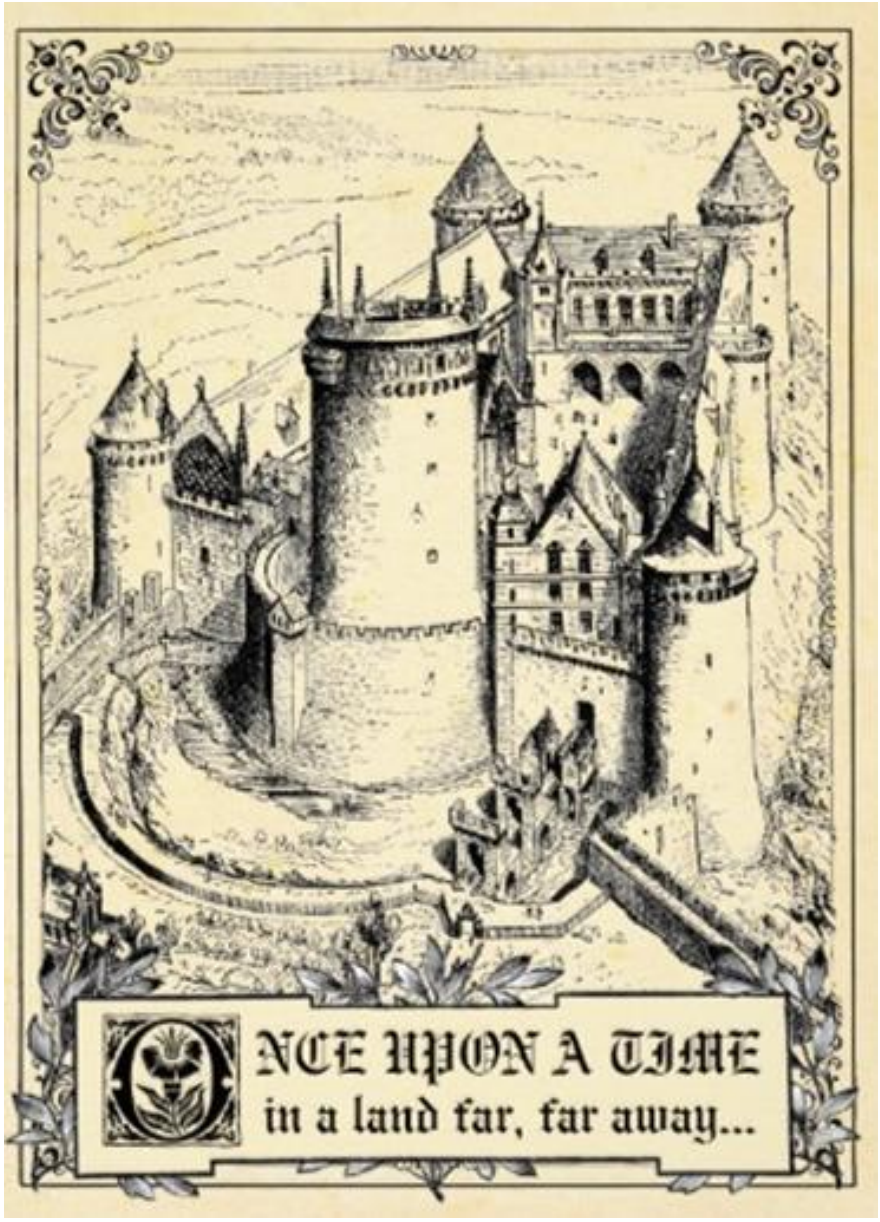


MYTHS AND MISCONCEPTIONS IN DATACENTER RATING

המצגת הוצגה ע"י שמעון כץ,
מנהל פרויקט רותם מטעם בנק הפועלים
במסגרת כנס

ELECTRICITY 2013– Jerusalem, Israel

Once upon a time, in a land far, far away, there was a beautiful **Tier IV datacenter**...

Was it really a Tier IV datacenter?

