



*Flexible, Scientific Infrastructure
for Research on the Future
of Cloud Computing*

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Recent Facility-focused Research

- Long-term study of hardware performance
 - Paper presented at **USENIX OSDI'18**:
<https://www.usenix.org/system/files/osdi18-maricq.pdf>
 - Data and code are publicly available:
<https://zenodo.org/record/1435969#.XO1g0NNKh24>
- Analysis of facility's control framework and user activity
 - Paper accepted to **USENIX ATC'19** (will be available online soon)
 - Data and code are publicly available:
<https://gitlab.flux.utah.edu/emulab/cloudlab-usage>

Measuring Hardware Performance

22 months
4M data points
2K servers

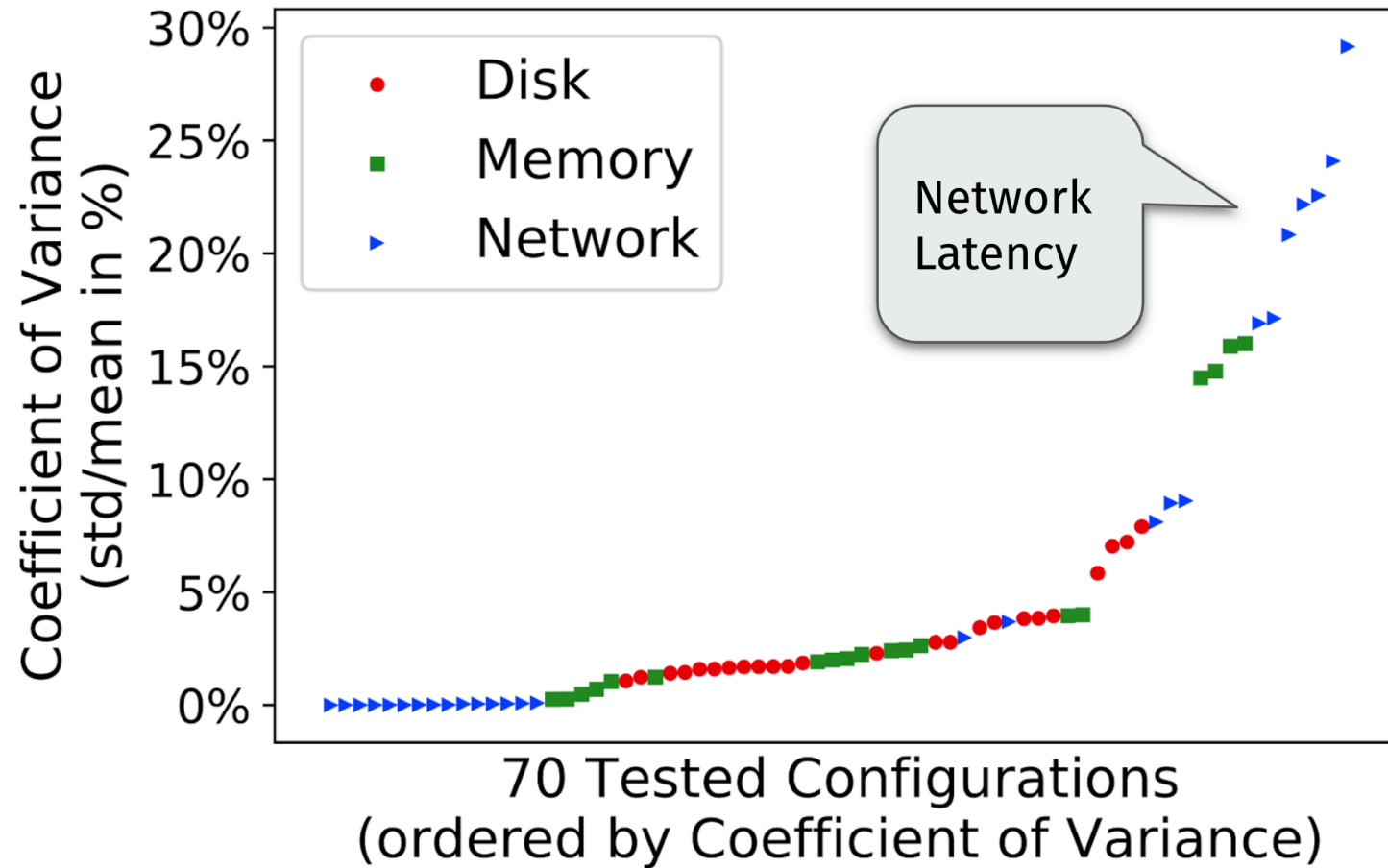
Memory
Disk
