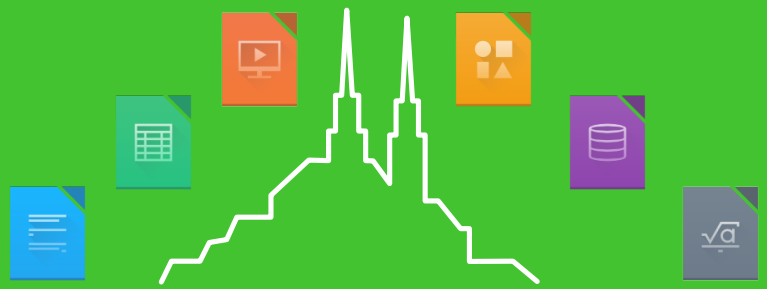
BRNO 2016
CONFERENCE



User-specific Configuration Management for Office Extensions

Florian Haftmann, it@M
(City of Munich)

LibreOffice

LibreOffice and Linux in the Municipality of Munich

- Municipality of Munich runs with an Ubuntu-based Linux system on 18.000 machines with 33.000 users
- …with leading office platform being LibreOffice 4.1
  - transition to LibreOffice 5.0 planned

Migration in the 2000ies

Migration in the 2000ies

- Free software desktop
- Automated software deployment
- Configuration management
- Admin training
- User training
- ...

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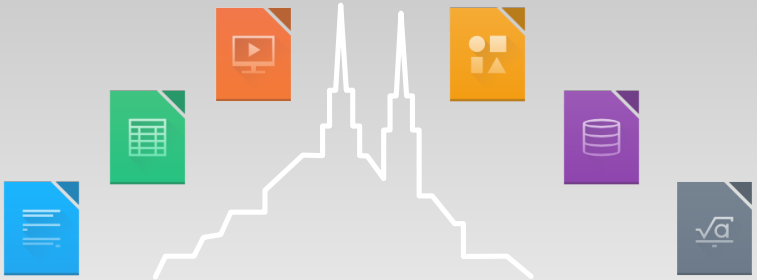
desktop migration

office migration

Migration in the 2000ies



- Free software desktop
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- Free office suite
- Letter head system (WollMux)
- Artefact consolidation
- User training
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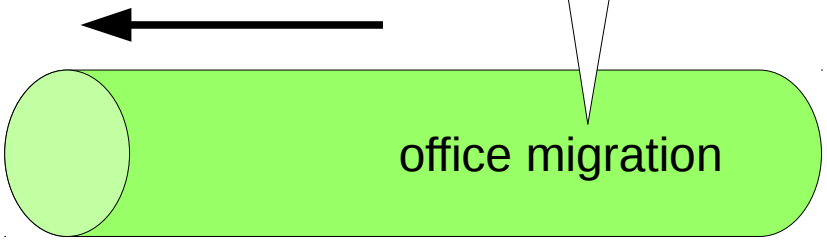

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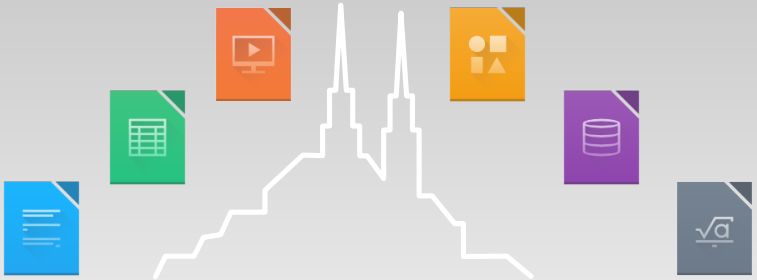

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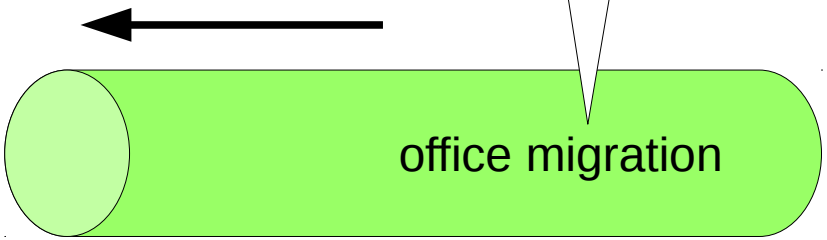

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desktop migration

2012
migration achieved

office migration

Migration in the 2000ies

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well, almost…

desktop migration

2012
migration achieved

office migration

Key benefits of desktop migration

- Free software desktop
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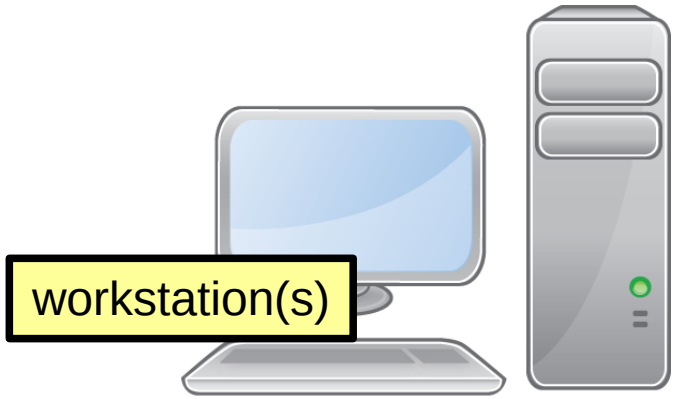
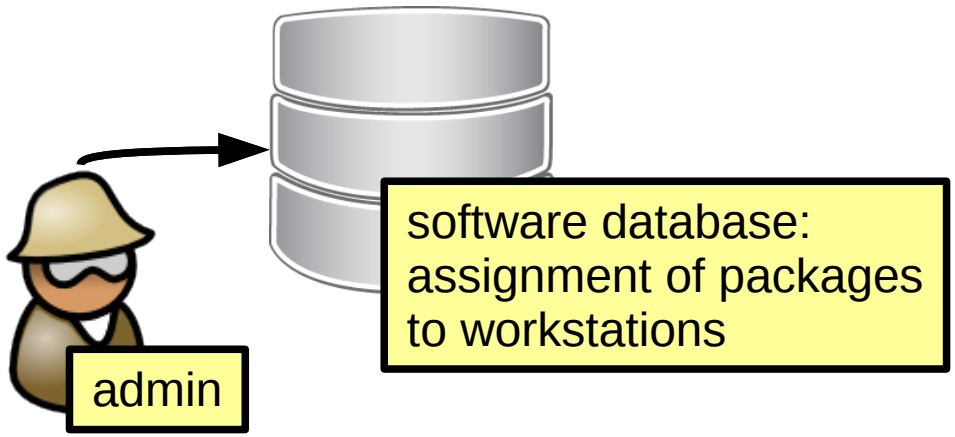
- ...

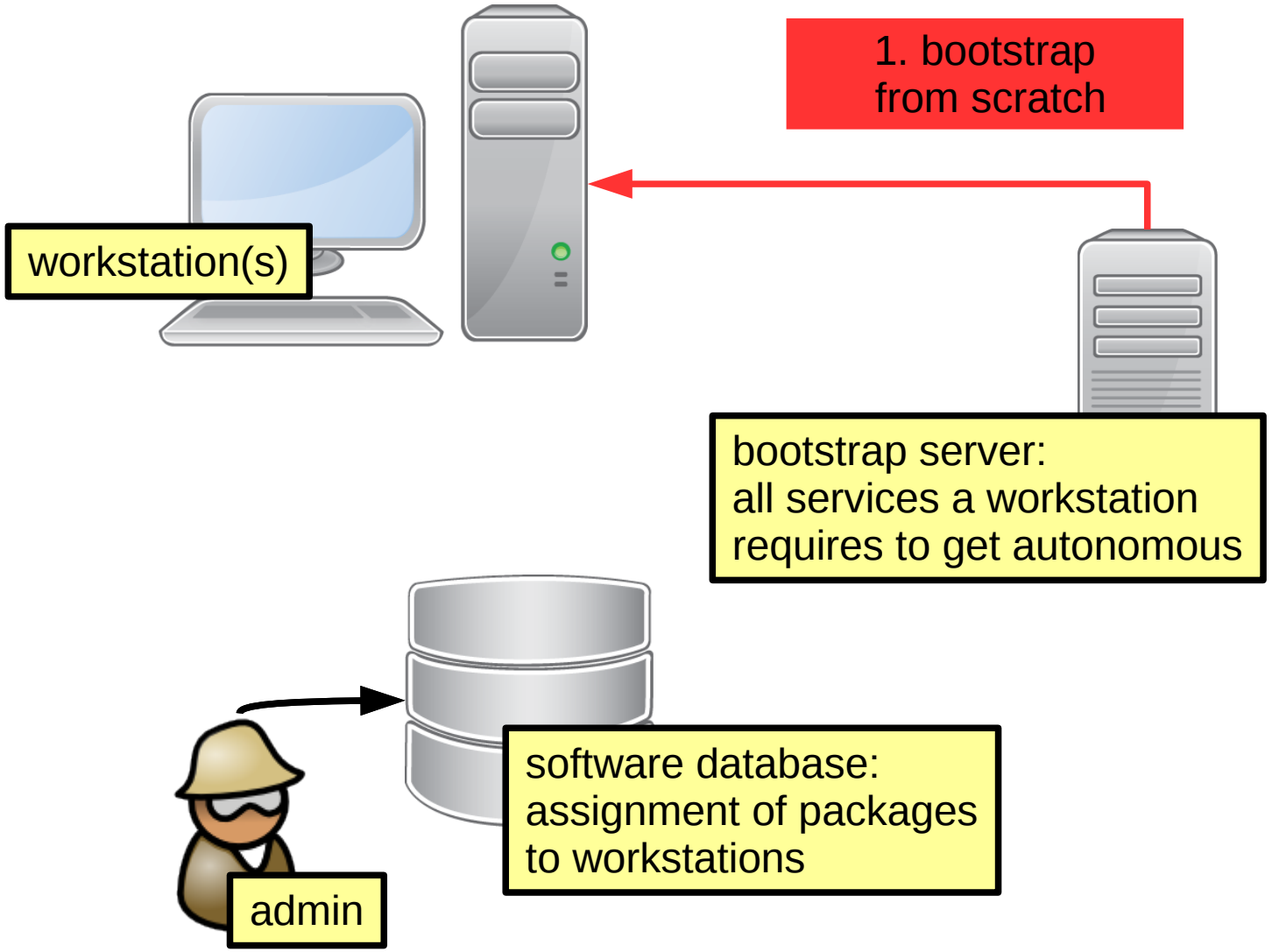
desktop migration | 2012 migration achieved | office migration

Software deployment





Software deployment



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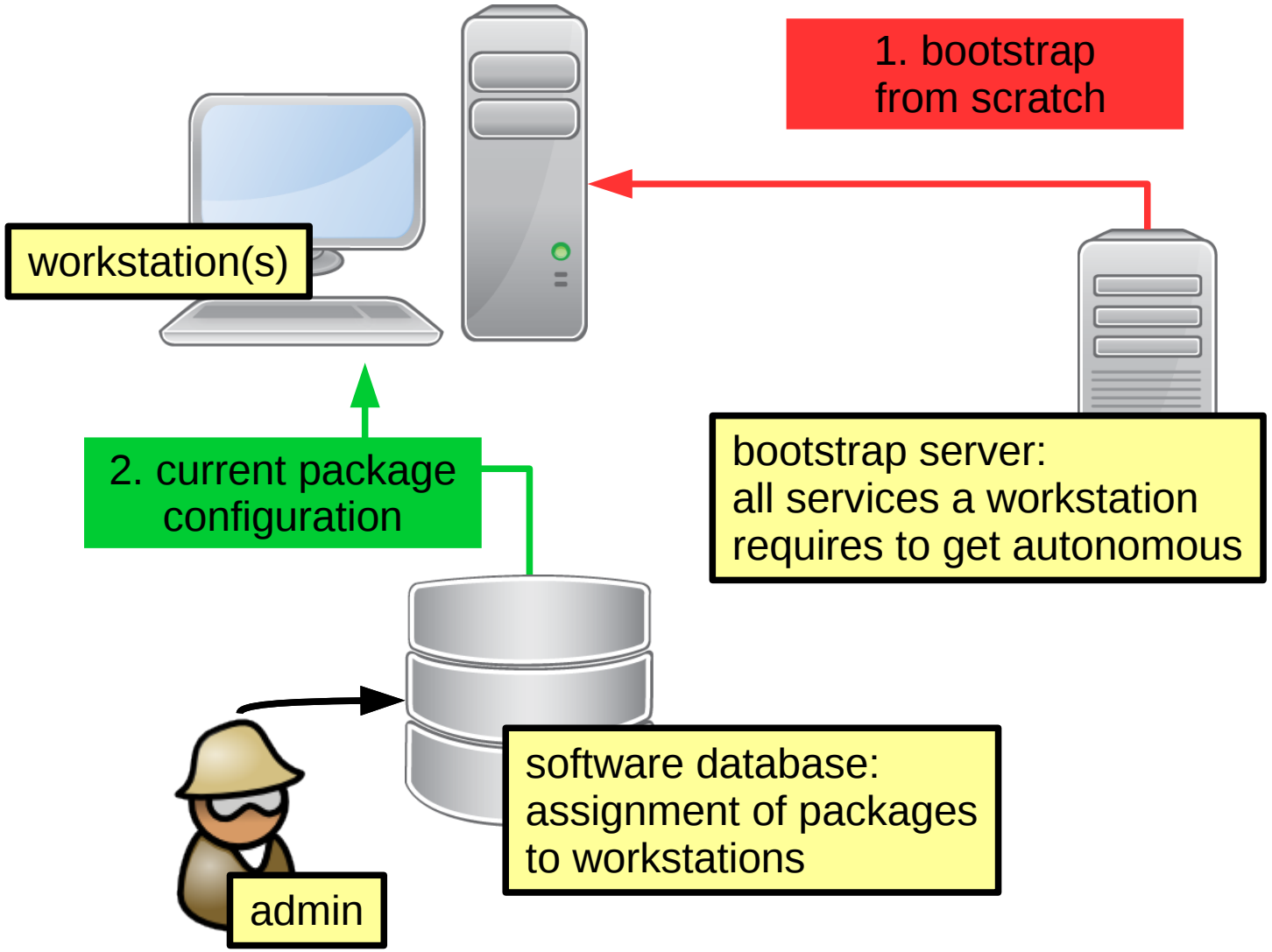

