ViSE Milestone 1e and 1f

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The ViSE project has completed milestone 1e and 1f, due 10 months from contract start date of October 1st, 2008.

Milestone 1e is as follows:

- **Milestone 1e**.

  [1e] Contingent upon availability of reference implementation of Shirako/ORCA at 6 months, import and then integrate.

ViSE is running the latest reference implementation of the Shirako/Orca codebase. Note that Milestone 1c (completed February 1st, 2009) required ViSE to perform an initial integration of Shirako/Orca prior to an official reference implementation being released. See that milestone for specific details related to the integration. Incorporating the latest reference implementation required only minor (although tedious) code porting. Additionally, as a result of the Orca-fest conference call on May 28th, the GENI Project Office and Cluster D set mini-milestones that were not in the original Statement of Work. These milestones are related to Milestone 1e, since they involve the particular instantiation of Orca that Cluster D will use. In particular, by June 15th, 2009, we upgraded our ORCA actors to support secure SOAP messages. As part of this mini-milestone, Brian Lynn of the DOME project and the ViSE project also setup a control plane server that will host the aggregate manager and portal servers for both the DOME and ViSE projects. This server has the DNS name geni.cs.umass.edu. The server includes 4 network interface cards: one connects to a gateway ViSE node on the CS department roof, one will connect to an Internet2 backbone site (via a VLAN), one connects to the public Internet, and one connects to an internal development ViSE node. The installation of geni.cs.umass.edu with the latest version of Orca means that we are well-prepared to transition to using a remote Clearinghouse provided by RENCI.

During the Orca-fest and subsequent Cluster D meetings we set the milestone for shifting within the range of August 15th, 2009 and September 1st, 2009. We are currently discussing with the Duke/RENCI Orca/Ben group to complete this milestone in a few intermediary steps—-first moving the DOME and ViSE brokers to RENCI and then incorporating them into the same Clearinghouse as the other Cluster D projects. Since we have already setup and tested the latest implementation of Orca on geni.cs.umass.edu, we are well-positioned to transition to a remote Clearinghouse if provided by RENCI.

Milestone 1f is as follows:

- **Milestone 1f**.

  [1e] Complete Xen sensor virtualization. Non-slivered VM access to radar data.

We have completed an initial research-grade implementation of sensor virtualization in Xen and released a technical report that applies the approach to Pan-Tilt-Zoom video cameras. The technical report can be found on the web at `http://www.cs.umass.edu/publication/details.php?id=1575` and is also attached to this milestone report. As detailed in our quarterly status report we have faced challenges in applying the same techniques to the Raymarine radars in the ViSE testbed because their drivers do not operate by default inside of Xen's domain-0 management domain. The problem affects other high-bandwidth I/O devices that use Xen, and is being actively worked on in the Xen community. As these problems are worked out, we have transitioned to

using vservers as ViSE's preferred virtualization technology, and developed vserver handlers for Orca. We are also porting VSense to work with vservers as well as with Xen; its modular design makes this port straightforward. Our demonstration at GEC5 in Seattle showed non-slivered VM access to radar control and data using vservers; once we complete our port of VSense we will be able to support slivered access. A more detailed description of these Xen, vservers, and sensors in ViSE is available in the quarter 2 quarterly report for ViSE.