A Privacy Protection Comparison of Popular Web Browsers

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Abstract: This report compares the privacy protection options of the five latest popular Web browser versions for Microsoft Windows 2000 and MacOS X. These browsers are Microsoft Internet Explorer, Netscape, Mozilla, Opera and OmniWeb. Currently the privacy protection of browsers allows one to control cookies and images. We choose cookie and image control mechanisms as the major comparison measurement. Some additional unique privacy protection features are identified herein.

Keywords: browsers, privacy, cookies, Internet Explorer, Netscape, Mozilla, Opera, OmniWeb

1. Introduction

Consumers are increasingly concerned about invasions of their privacy due to the prevalence of data collection and targeted marketing. For example, cookies and Web bugs are widely used in web pages to track consumers' browsing patterns and/or collect personally identifiable/unidentifiable information. Recently, most popular browsers have improved their privacy protection features to reflect this concern. These features allow users to set their browsers to accept, reject or flag certain cookies and images. In this report,

we compare the privacy features of five latest popular Web browser versions for Microsoft Windows 2000 and MacOS X. We aim to indicate the advantages and disadvantages of popular browser privacy features and provide a reference for our privacy trustworthiness assessment project.

This report is organized as follows. Section 2 summarizes the privacy features of popular browsers for MacOS X and Microsoft Windows 2000. Section 3 provides a detailed comparison of these popular browsers in a tabular format. Section 4 summarizes the privacy features of three additional browsers for Windows 2000. Section 5 provides several insights about the popular browsers' privacy features. Finally, in Section 6 we provide several images of the privacy preferences settings dialogue boxes for each of the popular browsers examined in this report.

2. Popular Browsers' Privacy Features [Test Date: 06/25/02]:

This section provides an analysis of the privacy features of popular browsers as tested on two platforms: Microsoft Windows 2000 and MacOS X. In our analysis we observed that the latest version of two browsers for each platform offers different privacy management support; specifically IE 6 for Windows and IE 5.2 for MacOS X as well as Opera 6 for Windows and Opera 5 for MacOS X. In contrast, the latest privacy management features in Netscape and Mozilla for both platforms are basically equivalent. The distinguishing characteristics of these browsers are detailed in Table 3.1.

Internet Explorer

Microsoft Internet Explorer is one of the most popular browsers. The unique privacy feature of IE 6 is that it provides a "Privacy Report" for the page you are visiting (Figure 6.1). The report displays all the links to image files, .js files, .css files, etc. on this page. Also if a website is P3P compliant, you can click the "Privacy Summary" button (Figure 6.2) to view the summary of the website's privacy.

IE 6's cookie control mechanism is flexible but not as good as that of Netscape 7. Users can choose the privacy setting level (block all cookies, high, medium high, medium, low, accept all cookies) for their browser to apply different cookie control strategies (Figure 6.3). If some cookies are restricted, IE 6 will prompt before storing these cookies on the machine. However, it does not provide tools

to manage stored cookies as Netscape and Mozilla do. IE 6 does not provide mails and newsgroups cookie control. The image control mechanism is not as flexible as Mozilla's or OmniWeb's; it only asks whether to display images or not. IE 6 does not prompt before loading an image, nor does it differentiate first-party and third-party images.

It is interesting to note that IE 5.2 for MacOS X has the function to manage stored cookies, whereas IE 6 for Windows, Microsoft removed this function.

Netscape

Netscape 7 provides greater user control over cookies than all other popular browsers (Figure 6.6). It can control cookies in mails and newsgroups. The privacy setting level (Figure 6.7) is as flexible as IE 6. You can customize your cookie control settings and the Cookie Manager (Figure 6.8) allows users to manage stored cookies. However, it does not generate a privacy report like IE 6. The image control mechanism is the similar to IE 6 (as described above).

Mozilla

Mozilla 1.0's privacy preferences settings are similar to Netscape's. Its cookie control function (Figure 6.9) is a subset of Netscape's but it provides a better image control (Figure 6.10) through its Image Manager. It offers superior image control compared to the other analyzed browsers. Mozilla can prompt before loading an image; it also differentiates 1st party and 3rd party images.

Opera

Opera 6's cookie control is very limited. The only thing worth mentioning is that Opera 6 provides a server filter tool (Figure 6.12) that allows users to control cookies not only from a specific website, but also from a specific domain (domains including both doubleclick.com and .com). Opera also provides three additional checkboxes in the privacy preferences settings (Figure 6.11): (1) enable referrer logging; (2) enable automatic redirection; (3) use cookies to trace password-protected documents.

OmniWeb

OmniWeb 4.1 is a web browser designed for MacOS X. OmniWeb has a unique function that can block standard sized ads (Figure 6.14). OmniWeb also allows users to choose “don’t load anything from web sites matching specific expressions” or not. Although OmniWeb 4.1’s cookie control is not flexible, you can set default actions for new cookies (Figure 6.13). This is a distinct feature.

