



NEXT
GENERATION
.NET CLOUD
COMPUTING
COMPANY

Manjrascript

Innovative Solutions for
Cloud Computing

ANEKA

Next Generation
Enterprise **.NET**
Cloud Computing
Platform

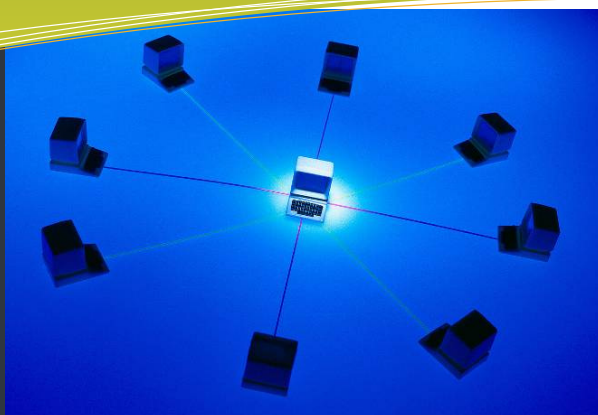
Multiple
programming
models available
on one platform,
including

- Thread
- Task &
- Map Reduce

Solution
Is
ANEKA

Solutions for:

- Life Sciences
- Finance
- Entertainment
- Energy
- Engineering
- Research
- More



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Introducing Manjrascript Pty Ltd

Manjrascript is a start-up business focused on developing Next Generation .NET-based Cloud Computing technologies that ultimately save you time and money.

What does Manjrascript do?

- Develop flexible and scalable Building Blocks that are central to Cloud Computing platforms.
- Develop software optimised for networked Multi-core computers to accelerate applications.
- Provide Quality of Service (QoS) and Service Level Agreement (SLA)-based management solutions enabling application scheduling, dispatching, pricing, accounting for enterprise and/or public network computing environments.

Our First Product

The first of Cloud Computing technologies being commercialised is “**ANEKA**”, which is a proven platform for .NET-based enterprise Cloud Computing.

ANEKA is a patented (PCT pending) Cloud computing technology building block that enhances:

- **Applications development** through a support for **rapid creation** of legacy and new applications using innovative parallel and distributed programming models.
- Ability of organisations to **harness** computing resources within an enterprise for **accelerating** execution of “compute” or “data” - intensive applications

Meet the CEO



Dr. Rajkumar Buyya

CEO – Manjrasoft Pty Ltd
Director, GRIDS
Laboratory, University of
Melbourne, Australia

Dr Buyya is:

- **Globally recognised** as a thought leader in Utility and Distributed Computing.
- **Over 15 years experience** in research, design and development of high-performance distributed computing systems.
- **Received the 2009 IEEE Medal for Excellence in Scalable Computing, IEEE Computer Society TCSC, USA.**
- **For Opportunities contact Raj at:** raj@manjrasoft.com

ANEKA

Your choice
for Enterprise
.NET
Cloud Solutions



ANEKA provides a set of services that make enterprise cloud construction and development of applications as easy as possible without sacrificing flexibility, scalability, reliability and extensibility.

The key features supported by **ANEKA** are:

- A configurable and flexible execution platform (container) enabling -
 - pluggable services;
 - security implementations - multiple authentication / authorisation mechanisms such as role-based security and Windows domain-based authentication;
 - multiple persistence options including RDBMS, SQL Express, MySQL and flat files;
- SDK (Software Development Kit) supporting multiple programming models including –
 - Object oriented thread model,
 - Task model for legacy applications
 - Map Reduce model for data-intensive applications
 - Custom tools such as Design Explorer for parameter sweep studies
- Easy to use management tool for SLA and QoS negotiation and resource allocation.

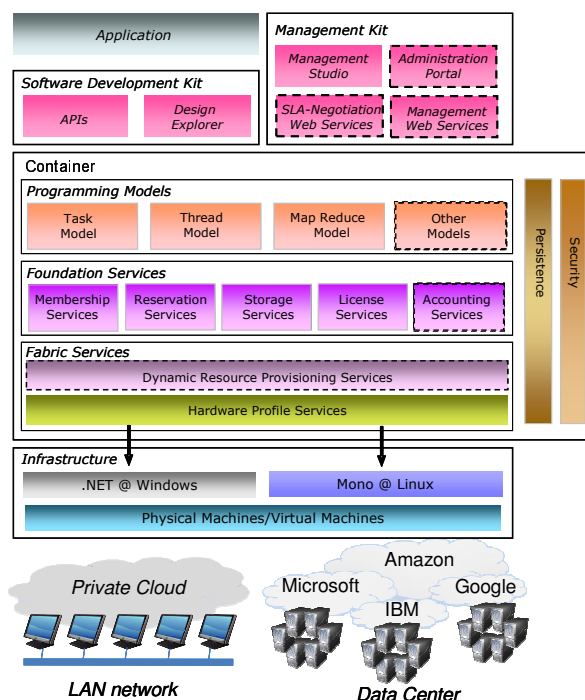
Introducing the **ANEKA** PLATFORM

ANEKA – the first choice for flexible, extensible .NET enterprise Cloud application development and deployment.

