

# Accessing Go and Computer Go Resources on the Internet

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## Abstract

The game of Go provides a rich domain for academic research in computer science, artificial intelligence and psychology. Researchers in the computer Go field as well as individuals involved in implementing Go programs for recreation or profit can benefit from resources available on the Internet. This paper provides a guide to accessing the resources that may benefit those in the computer Go field. We describe these resources and how they can be accessed.

The resources described include archive sites, the Go Frequently Asked Questions (FAQ), the Internet Go Server (IGS), the rec.games.go news group, the computer-go mailing list, the Computer Go Ladder and official computer Go competitions, and bibliographies on computer Go research and programming.

Technical information is provided on how to access Internet resources including anonymous file transfer protocol (FTP), hypertext transfer protocol (HTTP), and telnet, and on how to uncompress files that have been transferred using anonymous FTP.

This document is itself accessible on the Internet. It can be accessed in Postscript format by HTTP at:

<http://www.psy.uq.edu.au/~jay/papers/comp-go.internet.ps.Z>

and by anonymous FTP at:

[clavinet.cs.uq.edu.au:/pub/pdp/go/comp-go.internet.ps.Z](http://clavinet.cs.uq.edu.au:/pub/pdp/go/comp-go.internet.ps.Z)

and a modified version with HTTP links is available at:

<http://www.psy.uq.edu.au/~jay/go/CS-TR-339.html#8.0>

## Introduction

This paper describes Internet resources pertaining to computer Go (Section 2) and Go (Section 3). Technical details relating to the general access of Internet resources (Section 1) can be ignored by experienced Internet users other than section 1.4 which describes the address conventions used in this paper. Access information for particular resources are provided underneath their descriptions and are correct as at August 1995. It should be noted that due to the nature of Internet resources, there is no guarantee that the resources described will still be maintained or still reside at the addresses indicated at a later date.

# 1 Accessing Internet Resources

The information in this section is intended to be a general introduction to accessing Internet resources. Machine/system specific information not found here should be obtained from friends, colleagues, system administrators or computer/software suppliers.

## 1.1.1 File Transfer Protocol (FTP)

The file transfer protocol (FTP) is a format for encoding data which enables the transfer of files to and from remote computers. Anonymous FTP enables the sharing of files without restriction, i.e. information available by anonymous FTP is “in the public domain”. Such public FTP archive sites allow “anonymous” users to login and retrieve files from the archive.

## 1.1.2 Accessing FTP Sites<sup>1</sup> (Login Procedure)

To access an FTP site, type

```
ftp <site-address>
```

where <site-address> is either the alpha-numeric address of the FTP site, e.g.

```
ftp bsdserver.ucsf.edu
```

or the Internet protocol (IP) number<sup>2</sup> of the site, e.g.

```
ftp 128.218.80.68.
```

Unless otherwise instructed in the welcome message, the following procedure should be used to login to an anonymous FTP site:

- when asked for name or login details, type  
anonymous
- when asked for a password, type in your full e-mail address.

## 1.1.3 Retrieving Files

Upon completion of the login procedure, files can be retrieved typing

```
get <remote-filename> <local-filename>
```

where <remote-filename> is the name of the file being retrieved from the FTP site and <local-filename> is the name under which the file is saved on your machine/system. If <local-filename> is not supplied it defaults to <remote-filename>. It is a good practice to treat all directory and file names as case-sensitive.

Retrieving multiple files can be accomplished interactively by typing

```
mget <filename-list>
```

where the variable <filename-list> can be a list of space separated filenames e.g. RULES RULES.PS.Z RULES.SG or can be an expression using a wildcard (\*) e.g., RULES\*.

### 1.1.3.1 Binary Mode

Since executable files cannot be transferred successfully using a text transfer mode, the transfer mode should be set to binary. This can be accomplished by typing

```
binary
```

once access to an FTP site has been gained. This is particularly important for users of non-Unix platforms e.g. DOS, Macintosh etc. since Unix-to-Unix FTP will usually default to binary mode when executables are transferred.

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1. The description in section 1 assumes a command line interface is being used. If an FTP software package is being used, the FTP addresses etc. must be typed into the appropriate dialogue boxes.  
2. IP numbers can be used as alternative addresses if access via alpha-numeric addresses fail.