3. Browser Comparison Summary Table

Browser	Internet Explorer		Netscape	Mozilla	Opera		OmniWeb
OS Platform	**Win2000**	**MacOS X**	**Win2000 MacOS X**	**Win2000 MacOS X**	**Win2000**	**MacOS X**	**MacOS X**
Browser Version	**6.0**	**5.2**	**7.0 PR1**	**1.0**	**6.03**	**5.0**	**4.1**
Cookie control	Flexible	Not flexible	Flexible	Not flexible	Not flexible	Not flexible	Not flexible
Differentiate 1st and 3rd party cookies	Yes	No	Yes	Yes, but limited	Yes	Yes, but limited	No
Control cookies in mails and newsgroups	No	No	Yes	Yes	No	No	No
Prompt before storing a cookie	Yes	Yes	Yes	Yes	No	No	Yes
Maximum lifetime of cookies control	No	No	Yes	Yes	No	No	No
Manage stored cookies	No	Yes	Yes, through cookie manager	Yes	No	No	Yes
Per Site Cookie Control	Yes	Yes	Yes, but limited	Yes, but limited	Yes (also per domain cookie control)	Yes (also per domain cookie control)	Yes, but limited
Privacy level settings	Flexible	No	Flexible	No settings at all	No settings at all	No settings at all	No settings at all
Privacy summary	Yes	No	No	No	No	No	No
Privacy report	Yes	No	No	No	No	No	No
Image control	Yes (but very limited, only allows you to set *show images or not*)	Yes (but very limited, only allows you to set *show images or not*)	Yes	Yes, and even better than Netscape 7.0 (through image manager)	Yes (but very limited, only allows you to set *show images or not*)	Yes (but very limited, only allows you to set *show images or not*)	Yes, OmniWeb has a unique function that can block the ads of standard sizes
Prompt before loading an image	No	No	No	Yes	No	No	No

Differentiate 1st and 3rd party images	No	No	No	Yes	No	No	No

Table 3.1 Browser Comparison Summary

4. Other Browsers' Privacy Features [Test Date: 06/25/02]:

This section summarizes the privacy features of three other latest web browser versions, tested on Microsoft Windows 2000: NCSA Mosaic, Lynx and HotJava.

NCSA Mosaic 3.0

NCSA has not upgraded Mosaic since 1997. Subsequently this browser offers no privacy protection.

Lynx 2.8.4

Lynx is a text browser for the WWW. Subsequently it offers very little privacy protection as well (e.g., no cookie control and no image control).

HotJava 3.0

HotJava has limited privacy protection. It only asks you before storing a cookie and allows you to specify whether to display images or not. There are no additional cookies and images control features.

5. Discussion

An examination of the aforementioned popular web browsers provided several insights as we now discuss. IE 6 generates a privacy report, which other browsers do not offer. However, its cookie and image control management features are not the best. Note that in IE5.2 for MacOS X users can manage stored cookies, but not in IE 6 for Windows. We found this ironic given that the Windows version was released more recently than the MacOS X version. This suggests that Microsoft may intend to limit one's ability to manage privacy preferences in the future, in spite of their focus on P3P. Netscape's cookie control is very good. However, if it could

incorporate Mozilla's image control and Opera's per server/domain cookie control, it would be much more powerful. Mozilla's cookies control function is a subset of Netscape 7.0's but its image control is better than Netscape's (see Table 4.1). Opera has very limited privacy protection. However, it provides a server filter tool that allows both server and domain cookie control. Additionally, Opera provides three additional checkboxes: (1) enable referrer logging, (2) enable automatic redirection, (3) use cookies to trace password-protected documents. OmniWeb allows users to choose "don't load anything from web sites matching specific expressions"; set default actions for new cookies; and block standard sized ads.

