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Humanities and Arts: Sharing Center Stage on the Internet
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Abstract

This document is designed primarily for individuals who have limited knowledge of, or experience with, the Internet.

The purpose of this document is to provide members of the arts and humanities communities with an introduction to the Internet as a valuable tool, resource, and medium for the creation, presentation, and preservation of arts and humanities-based content.

The intended audience is practicing artists, scholars, related professionals, and others who's knowledge, expertise and support is important to ensuring the arts and humanities are well-placed in the global information infrastructure.

For purposes of simplicity this document will use the word "Artist"

to mean both Artist and Humanist: "all practitioners who work in the fields of the visual, performance, and literary arts, as well as

museum curators, librarians, and others who are involved in the research, restoration, and presentation of that which comprises our cultural heritage." (See [Section 1.1](#) for further definitions of Arts and Humanities.)

Table of Contents

- i. Conventions for this Draft..... [3](#)

- [1.](#) Introduction..... [4](#)
 - [1.1](#) Definition of Arts and Humanities..... [4](#)
 - [1.2](#) What is the Internet..... [4](#)
 - [1.3](#) What is the World Wide Web..... [5](#)

- [2.](#) What does the Internet mean to the "Artist?"..... [7](#)
 - [2.1](#) Access to the Global Community:
Museums, libraries, newspapers, periodicals, stores..... [8](#)
 - [2.2](#) Discovering the work of others..... [8](#)
 - [2.3](#) Freely Available software, and other information..... [9](#)
 - [2.4](#) Sharing your work with others..... [10](#)
 - [2.5](#) Communicating about the arts..... [10](#)
 - [2.6](#) Collaborating..... [9](#)

- [3.](#) Forums..... [11](#)
 - [3.1](#) Message Based Communications..... [11](#)
 - [3.1.1](#) Electronic mail (email)..... [11](#)
 - [3.1.2](#) Mailing list server (listserv)..... [12](#)
 - [3.1.3](#) Newsgroups..... [12](#)
 - [3.1.4](#) Electronic Bulletin Board System (BBS) [13](#)
 - [3.2](#) Real-Time Communications..... [13](#)
 - [3.2.1](#) Internet Relay Chat (IRC)..... [13](#)
 - [3.2.2](#) Multi-User Dungeon (MUD)..... [14](#)
 - [3.2.3](#) Audio/Video Conferencing..... [14](#)
 - [3.2.4](#) Whiteboard Systems..... [14](#)
 - [3.3](#) Archives..... [14](#)
 - [3.3.1](#) Searching..... [15](#)
 - [3.3.2](#) Compound Searches..... [16](#)

- [4.](#) Accessing the Internet..... [17](#)
 - [4.1](#) Getting Started..... [18](#)
 - [4.2](#) Internet Service Providers..... [20](#)
 - [4.3](#) Computer Software and Hardware Tools..... [21](#)
 - [4.4](#) Multimedia..... [22](#)

- [5.](#) Creating Content..... [23](#)
 - [5.1](#) Getting Help..... [23](#)
 - [5.2](#) Basic Design Issues: Understanding Formats..... [24](#)
 - [5.3](#) Text and Hypertext..... [24](#)

5.4	Graphic and Moving Images.....	24
5.5	Music and Sound.....	24
5.6	Content Design Issues.....	26
5.7	Publicizing your Work.....	26

- [6.](#) Issues and Challenges..... [26](#)
- [6.1](#) Security Issues..... [27](#)
- [6.2](#) Viruses..... [27](#)
- [6.3](#) Rights..... [27](#)
- [6.4](#) Conducting Business over the Internet..... [28](#)
- [6.5](#) Netiquette..... [28](#)

- [7.](#) Glossary..... [28](#)

- [8.](#) Resources..... [28](#)
- [8.1](#) RFCs..... [29](#)
- [8.1.1](#) Using RFC-INFO@ISI.EDU to retrieve RFCs..... [29](#)

- [9.](#) References..... [29](#)
- [10.](#) Security Considerations..... [30](#)
- [11.](#) Acknowledgments..... [32](#)
- [12.](#) Authors' Address..... [32](#)

[Appendix A.](#) Examples/Projects on the Internet of Interest to the Arts and Humanities Communities

[Appendix B.](#) Some other URL's of interest

[Appendix C.](#) Examples for using the RFC server RFC-INFO@ISI.EDU

i. Conventions and Notes in the March 1997 Draft.

We have agreed that testimonial sections are essential, so we need everyone to begin collecting quotes and experiences for each section.

Also every section should have many pointers to more information. Any and all input, suggestions, and submissions graciously accepted.

This draft includes the following notation to aid completion:

- At the sign of two asterisks (**) are important notes and questions.
- At the sign of two plus signs (++) information is needed. Where known a contributor is mentioned by name, otherwise, please volunteer!
- At the sign of two question marks(??) we need to decide what goes there.

[1.](#) Introduction

This document has been structured to provide information about, and examples of, the wide range of functions and capabilities inherent to online services. It will also show the potential of

networking technologies for enhancing Arts and Humanities content and interests.

The basic functions of the Internet are described, along with their application for building online communities of interest (including the Arts and Humanities).

This is followed by discussion and examples of how Arts and Humanities content can be represented, stored, and retrieved on the Internet.

Also provided are examples of hardware and software being used, and in development, to support the creation and presentation of new artistic and literary works.

In addition to illustrating the great potential of the Internet, this document aspires to provide an introduction to the issues and challenges that affect the development and presentation of arts and humanities content online.

Finally, some tools and resources have been provided to assist both novice and experienced users in benefiting from, and contributing to the global online arts and humanities community.

1.1 Definitions of Arts and Humanities

For purposes of this document the term "Arts" includes, but is not limited to, dance, design arts, folk arts, literary arts, media and film arts, music, theater, and visual arts.

The term "Humanities" includes, but is not limited to, the study of the following: language, both modern and classical; linguistics; literature; history; jurisprudence philosophy; archaeology; comparative religion; ethics; the history, criticism and theory of the arts; those aspects of social sciences which have humanistic content and employ humanistic methods; and the study and application of the humanities to the human environment.

1.2 What is the Internet?

As new users, the first question that probably comes to mind is: "What is the Internet?" The answer is: "People, computers and information electronically linked around the world by a common Protocol for communicating with each other."

The beginnings come from the US Department of Defense's desire to transport government and military information during the time of a "nuclear event". Thus the Advanced Research Projects Agency was formed, which created ARPANET. From this, over the next 26 years or so, grew the network known as "The Internet", now dubbed the "Information Superhighway". There are several million computers connected and over 40 million users.

The common language or "Communication Protocol" which these computers on the Internet speak, is the Internet Protocol, or IP.

Humanities and Arts [[draft-ietf-harts-guide-02.txt](#)]

[Page 4]

This is the underlying layer which allows transmission of diverse data, information, text, pictures, sound, etc. to be passed between otherwise incompatible machines.

The Internet should not be confused with America OnLine (AOL), CompuServe, Prodigy, and other type service providers, which may use their own, often proprietary, protocols and are sites unto themselves but may have connections to the Internet. The Internet should also not be confused with the World Wide Web which is the topic of the next section.

1.3 What is the World Wide Web?

The World Wide Web, often called, "The Web" is a vast multimedia document distributed among a large number of the computers on the internet. This document is in a format called HyperText which allows information in the web to be linked by words or pictures viewed on the computer.

The Web is broken up into a large set of pages (Web Pages) of information connected by HyperText "Links" which let you click on a highlighted word or picture to call up a page of related information. This is what differentiates HyperText from "normal" text. In "normal" text, each sentence or idea is connected in a single sequence or "train of thought", from beginning to end. In HyperText however, the flow of ideas branches out, so that each idea may be connected to many different "trains of thought" that jump from link to link. This allows you to read HyperText documents, in a way more naturally resembling human thought.

There is no central hierarchy that organizes the Web. Instead, the information is distributed among many "Web Sites" created and used by the many people involved. A Web Site is much like a magazine in that it has a Front Page, called the Home Page, and may have many other pages of related information that can be connected in whatever way the author wishes.

For example, you could create a "Cool Music" Web Page and place it on a Web Server, which can be any computer somewhere on the internet running software to provide access to the resident Web Pages. Anyone on the internet could then use a piece of software called a Web Browser to ask the Web Server to look at your Home Page.

