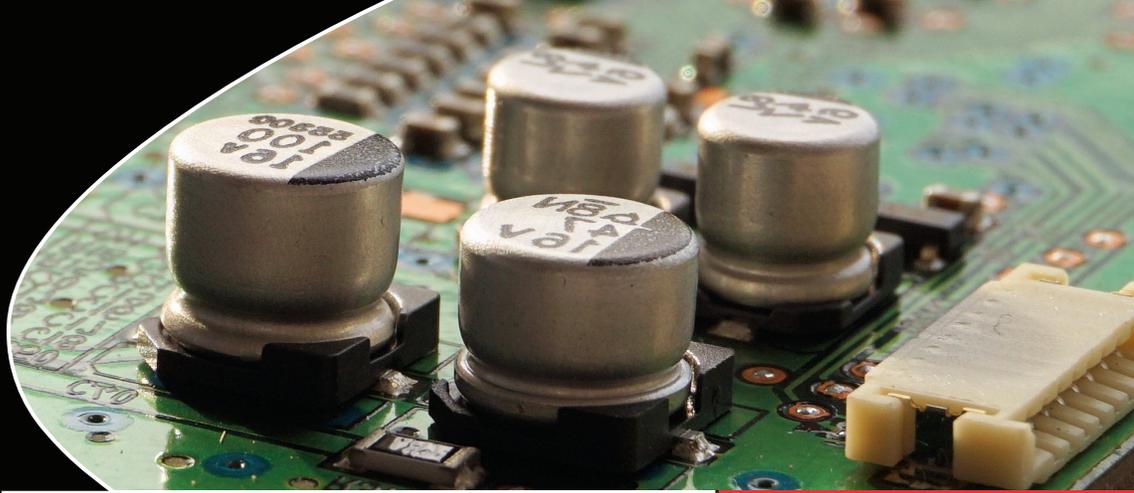


# CENGN

## ARCHES

### INNOVATION

### HIGHLIGHT



## ARCHES

COMPUTING SYSTEMS

### COMPANY OVERVIEW

ArchES Computing Systems is a Toronto-based company, specializing in developing customized computer chips for extremely high-performance applications. Since being incorporated in 2003, they've targeted the finance industry and consulted for Canadian and USA banks, broker-dealers, and stock exchanges. ArchES designs and builds computer systems for performance and latency-sensitive applications.

### LOCATION

Toronto, ON

### TECHNOLOGY



Network Application

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To keep up with ever-increasing demands, the finance industry has been an early adopter of technological innovation. One technology that is becoming mainstream in high-performance computing is Field-Programmable Gate Array (FPGA) computer chips allowing applications to be run up to 100x faster than traditional servers. FPGAs can be plugged directly into highspeed data networks, allowing them to communicate directly with external systems while also requiring less power and space than traditional servers, allowing racks of systems to be combined into a small number of chips. Despite their density and performance, FPGAs have often been overlooked due to their complicated programming model.

### FINOS - EMPOWERING BUSINESSES WITH HIGH PERFORMANCE APPLICATIONS

ArchES developed FinOS, a FPGA-based operating system that is used to facilitate the development and execution of extremely low-latency applications. FinOS allows developers to build hardware applications in high-level languages such as C/C++, and provides those application's resources such as highspeed networking, database access, and real-time monitoring. FinOS can be configured with hardware components for handling market data, generating and routing orders to stock exchanges, real-time risk evaluation, and customized trading algorithms ArchES has leveraged software development best-practices in FinOS, allowing the development of FPGA applications with software-development timelines.

### STRESS TESTING AND VALIDATING ON THE CENGN INFRASTRUCTURE

Preparing for market growth, ArchES came to CENGN to stress test their new network solution for lower latency and faster speeds on next-generation computer networks. While at CENGN, ArchES validated the core networking components that FinOS provides, a TCP/UDP core that operates at speeds up to 100Gb/s, and with nanosecond-level latency.

**“ The support provided by CENGN staff was outstanding. There were many aspects of this project that were new to both ArchES and CENGN, and the CENGN staff were extremely accommodating and adaptive. ”**

Chris Madill

Project Lead, ArchES

