Digital preservation, as a research and technical problem, is related with the purpose of maintaining digital objects accessible over a long period of time, regardless the challenges concerning technological or organizational changes or failures. In this poster we propose solutions that can evaluate and support the design of strategies in the context of preservation systems based on federations of data grids. The purpose is to have in place techniques that, when in the presence of verified failures or potential risks, automatically apply specific business rules considering the perceived state of the system.

This means that federations of data grids, as preservation systems, must be able to react to threats in order to keep the main properties of the system aligned with its business objectives. Ideally, those reactions should result in a self-organization of the system, especially when the changes occur between some limits. When out of those limits, the reactions should be effective at least to request human intervention.

Digital Preservation Control Environment

The main proposal is to address the issue as a normal feedback system control problem, where a control system reacts with feedback control to changes in the state of the preservation system.

For a scenario where the Object Space is in a state OS1, the Preservation System can self-organize itself, in automatic mode, anytime the technological system oscillates between the states TS1 and TS2. However, if the Object System jumps to the state OS2 (e.g., a large number of objects is delivered for preservation), then the technological system also will have to be reconfigured for a state above TS3 (more storage nodes and capacity will be required).

The border between the two spaces can be controlled by Preservation Policies which, at any instant of time, can be changed (for example, the number of replicas for each storage resource).

Using Federations of Data Grids for Digital Preservation

Data grids provide functionalities required by digital preservation systems (e.g., massive data sets, file management, networking), especially when massive amounts of data are required to be preserved, as in e-Science domains.

- **GRITO** ([http://grito.intraneia.com](http://grito.intraneia.com))
  - National project
  - Exclusive storage clusters (dedicated to digital preservation)
  - Extended storage clusters (using surplus resources of computing clusters)

- **SHAMAN** - Sustaining Heritage Access through Multivalent ArchivistNg ([http://shaman-ip.eu/shaman](http://shaman-ip.eu/shaman))
  - Three domains of focus: memory institutions, engineering and e-Science
  - Strong focus on authenticity and integrity
  - Definition of architectures for digital preservation