SEEC Harlem Project: Scaling Community Edge Clouds in Harlem

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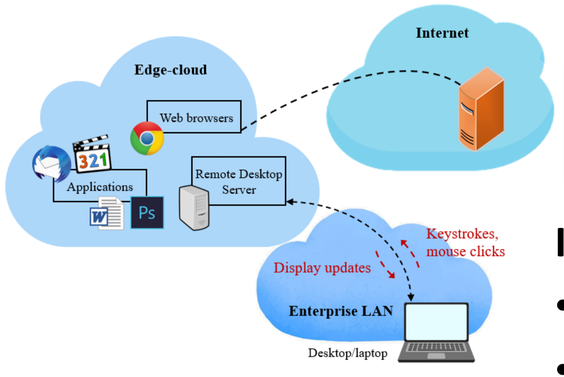
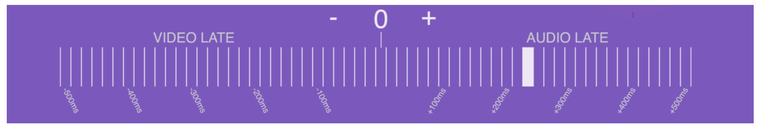
NSF SCC IRG Track 2 FY2017

Problem:

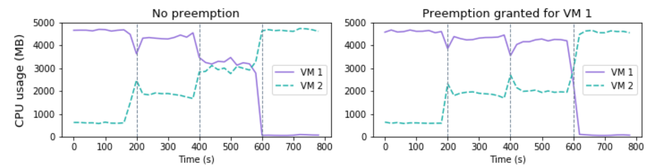
How to provide affordable, secure, efficient and accessible computing that is responsive to the needs of dense urban communities, without creating a lower performance class of digital citizenry



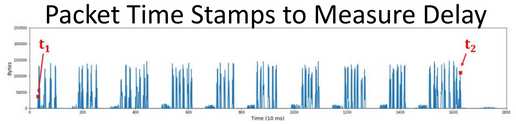
Measuring Audio-Video Misalignment



Virtual Machine Allocation Strategy Experiments



Packet Time Stamps to Measure Delay



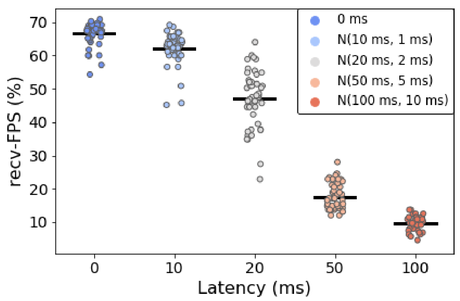
Intellectual merits span multi-disciplinary dimensions:

- edge cloud architectures to disaggregate computing in communities
- distributed community governance models for community edge clouds
- education and remote collaboration through community edge clouds

High performance virtual desktop computing across communities

- Experiments on different VDI protocols and architectures: establish network performance requirements, provisioning strategies
- User trials and meetings: initial feedback on technology & uses
- Edge cloud architectures integrating wireless and optical networks: dynamic operation and AI-based controls

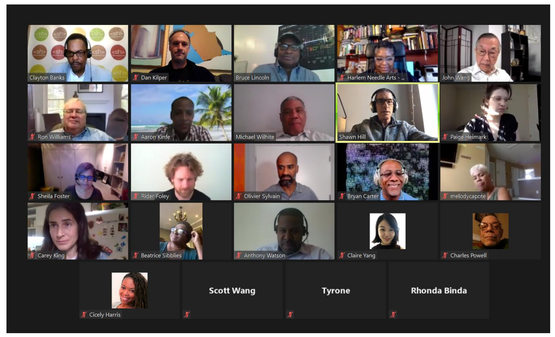
Video FPS Threshold



Community Edge Cloud

- Establish 100 server edge data center in SH use open-source cloud and VDI software
- Combine with gigabit center digital maker space and resource space at SH
- Organized Community Advisory Board: Discuss technology, identify community needs, provide feedback on technology design for trials

Community Advisory Board



Broader Impact:

Large group of Harlem-area stakeholders invested in advancing technology within community

- Covid highlights needs
- Community activities, project learnings supported NYC selection of SH for Gigabit Center and Harlem WiFi acquisition

Growing momentum within community and SH partner to provide digital services to upper Manhattan

- Established gigabit center digital maker space in upper Manhattan with community edge cloud data center.
- Community handover and SH scaling: other cities?
- Will community edge clouds be the future of community-centered smart cities?

Next Steps:

Use COSMOS and Harlem WiFi networks to connect SH edge data center to users for large scale trial (summer 2021)

2021 S&CC Principal Investigators' Meeting
April 7-9, 2021

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