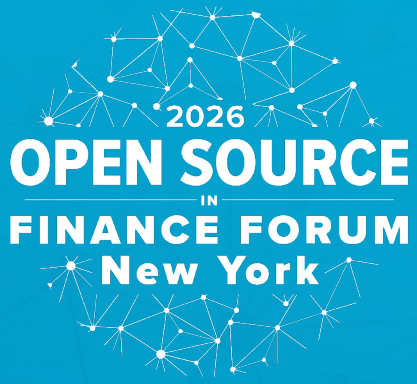


Open Resource Broker

A Unified API for HPC Cloud Capacity provisioning

Flamur Gogolli

~~AWS~~ | Maintainer for ORB & HTC-Grid | FINOS TOC

November 5th, 2026



Open Resource Broker

A Unified API for ~~HPC Cloud Capacity~~ provisioning compute dynamically

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HPC use cases in Financial Services

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Organizations rely on High Performance Computing to calculate risk, value portfolios, and provide reports to their internal control functions and external regulators.



Banking

- Regulatory mandates
- Lending decisions
- Mortgage cash flow modeling



Capital Markets

- Regulatory mandates
- Market risk
- Portfolio optimization/ Derivative pricing
- Backtesting



Insurance

- Regulatory compliance
- Catastrophe modeling
- Actuarial modeling

The **happy** path...

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1 Scheduler

/ˈʃɛdjuːlə/

Responsible for managing the lifecycle of tasks. For example, prioritisation, retry logic, 'fairness'.

"I have 100,000 tasks in the queue, I need 2,000 more vCPUs"

2 Orchestrator

/ˈɔːrkɪstreɪtər/

Responsible for delivering or removing compute capacity in response to the needs of a scheduler.

"Give me 130x r5.4xlarge instances on Spot, in this AZ"

3 Capacity Provider

/ˈkəpásətɪj prəˈvaɪdər/

The method of delivering capacity.

"Okay, here are the machine IDs… Enjoy. 👍"

Key Notes

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Access to compute capacity is essential to most cloud workloads but especially for High Performance Computing

