

CC*Integration: BRACELET: Robust Cloudlet Infrastructure for Scientific Instruments' Lifetime Connectivity

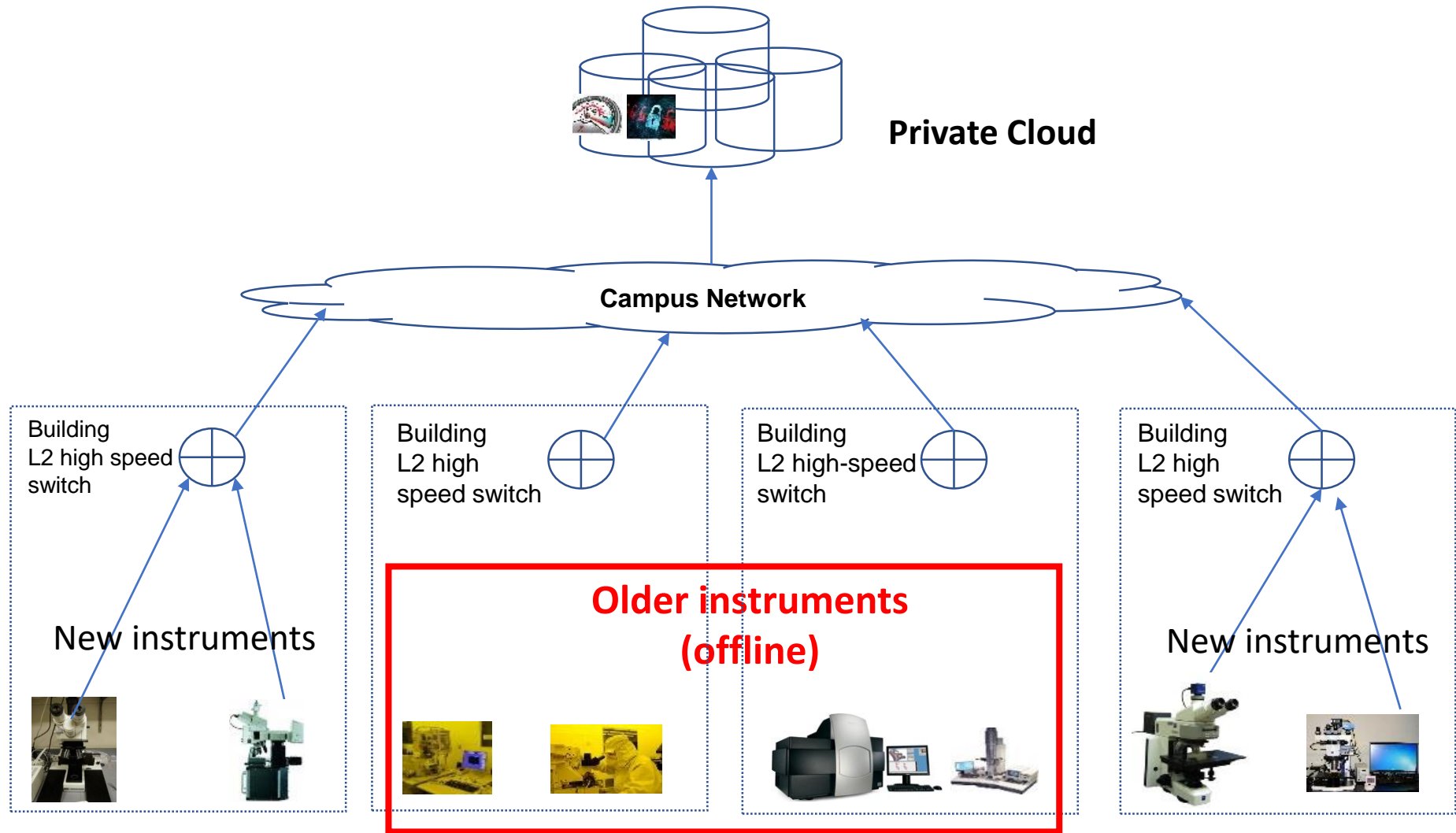
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Current situation in campus scientific instruments cyber-infrastructure



Goal of BRACELET: Connect older Scientific Instruments to Private Cloud

- Allow connections from Windows NT, Windows XP, Windows 2000 PCs to Private Cloud
- Allow upload of data from old instruments to the private cloud
- Allow some curation functions of data close to older instruments

