

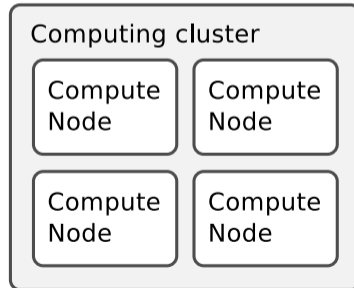


# GNU Guix for maintaining a HPC software stack

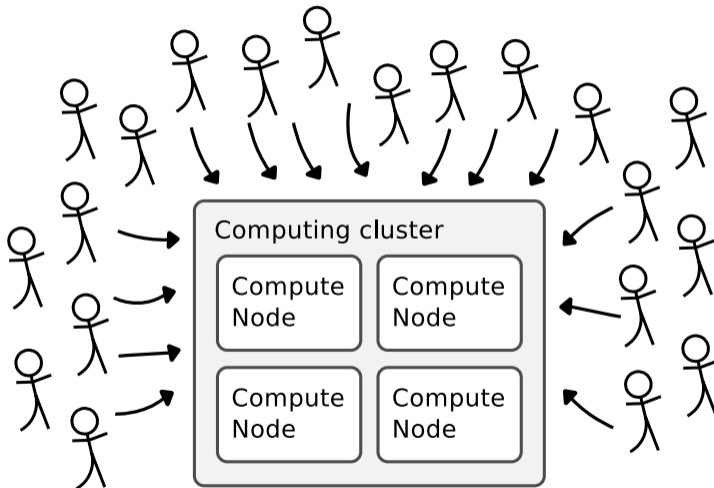
Roel Janssen

February 6, 2017

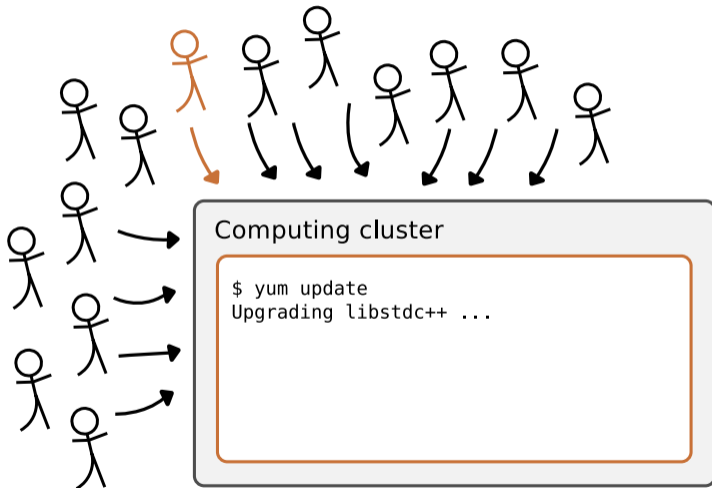
# Computers



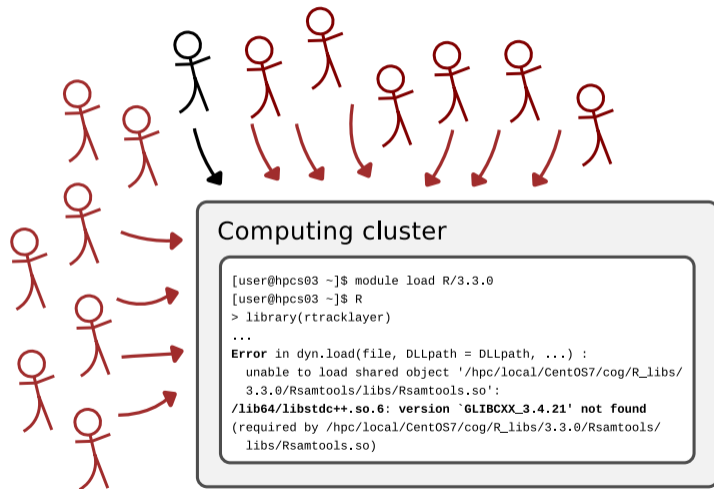
# Users



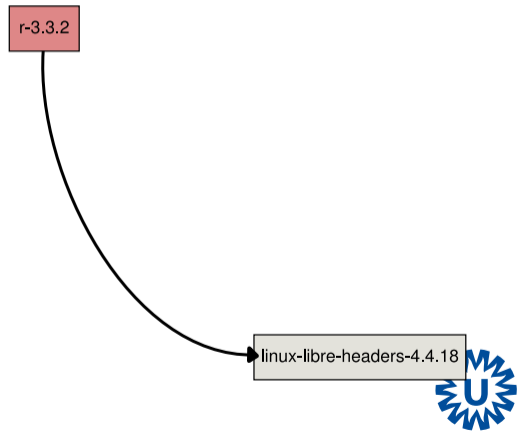
# Software



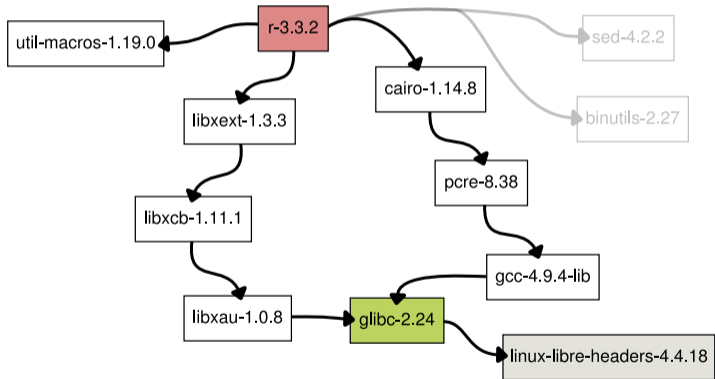
## Software



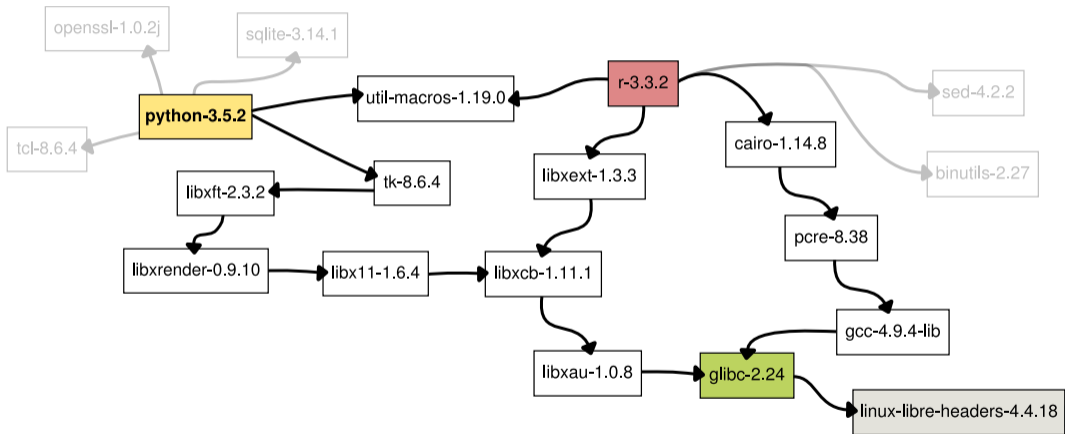
# What happened



# What happened

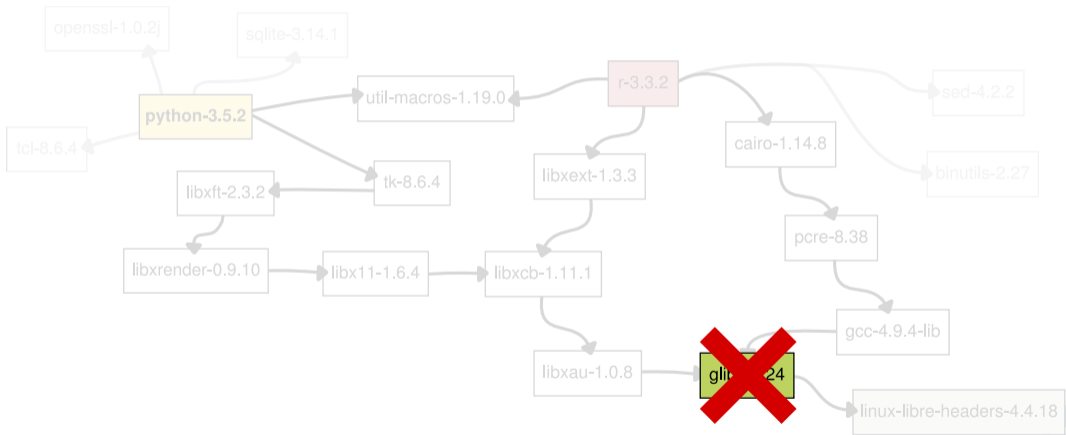


# What happened

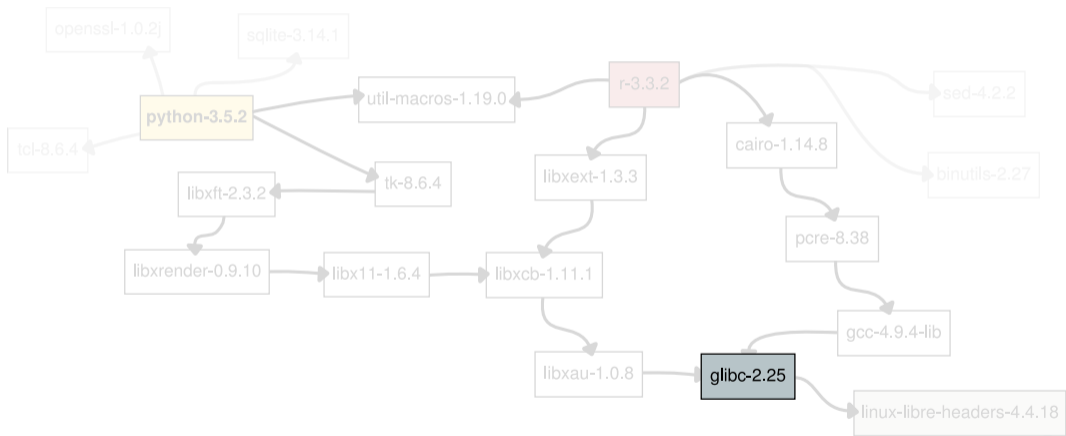




