Use Case - ACIGA gravitational wave data channel access

Summary:
To access combined data with common conditions from geographically disparate gravitational wave observatories.

Narrative:
From a computational perspective, gravitational wave science requires the ability to perform intensive computation on globally distributed, terabyte-scale datasets. ACIGA is committed to implementing emerging technologies towards the sharing of such data and computational resources located within Australia and throughout the LIGO collaboration. Australian facilities must allow researchers to:

- Acquire, store, and analyze LIGO science data in near real-time, optimizing the privileged access of the ACIGA to data as members of the LIGO Scientific Collaboration
- Leverage a worldwide leading position in the emerging field of gravitational wave astronomy. Then capitalize on Australia's singular expertise in modeling gravitational wave sources with existing and future Australian observatories to correlate sources. (Global sharing of Australian observation data and computational model output.)
- Obtain favourable terms of engagement in the next-generation of LIGO by contributing a fraction of our data infrastructure to the international project stakeholders - a strategy that LIGO has already endorsed

Use Case Number	RUC04
Use Case Name	ACIGA gravitational wave data "channel" access
Work Package	
Stakeholders & Interests	Researchers. ACIGA data analysis group (ANU, UWA, UA, Monash, UM, CSIRO). LIGO international scientific collaboration.
Preconditions	Actors: Data Producer, Collaborator, Repository, Local Repository, Extended LDR Service (Lightweight Data Repicator) 1. Data collections exists in digital format in one or more Repositories.

	2. Data Producer and Repository have determined authorisation permissions for the data collections. 3. Identities (collaborators) and virtual organisations (collaborators organisational structure) are provisioned. 4. Collaborator has write access to Local Repository.
Success Guarantee (Post-conditions)	
Main Success Scenario (Basic Flow)	Actors: Data Producer, Collaborator, Repository, Local Repository, Extended LDR Service (Lightweight Data Repicator) 1. Collaborator searches federated registry to discover data collections containing specific channels, epoch, and other conditions. 2. Collaborator's authenticated identity is used to display the collections for which she has access. 3. Collaborator requests the Extended LDR Service that data meeting the specific conditions be extracted from the collections, merged and transferred to specified Local Repository. Collaborator identity is used to access the Extended LDR Service. 4. Extended LDR Service retrieves data collections from Repositories, extracts data meeting specified conditions, merges the extracts and stores the output at the specified Local Repository. (The retrieval, extract and merge may occur in a distributed fashion.) All operations must be performed as if by the Collaborator's authority. 5. Extended LDR Service notifies Collaborator of completion. 6. Collaborator identity is used to authorise access to Local Repository and collection. 7. Collaborator is given access to collection metadata and/or data.
Extensions (Alternate Flow)	3: Collaborator is denied access and reason is communicated. 4: Collaborator is denied access to Repositories or Local Repository and reason is communicated.

Data Items	Required Attributes: • Virtual Organistion (**organizationName** or **eduPersonOrgDN**?) • Organisation Role (more arbitrary than eduPersonAffiliation, perhaps **eduPersonEntitlement**?)
Special Requirements	
Frequency of Occurrence	Weekly. Monthly.
	Business Rules: 1. Virtual organisation and institutions must provide authorisation policy and rules. 2. Members of international scientific collaboration should be able to use their identity provider authentication to access Australian data repositories and vice versa.
Open Issues	References: http://www.anu.edu.au/Physics/ACIGA/\\ http://www.ligo.caltech.edu/\\

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