DataNet Federation Consortium

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http://dfc.renci.org

DataNet Federation Consortium

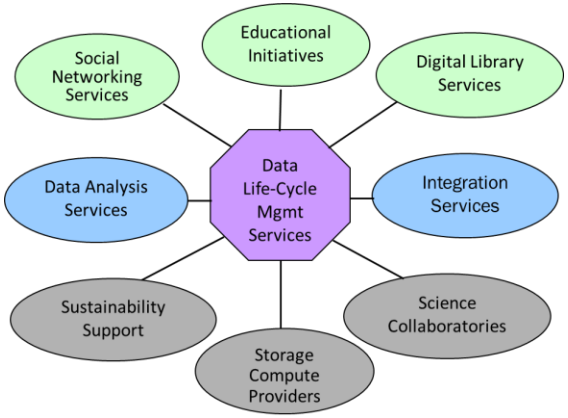
Data Driven Science

- Implement national data grid
  - Federate existing discipline-specific data management systems to enable national research collaborations
- Enable collaborative research on shared data collections
  - Manage collection life cycle as the user community broadens
- Integrate "live" research data into education initiatives
  - Enable student research participation through control policies

Project
Shared Collection
Processing Pipeline
Digital Library
Reference Collection
Federation

Collection Life Cycle

Cyber-infrastructure Partners:
Univ. of North Carolina, Chapel Hill
Univ. of California, San Diego
Arizona State University
Drexel University
Duke University
University of Arizona
University of South Carolina



Science and Engineering Initiatives:
Ocean Observatories Initiative
the iPlant Collaborative
CUAHSI
CIBER-U
Odum Social Science Institute
Temporal Dynamics of Learning Center

i·R·O·D·S
Policy-based data management

National Science Foundation Cooperative Agreement: OCI-0940841

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College of Information Science and Technology
THE UNIVERSITY of NORTH CAROLINA at CHAPEL HILL
UCSD
UNIVERSITY OF SOUTH CAROLINA
College of Engineering and Computing
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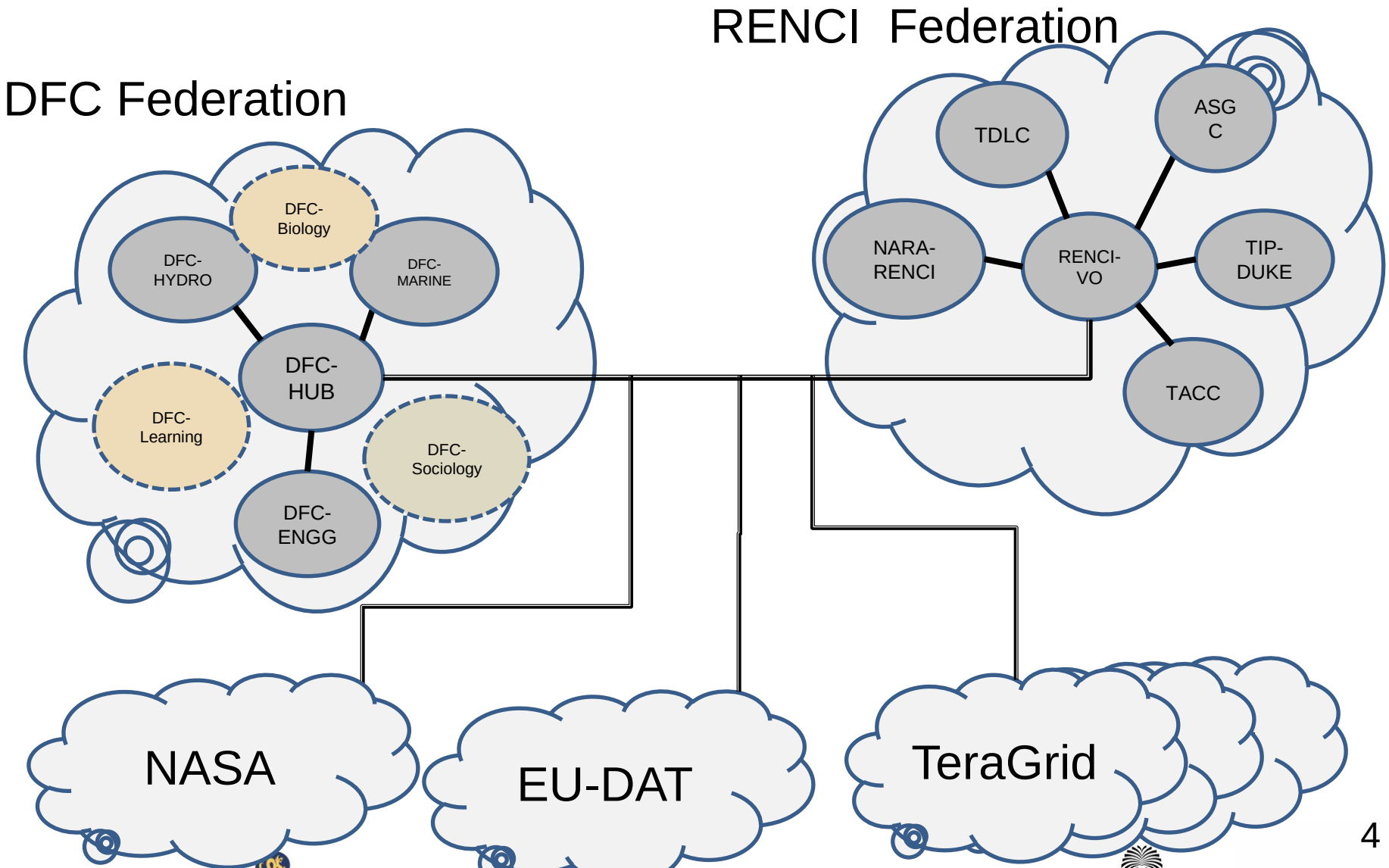
Collaboration Environment