Challenges

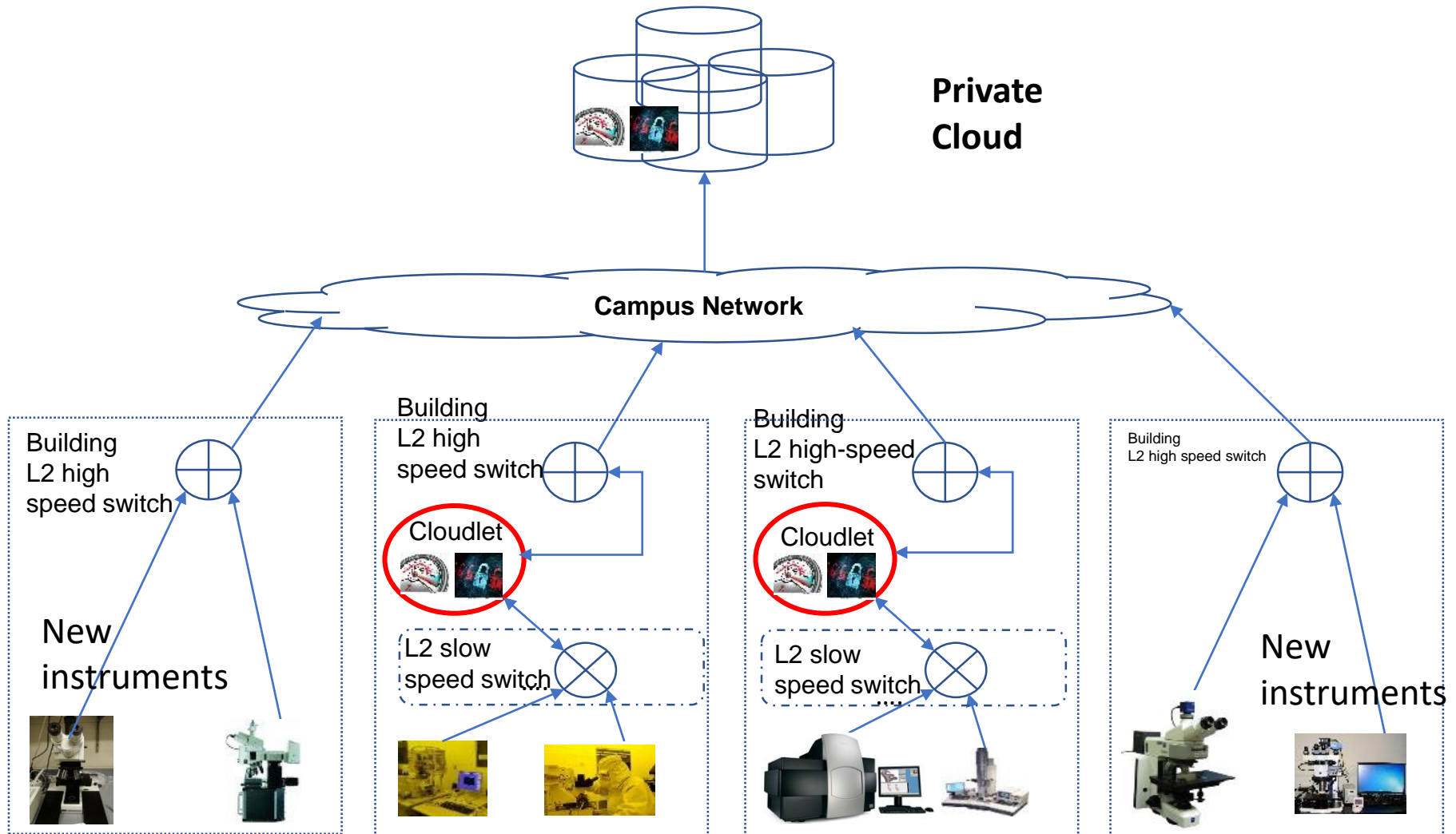


- **Performance mismatch:** Older instruments' Windows NT or XP runs network protocols at lower bandwidth speeds (10Mbps or 100Mbps)



