



Smart Libraries™

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Smarter Libraries through Technology

Building Comprehensive Resource Discovery Platforms

By Marshall Breeding

One major trend in the library automation industry that I have been following in recent years is the evolution of discovery systems toward a model that provides access to a more comprehensive representation of library collections. A variety of products and projects have emerged with the ambitious goal of addressing the content represented in a library's subscriptions to electronic resources in addition to the books and other materials managed in the integrated library system.

One of the strategies behind these products is the creation of massive consolidated indexes created out of citation metadata or the full text of articles harvested from the publishers and providers of content to libraries. This model of discovery creates an index spanning all types of library content that can provide fast retrieval of search results.

With articles represented in the index, users can more easily discover items of interest to their research, and click through from the search results to the electronic article on the provider's server. By making metadata or full text available to the discovery service, a publisher of electronic content gains better exposure of their content, while retaining control over the display or delivery of that content.

This model of discovery depends on the cooperation between the producers of content and the creators of discovery services. Some of the major discovery providers that follow this approach include the Serials Solutions' Summon service, EBSCO Discovery Service, OCLC WorldCat Local, and Ex Libris Primo Central. Each of these organizations has aggressively pursued content providers to contribute data that can be indexed within their discovery service to help achieve the maximum degree of comprehensive coverage of the content to which libraries subscribe.

An event that recently took place in this arena involved EBSCO's move to discontinue making its content available to Ex Libris for inclusion in Primo Central. EBSCO originally made an agreement to provide citation data from its EBSCOhost products to Ex Libris in July 2009, prior to releasing its EBSCO Discovery Service, a direct competitor to Primo Central. The competitive issues between their two discovery products outweighed any advantages EBSCO would have by cooperating with Ex Libris to contribute content to enhance Primo Central.

While losing the EBSCOhost content in Primo Central is a short-term disruption, it is not necessarily a long-term

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obstacle to the development of Primo Central in particular or a general mark against this model of discovery based on large aggregate indexes. When populating an index for a discovery service, it's helpful to gain access to large numbers of articles in a single package through a deal with an aggregator. It's also possible to represent the same content in the indexes through cooperative arrangements with the primary publishers and content providers covered within any given aggregated database of article content. Discovery service developers do well to pursue multiple paths in parallel to ensure the maximum coverage of articles and to hedge their bets relative to competitive issues such as the one between Ex Libris and EBSCO.

To the extent that libraries favor this approach of discovery based on consolidated indexes, they have an interest in the highest level of cooperation between the publishers and providers from which they license content and the organizations that offer discovery systems. When a content provider opts out of making their materials available to discovery products for indexing, it causes problems for libraries that depend on dis-

covery services. I believe that it's mutually advantageous to both publishers and discovery providers to cooperate, since it both increases the effectiveness of the discovery products and improves the value of the content for libraries as it makes that content more easily available to their users.

Libraries can take part in the process of increasing the content available within discovery services by bringing this issue into their selection and procurement process. In the same way that libraries routinely require license terms for providers of content products support practices such as COUNTER statistics for measuring the use of materials, SUSHI for automatically delivering those statistics, or OpenURL for linking, it would likewise be reasonable for libraries to introduce requirements that vendors make content available to the discovery services provider of their choice for the sole purpose of indexing. Although there seems to be a broader acceptance of content providers to work with discovery systems, making it part of the license terms will help close the gap on the content not currently supported in this important genre of library software.

Net neutrality: Libraries Rally to Preserve the Open Internet

A variety of activities have taken place in recent months involving net neutrality, a critical issue for libraries and educational organizations. The continued adherence to the basic principles that ensure that information flows on the Internet to all users equally can no longer be taken for granted. A political climate that favors deregulation, court rulings that could dramatically impact the issue, and the questioned authority of the FCC to impose regulations on the Internet makes the preservation of net neutrality an uncertain question. In this article we lay out a basic definition of network neutrality, summarize some of recent events that stand to threaten its continued practice, explain why it matters to libraries, and review some of the recent statements or positions issued by key library organizations on the topic.

What is Net Neutrality?