# What happened



# What happened



# The problems

- Constructing software is complex
- Software change over time
- The only way is forward



# File system

## Store

```
/gnu/store/vikzgmm369g5hgckdxnkywbd7p2cjpb0-gcc-5.3.0  
/gnu/store/hyk2i7bgpxvm6alnxjll14dm10d4jvb0-libstdc++-4.9.4  
/gnu/store/r4zw1r5krr6fpkxcwwxlbriva2c8cx2s-python-3.4.3  
/gnu/store/kcc3cxn0ddxxgpa88s60pk25marzk13i-python-2.7.10  
/gnu/store/rh11hmb3yxp94956m512cyyfds1wx8i-r-3.3.2  
/gnu/store/tghd4f8q8fr80n5xprraab5zni6ip5lza-r-3.0.1  
/gnu/store/6slzn4ixcjlhy3av3biglqfli9pwxn9-guile-2.0.11  
/gnu/store/q2i2k2w45zbaygcr5r5ia7a-emacs-24.5  
...
```



# File system

kcc3cxn0ddxxgpa88s60pk25marzk13i  
[source] [dependency-hashes] [...]

```
Store
/gnu/store/vi...gmm369g5hgckdxnkywd7p2cjpb0-gcc-5.3.0
/gnu/store/hy...7bgpxvm6alnxxj114dml0d4jvb0-libstdc++-4.9.4
/gnu/store/r4z...5krr6fpxcwxlbriva2c8cx2s-python-3.4.3
/gnu/store/kcc3cxn0ddxxgpa88s60pk25marzk13i-python-2.7.10
/gnu/store/rh11hmb3yxp...94956m512cyyf...dslwx8i-r-3.3.2
/gnu/store/tghd4f8q8fr80n5xp...raab5zni6ip5lza-r-3.0.1
/gnu/store/6slzn4ixcjlhy3av3biglqf1i9pwxn9-guile-2.0.11
/gnu/store/q2i2k2w45zbaygcr...rcy2z8k07cr5ia7a-emacs-24.5
...
```

