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. The initial version of the report included a preliminary set of categories and descriptions with lists of vendors and invited readers to propose revisions to the categories and lists. The project was posted on the Light Reading Website on November 10, 2003, and publicized via email broadcasts to Light Reading readers who are registered as being affiliated with the components industry. Based on suggestions and comments from readers, changes were made to the product categories and vendor lists.

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. The survey was conducted from December 11, 2003, through December 29, 2003. Email invitations to participate in the survey were sent to lists of qualified participants on December 11 and December 18. As an incentive, participants were enrolled in a contest to win a $1,000 gift certificate.

The questionnaire was constructed so that respondents answered market perception questions involving only those product categories with which they claimed to be familiar. The following 31 product categories were included in the final study:

- Telephony (PDH) Chips
- DSL Chips
- PON Chips
- Ethernet PHY Chips
- Ethernet MAC Chips
- Ethernet Controller Chips
- Ethernet Switch Chips
- VOIP Chips
- Communications Processors
- Laser Driver Chips
- Modulator Driver Chips
- Pre- and Post-Amplifier Chips
- Crosspoint Switch Fabrics
- Sonet/SDH Data Transceivers
- Dispersion Compensation Chips
- Framer/ Mapper Chips
- Digital Wrapper/FEC Devices
- Backplane Transceiver Chips
- Circuit Switch Fabrics
- Network Processors
- Standalone Traffic Manager Chips
- Search Engines
- Content Processors
- Security Processors
- Packet Switch Fabrics
- ATM SAR Chips
- ATM Interworking Chips
- ATM Switch Fabrics
- Circuit Emulation Chips
- Control-Plane Processors
- Field-Programmable Gate Arrays

In addition, three other product categories were included in the survey but were eliminated from the final report. The system timing chips and custom-designed ASICs categories were eliminated.
because of incomplete vendor listings in the survey. The CMTS (cable modem termination system) chips category was eliminated because the survey sample size was too low to yield meaningful results.

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

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

For each product category, all companies known by Heavy Reading to offer products in that market sector were listed for consideration by survey participants. 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, all participants were invited to comment on their overall perceptions of the wireless LAN market.

**Survey Respondents**

945 potential participants responded to the email invitation from Heavy Reading. Of those candidates, 449 met Heavy Reading’s qualifications to participate and were included in the final survey results. The final base of survey participants represents employees from more than 200 different systems vendors, OEMs, and system integrators.

The numbers of respondents who participated in the specific product category surveys are as follows:

**Respondents by Product Categories**

<table>
<thead>
<tr>
<th>PRODUCT CATEGORY</th>
<th>NUMBER OF RESPONDENTS</th>
</tr>
</thead>
<tbody>
<tr>
<td>Telephony (PDH) Chips</td>
<td>77</td>
</tr>
<tr>
<td>DSL Chips</td>
<td>82</td>
</tr>
<tr>
<td>PON Chips</td>
<td>48</td>
</tr>
<tr>
<td>Ethernet PHY Chips</td>
<td>114</td>
</tr>
<tr>
<td>Ethernet MAC Chips</td>
<td>109</td>
</tr>
<tr>
<td>Ethernet Controller Chips</td>
<td>93</td>
</tr>
<tr>
<td>Ethernet Switch Chips</td>
<td>106</td>
</tr>
<tr>
<td>VOIP Chips</td>
<td>67</td>
</tr>
<tr>
<td>Communications Processors</td>
<td>109</td>
</tr>
<tr>
<td>Laser Driver Chips</td>
<td>57</td>
</tr>
<tr>
<td>Modulator Driver Chips</td>
<td>35</td>
</tr>
<tr>
<td>Pre- and Post-Amplifier Chips</td>
<td>40</td>
</tr>
<tr>
<td>Crosspoint Switch Fabrics</td>
<td>55</td>
</tr>
<tr>
<td>Sonet/SDH Data Transceivers</td>
<td>84</td>
</tr>
<tr>
<td>Dispersion Compensation Chips</td>
<td>28</td>
</tr>
<tr>
<td>Framer/Mapper Chips</td>
<td>84</td>
</tr>
<tr>
<td>Digital Wrapper/FEC Devices</td>
<td>42</td>
</tr>
</tbody>
</table>
Vendor Rankings

Vendor rankings in the product categories were determined by a simple grading system in which the leading vendor in each survey category (recognition, price, performance, quality and reliability, and service and support) received a score of 1 for finishing first in the category, 2 for finishing second, etc. Scores for all five categories were then added, with the lowest score yielding the top-performing vendor in that category. In case of ties, all vendors with the same rating received the same score (i.e., if three vendors had the same sixth-best rating in a category, all three received a score of 6 for that category).

Cross-category vendor ratings were determined by averaging the scores received by the vendor in question in each of the five survey categories for all product categories in which that vendor participates. For example, for a vendor appearing in five product categories, recognition scores from the five categories were added and then divided by five to obtain an average rating.