

# GNU GLOBAL Source Code Tag System

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Edition 6.3, for GNU GLOBAL version 6.3  
9 June 2014

by Tama Communications Corporation

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This manual is for GNU GLOBAL (version 6.3, 9 June 2014), a source code tag system that works the same way across diverse environments.

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# 1 Overview of this tool

## 1.1 What is GNU GLOBAL?

GNU GLOBAL is a source code tag system that works the same way across diverse environments, such as Emacs editor, Vi editor, Less viewer, Bash shell, various web browsers, etc. You can locate specified tags, such as functions, macros, structs, classes, in your source files and move there easily. It is useful for hacking large projects which contain many sub-directories, many `#ifdef` and many `main()` functions. It is similar to `ctags` or `etags`, but is different from them at the point of independence of any editor.

## 1.2 Concept of project

GNU GLOBAL can treat a source tree containing sub-directories as a project. Anywhere in the project, you can utilize the high performance tag database. You need not specify where the database is, as `global(1)` locates it by itself. Because of this feature, you can move freely in a project, and in and out of many projects.

## 1.3 Features

GNU GLOBAL has the following features:

- supports C, C++, Yacc, Java, PHP4 and assembly.
- works the same way across diverse environments like follows:
  - Shell command line
  - Bash shell
  - Vi editor (Nvi, Elvis, vim)
  - Less viewer
  - Emacs editor (Emacs, Mule, Xemacs)
  - Web browser
  - Doxygen documentation system
- finds locations of specified symbol quickly.
- locates not only definitions but also references.
- allows duplicate tags.
- locates paths which matches to the specified pattern.
- hierarchical searches by default.
- searches not only in a source project but also in library projects.
- generates completion list for completing input method.
- supports various output formats.
- allows customizing of the set of candidate files to be tagged.
- understands POSIX 1003.2 regular expression.
- supports `idutils` as an external search engine.
- tag files are independent of machine architecture.

- supports incremental updating of tag files.
- plug-in parser is available to treat new language.
- supports customizing with `gtags.conf`.
- generates a hypertext of source code.
- compact format to save disk space.
- supports client/server environment (TRAMP ready).
- ignores binary files, dot files and specified files.
- includes cscope-compatible program (gtags-cscope).
- includes grep-like command (-g command).

## 2 Command line GLOBAL

You can use the tag facilities from shell command line. It is a big merit of GLOBAL compared with any other tag system.

### 2.1 Preparation

Before beginning, please read the FAQ (Frequently Asked Questions) file.

```
$ more /usr/local/share/gtags/FAQ
```

First of all, you must execute gtags(1) (see [Section 5.2 \[gtags\], page 31](#)) at the root of the source tree. For example, if you want to browse the source code of Vi editor in FreeBSD, please move to the source directory and invoke gtags(1).

```
$ cd /usr/src/usr.bin/vi
$ gtags
```

Gtags traverses sub-directories, picks up source files and makes three tag files at the current directory. After this, all files under this directory are treated as a project.

```
$ ls G*
GPATH  GRTAGS  GTAGS
```

- GTAGS definition database
- GRTAGS reference database
- GPATH path name database

You should prepare for considerable disk space for the tag files. For example, Linux-2.6.32 source code requires the following disk space.

source code(Linux-2.6.32)	390MB
GPATH	6MB
GTAGS	81MB
GRTAGS	202MB
-----	
total of tag files	289MB

### 2.2 Basic usage

Consider the following source tree:

```
/home/user/
|
|-ROOT/      <- the root of source tree (GTAGS,GRTAGS,...)
|
|  |- README      ..... +-----+
|  |               |The function of|
|  |               +-----+
|  |- DIR1/
|  | |
|  | |- fileA.c    ..... +-----+
|  | |             |main(){      |
```

```

| |                                     |      func1();|
| |                                     |      func2();|
| |                                     |}              |
| |                                     +-----+
| |
| |- fileB.c      ..... +-----+
| |                                     |func1(){ ... } |
| |                                     +-----+
|- DIR2/
|
| |- fileC.c      ..... +-----+
| |                                     |#ifdef X      |
| |                                     |func2(){ i++; }|
| |                                     |#else        |
| |                                     |func2(){ i--; }|
| |                                     |#endif        |
| |                                     |func3(){      |
| |                                     |      func1();|
| |                                     |}              |
| |                                     +-----+

```

- Once you make the tag files at the root directory of the source tree, you can execute `global(1)` from anywhere in the tree. By default, you get the relative path of the located files. You need not specify where the tag file is, as `global(1)` locates it by itself.

```

$ cd /home/user/ROOT
$ global func1
DIR1/fileB.c          # func1() is defined in fileB.c
$ cd DIR1
$ global func1
fileB.c               # relative path from DIR1
$ cd ../DIR2
$ global func1
../DIR1/fileB.c       # relative path from DIR2

```

Global command is possible to use only when you are in a project. If you are out of any project, it shows an error message like follows:

```

$ cd /home/user
$ global func1
global: GTAGS not found.

```

- The `-r` option locates references.

```

$ global -r func2
../DIR1/fileA.c       # func2() is referred from fileA.c

```

- You can use POSIX regular expressions.

```

$ cd /home/user/ROOT
$ global 'func[1-3]'
DIR1/fileB.c          # func1, func2 and func3 are matched
DIR2/fileC.c

```

- The `-x` option shows the details. It is similar to the `-x` option in `ctags(1)`.

```
$ global func2
DIR2/fileC.c
$ global -x func2
func2          2 DIR2/fileC.c      func2(){ i++; }
func2          4 DIR2/fileC.c      func2(){ i--; }
```

- The `-a` option produces the absolute path name.

```
$ global -a func1
/home/user/ROOT/DIR1/fileB.c
```

- The `-s` command locates symbols which are not defined in `GTags`.

```
$ global -xs X
X                  1 DIR2/fileC.c #ifdef X
```

- The `-g` command locates lines which have the specified pattern.

```
$ global -xg '#ifdef'
#ifdef             1 DIR2/fileC.c #ifdef X
```

It is similar to `egrep(1)` but is far more convenient for source code reading, because it allows you to search through a project, and only in the source files.

Additionally, you can use various options:

- `-0`          search only in the text files.
- `-o`          search in both the source files and text files.
- `-l`          search only under the current directory.

The `-e`, `-G` and `-i` options are available too. The usage is the same as `egrep(1)`.

You can even change the output format of `global(1)` to the `grep` style using the `--result=grep` option. Of course, these options can be used even by other commands.

- The `-P` command locates path names which include the specified pattern.

```
$ global -P fileB
DIR1/fileB.c
$ global -P '1/'
DIR1/fileA.c
DIR1/fileB.c
$ global -P '\.c$'
DIR1/fileA.c
DIR1/fileB.c
DIR2/fileC.c
```

- The `-f` command prints a list of tags in the specified file(s).

```
$ global -f DIR2/fileC.c
func2          2 DIR2/fileC.c      func2(){ i++; }
func2          4 DIR2/fileC.c      func2(){ i--; }
func3          6 DIR2/fileC.c      func3(){
```

- The `-l` option limits the range of the retrieval under the current directory.

```
$ cd DIR1
$ global -xl func[1-3]
func1          1 fileB.c          func1(){...}
```

## 2.3 Applied usage

- You can customize a set of candidate files to be tagged.

```
$ find . -type f -print >/tmp/list      # make a file set
$ vi /tmp/list                          # customize the file set
$ gtags -f /tmp/list
```

- If your source files are on a read-only device, such as CDROM, then you cannot make tag files at the root of the source tree. In such case, you can make tag files in another place using the GTAGSROOT environment variable.

```
$ mkdir /var/dbpath
$ cd /cdrom/src                        # the root of source tree
$ gtags /var/dbpath                    # make tag files in /var/dbpath
$ export GTAGSROOT='pwd'
$ export GTAGSDBPATH=/var/dbpath
$ global func
```

There is another method for it. Since global(1) locates tag files also in /usr/obj + <current directory>, you can setup like follows:

```
$ cd /cdrom/src                        # the root of source tree
$ mkdir -p /usr/obj/cdrom/src
$ gtags /usr/obj/cdrom/src            # make tag files in /usr/obj/cdrom/src
$ global func
```

The value /usr/obj can be changed by environment variable MAKEOBJDIRPREFIX. The -O, --objdir option does it automatically for you.

- If you want to locate symbols that are not defined in the source tree, then you can specify library directories with the GTAGSLIBPATH environment variable.

You should execute gtags at each directory of the path. If GTAGS is not found there, global ignores it.

```
$ pwd
/develop/src/mh                        # this is a source project
$ gtags
$ ls G*TAGS
GRTAGS  GTAGS
$ global mhl
uip/mhlsbr.c                          # mhl() is found
$ global strlen                       # strlen() is not found
$ (cd /usr/src/lib; gtags)             # library source
$ (cd /usr/src/sys; gtags)            # kernel source
$ export GTAGSLIBPATH=/usr/src/lib:/usr/src/sys
$ global strlen
../../../../usr/src/lib/libc/string/strlen.c # found in library
$ global access
../../../../usr/src/sys/kern/vfs_syscalls.c  # found in kernel
```

Or, you can take a more straightforward way to do the same thing. In the following example, we treat as if the system library and the kernel are part of our project.



```
$ ln -s /usr/src/lib .
$ ln -s /usr/src/sys .
$ gtags
$ global strlen
lib/libc/string/strlen.c
$ global access
sys/kern/vfs_syscalls.c
```

- If you forget symbol names, you can use the `-c` (complete) command.

```
$ global -c kmem                # maybe k..k.. kmem..
kmem_alloc
kmem_alloc_pageable
kmem_alloc_wait
kmem_free
kmem_free_wakeup
kmem_init
kmem_malloc
kmem_suballoc                  # This is what I need!
$ global kmem_suballoc
../vm/vm_kern.c
```

- You can use the `-c` command with the complete command in the shell.

In Bash:

```
$ funcs()
> {
>     local cur
>     cur=${COMP_WORDS[COMP_CWORD]}
>     COMPREPLY=('global -c $cur')
> }
$ complete -F funcs global
$ global kmem_TABTAB
kmem_alloc          kmem_alloc_wait      kmem_init
kmem_alloc_nofault  kmem_free            kmem_malloc
kmem_alloc_pageable kmem_free_wakeup      kmem_suballoc
$ global kmem_sTAB
$ global kmem_suballoc
../vm/vm_kern.c
```

If you like input completion, you should try globash (see [Section 3.1 \[GloBash\]](#), page 9). It supports you in a suitable way without any preparation.

