OptIPuter—A High Performance SOA LambdaGrid Enabling Scientific Applications

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Abstract

During the last few years, a radical restructuring of optical networks supporting e-Science projects is beginning to occur around the world. U.S. universities are beginning to acquire access to private, high bandwidth light pipes (termed "lambdas") through the National LambdaRail and the Global Lambda Integrated Facility, providing direct access to global data repositories, scientific instruments, and computational resources from Linux clusters in individual user laboratories. These dedicated connections have a number of significant advantages over shared internet connections, including high bandwidth (10Gbps+), controlled performance (no jitter), lower cost per unit bandwidth, and security. These lambdas enable the Grid program to be completed, in that they add the network elements to the compute and storage elements which can be discovered, reserved, and integrated by the Grid middleware to form global LambdaGrids.

I will describe how Service Oriented Architecture LambdaGrids enable new capabilities in medical imaging, earth sciences, interactive ocean observatories, and marine microbial metagenomics.

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