

Slamming Spamming

Tech Tips

WWW Everyone

Spam of the email variety is easy to spot. It's a message (sometimes two or three!) from someone you've never heard of, advertising something that you'd never use or touting some opinion that you would rather do without, and, while it appears in your inbox, it isn't actually addressed to you.

And we all also agree on what we want done about spam — we want to get rid of it and never get any more. The first step is hitting the delete button. But would you like to do something more active? Don't send a flaming reply; that won't accomplish anything, except to confirm that your email address is a good one. What's the right way? Read on for instructions on how to complain about spam and for hints on how to avoid it.

The Origins of Spam

The term spam was originally used in Usenet newsgroups to describe identical commercial or off-topic posts made to multiple newsgroups. It has since been expanded to include ordinary email messages, both **UCE** (unsolicited commercial email) and **UBE** (unsolicited bulk email). (If it's on the Internet, it must have an acronym!)

The use of the name of a canned lunch meat for these postings and messages was inspired by a Monty Python skit in which a group of Vikings sing, "SPAM, SPAM, SPAM, ..." in the background, eventually drowning out all other conversation. Spam certainly is doing that, particularly on Usenet, even though most news servers, including ours, run programs that identify many incoming spam posts and drop them without distributing them.

The Internet wasn't born with spam. In fact, spam on the Internet has a birthday, and I remember it — I saw several copies of the first widely known spam message. It was sent in 1994 by a law firm

advertising their services for obtaining green cards through the U.S. Immigration and Nationalization Service's Diversity Visa lottery. Posting the ad to 6,000 Usenet news groups took them less than 90 minutes. Thousands of people sent flaming email responses back to the firm, which had used its own email address in the posting. The replies swamped the firm's ISP, which responded fairly quickly by terminating their account. (There's a copy on the Urban Legends Web site: http://www.urbanlegends.com/legal/green_card_spam.html)

The lawyers behind the Green Card Spam, Laurence Canter and Martha Siegel, went on to further spam glory, including writing a book about spam, *How To Make A Fortune On The Information Superhighway*. The book's title explains why spam is still flourishing — it works. Not well, but at the price — virtually free — spammers don't need much of a response rate to turn a profit.

Why Email Spam is Bad

Face it; there's always been spam — door-to-door salespeople, junk snail mail, telemarketing. What makes email spam worse than other forms of spam? Annoying as the others are, they have a built-in control that keeps them from being too destructive — they cost the spammer either money or time or both.

There are no such controls on email spam. Sending email spam is virtually free for the spammer. There are software tools that can send millions of copies of a message out in a matter of minutes and there are lots of enterprising people who are anxious to sell spammers the millions of email addresses they'll need to do it. No self-respecting spammer uses their own ISP's outgoing mail services anymore; that might cost them their account. But they don't need to. There are always thousands of

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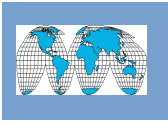
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Everyone



Novice



Expert

other machines on the Internet running poorly configured SMTP services that spammers can use.

Email spam does, of course, cost. When we receive spam, we pay for it in time, aggravation, and perhaps charges for connect time. Businesses pay for it in the time lost as their employees sift through spam to get to their real email, in their network administrators' time, in congestion on their local networks, and in connection charges. And we all pay for the congestion that spam causes on the Internet as a whole.

How to Complain

The simplest thing you can do with spam is to delete it as soon as you receive it. But if you feel that you must do something more, and some people who worry about spam think you should, here's how to complain.

Don't complain about spam by replying to the spam message or by trying to send email to an email address given in the body of the spam and asking to be removed from the mailing list.

That worked in 1994, but spammers are much too sophisticated now for replies to affect them at all. And the **From:** addresses in spam messages are usually faked anyway.

What you should do instead is complain to the ISPs that the spammer used. While there are exceptions, ISPs are generally very interested in keeping their systems free from spam, both because it gives them a bad name and because it takes resources from paying customers.

Step 1: Find the machines the spam traveled through.

Unfortunately, figuring out where a spam message really came from isn't as easy as you might hope. You have to look at the message's extended headers — the header fields that most email programs don't display unless you tell them to. "Reading Email Headers" on page 4 explains how to display and interpret extended email headers, in particular, the **Received:** headers that you'll read to follow the trail that the spam message took.

(Probably took, that is. Each legit mail server the message passes through will add its own **Received:** header, but it's quite possible for spammers to add faked **Received:** headers when they send their spam. So the machine that that appears to be the

originating server may not have anything to do with the spam at all.)

As an example, let's consider the spam message in figure 3, page 5. It's a real spam message, but the domain names and IP addresses in it have been altered. It:

Originated at a dialin connection, perhaps in Atlanta, belonging to **bigisp.net**, line ③. Went through a server in Spain, **qrd32565.qrd.es**, a.k.a. **spanishisp.com**, lines ② and ①. And the **From:** address is on a server in the United Kingdom, **englishisp.com**, line ⑥.

Step 2: Check the body of the note for email addresses or Web sites.

If there are email addresses or Web sites in the body of the spam message, add their "upstream providers" to your list of addresses to complain to. Unlike the **From:** address, these probably *do* have something to do with the spammer. Again, don't complain to the actual addresses — aim your complaints to the ISPs that provide them service.

