

## Research & Development

As we move toward a new era of ubiquitous networking, demand for new ways to use information technology is expanding. To provide the foundation for the products and services that will give shape to this new era, Fujitsu Laboratories is carrying out cutting-edge research and development in fields ranging from IT services to computing and telecommunications systems, as well as in supporting fields such as electronic devices and materials technologies.



Mobile phone with fingerprint-based authentication technology



Organic Server

### Major Research Accomplishments in Fiscal 2003

#### Protecting Privacy and Maintaining Data Security

We developed fingerprint-based biometric authentication technology for protecting personal data stored in mobile telephones. Utilizing a small sensor that can be built into a mobile handset, the technology is a highly practical solution for accurate and fast personal identification. We have applied it in some of the mobile phones we produce.

#### Stable IT Systems

We developed utility computing technology that allocates system resources according to user demand and system load conditions, ensuring stable uninterrupted service even when unanticipated huge spikes in access demand occur. We also developed a single-chip Ethernet switch that can instantaneously send and receive data at 10 gigabits per second, enabling very high-speed transmission of large volumes of data between servers, storage systems and other IT equipment. We are incorporating this device in our next-generation organic servers with autonomic operation.

#### Ultra-Fast, High-Capacity Networks of the Future

In collaboration with Germany's Heinrich Hertz Institute, we developed ultra-high-speed regeneration technology that can restore optical signals whose quality has degraded as a result of long-distance transmission without having to first convert them to digital signals. Using this technology, we successfully achieved transmission speeds of 160 gigabits per second in an optical 3R regeneration transmission trial – a new world record.

#### Technology for Stable Mass Production of High-Performance Logic Chips

We were the first in the world to develop and apply cutting-edge 90nm CMOS technology for stable mass production of logic chips. Through the integrated coordination and control of multiple processes – enabling any errors occurring in one process to be corrected in another process – we were able to raise yield rates. Going forward, we will leverage this advanced technology in volume production using large-sized wafers.

### Key Research Areas Going Forward

We will place particular emphasis on the following key areas in our R&D activities:

- ① Technologies relating to ubiquitous networking, including pervasive data access and security
- ② Data center technologies for core IT infrastructure
- ③ Software development technologies to reduce software development time and improve quality
- ④ Cross-area technologies spanning such fields as electronic devices, advanced materials, manufacturing innovation, and environmental protection