Troubleshooting Fundamentals

A Beginner's Guide

By Sunshine J. Carter and Stacie Traill

Libraries have been troubleshooting unexpected problems affecting access to content for as long as libraries have provided online content. Library systems and access models have matured as the volume of content delivered via those systems has grown. Thus, finding—and fixing—the causes of electronic resource access problems has become a complex, time-consuming, and often specialized task.

Maybe you've just started a new position as an electronic resources librarian. Maybe staffing changes at your library mean that e-resource troubleshooting has newly become your responsibility. Or maybe your library has just migrated to a new system and you need to learn how to troubleshoot access problems all over again. No matter what your situation, taking on new troubleshooting responsibilities can be both challenging and overwhelming. Although learning by trial and error as your users find and report access problems is always an option, a better and more efficient approach is to develop your troubleshooting skills more methodically.

But where should you start? The library literature offers many studies on topics relevant to e-resources troubleshooting, and conferences frequently feature presentations on troubleshooting. Still, it isn't always easy to determine which of these information resources might be most useful to a novice troubleshooter. In our experience, many e-resource access problems can be solved (or at least their causes understood) by mastering the basics in three fundamental areas.

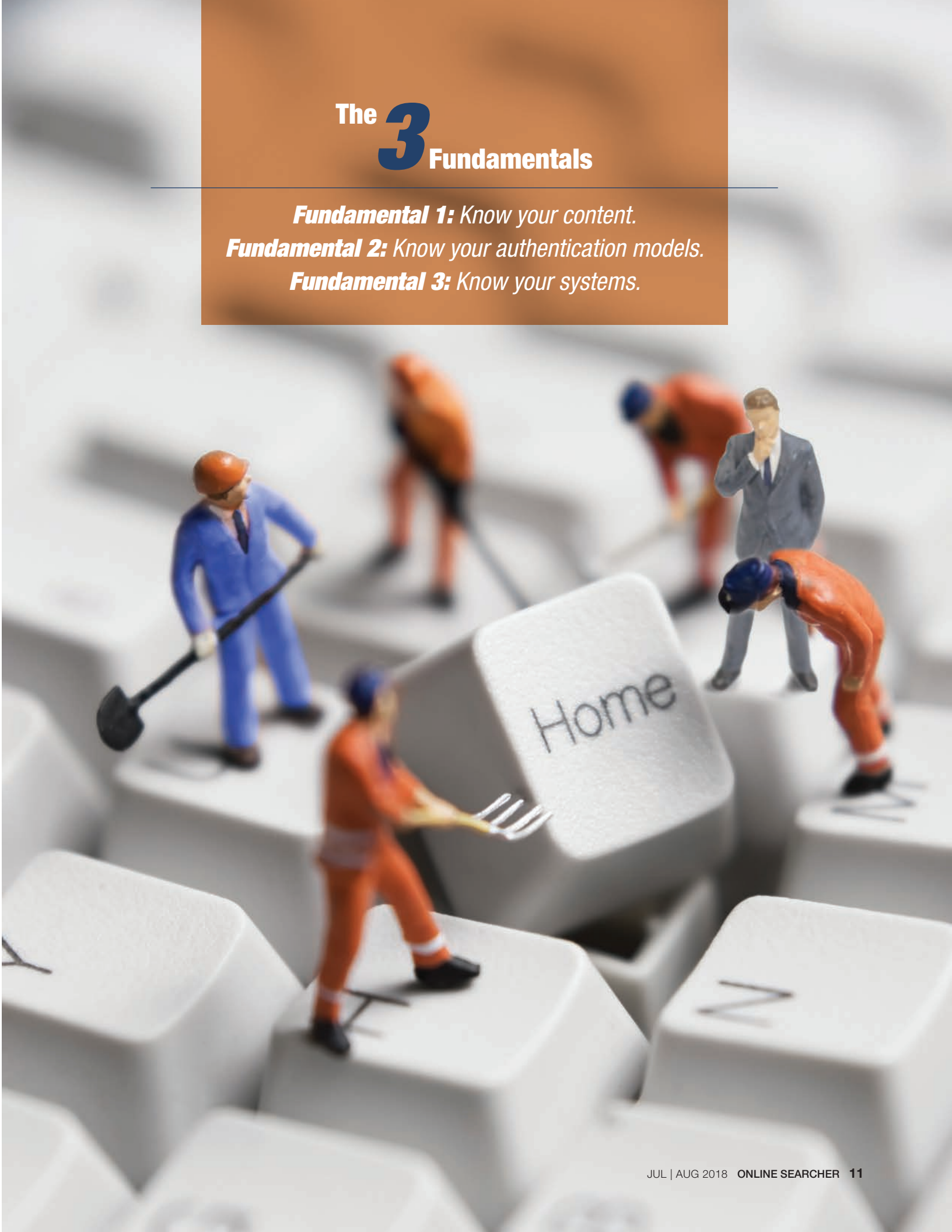
First, it's important to know what content your organization is entitled to and how access might be inadvertently lost. Second, you'll need to understand which of your users should have access to content and how they are authorized and authenticated. Finally, it's helpful to know which library and vendor systems play a role in controlling and providing e-resource access for your users. Becoming acquainted with these three broad areas will put you well on your way to becoming an effective and efficient troubleshooter.

