Operating System Services for Mobile/Cloud Applications

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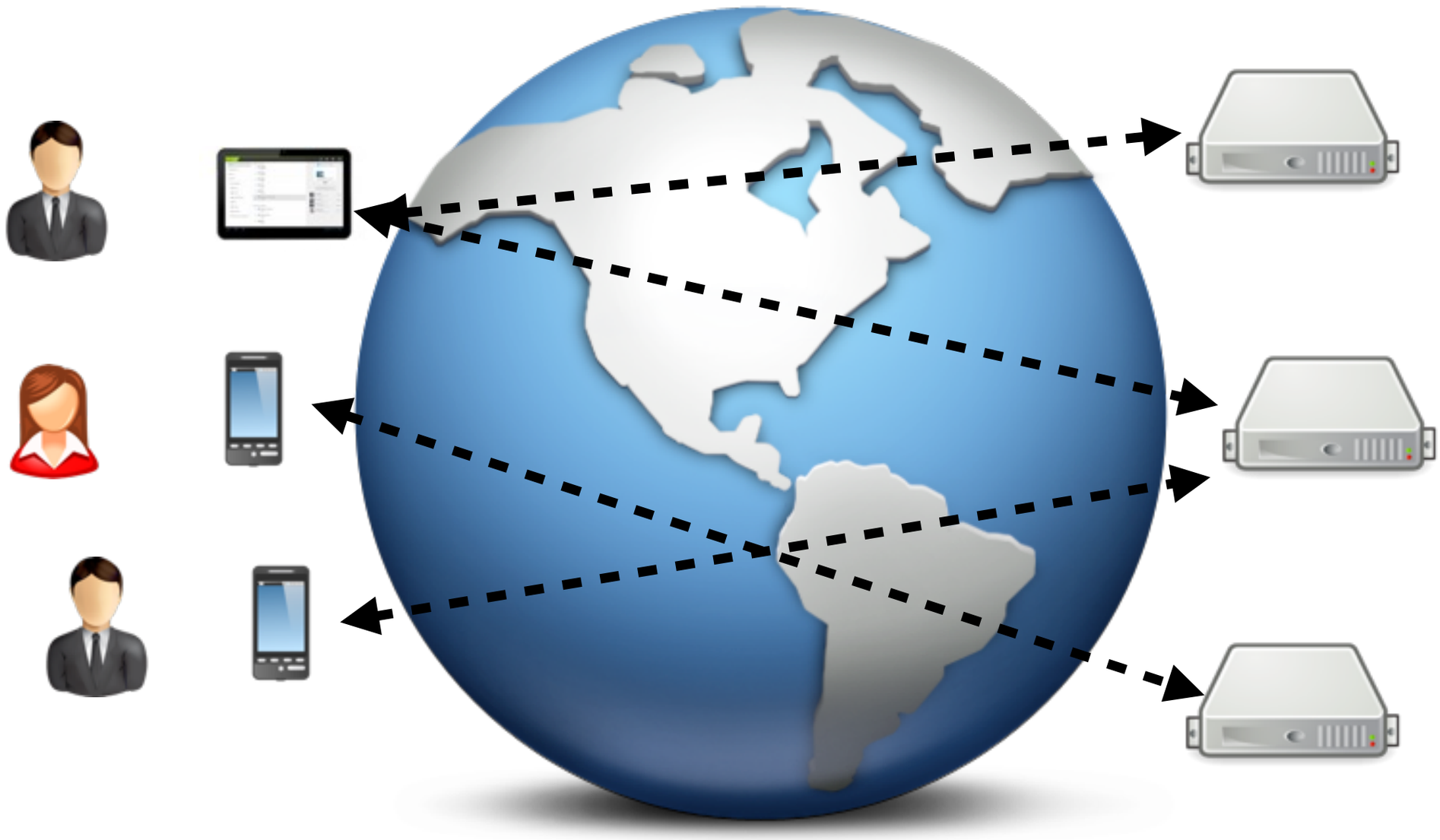
Modern applications span mobile devices & cloud servers.