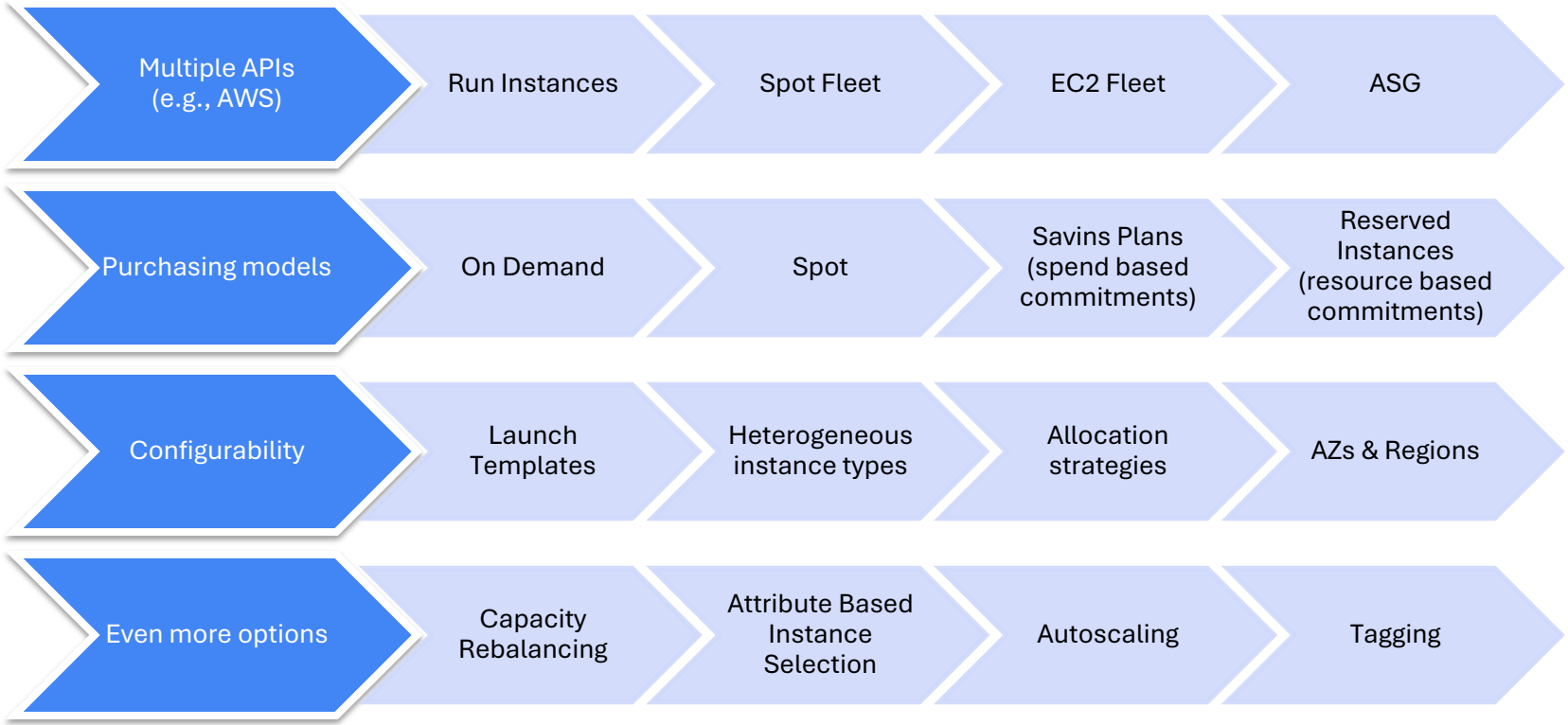


Cloud providers have **multiple APIs**, with **diverse purchasing options**, and **fluctuating real-time capacity**, making it difficult for 3rd party products to efficiently acquire compute resources



Every integration becomes custom glue code: **slow to onboard**, **hard to maintain**, **fragile in operations**, and **prone to lock-in**

Many many APIs..

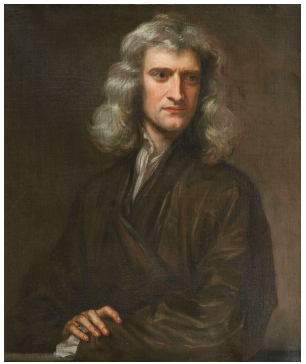


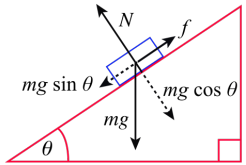
Increasing Scale: from deterministic to probabilistic provisioning

ORB: A path to Unified ~~Field~~ Capacity Theory

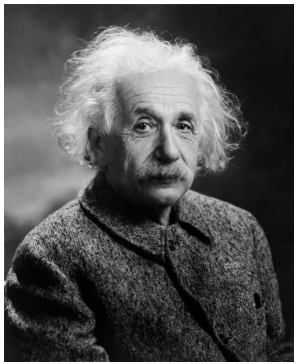
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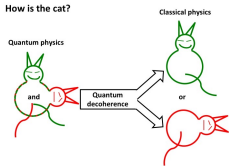
N Newtonian Physics





Q Quantum Mechanics





Partial fulfilment, **placement uncertainty**, **quota boundaries**, **retries**, and **timing variance**

The not-so-happy path...

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1 Scheduler

/ˈʃɛdjuːlə/

Responsible for managing the lifecycle of tasks. For example, prioritisation, retry logic, 'fairness'.

"I have 100,000 tasks in the queue, I need 2,000 more vCPUs"

2 Orchestrator

/ˈɔːrkɪstreɪtər/

Responsible for delivering or removing compute capacity in response to the needs of a scheduler.

"Give me 130x r5.4xlarge instances on Spot, in this AZ"

3 Capacity Provider

/ˈkəpásətɪj prəˈvaɪdər/

The method of delivering capacity.

"LOL, nope, I can do 73. Also, 5 of your existing instances have been interrupted. 😂"

Printers in the early 1980s...



PC LOAD LETTER - Every app integrates with every printer … or it doesn't.

