EXECUTIVE SUMMARY

After two years of dismal performance following the telecom industry’s worldwide financial collapse, makers of communications chips finally started to see some evidence of a turnaround in 2003. Final revenue numbers for the year are not yet available, but the end-of-year consensus among industry watchers was guardedly optimistic, with most estimating modest growth for the sector. But even single-digit growth is welcome in an industry that saw sales plummet by as much as 50 percent from 2000 to 2002.

Any general discussion of the comm chips market has to include one huge caveat: The dozens of individual product categories that make up this market are often vastly different from one another. These differences include not only market size but also the maturity and complexity of the underlying technology. The diversity of product types in this industry sector means the composite picture of the comm chips business is significantly different than the portraits of the individual categories. It’s not just the products that are diverse – buyers of comm chips and components tend to view the market in a very focused (read vertical) context.

Heavy Reading’s 2004 Communications Chips Market Perception Study demonstrates just how diffuse and segmented the comm chips business is in the eyes of prospective buyers. The heart of the study is an invitation-only survey gauging the perceptions of potential purchasers of communications chip technology in 31 different product categories.

449 respondents from the world’s leading systems vendors and original equipment manufacturers (OEMs) participated in the survey, yielding critical market perception data for 117 different components vendors (54 public, 63 private).

More than 47 percent of the respondents are employed by the world’s largest incumbent telecom equipment vendors, including Cisco Systems, Nortel Networks, Alcatel, Juniper Networks, Siemens, Lucent Technologies, Ciena, Tellabs, and Marconi.

Key findings on market perceptions of communications chip suppliers include the following:

- **Buyers in different product sectors often have markedly different perceptions of the major comm chip suppliers.** Among buyers of Ethernet access chips, Broadcom is clearly perceived as the industry leader, while suppliers such as Agere Systems, PMC-Sierra, and Vitesse Semiconductor are viewed largely as Ethernet also-rans. But those
roles are reversed in the view of Sonet/SDH transport chip buyers, who view Agere, PMC-Sierra, and Vitesse as industry leaders and Broadcom as a minor player.

- **Almost all major chip vendors have key sources of strength in specific product categories – and almost all have glaring weaknesses.** Agere was rated among the top three vendors in nine of the 19 categories in which it offers products covered by the survey. It also was ranked fifth or lower in five other categories. IBM earned the highest market perception scores in the packet switch fabric category; buyers of backplane transceivers rated IBM 14th in a field of 21 suppliers.

- **Results suggest that many buyers of commodity-class components don’t look beyond their current suppliers to evaluate products from other vendors.** In the Ethernet MAC and laser driver chips categories, respondents on average identified fewer than four suppliers, and in each case only two vendors were named by more than 50 percent of those respondents. In many product categories, 20 percent or more of prospective buyers did not name market leaders for price, product performance, product quality and reliability, or service and support.

- **Intel has achieved moderate success in establishing itself as a leading comm chips supplier in the eyes of prospective buyers.** Chip buyers ranked Intel among the top three suppliers in eight of 16 categories in which the vendor offers components. Intel is widely perceived as the leading supplier of network processors, and it shared top honors with Ethernet chip powerhouse Broadcom in the Ethernet controller segment. Overall, the Intel brand was fairly well recognized by buyers (although its average recognition rating of 52.9 percent is low for a company of Intel’s stature). But there are some glaring weaknesses in Intel’s perception ratings in the Sonet/SDH transport, VOIP, and commodity analog chip sectors.

- **Startups still have an opportunity to influence some of the developing comm chips segments.** Startup suppliers of PON chips, dispersion compensation chips, traffic manager chips, search engines, content processors, security processors, and circuit emulation chips have a significant opportunity to capture market mindshare, and some are on the way to doing just that. Those with the most promising prospects include Azanda Networks, Big Bear Networks, BroadLight, EZchip Technologies, Netlogic Microsystems, Velio Communications, Windega, and ZettaCom.

**REPORT STRUCTURE**

*Heavy Reading's 2004 Communications Chips Market Perception Study* includes a searchable database for analysis by a wide range of criteria and from a range of perspectives, including the following:

- Geographic region
- Company/organization type
- Respondent job category

The database allows for further analysis of all survey results for specific purposes, such as:

- **Chip vendors:** What are the strengths and weaknesses perceived by different demographic segments for specific product categories – and how effective are companies’ various marketing strategies in supporting their brand?

- **Financial analysts and investors:** Which comm chip vendors have mindshare with customers, which are getting ignored, and which ones have customers not even heard of?
Prospective buyers of comm chips: Which suppliers are recognized as leading the field on price, performance, quality and reliability, and, perhaps most important of all, service and support?

The survey drills down to show what buyers think about vendors’ products within 31 different product categories:

- 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

**Survey Respondents**

More than 900 responses were received for the study. Only those responses coming from employees of systems vendors, original equipment manufacturers (OEMs), and systems integrators were included in the survey database.

The final base of 449 survey participants includes employees from more than 200 different companies and organizations worldwide. Specific demographic breakouts of the survey base are as follows:
Excerpt: Survey Participants by Region

- United States: 64.4%
- Canada: 13.2%
- Europe: 13.0%
- Asia/Pacific: 6.7%
- Other (incl. Central and South America and Middle East): 2.7%

Excerpt: Survey Participants by Company Type

- Original Equipment Manufacturer: 42.2%
- Systems Vendor: 51.0%
- Systems Integrator: 2.7%
- Other (incl. Consultants): 4.1%

Excerpt: Survey Participants by Job Function

- Engineering: 45.0%
- Sales and Marketing: 25.2%
- Corporate Management: 12.6%
- Product Management: 11.9%
- Other: 5.3%
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

The *Heavy Reading* study analyzes overall results for each category and breaks out results for each survey category:

**Excerpt: Top Vendors by Recognition (from Telephony [PDH] Chips)**

<table>
<thead>
<tr>
<th>Vendor</th>
<th>Name Recognition</th>
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<tbody>
<tr>
<td>Agere</td>
<td></td>
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<tr>
<td>PMC-Sierra</td>
<td></td>
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<tr>
<td>Intel</td>
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<td>AMCC</td>
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<td>Infineon</td>
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<td>TranSwitch</td>
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</table>

The survey also contains more than 150 write-in comments from survey respondents, with the primary focus on general perceptions of communications chip buyers on the state of the market.

**Deep Analysis of Product Categories**

In addition to survey results and analysis, the report includes definitions of communications chip product categories along with technology and market overviews for each product sector.

*Heavy Reading’s 2004 Communications Chips Market Perception Study* will be essential reading matter for any company selling or buying comm chips, investing in the companies that make those products – or looking to sort the leaders from the followers in this important market.