6. Privacy Preferences Settings Images for Popular Web Browsers

Figure 6.1 IE 6.0 Privacy Report

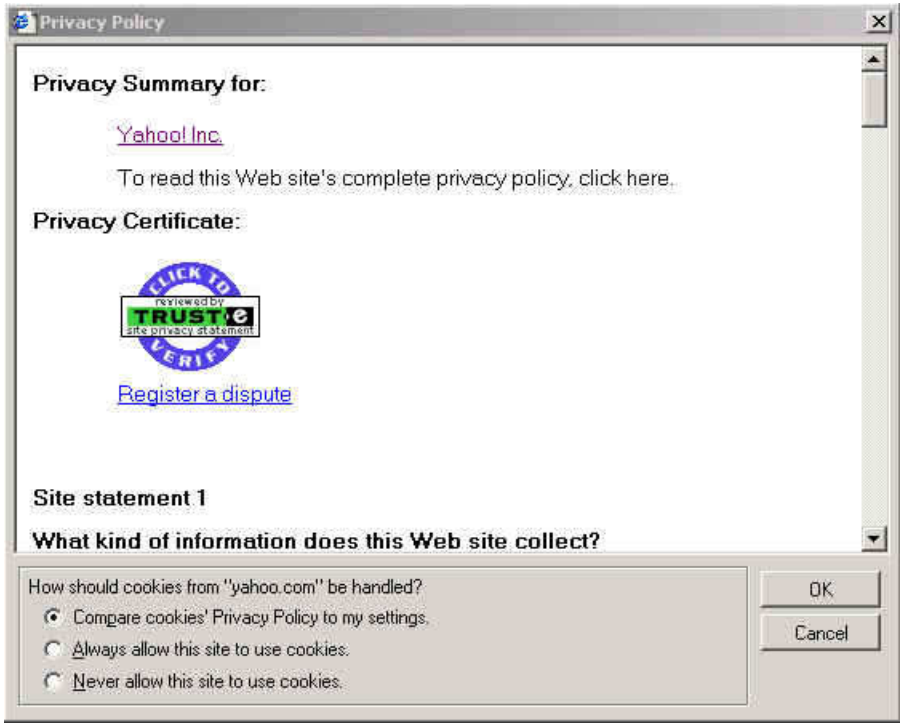

Figure 6.2 IE 6.0 Privacy Summary

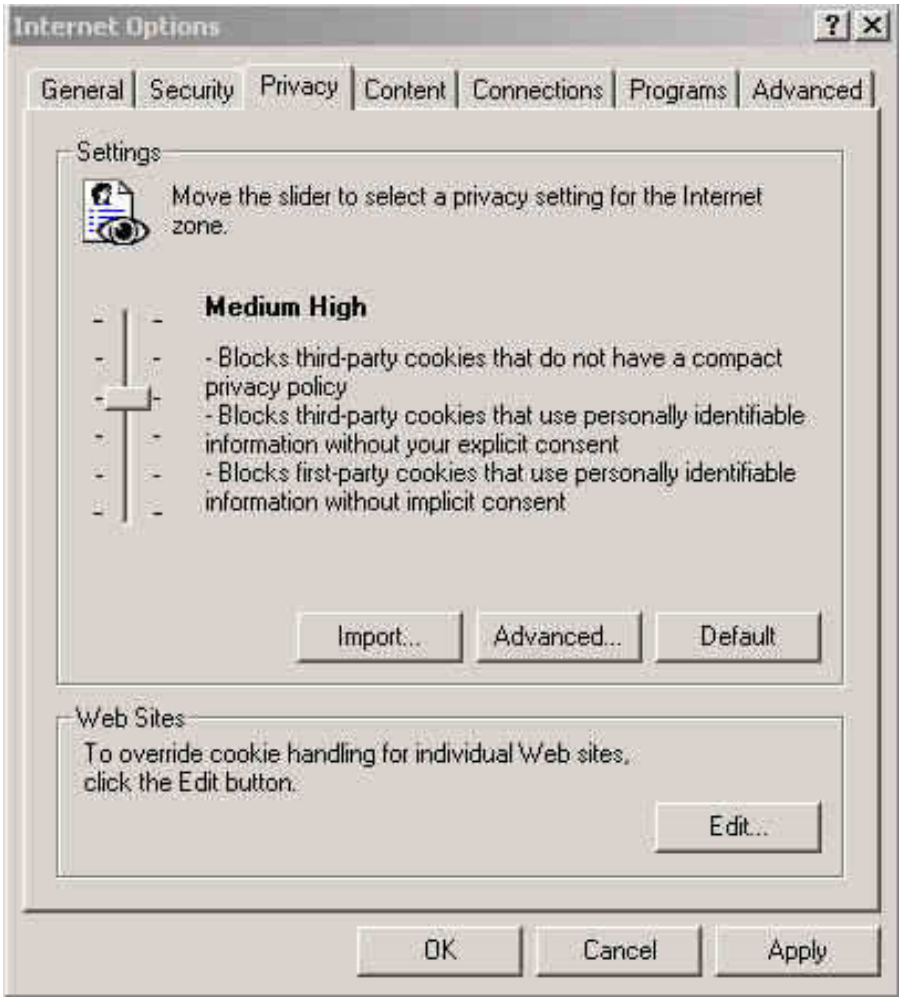