Lotus

WordPerfect
Novell Applications Group

dBase







A Unified Interface for Printing

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Lotus

WordPerfect
Novell Applications Group

dBase

QuickDraw / Graphics Device Interface

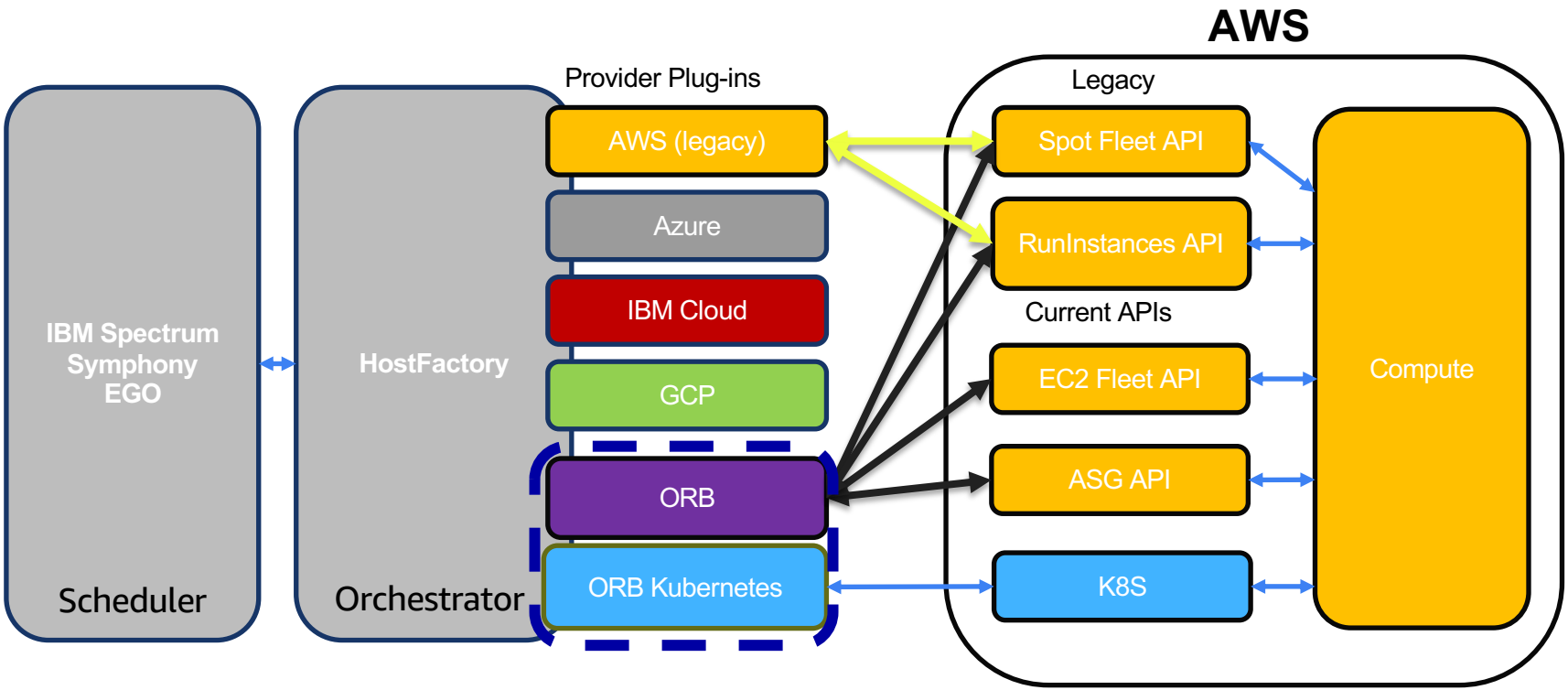






IBM Symphony HostFactory Plugin

