

# Tcl/Tk Status, July 2018

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# Current Releases

## \* 8.5 - Long Term Support

- \* No further releases expected except for security fixes (if needed)
- \* Expect one further capstone release when we stop support (as with 8.4.20)

## \* 8.6 - Main Production Release (8.6.8)

- \* Recommended for all new user code
- \* TCT permission *required* to target for changes

## \* Only two TIPped 8.6 changes in last year

- \* TIP 473: Allow a Defined Target **Namespace** in **oo::copy**
  - \* Bug fix, but in an API
- \* TIP 477: **Modernize** the **nmake** build system
  - \* Build system updates for MSVC toolchain

# Development

- \* **New TIP website**

- \* Based on fossil

- \* **8.7 - Open for New Features**

- \* Branch: `core-8-branch`
- \* Most TIPs should target this
- \* Currently in *alpha* (8.7a1 is out; a2 this year)

- \* **9.0 - Open for New Compatibility-Breaking Changes**

- \* Branch: `trunk`
- \* Try not to break things gratuitously!
- \* Currently in *very early alpha* (pre-9.0a1)

# The New TIP Website

- \* **Fossil** repository
  - \* Index page generated by a Tcl script
- \* More **accessible** to Tcl developers
  - \* I'm no longer the bottleneck!
  - \* Formatted using **Markdown**
- \* **Searching**
  - \* Uses SQLite FTS, of course
- \* Client-side **Filtering**
  - \* Basic categories

Many thanks to **Mark Janssen** for his work on this

## TIP Index

[Home](#)[Timeline](#)[Files](#)[Branches](#)[Tags](#)[Help](#)

[FlightAware bounty program](#) for improvements to Tcl and certain Tcl packages.

Welcome to the Tcl Improvement Proposals repository. For information on how to raise a new TIP see [Help](#)

 All 

Filter Toggles:

Drafts  Finals  Projects ( 8.4  8.5  8.6  8.7  9.0)  Informationals  Processes  
 Rejected  Withdrawn  Obsolete  Deferred  Jokes

#	Type	Tcl Version	Status	Title
510	Project	8.7	Draft	# TIP 510: Add Rbc to Tk
509	Project	8.7	Draft	# TIP 509: Implement reentrant mutexes on all platforms
508	Project	8.7	Draft	# TIP 508: New subcommand [array default]
507	Project	8.7	Draft	# TIP 507: Include simple svg support with nanosvg
506	Project	9.0	Draft	# TIP 506: Purge RefCount Macros
505	Project	8.6.9	Draft	# TIP 505: Make [ireplace] Accept All Out-of-Range Index Values
504	Project	8.7	Draft	# TIP 504: New subcommand [string insert]
503	Project	8.7	Final	# TIP 503: End Tcl 8.3 Source Compatibility Support
502	Project	8.7	Draft	# TIP 502: Index Value Reform
501	Project	8.7	Draft	# TIP 501: string is dict
500	Project	8.7	Final	# TIP 500: Private Methods and Variables in TclOO
499	Project	8.7	Final	# TIP 499: Custom locale search list for msgcat
498	Project	8.7	Draft	# TIP 498: Simplify Tcl_DeleteNamespace
497	Project	9.0	Draft	# TIP 497: Full support for Unicode 11.0 and later (part 2)
496	Project	8.7	Final	# TIP 496: Display hints in ::entry ::spinbox ::ttk::entry ::ttk::spinbox and ::ttk::combobox

# **New** *(so far)* **in Tcl 8.7**

# New Commands

- \* **array for** efficiently iterates over arrays
  - \* TIP 421: A Command for Iterating Over Arrays
- \* **package files** describes what a package really depends on
  - \* TIP 459: Tcl Package Introspection Improvements
- \* **tcl::process** adds better control over subprocesses
  - \* TIP 462: Add New [::tcl::process] Ensemble for Subprocess Management

