

# Datacenter 101

## Datacenter Consolidation

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# What is a Data Center

From Wikipedia:-

Datacenter is a facility used for housing a large amount of electronic equipment, typically computers and communications equipment

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# Why a Data Center

- Safety
    - (Nuclear War | Natural Disasters)
  - Consolidation
    - Data Storage Virtualization
    - Hardware
    - Application Services
    - Common Processes
  - High Availability
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# Physical Infrastructure

- 3 meter thick walls
  - HVAC
  - Cable Trays and POD
  - Cages
  - Racks
  - UPS/Generator
  - Video Cameras/Security
  - Floor(Point|Static) Load
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# Network Infrastructure

- Hardware: Router|Switch|FW
  - Peering
  - ISP WAN links
  - Bandwidth from Upstream
  - Bandwidth for Downstream
  - ASN Numbers for BGP routing
  - Carrier Neutral - Full Service DC
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# NMS

- Network Management System
  - Fault Management
  - Performance Management
  - Baselineing
  - SNMP: Host Resources
  - SNMP: Network Resources
  - SNMP: Enterprise
  - Logging infrastructure
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# System Architecture

- Linear Scalability
  - Cheaper | Faster | Reliable
    - Choose any two
  - LP Optimization
  - Least-Cost/User at optimum  
User Experience for large User numbers
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# Capex and Opex

Capacity Planning  
Capital Expenditure(capex)

Right Sizing  
Operational Expenditure(opex)

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# System Design

- Define Problems
  - Alternative Solutions
    - e.g. Load Balancer vs App. Config
  - Work as a Team
    - Fully solve problem in one layer
  - Pizza Boxes vs Big Iron
    - Time to market
  - Best Practices
  - TCO vs TBO
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# Data Center Operations

**System Administrator**

VS

**System Operations**

**Individual Efficiency**

VS

**Consolidated Processes**

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# NOC and SOC

## Network Operations(NOC)

- Hardware
- Network
- Console access to devices|servers
- Remote Hands

## Service Operations(SOC)

- OS Management
  - Application Management
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# Source to Data Center Development Environment

QA Stage

Training

Production

Disaster Recovery

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# HA Continuum

- Fault Tolerance
    - Dual power supply, ECC RAM
  - Redundant Hardware
    - Paired devices
  - Graceful Degradation
    - Fail noisily
  - Disaster Recovery
    - Two or more failures
    - MTTR
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# Current Trends

- High Density
  - Convergence(IP-Telecom)
  - Storage Consolidation & Virtualization
  - OS Virtualization
    - Xen, VMWare, KVM
  - Service Virtualization
    - JVM
    - Microsoft SoftGrid
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# Careers

- System Operations
    - Unix/Linux vs Windows
  - Network Operations
    - Network|Server Hardware
  - Service Operations
    - Close Development Coordination
    - Development Infrastructure
  - System Architect
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# Resources

- <http://wikipedia.com>
- <http://www.netcraft.com>
- RFC(s) 1771,1930
- Administering Data Centers
  - Wiley Dreamtech



# Questions