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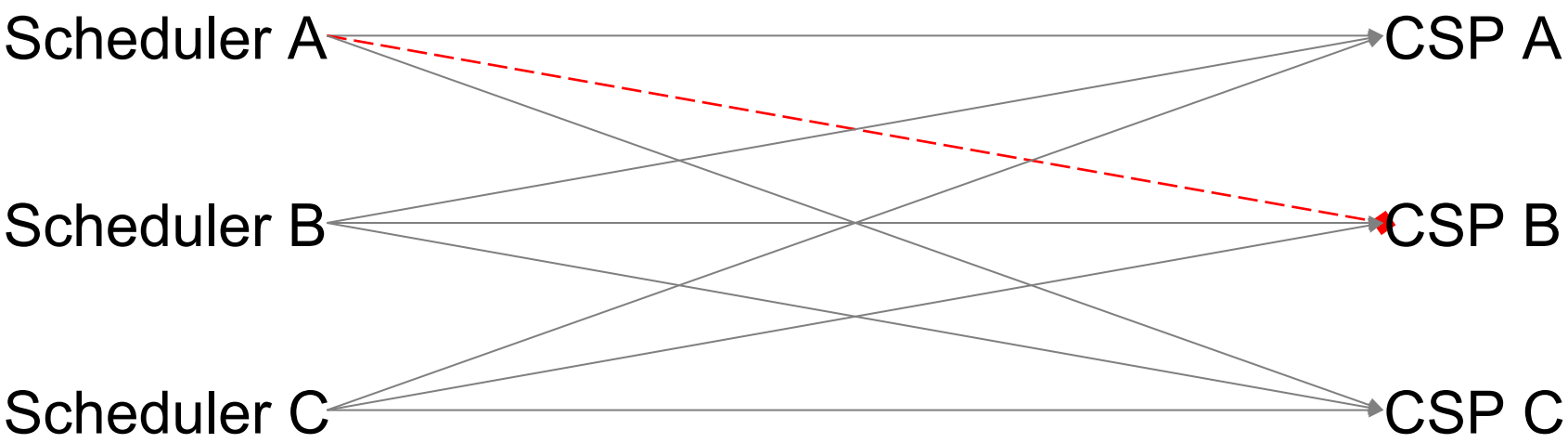
So, what is ORB?

Open Resource Broker *is a provider and scheduler agnostic compute broker connecting different providers to different schedulers through unified APIs.*

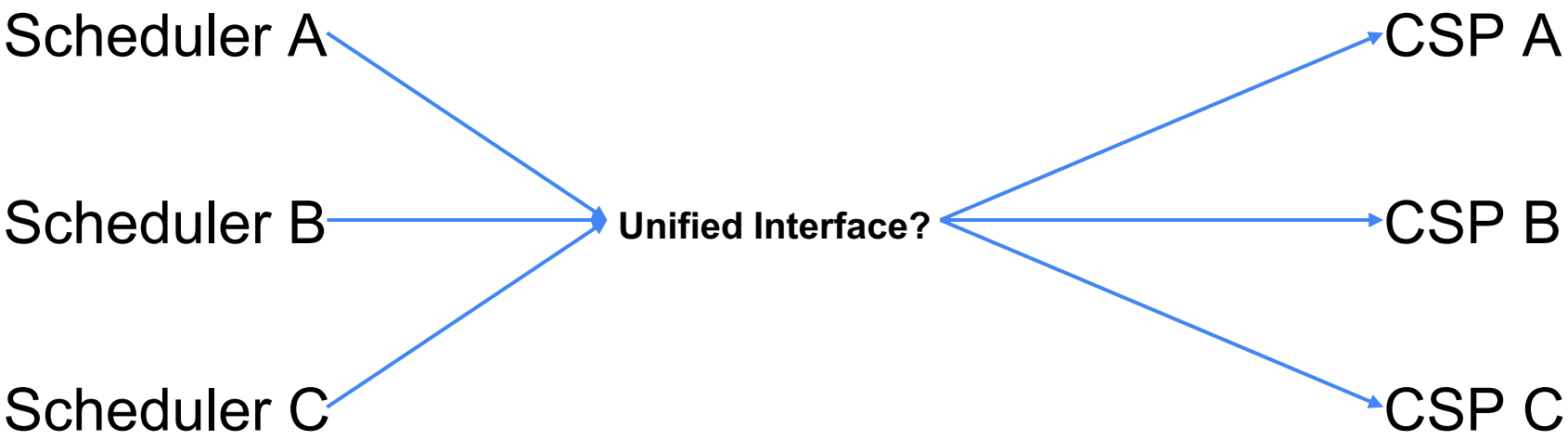
Key Architecture Features:

- ✓ Clean Architecture: Domain-driven design with clear separation of concerns
- ✓ CQRS Pattern: Command Query Responsibility Segregation for scalable operations
- ✓ Event-Driven Architecture: Domain events with optional event publishing for template operations
- ✓ Dependency Injection: Comprehensive DI container with automatic dependency resolution
- ✓ Strategy Pattern: Pluggable provider strategies with runtime selection
- ✓ Resilience Patterns: Built-in retry mechanisms, circuit breakers, and error handling

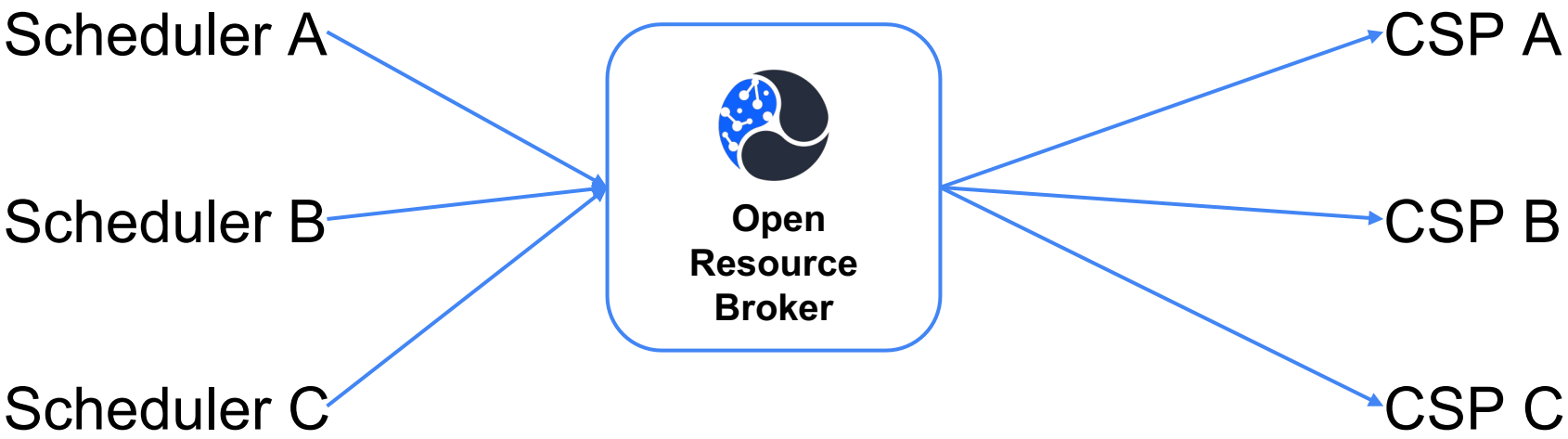
Today: Every scheduler integrates with every provider … or it doesn't.



A Unified Interface for HPC Compute Provisioning



A Unified Interface for HPC Compute Provisioning



Multi-Provider & Multi-Scheduler Capabilities

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ORB exposes a consistent interface across multiple cloud providers, simplifying resource requests and reducing provider-specific complexity.