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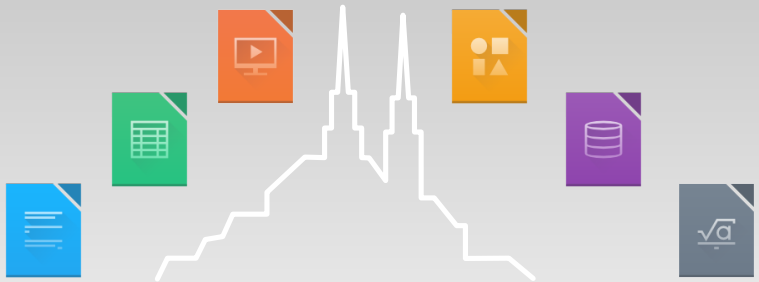
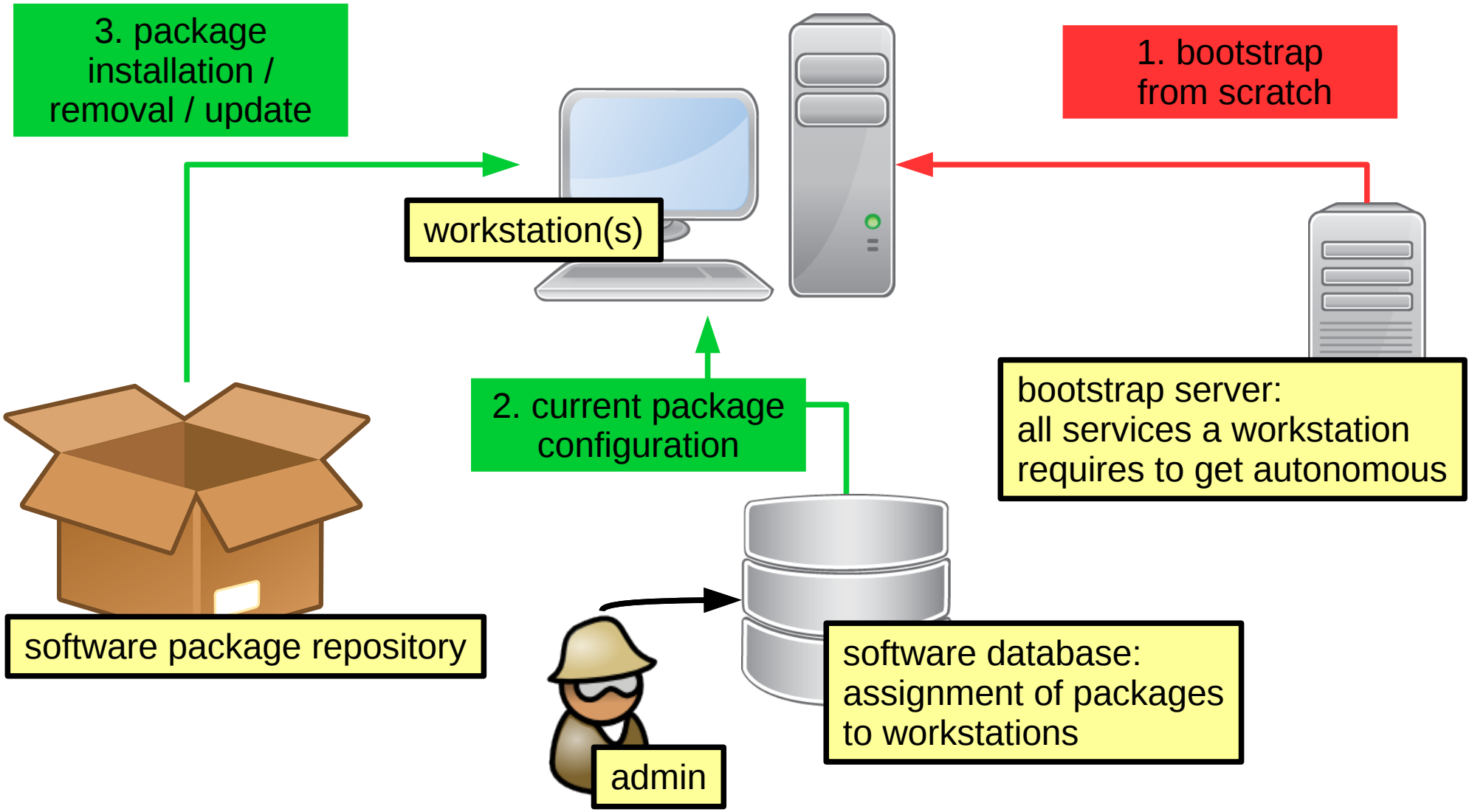
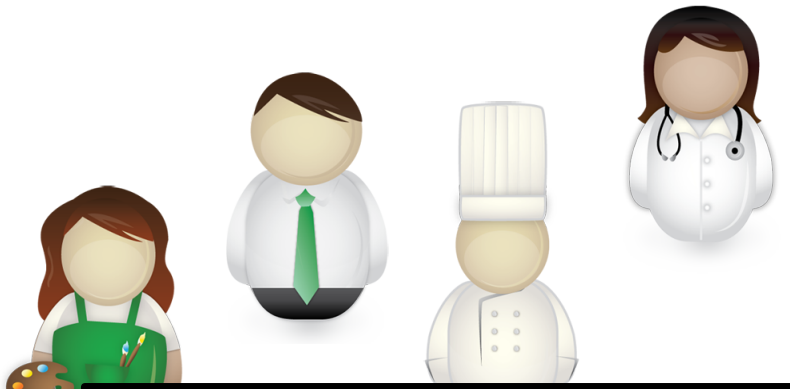




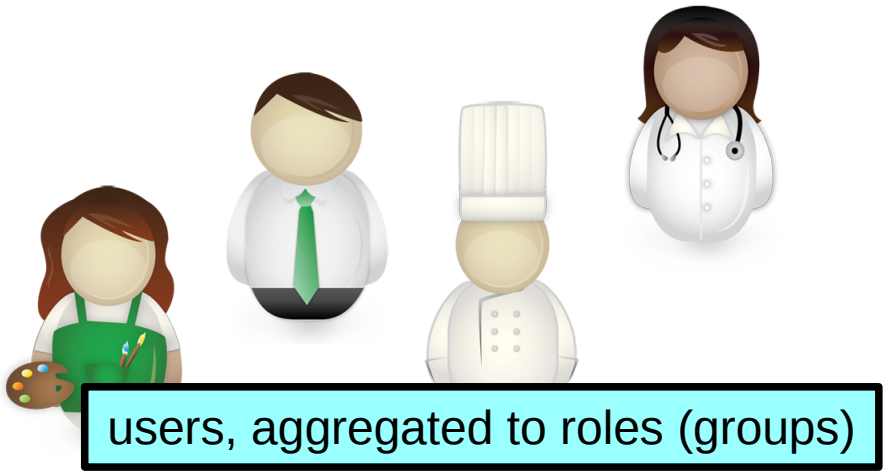
Configuration management



users, aggregated to roles (groups)

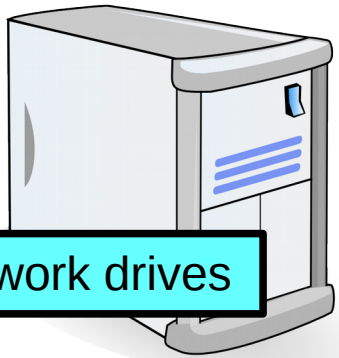
configuration database

Configuration management

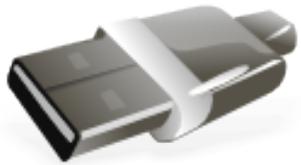


users, aggregated to roles (groups)

printers



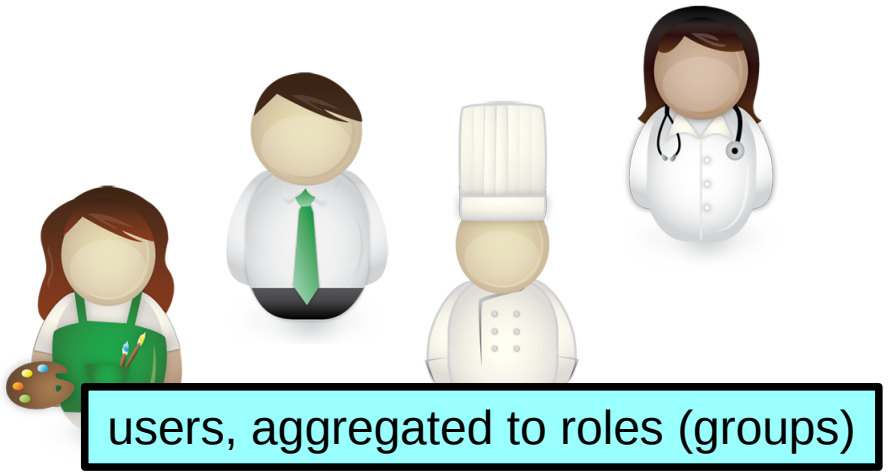
network drives



removable media

configuration database

Configuration management

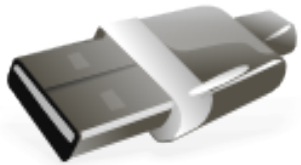


users, aggregated to roles (groups)

configuration parameters

`key=value`

applications



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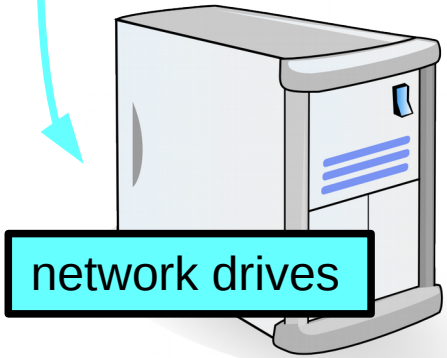
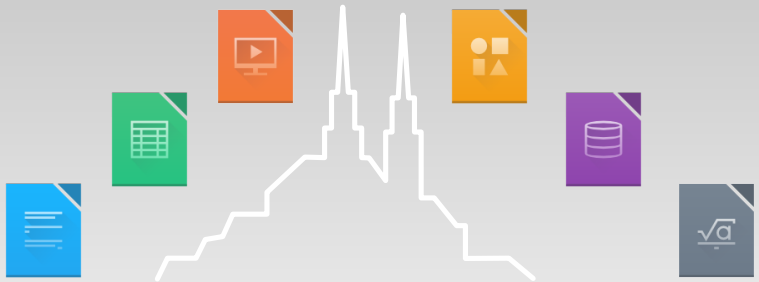


network drives

printers

configuration database

Example: Application deployment and assignment



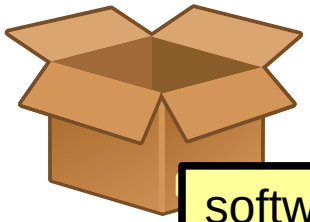
Alice

configuration database

workstation

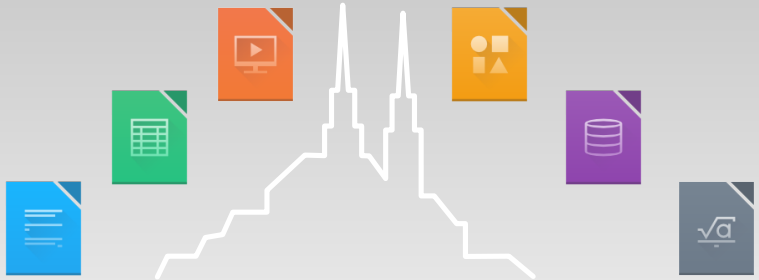
admin

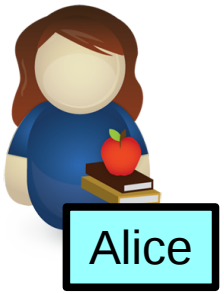
developer



software package repository

Example: Application deployment and assignment





Alice

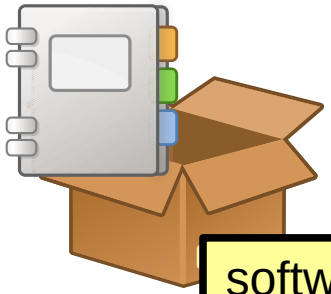
admin

configuration database

workstation

developer

uploads



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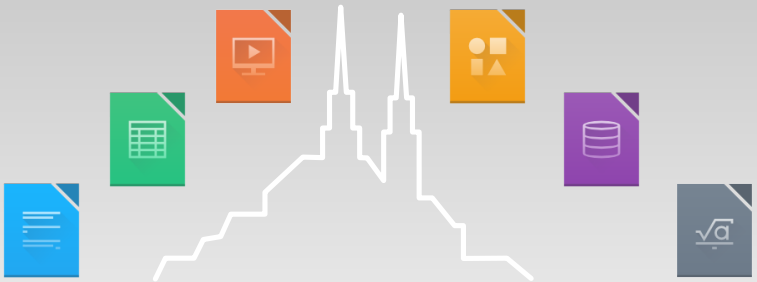
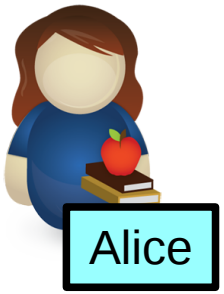


