

EuroT<sub>E</sub>X 2001

# Directions for the T<sub>E</sub>XLive

September 24, 2001

Fabrice Popineau



[Home Page](#)

[Title Page](#)



[Page 1 of 28](#)

[Go Back](#)

[Full Screen](#)

[Close](#)

[Quit](#)



[Home Page](#)

[Title Page](#)



[Page 2 of 28](#)

[Go Back](#)

[Full Screen](#)

[Close](#)

[Quit](#)



**TEXLive, 6th edition:  
Current Status**

# TEXLive: what is it? Where does it come from?



[Home Page](#)

[Title Page](#)



*Page 4 of 28*

[Go Back](#)

[Full Screen](#)

[Close](#)

[Quit](#)

# TEXLive: what is it? Where does it come from?

☞ TEX used to be difficult to install



[Home Page](#)

[Title Page](#)



Page 4 of 28

[Go Back](#)

[Full Screen](#)

[Close](#)

[Quit](#)

# TEXLive: what is it? Where does it come from?

- ☞ TEX used to be difficult to install
- ☞ *Precompiled distributions* like emTEX for dedicated platforms



[Home Page](#)

[Title Page](#)



Page 4 of 28

[Go Back](#)

[Full Screen](#)

[Close](#)

[Quit](#)

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- ☞ *Web2C* for Unix, but portable to Amiga, VMS, DOS, Win32



[Home Page](#)

[Title Page](#)



Page 4 of 28

[Go Back](#)

[Full Screen](#)

[Close](#)

[Quit](#)

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[Home Page](#)

[Title Page](#)



Page 4 of 28

[Go Back](#)

[Full Screen](#)

[Close](#)

[Quit](#)



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- ☞ Great and greater number of TEX macros packages on *CTAN*



[Home Page](#)

[Title Page](#)



[Page 4 of 28](#)

[Go Back](#)

[Full Screen](#)

[Close](#)

[Quit](#)

# T<sub>E</sub>XLive: what is it? Where does it come from?

- ☞ T<sub>E</sub>X used to be difficult to install
- ☞ *Precompiled distributions* like emT<sub>E</sub>X for dedicated platforms
- ☞ *Web2C* for Unix, but portable to Amiga, VMS, DOS, Win32
- ☞ Web2C gave birth to the *teT<sub>E</sub>X* distribution, complete and easy to use and easy to install
- ☞ Great and greater number of T<sub>E</sub>X macros packages on *CTAN*
- ☞ Standardization of the *TDS* (T<sub>E</sub>X Directory Structure)



[Home Page](#)

[Title Page](#)



[Page 4 of 28](#)

[Go Back](#)

[Full Screen](#)

[Close](#)

[Quit](#)

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- ☞ Web2C gave birth to the *teTEX* distribution, complete and easy to use and easy to install
- ☞ Great and greater number of TEX macros packages on *CTAN*
- ☞ Standardization of the *TDS* (TEX Directory Structure)
- ☞ Time to build the first multi-platform, ready-to-use TEX distribution.

[Home Page](#)

[Title Page](#)



[Page 4 of 28](#)

[Go Back](#)

[Full Screen](#)

[Close](#)

[Quit](#)

# The T<sub>E</sub>XLive Project



[Home Page](#)

[Title Page](#)



Page **5** of 28

[Go Back](#)

[Full Screen](#)

[Close](#)

[Quit](#)

# The T<sub>E</sub>XLive Project

☞ First version in 1996, headed by *Sebastian Rahtz* (many thanks to him!)

[Home Page](#)

[Title Page](#)



Page 5 of 28

[Go Back](#)

[Full Screen](#)

[Close](#)

[Quit](#)

# The T<sub>E</sub>XLive Project

- ➡ First version in 1996, headed by *Sebastian Rahtz* (many thanks to him!)
- ➡ T<sub>E</sub>X distributed on a CD-Rom

[Home Page](#)

[Title Page](#)



Page **5** of **28**

[Go Back](#)

[Full Screen](#)

[Close](#)

[Quit](#)

# The T<sub>E</sub>XLive Project

- First version in 1996, headed by *Sebastian Rahtz* (many thanks to him!)
- T<sub>E</sub>X distributed on a CD-Rom
- Directly usable projection of the T<sub>E</sub>X related software available on the CTAN

[Home Page](#)

[Title Page](#)

[◀◀](#) [▶▶](#)

[◀](#) [▶](#)

Page 5 of 28

[Go Back](#)

[Full Screen](#)

[Close](#)

[Quit](#)

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- The T<sub>E</sub>X software is usable without any prior installation and simple to setup if/when convinced

[Home Page](#)

[Title Page](#)



[Page 5 of 28](#)

[Go Back](#)

[Full Screen](#)

[Close](#)

[Quit](#)



# The T<sub>E</sub>XLive Project

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- ➡ Directly usable projection of the T<sub>E</sub>X related software available on the CTAN
- ➡ The T<sub>E</sub>X software is usable without any prior installation and simple to setup if/when convinced
- ➡ How to present the user with all these 40000 files?

