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**THIC Inc.**

## The "Killer App" for Tape SAN Backup

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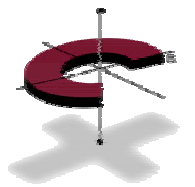
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Englewood CO 80112  
on June 28, 2000

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# Crossroads Systems, Inc

## *The “Killer App” for Tape SAN Backup*

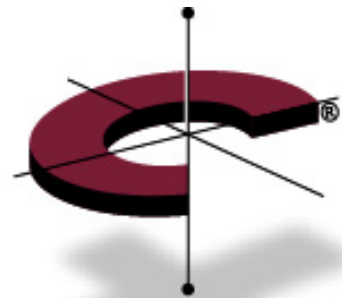
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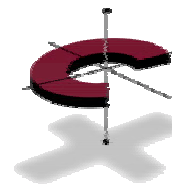
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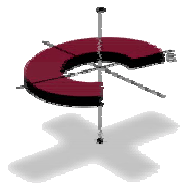
# Business Trends

- ⑩ Data is primary asset
- ⑩ Time, money, and resources are poured into keeping data secure and available for immediate use
- ◆ Globalization and “Internet time” remolding business models:
  - Customers demand instantaneous access
  - Business maintenance and recovery window shrunk to almost zero
  - Downtime much more apparent and publicized