This Home Page could be a striking artwork featuring a list of your favorite albums and a few labeled buttons. While your music plays from their speakers they choose to click on any album that catches their eye, or go to lists of information sorted by Artist, Label, or Genre. Once they get to the page for any particular album, they

would see the artwork, a song list, and many other links to follow. Clicking on a song could pull up the song lyrics, or perhaps even download parts of the song. Or they could follow a link from your page to the HomePage of the artist's record company, or to magazines

that have interviewed the band. If the information is out there, your page could link to it.

Web pages are written in a format called HTML, the HyperText Markup Language. This is a protocol for putting special symbols into a text document that specify links to other pages, fonts to use, images to load, and many other things. It is simple enough that most people can learn to use it, but rich enough in possibility that there will always be a thriving community of people making web pages for others.

In order to download information from distant places in the internet, your computer will be using a protocol called HTTP, the HyperText Transfer Protocol. HTTP was designed to allow web browser software to connect to web server software on another machine and request the transmission of a web page in the form of an HTML document and any associated images, audio, video, etc.

Since any part of a page can link to any accessible data on the Internet, each link must include a reference to exactly where on the internet the information is. This is the job of the Uniform Resource Locator, URL. The URL is very much like your home address. When you tell someone your "address", you give your postal code, country, state, town/city, street, building, and your name.

A URL is a machine readable (and hence somewhat cryptic) text string which tells both people and machines where to find the information. It contains the name, directory, machine, host address, and the protocol for accessing that information. URLs usually take the form "http://www.something.com", where "www" indicates the locations World Wide Web server, "something" indicates the name of the organization who runs it, and "com" indicates that that organization is a Company. Other extensions which indicate types of organizations, are ".gov" for US government sites, ".edu" for educational sites, and ".org" for other organizations such as "not for profit", etc. There are also specific extensions for each country in the world, such as ".CA" for sites in Canada, ".nl" for sites in the Netherlands, etc.

http in this example is the protocol used to access it. Since http is the primary protocol of the web, many browsers now assume it, and you will likely only need to know the protocol being used if its different from http. Other protocols include "ftp", the File Transfer Protocol, and "gopher" which are both text based, rather than graphic based. (See also [Section 3](#) - Forums)

After the communication protocol and site address are identified, the document's URL can go on to specify a particular page at the site. The example above will retrieve www.something.com's default homepage, usually index.html. The .html extension on that filename indicates

that the file is formatted with the HyperText Markup Language. Other file extensions might be .txt for standard format Text files, .gif for Graphic Image Format files, .jpg, another graphics format, .wav for certain audio files, and many others.

You can start browsing the Internet, or "surfing" as its often called, by entering a URL into your web browser, which will download the appropriate file. If you then select a link, your browser will read the URL built into the page itself, and use it to find and access the appropriate information.

At last check there were hundreds of thousands of web sites, home pages, and hosts on the Web. The contents of those sites are almost as varied. Some pages are personal pages containing photos of family members, lists of hobbies, or the sharing of collections such as song lyrics. Some pages are strictly business, selling everything from abalone to zymoscopes. (If you're interested in doing business over the Web, please read Sections [6](#) and [10](#) on Security.) Still other pages provide services such as information searches, and weather reports.

2. What does the Internet mean to the Artist?

The internet is exerting a profound influence on our society. Human culture is based on communication, and the widespread availability of information and the thought-like constructions of HyperText are the most powerful new ideas in communication since the invention of writing. A glance back at history will easily show how written language has shaped our societies. These results are only a foreshadowing of the things to come.

Even now in its infancy, the effects of the internet can be easily seen in popular media as well as in the way we do business. But the most dramatic influences are in the children who are now growing up with the net. Many parents are aware of the influence television has over their children. Eventually the net may become a superset of all TV, but with added power to inform as well as entertain. If we raise the internet right, it will return the favor by nurturing a generation that may well grow up wiser than ourselves.

And so we have a great responsibility to make sure that the best parts of human culture are represented on the internet. Because the net is still primarily created and run by Scientists and Engineers who are creatures of mind, it is the heart and soul of the internet that needs help. Artists are the heart and soul of human culture, and must bring the fruits of their efforts to the net to give the net culture (and future generations) their essence of humanity.

And if that doesn't convince you, we will also show that there are many ways in which artists may exploit the net for their own personal gain. As the online culture becomes a more balanced representation of humanity, the net will become an essential tool for collaboration,

communication, and distribution of art. The day is coming where those who are not on the net will be greatly handicapped in the expression and distribution of their art.

A great many visual and performing arts institutions and organizations have now established sites on the World Wide Web and a significant number of online discussion groups focus on the arts and humanities. Consortiums of museums and libraries are now using networking technologies to support research and projects involving more effective ways to collect, store, and disseminate objects of antiquity and other non-textual primary sources, as well as textual sources.

Thousands of sites are also created by individuals and for institutions, organizations, and businesses for reasons ranging from commerce to simple self expression. The net is the new frontier for the growth of humanity. Can you afford not to be involved?

2.1 Access to the Global Community

Access to art is no longer constrained by vicinity. Hang out your electronic shingle and just imagine who might drop in. The Internet connects hundreds of countries, thousands of cities, and countless groups and individuals around the globe. People all around the world will be looking for what they want on the net, and if you have what they want, then through the magic of the net, you are their next door neighbor.

The Internet explorer will find that more and more sites are becoming multilingual. The Internet provides a forum in which diverse cultures can merge, and allows the explorer to visit faraway places from the privacy and safety of their own computer.

2.2 Discovering the work of others

Once you have the basic tools for using the Internet (See [Section 4](#)) you will begin to understand how easy, helpful, informative, and exciting it can be. With a few quick strokes you have accessed a great library, museum, or gallery, toured a faraway city, or looked up an old friend. You might find an out of print book you have always wanted, then either read it on your computer screen, or print it out on your printer. If you do not have a printer, simply save it to your floppy disk and bring that to a shop or friend with a printer. Its really that easy.

You could spend the afternoon at the Smithsonian, or the Louvre without ever leaving your chair. For a more athletic adventure, you could put your computer in front of your treadmill, and jog through the online Olympics site.

When you are ready, you can explore deeper. Follow other links to smaller sites, lesser known writers, artists, poets, and thinkers, and discover the emerging world they are creating. With the proper

tools you can even view moving pictures, and listen to music and other audio.

With access to the Internet, the world is at your fingertips. Even more than art, literature, and humor, online is information. Bring your questions on health, the environment, government, and religion, and look through volumes of documentation on your concerns, or discuss your questions with others electronically. Once you get used to it, you will even be downloading more information and tools to assist you further.

Examples of sites to explore, and good starting points can be found in Appendices A and B.

2.3 Access to Freely Available Software, and Other Information

There is a world of useful software available to you via the Internet. Known as Shareware, Public Domain, or Freely Copyable, you can find many software programs you may download and use on your own machine, often completely free, occasionally for a small and/or optional fee which helps the author to afford to create more software for general use. There are also libraries, stores, and news groups you can peruse in search of just the tool or information you want.

As you explore the Internet, you will begin to find information that is beyond your reach without the right tools for viewing, listening, etc. For example, someone may have put up a sound file using a format which cannot be recognized by the software you have installed. In these cases, that person will often have included a pointer to the exact tool necessary to recognize their format, or convert the format, and you can download, install, and use this tool right away.

Using the basic tools acquired to access the Internet (See [Section 4](#)), you can begin to add to your collection software tools, both for accessing the information already on the Internet, and for creating your own content (See [Section 5](#)).

2.4 Sharing your work with others

There are many people both like, and unlike, yourself with whom you can meet, communicate, and share ideas. Some like to just talk, you can listen if you like. Others like to just listen, so you and others can talk.

There are also many forms that communication can take, from private electronic mail, to group video conferencing, to moderated newsgroups, to public bulletin boards. See [Section 3](#) for more information on Electronic Forums.

Artists often want to share their work with other artists on the Internet so that they will receive comments and recognition for their work. It is a great place to explore new ideas with other artists as

well. Perhaps a painter has tried a new paint and has a review of it, or has developed a new way to mix colors, or a photographer wants to share how to get a difficult shot. Perhaps you would like to

locate a rare album, or debate one musicians merit over anothers.

