

## **CCIX, Bump-in-the-Wire FPGAs, and HPC in the Cloud**

### **Abstract**

One of the most important recent datacenter innovations is the use of FPGAs as “bump-in-the-wire” accelerators for network functions. In this project, Red Hat and BU are exploring new forms of workload acceleration, including High Performance Computing applications. A topic of particular interest is leveraging emerging FPGA architectural enhancements to create development environments that make these embedded accelerators easily accessible to application programmers.

In this Micro-talk we will, very briefly, introduce FPGAs and their capabilities, describe the architecture of an FPGA-enhanced Cloud, and present the first results showing the possibility of strong scaling in such Clouds. The results show that FPGA-centric Clouds could fill important niches in the space of HPC computational resources. Using FPGA-enhanced nodes to achieve Universal HPC will require rethinking the entire system stack from applications through middle-ware down to hardware architecture.

### **Presenter**

Martin Herbordt is Professor of ECE at Boston University where he directs the Computer Architecture and Automated Design Lab. His research interests include computer architecture, high performance computing, and reconfigurable computing.