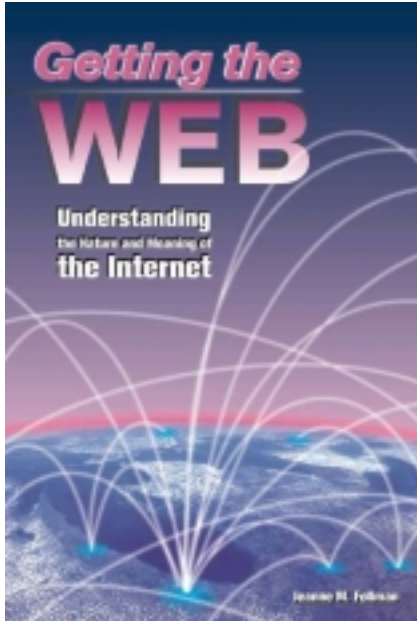


Read Me and Pass Me On
chapter excerpt & annotated Table of Contents

Getting the Web: Understanding the Nature and Meaning of the Internet



Courtesy of Duomo Press
full eBook and softcover available at
<http://www.duomopress.com>



This is copyrighted material. However, you have permission to read, email, print and pass it along for free, as long as you make no changes to its contents or digital format. The right to sell this book or any part of it is strictly reserved.

That said, Enjoy!

Getting the Web will be generally available in bookstores by September 2001. After mid-March, you can purchase the softcover book directly from Duomo Press at <http://www.duomopress.com> or order it through your favorite online retailers and traditional bookstores.

an eTaste of
Getting the Web

Understanding the
Nature and Meaning
of the Internet

Jeanne M. Follman

Published by Duomo Press, Chicago, IL
www.duomopress.com

Copyright © 2001 by Jeanne M. Follman

All rights reserved. Except as permitted under the Copyright Act of 1976, no part of this publication may be reproduced or distributed in any form or by any means or stored in a database or retrieval system, without the written permission of the publisher. However, you have permission to read, email, print and pass this eTaste along for free to anyone you like, as long as you make no changes or edits to its contents or digital format.

Product and company names mentioned herein may be trademarks of their respective owners. Their use does not imply any affiliation, connection, or endorsement of the products or their owners. Printed and bound in the United States of America.

**Best viewed at 100%, 125%, or Full Screen Mode
(select Full Screen from View menu).**

Open Standards

THE TELEPHONE network is well over 100 years old. Computers have been around for more than 40 years and have been on the desktop for more than 20 years. Yet only since the mid-1990s have they propagated in a big way, giving life to the Internet and the Web.

What was the essential ingredient that made it happen and made it happen so fast? Good pedigree. Both the telephone industry and the computer industry are almost completely standards-driven.

Standards and Communication

Files of words, pictures, sound, motion, and logic generate a considerable amount of traffic on the Internet in their travels from servers to clients. That's a lot of 0s and 1s – hundreds of billions a second, give or take a few billion. How do we decipher all those 0s and 1s? How do we tell the bits that represent a Mozart sonata from the bits that represent a picture from the bits that represent a definition from the Oxford English Dictionary? With standards.

By using standards, we are able to turn billions of 0s and 1s into complex files of words, pictures, sound, motion, and logic that actually mean something. Standards provide the language

that give context and therefore meaning to our 0s and 1s.

The Internet, like all communication, uses the model of the sender, the signal, and the receiver:

- Sender – the Server
- Signal – the File
- Receiver – the Client

For communication to take place, the sender and the receiver must understand the meaning of the signal. On the Internet and the Web, standards give meaning at many different levels to the bits flying back and forth in files between clients and servers. There are a huge number of standards that work with one another, layer upon layer, to enable just about any activity you could imagine on the Internet, from the most basic electrical interaction to high-level programming. In this chapter, we'll look at a small but crucial set – standards for files. We create meaning by agreeing upon standards for our files. They are the fertile soil in which client and server applications can grow, enabling new forms of communication and exchange.

The meaning of a file is given in two ways: first, by the type of file, and second by the standard that describes that file.

