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the technology commercialisation company of the University of Melbourne

ANEKA

- Next Generation Grid Computing Platform
- Allows the development of high performance grid applications
- Provisional Patent Protected

Key publications:

- Rajkumar Buyya (editor), High Performance Cluster Computing, Prentice Hall, New Jersey, USA, 1999.

- Rajkumar Buyya, David Abramson, and Srikumar Venugopal, The Grid Economy, Special Issue on Grid Computing, Proceedings of the IEEE, Manish Parashar and Craig Lee (editors), Volume 93, Issue 3, ISSN: 0018-9219, IEEE Press, New York, USA, March 2005.

- Krishna Nadiminti and Rajkumar Buyya, Enterprise Grid Computing: State-of-the-Art, Enterprise Open Source Journal, pages 19-22, Thomas Communications Inc, Dallas, Texas, USA, March/April 2006.

- Xingchen Chu, Krishna Nadiminti, Chao Jin, Srikumar Venugopal, and Rajkumar Buyya, Aneka: Next-Generation Enterprise Grid Platform for e-Science and e-Business Applications, Proceedings of the 3rd IEEE International Conference on e-Science and Grid Computing (e-Science 2007, IEEE CS Press, Los Alamitos, CA, USA), Dec. 10-13, 2007, Bangalore, India.

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Summary

Enterprise grid computing systems enable harnessing of resources and capabilities of computers including desktop PCs that are connected over either a corporate network or the internet. This type of grid computing is very useful and solves real end-user issues, but has been limited by the architectures used and the flexibility of key components.
ANEKA is a patented grid technology for building service-oriented enterprise grids and applications using various programming models. It is a '3rd generation' technology that overcomes many of the existing limitations of grid computing.

The opportunity exists to commercialise the ANEKA technology and have it 'integrated' into .NET based applications to provide high performance & high throughput computing solutions across industry verticals.

Background and Commercial Application

Aneka is a .NET desktop-based grid computing technology. .NET is widely accepted framework and has a very large community providing services at all points along the value and technology chain.

Key challenges with .NET based applications are performance and scalability. Desktop grid computing is a readily available solution to these issues of performance and scalability.

However, existing desktop grid computing platforms also face challenges. These include: flexibility, scalability, reliability and extensibility.

The current limitations of 2G platforms include
- A single programming model (most often master-slave)
- A rigid architecture, no QoS

The characteristics of 3G platforms include
- Service-oriented architecture
- Multiple models for programming parallel and distributed applications
- Flexible and extensible architecture
- Enterprise-class QoS

As a 3G platform, ANEKA addresses the issues and limitations of previous platforms, and allows grid construction and application development to be as easy as possible.

Application areas that will benefit from ANEKA are investment risk analysis, oil & mineral exploration, and enterprise applications.

The Technology

Aneka is a .NET based service-oriented platform for enterprise grid computing that provides:
- (i) a configurable service container hosting pluggable services for discovering, scheduling and balancing various types of workloads and
- (ii) a flexible and extensible framework/API supporting various programming models including threading, batch processing, MPI and dataflow. Users and developers can easily utilise different programming models and the services provided by the container to run their applications over desktop Grids managed by Aneka.

Key features of Aneka are:

- A configurable container enabling pluggable services, persistence solutions, security implementations, and communication protocols;
- decentralized architecture peering individual nodes;

- multiple programming models including object-oriented grid threading programming model (fine-grained abstraction), file-based grid task model (coarse-grained abstraction) for grid-enabling legacy applications, and dataflow model for coarse-grained data intensive applications;
- multiple authentication and authorisation mechanisms such as role-based security, X.509 certificates proxy and Windows domain-based authentication;
- multiple persistence options including RDBMS, ODBMS and XML or flat files;

- Web services interface supporting the task model for interoperability with custom grid middleware (e.g. for creating a global, cross-platform grid environment via a resource broker) and non-.NET programming languages.
- Service Level Agreement (SLA) and advanced resource reservation and negotiation support has been provided where user can reserve resources with guaranteed services

Patent Position

The technology is protected by a provisional Australian patent application. The detailed specification is available for review under a Confidential Disclosure Agreement.

Inventors

ANEKA was developed by Associate Professor Rajkumar Buyya, Xingchen Chu, Krishna Nadiminti and Dr Srikumar Venugopal, all from the Department of Computer Science and Software Engineering at the University of Melbourne. Dr Buyya has extensive experience in the field and has published widely. A previous technology invented by Dr Buyya and his team is Gridbus - a leading open source grid computing platform.

The University of Melbourne

The University of Melbourne is one of Australia's foremost research and teaching institutions, with strengths in engineering, information and communications sciences, animal and plant biotechnology, human and veterinary medicines, fundamental sciences and advanced materials science.

The University has an extensive record of technology commercialisation and transfer through wide research linkages, licensing and start-up companies.

Nature of the Opportunity

Melbourne Ventures, the technology commercialisation company of the University of Melbourne, is working with the inventors to identify and secure commercial partners with the requisite experience and market exposure necessary to advance this technology and drive its commercial exploitation.

Expressions of interest are sought from parties interested in the commercialisation or commercial application of ANEKA.

To explore this partnering opportunity, please contact:

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