Home Page

Title Page



Page 5 of 28

Go Back

Full Screen

Close

Quit



# What's new in the 6th edition?

[Home Page](#)

[Title Page](#)



*Page 6 of 28*

[Go Back](#)

[Full Screen](#)

[Close](#)

[Quit](#)

# What's new in the 6th edition?

👉 New structured description files

[Home Page](#)

[Title Page](#)



Page 6 of 28

[Go Back](#)

[Full Screen](#)

[Close](#)

[Quit](#)

## What's new in the 6th edition?

- 👉 New structured description files
- 👉 New layout for the packages

[Home Page](#)

[Title Page](#)



Page 6 of 28

[Go Back](#)

[Full Screen](#)

[Close](#)

[Quit](#)

## What's new in the 6th edition?

- ➡ New structured description files
- ➡ New layout for the packages
- ➡ New handling of language .dat

[Home Page](#)

[Title Page](#)



Page 6 of 28

[Go Back](#)

[Full Screen](#)

[Close](#)

[Quit](#)

## What's new in the 6th edition?

- ➡ New structured description files
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- ➡ New handling of language .dat
- ➡ New *Welcome* application (Win32)

Home Page

Title Page



Page 6 of 28

Go Back

Full Screen

Close

Quit

## What's new in the 6th edition?

- ➡ New structured description files
- ➡ New layout for the packages
- ➡ New handling of language .dat
- ➡ New *Welcome* application (Win32)
- ➡ All packages up to date

[Home Page](#)

[Title Page](#)



Page 6 of 28

[Go Back](#)

[Full Screen](#)

[Close](#)

[Quit](#)

# The repository



[Home Page](#)

[Title Page](#)



*Page 7 of 28*

[Go Back](#)

[Full Screen](#)

[Close](#)

[Quit](#)



# The repository

👉 CVS-like system : Perforce

[Home Page](#)

[Title Page](#)



Page 7 of 28

[Go Back](#)

[Full Screen](#)

[Close](#)

[Quit](#)

# The repository

➡ CVS-like system : Perforce

➡ <http://www.perforce.co.uk/>

[Home Page](#)

[Title Page](#)



Page 7 of 28

[Go Back](#)

[Full Screen](#)

[Close](#)

[Quit](#)

# The repository

- ➡ CVS-like system : Perforce
- ➡ <http://www.perforce.co.uk/>
- ➡ Clients for Mac, Unix, Win32

[Home Page](#)

[Title Page](#)



[Page 7 of 28](#)

[Go Back](#)

[Full Screen](#)

[Close](#)

[Quit](#)

# The repository

- ➡ CVS-like system : Perforce
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- ➡ Clients for Mac, Unix, Win32
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[Home Page](#)

[Title Page](#)



Page 7 of 28

[Go Back](#)

[Full Screen](#)

[Close](#)

[Quit](#)

# The repository

- ➡ CVS-like system : Perforce
- ➡ <http://www.perforce.co.uk/>
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[Home Page](#)

[Title Page](#)



Page 7 of 28

[Go Back](#)

[Full Screen](#)

[Close](#)

[Quit](#)

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- ➡ <http://www.perforce.co.uk/>
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- ➡ Repository handled by <http://texlive.dante.de>

[Home Page](#)

[Title Page](#)



Page 7 of 28

[Go Back](#)

[Full Screen](#)

[Close](#)

[Quit](#)

# The factory



[Home Page](#)

[Title Page](#)



*Page 8 of 28*

[Go Back](#)

[Full Screen](#)

[Close](#)

[Quit](#)

# The factory

- ➔ The repository machine has access to the Dante CTAN ftp site



[Home Page](#)

[Title Page](#)



*Page 8 of 28*

[Go Back](#)

[Full Screen](#)

[Close](#)

[Quit](#)



# The factory

- ➡ The repository machine has access to the Dante CTAN ftp site
- ➡ Sebastian Rahtz has written some Perl script that will install most of the CTAN  $\text{\TeX}$  packages right to their final location in the repository tree
- ➡ Kaja Christiansen runs the compilations for all architectures but Linux and Win32



[Home Page](#)

[Title Page](#)



[Page 8 of 28](#)

[Go Back](#)

[Full Screen](#)

[Close](#)

[Quit](#)

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[Home Page](#)

[Title Page](#)



Page 8 of 28

[Go Back](#)

[Full Screen](#)

[Close](#)

[Quit](#)

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- ➡ Sebastian Rahtz builds the documentation, ISO images and ensures the consistency



[Home Page](#)

[Title Page](#)



[Page 8 of 28](#)

[Go Back](#)

[Full Screen](#)

[Close](#)

[Quit](#)