KNOW YOUR CONTENT

The first rule of troubleshooting e-resource access issues is to determine whether your library has access rights to the content. Your gut instinct when troubleshooting will probably be to jump into the problem and fix it. However, a better approach is to verify your rights, because this can save you valuable time. There are many common reasons for losing access rights—accidental subscription lapse, publisher transfer, publisher error, and excluded or disappearing content. You may also receive reports of access issues for a title the library no longer owns (or never owned). Much of the information and documentation necessary to determine your access rights can be found in your licenses, ILS, e-resources >

The 3 Fundamentals

Fundamental 1: *Know your content.*
Fundamental 2: *Know your authentication models.*
Fundamental 3: *Know your systems.*



management system (ERMS), organizational financial system, or in email correspondence. Make sure you know where to find all the relevant information.

Accidental subscription lapses happen either when the publisher fails to send a renewal invoice or the library fails to pay it. Without a recorded payment in their system, some vendors automatically turn off access to content. Often access is restored once a resolution has been reached regarding the lapsed subscription. Surprisingly, users often report access issues for canceled or never-owned titles. Knowing the order and payment status for each reported access problem can keep you from wasting valuable time troubleshooting something you don't have rights to access.

Titles occasionally transition from publisher to publisher. Without adequate notice of these transitions, libraries may lose access because new content is only available on the new platform. Access can be restored by contacting the new publisher, activating access, and setting up access in your library's ERMS. Be aware that access to older content may only be available from the former publisher on its platform. Also, take care to research whether perpetual access to older volumes is accessible on the new or old platform (or both). This information impacts long-term access and can easily be lost in the shuffle. Sometimes, if no existing license is in place, you will need to negotiate a new license with the new publisher before access is granted.

Publishers, like libraries, are managing large amounts of entitlement information; sometimes mistakes happen. These mistakes, which can be the fault of either publishers or libraries, can restrict or extend the amount of content you are able to access. New processes, policies, systems, or human error is often to blame. Check to make sure there are no errors in your ERMS or other systems that control access. If everything is accurate on your end, contacting your publisher representative with detailed information about the lack of access is a good next step toward restoring the access.

Excluded or disappearing content is a frustrating problem to solve. Access to specific volumes, issues, and articles can sometimes be lost without warning. Moving access walls can place previously accessible volumes and issues behind a paywall. Specific articles in an issue may be inaccessible when the provider no longer has the rights to share the content. Additionally, libraries provide access to an increasing amount of freely available content that might move behind a paywall or disappear completely when the open access provider ceases to exist (or can no longer fully support their endeavor).

Many of the above situations could be mitigated with improved communication and e-resource management processes by both libraries and publishers. It should go without saying that when access to one title is lost, you should check to make sure other titles from the same publisher are not impacted. It's not uncommon for one small issue to expand into something larger.

KNOW YOUR AUTHENTICATION MODELS

What should you tackle next? Another important area to focus your attention on is the authentication model used by your organization. It's critical to understand who your authorized users are, how your e-resources are accessed, and the ways in which your organization handles authentication, both generally and for library resources.

First: Who are your authorized users? Your contract with the vendor will typically detail which users are authorized to access the licensed resources. For higher-education institutions, authorized user groups often include current students, faculty, and staff, along with walk-in users. For public libraries, these may be community members and/or library cardholders. For corporate libraries, these will likely be your organization's employees.

Each organization needs to arrive at a clear understanding of what constitutes a current user. For example, are continuing education students considered current students? Are visiting faculty considered current faculty? What about those with emeritus status? Are volunteers working in a laboratory considered current staff? Make these decisions thoughtfully and with consideration of your contract terms. Additionally, you should know which categories of users can have remote (off-site) access to library e-resources. Common contractual terms in higher-education institutions allow remote access for current students, faculty, and staff, but not for walk-ins. Knowing who the users are and how their roles impact e-resource access on- or off-site is an important first factor when troubleshooting access issues.

In addition to understanding your users' access rights, know the authentication methods by which your e-resources are accessed. IP-based authentication (whereby the vendor provides access to content based on the IP address of the user) is the most common access method for library e-resources, but occasionally, users will need a site-specific username and password, or you may need to install a resource onto a local drive or server.