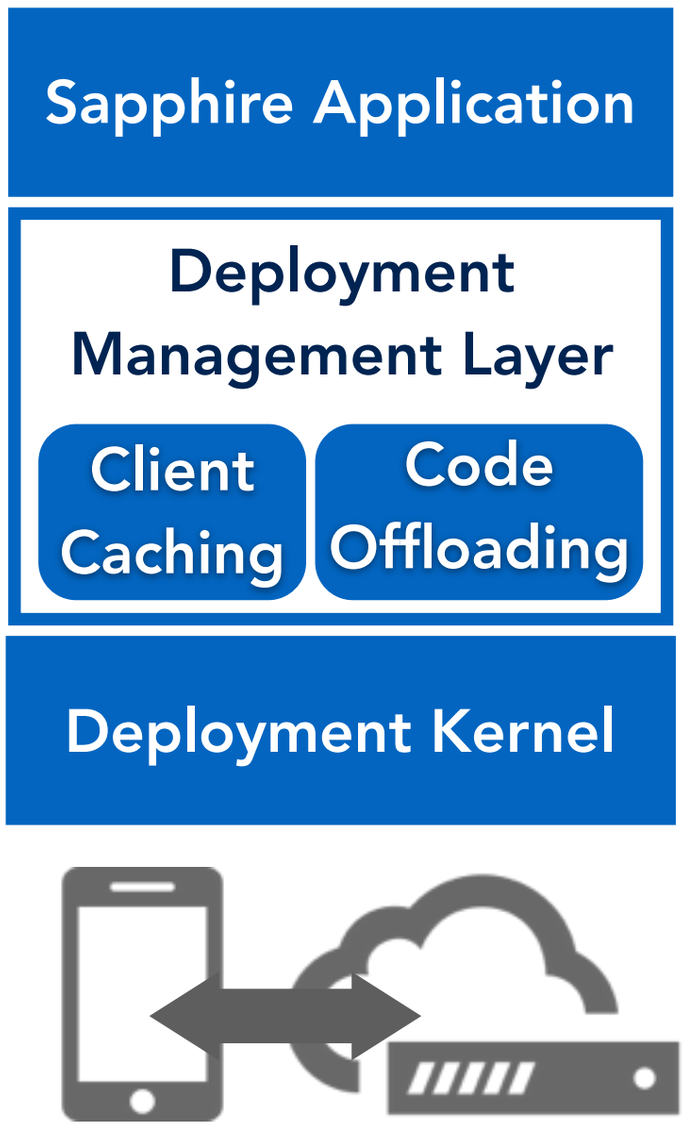
Traditional OS services no longer meet their needs.

Applications have assumed responsibility for:

- Managing heterogeneous execution environments.
- Protecting shared user data.
- Synchronizing caches & distributed storage.

