

T_EX Live Utility

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Outline

- History
- Goals of the software
- Features and description
- Problems
- Future development
- Architecture

History

- Discussion on the mactex@tug.org list started by Jérôme Laurens (Oct 2008)
- Started work on 6 Dec
- First alpha release on 7 Dec
- First beta release announced 30 December on Mac OS X TeX list

Motivation

- Problems with tlmgr and Perl/Tk GUI
 - Not Mac-like
 - Too complicated
 - Mac users avoid the command line
 - CLI output was all ad-hoc
- Karl said put up or shut up...

Goals

- Provide only the most common tasks
- Give users a consistent (Mac-like) experience
- Use tlmgr, instead of reimplementing it
- Give high-level feedback for errors
- No interaction with CLI
- Avoid blocking the GUI

Overall architecture

- GUI uses model/view/controller
- Cocoa frameworks, Objective-C and C
- Single main window and controller
- Privileged commands
 - Minimize privileged code
 - Executed in a separate process
 - IPC uses Distributed Objects
- New BSD license

Task architecture

- Tasks are NSOperations
- Asynchronous
- Parallel “read” ops can run
- Only one “write” op can run
- Minimal locking
- Encapsulates arguments and output

```

TLMReadWriteOperationQueue
- NSOperationQueue
- *_operationQueue;
- NSMutableArray
- *_pendingOperations;
- BOOL _isWriting;
- BOOL
- _suddenTerminationDisabled;
- NSLock *_queueLock;
- NSUInteger
- _operationCount;
    
```

```

BDSKTask
- NSString *_launchPath;
- NSArray *_arguments;
- NSDictionary *_environment;
- NSString *_currentDirectoryPath;
- id _standardInput;
- id _standardOutput;
- id _standardError;
- pid_t _processIdentifier;
- int32_t _terminationStatus;
- NSTaskTerminationReason
- _terminationReason;
- int32_t _running;
- int32_t _launched;
- struct BDSKTaskInternal *_internal;
    
```

```

TLMOperation
- TLMTask *_task;
- NSData *_outputData;
- NSData *_errorData;
- NSString *_errorMessages;
- BOOL _failed;
    
```

```

TLMTask
- NSData *_outputData;
- NSData *_errorData;
- NSString *_outputString;
- NSString *_errorString;
- NSConditionLock *_lock;
    
```

```

TLMLoadDatabaseOperation
- NSArray *_packageNodes;
- NSURL *_updateURL;
- BOOL _offline;
- NSMutableData *_dumpError;
- NSMutableData *_parseError;
    
```

```

TLMListOperation
- NSArray *_packageNodes;
- NSURL *_updateURL;
    
```

```

TLMBackupListOperation
- NSArray *_backupNodes;
    
```

```

TLMInfoOperation
- NSString *_packageName;
- NSArray *_documentationURLs;
    
```

```

TLMListUpdatesOperation
- NSArray *_packages;
- NSURL *_updateURL;
    
```

```

TLMAuthorizedOperation
- struct TLMAOInternal *_internal;
    
```

```

TLMInstallOperation
- NSArray *_packageNames;
- NSURL *_updateURL;
    
```

```

TLMBackupOperation
    
```

```

TLMInfraUpdateOperation
- NSString *_updateDirectory;
- NSString *_scriptPath;
- NSString *_hashPath;
- NSURL *_location;
- NSURLDownload *_download;
- long long _receivedLength;
- long long _lastLoggedLength;
- long long _expectedLength;
- BOOL _downloadComplete;
    
```

```

TLMRemoveOperation
- NSArray *_packageNames;
- NSMutableArray *_outputLines;
    
```

```

TLMUpdateOperation
- NSArray *_packageNames;
- NSURL *_updateURL;
    
```

```

TLMOptionOperation
    
```

```

TLMNetInstallOperation
- NSURL *_location;
- NSString *_updateDirectory;
- NSString *_scriptPath;
- NSURLDownload *_download;
- long long _receivedLength;
- long long _lastLoggedLength;
- long long _expectedLength;
- BOOL _downloadComplete;
    
```

```

TLM PapersizeOperation
    
```

Package	Status	Installed	Remote	Size
sciwordconv	Deleted on server	15878		
bidi	Updated on server	24342	24368	1.0 MB
cmarrows	Updated on server	15878	24378	56.6 KB
fifinddo-info	Updated on server	24319	24371	274.1 KB
morehype	Updated on server	24383	24369	922.3 KB
suftesi	Updated on server	24360	24373	624.0 KB
texlive-docindex	Updated on server	24351	24366	175.3 KB
tikz-cd	Updated on server	23938	24370	230.5 KB
xepersian	Updated on server	24333	24372	380.2 KB
collection-latexextra	Updated on server	24330	24374	3.7 KB

Main window: updates

All columns can be sorted, and you can filter the list or select items to get more details.

