

# Data Center Planning in 2005

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# Agenda

- Evolution of the infrastructure
- The data center's role in 2005
- Planning: Design to redesign
  - Initial steps
  - Common considerations
  - Design development
- 2005 trends



# Data Center History

## ● 1960's

- Mainframes & the military

## ● 1970's

- Telnet to Ethernet

## ● 1980's

- TCP/IP to DNS

## ● 1990's

- Windows to the WWW

## ● 2000

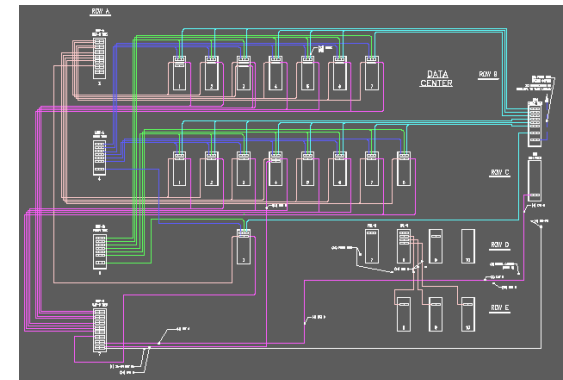
- Technologies e-merged

## ● Present

- Infrastructure architecture

# The Data Center's Role

- Knowledge management
  - Information policies
- Work products
  - Employee productivity
- Physical environment
  - Distributed vs. clustered systems



# Planning: Process

- **Initial steps**
  - Common considerations
  - System review
  - Site survey
- **Policy review**
  - Productivity
  - Security
- **Design development**
  - Cost estimates
  - Review criteria
  - Redesign



# Planning: Initial Steps

- **Technology direction**
- **Availability requirements**
- **Compliance or security requirements**
- **Equipment counts / additions**
- **Power estimates**
- **Air-conditioning requirements**
- **Preliminary floor plan layout**
- **Back-up power requirements**

# Planning: System Review

## ● Existing:

- Equipment
- Human resources
- Unique characteristics of the network
- Business growth curve
  - Cyclical or steady trajectory
- Lease terms & duration

## ● Planned:

- Equipment
- Human resources
- New applications
- Can technology reduce staff?
  - “People don’t scale”

# Planning: Common Data Center Physical Considerations

## ● **Balanced design**

- **Matched levels of backup**
  - **Power**
  - **Air conditioning**
  - **Incoming services**
    - **Telecom**
    - **Datacom**
  - **Technology**

## ● **Example of *un*-balanced design**

- **Redundant UPS**
- **Generator backup**
- **Air conditioners on generator**
- **Central chiller plant**
- **Chiller is *NOT* on the generator**
- **Chiller is *NOT* redundant**
  - **Thermal shutdown results**

# Planning: Common Data Center Cooling and Power Considerations

## ● Air conditioning

- More smaller units are more effective than fewer large units; however there is an associated cost with more units
- Service area requirements
  - 36" around CRAC's
  - 42" around PDU's
  - 42" for fire egress

## ● Electrical power

- Surge protection
- UPS configuration options
- External bypass
- Dual battery strings
- Dual service inputs

# Site Survey:

- **Where is the planned data center?**
  - Building lot and grade
  - Interior placement of main distribution frame (MDF)
  - Proximity calculations for maintenance services
  - Mechanical, electrical and plumbing (MEP) systems review and document
  
- **Core network & remote users**
  - Fail-over access
    - Both internal and external
  - Is a back-up data center existing or planned?

