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XSEDE Architecture Overview & Context

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XSEDE

Extreme Science and Engineering
Discovery Environment

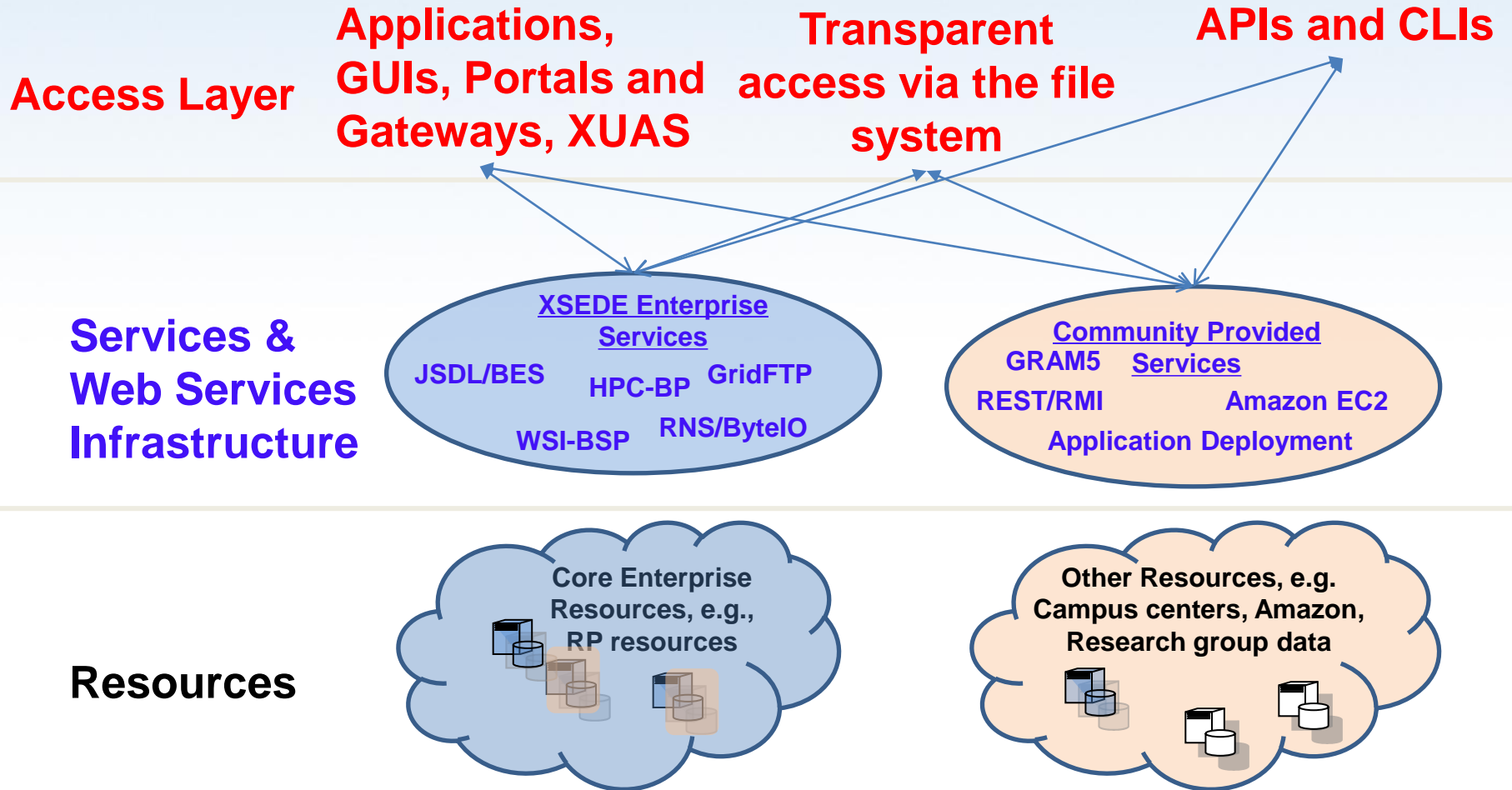
Initial XSEDE architecture: High-order bits

- Don't disrupt the user community! Maintain existing TeraGrid services
- Focus on user-facing access layer
 - For power users, “first, do no harm”
 - For other users, expand use via interfaces, new hosted XSEDE User Access Services (XUAS) and Global Federated File System (GFFS)
- Promote standards and best practices to enhance interoperability, portability, and implementation choice

