Selection of Alaska resources to be federated with GENI

Selection of Alaskan locations

UAF's rural campuses are of particular interest since they could provide connectivity to geographically isolated communities operating at the extremes of the network's thin edge. Initially, we are choosing two rural campuses for which we will set up a server in order to create a distributed ORCA installation between UAF, Ketchikan, and Dillingham.

UAF will house a server running the ORCA management software, and providing enough resources for several virtual machines (VMs). This server will interface with each remote site in order to create additional VMs, and provide a more diverse network.

New capabilities:

Providing resources in Fairbanks extends the reach of GENI experimentation by nearly 1500 miles[1] up through four fiber optic cables from Oregon and Washington to Alaska.
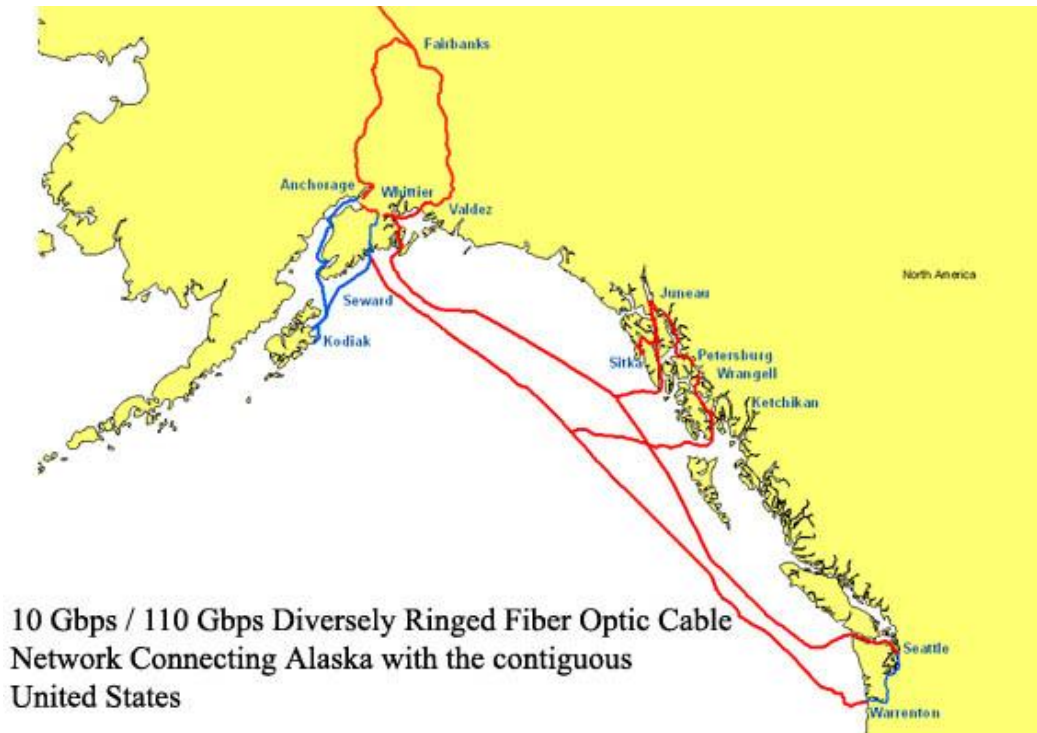

Image showing the routes of two fiber cables from the lower 48 to Fairbanks[2].

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[1] http://www.alaskaunited.com/route.htm