There are many types of content that artists can share. Including:

- text: stories, poetry, historic accounts, transcripts, etc.
- images of their visual work: paintings, photographs, sculpture
- images of themselves: photographs, self-portraits
- sound files of their audio works or voice presentations of their works: books on tape, speeches, tutorials, music
- moving pictures: video arts, performance arts, etc.
- a description of their art process and works of art
- resume and/or biographical data
- contact information in the form of electronic mail address, postal mail address, phone, etc. Electronic mail is most popular because it allows people to respond spontaneously.

After you've met some of the global critics, and compared your work with others, you may feel so bold as to share your work with others. Perhaps emailing a manuscript to a publisher, or putting up scans of your art will entice a buyer. Perhaps it will entice a critic to say wonderful things about you to a buyer.

Perhaps putting your work on the Internet will bring fortune and fame, or perhaps it will encourage others to put their work up. Increasing the cultural content of the Internet will have profound results in all areas of the Arts.

2.5 Communicating about the arts

Perhaps you prefer to discuss and compare the works of others with producers, collectors, gallery owners or other professionals in your field, or related fields. You might want to find out who's hot and why. You could also find out where, and when shows, showings, benefits, conferences, releases, signings, and performances are taking place, or announce your own showing.

They say that for every artist, there is a critic, and you could meet one, or be one, on the Internet.

2.6 Collaborating

There are many ways of collaborating over the Internet. There are art and literature projects which explore the Internet by asking people to put their feelings, thoughts, and ideas about the Internet in, and there are projects which simply arrive, or are downloaded over the Internet, in which people participate.

There are also games which are played over the Internet, by players

all over the planet. These types of games, which are described in
in greater detail in [Section 3](#), can be both entertainment and a
learning experience. Some games offer players the opportunity to

alter the environment, so that ideas and information contained in the game evolve over time into a jointly constructed experience.

3. Forums

Websters defines a forum as "A public meeting place for open discussion." In the world that could be a park or an auditorium. In the Internet, a forum will be electronic, but it may still feel like a roomful of people.

Many forums exist on the Internet. There are interactive forums where you can share information in real-time and carry on discussions with others. There are message-based forums where you send or receive a message and others involved in that forum can respond later, and there are archived forums where information is stored, and may be retrieved by anyone but modified only by its owner.

While we have attempted to list and describe a few of the more popular forums, we have not created an exhaustive, complete, or up-to-the-minute list here. You can find information on forums, lists and sites in many magazines and books today. (See [Section 4.1 - Getting Started](#))

3.1 Message-based Communications

In Message-based communication, a message is sent by one user, and received by one or many. For example, you might send a dinner invitation to an individual, a couple, or a group. In the same way, you send electronic messages to individuals or groups. Just like your Postal Service for physical mail, there are electronic mail servers for electronic mail. Just like you have a physical address to which your physical mail is sent, there is an electronic mail address to which your electronic mail is sent.

Message-based Communications includes electronic mail, listservs, newsgroups, and bulletin boards.

3.1.1 E-mail

Electronic mail (email) is a system whereby a computer user can exchange messages with other computer users (or groups of users) via a communications network.

Typical use of email consists of downloading messages as received from a mailbox or mail server, then reading and replying to them solely electronically using a mail program which behaves much like a word processor for the most part. The user can send mail to, or receive mail from, any other user with Internet access. Electronic mail is much like paper mail, in that it is sent, delivered, and

contains information. That information can be textual, graphic, or even sound. (See [Section 4](#) - Accessing the Internet, and [Section 5](#) - Creating Content, for more information on non-textonly email

messages.)

You will get an Electronic mail, or Email address usually from your Internet Service Provider (See [Section 4](#)). Your email address contains your name, and the address of the machine on which you receive your mail. The name of the machine will be in two parts, (separated by a dot or period symbol ".") the name of the machine itself, and the "domain" it is in. (See the documents reference in [Section 8](#) - Resources, for more information on domain names).

The possible extensions for a domain name will be one of: .edu, for educational institutions; .gov, for government sites; .com, for commercial companies; .org, for other organizations; or it might be a locational domain name which would contain the city, state, region, and country, as la.ca.us would be Los Angeles, California, United States.

An email address takes the form "yourname"@ "yoursite"."yourdomain"
For example, if your name is Jo Cool and you get your Internet service from Dirigible Online, your email address might be jcool@dirigible.com.

[3.1.2 Listserv \(mailing list server\)](#)

A Listserv is an automated program that accepts email messages from users and performs basic operations on mailing lists for those users. In the Internet, listservs are usually accessed as either "list-request@host.domain" or "listserv@host.domain"; for example, the list server for the hypothetical list "newsreports@acme.org" would be "newsreports-request@acme.org".

Sending email to "newsreports@acme.org" causes the message to be sent to all the list subscribers, which is inappropriate for "Subscribe" and "Unsubscribe" requests. Sending a message to "listserv@acme.org" sends the message only to the list server. Using "listserv@acme.org" you would put the listname in the subject field with "Subscribe me@my.domain" as the body of the message. Not all mailing lists use list servers to handle list administration duties.

[3.1.3 Newsgroups](#)

A Newsgroup is an electronic bulletin board system created originally by the Unix community and which is accessible via the Internet. Usenet News forms a discussion forum accessible by millions of users in almost every country in the world. Usenet News consists of thousands of topics arranged in a hierarchical form. Major topics include "comp" for computer topics, "rec" for recreational topics, "soc" for social topics, "sci" for science topics, and there are many others we will not list here. Within the major topics are subtopics,

such as "rec.music" for general music content, and "rec.music.classical" for classical music, or "sci.med.physics" for discussions relating to the physics of medical science.

If you have access to newsgroups, it would be wise to check news.announce.newusers first. This newsgroup provides detailed information on Newsgroups, such as how to find the right place to post or even information on newsgroup writing style.

Local Newsgroups are those that are accessible through your organization or company which contain news that is relevant only to your organization. For example, NASA Goddard Space Flight Center (GSFC) has many internal Newsgroups that are of interest only to GSFC's employees and none of the other NASA centers. Therefore, newsgroups have been formed to provide internal information to NASA GSFC employees only and no one else. Some examples are: gsfc.carpool, gsfc.dialup or gsfc.220.civil.servants.

Another example of a local newsgroup is news that is posted regarding your community or the vicinity in which you live. For example, if you lived in the Washington D.C. area some of the local newsgroups would be: dc.biking, dc.jobs or dc.smithsonian.

3.1.4 Electronic Bulletin Board System (BBS)

A Bulletin Board System consists of a computer, and associated software, typically providing electronic messaging services, archives of files, and any other services or activities of interest to the bulletin board systems' operator.

Typical use of a BBS has the user dial into the BBS via their modem and telephone line and select from a hierarchy of lists, files, subdirectories, or other data maintained by the operator. Once connected, the user can often send messages to other BBS users within the system.

Although BBSs have traditionally been the domain of hobbyists, an increasing number of BBSs are connected directly to the Internet, and many BBSs are currently operated by government, educational, research, and commercial institutions.

3.2. Real-Time Communications

Real-Time Communications describes the process of communicating with others via the Internet virtually simultaneously. Generally in a forum where you type something, which another user sees on their screen, and types something, which you see a moment later. The moment between when they begin typing, and you begin seeing their words, is known as "net-lag".

Forums which communicate in real-time are the Internet Relay Chat

(IRC), the Multi-User Dungeon (MUD), Audio/Video Conferencing (AVC), and White Board Systems (WBS).

3.2.1 IRC - Internet Relay Chat, WebChat

Internet Relay Chat, or IRC, provides a text-based mechanism for communication with multiple participants. IRC is an interactive forum set up in virtual rooms that you can move between, and where others can virtually "hang out". Chat rooms can be used to discuss common ideas or topics, or as part of a collaborative process. The connection method used will be specific to each IRC site.

Web chat is like IRC but it is done via a web browser such as Netscape Navigator or Internet Explorer and it is not a text only forum.

Once you have chosen the group you want to participate in, you must choose a nickname, commonly known in the chat world as a "handle" for yourself (usually a very creative name). With some software you can have your nickname link to your webpage or email. Some software also allows you to post a very small picture next to your name.

Many webchat sites require the user to register before being able to participate in the activity. If any additional software is needed based on your particular software and PC configuration the site will point you in the right direction so you can download the necessary software.