Figure 6.3 IE 6.0 Privacy Settings

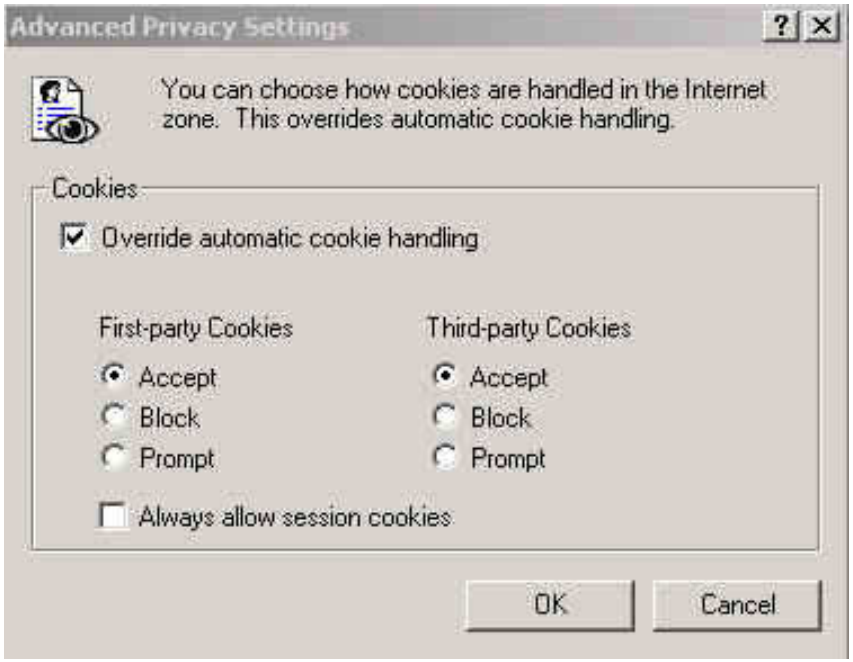

Figure 6.4 IE 6.0 Advanced Privacy Settings

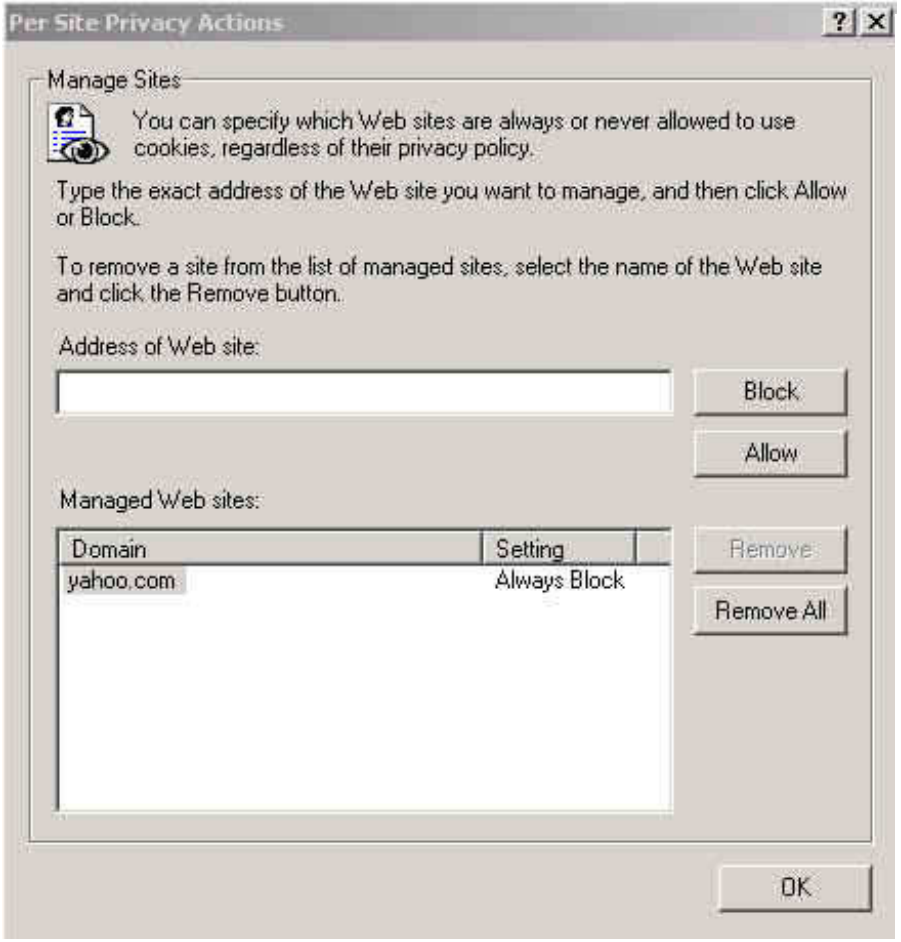