[2] http://www.alaskaunited.com/index.htm

In addition, to reaching Fairbanks, we plan to federate equipment in rural campuses. Initially we plan to have two servers at two different rural campuses that will run as ORCA Eucalyptus sites. By placing equipment at Ketchikan, and Dillingham we will gain the ability to perform GENI experiments over satellite and long range point-to-point connections. The image below shows the connection speeds and geographical distances of these campuses, as well as the planned distributed ORCA installation.
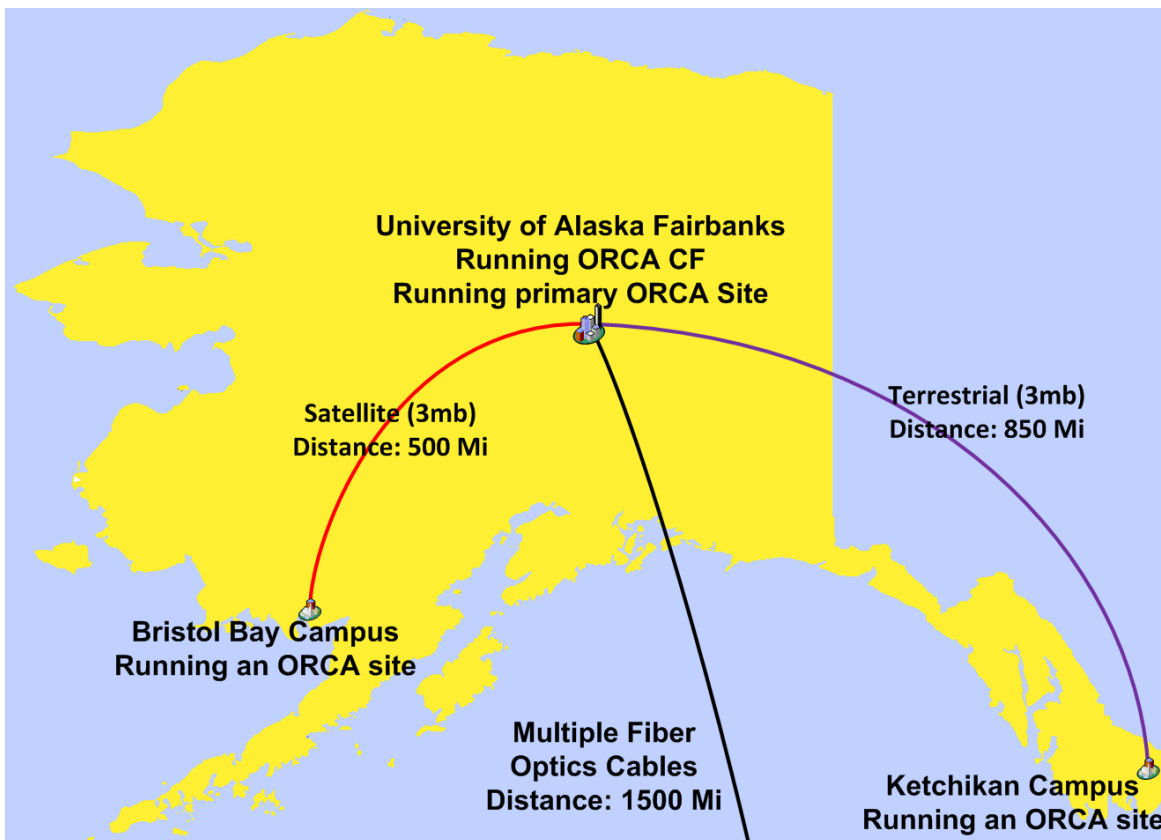
Equipment:

Our initial deployment is based on a server at UAF, which will run the ORCA aggregate manager and a primary site authority. We also plan to federate several small servers at rural campuses, by provisioning power, network connectivity, and a number of externally addressable IPs to each location. We will provision these resources through the universities IT staff, and on-site points of contact at each location. At this time, the servers are likely to be Mac Minis, which have a very small physical footprint, and do not require cooling or rack space. Each Mac Mini should be able to run 4-10 virtual machines depending on the amount of resources needed for each.

Model Federation Framework:

These small installations provide us with the opportunity to make the initial phase a trial federation that we can build upon as we continue to add more resources. Having our own installation also gives us the opportunity to test incentive models. In addition, we will be able to perform impact assessments and testing to monitor the systems, which will give us the ability to show potential future donors how we expect the system to act based on actual logs and statistics.

Lastly, having a small system that we administer will give the University direct contacts inside Alaska, who have the ability to reconfigure, or shutdown the system to better suit their needs as an early adopter of GENI. This is especially important since security mechanisms and slice isolation are still in development.

More information:

http://groups.geni.net/geni/wiki/VMI-FED
http://assert.uaf.edu/geni/

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