- You can edit all files which have specified tags by typing one command. For example:

```
$ vi 'global func1'          # edit fileB.c
```

- If you want to browse many files in order, do the following:

```
$ global -xr fork | awk '{printf "view +%s %s\n", $2, $3}'
view +650 ../dev/aic7xxx/aic7xxx_asm.c
view +250 ibcs2/ibcs2_misc.c
view +401 linux/linux_misc.c
view +310 ../kern/init_main.c
```

```
view +318 ../kern/init_main.c
view +336 ../kern/init_main.c
view +351 ../kern/init_main.c
$ !! | sh          # from now on, go to next tag with 'ZZ'.
```

## 3 Various applications

### 3.1 Global facility for Bash

Special support for Bash is available.

#### 3.1.1 Features

- Vi-like tag stack is available.
- Emacs-like tag name completion is available.
- Automatic invoking of editor.
- Tag mark facility is available.
- You can manage a directory list by cookie facility.

#### 3.1.2 Preparation

First, do the preparation of global. See [Section 2.1 \[Preparation\]](#), page 3. Then you can invoke `globash(1)` command.

```
$ globash
```

Only first time, you will see the following message.

```
GloBash needs a working directory. Do you create '/home/you/.globash'? ([y]/n)■
```

Pressing the ENTER key, you will see a prompt like this:

```
[/usr/src/sys]/kern _
```

This prompt means that the current directory is `'/usr/src/sys/kern'` and the root directory of the project is `'/usr/src/sys'`. Tag and marker are valid only in a project.

When you try to go out of the project, globash warns like:

```
[/usr/src/sys] cd ..
```

```
You are going to get out of the current project.
```

```
Tag stack and marker will be removed. Sure? ([y]/n)_
```

If you answer `y` *RET* or just *RET* in the above prompt then the tag stack and marker (described later) will be removed.

If you need help then please type *ghelp*.

#### 3.1.3 Usage

- Most of `global(1)`'s (see [Section 5.1 \[global\]](#), page 25) command characters are available as commands.

```
[/usr/src/sys] x fork          <- (global -x fork)
> 1 fork                      94 kern/kern_fork.c fork(p, uap)
[/usr/src/sys] r              <- (global -xr fork)
> 1 fork                      85 alpha/linux/linux_machdep.c
  2 fork                      184 i386/linux/linux_machdep.c
[/usr/src/sys] s lbolt        <- (global -xs lbolt)
> 1 lbolt                     1210 i386/isa/wd_cd.c      tsleep((cad
  2 lbolt                     1211 i386/isa/wd_cd.c      tsleep((cad
  3 lbolt                     709 i386/isa/wfd.c        tsleep((caddr
```

```

...
[/usr/src/sys] g                <- (global -xg lbolt)
> 1 lbolt                        1210 i386/isa/wd_cd.c      tsleep((cad
...
[/usr/src/sys] P init           <- (global -xP init)
> 1 path      1 dev/hea/eni_init.c
  2 path      1 dev/hfa/fore_init.c
  3 path      1 i386/i386/initcpu.c
  4 path      1 kern/init_main.c
  5 path      1 kern/init_sysent.c
  6 path      1 kern/vfs_init.c
  7 path      1 vm/vm_init.c
[/usr/src/sys] _

```

If no argument is specified then the latest argument is used.

- Input completion facility is available. For each command, suitable completion is applied.

```

[/usr/src/sys] x kmem_TABTAB
kmem_alloc      kmem_free      kmem_malloc
kmem_alloc_nofault kmem_free_wakeup kmem_object
kmem_alloc_wait kmem_init      kmem_suballoc
[/usr/src/sys] x kmem_sTAB
[/usr/src/sys] x kmem_suballoc

```

- You can select a tag by the `show` command.

```

[/usr/src/sys] x main
> 1 main      70 alpha/alpha/gensetdefs.c main(in
  2 main      1500 alpha/alpha/ieee_float.c main(i
  3 main      227 boot/alpha/boot1/boot1.c main()
....
[/usr/src/sys] show 3
(Load editor and show boot/alpha/boot1/boot1.c at line 227.)

```

The default editor is `vi(1)` but you can specify it statically by `EDITOR` environment variable or temporarily by options.

```

[/usr/src/sys] show -e 3
(Preloaded emacs show boot/alpha/boot1/boot1.c at line 227.)
[/usr/src/sys] show -l 3
(Load less and show boot/alpha/boot1/boot1.c at line 227.)
[/usr/src/sys] show -g 3
(Preloaded mozilla show boot/alpha/boot1/boot1.c at line 227.)

```

Otherwise, you can use the following commands (with abbreviated form):

```

list (l)  print tag list.
first      go to the first tag.
last       go to the last tag.
next (n)   go to the next tag.

```

`prev (p)` go to the previous tag.

`show N (1,2,3,...,999)`  
go to Nth tag

- You can use vi-like tag stack. You can return to the previous tag list by the `pop` or `CTRL-T` command.

```
[/usr/src/sys] x main
> 1 main          70 alpha/alpha/gensetdefs.c main(in
  2 main          1500 alpha/alpha/ieee_float.c main(i
  3 main          227 boot/alpha/boot1/boot1.c main()
....
[/usr/src/sys] show 3
(Load editor and show boot/alpha/boot1/boot1.c at line 227.)
[/usr/src/sys] x fork          <- push new tag on the tag stack.
> 1 fork          94 kern/kern_fork.c fork(p, uap)
[/usr/src/sys] pop          <- pop tag stack.
[/usr/src/sys] show
(Load editor and show boot/alpha/boot1/boot1.c at line 227.)
```

You can print the tag stack with the `tags` command.

- You can remember tags using the `mark` command.

```
[/usr/src/sys] x fork
> 1 fork          94 kern/kern_fork.c fork(p, uap)
[/usr/src/sys] mark
[/usr/src/sys] x main
> 1 main          70 alpha/alpha/gensetdefs.c main(in
  2 main          1500 alpha/alpha/ieee_float.c main(i
  3 main          227 boot/alpha/boot1/boot1.c main()
....
[/usr/src/sys] mark -l          <- show marker list.
  1 fork          94 kern/kern_fork.c fork(p, uap)
[/usr/src/sys] mark 1          <- select a marker.
(Load editor and show kern/kern_fork.c at line 227.)
[/usr/src/sys] list
> 1 main          70 alpha/alpha/gensetdefs.c main(in
  2 main          1500 alpha/alpha/ieee_float.c main(i
  3 main          227 boot/alpha/boot1/boot1.c main()
....
```

Marked tags are valid until you go out of the current project or quit the current Bash session.

- You can remember directories using the `cookie` command, and return there using the `warp` command.

```
[/usr/src/sys] cookie          <- drop a cookie.
[/usr/src/sys] cd kern
[/usr/src/sys]/kern cookie     <- drop a cookie again.
[/usr/src/sys]/kern cd ../i386
[/usr/src/sys]/i386 cookie -l  <- show cookie list.
```

```

1 /usr/src/sys/kern
2 /usr/src/sys
[/usr/src/sys]/i386 warp 2      <- warp to the selected cookie.
[/usr/src/sys] _

```

Cookie directories are valid until you delete them.

## 3.2 Less using GLOBAL

You can use GLOBAL as the tag system of Less(1) viewer instead of ctags.

### 3.2.1 Features

- You can use most of GLOBAL's facilities from Less viewer.
- Less viewer supports duplicated tag.

### 3.2.2 Preparation

First, do the preparation of global. See [Section 2.1 \[Preparation\]](#), page 3.

Second, to use global from Less, you need to set environment variable LESSGLOBALTAGS to 'global'.

```
$ export LESSGLOBALTAGS=global
```

### 3.2.3 Usage

- To go to func1, you can say

```
$ less -t func1
```

Please note that if tags exists in the current directory then Less uses it. If you want to use GTAGS even if tags exists then please specify the tag file explicitly like this:

```
$ less -TGTAGS -t func1
```

- To go to the referenced point of func1, please specify GRTAGS.

```
$ less -TGRTAGS -t func1
```

In the same way, you can use GTAGS, GRTAGS or GPATH as tag files.

- If a number of tags are located, Less goes to the first tag. You can go to next tag by typing *t* and back by typing *T*.

```
t          go to next tag.
```

```
T          go to previous tag.
```

- In a Less session, you can use the *:t* command to locate a new symbol. But in this case, you cannot change the tag file from the one specified by the *-T* option.
- With the *-T-* option, Less reads standard input as a tag file. You can connect global and Less with a pipe. It is very convenient.

```
$ global -x func | less -T-
```

In the same way, you can use the following command lines:

```
# pattern match with grep(1).
$ global -xg 'lseek(.*)' | less -T-
```

```
# pattern match with idutils(1).
$ global -xI func | less -T-

# all definitions in *.c.
$ global -f *.c | less -T-

# all files including 'init' in their path.
$ global -Px init | less -T-
```

- If your editor doesn't support GLOBAL directly then you can use Less as a footstool.

```
# invoke less
$ less -t main
main(int argc, char **argv)
{
  int i;
  .....
[xxx/main.c (tag 1 of 55)]

# type 'v'(vi) command in less session.
v

# load vi and show the same position.
.....
main((int argc, char **argv)
{
  int i;
  .....
[xxx/main.c 313 lines, 7783 char]

# type 'ZZ' command in vi session.
ZZ

# exit vi and back to less session.
main(int argc, char **argv)
{
  int i;
  .....
[xxx/main.c (tag 1 of 55)]
```

### 3.3 Nvi-1.81.5 using GLOBAL

You can use GLOBAL as the tag system of Nvi editor instead of ctags.

#### 3.3.1 Features

- You can use most of GLOBAL's facilities from Nvi.
- Intelligent recognition of the current token and its type.

### 3.3.2 Preparation

First, do the preparation of global. See [Section 2.1 \[Preparation\]](#), page 3.

Second, to use global from Nvi, you need to write to `.nexrc` like this. It is assumed that `gtags.pl` is put in `$HOME/perl`.

```
$HOME/.nexrc
+-----
|perl use lib "$ENV{'HOME'}/perl"
|perl require 'gtags.pl'
|map ^P :tagprev^M
|map ^N :tagnext^M
|map ^] :perl tag^M
|ab gtag perl tag qw(
|ab gta perl tag qw(
|ab gt perl tag qw(
```

You must start Nvi in a project as described in [Section 2.1 \[Preparation\]](#), page 3.

