

# StarFabric and Storage



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# StarFabric and Storage Technical Trends

Move to Distributed Storage Clusters

Move to Commodity processing components

Leverage PC-class storage products (IDE v. FC)

Use of Open Software (e.g. LINUX)

Move to Gigabit Ethernet as an Interconnection



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# StarFabric and Storage Market Trends

Storage needs doubling each year

Increase in multimedia files

Data becoming mission critical

Storage needs are 24 x 7

Managing storage is difficult and costly



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# Current Solutions

- **Fiber Channel SAN solutions**
  - Expensive
- **Infiniband Solutions**
  - Expensive
  - Tremendous amount of new software infrastructure required.
- **Gigabit Ethernet Solutions**
  - Protocol overhead (i.e., TCP/IP/Ethernet) excessive in room area network.



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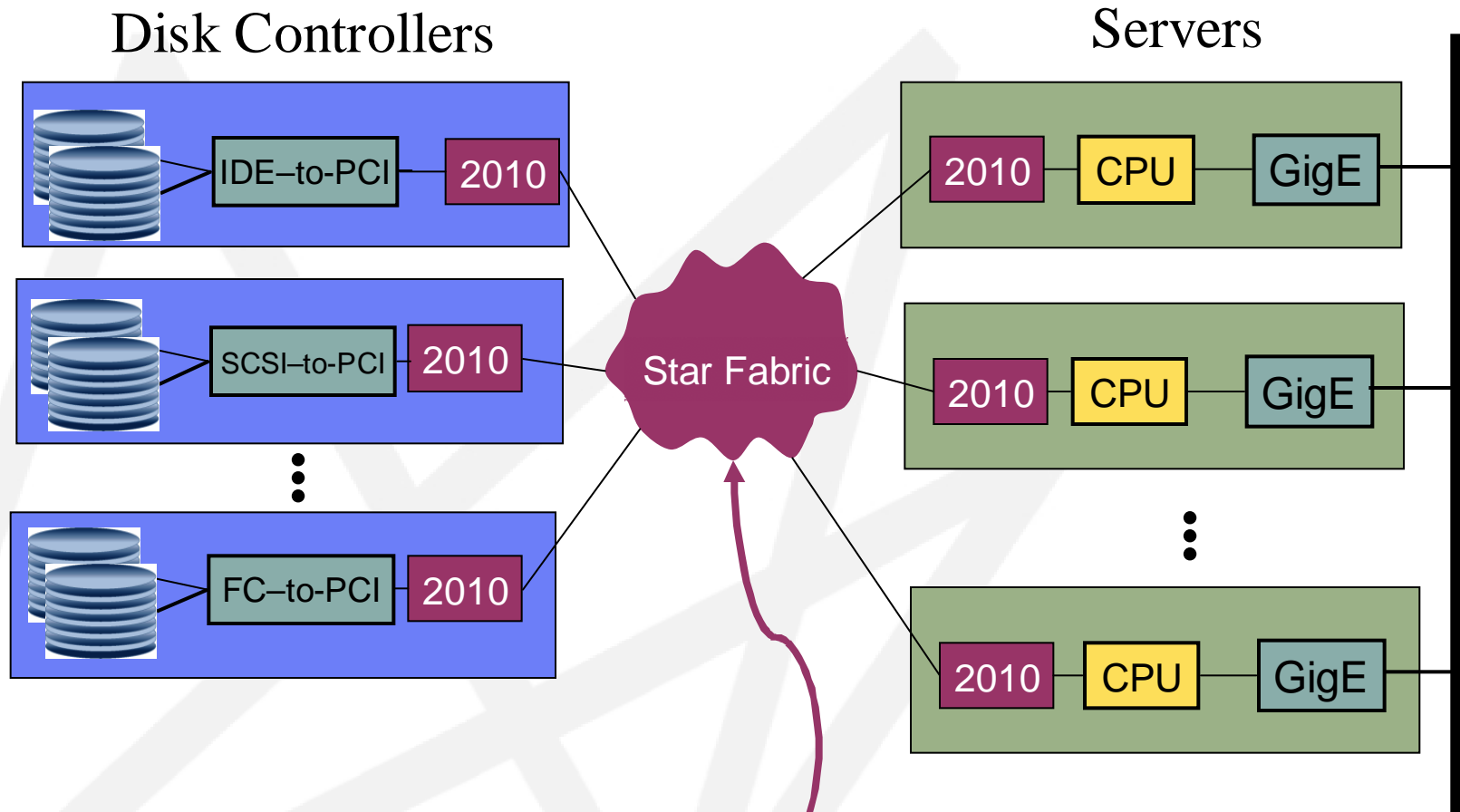
# StarFabric Advantage

