NICT NEWS
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National Institute of Information and Communications Technology
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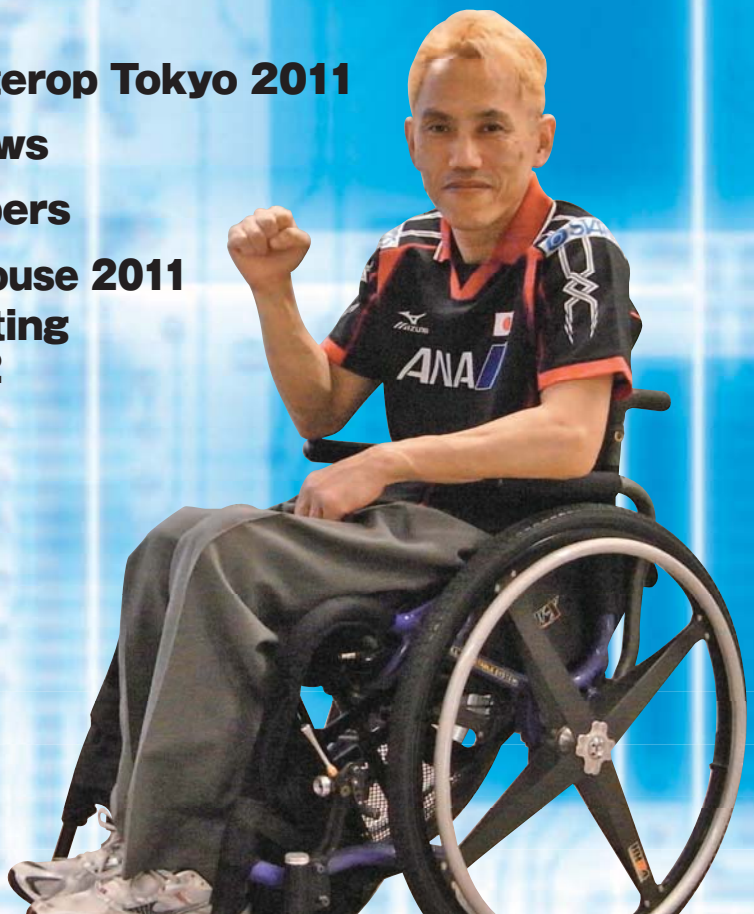
ITU's Standardization Activities for New-generation Networks



Vision of Future Networks ITU-T Y.3001

—International Standardization for New Generation Networks Now Progressing—

Nozomu Nishinaga

Director, New Generation Network Laboratory, Network Research Headquarters

After completing a master's course and serving as a fellow and assistant at Nagoya University, Nishinaga joined Communications Research Laboratory, Ministry of Posts and Telecommunications (currently NICT) in 1999. He has been studying satellite communications. Ph.D. (Engineering)

The need for a new-generation network

Do you use electronic mail (email)? I do. I send email to my colleagues and family almost every day. The manuscript of this article was actually sent to the Public Relations Department by email. Email has become an essential part of our lives. A huge amount of email comes into my in-box every day, usually come from colleagues, family, and friends. In the pile of email, however, are often strange messages with my name as the sender, although I do not remember sending them. They are "spam." Spam messages are sent to recipients unilaterally, usually in bulk, even though the messages are unsolicited. You may wonder, "But why do those messages show my name as the sender when I did not send them?" It is, in fact, pretty easy to send email on the Internet using any name, not necessarily your own. To make matters worse, it is very hard to track down the real senders.

The basic part of the current Internet architecture was built almost thirty years ago. Most of the people who used the Internet then were network researchers. They assumed that nobody would try to use a false identity when sending messages, so they did not incorporate a checking mechanism. Back then, the Internet was just a tiny network of coworkers and friends exchanging email and data with each other.

But how about today? Currently, over 78% of the Japanese people and globally almost 2 billion people use the Internet. The Internet also has a wide variety of uses. You can download music, send email, watch movies, shop on-line, transfer money, and so on. New uses that were unimagined thirty years ago are emerging one after another, and more and more people have an Internet connection. Can the current Internet, however, be used forever?