ANEKA allows servers and desktop PCs to be linked together to form a very powerful computing infrastructure.

This allows companies to become energy efficient and save money without investing in greater numbers of computers to run their complex applications.

Typical customer environments include: **CAD, 3D Rendering, Drug Discovery, Life Sciences, Data Mining & Investment Risk Analysis.**



ANEKA TECHNICAL OVERVIEW

Model choice

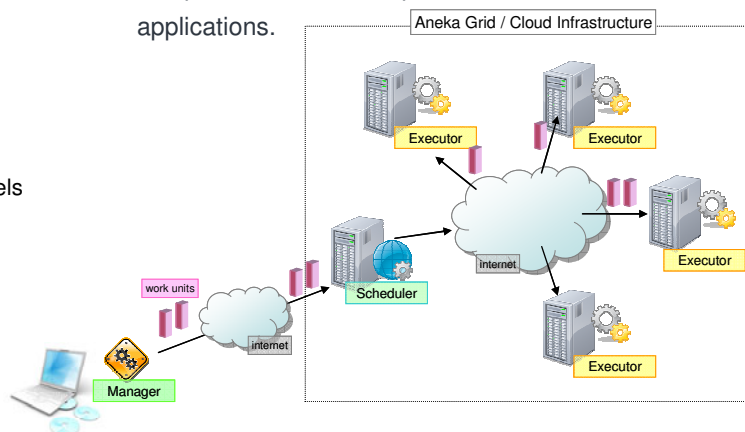
ANEKA offers four programming models which are closely aligned to many business and scientific applications, and also offers the unique ability to add more models as required.

Chose from:

- Aneka task
- Aneka thread
- Map Reduce
- Custom Models

ANEKA is built on a decentralised architecture. Each **ANEKA** node consists of a configurable container which includes information & indexing, scheduling, execution and storage services. **ANEKA** supports multiple programming models, security, persistence and communications protocols.

ANEKA provides a flexible and extensible environment which runs multiple applications simultaneously and supports complex models and dependencies within those applications.



EYE ON IT

Current Industry Trends

“The clouds are gathering”

Nearly every major technology vendor, industry player and academic institutions have signalled or released a cloud computing offering . At Manjrasoft we believe that most large corporate, ISVs and Services providers require both reliable and scalable technologies in a cloud environment.

ANEKA is a product that meets this need – Try it and See!

“Everyone is talking Clouds”

Who isn't talking clouds? The hype around cloud computing is growing. At Manjrasoft, we believe that cloud computing is here to stay. Many are building enterprise clouds.

Enterprise Cloud Technology Tips

Q: Many of the grid & cloud products only support Linux – what can I use on my Microsoft based systems ?

A: ANEKA is the first .NET-based enterprise cloud computing platform that supports multiple programming models. With most corporates using Windows-based PCs as desktops, a .NET-based solution enables you to seamlessly integrate your desktops with enterprise grid/cloud systems.

If you are looking to develop new .NET distributed computing applications or cloud/grid enable your legacy .NET applications, ANEKA is the product for you. Using ANEKA's DesignExplorer, a corporate developer, a software vendor or a services provider can quickly turn legacy applications into cloud/grid applications. This build and deploy model allows the user to take advantage of the scalable and reliable grid / cloud computing environment provided by ANEKA.



ANEKA in Life Sciences:

Drug Design, Medical Imaging, Modular & Quantum Mechanics, Genomic Search, etc.

Maximise ROI on underused assets

- Leverage idle hardware you already own

Higher Productivity

- Simulations take hours instead of days to complete
- Speed time to market by doing parallel and multiple simulations

Improve Quality and Precision

- Analysis expansion for clinical and protein data

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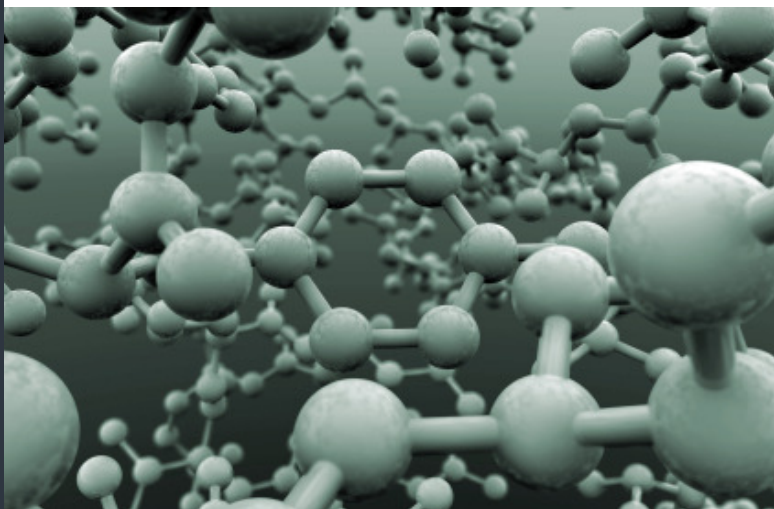
Life Science Areas to use ANEKA include:

Drug Design, Medical Imaging, Modular & Quantum Mechanics, Genomic Search, etc.

