Three New HP Integrity NonStop Platforms

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NED Product Management
Agenda

1. The New HP Integrity NonStop Servers
2. Performance
3. Architecture and I/O
4. Upgrades and Add-ons
5. Wrap-up and Q&A
HP Integrity
NonStop Platforms
HP Integrity NonStop Servers
The 200 Series

High End:  NS16200 NSAA
follow-on to the NS16000 NSAA

Mid-range: NS14200 NSAA
follow-on to the NS14000 NSAA

Entry Class: NS1200 NSVA
follow-on to the NS1000 NSVA

Based on the new Intel® Itanium® processor 9100 series
HP Integrity NonStop NS16200

- The new Intel® Itanium® processor 9100 series
  Early adopter of new technology on Itanium roadmap
- Same price as the NS16000
- Provides up to 20% better price/performance
- Triple- (TMR) and Dual- (DMR) Modular Redundancy NSAA
- Linear scalability:
  - 2-16 processors per node
  - 4-16 GB memory per processor
  - Clustering up to 4,080 processors
- Industry Standard Connections (IOAME)
  - 60 I/O adapters
  - Fibre Channel disk storage (FCDM and Enterprise SAN)
  - Gigabit Ethernet
- Connects to HP NonStop S-series disk and I/O
HP Integrity NonStop NS16200 Available As...

1. a complete **new** system

2. an **add-on*** to existing NS16000 and NS16200 systems (a mixed NS16200 system)
   (In 2P increments up to the maximum of 16 processors)

3. an **upgrade*** to an existing NS16000 system
   (complete or partial system upgrades available)

Requires H06.12 RVU or later

* cannot mix NS16000 and NS16200 CPU assemblies within the same complex
HP Integrity NonStop NS14200

- The new Intel® Itanium® processor 9100 series
  Early adopter of new technology on Itanium roadmap
- Same price as the NS14000
- 75% performance of the NS16200
- Triple- (TMR) and Dual- (DMR) Modular Redundancy NSAA
- Linear scalability
  - 2 - 8 processors per node
  - 4 - 8 GB memory per processor
  - Clustering up to 2,040 processors
- Industry Standard Connectivity (VIO)
  - 6 I/O adapters
  - Fibre Channel disk storage (FCDM and Enterprise SAN)
  - Gigabit Ethernet
HP Integrity NonStop NS14200 Available As...

1. a complete new system

2. an add-on* to existing NS14000 and NS14200 systems (a mixed NS14200 system) (In 2P increments up to the maximum of 8 processors)

3. an upgrade* to an existing NS14000 system (complete or partial system upgrades available)

Requires H06.13 RVU or later

* cannot mix NS14000 and NS14200 CPU assemblies within the same complex
HP Integrity NonStop NS1200

- The new Intel® Itanium® processor 9100 series
  Early adopter of new technology on Itanium roadmap
- Same pricing and bundles as the NS1000
- 65% performance of the NS16200
- HP rx2660 server chassis (off the shelf)
- Upgraded system disk drives
- 4 GB and 8 GB bundles with VIO support
- 36U cabinets in 2P configurations
- Industry Standard Connectivity (VIO)
  - 6 I/O adapters
  - Fibre Channel disk storage (FCDM and Enterprise SAN)
  - Gigabit Ethernet
HP Integrity NonStop NS1200 Available As...

1. a complete new system

2. an add-on to existing NS1000 and NS1200 systems (a mixed NS1200 system)
   (In 2P increments up to the maximum of 8 processors)

3. an upgrade to an existing NS1000 system
   (complete or partial system upgrades available)