There aren't any Web sites mentioned in the spam in figure 3. There is an email address, **orderdisknow@freeisp.com**, so we can add **freeisp.com** to the complaint list. (The real "freeisp.com" is a provider of free email accounts.)

Step 3: Find an email address on those machines to send your complaint to.

Most ISPs have an email address for complaints about abuses of their services. It's **abuse@domain.name** often enough that you can just send your complaint there: **abuse@bigisp.net**, **abuse@spanishisp.com**, and so on. If a message to an abuse address bounces, try re-sending it to the **postmaster** account.

If you want to be sure your message will be seen by a real person, you can look the machine's IP address up in Network Solution's Whois database. DShield.org's Whois lookup page is a good way to query Whois: **http://www.dshield.org/ipinfo.php** The data returned includes the name and contact info for a technical contact person for the machine.

(DShield is a new Web-based Internet intrusion detection complaint service; it collects and analyzes the intrusion attempt logs kept by personal firewalls such as ZoneAlarm. Personal firewalls were introduced in the April/May/June 2000 issue of the *A3C Connection*.)

Do you run a Unix machine or an NT server?

Then you might be helping spammers by running an open email relay. If you think your machine might be an open relay, check out our "Sendmail and Open Mail Relays" Web page, **http://www.uic.edu/depts/accc/ecom/openrelay.html**, which explains how to close open relays on several popular flavors of Unix.

What about spam on Usenet?

Spam is more broadly defined in Usenet newsgroups. Anything that is not related to the group's subject can be considered offensive. Many groups also have specific restrictions on ads and binaries. Complaints about Usenet abuse should be directed to the news administrator at the poster's site. At UIC, that's: newsmaster@uic.edu

Step 4: Compose and send your complaint.

Sending a note saying, "You spammed me, stop it now." won't help anyone.

Unless you include a copy of the spam message and all its headers, the ISPs won't be able to do anything about your complaint.

- ✓ Always include a copy of the spam message with your complaint, *including full headers.*
- ✓ Always forward the spam to the address you're complaining to rather than replying or creating a new message. Forwarding keeps the message's original headers intact.
- ✓ Make sure your complaint is before the body of the spam. ISPs get spam just like the rest of us; if your message looks like spam, they'll probably just delete it.
- ✓ Send only one complaint per ISP per spam message. Sending multiple messages won't get your complaint acted on any faster.

Speaking as someone who has to reply to spam complaints now and then, please remember that you're complaining to the ISPs that the spammer is using, not to the spammer. So please keep your complaint short and polite.

Don't expect to receive personalized replies.

While it is true that most ISPs are happy to receive complaints about people who are misusing their services, it is also true the people who take care of these complaints at most ISPs are overworked. And they're likely to have already received other complaints regarding the spam you're complaining about. So you'll probably receive an automated "Thank you for your information" reply. I think that's just fine. I'd rather they spend their time closing the spammers down than sending replies to me.

Spam Complaint Web Pages

Does this all seem like too much trouble? These Web sites offer free spam complaint services.

Spam Cop: <http://spamcop.net/>
Network Abuse Clearinghouse:
<http://www.abuse.net/>

Keep in mind that "free" doesn't mean anonymous. These services could be abused, so they're careful not to respond to false complaints.

Or you can forward your spam email to the U.S. Federal Trade Commission's spam collection address: uce@ftc.org
(<http://www.ftc.gov/os/1998/9806/email.htm>).

Figure 1: A Eudora Filter

To create a filter in Eudora, select **Tools→Filters**, then click **New**. The default mailbox for the **Transfer To** action is **In**; click on the mailbox bar to select another one. Make sure you put this general filter after all your specific filters. Say, for example, one that moves all your incoming email from LISTSERV or LSOFT lists into its own folder.



For the originating ISP and the ISPs of addresses or Web sites in the body of the spam:

"This unsolicited email message appears to be from one of your users. Please take appropriate actions to ensure it doesn't happen again."

For ISPs used as relays:

"This unsolicited email message appears to have been relayed by one of your machines. Please take appropriate actions to close this open relay."

Tricks to Minimize Email Spam

There's nothing you can do to prevent spam. But if you get a lot of it or if it really bothers you, there are some things you can do to protect yourself from it.

Never Reply To Spam

The people who worry about spam say you can reduce the amount of spam you receive by never responding to spam email, either directly or by visiting the spammer's Web site. That just identifies you as a real person who read their message.

This includes replying to spammers' offers to remove you from their mailing lists. The only exception is if the email in question isn't really "unsolicited" — say, if it's from a company that you've done online business with. Then unsubscribing is worth a try. You may even get an apology.

Use Email Filters

Even if you can't avoid spam altogether, you can keep it from clogging up your inbox. Most spam email isn't addressed directly to you. So, you can set up an email filter to move all messages that aren't

addressed directly to you into a separate mailbox. The Eudora filter in figure 1 does just that.

You don't want to delete these messages without looking at them; there will be some that you want to read or save, such as messages from LISTSERV or LSOFT lists and also email sent to you as a **Bcc:** — blind carbon copy.

