center, with MTDCs, you can migrate as and when needed. This provides faster go-to-market for your business.



Cost-Effective - Even operating a server rack on-premises is a costly affair. Imagine this where you have multiple racks. A captive data center eats up a lot of upfront investments; at the same time, it does not offer the

liberty to scale-up or scale-down as per your requirement. For instance, if you have unutilised racks, in an MTDC, you can surrender those to the provider without incurring additional expense. On the other hand, if you need to expand, you can lease more space from the provider.



Security & Reliability - The lifeline of any business - data, needs to be secured and accessible to ensure business continuity. An MTDC invests in multi-layer of security and protects the server racks from unauthorised access, both physical and virtual. For cyberthreats, MTDCs have a better capability and protection than as

a business you would invest in to keep your data secure. Additionally, to meet compliance standards and certifications, data center operators have an extensive, layered structure. Even if the intruder manages to breach one-layer, other layers may prevent the compromise of the entire system or alarm the management of the breach.



Power - The most critical factor of a data center. MTDCs generally get uninterrupted power. For backup, MTDCs have generator sets on site. However, as a customer, you should be asking the MTDC about the capacity of power they can provide at the site? Do they have power substation on their campus? Do they have the ability to operate the site without interruption for days on the backup power? Are UPSes redundant and more?



Connectivity - Network connectivity needs are as unique as us. Generally, MTDCs offer multiple telecoms and

network connectivity options. With a captive data center, you need to use the available service provider, hence you do not get options. However, since MTDCs offer major telecom and network operators, you can select the best as per your requirement or even go with the one you already use.



High Availability - MTDCs are generally designed with resiliency and redundant IT architecture. Businesses cannot afford any downtime and due to the redundant fail-safe architecture, MTDCs offer high availability of power and cooling for IT equipment.



Shared Resources - As one of the tenants along with many others, you benefit from the shared resources. For instance, security, power, network connectivity, real estate, and many other factors that otherwise are costly to maintain in a captive data center, are affordable with an MTDC.

DATA CENTER CERTIFICATIONS AND THEIR NEED

Businesses today rely on the **data center** and its supplementing services. Hence, it becomes imperative to have the best **data center** to host and manage your critical infrastructure. Your data center or colocation provider needs to assure you of their guaranteed performance. The SLA should provide the uptime of your server racks and IT equipment. In case of a disaster or crisis, is the colocation provider equipped to ensure business continuity? Hence, data centers are rated as per their Tier levels via different types of **certifications**. These Tier levels determine the performance and uptime guarantee level of data centers. They also provide you with an overview that a data center meets a

pre-determined list of standards laid by the **certification** agencies/institutes.

For **data centers** or colocation providers, these certifications help them to design and operate their facilities in line with the best practices globally.



POPULAR DATA CENTER TIER RATING CERTIFICATION PROVIDERS

When looking at colocation providers, you often come across Tier ratings. Colocation facilities or data centers need to be accredited with performance certification by experts who specialise in this. However, with too many accreditations and guidelines, it becomes difficult and confusing to select the best. The most popular Tier rating providers are Uptime Institute (UTI) and Telecommunications Industry Association (TIA).

These Tier certifications are also dependent on other factors, like where the data center is located. Although there are advantages to go in for a Tier rating certification, however, on the flip side, these certifications

are time-consuming and involve a lot of capital expenditure. Hence, most of the colocation providers skip the certification process or settle with the one that they can certify via some third-party agencies/vendors.



UNDERSTANDING UPTIME INSTITUTE TIER CERTIFICATION (UTI)

Uptime Institute is the most common name for Data Center Tier certification. They specialise in the certification of data center design, construction, and operation. They even offer specialised training for data center service providers. The Uptime Institute Tier certifications are widely recognised and accepted by customers and data centers, alike. **Uptime Institute has awarded over 1600 Tier Certifications in over 100 countries** and trained thousands of professionals with their Accredited Tier Training programs.

Uptime Institute Tier Certification for data centers is the de-facto gold-standard worldwide for evaluating the quality of mission-critical data centers. It is the only certification in the world which is outcome-based, assesses and certifies Data Centers on performance and continuity of Operations, as against some other

prevailing standards which only conform to the compliance of data center against a prescriptive checklist of components, but do not certify the data center for its performance and continuity of operations. **Uptime Institute certifies data centers** via its Tier classification that ranges from Tier I to Tier IV, from being more stringent and fault tolerant. These Tier Standards are an unbiased set of infrastructure and operating criteria which are certified by Uptime Institute's panel of officers, unlike any third-party consultants.