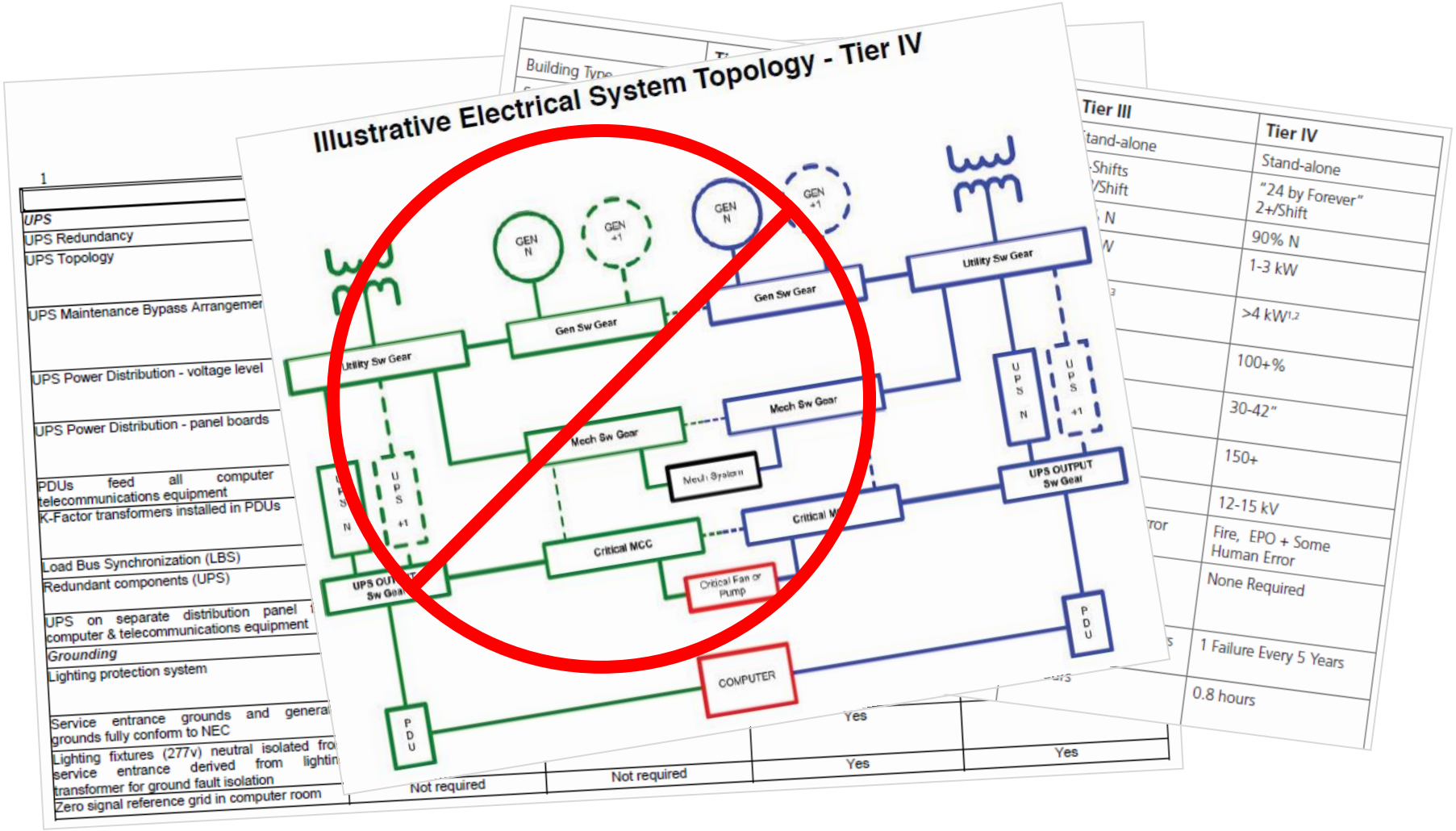
At this presentation I'll try to discuss some of the myths and misconceptions of datacenter tier system.

Uptime Institute's TIER TOPOLOGY

	TIER I	TIER II	TIER III	TIER IV
Active capacity components to support the IT load	N	N+1	N+1	N after any failure
Distribution Paths	1	1	1 active and 1 alternate	2 simultaneously active
Concurrently maintainable	NO	NO	YES	YES
Fault tolerant	NO	NO	NO	YES
Compartmentalization	NO	NO	NO	YES
Continues Cooling	NO	NO	NO	YES

Source: The Uptime Institute: Data center site infrastructure tier standard: Topology (TS102120-0812), 2012

Non-Standard components



Source: The Uptime Institute: Tier classifications define site infrastructure performance (TUI705C), 2006
TIA/EIA 942

TIER IV is the best

Not always

- Tiers are business-objective driven.
- An organization’s tolerance for risk determines the appropriate Tier.
- organization’s tolerance for planned shutdowns (according to mode of operation or DR capabilities) can lead to lower Tier selection

Two utility feeds are needed for TIER IV rating

FALSE

- N Active capacity, Continuous rated Generators are mandatory.
- Utility power is not even required for Tiers. The site can run continuously on generators. Utility is an economic substitute.

