Innovative Solutions for Solving Big Data Problems Faster on Clouds : Manjrasoft Pty Ltd

An exciting start-up company commercialising novel software technologies developed in the Cloud Computing and Distributed Systems (CLOUDS) Laboratory at the University of Melbourne, Manjrasoft's core technology enables enterprises to improve performance and scalability by \distributing compute and data-intensive applications within .NET Cloud computing environments. Manjrasoft's Aneka, a "world-first" Cloud Application Platform, supports (1) multiple programming models such as Task, Thread, and MapReduce and tools for rapid development of applications, (2) seamless integration of multiple distributed computing resources including private and public Clouds, and (3) elastic scaling of applications on multiple Clouds depending on customers' Quality of Service (QoS) requirements, which are part of SLA (Service Level Agreement) in market-based Cloud computing environments.

Founded in 2008, Manjrasoft Pty Ltd is a Melbourne, Australia based company focused on the creation of innovative software technologies for simplifying the development and deployment of applications on enterprise or public Clouds. Uniquely positioned in the cloud computing market, it is the only vendor offering a platform for building and managing applications and accelerating computer speeds on private, public and hybrid clouds using single or multiple programming models. Led by Professor Buyya, a recognised visionary in advanced distributed computing, the company has teamed up with various technology leaders such as Amazon AWS, GoGrid, IBM, Microsoft, VMWare, Citrix, Redhat, Autodesk and Intel to develop commercial products and has earned appreciation from clients such as Department of Space of India and Go Front, a subsidiary of China Southern Railways, to name a few.

Build-Accelerate-Manage

Since its launch, Manjrasoft has focused on the creation of innovative software technologies for simplifying the development and deployment of compute and data-intensive applications on Clouds. The company's core product is Aneka which plays the role of Application Platform as a Service (aPaaS) for Cloud computing. It supports various programming models and tools for development and execution of Cloud applications in scalable and reliable manner. Originally created with research and innovation grants from the Australian Research Council (ARC) and Australian Government Department of Innovation, Industry, Science and Research (DIISR), Aneka has evolved into a solid commercial product during the last 5 years. It has been successfully utilized in the creation of several applications in industrial sectors such as entertainment and media; Geographic Information Systems; engineering design; academic research; business intelligence (data mining); life sciences and health care.
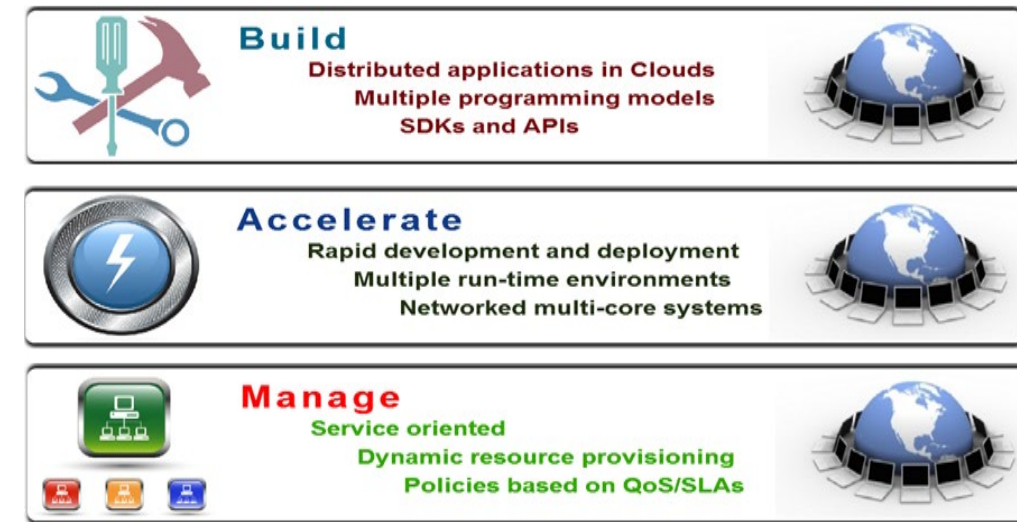
Aneka allows developers and software engineers to shift to Cloud-based environments easily. It reduces the time and cost involved in Cloud-enablement of existing applications or creation of new applications while allowing the seamless provisioning of distributed Cloud resources to accelerate their execution.

Aneka's SDK (Software Development Kit) supports familiar and easy-to-use programming models and APIs (application programming interfaces) such as

Task, Thread and MapReduce for creating new applications; and tools such as Design Explorer for organizing deployment of existing applications on Clouds using SPMD (Single Program, Multiple Data) execution model. Thus allowing businesses to benefit from utilizing cloud environments in a short time frame as re-designing or amending applications for cloud environments is not required.

Aneka has been developed using Microsoft.NET framework, which means that developers can access Aneka's APIs and capabilities via over 20+ programming languages such as C++, C#, scripting languages such as F#, and development tools like Visual Studio.

Knowing the Persons
Rajkumar Buyya, Founder & CEO
Dr. Rajkumar Buyya, a Fellow of the IEEE, has over two decades of experience in the design and development of internet-based distributed computing systems and their applications. The Software technologies for Grid and Cloud computing developed under his leadership are used at several academic institutions and commercial enterprises in 40 countries around the world. With over 450 co-authored publications and four "Best Paper Awards" from international conferences and a "2009 Outstanding Journal Paper Award" from the IEEE Communications Society, USA, his international R&D leadership has also been recognized through the award of "2009 IEEE Medal for Excellence in Scalable Computing" from the IEEE Computer Society, USA. He edited a book "Cloud Computing: Principles and Paradigms" published by Wiley Press, USA in 2011 and authored the book "Mastering Cloud Computing" book in 2013, published by McGraw Hill and Elsevier/Morgan Kaufmann, 2013 for Indian and international markets respectively. He is currently serving as the foundation Editor-in-Chief (EiC) of IEEE Transactions on Cloud Computing, also.

