



High Availability Computing 2007

- 1 Executive Overview
- 2 Market Drivers & Industry Dynamics
- 3 Market Segments & Product Requirements
- 4 Market Forecast & Market Shares
- 5 Emerging Technologies & Standards
- 6 Competitive Products & Positioning
- 7 Suppliers Profiles & Strategies
- 8 Channels of Distribution
- 9 Research Methodology
- 10 Appendices & Resources

Executive Summary

High Availability Industry Drivers	3
The rise of the Internet - 24x7 requirements	3
Convergence - Telecom and Datacomm Industries.....	3
Explosion in eCommerce & Implications.....	4
Major Causes of Downtime	4
Managing Risk of Downtime	4
Market Opportunities by Market Segment.....	5
Achieving High Availability	6
Achieving High Availability - Local, Remote	6
Vendors' Price/Availability Positioning to Achieve High Availability	7
High Availability Market - Overview	8
Demand for High Availability Computing & Telecom	8
High Availability Market Segments	8
High Availability Server Market	9
WW High Availability Servers Market Forecast 2006-10	11
HA Server Revenues by OS 2006-06	12
HA Server Shipments by OS 2006-10	12
HA Telecom Market 2006-2010.....	13
HA Telecom Equipments Market 2006-2010	13
HA Telecom Software Market 2006-2010.....	13
HA Telecom Services Market 2006-2010	13
High Availability Levels HAL 2-5	13
Market Forecast by HA Levels 2006-10.....	14
High Availability Industry Structure	15
High Availability End-to-End Internet	16
Carrier grade "web-tone and data-tone"	18
Clustering - a new paradigm in computing and communications	19
The fall of expensive proprietary solutions.....	19
High Availability in Data Centers	20
HA Equipment - Servers, Storage & Networking	20
HA Software - System SW, Utilities, Application SW.....	21
HA Databases Requirements	21
High Availability in Telecom	22
Telecom Equipment Market - Total & HA.....	22
HA Telecom Equipment Market Revenues 2006-2010	22
HA Telecom Equipment Market Drivers.....	22

Major HA Suppliers	23
HA Computing Suppliers.....	24
HA Telecom Suppliers.....	25
HA Convergence Markets - Major Players & New Suppliers.....	26
HA Suppliers - Tiers 0,1,2 and 3	26
Target Markets for HA Equipment Vendors	27
Opportunities for IT Equipment Manufacturers	27
Opportunities for Telecom Equipment Manufacturers.....	29
Channels of Distribution	30
Value Added Chain.....	30
Targeting Top Vendors.....	31
OEMs.....	31
HA System Integrators/Consultants.....	31
HA VARS/Distributors.....	31

Market Trends & Drivers

Factors driving High Availability.....	4
Online Internet.....	4
Mission Critical Requirements.....	4
Market Trends.....	5
UNIX vs. NT.....	6
Identifying High Availability Applications.....	8
Classifying Your Application's Criticality of Availability	8
Basic Productivity Applications	8
Core Business Applications	8
Customer Connection Applications	8
Impact & Cost of Downtime.....	9
Business Impact/Consequences of Outage	9
Impact of Computer Downtime	10
Loss per occurrence by company by industry	10
Cost of Network Downtime - Amount of Loss/incidence & No. of companies....	11
ROI decisions	11
Defining High Availability Goals	11
Separating the Mission-Critical	12
Calculating the Real Costs of Downtime	13
Calculate and Recalculate - Your Point of Diminishing Returns.....	16
Measuring High Availability - Precisely.....	16
Financial Impact of Downtime	17
Cost of Downtime in Fortune1000 Cos. - 1998 survey	17
Acceptable Levels of Downtime by Application.....	18
Acceptable Failover Time by Applications	18
Achieving High Availability	20
High Availability - Databases	20
High Availability Networks	20
Future of Networking.....	21
Convergence - Telecomm and Datacommunications Industries	21
Convergence Market Trends by year 2003	21
IP everything - the new communications platform	22
Bandwidth.....	23
Clustering.....	24
Definition.....	24

