Disnix: A toolset for distributed deployment

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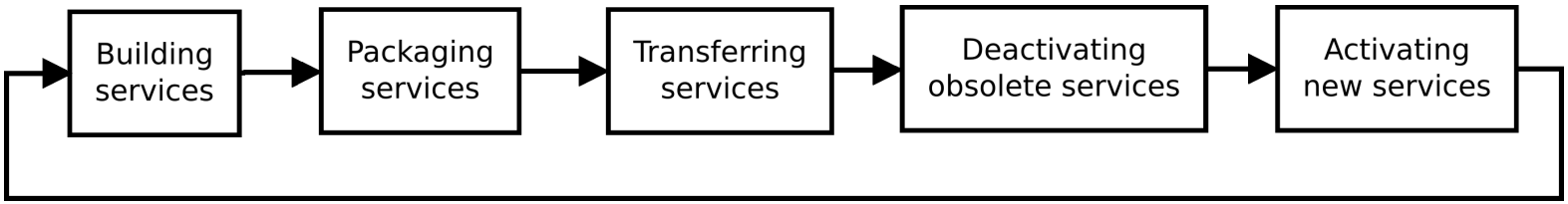
September 20, 2010

Disnix

Disnix is a tool to automatically deploy a distributed system in a network of machines



Research issues

- General issues:
  - Automatic deployment
  - Reliable deployment
  - Efficient deployment
  - Atomic upgrades/rollbacks
- Domain specific issues:
  - Security
  - Privacy
  - Performance