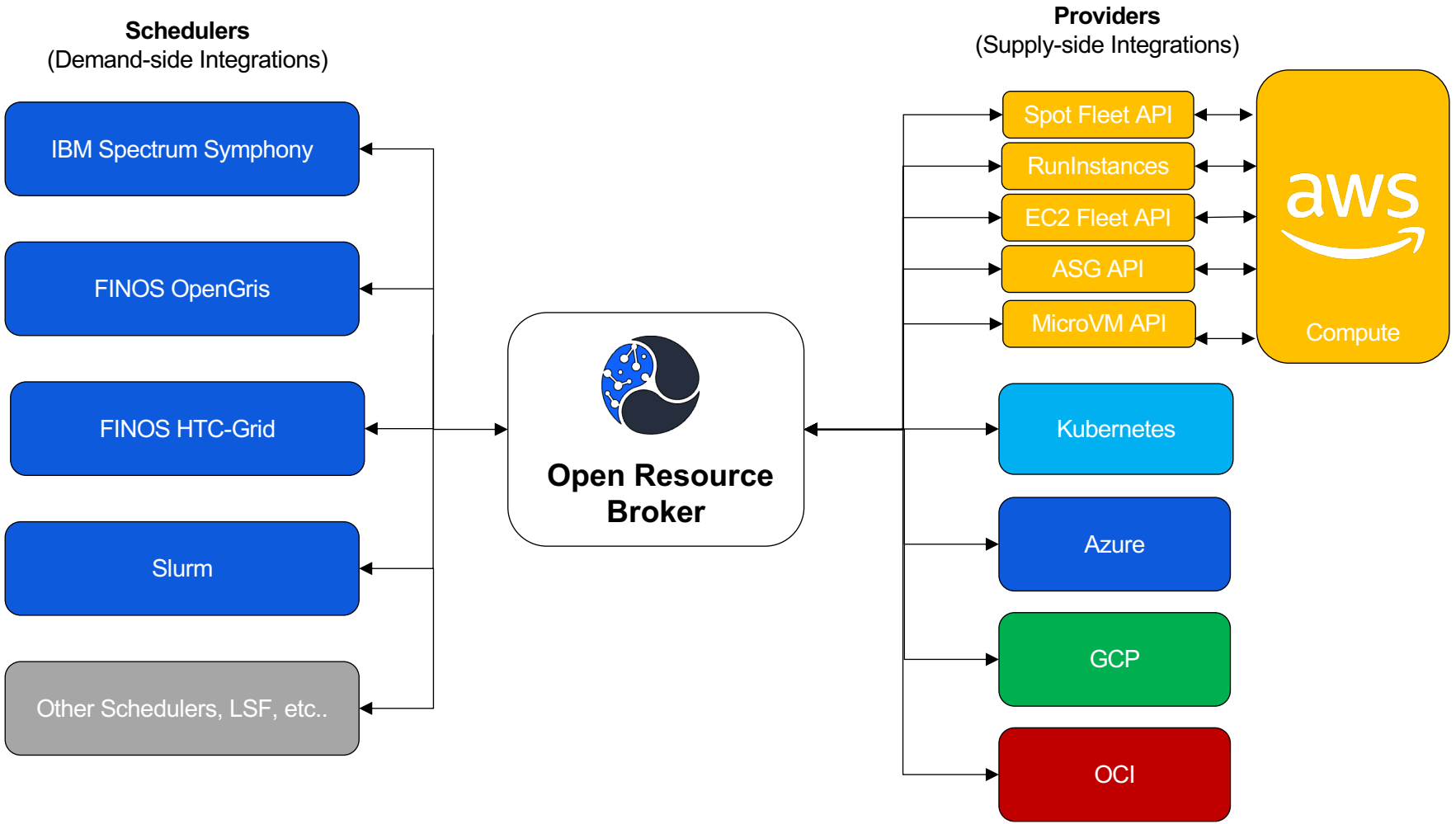
Route provisioning requests to the optimal provider and scheduler based on policy, cost, latency, and resource availability.



