HP NonStop NS-Series

Site Planning and Preparation
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Data Center Challenges

• A shift toward modular racked systems will have substantially higher power densities.

• Customers evolving into modular racked systems need to be well-informed of how system configurations can influence the dynamics of their Data Center.

• Facility managers are challenged to recognize these effects, and if necessary, upgrade their facility infrastructure to meet modular system requirements.
Challenges and Risks

- Cooling
- Site Power and UPS
- Access Flooring
- Fault Zones
- Delivery
- Installation
Cooling

At the system level, Power densities are increasing

• More powerful microprocessors
• Denser circuit cards and power supplies
• Faster larger capacity storage devices
Computer Industry Heat Density Trends

From Uptime Institute
Footprint power density

**Footprint Power Density**

Total power / foot print

Example:

4000 W / 7.4 ft² = 540 W/ft²

**Gross Power Density (GPD)**

Total power / ECA

Example:

4000 W / 50 ft² = 80 W/ft²

*ECA = 7.1 ft * 7.1 ft = 50 ft²

Effective Cooling Area
Improved Airflow Pattern: Hot Aisle, Cold Aisle
Improving Data Center Thermal Management

Based on findings consider the following enhancements:

- Eliminate hot spots by spreading heat sources

- Improve air distribution
  - Re-arrange floor tiles
  - Redirecting airflow with dampers
  - Adding ducts

- Improve Air Pattern
  - Hot aisle, cold aisle arrangement
## NS-Series DMR with Disk

<table>
<thead>
<tr>
<th>Component</th>
<th>Quantity</th>
<th>Height (U)</th>
<th>Weight (lbs)</th>
<th>Weight (kg)</th>
<th>Power (W)</th>
<th>AC (Amps) @208V</th>
<th>AC (Amps) @230V</th>
<th>Heat (Btu)</th>
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</thead>
<tbody>
<tr>
<td>Processor slice</td>
<td>2</td>
<td>10</td>
<td>224</td>
<td>101</td>
<td>2102</td>
<td>10.6</td>
<td>9.6</td>
<td>7174</td>
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<tr>
<td>LSU</td>
<td>1</td>
<td>4</td>
<td>60</td>
<td>27</td>
<td>144</td>
<td>0.8</td>
<td>0.7</td>
<td>492</td>
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<tr>
<td>Processor switch</td>
<td>2</td>
<td>6</td>
<td>140</td>
<td>63</td>
<td>470</td>
<td>2.7</td>
<td>2.4</td>
<td>1604</td>
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<tr>
<td>IOAM enclosure</td>
<td>1</td>
<td>11</td>
<td>200</td>
<td>90</td>
<td>824</td>
<td>5.3</td>
<td>4.8</td>
<td>2812</td>
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<tr>
<td>Disk-drive enclosure</td>
<td>3</td>
<td>9</td>
<td>267</td>
<td>120</td>
<td>900</td>
<td>5.1</td>
<td>4.6</td>
<td>3073</td>
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<tr>
<td>Modular cabinet</td>
<td>1</td>
<td>42</td>
<td>370</td>
<td>167</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
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<tr>
<td><strong>Total</strong></td>
<td>40</td>
<td>1261</td>
<td>567</td>
<td></td>
<td>4440</td>
<td>24.5</td>
<td>22.1</td>
<td>15154</td>
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</table>
Power PDU Options

Orientation of input Power
- Top or Bottom

RACK with or without UPS
- R5500 XR Integrated UPS

Country Specific Input Power
UPS Options (Site Wide)

Site Wide:

A Site UPS is large or moderately large UPS systems that supports multiple types of equipment in a computer room.

- Systems
- Network
- Air Conditioning

*Note: modular systems do not have batteries, must rely upon Site Wide UPS or Modular Rack UPS.*
### UPS Options (Modular Rack)

**R5500 XR Modular Rack UPS**

<table>
<thead>
<tr>
<th>Version</th>
<th>Operating Voltage Settings</th>
<th>Power Out (VA/Watts)</th>
<th>Input Plug</th>
<th>Branch Circuit</th>
</tr>
</thead>
<tbody>
<tr>
<td>North America and Japan</td>
<td>200/208*, 220, 230, 240</td>
<td>5000/4500</td>
<td>L6-30P</td>
<td>Dedicated 30 Amp</td>
</tr>
<tr>
<td>Other International</td>
<td>200, 230*, 240</td>
<td>6000/5400</td>
<td>IEC-309 32 Amp</td>
<td>Dedicated 30 Amp</td>
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<tr>
<td></td>
<td>If 200/208</td>
<td>Then 5000/4500</td>
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<td></td>
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</table>

* Factory default setting

For complete information and specifications, refer to the *HP UPS R5500 XR Models User Guide* (HP part number 351642).

