



Diamond Light Source Athena Platform

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Athena Platform

- Service-based experiment orchestration framework
- Built on top of Bluesky
- Managed and extensible deployment platform
- Wide spectrum of science use cases

Diamond Light Source

- UK's synchrotron
- ~40 instruments
- SSCC
 - Data Acquisition
 - Data Analysis
 - Beamline Controls
 - Accelerator Controls
 - Electronic Systems
 - Scientific Information Management
 - Cyber Security
 - Scientific Computing



Diamond II

- Upgrade to 3.5 GeV
- Increased brightness
 - Increased data rates
- Flagship beamlines
- Dark period
 - Focused development opportunity



Why do we need a new acquisition platform?

- Current platform (GDA)
 - Java based client-server application
- Obsolete technology
- Inflexibility
 - Scanning algorithms are locked away
- Multiple interfaces for scanning
- Lack of proper support for remote operation
 - Requires definition of API

Bluesky

- Set of open-source libraries to facilitate experiment control and collection of data
 - Ophyd for device layer
- Python fits well with scientist's existing skill sets
- Widespread adoption
- Bluesky Collaboration
 - Collaboration with NSLS-II on fly scanning

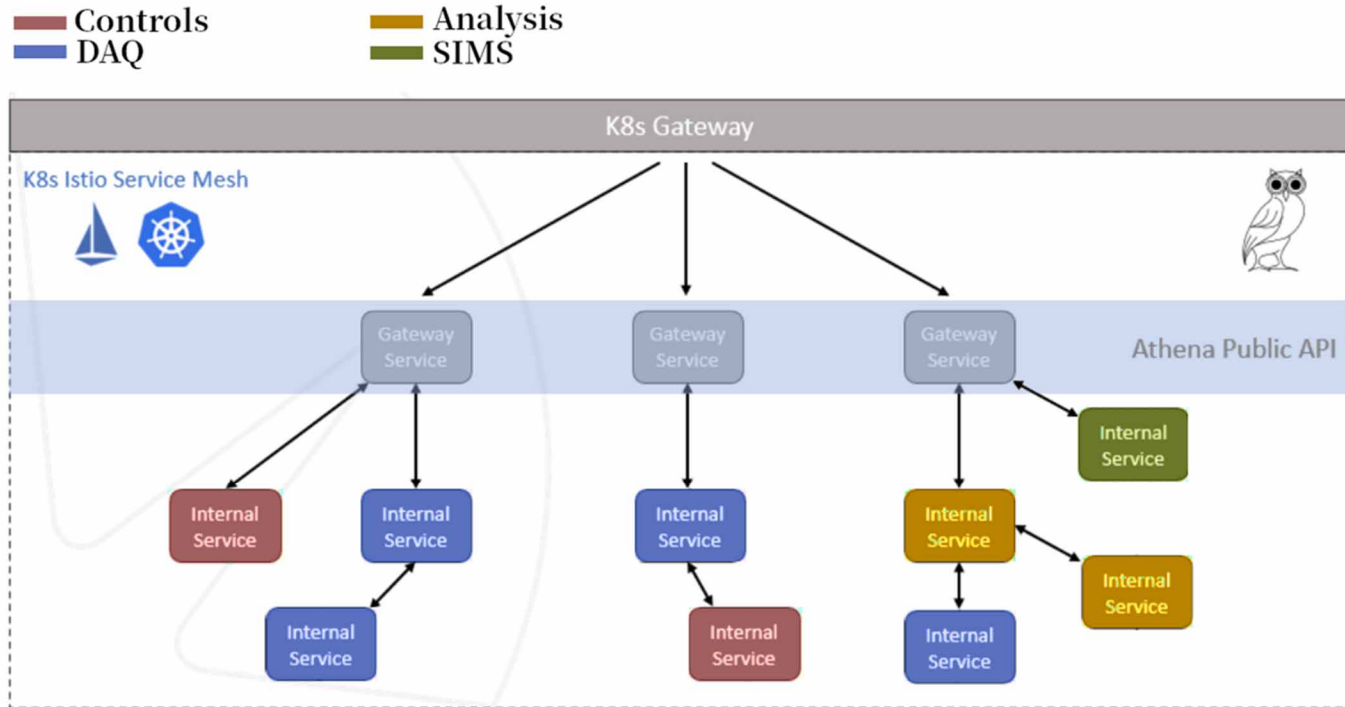




Service Based Architecture

- Service
 - Encapsulated block of functionality with an API
- Deployed on Kubernetes
 - Containerised applications
 - Standardised deployment management
- Managed onsite clusters
 - Kubernetes cluster per beamline
- Internal message bus for interservice communication
- Definition of public REST API
 - Authentication & authorisation

Service Based Architecture

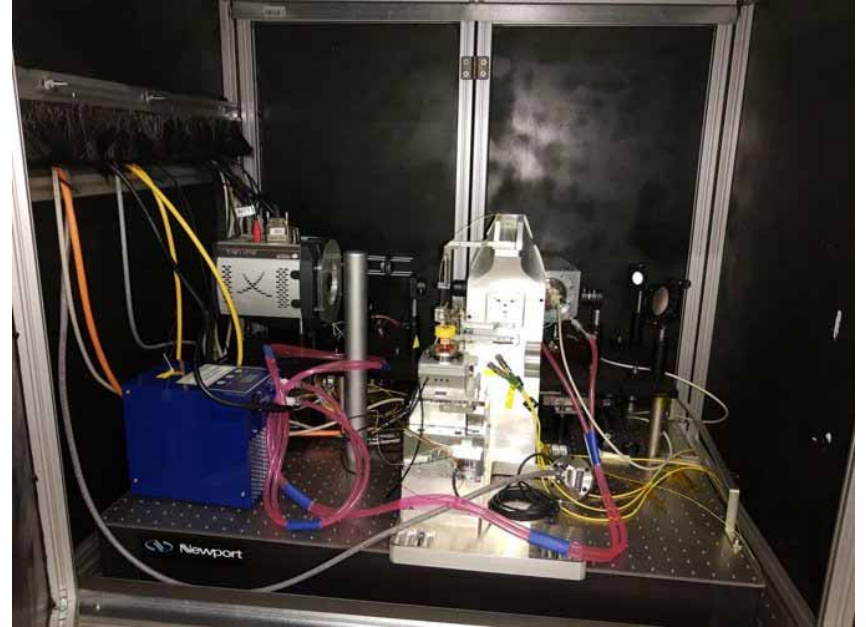


Service Based Architecture

- Core Services
 - BlueAPI
 - NeXus file writer
- Ongoing work will drive development of new services
 - Add capabilities in preparation for dark period
 - Controls will deploy containerised soft IOCs
- Deliver new functionality to existing Beamlines
 - Involve beamlines in development of platform
 - Driven through existing GDA interface

Ongoing work

- I22 Time Resolved Scanning
 - Continuous scanning
 - TFG replacement
- MX Hyperion
 - Increased efficiency
 - Sample throughput
 - Fast detectors
 - See THMBCMO34



Engagement and Simulations

- Establish familiarisation with Bluesky
 - Developers and Scientists
 - Drop-in sessions
 - Training rigs
- Simulating devices – Tickit
 - Interconnected device simulation
 - See TUPDP109



Summary

- Flexible maintainable platform
- Industry standard technologies and tooling
 - Kubernetes
- Bluesky
 - Collaboration
- Support beamline requirements



Questions?

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