# New Capabilities

- \* **Decimal** literals can be **prefixed** with **0d** (compare **0x**, **0o**, **0b**)
  - \* TIP 472: Add Support for 0d Radix Prefix to Integer Literals
- \* Use **commands** to generate **substitutions** with **regsub**
  - \* TIP 463: Command-Driven Substitutions for **regsub**
- \* New unit, **weekdays**, for **clock add**
  - \* TIP 444: Add "weekdays" unit in **clock add**
- \* **Updated** basic **Unicode** support (beyond the BMP, 🐼)
  - \* TIP 389: Full support for Unicode 10.0 and later (part 1)
- \* **Striding list searching**, just like striding list sorting
  - \* TIP 351: Add Striding Support to **lsearch**

# TclOO Changes

- \* Added **private methods...**
  - \* TIP 500: Private Methods and Variables in TclOO
- \* ... and **private variables**
  - \* TIP 500: Private Methods and Variables in TclOO
- \* Made it easier to **script your own definition commands**
  - \* TIP 470: Reliable Access to OO Definition Context Object
- \* Control over objects' **namespace names in oo::copy**
  - \* TIP 473: Allow a Defined Target Namespace in oo::copy

# Standard Package Changes

- \* Updates to **msgcat** package to give **richer locale searching** and make it work with **TclOO**
  - \* TIP 499: Custom locale search list for msgcat
  - \* TIP 490: msgcat for TclOO
- \* Updates to **tcctest** to allow for (optional) **performance** measurement of **tests**
  - \* TIP 447: Execution Time Verbosity Levels in **tcctest::configure**

# Rework of the Notifier

- \* Support for more modern notifiers
  - \* TIP 458: Add Support for `epoll()` and `kqueue()` in the Notifier
- \* Better in several ways
  - \* More **efficient**
  - \* Support **more open channels**
- \* Still use old notifiers on some platforms
  - \* Windows and OSX have their own
  - \* Very old Unix still uses `select()`

# Threading for Everyone

- \* Threaded builds are default for everyone
  - \* TIP 491: Threading Support: phasing out non-threaded builds
- \* Unthreaded builds have nasty bugs when used in threaded processes
  - \* Particularly an issue for embedding
- \* Windows and OSX already require threads
  - \* Platform-specific notifiers work that way
- \* Unthreaded Tcl builds will be phased out

# Low Level Changes

- \* **Internal types** are merged
  - \* TIP 484: Merge 'int' and 'wideInt' Obj-type to a single 'int'
- \* **Format consistencies** are removed
  - \* TIP 476: Scan/Printf format consistency
- \* **TCP server creation** is more flexible
  - \* TIP 456: Extend the C API to Support Passing Options to TCP Server Creation
- \* **Panics can use non-ASCII on Windows**
  - \* TIP 425: Correct use of UTF-8 in Panic Callback (Windows only)

# Expiring Support

- \* Some things are gone because **we really don't do them any more**
  - \* TIP 503: End Tcl 8.3 Source Compatibility Support
  - \* TIP 487: Stop support for Pre-XP Windows
- \* Some things are gone because **they are the wrong idea** and have been for a long time
  - \* TIP 493: Cease Distribution of http 1.0
  - \* TIP 345: Kill the 'identity' Encoding

# Bubbling Under

Some features we expect to vote on:

- \* ZIP filesystem
  - \* Core scripted documents
- \* Type `assertions` and aliasing assertions
  - \* Product of `tclquadcode` project
- \* In-place string and binary data modification
- \* More TclOO features
  - \* Import of `oo::util` package from `tcllib`