The Tier classifications describe the site-level infrastructure topology required to sustain data center operations, not the characteristics of individual systems or subsystems. The Tier Standard is predicated on the fact that data centers are dependent upon the successful and integrated operation of several separate site infrastructure subsystems, the number of which is dependent upon the individual technologies like power generation, cooling, uninterrupted power sources selected to sustain the operation. Every subsystem and system integrated into the data center site infrastructure must be consistently deployed with the same uptime objective

to satisfy the distinctive Tier requirements. Compliance with the requirements of each Tier is measured by outcome-based confirmation tests and operational impacts. This method of measurement differs from a prescriptive design approach or a checklist of required equipment.

The purpose of this standard is to equip design professionals, data center operators, and non-technical managers with an objective and effective means for identifying the anticipated performance of different data center site infrastructure design topologies.

WHAT MAKES UPTIME INSTITUTE TIER CERTIFICATION UNIQUE?



Performance-based:

Uptime Institute defines its Tier Standards on performance. It rates the data center on factors like availability, redundancy, and fault.



Technology agnostic:

Uptime Institute's Tier classification does not rely on a single or particular technology. The end focus is the performance and operational result. One can achieve the end-result via innovative and smart engineering, rather than following a linear process.



Vendor agnostic:

Colocation providers or facility builders can use any preferred brands or hardware or IT equipment. Uptime Institute does not endorse or recommend a brand.



Flexible:

Despite compliances and processes, one has the freedom to adhere to local rules and regulations of the state/country while achieving their Tier certification goal.



Lifecycle:

Starting with the right design with the Tier Standard in the Design Document phase and continuing with the Constructed Facility and Operational Sustainability phases, the Tier Standard covers the complete lifecycle of a facility.



Certification:

Uptime Institute administers and monitors its standards via a team of experts. The Tier Certification prescribed by them is not just a textbook process to follow, instead it is goal and performance-based.

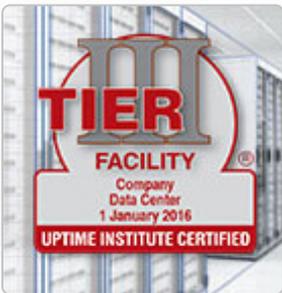
(Source: <https://uptimeinstitute.com/tier-certification>)

UPTIME INSTITUTE TIER CERTIFICATION TYPES



Tier Certification of Data Center Design Documents - Before constructing the facility, the design of the data center must meet the end performance goal. The design documents

of the data center are submitted to the Uptime Institute, which contains answers to the questions about all primary infrastructure. It also requires the colocation provider to provide the topological architecture of IT and networks. This certification covers mechanical, structural, electrical, and other site elements. These are reviewed by Uptime Institute, wherein they provide consulting support to the colocation provider for a final design compliant with the Tier rating. The Tier Certification of Design Documents is valid for two years from the date of issue.

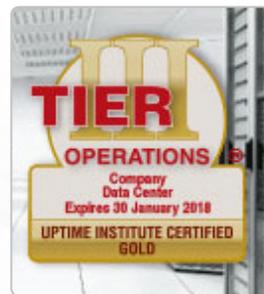


Tier Certification of Constructed Data Center Facility - This certification validates that the data center has been constructed as per the approved design and basis the Tier-Certified

design documents. Uptime Institute validates the performance of the facility with live demonstrations of critical systems under real-world conditions. This helps the colocation provider to focus on identifying and addressing construction issues before commencing the facility operations.

Within two years, the facility should go in for Tier Certification of Constructed Data Center Facility. The awarded validity of the certificate can be checked at Uptime Institute's website.

For instance, Yotta NM1, which was awarded the Tier IV certification for design, can be verified here - <https://uptimeinstitute.com/uptime-institute-awards/list/datacenter/yotta-nm1-/1257>



Tier Certification of Data Center Operational Sustainability - This certification assesses the Tier-Certified facility management and its operation practices. Any compromise on

reliability and performance are highlighted so that colocation providers can focus on achieving the best operational practices to attain the full potential of installed infrastructure.