If, as is likely, most of your resources utilize IP authentication, it may be easier to take an inventory of e-resources that use other means of authentication. Make sure you are knowledgeable in how authentication works for those resources. (Of course, if your primary authentication method is not IP-based, instead make note of the exceptions to whatever that authentication method is.) Vendors with IP-authenticated resources need to store a list of IP addresses that, in most cases, represents the IPs of your entire organization along with the IPs of your authentication systems (e.g., proxy server). Any edits to the IP addresses stored with the vendor, or any changes to the IP addresses of your organization, can affect access for your users. Communicate your organization's IP range changes to publishers as soon as reasonably possible.

A basic understanding of authentication technologies in use at your organization will help you quickly identify access issues related to authentication. Building a relationship and meeting with your organization or library information technology (IT) staff will increase your understanding of authentication in your environment and expedite communication and resolution to specific issues. If possible, it's a good idea to have someone who understands the unique needs and concerns of your library as a primary contact in your organizational IT office. Common

Next Steps

Now that you've started your journey to becoming an expert troubleshooter, you may want to dig into a few more detailed articles. These recommended articles delve into troubleshooting environments, essential skills, and methods for proactive troubleshooting:

Rathmel, A., L. Mobley, B. Pennington, A.Chandler. "Tools, Techniques, and Training: Results of an E-Resources Troubleshooting Survey," *Journal of Electronic Resources Librarianship*, 2015, 27(2):88–107.

Carter, S. & S. Traill. "Essential Skills and Knowledge for Troubleshooting E-Resources Access Issues in a Web-Scale Discovery Environment," *Journal of Electronic Resources Librarianship*, 2017, 29(1):1–15.

Mortimore, J. M. & J. Minihan. "Essential Audits for Proactive Electronic Resources Troubleshooting and Support," *Library Hi Tech News*, 2018, 35(1):):6–10.

authentication tools you probably need to learn about include proxies (e.g., EZproxy), single sign-on (e.g., Shibboleth Consortium, OpenAthens), and virtual private networks (VPN; e.g., Cisco AnyConnect). IT offices can also provide you with a list (and any future updates) of IP addresses which are needed for IP authenticated resources.

The last pieces of information you'll often need to solve authentication and authorization problems are details about the user experiencing the issue. If possible, ask a few common questions of users who are having issues, as this can be key to resolving the problem:

- What is your relationship with or role in the organization (if you can't determine that yourself)?
- Where were you when you tried to access the resource (e.g., on- or off-site)?
- How were you connected to the internet (mobile device, wired computer, Wi-Fi)?
- From what website were you trying to access the resource?

With these pieces of information and the general knowledge you've already gathered about authentication and authorization in your organization, you will be well-positioned to resolve any access issues related to those functions.

KNOW YOUR SYSTEMS

Finally, it's important to understand what systems are part of your library's e-resource access environment and how those systems communicate. This is especially critical for identifying the potential points of failure that are often the root cause of access issues. Depending on your role, you may work extensively with your library's ILS, link resolver, or ERMS. Or perhaps you manage a proxy server or a discovery layer. All of these systems—and possibly others—likely play a role in ensuring that your users can access electronic resources. Unless you work in a very small library, you probably do not manage all of these systems yourself. Knowing what all of the systems are that support access to online content, along with the broad outlines of how those systems communicate with one another, is a key step toward becoming an effective troubleshooter.

This task may seem overwhelming at first, especially if you are working in a new or unfamiliar e-resources environment. One helpful way to make the task more manageable is to treat it as an information-gathering exercise. Begin by making a list of all of the systems you know play a role in your environment. Once you've made the list, sketch out the connections between those systems (where you can do so). There will likely be both systems and connections that you aren't sure about. Make note of who in your organization can help you fill in the blanks and follow up with them. As an added benefit, you will have learned whom to contact when problems arise with systems you don't directly manage.

Once you've mapped out the systems in your e-resource environment and have a rough idea of how they communicate with each other, the next step is to determine what the result would be if any of the systems or their connections failed. For example, how does an authentication failure look different from a link resolver failure? You will also want to figure out how and when the user's entry point affects her ability to access desired content. A user trying and failing to access an ebook she discovered via the library's catalog is probably not experiencing the same type of failure as a user who is trying and failing to access an article via an OpenURL sent to the link resolver from a third-party database.

The exercise of matching up access failure scenarios to the systems and communication paths involved in those failures can greatly improve your troubleshooting efficiency. That's because, in many cases, you will be able to immediately identify the likely causes for various common access problems as they are reported. Furthermore, you'll be well on the way to documenting your best practices for troubleshooting, which will make it much easier to teach others how to triage or resolve e-resource access problems.

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