Requires H06.12 RVU or later
# Moving from NS1x000 to NS1x200

## What Stays the Same

<table>
<thead>
<tr>
<th>High End NS16200</th>
<th>Mid-Range NS14200</th>
<th>Entry Class NS1200</th>
</tr>
</thead>
<tbody>
<tr>
<td>NSAA</td>
<td>NSAA</td>
<td>NSVA</td>
</tr>
<tr>
<td>DMR / TMR</td>
<td>DMR / TMR</td>
<td>Software FT</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Hardware redundancy</td>
</tr>
<tr>
<td>16 GB max mem</td>
<td>8 GB max mem</td>
<td>8 GB max mem</td>
</tr>
<tr>
<td>Up to 16P/node</td>
<td>Up to 8P/node</td>
<td>Up to 8P/system</td>
</tr>
<tr>
<td>IOAME</td>
<td>VIO</td>
<td>VIO</td>
</tr>
<tr>
<td>ServerNet Clustered</td>
<td>ServerNet Clustered</td>
<td>“Expand” over ServerNet not ServerNet clustered</td>
</tr>
<tr>
<td>Fully scalable up to 4,080 processors</td>
<td>Scalable up to 2,040 processors</td>
<td>Scalable up to 8 processors</td>
</tr>
<tr>
<td>Processor chassis rx4640</td>
<td>Processor chassis rx4640</td>
<td>4 GB and 8 GB bundles</td>
</tr>
</tbody>
</table>
Performance, Architecture, and I/O
Performance

Up to 20% increase

65% of NS16200

75% of NS16200

NS16000 → NS16200 → NS14200 → NS1200
NonStop Systems Performance Summary Order Entry Benchmark

![Bar Chart]

- NS16200
- NS16000
- NS14200
- NS14000
- NS1200
- NS1000
- S88000
- S86000

Relative Performance

Relative Performance Range: 0 to 3.5
NonStop Advanced Architecture (NSAA)

NS16x00/14x00 4-processor system

NonStop Value Architecture (NSVA)

NS1x00 4-processor system
# NS Architecture Comparison

<table>
<thead>
<tr>
<th>Feature</th>
<th>NSVA</th>
<th>NSAA (DMR)</th>
<th>NSAA (TMR)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Redundant input power feeds</td>
<td>Y</td>
<td>Y</td>
<td>Y</td>
</tr>
<tr>
<td><strong>SW fault tolerance</strong></td>
<td>Y</td>
<td>Y</td>
<td>Y</td>
</tr>
<tr>
<td>System area network fault masking</td>
<td>Y</td>
<td>Y</td>
<td>Y</td>
</tr>
<tr>
<td>No single point of failure for a system</td>
<td>Y</td>
<td>Y</td>
<td>Y</td>
</tr>
<tr>
<td>End to end disk checksum</td>
<td>Y</td>
<td>Y</td>
<td>Y</td>
</tr>
<tr>
<td>Transactional consistency (TMF)</td>
<td>Y</td>
<td>Y</td>
<td>Y</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Feature</th>
<th>+</th>
<th>++</th>
<th>+++</th>
</tr>
</thead>
<tbody>
<tr>
<td>Non-FT SW application (under HW fault)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>FT SW application that requires &quot;the ultimate&quot; continuous availability (under HW fault)</td>
<td>Yes, if application can tolerate NonStop takeover time</td>
<td>Yes, if lack of this during repair is acceptable</td>
<td>Yes</td>
</tr>
</tbody>
</table>

Note: All NonStop systems have world class availability.

February, 2008: A revised version will be available later this year.
NonStop I/O Infrastructure Summary

- **IOAME:**
  - For NS16x00 and S-series
  - 10 I/O Slots
  - Up to six IOAMEs per system
  - Fibre Channel adapter (FCSA): 2 ports
  - Ethernet adapter (G4SA): 4 ports
  - P-switch for the NS16x00

- **VIO:**
  - For NS14x00 and NS1x00
  - Similar functionality as the IOAME but different form factor
  - One pair of VIO per system
  - Fibre Channel adapter: 4 ports
  - Ethernet adapter: 4 ports
  - No P-switch (ServerNet extenders)

<table>
<thead>
<tr>
<th>IO-Switch</th>
</tr>
</thead>
<tbody>
<tr>
<td>IO-Switch</td>
</tr>
<tr>
<td>OPEN</td>
</tr>
<tr>
<td>OPEN</td>
</tr>
<tr>
<td>FCSA</td>
</tr>
<tr>
<td>OPEN</td>
</tr>
<tr>
<td>OPEN</td>
</tr>
<tr>
<td>G4SA</td>
</tr>
<tr>
<td>OPEN</td>
</tr>
<tr>
<td>G4SA</td>
</tr>
<tr>
<td>FCSA</td>
</tr>
<tr>
<td>OPEN</td>
</tr>
</tbody>
</table>
Fiber Channel Disk Module - FCDM