### 1.1.4 Finding Directories and Files

The directories and files contained in a directory can be displayed by typing

```
ls
```

Displaying the directories and files in a directory in a long listing showing the file size in bytes can be achieved by typing

```
ls -l
```

Changing directories can be accomplished by typing

```
cd <directory-name>
```

where the variable <directory-name> is the name of a directory<sup>1</sup> or “..” for the parent of the current directory. The name of the current directory can be identified by typing

```
pwd
```

Information about where to find files etc. at FTP sites is usually contained in README files. If available in a particular directory, the README file can be displayed on the screen by typing

```
get README /dev/tty
```

(although if the README file is long it may be necessary to retrieve it and view it using a text editor or in printed form).

### 1.1.5 Uncompressing Files

Compression is a means of reducing the size of files to aid compactness of storage. Compressed files need to be uncompressed before they can be read or executed. There are many different compression formats and appropriate uncompression commands must be used to uncompress files. The compression format can be determined by the filename extension.

#### Common Uncompression Commands for Unix

File Extension	Uncompression Command	File Example	Uncompression Example
.Z	uncompress <filename>	a.Z	uncompress a.Z
.sh.Z	uncompress -c <filename>   sh	b.sh.Z	uncompress -c b.sh.Z   sh
.tar	tar -xf <filename>	c.tar	tar -xf c.tar
.tar.Z	zcat <filename>   tar -xf -	d.tar.Z	zcat d.tar.Z   tar -xf -
.zip	unzip <filename>	e.zip	unzip e.zip
.gz <sup>a</sup>	gunzip	f.gz	gunzip f.gz

- a. On some Unix platforms the extension .z (lower-case) is used to indicate that a file has been compressed using gzip.

Sources for obtaining compression and uncompression software for Unix, DOS, Macintosh, Atari and Amiga platforms is supplied at the end of the README<sup>2</sup> file in the Go directory at [bsdserver.ucsf.edu](http://bsdserver.ucsf.edu).

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1. The first character in long listing for a directory is “d”.
  2. This information also appears in the file HOWTO.UNPACK, available by anonymous FTP from [bsdserver.ucsf.edu/Go](http://bsdserver.ucsf.edu/Go) (see section 2.1).

### **1.1.5.1 Extracting Executables**

Some files contain many separate files which have been compressed together e.g., .tar, .sh etc. When uncompressed, the separate files will be “extracted”. It is usual for a README file to be included in the compressed group of files which contains general information about compiling the executable.

### **1.1.6 Mirrors**

FTP mirror sites are alternative archive sites which “mirror” a main FTP archive site i.e., they contain the same files. Mirror sites help to ensure the availability of archive files when the main site becomes inaccessible e.g., due hardware failure or high network traffic making file transfer difficult. Connecting to mirror sites may be preferred by users for whom connection cost is a consideration i.e., if the mirror site is geographically closer.

## **1.2 HyperText Transfer Protocol (HTTP)**

The hypertext transfer protocol (HTTP), like FTP, facilitates the transfer of files to and from remote computers using hypertext links. The advantage of using HTTP is that it is not necessary to know the complicated syntax of commands (e.g, FTP). Other advantages of using HTTP are: compressed files are uncompressed automatically, and graphics files (e.g., .gif, .tif, Postscript etc.) may be shown automatically.

Files can be retrieved via the hypertext links (underlined or coloured text) by activating the link (clicking a mouse button whilst over a link or using return key or function keys etc.). HTTP can be used to access Internet resources such as FTP sites, telnet, news groups etc.

## **1.3 Telnet**

Telnet is a protocol that allows a user to login to a remote computer. To access telnet sites, type  
telnet <site-address> <port-number>  
where <site-address> is either the alpha-numeric address or the IP number of the telnet site. The use of <port-number> is optional, however, it must be included if specified as part of a telnet address e.g. igs.nuri.net 6969<sup>1</sup>.