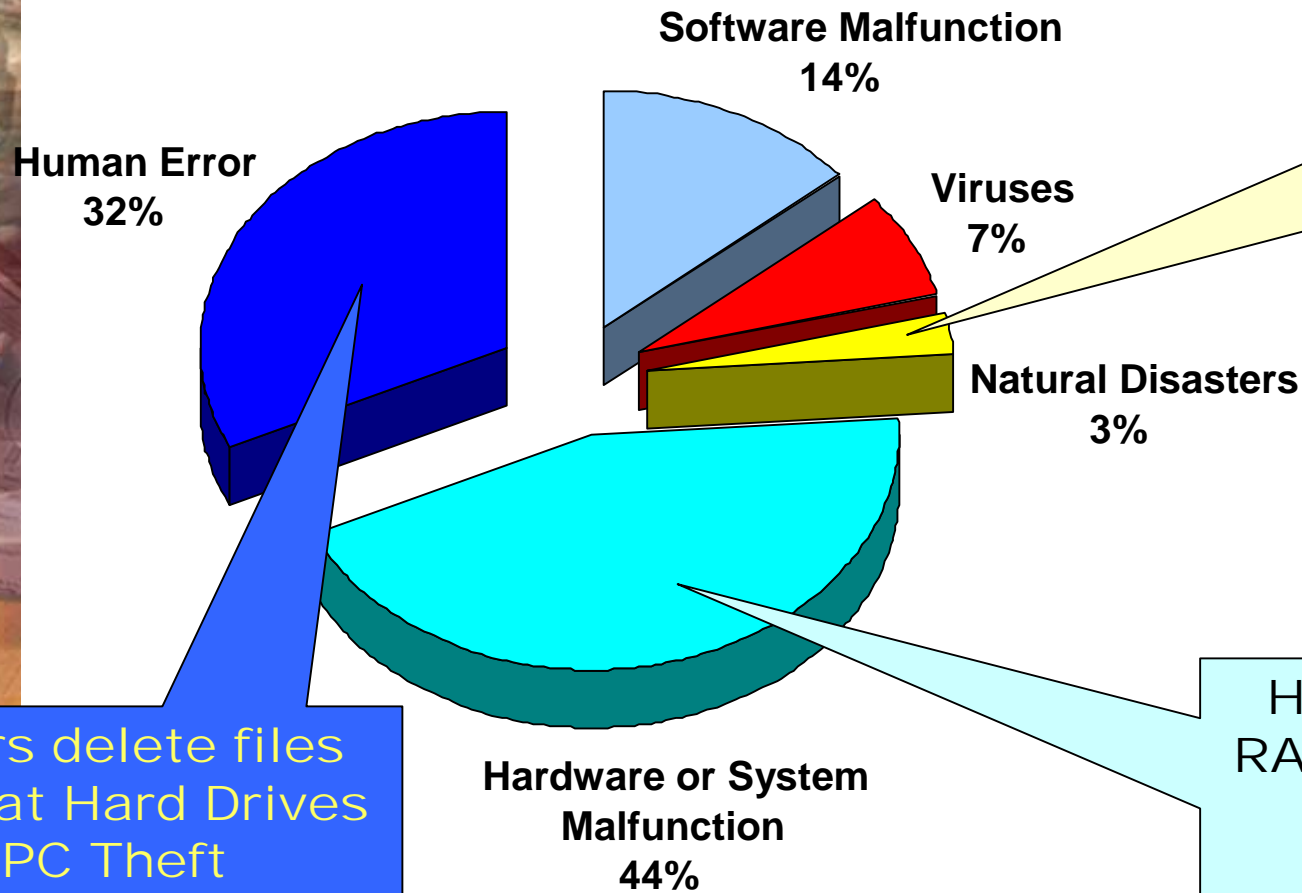


# Storage Trends

- ◆ Storage capacity is doubling every year
  - Average file size is growing as applications become more complex
  - Cost per megabyte of storage continues to decrease
- ◆ Backup window is disappearing
  - Server consolidation is creating global servers
  - Mission critical applications are moving down
  - Internet driving most business to 24/7 operation
- ◆ Managing backup is more expensive
  - More tapes are required to complete backups
  - More restore request are coming in
- ◆ Backup and Restore is still a mystery



# Why Backup



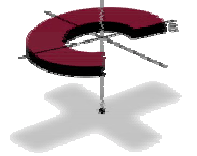
Users delete files  
Format Hard Drives  
PC Theft

Buildings Burn Down!  
Earthquakes!  
Flooding!

Hard Drives & RAID controllers Fail.  
  
Operating System dies.

