

BAcKFLiP:

Benchmarking network functions to collect the world largest NFV performance dataset

SS19-WS19/20

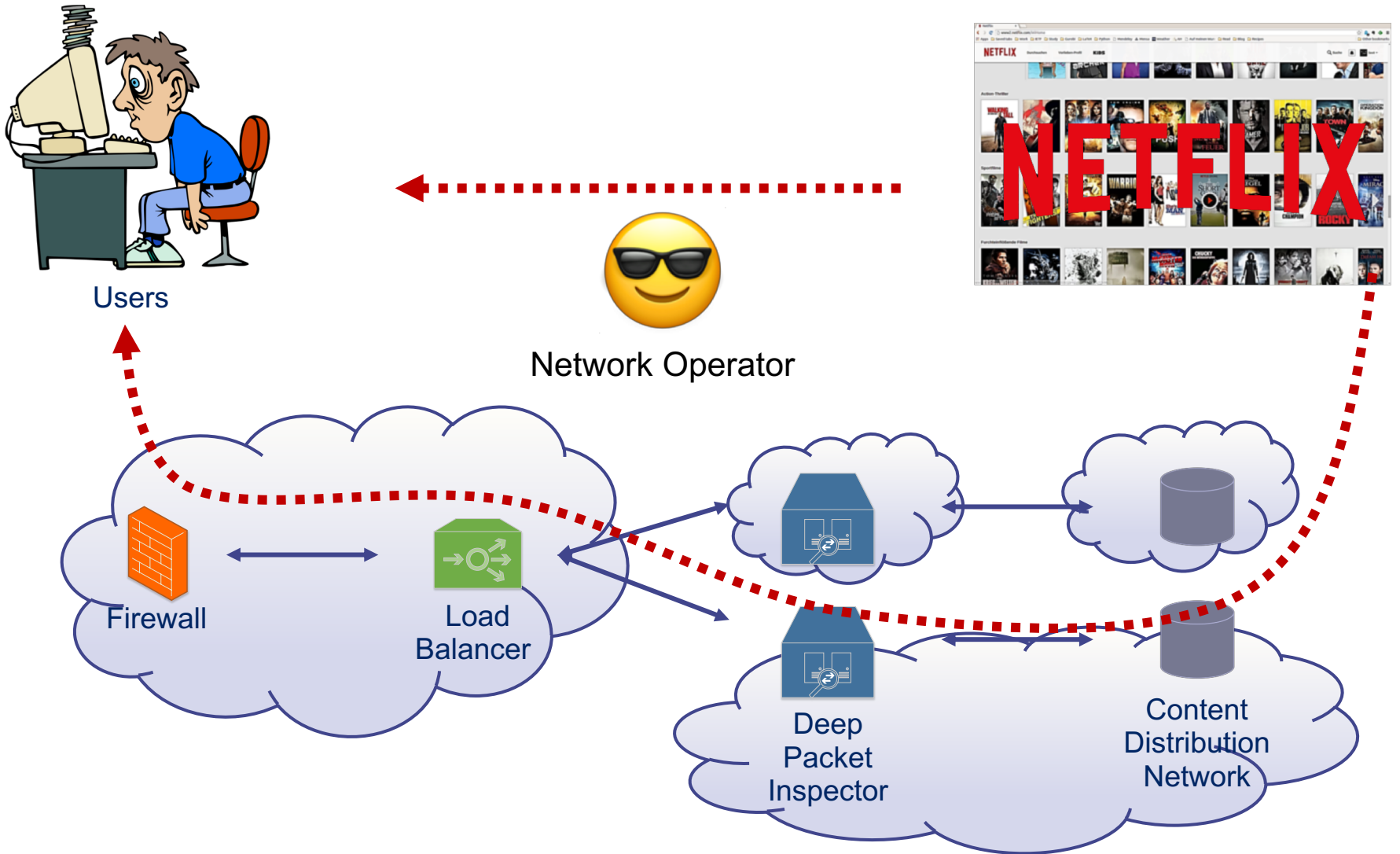
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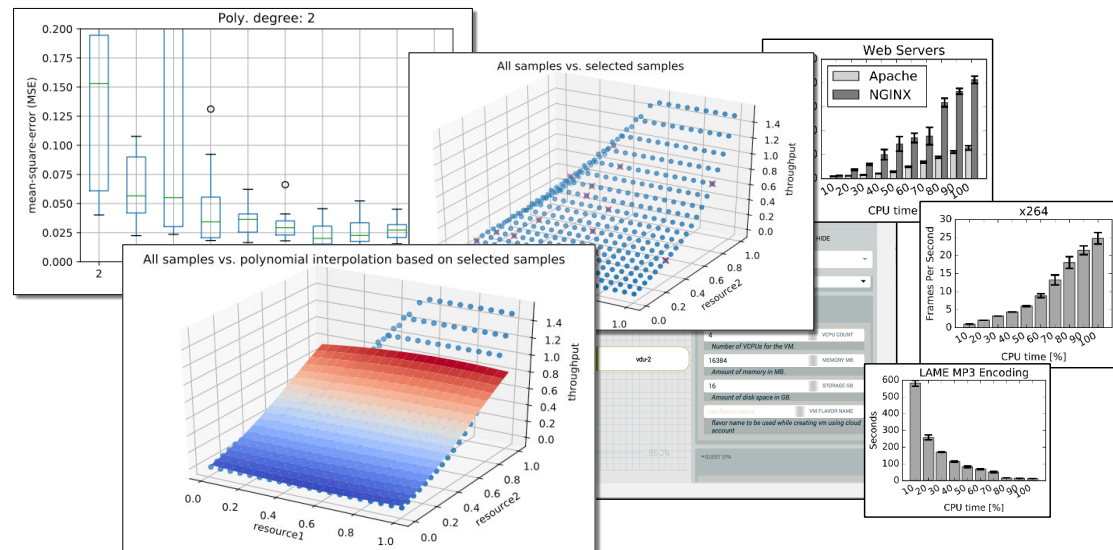
Computer Networks Group
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5G and NFV: Putting the network into the cloud



But if our network functions are virtualized ...

