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Technical report transmission

Dear professor,

Please find enclose two identical technical reports due for ENCS 282/4 section EE. These reports are submitted to you in partial fulfillment of this class. The subject of these reports is "The Web Browsers and their plug-ins, a new means of access to entertainment".

Please note that the books *JavaScriptPocket Reference, 2nd Edition* and *HTML Pocket Reference, 2nd Edition* are not hardcopy but e-books, therefore you won't find copies of their pages in appendix D. The e-book *JavaScriptPocket Reference, 2nd Edition* didn't have page numbers, therefore you won't find out which pages were used in the list of references.

Please read a copy of this technical report and appreciate the research, writing and formatting. Then mark it according to the value you award to it.

Sincerely,

Samuel Rollet

SR
CC
Enclosure: (2) technical reports.

ABSTRACT
The Web Browsers and their plug-ins,
a new means of access to entertainment
by Samuel Rollet

This report presents how the display capabilities of web browsers and their plug-ins lead to entertaining content on web pages. It reviews the evolution of web browsers. It describes their actual capabilities in language interpretation, both static like HTML and XHTML and dynamic like JavaScript. It explains that aside from text content web browsers can also display several image formats. It then talks about the background of plug-ins and how they enhance web browser capabilities. It describes how they interact with the web-browsers. It explains how to integrate plug-in related content on a web page using a language understood by the browsers. Finally it introduces the main plug-ins to display sound, video and animated contents. It concludes that web browsers are not only used to display information but also to entertain because they can display multimedia content.

Key Words: web browser, plug-in, multimedia, entertainment.

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The Web Browsers and their plug-ins, a new means of access to entertainment

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1. INTRODUCTION

Web browsers are commonly used to access web pages on the internet. Their capabilities can be extended using plug-ins to display specific content. The combination of web browsers and plug-ins allows for a display of more than just simple information. It is now possible to view entertainment content embedded into web pages. First this report will show the capability of web browsers on their own, and then how plug-ins work and how they make it possible to view multimedia content on the web.

2. WEB BROWSERS

A web browser is a program that allows users to access content on the internet. This chapter will detail how they have evolved and what kind of content they can display on their own.

2.1 Web Browsers Background

Before 1993 web browsers were only able to display text one line at a time. In summer 1993 Mosaic was launched. Developed by Marc Andreessen at the University of Illinois, it was the first web browser to display web pages in a window. It was also the first to display graphics images [1]. At the end of 1994, Netscape Navigator 1.0 was released. It was a commercial browser developed by the same team who developed Mosaic. It's not before 1996 that Microsoft decided to improve its own web browser Internet Explorer. It was the beginning of the "Browser wars". At the end of 1996, Internet Explorer was integrated to the Windows operating system [2]. The popularity of Internet Explorer has grown, attaining 96% of market share in 2002. Mozilla Firefox is a new browser based on the Netscape source code. It was first released at the end of 2004, and offers a more secure alternative to Internet Explorer [14].

2.2 Web Browsers Display Capability

Web browsers allow users not only to display content, but also to interact with web pages. This part details what kind of programming languages are used to create web pages. It also shows what other kind of content can be displayed by a browser.

2.2.1 Languages Interpreted by the Web Browsers

Web pages are coded using different languages. Some of them produce static content, whereas others produce interactive content.

2.2.1.1 Static Content of a Web Page. Static content is usually defined using one of the two languages: HTML or XHTML. HTML (HyperText Markup Language) is a markup language used to define the layout and the links between web-pages [9]. Html tags can be divided into four different groups. The first group defines the purpose of the text (title, heading…). The second defines how the text should be display (center, bold, italic, color…). The third group defines links between pages. The last one defines widget elements for form, such as buttons or textboxes [15].

