Internet Services: News-Groups

- Usenet: global, de-centralized distributed Internet discussion system
- Newsgroup: An on-line forum that allows users from all over the world to participate in a discussion about a specific topic
- First Grouping of newsgroups into categories (other groupings such as languages, countries, …):
  - comp.* —computer-related topics
  - news.* — Usenet-related issues
  - sci.* — scientific subjects
  - rec.* — recreational activities (e.g., games and hobbies)
  - soc.* — socialising and discussion of social issues
  - talk.* — contentious issues such as religion and politics.
  - misc.* — anything which does not fit in the other hierarchies
- Google Groups (http://groups.google.com) hosts an archive of newsgroups starting from May 1981

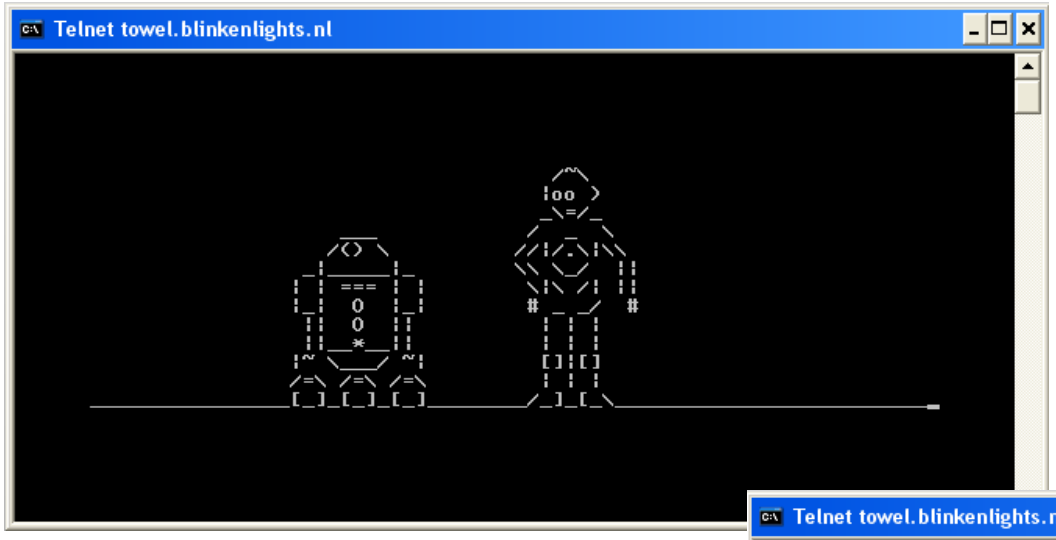
Telnet

- A program/protocol which permits a user on one computer to use that computer as a terminal to access another, perhaps distant, computer
- No built-in security
- Example:
  `telnet www.google.de 80`

- Successors of telnet are
  - SSH (Secure Shell) – Windows/LINUX
  - RDP (Remote Desktop Protocol) – Windows