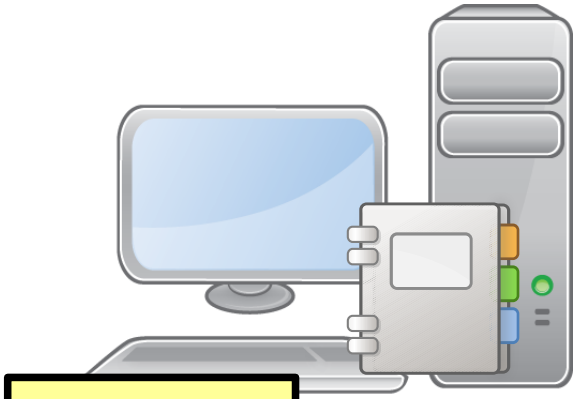


Alice

admin

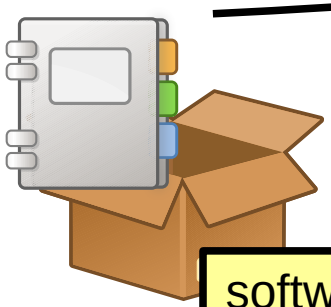
developer

configuration database



workstation

installs via
software deployment



software package repository

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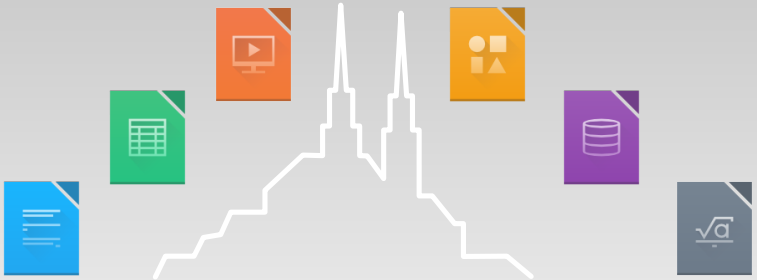
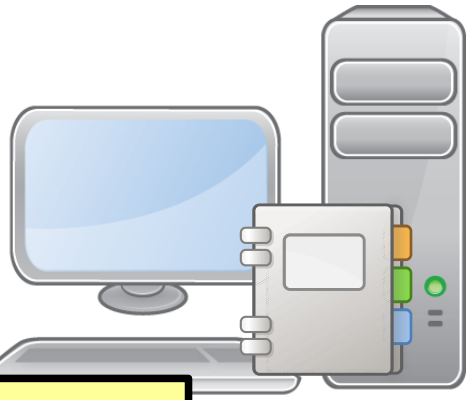


Alice

for Alice

configuration database

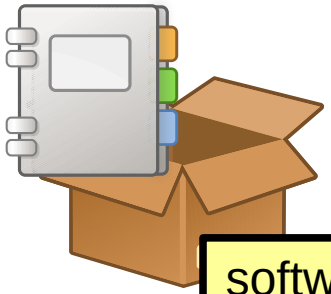


workstation

admin

assigns (and configures)

developer



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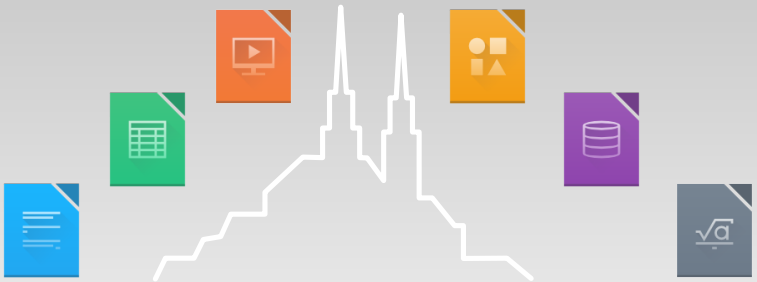
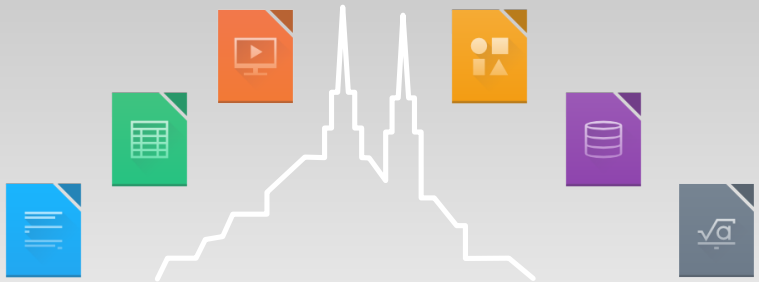
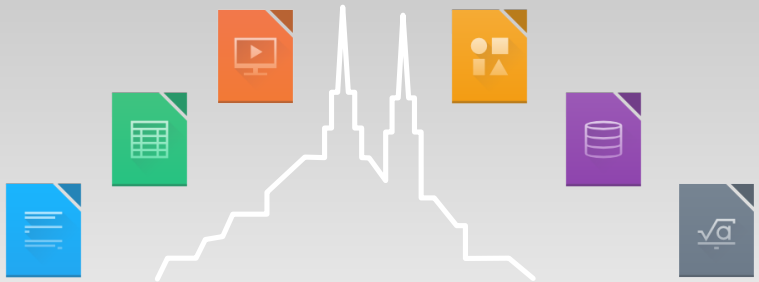


Benefits



- Applications themselves can be installed generously on a huge number of workstations.
  - Actual visibility is managed by configuration management.
    - User has everything she needs.
    - User is not molested by things she doesn't know about.
  - Local hard disk space is cheap.
  - License issues are rarely an obstacle.

Benefits



- Variance in machines installations can be minimized:
  - Easier to regulate actual visibility of applications by configuration management than software deployment:
    - Changes in configuration management apply immediately.
    - Changes in machine installations requires dedicated installation / update runs.
  - Aim of configuration management:
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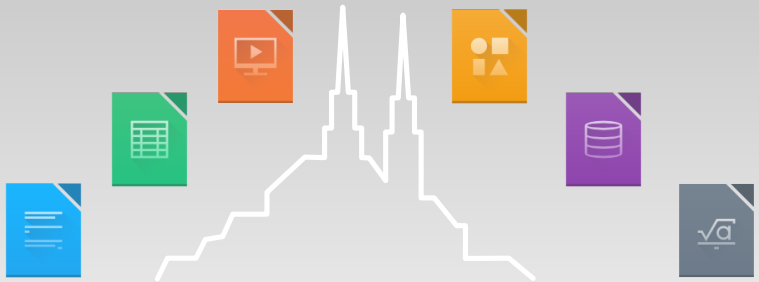
Benefits



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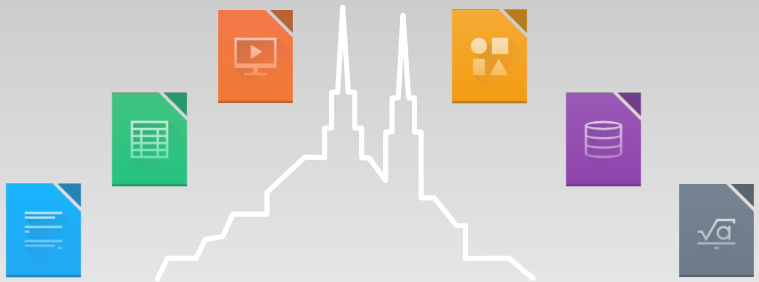

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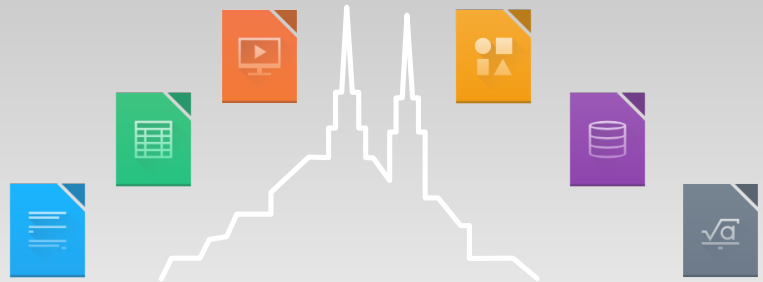
    - License issues are rarely an obstacle.
- Explicit bookkeeping in configuration management yields a zoning map: who needs what application.

Key benefits of office migration



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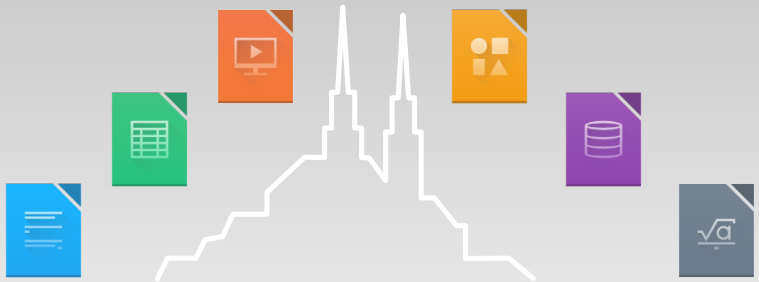
desktop migration | 2012 migration achieved | office migration

Office migration and consolidation



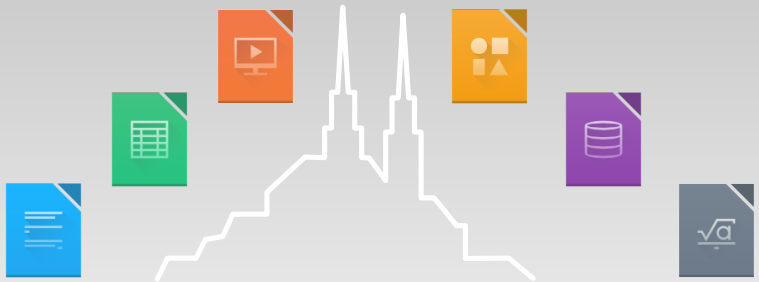
Before

Rich zoo of various office-based business solutions (about 21.000 macros, templates, forms)

Various versions of a popular proprietary office suite

After

Office migration and consolidation



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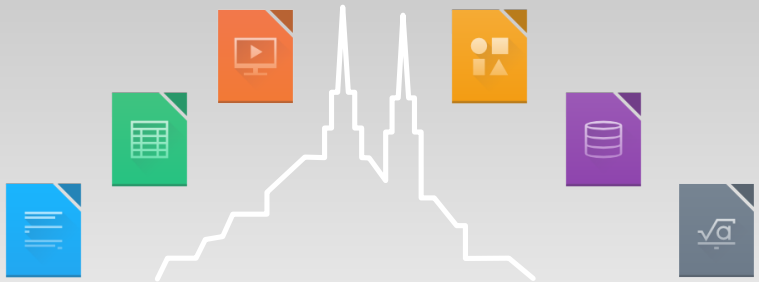
Free office suite with a managed life cycle

Office migration and consolidation



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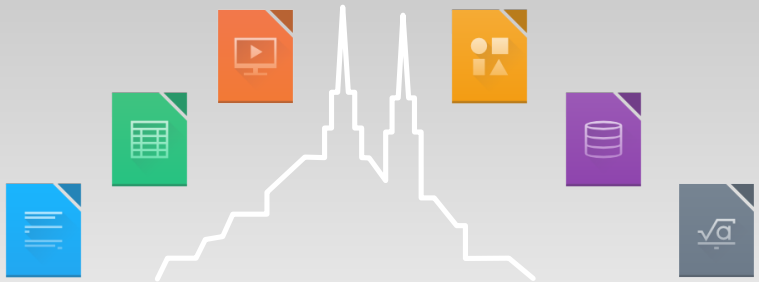

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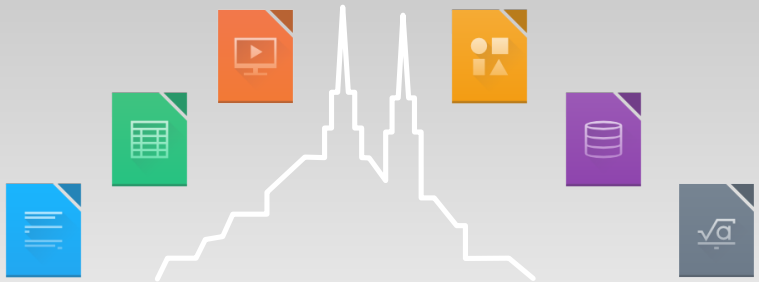

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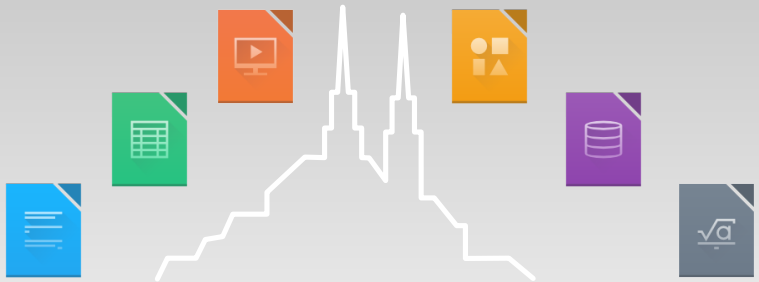

Before

Examples:

- »Parkraumbewirtschaftung« (parking lot management)
- »Elternbriefe« (letters to parents)
- »Hundesteuer« (dog tax)

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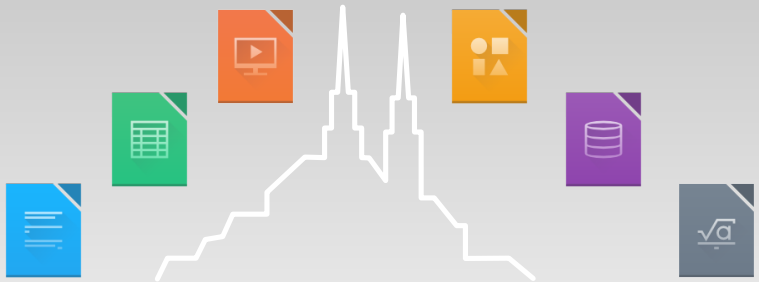

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Various versions of a popular proprietary office suite

After

About 100 specific solutions

Web-based applications

Consolidated templates

This tiny obstinate core of lightweight, office-based business applications is what the whole story is actually about.