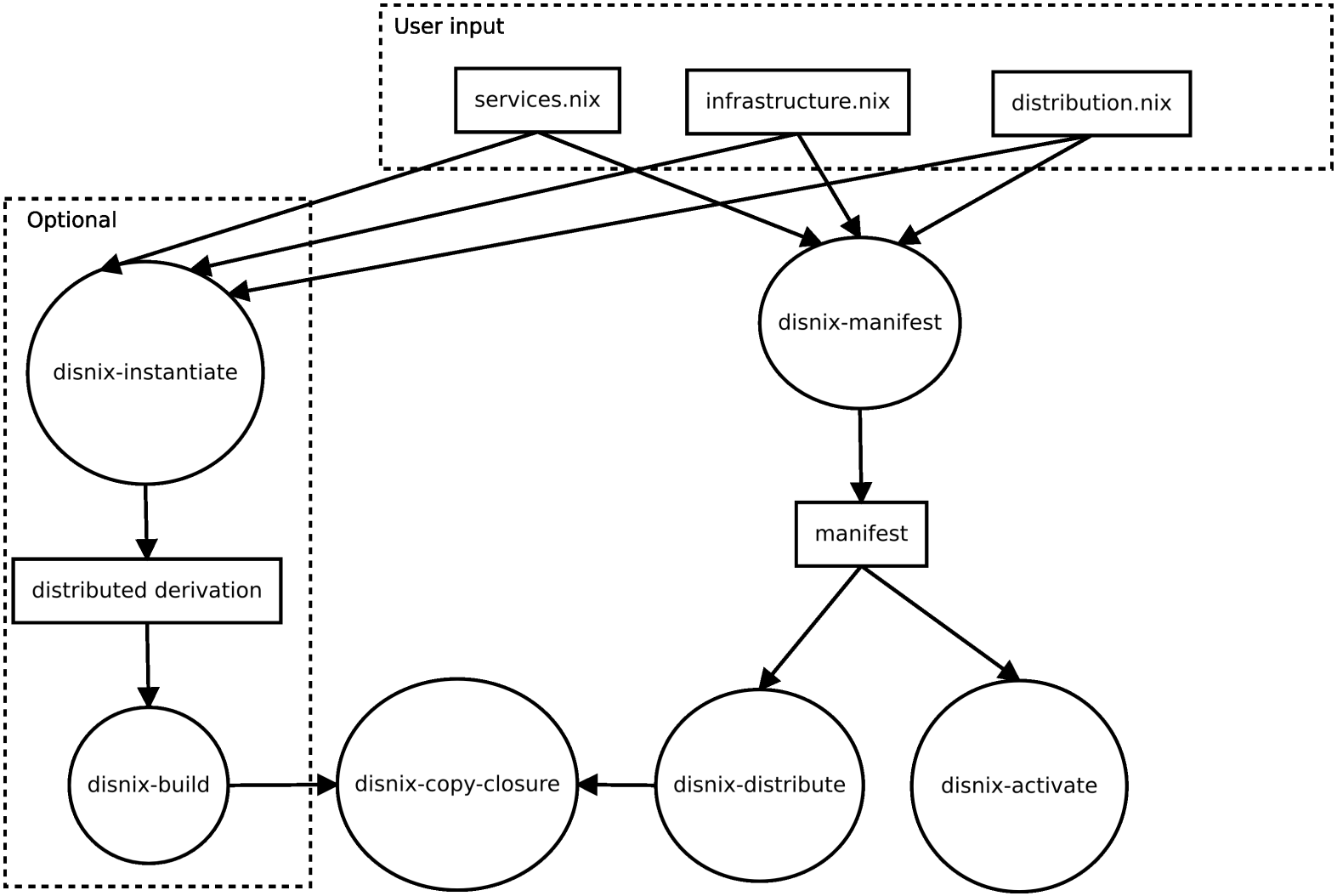
Research issues

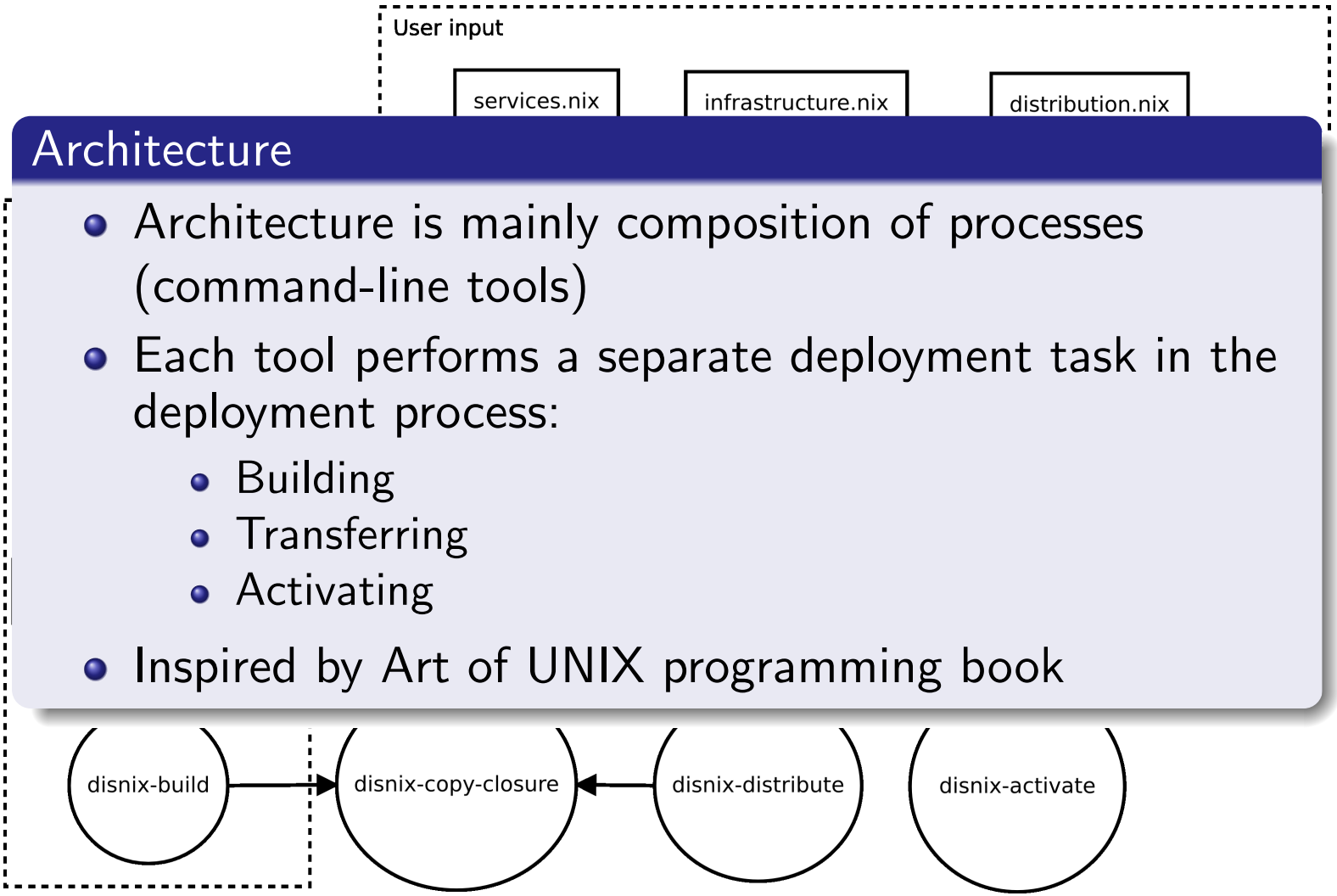
It is complex to implement and maintain a toolset dealing with these issues!