XHTML (Extensible Hypertext Markup Language) is a more recent markup language, it has the same capacity has HTML, but the syntax is stricter [9] [16]. Once a web browser receives an HTML or XHTML page, it interprets the tags of the page, and displays the content between the tags according to what the tags

specify. In the example code from Fig. 1, <h2> indicates that the text enclosed is a heading of level 2 [6]. The tag <i> indicates that the enclosed text is in italic [7]. The <a> tag defines a link to the web page at the address http://www.ora.com [4].

```
<html>
<head>
<title>My first HTML document</title>
</head>
<body>
<h2>My first HTML document</h2>
Hello, <i>World Wide Web!</i>
<!-- No "Hello, World" for us -->
<p>
Greetings from<br>
<a href="http://www.ora.com">O'Reilly & Associates</a>
<p>
Composed with care by:
<cite>(insert your name here)</cite>
<br>&copy;2000 and beyond
</body>
</html>
```

Fig. 1: A very simple HTML document [9].

The design of documents written with markup languages is defined using CSS (Cascading Style Sheets) language. This language defines the color, the font, the size and the position of elements between tags of a markup language. The purpose of this language is to separate the content and the presentation of a web page [17]. In the example code of Fig. 2 the <h2> tag is defined to be displayed centered, in red, with the font Times New Roman in italic and with a large size.

```
h2 {
    text-align: center;
    color: red;
    font-size: large;
    font-family: "Times New Roman", serif;
    font-style: italic;
}
```

Fig. 2: Style definition in CSS [17].

2.2.1.2 Dynamic Content of a Web Page. Dynamic content is also possible in regular web pages using client side scripting. Client side scripting refers to programs executed by the web browser on the user's computer. It's possible to define actions to perform according to how the user interacts with the webpage. The most used client side scripting language is JavaScript. The code is embedded in a web page and executed when the user does some action [18]. In the example of Fig. 3, the tag <script> is an HTML tag that defined the enclosed text as a script to be executed by the web browser. The confirm() function tells the browser to display a dialog box. If the user clicks on the button Yes, then the browser will write the date in the document [11]. The use of HTML or XHTML in association with CSS and JavaScript to create interactive websites is known as DHTML (Dynamic HTML). This technique is used to create small applications and display them as web pages [19].

```
<script>
if (confirm("Do you want to know the time?"))
{
    document.write("The time is: " + new Date());
}
</script>
```

Fig. 3: Interaction with the user using JavaScript [11].

2.2.2 Others Contents Displayed by Web Browsers

Web browsers do not only display formatted text. The principal other kinds of content they can display on their own are pictures. They support different formats of pictures like JPEG, GIF and PNG [20]. Images are integrated using the <img> tag with the address of the image. The web browser loads the image and displays it in the webpage [13].

This chapter has shown that the abilities of a web browser are limited if it has to display the content of the web pages on its own. It is possible to extend those abilities by the use of plug-ins.

3. PLUG-INS

Plug-ins are computer programs that "expand the capabilities"[3] of another program. In web browsers, plug-ins are used to display a specific type of content inside a web page [21]. This chapter presents how they work, and what kind of entertaining content they can add to a webpage.

3.1 Plug-ins background

Plug-ins were first introduced in web browsers by the Netscape Communications Corporation on January 1996 for Netscape Navigator 2.0. The idea was to define a standard on how those extensions should interact with the web browser. This guarantees the stability of the interaction of the browser with other programs, and allows any developers to create their own plug-ins for their specific applications. Microsoft quickly integrated this technology into Internet Explorer 3.0. Plug-ins are now an essential extension to modern web browsers to display enhanced content such as multimedia [3].

3.2 How Plug-ins Work

When a web browser starts, it checks for installed plug-ins. Each installed plug-in is associated with one or more file types called MIME (Multipurpose Internet Mail Extensions) types. When a user opens a page with a media type that requires a plug-in to be displayed, the web browser performs a sequence of operations. It check for an associated plug-in for this specific MIME type. If it

finds one, it loads, initializes and executes it. If the required plug-in is not found, the web browser launches an assistant to help the user to download the appropriate one [12].

Plug-ins can be divided into two types. Windowed plug-ins are displayed in their own windows. Windowless plug-ins are drawn into the same window as the rest of the webpage that called them. Therefore windowless plug-ins extend the possibilities of design and functionality for a webpage [12].

