Mercurial usage at Nokia

Scaling up to multi-gigabyte repositories and hundreds of developers

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Overview

- History and statistics
- Configuration
- Scalability
- Contributions and plans

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History and statistics

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- We like the concept of a monorepo!
  - Code sharing
  - Easy global refactoring
  - Visibility

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- We have 535 repositories on our server (quite a few are ‘team repos’ of the same main repository)
- Main repository:
  - Files: ~180 000
  - Revisions: 545 000 (190 000 merges / 35 %)
  - .hg/store size: 5.8 GB

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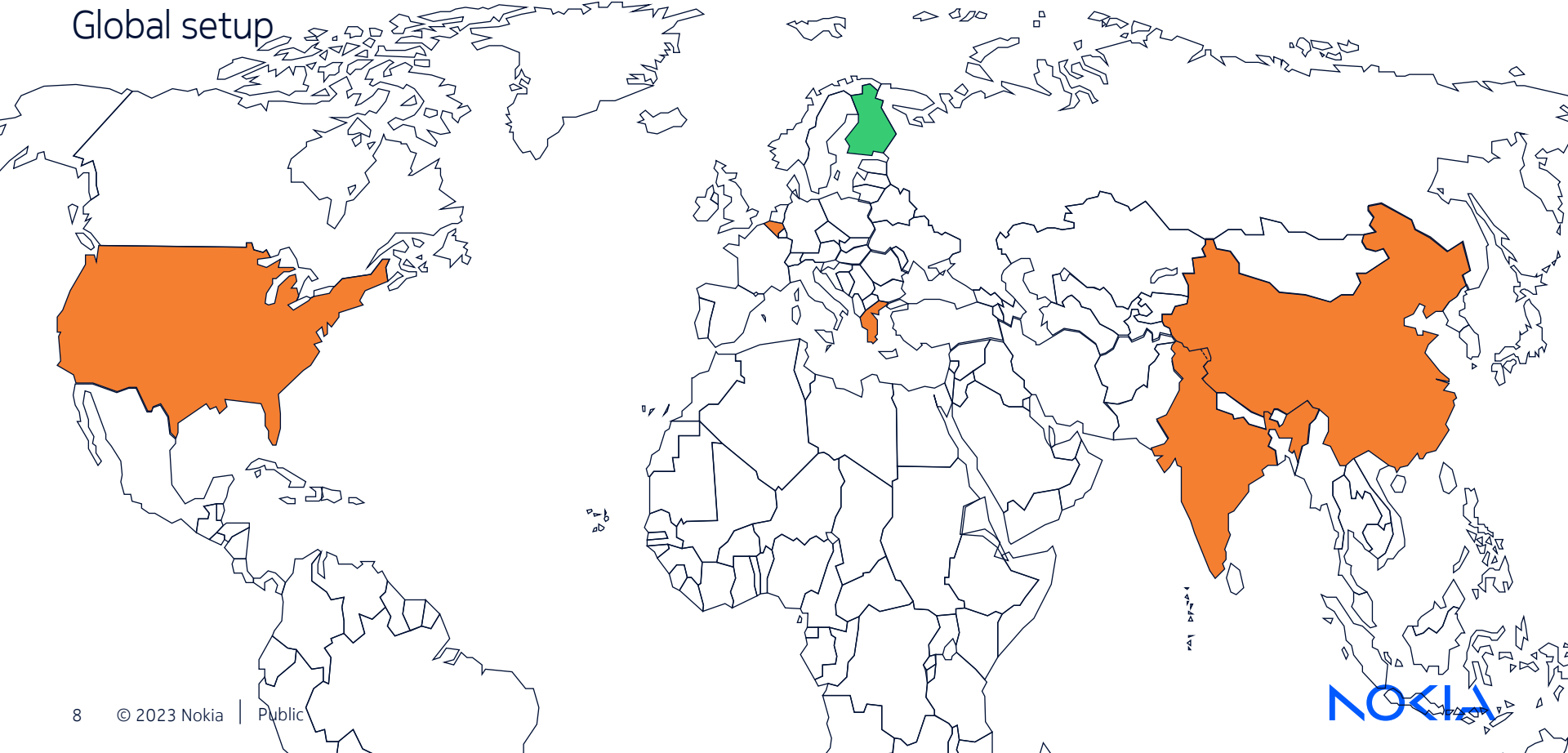
Configuration used at Nokia

Global setup



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Configuration used at Nokia

Settings

- Aliases
- Revsetaliases
- Schemes depending on location (allows: hg clone hg://some/repo)