Configuration types	24
Active/active:	24
Active/standby:	25
Fault tolerant:.....	25
NT Clustering Solutions.....	25
Impact of Microsoft Clustering Solutions.....	25
Factors driving High Availability.....	27
Ranking HA systems.....	28
Enabling software	30
Cost justification.....	31
Continuous availability formula.....	33
When disaster strikes	33
Cost of ownership.....	34
Fitting a specific solution.....	34
High Availability Market Segmentation & Opportunity Map.....	36
Networking software market targets “carrier class” high availability	36
Market Trends	36
Criteria for Evaluating an Operating System.....	36
Software Application Availability	36
Total Cost of Ownership.....	37
Market Trends	43
NT Server Expected to Mature to Support Mission-Critical Applications	43
Rack Servers & Blade Servers.....	44
Market Segmentation & Demand - Blade Servers	44
Types of Blade Servers	46
Suppliers - Blade Servers.....	46
Summary.....	46
Achieving High Availability	47
What Level of Availability Achievable in Win2K Environment?	48
Technology Infrastructure Required	49
Availability Continuum.....	50
IT Processes	56
How high is high enough?	58
Level One: standalone servers and storage.....	59
Level Two: RDBMS & RAID	59
Level Three: availability clusters.....	60
Level Four: scalability clusters.....	61
Level Five: geographically dispersed clusters	61
Improving Uptime.....	62
Software.....	63
Hardware.....	68

Market Requirements

Market Requirements for High Availability	4
Components of Availability.....	4
HA Availability Computing Levels.....	4
HA Market Segmentation by HA Product Levels.....	5
Factors driving High Availability	5
Online Internet	5
Mission Critical Requirements.....	5
Achieving Cost Effective High Availability	6
Database Applications - Failover.....	6
Issues	6
Solution.....	6
Acceptable Failover Time by Applications	7
Acceptable Downtime in Enterprises.....	8
High Availability - Price/System availability Tradeoffs.....	10
Keys to achieving High Availability	11
HA Challenges	12
E-Business and Business High Volume Model.....	12
HA Challenges for Key Technologies	12
Bulletproofing the Back Office	13
Hardware Solutions for HA Servers.....	13
Backend & Infrastructure High Volume Servers	13
Intel 8, 4 & 2-Way Servers	13
4-Way	13
2-Way	14
Server Management	14
Server Management SW	14
Affordable Front End Servers	14
High Availability Storage.....	14
Software Solutions for High Availability	15
HA Software.....	15
MSCS SW for Messaging Servers	15
WLBS SW for Web Servers	15
Other Fail-Safe Software	16
Maximizing Data Access	16
High Availability and Fault-Resilient Intel Architecture based volume Servers .	16

Product Requirements	17
Telecom High Availability Requirements	18
Telecom High Availability System Requirements.....	18
Telecom High Availability Failure Recovery Requirements.....	18
Database Availability Requirements.....	18
Databases - HA Requirements.....	18
Database App Fail-over	19
Oracle Standby Database.....	20
Database Recovery	20
Failover Performance	20
High Availability Requirements - Internet Data Centers	20
High Availability Solutions.....	20
High Availability Storage.....	21
Local Load Balancing.....	21
Distributed Load Balancing	21
Database Clustering	22
Market Dynamics	22
Market evolution of PC Clustering	22
Clustering	23

Market Forecast - Overview

WW IT Spending by Equipments and Services	3
WW Server Market 2006-10.....	4
Worldwide Server Market Forecast - Revenues by OS 2006-10	4
WW Servers Market Size - Factory Revenues by Price Groups	6
WW Servers Market Shares by Price Groups.....	6
HA Servers Market Opportunity Sizing by Price Groups	6
WW Server Market Shares 2010	9
WW High End Servers Market Shares 2007.....	9
High Availability Servers - Market Forecast by OS 2006-10	11
High Availability Servers Market - Revenues & Shipments by OS.....	11
HA Servers Mkt Opportunity - Cum Rev vs. Annual Growth 2006-10	12
HA Open Servers Market - Windows, Linux & UNIX Systems	13
HA Servers Market Forecast by HA Levels 2006-10.....	14
Market Shares - HA Servers 2007	18
Market shares - High Availability UNIX & NT Servers.....	18
Market shares - High Availability Proprietary Servers	18
HA Cluster Servers Market 2006-10	19
High Availability Clustering Equipments Market Segments	19
High Availability Cluster Servers Revenues 2006-2010 by OS	19
HA Clustering Infrastructure Market.....	21
HA Clustering Interconnect Market - Rev \$M	21
HA Software Market 2006-10	21
HA Clustering SW Market.....	21
HA Software Market By OS	22
HA SW Market by Environment	22
HW SW Market Shares.....	22
HA Storage Subsystems 2006-10.....	23
WW Storage Subsystems - GB/Server (by Platform).....	23
WW Storage Subsystems Rev - % of Server Revenues (by Platform).....	23
HA Storage Market by Environment & Applications	23
HA Storage on Internet.....	23
HA Storage on Intranet.....	23
HA Storage on Extranet.....	23