File Types

The MIME type (Multipurpose Internet Mail Extension) defines the type of file (e.g., Web page file, RealAudio audio file, QuickTime video file, etc.) that goes from the server to the client. Its peculiar name results from the fact that in the early days, email was the dominant file type on the Internet, so everything that came after it was considered an extension. The Internet Society (www.isoc.org) has defined hundreds of different MIME file types and each file on the Internet contains a MIME type identification. Your browser looks at that identification and then figures out how to display or play the file.

File Standards

Once the browser knows the type of file, it can interpret it correctly based upon the standard that defines the structure of the file. When you write a Web page, you follow the standard called HTML (Hyper Text Markup Language). HTML allows you to mark up text to control its display in a browser. For example, if you want some words to show up in bold text, you put the characters `` and `` before and after the text you want in bold. If you follow the HTML standard when writing Web pages, anyone with a browser that supports the standard can view the Web pages you write.

Standards and the Birth of the Web

In 1990, Tim Berners-Lee wrote three standards (HTML, HTTP, URL) to implement a way to display, link, and find documents on any computer hooked to the Internet. By writing these three standards as well as the first browser, Tim Berners-Lee, with a little help from his friends, invented the World Wide Web. People saw what he had done, thought it was cool, and started writing Web pages of their own. Other folks like Marc Andreessen started writing better browsers and the Web grew like wildfire. Luckily for us, the standards that Berners-Lee wrote were open standards that anyone could use. And they were also robust enough to scale from a World Wide Web of a few files on a server in Switzerland to the hundreds of millions of files we have on the Web today. Tim Berners-Lee tells his story and relates his hopes for the future of his brainchild in his book *Weaving the Web: The Original Design and Ultimate Destiny of the World Wide Web by Its Inventor* (New York: HarperCollins Publishers, 1999). He went on to found the World Wide Web Consortium (www.w3.org), a group whose mission is to realize the full potential of the Web, primarily through the evolution of open standards.

Standards Today

Once someone thinks up a standard that catches on, it typically evolves through use and through formalization by a standards committee. There are thousands of people in the telecommunications and computer industries involved in debating and formalizing the various standards in use today. Many of these are Internet and Web standards or are used in the infrastructure of the network itself. Key standards organizations include the Internet Society (www.isoc.org) and the World Wide Web Consortium (www.w3.org). In fact, the technical evolution of the Internet can be traced by looking at the Internet Society's Request For Comments documents (www.rfc-editor.org), the vehicle by which people propose, debate, and agree upon the standards and procedures that make the Internet work.

Here are some Internet buzzwords that you may have seen. They are some of the many standards in use on the Internet and Web today:

- ❑ TCP/IP (Transmission Control Protocol / Internet Protocol) – Standard that defines how files are split into packets, routed across the Internet, and put back together again at the other end.
- ❑ ASCII (American Standard Code for Information Interchange) – Standard that defines how numbers and letters are represented as bits.
- ❑ HTML (Hyper Text Markup Language) – Standard that describes how to mark up text to control its display in a browser.
- ❑ HTTP (Hyper Text Transfer Protocol) – Standard that describes how to connect files to one another over the Web via clickable links.
- ❑ URL (Uniform Resource Locator) – Standard that

provides a method to find a Web page on a server and the server on the Internet; identifies the protocol for accessing it.

- ❑ GIF (Graphics Interchange Format), PNG (Portable Network Graphic), and JPEG (Joint Photographic Experts Group) – Standards for image files.
- ❑ POP3 (Post Office Protocol 3) – Standard for receiving email.
- ❑ SMTP (Simple Mail Transfer Protocol) – Standard for sending email.

Open Standards

Standards define the context and the meaning of a signal in a communication. In a Web page, the bits might represent a word. In an image file, they might be color-squirting directions. In a RealAudio sound file, the bits might represent a phrase of a song. Standards perform the same service for computers that language performs for people – they give us the context (i.e., “Let’s speak English”) and the meaning of individual words. And just like no one “owns” English, no one should “own” standards, the language of computing.