The dangling link

About 100 specific solutions

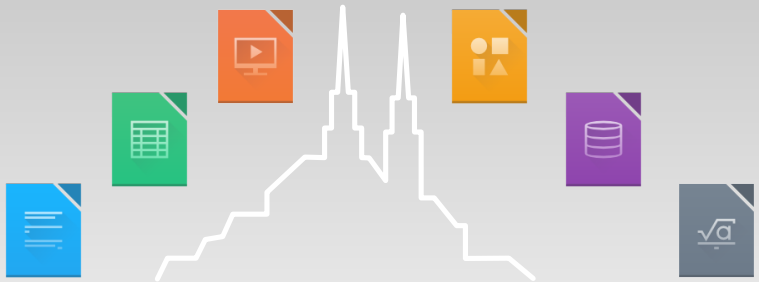
extensions

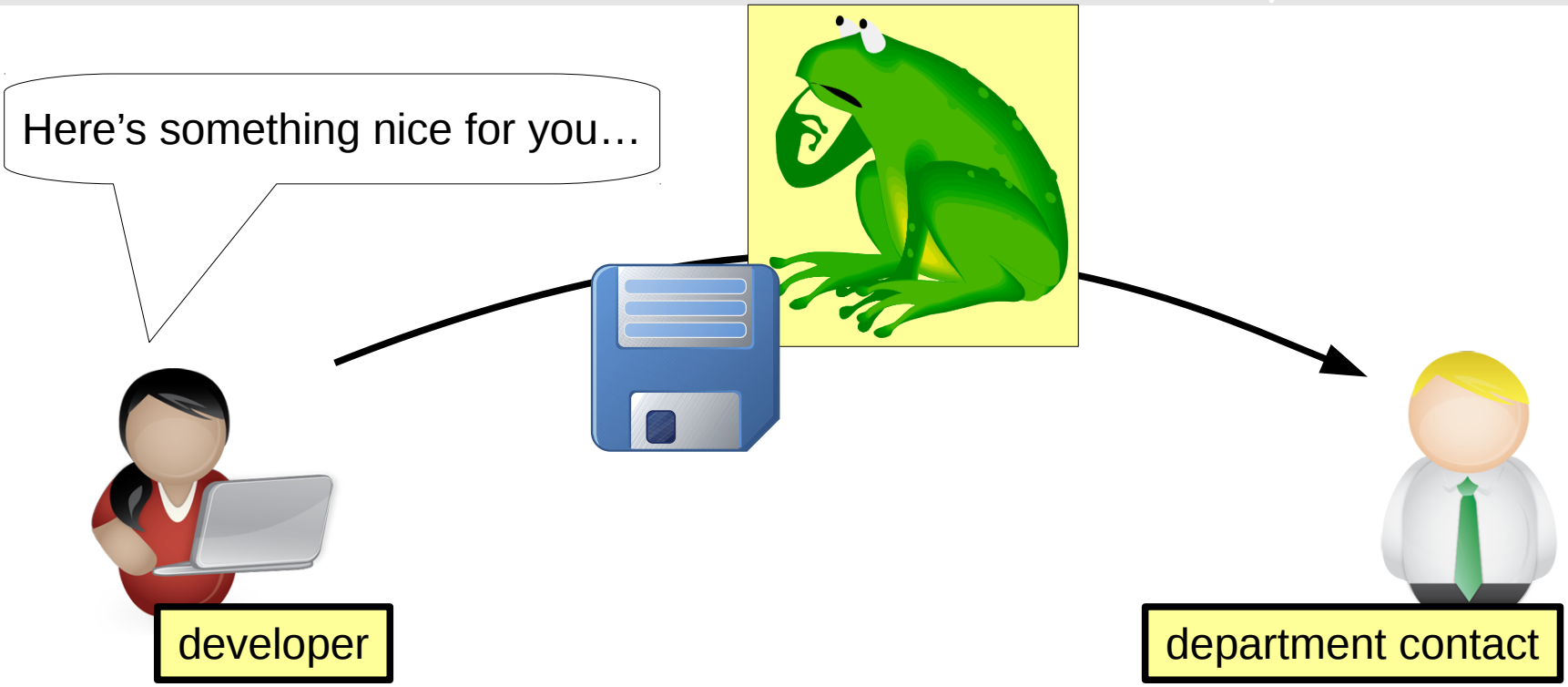
desktop migration

2012
migration achieved

office migration

How departments once got their office extensions





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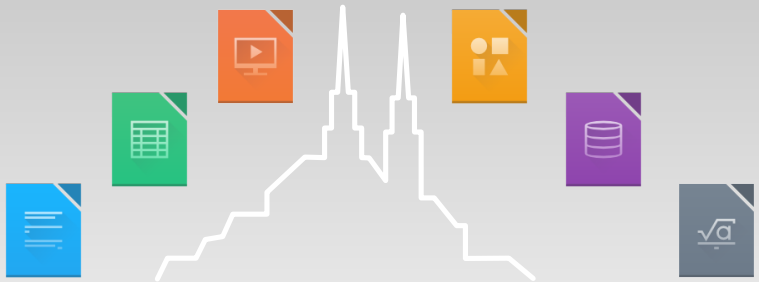
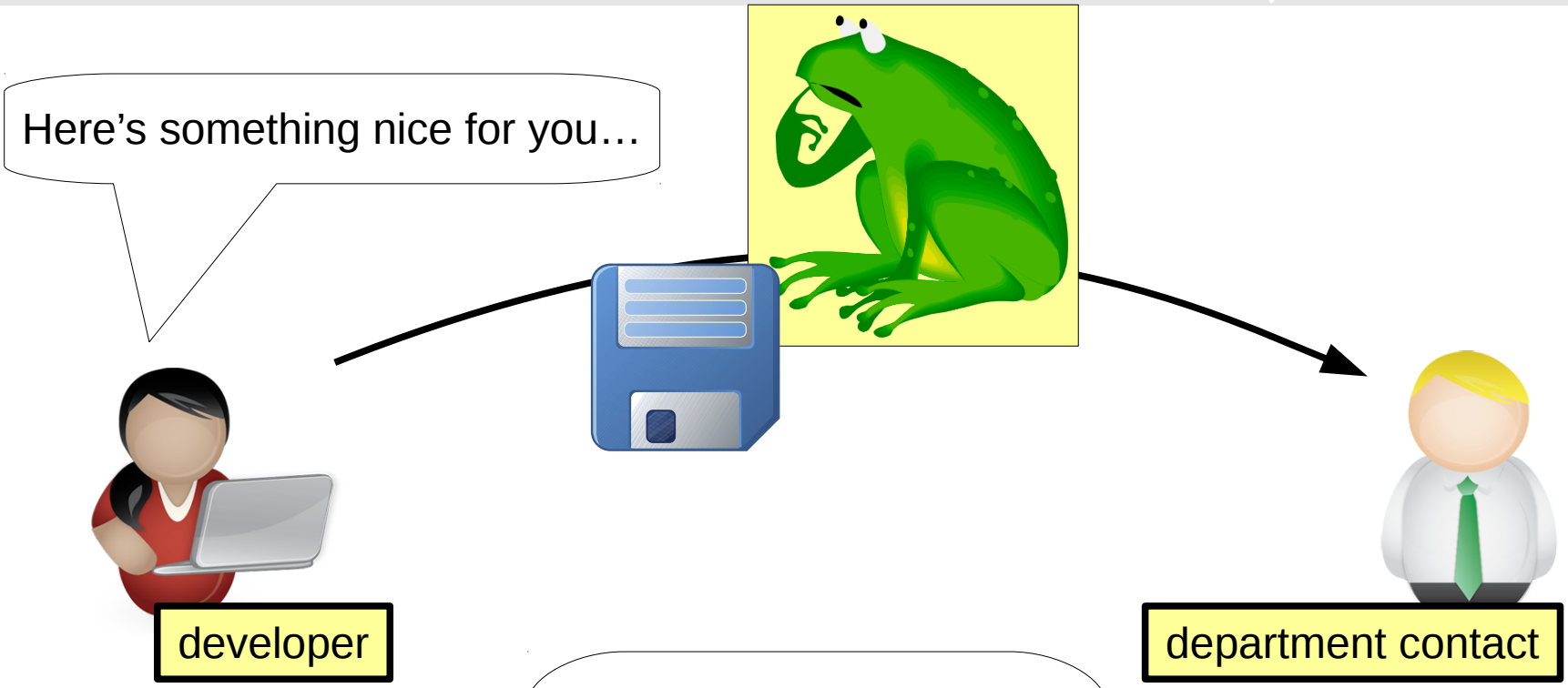


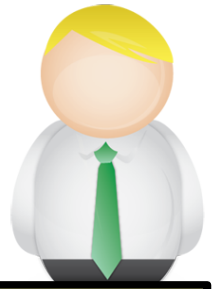


no automated software deployment

no configuration management

What happens then…

developer



department contact

?

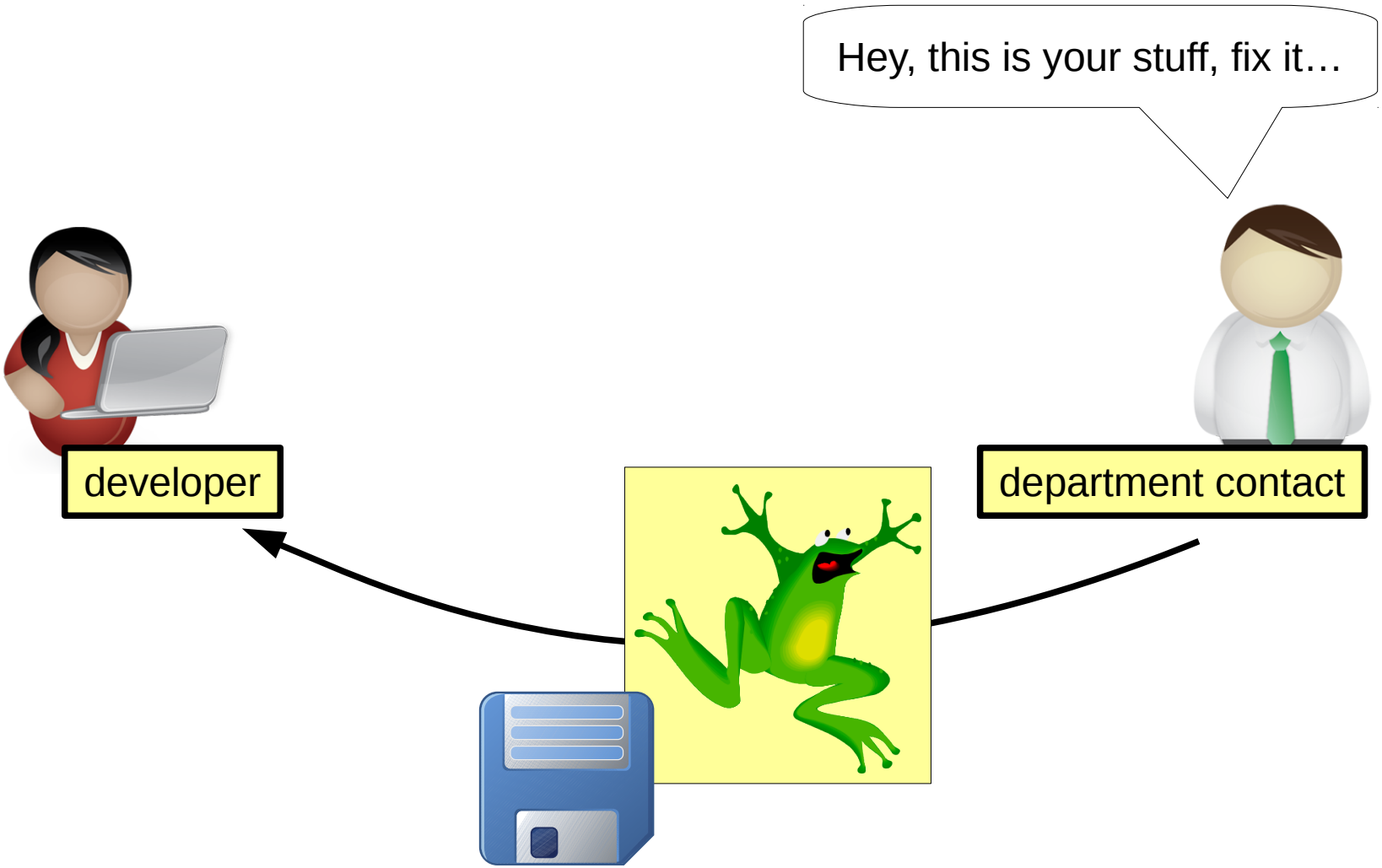
When you hear about them again…

developer

department contact

?

When you hear about them again…



When you hear about them again…

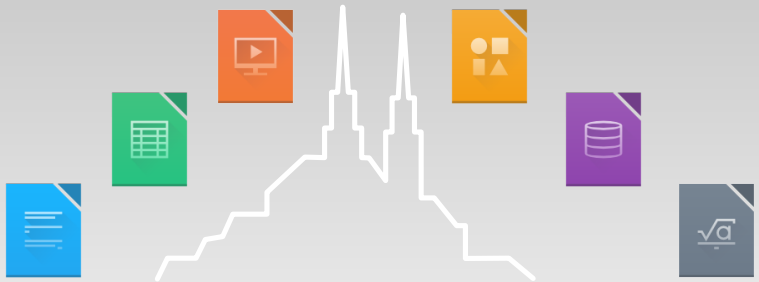
effective loss of control (»dark matter«)

Hey, this is your stuff, fix it…

developer

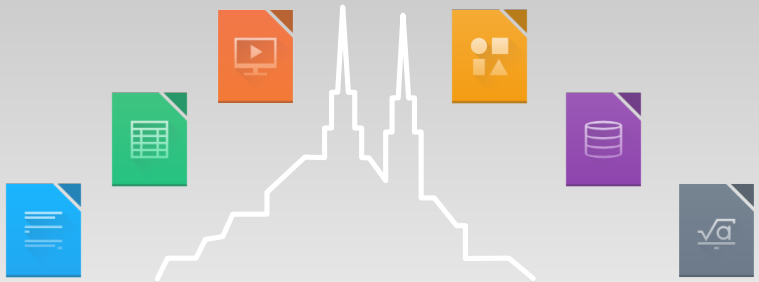
department contact

What gets lost



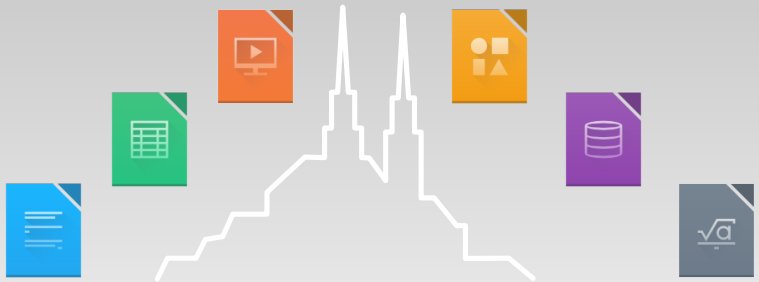
- Variance in machines installations can be minimized:
  - Easier to regulate actual visibility of applications by configuration management than software deployment:
    - Changes in configuration management apply immediately.
    - Changes in machine installations requires dedicated installation / update runs.
  - Applications themselves can be installed generously on a huge number of workstations:
    - Local hard disk space is cheap.
    - License issues are rarely an obstacle.
- Explicit bookkeeping in configuration management yields a zoning map: who needs what application.

Automated software deployment for office extensions



- Parametrized office extensions.
- Automated packaging and deployment of office extensions.
- Activation of office extensions based on roles.

