We report on the progress of !CHAOS, a framework for the development of control and data acquisition services for particle accelerators and large experimental apparatuses. !CHAOS introduces to the world of controls a new approach for designing and implementing communications and data distribution among components and for providing the middle-layer services for a control system. Based on software technologies borrowed from high-performance Internet services, !CHAOS offers, by using a centralized highly-scalable cloud-like approach, all the services needed for controlling and managing a large infrastructure. It includes a number of peculiar features such as high abstraction of services, devices and data, easy and modular customization, extensive data caching for enhancing performances, integration of all services in a common framework. Since the !CHAOS framework design was presented two years ago the INFN group has been working on the implementations of services and components of the software framework. Most of them have been completed and tested for evaluating performance and reliability. Some services are already installed and operational in experimental facilities at LNF.

!CHAOS keywords: scalability, abstraction, integration of services, distributed object caching, non-relational key/value database, binary serialization, object relational mapping, memcached, mongodb, msgpack, BSON, ...

We studied the possibility to introduce a circular buffer for sharing data among client applications. As an example, consider a GUI with a graph showing the last N values of a certain variable. When the GUI starts to fetch data from the KVDB, the User Interface Toolkit underneath allocates a lock-free circular buffer and provides the pointer to the buffer to the graph's manager (see Fig.6). The buffer, with size equal to the depth of the graph, is updated by the tracker taking into account the refresh rate of the device and the sampling of the graph.