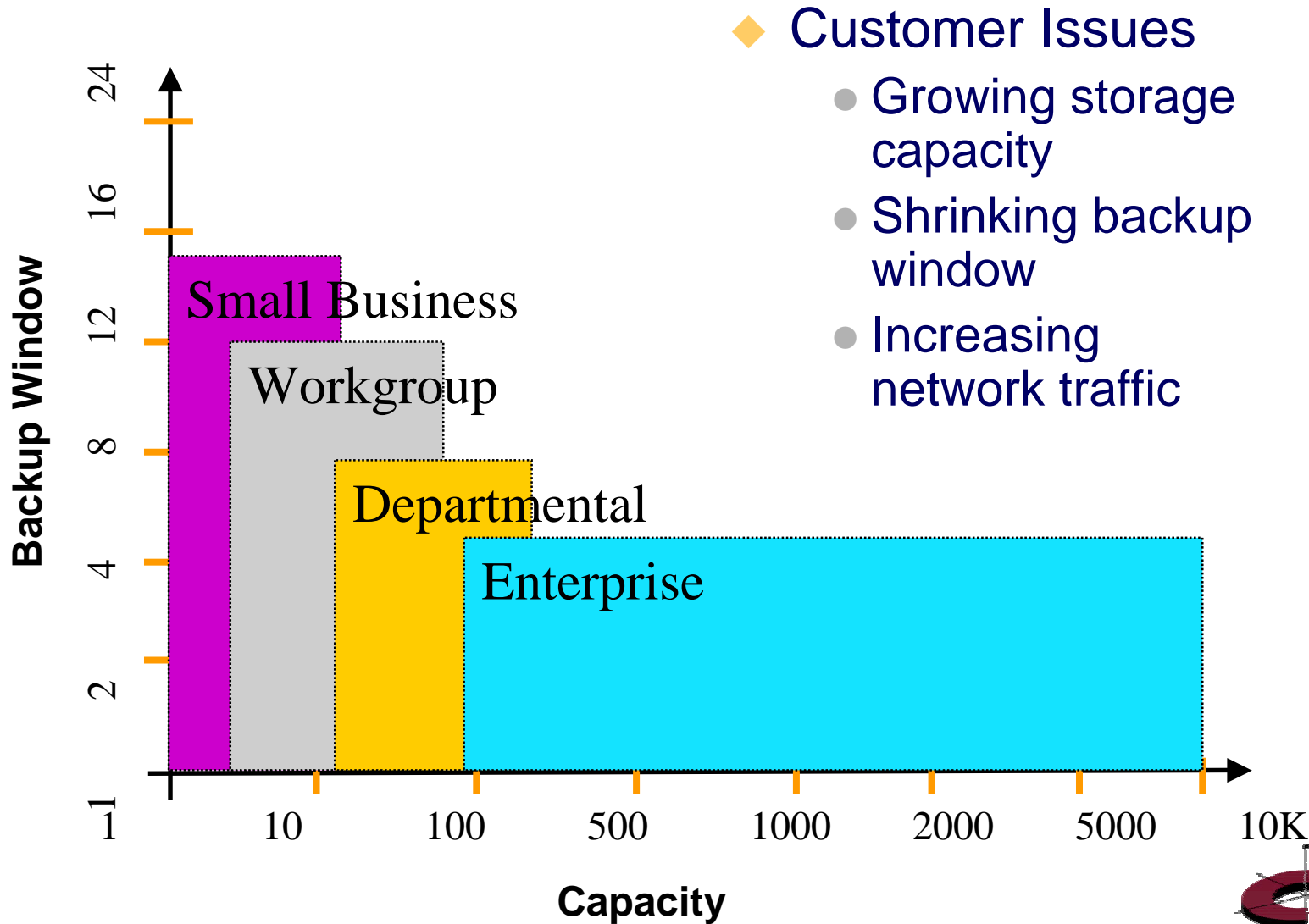


Source: Ontrack Data International



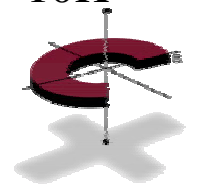


# Backup Characteristics



