

# Tin: A Tcl Package Manager

Version 0.6

Alex Baker

<https://github.com/ambaker1/Tin>

May 17, 2023

## **Abstract**

Tin is a package installer for Tcl. With Tin, you can easily install Tcl packages directly from GitHub.

---

# The Official Tin List

The Official Tin List is a database of Tcl packages that can be installed directly from GitHub.

As of Tin version 0.6, these are the packages in the Official Tin List:

## Auto-Tin Packages

Package	Repo	File	Version Requirements
errmsg	<a href="https://github.com/ambaker1/tcl-errmsg">https://github.com/ambaker1/tcl-errmsg</a>	install.tcl	0-
flytrap	<a href="https://github.com/ambaker1/flytrap">https://github.com/ambaker1/flytrap</a>	install.tcl	0-
mpjobs	<a href="https://github.com/ambaker1/mpjobs">https://github.com/ambaker1/mpjobs</a>	install.tcl	0.1-
ooida	<a href="https://github.com/ambaker1/ooida">https://github.com/ambaker1/ooida</a>	install.tcl	0-
tda	<a href="https://github.com/ambaker1/Tda">https://github.com/ambaker1/Tda</a>	install.tcl	0.1.1-
tin	<a href="https://github.com/ambaker1/Tin">https://github.com/ambaker1/Tin</a>	install.tcl	0
tintest	<a href="https://github.com/ambaker1/Tin-Test">https://github.com/ambaker1/Tin-Test</a>	install.tcl	0-
vutil	<a href="https://github.com/ambaker1/vutil">https://github.com/ambaker1/vutil</a>	install.tcl	0.1.1-
wob	<a href="https://github.com/ambaker1/wob">https://github.com/ambaker1/wob</a>	install.tcl	0.1.3-

---

## Adding to the Tin List

Tin installs packages based on entries in the “Tin List”, which can be added to in the current session with the commands *tin add*.

```
tin add <-tin> $name $version $repo $tag $file
```

<b>-tin</b>	Option to add an entry to the Tin List. Default.
<b>\$name</b>	Package name.
<b>\$version</b>	Package version.
<b>\$repo</b>	Github repository URL.
<b>\$tag</b>	Github release tag for version.
<b>\$file</b>	Installer file path in repo.

### Example 1: Adding entries to the Tin List

*Code:*

```
tin add foo 1.0 https://github.com/username/foo v1.0 install_foo.tcl
tin add foo 1.1 https://github.com/username/foo v1.1 install_foo.tcl
tin add foo 1.2 https://github.com/username/foo v1.2 install_foo.tcl
tin add foo 1.2.1 https://github.com/username/foo v1.2.1 install_foo.tcl
tin add foo 1.2.2 https://github.com/username/foo v1.2.2 install_foo.tcl
tin add foo 2a0 https://github.com/username/foo v2a0 install_foo.tcl
tin add foo 2.0 https://github.com/username/foo v2.0 install_foo.tcl
tin add foo 2.0.1 https://github.com/username/foo v2.0.1 install_foo.tcl
```

Clearly, this is a bit verbose... and repetitive...

---

## Auto-Tin Configuration

To streamline the process of populating the Tin List, simply use the command `tin add -auto` to specify an Auto-Tin configuration. An Auto-Tin configuration specifies a template for Tin entries, and this template is used in conjunction with GitHub release tags to automatically populate the Tin List.

```
tin add -auto $name $repo $file <<-exact> $version> <$reqs ...>
```

<code>-auto</code>	Option to add an Auto-Tin configuration to the Tin List.
<code>\$name</code>	Package name.
<code>\$repo</code>	Github repository URL.
<code>\$file</code>	Installer file path in repo.
<code>-exact</code>	Option to specify exact version.
<code>\$version</code>	Package version.
<code>\$reqs ...</code>	Package version requirements, mutually exclusive with <code>-exact</code> option.

### *Auto-Tin Tag Pattern*

In order for an Auto-Tin configuration to work, the GitHub repository must have release tags corresponding directly with the package versions, such as “v1.2.3”.