- Utility failure does not count as first failure!
-

For Tier III and IV the engine-generator plant must be operational at all times

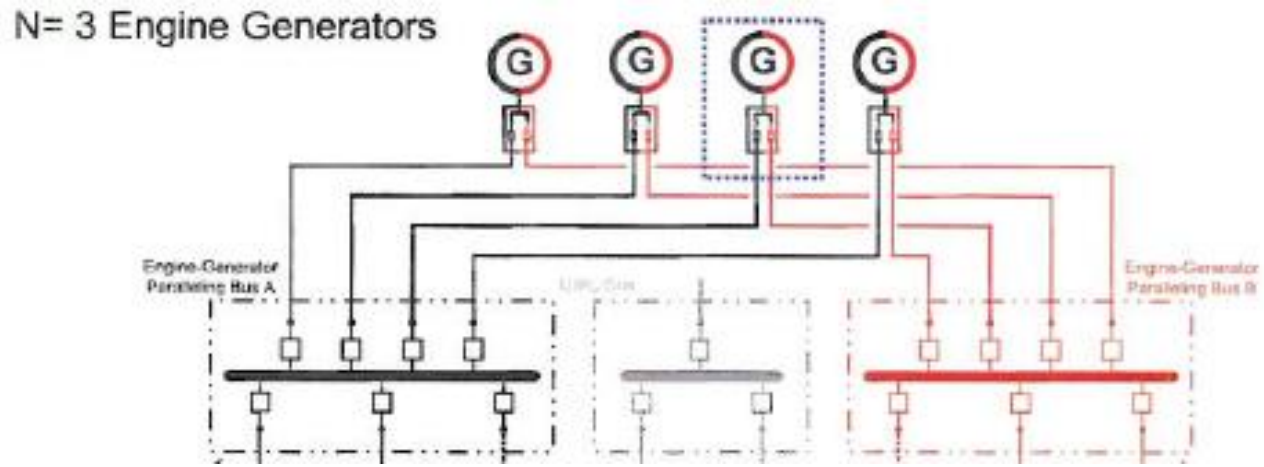
FALSE

- Tier does not require that engine generator plant run at all times
- Data centers will typically utilize the public utility a majority of the time
- Engine generator plant must be sized properly to carry the critical load continuously without limitations of time or temperature:
  - Continuous power – output available for unlimited time
  - Design point – extreme annual design conditions (N=20 years) – ASHRAE handbook
  - Environmental limitation / permits does not affect Tiers

2 (N+1) components are mandatory for Tier IV

FALSE

- N count does not determine Tier level
- It is possible to achieve Tier IV with just N+1 components for some systems.



Site location affects TIER level

FALSE

- Site location is critical consideration for life cycle operation but it is non part of Tier rating.
- Site location does impact Operational Sustainability – a different Tier system.

Generator fuel capacity should be 72 hours

FALSE

- Only 12 hours of on site fuel is mandatory.
- The fuel system is part of the critical systems – should be concurrently maintainable.
- A single bulk tank with more than 12 hours of fuel can comply with standard.