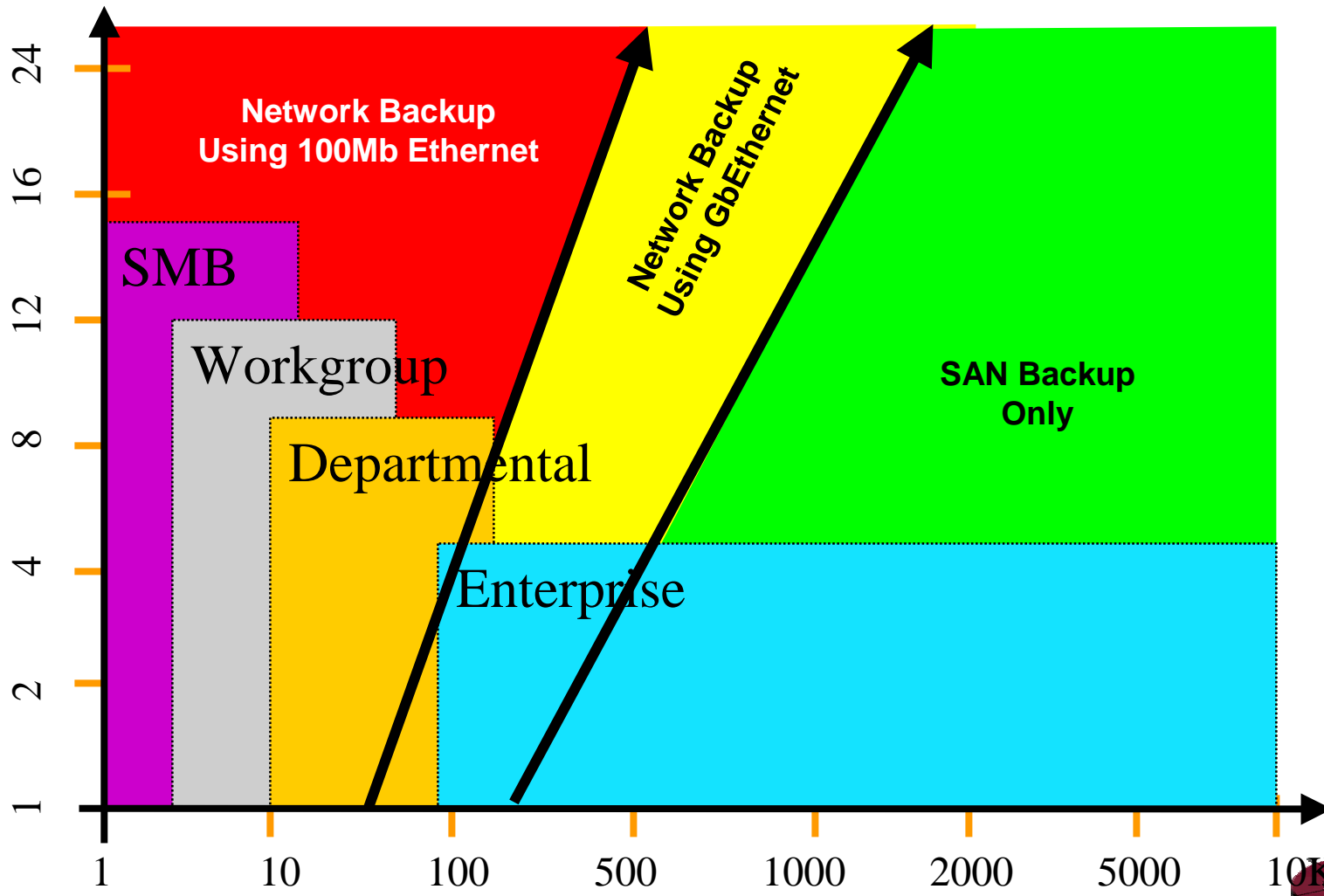
## ◆ Customer Issues

- Growing storage capacity
- Shrinking backup window
- Increasing network traffic