Network
CPU

Examine performance variability of testbed hardware

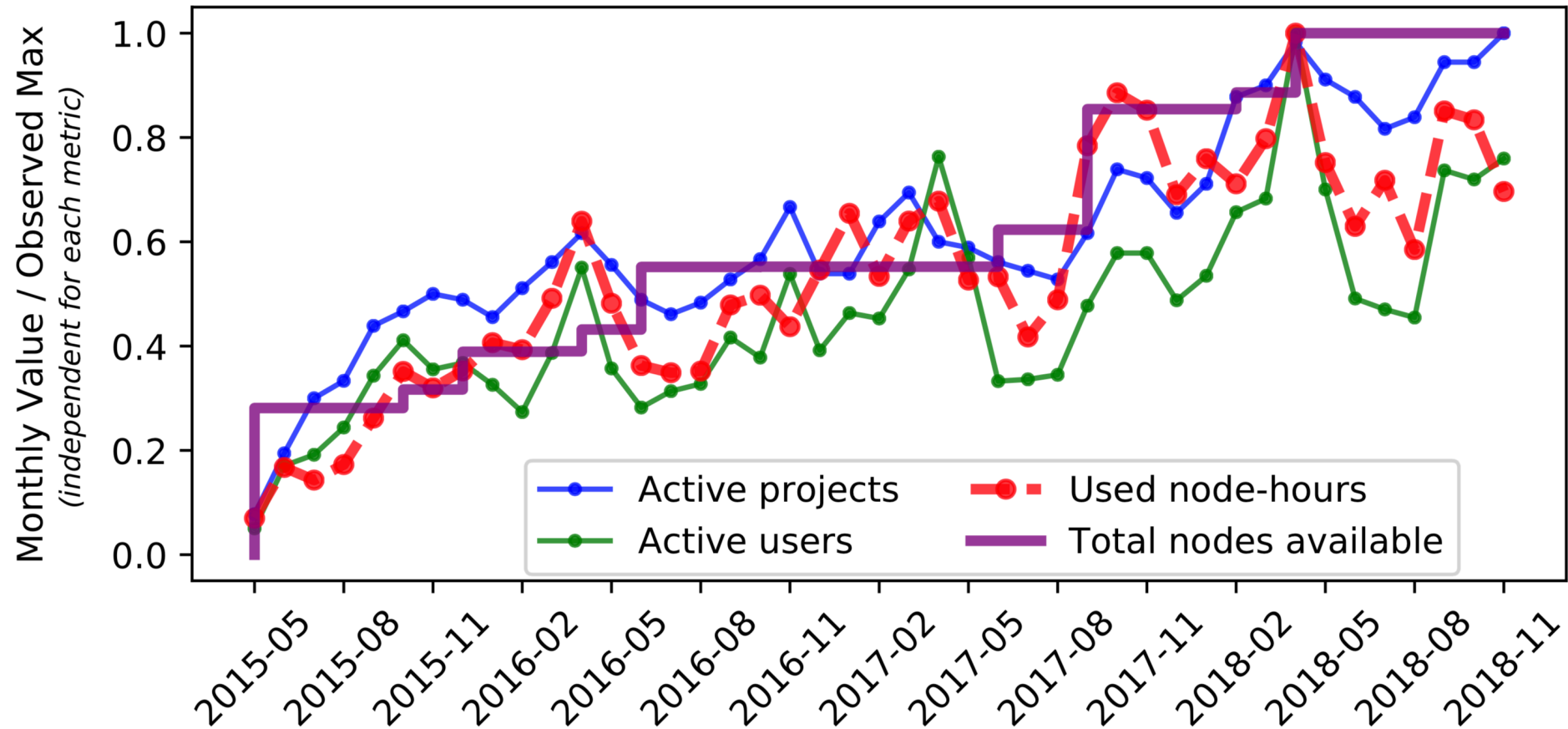
Within servers
Across servers



Long-term Study of Hardware Performance



Tracking User Activity



Summary of Research Use

Networking	30%
Security	16%
Storage	11%
Applications	10%
Computing	9%
Virtualization	8%
Databases	7%
Middleware	4%
Energy & Power	2%
Other	15%

Table 1: Research areas in 93 papers that used CloudLab.

More about CloudLab

Online:

<https://cloudlab.us/>
<https://www.flux.utah.edu/>

Today:

Parallel Tutorials	Session #1
13:30-15:00	<i>Getting Started with CloudLab</i> , Dmitry Duplyakin
15:00-15:30	<i>Coffee break</i>
15:30-17:00	<i>Experimenting with Complex Software Environments on CloudLab</i> , Dmitry Duplyakin