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Configuration used at Nokia

Settings

- Aliases
- Revsetaliases
- Schemes depending on location (allows: hg clone hg://some/repo)
- Commonly enabled extensions (either included or home-made)
- Common hooks (local and on the server): don’t allow multiple heads, binary files, …, merges (in some repositories)
- Performance: in-memory rebase: rebase.experimental.inmemory=true

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Scalability at Nokia

Issues encountered

- Scalability issues we encountered
  - Large files
  - Many files, many revisions
  - Cloning (time and server load)
  - Pulling (server load)

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Scalability at Nokia

Obvious solutions

- **Upgrade your Mercurial version**!
  - Improves performance
  - Provides additional optimization options (there are a lot!)
- **Upgrade your repositories**
- Switch to **SSDs** (also on the server!)

References:

- hg help debugupgrade

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Large files

- Largefiles extension (and predecessors)
- **Lfs extension**
- Let something else handle it (**build system**, ...)

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Many files, many revisions

- Narrow
- Fsmonitor/watchman
- Remotefilelog
- **Rust**
- **SSD**

References:

- https://foss.heptapod.net/mercurial/mercurial-devel/-/blob/branch/default/rust/README.rst

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Cloning (time and server load)

- Default clones: relatively slow and ‘heavy’ on the server → 32 minute clone
- **Clonebundles**: remove all server load → 30 minute clone
- **Streaming clonebundles**: speed up → 3-4 minute clone

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- **Mirrors:**
  - Multi-site? Put a mirror in each location
  - In our case, we use mercurial-server docker mirrors

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References:

- clonebundles: hg help clonebundles
- streaming clonebundles: hg help debugcreatestreamclonebundle
- mercurial-server: https://foss.heptapod.net/nokia/mercurial-server

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Pulling (server load)

- Light compared to clones, but still...
- **Pullbundles:** remove server load
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References:

- pullbundles: hg help clonebundles
- mercurial-server: https://foss.heptapod.net/nokia/mercurial-server

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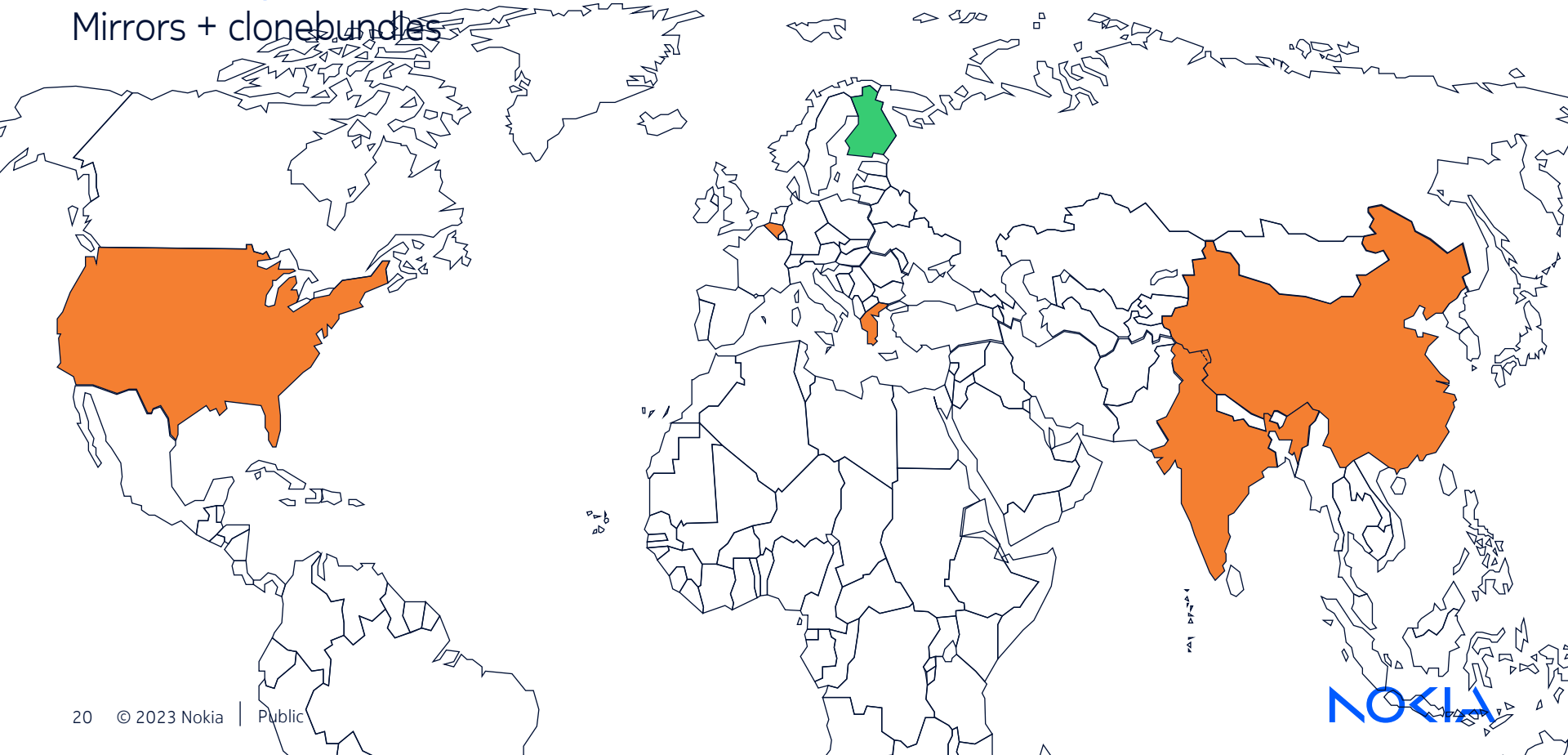
Mirrors + clonebundles