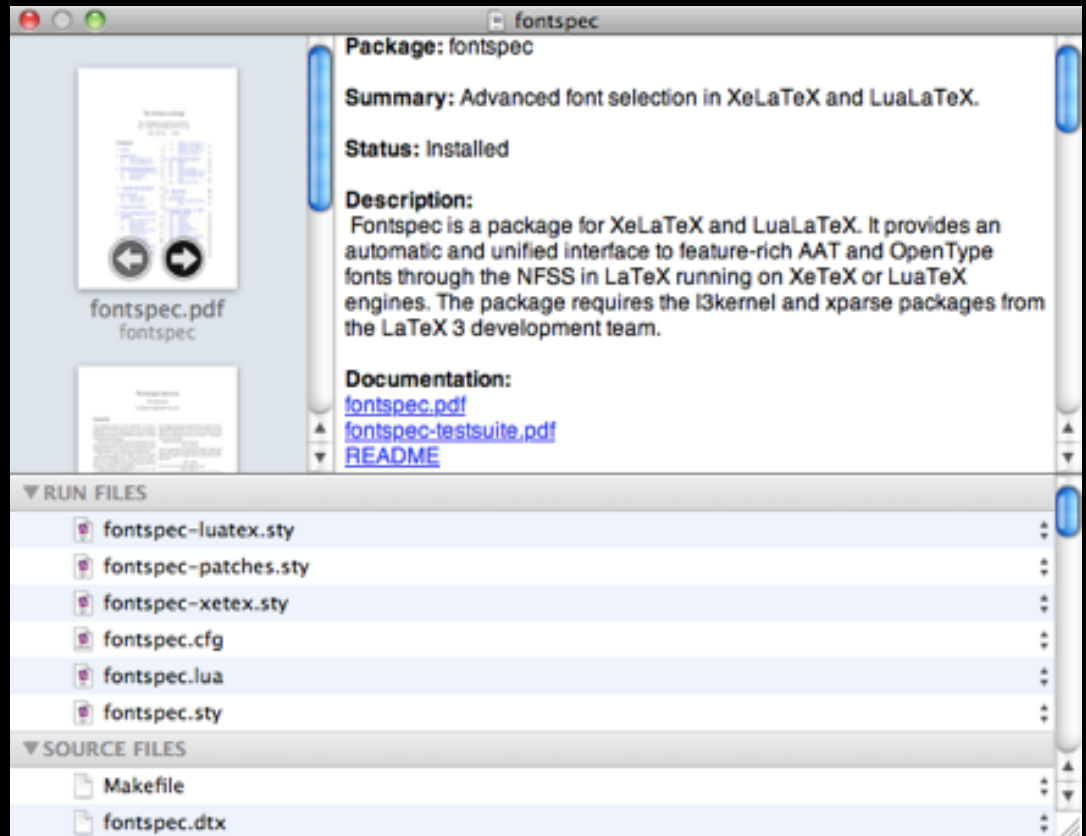
Info panel

Double-clicking on a package in the main lists will show details for that package.

Notes:

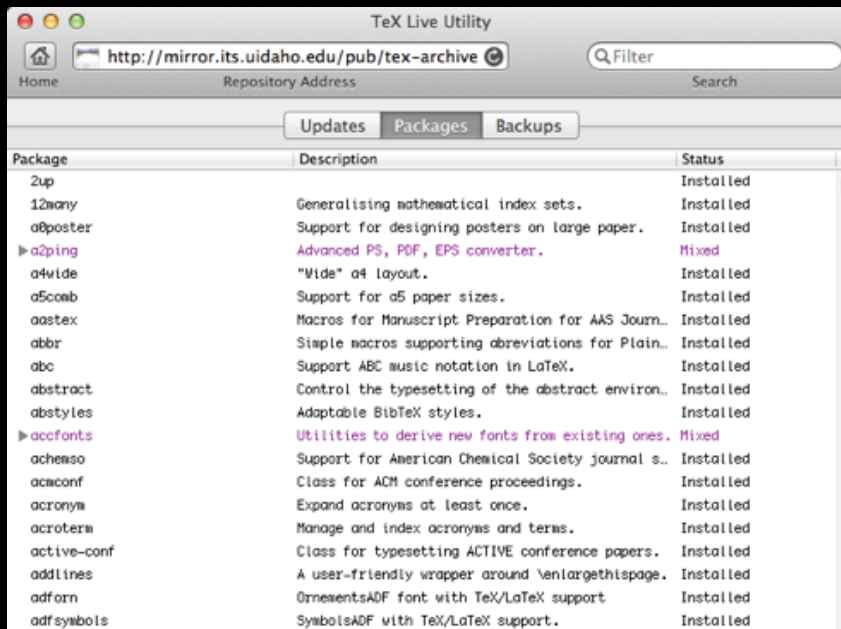
Some information comes from the tlpdb, and some comes from texdoc.

Parsing the tlpdb was necessary for performance.



Other main window tabs

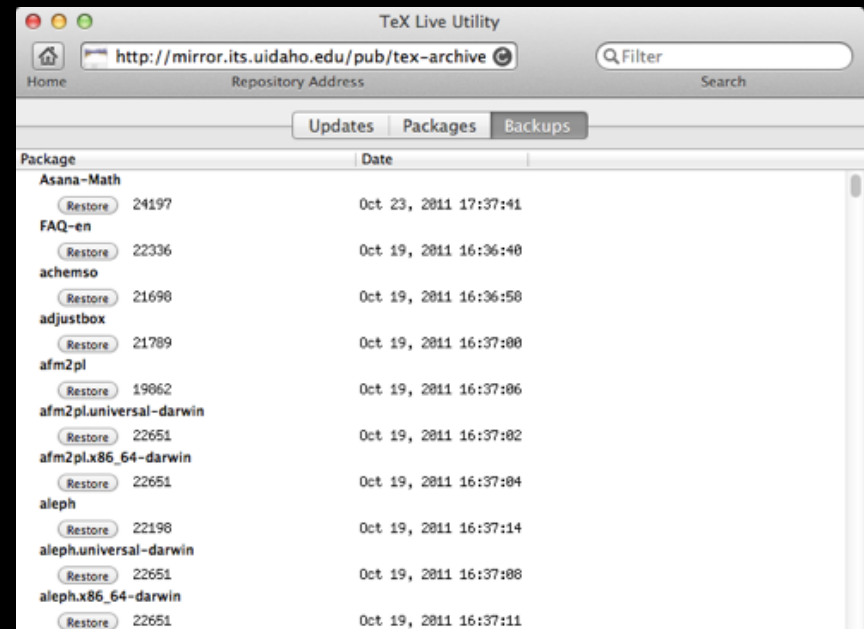
All packages



The screenshot shows the 'All packages' tab in the TeX Live Utility window. The browser address bar is set to <http://mirror.its.uidaho.edu/pub/tex-archive>. The 'Updates', 'Packages', and 'Backups' tabs are visible at the top. The main content is a table with three columns: Package, Description, and Status.

Package	Description	Status
2up		Installed
12many	Generalising mathematical index sets.	Installed
abposter	Support for designing posters on large paper.	Installed
a2ping	Advanced PS, PDF, EPS converter.	Mixed
a4wide	"Wide" a4 layout.	Installed
a5coab	Support for a5 paper sizes.	Installed
aastex	Macros for Manuscript Preparation for AAS Journ..	Installed
abbr	Simple macros supporting abbreviations for Plain..	Installed
abc	Support ABC music notation in LaTeX.	Installed
abstract	Control the typesetting of the abstract environ..	Installed
abstyles	Adaptable BibTeX styles.	Installed
accfonts	Utilities to derive new fonts from existing ones.	Mixed
achemso	Support for American Chemical Society journal s..	Installed
acmconf	Class for ACM conference proceedings.	Installed
acronym	Expand acronyms at least once.	Installed
acroterm	Manage and index acronyms and terms.	Installed
active-conf	Class for typesetting ACTIVE conference papers.	Installed
adlines	A user-friendly wrapper around \enlargethispage.	Installed
adform	OrnamentsADF font with TeX/LaTeX support.	Installed
adfsymbols	SymbolsADF with TeX/LaTeX support.	Installed