Use Usenet Wisely

In the old days, I used to post to Usenet newsgroups that are open to the entire world. In the old days, I used to get a lot of spam email, too. The spam-to-real-email ratio for my judygs@uic.edu email address has dropped steadily since I stopped using it to participate in public newsgroups. This is purely circumstantial evidence, but a lot of other people have noted similar circumstances.

Unfortunately never posting to Usenet groups won't prevent you from getting spam, and I've got circumstantial evidence to demonstrate that too. Another of my accounts, adabyron@uic.edu, is only used for demonstration purposes and has never posted to any Usenet newsgroup — I don't think I've sent more than ten email messages from it in all. It gets about as many spam messages as judygs@uic.edu does.

Switch to Email-Based Discussion Lists

I was able to quit using Usenet because I found *closed* email-based discussion groups — LISTSERV or LSOFT lists for which no one except for the group's owners can request subscriber lists — that cover the technical topics that I commonly want to discuss. I was lucky; it's entirely possible that you won't be able to do this.

Use a "Throw-away" Address on Usenet

Open an email account on one of the free email services available on the Internet, such as Yahoo! or Hotmail. Use that address when you post to public Usenet newsgroups or when a Web page requires you to enter an email address, and decide that you'll

live with whatever spam that account accumulates. Free accounts generally have a small inbox and/or automatic deletion of older (unread) email — both are good antispam measures.

The bad news is that some Web pages refuse to accept this kind of email address.

Fake your own From: address:

Take a hint from the spammers — avoid getting spam by using a somewhat faked version of your own email address when posting to a public forum or newsgroup. Include some text that makes your address indecipherable to an automated program but easy enough for a person to figure out. For example, I could use this **From:** address:

judygsTAKEOUT@uicREMOVE.edu

This would make my netid and domain name useless to the average harvester, but people should know what to do with it. (Read "Help I've been Spammed! What do I do?" by Greg Byshenk before you do this, though; he explains how to do it right: <http://www.byshenk.net/ive.been.spammed.html>)

If your newsreader or your ISP won't let you do this, you could use a Web-based Usenet service such as Deja.com instead (<http://www.deja.com/usenet>). They don't have any problems with your using an altered **From:** address.

About UIC Usenet Groups

The UIC-only Usenet groups — ones whose names start with **uic.**, including all the ones used by UIC classes — are restricted to distribution on the UIC campus. The restriction is made based on IP address, like most other UIC-only Internet services. This means that only a harvester program that was run on the UIC campus could be used to capture email addresses from posts to these groups. That's not impossible, but it does make it a little harder to harvest UIC addresses.

Comments are welcome; please send them to Judith Grobe Sachs, judygs@uic.edu

What about the other SPAM?

Hormel Foods, the makers of SPAM, the luncheon meat, is good-natured about the use of their trademarked name for unsolicited email. They only ask that we use spam in all lower case for the email and save SPAM in all upper case for their product. Visit their Web site, <http://www.spam.com>, which celebrates "The one in good taste." There's even a SPAM fan club and, of course, SPAM "stuff", including SPAM boxer shorts if you're so inclined.

Reading Email Headers

Tech Tips

Email headers are the lines at the top of an email message that are used by servers on the Internet as they deliver the message. Your email program normally shows you only the standard **To:**, **From:**,

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Subject:, and **Date:** headers, but there are more. The most important header when you want to complain about spam is **Received:**, which tells you the route the message took when it was sent to you.

Figure 2: Headers of a Legit Email Message

These are the slightly altered, complete headers of a normal email message.

```
Return-Path: <judygs@myisp.com>
❶ Received: from daedalus.cc.uic.edu [daedalus.cc.uic.edu [128.248.155.70]]
  by email1.cc.uic.edu (8.9.3/8.9.3) with ESMTP id SAA16958
  for <judygs@email1.cc.uic.edu>; Wed, 6 Dec 2000 18:35:07 -0600 (CST)
❷ Received: from postbox.myisp.com (smtp.myisp.com [111.208.131.20])
  by daedalus.cc.uic.edu (8.9.3/8.9.3) with ESMTP id SAA01839
  for <judygs@uic.edu>; Wed, 6 Dec 2000 18:38:48 -0600 (CST)
❸ Received: from myisp.com (local212.myisp.com [111.208.141.212])
  by postbox.myisp.com (8.10.2/8.10.2) with ESMTP id B70X2E26999
  for <judygs@uic.edu>; Wed, 6 Dec 2000 18:33:02 -0600 (CST)
❹ Message-ID: <3A2EDAF4735272@myisp.com>
❺ Date: Wed, 06 Dec 2000 18:34:03 -0600
❻ From: Judith Grobe Sachs <judygs@myisp.com>
X-Mailer: Mozilla 4.61 [en] (Win95; I)
X-Accept-Language: en
MIME-Version: 1.0
❼ To: Judith Grobe Sachs <judygs@uic.edu>
Subject: Hi there!
References: <5.0.0.25.2.20001128152553.00f90cd0@mailserv.uic.edu>
Content-Type: text/plain; charset=us-ascii
Content-Transfer-Encoding: 7bit
X-UID: 7
```