XSEDE provides capabilities

- Access and share data between campuses and centers
 - Access data on center resources from the campus, campus resources from a center, or campus A resources from campus B
- Access and share compute resources from home, campus, or center
 - to run a job directly on a particular resource
 - submit to one or more global queues
 - to execute a workflow

XSEDE Architecture



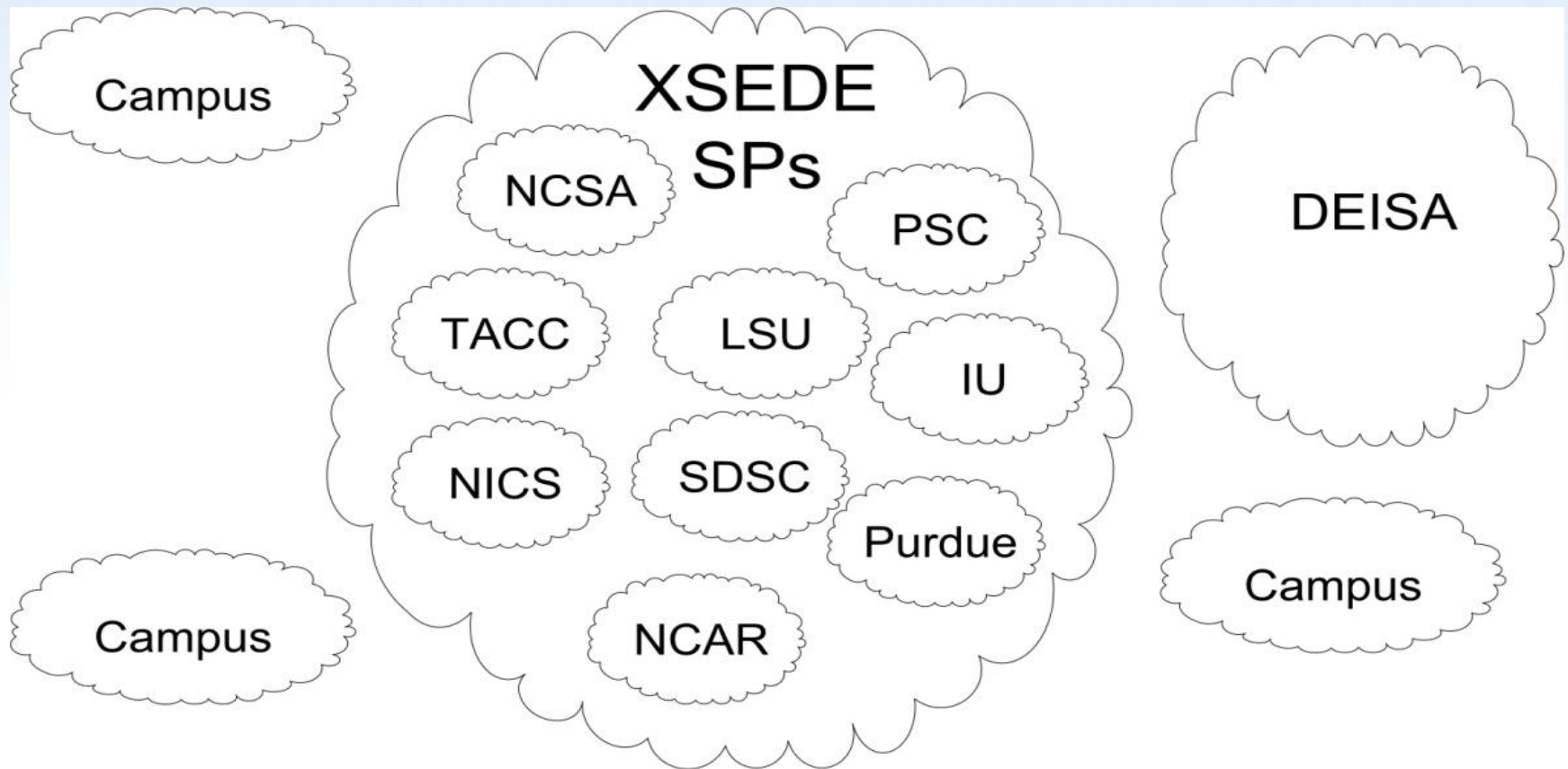
Implementations and Architecture

- The architecture defines the interfaces, communication, and interactions between software components
- The architecture defines how quality attributes are realized
 - Security, reliability, availability, performance, ..
- Architecture components (that implement interfaces) may have more than one implementation
 - Thus, we distinguish between the architecture and the implementation