# The factory

- The repository machine has access to the Dante CTAN ftp site
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- Kaja Christiansen runs the compilations for all architectures but Linux and Win32
- LUGS contribute to the documentation
- Sebastian Rahtz builds the documentation, ISO images and ensures the consistency
- Intermediate images available from <http://www.tug.org/texlive/tlprod/Images/>



[Home Page](#)

[Title Page](#)



[Page 8 of 28](#)

[Go Back](#)

[Full Screen](#)

[Close](#)

[Quit](#)

# Structured description files



[Home Page](#)

[Title Page](#)



*Page 9 of 28*

[Go Back](#)

[Full Screen](#)

[Close](#)

[Quit](#)

# Structured description files

☞ *TPM* : T<sub>E</sub>X Package Management



[Home Page](#)

[Title Page](#)



Page 9 of 28

[Go Back](#)

[Full Screen](#)

[Close](#)

[Quit](#)

# Structured description files

- ☞ *TPM* : T<sub>E</sub>X Package Management
- ☞ *RDF* format, ie. XML application

[Home Page](#)

[Title Page](#)



Page 9 of 28

[Go Back](#)

[Full Screen](#)

[Close](#)

[Quit](#)

# Structured description files

- ☞ *TPM* : T<sub>E</sub>X Package Management
- ☞ *RDF* format, ie. XML application
- ☞ *RDF* = Resource Description Framework

[Home Page](#)

[Title Page](#)



Page 9 of 28

[Go Back](#)

[Full Screen](#)

[Close](#)

[Quit](#)



# Structured description files

- *TPM* : T<sub>E</sub>X Package Management
- *RDF* format, ie. XML application
- *RDF* = Resource Description Framework
- *RDF* based on the *OAV* model: Object, Attribute, Value

[Home Page](#)

[Title Page](#)

[◀◀](#)

[▶▶](#)

[◀](#)

[▶](#)

Page 9 of 28

[Go Back](#)

[Full Screen](#)

[Close](#)

[Quit](#)

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- 👉 *TPM* : T<sub>E</sub>X Package Management
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- 👉 RDF use for managing software packages: describing information *about* some URL

[Home Page](#)

[Title Page](#)



[Page 9 of 28](#)

[Go Back](#)

[Full Screen](#)

[Close](#)

[Quit](#)

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- ☞ *TPM* : T<sub>E</sub>X Package Management
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- ☞ RDF = Resource Description Framework
- ☞ RDF based on the *OAV* model: Object, Attribute, Value
- ☞ RDF use for managing software packages: describing information *about* some URL
- ☞ Simple use of the RDF formal model, but always good to work with a consistent frame.

[Home Page](#)

[Title Page](#)



[Page 9 of 28](#)

[Go Back](#)

[Full Screen](#)

[Close](#)

[Quit](#)

# New layout for the packages



*Home Page*

*Title Page*



*Page 10 of 28*

*Go Back*

*Full Screen*

*Close*

*Quit*

# New layout for the packages

☞ The whole set has been split in *collections* and *packages*



Home Page

Title Page



Page 10 of 28

Go Back

Full Screen

Close

Quit

# New layout for the packages

- ☞ The whole set has been split in *collections* and *packages*
- ☞ Not a tree data structure, but a *graph* data structure

[Home Page](#)

[Title Page](#)



Page **10** of **28**

[Go Back](#)

[Full Screen](#)

[Close](#)

[Quit](#)

## New layout for the packages

- ➡ The whole set has been split in *collections* and *packages*
- ➡ Not a tree data structure, but a *graph* data structure
- ➡ Almost all of the free  $\text{T}_{\text{E}}\text{X}$  macros available on the CTAN repository

[Home Page](#)

[Title Page](#)



Page 10 of 28

[Go Back](#)

[Full Screen](#)

[Close](#)

[Quit](#)

## New layout for the packages

- The whole set has been split in *collections* and *packages*
- Not a tree data structure, but a *graph* data structure
- Almost all of the free T<sub>E</sub>X macros available on the CTAN repository
- About 240 (a bit more for the Win32 platform) programs and scripts from the Web2C/teT<sub>E</sub>X distribution augmented by bonus programs

[Home Page](#)[Title Page](#)[Page 10 of 28](#)[Go Back](#)[Full Screen](#)[Close](#)[Quit](#)



# New layout for the packages

- The whole set has been split in *collections* and *packages*
- Not a tree data structure, but a *graph* data structure
- Almost all of the free T<sub>E</sub>X macros available on the CTAN repository
- About 240 (a bit more for the Win32 platform) programs and scripts from the Web2C/teT<sub>E</sub>X distribution augmented by bonus programs
- Net result : about 50 collections and 750 packages

Home Page

Title Page

◀◀ ▶▶

◀ ▶

Page 10 of 28

Go Back

Full Screen

Close

Quit

# TPM format



[Home Page](#)

[Title Page](#)

[◀◀](#) [▶▶](#)

[◀](#) [▶](#)

Page 11 of 28

[Go Back](#)

[Full Screen](#)

[Close](#)

[Quit](#)

# TPM format

- ☞ Information about the component itself: name, date, version ...



