

# BLUESKY WEB CLIENT AT BESSY II

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**ABSTRACT:** Considering the existing Bluesky control framework at BESSY II, a web client with React based on Bluesky HTTP Server is being developed. We hope to achieve a cross-platform system to realize remote control and monitoring of experiments. The implemented functionalities for now are monitoring of the Bluesky QueueServer status, controlling over a Bluesky Run Engine environment, browsing of QueueServer history as well as editing and running of Bluesky plans. Challenges around the presentation of the live data with Tiled are explored.

## I. MOTIVATION

### • Web Control Potential

In the fast-paced age of network advancements and cutting-edge experiment control technology, the ability to control experiments via the web isn't just a luxury—it's a necessity.

### • Strategic Alignment at Bessy II

The Bluesky project has been developed and applied at Bessy II<sup>[1]</sup>. Experiment control via the web is on the agenda.

## II. SYSTEM ARCHITECTURE

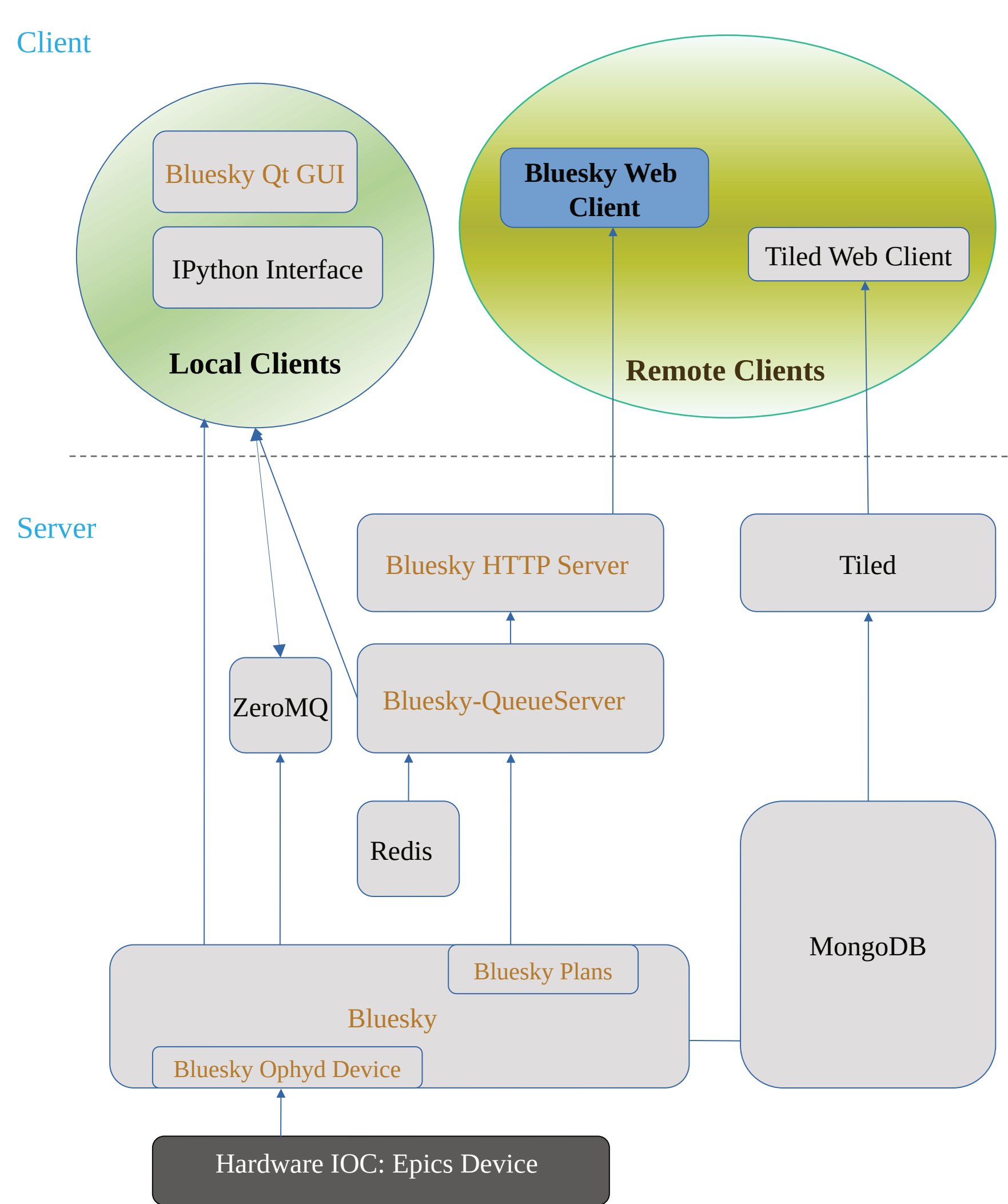


Figure 1: System architecture<sup>[2]</sup>

## III. METHODS

### Server Implementation

Keep All services in ONE place: Docker!