Rethinking the OS

Sapphire

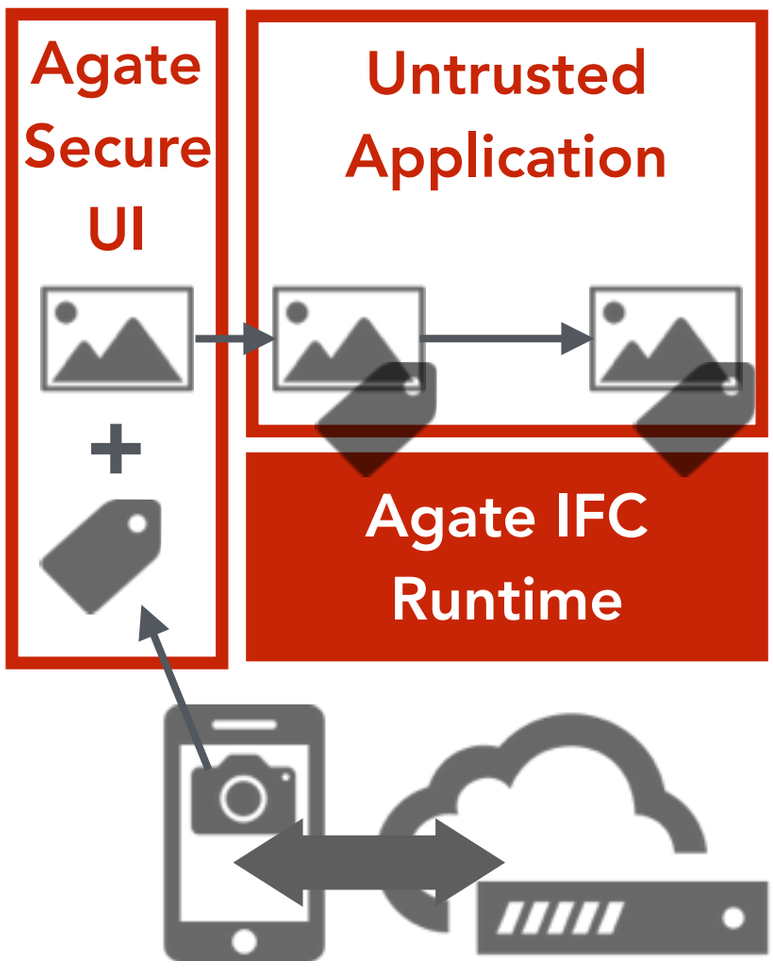


The System: A distributed runtime platform for executing mobile/cloud applications

The Challenge: Providing an application-specific runtime environment to give applications control over performance trade-offs

The Solution: A flexible and extensible runtime system architecture based on *deployment managers*

Agate

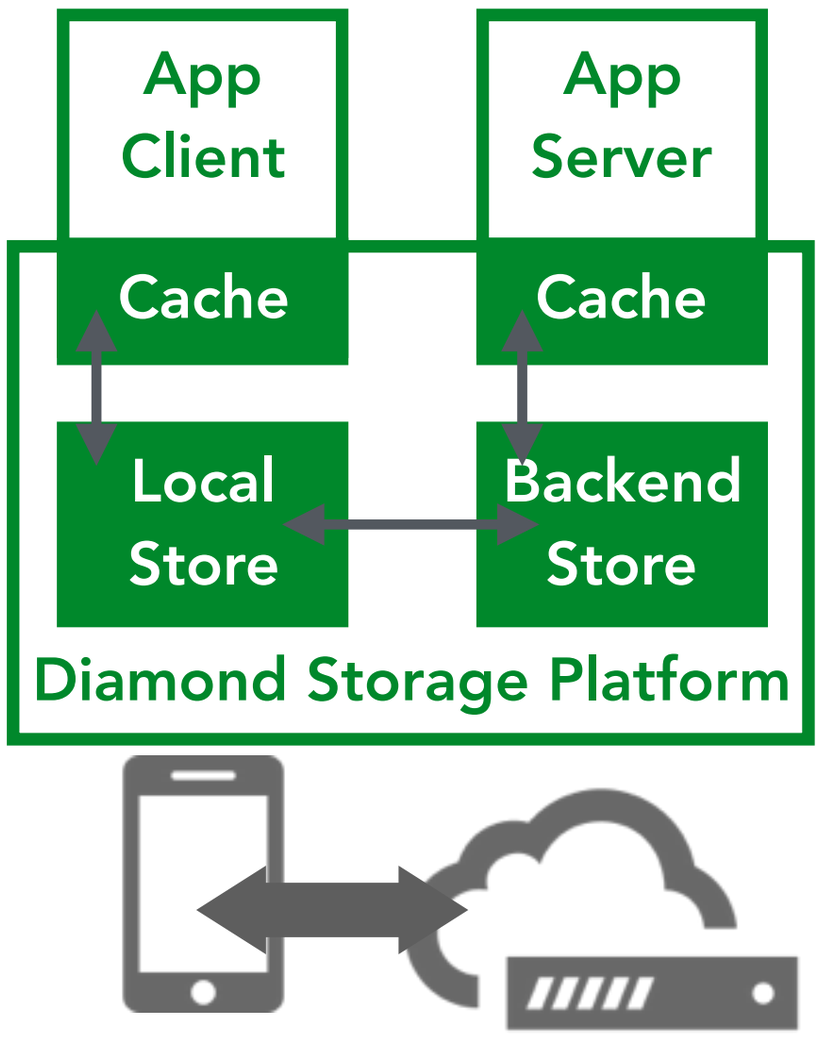


The System: A distributed security platform for protecting shared user data in mobile/cloud applications

The Challenge: Enforcing application-specific privacy policies without trusting the application

The Solution: User-defined sharing policies enforced using *information flow control* on *OS-protected resources*

Diamond



The System: A distributed storage platform for synchronizing data across mobile/cloud applications

The Challenge: Providing an application-specific storage interface to give applications control over the data and consistency models

The Solution: A new mobile/cloud-map abstraction with configurable consistency levels

Summary

OS services need a re-design to meet the needs of mobile/cloud applications.

Application-specific requirements pose a challenge to designing general OS systems.

We are working on three new OS platforms for mobile/cloud applications.