Regardless of the growing importance of the Internet, the basic architecture has not changed very much in the last thirty years. Instead of improving, the network has struggled to incorporate new functions, resulting in multiple unnecessary functions. Despite our desire to exchange valuable, confidential information through Internet, the Internet is full of information from dubious senders, and you never know whether the person who actually receives your information is the person you wish to have it. That kind of network will someday fail to meet the ever-increasing expectations of society. Moreover, the network's energy consumption also has been rising. Some researchers estimate that the amount of data exchanged will increase by 1,000 to 100,000 times by 2030. If that much data were to be exchanged on the current network, energy consumption would be a big concern.

We need a new network to replace the current one. This new network is generally known as the New Generation Network in Japan and the Future Network in other parts of the world. We need future networks to be safe, secure, and easy to use. NICT was among the first to notice the problems with the current Internet and, in 2006, embarked on the research and development of new generation networks. While promoting basic research into the technologies for new generation networks, NICT identified the vision and targets for new generation networks from a social point of view, and asked, "What kind of new generation networks will be desired in the future?" Through our activities in ITU-T FG-FN, we developed some answers, which are strongly reflected in Recommendation Y.3001. (More on this later.)

Establishment of Recommendation*1 Y.3001*2 regarding the objectives and design goals for future networks

So, now you understand why we need to build future networks. Your next question should be, what are the different kinds of future networks? It would not be efficient if different countries embarked on building such new networks in different ways, because the most important thing about networks is connectivity. Networks will create great value only when people can get any information they want from any part of the world and can communicate any information they have to any part of the world through the same world network. For this purpose, network researchers from around the world set up a special group to discuss the nature of future networks. This is the Focus Group on Future Networks (FG-FN), established by the ITU (International Telecommunications Union).ITU is a specialized agency of the United Nations that standardizes communication methods for all the nations around the world. A focus group is a very special group where anyone, whether ITU members or not, can share their opinions.FG-FN held its first meeting in June 2009 and completed its role with an eighth

meeting in December 2010. Researchers gathered from all over the world for discussions in various countries, including Sweden, the U.S., Switzerland, Japan, South Korea, and Slovenia. As Japan has been putting a great deal of effort into the research and development of future networks, it played a key role in the focus group. In fact, the chairman of the FG-FN and the joint editors who put together the Recommendation Y.3001 and its working draft were Japanese members.

In FG-FN meetings, participants engage in lively exchanges of opinion about the kind of characteristics that future networks should have and the ultimate design goals of a future network. More specifically, researchers put their ideas about the desirable characteristics and design goals of a future networks for people from all over the world into a document called "Contribution" and present it at a meeting. All participants provide input on the presented Contribution and refined the contents to incorporate it in a final version of document. By repeating these processes, the recommendation draft becomes richer, more substantial, more logically consistent, and less likely to be interpreted differently by different readers. The document, "Objectives and Design Goals for Future Networks" written by FG-FN, was submitted to ITU-T SG13, where it was further improved through discussions and finally completed as a recommendation draft. The draft was reviewed at a meeting held in May and established as Y.3001, which marks the first recommendation in the Y.3000 series.

What does Y.3001 say?

The Y.3001 is the world's first standardization document on future networks. Y.3001 consists of four objectives and twelve design goals.

Four Objectives

To be considered a future network, networks must meet the four objectives listed in Y.3001. Today's networks, such as the Internet and the telephone network, were designed before these four objectives were developed and are not considered to be future networks.

1. Service Awareness

The basic architecture of the current form of the Internet was created over thirty years ago and accommodates all kinds of services. One objective for future networks is to provide services that can be customized to meet the needs of applications and users. In other words, in addition to the services that users use now (for example, sending an email or visiting a website), the networks should be able to accommodate any new services that may see explosive growth in demand, and the management or deployment cost, if any, should be reasonable. To that end, future networks must be flexible so that they can offer optimum services for applications and users.