Tier IV requires a separate UPS for mechanical equipment

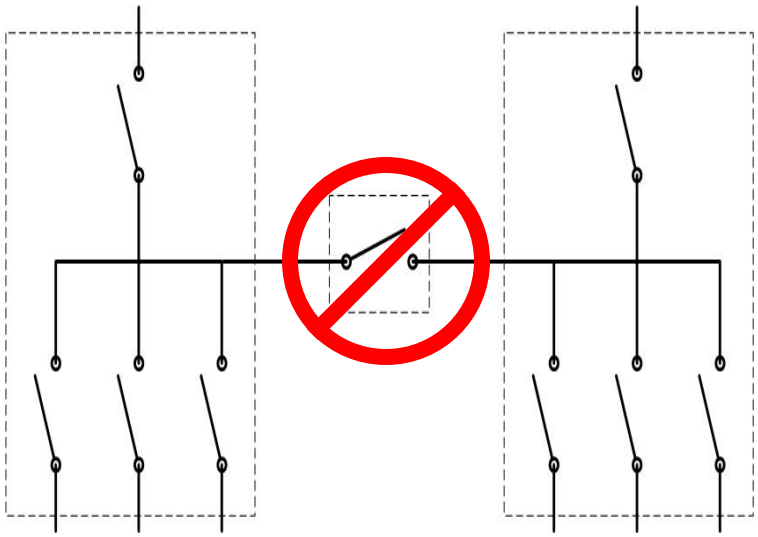
FALSE

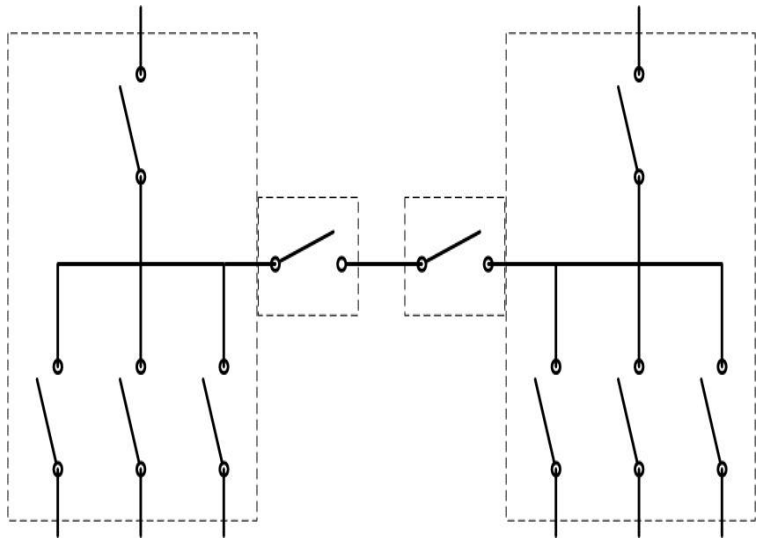
- The same UPS can feed IT and mechanical equipment.
- UPS supply to mechanical equipment is to:
  - Prevent temperature rise between generator and utility transfer.
  - Support the mechanical plant for the same time of the IT UPS backup time.

Tiers III and IV demand at least two adjacent elements (valves / breakers) to enable concurrent maintenance

FALSE

- Two adjacent elements needed only if it is necessary for concurrent maintenance.