[Home Page](#)

[Title Page](#)



Page 11 of 28

[Go Back](#)

[Full Screen](#)

[Close](#)

[Quit](#)

# TPM format

- ➡ Information about the component itself: name, date, version ...
- ➡ File lists:



[Home Page](#)

[Title Page](#)



Page 11 of 28

[Go Back](#)

[Full Screen](#)

[Close](#)

[Quit](#)

# TPM format

- ➡ Information about the component itself: name, date, version ...
- ➡ File lists:
  - ➡ bin files: tagged for the target architecture



[Home Page](#)

[Title Page](#)



Page 11 of 28

[Go Back](#)

[Full Screen](#)

[Close](#)

[Quit](#)

# TPM format

- ☞ Information about the component itself: name, date, version ...
- ☞ File lists:
  - ☞ bin files: tagged for the target architecture
  - ☞ run files: used by the  $\text{T}_{\text{E}}\text{X}$  system and architecture independent



[Home Page](#)

[Title Page](#)



Page 11 of 28

[Go Back](#)

[Full Screen](#)

[Close](#)

[Quit](#)

# TPM format

- ➡ Information about the component itself: name, date, version ...
- ➡ File lists:
  - ➡ bin files: tagged for the target architecture
  - ➡ run files: used by the T<sub>E</sub>X system and architecture independent
  - ➡ source files: source files for the macros packages only



[Home Page](#)

[Title Page](#)



Page 11 of 28

[Go Back](#)

[Full Screen](#)

[Close](#)

[Quit](#)

# TPM format

- ➡ Information about the component itself: name, date, version ...
- ➡ File lists:
  - ➡ bin files: tagged for the target architecture
  - ➡ run files: used by the T<sub>E</sub>X system and architecture independent
  - ➡ source files: source files for the macros packages only
  - ➡ doc files: documentation files accompanying the component



[Home Page](#)

[Title Page](#)



Page 11 of 28

[Go Back](#)

[Full Screen](#)

[Close](#)

[Quit](#)



# TPM format

- ➡ Information about the component itself: name, date, version ...
- ➡ File lists:
  - ➡ bin files: tagged for the target architecture
  - ➡ run files: used by the T<sub>E</sub>X system and architecture independent
  - ➡ source files: source files for the macros packages only
  - ➡ doc files: documentation files accompanying the component
  - ➡ remote files: non free files (Win32 only)



[Home Page](#)

[Title Page](#)



Page 11 of 28

[Go Back](#)

[Full Screen](#)

[Close](#)

[Quit](#)



# Package management system

[Home Page](#)

[Title Page](#)



Page *12* of *28*

[Go Back](#)

[Full Screen](#)

[Close](#)

[Quit](#)

# Package management system

☞ Features:

☞ Installation: install the files for the first time

[Home Page](#)

[Title Page](#)



Page 12 of 28

[Go Back](#)

[Full Screen](#)

[Close](#)

[Quit](#)

# Package management system

## 👉 Features:

- 👉 Installation: install the files for the first time
- 👉 Maintenance: add or upgrade (or remove?) components

Home Page

Title Page



Page 12 of 28

Go Back

Full Screen

Close

Quit

# Package management system

## ☞ Features:

- ☞ Installation: install the files for the first time
- ☞ Maintenance: add or upgrade (or remove?) components
- ☞ Removal: remove everything
- ☞ Consistency needed, but enforcing it can be tricky

Home Page

Title Page

◀◀ ▶▶

◀ ▶

Page 12 of 28

Go Back

Full Screen

Close

Quit



[Home Page](#)

[Title Page](#)



Page 13 of 28

[Go Back](#)

[Full Screen](#)

[Close](#)

[Quit](#)



# TEXLive: How to go further?

[Home Page](#)

[Title Page](#)



Page 14 of 28

[Go Back](#)

[Full Screen](#)

[Close](#)

[Quit](#)



[Home Page](#)

[Title Page](#)



[Page 15 of 28](#)