Star Wars via Telnet

- `> telnet towel.blinkenlights.nl`

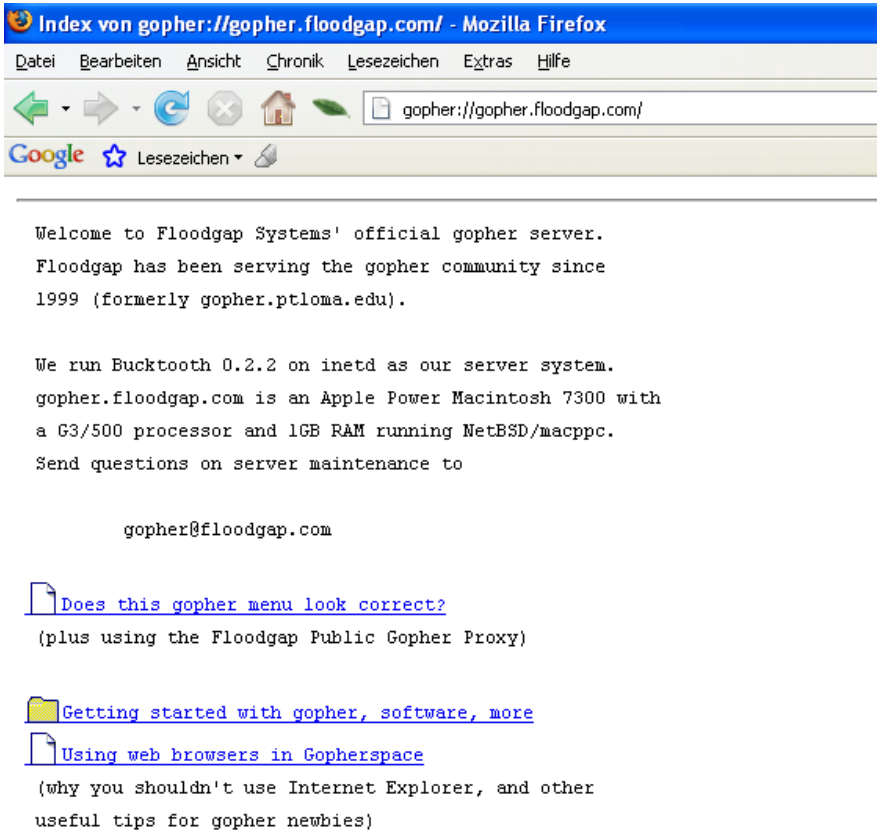


Source: Y. Langer, TAI10ABC

Internet Services: Gopher

- Internet service that can be accessed via a Gopher client or a Web browser
- Improved version of anonymous FTP
- Non-graphical, hierarchically structured hypertext system

- Try out http://wt.gopherite.org



Hypertext Transfer Protocol (HTTP)

- HTTP is the language that web clients and web servers use to talk to each other
  - HTTP is largely “under the hood,” but a basic understanding can be helpful
- Each message, whether a request or a response, has three parts:
  1. The request or the response line
  2. A header section
  3. The body of the message
- Most important HTTP commands:
  - GET – parameters are transferred within URL
  - POST – parameters are transferred transparently to the user

An HTTP Session

- A basic HTTP session has four phases:
  1. Client opens the connection (a TCP connection)
  2. Client makes a request
  3. Server sends a response
  4. Server closes the connection

- Example:

1. Open command prompt
2. **`telnet www.microsoft.com 80 [RETURN]`**
3. **`GET doesnotexist.html HTTP/1.1`**

HTTP Response

```
HTTP/1.1 400 Bad Request
Content-Type: text/html; charset=us-ascii
Server: Microsoft-HTTPAPI/2.0
Date: Sat, 05 Jan 2008 17:21:16 GMT
Connection: close
Content-Length: 334

<!DOCTYPE HTML PUBLIC "-//W3C//DTD HTML
   4.01//EN""http://www.w3.org/TR/html4/strict.dtd">
<HTML><HEAD><TITLE>Bad Request</TITLE>
<META HTTP-EQUIV="Content-Type" Content="text/html;
   charset=us-ascii"></HEAD>
<BODY><h2>Bad Request - Invalid Hostname</h2>
<hr><p>HTTP Error 400. The request hostname is
   invalid.</p>
</BODY></HTML>
```

Exercise 1.4

Important Features of HTTP

- Persistent connection (in HTTP 1.1)
  - only one connection is required to transfer, e.g., a number of inline images (prior to HTTP 1.1, one connection per object was required)
- Stateless
  - Each operation or transaction makes a new connection
  - Each operation is unaware of any other connection
  - each click is a new connection
  - After completion of requests, no information about those is retained -> how do those shopping carts work?
- Proxy caching
  - Can be cached by Web servers
- Content negotiation
  - For example, the client and server can agree on a gzip encoding of the HTML page

Web Servers

- A **Web Server** is an implementation of HTTP
  - It runs on some machine/device (server, toaster, router, …)
- Widely used Web servers: Apache, MS Internet Information Server/Services
- Serving dynamic Web content requires some server-side programming
  - PHP
  - ASP.NET
  - Ruby on Rails
  - …
- DIY Web Server?

Internet Services: Word Wide Web (WWW)

- An application that uses the Internet to transport hypertext/multimedia documents (Web pages). These documents are viewed by a *browser*
- Web pages are linked by Hyperlinks
- The WWW uses HTTP as a protocol, HTML for describing Web pages (content), and CSS for defining the layout of content

Exercises (1.5), 1.6