The simple part



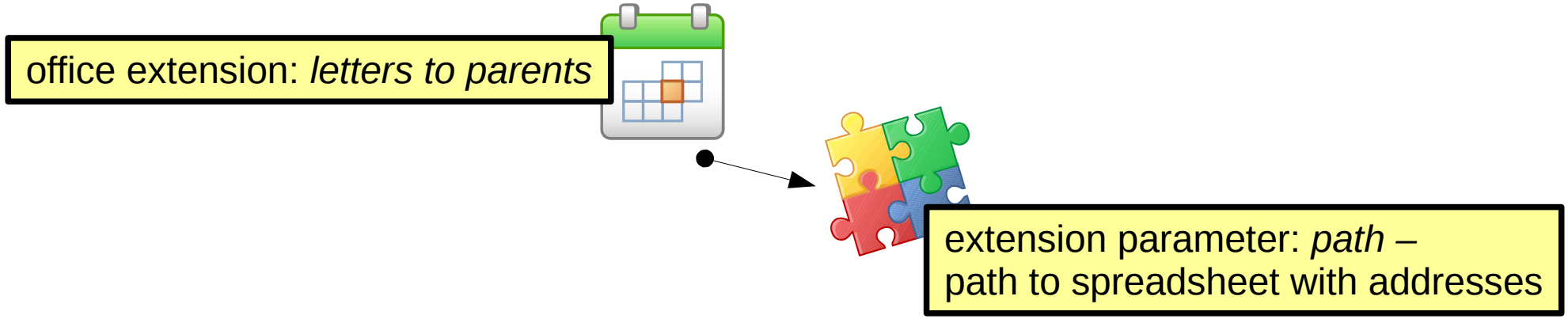
- Parametrized office extensions.
- Automated packaging and deployment of office extensions.

→ No fundamental obstacles.

→ Naive: separate implementation for each extension.

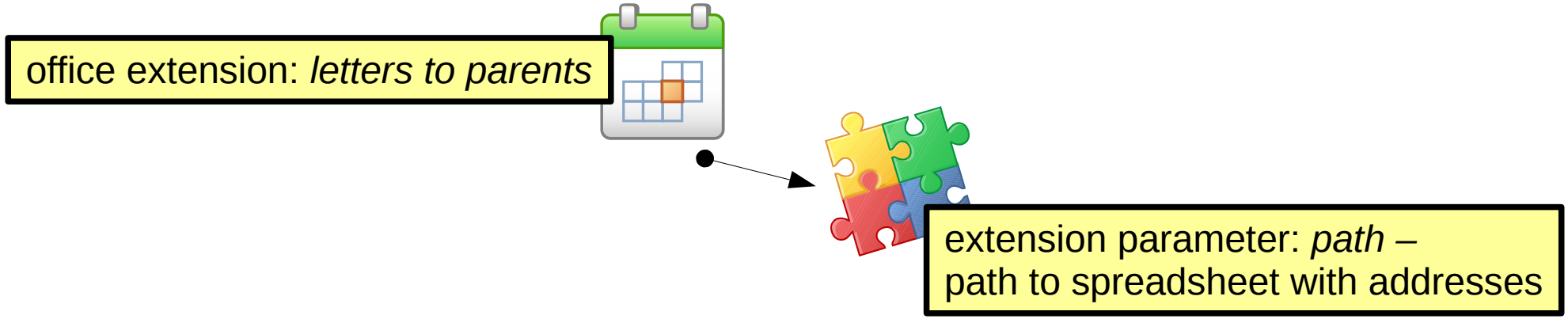
→ Clever: uniform implementation for all extensions.

Parametrized office extensions – running example



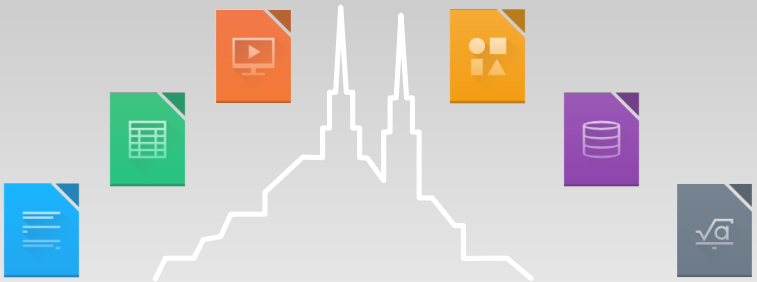
- Extension which reads address data from a particular spreadsheet on a network drive.
- Actual network drive and spreadsheet is a priori unknown and must be configured.

Parametrized office extensions – generic solution



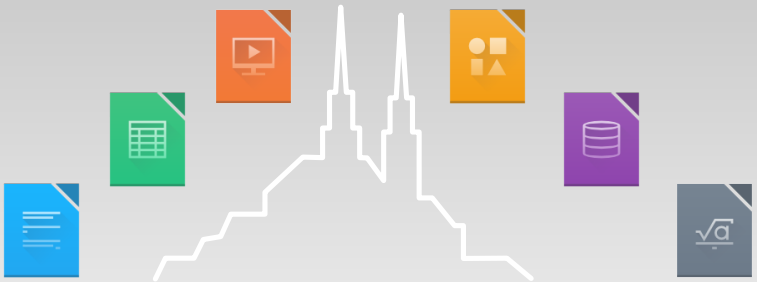
- Provide extension which allows other extensions to read (and write) settings (key-value-mappings) from (and to) a dedicated configuration file in the user's home directory.
- Use this extension for all extensions which require parameters.
- Dedicated configuration file can be filled using the *existing* configuration management, during user login.

Packaging of office extensions



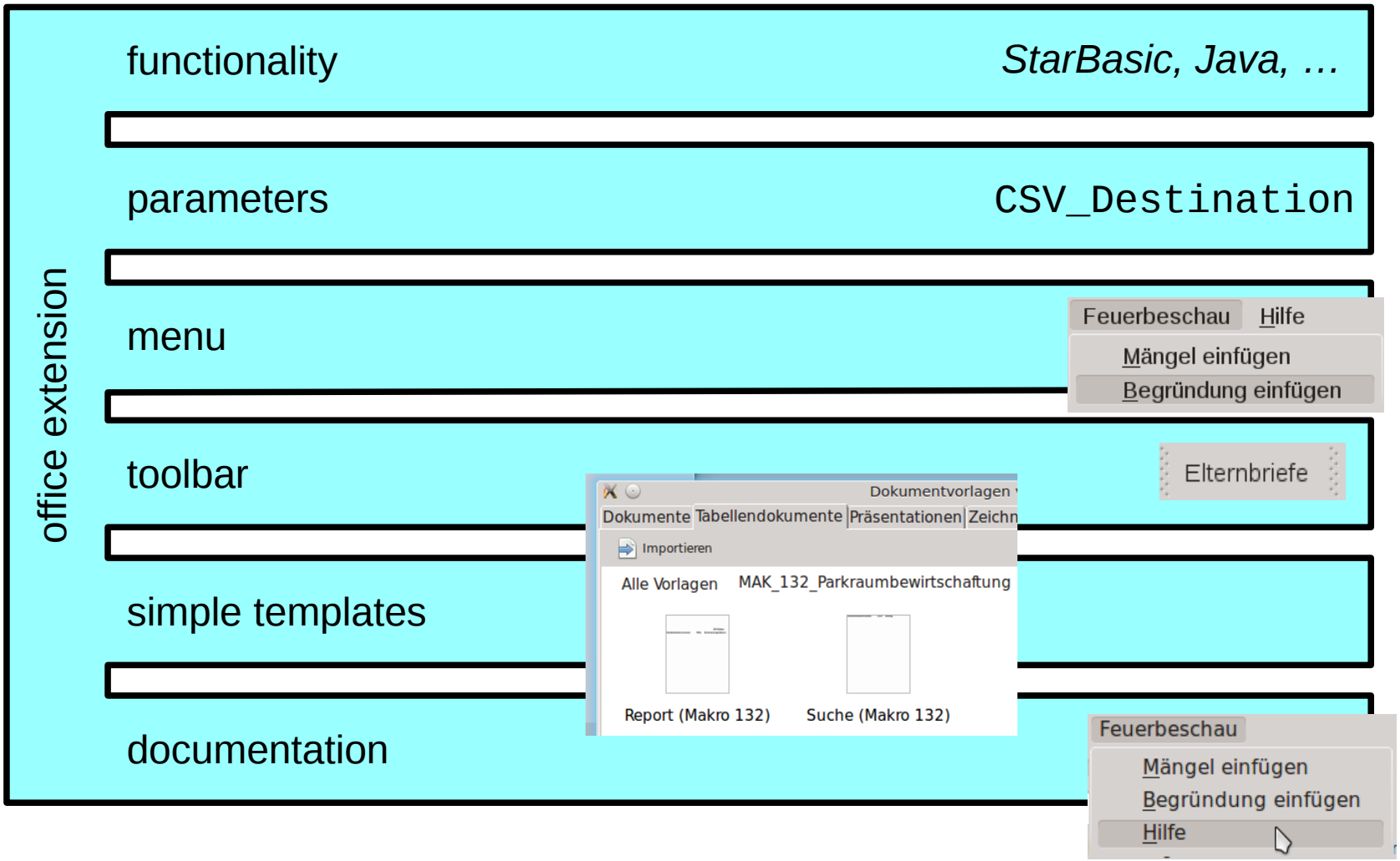
- Use standardized source layout for extensions.
- Provide *one* uniform build routine to turn such sources into a package fitting to your software deployment (e.g. Debian *deb*, Redhat *rpm*).
- Use your existing software deployment.

Packaging of office extensions

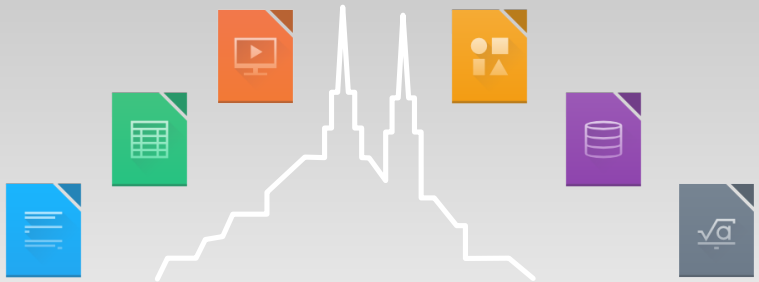


- Use standardized source layout for extensions.
- Provide *one* uniform build routine to turn such sources into a package fitting to your software deployment (e.g. Debian *deb*, Redhat *rpm*).
- Use your existing software deployment.
- Standardized source layouts yields standardized extension ingredients.

Standardized ingredients

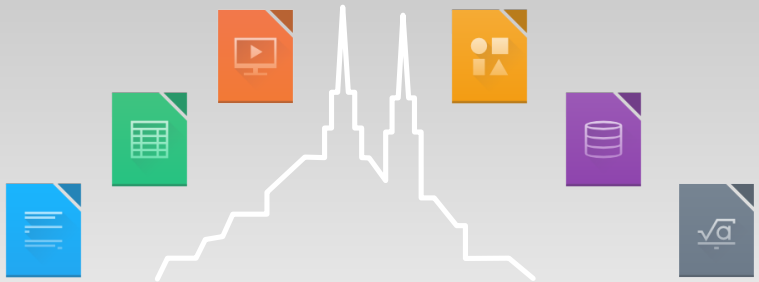


Automated software deployment for office extensions



- Parametrized office extensions.
- Automated packaging and deployment of office extensions.
- Activation of office extensions on a per-role basis.

Automated software deployment for office extensions

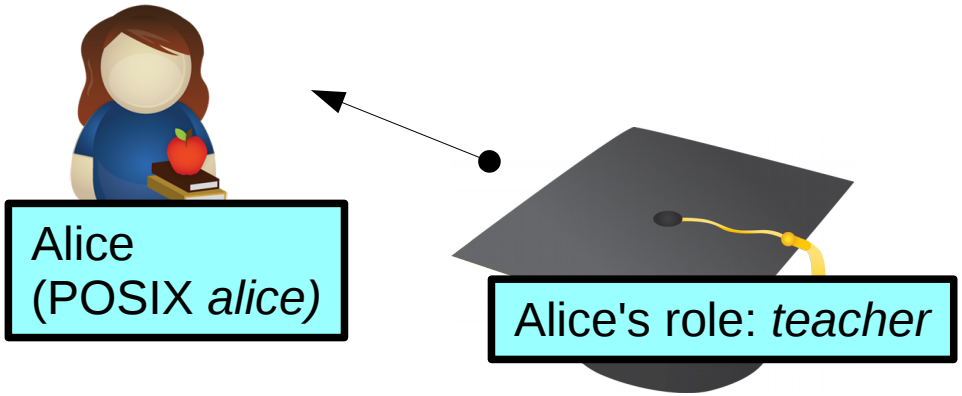


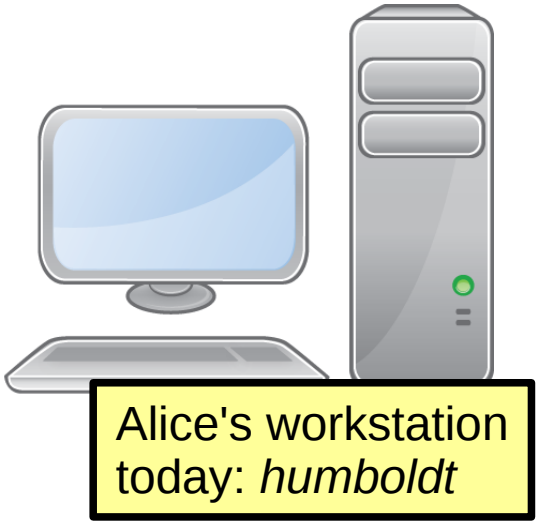
- Parametrized office extensions.
- Automated packaging and deployment of office extensions.
- Activation of office extensions on a per-role basis.

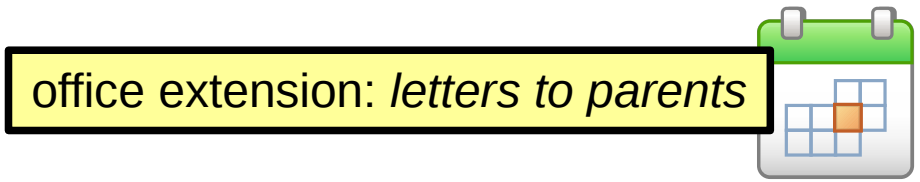
Challenge:

- »Activiation« for regular applications done via start menu.
- This does not make sense for office extensions.
- Different mechanism required.