Some sites will provide you with chat etiquette guidelines. Please be sure to read the directions before you participate in the Chat session.

Once you begin to chat you may find that there are some abbreviation used that you are not familiar with. These abbreviations are for various actions or phrases. Some very common ones are: by the way (btw), in my humble/honest opinion (imho), or ta ta for now (ttfn).

The following sites point to some of the chat groups accessible via the Web:

The Chat Hole - <http://acm.ewu.edu/homepage/wmundell/chathole.htm>

WebChat Broadcasting System - <http://pages.wbs.net/>

Yahoo! - Computers and Internet: Internet: World Wide Web: Chat - http://www.yahoo.com/Computers_and_Internet/Internet/World_Wide_Web/Chat/

3.2.2 MUD - Multi-User Dungeon

An interactive game environment where both real other players and virtual other players exist and with whom you can communicate to share ideas or solve puzzles, etc.

The word "Dungeon" refers to the setting of many of the original

games of this sort, in which you, our hero, must escape from a
dungeon-like environment where evil goblins, demons, and other
"bad-guys" are trying to kill you. Generally the goal, in order

to win the game, is to find and retrieve some treasure, or reach some hidden place, and find the way out.

++ vrml, avatar, digital editing systems, proprietary (palace, urban desires)

++ Expand on the concept of "shared construction" -- that this enables information and ideas to accrue over time.

3.2.3 Audio/Video Conferencing

CU-SeeMe is a desktop videoconferencing software tool. CU-SeeMe allows Macintosh and Windows users with an Internet connection and a desktop camera (some go for as little as \$100) to see, hear and speak with other CU-SeeMe users across the world. This program was developed at Cornell University in Ithaca, New York, USA and is freely available.

CU-SeeMe allows the user to have a one-to-one communication. It is also possible to have a one-to-many or many-to-many communication by installing a reflector on a Unix machine or using a public site (more on this later).

To download the software, see:

<ftp://cu-seeme.cornell.edu/pub/cu-seeme> or go to Cornell University's CU-SeeMe Page at <http://cu-seeme.cornell.edu/> for more information. This site also provides detailed information on what is needed to run CU-SeeMe.

Another reliable site is the CU-SeeMe Home Page:

<http://www.indstate.edu/msattler/sci-tech/comp/CU-SeeMe/>

For one-to-many or many-to-many communication, a reflector is needed. The reflector software must be installed on a Unix machine. The software can be obtained from Cornell University's CU-SeeMe Page mentioned above.

For a list of public reflectors see:

<http://www.indstate.edu/msattler/sci-tech/comp/CU-SeeMe/reflectors/nicknames.html>

Please note that there are Netiquette rules that ought to be observed when using a reflector, please see:

<http://cu-seeme.cornell.edu/Reflector.html>

There is an enhanced commercial version of CU-SeeMe, information on that can also be found at CU-SeeMe Home Page mentioned above.

++ multicasting

++ Expand on uses

Humanities and Arts [[draft-ietf-harts-guide-02.txt](#)]

[Page 15]

3.2.4 Whiteboard Systems

A Whiteboard is analogous to the blackboard, and is physically quite similar. A Whiteboard System allows people on the Internet to share text, drawings, and other graphic information which is being written in real-time on an electronically enhanced whiteboard.

Software exists which allows connections between two sites, or hundreds, over the Internet, the Web, or your telephone.

- ++ commercial, non-commercial, internet, non-internet.
- ++ PictureTel, SmartBoard,
- ++ wwwphone is freely available. Send mail to: jay@eit.com

3.3 Archives

Archive is defined in Webster's New World Dictionary as:

- n. 1 a) a place where public records, documents, etc. are kept
- b) a place where material having documentary interest, as private papers, institutional records, memorabilia, or photographs, is kept.

Archives on the Internet are pretty much the exact same thing. The motive and much of the content is the same, but the media changes (from paper files, to electronic files), and as such allows for a much greater diversity of content.

Archives on the Internet also allow many people access to their files simultaneously, and from all over the world.

Any and all information that people want to make available on the Internet can be. This means there is a truly vast amount of information out there, with more being added every day. In fact there is so much information that it is sometimes difficult and confusing to find the information you want. This is the topic of our next section.

3.3.1 Searching

One of the great challenges facing the internet is how to organize the vast amounts of information in ways that allow most people to find what they want. In theory, there may be a "perfect" organization, but in practice, we will never achieve it. This means that finding the information you want on the net may require some skill on your part. Fortunately there are many tools and strategies that may be helpful.

One of the all time great ideas for finding the information you want is a thing called a search engine. A search engine is a computer program usually living on a remote computer that spends its time downloading information from other computers and building an index of

what lives where. This behavior has given them the nickname of Web Crawlers. What this means to you, is that you can call up the Search Engine's home page, and enter in a subject, name, title, or random

string pattern, which is then used to search the engines index for stuff out on the net that seems related. This can lead to both a large volume of information, and some rather startling discoveries of information from unsuspected sources.

Some of the available Searchers and Indices on the Internet include:

- Yahoo - Index of WWW sites, with search capabilities
<http://www.yahoo.com/>
- [DejaNews](#) - USENET (news groups) search engine
<http://www.dejanews.com/>
- [WebCrawler](#) - <http://query.webcrawler.com/>
- [Lycos](#) - <http://www.lycos.com/>
- [AltaVista](#) - WWW and USENET search engine
<http://www.altavista.digital.com/>
- [Magellan](#) - Index of reviewed and rated Internet sites, with search capabilities
<http://www.mckinley.com/>

Yahoo, for example, has a high-level category called "Arts", which has a multitude of subcategories below it, most of which have further subdivision, each of which can contain lists of lists. For example, to find information on Modern Dance, one can follow the links to

<http://www.yahoo.com/Recreation/Dance/Modern/Groups>

or simply type "Modern Dance" into the search field and choose from a list of selections returned.

On a typical attempt on March 25, 1997, Yahoo returned 4 major categories of Modern Dance, and offered 82 other links to related pages around the web.

There are many other Searchers and Indices on the Internet, and a good way to find them, is to do a search for them in one of the services above, or others you encounter in your travels.

3.3.2 Compound Searches

After experimenting with the available search engines, it quickly becomes clear that searching on a broad category can result in too much information. For example, a recent search at AltaVista for the subject "Rembrandt" matched over 8500 individual items, including information on the famous artist (Rembrandt von Rijn (1606-1669)),

URL: <http://www.bod.net/CJackson/rembrand/rembrand.htm> and His Self-Portrait,

URL:<http://found.cs.nyu.edu/fox/art/rembrandt/self1660.html> a hotel in Thailand (Rembrandt Hotel and Plaza, Bangkok),

URL:<http://www.siam.net/rembrandt/index.html> and a pizza restaurant in California

Humanities and Arts [[draft-ietf-harts-guide-02.txt](#)]

[Page 17]

URL:<http://www.lososos.com/Rembrandt'sCafe/>.

To be more particular in what you find, all of the available search engines allow you to do compound searches, in which multiple keywords are used, possibly in combination with Boolean logic operators such as AND, OR, and NOT. For example, to focus in on Rembrandt the artist, at the exclusion of pizza cafes, try the following advanced search in Magellan:

Rembrandt AND artist AND portrait NOT pizza

Note that the method of entering search items differs slightly from service to service. When trying a new service, check the available help topic before searching. And as with any new skill, practice, practice, practice!

Test of search scope:

Lycos:	rembrandt.	1837 relevant documents
Lycos:	rembrandt and artist and portrait	6 relevant documents
Yahoo:	rembrandt	2 Catagory and 39 site matches
Yahoo:	rembrandt and artist	2 Catagory and 11 site matches
AltaVista:	rembrandt	about "10000" documents
AltaVista:	rembrandt +artist +museum	about "100" documents
WebCrawler:	rembrandt.	347 matching "rembrandt"
WebCrawler:	rembrandt and artist and portrait	21 matching documents
Magellan:	rembrandt	666 results
Magellan:	rembrandt and artist and portrait	39379 results

You'll notice, in the above statistics, that the numbers for Magellan are quite different from the others. This is because different search engines may function differently. When you do a this+that search on Magellan, it looks for all instances of This AND all instances of That rather than the standard response of Only documents which contain both This AND That. On almost all the sites I have explored, there is an explanation of how the search process works on that site. You should read that explanation if you're having trouble or need further information.

