

Maple, LaTeX and Other Tools for Mathematicians

**Presented by Kathy Gerber
of the ITC Research Computing Support Group**

April 4, 2005

To First Year Math Graduate Students

E-Mail: Res-Consult@Virginia.EDU

<http://www.itc.virginia.edu/researchers>

Telephone: 243-8800

Computer Systems for Mathematics

- Numerically intensive calculations
 - Compiled languages (**C**, **FORTRAN**)
 - **Matlab**, **R**, **SAS/IML**
- Computer Algebra Systems – manipulate symbols and formulas
 - **Maple**, **Mathematica**
 - GiNaC, MuPad
- Statistical Systems – data and statistical algorithms
 - **Minitab**, **SPSS**, **SAS**, **S-PLUS**, **R**, **Stata**
- Visualization tools
- Geometer's SketchPad
- Publishing environment – **TeX**
- Proof assistants - verify mathematical proofs, software and system validation
 - Isabelle, Theorema, Mizar
 - <http://www-formal.stanford.edu/clt/ARS/ars-db.html>

Our Focus Today

TeX

Maple

- Both TeX and Maple are available on most platforms
- We will be working in Windows XP
- Basic idea of using TeX and Maple together

Review the Requirements of Your Potential Publishers

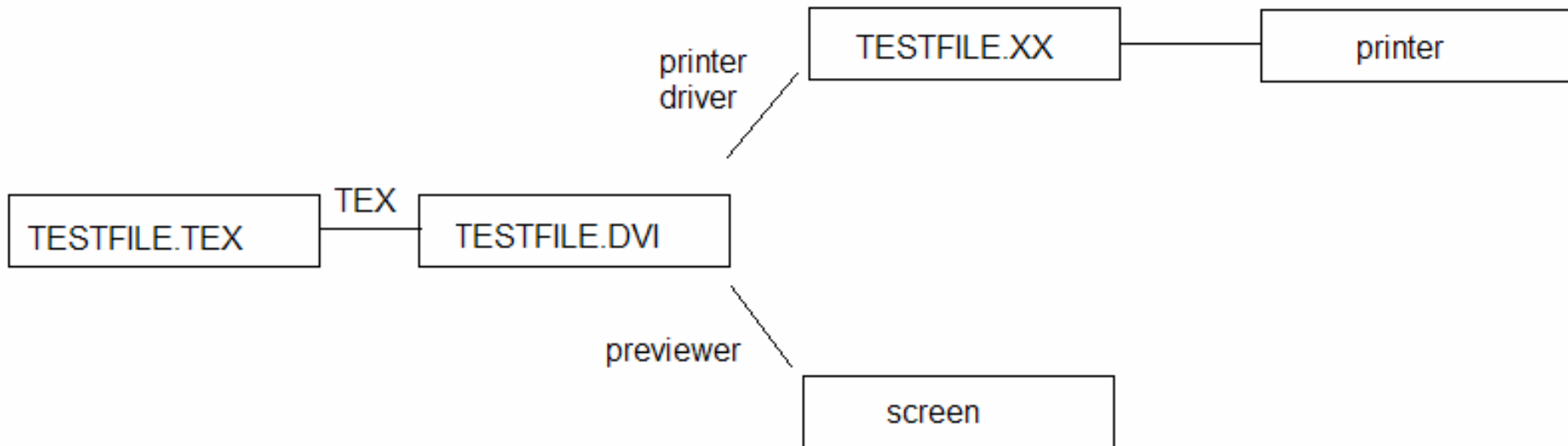
Example – AMS Publications

- The American Mathematical Society (AMS) uses the TeX formatting language to typeset its publications. In addition, the AMS offers two TeX-related style file collections, AMS-LaTeX and AMS-TeX, which provide easy ways to code manuscripts that contain mathematical expressions.
- Detailed Requirements – for example, AMS requires that graphics for electronic and/or print journals be in CMYK format
- See **General Information for Journals Authors** at <http://www.ams.org/jourhtml/authors.html>

TEX

- TEX is a computer typesetting program designed to produce high quality text output. It is especially useful for tables and mathematical formulas.
- TeX uses a "markup language"; unlike typical word processors it is not a WYSIWYG system!

