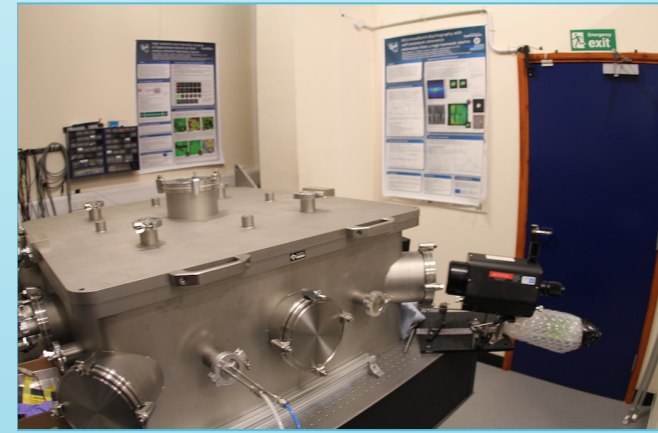


# A Virtual Space with Real IoT Data

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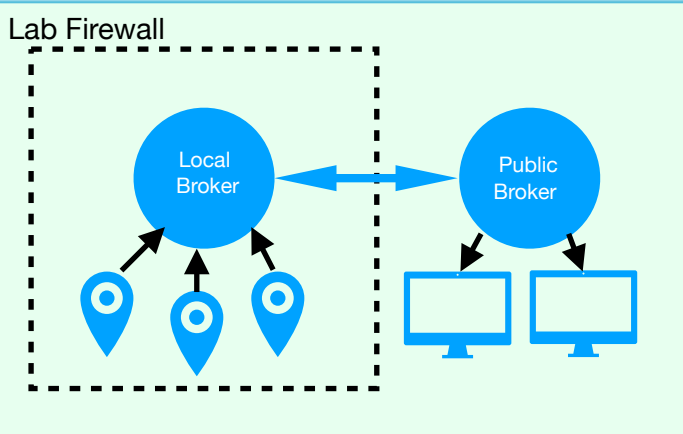
Live data collected by sensors in the University of Southampton's high power laser X-Ray lab is linked using MQTT to a VR model of the lab, allowing the systems to be monitored remotely.



MQTT is an open standard, industrial command and control protocol. Clients connect to a central broker, and subscribe to 'topics'. Data 'published' to a topic are forwarded by the broker to all subscribed clients

Sensors in the lab, publish measurements to the local MQTT broker, which is bridged to a public broker. Clients running the VR App subscribe, and receive updates from the public broker.

A VR model of the lab populated with real data allows users to monitor its status without entering, improving safety and reducing contamination. In addition data logged by MQTT level tools allows the conditions in the lab to be replayed, for verification or diagnostic purposes. The system also acts as a prototype for future AR implementations, which will display live data to users in the lab.



Within a the VR app, a proxy represents the broker, allowing virtual objects to subscribe, and receive status updates from their real world counterparts. Objects update their appearance to match the real lab, or to to display data bubbles when the user looks at them.