The Internet consists of many interconnected networks that operate using a set of protocols that ensure that traffic flows among all the possible destinations. The routing equipment used on the Internet follow rules that ensure that data finds its way to the proper destination and that allow network operators to manage traffic to deal with congestion and other operational issues. With net neutrality in place data are routed and delivered according to the best and fastest pathways available and distinctions are not made regarding its content or originator. Lifting the practice

would allow some types of traffic to gain privileged status, and to take advantage of the fastest performance available and other types of traffic shuttled into slower routed or even blocked entirely. Net neutrality is not a new proposition, but rather something that has been in place since the creation of the Internet.

Several types of networks come into play in the discussions of net neutrality. An Internet service provider offers connectivity to users of the Internet. Subscribers to these services include individual consumers in their homes, small businesses, schools, and libraries. Within the discussions of net neutrality, internet service providers that operate over the wired networks that serve stationary devices are distinguished from those that serve mobile users. Broadband services from cable operators such as Comcast or telephone carriers such as AT&T fall into the fixed or wired category while any of the data plans associated with cellular telephone service such as ATT Wireless, Verizon, or Sprint may be treated differently as wireless carriers.

The Internet also includes private networks that tap in through one or more high capacity connections, and route traffic internally for their users. These private networks would include universities, schools, corporations, and other organizations that provide internal network connectivity. These private networks do not fall under the same regulations as those that provide service to public consumers.

The longstanding business model for the internet is based on fees charged to individuals or organizations for a specified level

of bandwidth. A consumer might subscribe for Internet access through their cable company, for broadband access through a cable modem or for DSL from their telephony company. Small businesses or other organizations can subscribe through similar programs; large organizations such as corporations, municipalities or universities will likely purchase much higher level bandwidth services that connect their internal networks into the central routing structure of the Internet. Internet service providers scale the cost of the service according to the level of bandwidth specified in their subscription contract. The services provided by that organization and the level of consumption cannot technically exceed the contracted level of bandwidth. Organizations routinely increase bandwidth regularly as their demand inevitably grows.

The fees charged for Internet access on the wired Internet are usually tied to the maximum bandwidth allocated and are not usually tied to the actual volume of bandwidth consumed. The key point is that once an individual or organization pays for connectivity, no additional fees apply to make use of that connection to the fullest extent and with an expectation that information will be transmitted as efficiently as possible.

Under net neutrality, once an individual or organization has established a connection to the Internet at a specified level of bandwidth no additional fees would be incurred to initiate or receive content and any content transmitted would flow using optimal routes as it moves along the many networks and exchange points that comprise the Internet. An individual blogger, a small organization that wants to provide live streaming for an event, or a library that provides access to a multimedia collection would receive equal treatment to commercial services in the way that their traffic flows on the net. Any two persons or organizations that pay for the same level of connectivity can expect to receive the same throughput and quality of service.

Should net neutrality practices become weakened or eliminated, internet services providers would be allowed discretion in the way that they manage traffic, free to charge additional fees based on characteristics of the content transmitted above and beyond what has been paid for raw connectivity to provide optimal delivery or to allow delivery at all. The routing of traffic on the internet would not take place in a neutral way but might allow preferential or denigrated treatment based on competitive concerns or payments made for premium service.