Figure 3: A Typical Spam Email Message

These are the complete headers, altered to protect both the innocent and the guilty, and part of the body of an actual spam message.

```
❶ Received: from spanishisp.com (qrd32565.qrd.es [111.125.139.235])
  by postbox.myisp.com (8.10.2/8.10.2) with SMTP id eA03121
  for <judygs@myisp.com>; Sun, 19 Nov 2000 18:14:14 -0600 (CST)
Received: (qmail 20320 invoked from network); 19 Nov 2000 08:50:54 -0000
❷ Received: from dialup35.atl.bigisp.net
  (HELO dialup35.atl.bigisp.net??111.122.81.67?) (111.122.81.67)
  by qrd32565.qrd.es with SMTP; 19 Nov 2000 08:50:54 -0000
❸ Received: from
  by dialup35.atl.bigisp.net with ESMTPT; Sun, 19 Nov 2000 03:39:01 -0400
❹ Message-ID: <00000ee45f1f$000003dcf$00004947@>
❺ Date: Sun, 19 Nov 2000 03:38:48 -0400
❻ From: flyfish64@englishisp.com
❼ To: <Undisclosed.Recipients>
Subject: 60 million email addresses on CD + 17 million More
MIME-Version: 1.0
Content-Type: text/html; charset="iso-8859-1"
X-Priority: 3
X-MSMail-Priority: Normal
```

60 million email addresses on CD and a bonus of 17 million more, for \$389 Never offered before and never offered again.

...

All orders placed up to that time will be shipped on the 5:30Pm Last of day pickup. Ad \$10 for overnight Delivery! Call 888 555 1212 or email your order to <mailto:orderdisknow@freeisp.com>

PS Then this sale and outrageous price ends forever Monday at 4pm No exceptions.

You can instruct most email programs to display the full headers of any message that you receive. While viewing the message,

In Eudora: Click the **Blah Blah Blah** button.

In Netscape: Select: **View→Headers→All**

In Outlook: Select: **View→pOptions**

In Pine: Type **H**. (Requires the **enable-full-header-cmd** feature.)

In Webmail: WebMail doesn't have provisions to display extended headers. Use Eudora if you can. If not, if your email account is on tigger or icarus, you can login and use **pine**.

Figures 2 and 3 are the full headers of a normal email message and an actual, and typical, spam message. Comparing the two will give you an idea of how email travels and how spam differs from normal email messages. Except for the UIC-related items, the domain names, IP addresses, and email addresses in the headers have been altered.

The domain names and IP addresses in **Received:** headers are those of the actual machine that performed the service. These headers can be faked, but it's harder to do than faking **From:** addresses.

Received: Headers

The **Received:** headers of any email message will tell you where the message originated and what route it took to get to you. That's what you need to know to complain about spam.

You read **Received:** headers in reverse order. The sequence from the *last* **Received:** header in the message's headers — that is, the one furthest down in the headers — to the *first* **Received:** header should take you from the email server where the message originated, to a local incoming email server, and finally, to your inbox.

The Last Received: Header:

The last **Received:** header(s) in any message should identify (1) the first email server that handled the message and (2) its intended recipient.

For example, consider line ❸ in figure 2:

```
Received: from myisp.com (local212.myisp.com ...)
  by postbox.myisp.com (...) with ESMTP id ...
  for <judygs@uic.edu>; Wed, 6 Dec 2000 ...
```

Compare this with the equivalent line in the spam message, line ❸ in figure 3.

```
Received: from
  by dialup35.atl.bigisp.net with ESMTPT; Sun, ...
```

The spam's header gives us very little information about where it originated and doesn't say anything about whom it's to go to. This is common in spam. The "dialup35.atl.bigisp.net" domain name is altered; in real life it was a dialin line that I believe is in Atlanta, Georgia. It belongs to a really big ISP.

The lack of a "from" address in the spam's **Received:** header most likely means that the spammer used SMTP services on their own machine to send the message; most spam-generating software comes with basic sending mail services built-in.

Line ② is the next **Received:** header in both messages. In figure 2, line ② shows a simple trip from myisp.com to daedalus.cc.uic.edu, a mail server at UIC that handles incoming email. Line ② in the spam message is more interesting:

```
Received: from dialup35.atl.bigisp.net
(HELO dialup35.atl.bigisp.net??111.122.81.67?) ...
by qrd32565.qrd.es with SMTP; 19 Nov 2000 ...
```

The 111.122.81.67 and qrd32565.qrd are altered too, but the .es isn't; .es is the upper level domain for sites in Spain. This says that our spammer choose to send the message first to a machine in Spain.

The top **Received:** header, line ① in both messages, describes the final delivery of the message. The spam's top **Received:** header has additional information about the route it took:

```
Received: from spanishisp.com (qrd32565.qrd.es ...)
by postbox.myisp.com (...) with SMTP id eA03121
for <judygs@myisp.com>; Sun, 19 Nov 2000 ...
```

More altered domain names and IP addresses, but a quick **nslookup** (see below) on the real names

confirmed that the domain names qrd32565.qrd.es and spanishisp.com are associated with the same IP address, so they point to the same machine. In real life, that machine belongs to company in Spain.

