

Network Model for Circuit-Based Services.

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There are a number of active projects to design and develop a data control plane capability that steers traffic onto alternate network paths, instead of the default path provided through standard IP connectivity. Lambda Station, developed by Fermilab and Caltech, is one example of such solution, and is currently deployed at US CMS Tier1 facility at Fermilab and various Tier2 sites.

When the Lambda Station project started, the first challenge that we faced was how to decompose the complex, inter-related functions of the system into smaller, more distinct ones that end users and network administrators could clearly understand. Our task became to represent the network in abstract form, and be able to describe its elements in programming code. In other words, develop a reference model of the network.

In this paper, we will present a three level model of the network that evolved out of the Lambda Station project. This model is being used to describe network infrastructure of Fermilab and the local networks of collaborating sites. Based on our model, a site's Lambda Station server can reconfigure local network infrastructure to redirect selected traffic flows over alternate paths dynamically. An example XML description of Fermilab circuit service will be presented.

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