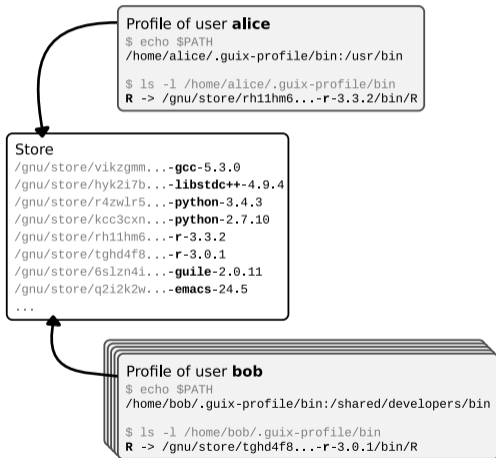


# File system

```
Store
/gnu/store/vikzgm369g5hgckdxnkywd7p2cjp0-gcc-5.3.0
/gnu/store/hyk2i7bgpxvm6alnxjll14dm10d4jvb0-libstdc++-4.9.4
├─ lib
│   └─ libstdc++.so.6
/gnu/store/r4zwlr5krr6fpkxcwwx1briva2c8cx2s-python-3.4.3
├─ bin
│   └─ python
/gnu/store/kcc3cxn0ddxxgpa88s60pk25marzk13i-python-2.7.10
/gnu/store/rh11hmb3yxpm94956m512cyyfds1wx8i-r-3.3.2
/gnu/store/tghd4f8q8fr80n5xpaaab5zni8ip5lza-r-3.0.1
/gnu/store/6slzn4ixcjlhy3av3biglqfli9pwxcn9-guile-2.0.11
/gnu/store/q2i2k2w45zbaygcrrcy2z8k07cr5ia7a-emacs-24.5
...
```



# User profiles

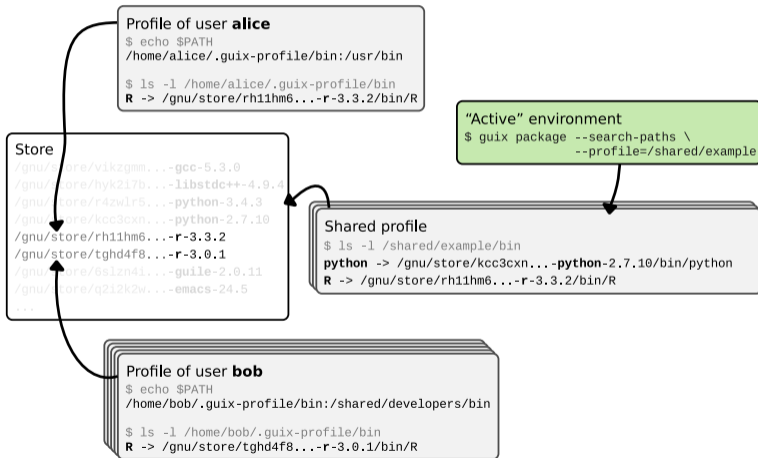


# Shared profiles

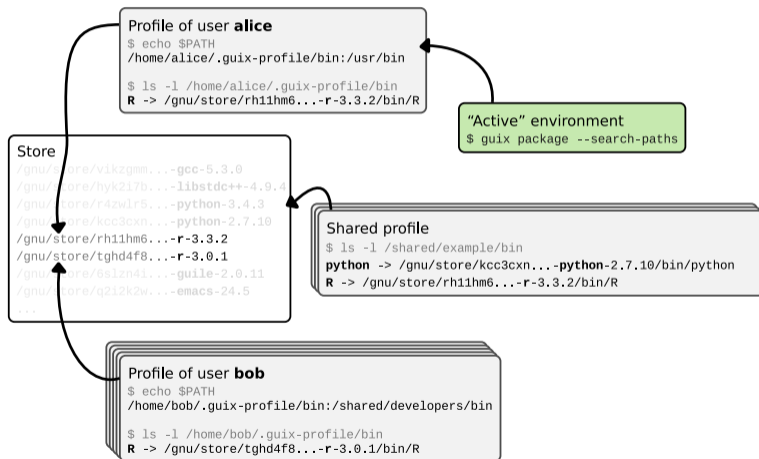




# Shell environment



# Shell environment



# Install packages

In your personal profile:

## Example

```
$ guix package --install python@3.4.3 r guile emacs@25.1
```

In a custom profile:

## Example

```
$ guix package --install r --profile=/path/to/profile
```



## Changing environment

With the `module` system it was:

### Example

```
$ module load package-name
```

With GNU Guix it will be:

### Example

```
$ guix package --search-paths -p /path/to/profile
```

Or for a single program:

### Example

```
$ guix environment package-name
```



# Containers

Isolate a program at kernel level:

## Example

```
$ guix environment --container python@3.4.3
```



# Providing a portable run-time environment

## Example

```
$ guix system container config.scm
```



## Some last things

- GNU Guix is a complete software deployment system
- Workflow management systems can build upon GNU Guix



## Find out more

- `https://gnu.org/s/guix`
- Available packages:  
`https://gnu.org/s/guix/packages/`
- `R.R.E.Janssen-10@umcutrecht.nl`





# Acknowledgements

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