Application Servers Market	24
2007 Application Servers Market Shares	24
Servers ASP Erosion by Application	25
Telecom Equipment Market.....	26
Total Converged Telecom Equipment Market Revenues	26
High Availability Telecom Equipment Market.....	27
High Availability Telecom Equipment Market Revenues 2006-2010	27
High Availability Telecom Equipment Market Unit Shipments2006-2010.....	27
Market Shares - Data/Telecom Equipment Markets.....	28
Market Opportunity Sizing - HA Data/Telecom Equipment Market	28
High Availability Internet Access & Backbone Telecom Equipment Suppliers ..	29

Emerging Technologies

High Availability - the next competitive frontier	3
Scaled Performance.....	4
Fault Tolerance.....	4
Cost effective cluster servers challenge expensive enterprise computers.....	4
Database Requirements for Clustered Servers.....	5
VIA - an open standard for Clustering	5
From Cluster to SAN.....	6
High Availability Levels	7
Failover Types	8
High Availability Technologies	8
High availability.....	8
Reliability and availability	9
Faults and their manifestations	9
Failure stages.....	9
Failure response strategies	9
Architectural strategies.....	10
Hardware approaches.....	10
Software approaches.....	10
Transparency.....	11
Trade-offs and considerations.....	11
The Open Standards Revolution	11
High Availability Makes It Possible	11
High Availability Component Standards.....	13
CompactPCI as a Telecom Platform.....	13
Achieving High Availability	15
High availability.....	15
Reliability and availability.	16
Faults and their manifestations.	16
Failure Mechanisms.....	16
Failure Response Strategies.....	17
EA vs HA vs CA	17
Achieving High Availability	17
Business Services	17
Architectural Designs	17
High Availability Hardware approaches.....	18
Storage.....	18
Network Integrity.....	19

Concurrent Maintenance	21
Software approaches.....	21
Transparency.....	21
Trade-offs and considerations.....	22
Centralization of System Management	22
Clustering.....	22
Clustering Definitions.....	22
Clustering Market Drivers and Inhibitors.....	24
Clustering Drivers	24
Clustering Inhibitors	24
Clustering Technologies.....	24
Interconnect Technologies	24
Available Solutions	24
Drivers for Clustering	25

Competitive Positioning

Targeting High Availability	3
The Five Pillars of High Availability Framework	3
Market Segmentation	5
Industry Standards & Metrics	5
Open System and Proprietary Servers	5
Cluster Systems	6
High Availability Cluster Servers.....	6
Enterprise Servers & Storage	7
Enterprise Hardware Vendors.....	8
Enterprise Software Vendors.....	10
HA Market Opportunity	13
Market Segmentation by Price/Performance & Environment	13
HA Market by Server Characteristics	14
High Availability Competitors & Positioning	20
HA Servers by Manufacturer, Platform & OS	20
HA Storage Subsystems and Vendors.....	21
HA Software Vendors & Products	22
HA NT Clustering Solutions	22
HA Clustering Interconnect Vendors & Products	23
Major Product Comparisons	24
HA Software - Review Criteria.....	24
HA Software - Competitor Matrix.....	25

Major HA Suppliers

High Availability Servers	10
High Availability Server Vendors by Platform & OS	10
HA Server OEMs.....	10
HA Clustering.....	11
HA Clustering System Vendors & Products.....	11
HA Clustering Software Vendors & Products	11
NT Clustering Products' Feature Comparison	12
High Availability Storage	13
HA RAID Storage Vendors & Products	13
Clustering - Interconnect Vendors & Products	14
HA Telecom Equipment Companies	15
Telecom Companies - Financials by Product Line	15
HA Telecom - Component Manufacturers.....	19
Compact cPCI Board Manufacturers.....	19
Sun System Integrators for PCI based Systems & Boards.....	20
Motorola's Embedded System Partners	21
Vendors & Products - High Availability Solutions	23