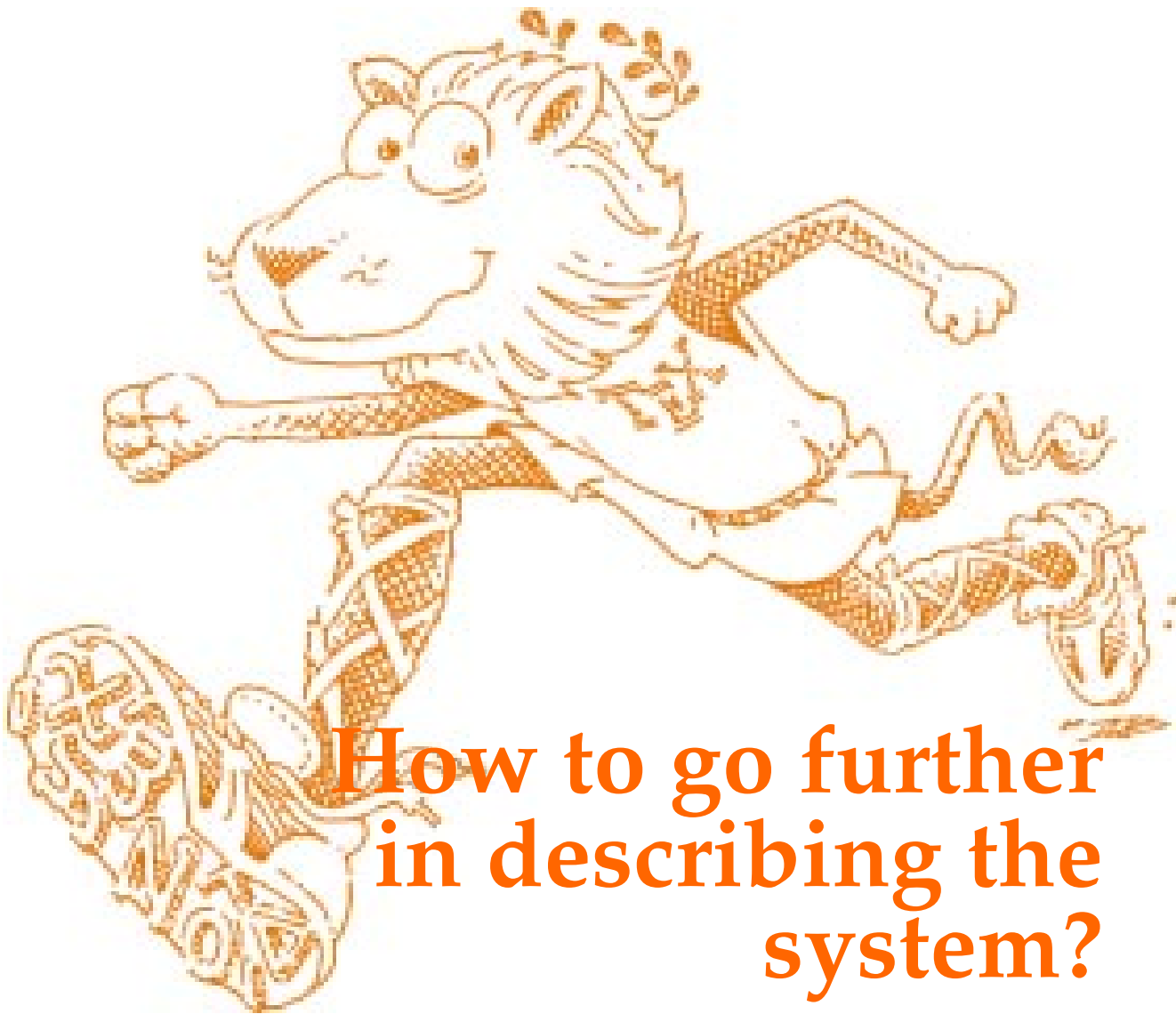
[Go Back](#)

[Full Screen](#)

[Close](#)

[Quit](#)





How to go further  
in describing the  
system?

[Home Page](#)

[Title Page](#)



Page 16 of 28

[Go Back](#)

[Full Screen](#)

[Close](#)

[Quit](#)

# Better description of the system



[Home Page](#)

[Title Page](#)



Page **17** of **28**

[Go Back](#)

[Full Screen](#)

[Close](#)

[Quit](#)

# Better description of the system

- ☞ Collections should not hold files, only require other collections or packages



*Home Page*

*Title Page*



*Page 17 of 28*

*Go Back*

*Full Screen*

*Close*

*Quit*

# Better description of the system

- ☞ Collections should not hold files, only require other collections or packages
- ☞ Binaries should be made a separate list of packages and dependencies between binaries introduced



[Home Page](#)

[Title Page](#)



Page 17 of 28

[Go Back](#)

[Full Screen](#)

[Close](#)

[Quit](#)

# Better description of the system

- ☞ Collections should not hold files, only require other collections or packages
- ☞ Binaries should be made a separate list of packages and dependencies between binaries introduced
- ☞ Problem with run-files, doc-files and source-files



[Home Page](#)

[Title Page](#)



Page 17 of 28

[Go Back](#)

[Full Screen](#)

[Close](#)

[Quit](#)

# Better description of the system

- Collections should not hold files, only require other collections or packages
- Binaries should be made a separate list of packages and dependencies between binaries introduced
- Problem with run-files, doc-files and source-files
- More general problem of maintaining descriptions: at least 3 sources:



[Home Page](#)

[Title Page](#)



Page **17** of **28**

[Go Back](#)

[Full Screen](#)

[Close](#)

[Quit](#)