UPTIME INSTITUTE TIER STANDARDS

Tier I: Basic Site Infrastructure - A Tier I basic data center has non-redundant capacity components, and a single, non-redundant distribution path serving the critical environment. Tier I infrastructure includes a dedicated space for IT systems, a UPS to filter power spikes, sags, and momentary outages, dedicated cooling equipment, and on-site power production

to protect IT functions from extended power outages. These data centers have 12 hours of on-site fuel storage for on-site power production. As the site is susceptible to disruption from both planned and unplanned activities, the infrastructure must be completely shut down on an annual basis to perform necessary preventive maintenance and repair work safely.

Uptime Institute Tier Rating System



Tier II: Redundant Site Infrastructure

Capacity Components - A Tier II data center has redundant capacity components and a single, non-redundant distribution path serving the critical environment. The redundant components are extra on-site power production, UPS modules, and energy storage, chillers, heat rejection equipment, pumps, cooling units, and fuel tanks. These data centers have 12 hours of on-site fuel storage for 'N' capacity. As the site is susceptible to disruption from both planned and unplanned activities, the infrastructure must be completely shut down on an annual basis to perform necessary preventive maintenance and repair work safely.

Tier III: Concurrently Maintainable Site Infrastructure

- A Tier III data center has redundant capacity components and multiple independent distribution paths serving the critical environment. For the electrical power backbone and mechanical distribution path, only one distribution path is required to serve the critical environment at any time. All IT equipment is dual powered and installed correctly to be compatible with the topology of the site's architecture. Transfer devices, such as point-of-use switches, must be incorporated for

the critical environment that does not meet this requirement. These data centers have 12 hours of on-site fuel storage for 'N' capacity. As the site is susceptible to disruption from both planned and unplanned activities, planned site infrastructure maintenance can be performed by using the redundant capacity components and distribution paths to safely work on the remaining equipment.

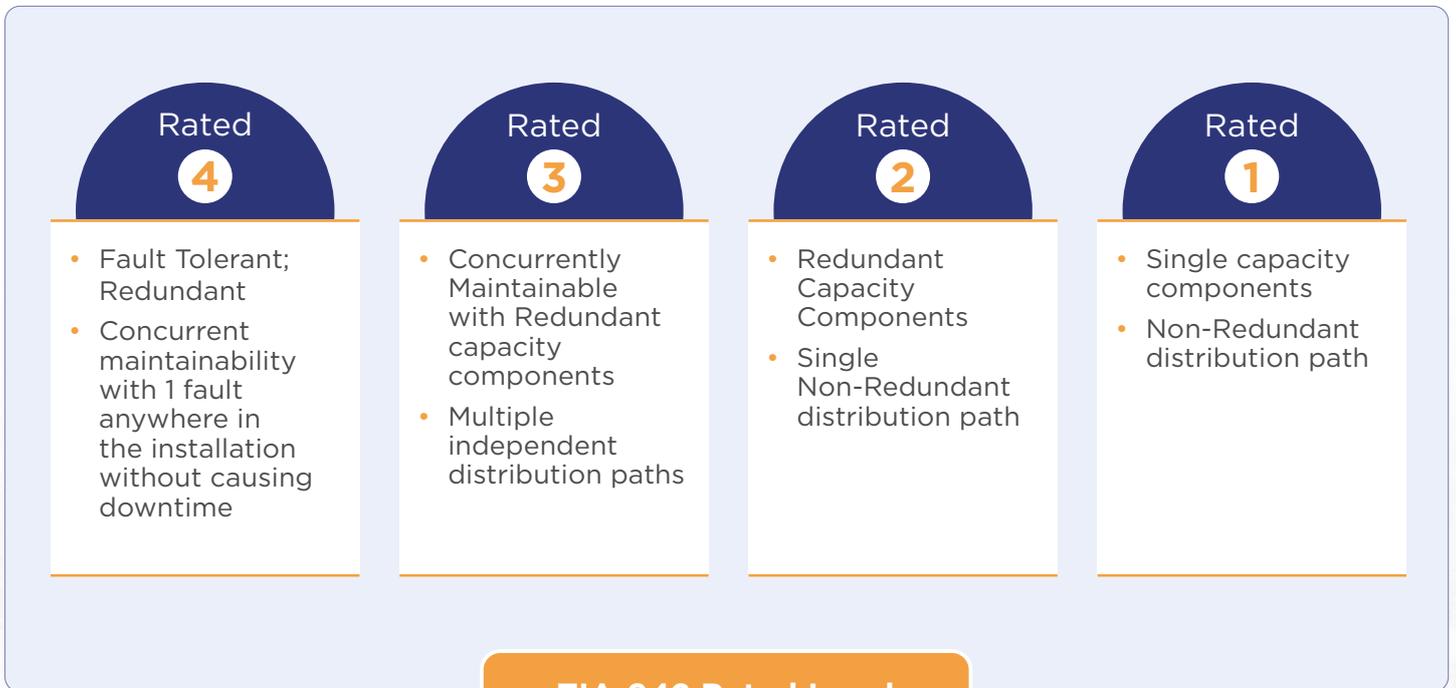
Tier IV: Fault Tolerant Site Infrastructure

