SPEC Kit 302

Managing Public Computing
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Introduction

Computers have been a major resource in libraries for many years. From the first OPAC terminal to librarian-assisted DIALOG searching, the role of computers in service to library patrons has come a long way. Today, library public computers serve many different needs of patrons. They are OPACs; gateways to databases, e-books, e-journals, video, and audio content; information resources about the library and its many services; e-mail kiosks; and a destination where patrons find numerous software applications. Often, all of these resources are loaded on each public computer. These computers are fully networked and often configured for or attached to numerous peripherals. Patrons flock to them.

This environment presents a wide range of challenges to academic and research library staff and administrators. In an environment that demands more of the resources, the infrastructure, and the staff who work to keep public computing the stable and reliable door to all things digital in the library, how are libraries managing and supporting public computing to meet the needs and expectations of today's library user?

The focus of this survey was on the management of library public computing, i.e., those computers that are located in public spaces for use by patrons, as distinct from staff computers and servers. By jointly looking at the scale of the public computing operations, the staffing and organizational structure, budgets, upgrades, maintenance, security, polices, and assessment, this survey pulls together and expands on issues covered in several previous SPEC Kits. SPEC Kit 281 *The Information Commons* (2004) indicated that only 22 of the 74 responding ARL member libraries had developed a specialized information commons computing area. SPEC Kit 275 *Laptop Computer Services* (2003) indicated that half of the 84 responding libraries were circulating laptops. SPEC Kit 277 *Library Public Access Workstation Authentication* (2003) examined this security practice which has changed significantly in the intervening four years. System wide library computing operations and staffing were examined by SPEC Kits 271 and 211, *Library Systems Office Organization* (2002 and 1995, respectively). Policies to address issues of access and use were included in SPEC Kit 218 *Information Technology Policies* (1996). The current survey brings these issues and others together to provide a comprehensive overview of public computing management.

Background

This survey was distributed to the 123 ARL member libraries in July 2007. Sixty-nine libraries (56%) responded to the survey. The survey respondents were primarily library deans, directors, and heads of library information technology or library systems departments. All 69 respondents indicated that their library contains public computers that need support. Responsibility for the support, service, repair, and replacement of computers in public library spaces falls solely on library staff in 44 of

the responding libraries (64%). Support is shared with non-library staff in 21 of the libraries (30%); in four libraries (6%), the institution's central IT staff provides sole support. In none of the libraries is computer support contracted out or provided by a consortium's IT staff.

Staffing and Management

Sixty-four respondents reported a total of 1005 professional, support, student, and other staff in library and campus units who provide public computing support. The total number of staff at each institution ranges from 2 to 82 with a mean of just under 16. At 55 of the responding libraries (86%), professional staff in the library IT unit provides public computing support. At all but four of these libraries the IT professional staff have additional assistance from support and student staff either within or outside the IT unit, or both; at 17 they also get assistance from librarians in other units, typically reference, circulation, and other public services departments. At the other nine libraries, public computing support is primarily the responsibility of support and student staff in the IT unit, with some assistance from other library staff. The main campus IT department is the primary source of support from outside of the library. In almost every case, IT professionals, support staff, and student employees support both public and staff computing, though at 25 libraries some staff is designated for public computing support only.

The person who has primary responsibility for managing and coordinating the public computing support operations is, not surprisingly, most often found in the Library Information Technology department. Other names for this department include Integrated Technology Services, Library Computing, or Library Systems. In a few cases, this person can be found in library reference or public services departments. Primary responsibility typically falls on the head or director of the library IT or systems department who in turn reports directly to the director of the library, the university librarian, or an associate university librarian. In nearly

half of the reporting libraries, it falls to a manager or specialist who in turn reports to the library IT or systems department head.

Public Computing Workload

After gathering data on who is responsible for providing public computing support in the libraries, the survey asked what the staff is supporting. A significant amount of the workload is focused on desktop computers distributed throughout public spaces across multiple libraries. Forty of the 62 responding libraries (65%) indicated that computers take the greatest amount of staff's time to support; printers are a distant second (16 or 26%). Four (7%) reported that no type of equipment takes any more time than the others.

When considering the total number of units supported, these responses are not surprising. Across 61 institutions, staff support over 20,000 desktop computers, ranging from 40 to 1600 per institution with an average of 328. Forty-two respondents manage a total of 1,919 loaner laptops. These libraries manage between 2 and 202 laptops with an average of 46 laptops per institution. Only 27 respondents indicated that they still support OPAC only terminals, on average 37 terminals each. With all of these computers, printers are also necessary. Fifty-six libraries reported managing an average of 34 printers each. Forty-seven institutions reported supporting a range of other equipment, including various types of scanners and microfilm and microfiche readers. Printing systems, audio-visual equipment, PDAs, and photocopiers are also supported.