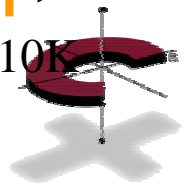
# Backup Challenge

Backup Window



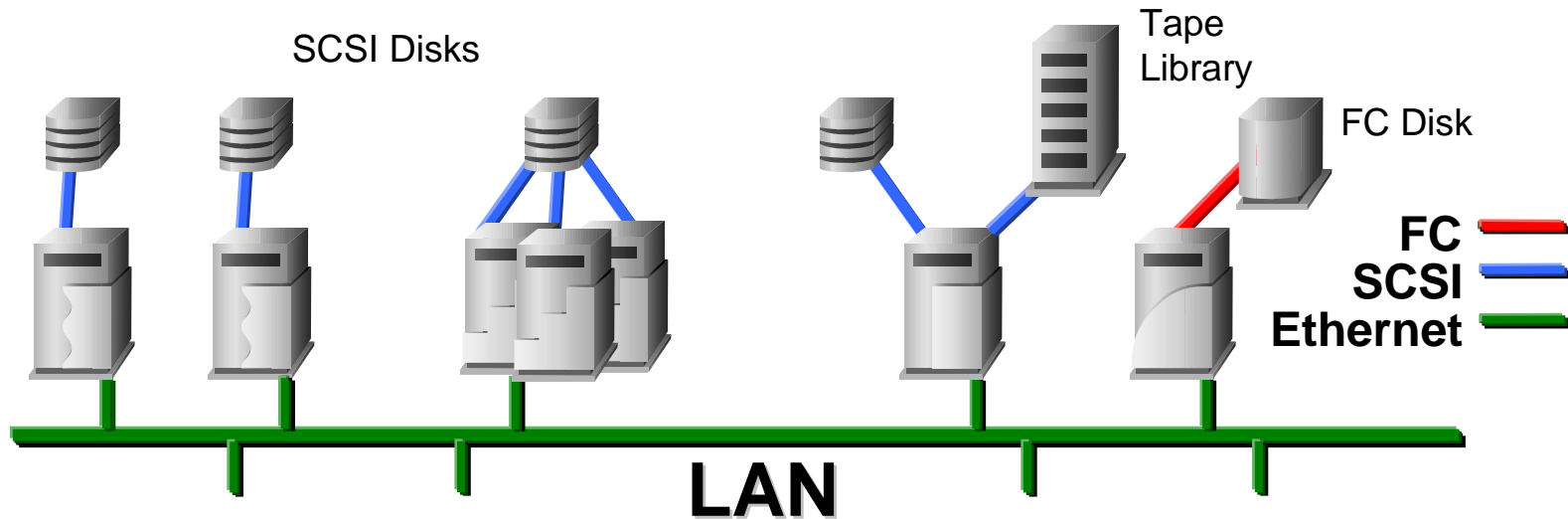
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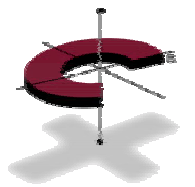
# Market Trends

## *Traditional Storage Environment*



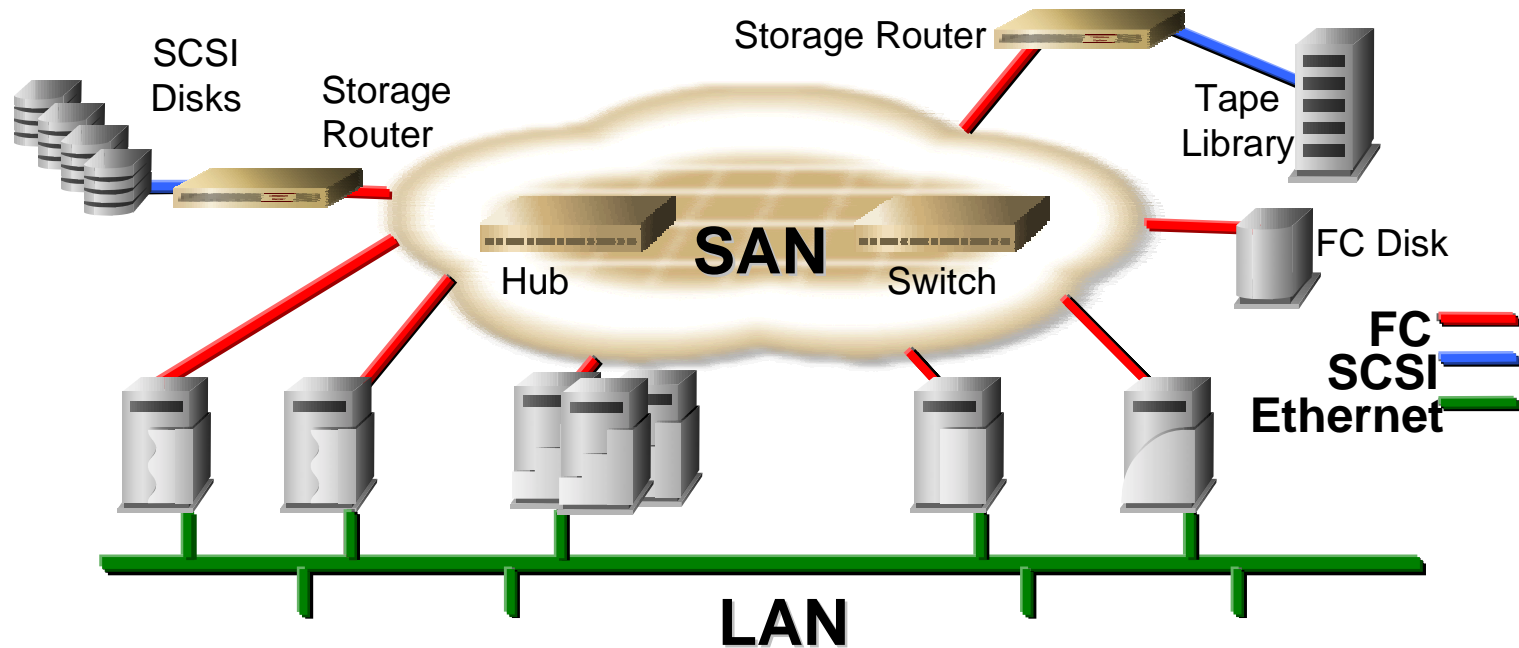
### **Business Problems with Storage Today:**

