New in NetworKit - Under the Hood
Fabian Brandt-Tumescheit, Charmaine Nyambura Ndolo

Department of Computer Science, Humboldt-Universität zu Berlin, Germany
What to expect

Distribution
- Installation
- Release Schedule

Notebooks
- Overview
- Cloud Infrastructure

Beginners

Experienced

Build System
- Cython Restructure
- Demo

Misc
- Unit Tests, Style Guide
- Documentation
Installation: pip3
Installation: spack — conda — brew

NetworKit

Python

Pythonized Classes
Task-Oriented Interface

networkit (brew, conda)
py-networkit (spack)

Cython

Wrapper Classes

C++

Data Structures

libnetworkit

pandas

matplotlib

...
Release Schedule

Bug Fixes
New Features
API Changes

Patch Release
On Demand

Minor Release
3 months

Major Release
6 months

networkit 7.1.0
Current Release
Jupyter Notebooks

Static Renderings
https://networkit.github.io/dev-docs/notebooks.html

Self-Hosted Playground
minimal example

```bash
$ python3 -m venv jupyterenv
$ jupyterenv/bin/activate
$ pip3 install --upgrade pip
$ pip3 install --quiet Cython networkit jupyter
$ git clone https://github.com/networkit/networkit 66 cd networkkit
$ jupyter notebook notebooks
```
NetworKit in the Cloud

Compute Namespace
- User Instance
  - NetworKit
  - jupyterlab

Management Namespace
- Registration
- Management
  - Ressource Management
  - Service Routing
  - Isolation
  - Instance Monitoring

networkit-cloud.com/xjivep77wd
networkit-cloud.com/1iep55acvo
networkit-cloud.com/register
Cython Build System

Monolithic
v1.0 - v7.0

NetworKit.pyx

Algebraic
Centrality
Viztasks

Base
Clique
Workflows

Module Based
from v7.1

base.pxd

base.pyx

centrality.pyx

Centrality

centrality.pxd

graph.pyx

Graph

from v7.1

base.pxd

base.pyx

centrality.pyx

Centrality

centrality.pxd

graph.pyx

Graph

Unit Tests, Style Guides and more

Static Code Analysis

- **Styling Check**
  - `./check-code.sh`
  - Include Guards
  - Indentation
  - clang-format
  - **HEADER:**
    // networkit-format
  - **CONFIG:**
    .clang-format

- **Code Coverage**
  - `cmake -DNETWORKIT_COVERAGE`

- **Linters**
  - `cmake -DNETWORKIT_CLANG_TIDY`
  - **CONFIG:**
    .clang-tidy

Dynamic Code Analysis

- **Memory Leaks**
  - `cmake -DNETWORKIT_WITH_SANITIZERS=leak`

- **Unit Tests**
  - `cmake -DNETWORKIT_WITH_TESTS=ON`
  - notebooks/test_notebooks.py

New in NetworKit - Under the Hood

Fabian Brandt-Tumescheit, Charmaine Nyambura Ndolo, HU Berlin
Documentation Build System

- Sphinx
- Bootstrap
- Doxygen

Travis CI

BREATHE
Exhale
Questions?