- **Optimized for back planes and room area interconnects.**
  - Lower Power
  - Lower Cost
- **Overcomes limitations of GigE**
  - Processing power to run interconnect stack and processes interrupts is less than 10% of GigE
- **Enables the use of low cost PC class IDE drives in a high availability, high performance storage system.**
  - Overcomes IDE distance limitation by bringing the PCI bus to the disk controller!
- **Provides the ability to scale capacity while system is in operation.**
- **Flexible disk interface**
  - Complete legacy compatibility
  - Application Specific Interface Enhancements



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# StarFabric and Storage



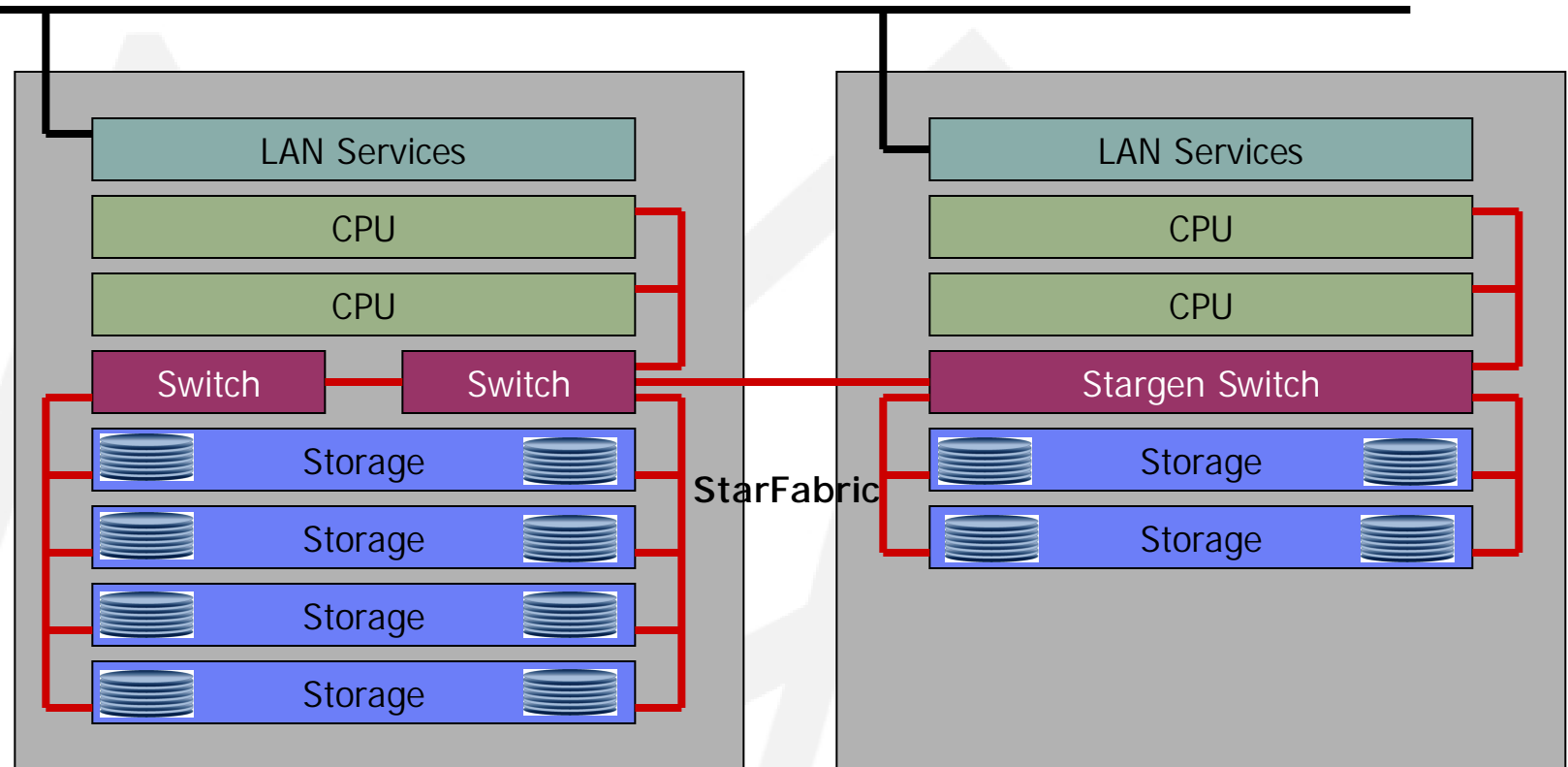
A Shelf, a Rack or a Room!