Extra capacity with Extended Runtime Module
Access Flooring

Static and Dynamic loading limits

Structural Problems

- Lateral Instability
- Vertical Instability
- Overloaded Panels
- Perimeter Tipping
Fault Zones

Several to consider:

• Cabling
• Cooling
• Power
• Systems
Site Preparation Walk-Through

What we look for?

Problems or Issues (Risks) in the follow areas:

– Computer Room
– Power & Lighting
– Safety
– Air Conditioning
– Electromagnetic Interference
– Storage for Media, S/W, Manuals, Documentation
– Building Access, Security & Equipment Delivery
– Communications
Risks

What is the impact of a Risk?

• The Walk-Through, when completed in its entirety will be used to determine the suitability of the data center for its intended use and identify actions or improvements (risks items) that may be required to upgrade the center to meet the required minimal standard.
• All Risks must be addressed.
• Professional Service assistance may be recommended to address areas of concern or risk identified.
Tips and Considerations

• When evaluating a potential computer site, consider the size and complexity of the proposed system and related peripherals.

• Consider the environmental specifications of all products being installed.

• Develop recommendations to address any potential problems or risks.

• Be prepared to provide appropriate justifications to support any recommendations.

• HP consulting resources are available to help identify problems and provide recommendations.
Use Visio to:

- Diagram current floor to include:
  - Existing systems
  - Air handling units
  - Power distribution units
- Show location of new system.
- Dimensions of data center

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Planning Aid (Visio Rack Layout)

Complete set of stencils for NS-Series rack components.
Professional Services

Data Center assistance from TSG Professional Service

– Availability Assessment or Availability Review

– Smart Cooling

– HP Power and Environmental Support

– Site Planning
Data Center Domain

Evolution Assessment Service:

• Site Preparation Walk-Through Questionnaire
• S-Series Heat & Power Excel Spreadsheet
• NS-Series Heat & Power Excel Spreadsheet
• NS-16000 Cable Label Creator output
• Visio template and stencils
• White papers and reference material
Resources (cont.)

NTL (NonStop Technical Library)

• **HP NonStop NS-Series Servers Site Preparation Guide**
  – System Hardware Overview
  – Facility Guidelines
  – Specifications for NonStop NS-Series Servers
  – Specifications for NonStop S-Series I/O Enclosures
  – Calculating Specifications for Enclosure Combinations
  – HP Site Services

• **HP NonStop NS-Series Planning Guide**

**Visio Café**

Take Away

Early involvement

• Team approach
  – Performing the Site prep for NS-Series will require a team effort to get all the data (different from K and S series).
  – All risks should be identified and addressed
• Start site prep as early as possible, identify and eliminate infrastructure inhibitors
• Capital improvements?

Additional Services and Resources

• site prep could lead to other environmental services (if needed)
References


Dr. Robert Sullivan, “Alternating Cold and Hot Aisles Provides More Reliable Cooling for Server Farms”, The Uptime Institute, 2002


# HP Integrity NonStop Server Education & Training news

<table>
<thead>
<tr>
<th>Title</th>
<th>Audience</th>
<th>Availability</th>
<th>Location/Type</th>
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<tr>
<td>- HP Integrity NonStop NS-Series Ops &amp; Mgmt Differences U8526S</td>
<td>Operations Management</td>
<td>Now</td>
<td>United States Education Centers</td>
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<tr>
<td>- NonStop H-Series Operating Systems Application Migration U8616S</td>
<td>Programmer Analysts System Administrators System Managers</td>
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<td>Operations Management</td>
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<td>- NonStop Kernel Architecture TNS/E U8609S</td>
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<td>Lecture/Lab, RAIL</td>
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## News from Nonstop Education & Training

<table>
<thead>
<tr>
<th>Free Apple iPod Mini promotion</th>
<th>Take any two NonStop classes and earn a Free Apple iPod.</th>
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<tbody>
<tr>
<td>Private training price reduction</td>
<td>Up to 60% reduction on any 2 NonStop classes at your site.</td>
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## Your NonStop Education & Training

### Contacts
- **Private Classes at your site**
  - Francine Barr: francine.barr@hp.com (703) 803-2931
- **Instructor-Led Live classes over Internet**
  - Ben Wood: ben.wood@hp.com (408) 285-9662
- **Scheduled classes at Education Centers**
  - Ben Wood: ben.wood@hp.com (408) 285-9662
- **Customer Conference Call enrollment**
  - Dan Porter: porter@hp.com (412) 303-5213

### Enroll
1-800-472-5277 (US) 1-800 563-5089 (Canada) [http://www.hp.com/education/](http://www.hp.com/education/)
Next week:
“Integrity NonStop Software Evolution and Application Development Environment”