An *open standard* is a published standard that is possessed by no one and used by all. HTML is an open standard. It is managed by the World Wide Web Consortium, which has responsibility for its dissemination and evolution. But the Consortium does not own it. No one does. Anyone can inspect, criticize, or suggest enhancements to an open standard and any changes must be made by consensus.

A *proprietary standard*, on the other hand, is typically owned by a corporation. Its internals can usually not be inspected. Its use is licensed by its owners. It can be changed at will.

Open vs. Proprietary Standards

The types of streaming audio that we discussed in the Sound and Motion chapter, RealAudio and MP3, illustrate this difference.

You can listen to RealAudio files using a Real client because RealNetworks has specified three things:

- how the sound is digitized,
- how the server streams the file to the client, and
- how the client interprets and plays the file once it arrives.

Such a specification is typically done by writing a standard: a set of rules describing interfaces and processes. This particular standard is a proprietary standard, created and controlled by RealNetworks. RealNetworks invented streaming audio and it owns the RealAudio standard. If you want to play a RealAudio file, you need the RealAudio client; you can't write your own. Likewise, if you want to serve RealAudio files you need RealAudio server software. The specifications that define how the servers talk to the clients are not open to public view and the evolution of the standard is controlled solely by RealNetworks.

MP3 is the other popular flavor of streaming audio on the Web. MP3 is an open standard, developed by a group of companies working through the International Standards Organization (ISO). ISO has published a technical specification of MP3 so anyone can write client software or server software for MP3 files. As a result, many companies have developed client software and many other companies have created Web sites that serve sound files. Since both client software and server software are written to the open MP3 standard, they can successfully communicate with one another even though the software is written by different people.

The MP3 standard typifies a different way of doing business,

one based on open rather than proprietary standards. Because the guts of the standard are published for all to see, many different individuals and companies can create different products and services based on the open standard, knowing they will all work together.

If you happen to develop the software that creates MP3 files, you have to pay a royalty fee to the appropriate patent holders, but you can still utilize the standard to write your software. And the people who use your software to create MP3 files, the people who build MP3 sites, and the people who develop MP3 client software to play the files can all utilize the open standard to their heart's content, royalty-free. As a result, an entire new industry has grown up around MP3. Sites with huge numbers of MP3 music files are sprouting all over the Web, giving access to music by all kinds of established and up-and-coming (and completely unheard of) artists. MP3 players have proliferated. So have CD rippers, the software that copies your CD tracks and stores them in much smaller MP3 files on your hard disk for later playback. Ironically, even though RealNetworks invented streaming audio, the big boom in digital music on the Web is MP3; RealNetworks has even come out with its own MP3 player. Such is the power of open standards.

Open Standards and Growth

Over and over again, open standards have proven to be the power that fuels phenomenal growth. Europeans use cellular phones twice as much as Americans. In Finland, wireless phones already outnumber wired ones. The main reason is because Europeans agreed to use a single, open, digital cellular standard. Equipment manufacturers therefore only have to build to one set of specifications and everyone's phones work equally well anywhere in Europe. As a result, business is booming and new services such as messaging and two-way data transfer are rolling

out much faster and much more comprehensively in Europe than they are in the United States.

Open standards can grow an entire industry, leaving more room and more opportunity for everyone. And they improve products, because rivals can compete only through price and quality. Most importantly, open standards provide the clarity and stability necessary to create new forms of communication and exchange. They provide an elegant, transparent way for people to interact in a cooperative fashion.

The Power of Cooperation

The Web is a product of the thoughtful cooperation of individuals all over the world. When we think of people cooperating, we often think of a group of people working together as a unit to attain a specific goal. The Web is a marvel of cooperation but ironically it utilizes cooperation so that each one of us can attain our own goals. Agreements to cooperate between people on the Web are constructed so that each person and organization can do its own thing. As Tim Berners-Lee says in *Weaving the Web*, “As long as we accept the rules of sending packets around, we can send packets containing anything to anyone.”

On the Web, cooperation results in people doing anything they want, often at cross-purposes. Astrology bits ride the network right along with bits from NASA; Shakespeare rides right next to Beevis and Butthead. When you participate on the Web either as a creator or as a consumer, although you agree to make your computer cooperate in a quite sophisticated and precise manner, what you then do is completely up to you. The more the Web grows in diversity and complexity, the more it comes to resemble the full extravagance, color, and richness of being human.