Ravikumar Challa– Business Development Manager (India)
Mr Ravi holds over 22 years of experience in the IT industry and has worked for various companies like HCL, HP, Accel Frontline and extended consultancy services to SSP 2000 Inc, BT Convergence Technologies, Pyramid Solutions, Nipun Networks, Varma Industries and Vizexperts.

Rajkumar Buyya, Founder & CEO

Applications built using Aneka can run on both Windows and Unix/Linux operating environments using Microsoft.NET and Mono frameworks respectively.

Aneka as a Cloud Application Platform can be deployed on public Clouds such as Microsoft Azure and Amazon EC2 for accelerating the execution of applications for solving problems faster at the same time minimising the cost of renting Cloud resources. In addition, Aneka can also be used for building Cloud computing infrastructure by harnessing the computing power of existing LAN-connected PCs (personal computers) running Windows without any extra investment in hardware; and solve problems faster by executing application tasks on them in parallel and distributed manner.

Future Plans

In spite of facing severe competition from companies/solutions like VMWare, Hadoop, IBM which offer product targeted at different niches within the Cloud and Big Data stack to address specific requirements, Aneka has a number of advantages over its competitors including Multiple programming models such as Thread, Task and MapReduce; RAD environment for parameter studies using legacy applications; Lightweight & service-orientated system; Best-in-class accounting & cost management capabilities; SLA-based resource allocation to meet quality of service requirements of users established through dynamic provisioning and negotiation and seamless interaction between private and public clouds.

The company is currently working on an Intercloud/Cloud Exchange and a Cloud Resource Broker for facilitating creation of a market-place for Cloud computing and solving conflicts between users and the Cloud marketplace through the Mediator (Broker). "Manjrasoft's immediate goals are to enhance Aneka to dramatically speed up Big Data processing tasks within private Clouds; and innovate a platform for the rapid creation and deployment of Internet of Things (IoT) applications in public Cloud environments", adds the Founder Dr Buyya.

Timeline

Time period	Significant events
Second half (H2) 2007	• Australian patent application on basis of Aneka is filed
First half (H1) 2008	• Manjrasoft established to commercialise Aneka IP
H2 2008	• AUS industry grant awarded to commercialise Aneka • University of Melbourne transfers Aneka IP to Manjrasoft
H1 2009	• Aneka beta version software released to the public • Go Front, a subsidiary of China Southern Railways, becomes the first major customer • Aneka 1.0 released
H2 2009	• MSR Institute of Technology, India becomes the second major customer • MAM College of Engineering, Tirchi, India becomes a client • Manjrasoft successfully conducts case study with Titan Gaming to test Aneka for distributed gaming platform
H1 2010	• Awarded funding under COMET 2 from the Department of Innovation, Industry, Science and Research • VelTech University, India becomes a client • C-DAC (Center for Development of Advanced Computing), India becomes a client • Manjrasoft wins the Frost and Sullivan 2010 "New Product Innovation Award"
H2 2010	• Department of Space, Government of India becomes a client • Aneka 2.0 launched • US and Indian patents filed
H1 2011	• Manjrasoft wins Microsoft "Start Up of the Day" • Manjrasoft finalist for Australian Museum Eureka prize – Google Australia Eureka Prize for innovation in computer science
H2 2011	• Trade Department of Inner Mongolia, China procures Aneka • Manjrasoft wins 2011 Telstra Innovation Challenge, People's Choice Award
H1 2012	• The University of Malaya, Kuala Lumpur, Malaysia procures Aneka • Thapar University, India, places order for Aneka • Jawaharlal Nehru Technological University (JNTU), Anantapur, India issues tender call for procuring Aneka
H2 2012	• Aneka 3.0 being launched • US PTO granted a patent to Manjrasoft for IP: "System and Method for Grid and Cloud Computing", Patent No: US 8,230,070 B2, Patent Office of the United States of America (USA), July 2012.
H1 2013	• A text book on "Mastering Cloud Computing" featuring Aneka in 4 chapters has been published in USA and India. • G Pulla Reddy Engineering College (Autonomous), Kurnool, India procures Aneka
H2 2013	• Manjrasoft CEO named as Editor-in-Chief of the IEEE Transactions on Cloud Computing, IEEE Computer Society, USA. • GMR Institute of Technology (GMRIT), Rajam, India procures Aneka 3.0 • Vasavi College of Engineering, Hyderabad, India produces Aneka 3.0 • A new patent in USA is filed: "System, Method and Computer Program Product for Energy-Efficient and Service Level Agreement (SLA)-Based Management of Data Centers for Cloud Computing, Application No. 13955956, Patent Office of the United States of America (USA), July 31, 2013." • Over 10,000 copies of "Mastering Cloud Computing" book featuring Aneka are solid in 2013. It serves a textbook for several universities in India, North America, Europe and South America creating excellent opportunity for promotion Aneka platform for Labs.
H2 2014	• National Institute of Technology Karnataka (NITK), India procures Aneka 3.0 • Anna University, Chennai, India procures Aneka 3.0 • Tribhuvan University, Nepal procures Aneka 3.0 • Manipal University, India procures Aneka 3.0 • JNTUA College of Engineering, Pulivendula, India procures Aneka
H1 2015	• Aneka 4.0 slated for release in early 2015 containing InterCloud capabilities and features supporting (1) APIs for rapid creation of Mobile and IoT (Internet of Things) applications and (2) tools for deployment of application tasks across multiple Clouds including private and public Clouds such as Microsoft Azure and Amazon EC2