Public computing support is challenged not only by the number of pieces of equipment but also by the fact that the equipment is spread out across many different libraries. Sixty-one respondents (98%) reported that they have equipment in multiple buildings, eight on average, most likely at various branch libraries. One library reported having equipment in 31 different buildings. Some libraries also have public computers on more than one floor of a building, adding additional complexity to staffing and maintenance.

Maintenance

With so many computers deployed across so many different locations, maintaining and upgrading hardware and the software on them is at times a daily task. Survey respondents schedule this work in a variety of different ways. Twenty-two libraries (35%) manage additions, updates, or changes to software applications by scheduling the work before each semester begins. Seventeen (27%) do it on an as needed basis; nine (14%) do it during holidays and breaks. More important changes and updates, such as Windows and anti-virus updates, are done much more frequently. At night, after hours is the time preferred by 18 libraries (28%). Slightly fewer do these critical updates either as needed or weekly (14 or 22% each) and 12 (19%) do so daily. Software upgrades on the other hand, are done much less frequently. Of the 61 libraries responding, 19 (31%) upgrade software once a semester and 6 (10%) upgrade just once a year. Fifteen of the libraries (25%) upgrade software when a new version appears. Others upgrade as needed, or at the request of faculty, staff, and students.

In order to actually make software changes, most of the responding institutions (36 or 57%) push the software changes out from a server. Eleven (17%) touch each computer with a fixed image, while three use a list of changes and modify each machine accordingly. The remaining respondents use a mixture of these methods to keep their software current. Software deployment applications are a popular utility used to facilitate deploying, changing, and updating software. Fifty-five institutions reported using one or more of these applications. Windows Active Directory is the most popular followed distantly by Novell Zenworks, Microsoft Systems Management Server, WinINSTALL, Altiris, Symantic Ghost, and custom scripting among other applications. Use of imaging software, another way to maintain computers, was reported by 57 libraries. The most popular imaging software is Ghost and DeepFreeze with the majority of respondents using some combination of one of these and Mac OS X Server.

Metering software is used to control access to software that limits the number of simultaneous users. Of the 22 libraries that reported using some form of metering software, the majority (13 or 52%) use Keyserve. A few use NetSupport, Citrix, Express Meter, or some locally written code. Twelve (52%) report that the library controls the metering of software. At nine institutions (39%) an external IT department controls the metering.

Unlike software that may be upgraded at least annually, the upgrade cycle on equipment is significantly longer. Of all of the public computing hardware maintained by the responding libraries, desktop computers are on the most regular replacement cycle. Twenty-one respondents (36%) reported that they upgrade or replace their desktop computers every three years, 26 (44%) replace them every four years. Printers, on the other hand, are replaced on a much less regular schedule. Of the 55 respondents, 23 do not have a regular printer replacement schedule and 16 replace them on an "as needed" basis. Only a few have printers on a regular two year (4 respondents), three year (6 respondents), or four year (6 respondents) schedule. There is also typically no particular replacement schedule for other equipment, such as scanners. For some libraries, available funding or equipment failure drive the replacement schedule.

Survey respondents were also asked what they do with equipment that has been retired. The most common procedure is to discard them to a recycling program. Computer manufacturers often run such programs and may reuse some materials while ensuring the rest are disposed of environmentally. Slightly more than half of the respondents cannibalize old equipment for parts. Roughly a quarter either rotate the machines to staff, sell them, or give them to charities. Many institutions reported that the equipment is sent to university surplus, often for sale or redistribution.

Public Computing Budget

The availability of funding has already been mentioned as a key driver of the replacement schedule

of public computing equipment. Since FY 2005, just under half of the respondents have seen a mixed impact on their hardware, software, and staffing budgets. At these libraries some budget categories have increased, others have decreased, but most have stayed the same. Seventeen libraries report their budgets have remained the same across the board. A lucky 14 have had increases across the board. At several institutions, the budget does not include a line for computer replacement, instead that expense must be taken from the general operating budget. The situation is further complicated by the fact that some institutions must compete for student technology fee dollars in order to replace public computing equipment. On the bright side, two respondents commented that they have been able to purchase more hardware for the same or less money as prices drop.

User Technical Support

At the other end of the public computing support spectrum is the direct support of the patrons who use the public computing equipment. The people who provide this support come from several different areas. When asked which staff are responsible for answering technical questions about library public computers, 41 (66%) responded that professional staff in the library IT department are responsible. At 26 of these libraries, librarians, and in most cases support and/or student staff, also answer users' questions. At 14 of the remaining 15 libraries support and/or student staff share that responsibility with the professional IT staff. At 15 other libraries user support falls on librarians with help from support and student staff. At only four libraries are support staff primarily responsible for user technical support.