## **1.4 Address Conventions in this Paper**

The category of a particular Internet resource is shown in capitals e.g. FTP. Accessing an address for a given category requires the appropriate command followed by the address. The FTP and HTTP addresses for a Postscript version of this document are:

FTP:       clavinet.uq.cs.edu.au:/pdp/go/comp-go.internet.ps.Z  
HTTP:     http://www.psy.uq.edu.au/~jay/papers/comp-go.internet.ps.Z

This document can be retrieved by FTP in Postscript format as follows:

```
ftp clavinet.cs.uq.edu.au  
<login procedure>2  
cd pub/pdp/go  
binary  
get comp-go.internet.ps.Z
```

Where several options exist, they are shown in square brackets e.g

```
ftp://bsdserver.ucsf.edu/Go/[info/][mgt/][prog/]
```

A valid address consists of the address preceding the options followed by exactly one of the

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1. For VMS platforms, port numbers are specified as /port= e.g. igs.nuri.net /port=6969.  
2. See section 1.1.2.

To appear in the Proceedings of the Second Game Programming Workshop in Japan, September 1995.

options without the square brackets e.g.

`ftp://bsdserver.ucsf.edu/Go/mgt`

Where a “/” appears after an option (such as in the above example), the options are directories.

Addresses in tables containing Site, Directory and File columns are constructed by appending the contents of each column to the preceding one with a “/” between them.

## 2 Computer Go Related Internet Resources

### 2.1 Anonymous FTP Archive and Mirror Sites

The main Go FTP archive site and its mirror sites contain a comprehensive archive of Go and computer Go material which is freely available by anonymous FTP. Below is a list<sup>1</sup> of the sub-directories of the Go directory along with a brief description of their contents:

- `aga` American Go Association Files.
- `clients` Clients for the Internet Go Server.
- `comp` Information about programming computers to play go, and various attempts to do so.
- `games` Commented games, and other specially formatted material.
- `igs` Games from the IGS, in Postscript or Smart-Go.
- `info` Informational files in plain text format.
- `mgt` Versions of MGT, a program for reading and writing Smart-Go files.
- `printing` Programs and files related to printing out go boards and diagrams.
- `pro` Uncommented professional games.
- `problems` Go problems, mostly in Smart-Go format.
- `prog` Programs related to go but which don't attempt to play the game.

The README file in the Go directory contains a comprehensive listing of the files in the Go directory and its sub-directories as well as a brief description of each file. The README file also appears in each sub-directory of the Go directory.

The contents of the comp directory include:

- Public domain games for the Amiga, Macintosh, IBM PC (DOS and Windows), Linux, and X windows.
- Archives of the computer-go mailing list.
- Computer Go bibliography.
- People and programs in computer Go.
- Various reports, papers and theses on Go programs or computer Go issues.

For those without FTP access, send an e-mail message to `ftpmail@decwrl.dec.com` containing the single line “help” to obtain information about ftping by mail. Any problems in connecting to the mail server can be overcome by contacting `adrian@bsdserver.ucsf.edu`<sup>2</sup>

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1. Adapted and modified from the README file.

2. This paragraph has been adapted and modified from the Go FAQ (see section 3.5).

FTP:

Type	Site <sup>a</sup>	Directory	IP Number	Location
main	bsdserver.ucsf.edu	Go	128.218.80.68	USA
mirror	ftp.pasteur.fr	pub/Go	157.99.64.12	France
	rzis1.rz.tu-bs.de	pub/go	134.169.9.44	Germany
	igs.nuri.net	Go	203.255.112.3	Korea

- a. Any information stated to be available by anonymous FTP at the main archive site in this document should also be available at the mirror sites.

HTTP:

Type	Site <sup>a</sup>	Directory	Location
main	ftp://bsdserver.ucsf.edu	Go	USA
mirror	ftp://ftp.pasteur.fr	pub/Go	France
	ftp://rzis1.rz.tu-bs.de	pub/go	Germany
	ftp://igs.nuri.net	Go	Korea

- a. Any information stated to be available by HTTP at the main archive site in this document should also be available at the mirror sites.

## 2.2 The Internet Go Server (IGS)

The Internet Go Server (IGS) provides a means for people to play real-time interactive games of Go against other people or against Go programs over the internet. The IGS serves as a virtual Go club which is particularly useful for players who do not have local access to other Go players or a Go club.