2. Data Awareness

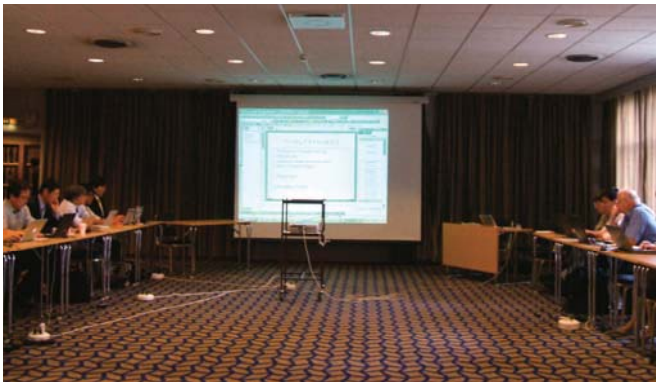
In conventional networks, we cannot access data without knowing where the data is located. Let's say you want to get a music file. If, however, you do not know in which folder of which server the music file is located, you cannot access the file to listen to the music. Future networks should have an architecture that is optimized for handling enormous amounts of data in a distributed environment and have mechanisms for retrieving data quickly, safely, easily, and correctly, regardless of its location.

3. Environmental Awareness

Little attention has been paid to the power consumption and carbon dioxide emissions of conventional networks. The basic architecture of future networks should use fewer materials, consume less energy, and emit less greenhouse gas in order to minimize the impact they have on the environment. Future networks should also be designed to reduce the environmental load in other areas that use networks, such as manufacturing and retail operations. Especially given the recent power shortages in Japan, future networks are an effective means of reducing power consumption.

4. Social and Economic Awareness

Most conventional networks, especially the early telephone networks, were established as national projects and were managed by the government. The closed nature of this management by government sometimes created barriers to cheaper services and the entry of new businesses. Future networks should be able to handle various socioeconomic challenges to allow different players to participate in the economic activities of the networks. Additionally, the architecture of future networks should reduce the life cycle cost because the networks are easy to distribute and are sustainable. All of those characteristics will help provide universal services and offer the ideal competition and appropriate profits for all stakeholders.



●Conference room

●On-going discussions in the conference room

Twelve Design Goals

Future networks will achieve the above-mentioned four objectives. These objectives, however, are conceptual and, therefore, more concrete design goals for network technologies are needed to actually proceed with the research and development of such a network. Y.3001 lists the following twelve technologies as design goals.

1. Service Diversity

Future networks should support diversified network services with a wide variety of traffic and behaviors. (For example, when transferring small volumes of data from a large number of terminals or transmitting extremely high-definition video signals to a specific place). They should also connect a huge number of devices, including sensors.

2. Functional Flexibility

Future networks should be functionally flexible to support new services derived from user demand. Networks that can support any type of user demand, however, may not be feasible for many years to come. Therefore, to bridge the gap, we should develop technologies that allow network functions to change dynamically.

