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Mochi: Composing Data Services for High-Performance Computing Environments

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What are we trying to accomplish?

We're trying to transform HPC data services from a monoculture to an ecosystem.

- Redefining how teams design and develop distributed services for use in HPC systems.
- Providing a portable "programming model" for these services.
- Providing a set of core building blocks.
- Demonstrating the methodology and tools with DOE science use cases.

We're trying to foster a community of service developers.

- Developing a set of training materials that will help others employ the tools.
- Making all these building blocks available to the larger community.

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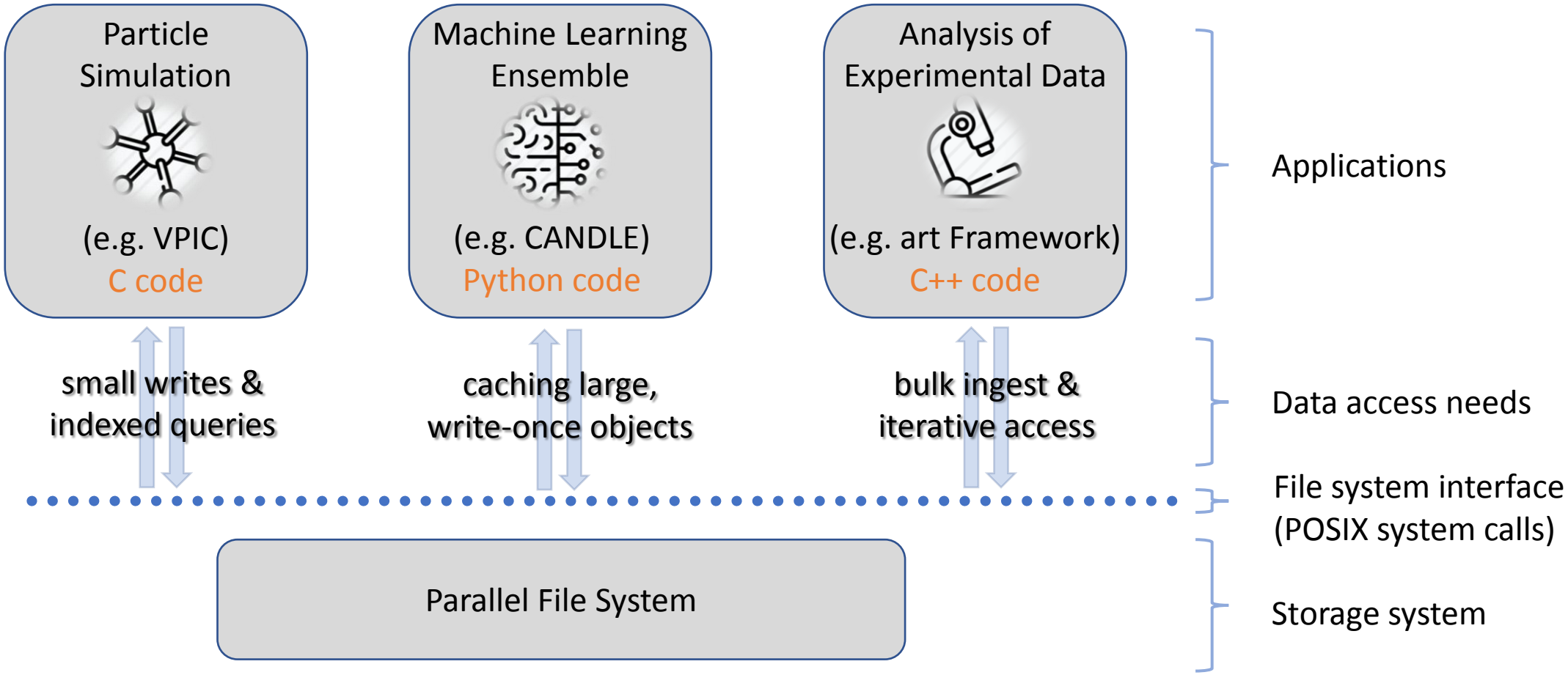
How is this traditionally done in HPC?

