Data center tier comparison

Tier/Level	Features	Requirements	Use Cases	Uptime Institute Standard	TIA-942 Standard
I	Basic infrastructure design with a focus on simplicity Single path for power and cooling Limited redundancy, making them susceptible to disruptions	Minimum 99.671% uptime Suitable for small businesses with non-critical applications	Entry-level data center suitable for businesses with limited IT requirements Cost-effective option for those not heavily reliant on continuous uptime	Susceptible to disruptions from planned or unplanned activities Single path for power and cooling distribution N+0 – no redundancy Includes a generator and UPS for outages and power spikes Minimum of 12 hours of generator fuel Requires complete shutdown for maintenance	Susceptible to disruptions from planned or unplanned activities Single path for power and cooling distribution N+0 – no redundancy May or may not have a raised floor, UPS, or generator Annual downtime of 28.8 hours Requires complete shutdown for maintenance 99.671% availability
II	Increased redundancy compared to Tier I Redundant components for power and cooling Provides a more reliable environment	Minimum 99.741% uptime Suitable for small to medium-sized businesses with growing IT needs	Businesses requiring higher reliability than Tier I but with moderate IT demands A balance between cost-effectiveness and improved uptime	Less susceptible to disruption from planned/unplanned activity Single path for power and cooling N+1 components including generators, UPS, energy storage, chillers, heat rejection, pumps, cooling, and fuel tanks Includes UPS and generator with 12 hours of fuel Redundant components can be removed for maintenance without disruption, but distribution path maintenance may require shutdown	Less susceptible to disruption from planned/unplanned activity Single path for power and cooling N+1 – includes redundant components Includes raised floor, UPS, and generator Annual downtime of 22 hours Maintenance of power path and backbone may require shutdown 99.741% availability
III	Significant redundancy with multiple paths for power and cooling Concurrently maintainable infrastructure for maintenance without downtime	Minimum 99.982% uptime Ideal for businesses with critical applications and higher uptime requirements	Businesses demanding continuous uptime for critical operations Suitable for industries where even short outages can have significant consequences	Normal activity will not disrupt critical operations, but unplanned activity/human error may Multiple distribution paths for power and cooling with one active at any one-time N+1 redundancy All IT equipment is dual-powered or features transfer devices Includes UPS and generator with 12 hours of fuel for every "N" capacity Maintains full operation with any component of distribution path removed for maintenance	Normal activity will not disrupt critical operations, but unplanned events could still cause disruption Multiple power and cooling distribution paths with one active at one-time N+1 redundancy Annual downtime of 1.6 hours Includes raised floor and ability to maintain full operation while performing maintenance on power path or backbone 99.982% availability
IV	Maximum fault tolerance with redundant systems and components Fault-tolerant infrastructure to withstand critical failures without downtime	Minimum 99.995% uptime Critical for businesses with mission-critical applications and stringent uptime needs	Industries where downtime is not an option, such as finance, healthcare, and telecommunications Businesses with the highest demand for continuous operations	Normal activity does not disrupt critical operations; can experience failure of any component with no impact Multiple power and cooling distribution paths that are independent, diverse, and simultaneously active N+1 redundancy with physical separation Continuous cooling required UPS and generators required with 12 hours of fuel for "N" capacity Every component can be removed from service for maintenance without affecting critical systems	Normal activity does not disrupt critical operations; can experience at least one unplanned event with no impact Multiple power and cooling distribution paths 2(N+1) redundancy – 2 UPS each with N+1 Annual downtime of 0.4 hours Includes raised floor and ability to maintain full operation during maintenance 99.995% availability

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