Steps in Using TEX



TEX Resources

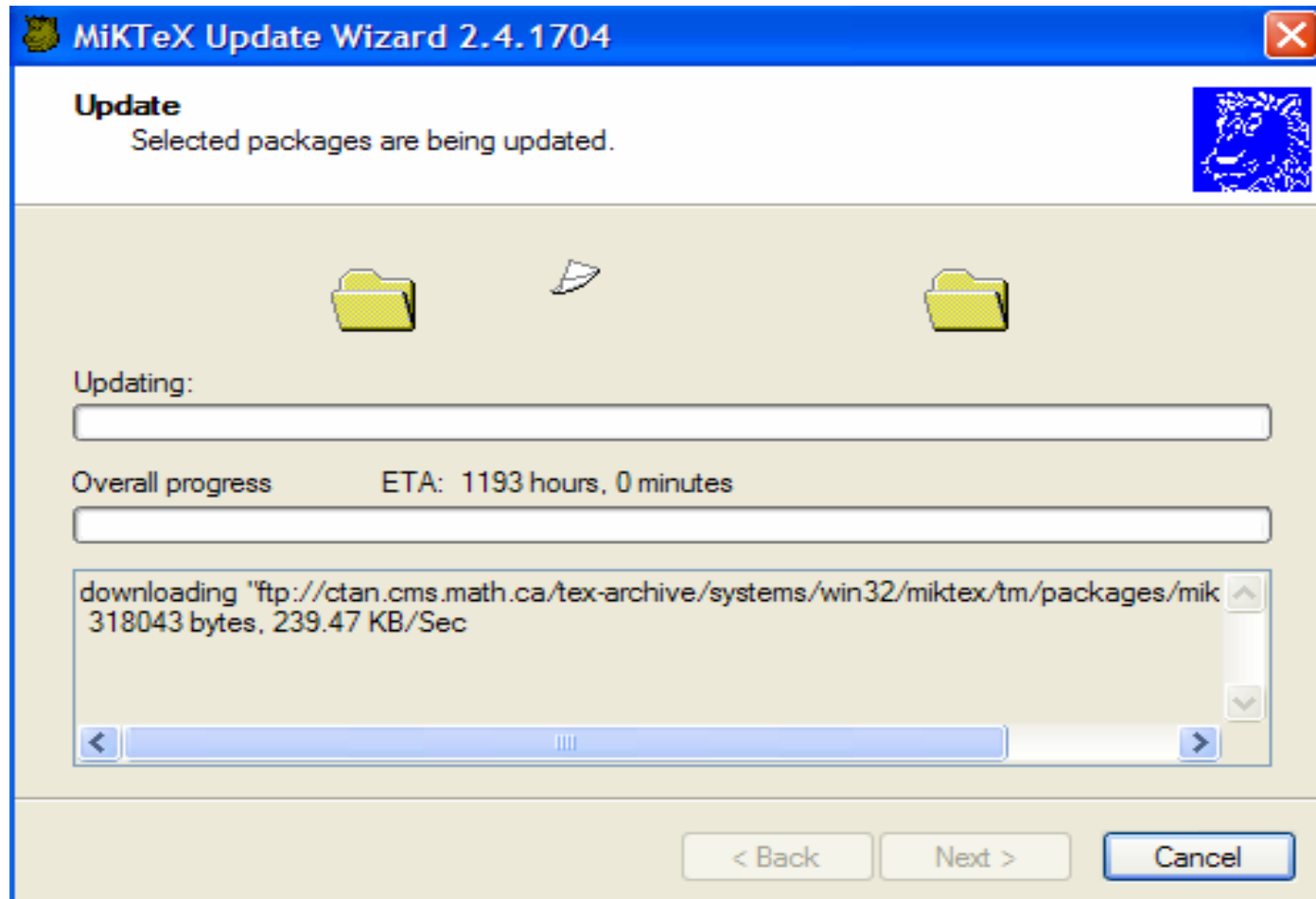
- **LaTeX** - <http://www.itc.virginia.edu/research/latex/>
 - LaTeX is a collection of TeX macros built on top of TeX that allows authors to concentrate more on the content of their files, rather than worrying about the exact formatting characteristics required by their publisher.
- **MiKTeX** - <http://www.miktex.org>
 - Not officially supported by ITC