Sample Scenario: Drug Design

Determine Protein Structures for design of drugs and treatment of disease

The structure of protein plays a key role in the design of drugs for the treatment of various diseases. It is a huge challenge to identify the protein structure based on its sequence. The complex task of predicting a protein structure is usually broken into two phases with an accurate secondary structure prediction a key element in correctly acquiring a tertiary structure (i.e. the specific atomic positions in three dimensional space).



ANEKA Solution: A Grid/Cloud portal for protein secondary structure prediction is developed based on ANEKA, with an AJAX based web console to monitor the status and performance statistics. Research scientists use the portal to discover new prediction structures in a parallel manner.

A Support Vector Machine (SVM) based prediction algorithm is used with 64 sample protein sequences with the prediction complete in 20 minutes (compared to more than eight hours). This demonstrates the power of using ANEKA Enterprise Cloud software when integrated into Life Science scenarios.

ANEKA – GET IT

Recommended Uses



Aneka Thread

An application as a collection of one or more independent threads. A thread model fits better for architecting and implementing new applications, algorithms on clouds as this models gives finer degree of control and flexibility.

Aneka Task

An application as a collection of one or more tasks, where each task represents an independent unit of execution. This model is more suitable for grid/cloud enabling of legacy applications.

Map Reduce

This model is designed to model the MapReduce concept and applicable to processing of large data intensive applications. A MapReduce application is executed in a parallel manner through two phases.

Custom

Develop an application which uses one or all of these models or create a new model with ANEKA.





ANEKA in Entertainment:

Film Rendering, Special Effects, 3D Gaming, etc.

Maximise ROI

- Leverage idle hardware you already own
- Use Public Cloud resources only when needed

Scalability and Quality

- Ability to scale to hundreds of servers
- Improve images with multiple simulations

Speed time to market

- Shorten editing process

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Entertainment areas to use ANEKA include:

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Sample Scenario: Gaming

Large online games use game portals to provide tournaments and private matches for various computer games. Players choose their favorite game and play with others online. A game controller is responsible for scheduling matches to different game servers, initializing a particular game plugin according to the type of game. A single game controller works well for a small number of simultaneous matches, however, does not scale to large number of matches. So the game controller needs to scale for large numbers.

Solution: ANEKA

By making the game controller and plug-ing “ANEKA-aware” the game controller is able to scale to hundreds or thousands of users.

The ANEKA-enabled game controller works with ANEKA enterprise Cloud infrastructure to achieve higher scalability of the game engine.



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ANEKA in Engineering:

Electronics Design,
Automotive/
Aerospace Design,
CAD & 3D Rendering.

Maximise ROI on underused assets

- Leverage idle hardware you already own

Higher Productivity

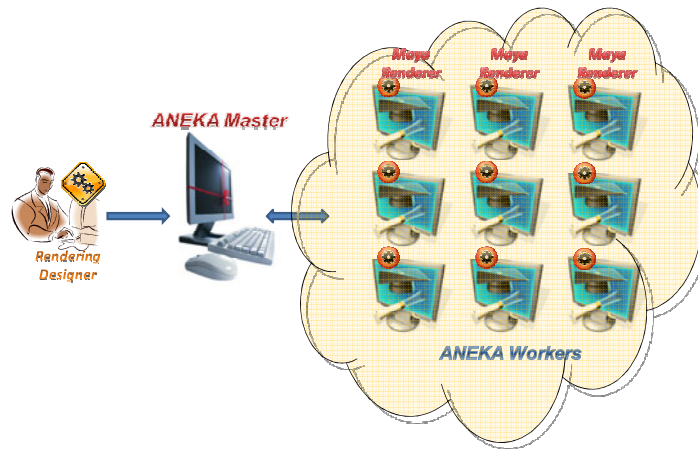
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Improve Quality and Precision

- Extra time to repeat simulations with different data points

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Engineering Applications for ANEKA include:

Electronics Design, Automotive/ Aerospace Design, CAD & 3D Rendering.