Figure 6.5 IE 6.0 Per Site Cookie Control

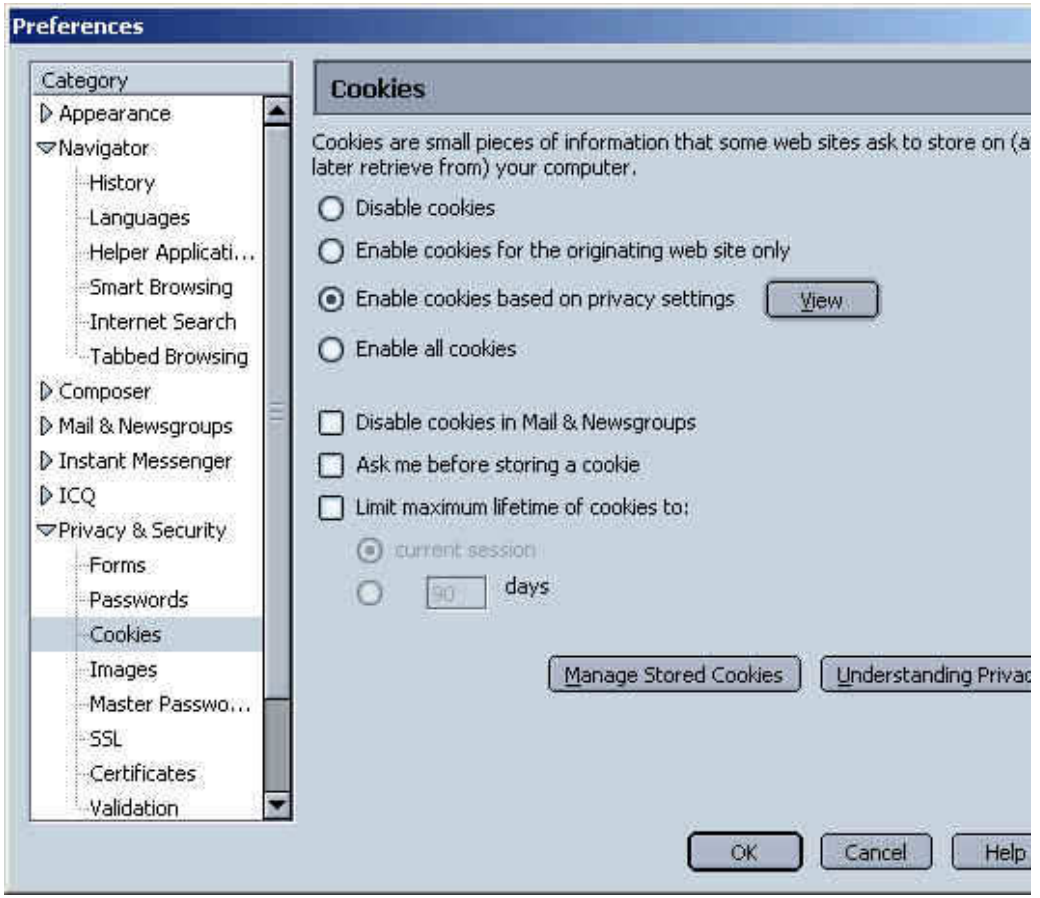

Figure 6.6 Netscape 7.0 PR1 Cookie Settings

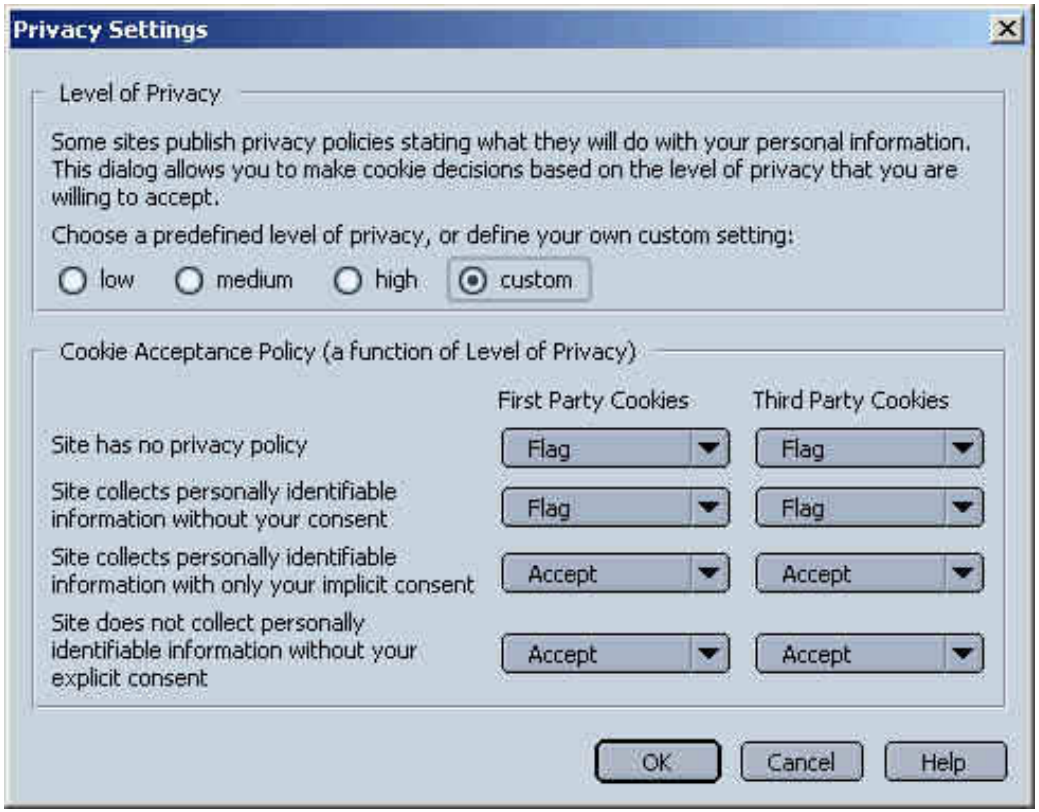

Figure 6.7 Netscape 7.0 PR1 Privacy Settings