Implementation Choices

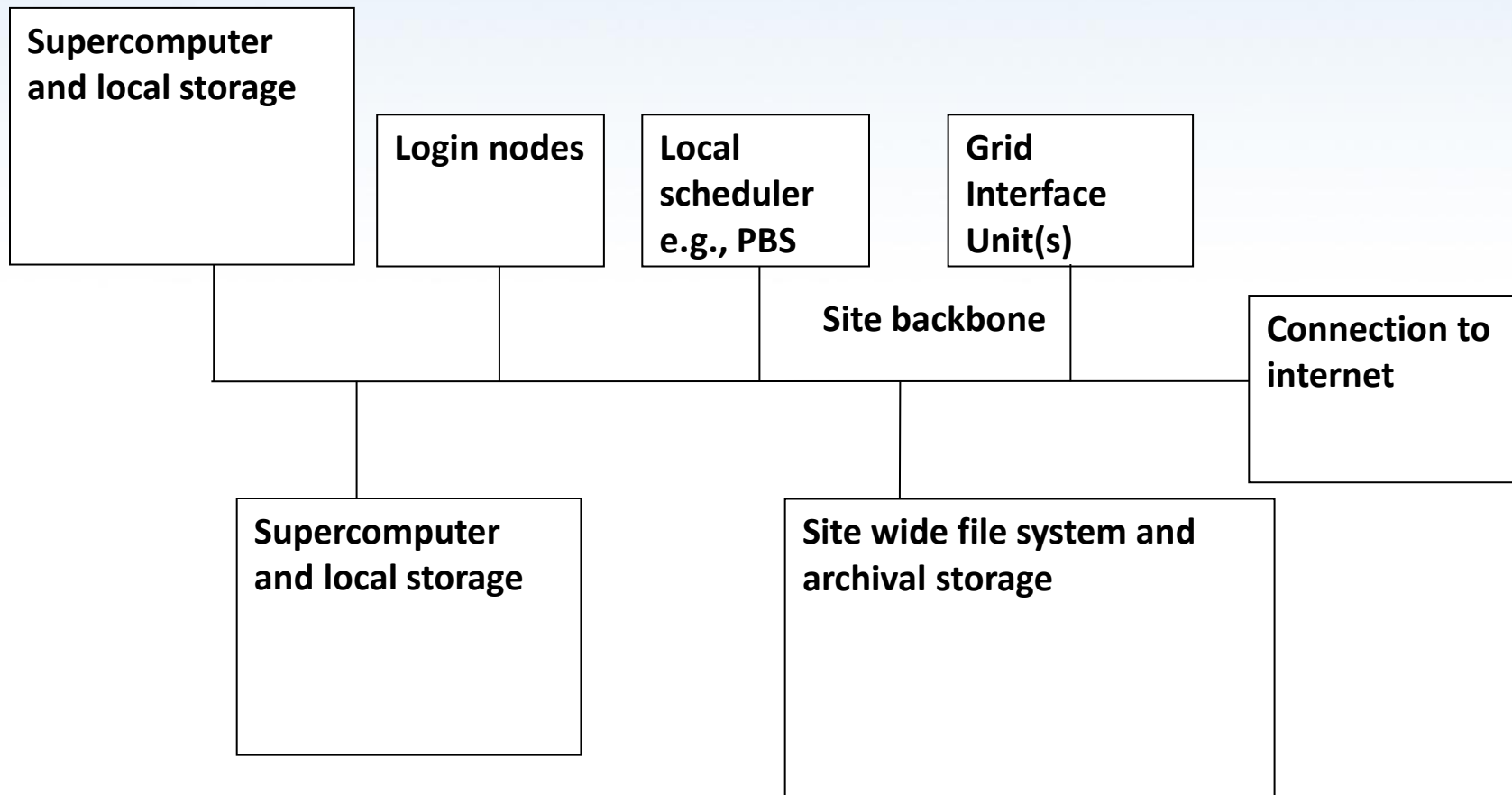
- We have made initial choices of implementations we will use
 - Process to evolve architecture & implementations
- Three major configuration items (software systems) providing implementations. They are (in alphabetical order)
 - Genesis II : **CLIs**, **APIs**, **GUI**, **GFFS**, **XES** services
 - Globus: **XAUS** (XD-Data), **gridFTP**
 - UNICORE 6: **GUI**, **XES** (BES at the SPs)
- XES services run on Grid Interface Units