- **Obsolete security:** Older devices and their OS systems cannot be patched, hence being vulnerable & taken offline

Approach: Putting edge device between older instruments and private cloud



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- **Performance component:**

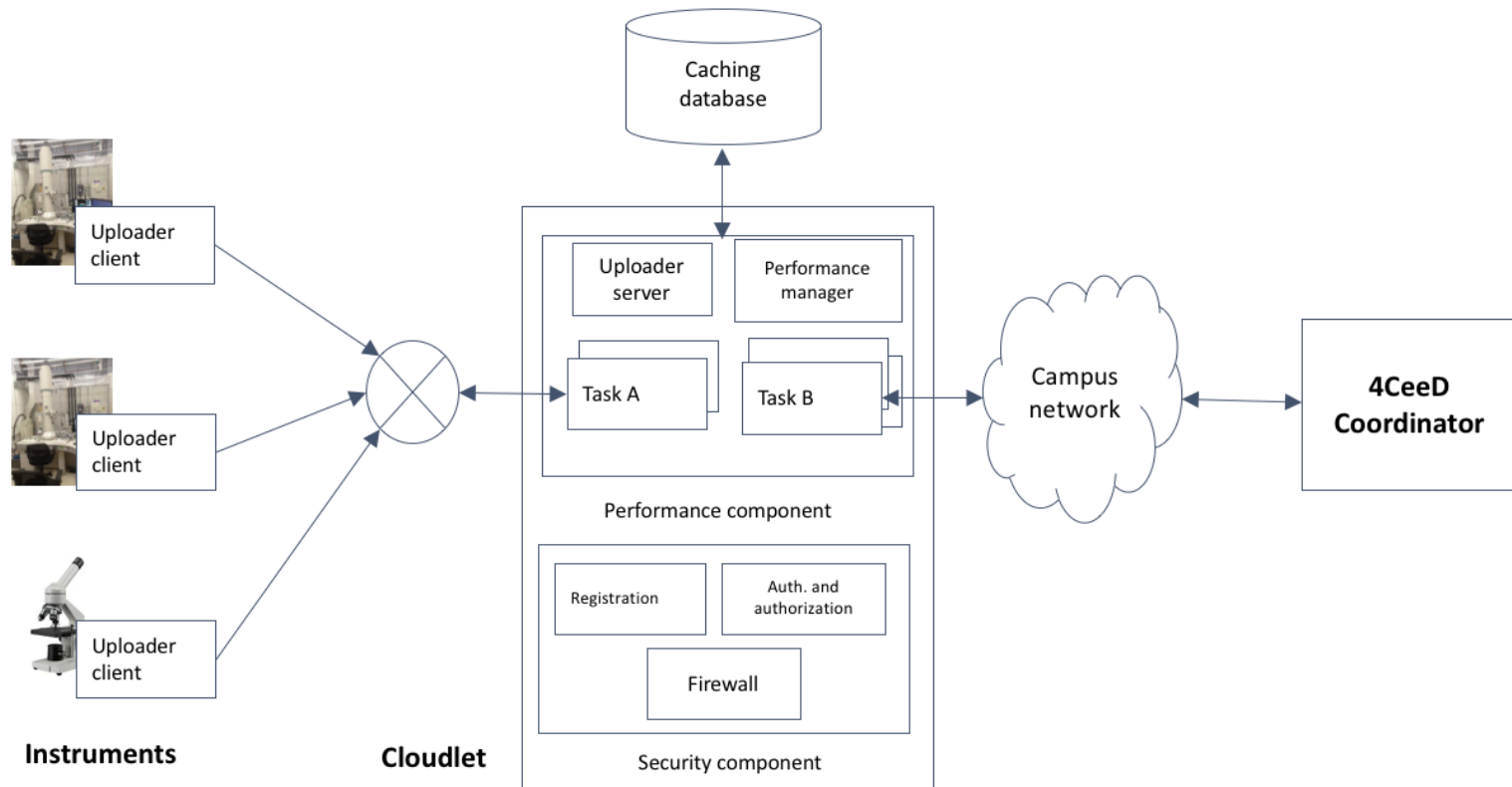
- Have two network interfaces configured at different speeds
- Perform traffic shaping from slower to faster network