Activation of office extensions based on roles – example



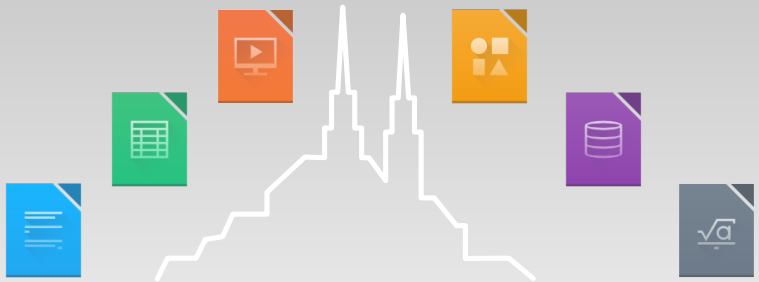




Aim: After *alice* (or any other *teacher*) has logged in, *letters to parents* (with its menus, toolbars, templates) is visible. But not if another user (non-*teacher)* logs in.

How to achieve this?

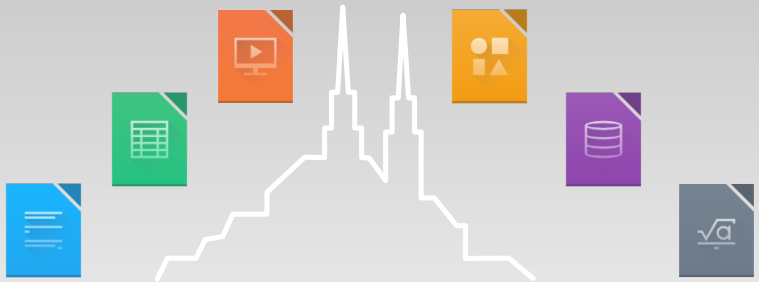
Activation of office extensions based on roles – basic options



option	scope	technique
executing `unopkg add`	user-local	educated tool usage (complex)
executing `unopkg add --shared`	system-global	educated tool usage (complex)
installation into `/usr/share/libreoffice/share/extensions/`	system-global	file system (simple)

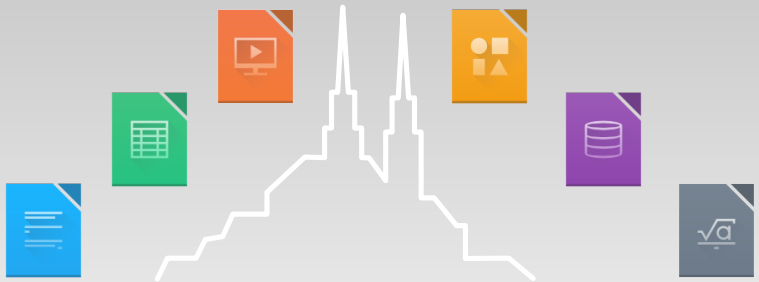
No option matches our needs in the first place!

Activation of office extensions based on roles – unopkg add



- Why `unopkg add` is a bad idea.
  - Tinkering with user’s office configuration is hard: strict separation of managed and non-managed material is required.
  - Space is wasted in the user's home directory.
  - User is able to tinker arbitrarily with material in his home directory.

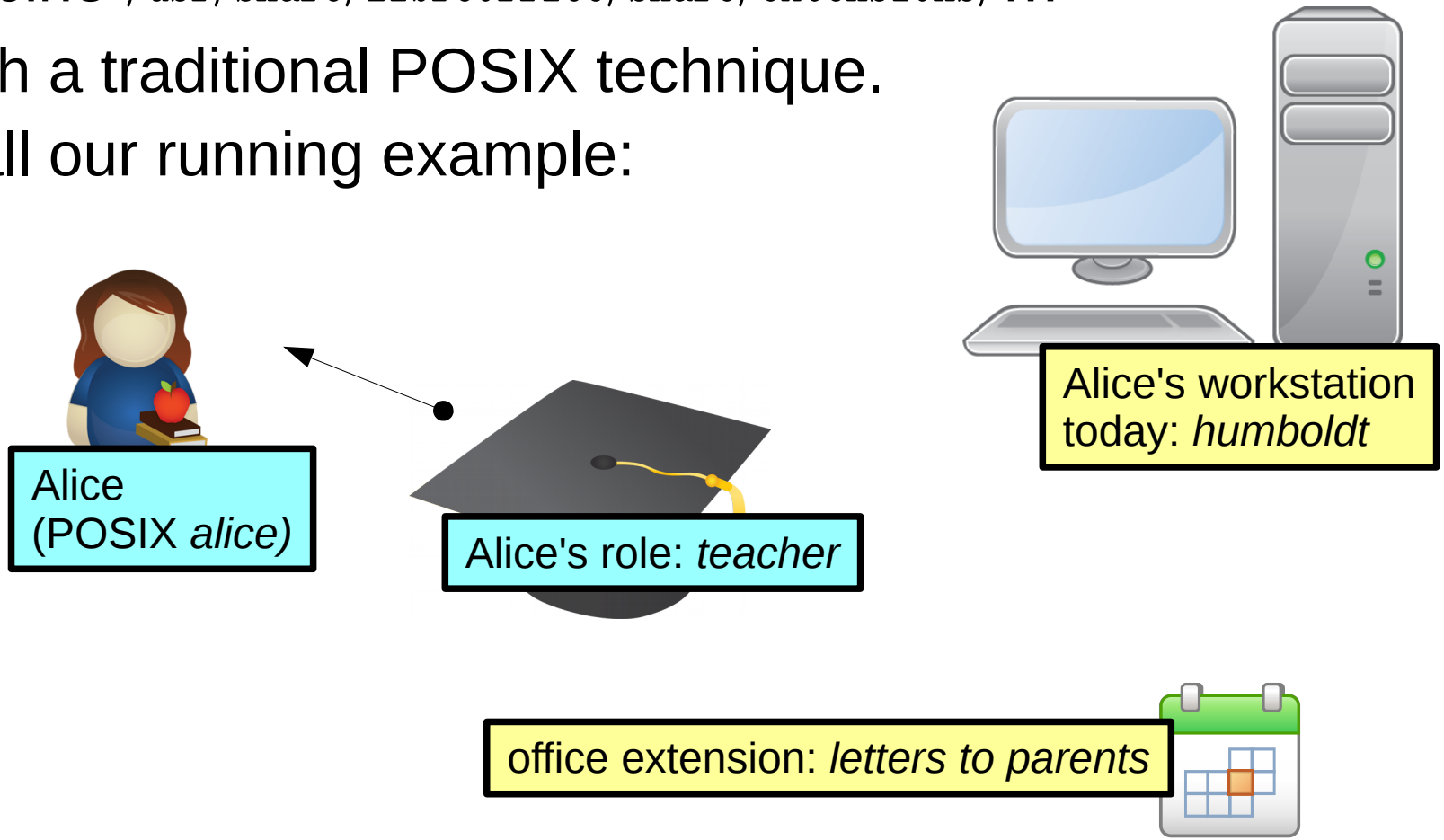
Activation of office extensions based on roles – key idea



- Combine `/usr/share/libreoffice/share/extensions/…`
- …with a traditional POSIX technique.

Activation of office extensions based on roles – key idea

- Combine `/usr/share/libreoffice/share/extensions/…`
- …with a traditional POSIX technique.
- Recall our running example:

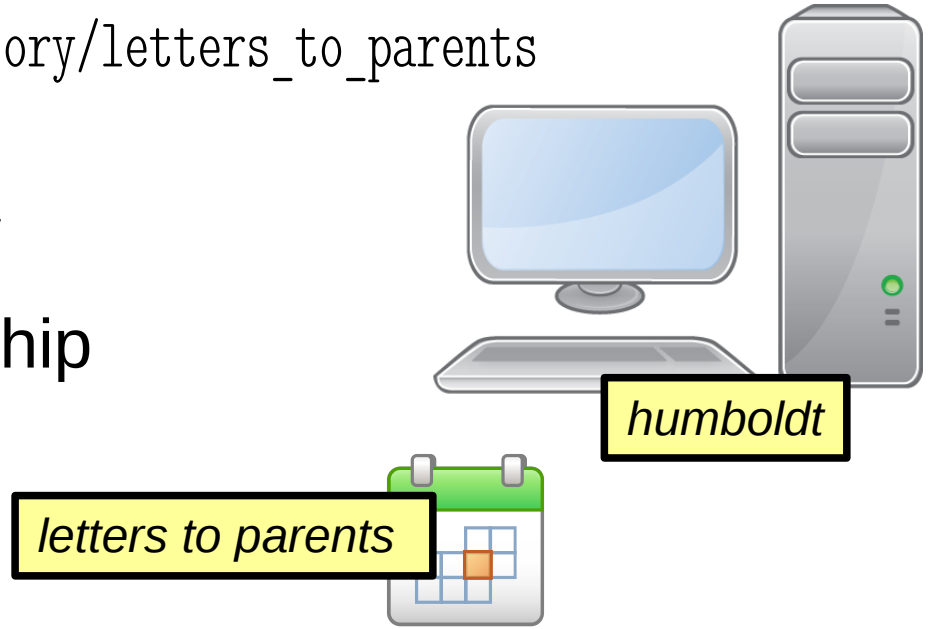


Activation of office extensions based on roles – key idea

- Combine `/usr/share/libreoffice/share/extensions/…`
- …with a traditional POSIX technique.
- Using symbolic links:
  - Install extension into *separate* directory

    `/usr/share/libreoffice/extension_repository/letters_to_parents`
  - Link by symbolic link(s) from

    `/usr/share/libreoffice/share/extensions/`
  - Use appropriate POSIX ownership and permissions.



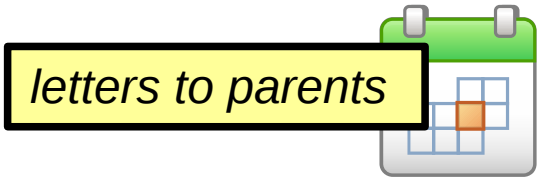
Activation of office extensions based on roles – detail

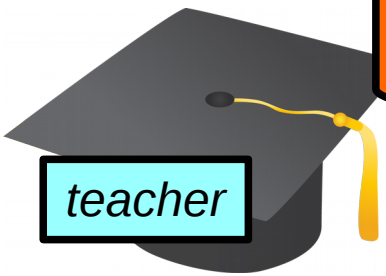
/usr/share/libreoffice/share/extensions/

Extensions placed in this directory are visible in office.

/usr/share/libreoffice/extension_repository/letters_to_parents

Location where extension package has been installed.





Activation of office extensions based on roles – detail

/usr/share/libreoffice/share/extensions/teacher@letters_to_parents

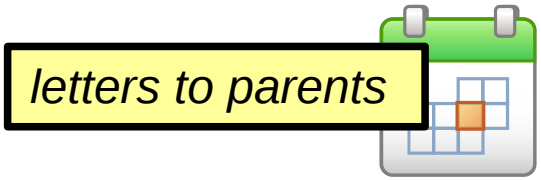
Purpose of this indirection becomes clear when looking at its ownership

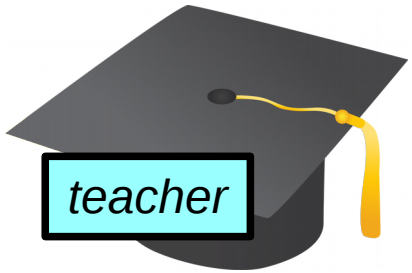
pointing to…

/var/run/libreoffice_group_extensions/teacher/letters_to_parents

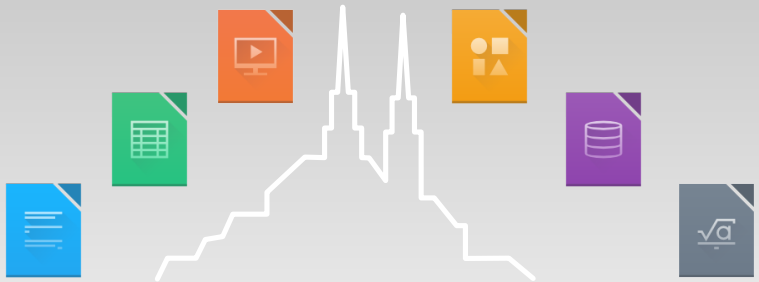
pointing to…

/usr/share/libreoffice/extension_repository/letters_to_parents





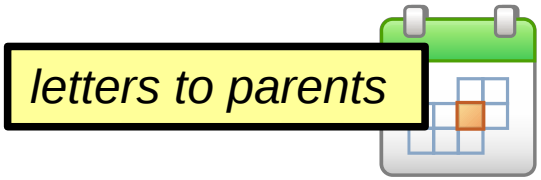
Activation of office extensions based on roles – detail

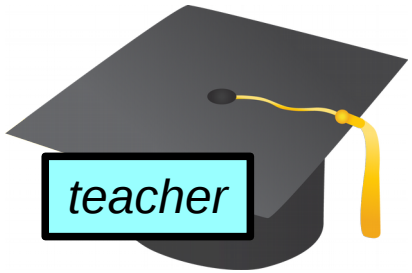


```
/usr/share/libreoffice/share/extensions/teacher@letters_to_parents
    lrwxrwxrwx root root
/var/run/libreoffice_group_extensions/teacher
    drwxr-x--- root teacher
/var/run/libreoffice_group_extensions/teacher/letters_to_parents
    lrwxrwxrwx root teacher
/usr/share/libreoffice/extension_repository/letters_to_parents
    drwxr-xr-x root root
```