3. Virtualization of Resources

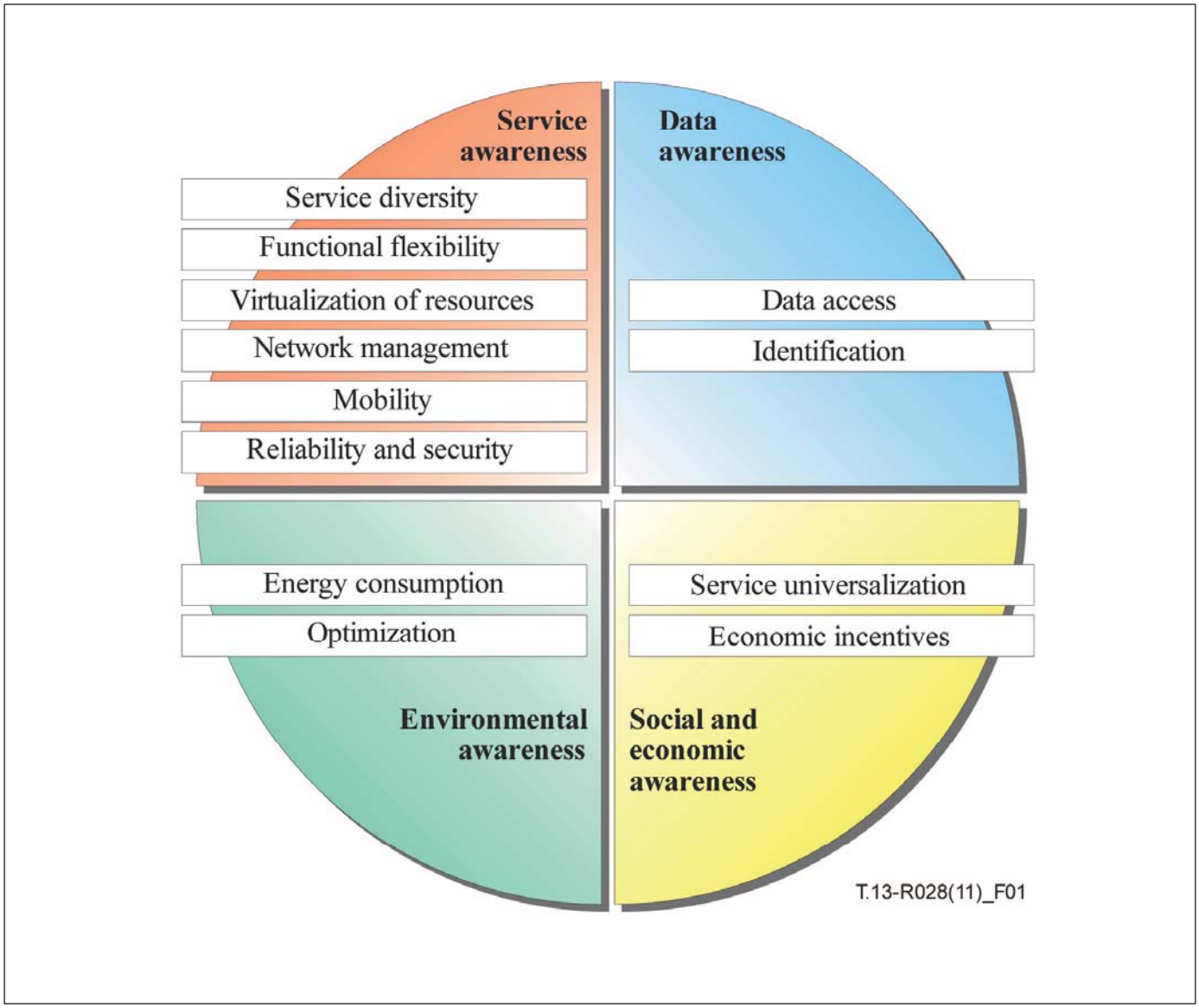
Future networks should support virtualization so that a single network can be partitioned into multiple, separately managed virtual networks to enhance efficiency.

4. Data Access

Future networks should be able to quickly and efficiently process a vast amount of data. Unlike the traditional access method that focuses on where data is located, future networks should establish mechanisms for retrieving data regardless of its location.

5. Energy Consumption

Future networks should have device-, system-, and network-level technologies to improve power efficiency and satisfy user requests with minimum traffic. The device-, system-, and network-level technologies should not operate independently, but should coordinate with each other to reduce network energy consumption.



● Four Objectives and Twelve Design Goals [1]

6. Service Universalization

Future networks should facilitate and accelerate the provision of convergent facilities in differing areas, such as towns or the countryside, and developed or developing countries, by reducing the life cycle cost of networks and applying the principle of open networks.

7. Economic Incentives

Future networks should be designed to provide a sustainable competitive environment in order to resolve economic conflicts that may occur between various stakeholders, including users, providers, government institutions, and intellectual property rights holders.

