SURVEY METHODOLOGY

This *Heavy Reading* study was conducted in two stages.

- In the first stage, a list of product categories and vendors was developed using a report entitled "Who Makes What" on the *Light Reading* Website, published on September 30, 2004. The initial version of the report included a set of wireline equipment categories with lists of vendors and invited readers to propose revisions to the categories and lists. Based on these submissions, changes were made to the vendor lists in a number of product categories.

- In the second stage of the study, an online questionnaire was developed based on the product categories and vendor lists from the refined "Who Makes What" report. Potential survey respondents were then solicited via email to participate in the study. Only responses from participants certified as employed by service providers were included in the final results.

*Heavy Reading* solicited participation from potential respondents via email invitations targeted specifically to service provider mailing lists. Email invitations were sent on November 11, 2004; November 17, 2004; December 15, 2004; and December 21, 2004. As an incentive, participants were enrolled in a contest to win a one-year subscription to *Light Reading Insider* (list price $1,350), a monthly research service from *Light Reading*.

The questionnaire was constructed so that respondents answered market perception questions involving only those product categories with which they claimed to be familiar.

Survey participants rated vendors in each product category according to five criteria:

- Name recognition
- Price leadership
- Product performance leadership
- Market leadership in product quality and reliability
- Market leadership in service and support

In addition, participants were invited to submit "write-in" comments on other vendors they perceived as being in that specific market segment, as well as on the key problems they perceive in each product category.

Finally, respondents in each category were asked to rate the importance of the four key leadership metrics – price, product performance, product quality and reliability, and service and support – in evaluating equipment suppliers.

These results were used to determine the relative weight of each metric in determining vendor rankings in individual product categories. See Figure 6 for the relative importance ratings for each metric in each equipment category.

**Survey Respondents**

Invitations to participate drew responses from 270 potential survey candidates. All responses coming from candidates who said they did not work for a service provider were eliminated from the survey database.

The final base of 160 survey participants represents employees from more than 100 different service providers worldwide. The service providers included in the survey are:
Service Providers With Multiple Responses:
- Alltel
- AT&T
- Bell Canada
- BT
- Cable & Wireless
- China Telecom
- Chunghwa Telecom
- Cingular Wireless
- Colt Telecom
- Deutsche Telekom
- Hutchison Global Communications
- Level 3 Communications
- Looking Glass Networks
- Qwest Communications International
- Reliance Infocomm
- SBC Communications
- Sprint
- Telstra
- T-Systems
- Verizon Communications

Service Providers With Single Responses:
- Affinity Internet
- American Fiber Network
- Arbinet
- Arfeen Group (Pakistan)
- Band-X
- Batelco Jordan
- Belgacom
- Belize Telecommunications
- BH Telecom
- Botswana Telecomms
- Broadwing Communications
- Broighter Networks
- Bulgarian Telecommunications
- Community of Yugoslav PTT
- Comsat International
- Concho Cellular Telephone
- Contactel
- CT Communications
- Czech Online (Telekom Austria)
- Electric Lightwave
- Eletronet (Brazil)
- Embratel
- Equant
- FFastFill
- Frontier
- Gajtanless
- Hangzhou Telecommunication
- Impsat
- Italtel
- Kerman Telephone Company
- Komset
- KPN Mobile (Netherlands)
- Level 3 Communications
- Madison River Communications
- Maruthi Broadband Solutions
- Matáv Hungarian Telecommunications
- MetNet Communications
- Mid-South Consulting Engineers
- Manitoba Telecom Services (MTS)
- Multilink
- Neuf Telecom
- Niacom (Brazil)
- Orient Telecommunications Networks
- Pacific Supernet (Hong Kong)
- Paetec Communications
- Paltel
- Patientline UK
- Qtel (Qatar Telecom)
- RTComm (Russia)
- Saudi Telecom
- Scarlet Belgium
- SeGI
- Servicios Axtel
- Sitel
- Sprint Local Telcom Division
- Supercable ALK Internacional (Venezuela)
- T-Com Croatia
- T-Mobile Hungary
- TelCove
- Telecom Argentina
- Telecom Fiji
- Telecom Communications
- Telefonica
- Telekom Malaysia
- Telekom Slovenije
- Telekom Srbija
- Telekomunikacja Polska
- Telemar
- TeleNet Polska
- Telenor
- TeliaSonera
- Telkom
- Tellas
- TelOne (Zimbabwe)
- Telus
- Tiscali International Network
- Totah Communications
- Ulidian Networks
- Vodafone
- Vonos
- Wilson Telephone
- Xspedius Communications
- Zajil International Telecom (Kuwait)
The numbers of respondents who participated in the specific product category surveys are shown in Figure 1.

**Figure 1: Respondents by Equipment Category**

<table>
<thead>
<tr>
<th>EQUIPMENT CATEGORY</th>
<th>NUMBER OF RESPONDENTS</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sonet-Based MSPPs</td>
<td>29</td>
</tr>
<tr>
<td>SDH-Based MSPPs</td>
<td>45</td>
</tr>
<tr>
<td>Ethernet-Based MSPPs</td>
<td>60</td>
</tr>
<tr>
<td>Multiservice Switches</td>
<td>59</td>
</tr>
<tr>
<td>Edge Routers</td>
<td>74</td>
</tr>
<tr>
<td>10-Gbit/s Ethernet Switches</td>
<td>51</td>
</tr>
<tr>
<td>Metro DWDM Equipment</td>
<td>47</td>
</tr>
<tr>
<td>CWDM Equipment</td>
<td>32</td>
</tr>
<tr>
<td>ROADM Equipment</td>
<td>23</td>
</tr>
<tr>
<td>Traffic Managers</td>
<td>39</td>
</tr>
<tr>
<td>Content Switches</td>
<td>25</td>
</tr>
<tr>
<td>Core Routers</td>
<td>73</td>
</tr>
<tr>
<td>Optical Switches</td>
<td>29</td>
</tr>
<tr>
<td>Terrestrial Long-Haul DWDM Equipment</td>
<td>32</td>
</tr>
<tr>
<td>DSLAMs and 3G DLCs</td>
<td>48</td>
</tr>
<tr>
<td>Broadband Remote Access Servers</td>
<td>41</td>
</tr>
<tr>
<td>FTTX Equipment</td>
<td>32</td>
</tr>
</tbody>
</table>