To be specific, version release tags must match the Auto-Tin tag pattern:

```
^v(0|[1-9]\d*)(\.(0|[1-9]\d*))*([ab](0|[1-9]\d*)(\.(0|[1-9]\d*))*)?>$
```

Note that this is not the same as “SemVer” (<https://semver.org/>), which is the standard version number format. This is because the Auto-Tin tag pattern specifically matches all version numbers compatible with Tcl, with a prefix of “v”. Most notably, the format for alpha and beta versions is different in Tcl, where “a” and “b” replace one of the periods (e.g. “v2a0”), and effectively represent “-.2.” and “-.1.”, respectively.

## Fetching and Auto-Fetching

If a package is configured as an Auto-Tin package, the Tin List can be automatically populated with versions available for installation with the command *tin fetch*. If the *-all* option is specified, it will return a dictionary of package names and versions added. Otherwise, it will simply return a list of the versions added for the package.

```
tin fetch $name <$pattern>
tin fetch -all <$names>
```

<b>\$name</b>	Package name.
<b>\$pattern</b>	Version number glob pattern for <i>git ls-remote</i> . Default “*”, or all versions.
<b>-all</b>	Option to fetch all available versions.
<b>\$names</b>	List of package names. Default all Auto-Tin packages.

Additionally, by default, Tin auto-fetches on the fly when it cannot find Tin entries satisfying version requirements. This can be toggled on/off with *tin auto*, which also returns the current auto-fetch status.

```
tin auto <$toggle>
```

<b>\$toggle</b>	Boolean, whether to auto-fetch. Default true.
-----------------	---

### Example 2: Adding an Auto-Tin configuration and fetching Tin entries

*Code:*

```
tin add -auto foo https://github.com/username/foo install_foo.tcl
tin fetch foo; # fetches all entries from GitHub
```

---

## Removing from the Tin List

Both Tin entries and Auto-Tin configurations can be removed from the Tin List in a session with the command *tin remove*.

```
tin remove <-tin> $name <$version> <$repo>
tin remove -auto $name <$repo> <$file>
tin remove -all <$names>
```

<b>-tin</b>	Option to remove a Tin entry from the Tin List. Default.
<b>-auto</b>	Option to remove an Auto-Tin configuration from the Tin List.
<b>-all</b>	Option to remove both Tin entries and Auto-Tin configurations.
<b>\$name</b>	Package name.
<b>\$names</b>	List of package names (default all packages).
<b>\$version</b>	Package version to remove (optional, default all versions).
<b>\$repo</b>	Repository to remove (optional, default all repositories).
<b>\$file</b>	Installer file path to remove (optional, default all installer files).

### *Clearing the Tin List*

The command *tin clear* removes all entries and Auto-Tin configurations from the Tin List, same as *tin remove -all*.

```
tin clear
```

---

## Saving and Resetting the Tin List

The state of the Tin List can be saved for future sessions with *tin save*, and reset to default or factory settings with *tin reset*. Note that *tin save* saves to a hidden user-config file located in the user's home directory.

```
tin save
```

```
tin reset <-soft>
```

```
tin reset -hard
```

**-soft**                      Option to reset to user settings (default).

**-hard**                     Option to reset to factory settings.

### Example 3: Saving changes to the Tin List

*Code:*

```
tin reset -hard
tin add foo 1.0 https://github.com/username/foo v1.0 install_foo.tcl
tin save
```

*Output:*

"~/tinlist.tcl" :

```
tin add foo 1.0 https://github.com/username/foo v1.0 install_foo.tcl
```

---

## Available Packages

The available packages in the Tin List can be queried with the command *tin packages*, and the existence of a package in the Tin List can be queried with the command *tin exists*.

```
tin packages <-all> <$pattern>
tin packages -tin <$pattern>
tin packages -auto <$pattern>
```

```
tin exists <-all> $name
tin exists -tin $name
tin exists -auto $name
```

<b>-all</b>	Option to search for both Tin and Auto-Tin packages. Default.
<b>-tin</b>	Option to search only for Tin packages.
<b>-auto</b>	Option to search only for Auto-Tin packages.
<b>\$pattern</b>	Optional “glob” pattern, default “*”, or all packages.
<b>\$name</b>	Name of package to search for.