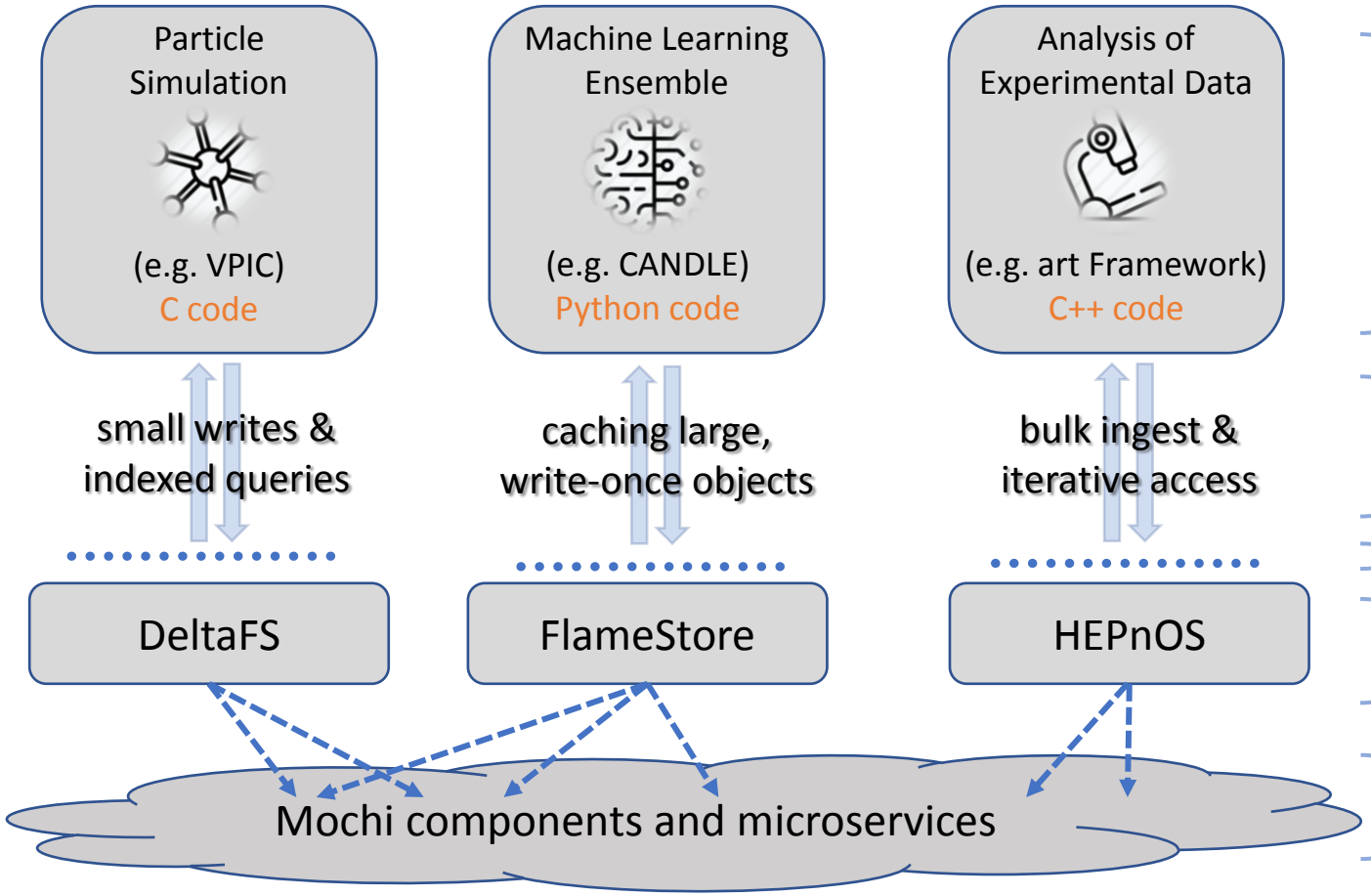
File system monoculture for data (dis)service



All applications use the same "one size fits all" file system interfaces, semantics, and policies for data access.

What's new in the Mochi approach?

An ecosystem of services co-existing and reusing functionality



This approach has allowed us to simultaneously pursue multiple specialized service implementations.

Instead of "one size fits all", Mochi data services present tailored interfaces, semantics, and policies for data access while still leveraging robust building blocks.

