



2003 Summary Report

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Networking, Advanced Technologies, and IT Security

The fourth section of the core data survey focused on networking, methods of remote access, bandwidth shaping, videoconferencing capabilities on campus, deployment of new technologies, and practices related to network security.

Network Speed and Shaping

The core data survey requested data about the bandwidth available from a campus to the commodity Internet and to high-speed networks. Table 4-1 shows the distinct patterns that characterize bandwidth availability to the Internet by Carnegie groups for responding institutions. Doctoral and OTHER schools have significantly more total bandwidth than MA, BA, and AA colleges, but do not differ significantly from each other. Master's institutions reported significantly more total bandwidth than AA and BA schools. The mean total

bandwidth available to the commodity Internet from campus increased significantly among ALL institutions that completed both surveys, from an average of 85 to 115 Mbps. Increases were also found within all groups except BA and MA schools.

Looking at access to high-speed networks, Table 4-2 shows that the greatest access was reported by doctoral institutions, most likely due to the large data sets, visualization, and other applications needed by faculty at such institutions for their academic work. About two-thirds of the AA and MA institutions and more than 80% of the BA colleges responding to our survey provide no access whatsoever to such networks. The total bandwidth available to high-performance networks from campuses was related to Carnegie class. Doctoral and OTHER schools have significantly more total bandwidth than MA, BA, and AA colleges, but

Table 4-1
Total Bandwidth Available to the Commodity Internet from Campus

| Bandwidth | ALL | DR | MA | BA | AA | OTHER |
|----------------------|-------|-------|-------|-------|-------|-------|
| 0 Mbps | 0.4% | 0.0% | 0.4% | 0.6% | 0.7% | 0.0% |
| More than 0–4.5 Mbps | 21.2% | 1.2% | 18.8% | 27.5% | 42.4% | 18.7% |
| 4.6–12 Mbps | 23.0% | 1.8% | 25.0% | 40.7% | 29.2% | 16.3% |
| 12.1–44 Mbps | 17.5% | 13.5% | 23.2% | 19.2% | 9.7% | 19.5% |
| 45–89 Mbps | 16.6% | 25.8% | 20.5% | 9.6% | 12.5% | 11.4% |
| 90–154 Mbps | 7.9% | 19.6% | 4.0% | 0.6% | 4.2% | 13.8% |
| 155–299 Mbps | 6.9% | 19.6% | 5.8% | 0.6% | 0.7% | 8.1% |
| 300–999 Mbps | 2.4% | 9.2% | 0.9% | 0.0% | 0.0% | 2.4% |
| 1,000 Mbps or more | 4.0% | 9.2% | 1.3% | 1.2% | 0.7% | 9.8% |

Table 4-2
Total Bandwidth Available to High-Performance Networks from Campus

| Bandwidth | ALL | DR | MA | BA | AA | OTHER |
|----------------------|------------|-----------|-----------|-----------|-----------|--------------|
| 0 Mbps | 55.2% | 11.0% | 67.1% | 80.2% | 66.7% | 44.7% |
| More than 0–4.5 Mbps | 4.3% | 0.0% | 4.9% | 3.6% | 9.0% | 4.1% |
| 4.6–12 Mbps | 5.1% | 2.5% | 2.7% | 6.6% | 9.0% | 6.5% |
| 12.1–44 Mbps | 4.1% | 4.3% | 5.8% | 0.0% | 4.2% | 6.5% |
| 45–89 Mbps | 10.1% | 19.6% | 11.1% | 6.0% | 5.6% | 6.5% |
| 90–154 Mbps | 3.9% | 8.6% | 2.7% | 1.2% | 3.5% | 4.1% |
| 155–299 Mbps | 7.7% | 28.2% | 3.1% | 0.6% | 1.4% | 5.7% |
| 300–999 Mbps | 2.8% | 11.0% | 1.3% | 0.0% | 0.0% | 1.6% |
| 1,000 Mbps or more | 6.8% | 14.7% | 1.3% | 1.8% | 0.7% | 20.3% |

