

Reliability Tiers within a Data Centre.

The TIA 942 standard has used information from the Uptime Institute, a consortium whose primary mission is to provide its members with benchmark comparisons and best practices for the design and management of data centres.

In the full standard details are given with regard to architectural, mechanical, electrical, security, and telecommunications. This includes information on raised floor heights, heating and cooling expectations power requirements and potential points of failure. Each tier also specifies the requirements for redundancy contingent in order to maintain the required processing availability.

Finally the standard also details illustrative construction costs, showing that the increase in the cost is not a linear scale when taking into account the higher availability timescales and requirements for redundancy back up systems. The costs of tier 3 are approximately double those of a tier 1 Data Centre.

One of purposes of breaking the data centre reliability down into 4 tiers is to provide designers with the ability to objectively compare different aspects of one data centre design against another.

Name	Availability	Definition
Tier 1 N Single system – No redundancy	99.671%	Service can be disrupted by both planned and unplanned events Single supply for power and for cooling channels, no in-built redundancy such as UPS or generators May not include raised floors Must be shut down completely to perform preventative maintenance Annual downtime expectations no more than 28.8 hours Implementation guidelines 3 months
Tier 2 N+1 Single system – Some components have redundant capacity	99.741%	Reduced susceptibility to planned or unplanned events Single supply for power and cooling channels including N+1 redundancy for critical components Will include a UPS and local generators Will include a raised floor Maintenance of the power channel and other parts of infrastructure will require process shutdown Annual downtime expectations no more than 22.0 hours Implementation guidelines 3 to 6 months
Tier 3 2N 2 fully independent system – 100% redundancy	99.982%	Planned maintenance can be carried out without disruption to processing, however unplanned events can still cause disruption Multiple power and cooling channels, but only one channel active Includes redundant components (N+1) Will include a raised floor There will be sufficient capacity and distributed infrastructure to carry load on one channel while maintenance is being performed on another Annual down time expectations no more than 1.6 hours Implementation guidelines 15 to 20 months
Tier 4 2(N+1) 2 fully independent systems – with full redundancy (N+1)	99.995%	Planned events to not cause any disruption to processing, and will sustain at least one worst case unplanned event with no critical processing impact Multiple power and cooling channels which are all active Includes full redundancy components; 2x (N+1) ie 2 generators with N+1 redundant back up. Annual downtime expectations no more than 0.4 hours Implementation guidelines 15 to 20 months.

"N" is used to represent the system requirements .



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