Customer example: Maya Rendering

GoFront Group is China's premier and largest nationwide research and manufacturer of rail electric traction equipment. The GoFront group is responsible for designing the high speed electric locomotive, metro car, urban transportation vehicle and the motor train. The raw design of the prototypes require high quality 3D images using Autodesk's rendering software called Maya. By examining the 3D images, engineers identify problems in the original design and make the appropriate design improvements.

The Maya GUI is used to implement Maya rendering (batch mode parameters, generate ANEKA tasks, monitor submitted ANEKA tasks and collect completed rendered images). The design image used to take three days to render (2000+ frames, each frame with more than five different camera angles). Using only 20, mostly idle legacy PCs, ANEKA software reduces the above Rendering scenario **from 3 days to 3 hours!**

Jixiong Sun, Vice Director of IT, GoFront Group said
"ANEKA technology not only improves the overall productivity of our product design, but also it gives us a fantastic opportunity to utilise our existing desktop resources which achieves the maximum utilisation of our existing investment."

ANEKA – GET IT

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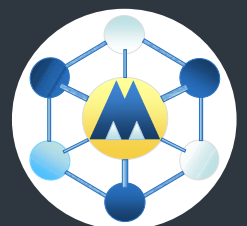
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ANEKA in Finance Applications:

Portfolio and risk analysis, credit fraud detection, portfolio optimization, and hedge simulations

Maximise ROI

- Leverage idle hardware you already own
- Beat the competition in estimating scenarios

Scalability

- Ability to scale to hundreds of servers
- Speed time to market by doing parallel and multiple simulations

Improve Quality & Precision

- Run more simulations with more data in shorter timeframe
- Reduce risk with greater confidence

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Finance applications for ANEKA include:

Portfolio and risk analysis, credit fraud detection, portfolio optimization, and hedge simulations.

Sample Scenario: Portfolio and Risk Analysis

The computational issues of common finance industry problems, such as option pricing, portfolio optimization, risk analysis, etc. requires the use of high-performance computing systems and algorithms.

For example, we did a complex portfolio optimization application that estimates the Value-at-Risk (VaR) for a given asset portfolio through Monte Carlo simulation.

Parameters Used:

100 different scenarios; over a holding period of 1 day; basic time step of 1 day; 500,000 price paths per scenario.



Solution: ANEKA

The above was performed over a **nationwide network** of four computers without rewriting the single machine application. From the results of our execution, it is evident that running on ANEKA reduces the time of execution significantly. Also, a user is able to run the application for more scenarios and receive a better estimation of Value-at-Risk (VaR) in a shorter period. **The time taken for ANEKA cloud computer network of four computers was half the time of single computer (e.g. 33 minutes vs. 67 minutes).**

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Aneka in Research and Education - The Changing of ICT

The demand for skills in advanced parallel & distributed computing is rapidly expanding as business and society are transformed by the Web and we search for new solutions that change the way we conduct science, operate business, and tackle challenging problems such as epidemic diseases and climate change.

The traditional method of enhancing the speed of computers has reached its limit. Instead of developing faster processors operating at higher clock rates, new technologies are taking shape:

- Multi-core CPUs,
- Grid, and
- Cloud Computing

The above are developed based on principles of parallel and distributed computing and are driving a huge demand for new manpower and skills.

ANEKA 1.0 – Get a Free 90 Day Evaluation Version Now

- **Go to [http:// www.manjrasoft.com](http://www.manjrasoft.com)**

Visit our site and read about Manjrasoft. You can download a range of information including Academic Whitepapers and Case Studies. Contact us for more information.

- **Register as a foundation ANEKA Developer**

To get access to a free evaluation version of ANEKA 1.0, you need to first register as an ANEKA developer. This is a free service allows you to communicate with our development team regarding how you are using ANEKA and share your experiences with a broader developer community.

- **Download ANEKA**

Once you have registered as an ANEKA developer, then download ANEKA to your desktop. Follow the instructions and start developing.

- **Start Developing**

When you download ANEKA we provide user documentation and sample code to help you begin your development. Use our technical support forum to ask for assistance or hints with your development.

Manjrasoft grid / cloud experts can assist with your application development. Contact Manjrasoft to discuss your requirements.

Manjrasoft is seeking interested parties to:

1. Build applications using Aneka (ISVs)
2. Make use of Aneka for speeding up execution of applications (end users).
3. Build Commercial relationships and joint Go-To-Markets.
4. Discuss investment and business opportunities.

Please contact Dr. Raj Buyya – CEO Manjrasoft at raj@manjrasoft.com to begin working with a market leader.

Academic Licenses Available

Manjrasoft provides “special” pricing for Research and Educational Sector. Contact us for more information.

GET ANEKA SOFTWARE

Use ANEKA to Master New Skills

- **Setup an enterprise Cloud:** Use ANEKA to create a virtual supercomputer by harnessing existing LAN-connected PCs
- **Use ANEKA SDK to learn application development skills**

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