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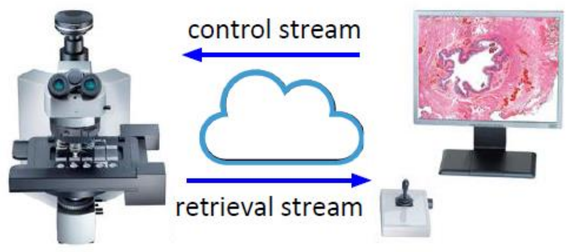
XXXIII Cycle - II year presentation

Cloud infrastructures for telepathology

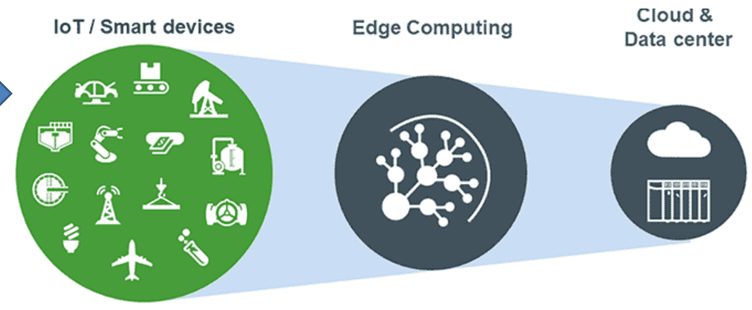
Telepathology involves *two* typical use cases:
1) **Remote consultation:** *remote control* of a microscope
2) **Remote computation:** *processing* and *elaboration* of images to help diagnosis



Cloud computing adoption *allows to*
+ **adapt resources** to user demands
+ provide **innovative telemedicine services**

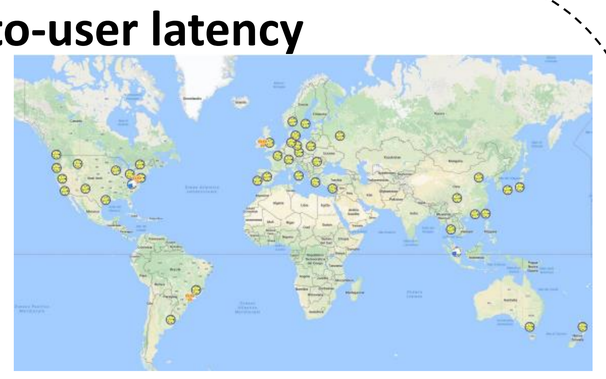
but implies
- **limited visibility** into **network performance**
- **higher latency**

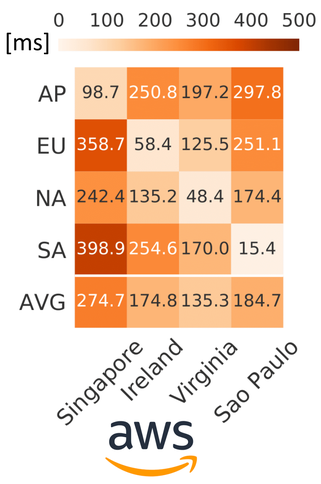
Edge computing brings resources **closer to end-users, reducing latency**

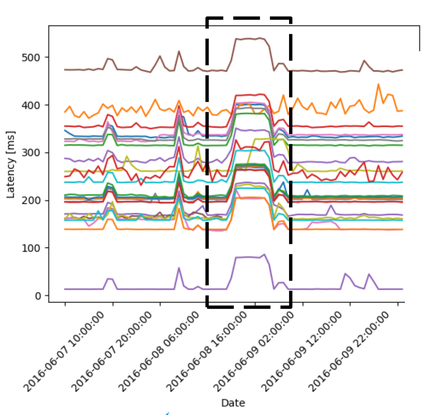


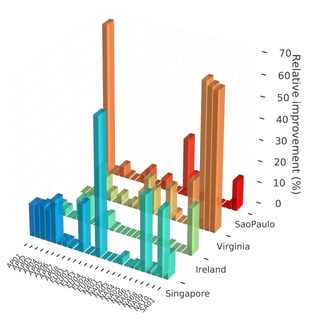
Analysis of cloud-to-user latency

- **2 providers** Azure aws
- **4 Cloud Regions**
- **25 Vantage Points** (in 4 regions)
- **14–days** campaign