So, the **Received:** headers, lines ③, ②, and ① in each message, give us the route that the message took. The spam message's route is quite suspect: from a dialup, perhaps in Atlanta, through a machine in Spain, and then to Chicago. And that's for a message whose stated sender is in the United Kingdom. (See the **From:** header below.)

About the Top Received: Header

Whether spam or legitimate email, the first **Received:** headers in any email message will always involve a local machine. Messages delivered to uic.edu addresses will have a first **Received:** header like the one in figure 2, line ①:

```
Received: from daedalus.cc.uic.edu (...)
by email1.cc.uic.edu (...) with ESMTP id ...
for <judygs@email1.cc.uic.edu>; Wed, ...
```

*The mention of a local machine in the top **Received:** header is correct and does not mean that that machine (daedalus, eeyore, or winnie, for example) is participating in sending spam. It's just delivering your incoming email to your account like it's supposed to do.*

Other Headers

From: headers in spam messages are usually fake, and generally aren't much use. The spam's **From:** header, line ⑥, makes it seem that the message came from a fly fishing site in the United Kingdom. It is probably faked.

The **Message-ID:** header should tell you where the message originated; its value is an id number, followed by "@", followed by a machine name (consider line ④ in figure 2). The spam's **Message-ID:** header leaves out the machine name:

```
Message-ID: <00000ee45f1f$00003dcf$00004947@>
```

Not much help here, either.

There's More Online

Space in the newsletter is limited; for more about email headers, check out this article online: <http://www.accc.uic.edu/newsletter/adn29/>

Comments are welcome; please send them to Judith Grobe Sachs, judygs@uic.edu

nslookup: Matching Host Names and IP Addresses

The **nslookup** command allows you to match a machine's Internet domain name (such email1.cc.uic.edu) with its IP address (such as 128.248.150.51) or vice versa. There's a **nslookup** command tigger and icarus. It's in WS Ping Tools in the Windows Network Services Kit (or you can open a DOS window and enter the **nslookup** command directly). There are also various **nslookup** Web sites, including InfoBear's <http://www.infobear.com/nslookup.shtml>.

Most **nslookup** utilities determine the search type from the format of the input. I logged into tigger to run these **nslookup** commands:

```
>nslookup email1.cc.uic.edu >nslookup 128.248.150.51
Server: uic-dns2.uic.edu Server: uic-dns2.uic.edu
Address: 128.248.7.50 Address: 128.248.7.50

Name: email1.cc.uic.edu Name: email1.cc.uic.edu
Address: 128.248.150.51 Address: 128.248.150.51
```

(Wondering what the email1.cc.uic.edu here and in figure 2 is? My email account is on mailserv, which, at this time, is a cluster of two Unix machines. My account happens to be on the second of the two machines, email1. The first is email0.)

Designing Accessible Web Pages

Tech Tips

Calling all Web designers! Surely you want to give your audience the same thing that you want as a Web user: effective and efficient navigation to the most useful information on your pages. And the way you design your site will have a direct impact on how accessible it is to those who surf your pages.

At UIC, your target audience probably includes faculty, staff, and current and prospective students, not to mention outside faculty, parents, and many others. You should keep in mind that such a diverse audience will include people with disabilities; people without fast Internet connections, big monitors, or the latest technology; and people who use mobile computing devices.

The Accessibility Goal

When designing a Web site, keep this goal in mind: creating a Web site that allows for the effective and efficient navigation of information on your pages *by everyone who surfs the site*. Because many different people will surf your pages, the way you design your site has a direct impact on how accessible it will be for them.

While reading this article, consider your current Web site or a site you frequently surf. Is the site accessible? If not, how would you make it accessible? Read on to find out! And after you make your site accessible, enter it in the university-wide Web accessibility contest. (See "UIC Web Accessibility Contest" on page 11.)

Creating Web Pages

Creating a Web site is quite easy. Hypertext Markup Language (HTML) is used to create the page. HTML is a set of tags, or codes, that describe how the information is to be presented on the page. Although some developers enter HTML codes manually as they create a page, people who are less familiar with HTML may use a "What You See Is What You Get" (WYSIWYG) editor. On our campus, Dreamweaver is frequently used for this purpose. However, for the most part, it doesn't matter what you use to create a Web site. It's the way you design your Web site that is critical!

This article was contributed by Joy Hyzny, Office of Disability Services

She would be happy to help you with any access problems or questions you might have. Contact her at 312-413-0886 or by email at jhyzny1@uic.edu.

WWW Everyone

The Importance of Web Design

Access to All

How many Web pages do you surf on a daily basis that are difficult to read and confusing? Chances are you have come across many pages that have not been designed with accessibility in mind, allowing visitors to be able to locate information and content in an effective and efficient manner.

Accessible sites are especially vital for people with disabilities. As Tim Berners-Lee, World Wide Web Consortium (W3C) director and the inventor of the World Wide Web, says, "The power of the Web is in its universality. Access by everyone regardless of disability is an essential aspect." (From the W3C's Web Accessibility Initiative (WAI) page:

<http://www.w3c.org/WAI/>)

Legislation

There are several legislative mandates or factors specific to Web accessibility and/or institutional responsibilities in providing access to all students. These include: Sections 504 and 508 of the Rehabilitation Act of 1973, the Americans with Disabilities Act, and Section 255 of the Telecommunications Act. California, New York, and Texas are among the states that have published access policy documentation. Refer to <http://www.w3.org/WAI/References/Policy#US> for more information.