OPEN STANDARDS

Cooperation on the Web has enabled an explosion of communication and exchange. We have much to say to one another and much to buy and sell; the wonder is that the cooperation implemented via standards has such a huge payback. Irrational exuberance strikes again!

Getting the Web

Annotated Table of Contents

A quick look at the other chapters in the book.

The Big Picture

The pictures taken by the Apollo 8 astronauts were the first to show us Earth, floating alone and majestic in space; these pictures forever changed the way we think about ourselves. Likewise, the Internet is now forever changing the way in which we interact. It is launching us into the new millennium by giving to each individual the powers of communication and exchange that in the past were held only by governments and corporations. This book explores what the Internet is, how computers and telephones shape the internet, and how the Internet shapes communication and exchange and ultimately, us. Technically, it's all quite complex and sophisticated. Conceptually it's a simple matter of moving files back and forth between servers and clients to engage people in communication and exchange. Chapter topics: Looking at What, Not How — Structure of the Book

Part I

In Part I, we see what happens when individuals exchange words, pictures, sound, motion, and logic by putting them in files and moving them back and forth on the Internet – the telephone company for computers.

The Telephone Company for Computers

How the telephone network and computers, as either clients or servers, make up the fabric of the Internet and create the basic mechanism for communication. Chapter topics: *Computers — The Telephone Network — Clients and Servers — Summary: The Telephone Company for Computers*

Files

Traffic on the Internet is no more or no less than billions of requests and files, flying back and forth all over the world, between clients that have requested the files and servers that have served them. Chapter topics: *Signals — Suck It and See*

Files of Words

How the Internet fits into the written tradition and how it turbocharges the power of the word, visualizing discourse and giving each individual the power to create complex repositories of thought and to enter into a conversation on that thought with anyone else on the planet. Chapter topics: *Visualizing Discourse — A Changing Relationship with Text — Mesopotamia dot COM — The Solitary Reader — The Logic of the Book — The Flavor of Text on the Internet — Hypertext - Connection Made Manifest — Breaking Down Barriers — What We Were After All Along?*

Files of Pictures

How images on the Web can be used to convey complex information that can only be fully done pictorially. Chapter topics: *Image File Guts - Pictures as 0s and 1s — Pictures are Cool — Visual Knowledge — Photographs — Art*

Files of Sound and Motion

How the Web can enable each one of us to become radio and

video broadcasters. Chapter topics: *Sound as 0s and 1s — Streaming Audio — MP3 — Internet Radio — Broadcasting Internet Radio — Video on the Web*

Files of Logic

Smart clients, smart servers, B2B: what happens when we start creating Web clients and servers that not only do “show and tell” (i.e., transmit files of words and pictures), but do the million other things that software is known for. Chapter topics: *Smart Servers — Smart Servers - Business to Business — Smart Clients — Downloading Programs — The Telephone Company for Computers*

Part II

Part II explores why the Internet is the way it is: how computers and telephone networks shape the nature of the Internet. We see how open standards successfully orchestrate the daily movement of millions of files, we look at search engines, we see why bandwidth is an issue, and we explore the crucial difference in a public network between content and connection.

Open Standards

Open standards are the power that fuels phenomenal growth, providing the clarity and stability necessary to create new forms of communication and exchange. They provide an elegant, transparent way for people to interact in a cooperative fashion. As Tim Berners-Lee says, “As long as we accept the rules of sending packets around, we can send packets containing anything to anyone.” Chapter topics: *Standards and Communication — File Types — File Standards — Standards and the Birth of the Web — Standards Today — Open Standards — Open vs. Proprietary Standards — Open Standards and Growth — The Power of Cooperation*

Searching the Web

Push vs. Pull, metadata, and why it's so hard to *find what you're looking for on the Web. Chapter topics: *Push vs. Pull — Catalogs, Search Engines, and Portals — Mechanizing Meaning — Metadata — Sort of Meta — Real Metadata*