Questions underlying Net Neutrality

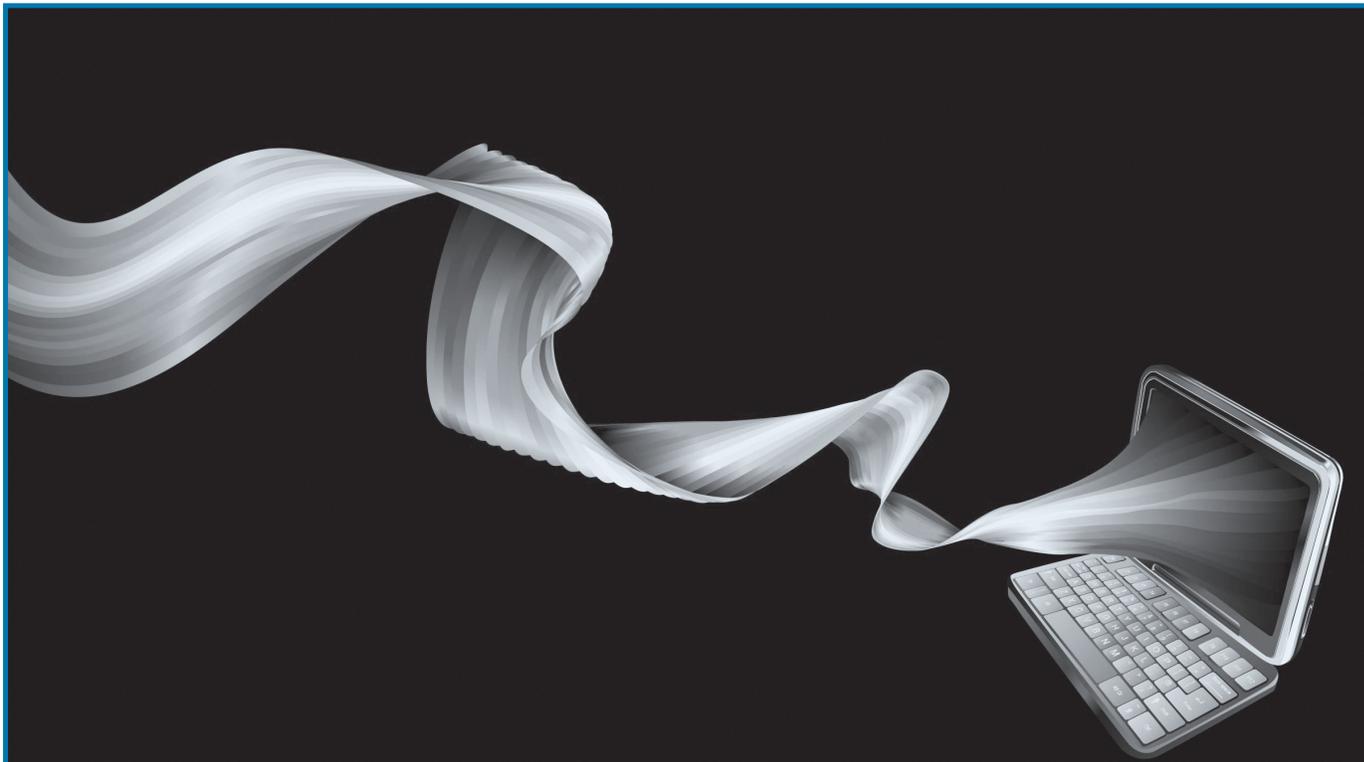
Streaming video consumes more bandwidth and introduces new competitive situations as the Internet increasingly encroaches on television as the delivery mechanism for entertainment,



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news, and other forms of content. The massive demands on internet service providers introduced by the recent surge of interest in high-quality streaming video has been a major factor in bringing questions of net neutrality to the fore.

Should broadband providers be allowed to collect additional fees to support the higher bandwidth consumed by commercial services or give preferential treatment to content associated with their own commercial interests? Should the internet devolve into a tiered environment, with the fast lanes reserved for preferred customers? Organizations not able to pay for premium service, such as educational institutions and libraries, have an interest in maintaining net neutrality and precluding scenarios where their content would be disadvantaged in delivery on the Internet.



Is it allowable, for example, for internet service providers to charge high-bandwidth consumers such as Netflix premium fees for faster delivery of data needed for their services? Is it fair for services associated with organizations without the deep resources of high-profile commercial services to not have access to the fastest delivery options?

Comcast and Netflix

The example that showcases the controversy involves Comcast and Netflix, or specifically the internet service provider Level 3 that delivers Netflix traffic onto the Internet. According to *Wired*, consumers accessing Netflix can account for as much as a one-fifth of all Internet traffic during peak periods. (<http://www.wired.com/epicenter/2010/10/netflix-instant-accounts-for-20-percent-of-peak-u-s-bandwidth-use/>). Although Netflix purchases capacity from Level 3 to funnel this traffic on to the Internet, broadband providers such as Comcast have to ramp up capacity to deliver the streaming service to their customers. Until recently, networks such as Comcast and Level 3 have routinely exchanged traffic without financial compensation. Beginning around October 2010 Comcast imposed a fee on Level 3 to recoup its costs in building capac-

ity to accept the massive Netflix traffic. Level 3 has challenged the fee and this battle has become a major chapter in the drama over net neutrality.

