

NAME

CPAN - query, download and build perl modules from CPAN sites

SYNOPSIS

Interactive mode:

```
perl -MCPAN -e shell
```

--or--

```
cpan
```

Basic commands:

Modules:

```
cpan> install Acme::Meta # in the shell
```

```
CPAN::Shell->install("Acme::Meta"); # in perl
```

Distributions:

```
cpan> install NWCLARK/Acme-Meta-0.02.tar.gz # in the shell
```

```
CPAN::Shell->
install("NWCLARK/Acme-Meta-0.02.tar.gz"); # in perl
```

module objects:

```
$mo = CPAN::Shell->expandany($mod);
$mo = CPAN::Shell->expand("Module",$mod); # same thing
```

distribution objects:

```
$do = CPAN::Shell->expand("Module",$mod)->distribution;
$do = CPAN::Shell->expandany($distro); # same thing
$do = CPAN::Shell->expand("Distribution",
    $distro); # same thing
```

DESCRIPTION

The CPAN module automates or at least simplifies the make and install of perl modules and extensions. It includes some primitive searching capabilities and knows how to use Net::FTP, LWP, and certain external download clients to fetch distributions from the net.

These are fetched from one or more mirrored CPAN (Comprehensive Perl Archive Network) sites and unpacked in a dedicated directory.

The CPAN module also supports named and versioned *bundles* of modules. Bundles simplify handling of sets of related modules. See Bundles below.

The package contains a session manager and a cache manager. The session manager keeps track of what has been fetched, built, and installed in the current session. The cache manager keeps track of the disk space occupied by the make processes and deletes excess space using a simple FIFO

mechanism. All methods provided are accessible in a programmer style and in an interactive shell style.

CPAN::shell([\$prompt, \$command]) Starting Interactive Mode

Enter interactive mode by running

```
perl -MCPAN -e shell
```

or

```
cpan
```

which puts you into a readline interface. If `Term::ReadKey` and either of `Term::ReadLine::Perl` or `Term::ReadLine::Gnu` are installed, history and command completion are supported.

Once at the command line, type `h` for one-page help screen; the rest should be self-explanatory.

The function call `shell` takes two optional arguments: one the prompt, the second the default initial command line (the latter only works if a real `ReadLine` interface module is installed).

The most common uses of the interactive modes are

Searching for authors, bundles, distribution files and modules

There are corresponding one-letter commands `a`, `b`, `d`, and `m` for each of the four categories and another, `i` for any of the mentioned four. Each of the four entities is implemented as a class with slightly differing methods for displaying an object.

Arguments to these commands are either strings exactly matching the identification string of an object, or regular expressions matched case-insensitively against various attributes of the objects. The parser only recognizes a regular expression when you enclose it with slashes.

The principle is that the number of objects found influences how an item is displayed. If the search finds one item, the result is displayed with the rather verbose method `as_string`, but if more than one is found, each object is displayed with the terse method `as_glimpse`.

Examples:

```
cpan> m Acme::MetaSyntactic
Module id = Acme::MetaSyntactic
  CPAN_USERID  BOOK (Philippe Bruhat (Book) <[...]>)
  CPAN_VERSION 0.99
  CPAN_FILE    B/BO/BOOK/Acme-MetaSyntactic-0.99.tar.gz
  UPLOAD_DATE  2006-11-06
  MANPAGE     Acme::MetaSyntactic - Themed metasyntactic variables
names
  INST_FILE   /usr/local/lib/perl/5.10.0/Acme/MetaSyntactic.pm
  INST_VERSION 0.99
cpan> a BOOK
Author id = BOOK
  EMAIL      [...]
  FULLNAME   Philippe Bruhat (Book)
cpan> d BOOK/Acme-MetaSyntactic-0.99.tar.gz
Distribution id = B/BO/BOOK/Acme-MetaSyntactic-0.99.tar.gz
  CPAN_USERID  BOOK (Philippe Bruhat (Book) <[...]>)
  CONTAINSMODS Acme::MetaSyntactic Acme::MetaSyntactic::Alias [...]
  UPLOAD_DATE  2006-11-06
cpan> m /lorem/
Module = Acme::MetaSyntactic::loremipsum
(BOOK/Acme-MetaSyntactic-0.99.tar.gz)
Module   Text::Lorem           (ADEOLA/Text-Lorem-0.3.tar.gz)
```

```

Module      Text::Lorem::More      (RKRIMEN/Text-Lorem-More-0.12.tar.gz)
Module      Text::Lorem::More::Source
(RKRIMEN/Text-Lorem-More-0.12.tar.gz)
cpan> i /berlin/
Distribution BEATNIK/Filter-NumberLines-0.02.tar.gz
Module      = DateTime::TimeZone::Europe::Berlin
(DROLSKY/DateTime-TimeZone-0.7904.tar.gz)
Module      Filter::NumberLines
(BEATNIK/Filter-NumberLines-0.02.tar.gz)
Author      [...]

```

The examples illustrate several aspects: the first three queries target modules, authors, or distros directly and yield exactly one result. The last two use regular expressions and yield several results. The last one targets all of bundles, modules, authors, and distros simultaneously. When more than one result is available, they are printed in one-line format.

`get`, `make`, `test`, `install`, `clean` modules or distributions

These commands take any number of arguments and investigate what is necessary to perform the action. If the argument is a distribution file name (recognized by embedded slashes), it is processed. If it is a module, CPAN determines the distribution file in which this module is included and processes that, following any dependencies named in the module's `META.yml` or `Makefile.PL` (this behavior is controlled by the configuration parameter `prerequisites_policy`.)

`get` downloads a distribution file and untars or unzips it, `make` builds it, `test` runs the test suite, and `install` installs it.

Any `make` or `test` is run unconditionally. An

```
install <distribution_file>
```

is also run unconditionally. But for

```
install <module>
```

CPAN checks whether an install is needed and prints *module up to date* if the distribution file containing the module doesn't need updating.

CPAN also keeps track of what it has done within the current session and doesn't try to build a package a second time regardless of whether it succeeded or not. It does not repeat a test run if the test has been run successfully before. Same for install runs.

The `force` pragma may precede another command (currently: `get`, `make`, `test`, or `install`) to execute the command from scratch and attempt to continue past certain errors. See the section below on the `force` and the `fforce` pragma.

The `notest` pragma skips the test part in the build process.

Example:

```
cpan> notest install Tk
```

A `clean` command results in a

```
make clean
```

being executed within the distribution file's working directory.

`readme`, `perldoc`, `look` module or distribution

`readme` displays the README file of the associated distribution. `look` gets and untars (if not yet done) the distribution file, changes to the appropriate directory and opens a subshell process in that directory. `perldoc` displays the module's pod documentation in html or plain text format.

```
ls author
```

ls globbing_expression

The first form lists all distribution files in and below an author's CPAN directory as stored in the CHECKUMS files distributed on CPAN. The listing recurses into subdirectories.

The second form limits or expands the output with shell globbing as in the following examples:

```
ls JV/make*
ls GSAR/*make*
ls */*make*
```

The last example is very slow and outputs extra progress indicators that break the alignment of the result.

Note that globbing only lists directories explicitly asked for, for example FOO/* will not list FOO/bar/Acme-Sthg-n.nn.tar.gz. This may be regarded as a bug that may be changed in some future version.

failed

The `failed` command reports all distributions that failed on one of `make`, `test` or `install` for some reason in the currently running shell session.

Persistence between sessions

If the `YAML` or the `YAML::Syck` module is installed a record of the internal state of all modules is written to disk after each step. The files contain a signature of the currently running perl version for later perusal.

If the configurations variable `build_dir_reuse` is set to a true value, then `CPAN.pm` reads the collected `YAML` files. If the stored signature matches the currently running perl, the stored state is loaded into memory such that persistence between sessions is effectively established.

The `force` and the `fforce` pragma

To speed things up in complex installation scenarios, `CPAN.pm` keeps track of what it has already done and refuses to do some things a second time. A `get`, a `make`, and an `install` are not repeated. A `test` is repeated only if the previous test was unsuccessful. The diagnostic message when `CPAN.pm` refuses to do something a second time is one of *Has already been unwrapped|made|tested successfully* or something similar. Another situation where `CPAN` refuses to act is an `install` if the corresponding `test` was not successful.

In all these cases, the user can override this stubborn behaviour by prepending the command with the word `force`, for example:

```
cpan> force get Foo
cpan> force make AUTHOR/Bar-3.14.tar.gz
cpan> force test Baz
cpan> force install Acme::Meta
```

Each *forced* command is executed with the corresponding part of its memory erased.

The `fforce` pragma is a variant that emulates a `force get` which erases the entire memory followed by the action specified, effectively restarting the whole `get/make/test/install` procedure from scratch.

Lockfile

Interactive sessions maintain a lockfile, by default `~/ .cpan/ .lock`. Batch jobs can run without a lockfile and not disturb each other.

The shell offers to run in *downgraded mode* when another process is holding the lockfile. This is an experimental feature that is not yet tested very well. This second shell then does not write the history file, does not use the metadata file, and has a different prompt.