Primary disks

Mirror disks

- Compact packaging: self contained module
  - Up to 14 disks per module
  - Dual Fibre Channel Arbitrated loops connect the disks
- FC direct attach to NonStop servers
- Produced by HP StorageWorks
  - 146 GB 15K RPM disks
  - 300 GB 15K RPM disks
Enterprise Storage - XP Disk Arrays and NonStop Support Since 2004

- Mission Critical Availability
- No single point of failure
- Fully redundant cache
- S and NS series

Enhanced, tested, qualified, sold, supported by HP
NS16000 DMR Add-on
Example: 4P + an Additional 4P

NS16000 DMR
4 Processor
H06.08

NS16x00 DMR
8 Processor
H06.12

Result: A mixed system with an: NS16000 4P (original) plus an NS16200 4P (add-on)

+ NS16200 4P Processor Assembly (Memory, LSU, etc)
NS16000 DMR Upgrade

Example: Replace a 4P

NS16000 DMR
4 Processor
H06.08

NS16200 DMR
4 Processor
H06.12

Result: An NS16200 4P

△
an NS16000 4P Processor Assembly with an NS16200 Processor Assembly
**NS14000 DMR Add-on**

**Example: 4P + an Additional 4P**

NS14000 DMR  
4 Processor  
H06.08

NS14x00 DMR  
8 Processor  
H06.13

Result: A mixed system with an NS14000 4P (original) plus an NS14200 4P (add-on)

+ NS14200 4P Processor Assembly (Memory, LSU, etc)
NS14000 DMR Upgrade

Example: Replace a 4P

NS14000 DMR 4 Processor H06.08

NS14200 DMR 4 Processor H06.13

Result: A NS14200 4P

an NS14000 4P Processor Assembly with an NS14200 Processor Assembly
HP Integrity NonStop NS1x00 Server Configuration

- **VIO**
- **Processors**
- **FCDMs**
- **System Console**
**NS1000 Add-on**

Example: 2P + an Additional 2P

<table>
<thead>
<tr>
<th>NS1000</th>
<th>NS1x00</th>
</tr>
</thead>
<tbody>
<tr>
<td>2 Processor</td>
<td>4 Processor</td>
</tr>
<tr>
<td>H06.08</td>
<td>H06.12</td>
</tr>
</tbody>
</table>

Result: A Mixed NS1000 2P (original) plus an NS1200 2P (add-on)
NS1000 Upgrade
Example: Replace a 2P

NS1000
2 Processor
H06.08

Result: A NS1200 4P

an NS1000 2P
Server with an
NS1200 Server

NS1200
2 Processor
H06.13
# RVU History

<table>
<thead>
<tr>
<th>Calendar Quarters</th>
<th>Calendar Years</th>
<th>G-series RVU</th>
<th>H-series RVU</th>
</tr>
</thead>
<tbody>
<tr>
<td>Q1</td>
<td>2006</td>
<td>G06.28</td>
<td>H06.05</td>
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<tr>
<td>Q2</td>
<td>2006</td>
<td>-</td>
<td>H06.06</td>
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<tr>
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<td>2006</td>
<td>G06.29</td>
<td>H06.07</td>
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<tr>
<td>Q4</td>
<td>2006</td>
<td>-</td>
<td>H06.08</td>
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<td>H06.09</td>
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<td>2007</td>
<td>-</td>
<td>H06.10</td>
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<tr>
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<td>H06.11</td>
</tr>
<tr>
<td>Q4</td>
<td>2007</td>
<td>-</td>
<td>H06.12</td>
</tr>
<tr>
<td>Q1</td>
<td>2008</td>
<td>-</td>
<td>H06.13</td>
</tr>
</tbody>
</table>
The New Integrity NonStop 200 Series Platforms

- Continued commitment to Intel Itanium roadmap
- Investment Protection
- Ease of migration with “mixed” systems
Three New HP Integrity NonStop Platforms

Questions?

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