### 3.3.3 Usage

- To go to `func1`, you can say

```
:perl tag qw(func1)
```

Suggested `.nexrc`:

```
ab gtag perl tag qw(
ab gta perl tag qw(
ab gt perl tag qw(
```

- To go to the referenced point of `func1`, add the option `-r`

```
:perl tag qw(-r func1)
```

- If a number of tags are located, Nvi goes to the first tag. You can go to next tag by typing `:tagnext` and back by typing `:tagprev`.

Suggested `.nexrc`:

```
map ^N :tagnext^M
map ^P :tagprev^M
```

- If you don't specify any argument, `:perl tag` command does the following:

If the context of the current token is a definition then it is equivalent to `:perl tag qw(-r current-token)`. Otherwise, if it is a reference to some definitions then it is equivalent to `:perl tag qw(current-token)` else it is equivalent to `:perl tag qw(-s current-token)`.

Suggested `.nexrc`:

```
map ^] :perl tag^M
```

It is similar to `CTRL-]` command.

- You can use the `-s` option; it locates symbols which are not defined in `GTags`.

```
:perl tag qw(-s pat)
```

- The `-g`, `-f` and `-P` options are also available. It works like the command line.

```
:perl tag qw(-g pat)
```



- When you want to locate tags the name of which start with ‘set’ or ‘get’, use:

```
:perl tag qw(^[sg]et)
```

- Other tag commands are also available:

*CTRL-T*      return to the most recent tag location.

`:tagpop`    return to the most recent tag location.

`:tagtop`    return to the top of the tag stack.

```
:display tags
    display the tags stack.
```

### 3.4 Elvis using GLOBAL

Elvis 2.1 or later has two variables, `tagprg` and `tagprgonce`, for running an external tag search program. You can use them for GLOBAL.

### 3.4.1 Features

- You can use most of GLOBAL's facilities from Elvis.
- Mouse is supported.

### 3.4.2 Preparation

First, do the preparation of global. See [Section 2.1 \[Preparation\]](#), page 3.

Second, start Elvis and execute `set tagprg="global -t $1"` like this:

```
$ elvis  
~  
~  
~  
~  
~  
~  
~  
  
:set tagprg="global -t $1"
```

### 3.4.3 Usage

- To go to `func1`, you can say

```
:tag func1
```

It seems the same as original Elvis, but Elvis executes `global -t func1` internally and read the output instead of tags file.

- To go to the referenced point of `func1`, add `-r` option.

```
:tag -r func1
```

- To locate symbols which are not defined in **GTAGS**, try this:

```
:tag -s lbolt
```

- To locate strings, try this:

```
:tag -g Copyright
```

- When a lot of results are expected, it's better to use the browse command.

```
:browse -r fork
```

It brings a following selection list. You can select a tag line and go to the point.

```
Browse -r fork (2 matches)
+-----+-----+-----+
| TAG NAME      | SOURCE FILE    | SOURCE LINE    |
+-----+-----+-----+
| fork          | ux/linux_misc.c | (line 565)     |
| fork          | ern/init_main.c | (line 191)     |
+-----+-----+-----+
```

- To get a list of tags in specified files, use the `-f` command.

```
:browse -f main.c          <- locate definitions in main.c
```

- Other tag commands are also available:

`CTRL-J` go to the definition of the current token.

`CTRL-T` return to the most recent tag context.

`:tag` without argument, go to the next tag.

`:pop` return to the most recent tag context.

`:stack` display the tags stack.

`:stag` create a new window and move its cursor to the tag's definition point.

`:sbrowse` same as `browse` but show in a new window.

- You can use POSIX regular expressions.

```
:tag ^put_                  <- locate tags start with 'put_'
```

```
:browse -g 'fseek(.*L_SET)' <- locate fseek() using L_SET argument
```

- You can browse tag's list of many files.

```
:browse -f *.c              <- locate tags in *.c
```

- You can browse the files whose path includes specified pattern.

```
:browse -P /vm/              <- under vm/ directory
```

```
:browse -P \.h$              <- all include files
```

```
:browse -P init              <- path including 'init'
```

- You can use mouse for tag operations.

If you have a mouse, then you can use the left button to double-click on a word in the text, to have Elvis perform a `:tag` search on that word. Double-clicking the right button anywhere in the text will perform a `:pop` command.

In the selection list of the `browse` command, you can use the left button to double-click on a tag name, to have Elvis select the tag. To come back, double-click the right button.

### 3.5 Vim using GLOBAL

In Vim 6.2 or later, you can use the `gtags.vim` script.

### 3.5.1 Features

- You can use most of GLOBAL's facilities from Vim.
- Intelligent recognition of the current token and its type.
- Special characters '%', '#' and input completion are available.

To our regret, the tag stack facility is not available. If you want to use the facility, please try gtags-cscope. See [Section 3.7 \[Gtags-cscope\]](#), page 21.

### 3.5.2 Preparation

First, do the preparation of global. See [Section 2.1 \[Preparation\]](#), page 3.

Second, copy gtags.vim to your plug-in directory or source it from your vimrc.

```
$ cp /usr/local/share/gtags/gtags.vim $HOME/.vim/plugin
```

### 3.5.3 Usage

- To go to main, you can say

```
:Gtags main
```

Vim executes global(1), parses the output, lists located tags in quickfix window and loads the first entry. The quickfix window is like this:

```
gozilla/gozilla.c|200| main(int argc, char **argv)
gtags-cscope/gtags-cscope.c|124| main(int argc, char **argv)
gtags-parser/asm_scan.c|2056| int main()
gtags-parser/gctags.c|157| main(int argc, char **argv)
gtags-parser/php.c|2116| int main()
gtags/gtags.c|152| main(int argc, char **argv)
[Quickfix List]
```

You can go to any entry using quickfix command.

```
:cn      go to the next entry.
:cp      go to the previous entry.
:ccN     go to the N'th entry.
:cl      list all entries.
```

You can see the help of quickfix like this:

```
:h quickfix
```

Suggested map:

```
map <C-n> :cn<CR>
map <C-p> :cp<CR>
```

- To go to the referenced point of func1, add the -r option.  

```
:Gtags -r func1
```
- To locate symbols which are not defined in GTAGS, try this:  

```
:Gtags -s lbolt
```
- To locate strings, try this:

```
:Gtags -g int argc
```

```
:Gtags -g "root"
```

```
:Gtags -ge -C          <- locate '-C'
```

- To get a list of tags in specified files, use the `-f` command.

```
:Gtags -f main.c       <- locate tags in main.c
```

If you are editing `main.c` itself, you can use `'%'` instead.

```
:Gtags -f %            <- locate tags in main.c
```

- You can use POSIX regular expressions.

```
:Gtags ^put_           <- locate tags starting with 'put_'
```

```
:Gtags -g fseek(*SEEK_SET) <- locate fseek() using SEEK_SET
```

- Input completion is available.

In the command line, press `CTRL-D` after some typing and Vim will show a list of tag names that start with the string. Press `TAB` and Vim will complete the tag name.

```
:Gtags fuTAB
```

```
:Gtags func1          <- 'nc1' is appended by vim
```

- You can browse files whose path includes specified pattern.

```
:Gtags -P /vm/         <- under vm/ directory
```

```
:Gtags -P \.h$         <- all include files
```

```
:Gtags -P init         <- path including 'init'
```

- You can use all options of `global(1)` except for `-c -n -p -q -u -v` and all long name options. They are sent to `global(1)` as is. For example:

```
:Gtags -gi paTtern     <- matches both 'PATTERN' and 'pattern'
```

```
:Gtags -POi make       <- matches Makefile but not makeit.c
```

About the other options, please see [Section 5.1 \[global\], page 25](#).

- The `GtagsCursor` command brings you to the definition or reference of the current token.

If the context of the current token is a definition then it is equivalent to `:Gtags -r current-token`; if it is a reference to some definitions then it is equivalent to `:Gtags current-token`; else it is equivalent to `:Gtags -s current-token`.

```
:GtagsCursor
```

Suggested map:

```
map <C-\>^] :GtagsCursor<CR>
```

Though the mapping of `:GtagsCursor` to `^]` seems suitable, it will bring an inconvenience in the help screen.

- If you have the hypertext generated by `htags(1)` then you can display the same part of the source code in the mozilla browser. Let's load mozilla and try this:

```
:Gozilla
```

Suggested map:

```
map <C-g> :Gozilla<CR>
```

- If you want to load Vim with all main()s then following command line is useful.

```
$ vim '+Gtags main'
```

## 3.6 Extended Emacs using GLOBAL

You can use GLOBAL as the tag system of Emacs editor instead of etags.

### 3.6.1 Features

- You can use most of GLOBAL's facilities from the editor.
- More intelligent recognition of the current token and its type.
- Tag completion is available for input tag name.
- Mouse is supported.

### 3.6.2 Preparation

First, do the preparation of global. See [Section 2.1 \[Preparation\]](#), page 3.

Second, to use global from Emacs, you need to load the `gtags.el` and execute `gtags-mode` function in it.

Write the call to autoload function to your `$HOME/.emacs`, start Emacs and execute `gtags-mode` function. If you put `gtags.el` in a directory other than the standard macro directory, you need to add it to `load-path`.

```
$HOME/.emacs
+-----+
|(setq load-path (cons "/home/owner/global" load-path))
|(autoload 'gtags-mode "gtags" "" t)

$ emacs

|
|J_:-----Mule: *scratch*          (Lisp Interaction)--L16--All----
|M-x gtags-mode[RET]
+-----+
```

If you want to get into `gtags-mode` whenever you get into `c-mode` then you can append the following code to your `$HOME/.emacs`.

```
(setq c-mode-hook
      '(lambda ()
          (gtags-mode 1)
        ))
```

About key mappings, please see the comment of `gtags.el`.