LaTeX on Unix

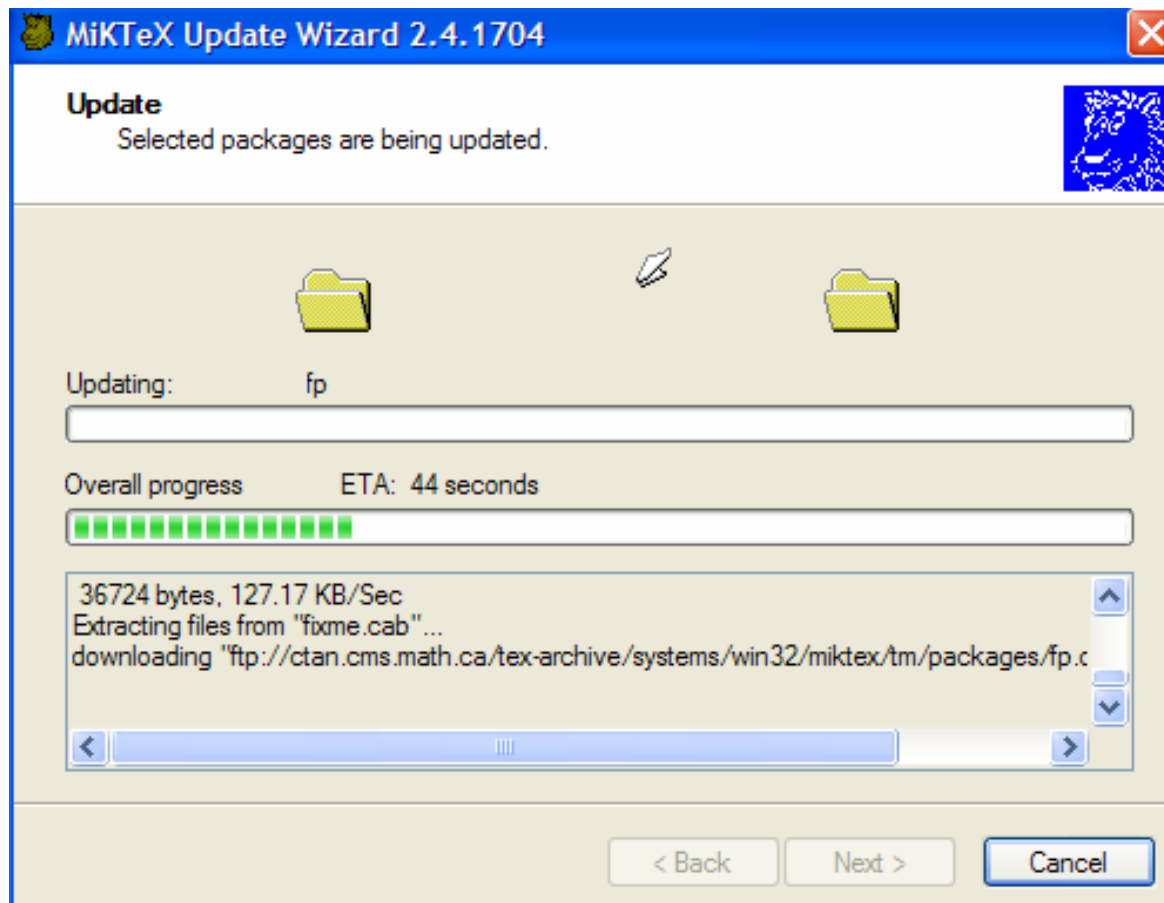
- TeX, version 3.14159 on Unix platforms that ITC supports: Sun Solaris, SGI IRIX (see [ITC's Unix Lab](#)), and IBM AIX (blue.unix).
- Linux - Full TeX system available with most distributions
- Linux on grounds - mount shared drive – <http://www.itc.virginia.edu/desktop/linux/mount.html>

Installing & Updating MiKTeX

Wait a few minutes after this screen appears:



Progress Bar



Update MikTeX

MikTeX Update Wizard 2.4.1704

Update List
Select the packages you wish to update.

The following updates are available. Select the packages you wish to update. Click Next, to start the update process.

