ORCA-BEN QSR

Period: Jan. 1, 2009 - Mar 31, 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 goal for Spiral 1 is to demonstrate multi-layer slice provisioning on BEN using ORCA.

In this period the team has been concentrating on developing the code to enable provisioning of VLAN slices across BEN. We developed the ORCA driver for Cisco 6509 and developed a slice controller to take advantage of this capability. We demonstrated our achievements at GEC4 by creating several parallel slices across BEN which included edge resources (VMs at Duke and RENCI BEN PoPs) interconnected via VLANs provisioned across BEN. This completes milestone 1a (Extend ORCA as a GENI Control Framework) for our project.

We've also held a number of discussions within Cluster D regarding ORCA architecture and ways of integrating projects with ORCA. At GEC4 Cluster D participants have agreed to hold a developer meeting in late April, early May 2009 for an 'ORCA Fest' at RENCI to streamline Cluster D integration efforts. We have released the ORCA code to the Cluster D, completing milestone 1b.

We are currently preparing for the backbone demo (provisioning of slices across BEN and NLR) by completing the development 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
Extend ORCA as a GENI Control Framework	Deployed ORCA on BEN substrate, developed a driver for VLAN slivering of BEN, developed a VLAN slice controller and integrated into ORCA	1a (Completed)
Code release	Released a buildable version of ORCA code to the Cluster D participants.	1b (Completed)

BEN	Deployed equipment into NCSU and UNC-CH BEN PoPs in anticipation of completion of fiber connections.	1d, 1e
NDL	Completed NDL schema design as well as BEN description in NDL.	1c, 1d
NDL toolkit	Began the design of an NDL toolkit for resource description to be integrated into ORCA	1d
GEC4 presentations	Presented ORCA vertical integration details at the Substrate WG meeting.	
Demos	Held a BEN VLAN demo at GEC4 provisioning slices consisting of VMs interconnected by VLANs over BEN substrate	1a, 1e
GPO Architectural discussions	Held a number of architectural discussions with GPO SEs regarding ORCA over teleconference as well as at GEC4.	1f
Substrate description	Provided GPO SE (John Jacob) with updated BEN substrate description complete with horizontal and vertical integration details.	
ORCA codebase modifications	Created a detailed implementation plan for supporting NLR backbone demo. Began implementation work.	1d, 1e
BEN equipment drivers	Completed Cisco 6509 driver. Developed most of Infinera DTN as well as Polatis switch drivers for ORCA.	1a, 1d, 1e

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

- Gave ORCA-BEN demo to prospective CS graduate students at Duke.
- Held several conference/webex calls within Cluster D to discuss strategies of integrating with ORCA.
- Presented at GEC4 on the details of ORCA vertical integration.
- Held discussions with ORBIT (Max Ott) on best approaches to resource representation in GENI. Included discussed ideas in our respective I&A Proposals for Spiral 2.