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- ☞ Collections should not hold files, only require other collections or packages
- ☞ Binaries should be made a separate list of packages and dependencies between binaries introduced
- ☞ Problem with run-files, doc-files and source-files
- ☞ More general problem of maintaining descriptions: at least 3 sources:
  - ☞ .tpm files



[Home Page](#)

[Title Page](#)



Page 17 of 28

[Go Back](#)

[Full Screen](#)

[Close](#)

[Quit](#)

# Better description of the system



- Collections should not hold files, only require other collections or packages
- Binaries should be made a separate list of packages and dependencies between binaries introduced
- Problem with run-files, doc-files and source-files
- More general problem of maintaining descriptions: at least 3 sources:
  - .tpm files
  - Graham Williams Catalogue

[Home Page](#)

[Title Page](#)



Page 17 of 28

[Go Back](#)

[Full Screen](#)

[Close](#)

[Quit](#)



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- Collections should not hold files, only require other collections or packages
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- Problem with run-files, doc-files and source-files
- More general problem of maintaining descriptions: at least 3 sources:
  - .tpm files
  - Graham Williams Catalogue
  - texdoctk database



[Home Page](#)

[Title Page](#)



Page 17 of 28

[Go Back](#)

[Full Screen](#)

[Close](#)

[Quit](#)

# Better description of the system

- Collections should not hold files, only require other collections or packages
  - Binaries should be made a separate list of packages and dependencies between binaries introduced
  - Problem with run-files, doc-files and source-files
  - More general problem of maintaining descriptions: at least 3 sources:
    - .tpm files
    - Graham Williams Catalogue
    - texdoctk database
- Something needs to be done there!



[Home Page](#)

[Title Page](#)



Page 17 of 28

[Go Back](#)

[Full Screen](#)

[Close](#)

[Quit](#)

# Remaining problems with the setup system



*Home Page*

*Title Page*



*Page 18 of 28*

*Go Back*

*Full Screen*

*Close*

*Quit*

# Remaining problems with the setup system

☞ Configuration files: solved for language.dat ...



[Home Page](#)

[Title Page](#)



Page 18 of 28

[Go Back](#)

[Full Screen](#)

[Close](#)

[Quit](#)

# Remaining problems with the setup system

- ➡ Configuration files: solved for `language.dat` ...
- ➡ but what for the others: `fmtutil.cnf`, `config.ps`, `pdftex.cfg`?



[Home Page](#)

[Title Page](#)



Page 18 of 28

[Go Back](#)

[Full Screen](#)

[Close](#)

[Quit](#)

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[Home Page](#)

[Title Page](#)



Page 18 of 28

[Go Back](#)

[Full Screen](#)

[Close](#)

[Quit](#)

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[Home Page](#)

[Title Page](#)



Page 18 of 28

[Go Back](#)

[Full Screen](#)

[Close](#)

[Quit](#)

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[Home Page](#)

[Title Page](#)



Page 18 of 28

[Go Back](#)

[Full Screen](#)

[Close](#)

[Quit](#)



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[Home Page](#)

[Title Page](#)



Page 18 of 28

[Go Back](#)

[Full Screen](#)

[Close](#)

[Quit](#)

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[Home Page](#)

[Title Page](#)



Page 18 of 28

[Go Back](#)

[Full Screen](#)

[Close](#)

[Quit](#)

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[Home Page](#)

[Title Page](#)



Page 18 of 28

[Go Back](#)

[Full Screen](#)

[Close](#)

[Quit](#)

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  - ➡ TPM files could hold part of the installation instructions



[Home Page](#)

[Title Page](#)



Page 18 of 28

[Go Back](#)

[Full Screen](#)

[Close](#)

[Quit](#)

# Layout of the packages



*Home Page*

*Title Page*



*Page 19 of 28*

*Go Back*

*Full Screen*

*Close*

*Quit*

# Layout of the packages

☞ More granularity is needed



*Home Page*

*Title Page*



*Page 19 of 28*

*Go Back*

*Full Screen*

*Close*

*Quit*

# Layout of the packages

- More granularity is needed
- Example: langgreek collection has 5 different setups for the Greek language ... which one is best?

*Home Page*

*Title Page*



*Page 19 of 28*

*Go Back*

*Full Screen*

*Close*

*Quit*

# Layout of the packages

- More granularity is needed
- Example: langgreek collection has 5 different setups for the Greek language ... which one is best?
- Far too many packages, maybe some selection is needed

[Home Page](#)

[Title Page](#)

[◀◀](#) [▶▶](#)

[◀](#) [▶](#)

Page 19 of 28

[Go Back](#)

[Full Screen](#)

[Close](#)

[Quit](#)



# Layout of the packages

- ➡ More granularity is needed
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- ➡ Different schemes should be offered: ConT $\text{T}\text{E}\text{X}$ t users, basic L $\text{A}\text{T}\text{E}\text{X}$  users ...