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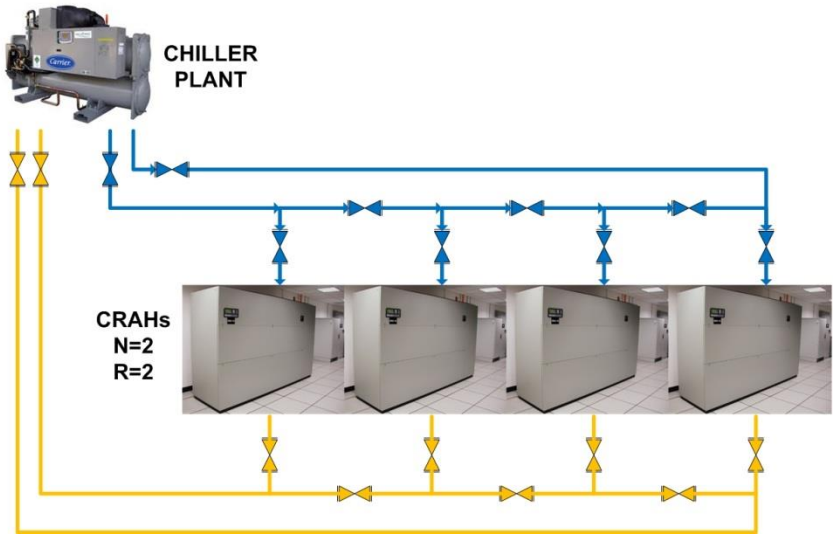
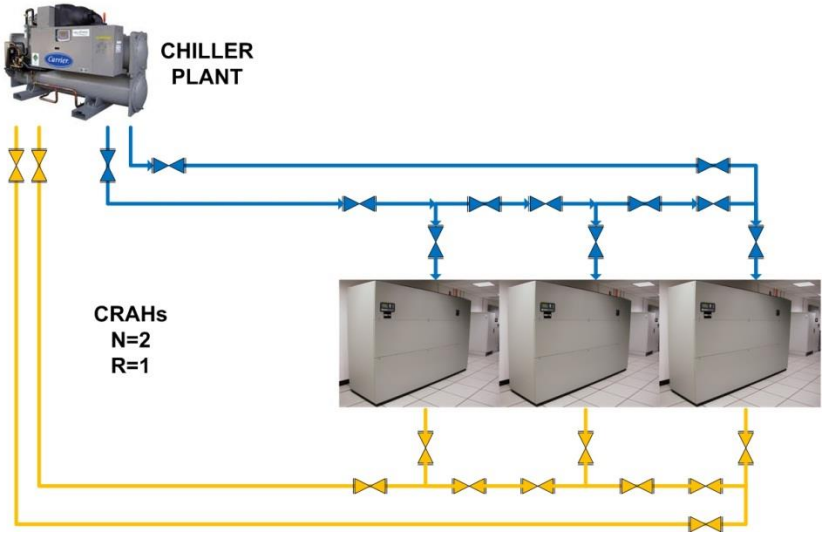
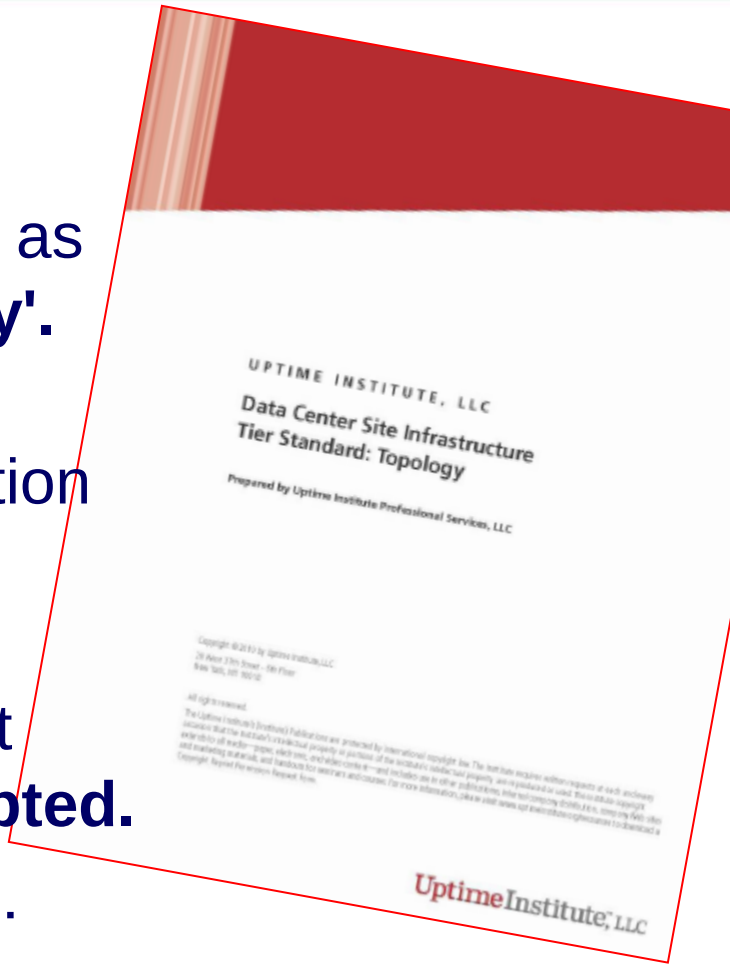




Is the TIER topology a standard ?

TRUE

- A standard might simply be defined as **'a set of rules for ensuring quality'.**
- The Uptime Institute is a research, education, and consulting organization and **not a formal** standardization institute.
- Nevertheless it is probably the most common standard **voluntarily adopted.**
- Other standards: BICSI, TIA-942…



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Sources of myths and misconceptions:

- Chronology of TUI papers:
  - 1996 - 2008 - **White papers** - Tier classifications define site infrastructure performance
  - 2009 – 2012 - Data center site infrastructure tier **standard**: Topology
- Similarity with TIA 942 and other standards
- Partial adoption of standard demands