First time users can login as “guest”. Full access can be gained by registering for an account. Information about registering can be obtained by typing “help register”. The help command provides information on how to use the interface. Once logged on to the IGS, you can play a game against another player, watch games in progress, or even comment on games in progress.

Interfacing to the IGS can be difficult and as a result, client programs have been written for various platforms e.g. Atari ST, Amiga, Macintosh, NeXT, MS Windows, IBM PC, Unix (ASCII) and X11.

Client programs available in the clients directory<sup>1</sup>:

FTP: bsdserver.ucsf.edu/Go/clients

HTTP: ftp://bsdserver.ucsf.edu/Go/clients

Help on client programs:

HTTP: <http://www.well.com/user/mmcadams/igs.howto.html#client> easy

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1. The README file describes which files provide clients for which platforms. Most of the clients contain README files when the constituent files have been extracted (see section 1.5.1 and 1.5.1.1).

TELNET:

Site	IP Number	Location
igs.nuri.net 6969	203.255.112.3 6969	Korea
hellspark.wharton.upenn.edu 6969	165.123.8.103 6969	USA

HTTP: <telnet://igs.nuri.net:6969><sup>1</sup>  
<telnet://hellspark.wharton.upenn.edu:6969>

Help files on using the IGS:

FTP: [bsdserver.ucsf.edu/Go/igs/\[igs\\_ug.ps.Z\]\[igs\\_ug.txt.Z\]\[igshelp.Z\]](ftp://bsdserver.ucsf.edu/Go/igs/[igs_ug.ps.Z][igs_ug.txt.Z][igshelp.Z])  
HTTP: <http://www.well.com/user/mmcadams/igs.howto.html>  
[ftp://bsdserver.ucsf.edu/Go/igs/\[igs\\_ug.ps.Z\]\[igs\\_ug.txt.Z\]\[igshelp.Z\]](ftp://bsdserver.ucsf.edu/Go/igs/[igs_ug.ps.Z][igs_ug.txt.Z][igshelp.Z])  
<http://ltiwww.epfl.ch/~warkent/go/etiquette/et.html>

### 2.3 Game Record Formats

Several game record formats<sup>2</sup> exist although currently the two most commonly used are Smart Go Format (SGF) and Ishi “Standard” Format. Information, executables, converters etc. related to game record formats can be found in the info, mgt and prog directories of the FTP archive sites.

FTP: [bsdserver.ucsf.edu/Go/\[info/\]\[mgt/\]\[prog/\]](ftp://bsdserver.ucsf.edu/Go/[info/][mgt/][prog/])  
HTTP: [ftp://bsdserver.ucsf.edu/Go/\[info/\]\[mgt/\]\[prog/\]](ftp://bsdserver.ucsf.edu/Go/[info/][mgt/][prog/])  
<http://www.cwi.nl/~jansteen/go/games/SGF/sgf.html> (Smart Go Format)

### 2.4 The Computer-Go Mailing List

The computer-go mailing list is specifically designed as a forum for discussion about programming Go and related issues. E-mail messages sent to the list are distributed to members of the mailing list.

Many individuals involved in the computer Go field either for recreation, profit or research converse with each other via the mailing list. The types of discussions vary from abstract to implementation related. The mailing list is a good source for inspiration and new ideas, information about approaches to programming Go that have been tried and have failed, constructive criticism on ideas by others involved in programming Go, information about tournaments and results, and much more. Archives of old and current messages are also available.

The computer-go mailing list can be joined by sending an subscribe message by e-mail to:  
[computer-go-request@comlab.oxford.ac.uk](mailto:computer-go-request@comlab.oxford.ac.uk)

Past message archive:

FTP: [bsdserver.ucsf.edu/Go/comp/compgo-mail-\\*.Z](ftp://bsdserver.ucsf.edu/Go/comp/compgo-mail-*.Z)<sup>3</sup>  
HTTP: [ftp://bsdserver.ucsf.edu/Go/comp/compgo-mail-\\*.Z](ftp://bsdserver.ucsf.edu/Go/comp/compgo-mail-*.Z)

- 
1. An alternative is to use the port number 7777.
  2. See points 9 and 10 in the Go FAQ (section 3.5).
  3. At the time of publication there were 5 archive files i.e. \* can be replaced by any number between 1 and 5 inclusive although the number of archive files are constantly growing.