### 3.6.3 Usage

- To go to `func1`, invoke `gtags-find-tag` and you can see a prompt in the mini-buffer. Then input the tag name.

```
Find tag: func1 <- 'Find tag: ' is a prompt
```

- To go to the referenced point of `func1`, invoke `gtags-find-rtag`.

```
Find tag (reference): func1
```

- Tag name completion is available.

```
Find tag: fuTAB
```

```
Find tag: func1
```

<- 'nc1' is appended by emacs

- If a number of tags are located, Emacs goes into *GTags SELECT MODE* like this:

```
+-----+
|main          347 i386/isa/ultra14f.c main()
|main          128 kern/init_main.c  main(framep)
|main          104 netiso/clnp_debug.c main()
|main          164 netiso/xebec/main.c main(argc, argv)
|
|
|
|
|
|J_:--%*-Mule: *scratch*          (Gtags Select)--L1--All----
|[GTags SELECT MODE] 4 lines
+-----+
```

Please select a tag line by any Emacs command and press RET, and you can go to the tag's point. When you want to go to the next or previous tag, please return to the above mode with `gtags-pop-stack` and reselect.

You can customize the path style in this mode by setting `gtags-path-style` variable.

`root`        relative from the root of the project (Default)

`relative`   relative from the current directory

`absolute`   absolute (relative from the system root directory)

There are two methods to set this variable:

- You can change it dynamically using the `customize` command of Emacs. You will find the entry in the Programming/Tools/Gtags group.
- You can change it when Emacs is loaded using `.emacs` file like this:

```
(setq gtags-mode-hook
      '(lambda ()
          (setq gtags-path-style 'relative)))
```

- `gtags-find-tag-from-here` command is available.

If current token is a definition, it is equivalent to `Find tag (reference): current-tokenRET`, otherwise it is equivalent to `Find tag: current-tokenRET`.

- To locate symbols which are not defined in GTags, try `gtags-find-symbol`.

```
Find symbol: lbolt                <- 'Find symbol:' is a prompt
```

- To locate strings, try `gtags-find-with-grep`.

```
Find pattern: Copyright
```

- You can use POSIX regular expressions.

```
Find tag: ^put_          <- locate tags starting with 'put_'
```

- Mouse command is available.

If you use X version Emacs, try the following:

Move the mouse cursor to a symbol name and click the middle button, and you can go to the point of the definitions, or to its references, depending on the context. In 'GTAGS SELECT MODE', move the mouse cursor to a line and click the center button.

To return to the previous position, click the right button.

### 3.7 Gtags-cscope

You can also use cscope as a client of GNU GLOBAL. GLOBAL package includes a command named 'gtags-cscope' which is a port of cscope, that is, it is cscope itself except that it use GLOBAL as a search engine instead of cscope's one.

```
$ gtags-cscope
```

Its function is available from vim editor. Please input like follows in the command mode.

```
:set csprg=gtags-cscope
:cs add GTAGS
```

After this, you can use built-in `cs find` commands in the Vim editor. Though the deceit is not perfect (`cs find d` is not implemented), this method might be more convenient than `gtags.vim` in that you can use the tag stack facility of Vim.

### 3.8 Hypertext generator

You can use GLOBAL's facilities from web browsers.

#### 3.8.1 Features

- Htags makes a hypertext from C, C++, Yacc and Java source files.
- Once the hypertext is generated, you need nothing other than a web browser.
- You can move the hypertext to anywhere; it is independent of the source code.
- You can use all of your browser's functions, such as search, history, bookmark, save, frames, windows, etc.

#### 3.8.2 Preparation

At first, you must ensure that you have a lot of disk space for hypertext. For example, Linux-2.6.32 source code (390MB) requires 4–6 GB of disk space.

source code(Linux-2.6.32)	390MB
GPATH,GTAGS,GRTAGS	289MB
hypertext (with no option)	3.8GB
hypertext (with --suggest option)	5.7GB

Please invoke `gtags(1)` (see [Section 5.2 \[gtags\], page 31](#)) and `htags(1)` (see [Section 5.3 \[htags\], page 35](#)) in order like this:

```
(at the root directory of your source project)
$ gtags                # make tag files(GPATH,GTAGS,GRTAGS)
$ htags                # make hypertext(HTML/)
```

Then you will find a directory named `HTML` in the current directory.

Htags has rich options. If you are new on htags then you are recommended to use the `--suggest` option. This option makes some popular options effective, and invokes `gtags(1)` if there is no tag files.

```
$ htags --suggest
```

If HTTP server is available then the `-D` and `-f` options are also useful.

### 3.8.3 Usage

Please start a web browser like this:

```
$ lynx HTML/index.html
```

You will understand the usage by looking at the examples.

You can move the `HTML` directory to anywhere. It is independent of the source code as long as CGI facility is not used.

Using mozilla, you can also utilize the hypertext from your command line like this:

```
$ mozilla                # load mozilla
$ global -x main
main      10 main.c main(int argc, char *argv[]) {
$ gozilla +10 main.c      # usage is similar to vi editor.
(show main.c at 10 on mozilla's screen.)
```

But in this case, you must not move the `HTML` directory from the source directory.

## 3.9 Doxygen using GLOBAL

You can use `GLOBAL` as the source browser of Doxygen.

Doxygen Release 1.4.3 or later has config option `USE_HTAGS`. When enabled in combination with `SOURCE_BROWSER=YES`, `htags(1)` is used as the source browser instead of Doxygen's own.

Here is an example.

```
(in source directory)
$ doxygen -g
$ vi Doxyfile
+-----+
|...
|INPUT              = .
|RECURSIVE          = YES
|SOURCE_BROWSER     = YES
|USE_HTAGS          = YES
|...

$ doxygen
$ lynx html/index.html
```



## 4 Other topics

### 4.1 How to configure GLOBAL

You can customize GLOBAL using configuration file.

```
# cp gtags.conf /etc/gtags.conf          # system wide config file.
# vi /etc/gtags.conf

$ cp gtags.conf $HOME/.globalrc          # personal config file.
$ vi $HOME/.globalrc
```

If `$HOME/.globalrc` exists then GLOBAL uses it; else if `/etc/gtags.conf` exists then GLOBAL uses it; otherwise default value is used. The format of `gtags.conf` resembles `termcap(5)`. By default, 'default' target is used. About the capabilities, please see each command manual. See [Chapter 5 \[Reference\]](#), page 25.

### 4.2 Plug-in parser

You can write a new parser for `gtags(1)`.

Command layer plug-in parser was abolished. Please write function layer plug-in parser instead. See `plugin-factory/` to discover the function layer plug-in parser.

You can use Exuberant ctags as a plug-in parser too. This requires Exuberant ctags version 5.5 or later.

```
# Installation of GLOBAL
# It assumed that ctags command is installed in '/usr/local/bin'.

$ ./configure --with-exuberant-ctags=/usr/local/bin/ctags
$ make
$ sudo make install

# Executing of gtags
# It assumed that GLOBAL is installed in '/usr/local'.

$ export GTAGSCONF=/usr/local/share/gtags/gtags.conf
$ export GTAGSLABEL=ctags
$ gtags                                # gtags invokes Exuberant Ctags internally
```

### 4.3 Incremental updating

Modifying some source files, you need not remake the entire tag files. Instead, you can use incremental updating facility (`-u` option).

```
$ gtags
$ cd kernel
$ vi user.c                                # modify user.c
...
:wq
$ global -vu                                # -v means verbose
```

```
[Sat May 29 00:31:41 JST 2010] Gtags started.  
Tag found in '/usr/local/src/linux-2.6.32'.  
Incremental updating.  
[Sat May 29 00:31:43 JST 2010] Updating 'GTAGS' and 'GRTAGS'.  
[1/1] deleting tags of kernel/user.c  
[1/1] extracting tags of kernel/user.c  
Global databases have been modified.  
[Sat May 29 00:31:51 JST 2010] Done.  
  
$ global -vu                                # try again  
[Sat May 29 00:33:16 JST 2010] Gtags started.  
Tag found in '/usr/local/src/linux-2.6.32'.  
Incremental updating.  
Global databases are up to date.             # do nothing  
[Sat May 29 00:33:19 JST 2010] Done.
```

## 5 Command References

### 5.1 global - print locations of given symbols

#### NAME

global - print locations of given symbols

#### SYNOPSIS

```
global [-adEFGilMnqrstTvx][-S dir][-e] pattern
global -c[dFiIMoOPrsT] prefix
global -f[adlnqrstvx][-L file-list][-S dir] files
global -g[aEGilMnoOqtVx][-L file-list][-S dir][-e] pattern [files]
global -I[ailMnqtvx][-S dir][-e] pattern
global -P[aEGilMnoOqtVx][-S dir][-e] pattern
global -p[qrv]
global -u[qv]
```

#### DESCRIPTION

Global finds locations of given symbols in C, C++, Yacc, Java, PHP and Assembly source files, and prints the path name, line number and line image of the locations. Global can locate not only definitions but also references and other symbols.

Global can treat a source tree, that is, a directory that has sub-directories and source files, as a project. In advance of using this command, you must execute gtags(1) at the root directory of the project which you want to investigate to make tag files. Then you can use global command anywhere in the project. You need not specify where the tag file is. Instead, global locates it by itself.

You can specify a regular expression for pattern. Global understands two different versions of regular expression syntax: basic and extended (default).

#### COMMANDS

The following commands are available:

<no command> pattern

Print tags which match to pattern. By default, print definition tags.

‘-c’, ‘--completion’ [prefix]

Print symbols which start with prefix. If prefix is not given, print all symbols.

‘-f’, ‘--file’ files

Print all tags in the files. This command implies the ‘-x’ option.

‘-g’, ‘--grep’ pattern [files]

Print all lines which match to the pattern. If files are given, this command searches in those files.

‘--help’ Print a usage message.

‘-I’, ‘--idutils’ pattern

Print all lines which match to pattern. This function uses idutils(1) as a search engine. To use this command, you need to install idutils(1) in your system and execute gtags(1) with the ‘-I’ option.

‘-P’, ‘--path’ [pattern]

Print path names which match to pattern. If no pattern is given, print all paths in the project.

‘-p’, ‘--print-dbpath’

Print location of GTAGS.

‘-u’, ‘--update’

Update tag files incrementally. This command internally invokes gtags(1). You can execute this command anywhere in the project, differing from gtags(1).

‘--version’

Show version number.

## OPTIONS

The following options are available:

‘-a’, ‘--absolute’

Print absolute path names. By default, print relative path names.

‘--color’ when

Use color to highlight the pattern within the line; when may be one of: never, always or auto (default). The default color is bold red text on current background; the environment variable *GREP\_COLORS* or *GREP\_COLOR* defines it. This option is effective to the following commands: <no command>, -f, -g, -I, -P.

‘-d’, ‘--definition’

Print locations of definitions.