Signals

CPAN.pm installs signal handlers for SIGINT and SIGTERM. While you are in the cpan-shell, it is intended that you can press `^C` anytime and return to the cpan-shell prompt. A SIGTERM will cause the cpan-shell to clean up and leave the shell loop. You can emulate the effect of a SIGTERM by sending two consecutive SIGINTs, which usually means by pressing `^C` twice.

CPAN.pm ignores SIGPIPE. If the user sets `inactivity_timeout`, a SIGALRM is used during the run of the `perl Makefile.PL` or `perl Build.PL` subprocess.

CPAN::Shell

The commands available in the shell interface are methods in the package CPAN::Shell. If you enter the shell command, your input is split by the `Text::ParseWords::shellwords()` routine, which acts like most shells do. The first word is interpreted as the method to be invoked, and the rest of the words are treated as the method's arguments. Continuation lines are supported by ending a line with a literal backslash.

autobundle

`autobundle` writes a bundle file into the `$CPAN::Config->{cpan_home}/Bundle` directory. The file contains a list of all modules that are both available from CPAN and currently installed within `@INC`. The name of the bundle file is based on the current date and a counter.

hosts

Note: this feature is still in alpha state and may change in future versions of CPAN.pm

This commands provides a statistical overview over recent download activities. The data for this is collected in the YAML file `FTPstats.yml` in your `cpan_home` directory. If no YAML module is configured or YAML not installed, no stats are provided.

mkmyconfig

`mkmyconfig()` writes your own CPAN::MyConfig file into your `~/ .cpan/` directory so that you can save your own preferences instead of the system-wide ones.

recent *****EXPERIMENTAL COMMAND*****

The `recent` command downloads a list of recent uploads to CPAN and displays them *slowly*. While the command is running, a `^C` exits the loop after displaying the current item.

Note: This command requires XML::LibXML installed.

Note: This whole command currently is just a hack and will probably change in future versions of CPAN.pm, but the general approach will likely remain.

Note: See also *smoke*

recompile

`recompile()` is a special command that takes no argument and runs the `make/test/install` cycle with brute force over all installed dynamically loadable extensions (aka XS modules) with 'force' in effect. The primary purpose of this command is to finish a network installation. Imagine you have a common source tree for two different architectures. You decide to do a completely independent fresh installation. You start on one architecture with the help of a Bundle file produced earlier. CPAN installs the whole Bundle for you, but when you try to repeat the job on the second architecture, CPAN responds with a "Foo up to date" message for all modules. So you invoke CPAN's `recompile` on the second architecture and you're done.

Another popular use for `recompile` is to act as a rescue in case your perl breaks binary compatibility. If one of the modules that CPAN uses is in turn depending on binary compatibility (so you cannot run CPAN commands), then you should try the CPAN::Nox module for recovery.

report Bundle|Distribution|Module

The `report` command temporarily turns on the `test_report` config variable, then runs the `force test` command with the given arguments. The `force` pragma reruns the tests and repeats every step that might have failed before.

smoke *EXPERIMENTAL COMMAND*****

***** WARNING: this command downloads and executes software from CPAN to your computer of completely unknown status. You should never do this with your normal account and better have a dedicated well separated and secured machine to do this. *****

The `smoke` command takes the list of recent uploads to CPAN as provided by the `recent` command and tests them all. While the command is running `$SIG{INT}` is defined to mean that the current item shall be skipped.

Note: This whole command currently is just a hack and will probably change in future versions of CPAN.pm, but the general approach will likely remain.

Note: See also *recent*

upgrade [Module|Regex]...

The `upgrade` command first runs an `r` command with the given arguments and then installs the newest versions of all modules that were listed by that.

The four CPAN::* Classes: Author, Bundle, Module, Distribution

Although it may be considered internal, the class hierarchy does matter for both users and programmer. CPAN.pm deals with the four classes mentioned above, and those classes all share a set of methods. Classical single polymorphism is in effect. A metaclass object registers all objects of all kinds and indexes them with a string. The strings referencing objects have a separated namespace (well, not completely separated):

Namespace	Class
words containing a "/" (slash)	Distribution
words starting with <code>Bundle::</code>	Bundle
everything else	Module or Author

Modules know their associated Distribution objects. They always refer to the most recent official release. Developers may mark their releases as unstable development versions (by inserting an underbar into the module version number which will also be reflected in the distribution name when you run 'make dist'), so the really hottest and newest distribution is not always the default. If a module Foo circulates on CPAN in both version 1.23 and 1.23_90, CPAN.pm offers a convenient way to install version 1.23 by saying

```
install Foo
```

This would install the complete distribution file (say `BAR/Foo-1.23.tar.gz`) with all accompanying material. But if you would like to install version 1.23_90, you need to know where the distribution file resides on CPAN relative to the `authors/id/` directory. If the author is BAR, this might be `BAR/Foo-1.23_90.tar.gz`; so you would have to say

```
install BAR/Foo-1.23_90.tar.gz
```

The first example will be driven by an object of the class `CPAN::Module`, the second by an object of class `CPAN::Distribution`.

Integrating local directories

Note: this feature is still in alpha state and may change in future versions of CPAN.pm

Distribution objects are normally distributions from the CPAN, but there is a slightly degenerate case for Distribution objects, too, of projects held on the local disk. These distribution objects have the same name as the local directory and end with a dot. A dot by itself is also allowed for the current directory at the time CPAN.pm was used. All actions such as `make`, `test`, and `install` are applied directly to that directory. This gives the command `cpan .` an interesting touch: while the normal mantra of installing a CPAN module without CPAN.pm is one of

```
perl Makefile.PL          perl Build.PL
    ( go and get prerequisites )
make                      ./Build
make test                 ./Build test
make install              ./Build install
```

the command `cpan .` does all of this at once. It figures out which of the two mantras is appropriate, fetches and installs all prerequisites, takes care of them recursively, and finally finishes the installation of the module in the current directory, be it a CPAN module or not.

The typical usage case is for private modules or working copies of projects from remote repositories on the local disk.

Redirection

The usual shell redirection symbols `|` and `>` are recognized by the `cpan` shell **only when surrounded by whitespace**. So piping to pager or redirecting output into a file works somewhat as in a normal shell, with the stipulation that you must type extra spaces.

CONFIGURATION

When the CPAN module is used for the first time, a configuration dialogue tries to determine a couple of site specific options. The result of the dialog is stored in a hash reference `$CPAN::Config` in a file `CPAN/Config.pm`.

Default values defined in the `CPAN/Config.pm` file can be overridden in a user specific file: `CPAN/MyConfig.pm`. Such a file is best placed in `$HOME/.cpan/CPAN/MyConfig.pm`, because `$HOME/.cpan` is added to the search path of the CPAN module before the `use()` or `require()` statements. The `mkmyconfig` command writes this file for you.

The `o conf` command has various bells and whistles:

completion support

If you have a ReadLine module installed, you can hit TAB at any point of the commandline and `o conf` will offer you completion for the built-in subcommands and/or config variable names.

displaying some help: `o conf help`

Displays a short help

displaying current values: `o conf [KEY]`

Displays the current value(s) for this config variable. Without KEY, displays all subcommands and config variables.

Example:

```
o conf shell
```

If KEY starts and ends with a slash, the string in between is treated as a regular expression and only keys matching this regex are displayed

Example:

```
o conf /color/
```

changing of scalar values: `o conf KEY VALUE`

Sets the config variable KEY to VALUE. The empty string can be specified as usual in shells, with '' or ""

Example:

```
o conf wget /usr/bin/wget
```

changing of list values: `o conf KEY SHIFT|UNSHIFT|PUSH|POP|SPLICE|LIST`

If a config variable name ends with `list`, it is a list. `o conf KEY shift` removes the first element of the list, `o conf KEY pop` removes the last element of the list. `o conf KEYS unshift LIST` prepends a list of values to the list, `o conf KEYS push LIST` appends a list of values to the list.

Likewise, `o conf KEY splice LIST` passes the LIST to the corresponding splice command.

Finally, any other list of arguments is taken as a new list value for the KEY variable discarding the previous value.

Examples:

```
o conf urllist unshift http://cpan.dev.local/CPAN
o conf urllist splice 3 1
o conf urllist http://cpan1.local http://cpan2.local
ftp://ftp.perl.org
```

reverting to saved: `o conf defaults`

Reverts all config variables to the state in the saved config file.

saving the config: `o conf commit`

Saves all config variables to the current config file (CPAN/Config.pm or CPAN/MyConfig.pm that was loaded at start).

The configuration dialog can be started any time later again by issuing the command `o conf init` in the CPAN shell. A subset of the configuration dialog can be run by issuing `o conf init WORD` where WORD is any valid config variable or a regular expression.

