VDC
VIRTUAL DATA
COLLABORATORY

VDC Data Services Integration with NSDF discussion (Use case scenario)

10 Feb 2022

NSDF

THE UNIVERSITY OF UTAH®

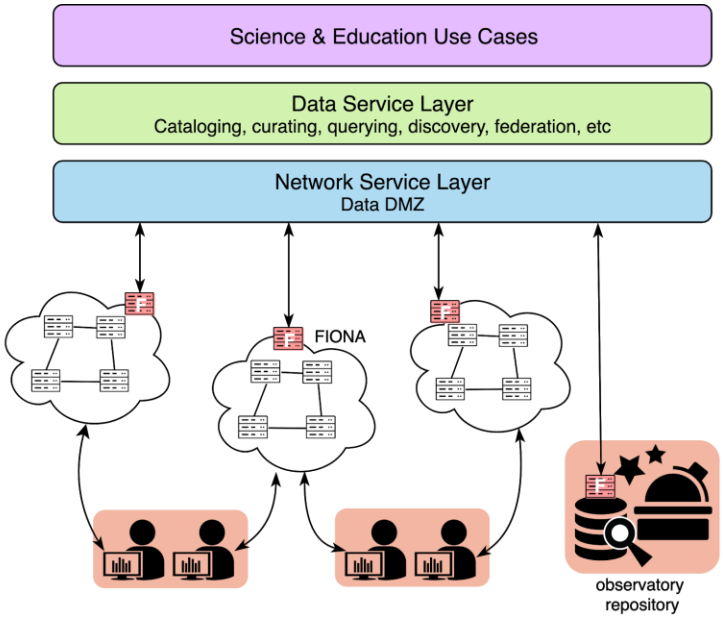
CIF21 DIBBs: EI: Element: The Virtual Data Collaboratory: a Regional Cyberinfrastructure for Collaborative Data Intense Science (VDC)

Award #: 1640834

"A federated data cyberinfrastructure for data-intensive, interdisciplinary and collaborative research."

Key VDC features:

- A dedicated high-speed network, compute and storage **resources federated** over the participating institutions
- **Data discovery**: a set of Data Services including indexing, cataloging, sharing and metadata management
- An **Internet-scale execution platform** for containers, allowing to distribute complex distributed analytics close to the data source
- A network of **high-performance DTNs** equipped with fast storage for implementing smart data delivery strategies.



Impact:

- VDC connects people with data and compute
- Enhanced early warning using online data fusion from large facilities (data streaming)
- Structural bioinformatics

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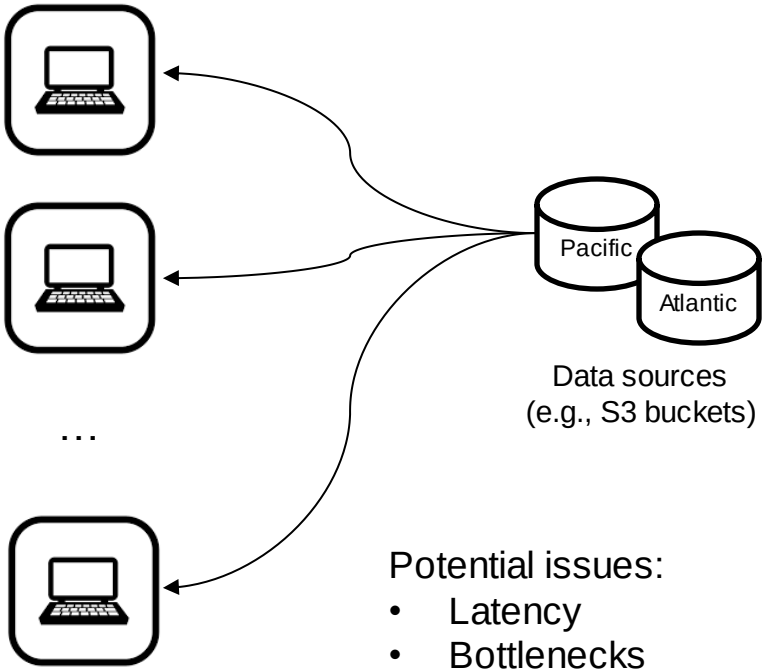
Collaboratory – Use Case Scenario