- ◆ “Islands” of data require significant personnel to manage
- ◆ Expanding storage is time consuming, costly, and difficult
- ◆ Backups are complicated and not meeting business needs
- ◆ Servers and Storage are the single points of failure
- ◆ Traditional highly available storage is cost prohibitive



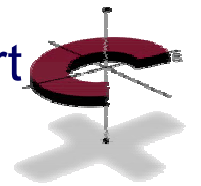
# Market Trends

## *Storage Consolidation through SAN*

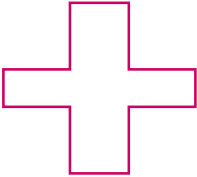



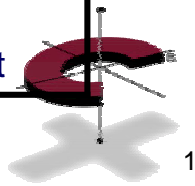
### **The Storage Area Network – SAN**

- ◆ Better utilization of IT staff to manage storage growth
- ◆ Faster, easier system deployment to support new business
- ◆ Reduce the risk of data being unavailable
- ◆ Lower total cost of acquisition, administration, and support



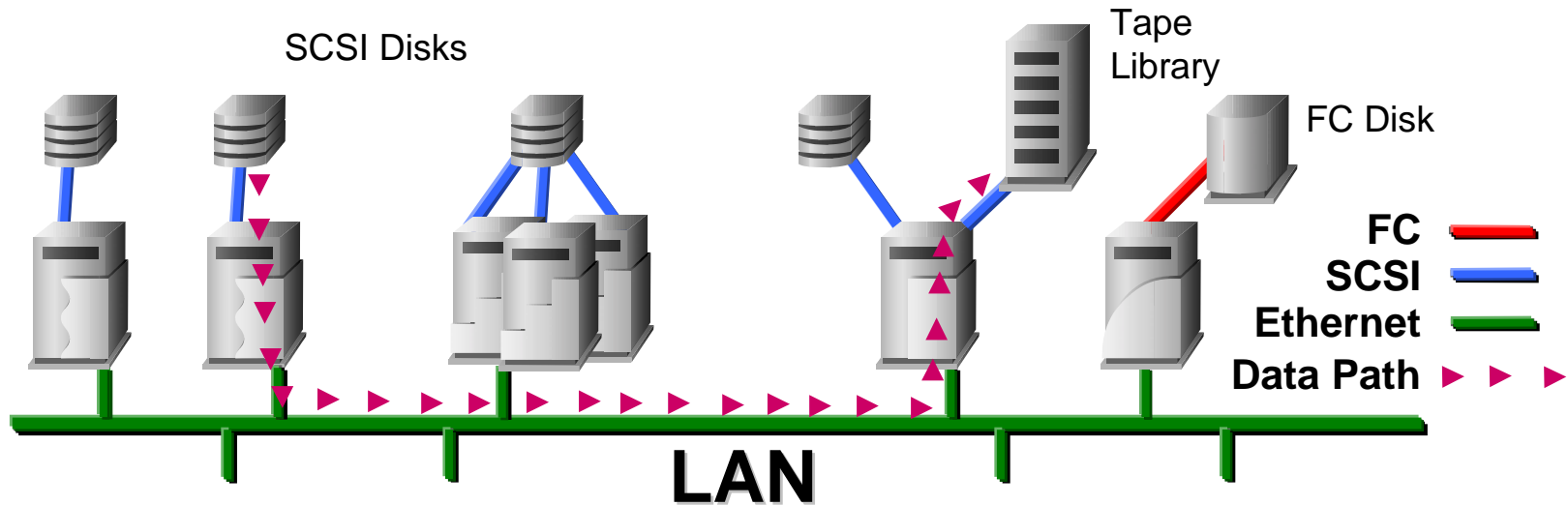
# Backup Solutions

|   | Server Attached Tape  | Network Attached Tape   | SAN LAN-free Backup   | SAN Server-free Backup   |
|---|---|---|---|--|
|    | <ul style="list-style-type: none"> <li>Company assets (information) are protected from accidental or malicious destruction</li> </ul>   | <ul style="list-style-type: none"> <li>Reduced cost over server-attached backup</li> </ul>  | <ul style="list-style-type: none"> <li>Backup and restore data confined to SAN</li> </ul>         | <ul style="list-style-type: none"> <li>Backup and restore data confined to SAN</li> <li>Server resources available during data transfer</li> </ul> |
|  | <ul style="list-style-type: none"> <li>All backup and restore data goes over LAN, competing with application data</li> <li>Backup server in data path, could be bottleneck</li> </ul> | <ul style="list-style-type: none"> <li>All backup and restore data goes over LAN, competing with application data</li> <li>Backup server in data path, could be bottleneck</li> </ul> | <ul style="list-style-type: none"> <li>Backup server in data path, could be bottleneck</li> </ul> | <ul style="list-style-type: none"> <li>Backup window is reduced, but still not eliminated</li> </ul>   |
| <b>Comments</b>   | Traditional backup  | Traditional backup  | Leverages SAN capabilities, eases network congestion  | Enables consolidation, reduces network cost  |



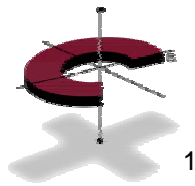
# Server-Attached Tape

## *Traditional Storage Environment*



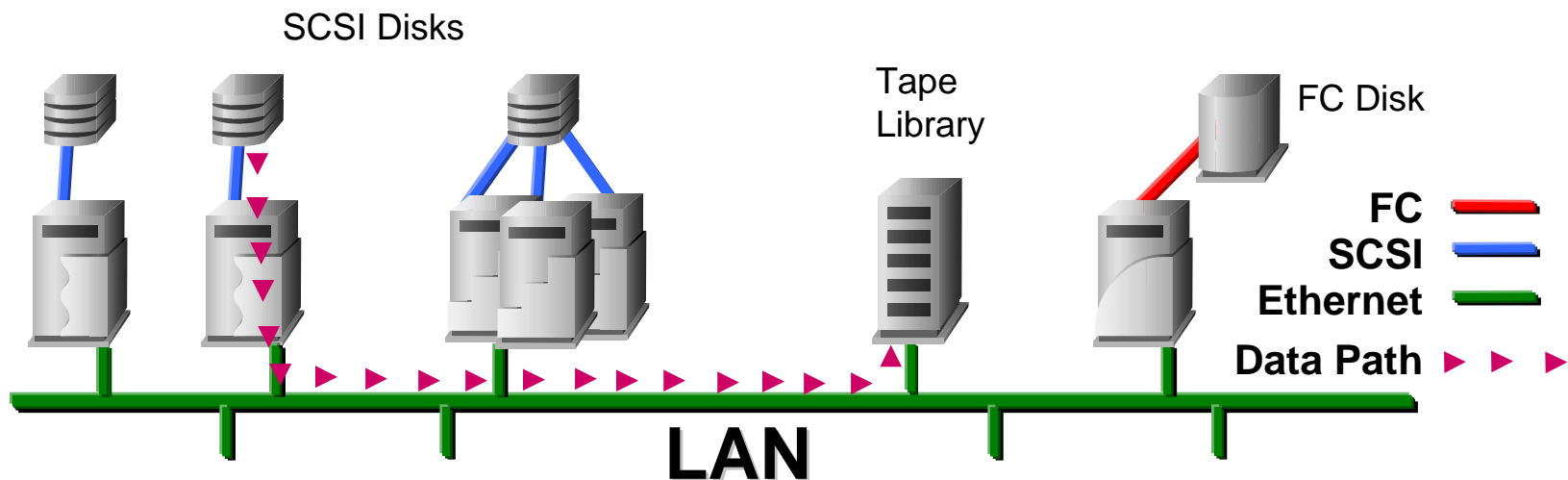
### Traditional Backup:

- ◆ Backup consumes many business resources
- ◆ Expanding storage capacity requires larger backup window, but new business models drive towards smaller backup windows
- ◆ Many single points of failure



