A Home on the WEB

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Our home - Svingen 10, N-1671 Kråkerøy
http://www.ludvigsen.dhhalden.no

Our family home near Fredrikstad, Norway has been the object of a research project as a multimedia remote workplace since last spring. We have an ethernet of 5 computers plugged into the Internet with full “real time” connectivity provided by a 64Kbps fixed digital line. Our home also has its own World Wide Web server.

The aim of this paper is to give some insight into our experience with continual, and for some of us immersive connectivity to what is commonly called Cyberspace. It will cover both technical aspects as they pertain to the practical installation, maintenance and administration of the network as a fully integrated subdomain of the Internet. It will also cover aspects of functionality, usage and perceived social impact focusing especially on the exposure and opportunity for publication provided by the simple functionality of a domestic World Wide Web server.

CoMMedia.

In order to provide a common basis for research and development of nationally distributed multimedia systems, the CoMMedia (Cooperation, Communication & Multimedia) program has been established on the initiative of Norwegian universities and research institutes.
Participants in the program are the universities in Oslo, Bergen, Trondheim and Tromsøe along with Østfold Regional College, Televerkets Forskningsinstitutt (TF), NR, SINTEF DELAB, SINTEF SI, NORUT IT, UNINETT and the National Library in Rana (NBR).

CoMMedia is a national Norwegian distributed multimedia research program to which the project described below is my college’s (Østfold Regional College) contribution. Information about the other participating projects can be found at the project secretariat with UNINETT in Trondheim. (UNINETT is the Norwegian Internet provider for the research and educational community.

CoMMedia:
http://www.ludvigsen.dhhalden.no/webdoc/commedia_slutt_rapport.html

Uninett:
gopher://gopher.uninett.no/00/UNINETT%20informasjonstjener/uninett/uninett.over\
view

Our network - the remote workplace.

The project started as a research project into remote workplace technology and use. The aim was simply to have the same resources available at home as I had at work. Primarily, the same access to the network (Internet) and out local network at the college, but also access to the same computing capacity, tools and aids.

With the continual drop in prices of hardware, there no longer seemed to be any convincing arguments for not be able to work with the same functionality at home as at work. The only real and great difference was the idea of the network connection. As my primary area of work is “multimedia” where file-sizes are often not within the realm of easily transportable magnetic media. The idea of being able to move freely around while the data on which one is working essentially remains at one site, was the real appeal of the project.

Note: The URLs quoted in this paper have hyphenated addresses. When attempting connections on basis of the URLs, remove hyphens at the end of lines, unless they are obvious address dividers.

Norwegian Telecom Research:
http://www.nta.no/xtf/xtf.html

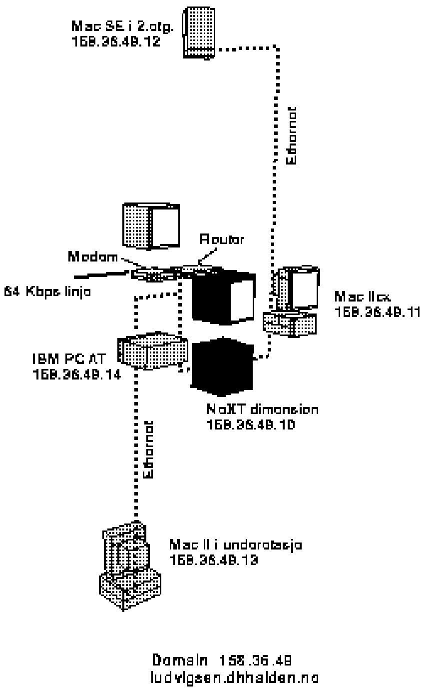
Our domain

The essential part of the installation, the network connection is sponsored by UNINETT and Norwegian Telecom.

Technically, the installation consists of a 64Kbps fixed line to the nearest UNINETT node which a nursing college about 1.5 kilometers up the road. They are in turn connected with an identical 64K line to the college in Halden, which is 40kms to the south east. Østfold Regional College itself, which is the main node for our county and situated about 200km south east of Oslo on the Swedish border, is connected to UNINETT backbone in Oslo with a 256K frame relay line.

Internally, the house is cabled with thin Ethernet. There are a total of 6 computer connections and at the moment 5 machines are on the net. There are three machines in my personal workplace. In addition, there is the WWW server machine, and one upstairs. Our son's Macintosh in the basement is temporarily disconnected.

Our domain is ludvigsen.dhhalden.no.



The bridge between the modem connecting the 64K line and the local net is an HP Router ER, which defines our home as a separate sub-domain on the Internet.