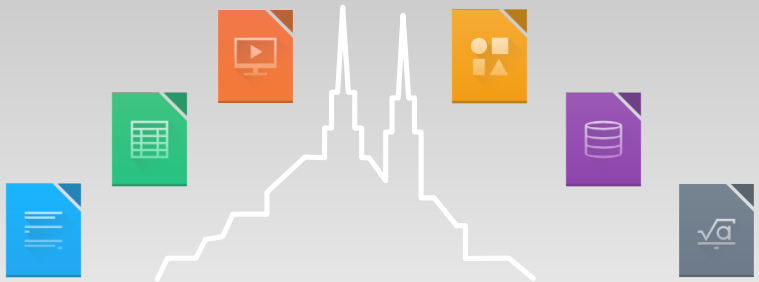
pointing to…

pointing to…





Activation of office extensions based on roles – detail



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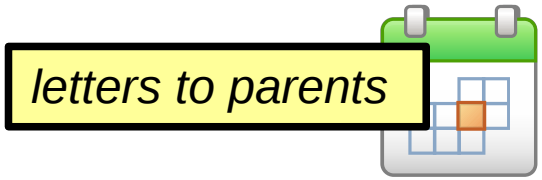
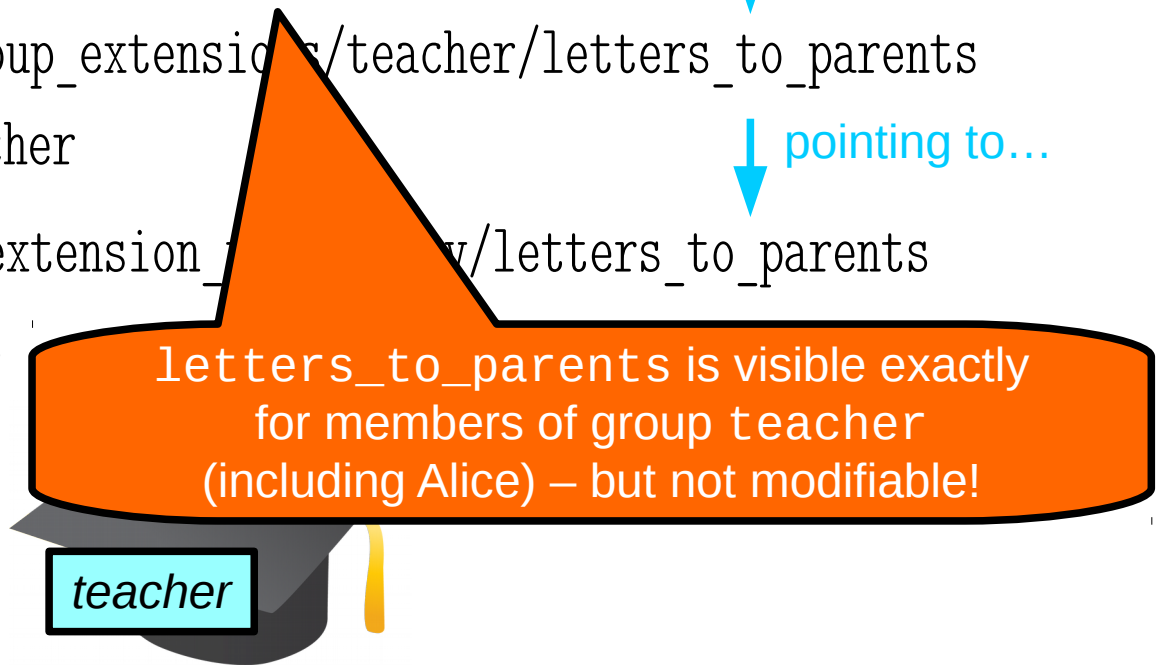
    lrwxrwxrwx root root
/var/run/libreoffice_group_extensions/teacher
    drwxr-x--- root teacher
/var/run/libreoffice_group_extensions/teacher/letters_to_parents
    lrwxrwxrwx root teacher
/usr/share/libreoffice/extension_[illegible]/letters_to_parents
    drwxr-xr-x root root
```

pointing to…

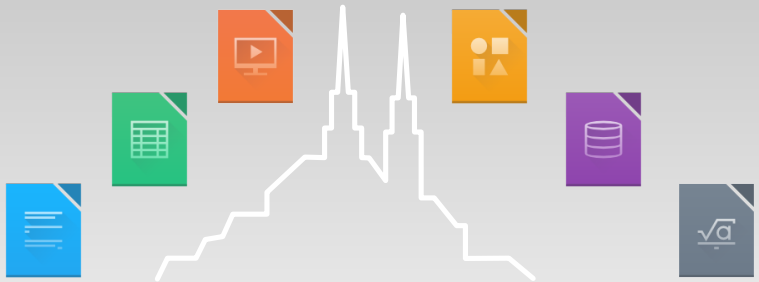
pointing to…

`letters_to_parents` is visible exactly for members of group `teacher` (including Alice) – but not modifiable!





Activation of office extensions based on roles – detail



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    lrwxrwxrwx root teacher
/usr/share/libreoffice/extension_repository/
    drwxr-xr-x root root
```
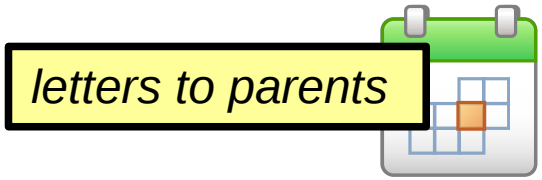
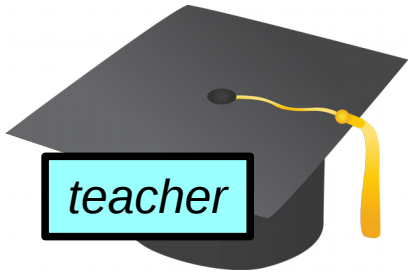
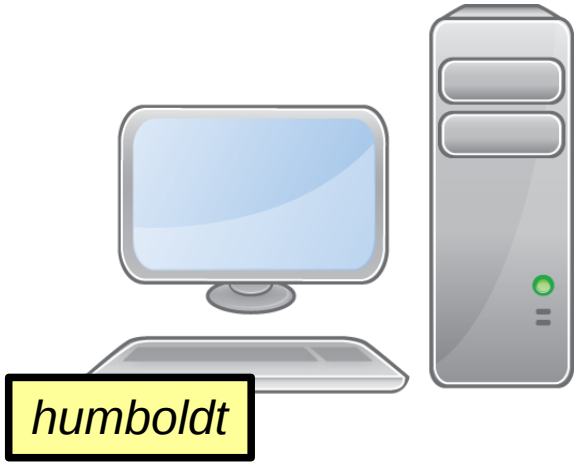

pointing to…





- lightweight
- purely POSIX
- self-cleaning: `/var/run` gets purged on machine shutdown
- no manipulation in user's home directory