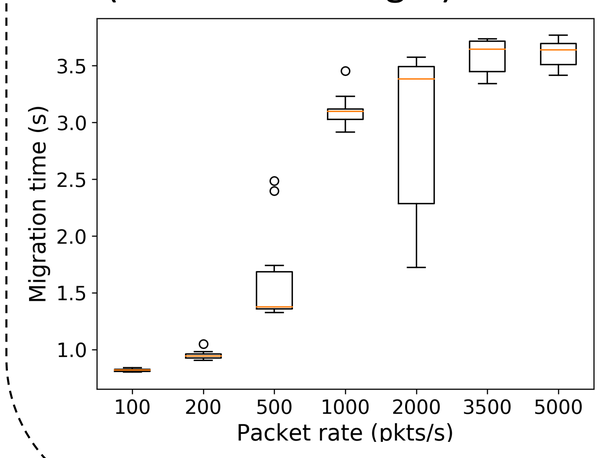
→ Best-performing provider **changes** with the **specific Cloud Region** considered

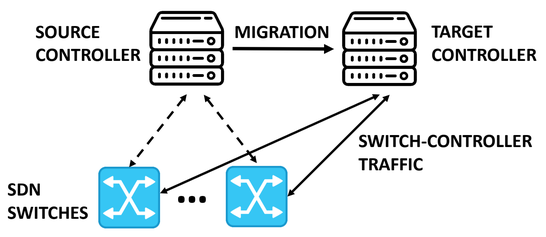
→ **Detecting** and **locating badness events**, allowing root cause analysis

→ Evaluating **benefits** of **multi-cloud deployments**

FLOCK: Live migration of SDN controllers

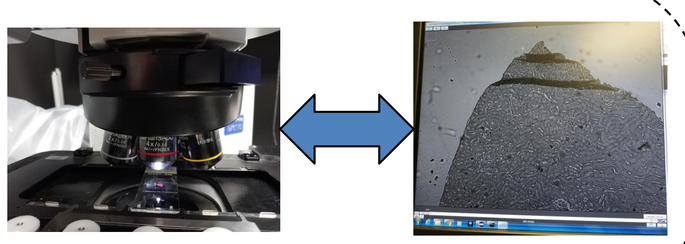
- Protocol **design** and **evaluation**
- Modular architecture **independent** from **specific** SDN controllers
- Considering **dirty–packets** for *real* live migration
- **Experimental evaluation** with **2 controllers** (1 source – 1 target)





→ **Low overhead** even for **high switch – controller traffic** load

Development and **evaluation** of a **system prototype** for **remote consultation** using **real microscopes**



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Future steps

- Evaluation of **latency prediction** techniques
- **Modeling** of **campus network traffic** for telepathology applications
- Development of an **edge computing based architecture** for the **remote computation** use case

References

[1] **F. Palumbo**, G. Aceto, A. Botta, D. Ciuonzo, V. Persico and A. Pescapé, *"Characterizing Cloud-to-user Latency as perceived by AWS and Azure Users spread over the Globe"*, IEEE GLOBECOM 2019.
[2] C. Contoli, **F. Palumbo**, F. Esposito, F. Callegati, and A. Pescapé, *"FLOCK: a live migration protocol for SDN controllers"*, IEEE NFV-SDN 2019. ***Best Fast Track paper Award.***
[3] W. Shi, J. Cao, Q. Zhang, Y. Li and L. Xu, *"Edge Computing: Vision and Challenges"*, in IEEE Internet of Things Journal, Oct. 2016.