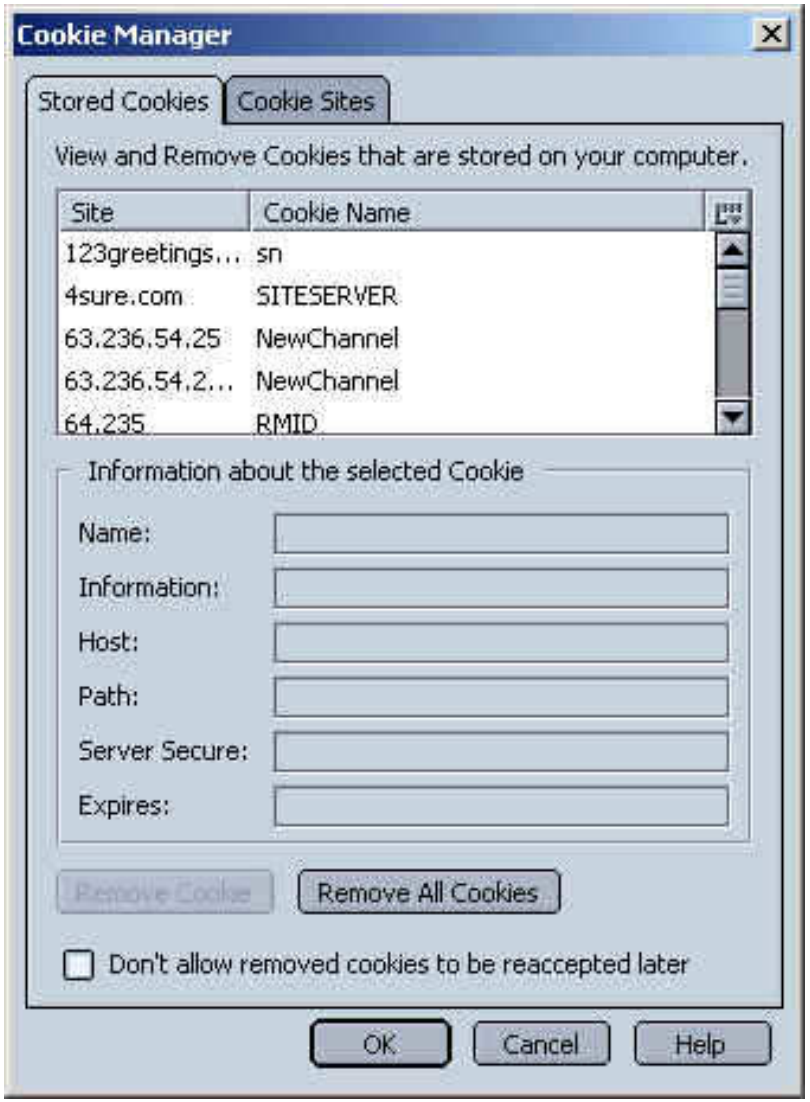

Figure 6.8 Netscape 7.0 PR1 Cookie Manager

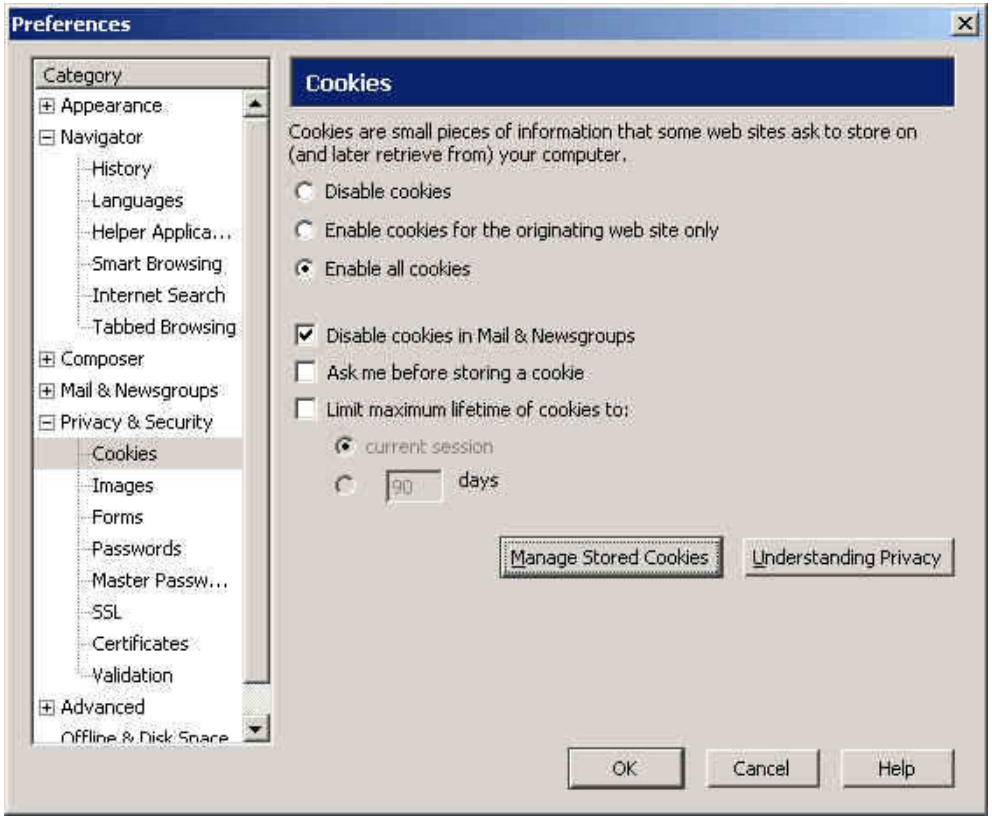

Figure 6.9 Mozilla 3.0 Cookie Settings

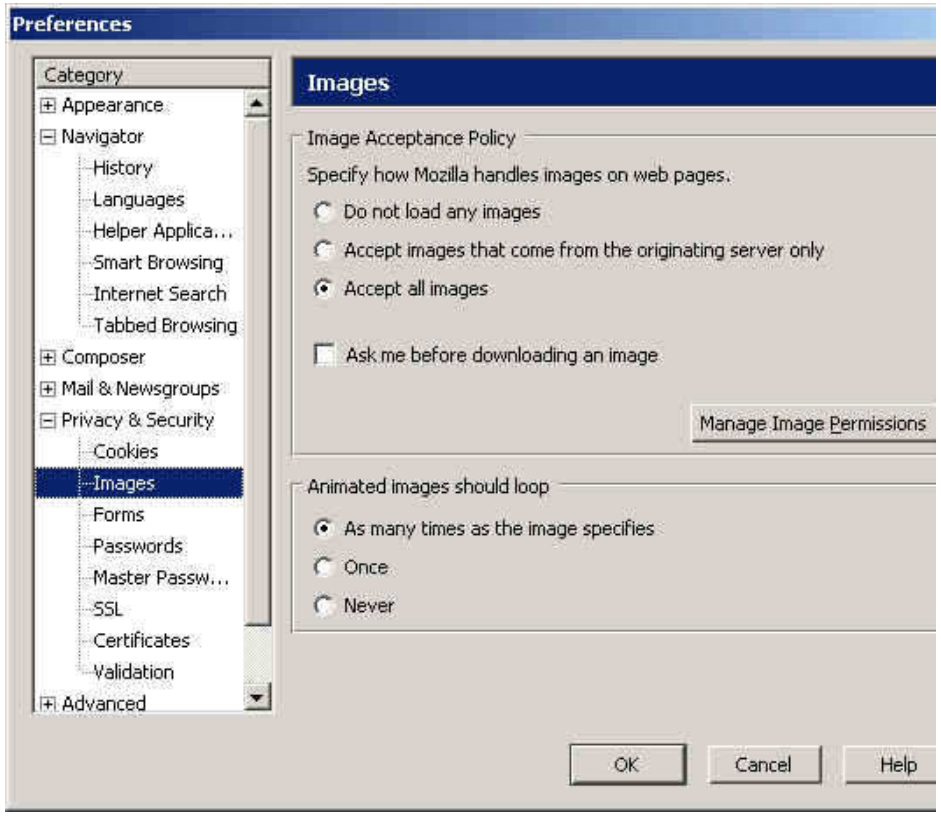