You will also begin to see patterns in the way people name, or file, their information, which will help you find more information. Some may list their links to ART, while others list their links to PAINTINGS. Also many people put links to related pages in their pages, so one page you find that doesn't have what you're looking for, may have a pointer to another page that does have what you're looking for. Searching is an iterative process, keep going from one search key to another, and continue down multiple levels to see what is out there. Its known as Exploring, or Surfing the Net, and it is a major part of the joy of the Internet.

4. Accessing the Internet

Accessing the Internet in terms of simply receiving, downloading, and viewing files, uses most of the same tools (software and hardware) needed to create files and make them available on the Internet. This section, and the next, overlap in the areas of basic hardware and software.

The Internet can be accessed in many comfortable ways: at school, at home, at work, and even at trendy CyberCoffeeHouses. Accessing the Internet is not synonymous with publishing and displaying on the Internet, however. You may need different equipment for creating and retrieving content.

4.1 Getting Started

Many Internet Service Providers (See [Section 4.2](#)) offer free instruction to get you started in accessing the Internet as well as creating content. With the competition of Internet providers, you should be able to find one or two that offer the instruction you need. Artists in smaller communities may need to rely more heavily upon online sources of information.

Check with local libraries and schools which may offer classes on Internet related subjects, including getting connected, or check the Internet section available in most bookstores today.

Don't be dissuaded if you find limited access. The Internet will soon be everywhere, but if you don't want to wait, then do what these enterprising youths did...

When several students from large universities returned home to Taos, NM, a couple of summers ago, they left behind their Internet connections. Missing their connectivity, they approached the owner of a local bakery and suggested he start an Internet room where he could charge people by the hour to use the Internet. The entrepreneurial baker applied for a government grant and received a few computers with high speed modems.

You may be able to find a place like this, often called a CyberCafe, rather than having to create one. Try your local magazine stand for the latest periodicals, or your public library or bookstore for pointers to other people who will know more.

Once you have some Internet access, you can find out more about Cybercafes, InternetCafes, and other physical Internet access points, by searching as described in [Section 3](#), and in the newsgroup alt.cybercafes.

[4.2](#) Internet Service Providers

Being an Internet Service Provider (ISP) these days is pretty easy and can be financially worthwhile, so there are a lot of them, and they are starting and failing every day. In addition to the information and pointers you will find in this document, many organizations exist to help you locate, and choose a service provider. In any case, be sure to get references, not only for the ISP but also for the organizations who recommend them. Some organizations exist solely to recommend those who pay them. Most Internet related magazines these days contain extensive advertising by ISPs in your area. See [Appendix D](#) for a listing of many magazines which now contain information and pointers about the Internet.

As we discussed in [Section 1](#), every machine on the Internet needs an address by which it is accessed. Even machines which are only browsing need an address to which the browsed information is returned. This is actually called your IP (Internet Protocol) address. Usually you will get your IP address from your work, school, or ISP when you get your configuration information for your Internet connection. If you were trying to get an IP Address on your own, you would go to the Internet Assigned Numbers Authority (IANA).

The following is sent out by the IANA in response to a request for an IP network number assignment.

You should get your IP address (a 32bit number) from your network service provider.

Your network service provider works with a regional registry to manage these addresses. The regional registry for the US is the Internic, for Europe is RIPE, for the Asia and Pacific region is the AP-NIC, and parts of the world not otherwise covered are managed by the Internic.

If for some reason your network service provider does not provide you with an IP address, you can contact the your regional registry at one of the following addresses:

Internic	<hostmaster@internic.net>
RIPE	<ncc@ripe.net>
AP-NIC	<admin@apnic.net>

Please do contact your network service provider first, though. The regional registry will want to know all the gory details about why that didn't work out before they allocate you an address directly.

4.3 Computer Software and Hardware Tools

A basic computer system consists of a box containing a Central Processor Unit (CPU), MotherBoard, and Floppy Drive. It will also come with a keyboard, and you will need a Hard Drive, Memory, and a Video Monitor. How much memory, how large a hard drive, and how fabulous a monitor, will vary with your needs and experience.

To connect to an ISP you will also need a modem and a phone line. Your normal telephone line will do, but if you have call-waiting you will probably want to disable it for the duration of your networking session so that you do not lose data to a lost connection.

There are many types of computers available including PC's, Macs, and other Workstations. The most affordable systems are generally PCs and Macs. You may also need to choose an Operating System (OS) for the machine you choose.

Personal Computers (PCs) can run a version of DOS, anything from Microsoft(R), or a version of Unix (BSDI, FreeBSD, Linux, etc.) Apple Macintosh computers can run the common Mac Windows, or Apples version of Unix. Workstations generally run a Unix derived OS.

With any system, you should ensure that it contains the software and hardware necessary to maintain both itself and your data. While computer data is not particularly fragile, it is still sometimes lost due to hardware or software problems or simple human error. For this reason it is considered important to "back up" your system by making extra copies of important data. While simply copying data onto floppy disks could work, the small storage size of the disks makes it alot of work and prone to human error. Many large capacity disk and tape drives are available with special software specifically for doing backups. It is highly recommended that you purchase a backup solution along with your computer.

It is also important to protect your data from being damaged by computer viruses. When you connect to the net and move data back and forth, it is possible that there can be a small piece of software (called a virus) that could hide in some of the data and "infect" your system, possibly then using your system to infect other machines that you connect to. These viruses are often created by misguided people as a sort of computer prank, and can accidentally or maliciously damage your data. Fortunately it is possible to buy virus checking software that can regularly scan your system to see if it has been infected. This software is important whether you are downloading information from the net, or using other peoples floppy disks. See [Section 6](#) for more information on viruses.

Determining your ideal hardware and software configuration will

take some time and patience. You need an understanding of what you want to do, and how, and whether you wish to simply view, or create.

You'll also want to know the limitations and expandability potential

of the system, so you can determine if it will have a useful lifespan. If the machine cannot grow for the foreseeable few years, it will become obsolete before its given you its fullest value.

4.4 Multimedia

Depending upon your needs, you may require special hardware installed in the machine, or attached externally by cables. These additional pieces of hardware are known as peripherals.

The peripherals needed for accessing information on the Internet might include the following:

- a sound card and speakers to hear sounds, music, speech, etc.
- a CD-ROM player to read stored images of artwork
- midi equipment for audio artists
- video equipment for participating in video forums
- a printer to make hardcopy of files, or images
- Other equipment for creating content See [Section 5](#).

Most of these peripherals will require specialized software. If you plan to purchase all the hardware and software at once, find a vendor who will connect and test all the hardware, software, and peripherals for you. Due to the complexity of these systems, they can be difficult to configure for the inexperienced user.

Also, verify that the vendor will stand behind their equipment, and this configuration in the event that it doesn't work the way you want it to. Hook the system up, and test it extensively right away, so as to determine any problems before your warrantee period expires.

5. Creating Content

As the hardware and software of the net becomes cheaper and better understood, the technology itself will become less important than the content which lives on the net. Many of the rewards of the Internet will go to the people who create such content.

There are different ways to add content to the Internet. One may start with pre-existing content, such as paintings or stories, and find a place for it, or one may create content specifically for the net such as a web page.

Let us for the moment assume that you have already created something which you would like to make available on the net. There are many ways in which you could do this. You could deal with agencies who provide this service professionally, find friends or others willing

to do it for free, or get yourself on the net in some fashion and create a place for it yourself.

If you chose to do it yourself, you will need your own computer and some form of internet access from an Internet Service Provider (ISP) or Web Space Provider (WSP).

Once you have a place to put your content, you will need to put it in the right format. Images may have to be digitized, audio may have to be recorded into computer files, etc. [Section 5.2](#) discusses the various information formats in more detail. While hardware, such as image scanners, are readily available, there are also many other options available. For example, most print, or copy shops today can do high quality image scans and some WSPs may provide this as one of their services.

If you are placing your content on the Web, a web page must be created for it in the form of an HTML document that references the content in the appropriate file format. While this is easy enough to do yourself, many WSPs also offer this service, and there are also independent web page designers who may be able to do a better job.