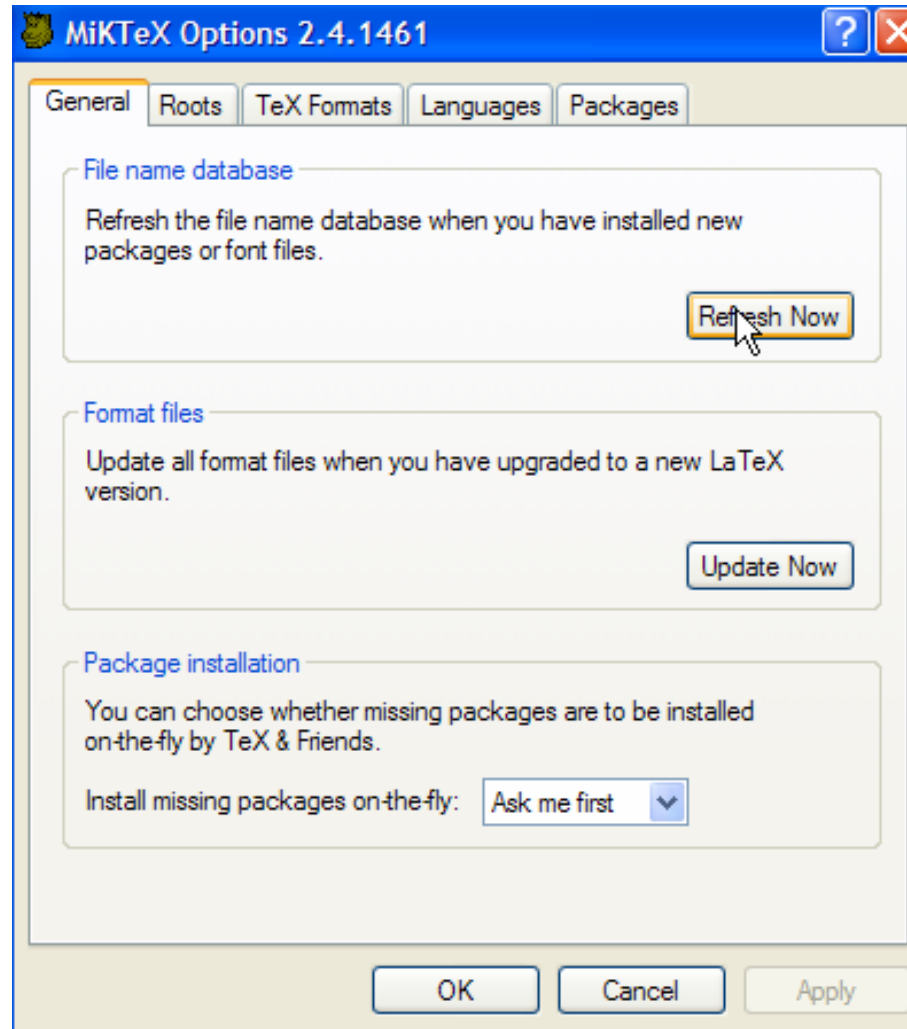
Name	Old	New
<input checked="" type="checkbox"/> algorithm2e	26-Jun-04	13-Feb-05
<input checked="" type="checkbox"/> arrayjob	20-Jan-05	13-Feb-05
<input checked="" type="checkbox"/> ednotes	11-Nov-04	13-Feb-05
<input checked="" type="checkbox"/> esint	16-Jul-04	13-Feb-05
<input checked="" type="checkbox"/> europecv	28-Nov-04	13-Feb-05
<input checked="" type="checkbox"/> evautofl	20-Jan-05	13-Feb-05
<input checked="" type="checkbox"/> evweek	27-Mar-03	13-Feb-05
<input checked="" type="checkbox"/> extract	20-Jan-05	13-Feb-05

Select All Deselect All

< Back Next > Cancel

Refresh the FNDB

after updating and when logging in as another user



A Few Editors and Environments

Editor	OS	URL
Emacs	L,M,U,W	http://www.gnu.org/software/emacs/emacs.html
vi	L,M,U,W	http://www.vim.org/
Nedit	L,U	http://www.nedit.org/
Scientific Word \$\$	W	http://www.mackichan.com/
TeXShop	M	http://www.uoregon.edu/~koch/texshop/texshop.html
WinEdt \$\$	W	http://www.winedt.com/
WinShell	W	http://www.winshell.de/

L – Linux, U – Unix, M – MacIntosh, W - Windows

WinShell Environment

- Multi language support (English, German, French, Spanish, Italian, Polish, Swedish, Czech and Japanese)
- Project file
- Integrated SpellChecker based on ASpell
- Forward and inverse search
- BibTeX entries Projectspace
- Table-Wizard
- One-instance-program
- Multiple documents
- Log- and projectspace
- User defined programs
- Configure Tool Bars (symbols, user-def. programs, macros)
- Define macros
- Choose font
- Unix files can be read
- WinShell starts command line driven
- Syntax highlighting
- Wrap mode
- Drag & Drop

Start WinShell

WinEdt Environment

- Community site - <http://www.winedt.org>

[Start WinEdt](#)

Scientific Word and Related Products

If you need to ▼	Choose ▶	Scientific WorkPlace	Scientific Word	Scientific Notebook	MuPAD Pro
Create mathematical documents		▪	▪	▪	
Typeset your documents		▪	▪		
Publish books or journal articles		▪	▪		
Collaborate with LaTeX users		▪	▪		
Compute symbolically and numerically		▪		▪	▪
Publish on the web		▪	▪	▪	
Develop a mathematical website		▪		▪	
Write exams and course materials		▪		▪	
Program and debug mathematical applications					▪
Teach and study mathematics and science at the undergraduate and secondary school levels				▪	

Mackichan Price List

Visit <http://www.mackichan.com> for current pricing, timed downloadable demos, and additional information on their products.

Maple

- Notes from this talk and associated Maple source (**maple200504.mw** file) will be available online at <http://www.itc.virginia.edu/research/talks>
- Download MapleEssentials.zip from <http://www.maplesoft.com>

Part II of this presentation is in the Maple document,
<http://www.itc.virginia.edu/research/talks/maple200504.mw>

[Start Maple](#)