Example: interactive training event

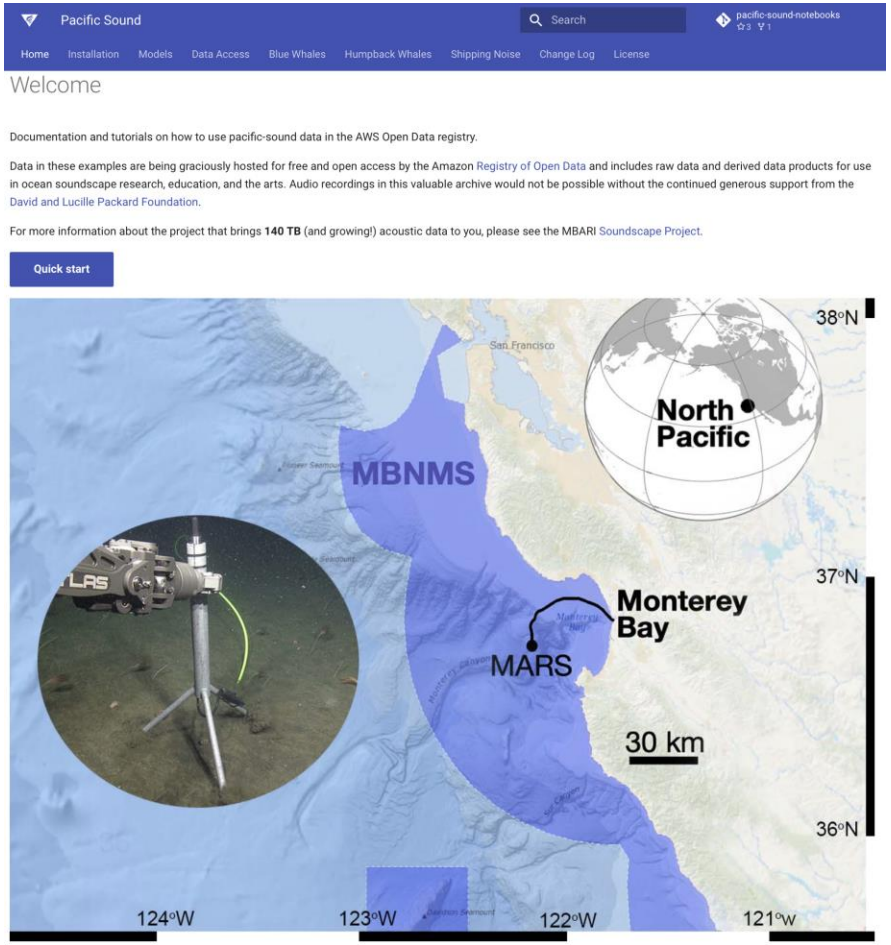
- Diverse data sources
- 50+ trainees



Data sources
(e.g., S3 buckets)

Potential issues:

- Latency
- Bottlenecks
- Compute costs
- Potential egress costs
- Etc.



https://docs.mbari.org/pacific-sound/

(Open data on AWS)

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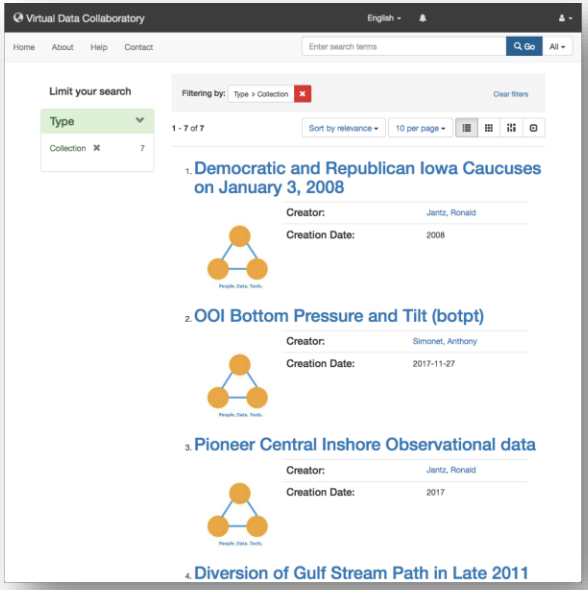
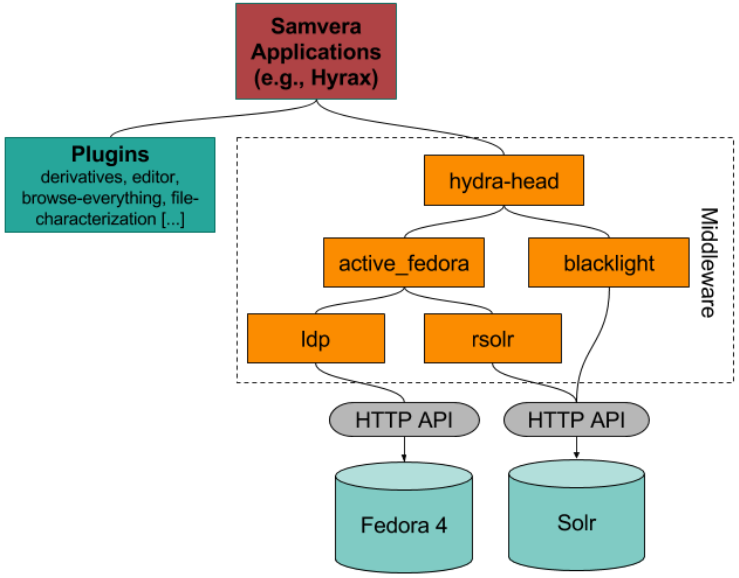
VDC Data Services