Web accessibility is also being emphasized and implemented in higher education. The University of Wisconsin-Madison has just adopted a Web access policy; you can obtain specific information at: <http://www.wisc.edu/wiscinfo/policy/wwwap.html>

Web Accessibility at UIC — An Example

In August, Walter Edelberg, an associate professor in the Department of Philosophy, created a text version of the department's Web page after being notified that the home page on their site was inaccessible. At that time, most of the links on the Department of Philosophy home page were clickable areas within an

image map, leaving all the information about courses and similar offerings completely inaccessible to students using screen readers.

Walter made several improvements to the design and style of the department's Web pages in order to improve access. He cited a number of vital reasons for achieving Web accessibility, including the following: "(1) Making your department's Web site accessible is in your department's interest: you will reach a wider audience. (2) It is unfair to deploy education materials (including information on your department) that are inaccessible to some students, when those materials could be made accessible to all without too much trouble. (3) It conforms to federal laws. (4) Users without disabilities also benefit: the accessible site loads faster and it's easier for everyone to use."

I asked Walter about the greatest benefit of knowing about Web accessibility. He replied, "Before learning about 'Web accessibility,' I didn't know that software screen readers and Braille displays are available to help make Web content available to people with disabilities. Now I know that if we do our part, our department Web site can be used with these devices. Knowing about Web accessibility has also helped me to design course Web sites that are cleaner and easier for everyone to navigate."

You're probably wondering how long it will take to make your Web site accessible. It took Walter only one afternoon to create an accessible version of the department's 63-page site. The approach that Walter used was to "deploy two versions of our Web site: the original one (with graphics), and an accessible version (text only). A link near the top of the graphics version takes users to the text-only site. To make the text-only pages, we simply copied the entire site to a new folder, then removed images and background graphics from the copied files. We added a site map to the accessible version to make it easier for all users to navigate."

At first, it took Walter some time to become accustomed to making changes on both versions when updating the site. By now, though, Walter says that it's becoming routine. So it does not necessarily need to take a long time to make an inaccessible site accessible. Furthermore, keeping Web accessibility guidelines in mind as you work will help you to design a site from the beginning that will provide you ultimate access from the start.

The Department of Philosophy's text-only pages *are* being used. The department uses the Webalizer program on tigger

(<http://www.uic.edu/depts/accc/webpub/webalizer.html>) to track the number of hits and users.

Walter stated, "In November 2000, we had a total of 1413 hits on our six main section home pages. Of these, 13 percent were on the accessible versions of the pages. For the undergraduate section, that figure jumps to 28 percent."

For additional information about designing accessible Web pages, see :

<http://www.uic.edu/depts/accc/webpub>

Making Your Web Page Accessible

The following recommendations will provide you with ideas to make your Web site accessible:

Web Access Essentials:

- ✓ Add descriptive ALT text tags to all graphic images. ALT text tags allow a person using a screen reader to obtain a better understanding of the Web page's content. In most browsers, the ALT text also appears in small window when the mouse cursor is placed over the image.
- ✓ Use appropriate descriptions for hypertext links. Avoid using "click here" without providing information about why the link is important. Descriptive link text is also good for the Web search engines that categorize pages by the text with which they are linked.
- ✓ Provide a site map to alleviate confusion among your various Web pages.
- ✓ Provide column headings, table headers, and a table summary if you use tables. Keep in mind that tables, if not designed correctly, can be very difficult to understand for people using screen readers.
- ✓ Stay away from frames — they do not have the necessary level of access.
- ✓ Use cascading style sheets (CSS) to ensure that Web pages that are similar in structure are also similar in appearance. Web pages that have a consistent layout are easier for everyone to navigate efficiently. The key here is to ensure that the page's style offers good organization.
- ✓ Create Web pages using "relative" font sizes. This will allow the user to access the site with their own browser settings.

Users without disabilities also benefit: the accessible site loads faster and it's easier for everyone to use.

Accessibility Standards:

The Architectural and Transportation Barriers Compliance Board (Access Board) has recently published "accessibility standards for electronic and information technology covered by section 508 of the Rehabilitation Act Amendments of 1998." To find out more about requirements and timelines, visit: <http://www.access-board.gov/sec508/508standards.htm>

- ✓ Choose text colors that provide enough contrast from the background color and vice versa, so that the text is easy to read.
- ✓ If the initial page in your Web site is not as accommodating as it could be, create a text-only version of it. The link for the text-only version of the page should be located near the top of the Web page. Ideally, however, your initial page should be accessible enough that a text-only version won't be necessary.

Additional Tips:

- ✓ Provide essential material on your initial (home) page.
- ✓ Avoid placing too much information on any one page.
- ✓ Set your pages up so that the user will not need to perform multiple mouse clicks to get to basic material and will not need to navigate from one end of the screen to the other repeatedly.
- ✓ Avoid using abbreviations, or be sure to type the information out, followed by the abbreviation.
- ✓ Use correct HTML code and *validate the code*.
- ✓ If you decide to use additional media (audio, video, graphic, etc.), make the information it contains accessible in an alternative form.