Comcast's position has become even more entangled as it acquires majority ownership of NBC Universal, a major provider of content with strong competitive interests against Netflix. Regulatory approval of the deal was approved in January 2011, with some conditions stipulating that Comcast will not give NBC Universal content preferential treatment on its broadband services. With this deal, one of the largest internet service providers gains ownership of a major content provider, creating a combined organization with a complex entanglement of interests.

The Comcast versus Netflix case can be seen an early example that stands to erode the principles of a neutral internet in favor of tiered levels of service. In a tiered Internet, access to the fastest bandwidth could be reserved to those that pay premium fees, with others relegated to slower delivery. Companies such as Amazon.com, Netflix, Google, or e-Bay might find it worthwhile to pay for premium access to the internet; organizations lacking deep pockets such as libraries, local governments, small businesses, nonprofits, individual Web site operators, or bloggers would travel on the slow lane of the Internet.

Recent events impacting Net Neutrality

On December 21, 2010, the FCC issued a set of regulations that address issues of net neutrality. The regulations reflect a compromise position that to a large extent preserves the general principles of net neutrality, but with some significant departures. Different rules were issued for wired networks that serve fixed devices and those that serve mobile users. In broad terms, the rules that apply to mobile networks allow more discretion to carriers while fixed networks must operate closer to the principles of net neutrality.

Advocates of net neutrality see the erosion of the principles on mobile networks as a major concern. Wired and wireless access to the Internet will co-exist indefinitely, though the proportions will shift toward the cellular network. The organizations with more immediate concerns for network neutrality on the wired networks today will face the same issues on the mobile networks in the future.

One of the major issues centers on whether the Federal Communications Commission has the authority to impose regulations on the Internet. Legislation was introduced in January 2011 to the US House of Representatives by Marsha Blackburn (R- TN) to eliminate the authority of the FCC to regulate the internet, taking the position that net neutrality should be replaced by market forces as the governing principles of the Internet.

Impact on Libraries

Libraries have a strong interest in preserving the principles of network neutrality and avoiding the alternative scenarios where libraries as content providers and library users as content consumers may face limitations in bandwidth or increased costs. Under network neutrality, access to the resources of libraries and other cultural or educational institutions receives equal treatment relative to that of commercial organizations. In a tiered environment, libraries would be unlikely to have the funding to support access to the premium tier. Libraries also voiced interest in preserving neutrality based on content. Should internet service providers be allowed to block traffic based on content, it's possible that access involving fair use of copyrighted materials could be blocked. Libraries and educational organizations by in large have taken strong positions in favor of maintaining net neutrality.

Library Advocacy for Net Neutrality

Several library organizations have been involved in advocacy to preserve network neutrality. The FCC order sparked sev-

In a tiered environment, libraries would be unlikely to have the funding to support access to the premium tier.

eral recent studies and announcements by key library and educational organizations.

ALA has taken a strong position supporting net neutrality and participated in the comment process leading up to the FCC rule making. Once the rules were issued, the ALA Washington Office commissioned John Windhausen and Bob Bocher to prepare a detailed assessment that itemizes what aspects of network neutrality the FCC regulations did or did not address. This assessment was published on January 24, 2011 and provides a matrix of key issues, the position that ALA supported related to that issue, and what the order actually states, with a brief narrative on each point. The matrix includes how fixed or mobile networks each may discriminate, block, allow paid prioritization, or allow special services that may not be subject to net neutrality principles and whether the relative scope of each is defined to include libraries or not. See: <http://www.wo.ala.org/district-dispatch/wp-content/uploads/2011/01/FCC-NN-Order-Matrix-Final-2011Jan241.pdf>

The Association of Research libraries issued a brief addressing the FCC Net Neutrality rules. The brief, prepared by Kristen Riccard, summarizes ARL's involvement in the issue, mentioning the letter it issued to the FCC and related materials it has published and summarizes and provides background information on the issues covered in the rules relative to the positions of ARL. Of particular interest is the section of the brief that addresses lawful content and copyright, pointing out that the rules prohibiting blocking and discrimination apply only to lawful content, though without an explicit process on how network operators determine whether copyright is lawful and how fair use and other rights might be applied. Overall, ARL sees the current rules as falling short of the positions they advocated on behalf of the interest of their member libraries. The brief concludes by highlighting subsequent events such a Blackburn's bill and an appeal filed in the federal court by Verizon challenging the FCC's authority to regulate internet services providers.

