Rajkumar Buyya,

I'd like to write a story for Technology Research News (TRNmag.com) about your Grid management interface. My questions follow. I was hoping you could answer them by Tuesday. Please let me know.

Here are my questions:

What gave you the idea for Gridscape?

How exactly does the tool work? Can you describe it so I can picture it? How does it enable the creation of interactive, dynamic testbed portals without a programming effort?

What was the technical and/or conceptual breakthrough that allowed this to work?

What were the technical challenges you had to address in order to make this work?

Was there anything surprising about the results? Why?

What are the pluses and minuses of using Gridscape?

How does your work fit into the body of work on the Internet and on Grid computing, and what is different about it?

How could Gridscape be applied practically? Even further down the road, what types of uses might it have or eventually lead to?

What are the next steps in the Gridscape effort? What are you ultimately aiming for?

I was hoping you could tell me a little bit about the possible future of Grid computing -- what is its potential?

Can you give me a ballpark estimate of when Gridscape could be technically ready to be applied practically? I'm looking for a rough estimate on the order of less than two years, 3-6 years, five years, more than 10 years, etc.

Who funded the research?

What is your job title?

Is there anything else you'd like to say?

Thanks.

Best regards,
Kim Patch
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Answers to the Technology Research News Magazine Questions

1. What gave you the idea for Gridscape?

The idea for Gridscape originated from the fact that an increasing number of people were getting involved in Grid computing and setting up Grid testbeds, however creating software to monitor Grid nodes required a significant investment of time and effort. We ourselves felt this requirement due to our involvement in various Grid activities and demonstrations such as the World Wide Grid (WWG), Global Grid Testbed Collaboration, and Belle Data Analysis Grid (BADG). Gridscape, as a Toolkit, aims to meet the needs of people who wish to create a portal specific to their testbed without having to build their own from scratch.

2. How exactly does the tool work? Can you describe it so I can picture it? How does it enable the creation of interactive, dynamic testbed portals without a programming effort?

There are basically 2 parts to the Gridscape Toolkit. Firstly, Gridscape provides a generic template/presentation layer (Web portal) for displaying Grid testbed information. This is achieved by using dynamically created web content (Java JSP and Servlets) as well as using dynamic and interactive client side Javascript. However, for the dynamic content to be created, Gridscape must be told the specific details of your testbed. This includes information such as testbed name, logo, a geographical map to use for displaying your testbed, and also details about the Grid nodes in your testbed. To make the gathering of this information easier, Gridscape provides a testbed administration tool which presents the user with a user-friendly graphical interface. Once the user has finished customising their portal the changes may be viewed online immediately.

2. What was the technical and/or conceptual breakthrough that allowed this to work? What were the technical challenges you had to address in order to make this work?

The information services component of the Globus toolkit really provided a good starting point from which to build on. It provides us with a standard interface for gathering Grid resource information, and without these protocols a generalised tool like this really would be difficult to produce. With this project, the main breakthrough was identifying the need for a tool which would enable the rapid development of Grid testbed portals and then being able to actually create that. We also wanted the portal to be simple, light-weight and widely accessible.

3. Was there anything surprising about the results? Why?

One pleasing aspect is the interest which seems to exist around this project. Initially this began as a Grid computing class project and its future really seems brighter as we see its increased usage day-by-day.

4. What are the pluses and minuses of using Gridscape?

The major advantages of a tool such as Gridscape are:

  + it enables the rapid development of testbed portals with no programming effort.

  + portals are web based, are interactive and dynamic, and are widely accessible.

  + the client side application is light-weight (compared to a Java applet).

The only real disadvantage of this type of tool is that it may not be as specific to the needs of some testbed requirements. In which case Gridscape may be extended, or developers may decide they are willing to invest the considerable time required to develop a highly specific piece of software for their needs.

5. How does your work fit into the body of work on the Internet and on Grid computing, and what is different about it?

There are a number of examples of Grid testbed monitoring software which already exist. However, a lot of these

are application specific portals which relate only to a certain testbed and which cannot be used with other testbeds. Other work includes low-level portal development kits which provide a programming interface to the lower level Grid framework. While the latter works do assist in the creation of these portals, they still require a large amount of programming effort. Gridscape offers a more generic solution - one which requires no programming effort and is easy to modify.

6. How could Gridscape be applied practically? Even further down the road, what types of uses might it have or eventually lead to? What are the next steps in the Gridscape effort? What are you ultimately aiming for?

Gridscape essentially is designed as a means of presenting Grid testbed information. It can most simply be used for the purposes of providing users with a holistic view of their testbed. This can be useful for being able to quickly check the attributes of certain Grid nodes, searching for Grid nodes with certain attributes, or just to check which resources are currently online. Gridscape can also be useful during presentations and is appreciated by both technical and non-technical audiences. Ultimately we have plans of integrating Gridscape with another of our tools, G-monitor. G-monitor is a web portal which allows users to monitor, control and steer the execution of application jobs on Global Grids. We are also planning to extend Gridscape to support handheld and mobile devices such as Palm PC and mobile phones.

7. I was hoping you could tell me a little bit about the possible future of Grid computing and what is its potential?

Grid computing has already been identified as an exciting new area in computing and one which is likely to dominate the IT (Information Technology) field in the future. Currently the potential applications for Grid computing seem infinite. Distributed computing is opening new doors and allowing us to deal with data and compute intensive problems which we previously thought were unfeasible. As current research into specific applications is ongoing, new and innovative applications in both research and commercial fields continue to surface. Ultimately, we are destined to see Grid computing power become analogous to our current electrical power grids, where consumers can elect to consume computing power as a utility, as they do with their electricity, gas and water.

8. Can you give me a ballpark estimate of when Gridscape could be technically ready to be applied practically? I'm looking for a rough estimate on the order of less than two years, 3-6 years, five years, more than 10 years, etc.

The first complete version of Gridscape is now ready and in regular use. We are currently beautifying the code and preparing for its release as "open source" software very soon. This version will allow you to create a dynamic and interactive web portal which will present MDS based information.

9. Who funded the research?

Gridscape has been developed as part of the Gridbus Project (http://www.gridbus.org) at the GRIDS Lab. The Gridbus Project R&D activities are funded by: University of Melbourne, VPAC (Victorian Partnership for Advanced Computing), and Sun Microsystems, USA.

10. What is your job title?

The co-authors of Gridscape are Dr. Rajkumar Buyya, Director, GRIDS (Grid Computing and Distributed Systems) Lab and Hussein Gibbins, Research Assistant, GRIDS Lab, The University of Melbourne, Australia.