‘-e’, ‘--regexp’ pattern

Use pattern as the pattern; useful to protect patterns starting with ‘-’.

‘-E’, ‘--extended-regexp’

Interpret pattern as a extended regular expression. This is the default.

‘--encode-path’ chars

Convert path characters in chars into a ‘%’ symbol, followed by the two-digit hexadecimal representation of the character. A blank will be converted to ‘%20’.

‘-F’, ‘--first-match’

End the search without go through all the tag files listed in *GTAGSLIBPATH* when tags are found in a tag file. This is the default.

‘--from-here’ context

Decide tag type by context, which must be ‘lineno:path’. If this option is specified then ‘-s’ and ‘-r’ are ignored. Regular expression is not allowed for pattern. This option assumes use in conversational environments such as editors and IDEs.

- ‘-G’, ‘--basic-regexp’**  
Interpret pattern as a basic regular expression. The default is an extended regular expression.
- ‘--gtagsconf’ file**  
Set environment variable *GTAGSCONF* to file.
- ‘--gtagslabel’ label**  
Set environment variable *GTAGSLABEL* to label.
- ‘-i’, ‘--ignore-case’**  
Ignore case distinctions in the pattern.
- ‘-L’, ‘--file-list’ file**  
Obtain files from file in addition to the arguments. The argument file can be set to ‘-’ to accept a list of files from the standard input. File names must be separated by newline.
- ‘-l’, ‘--local’**  
Print only tags which exist under the current directory.
- ‘--literal’**  
Execute literal search instead of regular expression search. This option is only valid when the ‘-g’ command is specified.
- ‘-M’, ‘--match-case’**  
Search is case-sensitive. This is the default.
- ‘--match-part part’**  
Specify how path name completion should match, where part is one of: ‘first’, ‘last’ or ‘all’ (default). This option is valid only with the ‘-c’ command in conjunction with ‘-P’.
- ‘-n’, ‘--nofilter’**  
Suppress sort filter and path conversion filter.
- ‘-O’, ‘--only-other’**  
Treat only text files other than source code, like *README*. This option is valid only with the ‘-g’ or ‘-P’ command. This option overrides the ‘-o’ option.
- ‘-o’, ‘--other’**  
Treat not only source files but also text files other than source code, like *README*. This option is valid only with the ‘-g’ or ‘-P’ command.
- ‘--path-style’ format**  
Print path names using format, which may be one of: ‘relative’, ‘absolute’, ‘shorter’, ‘abslib’ or ‘through’. The ‘--path-style’ option is given more priority than the ‘-a’ option.
- ‘--print0’**  
Print each record followed by a null character instead of a newline.
- ‘-q’, ‘--quiet’**  
Quiet mode.

‘-r’, ‘--reference’, ‘--rootdir’

Print reference tags. Reference means the reference to a symbol which has definitions. With the ‘-p’ option, print the root directory of the project.

‘--result’ format

Print out using format, which may be one of: ‘path’ (default), ‘ctags’, ‘ctags-x’, ‘grep’ or ‘cscope’. The ‘--result=ctags’ and ‘--result=ctags-x’ options are equivalent to the ‘-t’ and ‘-x’ options respectively. The ‘--result’ option is given more priority than the ‘-t’ and ‘-x’ options.

‘--single-update’ file

Update tag files using gtags(1) with the ‘--single-update’ option. It is considered that file was added or updated, and there is no change in other files. This option implies the ‘-u’ option.

‘-s’, ‘--symbol’

Print other symbol tags. Other symbol means the reference to a symbol which has no definition.

‘-S’, ‘--scope’ dir

Print only tags which exist under dir directory. It is similar to the ‘-l’ option, but you need not change directory.

‘-T’, ‘--through’

Go through all the tag files listed in *GTAGSLIBPATH*. By default, stop searching when tag is found. This option is ignored when either ‘-s’, ‘-r’ or ‘-l’ option is specified.

‘-t’, ‘--tags’

Use standard ctags format.

‘-V’, ‘--invert-match’

Invert the sense of matching, to select non-matching lines. This option is valid only with the ‘-g’ or ‘-P’ commands.

‘-v’, ‘--verbose’

Verbose mode.

‘-x’, ‘--cxref’

Use standard ctags cxref (with ‘-x’) format.

## EXAMPLES

```
$ ls -F
Makefile      src/      lib/
$ gtags
$ ls G*
GPATH  GRTAGS  GTAGS
$ global main
src/main.c
$ (cd src; global main)
main.c
$ global -x main
```

```

main          10 src/main.c  main (argc, argv) {
$ global -f src/main.c
main          10 src/main.c  main (argc, argv) {
func1    55 src/main.c  func1() {
func2    72 src/main.c  func2() {
func3   120 src/main.c  func3() {
$ global -x '[sg]et'
set_num      20 lib/util.c  set_num(values) {
get_num      30 lib/util.c  get_num() {
$ global -rx set_num
set_num      113 src/op.c          set_num(32);
set_num      225 src/opop.c        if (set_num(0) > 0) {
$ global strlen
$ (cd /usr/src/sys; gtags)
$ export GTAGSLIBPATH=/usr/src/sys
$ global -a strlen
/usr/src/sys/libkern/strlen.c
$ (cd /usr/src/lib; gtags)
$ GTAGSLIBPATH=/usr/src/lib:/usr/src/sys
$ global -a strlen
/usr/src/lib/libc/string/strlen.c

```

## FILES

**GTAGS**      Tag file for definitions.

**GRTAGS**     Tag file for references.

**GPATH**      Tag file for source files.

### GTAGSROOT

If environment variable *GTAGSROOT* is not set and file *GTAGSROOT* exists in the same directory as **GTAGS** then global sets *GTAGSROOT* to the contents of the file.

**\$HOME/.globalrc, gtags.conf**

Global load a configuration file according to the following priority (Lower number means higher priority).

- (1) **\$GTAGSCONF**
- (2) **[project root]/gtags.conf**
- (3) **\$HOME/.globalrc**
- (4) **/etc/gtags.conf**
- (5) **[sysconfdir]/gtags.conf**

## ENVIRONMENT

The following environment variables affect the execution of global:

### *GREP\_COLOR*

The color to use for '*--color*'; *GREP\_COLORS* has precedence.

**GREP\_COLORS**

The color (mt or ms) to use for ‘--color’; see `grep(1)`.

**GLOBAL\_OPTIONS**

The value of this variable is inserted in the head of arguments.

**GTAGSBLANKENCODING**

If this variable is set, the ‘--encode-path=" <TAB>"’ option is specified.

**GTAGSCACHE**

The size of the B-tree cache. The default is 50000000 (bytes).

**GTAGSCONF**

Configuration file. The default is `$HOME/.globalrc`.

**GTAGSDBPATH**

The directory in which the tag files exist. This value is ignored when `GTAGS-ROOT` is not defined.

**GTAGSFORCECPP**

If this variable is set, each file whose suffix is `.h` is treated as a C++ source file.

**GTAGSLABEL**

Configuration label. The default is default.

**GTAGSLIBPATH**

If this variable is set, it is used as the path to search for library functions. If the given symbol is not found in the project, global also searches in these paths. Since only `GTAGS` is targeted in the retrieval, this variable is ignored when ‘-r’ or ‘-s’ is specified.

**GTAGSLOGGING**

If this variable is set, `$GTAGSLOGGING` is used as the path name of a log file. There is no default value.

**GTAGSROOT**

The root directory of the project.

**GTAGSTHROUGH**

If this variable is set, the ‘-T’ option is specified.

**MAKEOBJDIR**

If this variable is set, `$MAKEOBJDIR` is used as the name of BSD-style objdir. The default is `obj`.

**MAKEOBJDIRPREFIX**

If this variable is set, `$MAKEOBJDIRPREFIX` is used as the prefix of BSD-style objdir. The default is `/usr/obj`.

**CONFIGURATION**

The following configuration variables affect the execution of global:

**icase\_path** (boolean)

Ignore case distinctions in pattern.



Addition to these, the variables listed in the ENVIRONMENT section except for GTAGSCONF and GTAGSLABEL are also available as configuration variables. Each environment variable is given more priority than configuration variable of the same name.

## DIAGNOSTICS

Global exits with a non-0 value if an error occurred, 0 otherwise.

## SEE ALSO

gtags(1), htags(1), less(1).

GNU GLOBAL source code tag system  
(<http://www.gnu.org/software/global/>).

## AUTHOR

Shigio YAMAGUCHI, Hideki IWAMOTO and others.

## HISTORY

The global command appeared in FreeBSD 2.2.2.

## 5.2 gtags - create tag files for global.

### NAME

gtags - create tag files for global.

### SYNOPSIS

```
gtags [-ciIOqvw][-d tag-file][-f file][dbpath]
```

### DESCRIPTION

Gtags is used to create tag files for global(1).

Gtags recursively collects source files under the current directory, picks up symbols and writes the cross-reference data into the tag files (GTAGS, GRTAGS and GPATH).

If `gtags.files` exists or the `-f` option is specified, target files are limited by it. Lines starting with `'.'` are comments.

C, yacc, Assembly, Java, C++ and PHP source files are supported. Files whose names end in `.c`, `.h` are assumed to be C source files. Files whose names end in `.y` are assumed to be yacc source files. Files whose names end in `.s`, `.S` are assumed to be Assembly source files. Files whose names end in `.java` are assumed to be Java source files. Files whose names end in `.c++`, `.cc`, `.hh`, `.cpp`, `.cxx`, `.hxx`, `.hpp`, `.C`, `.H` are assumed to be C++ source files. Files whose names end in `.php`, `.php3`, `.phtml` are assumed to be PHP source files. Other files are assumed to be text files. Gtags does not treat binary files.