# **New *(so far)* in Tk 8.7**

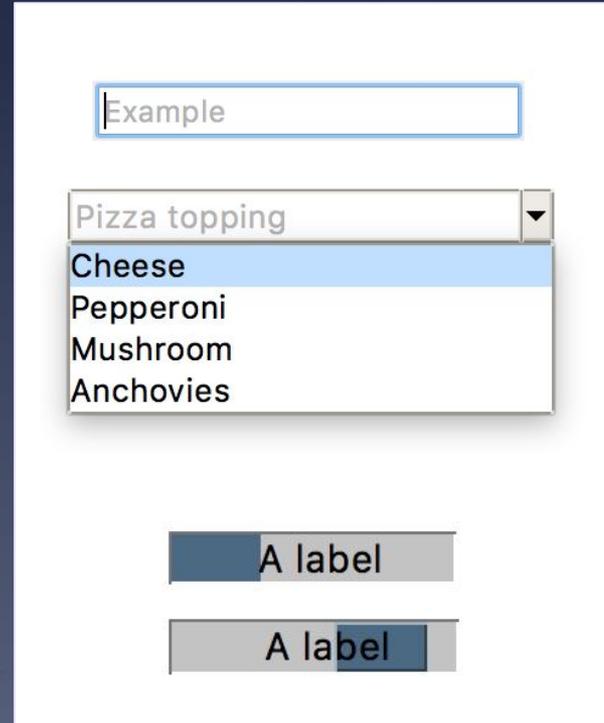
## Widget Changes

### \* Initial help text for **entry**-derived widgets

- \* TIP 496: Display hints in **::entry**  
**::spinbox** **::tk::entry** **::tk::spinbox**  
and **::tk::combobox**

### \* Labels for **progress bars**

- \* TIP 442: Display text in **progressbars**
- \* NB: label not visible in all styles!



# Other New Features

- \* **Snapshot a canvas** as an image
  - \* TIP 489: Add image widget command to the Tk **canvas**
- \* Tweaked **introspection**
  - \* TIP 492: Introspection for **tk busy**
  - \* TIP 449: **text** undo/redo to Return Range of Characters
- \* Some *really* old TIPS too
  - \* TIP 166: Reading and Writing the Photo **Image Alpha Channel**
  - \* TIP 161: Change Default for **Menu's -tearoff Option** to False

# Bubbling Under

Some features we expect to vote on:

- \* **SVG** support for the **canvas**
  - \* Support modern graphics
- \* **RBC** widgets (**graph**, **stripchart**, **barchart**)
  - \* Multiple production widgets
  - \* Needs coordination on “vector” in Tcl

# Changes *(so far)* in Tcl 9.0

# Changes in 9.0

- \* Tcl always gets **double-to-string conversions** right by default now
  - \* TIP 488: Remove **tcl\_precision**
- \* Long **deprecated API** now gone (e.g., **case**, old **puts** syntax)
  - \* TIP 485: Remove Deprecated API
- \* Some C API types aren't portable, so are removed from Tcl API
  - \* TIP 422: Don't Use stdarg.h/**va\_list** in Public API
- \* We had some horrid sort-of-documented bugs in **name resolution**
  - \* TIP 278: Fix Variable Name Resolution Quirks
- \* Octals like **0123** are now **replaced** with **0o123**
  - \* TIP 114: Eliminate Octal Parsing of Leading Zero Integer Strings

