

ATLAS Canada Project

The Challenge

As part of an international project to search for the origin of mass in the universe, a group at the University of Toronto, led by physicist Prof. Robert S. Orr, the NSERC Principal Investigator for ATLAS Canada, is making use of interconnected high-performance computers and high-speed networking to collaborate with researchers across Canada as part of the world's largest scientific experiment --- the Large Hadron Collider facilities at CERN in Switzerland.

Background

The project involves global-scale research collaborations among researchers in the ATLAS Canada Group, linking computing facilities at several Canadian universities to a large system at TRIUMF, Canada's National Laboratory for Particle and Nuclear Physics in Vancouver

The volume of data generated for specific experiments reaches petabyte size, and need to be shared over advanced network links. CERN is coordinating an international network of high-performance computing centres to provide the resources necessary for the analysis of data from the four LHC experiments. This network uses Grid tools to manage the data and to make efficient use of the computing resources. Over 100 sites of varying sizes in 31 countries are participating in the experiment.



ORION Makes a Difference

ATLAS has 10 Tier-1 centres and up to 50 Tier-2 centres around the world, Canada is providing one Tier-1 and the equivalent of two Tier-2 centres, including a site at the University of Toronto, which utilizes ORION to ensure its advanced global connectivity to research collaboration sites across Canada and around the world.

Results

High-speed networking enabled by ORION plays a crucial role by linking the Toronto site to the rest of Canada and to international collaborators throughout the world. The project represents a critical contribution from Ontario and Canada to this historic international scientific research collaboration, involving 1,800 scientists, engineers and technicians in several countries.

The Impact

"High speed networking is a crucial element, and in Ontario, ORION will play a central role in the future, as it has done in our early work."

- Prof. Robert S. Orr , Department of Physics, University of Toronto, Toronto lead on ATLAS Canada