

# Ubiquitous Access to Library e-Resources

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## Background

The licencing arrangements between university libraries and journal publishers permit students and faculty to access their copyrighted works online. Access from university campus locations is straightforward, but off-campus locations can be problematic. This is a major issue for medical schools as medical education becomes more distributed. At Queen's School of Medicine, for example, approximately 400 medical students, 300 residents, 300 full-time faculty, and 100 regional preceptors increasingly require access to online resources from their homes, regional hospitals, or community clinics on a daily basis.

## How Publishers Limit Access to Their Materials

Publishers generally restrict access to only those computers that reside on a university's campus network, as determined by the IP address of the connecting computer. Users who try to access their library's licenced online resources from home or from behind a hospital firewall, for example, find that access is denied unless there is a method to authenticate the remote user as a legitimate university student or faculty member.

## Conventional Solutions

Most universities use proxy servers, virtual private networking (VPN), and/or EZproxy to provide remote access to library e-resources. These solutions are generally cumbersome for users or costly to implement.

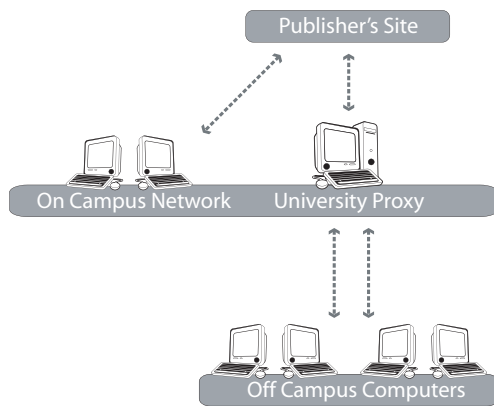


Figure 1 illustrates the flow of Internet traffic connections through a standard proxy server or web-based proxy server. Once connected to a university proxy server, the off campus computers are considered as being part of the campus network.

## Proxy servers:

This was an early solution and, at one time, was provided by nearly all universities. Users at off-campus locations must configure the web browser on their computer to use the university's proxy server. The proxy server can then authenticate the user and funnel all subsequent Internet traffic via one of the university's IP addresses. The publisher's website provides access because the off-campus user appears to be making a request from an on-campus computer.

Several Canadian universities are moving away from this solution due to the following limitations:

- ▶ Many users do not know how to configure their Internet browsers to use a proxy server, despite detailed instructions on library websites. The process is not intuitive, and users must pick instructions specific to the type and version of web browser they are using.
- ▶ Because it is so difficult for some users to configure their web browser to use a proxy server, the proxy server remains activated even when it is no longer needed, such as while browsing non-academic websites. This leads to an overload of the proxy server and a slowing down of the Internet experience for all proxy users.
- ▶ The proxy server generally does not work when users are behind hospital or other firewalls, because firewalls block the port used by the proxy server by default and/or because users are prevented from configuring the computer terminal's proxy settings.

## Virtual Private Networking (VPN):

This is a corporate level solution that encompasses an entire protocol rather than a specific software solution. The secure VPN protocol can be implemented through IPsec (part of IPv6), SSL (OpenVPN), PPTP (developed by Microsoft) and others. Major vendors such as Cisco and Alcatel sell VPN appliances (a stand-alone unit), which can help simplify the setup of a VPN server and provide a simpler solution. If configured correctly, a VPN solution can successfully extend geographic connectivity, improve security, and scale well with increasing numbers of users.

The limitations of VPN are:

- ▶ A successful VPN solution may be difficult to implement for smaller IT departments, due to the cost involved in purchasing and managing a dedicated VPN server.
- ▶ Users usually have to install a software application on each computer that connects to the VPN server. There are VPN solutions that do not require a client application to be installed, but these have not been widely adopted as a solution.
- ▶ Firewalls normally block the ports used by a VPN application, unless the firewall administrator agrees to open a "hole" in the firewall for the VPN application.

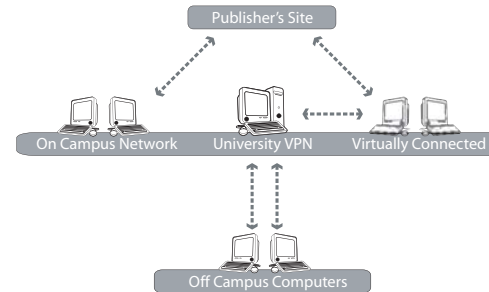


Figure 2 illustrates the flow of Internet traffic connections through a VPN server. Once connected to the university's VPN server the off campus computer is then part of the campus network and has access to the same resources as any other computer.

## EZproxy by Useful Utilities:

EZproxy is a commercial solution that is much more user-friendly than the above proxy servers or VPN. As a web-based proxy solution, there is no need for users to change the configuration of their web browsers, and there is no client-side application to install. As a result, EZproxy is used by a large number of universities in Canada and elsewhere. It works by rewriting the URL of a desired web page such that it appears as though the request originates from a university server, even though the user is actually off-campus. When EZproxy is implemented with the default configuration, the many ports that it uses are blocked by firewalls. There is a way to overcome the firewall limitation if EZproxy is implemented with an alternative host-based configuration, but this is a little-known solution.

The main disadvantage of EZproxy is the maintenance required to successfully manage the database of URLs (e.g. of journal websites) that EZproxy is allowed to visit. This is particularly onerous for libraries that subscribe to many thousands of journal titles from a variety of publishers and vendors.

An easier solution all along...

## CGIproxy by James Marshall

CGIproxy is another popular web-based proxy solution, first developed in 1999. The current version was released in 2002, and it is used almost exclusively by those wishing to surf the Internet anonymously without Big Brother watching. Compared to EZproxy, CGIproxy has the following advantages: it is free for non-commercial use, its implementation is very simple and fast, there is no need to maintain a database of authorized URLs, and firewalls pose no difficulty. Multiple types of authentication are supported, and HTTP authentication can be easily set up.

The only limitation of CGIproxy is that some pages with JavaScript do not load properly using the publicly available version 2.0.1 of the script.

<http://www.jmarshall.com/tools/cgiproxy/>

The next version of the code has solved the JavaScript problem and is implemented at Queen's; a public release is expected soon.

## Conclusion

Accreditation standards expect that medical students and residents have reliable, ubiquitous access to a university library's e-resources to support self-directed learning and to promote evidence-based medicine. CGIproxy is a simple, quick, user-friendly, and inexpensive solution that overcomes the limitations associated with conventional solutions.

For more information, please contact [medtech@meds.queensu.ca](mailto:medtech@meds.queensu.ca) or visit our website at <http://meds.queensu.ca/medtech>

	License	User friendly?	Admin friendly?	Service friendly?	Firewall friendly?
Proxy Server	Free (Squid) or commercial	☆	★★★★	☆☆	☆☆
VPN Server	Free (OpenVPN) or commercial (Cisco)	☆☆	☆☆	☆☆	☆☆
EZproxy	Commercial software	★★★★☆	☆☆	☆☆	☆☆
CGIproxy	Free for non-profit use	★★★★	★★★★	☆☆	★★★★

Figure 3 summarizes the various remote access solutions which have been covered in this presentation. It is important to note that the first two solutions are protocol specific, whereas EZproxy and CGIproxy are implementable software packages.



"45% of Canadian medical schools surveyed have trouble accessing the library e-resources from behind hospital firewalls."