Config Variables

The following keys in the hash reference `$CPAN::Config` are currently defined:

<code>applypatch</code>	path to external prg
<code>auto_commit</code>	commit all changes to config variables to disk
<code>build_cache</code>	size of cache for directories to build modules
<code>build_dir</code>	locally accessible directory to build modules
<code>build_dir_reuse</code>	boolean if distros in <code>build_dir</code> are persistent
<code>build_requires_install_policy</code>	to install or not to install when a module is only needed for building. <code>yes no ask/yes ask/no</code>
<code>bzip2</code>	path to external prg
<code>cache_metadata</code>	use serializer to cache metadata
<code>check_sigs</code>	if signatures should be verified
<code>colorize_debug</code>	<code>Term::ANSIColor</code> attributes for debugging output
<code>colorize_output</code>	boolean if <code>Term::ANSIColor</code> should colorize output
<code>colorize_print</code>	<code>Term::ANSIColor</code> attributes for normal output

colorize_warn	Term::ANSIColor attributes for warnings
commandnumber_in_prompt	boolean if you want to see current command number
commands_quote	preferred character to use for quoting external commands when running them. Defaults to double quote on Windows, single tick everywhere else; can be set to space to disable quoting
connect_to_internet_ok	whether to ask if opening a connection is ok before urllist is specified
cpan_home	local directory reserved for this package
curl	path to external prg
dontload_hash	DEPRECATED
dontload_list	arrayref: modules in the list will not be loaded by the CPAN::has_inst() routine
ftp	path to external prg
ftp_passive	if set, the envariable FTP_PASSIVE is set for downloads
ftp_proxy	proxy host for ftp requests
ftpstats_period	max number of days to keep download statistics
ftpstats_size	max number of items to keep in the download statistics
getcwd	see below
gpg	path to external prg
gzip	location of external program gzip
halt_on_failure	stop processing after the first failure of queued items or dependencies
histfile	file to maintain history between sessions
histsize	maximum number of lines to keep in histfile
http_proxy	proxy host for http requests
inactivity_timeout	breaks interactive Makefile.PLs or Build.PLs after this many seconds inactivity. Set to 0 to disable timeouts.
index_expire	refetch index files after this many days
inhibit_startup_message	if true, suppress the startup message
keep_source_where	directory in which to keep the source (if we do)
load_module_verbosity	report loading of optional modules used by CPAN.pm
lynx	path to external prg
make	location of external make program
make_arg	arguments that should always be passed to 'make'
make_install_make_command	the make command for running 'make install', for example 'sudo make'
make_install_arg	same as make_arg for 'make install'
makepl_arg	arguments passed to 'perl Makefile.PL'
mbuild_arg	arguments passed to './Build'
mbuild_install_arg	arguments passed to './Build install'
mbuild_install_build_command	command to use instead of './Build' when we are in the install stage, for example 'sudo ./Build'
mbuildpl_arg	arguments passed to 'perl Build.PL'
ncftp	path to external prg
ncftpget	path to external prg
no_proxy	don't proxy to these hosts/domains (comma separated list)

pager	location of external program more (or any pager)
password	your password if you CPAN server wants one
patch	path to external prg
patches_dir	local directory containing patch files
perl5lib_verbosity	verbosity level for PERL5LIB additions
prefer_installer	legal values are MB and EUMM: if a module comes with both a Makefile.PL and a Build.PL, use the former (EUMM) or the latter (MB); if the module comes with only one of the two, that one will be used no matter the setting
prerequisites_policy	what to do if you are missing module prerequisites ('follow' automatically, 'ask' me, or 'ignore')
prefs_dir	local directory to store per-distro build options
proxy_user	username for accessing an authenticating proxy
proxy_pass	password for accessing an authenticating proxy
randomize_urllist	add some randomness to the sequence of the urllist
scan_cache	controls scanning of cache ('atstart' or 'never')
shell	your favorite shell
show_unparsable_versions	boolean if r command tells which modules are
versionless	
show_upload_date	boolean if commands should try to determine upload date
show_zero_versions	boolean if r command tells for which modules \$version==0
tar	location of external program tar
tar_verbosity	verbosity level for the tar command
term_is_latin	deprecated: if true Unicode is translated to ISO-8859-1
term_ornaments	(and nonsense for characters outside latin range) boolean to turn ReadLine ornamenting on/off
test_report	email test reports (if CPAN::Reporter is installed)
trust_test_report_history	skip testing when previously tested ok (according to CPAN::Reporter history)
unzip	location of external program unzip
urllist	arrayref to nearby CPAN sites (or equivalent locations)
use_sqlite	use CPAN::SQLite for metadata storage (fast and lean)
username	your username if you CPAN server wants one
wait_list	arrayref to a wait server to try (See CPAN::WAIT)
wget	path to external prg
yaml_load_code	enable YAML code deserialisation via CPAN::DeferredCode
yaml_module	which module to use to read/write YAML files

You can set and query each of these options interactively in the `cpan` shell with the `o conf` or the `o conf init` command as specified below.

- ```
o conf <scalar option>
 prints the current value of the scalar option

o conf <scalar option> <value>
 Sets the value of the scalar option to value
```

- o `conf <list option>`  
prints the current value of the *list option* in MakeMaker's neatvalue format.
- o `conf <list option> [shift|pop]`  
shifts or pops the array in the *list option* variable
- o `conf <list option> [unshift|push|splice] <list>`  
works like the corresponding perl commands.

interactive editing: o `conf init [MATCH|LIST]`

Runs an interactive configuration dialog for matching variables. Without argument runs the dialog over all supported config variables. To specify a MATCH the argument must be enclosed by slashes.

Examples:

- o `conf init ftp_passive ftp_proxy`
- o `conf init /color/`

Note: this method of setting config variables often provides more explanation about the functioning of a variable than the manpage.

### CPAN::anycwd(\$path): Note on config variable getcwd

CPAN.pm changes the current working directory often and needs to determine its own current working directory. By default it uses `Cwd::cwd`, but if for some reason this doesn't work on your system, configure alternatives according to the following table:

|                          |                                               |
|--------------------------|-----------------------------------------------|
| <code>cwd</code>         | Calls <code>Cwd::cwd</code>                   |
| <code>getcwd</code>      | Calls <code>Cwd::getcwd</code>                |
| <code>fastcwd</code>     | Calls <code>Cwd::fastcwd</code>               |
| <code>backtickcwd</code> | Calls the external command <code>cwd</code> . |

### Note on the format of the urllist parameter

urllist parameters are URLs according to RFC 1738. We do a little guessing if your URL is not compliant, but if you have problems with `file` URLs, please try the correct format. Either:

```
file://localhost/whatever/ftp/pub/CPAN/
```

or

```
file:///home/ftp/pub/CPAN/
```

### The urllist parameter has CD-ROM support

The `urllist` parameter of the configuration table contains a list of URLs used for downloading. If the list contains any `file` URLs, CPAN always tries there first. This feature is disabled for index files. So the recommendation for the owner of a CD-ROM with CPAN contents is: include your local, possibly outdated CD-ROM as a `file` URL at the end of `urllist`, e.g.

- o `conf urllist push file://localhost/CDROM/CPAN`

CPAN.pm will then fetch the index files from one of the CPAN sites that come at the beginning of urllist. It will later check for each module to see whether there is a local copy of the most recent version.

Another peculiarity of urllist is that the site that we could successfully fetch the last file from automatically gets a preference token and is tried as the first site for the next request. So if you add a new site at runtime it may happen that the previously preferred site will be tried another time. This means that if you want to disallow a site for the next transfer, it must be explicitly removed from urllist.

### Maintaining the urllist parameter

If you have YAML.pm (or some other YAML module configured in `yaml_module`) installed, CPAN.pm collects a few statistical data about recent downloads. You can view the statistics with the `hosts` command or inspect them directly by looking into the `FTPstats.yml` file in your `cpan_home` directory.

To get some interesting statistics, it is recommended that `randomize_urllist` be set; this introduces some amount of randomness into the URL selection.

### The requires and build\_requires dependency declarations

Since CPAN.pm version 1.88\_51 modules declared as `build_requires` by a distribution are treated differently depending on the config variable `build_requires_install_policy`. By setting `build_requires_install_policy` to `no`, such a module is not installed. It is only built and tested, and then kept in the list of tested but uninstalled modules. As such, it is available during the build of the dependent module by integrating the path to the `blib/arch` and `blib/lib` directories in the environment variable `PERL5LIB`. If `build_requires_install_policy` is set to `yes`, then both modules declared as `requires` and those declared as `build_requires` are treated alike. By setting to `ask/yes` or `ask/no`, CPAN.pm asks the user and sets the default accordingly.

### Configuration for individual distributions (Distroprefs)

(**Note:** This feature has been introduced in CPAN.pm 1.8854 and is still considered beta quality)

Distributions on CPAN usually behave according to what we call the CPAN mantra. Or since the advent of `Module::Build` we should talk about two mantras:

```
perl Makefile.PL perl Build.PL
make ./Build
make test ./Build test
make install ./Build install
```

But some modules cannot be built with this mantra. They try to get some extra data from the user via the environment, extra arguments, or interactively--thus disturbing the installation of large bundles like `Phalanx100` or modules with many dependencies like `Plagger`.