Backups



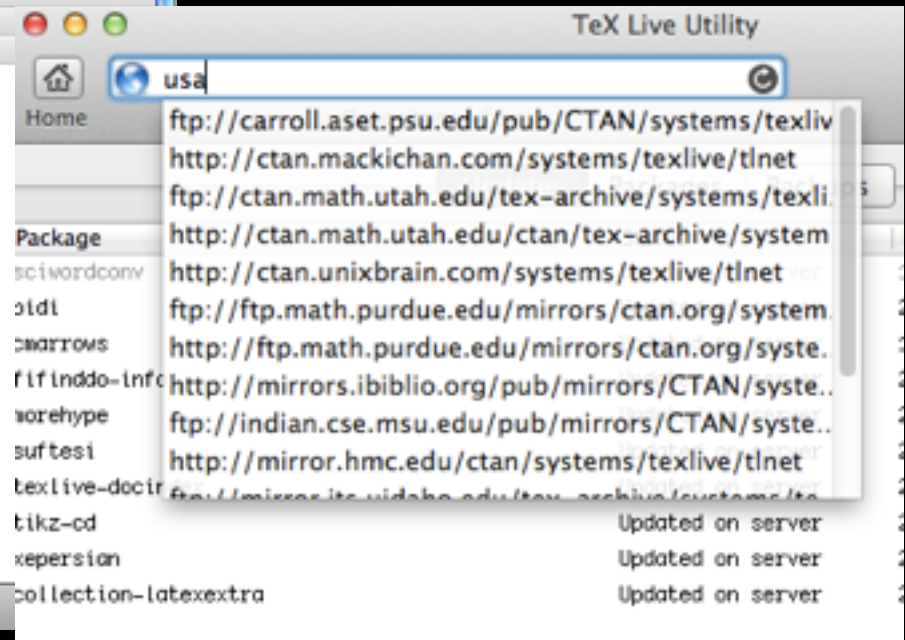
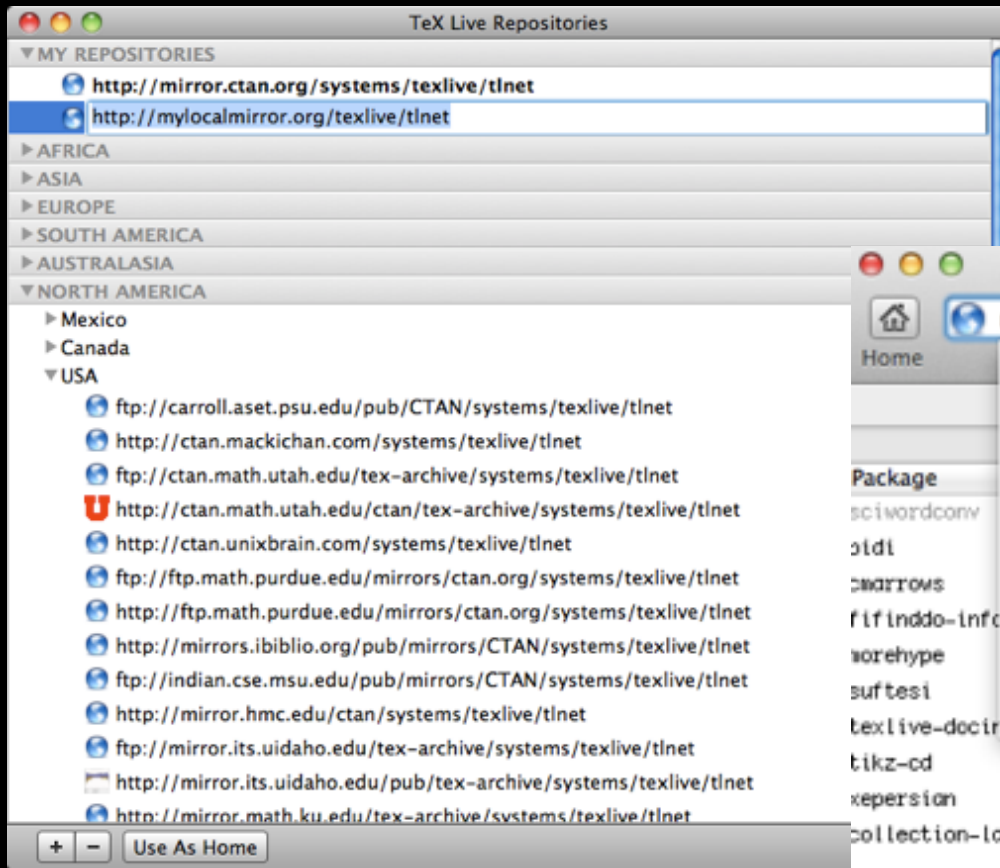
The screenshot shows the 'Backups' tab in the TeX Live Utility window. The browser address bar is set to <http://mirror.its.uidaho.edu/pub/tex-archive>. The 'Updates', 'Packages', and 'Backups' tabs are visible at the top. The main content is a table with two columns: Package and Date.