Current message archive:

FTP: [ftp.comlab.ox.ac.uk:/pub/Documents/computer-go/mail-archive](ftp://comlab.ox.ac.uk:/pub/Documents/computer-go/mail-archive)<sup>1</sup>

HTTP: <ftp://ftp.comlab.ox.ac.uk/pub/Documents/computer-go/mail-archive>

## 2.5 The Computer Go Ladder

Discussions on the computer-go mailing list resulted in the establishment of an informal competition between computer Go programs called the Computer Go Ladder. The primary purpose of the ladder is for the enjoyment of the participants with the secondary purposes of stimulating both interest and work on computer Go programs and providing a way of measuring the state-of-the-art of current programs.

There are HTTP links from the Computer Go Ladder page to pages related to some of the programmers and some of the programs involved in the Computer Go Ladder, world computer Go competition results, the IGS and various other associated pages on the Internet. The Computer Go Ladder is maintained by Eric Pettersen ([pett@cgl.ucsf.edu](mailto:pett@cgl.ucsf.edu)).

HTTP: <http://cgl.ucsf.edu/go/ladder.html>

## 2.6 Computer Go Competitions/Tournaments and Results

Various computer Go competitions/tournaments<sup>2</sup> exist and some of their results are available on the Internet.

HTTP: <http://nobi.ethz.ch/martin/cgresults.html>  
<http://www.mth.kcl.ac.uk/~mreiss/gores.html>

## 2.7 Computer Go Bibliographies

There are several sources of computer Go bibliographies available. Peter Lipp compiled a bibliography of books, articles, theses etc. pertaining to Go, computer Go and game related issues e.g. complexity etc. Michael Reiss advertised for computer Go references on the computer-go mailing list and has compiled three WWW bibliography pages. Martin Müller and Jay Burmeister have placed the computer Go bibliographies resulting from their PhD work on WWW pages.

FTP:	<a href="bsdserver.ucsf.edu:/Go/comp/compbibs.Z">bsdserver.ucsf.edu:/Go/comp/compbibs.Z</a>	(Peter Lipp)
HTTP:	<a href="ftp://bsdserver.ucsf.edu/Go/comp/compbibs.Z">ftp://bsdserver.ucsf.edu/Go/comp/compbibs.Z</a>	(Peter Lipp)
	<a href="http://nobi.ethz.ch/martin/references.html">http://nobi.ethz.ch/martin/references.html</a>	(Martin Müller)
	<a href="http://www.mth.kcl.ac.uk/~mreiss/bib.html">http://www.mth.kcl.ac.uk/~mreiss/bib.html</a>	(Michael Reiss)
	<a href="http://www.psy.uq.edu.au/~jay/go/comp-go.bib.html">http://www.psy.uq.edu.au/~jay/go/comp-go.bib.html</a>	(Jay Burmeister)

## 2.8 Game Databases

The IGS game archive contains games played on the IGS archived in Postscript and Smart Go formats. Jan van der Steen is involved in a Go database project, GoBase, which is designed to allow thousands of professional Go games to be searched.

FTP: <igs.nuri.net:/Go/IGSArch/> (IGS archive)  
[bsdserver.ucsf.edu/Go/\[games/\]\[pro/\]](bsdserver.ucsf.edu/Go/[games/][pro/])

- 
1. The archive file can optionally be accessed in either compressed (mail-archive.Z) or gzipped (mail-archive.gz) format with compression being done by the server (binary mode necessary).
  2. See points 14 and 15 in the Go FAQ (section 3.5).



HTTP: <ftp://igs.nuri.net/Go/IGSArch/> (IGS archive)  
[ftp://bsdserver.ucsf.edu/Go/\[games/\]pro/](ftp://bsdserver.ucsf.edu/Go/[games/]pro/)  
<http://imageek.york.cuny.edu/search5d.html> (5+ dan IGS games)  
<http://www.cwi.nl/~jansteen/gobase/gobase.html> (Go Base)

## 3 Go Related Internet Resources

### 3.1 Go Rules and Learning to Play

There are different versions of Go rules, some of which are available in various formats on the Internet.