- Provide tools and services to work with large datasets
- Registering objects (collections/files/links)
- Searching, Discovering, Sharing
- Create DOI, Store/edit Metadata
- Deriving data, storing provenance
- Provides Globus endpoints for deposited data
- Multiple upload methods (direct, Dropbox,Google Drive, etc.)
- AAI integrated with CILogon





- FAIR Technology stack
- Based on Samvera (customized)
- Fedora provides content as linked data (RDF)
- Semantic support: data and metadata using any ontologies and vocabularies
- Advanced search: content indexed into Solr
- Advanced Query: can be easily indexed using triple store applications (e.g., Jena Fuseki) - SPARQL query language support

https://samvera.org/samvera-open-source-repository-framework/technology-stack/

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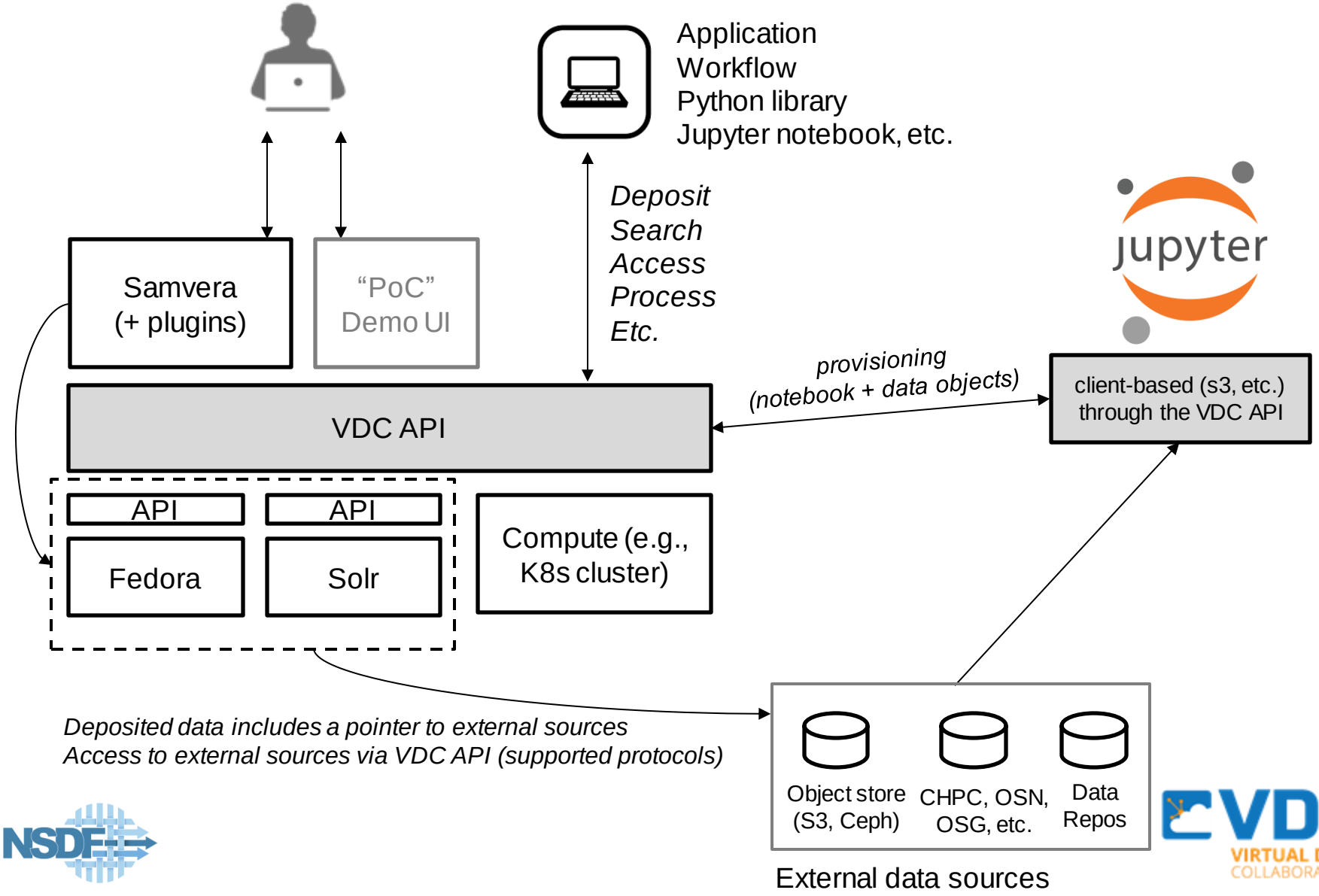
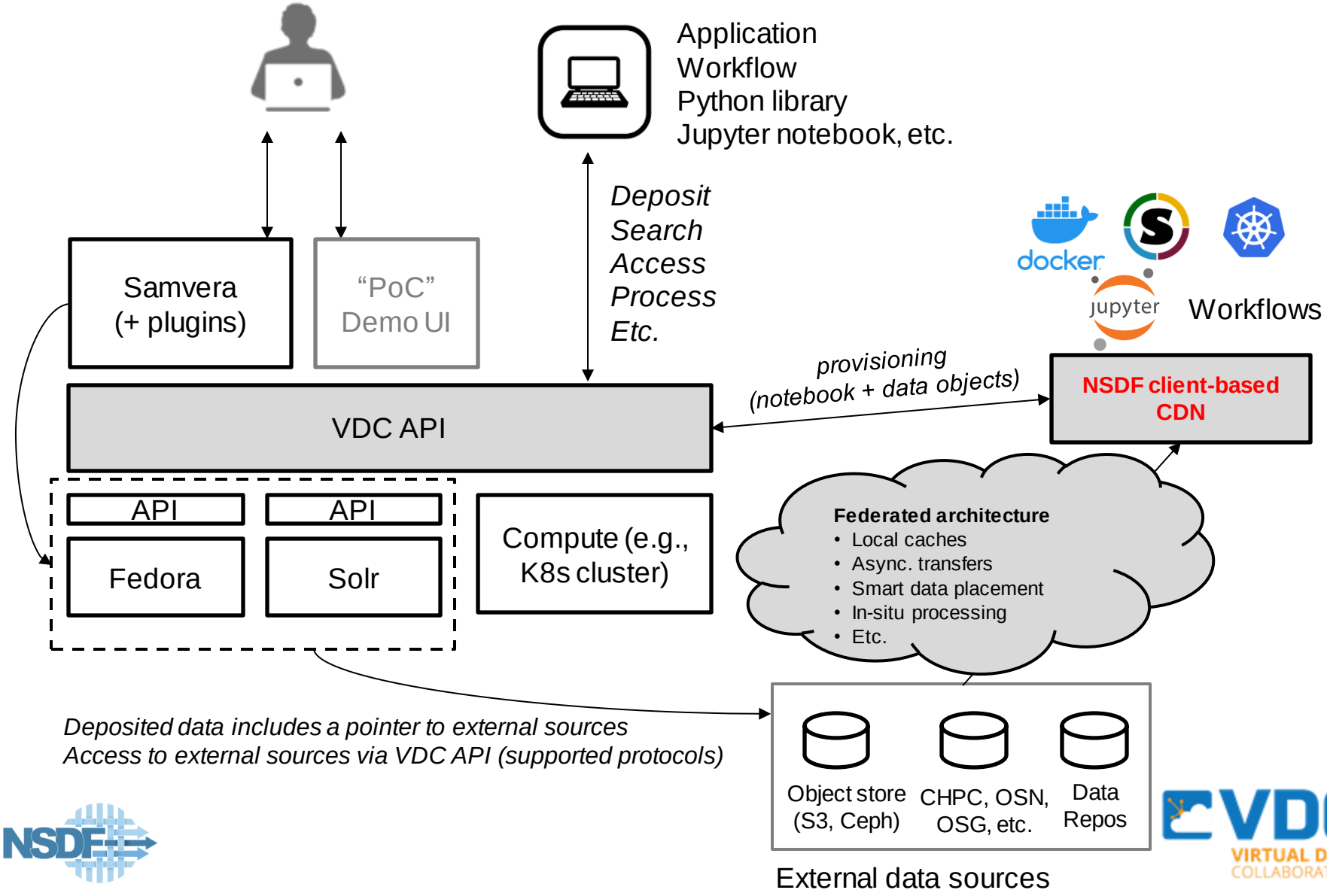
Today's Demonstration (1/2)