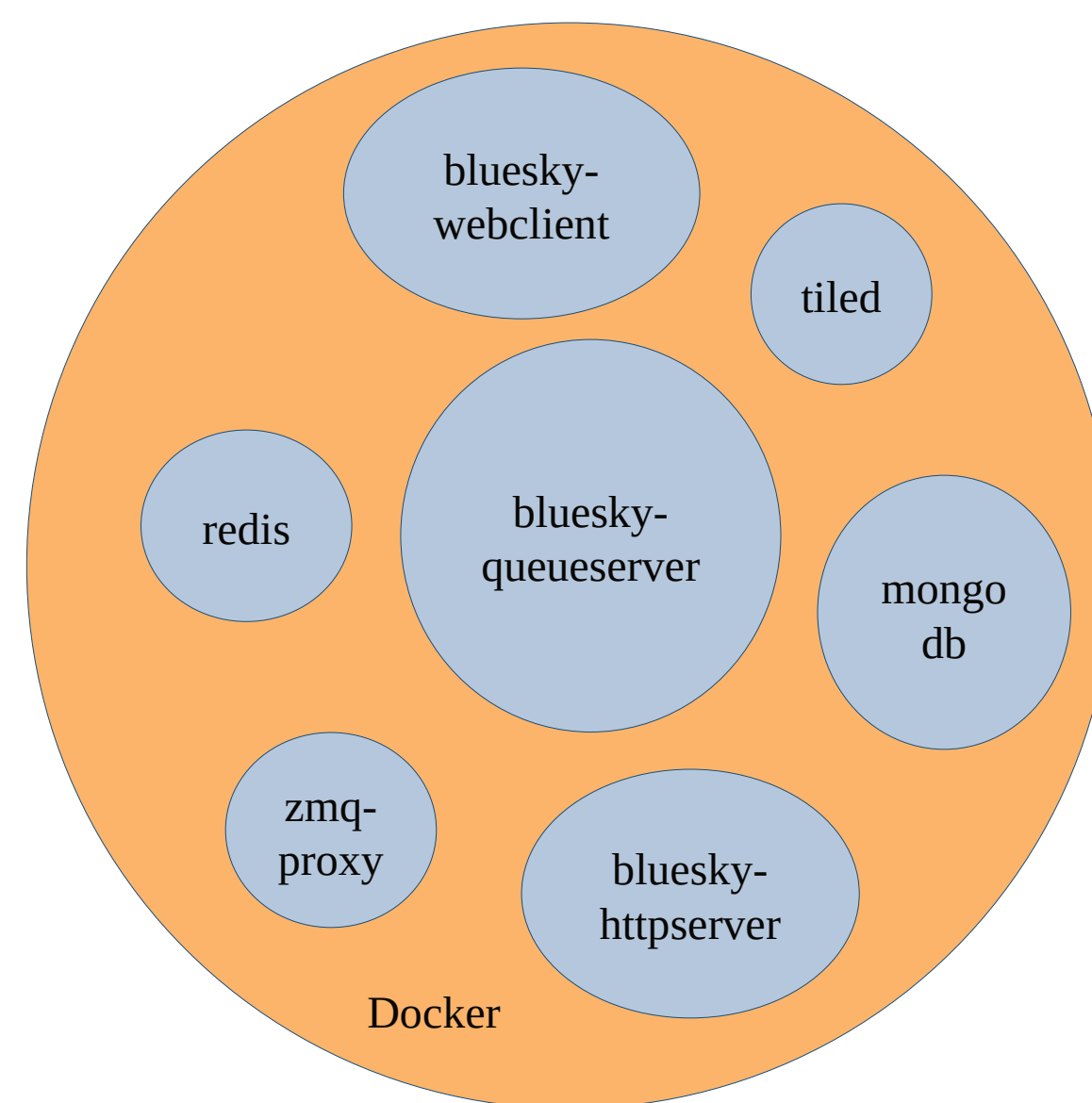


Figure 2: All Services in Docker

Name	Command	State	Ports
bluesky-webclient	docker-entrypoint.sh yarn start	up	0.0.0.0:3000->3000/tcp,:::3000->3000/tcp
bluesky-httpserver	./start.sh	up	0.0.0.0:60610->60610/tcp,:::60610->60610/tcp
bluesky-queueserver	./start_re.sh	up	0.0.0.0:60615->60615/tcp,:::60615->60615/tcp, 0.0.0.0:60625->60625/tcp,:::60625->60625/tcp
redis	docker-entrypoint.sh redis ...	up	0.0.0.0:6379->6379/tcp,:::6379->6379/tcp
zmq-proxy	bluesky-0MQ-proxy 5567 5568	up	0.0.0.0:5567->5567/tcp,:::5567->5567/tcp, 0.0.0.0:5568->5568/tcp,:::5568->5568/tcp
tiled	tiled serve config /deploy/config/config.yml --host 0.0.0.0	up	0.0.0.0:8000->8000/tcp,:::8000->8000/tcp
mongodb	docker-entrypoint.sh mongod	up	0.0.0.0:27017->27017/tcp,:::27017->27017/tcp