- A Tier IV data center has multiple, independent, physically isolated systems that provide redundant capacity components and multiple, independent, diverse, active distribution paths simultaneously serving the critical environment. The redundant capacity components and diverse distribution paths shall be configured such that 'N' capacity is providing power and cooling to the critical environment after any infrastructure failure. All IT equipment is dual powered with a Fault tolerant power design internal to the unit and installed properly to be compatible with the topology of the site's architecture. The site is not susceptible to disruption from a single unplanned event and any planned work activities.

UNDERSTANDING TELECOMMUNICATIONS INDUSTRY ASSOCIATION - TIA-942 CERTIFICATION

Another popular certification provider - **Telecommunications Industry Association's - TIA-942 certification** was developed by the American National Standards Institute (ANSI) in 2005. It lays out the guidelines for planning and building telecom infrastructure like data centers. The ANSI/**TIA-942** standard provides an inclusive understanding of data center design to plan the facility, network, and the cabling system. It also covers physical data center that includes

architecture (facility location, safety and security, fire suppression) electrical, mechanical and telecommunication systems. Unlike the Uptime Institute which acts a certifying body, **TIA-942 certifications** are validated by qualified external auditors and authorised organisations. The requirements are organised in four rating classifications, termed as Rated 1, Rated 2, Rated 3 and Rated 4.



TIA-942 ratings have been arrived out of **Uptime Institute standards**; hence, both, **Uptime Institute Tier IV rating** and **TIA-942 Rated 4** appear to be identical. **TIA-942** also used Tier level indications like the Uptime

Institute, however from 2014, **TIA-942** started using the term '**Rated**' to separate itself from the **Uptime Institute's Tier rating** system.

TYPES OF ANSI/TIA-942 CERTIFICATION

ANSI/TIA-942 Design Certification:

This status indicates that the design documents of the data center under scope have been reviewed for conformity to the design criteria of the **ANSI/TIA-942** standard for the respective Rating level. The **ANSI/TIA-942** design certification is valid for one year, extendable if a site is not operational yet.

ANSI/TIA-942 Facilities Certification:

This status indicates that the data center facility under scope has been physically inspected for conformity to the design criteria of the **ANSI/TIA-942** standard for the respective Rating level. This physical inspection covers both an assessment of all related design documents as well as a physical on-site inspection for each area under the scope of the **ANSI/TIA-942** standard. The **ANSI/TIA-942** Facilities Certification is valid for 3 years. By the end

of year-1 and year-2, the data center should undergo a surveillance audit. By the end of year-3, the data center has to undergo a re-certification audit to keep its certification valid.

ANSI/TIA-942 Ready:

This status indicates that a product, typically a modular data center such as pre-fabricated data center or a container based data center product has been designed in accordance to the requirements of the **ANSI/TIA-942** standard for the respective Rating level. This certification will ensure that once the modular data center solution has been placed in the appropriate environment that it will meet the indicated Rating level. The **ANSI/TIA-942 Ready** Certification is valid for one year with yearly re-certification.