Creating online content involves moving your art into an electronic format and then, perhaps, re-formatting it for the Internet. For some art forms, the initial electronic step is fairly painless: translating a short story, poem, novel (or any type of creative writing that doesn't have much desktop publishing formatting, for example) into HTML is fairly straight forward. Likewise, moving a computer graphic to the Internet requires a converter program to make the graphic follow the right format. Performing arts, sculpture, and other pieces that are hard to capture on a computer disk, require more work and creative thinking.

Much of the information needed to help you think creatively about publicizing your work online is available in classes, books, local Internet cafes, and on the Internet itself. Many Internet magazines are available for subscriptions or individual issues can help get you started. Most new bookstores and, to some extent, used bookstores provide numerous volumes of Internet information. However, even the most recently published books may contain outdated information. The latest 'standards' can be obtained directly from the Internet Engineering Task Force, or IETF, at <http://www.ietf.org/>. The document you are reading now is a product of that organization.

If you learn better by doing, rather than reading, you may be interested in taking a HTML or Internet Introduction course at a local college. Most larger metropolitan area schools provide classes for the basics, which can also expose you to other artists. Make sure you read the course description; some courses may only cover accessing the Internet while you may want to actually be creating documents. If no colleges in your area offer classes, contact the

computer science department or the continuing education office and suggest a topic. If the school can obtain enough support, they may offer a class the following semester.

5.1 Getting Help: Consultants, Web Page Designers, Providers, etc.

Once you're connected to the Internet, there are many more ways of getting help with it. Try the forums, listed in [Section 3](#), such as Newsgroups, Bulletin Boards, and Chat rooms. If you've checked the local netiquette guidelines, and behave accordingly, the Internet community will usually be very helpful toward new arrivals.

When looking for good consultants and web page designers, start with the sites you like, and find out who did their pages. Discuss your needs with other artists, or check the phone book, library, books, magazines and other periodicals for artist collectives and groups who may be available to assist you. Look for groups whose cause is artistically motivated, rather than trusting people who are paid to point you at a particular consultant or assistant.

Know what you want. If it takes you a while to figure out what you want, take that time. This shouldn't be something you need to rush into. The Internet isn't going to go away. Whatever you decide to do, don't be afraid to ask for references. A good provider of services will always be happy to provide you with a list of happy customers.

5.2 Basic design issues: Understanding Formats

As described in [Section 1.3](#), there are many file formats available on the Internet. You'll need to understand a little bit about the formats you'll want to present, in order to create them for others to see. Some formats are called Public Domain, and are freely copyable, and the software tools used to create this content is available for you to download off the net. Other formats are called Proprietary, and are only readable and creatable using software you must purchase from the vendor who created it, or their authorized reseller. Some formats, and their associated formatting tools, come along with other software packages. For example, Microsoft Windows comes with a Sound Recorder, which makes and plays back .wav files. Now people who want sound cues in the software they write for Windows can use .wav files and give you more options with the tools you have. So you can now surf the net for .wav files to add to the usefulness of those tools.

For more information on file formats, connect to:

<http://www.matisse.net/files/formats.html>

or

<http://rodent.lib.rochester.edu/multimed/contents.htm>

(note the extension in this case is .htm rather than .html - this is the case when files are created in an environment that only supports three character extensions, such as DOS.)

++ List, define, and describe, formats and extensions...
++ Sound, Image, Text, Hypertext

Some artists are actually using html as an artform in itself and are helping to push the boundaries of this medium.

- ++ Mention scanners, tablets, speakers, recorders,
- ++ encoders/decoders, slide reader video equipment, software needed,
- ++ Save in-depth for the appropriate subsection.

- ++ Don't forget Examples: How people are creating content ...

5.3 Text and Hypertext

- ++ what and how

5.4 Graphic and Moving images

- ++ Creating mpeg, jpeg, gif, jpg, Compression: jpg vs. gif
- ++ What is a thumbnail?

5.5 Music and Sound

The World Wide Web supports audio data as well as visual data. The most obvious way to send audio across the net would be to use digital audio like that used for the Compact Disc or "CD". However, CD format digital audio requires 44,100 16 bit words per second for a mono signal, and twice that for a stereo signal. While there are many places where one can find digital audio in Windows ".wav", or the MacIntosh ".au" format, these files typically take a very long time to download even a few seconds of audio. The size of these formats makes them too inefficient for widespread use on the net today.

It is however possible to do "useful" audio over the net. The emerging "de facto" standard seems to be RealAudio, based on the freely distributable server/player application, RealAudio version 2.0, developed by the Seattle based company Progressive Networks. First released in 1995, RealAudio allows useable digital audio in realtime over a 28.8 kB line, and has already been put into service on the home pages of most major record companies as well as in many niche applications. In addition, RealAudio provides a "Voice mode" optimized for understandable speech transmission over a 14.4kB line.

Unfortunately the quality of RealAudio leaves much to be desired. In particular, the sample rate in Music Mode is only 8Khz (as compared to CD quality 44.1 Khz), meaning that all high frequencies above 4khz are simply missing. The resulting audio is still pleasing to listen to, but sounds very dull and dark.

More information about RealAudio can be found at www.RealAudio.com.

Clearly Digital Audio is the way of the future, but until more bandwidth is available to the average person, it may not be the way of the present. Fortunately, at least in the area of music, there is an interesting alternative.

MIDI (the Musical Instrument Digital Interface), as developed for electronic musical instruments (keyboards, samplers, drum machines, etc.) works well for certain kinds of music over the net. It involves sending no sound sources at all, just the description of the music -- kind of like the score, without the instruments. If the receiver has the right instruments on their computer (such as the sounds defined in the General Midi soundset found on many soundcards), they can play back the musical score.

The big disadvantage to using MIDI is that other than the limited selection of sounds in the General Midi set, it is extremely difficult to make sure the music sounds more than approximately like the original. And there is no way to handle non-MIDI instruments such as guitar or voice, so it is useless to hear the new song by your favorite rock and roll band.

The big advantage to MIDI is how fast it works over slow net connections. For example, five minutes of music, fits in a mere 30k file, and usually will not take more than a few seconds even on the slowest of dialup connections! This makes it ideal for applications such as networked games, or music to go along with a web page.

There are many ways of embedding MIDI files into HTML documents, for WWW distribution.

Anyone who wants to add MIDI to a page can choose to use existing public access MIDI file banks, of which there are many, or to produce new MIDI themselves.

Crescendo is one package available for embedding MIDI files in HTML <http://www.liveupdate.com> Crescendo works for both MacIntosh and Windows.

Helpful Links: Publicly Available Audio and Music Applications
<http://reality.sgi.com/employees/cook/audio.apps/public.html>

Music of J.S. Bach for keyboard
<ftp://ftp.cs.ruu.nl/pub/MIDI/SONGS/CLASSICAL/BACH/HARPSICHORD/>

RISM (repertoire of manuscript sources), plus other access to online scholarly music resources. <http://rism.harvard.edu/RISM/>

Crescendo is used in the web pages at <http://mcentury.citi.doc.ca> along with a growing number of others. One very interesting use of Crescendo occurs on the Music Theory Online publication, a serious

scholarly site for publishing and debating musicology and music theory. Articles there now routinely include short musical examples, a great sign of the future of scholarly publishing in the age of

dynamic, interactive content.

<http://boethius.music.ucsb.edu/mto/issues/mto.96.2.4/>

Formerly, debate on musical form and structure occurred in the pages of journals, referring usually to music examples in terms of its visual notation. This notation requires a certain degree of training to decode, effectively restricting the potential readership to those with this professional training. With sound examples embedded directly in the text, at least the aural effect of the music comes across, even to those unable to read the notation accurately. This shift is appropriate to the newer trends in music scholarship, which talk about music in terms of its social and cultural context, instead of only in formal terms.

5.6 Content Design Issues

Know your intended audience. If you want more people to see your work, you'll need to make it more accessible.

Many sites are very careful about what content they will allow access to. If you want all audiences to be able to view your work, make sure you are careful about your content and language.

Another content design issue is tool friendliness. Some machines have limitations which will not allow them to see or hear what you'd like them to. For example, older or less expensive models of monitors may have monochrome, or one-color displays, or display only 16 colors, or 256 colors. If you create and view images which look fabulous with a 64,000 color display, you may want to test them using a 16 color display to see what the effect is. Sometimes you can modify your image slightly to get a wider audience while only having a minor impact on the effect.