Package	Date
Asana-Math Restore 24197	Oct 23, 2011 17:37:41
FAQ-en Restore 22336	Oct 19, 2011 16:36:40
achemso Restore 21698	Oct 19, 2011 16:36:58
adjustbox Restore 21789	Oct 19, 2011 16:37:00
afm2pl Restore 19062	Oct 19, 2011 16:37:06
afm2pl.universal-darwin Restore 22651	Oct 19, 2011 16:37:02
afm2pl.x86_64-darwin Restore 22651	Oct 19, 2011 16:37:04
aleph Restore 22198	Oct 19, 2011 16:37:14
aleph.universal-darwin Restore 22651	Oct 19, 2011 16:37:08
aleph.x86_64-darwin Restore 22651	Oct 19, 2011 16:37:11

Log			
Date	Sender	Message	
Oct 15, 2011 18:06			
10/15/11 18:06:24	+ [TLMEnvironment upda..	nothing to update for /Volumes/Local/texlive/2011	
10/15/11 18:06:24	- [TLMInstallDataSourc..	Using previous profile for TeX Live 2011 from /Volumes/Local/Users/amaxwell/Library/Application Support/TeX Live Utility/default.tluprofile	
10/15/11 18:06:24	+ [TLMDatabase initial..	Using custom database download timeout of 10 seconds	
10/15/11 18:06:24	- [TLMDatabase _downlo..	Checking the repository version. Please be patient.	
10/15/11 18:06:24	- [TLMDatabase _downlo..	Downloading at least 2048 bytes of tlpdb for a version check..	
10/15/11 18:06:24	- [TLMDatabase connect..	redirected request to http://mirrors.ibiblio.org/pub/mirrors/CTAN/systems/texlive/tinet/tlpkg/texlive.tlpdb	
10/15/11 18:06:25	- [TLMDatabase _downlo..	Downloaded 2662 bytes of tlpdb for version check	
10/15/11 18:06:25	- [TLMEnvironment _get..	Repository version appears to be 2011; a young TeX Live	
10/15/11 18:06:25	- [TLMMainWindowContro..	Updating local package database	
10/15/11 18:06:25	- [TLMMainWindowContro..	Refreshing list of updated packages..	
10/15/11 18:06:45	- [TLMOperation main]	Successfully executed `/usr/texbin/tlmgr --machine-readable --repository http://mirrors.ibiblio.org/pub/mirrors/CTAN/systems/texlive/tinet/ update --list --all`	
10/15/11 18:06:45	- [TLMOperation main]	tlmgr: package repository http://mirrors.ibiblio.org/pub/mirrors/CTAN/systems/texlive/tinet/	

Log Panel

Used to be part of the main window, now hidden by default. Keeps a preset number of sessions, and can be “stuck” to the main window.

