

# MIER

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## LAB TESTING SUMMARY REPORT

September 2000

Report 090800

Product Category:  
**Remote-Access  
Servers (RAS)**

Vendors/Products Tested:

**Ariel RS4200/NT**

**Ariel RS4200/Linux**

**Cisco Systems AS5300**

**Lucent MAX 6096**

**Lucent Portmaster 3**

**3Com Total Control 1000**



### Key findings and conclusions:

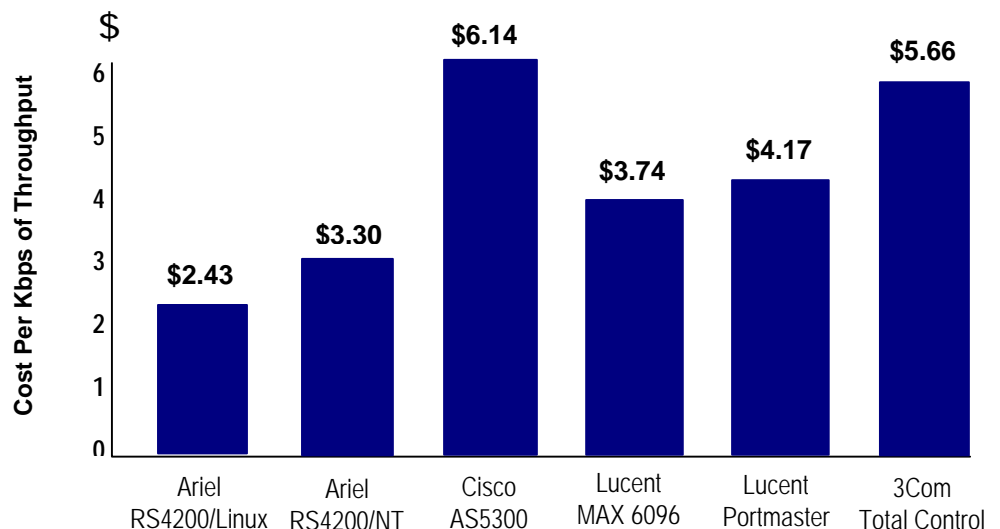
- The clear winner in price for performance
- Fastest initial call-connect time on the RS4200/Linux RAS
- Easiest to install and configure (RS4200/NT)
- Among the top performers in call-duration and call-completion tests

**A**riel Corporation engaged MIERComms to undertake a comprehensive, comparative evaluation of its RS4200/NT and RS4200/Linux remote-access servers (RAS) and competitive products from three other vendors. The objective of these test was to determine how well the RS4200 RAS's stacked up against the competition in various categories, including performance and price/performance, installation and ease of use, configuration, management and features. Ariel's RS4200 RAS's were the clear winners in terms of price for performance, with only a \$2.43 (Linux) and \$3.30 (NT) per kbps of throughput compared to a high of \$6.14 per kbps of throughput on Cisco's AS5300 RAS. Ariel's product also achieved impressive performance numbers in "initial time-to-connect speed" and "call duration" tests. Priced aggressively, Ariel's RS4200 RAS's offer good value and proved that they can "hold their own" against many of the leading competitors in this market.

