

CI Compass Services Offered to the Major Facilities (MFs)

<i>Evaluate CI Data Lifecycle (DLC) Plans, Help Design New Solutions, Develop Proofs of Concept, Assess Applicability/Performance of Existing Solutions, Help Leverage CI Solutions</i> <i>*** Indicates services that may involve multiple DLC stages (crosscutting)</i>	
Data Capture	Discuss sensor data annotations: apply community sensor data models to the MFs data, explore messaging systems, support interoperability across MFs, and connect to industry standards and to similar communities of practice within scientific domains.
	Comment on structured data and metadata for data capture as well as provenance metadata to improve quality control and quality assurance and to better understand the collected data relative to other experimental data.
Initial Processing	Provide advice on solutions for processing data at the edge: applying filtering, performing data annotation and preparation, managing resources under constraints, etc.
	Assist in designing robust data transmission of sensor data to the data centers (identify applicable protocols and data ingest toolchain, identify reliable data movement and long-haul data transfer solutions, etc.)
Central Processing	Provide independent evaluations of data center architectures during construction/enhancement.
	Provide advice about on-prem, cloud, hybrid, and national CI data processing solutions considering cost/performance/robustness tradeoffs.
	Assist in designing cloud migration strategies and cloud architectures for large-scale data storage and processing considering MF-focused evaluation criteria. ***
	Discuss up-to-date CI development practices: DevOps, CI/CD, and testing. ***
	Assist in designing or enhancing infrastructure monitoring services for failure and anomaly detection; discuss effective CI troubleshooting approaches.
	Leverage existing testbeds to evaluate new software stacks and configurations during CI design/enhancements.
	Assist in orchestrating services within the data center, considering performance and resilience.
	Assist in enhancing network infrastructure, considering real-time constraints, resilience, egress, etc. ***
Explore event-based processing, data processing automation for high throughput and robustness. ***	
Storage/Curation/Archiving	Assist in designing and evaluating data storage architectures for reliability, availability, and cost-effectiveness (tiering, cloud backup and storage, DB architecture, etc.)
	Assist in designing and comparing data backup and disaster recovery policies.
	Assist in designing and exploring long-term data curation and preservation techniques.
Data Access/Dissemination/Visualization	Assist in leveraging large-scale data movement tools for efficient delivery of data to scientists and other facilities (computing centers, external institutions).
	Assist in leveraging portal tools, including technologies for web-based user interfaces.
	Provide advice on data streaming technologies (on-demand processing, analytics, and visualization) for better user experience.
	Provide advice on data discovery solutions and approaches, including making data FAIR (might involve multiple DLC stages). This includes aiding in the creation and adoption of community driven standardized vocabularies and ontologies as well as assisting in the creation of local vocabularies and ontologies and harmonizing these community standards, where needed. ***
	Assist in designing data visualization solutions (tools, formats, proofs of concept, etc.) for enhancing data discoverability and accessibility.
	Critique web-based user interfaces, help explore server-side vs client-side processing tradeoffs.
	Help evaluate identity management solutions for managing user data access and data usage reporting. ***