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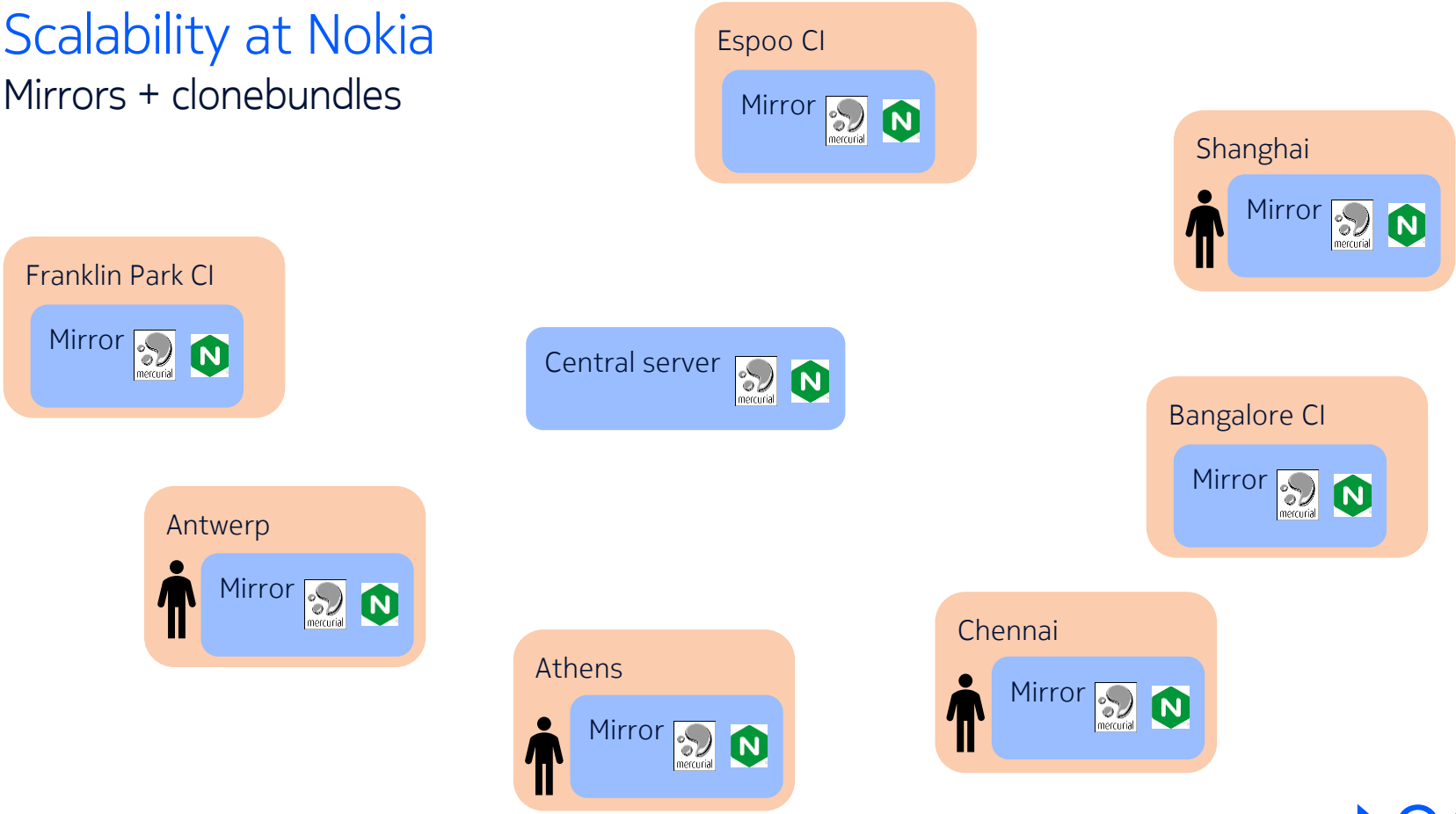