### Performance

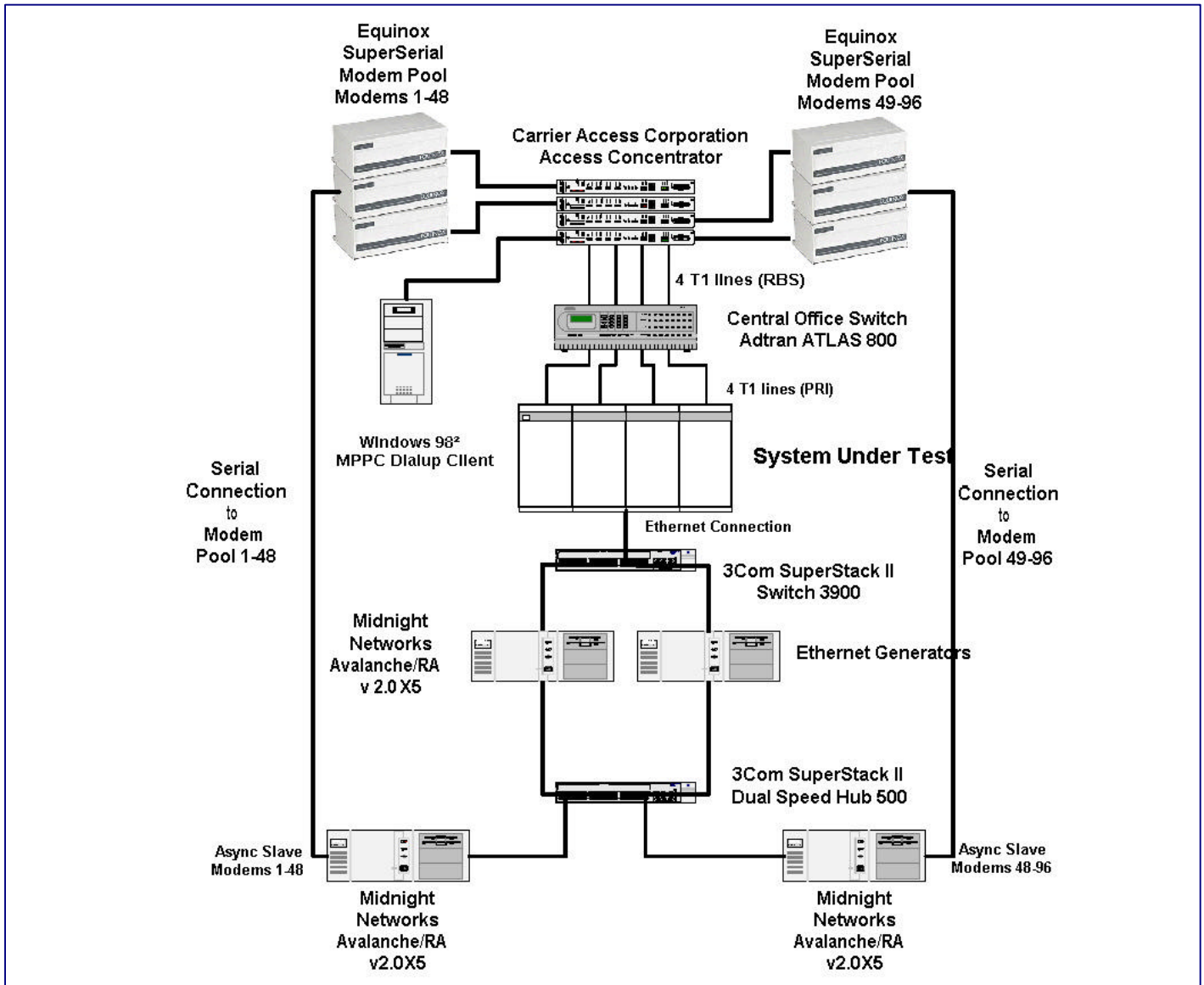
All of the systems were analyzed and compared according to five different performance metrics. These included initial time-to-connect

### Cost Per Kbps of Throughput\*



\*Based on an average per-port price per RAS divided by the average kbps throughput rate per port for each system. The throughput is based on tests using 1,460-byte packets.

## Test Bed Set-up



**About the testing...** To quantify the average per-port throughput of RAS systems tested, we used FTP packets. Midnight Network's Avalanche system (version 2.0) running on Equinox V.90 modem benches and the *throughput.avl* script activated the maximum number of calls the system supported. A 10-percent failure threshold was allowed. The Avalanche was then scripted to send low-compressible FTP files on the Ethernet side; packets with payloads of various sizes were sent to each port at the maximum per-second rate the system under test could sustain without dropping more than 10 percent of the packets. We also tested the throughput rate at which a client machine could download a file that was MPPC-compressed through the RAS systems using a highly-compressible 1-MB ASCII file from the Avalanche. To determine the maximum number of connections each system tested could make and then the initial connection rates of each connection, we used the Avalanche *connect-speed.avl* script. All 96 ports were loaded simultaneously with modem calls from V.90 modems. Under test parameters, call completion was achieved when a modem call was placed and sustained for a minimum of 30 seconds. Three iterations of the test were run, and the results averaged. To record average and median initial call-connect times for the maximum number of concurrent connections, we scripted the Avalanche system (using *connection-time.avl*) to dial into the RAS with one channel, record the time (in milliseconds) that it took to establish Line Control Protocol (LCP), and then tear down the connection. The Avalanche then initiated two calls, calculating and recording the average time it took to establish LCP on both channels, then tear down the connections (and so on) until the maximum number of connections supported were attempted. To observe how many active connections the RAS under test could sustain over a 24-hour period, we used the Avalanche to simultaneously place 92 calls (the maximum number of ports supported was 96, but the systems were tested with 92 ports using ISDN PRI) and leave them connected for 24 hours. We used a customized script, *newkeepitup.avl*, which brings up the calls on the SUT, then calls the *throughput.avl* script in a loop to continually send traffic to the RAS for the duration of the test. We expected all SUTs to maintain at least 50 percent of the per-port average throughput achieved in previous tests. We recorded all dropped calls and the time that elapsed from the beginning of the test to the time the call dropped. We charted the number of calls as a percentage of the total number of ports supported on each RAS system tested.