Challenges

- How to develop this toolset in a convenient way?
- Some non-functional requirements of the domain cannot be solved generically
- Maintaining everything ourselves is a lot of effort:
  - Programming language compilers/interpreters: C, Java, Python, PHP, ...
  - Libraries: Apache Axis2, libxml2, ...
  - Infrastructure components: Apache Tomcat, MySQL, ...
- The tool is used in a distributed setting. How to test?

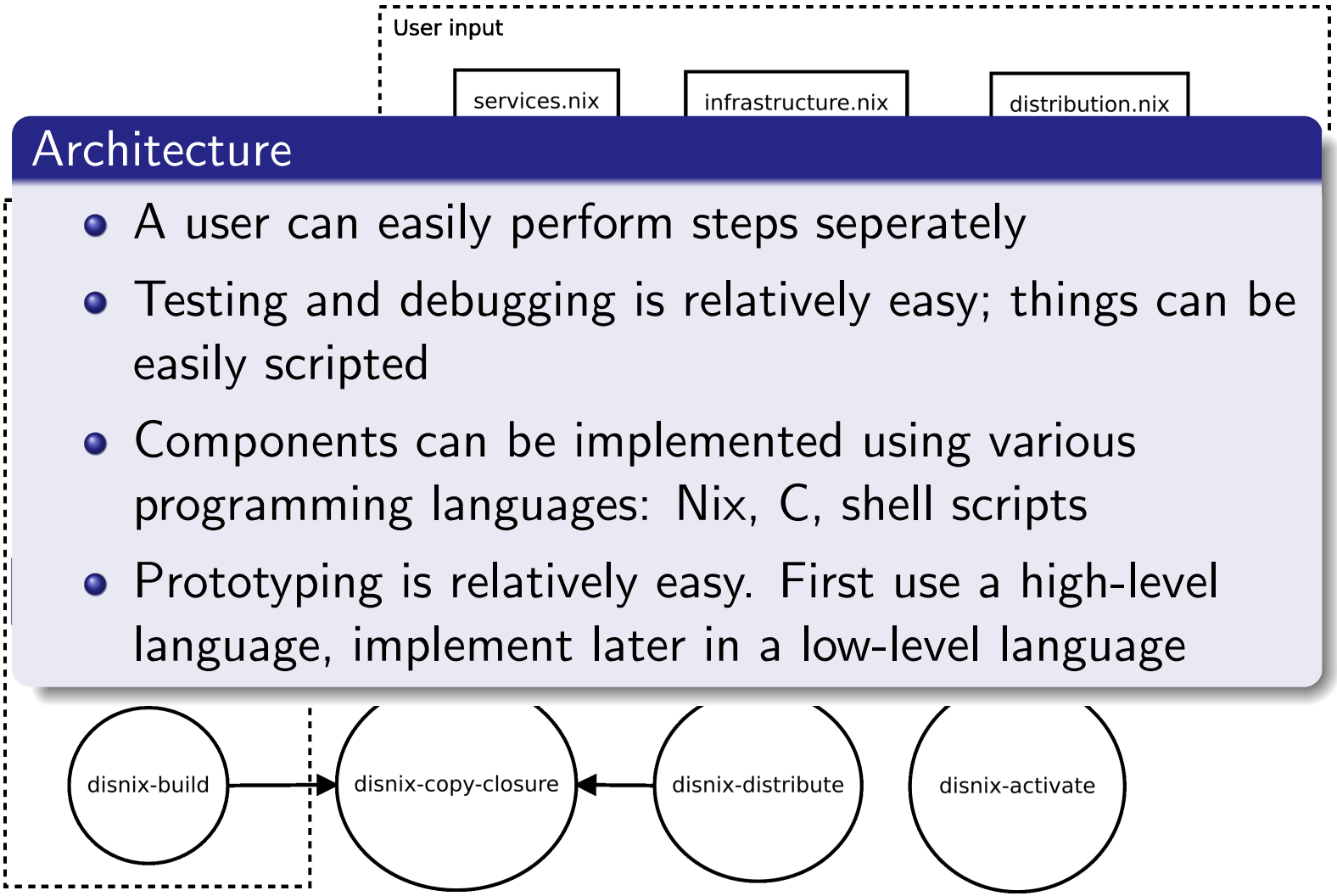
Architecture





Architecture

- Architecture is mainly composition of processes (command-line tools)
- Each tool performs a separate deployment task in the deployment process:
  - Building
  - Transferring
  - Activating
- Inspired by Art of UNIX programming book