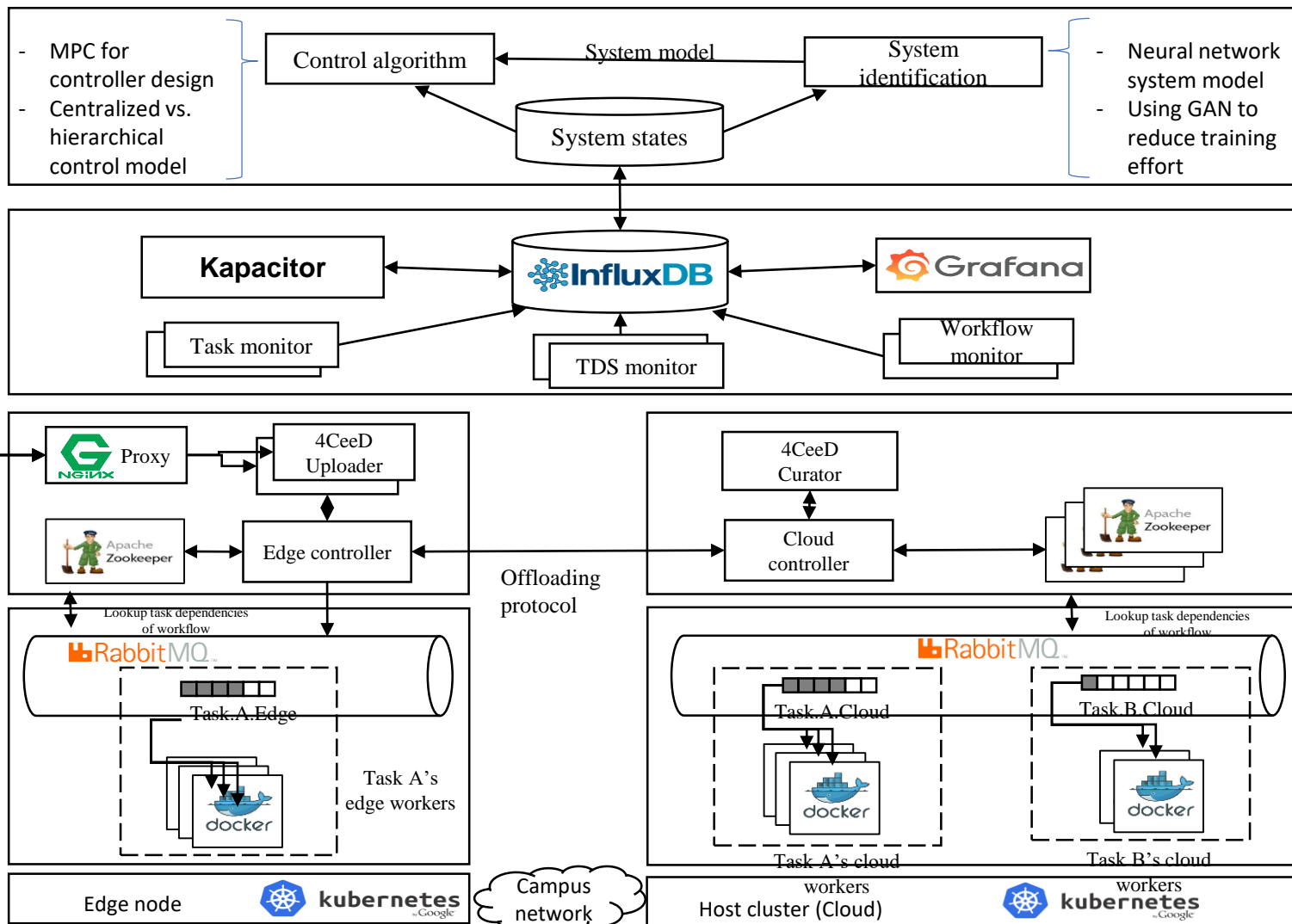
- **Security component:**

- User & instrument registration
- Data encryption during upload
- Firewall to protect against external threats

Co-design of performance and security components at the cloudlet



Cloudlet & private cloud integration with resource monitoring & adaptation



Current status

- Finalized preliminary design of BRACELET's cloudlet & its integration to private cloud architecture
- Setup BRACELET's cloud & edge testbed
- Worked with Engineering IT to allocate & configure isolated networks for testing BRACELET in real environment