The recent report and order by the FCC on net neutrality stands not as a final determination, but as more of as a touchstone event in an ongoing struggle regarding what rules will prevail on the Internet. Libraries have a vital interest in this issue and should continue to follow it closely and advocate for preserving the principles of net neutrality.

—Marshall Breeding

News on the ILS Front

Ex Libris announced a new offering, VoyagerPlus, a fully hosted version of the Voyager ILS. This new deployment option for Voyager falls within the company's increasing focus on products delivered through cloud infrastructure. VoyagerPlus is optimized to be paired with the Primo discovery platform, which is also available as a hosted service. Ex Libris also announced that the new automation framework that it has been developing under the conceptual name Unified Resource Management is now named Alma. Work continues with a third interim release to be made available to development partners in March 2011, with a general release expected in early 2012. The National Library of Luxembourg, an Aleph site since 2000, has selected Primo as its new discovery environment.

Web-Scale Management Services, the new automation platform offered by OCLC based on WorldCat, reached a major benchmark as a handful of libraries now use the software as their production environment. Libraries now live on Web-scale Management Services include Pepperdine University, Simpson University, the library of the Samuel Roberts Nobel Foundation, the Boundary County District Library in Idaho, and the ten libraries of the Craven-Pamlico-Carteret Regional Library System.

The **Koha** open source ILS continues to see new adoptions. D'Youville College in Buffalo, NY is now live with Koha through a

purchase arrangement with **WALDO** and support from **LibLime**; the Mabee Library of Sterling College migrated from Horizon to Koha with support from LibLime; the Macon Public Library in Missouri and the Erikson Institute of Chicago implemented Koha with support from **ByWater Solutions**, a consortium of three small colleges in Alberta including Alberta Bible College, Canadian Southern Baptist Seminary and College, and Rocky Mountain College launched Koha with support from **Equinox Software**;

Development of the Kuali OLE open source library management platform continues under a two-year grant from the Andrew W. Mellon Foundation and participation from a large group of academic libraries. The project recently announced that **HLT Global Services**, with development facilities in Troy, MI in the US and Chennai and Hyderabad India has joined the project as a development partner and will apply its core expertise in enterprise-scale systems to contribute in the areas of system design and quality assurance. The Kuali OLE project also added personnel to its core team including **Rich Slabach** as quality assurance manager, **Kathleen Gerdink** as business analyst, and **Lydia Reed** as data architect, all reporting to **Brad Skiles** OLE Project Manager.

—Marshall Breeding

New Issue of *Library Technology Reports* Offers Detailed Exploration of Web Scale Discovery Systems

In January, ALA TechSource published a new issue of *Library Technology Reports* covering the library automation industry—"Web Scale Discovery Services" by Jason Vaughan.

Web scale discovery services are a tool with major potential to transform the nature of library systems. These services are capable of searching quickly and seamlessly across a vast range of local and remote content and providing relevancy-ranked results in the type of intuitive interface that today's information seekers expect.

This report describes in detail the content, interface and functionality of Web scale discovery services developed by four major library vendors: OCLC, Serials Solutions, Ebsco and Ex Libris. Each of these services is evolving rapidly, indicative of

their open framework design and an ongoing expansion of indexed content as additional publisher and aggregator agreements are brokered. Although many similarities among the services are apparent, this report also outlines some observed differences, though these differences are becoming hazy as each vendor adds new functions, features and content.

To help individual libraries evaluate which service will best meet the needs of the library and its community, this report provides detailed evaluation questions and concludes with a section providing additional background information on each service.

Vaughan spoke more about these technologies in the December 2010 Dispatches column in *American Libraries*.

