Intel System Fabrics Today and Tomorrow

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1. Introduction

Datacenter growth, mainly driven by HPC and Cloud, requires new innovation to meet the growing demand. In addition to the performance of the CPU, memory subsystem and thermal specification the interconnect technology is becoming a key pain element for IT.
Fabrics are becoming the next bottleneck to an unrelenting need for data in Cloud and HPC workloads. Fabric integration is required to address the growing need for bandwidth scalability, power, and system density. Intel is uniquely positioned through acquisitions of Cray, QLogic and Fulcrum assets to meet the need with fabric technology innovation and CPU platform integration in the future.

2. Description of a problem solution

One possible solution for the future may be integrating the fabric controller in the CPU and provide 100Gb+ bandwidth meeting high performance goals and at the same time highest possible energy efficiency. This type of implementation will address a lot of challenges at the system level, node level and fabrics level.

3. Results

From the system level perspective we need to find a solution that supports multiple topologies with sufficient fabric management instrumentation. This solution needs to be able to operate with next generation middleware, APIs, and application libraries. This new generation of fabrics will also needs to address the most sophisticated Data Center Security Solutions. If we look one level down at the node level requirement we are challenged with new mechanical and thermal boundaries plus necessary work around for high speed signaling and develop a complete new cabling and connector infrastructure. At the fabrics level, development of a new host adapter and switching mechanism will be required. For the next generation solution with integrated CPU and fabric we need to find an implementation able to meet bandwidth, latency, power, and density requirements.

During the talk we will present Intel's vision of the next generation fabric infrastructure and discuss the potential consequences and benefits of closer integration between the CPU and Fabric.