Table 4-3
Bandwidth Tracking and Shaping

| Practice | ALL | DR | MA | BA | AA | OTHER |
|-----------------------------|------------|-----------|-----------|-----------|-----------|--------------|
| Track bandwidth utilization | 50.9% | 42.3% | 51.6% | 46.7% | 59.0% | 56.9% |
| Shape by time of day | 25.2% | 27.0% | 31.6% | 35.9% | 8.3% | 16.3% |
| Shape by location on campus | 46.7% | 71.2% | 55.1% | 55.1% | 10.4% | 30.1% |
| Shape by type of traffic | 67.6% | 75.5% | 81.8% | 85.0% | 29.9% | 52.0% |
| Shape by direction | 51.1% | 64.4% | 60.9% | 69.5% | 18.8% | 28.5% |
| Do not track or shape | 9.9% | 3.1% | 5.3% | 4.2% | 26.4% | 15.4% |

do not differ significantly from each other. The total bandwidth available to high-performance networks did not differ significantly among MA, BA, and AA colleges. From 2002 to 2003, the total bandwidth available to high-performance networks increased significantly among ALL institutions completing both surveys, from an average of 147 to 218 Mbps.

Shaping bandwidth refers to adjusting parameters on the campus Internet connection to limit use through various means, such as type of connection, location of connection, direction of traffic, time of day, or other specific characteristics. A campus may choose to shape bandwidth to ensure that the downloading of large files does not interfere with the basic operational needs of the campus and that the bandwidth is available when faculty and students need it for their academic work.

As seen in Table 4-3, about 10% of ALL campuses report not tracking or shaping bandwidth at all, but this percentage is ele-

vated by the high percentage of AA colleges (more than one-fourth) reporting no such practices. The dominant strategy of AA colleges appears to be tracking by utilization, with this group reporting much less use of shaping strategies than the other groups. The most popular strategy overall is shaping by the type of network traffic, with AA institutions nonetheless using this strategy far less than doctoral, MA, or BA institutions.

Baccalaureate and MA schools most often reported shaping by type of traffic, direction, and location. For each of these strategies, OTHER schools yielded considerably smaller percentages and AA colleges the smallest percentages. For example, fewer than 9% of these institutions reported shaping by time of day (compared to more than one-third of BA colleges) and about 19% reported shaping by direction (compared to 64.4%, 60.9%, and 69.5%, respectively, for doctoral, MA, and BA schools). More than 71% of doctoral institu-

Table 4-4
Level of Remote Access Provided via an Internal Modem Pool
to Various Constituencies

| | ALL | DR | MA | BA | AA | OTHER |
|--------------|------------|-----------|-----------|-----------|-----------|--------------|
| Faculty | 55.6% | 74.8% | 52.0% | 60.5% | 35.4% | 53.7% |
| Students | 39.5% | 65.6% | 41.8% | 41.3% | 10.4% | 32.5% |
| Staff | 59.2% | 77.3% | 55.1% | 65.3% | 40.3% | 56.9% |
| Alumni | 6.8% | 9.8% | 7.6% | 8.4% | 2.1% | 4.9% |
| Not provided | 39.3% | 22.7% | 43.1% | 33.5% | 57.6% | 40.7% |

Table 4-5
Percentage of Institutions Providing Remote Access to Faculty in Various Ways

| | ALL | DR | MA | BA | AA | OTHER |
|--|------------|-----------|-----------|-----------|-----------|--------------|
| Modem pool | 55.6% | 74.8% | 52.0% | 60.5% | 35.4% | 53.7% |
| Outsourced modem pool | 4.1% | 6.1% | 1.8% | 3.6% | 4.9% | 5.7% |
| Institutionally arranged discount with ISP | 15.9% | 28.8% | 14.7% | 11.4% | 7.6% | 17.1% |
| Subsidized ISP accounts | 6.7% | 6.7% | 4.4% | 6.6% | 4.2% | 13.8% |
| State academic network | 19.2% | 22.7% | 19.1% | 15.6% | 20.8% | 17.9% |
| Regional academic network | 8.4% | 16.0% | 4.4% | 4.8% | 4.2% | 15.4% |

tions reported shaping by location, the highest percentage of all groups.

In looking at the data set for schools that completed both the 2002 and 2003 surveys, there was a significant increase in the percentage of schools that shape by location on campus (from 40.4% to 47.1%), type of traffic (from 64.9% to 70%), and direction (from 43.7% to 54.5%). In addition, the percentage of BA schools that do not track or shape bandwidth decreased significantly, from 8.2% to 2.1%.

