Security improvements in TEX Live

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BachoTEX 2016

Overview

- status up to (and including) 2015
- possible attack vectors
- integrity and authenticity
- verification architecture
- (non-)distributing GnuGP (and alternatives)
- Problems
- user experience
- further improvements

Status up to 2015

- container checksum (md5) is available in the tlpdb

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name 12many
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containersize 2100
containermd5 .....
doccontainersize 375404
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- but ...

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  not for `tlmgr update` nor for normal installation!

Do we need better security?

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Verification of checksums (md5)
In `tlcritical` since a few month, but not pushed out

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No counter measures by now!

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Cryptographic signatures

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↓

`tlmgr` verifies authenticity of the `tlpdb`

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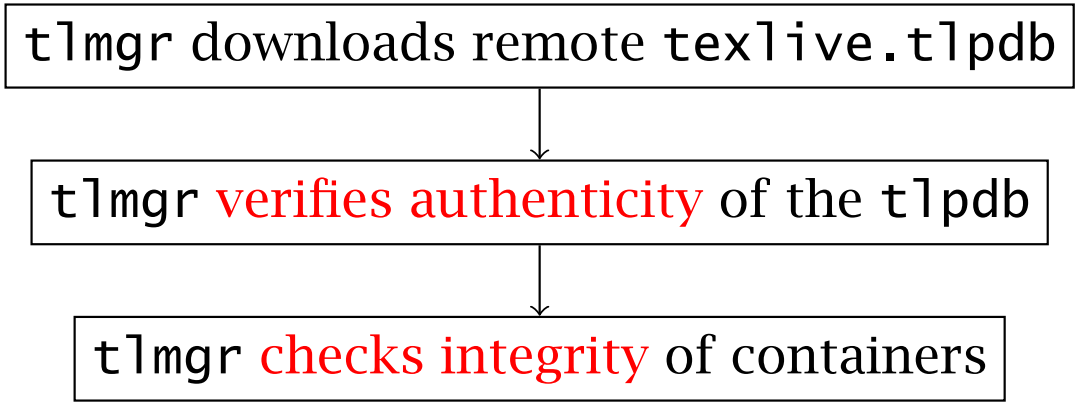

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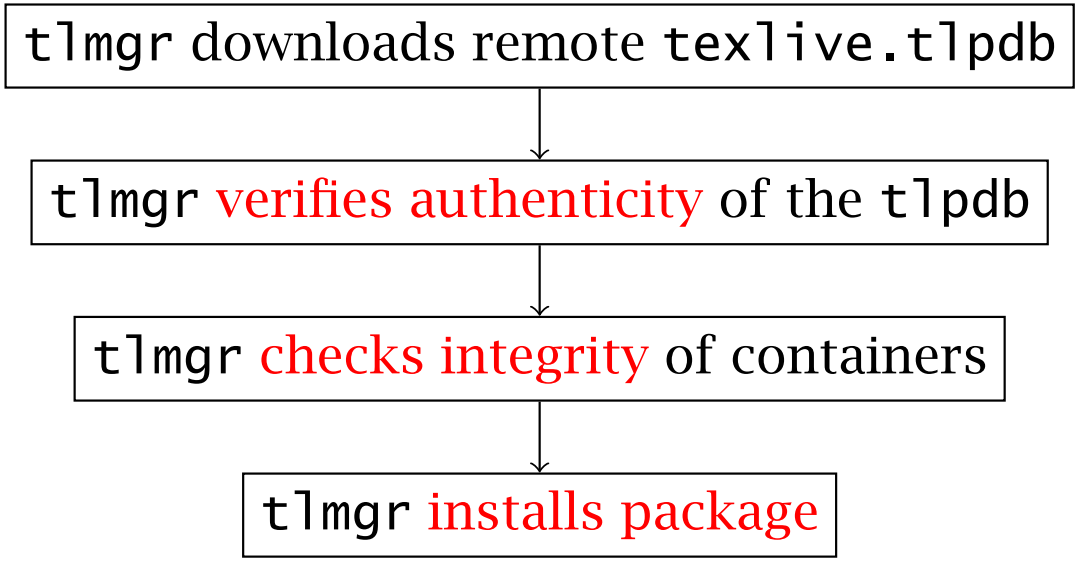