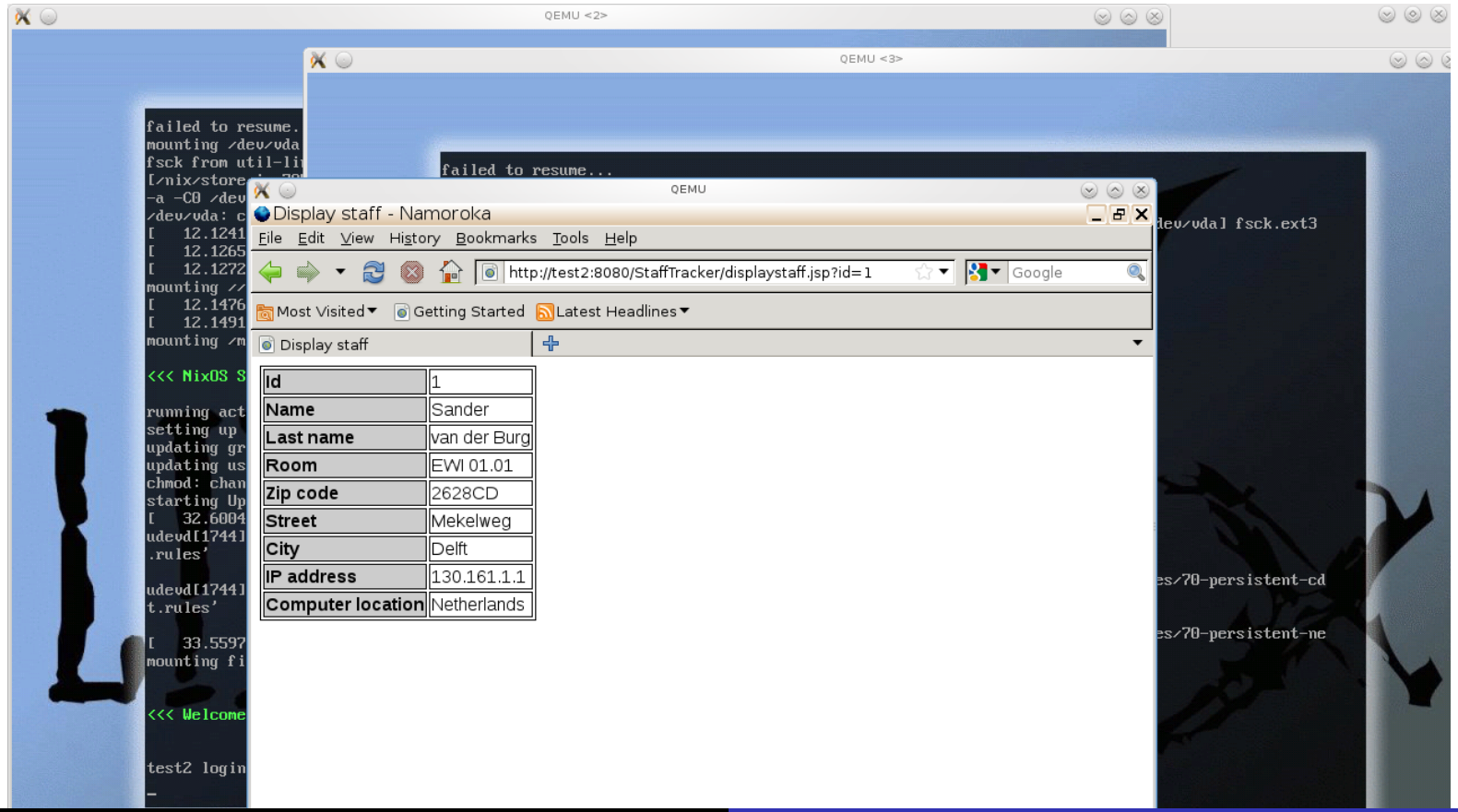
Architecture

- A user can easily perform steps seperately
- Testing and debugging is relatively easy; things can be easily scripted
- Components can be implemented using various programming languages: Nix, C, shell scripts
- Prototyping is relatively easy. First use a high-level language, implement later in a low-level language