Remote and Wireless Access

Providing remote access to the Internet and to campus networks is critical to serving faculty and students who live off campus. The survey asked about six commonly used methods of providing such access to four constituencies: faculty, students, staff, and alumni. Internal modem pool access is differentially employed for various constituencies, as shown in Table 4-4, with the greatest access provided to faculty and staff and considerably less to students. Only about 7% of ALL respondents make such access available to alumni. The percentage of institutions reporting that remote access is pro-

vided via an internal modem pool decreased significantly from 2002 to 2003 for faculty, students, and staff.

Table 4-5 shows the percentage of schools providing remote access to faculty in various ways. Providing access to faculty via an internal modem pool, the strategy employed by about 56% of ALL responding campuses, is the most common method employed. About 4% of ALL campuses reported providing access by an outsourced modem pool, and there are no differences in the frequency of such offerings across types of institutions. Approximately 16% provide access via ISPs with an institutionally arranged discount, while roughly 7% of campuses provide subsidized ISP accounts.

The growth of wireless network access on campuses is striking. The core data survey captured detailed data (far too great to include in this summary report) about the extent of penetration of wireless into seven areas of the campus: classrooms, libraries, open spaces, research facilities, administrative offices, public laboratories, and residence halls. In general, there is wide variation as to the level of deployment of wireless across these categories

Table 4-6
Number of Campus Sites from Which Interactive Videoconferencing
Can Be Initiated

| | ALL | DR | MA | BA | AA | OTHER |
|--------------|------------|-----------|-----------|-----------|-----------|--------------|
| 0 | 19.1% | 0.0% | 18.7% | 43.1% | 15.3% | 17.1% |
| 1 | 16.4% | 4.3% | 16.0% | 29.9% | 14.6% | 17.1% |
| 2 | 14.5% | 9.8% | 15.1% | 12.6% | 24.3% | 10.6% |
| 3 | 10.0% | 6.7% | 12.0% | 4.8% | 15.3% | 11.4% |
| 4-5 | 11.4% | 12.9% | 14.7% | 3.6% | 11.8% | 13.8% |
| 6-10 | 15.3% | 29.4% | 15.1% | 5.4% | 9.7% | 17.1% |
| 11-20 | 7.1% | 18.4% | 5.8% | 0.6% | 4.9% | 5.7% |
| More than 20 | 6.2% | 18.4% | 2.7% | 0.0% | 4.2% | 7.3% |

Table 4-7
Percentage of Campus Desktops That Can Deploy Desktop Videoconferencing

| % of Desktops | ALL | DR | MA | BA | AA | OTHER |
|----------------------|------------|-----------|-----------|-----------|-----------|--------------|
| 0% | 39.2% | 10.4% | 40.4% | 59.9% | 47.9% | 36.6% |
| Up to 19% | 44.8% | 58.9% | 46.2% | 27.5% | 43.1% | 48.8% |
| 20-39% | 5.7% | 13.5% | 4.4% | 3.6% | 3.5% | 3.3% |
| 40-59% | 2.7% | 6.1% | 1.8% | 1.8% | 0.0% | 4.1% |
| 60-79% | 2.7% | 5.5% | 1.3% | 2.4% | 2.8% | 1.6% |
| 80-100% | 5.0% | 5.5% | 5.8% | 4.8% | 2.8% | 5.7% |

and across Carnegie groups. Overall, the highest level of penetration is found in libraries, with more than 42% of ALL respondents reporting that 76-100% of their libraries provide wireless access. Doctoral institutions have incorporated wireless technology into classrooms and open spaces to a greater extent than other Carnegie classes. Overall, wireless access is least available in residence halls, open spaces, and research facilities.

Videoconferencing Capabilities

Videoconferencing capabilities were reported by all campus types, but about one-fifth of ALL responding campuses do not have a single site (not including desktop videoconferencing) from which interactive conferences can be initiated, with that being true for about 43% of the BA institutions. In addition, the level of penetration varied immensely by Carnegie class, as seen in Table 4-6. More doctoral institutions reported availability of these facilities, with about 18% of universities in this

category having more than 20 such sites.

In addition to central sites for videoconferencing, respondents were asked about the percentage of desktops that could deploy videoconferencing. The same pattern was found as with central sites, with doctoral institutions having the most such capability, followed by OTHER and MA institutions. As seen in Table 4-7, about 60% of BA schools reported not having a single machine with such capability.