**Figures 2 through 5** provide other details on survey respondents. Note that respondents were allowed to select more than one answer for service provider type (**Figure 3**) and job function (**Figure 5**).

**Figure 2: Survey Respondents by Geographic Region (160 Total Respondents)**

- **Europe** 31.9%
- **U.S.** 34.4%
- **Asia/Pacific** 17.5%
- **Middle East** 4.4%
- **Central/South America** 6.8%
- **Canada** 2.5%
- **Africa** 2.5%
About the Rankings

Vendor rankings in the product categories were determined by a simple grading system in which the leading vendor in each survey subcategory (recognition, price, product performance, product quality and reliability, and service and support) received a score of 1 for finishing first in the category, 2 for finishing second, and so on. Scores for all five categories were then added, with the lowest score yielding the top-performing overall vendor in that category.

In case of ties within the survey subcategories, all vendors with the same rating received the same score (i.e., if three vendors placed sixth, all three received a score of 6). In case of ties for the overall ratings, category weightings were used as tie-breakers when possible. The weightings were determined directly from survey data in which respondents indicated the importance of each of the four key leadership metrics – price, product performance, product quality and reliability, and service and support – in evaluating suppliers in each product category.

Figure 6 shows the importance ratings for each metric in each product category. Metrics were rated on a scale of 0 to 4, based on the following descriptors:

- Critical (4)
- Very important (3)
- Important (2)
- Not very important (1)
- Not important at all (0)

Figure 6: Relative Importance of Leadership Metrics

<table>
<thead>
<tr>
<th>EQUIPMENT CATEGORY</th>
<th>PRICE</th>
<th>PERFORMANCE</th>
<th>QUALITY &amp; RELIABILITY</th>
<th>SERVICE &amp; SUPPORT</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sonet-Based MSPPs</td>
<td>3.27</td>
<td>3.52</td>
<td>3.47</td>
<td>3.23</td>
</tr>
<tr>
<td>SDH-Based MSPPs</td>
<td>3.20</td>
<td>3.27</td>
<td>3.29</td>
<td>2.84</td>
</tr>
<tr>
<td>Ethernet-Based MSPPs</td>
<td>3.10</td>
<td>3.27</td>
<td>3.41</td>
<td>2.93</td>
</tr>
<tr>
<td>Multiservice Switches</td>
<td>3.04</td>
<td>3.41</td>
<td>3.48</td>
<td>2.96</td>
</tr>
<tr>
<td>Edge Routers</td>
<td>2.93</td>
<td>3.42</td>
<td>3.59</td>
<td>2.73</td>
</tr>
<tr>
<td>10-Gbit/s Ethernet Switches</td>
<td>2.96</td>
<td>3.27</td>
<td>3.37</td>
<td>2.90</td>
</tr>
<tr>
<td>Metro DWDM Equipment</td>
<td>3.11</td>
<td>3.51</td>
<td>3.49</td>
<td>2.89</td>
</tr>
<tr>
<td>CWDM Equipment</td>
<td>3.31</td>
<td>3.38</td>
<td>3.31</td>
<td>2.97</td>
</tr>
<tr>
<td>ROADM Equipment</td>
<td>3.33</td>
<td>3.45</td>
<td>3.54</td>
<td>2.88</td>
</tr>
<tr>
<td>Traffic Managers</td>
<td>2.95</td>
<td>3.50</td>
<td>3.45</td>
<td>3.17</td>
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<tr>
<td>Content Switches</td>
<td>3.12</td>
<td>3.44</td>
<td>3.52</td>
<td>3.16</td>
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<tr>
<td>Core Routers</td>
<td>2.97</td>
<td>3.67</td>
<td>3.72</td>
<td>3.21</td>
</tr>
<tr>
<td>Optical Switches</td>
<td>3.38</td>
<td>3.45</td>
<td>3.55</td>
<td>2.93</td>
</tr>
<tr>
<td>Terrestrial Long-Haul DWDM Equipment</td>
<td>3.32</td>
<td>3.32</td>
<td>3.38</td>
<td>3.03</td>
</tr>
<tr>
<td>DSLAMs and 3G DLCs</td>
<td>3.04</td>
<td>3.50</td>
<td>3.48</td>
<td>3.10</td>
</tr>
<tr>
<td>Broadband Remote Access Servers</td>
<td>2.95</td>
<td>3.51</td>
<td>3.46</td>
<td>2.95</td>
</tr>
<tr>
<td>FTTX Equipment</td>
<td>3.03</td>
<td>3.26</td>
<td>3.45</td>
<td>3.03</td>
</tr>
<tr>
<td>Average Rating (All Categories)</td>
<td>3.12</td>
<td>3.42</td>
<td>3.47</td>
<td>2.99</td>
</tr>
</tbody>
</table>