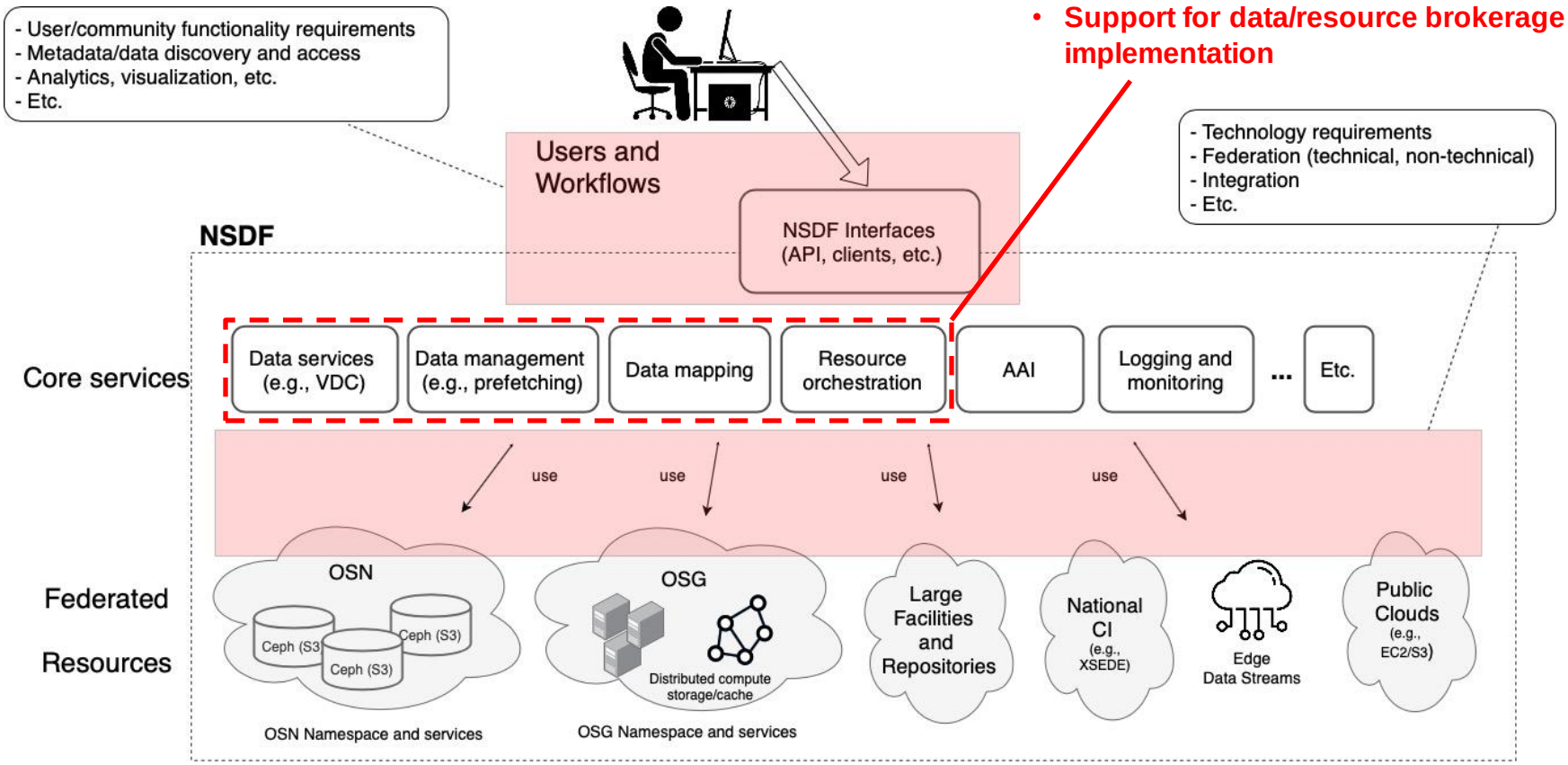


Today's Demonstration (2/2)