The `distroprefs` system of `CPAN.pm` addresses this problem by allowing the user to specify extra informations and recipes in YAML files to either

- pass additional arguments to one of the four commands,
- set environment variables
- instantiate an Expect object that reads from the console, waits for some regular expressions and enters some answers
- temporarily override assorted `CPAN.pm` configuration variables
- specify dependencies the original maintainer forgot
- disable the installation of an object altogether

See the `YAML` and `Data::Dumper` files that come with the `CPAN.pm` distribution in the

`distroprefs/` directory for examples.

## Filenames

The YAML files themselves must have the `.yaml` extension; all other files are ignored (for two exceptions see *Fallback Data::Dumper and Storable* below). The containing directory can be specified in `CPAN.pm` in the `prefs_dir` config variable. Try `o conf init prefs_dir` in the CPAN shell to set and activate the distroprefs system.

Every YAML file may contain arbitrary documents according to the YAML specification, and every document is treated as an entity that can specify the treatment of a single distribution.

Filenames can be picked arbitrarily; `CPAN.pm` always reads all files (in alphabetical order) and takes the key `match` (see below in *Language Specs*) as a hashref containing match criteria that determine if the current distribution matches the YAML document or not.

## Fallback Data::Dumper and Storable

If neither your configured `yaml_module` nor `YAML.pm` is installed, `CPAN.pm` falls back to using `Data::Dumper` and `Storable` and looks for files with the extensions `.dd` or `.st` in the `prefs_dir` directory. These files are expected to contain one or more hashrefs. For `Data::Dumper` generated files, this is expected to be done with by defining `$VAR1`, `$VAR2`, etc. The YAML shell would produce these with the command

```
ysh < somefile.yaml > somefile.dd
```

For `Storable` files the rule is that they must be constructed such that `Storable::retrieve(file)` returns an array reference and the array elements represent one distropref object each. The conversion from YAML would look like so:

```
perl -MYAML=LoadFile -MStorable=nstore -e '
 @y=LoadFile(shift);
 nstore(\@y, shift)' somefile.yaml somefile.st
```

In bootstrapping situations it is usually sufficient to translate only a few YAML files to `Data::Dumper` for crucial modules like `YAML::Syck`, `YAML.pm` and `Expect.pm`. If you prefer `Storable` over `Data::Dumper`, remember to pull out a `Storable` version that writes an older format than all the other `Storable` versions that will need to read them.

## Blueprint

The following example contains all supported keywords and structures with the exception of `eexpect` which can be used instead of `expect`.

```

comment: "Demo"
match:
 module: "Dancing::Queen"
 distribution: "^CHACHACHA/Dancing-"
 not_distribution: "\.zip$"
 perl: "/usr/local/cariba-perl/bin/perl"
 perlconfig:
 archname: "freebsd"
 not_cc: "gcc"
 env:
 DANCING_FLOOR: "Shubiduh"
disabled: 1
cpanconfig:
 make: gmake
pl:
```

```
args:
 - "--somearg=specialcase"

env: {}

expect:
 - "Which is your favorite fruit"
 - "apple\n"

make:
 args:
 - all
 - extra-all

 env: {}

 expect: []

 commendline: "echo SKIPPING make"

test:
 args: []

 env: {}

 expect: []

install:
 args: []

 env:
 WANT_TO_INSTALL: YES

 expect:
 - "Do you really want to install"
 - "y\n"

patches:
 - "ABCDE/Fedcba-3.14-ABCDE-01.patch"

depends:
 configure_requires:
 LWP: 5.8
 build_requires:
 Test::Exception: 0.25
 requires:
 Spiffy: 0.30
```

## Language Specs

Every YAML document represents a single hash reference. The valid keys in this hash are as follows:

**comment** [scalar]

A comment

**cpanconfig** [hash]

Temporarily override assorted `CPAN.pm` configuration variables.

Supported are: `build_requires_install_policy`, `check_sigs`, `make`, `make_install_make_command`, `prefer_installer`, `test_report`. Please report as a bug when you need another one supported.

**depends** [hash] \*\*\* EXPERIMENTAL FEATURE \*\*\*

All three types, namely `configure_requires`, `build_requires`, and `requires` are supported in the way specified in the `META.yml` specification. The current implementation *merges* the specified dependencies with those declared by the package maintainer. In a future implementation this may be changed to override the original declaration.

**disabled** [boolean]

Specifies that this distribution shall not be processed at all.

**features** [array] \*\*\* EXPERIMENTAL FEATURE \*\*\*

Experimental implementation to deal with `optional_features` from `META.yml`. Still needs coordination with installer software and currently works only for `META.yml` declaring `dynamic_config=0`. Use with caution.

**goto** [string]

The canonical name of a delegate distribution to install instead. Useful when a new version, although it tests OK itself, breaks something else or a developer release or a fork is already uploaded that is better than the last released version.

**install** [hash]

Processing instructions for the `make install` or `./Build install` phase of the CPAN mantra. See below under *Processing Instructions*.

**make** [hash]

Processing instructions for the `make` or `./Build` phase of the CPAN mantra. See below under *Processing Instructions*.

**match** [hash]

A hashref with one or more of the keys `distribution`, `modules`, `perl`, `perlconfig`, and `env` that specify whether a document is targeted at a specific CPAN distribution or installation. Keys prefixed with `not_` negates the corresponding match.

The corresponding values are interpreted as regular expressions. The `distribution` related one will be matched against the canonical distribution name, e.g. "AUTHOR/Foo-Bar-3.14.tar.gz".

The `module` related one will be matched against *all* modules contained in the distribution until one module matches.

The `perl` related one will be matched against `$^X` (but with the absolute path).

The value associated with `perlconfig` is itself a hashref that is matched against corresponding values in the `%Config::Config` hash living in the `Config.pm` module. Keys prefixed with `not_` negates the corresponding match.

The value associated with `env` is itself a hashref that is matched against corresponding values in the `%ENV` hash. Keys prefixed with `not_` negates the corresponding match.

If more than one restriction of `module`, `distribution`, etc. is specified, the results of the separately computed match values must all match. If so, the hashref represented by the

YAML document is returned as the preference structure for the current distribution.

#### patches [array]

An array of patches on CPAN or on the local disk to be applied in order via an external patch program. If the value for the `-p` parameter is 0 or 1 is determined by reading the patch beforehand. The path to each patch is either an absolute path on the local filesystem or relative to a patch directory specified in the `patches_dir` configuration variable or in the format of a canonical distroname. For examples please consult the `distroprefs/` directory in the CPAN.pm distribution (these examples are not installed by default).

Note: if the `applypatch` program is installed and `CPAN::Config` knows about it **and** a patch is written by the `makepatch` program, then `CPAN.pm` lets `applypatch` apply the patch. Both `makepatch` and `applypatch` are available from CPAN in the `JV/makepatch-*` distribution.

#### pl [hash]

Processing instructions for the `perl Makefile.PL` or `perl Build.PL` phase of the CPAN mantra. See below under *Processing Instructions*.

#### test [hash]

Processing instructions for the `make test` or `./Build test` phase of the CPAN mantra. See below under *Processing Instructions*.

### Processing Instructions

#### args [array]

Arguments to be added to the command line

#### commandline

A full commandline to run via `system()`. During execution, the environment variable `PERL` is set to `$^X` (but with an absolute path). If `commandline` is specified, `args` is not used.

#### eexpect [hash]

Extended `expect`. This is a hash reference with four allowed keys, `mode`, `timeout`, `reuse`, and `talk`.

`mode` may have the values `deterministic` for the case where all questions come in the order written down and `anyorder` for the case where the questions may come in any order. The default mode is `deterministic`.

`timeout` denotes a timeout in seconds. Floating-point timeouts are OK. With `mode=deterministic`, the `timeout` denotes the timeout per question; with `mode=anyorder` it denotes the timeout per byte received from the stream or questions.

`talk` is a reference to an array that contains alternating questions and answers. Questions are regular expressions and answers are literal strings. The Expect module watches the stream from the execution of the external program (`perl Makefile.PL`, `perl Build.PL`, `make`, etc.).

For `mode=deterministic`, the CPAN.pm injects the corresponding answer as soon as the stream matches the regular expression.

For `mode=anyorder` CPAN.pm answers a question as soon as the timeout is reached for the next byte in the input stream. In this mode you can use the `reuse` parameter to decide what will happen with a question-answer pair after it has been used. In the default case (`reuse=0`) it is removed from the array, avoiding being used again accidentally. If you want to answer the question `Do you really want to do that` several times, then it must be included in the array at least as often as you want this answer to be given. Setting the parameter `reuse` to 1 makes this repetition unnecessary.

#### env [hash]

Environment variables to be set during the command

expect [array]

expect: <array> is a short notation for

eexpect: mode: deterministic timeout: 15 talk: <array>

### Schema verification with Kwalify

If you have the `Kwalify` module installed (which is part of the `Bundle::CPANxxl`), then all your distroprefs files are checked for syntactic correctness.