- Manage data and workflows for reproducible research
  - Enforce domain policies
  - Capture workflow process provenance
  - Interact with remote data resources
  - Capture copies of all research data and metadata
  - Orchestrate data intensive and compute workflows
- Enable research project to manage research results
  - Create / share / publish / archive / repurpose
  - Reference collections

Federation of Federations



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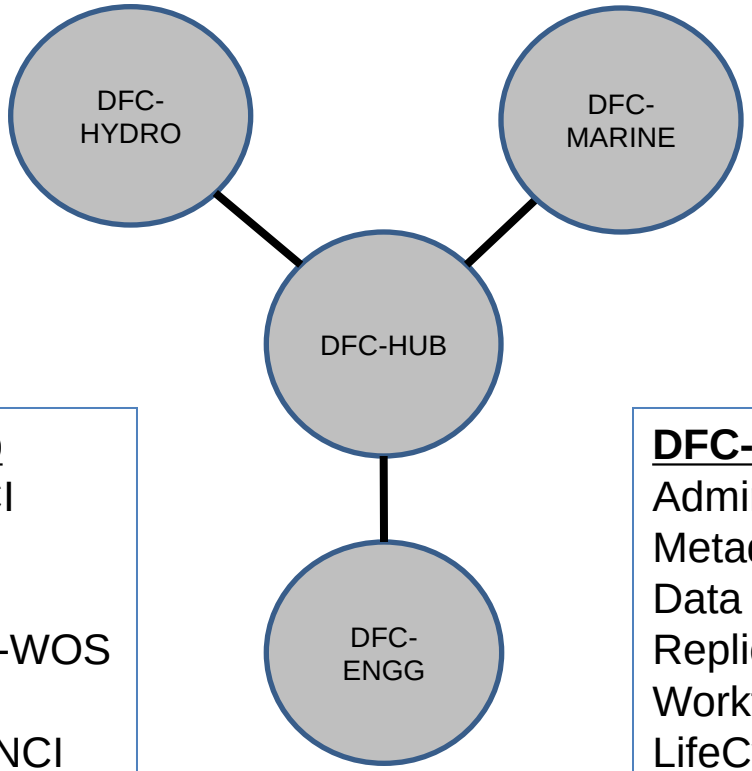
DFC Grid Phase-1
(current federation)

DFC-Hydrology
Administration: RENCI
Metadata: RENCI
Data Resc: USC
Data Resc: NCDC
Replica Resc: RENCI
Workflow Resc: ALL
LifeCycle Engine: RENCI
Message Hub: RENCI



DFC-Marine
Administration: UCSD
Metadata: UCSD
Data Resc: UCSD
Replica Resc: RENCI
Workflow Resc: ALL
LifeCycle Engine: UCSD
Message Hub: UCSD

DFC-Federation Hub
Administration: RENCI
Metadata: RENCI
Data Resc: RENCI
Replica Resc: RENCI-WOS
Workflow Resc: ALL
LifeCycle Engine: RENCI
Message Hub: RENCI

DFC-Engineering
Administration: Drexel
Metadata: Drexel
Data Resc: Drexel
Replica Resc: RENCI
Workflow Resc: ALL
LifeCycle Engine: RENCI
Message Hub: Drexel

Data Grid

- Build on capabilities of iRODS data grid
  - Soft links: Register remote data file into a collection
  - Active object: Register a workflow into a collection
  - Policies: Validate assessment criteria
    Automate administrative tasks
  - Federation: Manage federation policies

Applications

- Provide access to NOAA climatic data record archive for Ocean Observatories Initiative data streams
  - Interface to OOI stream service
- Automate hydrology workflow analyses
  - Access to NOAA, USGS repositories
- Build an engineering digital library
  - Support registry for engineering data formats

Extensible Environment

- Federate additional data management systems
  - Incorporate Pluggable Authentication Modules
  - Support data analysis libraries – netCDF
  - Incorporate semantic mediation – HIVE
- Apply to NSF infrastructure projects
  - EarthCube – NSF Geosciences
  - XSEDE

DFC DataNet FEDERATION CONSORTIUM

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***NSF* OCI-0940841 "DataNet Federation Consortium**

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