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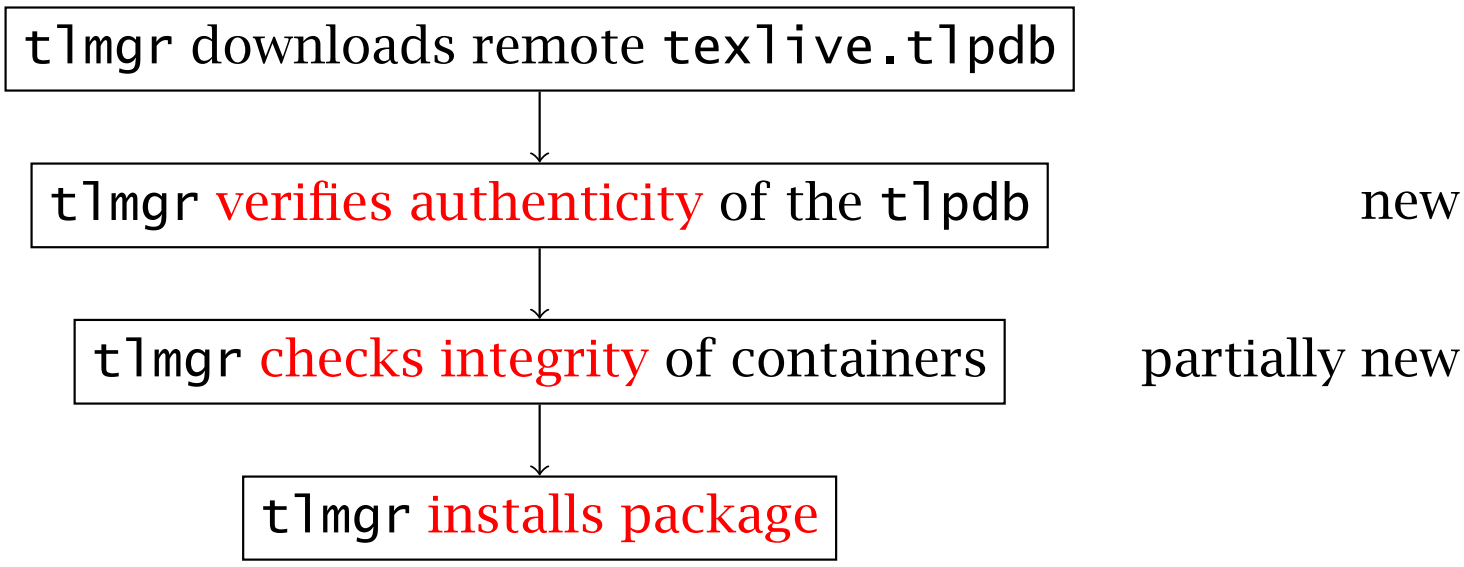

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texlive.tlpdb

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containerchecksum ...
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⟶

texlive.tlpdb.sha512

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<128 hex digits> texlive.tlpdb
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→

texlive.tlpdb.sha512

```
<128 hex digits> texlive.tlpdb
```

↓

texlive.tlpdb.sha512.asc

```
--BEGIN PGP SIGNATURE--

iQEVAwUBVyAV9kzhh3...
r2mB9xEnR4o2SRBDNI...
...
--END PGP SIGNATURE--
```

Signing key

```
pub   2048R/06BAB6BC 2016-03-19
  Key fingerprint = C78B 82D8 C795 12F7 9CC0  D7C8 0D5E 5D91 06BA B6BC
uid        TeX Live Distribution <tex-live@tug.org>
sig 3   06BAB6BC 2016-03-19  TeX Live Distribution <tex-live@tug.org>
sig 3   06BAB6BC 2016-03-19  TeX Live Distribution <tex-live@tug.org>
sig     860CDC13 2016-03-20  Norbert Preining <norbert@preining.info>
sig     30D155AD 2016-03-20  Karl Berry <karl@freefriends.org>
```

- signed by Karl and my key (mine is also in the Debian keyring)
- actual signing subkey is used, main key is offline
  (in case of breach of TUG server we can revoke the sub-key)

Verification of authenticity II

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Why SHA512?

- currently considered uncompromisable (in contrast to MD5)
- will hopefully hold for several years
  (other options SHA256 etc)

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- We actually check also the size (might delete that one!)

(Non-)distributing of GnuPG

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- We don't want to support (and compile it)
  (but could go into private space like `xz` and `wget`!)
- Export and import restrictions, Waasenaar Agreement
  Export might be ok nowadays, but there are many counries the strictly forbid *import* of cryptographic software (India, France is a bit unclear, …)
  TUG does not want to get involved in legal battles (not funny) when sending DVDs to India or other countries.

Alternative for TEX Live

```
tlmgr -repository http://www.preining.info/tlgpg/
                  install tlgpg
```

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                  install tlgpg
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- installs binaries into `tlpkg/installer/gpg/`
- GnuPG binaries for Windows and Mac (both archs)
- already supported by TLU on Mac
- most big distributions have GnuPG (1 or 2) installed (both fine)
- the TEX Live infrastructure already checks for the above location
- not affiliated with TUG (smile)
- maybe could be hosted at DANTE or some other server?

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Users' complains

reduce visibility of warnings/information shown,
try to provide a unspectacular introduction of the feature

User experience – changes in the interface

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```
[~] tlmgr update --list --repository http://localhost/tlpretest/
tlmgr: package repository http://localhost/tlpretest/ (verified)
...
```

User experience – changes in the interface

Aim: nearly no user visible change

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[~] tlmgr update --list --repository http://localhost/tlpretest/
tlmgr: package repository http://localhost/tlpretest/ (verified)
...
```

If not GnuPG is found the output is:

```
[~] tlmgr update --list --repository http://localhost/tlpretest/
tlmgr: package repository http://localhost/tlpretest/ (not verified)
...
```

Similar for multiple repositories

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- handling of alternative repositories – key management
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Thanks for your attention