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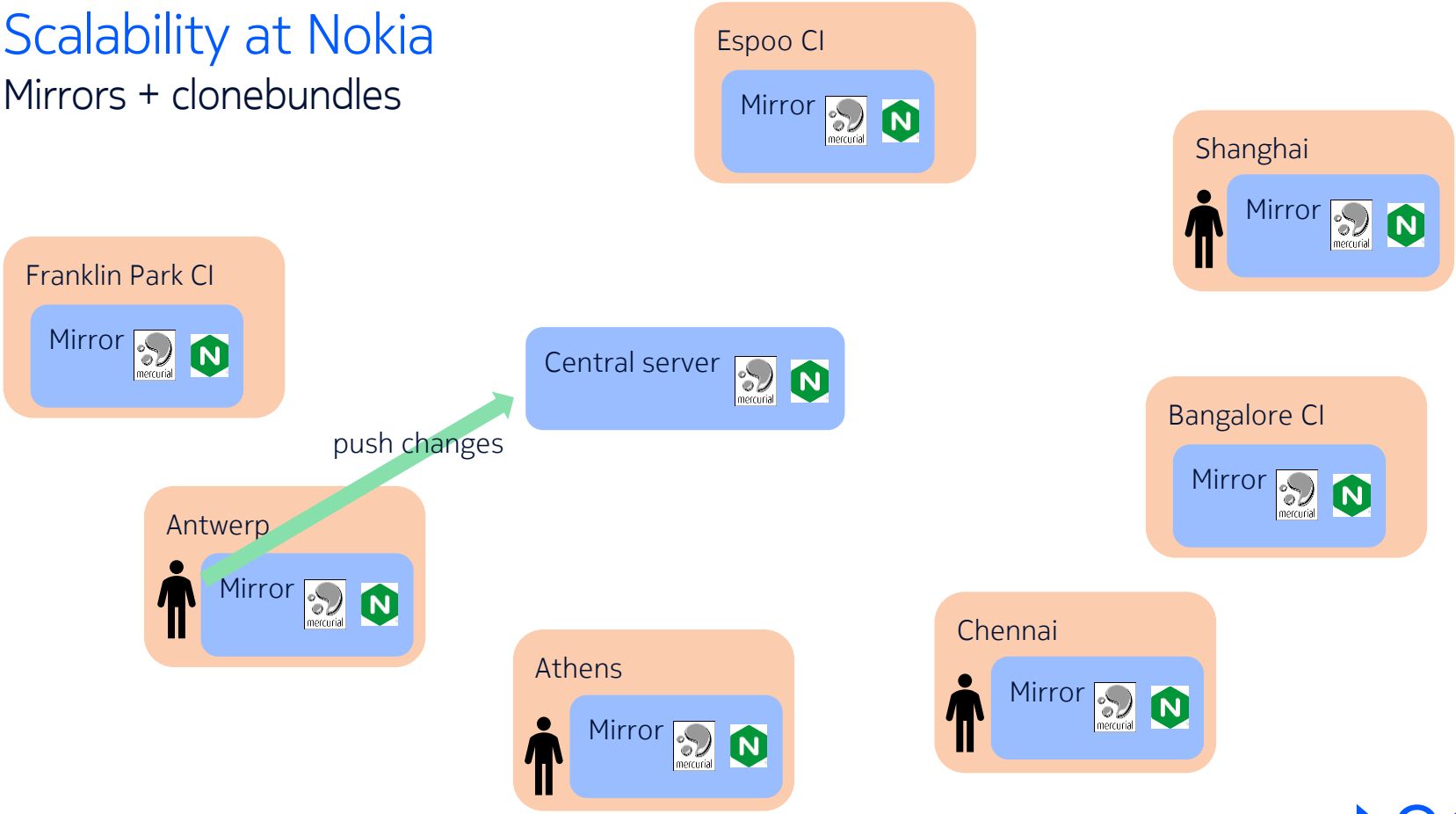