Deployment of New Technologies

The core data survey explored the level of deployment of 10 new technologies this year that are currently hot topics of conversation within the higher education IT community. These questions continued six technologies over from last year, expanded the definition of one, and added three new technologies. Data for these technologies are presented in Tables 4-8 through 4-17.

As shown in Table 4-8, voice over IP (VoIP) technology is being fully deployed at about

**Table 4-8
Status of Voice over IP Technology**

| | ALL | DR | MA | BA | AA | OTHER |
|-------------|------------|-----------|-----------|-----------|-----------|--------------|
| Deployed | 19.1% | 27.6% | 14.7% | 9.0% | 22.2% | 26.0% |
| Piloting | 14.4% | 32.5% | 10.7% | 5.4% | 7.6% | 17.1% |
| In progress | 6.7% | 4.9% | 6.2% | 2.4% | 11.8% | 9.8% |
| Considering | 42.7% | 31.3% | 50.2% | 58.1% | 36.8% | 30.1% |
| Not planned | 17.2% | 3.7% | 18.2% | 25.1% | 21.5% | 17.1% |

**Table 4-9
Status of Video over IP Technology**

| | ALL | DR | MA | BA | AA | OTHER |
|-------------|------------|-----------|-----------|-----------|-----------|--------------|
| Deployed | 36.7% | 54.0% | 35.6% | 20.4% | 39.6% | 35.0% |
| Piloting | 11.6% | 17.8% | 7.6% | 10.2% | 6.3% | 18.7% |
| In progress | 10.0% | 11.0% | 9.3% | 4.8% | 15.3% | 10.6% |
| Considering | 27.4% | 14.1% | 32.9% | 35.9% | 27.1% | 23.6% |
| Not planned | 14.4% | 3.1% | 14.7% | 28.7% | 11.8% | 12.2% |

**Table 4-10
Status of PKI Technology**

| | ALL | DR | MA | BA | AA | OTHER |
|-------------|------------|-----------|-----------|-----------|-----------|--------------|
| Deployed | 14.1% | 9.8% | 12.9% | 12.6% | 20.8% | 16.3% |
| Piloting | 4.1% | 11.0% | 2.2% | 1.8% | 1.4% | 4.9% |
| In progress | 6.9% | 12.3% | 4.4% | 5.4% | 6.3% | 7.3% |
| Considering | 35.2% | 47.2% | 36.4% | 29.3% | 24.3% | 37.4% |
| Not planned | 39.7% | 19.6% | 44.0% | 50.9% | 47.2% | 34.1% |

19% of ALL responding campuses, up from 13% last year, with the highest level reported by doctoral institutions and the lowest by BA institutions. Approximately 17% of ALL respondents reported no plans for this technology, down from 23% last year, with this being most the case for BA and AA institutions and least for doctoral campuses.

Video over IP technology is employed to a much higher extent than voice over IP, as shown in Table 4-9. About 37% of ALL campuses reported using this technology (up from 29.8% last year), but, again, this is most true for doctoral institutions and least true for BA institutions. AA schools are second highest in reporting using this advanced technology, probably in large part due to their innovative use of technology in teaching and learning.

The use of public key infrastructure (PKI) is

interesting to note, as this technology may well be critical in the deployment of campus security policies and practices. As seen in Table 4-10, deployment of PKI is still in the early stages of diffusion, despite the amount of campus discussion and numbers of conference presentations on this topic. As one would expect, doctoral institutions are furthest along with implementing this technology, but second are AA institutions, although a large percentage of campuses in this Carnegie class indicate that they are not planning such an implementation. There was virtually no change in the level of deployment, piloting, or progress in deployment of PKI since last year.

The 2003 core data survey asked about enterprise directory usage rather than the more specific Lightweight Directory Access Protocol (LDAP) terminology that was includ-

Table 4-11
Status of Enterprise Directory Technology

| | ALL | DR | MA | BA | AA | OTHER |
|-------------|------------|-----------|-----------|-----------|-----------|--------------|
| Deployed | 57.1% | 76.1% | 50.2% | 47.9% | 54.2% | 60.2% |
| Piloting | 5.1% | 3.7% | 4.9% | 7.2% | 4.2% | 5.7% |
| In progress | 17.0% | 14.7% | 23.6% | 15.6% | 11.8% | 16.3% |
| Considering | 11.7% | 4.3% | 15.1% | 10.8% | 16.0% | 11.4% |
| Not planned | 9.1% | 1.2% | 6.2% | 18.6% | 13.9% | 6.5% |