## Performance – continued

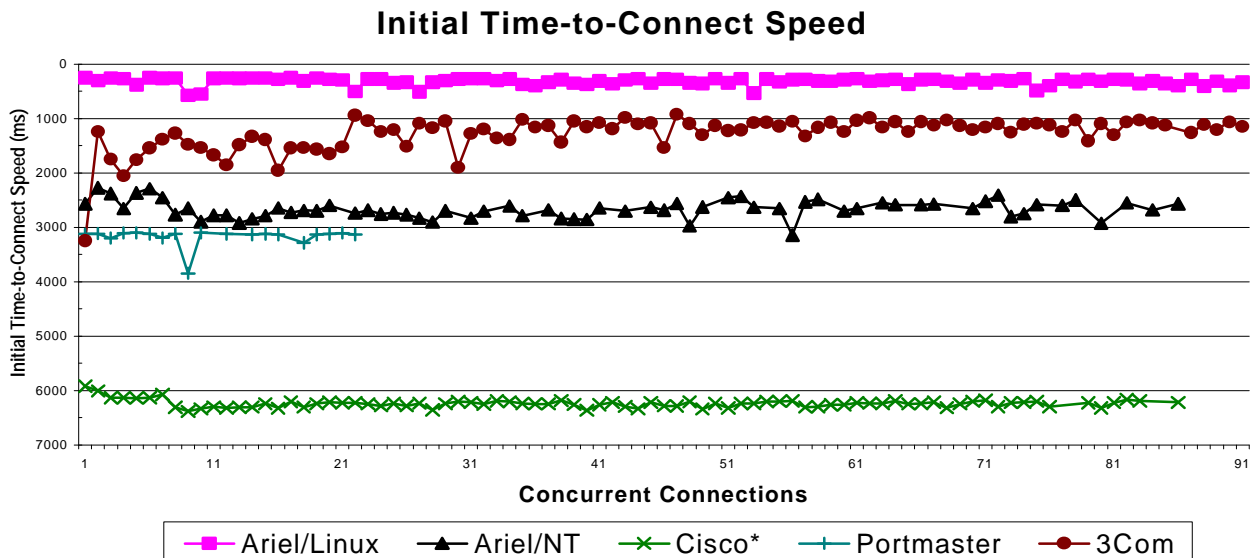
speed, average throughput, call duration, call-completion rate, and connect-rate (the ability to connect at the highest rated speed). Performance results are summarized in the following sections.

**Initial time-to-connect speed:** In this test, we recorded the average and median initial call-connect times for the maximum concurrent connections each RAS could sustain—which on Ariel's RS4200 is 92 connections. (The RS4200 supports 96 remote-access connections, but we tested using ISDN PRI and, therefore, used 92 of the ports.) The RS4200 made an impressive showing, coming in first (Linux version) and third (NT version) among the six RAS's tested. Average initial time-to-connect speeds on the RS4200/Linux were between 250 and 300 milliseconds (ms), and between 2K and 3K ms on the NT version. (Both products were tested using K56-flex modems.) 3Com's Total Control placed second, with initial call-connect rates ranging from 1K ms to 2K ms. (The majority of those rates were closer to 1K ms rather than 2K

ms.) Overall, there was a wide variation in the time it took all the RAS's to make initial connection, ranging from a low of 250 ms on Ariel's RS4200/Linux to a high of 6.7K ms on Cisco's AS5300.