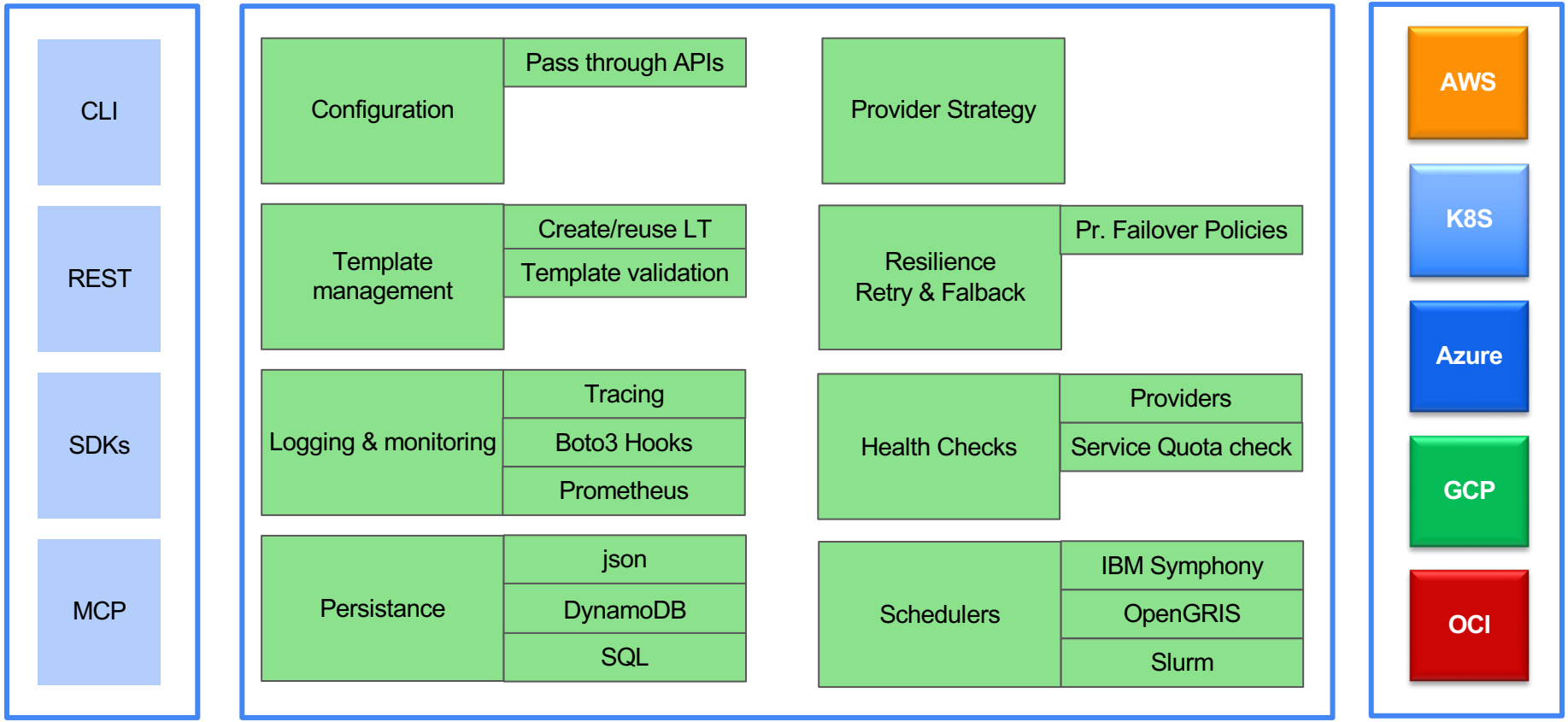
Support for multiple scheduler implementations enables workload-specific placement strategies and easy integration of new scheduling policies.



Decouple workloads from provider lock-in. Failover between providers and schedulers to maintain availability and performance.


Schedulers
(Demand-side Integrations)
IBM Spectrum Symphony
FINOS OpenGris
FINOS HTC-Grid
Slurm
Other Schedulers, LSF, etc..
Open Resource Broker
Providers
(Supply-side Integrations)
Spot Fleet API
RunInstances
EC2 Fleet API
ASG API
MicroVM API
aws
Compute
Kubernetes
Azure
GCP
OCI

ORB Architecture



Scheduler Integrations

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✓ Completed

- IBM Spectrum Symphony HostFactory
- FINOS OpenGRIS
- FINOS HTC-Grid
- SchedMD Slurm