XSEDE is a System of Systems

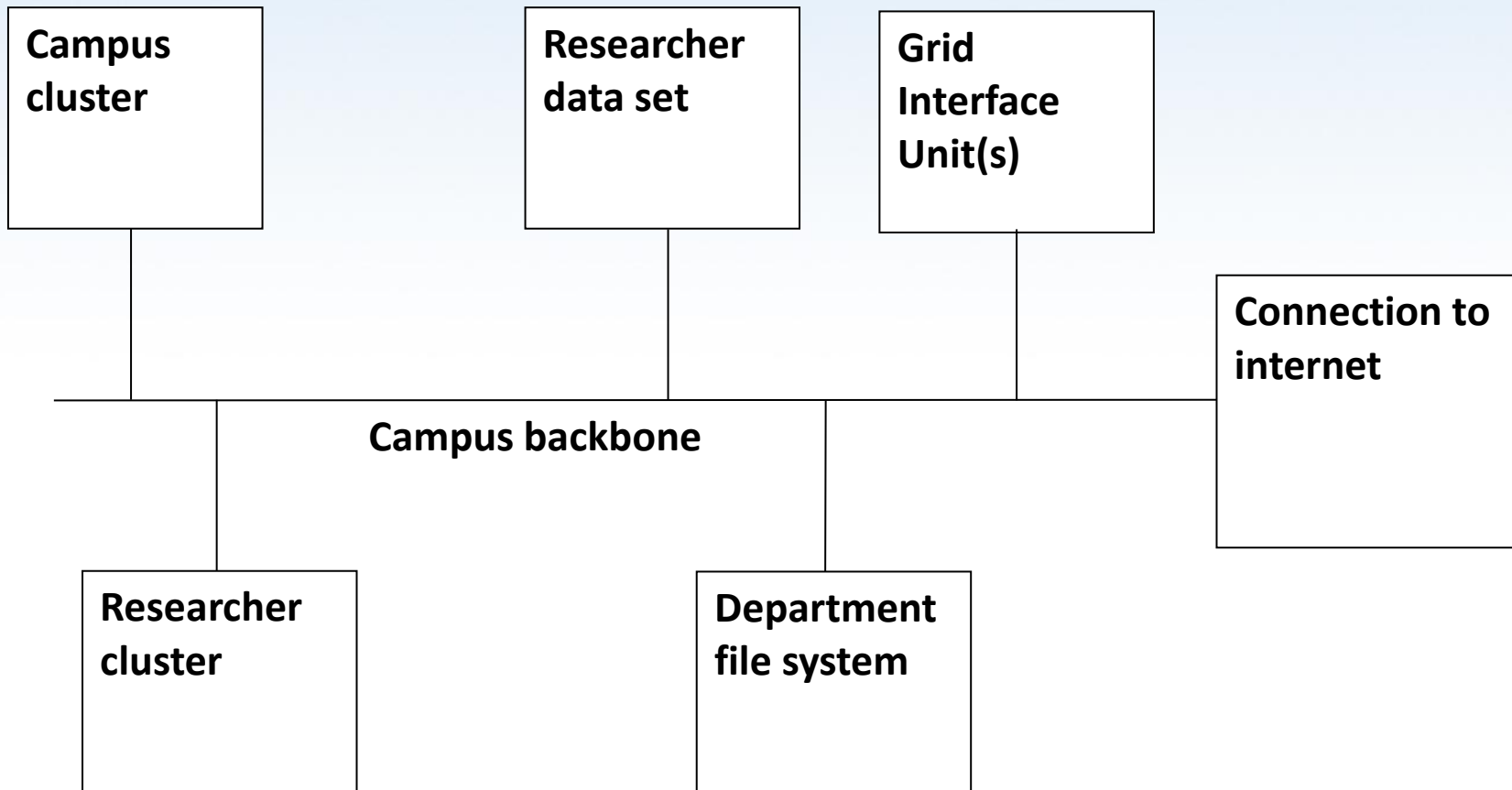


XSEDE is a system of systems: Different organizations may be running different standards-compliant software stacks.

A Typical Service Provider Setup



A Typical Campus Setup



Simple Grid Interface Unit