## OPTIONS

The following options are available:

- ‘--accept-dotfiles’  
Accept files and directories whose names begin with a dot. By default, gtags ignores them.
- ‘-c’, ‘--compact’  
Make GTAGS in compact format. This option does not influence GRTAGS, because that is always made in compact format.
- ‘--config’[=name]  
Print the value of config variable name. If name is not specified then print all names and values.
- ‘-d’, ‘--dump’ tag-file  
Dump a tag file as text to the standard output. Output format is ‘key<tab>data’. This is for debugging.
- ‘-f’, ‘--file’ file  
Browse through all files whose names are listed in file. The argument file can be set to ‘-’ to accept a list of files from the standard input. File names must be separated by newline.
- ‘--gtagsconf’ file  
Set environment variable *GTAGSCONF* to file.
- ‘--gtagslabel’ label  
Set environment variable *GTAGSLABEL* to label.
- ‘-I’, ‘--idutils’  
In addition to tag files, make ID database for idutils(1).
- ‘-i’, ‘--incremental’  
Update tag files incrementally. It’s better to use global(1) with the ‘-u’ command.
- ‘-O’, ‘--objdir’  
Use BSD-style objdir as the location of tag files. If \$MAKEOBJDIRPREFIX directory exists, gtags creates \$MAKEOBJDIRPREFIX/<current directory> directory and makes tag files in it. If dbpath is specified, this option is ignored.
- ‘--single-update’ file  
Update tag files for a single file. It is considered that file was added or updated, and there is no change in other files. This option implies the ‘-i’ option.
- ‘--statistics’  
Print statistics information.
- ‘-q’, ‘--quiet’  
Quiet mode.
- ‘-v’, ‘--verbose’  
Verbose mode.

`'-w', '--warning'`

Print warning messages.

`dbpath` The directory in which tag files are generated. The default is the current directory.

## EXAMPLES

```
$ ls -F
Makefile      src/      lib/
$ gtags -v
$ global -x main
main          10 src/main.c  main (argc, argv) {
```

## FILES

`GTAGS` Tag file for definitions.

`GRTAGS` Tag file for references.

`GPATH` Tag file for source files.

`$HOME/.globalrc, gtags.conf`

Gtags load a configuration file according to the following priority (Lower number means higher priority).

- (1) `$GTAGSCONF`
- (2) `[project root]/gtags.conf`
- (3) `$HOME/.globalrc`
- (4) `/etc/gtags.conf`
- (5) `[sysconfdir]/gtags.conf`

`gtags.files`

The list of candidates of target files.

## ENVIRONMENT

The following environment variables affect the execution of gtags:

`GTAGSCACHE`

The size of the B-tree cache. The default is 50000000 (bytes).

`GTAGSCONF`

Configuration file. The default is `$HOME/.globalrc`.

`GTAGSFORCECPP`

If this variable is set, each file whose suffix is `.h` is treated as a C++ source file.

`GTAGSLABEL`

Configuration label. The default is `'default'`.

`GTAGSLOGGING`

If this variable is set, `$GTAGSLOGGING` is used as the path name of a log file. There is no default value.

`GTAGS_OPTIONS`

The value of this variable is inserted in the head of arguments.

**MAKEOBJDIR**

If this variable is set, **\$MAKEOBJDIR** is used as the name of BSD-style objdir. The default is **obj**.

**MAKEOBJDIRPREFIX**

If this variable is set, **\$MAKEOBJDIRPREFIX** is used as the prefix of BSD-style objdir. The default is **/usr/obj**.

**TMPDIR** The location used to stored temporary files. The default is **/tmp**.

**CONFIGURATION**

The following configuration variables affect the execution of gtags. You can see the default value for each variable with the ‘**--config**’ option.

**gtags\_parser** (comma separated list)

Specify the mapping of language names and plug-in parsers. Each part delimited by the comma consists of the language name, a colon, the shared object path, an optional colon followed by a function name. If the function name is not specified, ‘parser’ is assumed. As a special exception, gtags collects values from multiple **gtags\_parser** variables.

**icase\_path** (boolean)

Ignore case distinctions in the path. Suffixes check is affected by this capability.

**langmap** (comma separated list)

Language mapping. Each comma-separated map consists of the language name, a colon, and a list of file extensions. As a special exception, gtags collects values from multiple **langmap** variables. Default mapping is: ‘**c:.c.h,yacc:.y,asm:.s.S,java:.java,cpp:.c++.cc.hh.cpp.cxx.hxx.hpp.C.H,php:.php.ph**

**skip** (comma separated list)

Gtags skips files and directories which are given in this list. As a special exception, gtags collects values from multiple **skip** variables. If the value ends with ‘/’, it is assumed as a directory and gtags skips all files under it. The value may include glob patterns (\*, ?, [...], [!...], [^...]). If the value starts with ‘/’, it is assumed a relative path name from the root directory of the project. You cannot use glob patterns for a path name.

In addition to these, the variables listed in the ENVIRONMENT section except for GTAGSCONF and GTAGSLABEL are also available as configuration variables. Each environment variable is given more priority than configuration variable of the same name.

**DIAGNOSTICS**

Gtags exits with a non-0 value if an error occurred, 0 otherwise.

**SEE ALSO**

global(1), htags(1).

GNU GLOBAL source code tag system  
(<http://www.gnu.org/software/global/>).

## BUG

**GTags** and **GRTags** are very large. In advance of using this command, check the space of your disk.

Assembly support is far from complete. It extracts only **ENTRY()** and **ALTENTRY()** from source file. Probably valid only for FreeBSD and Linux kernel source.

There is no concurrency control about tag files.

## AUTHOR

Shigio YAMAGUCHI, Hideki IWAMOTO and others.

## HISTORY

The **gtags** command appeared in FreeBSD 2.2.2.

## 5.3 htags - generate a hypertext from a set of source files.

### NAME

**htags** - generate a hypertext from a set of source files.

### SYNOPSIS

```
htags [-acDfGhInosTvwx][-d dbpath][-m name][-t title][dir]
```

### DESCRIPTION

Htags generates a hypertext from a set of source files of C, C++, Yacc, Java, PHP and Assembly.

In advance of using this command, you should execute **gtags(1)** in the root directory of a source project. Then you can execute **htags** in the same place. Htags makes a directory named **HTML**, and puts a hypertext in it. You can start browsing at **HTML/index.html**.

Since **htags** generates a static hypertext as long as the **-D** or **-f** option is not specified, you can move it anywhere and browse it by any browser without any HTTP server.

This command has so many options. If you are new to **htags**, it is recommended to use the **--suggest** option. With that option, **htags** chooses popular options on your behalf.

### OPTIONS

The following options are available:

**-a**, **--alphabet**

Make an alphabetical index suitable for a large project.

**--auto-completion**[=*limit*]

Enable auto-completion facility for the input form. If *limit* is specified, number of candidates is limited to the value. Please note this function requires javascript language in your browser.

**--caution**

Display a caution message on the top page.

`--cflow` cflowfile

Add a call tree by cflow(1). cflowfile must be posix format. If you use GNU cflow, invoke the command at the project root directory with the `--format=posix` option. This option is deprecated; please use `--call-tree` or `--callee-tree` instead.

`--call-tree` callfile

Add a call tree by cflow(1); callfile must be posix format. If you use GNU cflow, invoke the command at the project root directory with the `--format=posix` option.

`--callee-tree` calleefile

Add a callee tree by cflow(1); calleefile must be posix format. If you use GNU cflow, invoke the command at the project root directory with the `--format=posix` and `--reverse` options.

`-c`, `--compact`

Compress html files by gzip(1). You need to configure HTTP server so that gzip(1) is invoked for each compressed file. See HTML/.htaccess that is generated by htags. This option is deprecated.

`--colorize-warned-line`

Use color to highlight warned lines.

`--cvsweb` url

Add a link to cvsweb; url is used as the base of URL. When directory CVS exists in the root directory of the project, the content of CVS/Repository is used as the relative path from the base.

`--cvsweb-cvsroot` cvsroot

Specify cvsroot in cvsweb URL.

`-D`, `--dynamic`

Generate a tag list dynamically using CGI program. Though this option decreases both the size and generation time of hypertext, you need to start up HTTP server.

`-d`, `--dbpath` dbpath

Specify the directory in which GTAGS exists. The default is the current directory.

`--disable-grep`

Disable grep in the search form (`-f`, `--form`).

`--disable-idutils`

Disable idutils in the search form (`-f`, `--form`).

`-F`, `--frame`

Use frames for the top page.

`-f`, `--form`

Add a search form using CGI program. You need to start a HTTP server for it.

`--fixed-guide`

Put a fixed guide at the bottom of the screen of the browser.

- `--full-path`  
Use full path name in the file index. By default, use just the last component of a path.
- `-g`, `--gtags`  
Execute gtags(1) before starting job. The `-v`, `-w` and `dbpath` options are passed to gtags.
- `--gtagsconf` file  
Set environment variable *GTAGSCONF* to file.
- `--gtagslabel` label  
Set environment variable *GTAGSLABEL* to label.
- `-h`, `--func-header`[=position]  
Insert a function header for each function. By default, htags doesn't generate them. You can choose the position using position, which allows one of `'before'`, `'right'` or `'after'` (default).
- `--html-header` file  
Insert a header record derived from file into the HTML header of each file.
- `-I`, `--icon`  
Use icons instead of text for some links.
- `--insert-footer` file  
Insert custom footer derived from file before `</body>` tag.
- `--insert-header` file  
Insert custom header derived from file after `<body>` tag.
- `--item-order` spec  
Specify the order of the items in the top page. The spec is a string consisting of item signs in order. Each sign means as follows: `'c'`: caution; `'s'`: search form; `'m'`: mains; `'d'`: definitions; `'f'`: files; `'t'`: call tree. The default is `'csmdf'`.
- `-m`, `--main-func` name  
Specify startup function name; the default is `'main'`.
- `--map-file`  
Generate file MAP.
- `-n`, `--line-number`[=columns]  
Print line numbers. By default, don't print line numbers. The default value of columns is 4.
- `--no-order-list`  
Numbers are not given in list form.
- `-o`, `--other`  
Pick up not only source files but also other files for the file index.
- `--overwrite-key`  
Allow overwrite of an existing key with the `--system-cgi` option. This option is deprecated.

`--system-cgi` key

Use the system CGI script. key must be a unique key in your site. At the first time, you should (1) copy the CGI script written by this command into the system CGI directory, and (2) execute `bleess.sh` script at the HTML directory as a root user. This option is deprecated.

`-s`, `--symbol`

Make anchors not only for definitions and references but also other symbols.

`--show-position`

Print the position string per function definition. The string can be interpreted by general editors in UNIX. The default is false.

`--statistics`

Print statistics information.

`--suggest`

Htags chooses popular options on behalf of beginners. It is equivalent to `'-aghInosTxv --show-position --fixed-guide'` now.

`--suggest2`

Htags chooses popular options on behalf of beginners. This option enables frame, AJAX and CGI facility in addition to the facilities by the `'--suggest'` option. It is equivalent to `'--suggest -DfF --auto-completion --tree-view=filetree'` now.