(Source: <https://tiaonline.org/products-and-services/tia942certification/tia-942-certifications-ratings/>)

SNAPSHOT - UPTIME INSTITUTE AND TIA-942

| DESCRIPTION | UPTIME INSTITUTE | TIA-942 |
|--------------------------------|--|--|
| Tier Classification | Tier-I Basic Capacity | Rated 1 Basic |
| | Tier-II Redundant Components | Rated 2 Redundant Components |
| | Tier-III Concurrently Maintainable | Rated 3 Concurrently Maintainable |
| | Tier-IV Fault Tolerant | Rated 4 Fault Tolerant |
| Rating Method | Measured on Performance and Operation impacts | Based on Reference Guides and check-lists |
| Covers | Electrical, Mechanical, and Ancillary (engine generator, fuel system, make-up water system, building automation system) | Telecommunications, Electrical, Architectural, and Mechanical (TEAM) |
| Types of Certification | <ul style="list-style-type: none"> Tier Certification Design Documents (TCDD) Tier Certification Constructed Facility (TCCF) Tier Certification Operational Sustainability (TCOS) | Design - Conforms to the design criteria of ANSI/TIA-942 Facilities - The facility and related design documents have been physically onsite inspected Ready - Typically a modular data center, has been designed in accordance to ANSI/TIA-942 <i>Source - TIA942.org</i> |
| Certification Agency/Institute | Uptime | Authorised third-party agency by TIA |

TIA-942 AND UPTIME INSTITUTE - THE DIFFERENCE

The debate between Uptime Institute and TIA-942 ratings have been ongoing since ages. At the surface, both the Uptime Institute and TIA-942 Tier ratings seem similar. However, there are differences in terms of usage of equipment, for instance, Uptime Institute requires the use of continuously rated or data center rated generators. At the same time, TIA-942 permits the use of standby or replacement rated generators. In terms of cooling, which plays a vital role in a data center, Uptime Institute requires that the data centers cooling capacities should be able to handle extreme conditions based on the data center location. At the same time, the TIA-942 standard is not as stringent in this department. As mentioned earlier, unlike Uptime Institute that evaluates and certifies the facility themselves, TIA-942 certifications are provided by third-party auditors authorised by TIA.



WHY UPTIME INSTITUTE RATING MATTERS AND SHOULD YOU MAKE THE MOVE TO TIER IV DATA CENTER?

According to **Ponemon Study**, the average cost of unplanned data center outage is \$9000 per minute; this figure has increased considerably as you read this. With cloud dependency, smartphone usage, online shopping and remote working becoming the new norm, businesses cannot take chances with their IT infrastructure facilities for business continuity. Uptime Institute rates the data center as per its availability to serve the critical requirements of its customer, that is, the uptime of the data center amidst disruptions such as power outage, natural calamity, IT equipment failure, fire and more. While all Tiers by Uptime Institute offer more than 99% of uptime, you will be surprised to see the real-world difference of all Tiers, that is Tier I to Tier III against a

Tier IV data center and how it can impact your business. For instance, a Tier I data center can have a downtime of average 28.8 hours per year, that is more than a day lost, which can translate to a loss of millions for a business. A Tier II data center has a downtime of average 22 hours per year which is also considerably more. The most common data centers that are found are Tier III, they have average 1.6 hours of downtime per year, in comparison to Tier IV data centers that have just almost 100% of uptime and have only average **26.3 minutes of downtime per annum** for purposes of optimising operations and due to the fault tolerant and redundant design, these data centers do not impact customers hosted there.

It is business as usual for years and years, as the 26.3 minutes downtime is average and therefore in actual conditions there may not be any downtime for consecutive years.

Uptime Institute certified Tier IV designed data centers ensure efficiency. With better temperature control and consistency, your IT hardware like servers tend to benefit with extended life, and above all, there are no downtimes for you. One of the common myths that many people have is that collocation at Tier IV data centers is costlier than a Tier III data center. Data center like Yotta NM1, which is a part of the Yotta Data Center Park is an Uptime Institute Tier IV designed data center that offers collocation that is at par with Tier III data center cost and with quality and reliability of Tier IV. Also, not every Tier IV data centers are same. The operational side is as important as the design. Most of the time, infrastructure failure occurs because of people and not because of equipment. Hence, other factors

like IT workforce employed by the Data Center, Financial health of the provider, scalable operation, geographical presence, adhering to compliances and more needs to be considered. The cherry on the cake is also when the Tier IV data center is a hyper-scale facility. This ensures you can scale vertically or horizontally as per your business needs. To lure customers, many Data Centers or collocation providers market themselves as Tier Rated 4 or Tier compliant. This generally is done to take advantage of customers novice knowledge about data center tier ratings. When in doubt, ask the provider to produce their [certification foil](#). Most importantly, remember you will be using the data center and its services for the long term, at least a minimum of 36-months to 60-months. Hence, go with a collocation provider that is accredited with Tier IV certification, this ensures you guaranteed uptime and stamps the reliability.





