ORCA-BEN QSR

Period: Apr. 1, 2009 – Jun. 30, 2009

Overview

ORCA-BEN Project is adapting the existing ORCA (Open Resource Control Architecture) software developed at Duke as a control framework prototype for GENI. It uses BEN (Breakable Experimental Network, https://ben.renci.org) as the networked substrate, which exposes equipment at different layers: optical, circuit, packet as well as edge resources. The main goal for Spiral 1 is to demonstrate multi-layer slice provisioning on BEN using ORCA.

In this period we have been preparing for a major Spiral 1 milestone – a demo of ORCA provisioning slices using BEN and a backbone network (NLR). We have completed or are in the process of completion of a number of items detailed in Table 1, which include drivers for BEN networking elements as well as supporting logic to use NDL-OWL ontologies for cross-layer slice provisioning. NDL-OWL is our extension to the NDL (Network Description Language) developed by University of Amsterdam and used in international GLIF facility, which, in addition to lambdas, supports provisioning using higher layer mechanisms, like VLANs and later routes, tunnels.

We've also organized and conducted ORCA-Fest: a one-day virtual meeting between the developers within Cluster D and the GPO to allow for sharing of information with respect to the integration paths the different projects in the cluster are taking. It also allowed the GPO to take a snapshot view of the level of integration within the cluster and provide guidance to the participants to the GPO priorities.

We are currently in the final preparations for the backbone demo (provisioning of slices across BEN and NLR) by completing the development and integration of Infinera DTN and Polatis drivers and introducing NDL-based resource description toolkit into ORCA.

Activities performed during specified period

Activities

Activity	Description	GPO target milestone
BEN	Deployed additional edge compute resources in BEN in support of the demo.	1d, 1e
NDL-OWL	Refined NDL description of BEN.	1c

NDL toolkit	Created initial Java toolkit implementation to operate on NDL-OWL. Currently integrating into ORCA codebase.	1c, 1d
RSpec discussion	Participated in an RSpec workshop on 06/25/09. Presented NDL-OWL and ideas about using ontologies for resource representations developed jointly with Cluster E.	1f
ORCA codebase modifications	In the process of completing integration of various parts of code for the backbone demo	1d, 1e
BEN equipment drivers	Added features to the Cisco 6509 driver. Completed DTN and Polatis optical switch drivers.	1a, 1d, 1e
Developed ORCA-BEN integration plan and feature roadmap	Developed and presented to the GPO and Cluster D a document describing the integration plan for the Cluster, as well as a list of features that are on the short list of being implemented, to help Cluster participants plan their activities.	1f
Organized ORCA-fest	Organized a virtual meeting for Cluster D developers to help explain ORCA code base and present and discuss ORCA-BEN's feature roadmap.	1f

Participants
Ilia Baldine PI, RENCI

Jeff Chase PI, Duke University

Yufeng Xin, Dan Evans, Aydan Yumerefendi – core development team, RENCI

Chris Heermann – BEN Operations, RENCI

Varun Marupadi, student, Duke University

Matt Sayler, student, Duke University

Outreach activities
- Participated in RSpec workshop.
- Held several conference/webex calls within Cluster D to discuss strategies of integrating with ORCA.
- Organized ORCA-fest for Cluster-D developers.

- Held discussions with ORBIT (Max Ott) on best approaches to resource representation in GENI (advantages of ontologies based on ITU G.805 model over ad hoc XML representations).