`-T`, `--table-flist`[=rows]

Use `<table>` tag to display the file index. You can optionally specify the number of rows; the default is 5.

`-t`, `--title` title

Title of the hypertext. The default is the last component of the path of the current directory.

`--tabs` cols

Tab stops. The default is 8.

`--table-list`

Use `<table>` tag to display the tag list.

`--tree-view`[=type]

Use treeview for the file index. Please note this function requires javascript language in your browser. Possible values of type are as follows: treeview, filetree, treeview-red, treeview-black, treeview-gray, treeview-famfamfam. The default is treeview.

`-v`, `--verbose`

Verbose mode.

`-w`, `--warning`

Print warning messages.

`-x`, `--xhtml`[=version]

Generate XHTML hypertext. This is the default. If the `'--frame'` option is specified then generate XHTML-1.0 Frameset for `index.html` and XHTML-1.0



Transitional for other files; else if version is '1.1' or config variable `xhtml_version` is set to '1.1' then generate XHTML-1.1; else generate XHTML-1.0 Transitional. This option is deprecated.

**dir**           The directory in which the result of this command is stored. The default is the current directory.

## EXAMPLES

```
$ gtags -v
$ htags -sanohITvt 'Welcome to XXX source tour!'
$ firefox HTML/index.html

$ htags --suggest
```

## FILES

**GTAGS**       Tag file for definitions.

**GRTAGS**      Tag file for references.

**GPATH**       Tag file for source files.

**\$HOME/.globalrc, gtags.conf**

Htags load a configuration file according to the following priority (Lower number means higher priority).

- (1) `$GTAGSCONF`
- (2) `[project root]/gtags.conf`
- (3) `$HOME/.globalrc`
- (4) `/etc/gtags.conf`
- (5) `[sysconfdir]/gtags.conf`

**HTML/FILEMAP**

Mapping file for converting file name into the path of the file.

**HTML/GTAGSROOT**

If this file exists, CGI program `global.cgi` sets environment variable `GTAGS-ROOT` to the contents of it. If you move directory `HTML` from the original place, please make this file.

**HTML/.htaccess**

Local configuration file for Apache. This file is generated when the '-f', '-D' or '-c' options are specified.

**HTML/index.html**

Start-up file.

**HTML/MAP**    Mapping file for converting tag name into the path of tag list.

**HTML/style.css**

Style sheet file.

**/usr/local/share/gtags/style.css.tpl**

The template of the style sheet file (`HTML/style.css`).

`/usr/local/var/gtags/sitekeys`

Site key database directory used for the ‘`--system-cgi`’. Though its mode is set as 755 by default, it is left to the system administrator. If it is writable, you need not execute `bleess.sh` script as a root user.

## ENVIRONMENT

The following environment variables affect the execution of `htags`:

*GTAGSCACHE*

The size of the B-tree cache. The default is 50000000 (bytes).

*GTAGSCONF*

Configuration file. The default is `$HOME/.globalrc`.

*GTAGSLABEL*

Configuration label. The default is ‘`default`’.

*HTAGS\_OPTIONS*

The value of this variable is inserted in the head of arguments.

*TMPDIR* The location used to stored temporary files. The default is `/tmp`.

*GTAGSFORCECPP*

If this variable is set, each file whose suffix is `.h` is treated as a C++ source file.

## CONFIGURATION

The following configuration variables affect the execution of `htags`:

`datadir(string)`

Shared data directory. The default is `/usr/local/share` but you can change the value using `configure` script. `htags` looks up template files in the `htags` directory in this data directory.

`gzipped_suffix(string)`

Suffix for compressed html file. The default is `ghtml`. This variable is deprecated.

`htags_options(string)`

Default options for `htags`. This value is inserted into the head of arguments. The default is null.

`include_file_suffixes(comma separated list)`

Suffixes of include files. The default is:  
‘`h,hh,hxx,hpp,H,inc.php`’.

`langmap(comma separated list)`

Language mapping. Each comma-separated map consists of the language name, a colon, and a list of file extensions. Default mapping is:  
‘`c:.c,h,yacc:.y,asm:.s,S,java:.java,cpp:.c++.cc,hh.cpp.cxx,hxx.hpp.C.H,php:.php.ph`’.

`ncol(number)`

Columns of line number. The default is 4. This variable is deprecated. Use the `-n` (`--line-number`) option instead.

**normal\_suffix**(string)

Suffix for normal html file. The default is `html`. This variable is deprecated.

**script\_alias**(string)

Script alias for system cgi script (`--system-cgi`). This variable is deprecated.

**tabs**(number)

Tab stops. The default is 8. This variable is deprecated. Use the `-tabs` option instead.

**xhtml\_version**(1.0|1.1)

XHTML version. '1.0' and '1.1' are acceptable. The default is '1.0'. This variable is deprecated.

Addition to these, the variables listed in the ENVIRONMENT section except for GTAGSCONF and GTAGSLABEL are also available as configuration variables. Each environment variable is given more priority than configuration variable of the same name.

## DIAGNOSTICS

Htags exits with a non-0 value if an error occurred, 0 otherwise.

## SEE ALSO

`global(1)`, `htags(1)`.

GNU GLOBAL source code tag system

(<http://www.gnu.org/software/global/>).

## BUG

Generated hypertext is VERY LARGE. In advance, check the space of your disk.

PHP support is far from complete.

The `-f`, `-D` and `-c` options generate CGI programs. If you open the hypertext to the public, please recognize security dangers.

## AUTHOR

Shigio YAMAGUCHI, Hideki IWAMOTO and others.

## HISTORY

The `htags` command appeared in FreeBSD 2.2.2.

## 5.4 htags-server - start a private Web/CGI server for hyper-text

### NAME

`htags-server` - start a private Web/CGI server for hyper-text

### SYNOPSIS

```
htags-server [-b ip-address][-u language][port]
```

## DESCRIPTION

Htags-server is a private Web/CGI server for the hyper-text generated by htags(1).

In advance of using this command, you should execute htags(1). Then you can execute htags-server at the same place. You can start browsing at 'http://localhost:8000/' by default. To stop the server, just press on 'CTRL-C'.

Python 2/3 or Ruby equipped with WEBrick is required. By default, htags-server looks for python first, if not found then looks for ruby.

## OPTIONS

The following options are available:

- '-b', '--bind' ip-address  
Specifies the IP address on which htags-server listen. The default value is 127.0.0.1.
- '-u', '--use' language  
Specifies language to use, which may be one of: 'python' and 'ruby'.
- port  
Specifies the port on which htags-server listen. If you want to use multiple sessions, you must use unique number for each htags-server. The default value is 8000.

## EXAMPLES

```
$ gtags
$ htags --suggest2
$ htags-server
Python2 http/cgi server
Serving HTTP on 127.0.0.1 port 8000 ...
```

```
(another terminal)
$ firefox http://localhost:8000/
```

## DIAGNOSTICS

Htags-server exits with a non-0 value if an error occurred, 0 otherwise.

## SEE ALSO

global(1), gtags(1), htags(1), python(1), ruby(1).

GNU GLOBAL source code tag system  
(<http://www.gnu.org/software/global/>).

## BUG

Since Python and Ruby are not Web servers, you must not expect high security.

## AUTHOR

Shigio YAMAGUCHI.

## 5.5 gozilla - force mozilla to display specified part of a source file.

### NAME

gozilla - force mozilla to display specified part of a source file.

### SYNOPSIS

```
gozilla [-b browser][-p][+no] file
gozilla [-b browser][-p] -d name
```

### DESCRIPTION

Gozilla forces mozilla to display specified part of a source file. Gozilla can be used with other browsers like firefox and epiphany.

In advance of using this command, you must execute gtags(1) and htags(1) at the root directory of the project to make tag files. Then you can execute this command anywhere in the project.

First form:

You can specify a source file and optional line number. This syntax is similar to vi(1) and emacs(1).

Second form:

You can specify a definition name directly. The definition name should exist in GTAGS. This option requires HTML/MAP generated by htags(1).

Some browsers require you to load it before executing gozilla.

### OPTIONS

The following options are available:

- '+no'        Line number.
- '-b' browser        Browser to use. By default, it is assumed mozilla.
- '-d' name    Print definitions.
- '--help'    Show help.
- '-p'        Just print a generated URL instead of displaying it.
- file        File name or alias name.
- '-q', '--quiet'    Quiet mode.
- '-v', '--verbose'    Verbose mode.
- '--version'        Show version number.

## FILES

**GTags** Tag file for definitions.

**HTML/** Hypertext of source code.

**HTML/MAP** Mapping file for converting tag name into the path of tag list.

**\$HOME/.gozillarc**  
Alias file. Please read the source code for details.

## ENVIRONMENT

**BROWSER**  
Browser to use. By default, it is assumed mozilla.

**GTagsDBPATH**  
The directory in which the tag files exist. This value is ignored when *GTags-ROOT* is not defined.

**GTagsROOT**  
The root directory of the project.

## EXAMPLES

```
$ gtags
$ htags
$ global -x main
main          82 ctags.c          main(argc, argv)
$ mozilla &
$ gozilla +82 ctags.c
$ gozilla -d main

$ firefox &
$ gozilla -b firefox +82 ctags.c
```

## DIAGNOSTICS

Gozilla exits with a non-0 value if an error occurred, 0 otherwise.

## SEE ALSO

global(1), gtags(1), htags(1), firefox(1), epiphany(1), mozilla(1).

GNU GLOBAL source code tag system  
(<http://www.gnu.org/software/global/>).

## BUGS

Gozilla can accept not only source files but also text files, directories, HTML files and even URLs, because it is omnivorous.

## AUTHORS

Shigio YAMAGUCHI.

## HISTORY

The `gozilla` command appeared in FreeBSD 2.2.2 but was not installed by default.

## 5.6 gtags-cscope - interactively examine a C program.

### NAME

`gtags-cscope` - interactively examine a C program.

### SYNOPSIS

```
gtags-cscope [-bCdehLIVv][-F file ][-012345678 pattern][-p n]
```

### DESCRIPTION

`gtags-cscope` is an interactive, screen-oriented tool that allows the user to browse through C source files for specified elements of code.

`gtags-cscope` builds the symbol cross-reference the first time it is used on the source files for the program being browsed. On a subsequent invocation, `gtags-cscope` rebuilds the cross-reference only if a source file has changed or the list of source files is different. When the cross-reference is rebuilt, it is updated incrementally, which makes rebuilding faster than the initial build.