#### FTP and HTTP Addresses for Various Format Rule Files

Version	Format	File <sup>a</sup>
Text	Text	RULES.Z
Text	Postscript	RULES.PS.Z
Smart Go	Smart Go	RULES.SG.Z
AGA	Text	aga/aga.rules.Z
Ing	Encapsulated Postscript	aga/ingrules.zip
GOE	Text	igs/goe.rules.Z
GOE on IGS	Text	igs/goe.on.igs.Z

- a. Add FTP or HTTP stem from Site and Directory columns in the tables in section 2.1 to path in File column e.g.  
<ftp://igs.nuri.net/Go/RULES>  
[ftp ftp.pastuer.fr](ftp://ftp.pastuer.fr)  
<follow instructions in section 1.1 to retrieve /pub/Go/aga/ingrules.Z>

### 3.2 Go Learning Aids and Tutorials

There are Go tutorials and versions of Go rules which are also designed to give novice players tutorial help in learning Go available on the Internet.

FTP: <bsdserver.ucsf.edu/Go/RULES.PS.Z>  
HTTP: <ftp://bsdserver.ucsf.edu/Go/RULES.PS.Z>  
<http://www.cwi.nl/~jansteen/go/go-2.html>  
<http://www.cs.vu.nl/~willems/go.html>  
<http://ltiwww.epfl.ch/~warkent/go/rules/rules.html>  
<http://ltiwww.epfl.ch/~warkent/go/rules/9x9game/1.html>  
<http://www.mcs.com/~whhosken/home.html>  
<http://www.psy.uq.edu.au/~jay/go/CS-TR-339.html>

### 3.3 Go Terms

A glossary of Go terms and their English equivalents is useful for understanding educational Go books, research articles etc.

FTP: <bsdserver.ucsf.edu/Go/info/definitions.Z>

HTTP: <ftp://bsdserver.ucsf.edu/Go/info/definitions.Z>

### 3.4 The Go News Group

The news group `rec.games.go` is a good forum for discovering and sharing information about Go, tournaments, the IGS, etc. The Go news group is not specifically aimed at computer Go, however, discussions and information related to computer Go sometimes appear on the news-group.

NEWS READER<sup>1</sup>: `rec.games.go`  
HTTP: `news:rec.games.go`

### 3.5 The Go Frequently Asked Questions (FAQ)

The Go FAQ contains questions that are frequently posted to the `rec.games.go` newsgroup and includes sections on basic Go, the IGS, and computer Go related issues.

FTP:

Site	Directory	File	IP Number	Location
<code>bsdserver.ucsf.edu</code>	<code>Go</code>	<code>FAQ</code>	<code>128.218.80.68</code>	USA
<code>rtfm.mit.edu</code>	<code>pub/usenet/ news.answers/games</code>	<code>go-faq</code>	<code>18.181.0.24</code>	USA

If you do not have FTP, you can request messages from `rtfm` by using the local mail server. Send e-mail to `mail-server@rtfm.mit.edu` containing the line “send `usenet/news.answers/games/go-faq`” to get the `go-faq` file. Send a message containing “help” to get general information about the mail server. The `rtfm` mail server can only be used to obtain FAQs; files from the go archive site cannot be accessed via the `rtfm` mail server<sup>2</sup>. The `rec.games.go` FAQ is maintained by Adrian Mariano (`adrian@bsdserver.ucsf.edu`).

HTTP: <ftp://bsdserver.ucsf.edu/Go/FAQ>  
<ftp://rtfm.mit.edu/pub/usenet/news.answers/games/go-faq>  
<http://www.cs.utexas.edu/users/orb/go/gofaq.html>

## Acknowledgements

We thank the Department of Computer Science at the University of Queensland for the facilities to carry out this project and for providing a Summer Research Associate position to the first author and the University of Queensland for subsequently providing a University of Queensland Postgraduate Research Scholarship to the first author. We would also like to thank Rafael Brander for reviewing this paper.

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1. Any software package for reading news groups.  
2. This paragraph has been adapted and modified from the Go FAQ (see section 3.5).