# Likely Future Changes

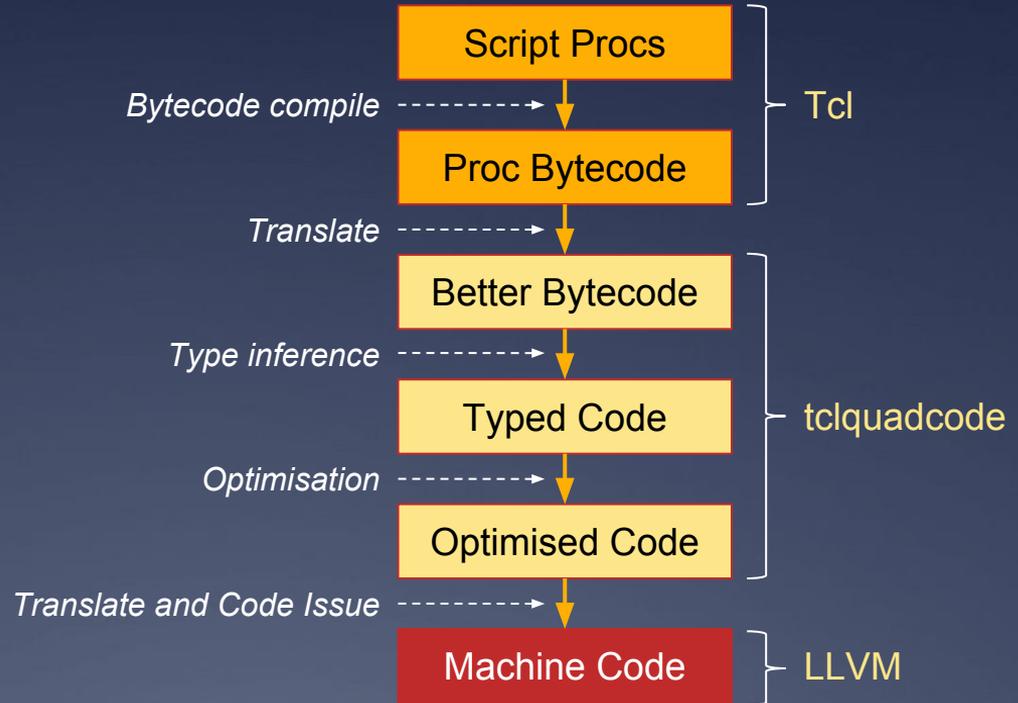
- \* **64-bit Memory Object Sizes**
  - \* Big Strings
  - \* Long Lists
  - \* Huge Hashtables
  - \* Causes many small (annoying) changes at C API level
- \* **Full Unicode Support**
  - \* Change of Tcl\_UniChar size
  - \* Supporting Tcl commands for normalisation, etc.

# The tclquadcode Project

Status and Demo

# Compiling Tcl... All of Tcl...

1. Discover procedures in package
2. Translate bytecode to “better bytecode”
3. Add types
4. Optimise
5. Generate native code
6. Write code to DLL
7. Load DLL to implement package



# Compiling Tcl... All of Tcl...

- \* **Quadcode** is our better bytecode
  - \* Not really bytecode; Tcl lists are easier to read
- \* **Static Single Assignment** form allows **optimisation** work
  - \* Variable Liveness Analysis
  - \* Cross-Procedure Analysis
- \* **Type system** for Tcl code
  - \* Everything is a string... or a *subtype* of string
    - \* Integer, Float, Boolean
- \* **Generate native code** using **LLVM**
  - \* Slow but portable
  - \* Potential for other targets...

# Status

## Currently Working

- \* Support almost all **bytecoded** procedures
  - \* Prototype of coroutine support
  - \* Access to arrays, global variables, upvar
- \* **Call to Tcl interpreter** for general commands
  - \* I/O handled this way
  - \* User C code handled this way
  - \* Some special cases

## In Progress or Planned

- \* Types to do
  - \* **Bignums** (Tcl API needs work)
  - \* **Lists** (types of elements)
  - \* **Dicts** (types of elements)
- \* **Bytecoded Entities to do**
  - \* **TclOO methods**
  - \* **Lambda** terms
  - \* Code outside procedures
    - \* Probably will *never* be done

# Live Demo!



# Current Areas of Work

- \* **Stackless form and Coroutines**
  - \* I believe it works, but with a performance penalty
  - \* Costs relate to extra memory allocations required
- \* **Removing static data in the implementation**
  - \* Original design goal was for code that was loaded once (JIT)
  - \* LLVM too slow for that to be realistic
    - \* Workaround: Generate good code in a DLL (or executable?) and load it
  - \* Multiple uses per process possible → **keep data** in interpreter or **command clientData**
- \* **Making a better front-end API to the compiler**
  - \* Let other analysis tools use our output (nagelfar?)
  - \* Let some package code also be fully compiled (vectcl?)