### OPTIONS

Some command line arguments can only occur as the only argument in the execution of `gtags-cscope`. They cause the program to just print out some output and exit immediately:

- ‘-h’           View the long usage help display.
- ‘-V’           Print the version number of `gtags-cscope`.
- ‘--help’      Same as ‘-h’
- ‘--version’   Same as ‘-V’

The following options can appear in any combination:

- ‘-a’           Print absolute path names.
- ‘-b’           Build the cross-reference only.
- ‘-C’           Ignore letter case when searching.
- ‘-d’           Do not update the cross-reference.
- ‘-e’           Suppress the `^e` command prompt between files.
- ‘-F’ file      Read symbol reference lines from file. (A symbol reference file is created by `>` and `>>`, and can also be read using the `<` command, described under “Issuing Subsequent Requests”, below.)
- ‘-i’           Ignore SIGINT signal in line-oriented mode.

- '-L'            Do a single search with line-oriented output when used with the -num pattern option.
- '-l'            Line-oriented interface. This option implies the '-d' option.
- '-[0-9]' pattern  
                Go to input field num (counting from 0) and find pattern.
- '-p' n          Display the last n file path components instead of the default (1). Use '0' to not display the file name at all.
- '-v'            Be more verbose in line-oriented mode.

## Requesting the initial search

After the cross-reference is ready, gtags-cscope will display this menu:

```
Find this C symbol:
Find this function definition:
Find functions called by this function (N/A):
Find functions calling this function:
Find this text string:
Change this text string:
Find this egrep pattern:
Find this file:
Find files #including this file:
```

Press the <Up> or <Down> keys repeatedly to move to the desired input field, type the text to search for, and then press the <Return> key.

## Issuing subsequent requests

If the search is successful, any of these single-character commands can be used:

- 0-9a-zA-Z    Edit the file referenced by the given line number.
- <Space>      Display next set of matching lines.
- <Tab>        Alternate between the menu and the list of matching lines
- <Up>         Move to the previous menu item (if the cursor is in the menu) or move to the previous matching line (if the cursor is in the matching line list).
- <Down>       Move to the next menu item (if the cursor is in the menu) or move to the next matching line (if the cursor is in the matching line list).
- +        Display next set of matching lines.
- Display previous set of matching lines.
- ^e       Edit displayed files in order.
- >        Write the displayed list of lines to a file.
- >>       Append the displayed list of lines to a file.
- <        Read lines from a file that is in symbol reference format (created by > or >>), just like the '-F' option.



- `~` Filter all lines through a shell command and display the resulting lines, replacing the lines that were already there.
- `|` Pipe all lines to a shell command and display them without changing them.
- `^g` Read lines from the result of the execution of `global(1)`.

At any time these single-character commands can also be used:

- `<Return>` Move to next input field.
- `^n` Move to next input field.
- `^p` Move to previous input field.
- `^y` Search with the last text typed.
- `^b` Move to previous input field and search pattern.
- `^f` Move to next input field and search pattern.
- `^c` Toggle ignore/use letter case when searching. (When ignoring letter case, a search for `'FILE'` will match `'File'` and `'file'`.)
- `^r` Rebuild the cross-reference.
- `!` Start an interactive shell (type `^d` to return to `gtags-cscope`).
- `^l` Redraw the screen.
- `?` Give help information about `gtags-cscope` commands.
- `^d` Exit `gtags-cscope`.

NOTE: If the first character of the text to be searched for matches one of the above commands, escape it by typing a `\` (backslash) first.

Substituting new text for old text

After the text to be changed has been typed, `gtags-cscope` will prompt for the new text, and then it will display the lines containing the old text. Select the lines to be changed with these single-character commands:

- `0-9a-zA-Z` Mark or unmark the line to be changed.
- `*` Mark or unmark all displayed lines to be changed.
- `<Space>` Display next set of lines.
- `+` Display next set of lines.
- `-` Display previous set of lines.
- `^a` Mark or unmark all lines to be changed.
- `^d` Change the marked lines and exit.
- `<Esc>` Exit without changing the marked lines.
- `!` Start an interactive shell (type `^d` to return to `gtags-cscope`).
- `^l` Redraw the screen.
- `?` Give help information about `gtags-cscope` commands.

### Special keys

If your terminal has arrow keys that work in vi, you can use them to move around the input fields. The up-arrow key is useful to move to the previous input field instead of using the <Tab> key repeatedly. If you have <CLEAR>, <NEXT>, or <PREV> keys they will act as the ^1, +, and - commands, respectively.

## Line-Oriented interface

The '-1' option lets you use gtags-cscope where a screen-oriented interface would not be useful, for example, from another screen-oriented program.

gtags-cscope will prompt with '>>' when it is ready for an input line, which starts with the field number (counting from 0), immediately followed by the search pattern. For example, '1main' finds the definition of the 'main' function.

If you just want a single search, instead of the '-1' option use the '-L' and '-num pattern' options, and you won't get the '>>' prompt.

For '-1', gtags-cscope outputs the number of reference lines:  
cscope: 2 lines

For each reference found, gtags-cscope outputs a line consisting of the file name, function name, line number, and line text, separated by spaces. For example:  
main.c main 161 main(argc, argv)

Note that the editor is not called to display a single reference, unlike the screen-oriented interface.

You can use the *c* command to toggle ignore/use letter case when searching. (When ignoring letter case, a search for 'FILE' will match 'File' and 'file'.)

You can use the *r* command to rebuild the database.

gtags-cscope will quit when it detects end-of-file, or when the first character of an input line is ^d or q.

## ENVIRONMENT VARIABLES

The following environment variables are of cscope origin.

### *CSCOPE\_EDITOR*

Overrides the *EDITOR* and *VIEWER* variables. Use this if you wish to use a different editor with cscope than that specified by your *EDITOR/VIEWER* variables.

### *CSCOPE\_LINEFLAG*

Format of the line number flag for your editor. By default, cscope invokes your editor via the equivalent of 'editor +N file', where N is the line number that the editor should jump to. This format is used by both emacs and vi. If your editor needs something different, specify it in this variable, with '%s' as a placeholder for the line number. Eg: if your editor needs to be invoked as 'editor -#103 file' to go to line 103, set this variable to '-#s'.

### *CSCOPE\_LINEFLAG\_AFTER\_FILE*

Set this variable to 'yes' if your editor needs to be invoked with the line number option after the filename to be edited. To continue the example

from *CSCOPE\_LINEFLAG*, above: if your editor needs to see ‘*editor file -#number*’, set this environment variable. Users of most standard editors (vi, emacs) do not need to set this variable.

*EDITOR* Preferred editor, which defaults to vi.

*HOME* Home directory, which is automatically set at login.

*SHELL* Preferred shell, which defaults to sh.

*TERM* Terminal type, which must be a screen terminal.

*TERMINFO*

Terminal information directory full path name. If your terminal is not in the standard terminfo directory, see curses and terminfo for how to make your own terminal description.

*TMPDIR* Temporary file directory, which defaults to /tmp.

*VIEWER* Preferred file display program (such as less), which overrides *EDITOR* (see above).

The following environment variables are of GLOBAL origin.

*GTAGSCONF*

Configuration file. The default is \$HOME/.globalrc.

*GTAGSGLOBAL*

If this variable is set, \$GTAGSGLOBAL is used as the name of global(1). The default is global.

*GTAGSGTAGS*

If this variable is set, \$GTAGSGTAGS is used as the name of gtags(1). The default is gtags.

*GTAGSDBPATH*

The directory in which the tag files exist. This value is ignored when *GTAGS-ROOT* is not defined.

*GTAGSLABEL*

Configuration label. The default is ‘default’.

*GTAGSLIBPATH*

If this variable is set, it is used as the path to search for library functions. If the specified tags is not found in the project, global also searches in these paths. Since only *GTAGS* is targeted in the retrieval, this variable is ignored when ‘-r’ or ‘-s’ is specified.

*GTAGSROOT*

The root directory of the project.

*MAKEOBJDIR*

If this variable is set, \$MAKEOBJDIR is used as the name of BSD-style objdir. The default is obj.

*MAKEOBJDIRPREFIX*

If this variable is set, \$MAKEOBJDIRPREFIX is used as the prefix of BSD-style objdir. The default is /usr/obj.

## FILES

**GTags** Tag file for definitions.

**GRTags** Tag file for references.

**GPath** Tag file for source files.

**GTagsRoot**

If environment variable *GTagsRoot* is not set and file **GTagsRoot** exists in the same directory as **GTags** then global sets *GTagsRoot* to the contents of the file.

`$HOME/.globalrc`, `/etc/gtags.conf`, `[sysconfdir]/gtags.conf`  
Configuration files.

## SEE ALSO

`gtags(1)`, `global(1)`, `htags(1)`.

GNU GLOBAL source code tag system  
(<http://www.gnu.org/software/global/>).

## BUG

The function field of the display is almost <unknown> since GLOBAL doesn't recognize it.

'Find functions called by this function' is not implemented.

## AUTHOR

Joe Steffen (original author) and others.

## HISTORY

Cscope was originally developed at Bell Labs in the early 1980s, and was released as free software under the BSD license in April 2000. Gtags-cscope is a derivative of cscope to use GLOBAL as the back-end. Its line-oriented interface was originally written in 2006, and was re-implemented in 2011 using cscope itself.

## 5.7 globash - a special shell for GLOBAL using GNU bash.

### NAME

globash - a special shell for GLOBAL using GNU bash.

### SYNOPSIS

globash

### DESCRIPTION

Globash is a special shell for GLOBAL using GNU bash. You can use a lot of functions to ease reading source code, like tag stack, tag mark and cookie. At first, you should make

tag files using gtags and invoke this command in the project. Please refer to the help (type *ghelp*<RET>) for detailed usage.

## FILES

**GTAGS**        Tag file for definitions.  
**GRTAGS**      Tag file for references.  
**GPATH**       Tag file for source files.  
**~/.globashrc**  
              Start-up file.

## ENVIRONMENT

The following environment variables affect the execution of globash:

*EDITOR*    The editor used by the show command.

## SEE ALSO

gtags(1), htags(1), less(1).

GNU GLOBAL source code tag system  
(<http://www.gnu.org/software/global/>).

## AUTHOR

Shigio YAMAGUCHI.

## HISTORY

The globash command appeared in GLOBAL-4.1 (2001).

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Version 1.2, November 2002

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