Running example at a glance



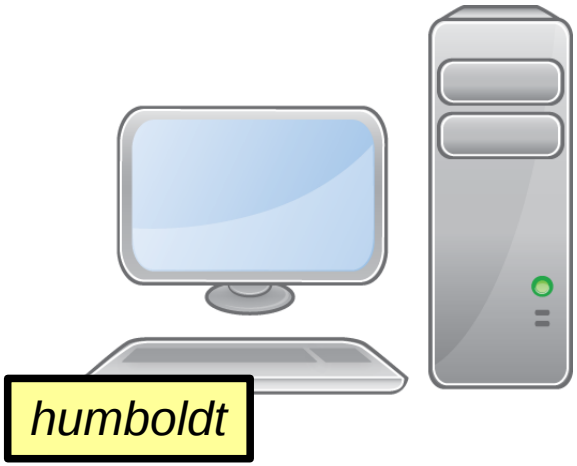
Running example at a glance

alice

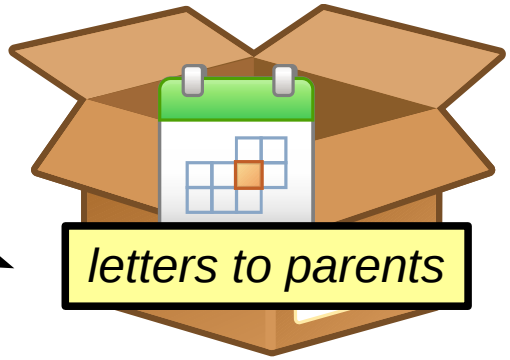
admin

developer

uploads



humboldt



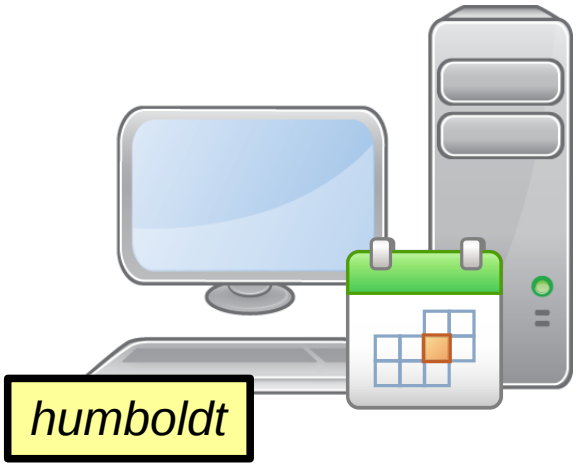
letters to parents

Running example at a glance

alice

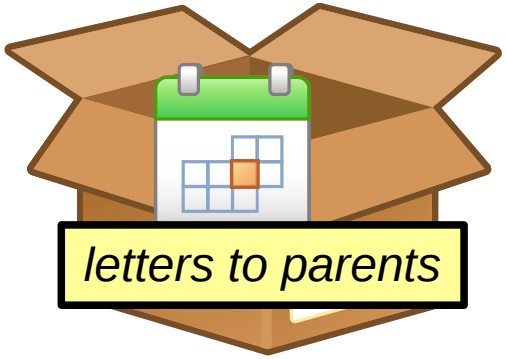
admin

developer



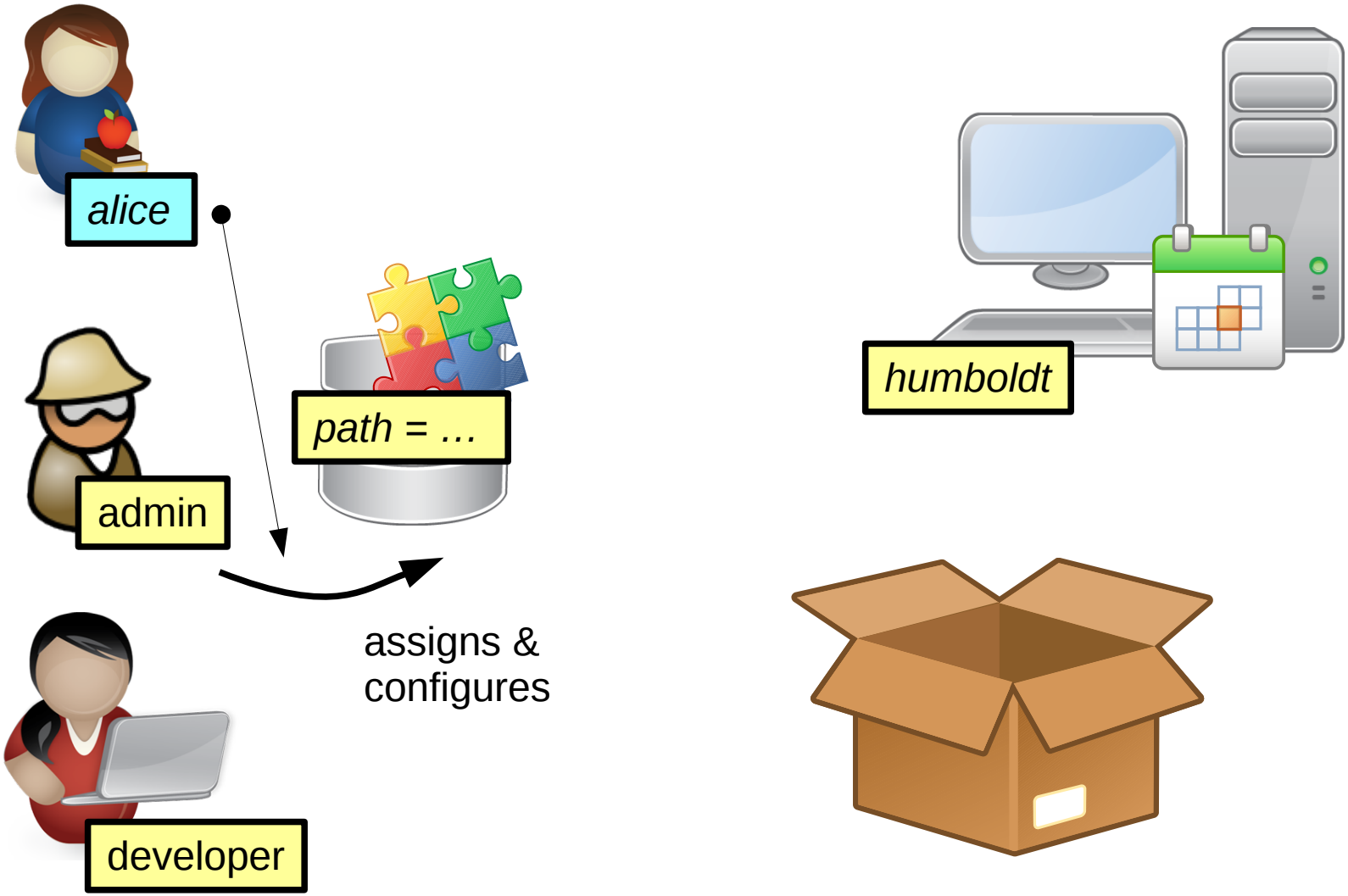
humboldt

installs

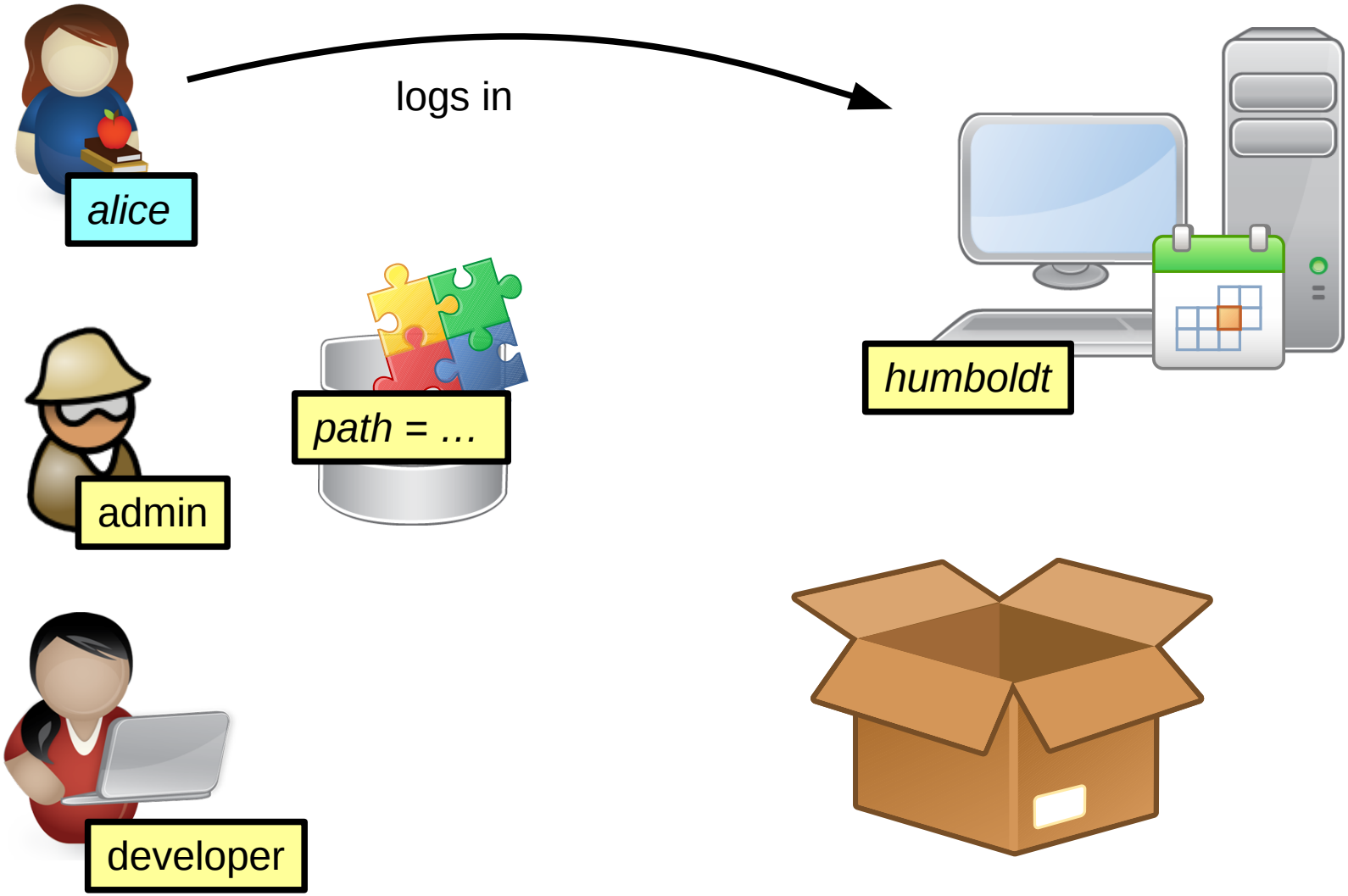


letters to parents

Running example at a glance



Running example at a glance



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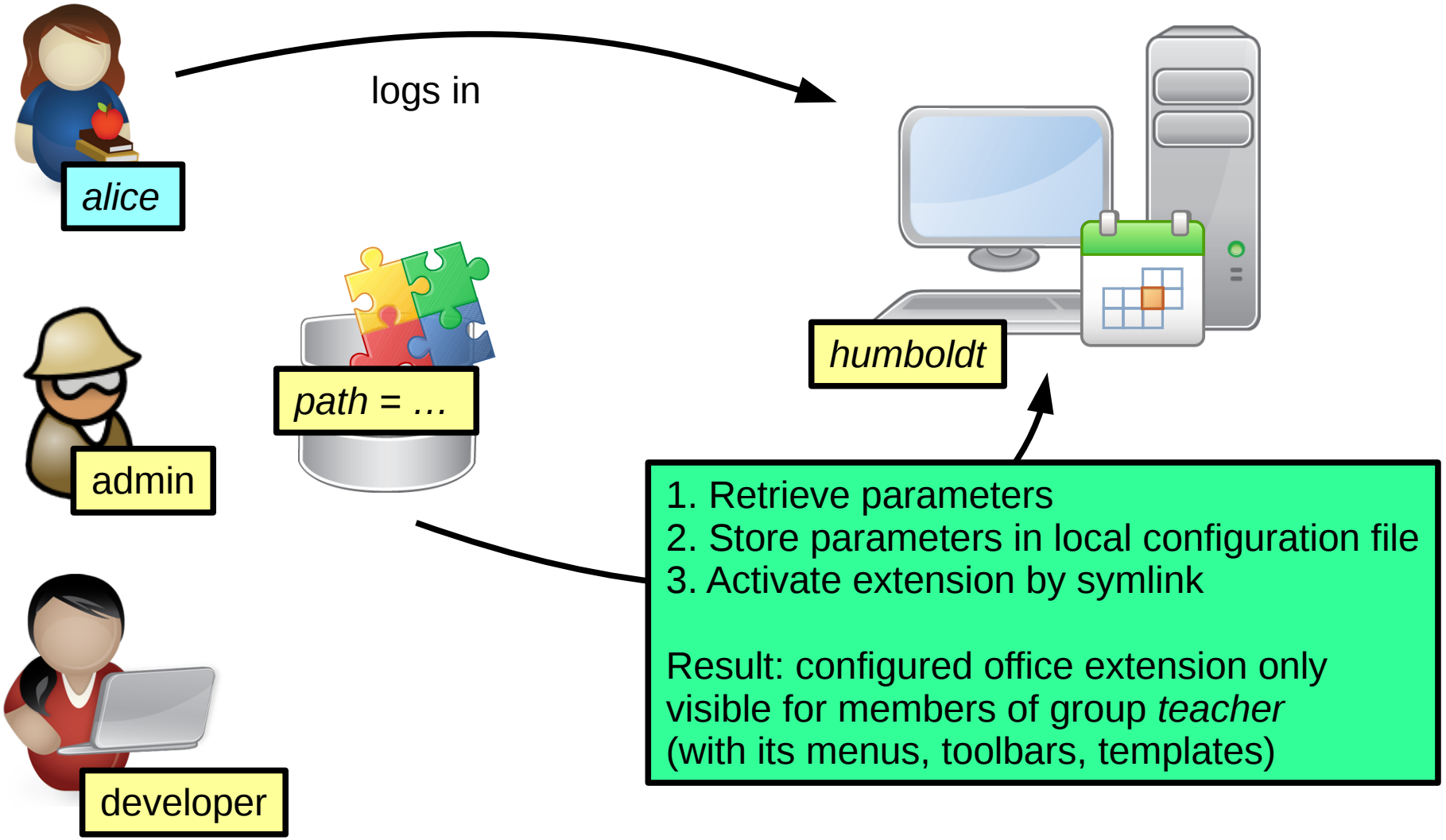
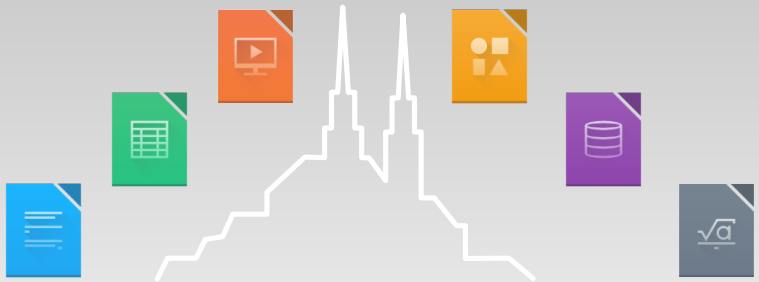
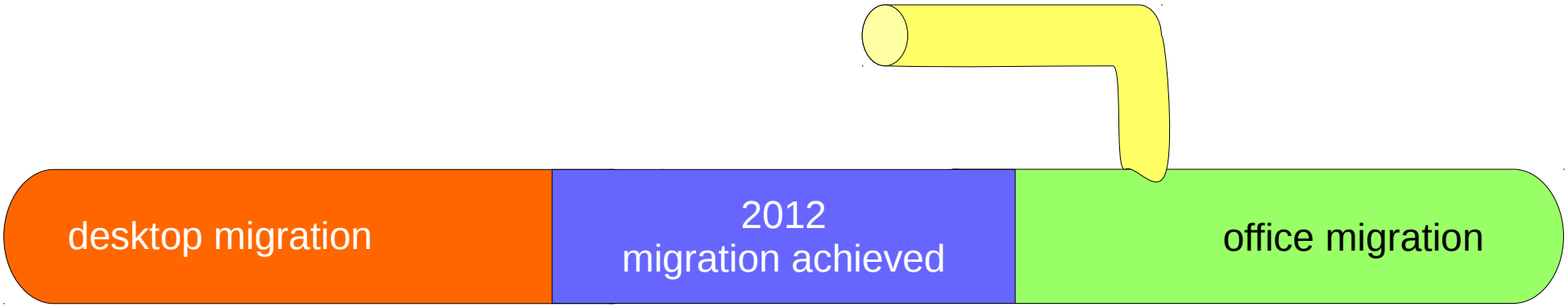


Key elements at a glance

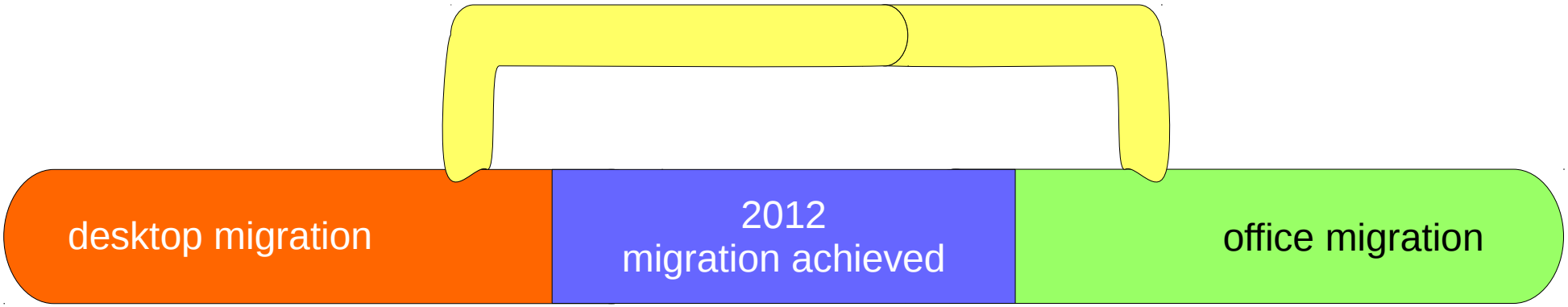


- Parametrized office extensions.
  - Key element: dedicated extension for configuration settings
- Automated packaging and deployment of office extensions.
  - Key element: standardized layout
- Activation of office extensions based on roles
  - Key element: POSIX and symlinks

Stocktaking: Bridging the gap

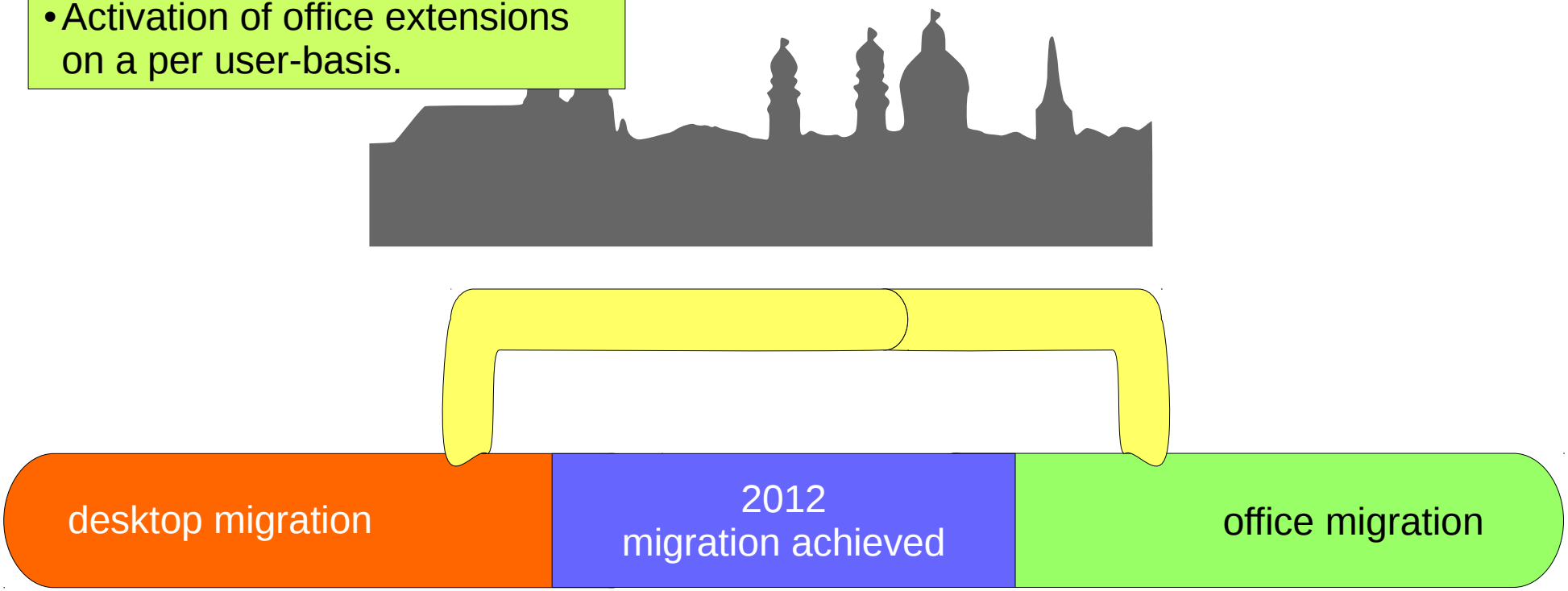


Stocktaking: Bridging the gap



Stocktaking: Bridging the gap

- Automated packaging and deployment of office extensions.
- Parametrized office extensions.
- Activation of office extensions on a per user-basis.



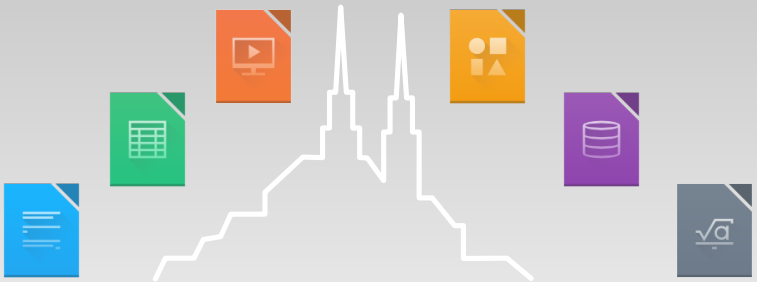
Stocktaking: Bridging the gap

- Automated packaging and deployment of office extensions.
- Parametrized office extensions.
- Activation of office extensions on a per user-basis.

yields

- Structured ingredients.
- Automated software deployment for office extensions.
- User-specific configuration management for office extensions.

Stocktaking: Bridging the gap



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yields

- Structured ingredients.
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migration