8. Network Management

Future networks should be able to efficiently operate, maintain, and provide a growing number of services and entities. They should have mechanisms to efficiently and effectively process administrative data and information, convert that data into relevant information and knowledge, and deliver it to an administrator.

9. Mobility

Future networks should be designed and implemented to provide mobility that facilitates high levels of reliability, availability, and quality of service in an environment where a huge number of nodes (communication systems) can dynamically move across the heterogeneous networks (e.g. between cell phone and wireless LAN). They should also support mobile services, regardless of the mobility of the nodes.

10. Optimization

Future networks should provide sufficient performance by optimizing the capacity of the network equipment based on the service requirements and user demand. They should be able to optimize various types of network equipment within the physical limits of each type of equipment.

11. Identification

Future networks should provide a new identification structure that can effectively support mobility and data access in a scalable manner.

12. Reliability and Security

Future networks should be designed, operated, and developed to be fault-tolerant in difficult situations and support extremely high-reliability services. The design should consider the security and privacy of users.

These twelve design goals should be satisfied in order to meet the above-mentioned four objectives, but it may be extremely difficult to meet some of the goals in some networks. In addition, not all design goals need to be met for all future networks.

The relationship between the objectives and the design goals for future networks is shown in the figure. Some design goals can be linked to two or more objectives, but the figure connects them with the most deeply associated one.

Future Development of Future Networks

This article explained why future networks are needed, introduced the world's first standardization recommendation for future networks, Y.3001, and described how it was created. Y.3001 describes the objectives and design goals for future networks. To build future networks, it will be necessary to develop various technologies. In Japan, with NICT playing a central role, the New Generation Network R&D Project is underway to develop new generation networks through collaborations between industry, educational institutions, and the government. While proceeding with the development of more detailed technologies, we will promote international standardization activities so that the developed technologies can be used the world over.

Glossary

＊1 ITU Recommendation

A de jure standard in the information and communications fields. It is a very important standard, since, for example, a national standard is based on a de jure standard, and governments must procure parts according to specifications compliant with a de jure standard.

＊2 Y series

Standards on Global Information Infrastructure (GII) and Internet Protocol. For the next generation networks (NGN) that have already started to provide services, recommendations were made in the Y.2000 series.

Reference Literature

[1] Recommendation ITU-T Y.3001 (2011), Future Networks: Objectives and Design Goals.

● Profile

Shinichi Yoshida

General Affairs Office, General Affairs Department

Born in Fukushima Prefecture, Yoshida joined NICT in 2006.

Aiming to gain a berth at the London 2012 Paralympic Games What is waiting for me beyond that?

This section features staff members who support the researchers in NICT and highlights one member who stands out in various fields. This issue casts a spotlight on Mr. Shinichi Yoshida, who manages an electronic settlement system and reviews documents at the General Affairs Department. Mr. Yoshida is a leading figure in table tennis for the physically challenged and finishes in the top places every time he participates in a domestic or international competition. His current goal is to gain a spot in the London 2012 Paralympic Games. We talked with Mr. Yoshida about his passion for table tennis and his work at NICT.

Fateful encounter with table tennis

In 1995, the 50th National Sports Festival was held in Fukushima, the hometown of Mr. Yoshida. One year earlier, a person who dealt with wheelchairs suggested to Mr. Yoshida, who lived in Fukushima at that time, that he should take up a sport because the prefecture was looking for more players. Mr. Yoshida chose table tennis because, surprisingly, it just seemed easier than other events, such as baseketball and track and field. Mr. Yoshida is now a world-class table tennis player.

He took up table tennis without giving it serious thought, but maybe it was an inspired choice for Mr. Yoshida. Looking back to the time he started playing table tennis, he said, "I thought I was going to leave my mark on the world, where God demanded that I experience two different lives as a healthy person and as a physically challenged person." He was not chosen for the 31th National Sports Festival for the Disabled that year, but he soon distinguished himself and started winning championships in Fukushima and eventually in the Tohoku region.