**Throughput:** Overall, both versions of the RS4200 held their own against the competition in terms of throughput, and in a couple of tests, came out on or near the top. Ariel's RS4200/Linux achieved the highest average per-port throughput rate, 51.42 kbps, when tested with 1,460-byte packets. In tests using smaller, 256-byte packets, the RS4200 did not achieve the highest throughput rate, but its 47.7 kbps showing was the second highest—and only 2 kbps lower than the top 49.6 kbps rate achieved on Lucent's Portmaster RAS.

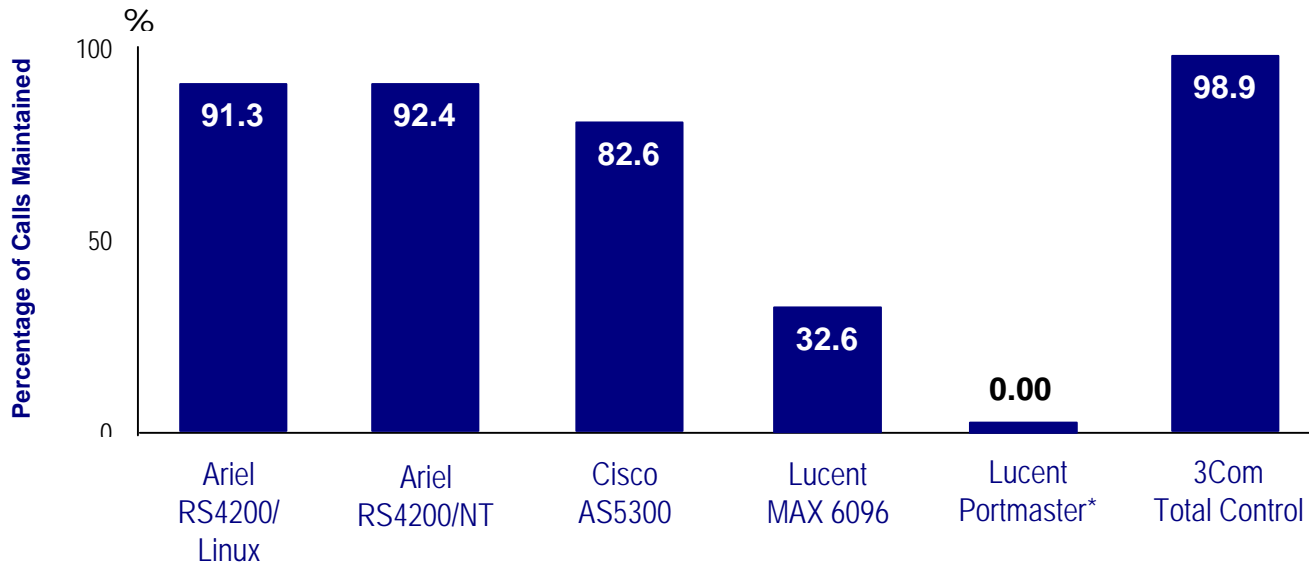
**Call duration:** In this test we determined how many active connections each RAS could sustain over a 24-hour period, maintaining at least 50-percent of the per-port average throughput (measured in a previous round of tests; see above). Calls were simultaneously placed and left connected for the 24-hour test period (see "About the testing," Page 2, for full



Note: In this test, Lucent's MAX 6096 brought up all ports through the sixth iteration of the test, but when it attempted to bring up seven ports, only one successfully established LCP. From this point, only one port could establish LCP in any further tests. Therefore, we obtained no results for the MAX, and it is not shown in the chart. In addition, Lucent's Portmaster failed to establish LCP with more than 24 ports, as shown.

\*Results shown for Cisco are averages of multiple iterations of the test; individual tests showed considerable variation.

## Call Duration: Percentage of Calls Maintained for 24 Hours



\*Note: All calls placed through Lucent's Portmaster were dropped after two hours.

### Performance - continued

details). In the chart above, we show the percentage of calls maintained during the 24-hour period. Ariel's RS4200/NT achieved second-place status, maintaining 92.4 percent of the calls (dropping only 7 in 24 hours). The 3Com Total Control was the top performer in this test, dropping only one call for a 98.9 percent call-maintenance rate. Neither of Lucent's products had a good showing in the call-duration tests. The MAX 6096 maintained only 32.6 percent of its calls during the 24-hour period, while the Portmaster stopped processing calls altogether after only two hours.