### Example Distroprefs Files

`CPAN.pm` comes with a collection of example YAML files. Note that these are really just examples and should not be used without care because they cannot fit everybody's purpose. After all, the authors of the packages that ask questions had a need to ask, so you should watch their questions and adjust the examples to your environment and your needs. You have been warned:-)

## PROGRAMMER'S INTERFACE

If you do not enter the shell, shell commands are available both as methods (`CPAN::Shell->install(...)`) and as functions in the calling package (`install(...)`). Before calling low-level commands, it makes sense to initialize components of CPAN you need, e.g.:

```
CPAN::HandleConfig->load;
CPAN::Shell::setup_output;
CPAN::Index->reload;
```

High-level commands do such initializations automatically.

There's currently only one class that has a stable interface - `CPAN::Shell`. All commands that are available in the CPAN shell are methods of the class `CPAN::Shell`. Each of the commands that produce listings of modules (`r`, `autobundle`, `u`) also return a list of the IDs of all modules within the list.

`expand($type, @things)`

The IDs of all objects available within a program are strings that can be expanded to the corresponding real objects with the `CPAN::Shell->expand("Module", @things)` method. `Expand` returns a list of `CPAN::Module` objects according to the `@things` arguments given. In scalar context, it returns only the first element of the list.

`expandany(@things)`

Like `expand`, but returns objects of the appropriate type, i.e. `CPAN::Bundle` objects for bundles, `CPAN::Module` objects for modules, and `CPAN::Distribution` objects for distributions. Note: it does not expand to `CPAN::Author` objects.

### Programming Examples

This enables the programmer to do operations that combine functionalities that are available in the shell.

```
install everything that is outdated on my disk:
perl -MCPAN -e 'CPAN::Shell->install(CPAN::Shell->r) '

install my favorite programs if necessary:
for $mod (qw(Net::FTP Digest::SHA Data::Dumper)) {
 CPAN::Shell->install($mod);
}

list all modules on my disk that have no VERSION number
for $mod (CPAN::Shell->expand("Module", "/./")) {
```

```

next unless $mod->inst_file;
MakeMaker convention for undefined $VERSION:
next unless $mod->inst_version eq "undef";
print "No VERSION in ", $mod->id, "\n";
}

find out which distribution on CPAN contains a module:
print CPAN::Shell->expand("Module","Apache::Constants")->cpan_file

```

Or if you want to schedule a *cron* job to watch CPAN, you could list all modules that need updating. First a quick and dirty way:

```
perl -e 'use CPAN; CPAN::Shell->r;'
```

If you don't want any output should all modules be up to date, parse the output of above command for the regular expression `/modules are up to date/` and decide to mail the output only if it doesn't match.

If you prefer to do it more in a programmerish style in one single process, something like this may better suit you:

```

list all modules on my disk that have newer versions on CPAN
for $mod (CPAN::Shell->expand("Module","/./")) {
 next unless $mod->inst_file;
 next if $mod->uptodate;
 printf "Module %s is installed as %s, could be updated to %s from
CPAN\n",
 $mod->id, $mod->inst_version, $mod->cpan_version;
}

```

If that gives too much output every day, you may want to watch only for three modules. You can write

```
for $mod (CPAN::Shell->expand("Module","/Apache|LWP|CGI/")) {
```

as the first line instead. Or you can combine some of the above tricks:

```

watch only for a new mod_perl module
$mod = CPAN::Shell->expand("Module","mod_perl");
exit if $mod->uptodate;
new mod_perl arrived, let me know all update recommendations
CPAN::Shell->r;

```

## Methods in the other Classes

CPAN::Author::as\_glimpse()

Returns a one-line description of the author

CPAN::Author::as\_string()

Returns a multi-line description of the author

CPAN::Author::email()

Returns the author's email address

CPAN::Author::fullname()

Returns the author's name

CPAN::Author::name()

An alias for fullname

- `CPAN::Bundle::as_glimpse()`  
Returns a one-line description of the bundle
- `CPAN::Bundle::as_string()`  
Returns a multi-line description of the bundle
- `CPAN::Bundle::clean()`  
Recursively runs the `clean` method on all items contained in the bundle.
- `CPAN::Bundle::contains()`  
Returns a list of objects' IDs contained in a bundle. The associated objects may be bundles, modules or distributions.
- `CPAN::Bundle::force($method, @args)`  
Forces CPAN to perform a task that it normally would have refused to do. Force takes as arguments a method name to be called and any number of additional arguments that should be passed to the called method. The internals of the object get the needed changes so that CPAN.pm does not refuse to take the action. The `force` is passed recursively to all contained objects. See also the section above on the `force` and the `fforce` pragma.
- `CPAN::Bundle::get()`  
Recursively runs the `get` method on all items contained in the bundle
- `CPAN::Bundle::inst_file()`  
Returns the highest installed version of the bundle in either `@INC` or `$CPAN::Config-{cpan_home}>`. Note that this is different from `CPAN::Module::inst_file`.
- `CPAN::Bundle::inst_version()`  
Like `CPAN::Bundle::inst_file`, but returns the `$VERSION`
- `CPAN::Bundle::uptodate()`  
Returns 1 if the bundle itself and all its members are uptodate.
- `CPAN::Bundle::install()`  
Recursively runs the `install` method on all items contained in the bundle
- `CPAN::Bundle::make()`  
Recursively runs the `make` method on all items contained in the bundle
- `CPAN::Bundle::readme()`  
Recursively runs the `readme` method on all items contained in the bundle
- `CPAN::Bundle::test()`  
Recursively runs the `test` method on all items contained in the bundle
- `CPAN::Distribution::as_glimpse()`  
Returns a one-line description of the distribution
- `CPAN::Distribution::as_string()`  
Returns a multi-line description of the distribution
- `CPAN::Distribution::author`  
Returns the `CPAN::Author` object of the maintainer who uploaded this distribution
- `CPAN::Distribution::pretty_id()`  
Returns a string of the form "AUTHORID/TARBALL", where AUTHORID is the author's

PAUSE ID and `TARBALL` is the distribution filename.

`CPAN::Distribution::base_id()`

Returns the distribution filename without any archive suffix. E.g "Foo-Bar-0.01"

`CPAN::Distribution::clean()`

Changes to the directory where the distribution has been unpacked and runs `make clean` there.

`CPAN::Distribution::containsmods()`

Returns a list of IDs of modules contained in a distribution file. Works only for distributions listed in the `02packages.details.txt.gz` file. This typically means that just most recent version of a distribution is covered.

`CPAN::Distribution::cvs_import()`

Changes to the directory where the distribution has been unpacked and runs something like

```
cvs -d $cvs_root import -m $cvs_log $cvs_dir $userid v$version
```

there.

`CPAN::Distribution::dir()`

Returns the directory into which this distribution has been unpacked.

`CPAN::Distribution::force($method,@args)`

Forces CPAN to perform a task that it normally would have refused to do. Force takes as arguments a method name to be called and any number of additional arguments that should be passed to the called method. The internals of the object get the needed changes so that `CPAN.pm` does not refuse to take the action. See also the section above on the `force` and the `fforce` pragma.

`CPAN::Distribution::get()`

Downloads the distribution from CPAN and unpacks it. Does nothing if the distribution has already been downloaded and unpacked within the current session.

`CPAN::Distribution::install()`

Changes to the directory where the distribution has been unpacked and runs the external command `make install` there. If `make` has not yet been run, it will be run first. A `make test` is issued in any case and if this fails, the install is cancelled. The cancellation can be avoided by letting `force` run the `install` for you.

This install method only has the power to install the distribution if there are no dependencies in the way. To install an object along with all its dependencies, use `CPAN::Shell->install`.

Note that `install()` gives no meaningful return value. See `uptodate()`.

`CPAN::Distribution::install_tested()`

Install all distributions that have tested successfully but not yet installed. See also `is_tested`.

`CPAN::Distribution::isa_perl()`

Returns 1 if this distribution file seems to be a perl distribution. Normally this is derived from the file name only, but the index from CPAN can contain a hint to achieve a return value of true for other filenames too.

`CPAN::Distribution::look()`

Changes to the directory where the distribution has been unpacked and opens a subshell there. Exiting the subshell returns.

**CPAN::Distribution::make()**

First runs the `get` method to make sure the distribution is downloaded and unpacked. Changes to the directory where the distribution has been unpacked and runs the external commands `perl Makefile.PL` or `perl Build.PL` and `make` there.

**CPAN::Distribution::perldoc()**

Downloads the pod documentation of the file associated with a distribution (in HTML format) and runs it through the external command `lynx` specified in `$CPAN::Config->{lynx}`>. If `lynx` isn't available, it converts it to plain text with the external command `html2text` and runs it through the pager specified in `$CPAN::Config->{pager}`>

**CPAN::Distribution::prefs()**

Returns the hash reference from the first matching YAML file that the user has deposited in the `prefs_dir/` directory. The first succeeding match wins. The files in the `prefs_dir/` are processed alphabetically, and the canonical distroname (e.g. `AUTHOR/Foo-Bar-3.14.tar.gz`) is matched against the regular expressions stored in the `$root->{match}{distribution}` attribute value. Additionally all module names contained in a distribution are matched against the regular expressions in the `$root->{match}{module}` attribute value. The two match values are ANDed together. Each of the two attributes are optional.