Go-to-Market: Disty Channels

High Availability Industry Structure	4
High Availability Value-Added Chain - Overview	5
Manufacturers.....	5
Distribution Channels.....	5
Services Providers.....	5
End Users.....	5
High Availability Equipment Suppliers.....	6
High Availability Server Vendors by Platform & OS	6
HA Server OEMs.....	6
Component Manufacturers - HA Telecom	7
Compact PCI Board Manufacturers.....	7
High Availability Cluster Systems	8
RAID Storage Subsystems and vendors for Cluster Servers	8
Cluster Interconnect Vendors & Products.....	9
Cluster SW Providers	9
High Availability SW	9
High Availability Multipath SW	10
Clustered SAN Network Equipment	10
HA Component Manufacturers.....	12
SOFTWARE.....	12
HW	12
HA Subsystems	14
HA Storage OEMs	14
Data Networking Equipment Manufacturers.....	16
Access Equipment.....	16
Backbone - Edge Switches & Routers	16
Backbone - Core.....	16
High Availability Networks	17
LAN/WAN Manufacturers	17
Private Labelers	18
Telecom Equipment Private Labelers offer support and services for all of the leading Telecom manufacturers. Since they sell different telecom equipments from various vendors they could become missionaries and could serve as referrals of high availability solutions from Lucent.....	18
Data Compression Vendors	19

Communications Processors Vendors	19
Telecom Industry Structure	20
HA Telecom Equipment Providers.....	21
Financial Profiles 1996-2000	21
Product Line Mix.....	21
Convergence Equipment Manufacturers	22
Computer Telephony	24
Channels of Distribution.....	25
Distributors	25
HA Systems Distributors - US.....	25
HA Telecom Distributors	25
Resellers - Telecom.....	26
HA Telecom Resellers - Wireless/PCS/Satellite	26
Call Center Management, Network OAM&P	26
Intelligent Network	26
Communications/Networks/Servers.....	27
HA Telecom Resellers - Wireline	27
Intelligent Networks	27
VARs	28
VARs.....	28
VARs - HA Telecom/Networks	28
System Integrators	29
System Integrators - Computer Telephony	29
System Consultants	36
Telecom/Data Services Providers.....	37
Carriers - RBOCs & Others.....	37
Cable Access	37
US Cable Access Based ISPs	37
Cable Companies	37
Cable Operators	38
National Cable Operators	38
Regional Cable Operators	38
Satellite Operators	38
Private IP fax Services.....	38
CLECS	39
Major CLECs.....	39

ISPs..... 39
 Key Trends..... 39
 Successful ISP Niches & Strategies - Typical Cases 40
 Major ISPs - National 42

TOP LISTS 45
 Top 25 HA Network/Telecom VARS by Rev Rank..... 45
 Top 50 HA System Integrators by Rev Rank 46
 Top 35 HA Distributors (by Rev Rank)..... 47
 Top 150 HA VARS 48

Research Methodology

Methodology	2
Primary Data	2
Factors Fueling Growth.....	2
Key Findings.....	3
Markets	3
Market Segments	3
Server Platform by price/performance segments:.....	3
Server and storage subsystems shipments by major OS categories:.....	3
Server and storage subsystems shipments by price categories:	3
Server and storage subsystems shipments by Channels of Distribution:	3
Server and storage subsystems shipments by File Systems:.....	3
Server and storage subsystems shipments forecast by applications categories (in future)	3
Server and storage subsystems worldwide shipments by Geography (future) ..	3
Market Demand Forecast	4
Market Demand 2006	4
Near Term Forecast 2004.....	4
Long-Term Forecast 2003-2006	4
Market Shares.....	4
Geographic Coverage.....	4
IMEX Definitions & Terminology	5
Definitions.....	5
Terminology.....	5
Computer Systems & Servers	5
Storage Subsystems.....	5
References	6
Related Market Research	6
Glossary of Terms.....	6
Computer Systems & Servers	6
Networking - LANs/WANs, Internet/Intranet/Extranets	6
Storage Subsystems.....	6