

An Industry Report  
Modular Computing Series 2006



# Architecting Next Generation Data Centers

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# Architecting Next Generation Data Centers

## T A B L E O F C O N T E N T S

### 1. Executive Overview

### 2. Market Drivers & Industry Dynamics

**Data Center automation Targets**

**Applications Driven architectures**

**The rise of Blade Computing**

**Key Technologies - Clustering, Server Interconnects & Virtualization**

**Pros & cons of Proprietary vs. Open Cluster Interconnect solutions**

Interconnect Contenders: Characteristics, Status

Fibre Channel, InfiniBand, TCP/IP/Ethernet

Technology Comparison - Interconnect Fabrics

State of Cluster Interconnect Fabrics

Technology Issues – Bandwidth, Latency (Memory, LAN, WAN, TLB, Disk, Cache OS), Scaling, Storage

### 3. Market Segments & Product Requirements

**Market Segments & Product Requirements by Application**

**OLTP**

Transaction Processing (ERP/CRM/SCM), eCommerce

**IP Telecom**

VoIP, Messaging, Convergence (Voice, Data, Video)

**Decision Support Systems**

Business Intelligence, OLAP, Data Mining

**HPC / Grids**

Technical & Commercial Grids, Transaction Grids

Bioinformatics, Visualization/Rendering, Earth Resources Exploration...

HPCC Architectures, Building Block, Software, Hardware Components

Network and Server Interconnects, Management and Monitoring

**Streaming**

Medical, Entertainment Content, MP3, VOD

**Market Segments & Product Requirements by Tiers – 1,2 & 3**

**Technology Challenges**

### 4. Market Forecast & Market Shares

**WW IT Spending**

**WW Server Market Forecast (Revenues, Units, ASP)**

By OS

By Price Groups

By Processor Technologies

By Workloads

By Tiers - Web Servers, Application Servers, DB/Transaction Servers

By Scale Up vs. Scale Out Technologies

By High Availability Levels

**WW Networking Market Forecast (Revenues, Ports, ASP)**

By Gateways & Switches (Managed & Unmanaged)

By Server Interconnects (IB, GbE..)

## **5. Emerging Technologies & Standards**

### **Server Technologies**

Blade Servers

Clustering

Interconnect Fabrics (IB, proprietary, IP, PCI-Express)

Server Virtualization

Server I/O Technologies

Provisioning – Solutions and Standards

Automation

SAN Technologies

### **Industry Initiatives**

Infiniband, GEA, RDMA Consortium, MS Chimney..

### **State of Progression of Interconnect & related Technologies**

TOE, RDMA, iSCSI, RDMA over IB and RDMA over IP,

Integrated Remote Management

FC vs. IP SANs

### **Performance Benchmarks & Standards**

## **6. Major Suppliers & Strategies**

### **Players by Market Segment**

### **Vendors in Value Chain by Technology Segment**

Infiniband (Chips, HCA/TCAs, Switches/Gateways, Systems, Solution Providers, Distributors)

GbE/10GbE (Chips, HBA, Multifunction NICs, Hubs/Switches/Routers, Systems, Solution Providers, Distributors)

### **IB Vendor Profiles**

Mellanox, Fujitsu, Infinicon, Top Spin, Voltaire, Agilent, HP, Sun, IBM ..

### **GbE Vendors Profiles**

## **7. Competitive Products Positioning**

### **Interconnect Metrics - Latency vs. Bandwidth**

Proprietary Interconnects Myrinet, Quadrics, ServerNet, SCI..)

Open Standard Interconnects (Infiniband, GbE PCI Express..)

Pricing Structures & Price Erosion Curves

## **8. Go-to-Market Strategies & Channels of Distribution**

Targeted Markets – OEMs vs. Partners

Effective Marketing Programs

Channels used by Chip, Switch & System Vendors

Pricing Structures – OEM, Distribution, Street

Top 10 Potential OEMs

Top 50 Potential System Integrators

Top 50 Potential Solution Providers

Top 50 End Users by Vertical Industry Sectors

## **9. Recommendations**

## **10. Research Methodology & Appendices**