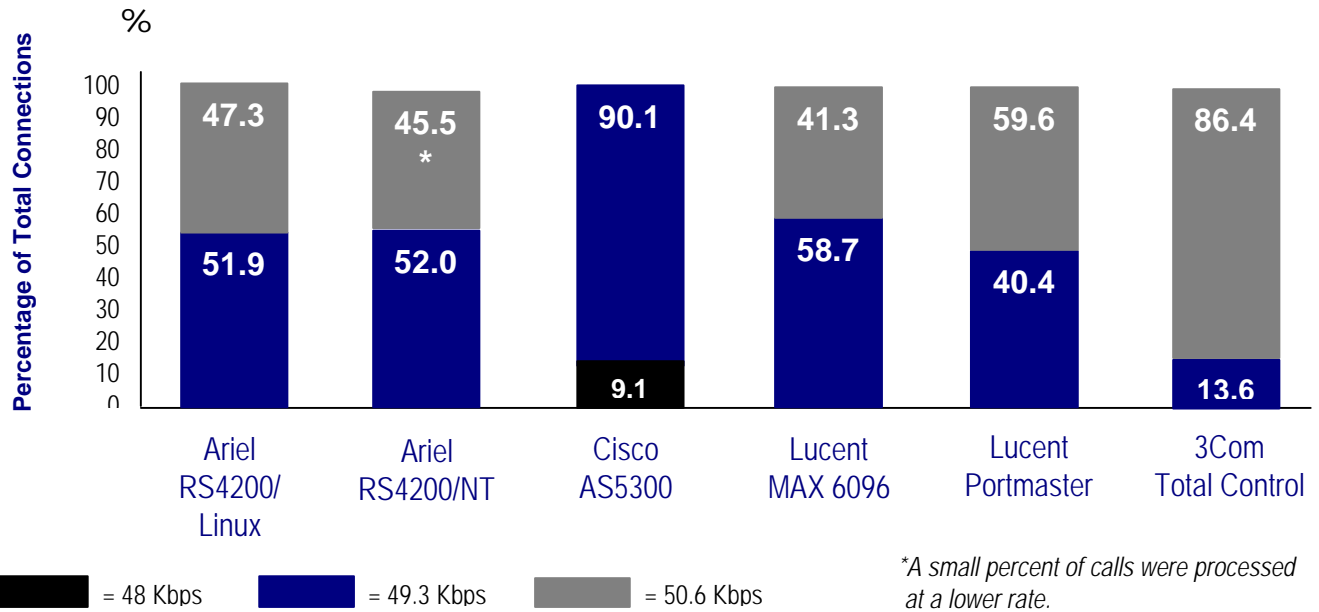
**Call completion:** With a 99.64-percent success rate, Ariel's RS4200 ranked in second place (behind Cisco's AS5300 and 3Com's Total Control, which were tied) and ahead of the Lucent Portmaster (96.7 percent) and Lucent MAX (95.11 percent) in call-completion tests (using V.90 modems). Under the test parameters, call completion was achieved when a modem call was placed and sustained for a minimum of 30 seconds.

**Connect rate:** In this test, we measured the number of calls that the RAS systems completed at various connection rates—ranging from 31.2 kbps up to 50.6 kbps. The RS4200/Linux completed 51.9 percent of its connections at a 49.3 kbps rate and 47.3 percent at the higher 50.6 kbps rate. Ariel's RS4200/NT RAS demonstrated an equivalent performance—completing 52.0 percent of its calls at 49.3 kbps and 45.5 percent at 50.6 kbps. These results place the RS4200 in the mid-range among the six products tested. By comparison, 3Com's Total Control completed 86.4 percent of its calls at the 50.6 kbps rate, while Cisco's AS5300 completed no calls at 50.6 kbps, but 90.9 percent of them at 49.3 kbps and 9.1 percent at 48 kbps. Lucent's Portmaster completed 40.4 percent of its calls at the 49.3-bps rate and 59.6 percent at the higher 50.6 percent rate. (See chart on Page 4.)

