



Preface

Special Issue on Grid Computing

A handwritten signature in black ink, reading "Kimio Miyazawa". The signature is fluid and cursive, with the first name "Kimio" and last name "Miyazawa" clearly distinguishable.

Kimio Miyazawa
Senior Vice President
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In 1965, Gordon Moore, one of the founders of Intel, predicted that transistor counts in chips would double every 18 months to 2 years; this is known as Moore's Law. Later, in 1998, George Gilder, the visionary author of "Telecom," stated that bandwidth grows at least three times faster than computer power. Therefore, according to Gilder, if computer power doubles every 18 months (as per Moore's Law), then communications power doubles at least every 6 months. Because of various innovations in information technology (IT), these predictions have come true, and as a natural result of the improvements in powerful computers and networks, Grid computing technologies have emerged to enable more effective use of geographically dispersed heterogeneous computers.

Meanwhile, standardization in the IT domain has been accelerated so that Internet technologies can be used not only in Internet services for consumers, but also by enterprise users to develop more flexible and stable enterprise systems. IT resources such as servers, storages, and network devices became connected by standard Internet Protocol (IP). In response, we have developed an organic computing mechanism that enables these IT resources to work autonomously in the same way that the brain and nerves enable autonomous activity in each organ of the human body. Furthermore, organic computing resources such as geographically dispersed organic servers and organic storages are interconnected and can be used as a single powerful computer by using Grid computing technologies. TRIOLE is a concept and set of technologies to realize these environments. Additionally, Web services are evolving towards the realization of improved Web application services on these Grid environments. Against this background, the key concept for our strategy has been drawn up as "Web services powered by Grid

computing plus Organic computing: TRIOLE.”

Fujitsu’s activities are contributing to innovations in Grid computing technologies, not only in Japan, but also overseas. Our Grid research and development efforts started from two viewpoints. One of these was to develop a computational Grid middleware called CyberGRIP (GRid Innovation Platform) to reduce the turnaround time and person-hours required to make simulations for hardware developments and risk management in financial businesses. The other was to contribute to the standardization of Grid computing technologies in the Global Grid Forum (GGF).

Currently, we use CyberGRIP for CAD-Grid, which is a system used inside Fujitsu that is dramatically improving the efficiency of simulations. Regarding our contribution to the GGF, our researchers are collectively acting as chairperson and developing a standard specification for the Open Grid Services Architecture (OGSA), which is the key part of standardization. Various projects for Grid computing are in progress, and our researchers and developers are contributing to them as main members. Some examples of these projects are the following national projects in Japan: the Business Grid Project, National Research Grid Initiative (NAREGI), Japanese Virtual Observatory (JVO), and Visualization Grid (VizGrid). Furthermore, overseas research groups have developed new Grid middleware such as UNICORE and FSE Grid middleware, and these products are already being used by customers all over the world. Our activities for Grid computing technologies are steadily improving, and many customers in manufacturing, finance, universities, and other areas in Japan and overseas have started using our Grid computing technologies.

The speed of technological innovation is expected to increase exponentially. This includes innovation in Grid computing, and although there are many Grid issues to be solved, for example, regarding security and accounting, we will continue our efforts and create a new Grid-based computing paradigm. I therefore wish to emphasize again that the key concept for our strategy is “Web services powered by Grid computing plus Organic computing: TRIOLE.”