Came to Tokyo by himself Having difficulty striking a balance between table tennis and job

Mr. Yoshida quickly improved his skills enough to beat any opponent in local competitions and started eying the Kanto region, Japan as a whole, and the world. He started thinking, "I want to practice in Tokyo," and the thought finally became a determination. He put his stuff in his car and headed for Tokyo, leaving his family behind, who told him to come back if he could not find a job within a week.

As soon as he arrived in Tokyo, he went straight to a job-placement office and applied for a job. There was an age limit for the position, however, which was a barrier for him. However, it did not stop Mr. Yoshida. He negotiated directly with the recruitment staff to give him a chance to be interviewed, and he eventually got the job. His seriousness about his urgent situation brought him a good outcome.

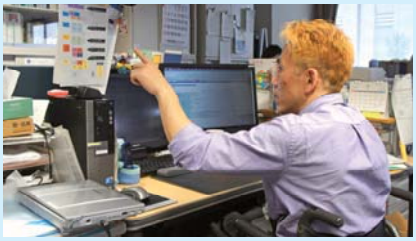
Although he was lucky enough to get the job, it was not easy to strike a balance between work and table tennis. The company used to train players—some have participated in the Olympics—but such activities had already ended before Mr. Yoshida joined the company. In the meantime, he continued to play table tennis, mostly in domestic competitions, by taking holidays from work. He knew, however, that this lifestyle would not take him to where he dreamed of going—the world. He led this life for a quite long time, but quitting table tennis was not an option for him. He finally decided to leave the company. Six years had passed since he first brought his dream to Tokyo.

Joined NICT Toward the long-sought-World Championships

Mr. Yoshida joined NICT in 2006. Since then, he has been working hard both at work and at table tennis, competing in both domestic and international competitions. He participated in seven international competitions in 2009.

In the Arafura Games 2009 held in Darwin, Australia, he won medals in every event that he entered (open match, individual match, open doubles, and team competition), bringing home 2 gold medals, 1 silver medal, and 1 bronze medal. He still cherishes the memory of the national flag of Japan being hoisted on the center pole and the national anthem being played. It was really a touching moment for him.

That same year he won eight medals and gained a spot the following year in the 2010 ITTF PTT World Championships held in South Korea (Kwangju). This is the highest level of games following the Paralympics, and Mr. Yoshida reached a world ranking of 14, the highest among Japanese players in a wheelchair. In the championships, he reached the final 16.



●Operation and management of the electronic settlement system in the organization are left entirely to Mr. Yoshida.

Wish to contribute using my special skill - table tennis -

The opportunities that table tennis has given him to meet people from various countries have become a priceless treasure for him. Especially in the Dutch Open 2011 in May, many distinguished world-class players who compete in the Olympics and Paralympics kindly wrote heart-warming messages for disaster-hit Japan, on a Japanese flag. He delivered the flag to the Table Tennis Association for Crippled Persons in Fukushima, his hometown. "I'm glad I have come so far that I can encourage people and make them happy through what I am good at." he said. His sincere wish to be of some help to the people in the disaster-stricken Fukushima was conveyed to us.

●Competing for a medal with strong opponents from all over the world

●In the Dutch Open 2011 held in May, players from various countries gave a message of cheer to disaster-hit Japan

Support from NICT

While NICT has been watching Mr. Yoshida's activities since he joined, in April 2011 it officially introduced a system that exempts staff members who participate in international competitions or other important events from work during the event. The system allows him more time, in addition to his holidays, for participating in a competition. Acknowledging Mr. Yoshida's activities through table tennis, NICT is now pleased to offer as much support as possible. "I'm certainly grateful for the support, I also feel more pressure to achieve a good result", he smiled bitterly. So now, you may imagine that he could totally forget about his job during a competition, but that is not true. While he is away from the office during a competition, he checks e-mails using a mobile device and processes some tasks, such as reviewing documents, using a remote access service so that he can smoothly get back to business after he returns from an event.