Architecture

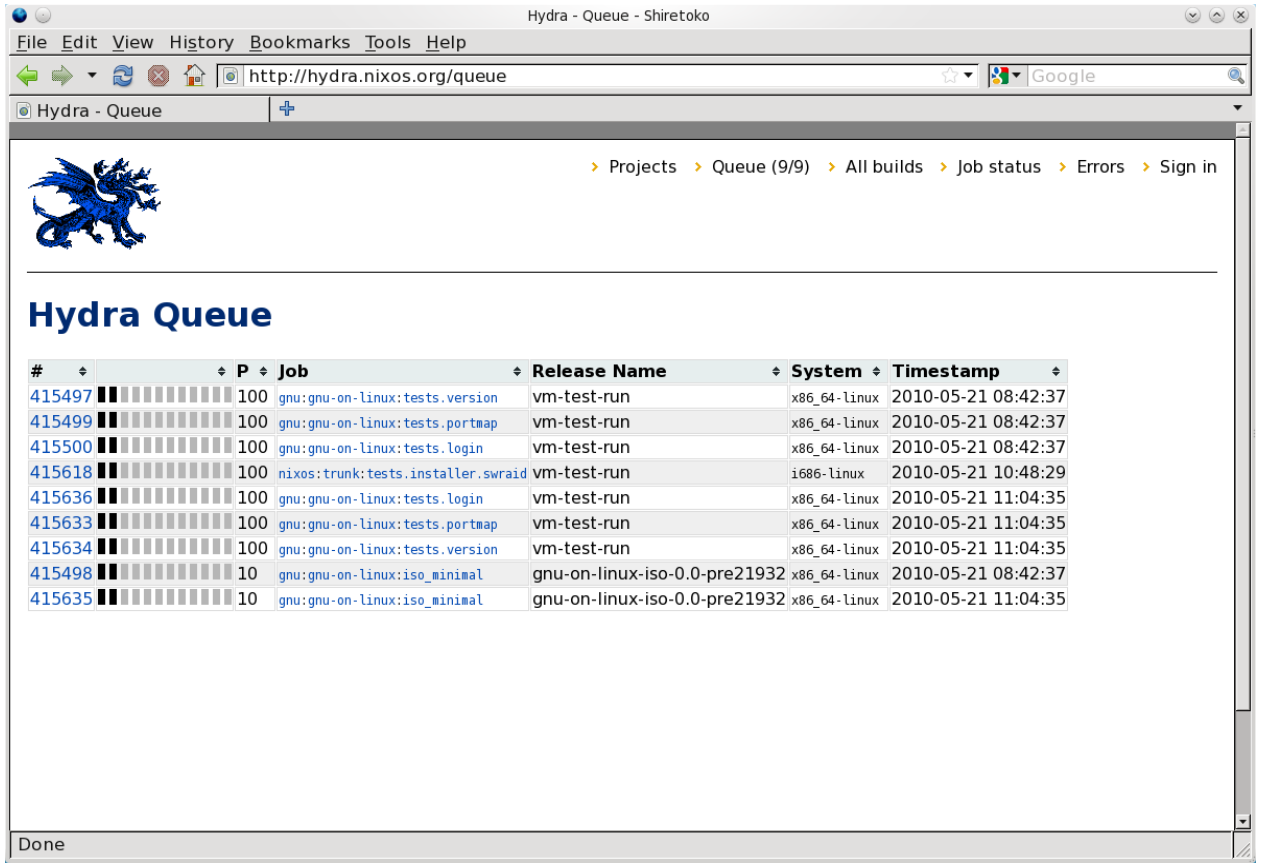
Extensions with custom modules are implemented by composing processes:

- Virtualization extension
- Dynamic deployment
- Service abstraction layer

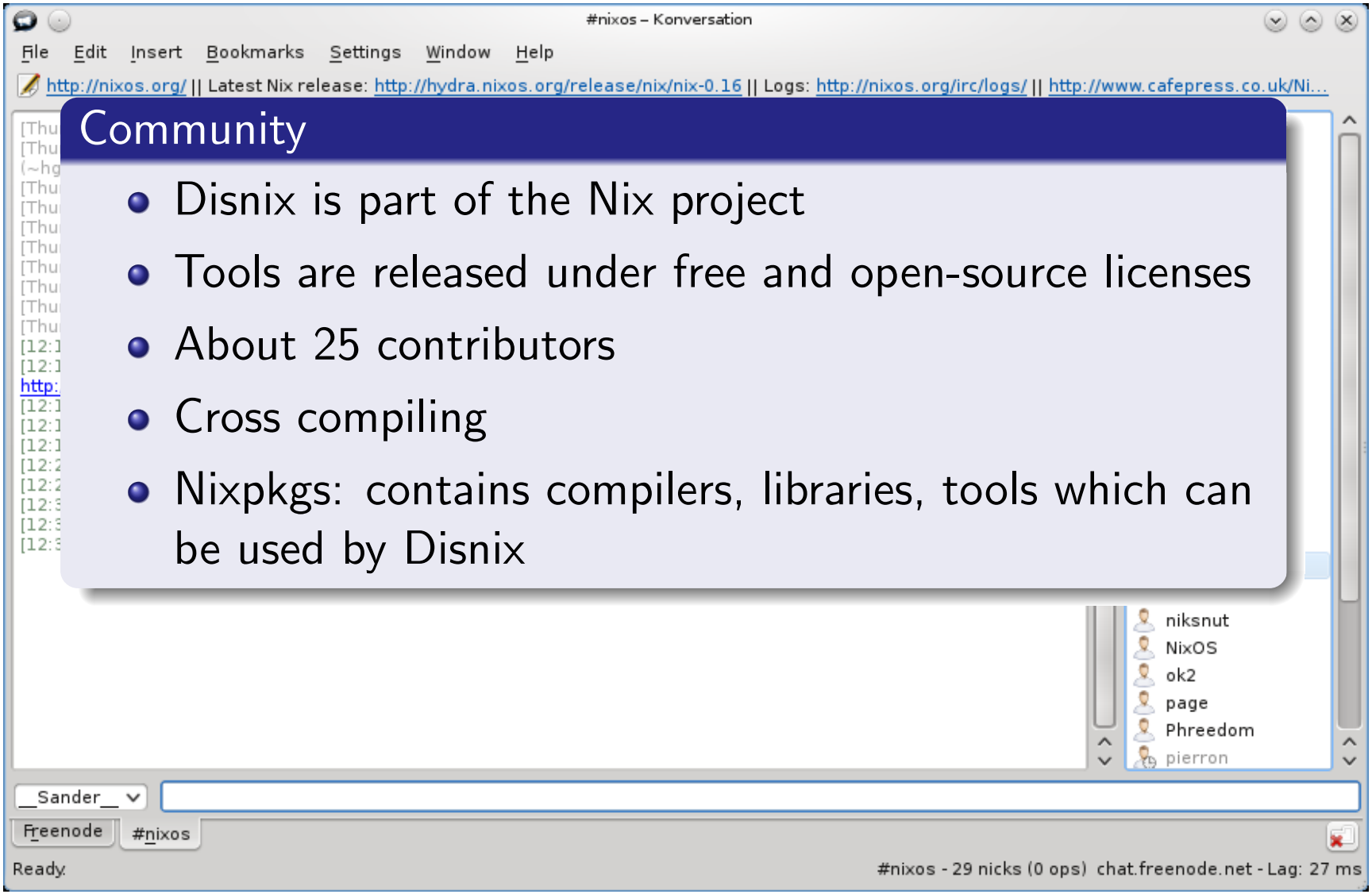


Testing

- Generate cheap virtual networks from declarative specifications
- Automatically performs testcases on them
- Completely scripted
- Disnix is continuously integrated and tested by *Hydra*



Community


#nixos – Konversation
File Edit Insert Bookmarks Settings Window Help
http://nixos.org/ || Latest Nix release: http://hydra.nixos.org/release/nix/nix-0.16 || Logs: http://nixos.org/irc/logs/ || http://www.cafepress.co.uk/Ni...
Community
Disnix is part of the Nix project
Tools are released under free and open-source licenses
About 25 contributors
Cross compiling
Nixpkgs: contains compilers, libraries, tools which can be used by Disnix
niksnut
NixOS
ok2
page
Phreedom
pierron
__Sander__
Freenode
#nixos
Ready.
#nixos - 29 nicks (0 ops) chat.freenode.net - Lag: 27 ms

Lessons learned

- Architecture works well for supporting development
  - Easy prototyping, debugging, testing, extendable
- Our test approach works well; we can automatically perform distributed testcases
- Community is crucial; too much effort to maintain everything ourselves

Website

Disnix, and other related Nix tooling: Hydra, NixOS can be freely downloaded from: `http://nixos.org`

Questions