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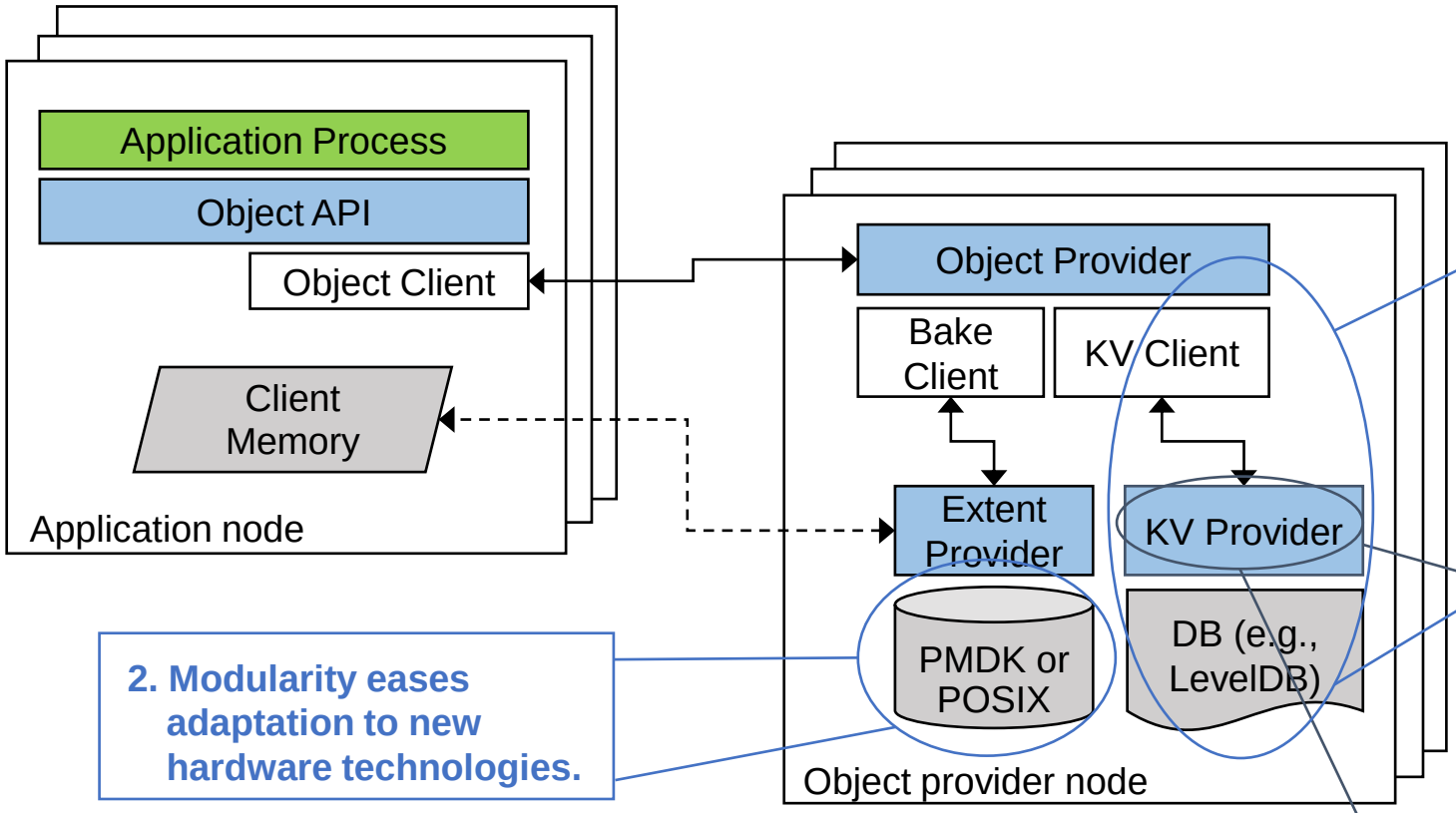
What's new in the Mochi approach?

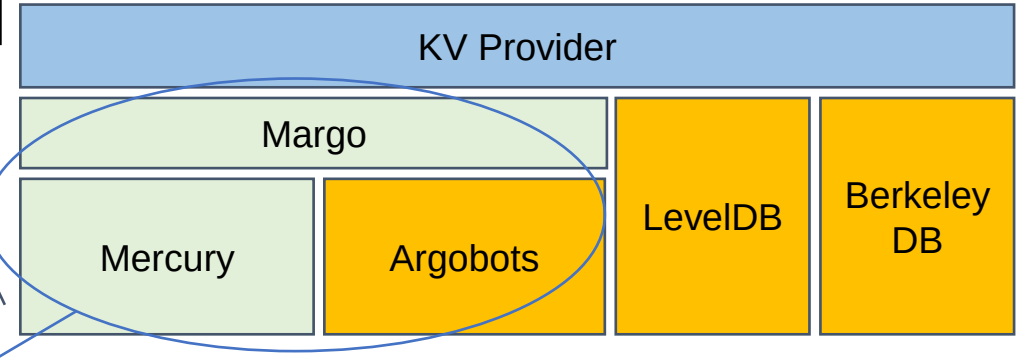


1. Core functionality developed as stand-alone components and "microservices", cleanly reusable in different configurations and products.

2. Modularity eases adaptation to new hardware technologies.

3. Multiple methods of programming (C, C++, Python), more accessible.

4. Portable RPC communication library designed for multi-service environments



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Thanks!

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http://www.mcs.anl.gov/research/projects/mochi/