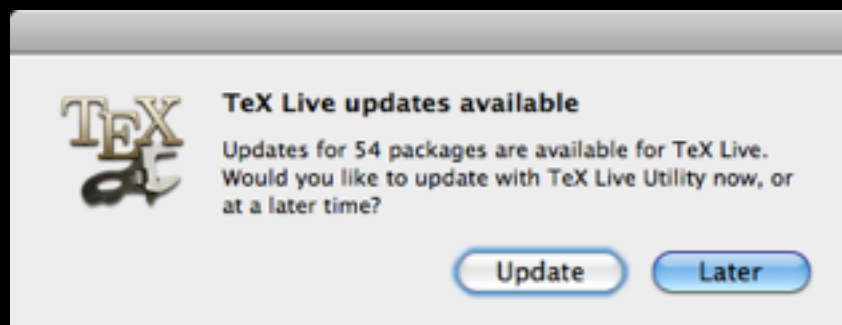
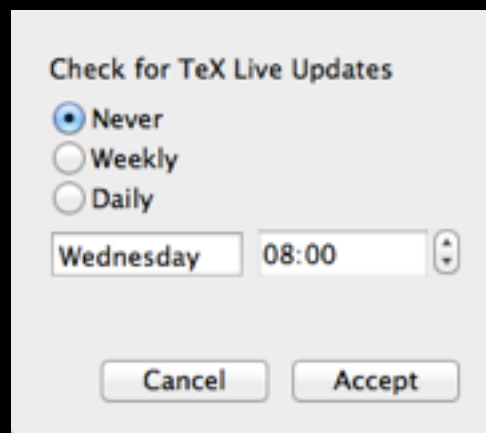
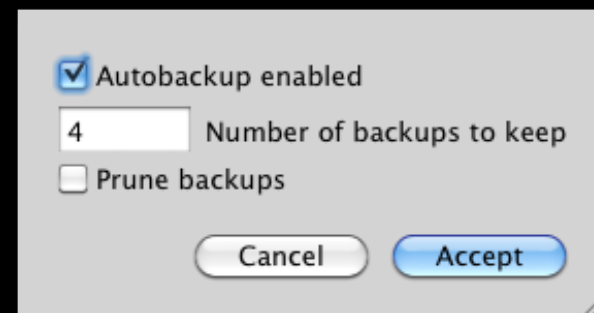
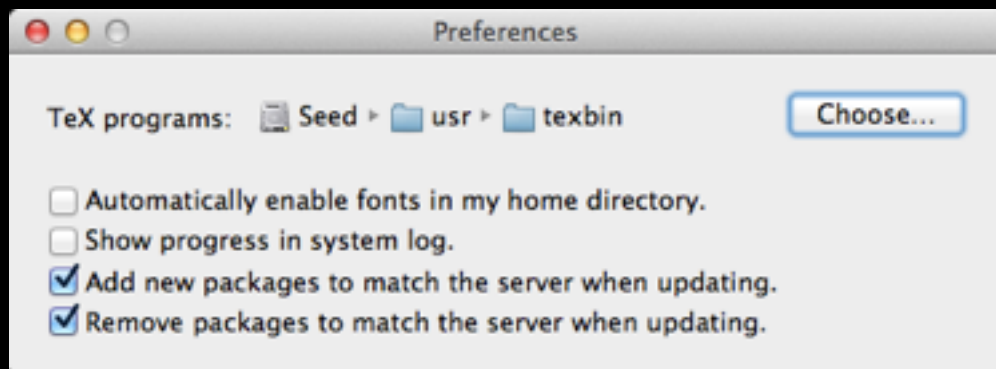


Repository management

Base list comes from parsing CTAN.sites (using Python). Custom mirrors can also be added, and the default repository is shown in bold. Drag-and-drop works with web browsers and the TLU main window.

Other features

- Autobackup configuration
- Infrastructure updates (including tlcritical)
- Check for updates and notification (using Python/launchd)
- Uses the OS settings for proxy configuration
- Paper size
- Can be used with obsolete TeX Live
- Configure and run net install (hidden)



Assistance from TL team

- Thanks to Karl, Norbert, and others!
- Machine-readable output from tlmgr
- Offline operation, dump-tlpdb action
- Improvements in tlmgr error handling
- Machine-readable output from texdoc

Problems with tlmgr

- Reimplemented error checking
 - Original tlmgr did not check versions
 - Error codes from tlmgr are useless
 - I need to show users the relevant error text, not a hundred lines of output
- When using the multiplexer, it can switch mirrors between list and update
- Original tlmgr killed itself during self update