... knowing about their performance will be challenging!



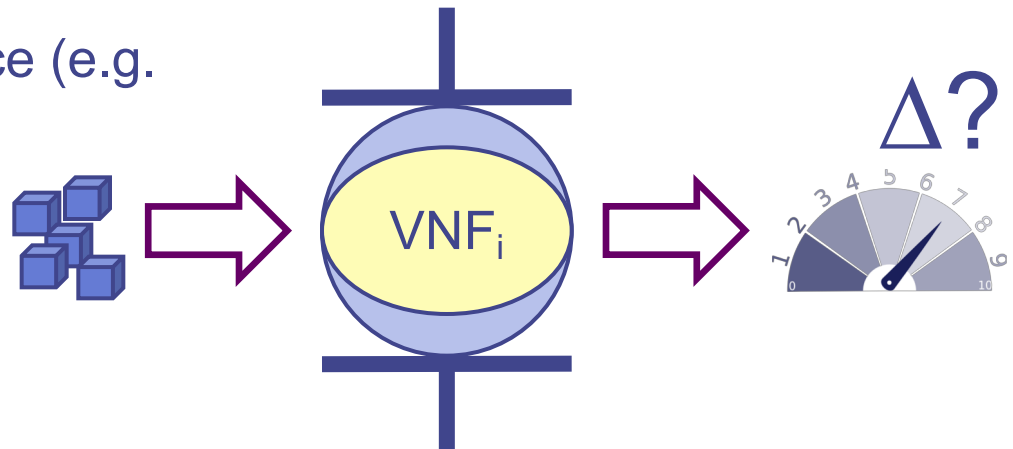
- Orchestration:
 - Resource dimensioning and scaling?
 - Placement?
- Development / Testing
 - Bottlenecks?



Data?

How to generate such performance profiles?

- General idea:
 1. Run service chain
 2. Manipulate available resource for each VNF
 3. Measure performance (e.g. throughput)



- Resource limitation
 - cpu_cores
 - cpu_time
 - mem_max
 - mem_swap_max
 - block_io_bw

How to generate such performance profiles?

NFV Profiling/Benchmarking

But, all this needs to be fully automated!

Ongoing work:

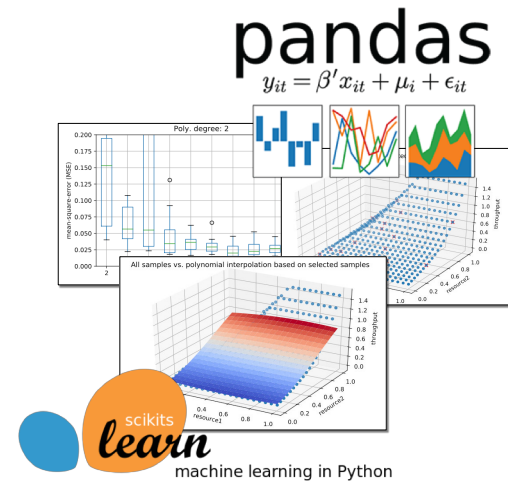
- **M. Peuster** and H. Karl: [Profile Your Chains, Not Functions: Automated Network Service Profiling in DevOps Environments](#). IEEE Conference on Network Function Virtualization and Software Defined Networks (NFV-SDN), Berlin, Germany. **(2017)**
- R. Rosa, C. Rothenberg, **M. Peuster**, H.Karl : [Methodology for VNF Benchmarking Automation](#). IETF draft BMWG (ongoing work) **(2018)**



Integrate



Analyze



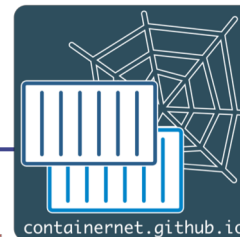
Experiment



Open Source
MANO



docker



- Identify and analyze candidate VNFs and network services
- Setup a benchmarking testbed and integrate it with existing NFV benchmarking solutions
- Design and run a first set of benchmarking experiments using the existing toolchain
- Extend and improve the [5GTANGO benchmarking tool](#) to be able work with one of the most prominent NFV MANO solutions in the telecom industry: [OpenSource MANO](#)
- Run a second set of benchmarking experiments using your extended toolchain
- Document all experiment setups and outcomes
- Analyse the outcomes and polish the data for publication

- **5G:** Work with state-of-the-art cloud and NFV technologies ([OpenStack](#), [Kubernetes](#), etc.)
- **Open source:** Contribute to large open source projects (e.g. [5GTANGO](#))
- **Big data:** Dive into data analysis (workflows, tools, etc.)
- **Standards:** The outcomes of this PG will contribute to our IETF draft on NFV benchmarking automation [2]
- **Community:** Be part of the research community and contribute to 5G (or even 6G? ;-))

- Basic networking concepts (Layer 2 and above)
 - Good understanding of Linux
 - Programming experience (most tools are written in Python)
 - Cloud, container, DevOps knowledge is definitively a plus
 - Data analysis (Pandas, etc.)
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- **Willingness to learn, work, and grow as a team!**



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- More details: <https://github.com/CN-UPB/pg-backflip/wiki>
- Or speak to us after this presentation.