··· Pending

- IBM LSF Resource Connector
- HTCondor

★ Planned

- *More to come*
- *(Please let us know what you would like to see next!)*

Capacity Provider Integrations

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✓ Completed

- AWS
- Kubernetes
- Azure
- GCP
- OCI

··· Pending

- OnPrem Providers

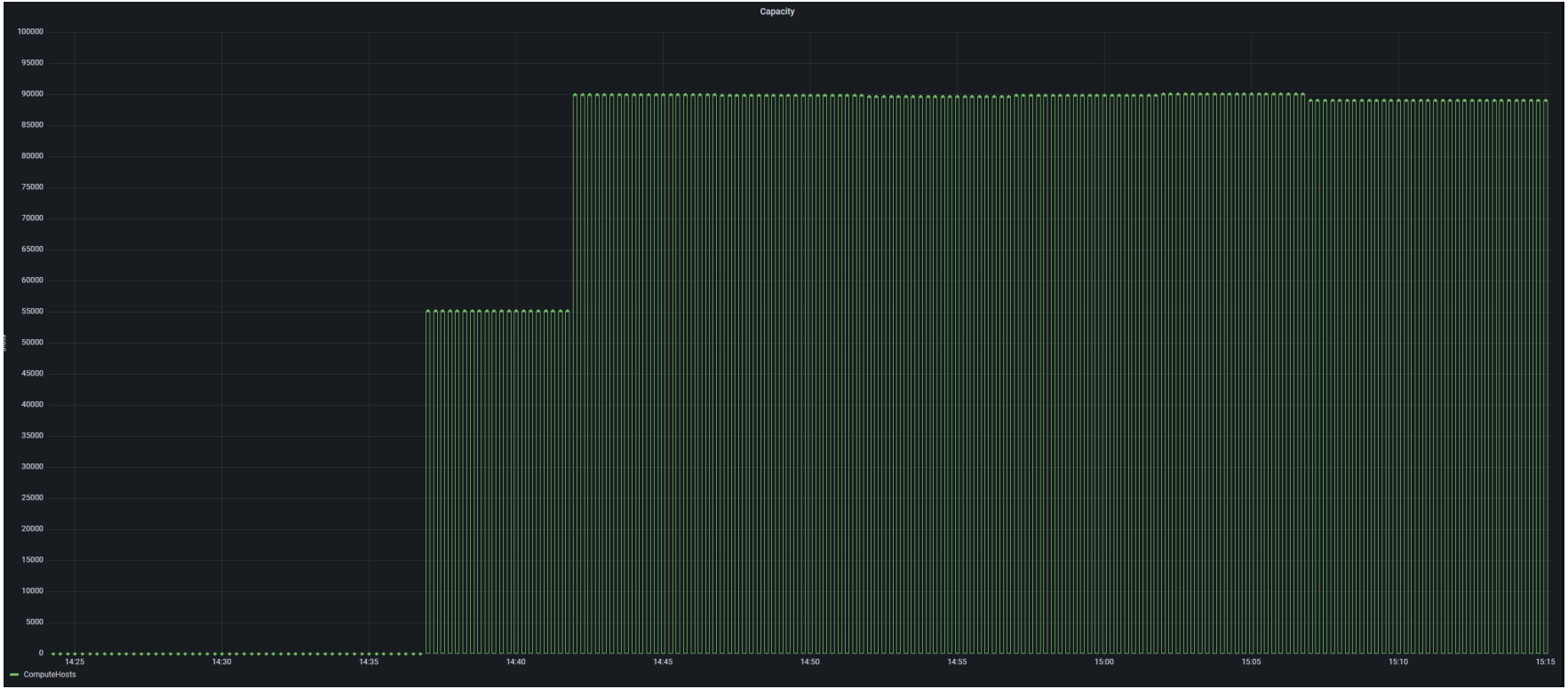
★ Planned

- **AWS**
  - Lambda
  - ECS
- **Kubernetes**
  - Operator Pattern
  - Additional Resource Types



Demo Time

Running this on multiple providers



What's Next

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ORB integrations at multiple FSI customers



FINOS Community and Industry outreach



Implementation roadmap for future releases

Resources

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Repository	https://github.com/finos/open-resource-broker
Documentation	https://finos.github.io/open-resource-broker/
PyPI	https://pypi.org/project/orb-py/



Thank you!

November 5th, 2026



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