

DATA CENTER STANDARDS

Data Center Size and Density

Prepared by The Strategic Directions Group Pty Ltd and
AFCOM's Data Center Institute

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4. Considerations

Standards and definitions often create discussions around variations and interpretations. While not attempting to cover all such deliberations, the following items are noted considerations.

4.1 Greenfield Data Center Design

When considering the design and development of a new greenfield data center, a number of metrics are obviously unknown; for example, the Average Measured Peak kW Load of the Compute Space.

In this case the intent is for the project team to work backwards from planned project outcomes and deliverables:

1. Determine how many racks or REUs need to be supported = [Rack Yield]
2. Determine the kW Load the Compute Space is required to support = [Design kW Load]

From Rack Yield we can calculate the anticipated Size of the Compute Space:

$$[Compute Space] = [Rack Yield] \times [Rack Area]$$

From Design kW Load, we can determine the planned Average Measured Peak kW Load the Compute Space will be designed to handle:

$$[Average Measured Peak kW] = [Design kW Load] \text{ divided by } [Rack Yield]$$

The project design process can use the metrics above to help guide the remaining area required for the data center facility, and the associated power and cooling infrastructure required.

4.2 Upgrades and Refurbishments

Similar in concept to Greenfield Data Center Design, the project team should have an understanding of the business and technical requirements in terms of planned project outcomes:

1. If more racks or REUs need to be supported = Increase in [Rack Yield]
2. If additional kW Load for the Compute Space is required = Increase in [Design kW Load]

Based on the requirements, the associated Compute Space and/or Average Measured Peak kW Loads may increase using the calculations noted in Section 4.1.

4.3 kW Load Increases across Technology

As witnessed over the last 10 years, the Density of racks and Compute Space has continued to increase. In essence this may mean the Density metrics noted in Section 2.2 become obsolete, particularly if Extreme densities become the norm.

Strategic Directions and the Data Center Institute anticipate there will always be Low, Medium, High and Extreme density racks and Compute Spaces as defined. However, should rack and Compute Space densities significantly exceeding the Extreme Density metric become regular and common across the data center industry, the opportunity to nominate an additional metric will be considered.

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