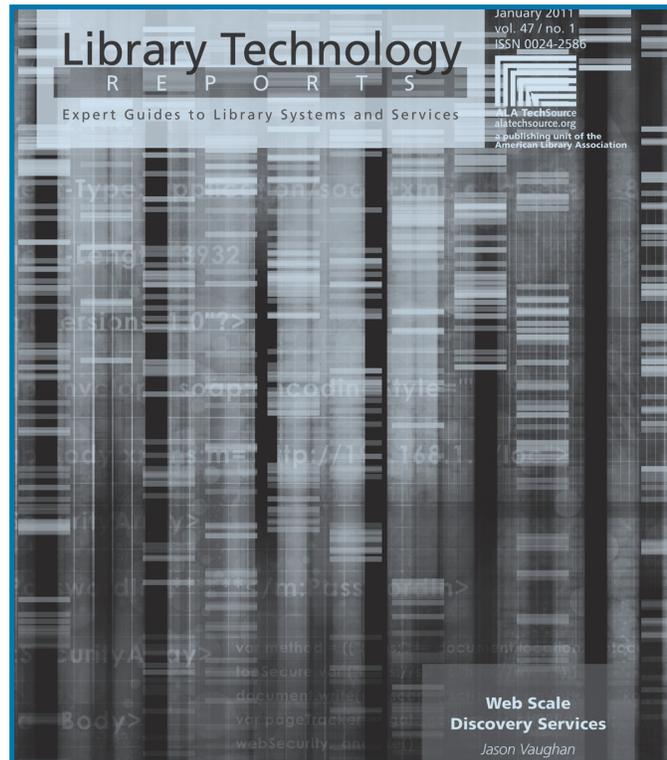
He wrote:

“Web-scale discovery services for the library environment are an evolution holding great potential to easily connect researchers with the library’s vast information repository, whether physical holdings, such as books and DVDs; local electronic content, such as digital image collections and institutional repository materials; or remotely hosted content purchased or licensed by the library, such as e-books and publisher or aggregator content for thousands of full-text and abstracting and indexing resources. For our purposes, web-scale discovery can be considered a service capable of searching across a vast range of preharvested and indexed content quickly and seamlessly. They provide discovery and delivery services that often have the following traits:

- Content harvested from local and remotely hosted repositories to create a vastly comprehensive centralized index—to the article level—based on a normalized schema across content types, well suited for rapid search and retrieval of results ranked by relevancy. Content is enabled through the harvesting of local library resources, combined with brokered agreements with publishers and aggregators allowing access to their metadata or full-text content for indexing purposes.
- Discovery provided by a single search box providing a Google-like search experience (as well as advanced searching capabilities).
- Delivery of quick results ranked by relevancy in a modern interface offering functionality and design cues intuitive to and expected by today’s users, such as faceted navigation to drill down to more specific results.
- Flexibility agnostic to underlying systems, whether hosted by the library or hosted remotely by content providers. These services are open compared to traditional library systems and allow a library greater latitude to customize the services and make them its own.

As illustrated by research from as far back as the 1990s, if not earlier, to as recent as 2010, library discovery systems within the networked online environment have evolved, yet continue to struggle to serve users. As a result, the library, or systems supported and maintained by the library, is often not the first stop for research—or worse, not a stop at all. Users have defected, and research continues to illustrate this fact.

Other factors, apart from user behavior and preferences, also give reasons for libraries to use web-scale discovery services. First, and most obvious, is that if something is not discovered, it has no chance of being used. Whether a librarian conducts a reference interview, a user browses the shelves, a friend provides word-of-mouth, a user searches



in Google or a library database, or a user scans issues and article titles in an electronic journal, discovery must happen, either by focused intent or serendipitously. Libraries often spend tremendous amounts of money every year to purchase or pay for access to an ever-growing body of electronic content, and the cost for access to this content often increases on an annualized basis. But for the content to be used, it must be discoverable—and for today’s users, easily discoverable.”

This issue of Library Technology Reports can be purchased in print or electronically from the ALA Store. See (<http://www.alastore.ala.org/detail.aspx?ID=3270>)

Jason Vaughan is the director of library technologies at the University of Nevada, Las Vegas (UNLV). In this capacity, he serves as a senior administrator and provides overall leadership for three units within the UNLV University Libraries: Digital Collections, Library Systems and Web and Application Development. Previous positions at UNLV include Head of Library Systems and Information Systems Librarian. He has published extensively on library and library technology topics, including library automation, digitization, planning and policy.

—Dan Freeman



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