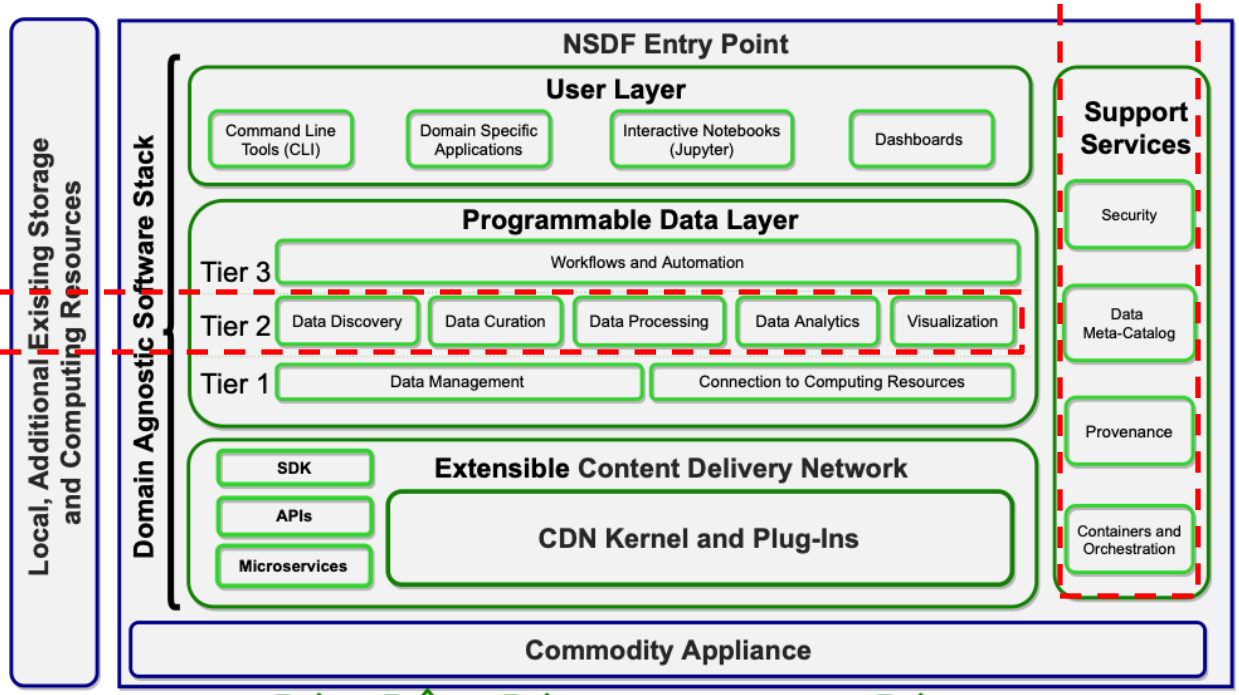
Proposed NSDF Architecture (1/2)

- Leverage core VDC components and APIs (e.g., data discovery/access)
- Building block for developing "smart" data management services
- Support for data/resource brokerage implementation



Proposed NSDF Architecture (2/2)

- Building block for support services



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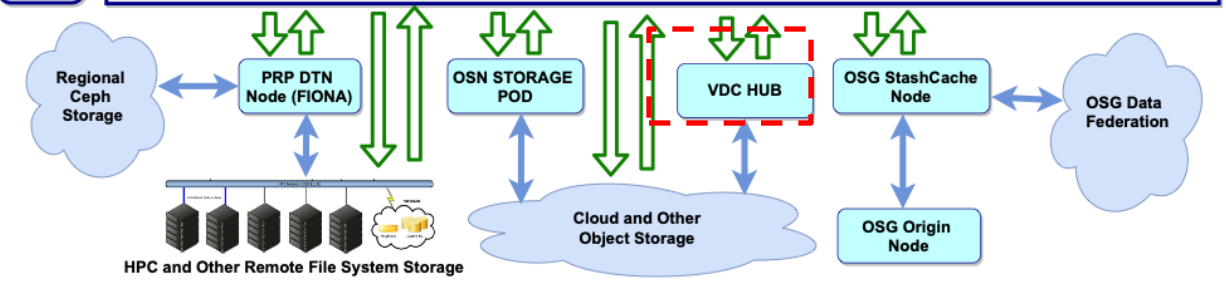

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Thank you!

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