A LOOK AT ASIA'S LARGEST AND WORLD'S SECOND-LARGEST UPTIME INSTITUTE TIER IV DESIGNED DATA CENTER - WHAT SETS IT APART?

Various technical features differentiate Yotta NM1 Data Center with the other data centers, which may be non-certified or self-certified or certified by third parties (and not by the certification body itself) or rated against any different standards are enumerated below:



Concurrently Maintainable

Uptime Institute Tier IV certification builds on the top of Tier III certification criteria of Concurrent maintainability, wherein all the MEP equipment are required to be deployed in minimum N+1 redundant configuration, so that any maintenance activity can be carried out on any single equipment without causing any downtime to any IT load within the data center. Likewise, all the power and chilled-water distribution paths are required to be deployed in N+N redundant configuration, to ensure any planned or unplanned maintenance activity on such paths. To meet these requirements, the design of Yotta NM1 includes redundancies at every single level as per the following:

N+N CONFIGURATION

Incoming HT, Utility Feeders, UPSes, PDU's, UPSes for Pumps and PAHUs, Fuel Pumps and distribution piping in N+N (1W+1S) configuration, BMS with PLCs for monitoring working in active/inactive mode, Additional PLCs for control functions

N+1 CONFIGURATION

Air-cooled Chillers, Centrifugal in-line Pumps, Precision Air Handling Units (PAHU), Distribution Transformers in N+2 configuration. Generators in N+2 configuration and Dual-path of feed of electrical power and chilled water supply to each load



Fault-Tolerant

To comply with Uptime Institute Tier-IV certification requirements, this is the main additional requirement above and beyond Tier-III certification criteria, wherein any sudden fault in the power and cooling systems, should result in the automatic transfer of the entire IT and cooling loads to the standby equipment, through redundant distribution path, without any downtime to any Server Racks. Such faults include many things including, for example, any leakage (small or big) in the chilled water pipelines, apart from the failure of power and cooling equipment. Accordingly, any such incidence of leakage in the piping should be automatically detected, isolated, arrested and contained. To meet these requirements, the design of Yotta NM1 includes the following:

- Automatic Transfer Switches (ATS) between the working and standby Transformers/DG sets
- Automatic Source Changeover Switches (ASCS) between Transformers & Generators
- Dual feeds to all the Server Racks
- Dual-Coil PAHU machines
- Automatic motorised valves in piping to ensure immediate isolation of leaking spot
- Water Leak Detection cable tracing entire piping in multiple zones
- Dual feeds of fuel to each Day Tank of generators
- Fuel Leak Detection cable tracing entire fuel piping
- Dual Redundant PLCs in the BMS for sensing the leakages and controlling the valves



Fire Compartmentalization

This is yet another additional requirement to comply with Tier-IV, wherein any event of a fire in any part of the data center should not result in any downtime to any of the Server Racks and full power, and cooling load must continue to work for minimum one hour, while the fire is still raging. To meet this requirement, the design of NM1 includes the following:

- Fire separation of working and standby equipment of power, cooling and BMS
- Fire separation of two active/active distribution path of power, cooling and BMS
- Use of fire-rated components in the distribution path of power, cooling and BMS



Consequential Effects of Fire Protection

Even after meeting the fire compartmentalisation criteria, any consequential damage caused to fire-rated elements/equipment located nearby, from a heavy spray of water due to activation of fire protection systems such as sprinklers, also needs to be taken care of, to comply with Tier-IV. Such incidents in any part of the data center should not result in any downtime to the Server Racks, and full IT load and cooling load must continue to work. To meet this requirement, the design of NM1 includes the following:

- Concurrent Ingress Protection (IP) Rating and Fire Rating of Bus-ducts
- Concurrent Ingress Protection (IP) Rating and Fire Rating of all control cables