**CPAN::Distribution::prereq\_pm()**

Returns the hash reference that has been announced by a distribution as the `requires` and `build_requires` elements. These can be declared either by the `META.yml` (if authoritative) or can be deposited after the run of `Build.PL` in the file `./_build/prereqs` or after the run of `Makfile.PL` written as the `PREREQ_PM` hash in a comment in the produced `Makefile`. *Note:* this method only works after an attempt has been made to make the distribution. Returns `undef` otherwise.

**CPAN::Distribution::readme()**

Downloads the README file associated with a distribution and runs it through the pager specified in `$CPAN::Config->{pager}`>.

**CPAN::Distribution::reports()**

Downloads report data for this distribution from `www.cpanesters.org` and displays a subset of them.

**CPAN::Distribution::read\_yaml()**

Returns the content of the `META.yml` of this distro as a hashref. *Note:* works only after an attempt has been made to make the distribution. Returns `undef` otherwise. Also returns `undef` if the content of `META.yml` is not authoritative. (The rules about what exactly makes the content authoritative are still in flux.)

**CPAN::Distribution::test()**

Changes to the directory where the distribution has been unpacked and runs `make test` there.

**CPAN::Distribution::uptodate()**

Returns 1 if all the modules contained in the distribution are uptodate. Relies on `containsmods`.

**CPAN::Index::force\_reload()**

Forces a reload of all indices.

**CPAN::Index::reload()**

Reloads all indices if they have not been read for more than `$CPAN::Config->{index_expire}`> days.

**CPAN::InfoObj::dump()**

CPAN::Author, CPAN::Bundle, CPAN::Module, and CPAN::Distribution inherit this method. It prints the data structure associated with an object. Useful for debugging. Note: the data structure is considered internal and thus subject to change without notice.

**CPAN::Module::as\_glimpse()**

Returns a one-line description of the module in four columns: The first column contains the word `Module`, the second column consists of one character: an equals sign if this module is already installed and uptodate, a less-than sign if this module is installed but can be upgraded, and a space if the module is not installed. The third column is the name of the module and the fourth column gives maintainer or distribution information.

**CPAN::Module::as\_string()**

Returns a multi-line description of the module

**CPAN::Module::clean()**

Runs a clean on the distribution associated with this module.

**CPAN::Module::cpan\_file()**

Returns the filename on CPAN that is associated with the module.

**CPAN::Module::cpan\_version()**

Returns the latest version of this module available on CPAN.

**CPAN::Module::cvs\_import()**

Runs a `cvs_import` on the distribution associated with this module.

**CPAN::Module::description()**

Returns a 44 character description of this module. Only available for modules listed in The Module List (CPAN/modules/00modlist.long.html or 00modlist.long.txt.gz)

**CPAN::Module::distribution()**

Returns the CPAN::Distribution object that contains the current version of this module.

**CPAN::Module::dslip\_status()**

Returns a hash reference. The keys of the hash are the letters `D`, `S`, `L`, `I`, and `<P>`, for development status, support level, language, interface and public licence respectively. The data for the DSLIP status are collected by [pause.perl.org](http://pause.perl.org) when authors register their namespaces. The values of the 5 hash elements are one-character words whose meaning is described in the table below. There are also 5 hash elements `DV`, `SV`, `LV`, `IV`, and `<PV>` that carry a more verbose value of the 5 status variables.

Where the 'DSLIP' characters have the following meanings:

```
D - Development Stage (Note: *NO IMPLIED TIMESCALES*):
 i - Idea, listed to gain consensus or as a placeholder
 c - under construction but pre-alpha (not yet released)
 a/b - Alpha/Beta testing
 R - Released
 M - Mature (no rigorous definition)
 S - Standard, supplied with Perl 5
```

```
S - Support Level:
 m - Mailing-list
 d - Developer
 u - Usenet newsgroup comp.lang.perl.modules
 n - None known, try comp.lang.perl.modules
```

- a - abandoned; volunteers welcome to take over maintainance
- L - Language Used:
  - p - Perl-only, no compiler needed, should be platform independent
  - c - C and perl, a C compiler will be needed
  - h - Hybrid, written in perl with optional C code, no compiler needed
  - o - perl and another language other than C or C++
  - +
  - o - C++ and perl, a C++ compiler will be needed
- I - Interface Style
  - f - plain Functions, no references used
  - h - hybrid, object and function interfaces available
  - n - no interface at all (huh?)
  - r - some use of unblessed References or ties
  - O - Object oriented using blessed references and/or inheritance
- P - Public License
  - p - Standard-Perl: user may choose between GPL and Artistic
  - g - GPL: GNU General Public License
  - l - LGPL: "GNU Lesser General Public License" (previously known as "GNU Library General Public License")
  - b - BSD: The BSD License
  - a - Artistic license alone
  - 2 - Artistic license 2.0 or later
  - o - open source: approved by [www.opensource.org](http://www.opensource.org)
  - d - allows distribution without restrictions
  - r - restricted distribution
  - n - no license at all

#### CPAN::Module::force(\$method,@args)

Forces CPAN to perform a task it would normally refuse to do. Force takes as arguments a method name to be invoked and any number of additional arguments to pass that method. The internals of the object get the needed changes so that CPAN.pm does not refuse to take the action. See also the section above on the `force` and the `fforce` pragma.

#### CPAN::Module::get()

Runs a `get` on the distribution associated with this module.

#### CPAN::Module::inst\_file()

Returns the filename of the module found in `@INC`. The first file found is reported, just as perl itself stops searching `@INC` once it finds a module.

#### CPAN::Module::available\_file()

Returns the filename of the module found in `PERL5LIB` or `@INC`. The first file found is reported. The advantage of this method over `inst_file` is that modules that have been tested but not yet installed are included because `PERL5LIB` keeps track of tested modules.

#### CPAN::Module::inst\_version()

Returns the version number of the installed module in readable format.

#### CPAN::Module::available\_version()

Returns the version number of the available module in readable format.

CPAN::Module::install()

Runs an `install` on the distribution associated with this module.

CPAN::Module::look()

Changes to the directory where the distribution associated with this module has been unpacked and opens a subshell there. Exiting the subshell returns.

CPAN::Module::make()

Runs a `make` on the distribution associated with this module.

CPAN::Module::manpage\_headline()

If module is installed, peeks into the module's manpage, reads the headline, and returns it. Moreover, if the module has been downloaded within this session, does the equivalent on the downloaded module even if it hasn't been installed yet.

CPAN::Module::perldoc()

Runs a `perldoc` on this module.

CPAN::Module::readme()

Runs a `readme` on the distribution associated with this module.

CPAN::Module::reports()

Calls the `reports()` method on the associated distribution object.

CPAN::Module::test()

Runs a `test` on the distribution associated with this module.

CPAN::Module::uptodate()

Returns 1 if the module is installed and up-to-date.

CPAN::Module::userid()

Returns the author's ID of the module.

## Cache Manager

Currently the cache manager only keeps track of the build directory (`$CPAN::Config->{build_dir}`). It is a simple FIFO mechanism that deletes complete directories below `build_dir` as soon as the size of all directories there gets bigger than `$CPAN::Config->{build_cache}` (in MB). The contents of this cache may be used for later re-installations that you intend to do manually, but will never be trusted by CPAN itself. This is due to the fact that the user might use these directories for building modules on different architectures.

There is another directory (`$CPAN::Config->{keep_source_where}`) where the original distribution files are kept. This directory is not covered by the cache manager and must be controlled by the user. If you choose to have the same directory as `build_dir` and as `keep_source_where` directory, then your sources will be deleted with the same fifo mechanism.

## Bundles

A bundle is just a perl module in the namespace `Bundle::` that does not define any functions or methods. It usually only contains documentation.

It starts like a perl module with a package declaration and a `$VERSION` variable. After that the pod section looks like any other pod with the only difference being that *one special pod section* exists starting with (verbatim):

```
=head1 CONTENTS
```

In this pod section each line obeys the format

```
Module_Name [Version_String] [- optional text]
```

The only required part is the first field, the name of a module (e.g. Foo::Bar, ie. *not* the name of the distribution file). The rest of the line is optional. The comment part is delimited by a dash just as in the man page header.

The distribution of a bundle should follow the same convention as other distributions.

Bundles are treated specially in the CPAN package. If you say 'install Bundle::Tkkit' (assuming such a bundle exists), CPAN will install all the modules in the CONTENTS section of the pod. You can install your own Bundles locally by placing a conformant Bundle file somewhere into your @INC path. The autobundle() command which is available in the shell interface does that for you by including all currently installed modules in a snapshot bundle file.

## PREREQUISITES

If you have a local mirror of CPAN and can access all files with "file:" URLs, then you only need a perl later than perl5.003 to run this module. Otherwise Net::FTP is strongly recommended. LWP may be required for non-UNIX systems, or if your nearest CPAN site is associated with a URL that is not ftp:.

If you have neither Net::FTP nor LWP, there is a fallback mechanism implemented for an external ftp command or for an external lynx command.

