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Distinguished Speaker Series

Forest Godfrey

Cray, Inc.

The Cray Gemini Network: Architecture & Resiliency Analysis

Thursday, March 1, 2012

4 - 5 PM CST

3405 Siebel Center

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Abstract

In the early days of high performance computing, supercomputers were assembled from a small number of extremely fast and customized processors attached to a pool of memory. This has given way to highly scaled networks of commodity microprocessors. To achieve this scaling challenges in communication and reliability need to be overcome.

This talk will focus on two areas. The first part will provide an overview the Cray(R) Gemini network which is one such highly scaled computer architecture. It is used in the Cray XE and XK systems such as "Blue Waters" currently being installed at NCSA and "Titan" currently being installed at Oak Ridge National Labs.

The second part of the talk will focus on the resiliency analysis techniques used to analyze the expected hardware failure rates (as typically measured in units of failures per one billion hours, or Failures In Time). This analysis is intended to motivate further study into software techniques for mitigation of hardware failures.

Bio

Forest Godfrey is a principal engineer at Cray Inc., having been with the company for more than 10 years. He is currently serving as the lead software architect for GPUs at Cray as well as the lead architect for future system control environments.

Over his career, Mr. Godfrey has worked as a kernel and system controller programmer on the Cray(R) X1, X1E, X2, and XT series of supercomputers. He served on the system architecture teams for the X2, XE and XK series of supercomputers as well as several other as-yet-unshipped systems. In his system architecture role, Mr. Godfrey has focussed on the Reliability, Availability and Serviceability (RAS) of Cray systems.

Mr. Godfrey received his Bachelor's in Computer Science from Carnegie Mellon University in 1999. He holds two US patents for his work with Cray.



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