[Home Page](#)

[Title Page](#)



Page 19 of 28

[Go Back](#)

[Full Screen](#)

[Close](#)

[Quit](#)

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- ➡ Example: langgreek collection has 5 different setups for the Greek language ... which one is best?
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- ➡ Different schemes should be offered: ConT $\text{T}_{\text{E}}\text{X}$ t users, basic L $\text{A}\text{T}_{\text{E}}\text{X}$  users ...
- ➡ We need small and simple T $\text{E}\text{X}$  distributions to make T $\text{E}\text{X}$  more popular.

[Home Page](#)

[Title Page](#)

[◀](#) [▶](#)

[◀](#) [▶](#)

Page 19 of 28

[Go Back](#)

[Full Screen](#)

[Close](#)

[Quit](#)



TEXLive: what do we miss ?

[Home Page](#)

[Title Page](#)



Page 20 of 28

[Go Back](#)

[Full Screen](#)

[Close](#)

[Quit](#)

# TEXLive: what do we miss ?

☞ More testers ! Thanks to the people currently involved,  
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[Home Page](#)

[Title Page](#)



Page 20 of 28

[Go Back](#)

[Full Screen](#)

[Close](#)

[Quit](#)

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[Home Page](#)

[Title Page](#)



Page 20 of 28

[Go Back](#)

[Full Screen](#)

[Close](#)

[Quit](#)

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[Home Page](#)

[Title Page](#)



Page 20 of 28

[Go Back](#)

[Full Screen](#)

[Close](#)

[Quit](#)

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- ➡ People who want to write better documentation

[Home Page](#)

[Title Page](#)



Page 20 of 28

[Go Back](#)

[Full Screen](#)

[Close](#)

[Quit](#)



[Home Page](#)

[Title Page](#)



[Page 21 of 28](#)

[Go Back](#)

[Full Screen](#)

[Close](#)

[Quit](#)





How to go further:  
at the heart of the  
system.



# Unforeseen usage of Web2C

[Home Page](#)

[Title Page](#)



Page **23** of **28**

[Go Back](#)

[Full Screen](#)

[Close](#)

[Quit](#)

# Unforeseen usage of Web2C

☞ `\write18` primitive largely used

[Home Page](#)

[Title Page](#)



Page **23** of 28

[Go Back](#)

[Full Screen](#)

[Close](#)

[Quit](#)

## Unforeseen usage of Web2C

- 👉 `\write18` primitive largely used
- 👉 Overhead in calling chains of Kpathsea linked programs: the library is initialized several times

[Home Page](#)

[Title Page](#)



Page 23 of 28

[Go Back](#)

[Full Screen](#)

[Close](#)

[Quit](#)

## Unforeseen usage of Web2C

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Home Page

Title Page



Page 23 of 28

Go Back

Full Screen

Close

Quit

## Unforeseen usage of Web2C

- ☞ `\write18` primitive largely used
- ☞ Overhead in calling chains of Kpathsea linked programs: the library is initialized several times
- ☞ Situation even worse under NT/Win2K
- ☞ An experiment has been made: sharing these data structures decreased the run time.

[Home Page](#)

[Title Page](#)



Page 23 of 28

[Go Back](#)

[Full Screen](#)

[Close](#)

[Quit](#)

# Kpathsea and remote files



[Home Page](#)

[Title Page](#)



Page **24** of 28

[Go Back](#)

[Full Screen](#)

[Close](#)

[Quit](#)

# Kpathsea and remote files

- 👉 Kpathsea implements a common interface to *paths* across different platforms



[Home Page](#)

[Title Page](#)



Page 24 of 28

[Go Back](#)

[Full Screen](#)

[Close](#)

[Quit](#)



# Kpathsea and remote files

- ☞ Kpathsea implements a common interface to *paths* across different platforms
- ☞ URLs are only a new kind of *paths*



Home Page

Title Page



Page 24 of 28

Go Back

Full Screen

Close

Quit

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- ➡ Kpathsea implements a common interface to *paths* across different platforms
- ➡ URLs are only a new kind of *paths*
- ➡ We could imagine this kind of syntax:

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\RequirePackage{tds:graphics.sty}
```