### Installation and Ease of Use

Installation and set up of the RS4200/NT was the easiest among all the systems tested. After the proper NT environment is built (which includes RRAS, which doesn't come with NT but is downloadable for free), getting

## Initial Connect Rates (Using V.90 Modems)



### Installation and Ease of Use – continued

the RAS4200/NT up and running takes only about an hour, provided that the person installing the system is technically proficient. The RS4200/Linux contained an rpm file and installation scripts that greatly facilitated the set-up process. This allowed the RS4200/Linux to achieve a mid-range position of fourth place in “Installation and Ease of Use” among the products tested.

Among the other RAS’s tested, Cisco’s 5300 posed some difficulties because it can be configured only via command-line interface. Sample configuration files downloaded from the

Cisco Web site helped speed the installation, but it still took two hours and required a basic knowledge of Cisco router configuration.

### Configuration

Ariel’s RS4200 receives top scores in this category—chiefly for its port density. Both products support 96 remote-access lines, although we used only 92 via ISDN PRI during testing. Another plus is the ability to install the RS4200 (both versions) on a conventional PC with moderate horsepower.

### Management and Administration

Ariel’s RS4200 RAS’s are managed through a Java-based “Management Console” that runs on Windows 98/NT, Red Hat Linux, or any operating system with an installed Java virtual machine. While effective for configuring and real-time monitoring (data updates occur once per minute, and there is a refresh capability), the system is not integrated under a single user interface and application, which MIERComms highly recommends. Compared to the other RAS’s tested, Ariel’s management application is adequate; in fact, in the management area, all of the RAS’s tested could be improved.

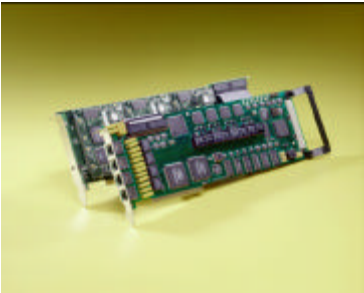
| Ariel RS4200 RAS: Key Features          |  |
|---|--|
| <b>Platforms supported</b>              | Windows NT Server, v4.0+;<br>Red Hat Linux v6.1        |
| <b>Maximum configuration:</b>           | 96/120 ports   |
| <b>Interfaces supported</b>             | T1/E1, ISDN-PRI  |
| <b>Modems supported</b>                 | V.90, K56flex, V.34bis and<br>64-kpbs basic rate ISDN  |
| <b>System price (US list) as tested</b> | \$11,995 (\$9,500 for cards;<br>\$2,495 for PC and OS) |
| <b>Price per port</b>                   | \$125  |

## Meets Expectations

Ariel Corporation's RS4200/NT and RS4200/Linux remote-access systems (RAS) were the price-performance leaders among six products tested competitively by MIERComms recently. At only \$2.43 and \$3.30 per kbps of throughput on the RS4200/Linux and RS4200/NT systems, respectively, Ariel's RAS's offer good value for the price. The products performed "head of class" in a number of performance areas, including call-completion rate, initial time-to-connect speed and call-duration. The RS4200's were also cited for their excellent port density (96 remote-access ports).



In the unanimous opinion of the testers, Ariel Corporation's RS4200/NT and RS4200/Linux systems fully meet the expectations and requirements of the target user community for which they were designed and are hereby presented the "NetWORKS As Advertised™" award.



# Ariel

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**Ariel Corporation**  
**RS4200 RAS**

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## About MIER Communications Product Testing Services...

With hundreds of its product-comparison analyses published over the years in such leading network trade periodicals as *Business Communications Review*, *NetworkWorld*, and *InternetWeek*, MIER Communications' reputation as the leading, independent product test center is unquestioned. MIERComms is also a proud member of the NetworkWorld Test Alliance. Founded in 1988 by Edwin E. Mier, formerly managing editor of *Data Communications* magazine and a practicing network consultant for over 20 years, the company has pioneered the comparative assessment of networking hardware and software, having developed methodologies for testing products from ATM switches to network operating systems. MIER Communications' private test services include competitive product analyses, as well as individual product evaluations. Products submitted for review are typically evaluated under the "NetWORKS As Advertised" program, in which networking-related products must endure a comprehensive, independent assessment of the products' usability and performance. Products that meet the appropriate criteria and performance levels receive the "NetWORKS As Advertised" award and MIER Communications Labs' testimonial endorsement.

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