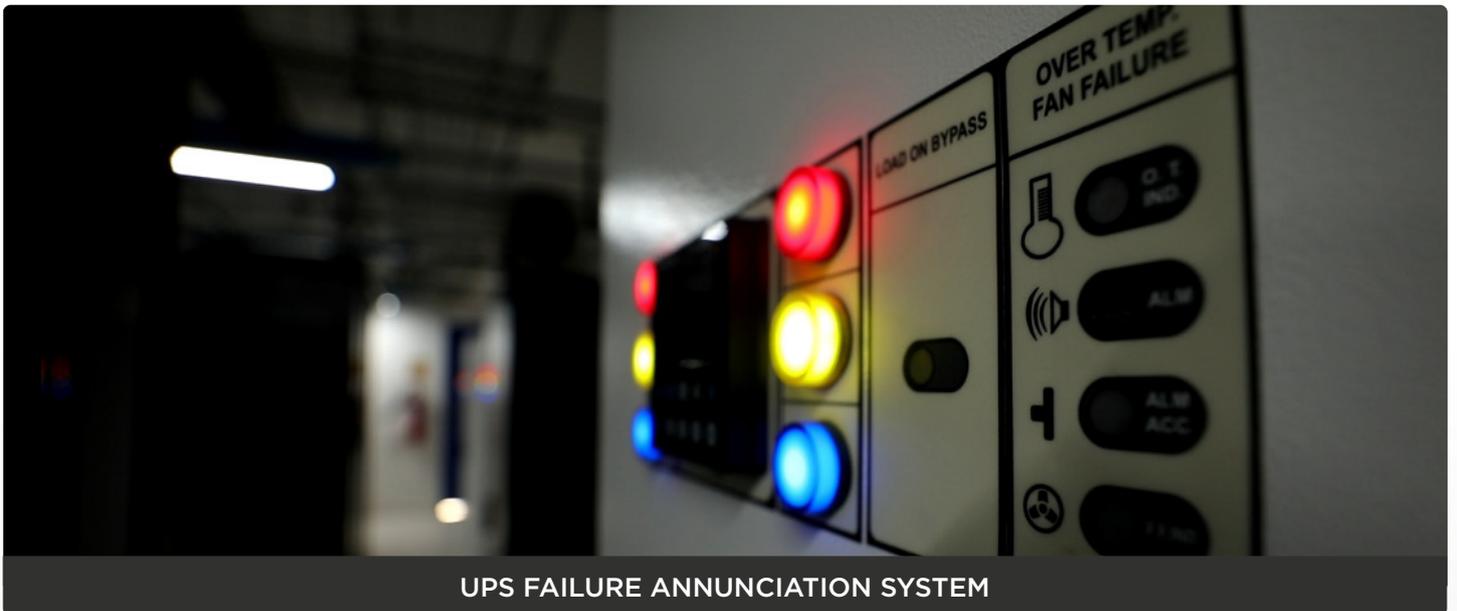
NOVEC BASED FIRE SUPPRESSION SYSTEM



Protection Against Mechanical Impact

The design must comply with this requirement in such a way that any accidental mechanical impact anywhere in the data center should not result in damage to both the working and standby equipment or redundant distribution paths and full IT power and full cooling continue to remain functional without any downtime to any server racks. An example could be movement of some heavy machinery for maintenance/replacement, tripping-over accidentally and damaging both the working and standby pipelines or bus-ducts enroute. To meet this requirement, the design of NM1 includes the following:

- Physical isolation or adequate separation between the working and standby equipment
- Provision of additional physical barrier, in the absence of such separation



UPS FAILURE ANNUNCIATION SYSTEM

ROBUST DIGITAL INFRASTRUCTURE FOR GROWING DIGITAL INDIA NEEDS

Yotta NM1 has set a benchmark in the India data center industry. Offering scalable Uptime Institute certified Tier IV facility at reasonable pricing, enterprises can benefit of guaranteed uptime. With the data boom and connected world, Yotta NM1 offers Enterprises the benefit from direct savings through lower power costs, lower rack costs and exceptional quality.

Besides colocation, Yotta also offers a complete range of enterprise IT services including High Performance Computing, Desktop-as-a-Service, Graphics Workstation as-a-Service, and enterprise cloud services that support innovative technologies like AI/ML and IoT on a pay-as-you-use model, among many others.

For more information on Uptime Institute, visit - www.uptimeinstitute.com/

For information on TIA, visit - www.tiaonline.org

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