```
...
```

```
\font\foo=http://www.font.net/foo/bar/x
```



[Home Page](#)

[Title Page](#)



Page 24 of 28

[Go Back](#)

[Full Screen](#)

[Close](#)

[Quit](#)

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Home Page

Title Page



Page 24 of 28

Go Back

Full Screen

Close

Quit

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Home Page

Title Page



Page 24 of 28

Go Back

Full Screen

Close

Quit

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  - ☞ Caching file system LRU based
  - ☞ Turn Kpathsea itself into a server?



Home Page

Title Page



Page 24 of 28

Go Back

Full Screen

Close

Quit



# Other extensions

[Home Page](#)

[Title Page](#)



*Page 25 of 28*

[Go Back](#)

[Full Screen](#)

[Close](#)

[Quit](#)

## Other extensions

- ➡ Dynamic memory allocation
  - ➡ Format files need to be rebuild when arrays are enlarged

[Home Page](#)

[Title Page](#)



Page 25 of 28

[Go Back](#)

[Full Screen](#)

[Close](#)

[Quit](#)

## Other extensions

### ☞ Dynamic memory allocation

- ☞ Format files need to be rebuild when arrays are enlarged
- ☞ Nothing to warn users in the documents typeset using an enlarged engine

[Home Page](#)

[Title Page](#)



Page 25 of 28

[Go Back](#)

[Full Screen](#)

[Close](#)

[Quit](#)



## Other extensions

### ☞ Dynamic memory allocation

- ☞ Format files need to be rebuild when arrays are enlarged
- ☞ Nothing to warn users in the documents typeset using an enlarged engine
- ☞ Not all arrays in the source code has been made extensible!

[Home Page](#)

[Title Page](#)

[◀](#) [▶](#)

[◀](#) [▶](#)

Page 25 of 28

[Go Back](#)

[Full Screen](#)

[Close](#)

[Quit](#)

# Other extensions



[Home Page](#)

[Title Page](#)



Page **26** of **28**

[Go Back](#)

[Full Screen](#)

[Close](#)

[Quit](#)

# Other extensions

☞ Simplify Kpathsea:

☞ It should be simpler for Kpathsea to put files in the TDS tree



[Home Page](#)

[Title Page](#)



Page 26 of 28

[Go Back](#)

[Full Screen](#)

[Close](#)

[Quit](#)

# Other extensions

## ☞ Simplify Kpathsea:

- ☞ It should be simpler for Kpathsea to put files in the TDS tree
- ☞ OK to keep a user defined procedure to place the files but ...



[Home Page](#)

[Title Page](#)



Page 26 of 28

[Go Back](#)

[Full Screen](#)

[Close](#)

[Quit](#)

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- ☞ It should be simpler for Kpathsea to put files in the TDS tree
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[Home Page](#)

[Title Page](#)



Page 26 of 28

[Go Back](#)

[Full Screen](#)

[Close](#)

[Quit](#)

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Home Page

Title Page

◀▶

◀▶

Page 26 of 28

Go Back

Full Screen

Close

Quit

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☞

Home Page

Title Page

◀▶

◀▶

Page 26 of 28

Go Back

Full Screen

Close

Quit

# Core code considerations



[Home Page](#)

[Title Page](#)



Page **27** of **28**

[Go Back](#)

[Full Screen](#)

[Close](#)

[Quit](#)



# Core code considerations

- ☞ Sharing and reusing code: various routines duplicated
  - ☞ basic ones, like reading a line in a text file



[Home Page](#)

[Title Page](#)



Page 27 of 28

[Go Back](#)

[Full Screen](#)

[Close](#)

[Quit](#)

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- ➡ Sharing and reusing code: various routines duplicated
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  - ➡ higher ones like reading a DVI file



[Home Page](#)

[Title Page](#)



Page 27 of 28

[Go Back](#)

[Full Screen](#)

[Close](#)

[Quit](#)

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[Home Page](#)

[Title Page](#)



Page 27 of 28

[Go Back](#)

[Full Screen](#)

[Close](#)

[Quit](#)

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  - ☞ We need an integrated system to make T<sub>E</sub>X more popular



[Home Page](#)

[Title Page](#)



Page 27 of 28

[Go Back](#)

[Full Screen](#)

[Close](#)

[Quit](#)

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[Home Page](#)

[Title Page](#)



Page 27 of 28

[Go Back](#)

[Full Screen](#)

[Close](#)

[Quit](#)

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  - ➡ (X)Emacs as a shell
  - ➡ T<sub>E</sub>X might need to share some of its data to achieve better effect.

[Home Page](#)

[Title Page](#)



Page 27 of 28

[Go Back](#)

[Full Screen](#)

[Close](#)

[Quit](#)



# Conclusion

[Home Page](#)

[Title Page](#)



*Page 28 of 28*

[Go Back](#)

[Full Screen](#)

[Close](#)

[Quit](#)

# Conclusion

☞ Things have become smoother over the years

[Home Page](#)

[Title Page](#)



Page **28** of **28**

[Go Back](#)

[Full Screen](#)

[Close](#)

[Quit](#)



## Conclusion

- 👉 Things have become smoother over the years
- 👉 but (free) T<sub>E</sub>X is not yet up to the current standards of the plug-and-play software

[Home Page](#)

[Title Page](#)



Page 28 of 28

[Go Back](#)

[Full Screen](#)

[Close](#)

[Quit](#)

## Conclusion

- ☞ Things have become smoother over the years
- ☞ but (free) T<sub>E</sub>X is not yet up to the current standards of the plug-and-play software
- ☞ Any new T<sub>E</sub>X project (NTS?) should take these issues into serious consideration.

[Home Page](#)

[Title Page](#)



Page 28 of 28

[Go Back](#)

[Full Screen](#)

[Close](#)

[Quit](#)