The following sites give you pointers on what to consider when designing a web page that is content- rich:

- Sun's Guide to Web Style - <http://www.sun.com/styleguide/>
- Yale C/AIM Web Style Guide - <http://info.med.yale.edu/caim/manual/>
- Web Development - <http://www.december.com/web/develop.html>
- A Guide to Creating a Successful Web Site = <http://www.hooked.net/~larrylin/web.htm>
- Bandwidth Conservation Society - <http://www.infohiway.com/faster/>
[This](#) is resource for web developers with an interest in optimizing performance.

See [Section 6](#) for other issues and challenges relating to content.

5.7 Publicizing your work

++ advertising on the net. point to Sally's doc.

Humanities and Arts [[draft-ietf-harts-guide-02.txt](#)]

[Page 27]

6. Issues and Challenges

The Internet has many issues and challenges, among which are security, privacy, property rights, copyrights and freedom of speech. Security issues involve both the security of your data, as well as your image. Viruses can be transmitted easily over the net, and precautions should always be taken. If you choose to keep your own information available on the net it can be the subject of vandalism and theft. You may also find yourself being persecuted for the information you provide as more and more people join the Internet community and feel the need to impose their morality upon it.

This is no different from any society. We must draw our own lines, and our own conclusions. This section is terribly brief, and entirely summary in nature, and is in no way intended to be comprehensive. It is intended to warn you and advise you. If you have real concerns about your property rights, copyrights, and/or personal rights, please do your own research. Internet laws are in such a state of flux that they are changing as I write this, and they will be changing as you read it.

At last check, however, freedom of speech was prevailing in the United States, and so far the government has not upheld any laws prohibiting the exhibition of anything on the Internet. Support your local constitutional rights.

6.1 Security Issues

- ++ See [Section 10](#). but describe here also.
- ++ Security of content, site, ownership.

6.2 Viruses

A "virus" is a program that modifies other programs by placing a copy of itself inside them. It cannot run independently. It requires that its host program be run to activate it.

The damage caused by a virus may consist of the deletion of data or programs, maybe even reformatting of the hard disk, but more subtle damage is also possible. Some viruses may modify data or introduce typing errors into text. Other viruses may have no intentional effects other than replicating itself.

Viruses can be transmitted over the Internet inside other programs, but usually they are transmitted by floppy disk. Your best bet is to purchase a really versatile and up-to-date virus checking program from your local software retailer, and run it over every floppy you

plan to read, and every program you plan to run, as well as periodically over the entire machine.

Computer viruses are enough like organic viruses that many of the same precautions apply. Early detection is key. Diligence will mitigate potential damage, but frequent incremental backups are your best strategy for recovery.

6.3 Rights

- ++ Intro to protecting your copyright on the Internet.
- ++ References: Copyright law, cases, etc.
- ** Remember Laws on Intellectual property are constantly changing!
- ++ examples of: copyright, trademark, disclaimers, international
- ++ concerns big issue re: other countries who do not recognize US law
- ++ goes both ways... respecting others copyrights

- ++ The implications of the Telecom Reform Bill with regard to
- ++ Freedom of Speech.
- ++ Censorship issues, need *your* help.

- ++ INTERNATIONALIZE: ie: Canada will not allow the import of anything
- ++ that is "degrading" to women. Etc.

6.4 Conducting Business over the Internet

- ++ Secure transaction are possible, pointers to pgp, etc.

6.5 Netiquette

- ++ The Responsible Use of the Network document outline, and pointers.
- ++ ie: AVOID SHOUTING

FYI 28 "Netiquette Guidelines", (Also [RFC 1855](#)), October 1995.

- ++ It never hurts to keep silent until you know your audience better.
- ++ Not being offended by others, ie: don't take it personally
- ++ keeping in mind international cultural differences, etc.

7. Glossary

- ++ point to userglos, trainmat, and useful stuff that needs to be on
- ++ the same doc. for ease of use

FYI 29 "Catalogue of Network Training Materials", (Also [RFC 2007](#)), October 1996.

FYI 22 "Frequently Asked Questions for Schools", (Also [RFC 1941](#)), May 1996.

FYI 18 "Internet Users' Glossary", (Also [RFC 1983](#)), August 1996.

Humanities and Arts [[draft-ietf-harts-guide-02.txt](#)]

[Page 29]

** words contained within this document which need to be defined for
** the audience: Boolean,

8. Resources

++ Places to find more information of use and interest.
++ specific arts and humanities studies, projects, programs, getty

Much of the information provided by this document was gathered from other documents. Wherever important to the discussion, a pointer to the document was given, however, many more documents are available on many other topics.

8.1 Request for Comment

One of the most important collections of informational documents about the Internet are written as Requests for Comment by the Internet Engineering Task Force. The name Request for Comment is historical, as these documents are submitted by their authors' for the approval of the Internet community as Internet Standards, and valid Informational RFCs called FYIs, of which this document is one. Basically, if the IETF collective uses a tool or resource, they document its use in an RFC so that there is no mystery to its functionality, uses, designations, specifications, or purposes.

More information on RFCs, FYIs, the IETF, and its organizations, documents, policies and purposes can be found in the RFCs themselves, by a number of means.

8.1.1 The ISI RFC-INFO service

There are many way to get copies of RFCs over the Internet (see ConneqXions, Vol.6, No.1, January 1992). Most of these simply access a directory of files where each RFC is in a file. The searching capability (if any) is limited to the filename recognition features of that system.

The ISI RFC-INFO server is a system you can search for an RFC by author, date, or keyword (all title words are automatically keywords).

RFC-INFO is an e-mail based service to help in locating and retrieval of RFCs and FYIs. Users can ask for "lists" of all RFCs and FYIs having certain attributes ("filters") such as their ID, keywords, title, author, issuing organization, and date. Once an RFC is uniquely identified (e.g., by its RFC number) it may also be retrieved.

To use the service send e-mail to RFC-INFO@ISI.EDU with your requests

in the body of the message. Feel free to put anything in the SUBJECT, the system ignores it. (All is case independent.)

Humanities and Arts [[draft-ietf-harts-guide-02.txt](#)]

[Page 30]

See [Appendix C](#). Examples for using the RFC server RFC-INFO@ISI.EDU

9. References

++ should we create [#] footnotes?? i.e.: ISN doc, etc.
++ reference the publications and/or sites of key
++ arts and humanities organizations (e.g. Getty, NINCH)

10. Security Considerations

** jkrey points to site sec. handbook:
** "The "current" Work in Progress for the Site Security Handbook WG
** is the I-D - [draft-ietf-ssh-handbook-03.txt](#). This group is
** working on a companion document for the "user". Stay tuned for
** the I-D. They should have that out before San Jose."

There are a wide variety of ways in which systems can be violated, some intentional, some accidental. Of the intentional attacks, a portion may be exploratory, others simply abusive of your resources (using up your CPU time) but many are actively malicious. No system is 100% safe, but there are steps you can take to protect against misconfigured devices spraying packets, casual intruders, and a variety of focused assaults.

Your best defense is to educate yourself on the subject of security. There are places on the net devoted to teaching users about security - most prominently, the CERT Coordination Center located at the Software Engineering Institute at Carnegie Mellon university. You can point your web browser (or direct your ftp connection) to ftp://info.cert.org/pub/cert_faq to start. This is a frequently asked questions guide and general overview on CERT. It includes a bibliography of suggested reading and a variety of sources to find more information.

Next, you should probably read

ftp://info.cert.org/pub/tech_tips/security_info

which contains a (primarily based on the UNIX operating system) checklist to help you determine whether you're site has suffered a security breach. You can use it to guide you through handling a specific incident if you think your system has been compromised or you can use it as a list of common vulnerabilities. CERT also maintains a wide variety of bulletins, software patches, and tools to help you keep up to date and secure.

Before you are even online, you should consider some basic steps:

10.1 Formulate a security policy.

It should include policies regarding physical access procedures,

Humanities and Arts [[draft-ietf-harts-guide-02.txt](#)]

[Page 31]

security incident response, online privileges and back-up media. Put a message at the login to establish your policy clearly.

An example:

"This system is for the use of authorized users only. It may be monitored in the course of routine operation to detect unauthorized use. Evidence of unauthorized use or criminal activity may result in legal prosecution."

