eResearch Australasia

Ian Atkinson: Sensor grids and ARCHER

Abstract

One of the core 'Grids' that is often referred to, is the Instrument or Sensor Grid. This is commonly interpreted to mean the interconnection of sensors or scientific instrumentation with grid storage and processing elements to facility facile data transfers and automatic data processing. While this often appears as 'slide-ware', the production implementation of Sensor Grids is not well known.

The term 'sensor network' refers to a widely distributed array of small, inexpensive, wirelessly interconnected sensors. The actual sensors come in many shapes and sizes and measure a wide range of parameters, for example temperature, humidity or %CO2. There is a rapid development in sensor and wireless networking technologies and the variety of commercial and research sensor networks is growing rapidly-driven by applications in industrial, environmental and domestic domains.

Typically, most industrial sensor networks are homogeneous, custom systems with a very limited capability to inter-link with other varieties of sensor networks. At present there are no standards regarding how sensors can be discovered, probed, queried and controlled. The disparities between sensor technologies make the process of accessing and collecting data from multiple heterogeneous sensors difficult.

Under the ARCHER project we are developing a Sensor Abstraction Layer (SAL) aiming at masking the peculiarities of the underlying sensing technologies and providing the rest of the ARCHER architecture with a consistent and seamless interface to sensors. SAL allows the organising of heterogeneous sensing devices for simple probing, piloting, access and reference. This is an essential development if the widespread, real-time monitoring of environments via sensor networks is to be rapidly adopted. We are working with several communities (for example the IMOS GBROOS barrier reef observation network) to deploy reliable and robust sensor networks using SAL and other data integration developed and within ARCHER.

About the speaker

Ian Atkinson has a background in computational chemistry that led him to the world of Supercomputing. More recently he has been engaged in the APAC Grid program providing portal and grid computing services to the national research community. He has a long-standing interest in eResearch methods and applications including shared visualisation via AccessGrid and in particular grid mediated access to data sources. He is a CI on the DEST DART eResearch project focussing on data collection from instruments and sensors.

He holds joint appointments as the Manager of High Performance Computing within Information Technology and Resources at JCU and also a facility member of the School of IT at JCU. He is also the Deputy-CEO of QPSF.

Last updated: 20 June 2007