The machines used in the net are:

A NeXT Dimension Cube which serves as the main work machine and mail server for the house. The choice of the NeXT was purely personal and not an essential part of the system. It is however, convenient to receive mail on the machine as a server, avoiding the remote processing of mail.

A Macintosh Quadra 700 which is primarily used for graphic work and interactive video conferencing.

An IBM PC AT which is used to receive weather satellite images. Not a direct part of the remote workplace project, but never the less a part of the local network and source of some quite large image files that are processed and transmitted out over the net.

A Macintosh SE 20 which located upstairs on the seconds floor, and which is used by other members of the family.

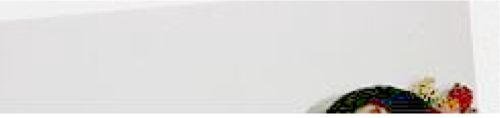
A Macintosh SE 30 that serves as WWW server.

The installation of the digital line was done by a service man from Telecom. The rest of the installation, including cabling and connectors was installed by myself. This includes connecting up the modems both here and at the nursing college and putting the router on line and connecting it to the net.

Administration of the system is not trivial when taking into account the Unix machine. However, this is purely be personal choice and done as an exercise in understanding such administration.

Had the network been set up with PC's and Macs alone, system administration would have been left on the servers at the nearest higher level domain, the college. Mail could have been delivered on the remote servers and picked up with client programs such as Eudora or Mailstrom.

The only administration necessary on the local machines would then have been configuration of the TCP drivers on the individual machines. Administration of the router other than software upgrades has been done by UNINETT staff over the network. Software upgrades have been completed through telephone instructions as it is necessary to access the router console from the local side of the router. The software has been downloaded with tftp to the NeXT and them picked up by the router software itself on console commands.



Installation and administration of the http software for the web-server was a fairly straight forward process. The initial server installed on December 18, 1993 was the standard MacHTTP 1.2.1 release, which was subsequently upgraded to 1.2.3 and 1.2.4.

The installation procedure and authoring of 3 html documents took all of three hours from scratch, including the necessary reading of documentation and with absolutely no prior knowledge of either html or http. The server software installation was simply a matter of downloading the package with ftp. Most ftp applications on the Mac will decompress and unarchive the software too. After downloading, all that was necessary was a double click and testing the servers default documents with a client on another machine.

An ftp daemon as since been added to the software running on the server enabling remote access and administration of documents.

The network connection was installed around April 15 last year and the whole net was configured and working in early June.

Usage

The users of the net include all the members of the family depending on who is at home at any one time.

The users of the `ludvigsen.dhhalden.no` sub-domain gathered in early June, just after everything was up and working.

In the illustration at left, from left to right: Stig Olsen (Stig was active on the net while he was a student at ØDH, but has since left us), our daughter Antonia Reime <antonial@dhhalden.no> (Antonia is in Ghana at the moment, but will be returning in later this month), Eva Lunde <eval@ludvigsen.dhhalden.no>, our son Sebastian <sebl@dhhalden.no> (Sebastian is doing an apprenticeship in photography in Sandnes near Stavanger, but will be back in about a year's time), his girlfriend Linn Iren <linnh@ifi.uio.no> is on the monitor on his lap (Linn Iren studies mathematics at the University in Oslo) and finally myself, the concierge.

We have two basic modes of using the net. Apart from my own fairly intense use of basically all the network facilities installed, the other users mainly read mail and Usenet news. Linn Iren has also made extensive use of remote X-windows facilities when logging into the machines at the University in Oslo from the Mac downstairs.

My own use which spans from fairly simple remote logins, to directly mounted volumes on remote machines (not very efficient over a 64K line) through real-time audio and video applications, is supplemented by fairly useful external use. When traveling, I find myself logging in daily, not only to read mail, but also for the reassurance just seeing the machines working gives. The reasoning being that if the machines are happy, the rest of the house is also whole.

Since the installation of the Web-server, one of the most time-consuming activities on our domestic net has been authoring and maintaining html documents. Initial development of documents is usually done with Emacs on the NeXT. (The very first documents were authored with the old NeXT browser/editor.) After local testing using XMosaic (I have Co-Xist installed on the NeXT), the document is moved to the SE30 through the Quadra, which has the NeXT mounted as a couple of NFS volumes, and the SE30 mounted as an Appleshare volume. Subsequent maintenance is usually done with Emacs on the Quadra. There are several advantages to using Emacs in html-mode. Writing html code directly gives great control over code and cleaner documents that behave better on a variety of