W3C Web Accessibility Initiative

To assist you with the process of designing accessible sites, the World Wide Web Consortium (W3C) has created the Web Access Initiative (WAI) guidelines. The latest Web Content Accessibility Guidelines (Version 1.0) were released in May 1999 and can be found at:

<http://www.w3.org/TR/WCAG10/#Guidelines>

The W3C WAI guidelines take into consideration the needs of your visitors and the manner in which they access the Web. Good Web design will incorporate access to Web pages for those using different agents or platforms — i.e., computer, phone, etc. — and operating within different environments — loud, visually restrictive, etc. (<http://www.w3.org/TR/WAI-WEBCONTENT/>)

W3C Quick Tips

When you're first starting, the W3C WAI guidelines might be a bit overwhelming. In that case, you might prefer the W3C Web Access Initiative's ten

"Quick Tips" listing fundamental considerations for accessible Web pages (<http://www.w3.org/WAI/References/QuickTips/#QuickTips>). You can also contact Joy Hyzny from the Office of Disability Services at 312-413-0886 for further details.

Navigating a Web Page From the Perspective of a Surfer With a Disability

People with disabilities frequently use **assistive technology products**. These products are designed to provide a method for performing a specific activity. The assistive technology products designed specifically for computer access include: screen magnifiers and readers for people with visual disabilities; alternative input devices, ergonomic mouse options, and voice recognition for people with physical disabilities; and touch screens for people with cognitive disabilities. This is by no means an all-inclusive list.

These products provide people with disabilities an avenue to access the computer. Unfortunately, however, no available technology can intuitively interpret the various aspects of Web page design.

Visual Disabilities — Screen Magnifiers

For people with limited vision, there are software programs that will magnify information on the computer screen. ZoomText is one such program. It provides options that allow the user to customize the amount of magnification he or she needs.

Overall Structure of the Page

A major factor in Web design that hinders access when using screen magnifiers is the organization of the page. When people with visual disabilities surf your page using a screen magnifier, they will only have a partial view of what each page actually looks like. They will thus be at a disadvantage if your pages require an overall view to understand them. Headings, lists, consistent structure, and, in particular, the use of the same cascading style sheets for each page's layout and style will help organize your pages.

A repetitively structured site will provide people using a screen magnifier — or people with small monitors — with the necessary tools to know what to expect when linking to the next page. Consistency is a good thing!

Unfortunately, however, no available technology can intuitively interpret the various aspects of Web page design.

Visual Disabilities — Screen Readers

By using appropriate hardware (a speech synthesizer) and a software program (a screen reader), people with visual disabilities can listen to information on the Web page as it is read aloud. Window-Eyes and JAWS are two commonly used screen readers.

Graphics and the ALT Tag

One of the major factors that contribute to poor Web access when using screen readers relates to graphic images. Screen readers read basic text. Therefore, graphics that do not contain an ALT text tag will not be read. The ALT tag provides the screen reader with textual information about the graphic image. This is vital if there is a link within the graphic. If no ALT tag is present, the user will have no idea that the link exists, denying them access to essential information.

It is extremely easy to add an ALT tag in either Dreamweaver or basic HTML. If you have a graphic image that displays “LogIn”, for example, an appropriate HTML code you can use to include it might be something like:

```
<IMG SRC="loginphoto.jpg" ALT="LogIn">
```

In Dreamweaver, you can indicate the ALT text by clicking on the image and typing the text in the **Alt** field in the **Properties** inspector box. (Select **View**→**Properties** to open the Properties box.)

Reading Tables

Another major consideration when designing Web pages for use with screen readers is to understand that a screen reader reads information line-by-line, from left to right, just like we do when we read standard text out of a book. It is easy to get confused when a screen reader reads Web pages with rows and columns.

Whenever you use a table in a Web page, consider designing it with the rows as columns (that is, order the information from left to right instead of top to bottom) to ensure greater access and understanding of the table when it is read by screen readers. Providing headers and a summary of your table is another way to make your table more accessible.

Frames and Drop Down Menus

Frames and drop down menus are also problematic for people using screen readers. Although the WAI provides some ideas for using frames, the accessibility is still low whenever you use them. And remember that frames cannot be bookmarked.

Therefore, Web page designers should avoid frames at all cost.

Additional Accessibility Features

There are accessibility features built in to Windows 95, 98, and 2000, as well as in various Web browsers. Internet Explorer (IE), for example, has numerous settings that allow for greater access.

For more information about Internet Explorer’s accessibility features, select **Help** from the Internet Explorer menu bar, then **Index**, then **Disabilities**, **Access for**. For information on Windows accessibility features, click **Start**, then **Help**. Click on the book icon beside **How To** to expand the How To menu, and browse the **Set Up Windows Accessibility Features** menu.