Bandwidth and the World Wide Wait

A quick tour of the Internet, why squeezing bits through the voice telephone network is such a slow process and what forthcoming "broadband" solutions, especially ADSL and cable, can do to help the situation. Chapter topics: *The Local Loop — The Internet — The Internet Service Provider (ISP) — Traffic on the Internet — Bandwidth — Speeding up the Internet Network — Speeding Up the Local Loop — In the Interim — Speed in Both Directions — Broadband Solutions — Asymmetric Digital Subscriber Line (ADSL) and the Pooz Deaf Telephone Company — Cable TV — Fiber — Wireless Options — Accessibility Issues — Cost and Convergence — Why Bandwidth Matters*

Content and Connection

What happens when a number of centralized, private networks such as TV broadcast and cable networks crunch into the distributed, decentralized public network that is the Internet. Chapter topics: *Bundling — Bundling in a Broadband World — Bundling Access and ISPs — Public Networks Connect — Content, Connection and Convergence — History Repeats Itself — The Pricing Issue — The Infrastructure Challenge*

Part III

In Part III, we discuss the ways in which the Internet shapes communication and exchange and ultimately, us. The Internet gives us a splendid mechanism to hold an enriched conversation or to

do business with anyone on the planet. And when people start talking on the Internet, information flows freely, anyone can publish, barriers to entry for many businesses are virtually eliminated, intellectual capital increases, feedback shapes content, communities of interest gain voice, local communities thrive, and complex and differentiated entities form and emerge, like the open source movement and the Internet itself. Information illuminates. The Internet will make obvious new ways of doing things and create new ways of looking at life. With it, we can more easily see ourselves in the full context of who we really are and ensure that our institutions truly function the way they should.

Individuals in Conversation

On the Internet, the vast complexity and storage capacity of computers fuses with the reach of the telephone network, dramatically enriching our conversations. If your interests, your business, or your mission in life lay within the realm of communication or exchange, the Internet is the tool for you. Are you ready? Chapter topics: *Communication and Exchange — The Power of Publishing — The Power To Exchange — The Creator's Tool of Choice — Using Files for Communication and Exchange — Visualizing Discourse — Internet Time — Discourse and the Shaping of Content — Sharing and Amplifying Intellectual Capital*

Formation of Community

On the Internet, it's not unusual for people who would otherwise be complete strangers to do cool stuff as a community for no other reason than their love of doing cool stuff. Far from being a force for social isolation, for people of like minds or similar interests, the Internet is a wellspring of community formation, and is itself the product of such a community. The Internet dissolves barriers, the main but not the only one being distance, and provides a forum for conversation, debate, and interaction. Chapter

topics: *Conveying Presence — Reaching the Niche Audience — A Small Corner of Cyberspace — Victorian Email — Enhancing Physical Communities — The Virtual Corporation — The Community that Created the Internet — Doing Good and Showing Off — Open Source — Transparency and Complexity — Cyberspace is Earth*

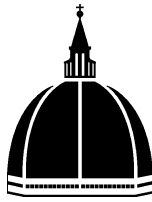
Conversations Driving Change

The Internet doesn't cause change but the people using it certainly do. If there are conversations between people and within communities that the Internet can bring about, it is from these conversations that change will come. Information and access have become both democratic and global, generating deep structural changes in the way we communicate and do business. Chapter topics: *The Free Flow of Information — Access Changes Structure — Everyone's an Operator — The Price in the Marketplace — The Marketplace Itself — A Market of One*

An Outbreak of Sanity

Information illuminates. With it, we can see ourselves in the full context of who we really are and insure through transparency that our organizations function the way they should. Using the Internet, each individual, alone or in communities of interest and knowledge, finally has the power to trump the agenda of the institution and shape it to serve those who give it meaning. It may be just the thing we need to permanently nail into place the mother of all paradigm shifts: the idea that the person gives meaning to the institution, not the other way around. Chapter topics: *Illumination and Formalization — Transparency — Epiphanies of Context — Welcome to the Renaissance*

Glossary, Bibliography, Index



Duomo Press
CHICAGO

<http://www.duomopress.com>