3.3 How to Display Plug-in Content into a Web Page

Two HTML tags can be used to integrate new media into a webpage. The <object> tag is the standard HTML tag to add an element to a page. As illustrated by Fig. 4, the <object> attributes define what should be displayed, and how. CLASSID or DATA specifies the address of the file to display depending on the object type. CODEBASE specifies the address where the appropriate plug-in can be found if it's not already installed. TYPE specifies the MIME type of the data. Other attributes are used to specify the position and the size of the object. The detail of all attributes is given in Appendix 1. The <param> tag can be added between <object> and it's end (</object>) to pass information to the plug-in itself on how to display the content [8] [12].

```
<OBJECT
CLASSID="classFile"
DATA="dataLocation"
CODEBASE="classFileDir"
TYPE="MIMEtype"
ALIGN="alignment"
HEIGHT="pixHeight"
WIDTH="pixWidth"
ID="name"
>
```

Fig. 4: Object tag to integrate plug-ins content [12].

The <embed> is a nonstandard element of HTML. It works on the same principle as <object> but is less flexible. It is now only used for backward compatibility with older web browsers [5] [12].

3.4 Entertainment Plug-ins

The addition of plug-ins and a general evolution in technology allow web developers to change web pages from giving information to displaying entertaining content like videos or games.

3.4.1 Audio and Video Plug-ins

The principal plug-ins used to play audio and video files on a webpage are Microsoft Windows Media Player, RealPlayer, and Apple QuickTime Player. Those applications are stand-alone applications, but they also have associated plug-ins to be displayed as part of a webpage. They can display standard audio and video files [22] [23]. They can also play streaming audio and video files. "Streaming is the process of sending media over a network for viewing in real

time."[24] This technology is used to display live content or content that is too big to be downloaded first and played later [24].

The example given by Fig. 5 is the trailer of the "Million Dollar Baby" movie. It shows how a video can be integrated into a webpage using the Apple Quick Tine plug-in.

Fig. 5: Video displayed into a web page [27].

3.4.2 Plug-ins for Animated Content

Plug-ins are also used to integrate animated content. Most animated content is developed using Macromedia Flash or Shockwave technology. Those two technologies allow developers to create animated graphical programs. These programs can be interactive. It integrates vector and 3D technology [25] [26]. Fig. 6 gives on example of a game developed in Flash and displayed into a webpage.

Fig. 6: Example of a game integrated into a webpage[28].

4. SUMMARY

As presented in this report, web browsers have evolved to display, organize and format information and pictures. They are also able to interact with the user. Plug-ins increase the capabilities of web browsers to integrate more specific content into web pages. They interact with the browsers and the content can be added to a webpage with simple tags. A broad range of available plug-ins allows displaying multimedia contents like videos and games into the web pages. The access to entertainment on the web is therefore possible because of web-browsers and the plug-ins that extend their capabilities.

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APPENDIX A: THE <OBJECT> TAG ATTRIBUTES [29]

Optional Attributes

DTD indicates in which DTD the attribute is allowed. S=Strict, T=Transitional, and F=Frameset.

Attribute	Value	Description	DTD
align	left right top bottom	Defines the text alignment around the object	TF
archive	URL	A space separated list of URL's to archives. The archives contains resources relevant to the object	STF
border	pixels	Defines a border around the object	TF
classid	class ID	Defines a class ID value as set in the Windows Registry or a URL	STF
codebase	URL	Defines where to find the code for the object	STF
codetype	MIME type	The internet media type of the code referred to by the classid attribute	STF
data	URL	Defines a URL that refers to the object's data	STF
declare	declare	Defines that the object should only be declared, not created or instantiated until needed	STF
height	pixels	Defines the height of the object	STF
hspace	pixels	Defines the horizontal spacing around the object	TF
name	unique_name	Defines a unique name for the object (to use in scripts)	STF
standby	text	Defines a text to display while the object is loading	STF
type	MIME_type	Defines the MIME type of data specified in the data attribute	STF
usemap	URL	Specifies a URL of a client-side image map to be used with the object	STF
vspace	pixels	Defines the vertical spacing around the object	TF
width	pixels	Defines the width of the object	STF

Standard Attributes

id, class, title, style, dir, lang, xml:lang

APPENDIX B

TOPIC APPROVAL

APPENDIX C

CONFIRMATION OF ORIGINALITY

APPENDIX D: HARD COPY REFERENCES

1. John Cassidy, *Dot.con*, Allen Lane The Penguin Press, England: London, 2002

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