A comparison of the responses to the questions on who provides equipment support and user support shows that in about a third of the cases it is the same staff. In 45% of the cases additional staff, typically in public services, help answer users' questions. In 24% of the cases user support falls to the higher-level staff in the group.

The survey asked which non-IT departments provide staff to answer users' technical questions. The departments most commonly mentioned include public services, reference, and circulation. Several respondents mentioned that the non-IT staff provide support primarily for applications-based questions and lower-level technical questions. When users need to alert library staff about public computing problems, in-person reporting is the most common approach. The majority of users report problems to the reference desk, significantly fewer report problems to the circulation desk. Only four libraries have a tech help desk. Several respondents clarified that users can report problems to any public service desk. Ten libraries take problem reports by e-mail or instant messaging and one has a Web-based help application. Since the reference and circulation desks receive most of the problem reports, it stands to reason that the staff at these two locations would be the ones who most frequently provide technical support to users.

To help manage and address public computer problems, about three-fourths of the responding libraries use helpdesk ticket tracking software. There is no consensus on which software is best. Sixteen use a locally developed system, five use Request Tracker, four use Remedy, and the rest use a variety of other software including NetSupport, JIRA, TrackIT, and Numara Footprints.

For most libraries, addressing public computing problems is an on-going challenge that keeps library IT staff busy every day. When asked how frequently library IT staff has to address a public computing problem, seven (11%) reported that they respond more then five times a day, 22 (36%) address problems between two and five times a day, and 10 (16%) just once a day. The remaining 21 libraries address problems less often then once a day.

Public Computer Use Policy

To ensure appropriate use of the public computer equipment, 61 respondents have a policy in place that is aimed at users. When asked whether the

library developed the policy or whether they use one created by their institution, 29 (48%) reported that they follow the institution-wide computer use policy, 23 (38%) developed their own document in accordance with the institution-wide policy, and nine (15%) developed their own public computer use document. At most institutions, the policy was developed by the university or central IT department. Within the library, developing the policy is most frequently the responsibility of the library administration, the public services department, or the library IT department. When asked how frequently the policy is reviewed for updates and revisions, all but a handful said that it is reviewed on an "as needed" basis. Only seven review it annually and two review it each semester.

Security

Security, as it relates to protecting the public computing infrastructure and also the users of the resources, has become a critical concern for all who support computing. When asked whether users are required to login to public computers to access applications and the network, 28 of the respondents (46%) said that users only have to login to some of the public computers, 15 (25%) require logins for all of their computers, and 18 (30%) do not require a login at all. Four years ago, 67 ARL member libraries answered a similar question in SPEC Kit 277: *Library Public Access Workstation Authentication* (2003). Their responses then were: 15 required some logins (22%); 7 required all logins (11%); 45 required no logins (67%). Thirty-nine institutions replied to both surveys. Eighteen still have the same login policy (6 yes, some; 4 yes, all; 8 no). Twenty now require more logins. Ten of these changed from no to yes, some; six from no to yes, all; and four from yes, some to yes, all. Only one has changed from yes, all to yes, some.

For those libraries that now require a login to use a computer, 20 (46%) will provide a guest login to people who are not affiliated with the institution. Sixteen (36%) just direct these patrons to the few machines that do not require a login. Some in-

stitutions will do both, while others are completely closed to unaffiliated people.

When asked if public computer users are allowed to install any software on a machine, 46 (74%) said that they are not. Sixteen (26%) do allow users to install software that complies with the library or institution's computer use policy. The software cannot require either an administrative login or a reboot. In most cases, the computers are set up to wipe away the installation when rebooted.

Although libraries have computer use policies in place and most require users to login and not install software, public computer support staff still have many security concerns. Even with imaging software, viruses, spyware, and malware remain a major concern. People hacking into the network, using the public computers to hack into other systems, and attempting to access or steal confidential or personal information are also of concern. Low-tech malicious acts like theft and vandalism of equipment are also still a problem.

Public Computing Assessment

Given the amount of time, effort, and resources committed to developing and maintaining a high quality computing environment, many libraries turn to assessment measures to determine how successful they are at meeting patrons' needs. When asked if the library assessed user satisfaction with public computing, more than half (35 or 59%) said that they did. Six have not but are planning for a user assessment. Of the 35 that have done an assessment, 28 (80%) assessed hardware, 27 (77%) assessed software, and 18 (51%) assessed the technical support provided. Several respondents indicated that they have used LibQUAL+® to gather assessment information.