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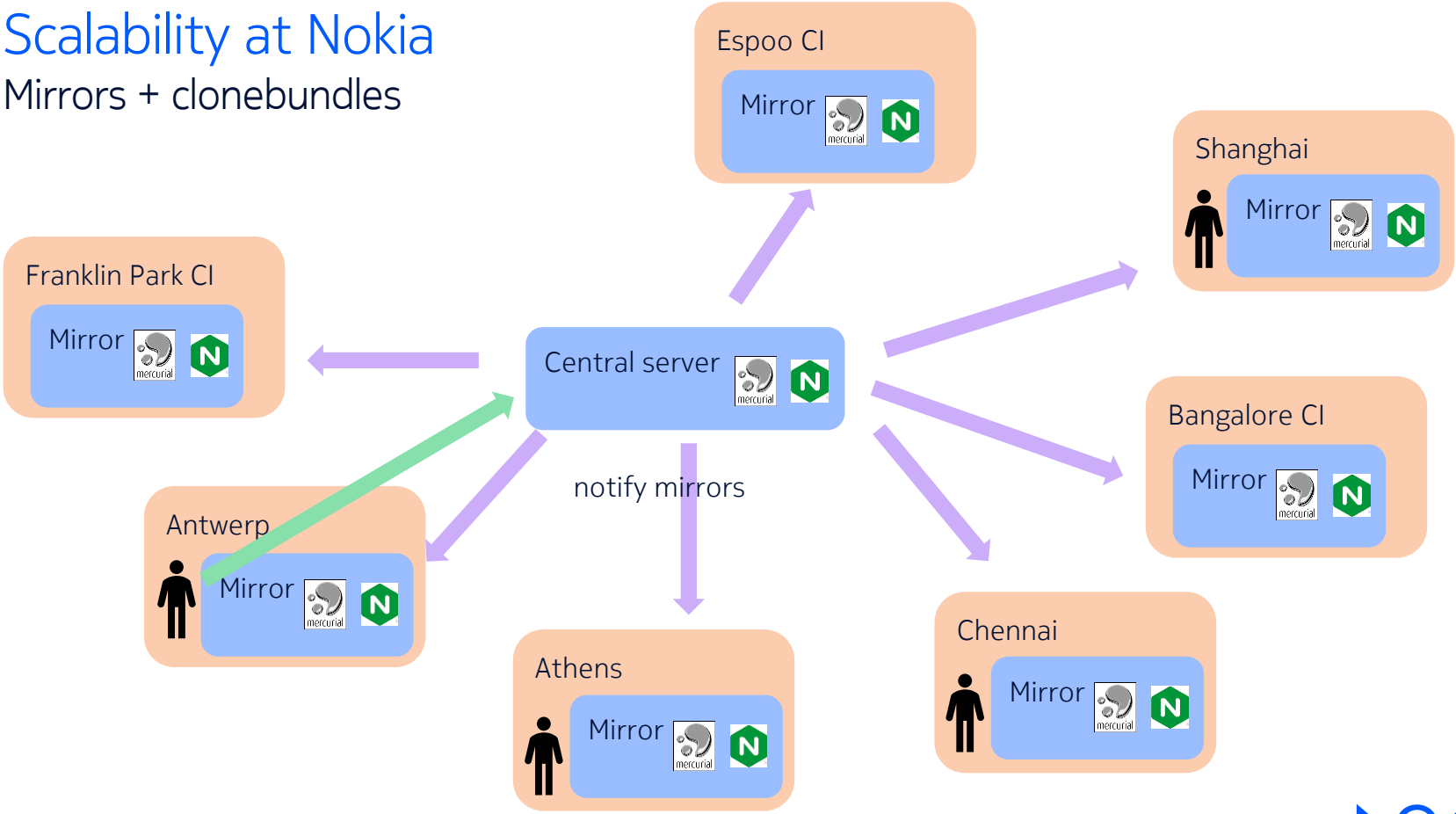

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Nokia contributions and plans

- Small patches every so often
- Mercurial-server project contributions: https://foss.heptapod.net/nokia/mercurial-server
  - Hosting Mercurial repositories (no graphical interface or pull requests)
  - Docker-based mirrors
- Inline streaming clonebundles: https://foss.heptapod.net/mercurial/mercurial-devel/-/merge_requests/180

Next things we are interested in:

- Heptapod possibilities
- Further optimizations

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Questions?

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