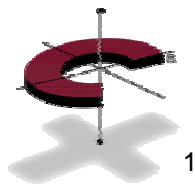
# Network-Attached Tape

## *Traditional Storage Environment*



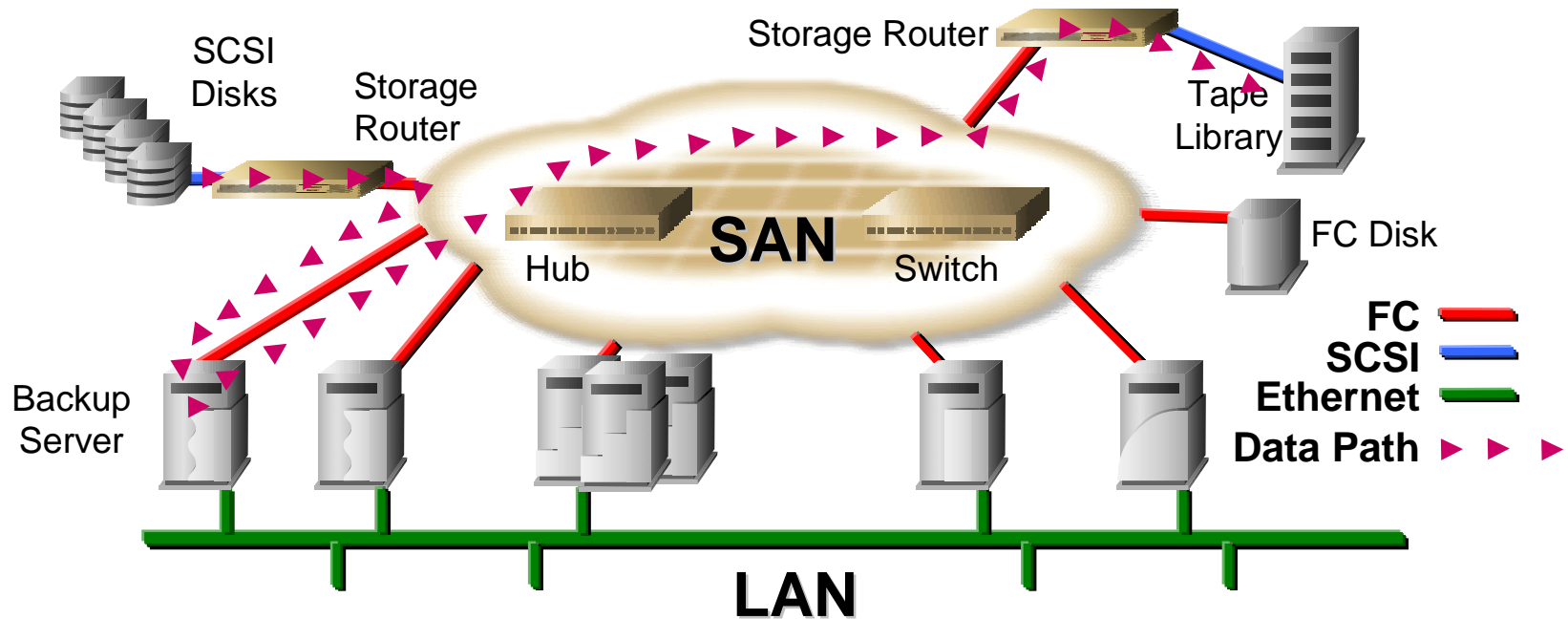
### Traditional Backup:

- ◆ Little improvement over traditional backup
- ◆ Expanding storage capacity requires larger backup window, but new business models drive towards smaller backup windows
- ◆ Still many single points of failure