Table 4-12
Status of Biometrics Technology

| | ALL | DR | MA | BA | AA | OTHER |
|-------------|------------|-----------|-----------|-----------|-----------|--------------|
| Deployed | 2.4% | 6.1% | 1.3% | 1.8% | 1.4% | 1.6% |
| Piloting | 2.2% | 4.9% | 3.6% | 0% | 0.7% | 0.8% |
| In progress | 1.5% | 1.8% | 0.9% | 0.6% | 2.1% | 2.4% |
| Considering | 17.3% | 27.6% | 18.7% | 9.0% | 11.1% | 19.5% |
| Not planned | 76.6% | 59.5% | 75.6% | 88.6% | 84.7% | 75.6% |

Table 4-13
Status of Smart Card Technology

| | ALL | DR | MA | BA | AA | OTHER |
|-------------|------------|-----------|-----------|-----------|-----------|--------------|
| Deployed | 16.8% | 24.5% | 19.6% | 18.0% | 2.8% | 16.3% |
| Piloting | 2.4% | 3.1% | 1.3% | 0.6% | 2.8% | 5.7% |
| In progress | 3.9% | 3.1% | 3.6% | 4.2% | 3.5% | 5.7% |
| Considering | 34.2% | 33.7% | 36.0% | 33.5% | 35.4% | 30.9% |
| Not planned | 42.7% | 35.6% | 39.6% | 43.7% | 55.6% | 41.5% |

ed in last year's survey. Such a directory is essential for the authentication and authorization efforts required in PKI, and over half of ALL respondents reported deployed directories, as shown in Table 4-11. Looking at the Carnegie groups, significant differences were found, with more than 76% of doctoral institutions having deployed this technology and only about 48% of BA institutions having done so.

There is still very little deployment of biometric technology on campuses, which includes use of fingerprints, retinal scans, or other physiological means of user identification for security purposes, although there were minor increases over last year. Nearly 77% of ALL responding campuses are not even planning for this technology (see Table 4-12).

As shown in Table 4-13, the deployment of

smart cards was reported most by doctoral institutions and least by AA institutions. The overall level of penetration is less than one might expect, with only about 17% of ALL responding institutions reporting deployment of smart card technology and more than 42% reporting that this technology is not planned.

Web services technology refers to a set of tools and building blocks for system development. As shown in Table 4-14, this technology is relatively advanced at a large percentage of institutions overall and within each Carnegie class. Nearly 72% of doctoral institutions have deployed Web services technology, and another 15.3% are piloting it or have it in progress. Among BA and AA colleges, 53.3% and 57.6% of schools have deployed this technology, respectively, and about 70% of the institutions within each of these Carnegie groups have

Table 4-14
Status of Web Services Technology

| | ALL | DR | MA | BA | AA | OTHER |
|-------------|------------|-----------|-----------|-----------|-----------|--------------|
| Deployed | 61.8% | 71.8% | 65.3% | 53.3% | 57.6% | 58.5% |
| Piloting | 3.6% | 5.5% | 2.7% | 2.4% | 2.8% | 5.7% |
| In progress | 10.9% | 9.8% | 8.9% | 16.2% | 8.3% | 12.2% |
| Considering | 15.0% | 11.0% | 12.0% | 17.4% | 17.4% | 19.5% |
| Not planned | 8.6% | 1.8% | 11.1% | 10.8% | 13.9% | 4.1% |

Table 4-15
Status of Antivirus Software

| | ALL | DR | MA | BA | AA | OTHER |
|-------------|------------|-----------|-----------|-----------|-----------|--------------|
| Deployed | 98.3% | 96.9% | 99.1% | 98.2% | 97.9% | 99.2% |
| Piloting | 0.0% | 0.0% | 0.0% | 0.0% | 0.0% | 0.0% |
| In progress | 1.3% | 2.5% | 0.4% | 1.2% | 2.1% | 0.8% |
| Considering | 0.4% | 0.6% | 0.4% | 0.6% | 0.0% | 0.0% |
| Not planned | 0.0% | 0.0% | 0.0% | 0.0% | 0.0% | 0.0% |

Table 4-16
Status of Electronic Signatures

| | ALL | DR | MA | BA | AA | OTHER |
|-------------|------------|-----------|-----------|-----------|-----------|--------------|
| Deployed | 7.2% | 7.4% | 7.6% | 6.6% | 6.9% | 7.3% |
| Piloting | 4.3% | 6.7% | 5.3% | 1.2% | 2.1% | 5.7% |
| In progress | 6.3% | 9.2% | 7.1% | 3.6% | 4.2% | 7.3% |
| Considering | 40.6% | 54.6% | 41.8% | 25.7% | 41.0% | 39.8% |
| Not planned | 41.6% | 22.1% | 38.2% | 62.9% | 45.8% | 39.8% |

deployed, are piloting, or have such technology in progress. The use of this technology notably increased from 2002 to 2003.