### Example 4: Getting available packages

Code:

```
set allPackages [tin packages]
set loadedPackages [tin packages -tin]
set autoPackages [tin packages -auto]
```

## Available Package Versions

A list of available versions for a Tin package that satisfy version requirements can be queried with the command *tin versions*. Similarly, the command *tin available* returns the version that would be installed with *tin install*, or blank if none can be found.

```
tin versions $name <<-exact> $version> <$reqs ...>
```

```
tin available $name <<-exact> $version> <$reqs ...>
```



<b>\$name</b>	Package name.
<b>-exact</b>	Option to specify exact version.
<b>\$version</b>	Package version.
<b>\$reqs ...</b>	Package version requirements, mutually exclusive with -exact option.

---

## Accessing the Tin List

For each package in the Tin List, the command *tin get* can be used to query basic information about Tin. Similar to *tin add* and *tin remove*, it has two forms, one for querying Tin packages and one for querying Auto-Tin packages. Returns a dictionary with all the Tin List information for the package, or blank if the package does not exist.

```
tin get <-tin> $name
tin get -auto $name
```

<b>-tin</b>	Option to query Tin packages. Default.
<b>-auto</b>	Option to query Auto-Tin packages.
<b>\$name</b>	Package name.

### Example 5: Getting info from the Tin List

*Code:*

```
package require tin
tin add foo 1.0 https://github.com/username/foo v1.0 install_foo.tcl
puts [tin get foo]
```

*Output:*

```
1.0 {https://github.com/username/foo {v1.0 install_foo.tcl}}
```

---

## Installing and Uninstalling Packages

The command *tin install* installs packages directly from GitHub, and returns the version installed.

The command *tin depend* installs packages only if they are not installed, and returns the version number installed (useful for dependencies in installation scripts).

The command *tin uninstall* uninstalls packages (as long as they are in the Tin List), and returns blank if successful, or error if it was unsuccessful in uninstalling the package.

```
tin install $name <<-exact> $version> <$reqs ...>
```

```
tin depend $name <<-exact> $version> <$reqs ...>
```

```
tin uninstall $name <<-exact> $version> <$reqs ...>
```

<b>\$name</b>	Package name.
<b>-exact</b>	Option to specify exact version.
<b>\$version</b>	Package version.
<b>\$reqs ...</b>	Package version requirements, mutually exclusive with -exact option.

By default, uninstalling a package simply deletes the library folder associated with the package. However, if a “pkgUninstall.tcl” file is located within the package folder, it will run that file instead, with the variable \$dir set to the package library folder path, similar to how “pkgIndex.tcl” files work.

### Example 6: Complex uninstall file “pkgUninstall.tcl”

Code:

```
set bindir [file dirname [info nameofexecutable]]
file delete [file join $bindir foo.bat]; # delete file in the bin directory
file delete -force $dir; # Clean up package
```

---

## Upgrading Packages

Upgrading packages involves first installing the new version with *tin install*, then uninstalling the old version with *tin uninstall*. The command *tin check* returns an upgrade list of available minor and patch upgrades for packages. The command *tin upgrade* checks for available upgrades with *tin check*, and then upgrades the packages, returning the upgrade list. If there is no upgrade available, the upgrade list will be empty. If the *-all* option is specified, the format of the upgrade list is “name {old new ...} ...”. Otherwise, the format of the upgrade list is “{old new ...}”.

```
tin check $name <<-exact> $version> <$reqs ...>
tin check -all <$names>
```

```
tin upgrade $name <<-exact> $version> <$reqs ...>
tin upgrade -all <$names>
```

<b>-all</b>	Option to look for upgrades in all installed major versions of the packages.
<b>\$names</b>	Package names. Default searches all packages in the Tin List.
<b>\$name</b>	Package name.
<b>-exact</b>	Option to specify exact version.
<b>\$version</b>	Package version.
<b>\$reqs ...</b>	Package version requirements, mutually exclusive with <i>-exact</i> option.

### Example 7: Upgrading Tin

Code:

```
# Upgrade Tin
package require tin
tin upgrade tin
```

---

## Loading and Importing Packages

The command *tin require* is similar to the Tcl command *package require*, but with the added feature that if the package is missing, it will try to install it with *tin install*.