Twenty-five respondents do not track the use of public computers, seven don't now but are planning for usage tracking. Of the 27 who do track the use of public computers, 17 (63%) track user logins, nine (33%) use software and scripts to track desktop activity, and five (19%) take physical head counts of users.

Based on these assessments of public computing usage, survey respondents were asked to rank typical user issues. Thirty-nine of the 55 respondents felt that the number of computers is a common issue for users. The availability of software applications and technical support are moderate issues for 39 respondents; wireless connectivity is a moderate issue for 33. One respondent indicated that the number and speed of printers was also an issue of concern for users. For most respondents network speed is rarely an issue.

Conclusion

Several respondents to this survey commented that the management of public computing is a complex collaborative effort often involving people both within and outside the library. It includes technically skilled staff and professionals as well as non-technical people who are dedicated to providing high quality service. It involves maintaining, upgrading, and protecting hundreds of pieces of equipment often distributed across many buildings. As a result, the level and quality of public computing supports varies from hour to hour and building to building.

At present, it appears that demand will continue to grow and will require each library to provide more equipment and support. A follow-up question sent to the survey respondents found that 90% (36 of 40) have seen a steady increase in the demand for public computing over the last five years. A few report that demand has stayed about the same. No one reported a decrease. In addition to the increase in demand for desktop public computers, several respondents mentioned that the greatest demand has been for laptops, wireless access, and laptop infrastructure (electrical outlets, docking stations). This growth in laptop utilization may be due in part to institutions building more flexible spaces within their libraries, which means public computing must go with the students instead of the students going to the public computing. Some respondents noted that although more students own laptops, they often prefer to use those that the library provides. This preference has also been observed in a study of students at the University of Rochester. (Foster and Gibbons, 2007)

Managing public computing is a challenge and will continue to be even as some libraries plan to shift the management of all or most of the public computers out from under the auspices of the library IT department and into the hands of the campus IT department. Although not asked by the survey, the issue of campus and library IT support centralization (or lack of it) was evident in many responses.

While researching ARL member institution's Web sites, it became clear that in many cases little or no information about library public computing is readily available and there is very little consistency in how the information is presented to the user; it varies from institution to institution and even library to library within an institution. Although some library sites have "computing" somewhere on that page, in many cases only a site search and further browsing leads one to this information. In some library Web sites it was not possible to find any substantive information on what a library offered in the way of public computing.

In preparing and researching this work, the authors discovered that there are things being done at some institutions that really stand out, though not addressed specifically in the survey. For example, Case Western Reserve University uses RSS and a blog approach to update their users on new and changing features of their public computing environment. There were enough of these innovations that "flew below the radar" of the survey results that the authors felt that it was appropriate to look at all of the ARL member library sites — not just those of the respondents — for these "notable innovations." This led to finding many remarkable innovations, such as North Carolina State University's real-time workstation availability, Brigham Young University's computer reservation systems, The University of Kansas' search interface which locates hardware and software across campus (including library locations), and also their

unique approach to providing individualized technical assistance known as "Desktop Coaching."

Since in so many cases computing needs have blurred the lines between the library and its campus, the authors discovered instances where a library's parent institution really went the extra mile to engage students about their public computing policies, such as the University of Delaware's entertaining and student-friendly "Responsible Use of the Campus Network: A Student Handbook" and the University of Virginia's "Responsible Computing Video." Although not created by libraries, these two are among the more innovative approaches the authors encountered for getting the word out to the students who use the libraries at these institutions. Please refer to the Selected Resources section titled "Notable Innovations" for a list of these exceptional efforts by ARL member institutions.

The management of public computing continues to evolve in ARL libraries. This evolution depends to a great degree on local budgeting and staffing considerations as well as on the structure of IT management in the libraries and their parent institutions. Although staff support is similar in many of them, the processes employed differ. The wild card in the overall picture usually relates to rising or falling trends in the computing behavior of library users, whether faculty, students, or others. Some libraries accommodate new kinds of assignments by the faculty they serve, for example by providing access to multimedia production facilities, poster printers, and so forth. In such libraries the nature of class assignments is driving the nature of the computing environments. Many respondents noted that seemingly every generation of students is increasingly tech-savvy, bringing with them a continuous stream of new and changing expectations. Like other areas of the survey, just how these expectations are met varies from place to place, sometimes even within the same institution. As some have noted, "A basic philosophical issue for libraries is the extent to which we should move in the direction of the users and how much we should expect users to move in our direction." (Thomas & McDonald, 2005) The results of this survey show that managing public computing continues to be complex task with a diverse set of challenges.