Problems with users

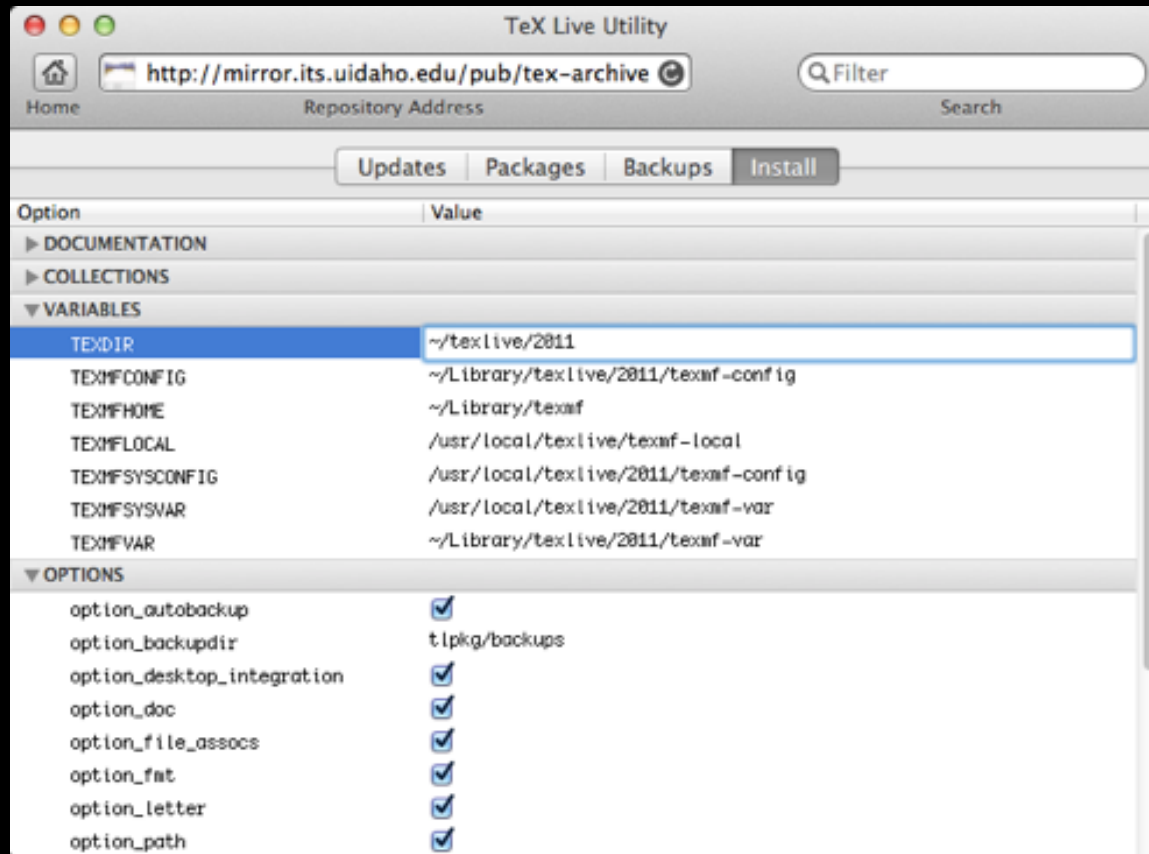
- Strange configurations
 - ~/ .MacOSX/environment.plist
 - Changing \$PATH
 - Changing \$TEX* and \$BIB* variables
 - Changing \$PYTHON* variables
- Mixing MacTeX with fink/teTeX/MacPorts
- Removing the Apple-supplied Python
- Legacy updmap(-sys) and font problems

Current issues

- Environment problem on Yosemite
- Progress bar appearance needs to be updated for 10.9
- Toolbar buttons needed
- Local directory as repository problem
- Apple has deprecated `AuthorizationExecuteWithPrivileges()`
- Google no longer allows hosting of binaries!

Future development

- Redesign to use launchd instead of AEW P
- Improvements to repository management
 - Support for new tlmgr features?
 - Blacklisting repos
- Better support for net install
 - Create TeX Distribution hierarchy
 - Simplify configuration



Net install tab

Allows installation in home directory for users without root access. Unfortunately, the options are too cryptic for most users, so this is a hidden feature.

Roadblocks

- It works pretty well as-is
- Apple keeps making Xcode worse
- MacTeX likes to support ancient OS versions
- The sole developer is really lazy

Lessons learned

- Native GUI cuts down on support issues
- Fewer features means fewer problems
- Make tlmgr do as much work as possible
- Be very careful with repositories and especially the multiplexer
- Be selective with features
- Hide the log output before users get addicted to it

Acknowledgements

- Karl Berry
- Norbert Preining
- Jérôme Laurens for the icon
- Denizens of the MacTeX list for feature ideas and testing, including
 - Bruno Voisin
 - Herb Schulz
 - Justin Walker

Links of interest

- <https://code.google.com/p/mactlmgr/>
- https://mactlmgr.googlecode.com/svn/trunk/parse_tlpdb.py
- https://mactlmgr.googlecode.com/svn/trunk/read_ctan_sites.py
- https://mactlmgr.googlecode.com/svn/trunk/agent/update_check.py