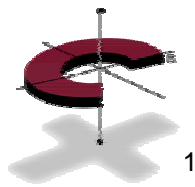
# LAN free Backup

## Storage Consolidation through SAN



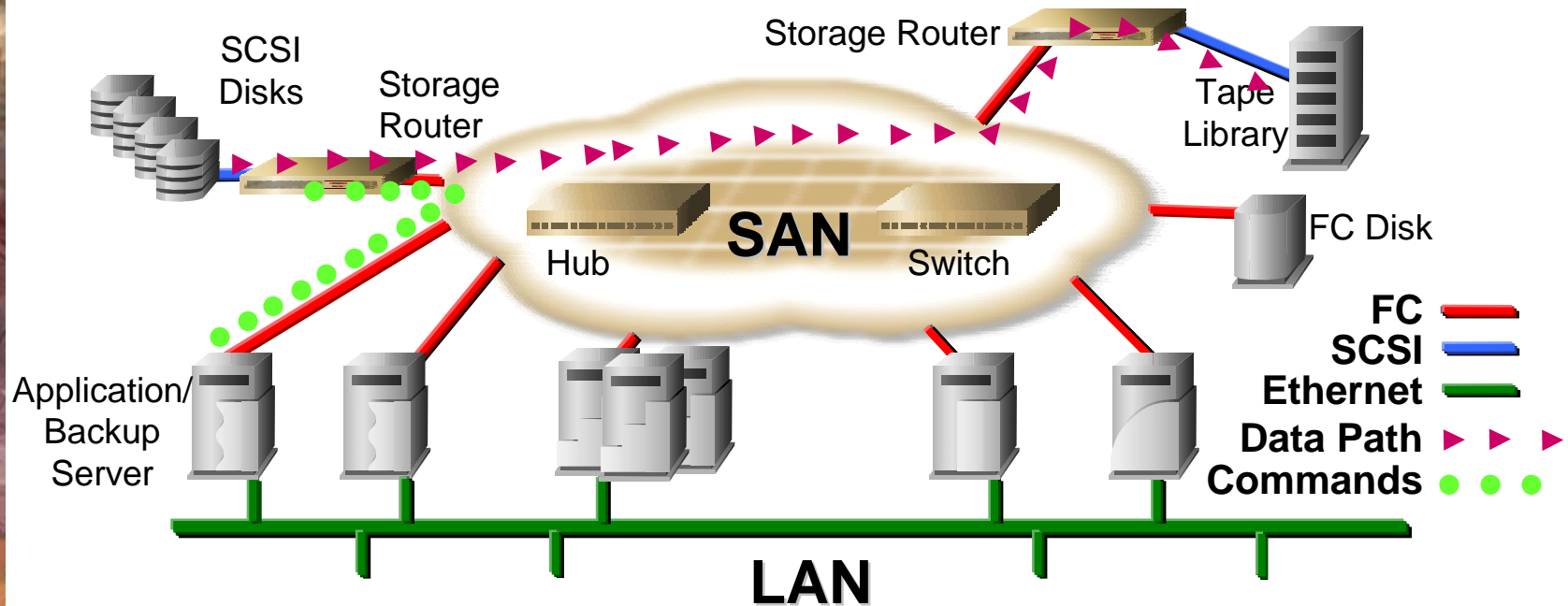
### Leveraging SAN for Backup

- ◆ Network freed from backup traffic, congestion eased
- ◆ Lower total cost of administration and support
- ◆ Reduces single points of failure and the risk of data being unavailable



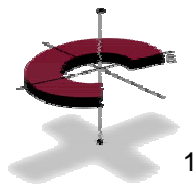
# Server free Backup

## Storage Consolidation through SAN



### Leveraging SAN for Backup

- ◆ Server freed of backup traffic, available for mission critical applications
- ◆ Lower total cost of administration and support
- ◆ Reduces single points of failure and the risk of data being unavailable



# The “Killer App”

- ◆ John Macarthur, IDC

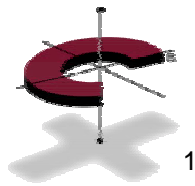
*“Dell has addressed the “killer-app” of SANs by integrating SAN-based backup solutions with Dell storage”*

- ◆ Robert Gray, IDC 1999

*“Today, one of the most critical storage issues facing MIS managers is the backup of mission-critical data applications. In order to address this concern, Legato Systems, MTI, and 3Com will launch an interoperable LAN-Free backup solution.”*

- ◆ Robert G. Amatruda, IDC December 1999

*“the advent of storage attached networks (SAN) and network-attached storage (NAS) will help drive demand for tape automation.”*



# Case Study – 800 GB OLTP Server

|                        | Backup Time | Server Utilization for Backup | Lost Revenue per week | Lost Revenue per year |
|------------------------|-------------|-------------------------------|-----------------------|-----------------------|
| Network Attached Tape  | 40 Hours    | 25%                           | \$ 2 Million          | \$154 Million         |
| SAN LAN-Free Backup    | 8 Hours     | 50%                           | \$800,000             | \$41 Million          |
| SAN Server-Free Backup | 4 Hours     | 25%                           | \$100,000             | \$5.2 Million         |

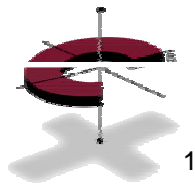
## Assumptions:

**\$200,000 per hour OLTP Application is running @100% CPU Utilization**

**7X24 OLTP operation**

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# Value of SAN Backup

- ◆ SAN backup more efficiently utilizes network and storage resources, reducing overall cost of ownership
- ◆ SAN backup is the only way to meet the backup window expectations of the customers
- ◆ SAN backup is easier and more efficient to manage, requiring less IT personnel to administer
- ◆ SAN backup saves money