The command *tin import* additionally handles most use-cases of *namespace import*. Both *tin require* and *tin import* return the version number of the package imported.

```
tin require $name <<-exact> $version> <$reqs ...>
```

<b>\$name</b>	Package name.
<b>-exact</b>	Option to specify exact version.
<b>\$version</b>	Package version.
<b>\$reqs ...</b>	Package version requirements, mutually exclusive with -exact option.

```
tin import <-force> <$patterns from> $name <<-exact> $version> <$reqs ...> <as $ns>
```

<b>-force</b>	Option to overwrite existing commands.
<b>\$patterns</b>	Commands to import, or “glob” patterns, default “*”, or all commands.
<b>\$name</b>	Package name.
<b>-exact</b>	Option to specify exact version.
<b>\$version</b>	Package version.
<b>\$reqs ...</b>	Package version requirements, mutually exclusive with -exact option.
<b>\$ns</b>	Namespace to import into. Default global namespace, or “::”.

### Example 8: Importing all commands package “foo”

Code:

```
package require tin
tin import foo 1.0
```

---

## Generic Package Utilities

Tin works alongside the Tcl *package* commands, and provides a few package utility commands that do not interface with the Tin List.

### *Check if a Package is Installed*

The command *tin installed* returns the package version number that would be loaded with *package require*, or blank if the package is not installed. If there is no package version in the Tcl package database satisfying the requirements, it will call the *package unknown* script to load *package ifneeded* statements from “pkgIndex.tcl” files, just like what *package require* does, but without loading the package.

```
tin installed $name <<-exact> $version> <$reqs ...>
```

<b>\$name</b>	Package name.
<b>-exact</b>	Option to specify exact version.
<b>\$version</b>	Package version.
<b>\$reqs ...</b>	Package version requirements, mutually exclusive with -exact option.

### *Unload a Package/Namespace*

The command *tin forget* is short-hand for both *package forget* and *namespace delete*, but it will not throw an error if there is no namespace corresponding with the package name. It is especially useful for reloading packages within an instance of Tcl.

```
tin forget $name ...
```

<b>\$name</b>	Package name.
---------------	---------------

#### Example 9: Loading and reloading a package

Code:

```
package require foo
tin forget foo
package require foo
```

---

## Utilities for Package Development

In addition to commands for installing and loading packages, Tin provides a few commands intended to help in writing installation and build files for your packages.

### *Creating Package Directories*

The command *tin mkdir* creates a library directory to install a package in, with a normalized naming convention that allows it to be uninstalled easily with *tin uninstall*.

```
tin mkdir <-force> <$basedir> $name $version
```

<b>-force</b>	Option to create fresh library directory (deletes existing folder).
<b>\$basedir</b>	Base directory, default one folder up from the Tcl library folder.
<b>\$name</b>	Package name.
<b>\$version</b>	Package version.

See the example installation file for a package “foo” that requires the package “bar 1.2”, and installs in library folder “foo-1.0”.

Example 10: Example file “install\_foo.tcl”

Code:

```
package require tin
tin depend bar 1.2
set dir [tin mkdir -force foo 1.0]
file copy README.md $dir
file copy LICENSE $dir
file copy lib/bar.tcl $dir
file copy lib/pkgIndex.pdf $dir
```

## Building Library Files from Source with Configuration Variable Substitution

The command *tin bake* takes an input text file, and writes an output text file after substitution of configuration variables such as @VERSION@. This is especially helpful for ensuring that the package version is consistent across the entire project. If a source directory is used as input, it will batch bake all “.tin” files.

```
tin bake $src $target $config
tin bake $src $target $varName $value ...
```

<b>\$src</b>	Source file, or directory with “.tin” files.
<b>\$target</b>	Target file, or directory to write “.tcl” files to.
<b>\$config</b>	Dictionary of config variable names and values. Config variables must be uppercase alphanumeric.
<b>\$varName \$value ...</b>	Config variable names and values. Mutually exclusive with \$config.

See below for an example of how *tin bake* can be used to automatically update a “pkgIndex.tcl” file:

### Example 11: Building a “pkgIndex.tcl” file

#### Code:

```
package require tin
tin bake pkgIndex.tin pkgIndex.tcl {VERSION 1.0}
```

#### Output:

*"pkgIndex.tin" :*

```
package ifneeded foo @VERSION@ [list source [file join $dir foo.tcl]]
```

*"pkgIndex.tcl" :*

```
package ifneeded foo 1.0 [list source [file join $dir foo.tcl]]
```