Figure 6.10 Mozilla 3.0 Image Settings

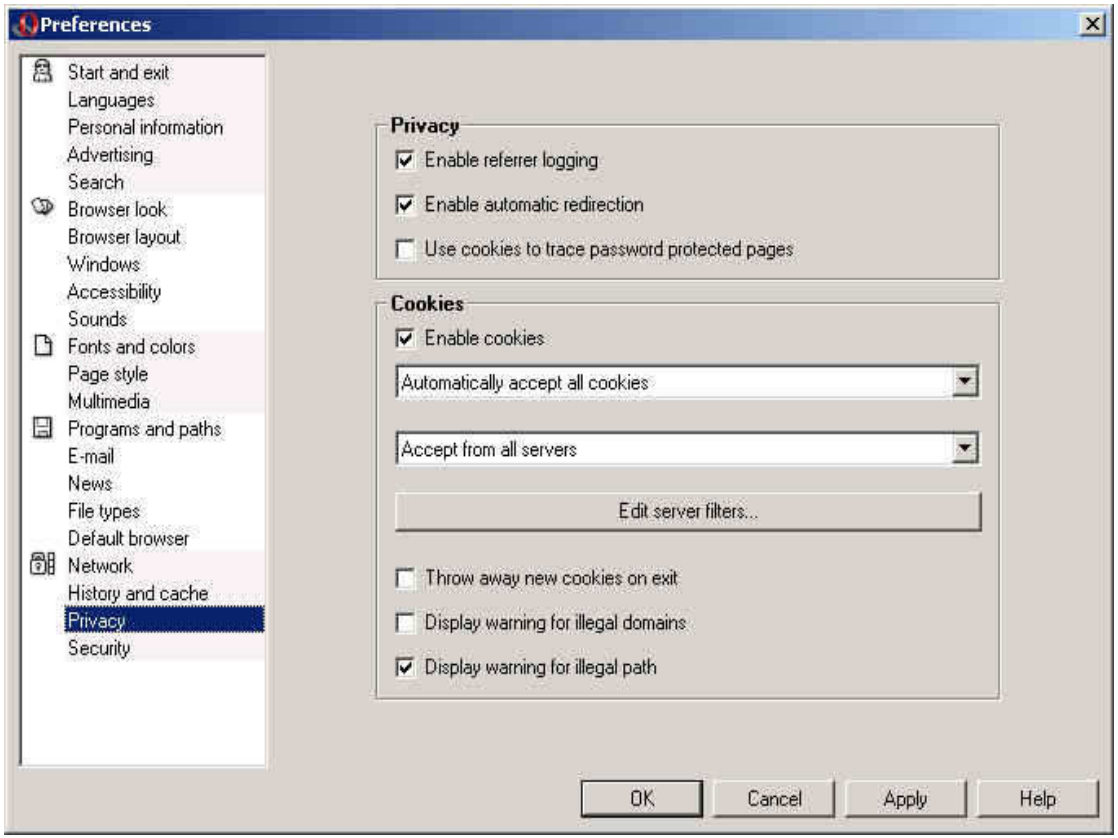

Figure 6.11 Opera 6.0 Privacy Settings

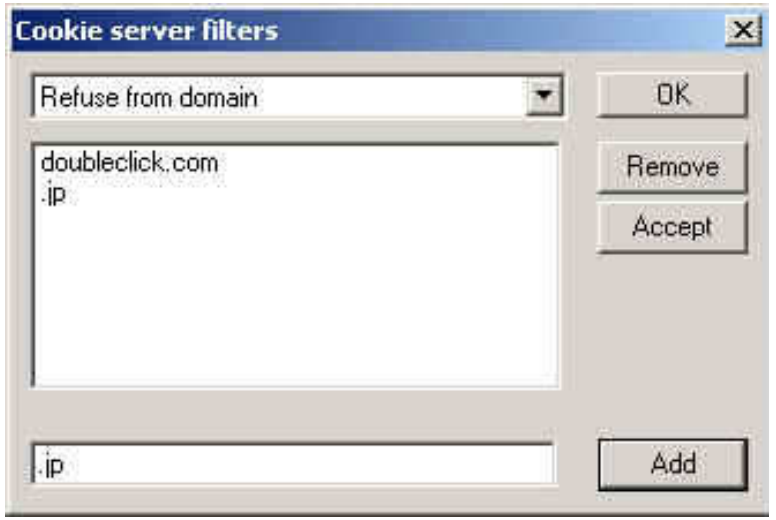

Figure 6.12 Opera 6.0 Cookie Server Filters