## UTILITIES

### Finding packages and VERSION

This module presumes that all packages on CPAN

- declare their \$VERSION variable in an easy to parse manner. This prerequisite can hardly be relaxed because it consumes far too much memory to load all packages into the running program just to determine the \$VERSION variable. Currently all programs that are dealing with version use something like this

```
perl -MExtUtils::MakeMaker -le \
 'print MM->parse_version(shift)' filename
```

If you are author of a package and wonder if your \$VERSION can be parsed, please try the above method.

- come as compressed or gzipped tarfiles or as zip files and contain a Makefile.PL or Build.PL (well, we try to handle a bit more, but with little enthusiasm).

### Debugging

Debugging this module is more than a bit complex due to interference from the software producing the indices on CPAN, the mirroring process on CPAN, packaging, configuration, synchronicity, and even (gasp!) due to bugs within the CPAN.pm module itself.

For debugging the code of CPAN.pm itself in interactive mode, some debugging aid can be turned on for most packages within CPAN.pm with one of

- o debug package...  
sets debug mode for packages.
- o debug -package...  
unsetts debug mode for packages.
- o debug all

turns debugging on for all packages.

o debug number

which sets the debugging packages directly. Note that `o debug 0` turns debugging off.

What seems a successful strategy is the combination of `reload cpan` and the debugging switches. Add a new debug statement while running in the shell and then issue a `reload cpan` and see the new debugging messages immediately without losing the current context.

`o debug` without an argument lists the valid package names and the current set of packages in debugging mode. `o debug` has built-in completion support.

For debugging of CPAN data there is the `dump` command which takes the same arguments as `make/test/install` and outputs each object's `Data::Dumper dump`. If an argument looks like a perl variable and contains one of `$`, `@` or `%`, it is `eval()`ed and fed to `Data::Dumper` directly.

## Floppy, Zip, Offline Mode

`CPAN.pm` works nicely without network access, too. If you maintain machines that are not networked at all, you should consider working with `file:` URLs. You'll have to collect your modules somewhere first. So you might use `CPAN.pm` to put together all you need on a networked machine. Then copy the `$CPAN::Config->{keep_source_where}` (but not `$CPAN::Config->{build_dir}`) directory on a floppy. This floppy is kind of a personal CPAN. `CPAN.pm` on the non-networked machines works nicely with this floppy. See also below the paragraph about CD-ROM support.

## Basic Utilities for Programmers

`has_inst($module)`

Returns true if the module is installed. Used to load all modules into the running `CPAN.pm` that are considered optional. The config variable `dontload_list` intercepts the `has_inst()` call such that an optional module is not loaded despite being available. For example, the following command will prevent `YAML.pm` from being loaded:

```
cpan> o conf dontload_list push YAML
```

See the source for details.

`has_usable($module)`

Returns true if the module is installed and in a usable state. Only useful for a handful of modules that are used internally. See the source for details.

`instance($module)`

The constructor for all the singletons used to represent modules, distributions, authors, and bundles. If the object already exists, this method returns the object; otherwise, it calls the constructor.

## SECURITY

There's no strong security layer in `CPAN.pm`. `CPAN.pm` helps you to install foreign, unmasked, unsigned code on your machine. We compare to a checksum that comes from the net just as the distribution file itself. But we try to make it easy to add security on demand:

### Cryptographically signed modules

Since release 1.77, `CPAN.pm` has been able to verify cryptographically signed module distributions using `Module::Signature`. The CPAN modules can be signed by their authors, thus giving more security. The simple unsigned MD5 checksums that were used before by CPAN protect mainly against accidental file corruption.

You will need to have `Module::Signature` installed, which in turn requires that you have at least one of `Crypt::OpenPGP` module or the command-line `gpg` tool installed.

You will also need to be able to connect over the Internet to the public key servers, like `pgp.mit.edu`, and their port 11731 (the HKP protocol).

The configuration parameter `check_sigs` is there to turn signature checking on or off.

## EXPORT

Most functions in package CPAN are exported by default. The reason for this is that the primary use is intended for the `cpan` shell or for one-liners.

## ENVIRONMENT

When the CPAN shell enters a subshell via the `look` command, it sets the environment `CPAN_SHELL_LEVEL` to 1, or increments that variable if it is already set.

When CPAN runs, it sets the environment variable `PERL5_CPAN_IS_RUNNING` to the ID of the running process. It also sets `PERL5_CPANPLUS_IS_RUNNING` to prevent runaway processes which could happen with older versions of `Module::Install`.

When running `perl Makefile.PL`, the environment variable `PERL5_CPAN_IS_EXECUTING` is set to the full path of the `Makefile.PL` that is being executed. This prevents runaway processes with newer versions of `Module::Install`.

When the config variable `ftp_passive` is set, all downloads will be run with the environment variable `FTP_PASSIVE` set to this value. This is in general a good idea as it influences both `Net::FTP` and `LWP` based connections. The same effect can be achieved by starting the `cpan` shell with this environment variable set. For `Net::FTP` alone, one can also always set passive mode by running `libnetcfg`.

## POPULATE AN INSTALLATION WITH LOTS OF MODULES

Populating a freshly installed perl with one's favorite modules is pretty easy if you maintain a private bundle definition file. To get a useful blueprint of a bundle definition file, the command `autobundle` can be used on the CPAN shell command line. This command writes a bundle definition file for all modules installed for the current perl interpreter. It's recommended to run this command once only, and from then on maintain the file manually under a private name, say `Bundle/my_bundle.pm`. With a clever bundle file you can then simply say

```
cpan> install Bundle::my_bundle
```

then answer a few questions and go out for coffee (possibly even in a different city).

Maintaining a bundle definition file means keeping track of two things: dependencies and interactivity. `CPAN.pm` sometimes fails on calculating dependencies because not all modules define all `MakeMaker` attributes correctly, so a bundle definition file should specify prerequisites as early as possible. On the other hand, it's annoying that so many distributions need some interactive configuring. So what you can try to accomplish in your private bundle file is to have the packages that need to be configured early in the file and the gentle ones later, so you can go out for coffee after a few minutes and leave `CPAN.pm` to churn away untended.

## WORKING WITH CPAN.pm BEHIND FIREWALLS

Thanks to Graham Barr for contributing the following paragraphs about the interaction between perl, and various firewall configurations. For further information on firewalls, it is recommended to consult the documentation that comes with the `ncftp` program. If you are unable to go through the firewall with a simple Perl setup, it is likely that you can configure `ncftp` so that it works through your firewall.

### Three basic types of firewalls

Firewalls can be categorized into three basic types.

http firewall

This is when the firewall machine runs a web server, and to access the outside world, you

must do so via that web server. If you set environment variables like `http_proxy` or `ftp_proxy` to values beginning with `http://`, or in your web browser you've proxy information set, then you know you are running behind an http firewall.

To access servers outside these types of firewalls with perl (even for ftp), you need LWP.

#### ftp firewall

This where the firewall machine runs an ftp server. This kind of firewall will only let you access ftp servers outside the firewall. This is usually done by connecting to the firewall with ftp, then entering a username like "user@outside.host.com".

To access servers outside these type of firewalls with perl, you need `Net::FTP`.

#### One-way visibility

One-way visibility means these firewalls try to make themselves invisible to users inside the firewall. An FTP data connection is normally created by sending your IP address to the remote server and then listening for the return connection. But the remote server will not be able to connect to you because of the firewall. For these types of firewall, FTP connections need to be done in a passive mode.

There are two that I can think off.

#### SOCKS

If you are using a SOCKS firewall, you will need to compile perl and link it with the SOCKS library. This is what is normally called a 'socksified' perl. With this executable you will be able to connect to servers outside the firewall as if it were not there.

#### IP Masquerade

This is when the firewall implemented in the kernel (via NAT, or networking address translation), it allows you to hide a complete network behind one IP address. With this firewall no special compiling is needed as you can access hosts directly.

For accessing ftp servers behind such firewalls you usually need to set the environment variable `FTP_PASSIVE` or the config variable `ftp_passive` to a true value.

### Configuring lynx or ncftp for going through a firewall

If you can go through your firewall with e.g. lynx, presumably with a command such as

```
/usr/local/bin/lynx -pscott:tiger
```

then you would configure CPAN.pm with the command

```
o conf lynx "/usr/local/bin/lynx -pscott:tiger"
```

That's all. Similarly for ncftp or ftp, you would configure something like

```
o conf ncftp "/usr/bin/ncftp -f /home/scott/ncftlogin.cfg"
```

Your mileage may vary...

### FAQ

1)

I installed a new version of module X but CPAN keeps saying, I have the old version installed. Probably you **do** have the old version installed. This can happen if a module installs itself into a different directory in the `@INC` path than it was previously installed. This is not really a CPAN.pm problem, you would have the same problem when installing the module manually. The easiest way to prevent this behaviour is to add the argument `UNINST=1` to the `make install` call, and that is why many people add this argument permanently by configuring

```
o conf make_install_arg UNINST=1
```

2)

So why is UNINST=1 not the default?

Because there are people who have their precise expectations about who may install where in the @INC path and who uses which @INC array. In fine tuned environments UNINST=1 can cause damage.

3)

I want to clean up my mess, and install a new perl along with all modules I have. How do I go about it?