10.1.1. Talk to your Internet Service Provider.

Depending upon your provider and router management situation, there are a number of things your ISP should be able to do for you to make your site more secure. Foremost, packet filtering on the router that connects you to the internet. You will want to consider IP filters to allow specific types of traffic (web, ftp, mail, etc.) to certain machines (the mailhost, the web server, etc.) and no others. Other filters can block certain types of IP spoofing where the intruder masks his or her identity using an IP address from inside your network to defeat your filters. Discuss your concerns and questions with your provider - the company may have standards or tools they can recommend.

10.1.2. Make sure your systems are up to date.

A significant number of incidents happen because older versions of software have well-known weaknesses that can be exploited from almost anywhere on the internet. CERT provides a depository for software patches designed by concerned net.citizens, CERT's engineers and by the vendors themselves.

10.1.3. Use the tools available.

Consider recording MD5 checksums on read-only media (the MD5-digest algorithm determines an electronic "fingerprint" for files to indicate their uniqueness -comparing more recent checksums to older ones can alert you to changes in important system files), installing tripwire on your systems (notes size and MD5 checksum changes, among other sanity checks), and periodically testing the integrity of your machines with programs an intruder might use, like SATAN and crack. [Details on MD5 are contained in [RFC 1321](#).]

Most files and fixes go through the basics before leaving you to figure things out on your own, but security can be a complicated issue, both technically and morally. When good security is implemented, no one really notices. Unfortunately, no one notices when it's not taken care of either. That is until the system crashes, your data gets corrupted, or you get a phone call from an

irate company whose site was cracked from your machines. It doesn't matter if you carry only public information. It doesn't matter if you think you're too small or unimportant to be noticed. No one is

too small or too big, no site is immune. Take precautions and be prepared.

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Appendix A.

++humanities computing projects, research projects,
++text encoding project (michael century) need to maintain perspective
++of the historic art archives and the "current" art in culture
++AHIB? Marty Harris, Susan Sigfried NIDGE?

Examples of Projects on the Internet of Interest to the Arts and
Humanities Communities

The commonplace insight about the web as a new distribution channel for cultural products is that it effaces the traditional border between producer and consumer. Publishers exploit two-way interactivity by re-designing the editorial mix to include reader response. Here follows some examples of the way creative artists attempt to design structures flexible enough for significant viewer input.

RENGA (<http://renga.ntticc.or.jp>) - An inspired transposition of a traditional collaborative writing practice into the realm of digital media supported by the NTT InterCommunication Centre in Tokyo. Renga means linked-image or linked-poem, and draws on the Japanese tradition of collaboration which effaces the unique notion of original author.

PING (<http://www.artcom.de/ping/mapper>) - by Art+Com, a Berlin based media centre and thinktank. Art+Com is a leader in producing high-end net visualization projects. Ping lets the browser add a link, which then becomes a part of the ongoing visual structure. It is similar, in this sense, to the Toronto Centre for Landscape Architecture's OASIS site.

Art+Com's T-Vision project (<http://www.artcom.de/projects/terra>) which uses satellites and networked VR computers to permit an astonishing fly-in to earth from space: acclaimed as one of the most imaginative realizations of the potential of networked computing.

OASIS(Image)INTERNET-DRAFT Toronto Centre for Landscape Architecture's OASIS site requires a specialized browser, but from a standard Netscape connection, you can view stills that give a sense of the beautiful images produced by the collaborative "design process". It is introduced by its designers as follows:

Oasis is a shared 3-Dimensional navigational environment for the world wide web. This virtual landscape allows one to bury their own information links throughout the terrain or to discover and connect to new information left by others.

TechnoSphere (<http://www.lond-inst.ac.uk/TechnoSphere/>) Is

TechnoSphere a Game?

Yes and no. It's an experiment on a global scale, a chance to

Humanities and Arts [[draft-ietf-harts-guide-02.txt](#)]

[Page 34]

develop complex artificial life on digital networks. TechnoSphere is interactive like a game, but transgresses the linear boundaries of branching and hierarchical games narrative to enable freer movement. TechnoSphere is designed to encourage a non-linear experiential exploration.

Body Missing (<http://yorku.ca/BodyMissing/index.html>)

Toronto artist Vera Frenkel created this richly evocative site on the disappearance of art and memory as an extension of her Transit Bar installation. It is conceived as a site open to new 'reconstructions' of the artworks confiscated during the Third Reich. First opened to the public as part of the ISEA95 exhibition in Montreal, it has since earned widespread critical comment and praise.

Molecular Clinic 1.0

(http://sc_web.cnds.canon.co.jp/molecular_clinic/artlab_bionet)

Molecular Clinic 1.0 ' is an art project realized through a collaboration between ARTLAB and Seiko Mikami, and is one of the most elaborate custom designed art projects yet created for the Web. During their initial visit users should download the MOLECULAR ENGINE VIEWER, which is a type of molecular laboratory for their computer. What they will see on the web site after this initial download is a virtual space containing a three dimensional computer generated Spider and Monolith object. The user will be able to navigate through and into this virtual space and can zoom into the spider all the way to the molecular level.

File Room (<http://fileroom.aaup.uic.edu/FILEROOM.html>) -

Cumulative database info on Censorship, hosted in Chicago but conceived by Spanish artist Antoni Muntadas.

Idea Futures (<http://if.arc.ab.ca/~jamesm/IF/IF.html>) -

Winner of the grand prize at the 1995 Ars Electronica competition for Web Sites, Idea Futures is a stock market of ideas, based on the theories of mathematical economist Robin Hanson. The 'truth' of any claim is assigned a weight calculated by the amount of virtual cash which members of the exchange are willing to bet. The scheme leads might lead toward a radical democratization of academic discourse, but just as easily, toward the trivialization of thought. See the following for a philosophical critique of the system.

(<http://merzbau.citi.doc.ca/~henry/Matrix/Erewhon.html>)

Firefly (<http://www.agents-inc.com/>) also a prize winner at Ars Electronica in 1995, Firefly is an prototypical example of what enthusiasts call a "personal music recommendation agent", which makes suggestions for what you might like to listen to, based on a stored

profile of your own likes and dislikes, and the evolving ratings submitted to the system by other members. Worth visiting, if only to understand what all the fashionable hype about 'intelligent agents'

Humanities and Arts [[draft-ietf-harts-guide-02.txt](#)]

[Page 35]

is all about; skeptics should know that even the promoters of these services admit the circularity of their systems: they're capable of reinforcing existing taste, but little else.

Appendix B: Some other URL's of interest

Art on the Net

<http://www.art.net/Welcome.html>

Artist Memorials

<http://www.cascade.net/kahlo.html>

Writers

<http://the-tech.mit.edu/Shakespeare/>

http://www.rain.org/~da5e/tom_robbins.html

Photography

<http://www.nyip.com/>

Personal Journals

<http://grateful.dead.net/RobertHunterArchive.html>

<http://www.cjnetworks.com/~jessa/>

Musical Groups

<http://www.dead.net> (Grateful Dead)

<http://www.netspace.org/phish/> (Phish)

Appendix C:

To get started you may send a message to RFC-INFO@ISI.EDU with requests such as in the following examples (without the explanation between []):

```
Help: Help                [to get this information]

List: FYI                 [list the FYI notes]
List: RFC                 [list RFCs with window as keyword or
                          in title]

  keywords: window
List: FYI                 [list FYIs about windows]
  Keywords: window
List: *                   [list both RFCs and FYIs about windows]
  Keywords: window
List: RFC                 [list RFCs about ARPANET, ARPA
                          NETWORK, etc.]

  title: ARPA*NET
List: RFC                 [list RFCs issued by MITRE, dated
                          1989-1991]

  Organization: MITRE
  Dated-after: Jan-01-1989
  Dated-before: Dec-31-1991
List: RFC                 [list RFCs obsoleting a given RFC]
  Obsoletes: RFC0010
List: RFC                 [list RFCs by authors starting with
                          "Bracken"]

  Author: Bracken*       [* is a wild card matches everything]
List: RFC                 [list RFCs by both Postel and Gillman]
  Authors: J. Postel     [note, the "filters" are ANDed]
  Authors: R. Gillman
List: RFC                 [list RFCs by any Crocker]
  Authors: Crocker
```