Testing Your Page

There are several specific ways to check your page for accessibility. A couple of common programs allow the Web page designer to type in their Web address (URL) and perform a check based on the W3C WAI guidelines. Bobby, <http://www.cast.org/bobby>, is most commonly used for this. UsableNet’s LIFT, <http://www.usablenet.com>, is another program that can be especially helpful in identifying and resolving accessibility issues.

These programs will not do everything for you; they overlook many accessibility features. For example, they cannot examine the page’s overall organization.

How Accessible Is My Web Page?

As part of your Web page evaluation process, it is a good idea to view it in a text-only browser such as Lynx or by turning off the graphics in Internet Explorer or Netscape. It is also helpful to view your page using several versions of both Internet Explorer and Netscape to ensure maximum access.

For example, here’s how to check your page using Internet Explorer.

First, open your page in Internet Explorer and examine it to make sure you know where all the graphics are. Then, when you are ready to turn pictures off, select **Tools**→**Internet Options**→**Advanced**, scroll down to Multimedia, and uncheck **Show Pictures**. Click the **OK** button and Refresh your display. (Click the **Refresh** icon — two arrows on a sheet of paper — or select **View**→**Refresh**.) The page will now appear without

ALT tags are vital if there is a link within a graphic. Without them, a user using a screen reader will have no idea that the link exists.

Copies of this newsletter are available in an alternative format.

Call Joy Hyzny (312-413-0886) or Judith Grobe Sachs (312-996-3758) to obtain it.

pictures.

There are additional Multimedia features that you can select to get a better idea of how your page will be read by a screen reader. Go back to **Tools** → **Internet Options** → **Advanced** → **Multimedia**. Make sure that the following boxes are not checked: **Play Animation**, **Play Videos**, **Show Image Download Placeholders**, **Smart Image Dithering**, in addition to **Show Pictures**. Now check your page again.

You can also try using the **Tab** key to navigate your pages and obtain a better sense of how screen readers navigate. Using tabs is the only way to move around in a text-only browser. If you've never used one, log into your icarus or tigger account and try it. Enter: **lynx your.page.uic.edu**
You should find it instructional.

Follow these steps with several of your Web pages.

Resources

W3C's Web Accessibility Initiative:

<http://www.w3.org/WAI>

UIC Office of Disability Services: <http://www.uic.edu/depts/counselctr/disability/diswebpg.htm>

A-Prompt: <http://aprompt.snow.utoronto.ca>

Bobby HTML validation program:

<http://www.cast.org/bobby>

Do-It World Wide Access: Accessible Web Design (1997, 2000). University of Washington:

<http://www.washington.edu/doiit>

Making Educational Software Accessible: Design Guidelines Including Math and Science Solutions: <http://www.wgbh.org/ncam> (A software program to synchronize text with A/V or pictures, etc. WGBH in Boston and funded by Trace Center.)

The National Center for Accessible Media:

<http://www.wgbh.org/wgbh/pages/ncam/webaccess/index.html>

Trace Research and Development Center:

<http://www.trace.wisc.edu>

UsableNet's LIFT: <http://www.usablenet.com>

Powell, T. A. 2000. *Web Design: The Complete Reference*. Osborne-McGraw-Hill: Berkeley.

Paciello, Michael G. 2000. *WEB Accessibility for People with Disabilities*. CMP Books: Lawrence, Kansas.

For More Information

If you are interested in more information, in a potential Web accessibility class, in help with reviewing your page using assistive technology products, or in the availability and use of assistive technology at UIC, please contact Joy Hyzny in the Office of Disability Services at 312-413-0886.

Also look for additional articles on this subject in future issues of the *A3C Connection*.

Comments are welcome; please send them to Joy Hyzny, jhyzny1@uic.edu

UIC Web Accessibility Contest

Calling all departments and units ... This challenge goes out to you! Revisit your official UIC Web pages with an eye toward accessibility, redesign them, and enter your newly accessible Web pages in the Office of Disability Services Web Accessibility Contest.

Entries will be reviewed for effective Web design techniques that optimize access and provide an informative and engaging site for all visitors. Your ability to design an interesting and accessible Web page is only limited by your creativity. Refer to the items above for accessibility tips.

A panel of judges with experience in disability, Web design, and accessible Web issues will review the entries for ultimate accessibility. The judges will consider the various accessibility and media properties that distinguish a site as exceptional.

To enter the contest, send an email message to Joy Hyzny at jhyzny1@uic.edu. Include:

- your name,
- the name of your department or unit, and
- the Web address (URL) of the page you're submitting.

All entries must be received on or before 4:00 p.m. on Friday, April 6, 2001. Winners will be notified by phone and email on Friday, April 23, 2001.

Computer-related prizes will be awarded to the faculty or staff sponsor submitting the winning entry for their particular department or unit.

The winners will be listed in the April/May/June issue of the *A3C Connection*.

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Contact us by electronic mail at connect@uic.edu; by telephone at the Client Service Office, (312) 413-0003; by US Mail at The A3C Connection, ACCC (MC 135), Room 124 Benjamin Goldberg Research Center, University of Illinois at Chicago, 1940 West Taylor Street, Chicago, Illinois 60612-7352; or by fax at (312) 996-6834.

We welcome any comments, suggestions, complaints, or requests you might have concerning the *A3C Connection*.

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