

# Best Practices for Data Centers

*Using Your FEC Experience to Take the Next Step*

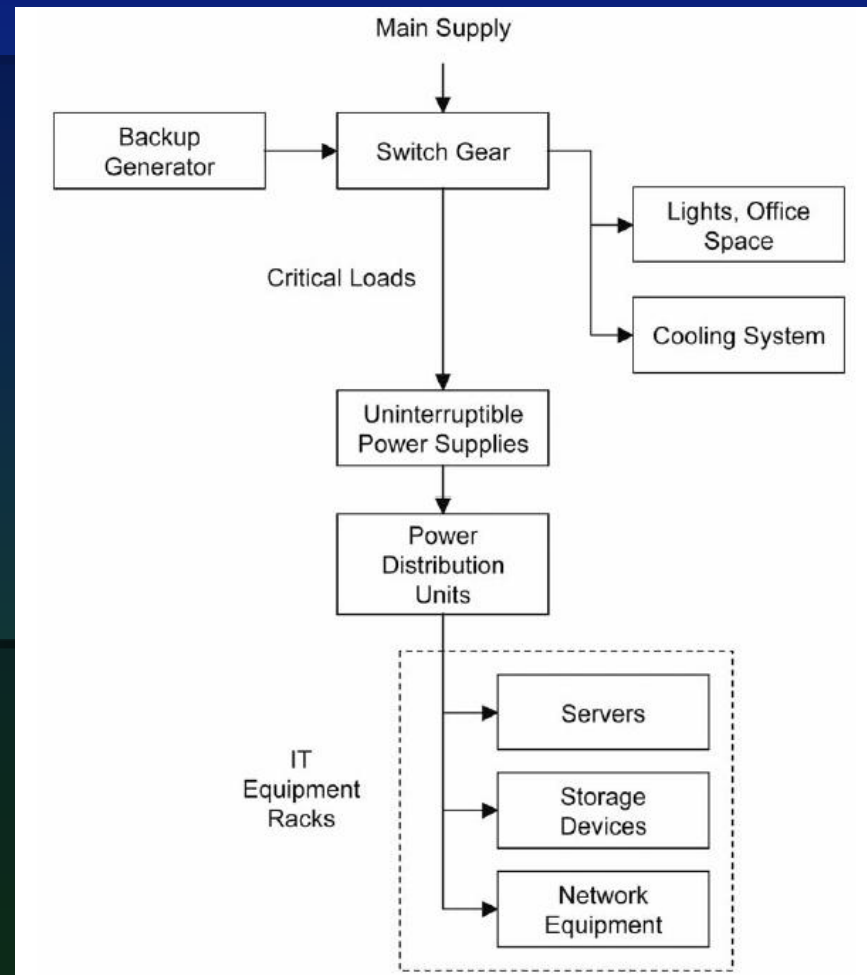
FEC Webinar  
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# Data Center Definition

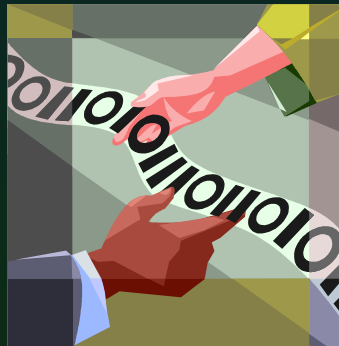
- A facility housing electronic equipment used for data processing, data storage, and communications networking
  - Houses server, network, and computer equipment
  - May have environmental controls
  - May contain or link to an uninterruptible, redundant and/or backup power supply
  - May be protected by physical security and protection devices or systems (e.g., closed circuit monitoring, fire suppression)
  - May be built for redundancy

# Data Center Elements



# Data Center Uses

- Electronic file storage, including databases
- Electronic communications, including routing and storage (e.g., email)
- Electronic networking, including internet and intranet connections and hosting (e.g., web sites)
- Processing power for high-end applications
- Back end for thin clients or other terminals



# Data Center Location

## *Relative to your facility*

- On site
  - Single desk, rack or closet containing one server and some infrastructure
  - Room(s) containing multiple servers, infrastructure and perhaps some environmental and security controls
- Off site
  - Buildings containing multiple servers, infrastructure and environmental and security controls

# Data Center Concerns



- Data centers used 61 billion kWh of electricity in 2006
  - 1.5% of all U.S. electricity consumption
  - Cost of \$4.5 billion
  - Double the amount consumed in 2000
- Federal data centers account for 10%
- Energy consumed by data centers is projected to grow by 12% per year

# Data Centers Impact Your Sustainability Goals!

- Executive Order 13514 requires federal agencies to implement best management practices in federal data centers
- All data centers use energy
  - Impacts greenhouse emissions
- Some data centers use
  - Water for cooling
  - Fuel for back up energy supply
  - Batteries for back up energy supply
- Executive Order 13514 also includes goals to reduce use of energy, water, fuel, and hazardous materials

# Engaging IT Staff

- Capitalize on existing relationships from FEC efforts
- Invite IT staff to FEC, EMS or other “green” team meeting
  - Focus the agenda on electronics or data centers specifically





# Engaging IT Staff



- Request a tour of your data center
- Swap training
  - Provide sustainability training
  - Request training on data center basics

# Transferring Lessons Learned

- Baselines set a sound foundation for improvement
  - Goal setting sets priorities for each year
  - Annual measurement demonstrates progress and highlights weaknesses
- 
- Resources and technical assistance are available

# Transferring Lessons Learned from the FEC



- Teamwork is critical
  - Bring data center staff permanently into your FEC, EMS or green team
- Recognition can spur participation and improvements
  - Consider data center staff and initiatives for internal awards

# Acquisition and Procurement

- Acquire EPEAT-registered electronic products
  - Supporting computers and monitors
  - Server standard available in next 3-4 years
- Acquire ENERGY STAR qualified products
  - Servers
  - Storage and UPS specification available in next year



# Use

- Extend the life of equipment
  - Maintain equipment and space
  - Plan acquisition and disposition
    - Trickle-down supporting computers and monitors
- Implement best practices
  - Information technology (IT) equipment
  - Environmental control equipment

# IT Improvements

- Consolidate servers and data storage
- Virtualize
- Utilize data center power management
- Implement load shifting
- Utilize variable speed fans

# Environmental Control Improvements

- Air handling and flow
- Water handling and flow (if applicable)
- Humidity controls
- Lighting
- Power and electrical systems

# Disposition

- Federally owned electronics follow the same disposition path, regardless of their location (data center or desktop)
  - GSA personal property disposition process
- Reuse
  - Used data center equipment may be valuable
- Recycle
  - Obsolete and broken equipment should be recycled utilizing certified recyclers



# Resources

- FEC Data Centers page
  - <http://www.epa.gov/fec/publications.html#centers>

# Contact Information

- FEC Champions
  - <http://www.epa.gov/fec/technical.html>
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