While the status of the various technologies discussed thus far has differed considerably across Carnegie groups, antivirus software was reported to be deployed at more than 98% of ALL responding institutions and by at least 96% of institutions within each Carnegie group. Table 4-15 shows the remarkable consistency and high level of deployment of antivirus software.

Like biometrics, electronic signature technology is not particularly common in higher education institutions across all Carnegie classes, as shown in Table 4-16. Again, the percentage of campuses at which such technology has been deployed, is in the pilot stage, or is in progress is greatest for doctoral

institutions, at 23.3% followed by approximately 20% of MA and OTHER colleges. This technology is not even planned at nearly 63% of BA institutions.

Table 4-17 shows the status of wireless security technology to be particularly advanced at doctoral institutions, with 57.1% reporting having deployed this technology and none reporting no plans for implementing it. Another 26.4% of doctoral schools are piloting this technology or have it in progress. About one-third of MA and OTHER colleges have deployed wireless security technologies, as have about 20% of BA institutions, the lowest percentage among the Carnegie classes. However, about 57% of BA colleges have deployed, are piloting, or have this technology in progress, a percentage slightly lower than that observed among AA colleges (about 60%).

**Table 4-17
Status of Wireless Security Technologies**

| | ALL | DR | MA | BA | AA | OTHER |
|-------------|------------|-----------|-----------|-----------|-----------|--------------|
| Deployed | 34.9% | 57.1% | 34.7% | 20.4% | 28.5% | 33.3% |
| Piloting | 11.8% | 12.3% | 12.9% | 8.4% | 12.5% | 13.0% |
| In progress | 22.0% | 14.1% | 22.7% | 28.1% | 20.8% | 24.4% |
| Considering | 26.4% | 16.6% | 24.4% | 32.3% | 35.4% | 24.4% |
| Not planned | 4.9% | 0.0% | 5.3% | 10.8% | 2.8% | 4.9% |

**Table 4-18
Campus Firewall Strategies**

| | ALL | DR | MA | BA | AA | OTHER |
|--|------------|-----------|-----------|-----------|-----------|--------------|
| Firewall at external Internet connection | 82.0% | 59.5% | 84.4% | 88.6% | 91.0% | 87.8% |
| Firewalls around certain high-security servers or networks | 58.0% | 82.2% | 61.8% | 43.1% | 38.9% | 61.8% |
| Firewalls deployed by or on behalf of individual departments | 29.3% | 73.6% | 24.0% | 10.2% | 9.7% | 29.3% |
| Campus site license for a personal firewall product | 6.9% | 13.5% | 7.6% | 3.0% | 2.8% | 7.3% |
| Plan to implement one or more firewalls | 14.5% | 20.2% | 12.9% | 9.0% | 11.8% | 20.3% |
| No firewalls | 1.8% | 1.2% | 2.2% | 3.0% | 0.7% | 1.6% |

Security

The final area of analysis in this section is security, including the processes being used to secure campuses from disruptions of service, incursions, and other security breaches. Perhaps the most common type of security protection being used by responding campuses is a firewall. However, experience has shown that a single firewall is not adequate for security because many of the individuals who pose a threat to security are students and personnel who work and operate within the environment protected by the firewall. Table 4-18 shows various strategies currently being employed and their relative frequency within each of the Carnegie groupings. This year an additional strategy was added as a choice, that is, whether there is a campus site license for a personal firewall product.

Overall, fewer than 2% of ALL campuses have no firewalls (down from 4.7% last year), with the most common strategy being the deployment of a firewall at the external

Internet connection; this percentage is up significantly, from 77.6% to 82% this year. This is true for a very large percentage of all types of schools other than doctoral institutions, which more often reported deploying firewalls around high-security servers and by or for individual departments.