### Client Implementation

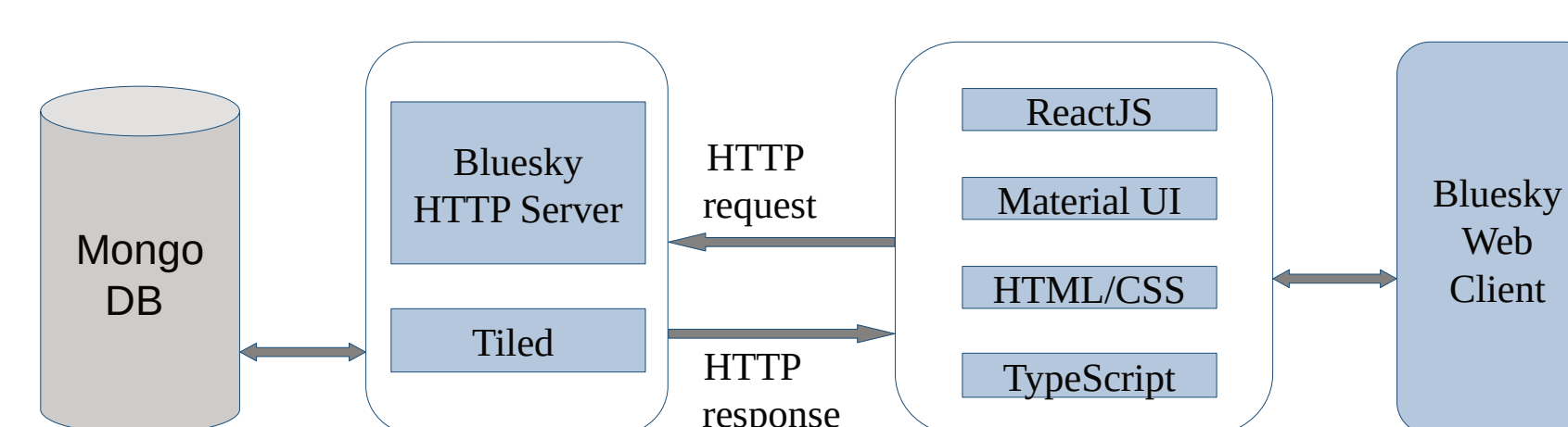


Figure 3: Interaction between Bluesky Web Client and the servers

## IV. USER INTERFACE

### Bluesky Web Client

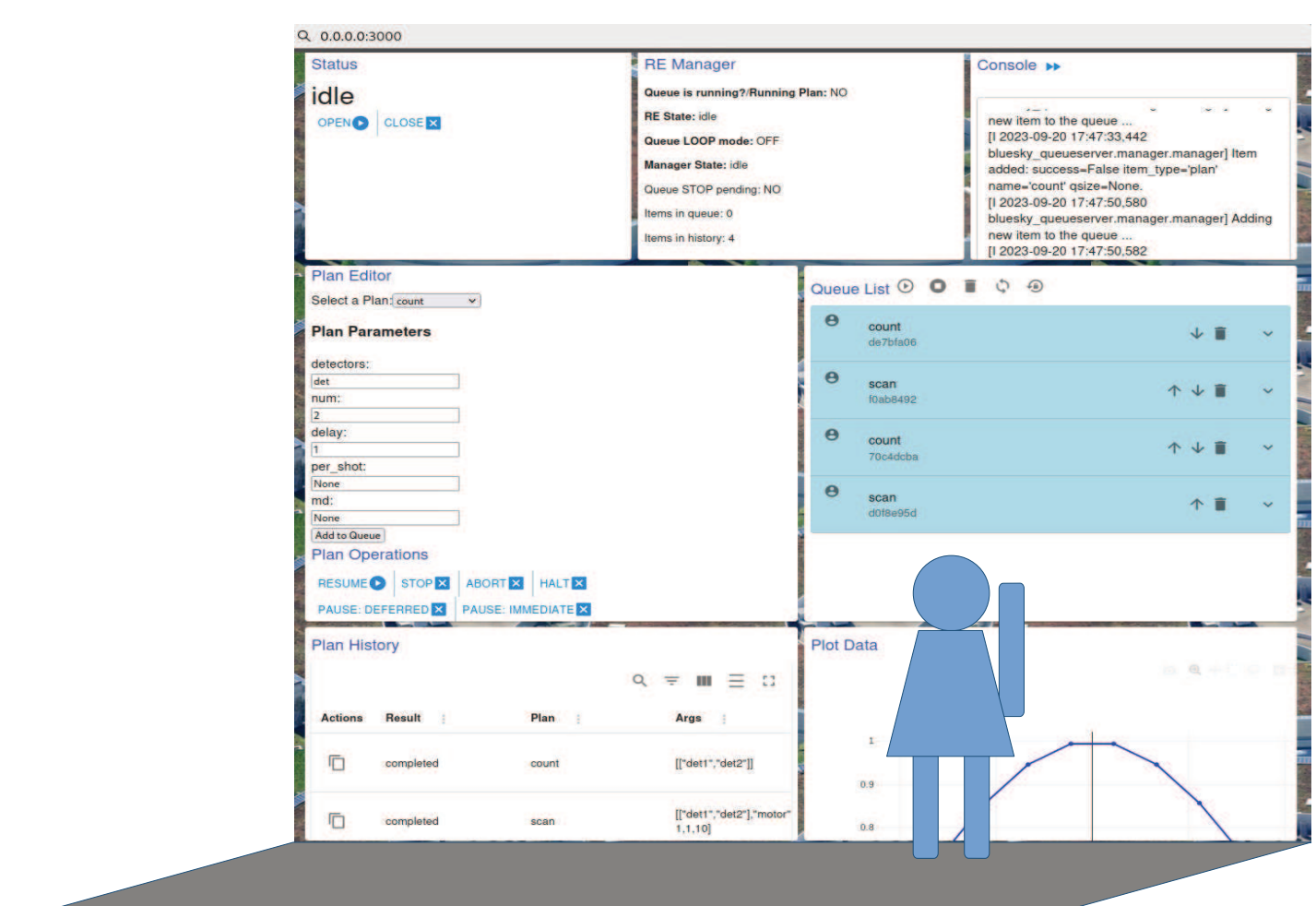


Figure 4: Bluesky Web Client

### Key Features

- **Real-time Status Display**  
Users can view the real-time status of the Bluesky Queue.
- **Plan Editor**  
New plans can be edited and added to the Bluesky Queue.
- **Queue Control**  
Bluesky plans in the Queue can be displayed and controlled. The Queue can be started, paused and stopped, the loop mode can be enabled or disabled.
- **Historical Data Display**  
After an experiment, the result and process data are displayed in the plan history table. The plans in the plan history table can be copied into the Bluesky Queue and executed again.

## V. CONCLUSION

With the user-friendly web interface and experiment control features, Bluesky Web Client reinvents the way experiments are conducted, making them not only more efficient but also more accessible. In addition, it bridges the gap between powerful scientific tools and accessibility through visual web pages and simple operations, meeting the diverse needs of both experienced experts and novices in the field of experimental control.

## ACKNOWLEDGEMENT

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## REFERENCES

- [1] William Smith, Sebastian Kazarski, Roland Mueller, Luis Vera Ramirez, Pierre Schnizer, Simone Vadilonga, "STATUS OF BLUESKY DEPLOYMENT AT BESSY II" in JACoW Publishing(ICALPCS2021), 2021
- [2] Maksim Rakitin, Stuart Campbell, Daniel Allan, Thomas Caswell, Dmitri Gavrilov, Marcus Hanwell, Stuart Wilkins, "Next generation experimental data access at NSLS-II" in Journal of Physics: Conference Series , 2380(2022), 2022

## MORE INFORMATION

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