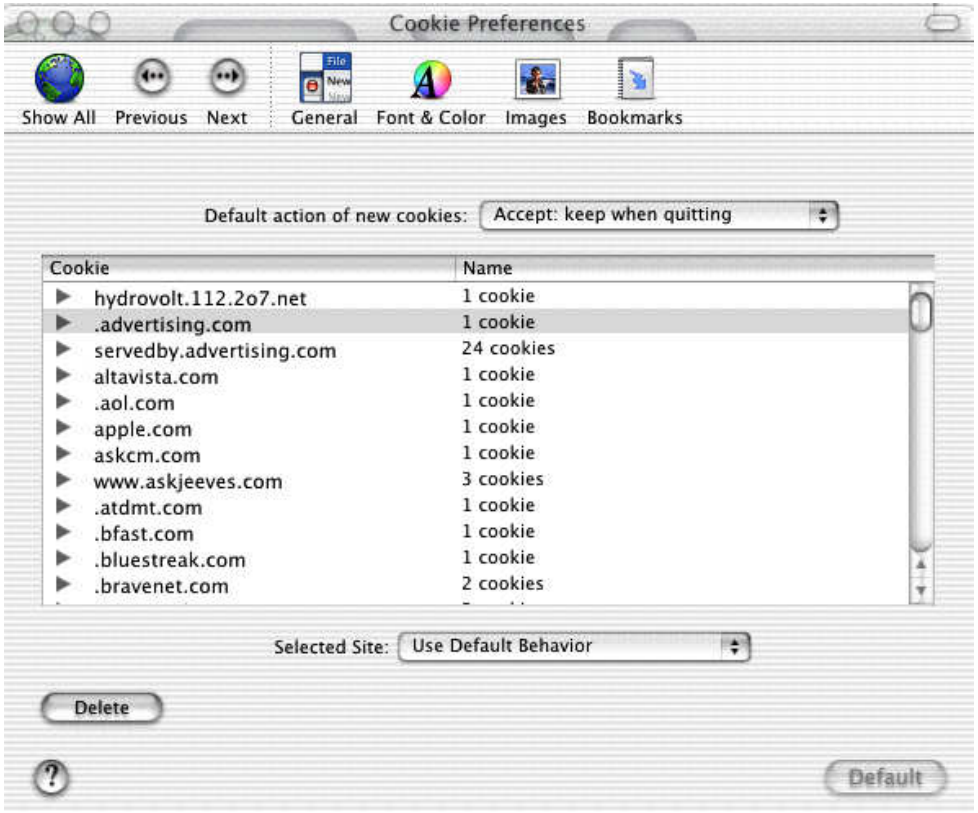

Figure 6.13 OmniWeb 4.1 Cookie Preferences

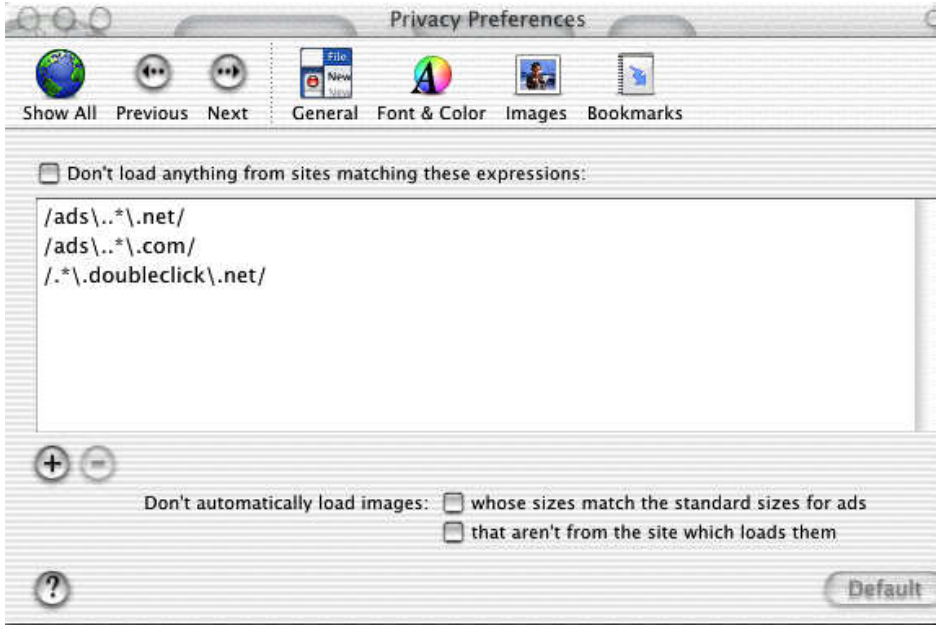

Figure 6.14 OmniWeb 4.1 Privacy Preferences Settings