

Analyzing Health Data Securely

The amount of research and educational content being generated and shared by Ontario's research, innovation and education (RE&I) community is growing exponentially. Our private connection to data centres means our users can safely store, access and transport sensitive content, allowing them to contribute to international collaborative research projects. For example, we're enabling the Ontario Brain Institute's "Brain-CODE" (Centre for Ontario Data Exploration) project through an increased connection with the High Performance Computing Virtual Laboratory (HPCVL), the data centre at Queen's University.

During the 15 years Dr. Ken Evans worked for Big Pharma, he was frustrated by drug failure after drug failure and the limitations of defining disease through observations alone. Depression, Alzheimer's and addiction could be said to have similar observed symptoms, but they differ biologically and respond to different treatments. Now, working from his lab at Queen's University in Kingston, Dr. Evans is contributing to an initiative by the Ontario Brain Institute that's on the cutting edge of defining disease states.

This medically based initiative allows Ontario researchers to access clinical data—including detailed brain images, samples and assessments—to better understand conditions like cerebral palsy, epilepsy, traumatic brain injury and autism. This data is massive, with a single file reaching up to 1 terabyte, or about the same size as 250,000 MP3 files. To facilitate collaboration,



Ontario researchers like the Canadian Biomarker Integration Network in Depression group can now analyze clinical data from across studies through a single database located at HPCVL in Kingston.

researchers require the proper bandwidth and network capacity to upload, download, store and manipulate these enormous files from anywhere and on any device—a task commercial networks are not up for.

Queen's University has changed the game. Through the ORION network, the university is linked to HPCVL, one of Ontario's high-performance computing and data centres. Recently, the university and HPCVL approached ORION with a plan to upgrade their ORION connection from 1 gigabyte to 10 gigabytes, allowing them to serve as the databank host for the Brain-CODE project.

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“We pushed for this upgrade because we have seen the amount of content from researchers grow year after year,” explains Costa Dafnas, HPCVL Research Computing Security Officer. “It was a necessary move to future-proof our network as researchers conduct more data-heavy, collaborative projects.”

The project also deals with highly sensitive data, making it critical to secure patients’ clinical information. Security measures start with encrypting sensitive data upon entry, continue with de-identification algorithms and all but finish

with infrastructure that strictly regulates access to different types of data, winning the group a place as a Privacy by Design Ambassador. The ORION network was the icing on the cake: by virtue of being a private network, the consortium ensures even greater safety by using it to transport the data.

As Ontario’s backbone of innovation, we are committed to ensuring that our province’s researchers are prepared to face such data challenges. From large-scale, groundbreaking collaboration to individual, local patient support, we will be there to support life-changing innovation.



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