Run the autobundle command for your old perl and optionally rename the resulting bundle file (e.g. Bundle/mybundle.pm), install the new perl with the Configure option prefix, e.g.

```
./Configure -Dprefix=/usr/local/perl-5.6.78.9
```

Install the bundle file you produced in the first step with something like

```
cpan> install Bundle::mybundle
```

and you're done.

4)

When I install bundles or multiple modules with one command there is too much output to keep track of.

You may want to configure something like

```
o conf make_arg "| tee -ai /root/.cpan/logs/make.out"
o conf make_install_arg "| tee -ai
/root/.cpan/logs/make_install.out"
```

so that STDOUT is captured in a file for later inspection.

5)

I am not root, how can I install a module in a personal directory?

First of all, you will want to use your own configuration, not the one that your root user installed. If you do not have permission to write in the cpan directory that root has configured, you will be asked if you want to create your own config. Answering "yes" will bring you into CPAN's configuration stage, using the system config for all defaults except things that have to do with CPAN's work directory, saving your choices to your MyConfig.pm file.

You can also manually initiate this process with the following command:

```
% perl -MCPAN -e 'mkmyconfig'
```

or by running

```
mkmyconfig
```

from the CPAN shell.

You will most probably also want to configure something like this:

```
o conf makepl_arg "LIB=~/myperl/lib \
INSTALLMAN1DIR=~/myperl/man/man1 \
INSTALLMAN3DIR=~/myperl/man/man3 \
INSTALLSCRIPT=~/myperl/bin \
INSTALLBIN=~/myperl/bin"
```

and then the equivalent command for `Module::Build`, which is

```
o conf mbuildpl_arg "--lib=~/myperl/lib \
 --installman1dir=~/myperl/man/man1 \
 --installman3dir=~/myperl/man/man3 \
 --installscript=~/myperl/bin \
 --installbin=~/myperl/bin"
```

You can make this setting permanent like all `o conf` settings with `o conf commit` or by setting `auto_commit` beforehand.

You will have to add `~/myperl/man` to the `MANPATH` environment variable and also tell your perl programs to look into `~/myperl/lib`, e.g. by including

```
use lib "$ENV{HOME}/myperl/lib";
```

or setting the `PERL5LIB` environment variable.

While we're speaking about `$ENV{HOME}`, it might be worth mentioning, that for Windows we use the `File::HomeDir` module that provides an equivalent to the concept of the home directory on Unix.

Another thing you should bear in mind is that the `UNINST` parameter can be dangerous when you are installing into a private area because you might accidentally remove modules that other people depend on that are not using the private area.

6)

How to get a package, unwrap it, and make a change before building it?

Have a look at the `look (!)` command.

7)

I installed a Bundle and had a couple of fails. When I retried, everything resolved nicely. Can this be fixed to work on first try?

The reason for this is that CPAN does not know the dependencies of all modules when it starts out. To decide about the additional items to install, it just uses data found in the `META.yml` file or the generated Makefile. An undetected missing piece breaks the process. But it may well be that your Bundle installs some prerequisite later than some depending item and thus your second try is able to resolve everything. Please note, `CPAN.pm` does not know the dependency tree in advance and cannot sort the queue of things to install in a topologically correct order. It resolves perfectly well **if** all modules declare the prerequisites correctly with the `PREREQ_PM` attribute to `MakeMaker` or the `requires` stanza of `Module::Build`. For bundles which fail and you need to install often, it is recommended to sort the Bundle definition file manually.

8)

In our intranet, we have many modules for internal use. How can I integrate these modules with `CPAN.pm` but without uploading the modules to CPAN?

Have a look at the `CPAN::Site` module.

9)

When I run CPAN's shell, I get an error message about things in my `/etc/inputrc` (or `~/inputrc`) file.

These are readline issues and can only be fixed by studying readline configuration on your architecture and adjusting the referenced file accordingly. Please make a backup of the `/etc/inputrc` or `~/inputrc` and edit them. Quite often harmless changes like uppercasing or lowercasing some arguments solves the problem.

10)

Some authors have strange characters in their names.

Internally CPAN.pm uses the UTF-8 charset. If your terminal is expecting ISO-8859-1 charset, a converter can be activated by setting `term_is_latin` to a true value in your config file. One way of doing so would be

```
cpan> o conf term_is_latin 1
```

If other charset support is needed, please file a bugreport against CPAN.pm at [rt.cpan.org](http://rt.cpan.org) and describe your needs. Maybe we can extend the support or maybe UTF-8 terminals become widely available.

Note: this config variable is deprecated and will be removed in a future version of CPAN.pm. It will be replaced with the conventions around the family of `$LANG` and `$LC_*` environment variables.

11)

When an install fails for some reason and then I correct the error condition and retry, CPAN.pm refuses to install the module, saying `Already tried without success`.

Use the force pragma like so

```
force install Foo::Bar
```

Or you can use

```
look Foo::Bar
```

and then `make install` directly in the subshell.

12)

How do I install a "DEVELOPER RELEASE" of a module?

By default, CPAN will install the latest non-developer release of a module. If you want to install a dev release, you have to specify the partial path starting with the author id to the tarball you wish to install, like so:

```
cpan> install KWILLIAMS/Module-Build-0.27_07.tar.gz
```

Note that you can use the `ls` command to get this path listed.

13)

How do I install a module and all its dependencies from the commandline, without being prompted for anything, despite my CPAN configuration (or lack thereof)?

CPAN uses `ExtUtils::MakeMaker's` `prompt()` function to ask its questions, so if you set the `PERL_MM_USE_DEFAULT` environment variable, you shouldn't be asked any questions at all (assuming the modules you are installing are nice about obeying that variable as well):

```
% PERL_MM_USE_DEFAULT=1 perl -MCPAN -e 'install My::Module'
```

14)

How do I create a `Module::Build` based `Build.PL` derived from an `ExtUtils::MakeMaker` focused `Makefile.PL`?

<http://search.cpan.org/search?query=Module::Build::Convert>

<http://www.refcnt.org/papers/module-build-convert>

15)

I'm frequently irritated with the CPAN shell's inability to help me select a good mirror.

The `urllist` config parameter is yours. You can add and remove sites at will. You should find out which sites have the best uptodateness, bandwidth, reliability, etc. and are topologically

close to you. Some people prefer fast downloads, others uptodateness, others reliability. You decide which to try in which order.

Henk P. Penning maintains a site that collects data about CPAN sites:

```
http://www.cs.uu.nl/people/henkp/mirmon/cpan.html
```

Also, feel free to play with experimental features. Run

```
o conf init randomize_urllist ftpstats_period ftpstats_size
```

and choose your favorite parameters. After a few downloads running the `hosts` command will probably assist you in choosing the best mirror sites.

16)

Why do I get asked the same questions every time I start the shell?

You can make your configuration changes permanent by calling the command `o conf commit`. Alternatively set the `auto_commit` variable to true by running `o conf init auto_commit` and answering the following question with yes.

17)

Older versions of CPAN.pm had the original root directory of all tarballs in the build directory. Now there are always random characters appended to these directory names. Why was this done?

The random characters are provided by `File::Temp` and ensure that each module's individual build directory is unique. This makes running CPAN.pm in concurrent processes simultaneously safe.

18)

Speaking of the build directory. Do I have to clean it up myself?

You have the choice to set the config variable `scan_cache` to `never`. Then you must clean it up yourself. The other possible value, `atstart` only cleans up the build directory when you start the CPAN shell. If you never start up the CPAN shell, you probably also have to clean up the build directory yourself.

## COMPATIBILITY

### OLD PERL VERSIONS

CPAN.pm is regularly tested to run under 5.004, 5.005, and assorted newer versions. It is getting more and more difficult to get the minimal prerequisites working on older perls. It is close to impossible to get the whole `Bundle::CPAN` working there. If you're in the position to have only these old versions, be advised that CPAN is designed to work fine without the `Bundle::CPAN` installed.

To get things going, note that `GBARR/Scalar-List-Utils-1.18.tar.gz` is compatible with ancient perls and that `File::Temp` is listed as a prerequisite but CPAN has reasonable workarounds if it is missing.

### CPANPLUS

This module and its competitor, the CPANPLUS module, are both much cooler than the other. CPAN.pm is older. CPANPLUS was designed to be more modular, but it was never intended to be compatible with CPAN.pm.

### SECURITY ADVICE

This software enables you to upgrade software on your computer and so is inherently dangerous because the newly installed software may contain bugs and may alter the way your computer works or even make it unusable. Please consider backing up your data before every upgrade.

**BUGS**

Please report bugs via <http://rt.cpan.org/>

Before submitting a bug, please make sure that the traditional method of building a Perl module package from a shell by following the installation instructions of that package still works in your environment.

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**LICENSE**

This program is free software; you can redistribute it and/or modify it under the same terms as Perl itself.

See <http://www.perl.com/perl/misc/Artistic.html>

**TRANSLATIONS**

Kawai, Takanori provides a Japanese translation of this manpage at <http://homepage3.nifty.com/hippo2000/perl/CPAN.htm>

**SEE ALSO**

*cpan*, *CPAN::Nox*, *CPAN::Version*