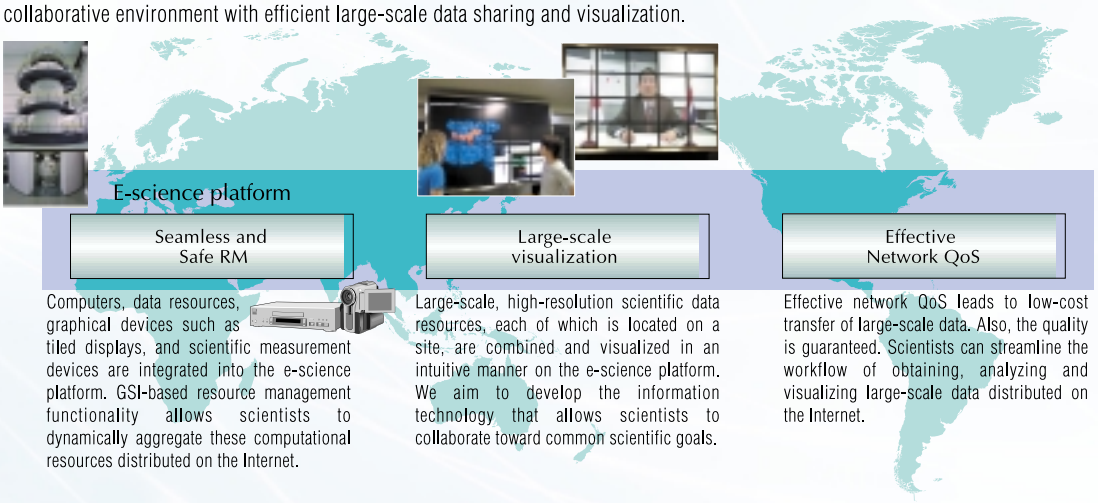
JGN2 Osaka RC and Partners' Activities

Platform Development for Next-Generation E-Science

Our team aims to develop a middleware and its component technology that will allow scientific experts to work together in a distributed collaborative environment with efficient large-scale data sharing and visualization.



Computers, data resources, graphical devices such as tiled displays, and scientific measurement devices are integrated into the e-science platform. GSI-based resource management functionality allows scientists to dynamically aggregate these computational resources distributed on the Internet.

Large-scale, high-resolution scientific data resources, each of which is located on a site, are combined and visualized in an intuitive manner on the e-science platform. We aim to develop the information technology that allows scientists to collaborate toward common scientific goals.

Effective network QoS leads to low-cost transfer of large-scale data. Also, the quality is guaranteed. Scientists can streamline the workflow of obtaining, analyzing and visualizing large-scale data distributed on the Internet.

E-Science Applications

Shared Remote Surveillance with Arbitrary Viewpoints

An omni-directional camera consists of an ordinary video camera and a hyperboloid surface mirror. It can acquire a 360-degree scene in a single frame of video. Using at least three omni-directional cameras, an image from an arbitrary viewpoint can be generated. This method can be applied to various remote surveillance systems.

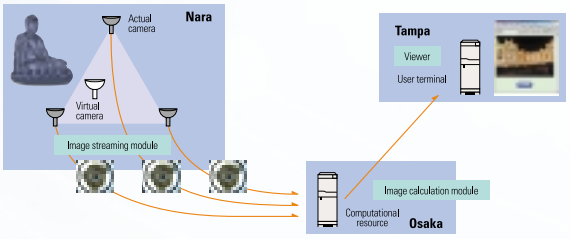
Omni-directional CAMERA


Omni-Directional Cameras


Omni-Directional Image

There are several challenging issues in developing such a system.
- Access control for the omni-directional cameras is required.
- A synchronization mechanism for the images from the different cameras is required.
- Suitable computational resources must be selected with regard to resource availability and the locations of both cameras and users.
- Generated images must be transferred to users in real-time.

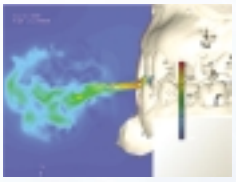
To provide high-quality images for multiple users in a remote surveillance system, high performance computing facilities and high-speed networks are required. This project is being conducted by NAIST (Nara Institute of Science and Technology), Osaka University and Osaka RC.

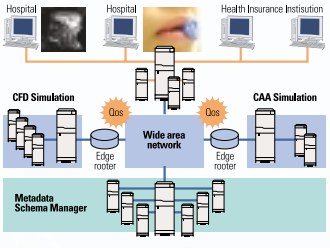


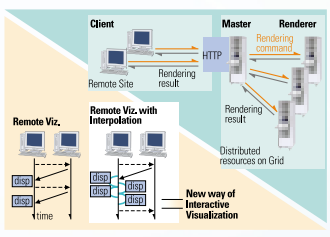
Oral Science

We developed a new method of speech analysis using numerical simulations similar to those used with computational fluid dynamics (CFD) and computational aero-acoustics (CAA). Our method improves the performance and usability of such numerical simulations with network QoS (Quality of Services) and parallel visualization techniques.

HPC Analysitic Challenge 2006







To use high performance devices effectively, we are also developing a 3D visualization system for observed specimen analysis. High performance devices produce very high-resolution specimen images. Thus, our system is designed to visualize high-resolution images from remote sites with a high frame rate. Our approach is also effective for visualizing simulation results.

National Institute of Information and Communications Technology
NICT Osaka Research Center
c/o Shimojo Lab. Cybermedia Centre
Osaka University
http://www.jgn.nict.go.jp/index.html

Nara Institute of Science and Technology
8916-5 Takayama, Ikoma, Nara 630-0192, JAPAN
http://www.naist.jp/
Nara Inst. of Sci. & Tech.
http://www.naist.jp/

大阪大学サイバーメディアセンター
Cybermedia Center, OSAKA University
Cybermedia Center, Osaka University
5-1 Mihogaoka Ibaraki Osaka 567-0047 JAPAN
http://www.lcmc.osaka-u.ac.jp/