# Policy Review:

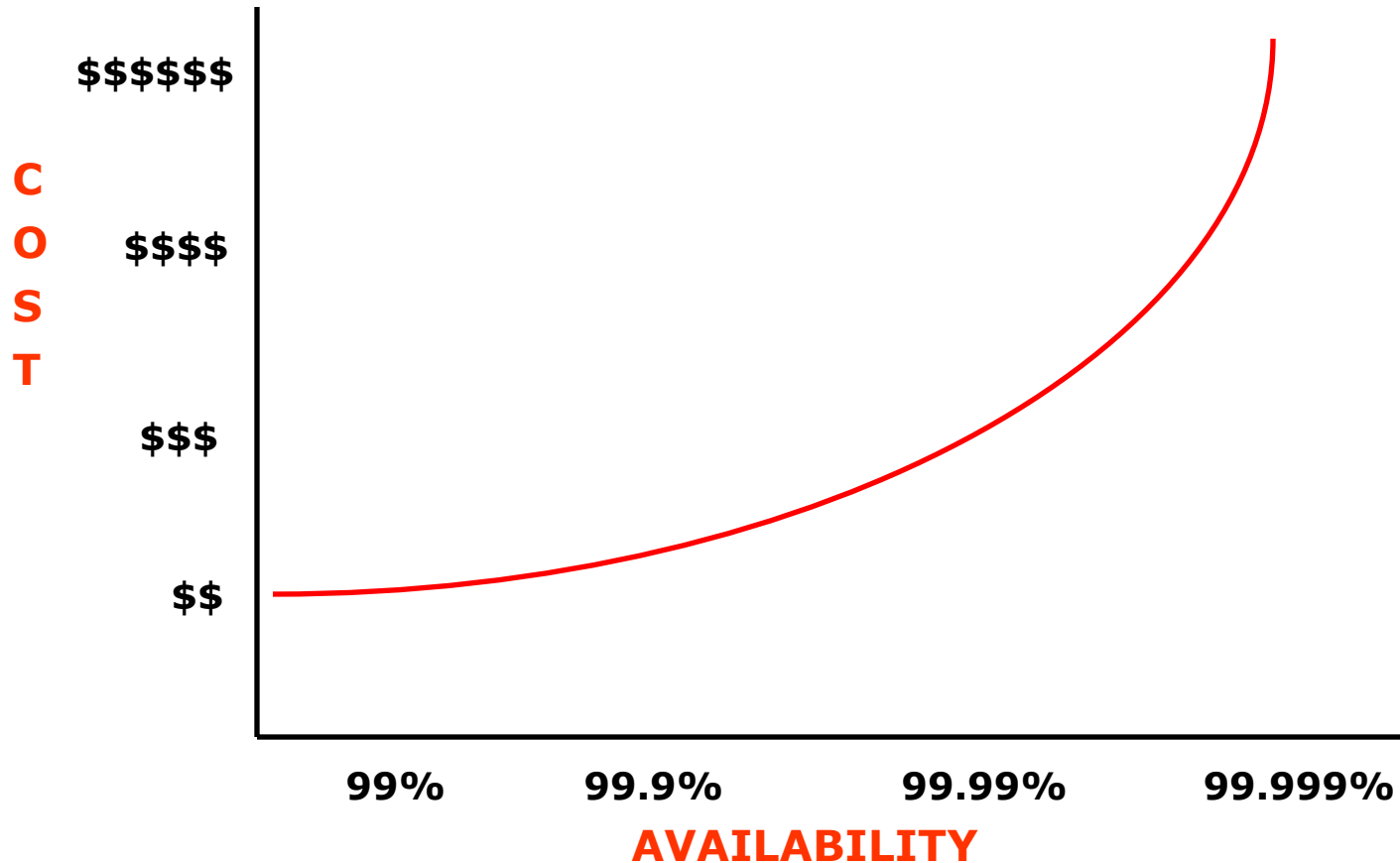
## ● Productivity policies

- Need to balance the must-have needs of the worker with must-have availability of the network
  - PointCast vs. bandwidth

## ● Security policies

- Need to balance the need for physical and information security to the degree that business will allow
  - Instant Messenger vs. possible breach

# Policy Review: Cost vs. Availability



# Planning: Design Development

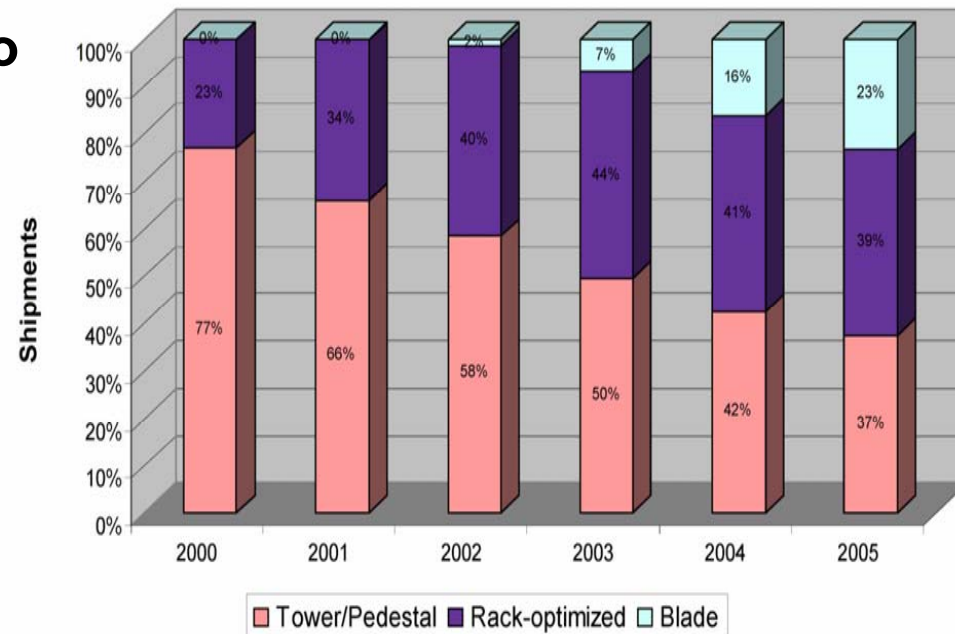
- **Cost estimates**
- **Goals revision**
- **Redesign**
- **General infrastructure**
- **Special spaces and systems**
  - **“Showplace visibility” / demo center**

# 2005 Trends

- Trend toward multi-service networks
  - Blade servers have evolved to blade desktop services
  - Wireless protocols becoming more prevalent

## Trends in Server Form Factor

WW Server Form Factor Trends



## 2005 Trends

- **Trend toward equipment, system and center redundancy**
  - High availability is not fault tolerance is not disaster recovery
- **Trend toward policy development and regulatory compliance**
  - HIPAA
  - Sarbanes-Oxley

# Questions and Answers about Data Center Planning in 2005

**Presented by Kelley S. Boyd**