Table 4-19 shows the patterns and use of software patches and other practices to ensure security on campus, with three new options in the survey this year replacing two others from last year. Far and away the most common practice is to expeditiously patch or update critical systems, with this being reported by about 96% of ALL campuses (up from 82% last year) and no significant differences among Carnegie groups for this practice.

The second most common practice is conducting proactive scans on critical systems, with this reported by nearly three-fourths of ALL respondents and most often by doctoral institutions. Expeditiously patching and updating campus computers was the next

Table 4-19
Security-Related Practices

| | ALL | DR | MA | BA | AA | OTHER |
|--|------------|-----------|-----------|-----------|-----------|--------------|
| All critical systems expeditiously patched or updated | 95.5% | 93.9% | 95.1% | 97.6% | 93.8% | 97.6% |
| Campus computers expeditiously patched or updated | 68.7% | 54.6% | 76.4% | 68.9% | 68.8% | 73.2% |
| Personal computers expeditiously patched or updated | 28.6% | 30.1% | 36.9% | 31.1% | 10.4% | 29.3% |
| Proactive scans in critical systems | 73.4% | 87.7% | 76.0% | 68.3% | 61.8% | 69.9% |
| Proactive scans in campus computers connected to the network | 57.4% | 63.8% | 62.7% | 50.9% | 50.0% | 56.9% |
| Proactive scans in PCs connected to the network | 28.5% | 39.3% | 31.6% | 29.9% | 12.5% | 25.2% |
| Security system includes intrusion detection system | 44.5% | 67.5% | 44.9% | 28.7% | 34.0% | 47.2% |

Table 4-20
Security Policy Advisory Participants

| | ALL | DR | MA | BA | AA | OTHER |
|-------------------------------|------------|-----------|-----------|-----------|-----------|--------------|
| IT policy/security officer | 62.0% | 79.1% | 56.9% | 43.1% | 60.4% | 76.4% |
| CIO/central IT representative | 95.1% | 100.0% | 96.0% | 94.6% | 87.5% | 96.7% |
| Auditor | 40.8% | 69.9% | 39.6% | 18.6% | 27.8% | 49.6% |
| General counsel | 51.2% | 85.3% | 50.2% | 36.5% | 34.0% | 48.0% |
| Chief financial officer | 49.9% | 50.3% | 55.6% | 49.7% | 45.1% | 44.7% |
| Chief academic officer | 51.9% | 59.5% | 54.7% | 49.1% | 48.6% | 44.7% |
| Campus police | 11.3% | 19.0% | 13.8% | 7.2% | 8.3% | 5.7% |
| President's cabinet | 58.3% | 53.4% | 63.1% | 54.5% | 70.1% | 47.2% |
| Board of trustees | 12.5% | 17.8% | 13.3% | 8.4% | 13.9% | 8.1% |
| Campus task force | 25.9% | 50.9% | 19.6% | 16.2% | 22.9% | 21.1% |
| Technology advisory committee | 50.1% | 49.7% | 52.0% | 44.9% | 54.9% | 48.8% |
| Faculty committee | 24.1% | 33.7% | 28.4% | 19.2% | 17.4% | 17.9% |
| State agency or system office | 19.7% | 23.3% | 24.0% | 5.4% | 34.0% | 9.8% |
| No policy development | 0.6% | 0.0% | 0.0% | 0.6% | 2.1% | 0.8% |

most common practice reported, by more than two thirds of ALL institutions. Proactive scanning of campus computers connected to the network was the fourth most commonly reported practice among ALL institutions.

Finally, respondents were asked to identify the participants in policy development related to security on campus. As shown in Table

4-20, the patterns of involvement and the breadth of participation in such policy efforts varied dramatically across Carnegie types. In all cases, the CIO or central IT organization representative was the most common participant in such processes, with about 95% of all campuses checking this option. A significantly higher percentage of doctoral institutions

than other types of schools reported involvement of the IT policy/security officer, the university counsel, the auditor, and a campus task force. The president's cabinet was reported to be used considerably more than other groups by AA colleges. Fewer BA institutions than schools in any of the other groups reported engaging an IT policy/security offi-

cer, auditor, campus task force, technology advisory committee, or state agency. The use of the following campus entities in developing IT security policy increased significantly from 2002 to 2003 among ALL institutions: auditor, general counsel, chief financial officer, chief academic officer, president's cabinet, and state agency or system office.