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# StarFabric

## Storage Application: 1U Implementation

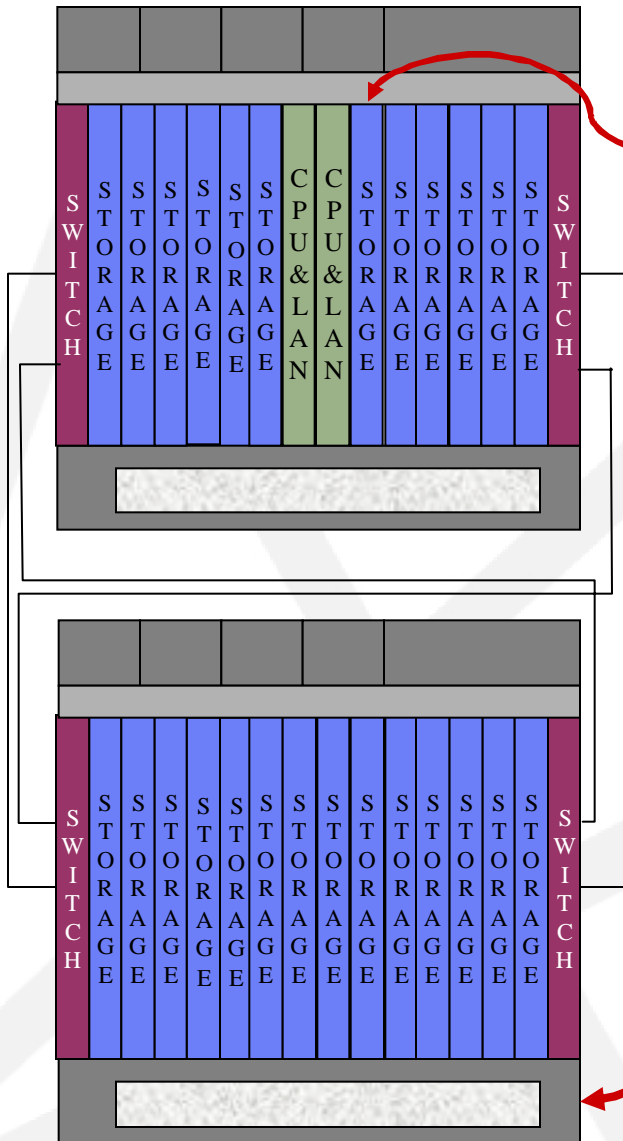


Scalable, Redundant, Low Power and Low Cost



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# Rack Mount Implementation



Ability to upgrade CPU's and Storage independently

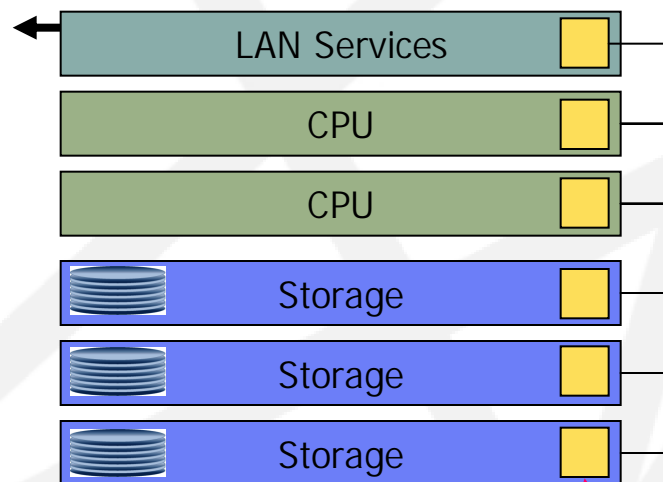
Second Chassis could have storage and redundant switch cards



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# Issues with GigE

- Ethernet has extreme processor utilization problems
  - Stack Overhead
  - Interrupt Processing Overhead
    - Over 20,000 per second with GigE
- Ethernet requires processors whenever you cross a subsystem boundary (Backplane or Chassis-to-Chassis)
- Ethernet is overkill for room area equipment



In-room distances are measured in 10's of feet not 100's meters.

Ghz processor on every system  
Just to run stack and process interrupts



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# StarFabric v. Infiniband

## StarFabric

- Scales from small systems to room scale systems
- Support for existing Line cards.
- Isochronous Traffic Support
- SW model is read/write compatible

## Infiniband

- Only cost effective with very large systems
- New Line cards required.
- No Isochronous traffic support
- SW model complete re-architecture.
  - Memory management
  - Buffer management
  - Security
  - Fabric management



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# StarFabric v. Infiniband

## StarFabric

- Complete Solution in 1Q03
- Device Communication via PCI HW and SW
- Reality ahead of Hype

## Infiniband

- Complete Solution in '05
- Device Communication via PCI HW and whole new software Interface
- Hype ahead of Reality



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