



# Power Trip Track Results

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# Abstract

- Powering the data center from utility to chip – How do we simplify the data center electrical system while increasing its efficiency, modularity, and monitoring capabilities

# Audience

- Data center owners, architects, managers and operators, manufacturers, and designers of all components of data center power networks

# Contents

## 1. Monitoring

- > Power line monitoring for IT equipment to all electrical system components (Long term goal)
- > Common communication standards (IP-SNMP) (Short term goal)
- > Need for data analysis tools (Long term goal)

## 2. Standards

- > Industry adopted universal testing standards for electrical component performance rating / reporting (Long term goal)
- > Pro - Levels the playing field for evaluation
- > Cons - Long development effort

# Contents

## 3. Modularity (Plug & Play)

- > How does an increasingly variable load on the data center affect the electrical system operation.
- > UPS ( Expandability / Compression) (Long term goal)
- > Distribution (Expandability / Flexibility) (Short term goal)
- > Generation (Expandability) (Short term goal)
  - Pro - Proportionality, Speed of change, Maintainability
  - Cons - Cost?, Reliability (More moving parts), Could require more space

# Contents

## 4. Power Supplies (IT Equipment)

- > Understand Power Factor creep in fully redundant systems (Short term goal)
- > Optimized for expected operating ranges and flatter eff curves (Short term goal)
- > High Voltage in US (277v- 480v) (Long term goal)

# Parking Lot Item

## 5. UPS Systems

- > Static vs Rotary - Application dependent
- > Equally efficient
- > Battery run time, maintenance, and environment control
- > Alternative storage technologies investigation (Long Term goal)
  - Flow batteries
  - Ultra Capacitors
  - Others???
- > Alternatives
  - Onsite / co generation Work on affordability.(Short term goal)