I play table tennis to learn why I play table tennis.

Mr. Yoshida says he has sacrificed many things to keep playing table tennis. He has that much passion for table tennis and this is exactly what he lives for. "Why am I so into this sport? To be honest, I don't know why, either. Perhaps this is why I keep playing table tennis, to look for the answer. This is not limited to table tennis, but you can learn more lessons when you lose than when you win. Through repeated practice and games, when I was able to play an actual game just as I have done in practice, that makes me really happy and it does not matter if I win or lose. But in the current situation, a result is all that matters. Therefore, I will try my best with the goal of, first, gaining a spot in Paralympics (top 22 in the world rankings) and then winning a medal in the event. Of course, I work hard, too! I feel sorry to cause such inconvenience to the people with whom I work," he said. We hope to see him achieve his dream to play in the Paralympics.

Comments from Supervisor

A first-class person who has mastered something indeed does a first-class job. Mr. Yoshida has proven that here in NICT. Never give up, no matter how hard the job may be. Always understand the purpose and meaning of the work you do. Be generous and kind to others. He pulls those things off. While everyone understands the importance in his or her head, it is difficult to "walk the walk." It makes me feel proud that I can work with a first-class athlete every day.

Toshiyuki Harashima

Group Leader, General Affairs Group, General Affairs Office, General Affairs Department

Mr. Yoshida has paid all of the expenses needed to play table tennis, including travel expenses to overseas competitions. Although he is a world-class player, he was having difficulty finding a sponsor. NICT introducing a system to sponsor his activities has encouraged him and allows him to spend more time practicing and participating in a competition, If he gets a medal in the Paralympics and other competitions, it is expected that some grant money may be channeled into the Japan Sports Association for the Disabled for training new players. The source of his energy, he says, is his wish to help improve the environment under which disabled table tennis players play and to promote the name of NICT through his activities.

(Interviewed and written by Rie Yamagata, fulfill co.)

独立行政法人
情報通信研究機構

Report on Exhibition at Interop Tokyo 2011

NICT took part in Interop Tokyo 2011 (Wednesday, June 8 through Friday, June 10 at Makuhari Messe) this year. Of the approximately 128,000 people who visited the 3-day exhibition, NICT welcomed an estimated 38,000 to our booths.

This time, we again showed a part of the functions of the Incident Analysis Center "nicter" on ShowNet, which is a huge demonstration network at Interop Tokyo 2011. We also exhibited our research results, including an optical packet and circuit integrated ring system, a virtualization node project, the CoreLab project, the "JGN-X", a next-generation communications network test bed, the StarBED^3, and a broad application layer information network monitoring system. We also sent out messages about our activities using Twitter for the first time.

Among the exhibitions NICT presented this time, the JGN-X jointly won the grand prize and a special award with private companies in the ShowNet demonstration category, Best of Show Awards. The awards are given to the best entry by category, where various companies participating in the exhibitions enter products to be announced or released in 2011.

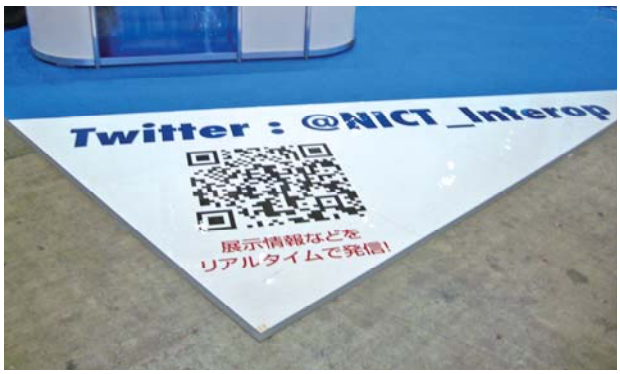


Figure 1●QR code for Twitter is displayed on the floor

ShowNet Demonstration Department

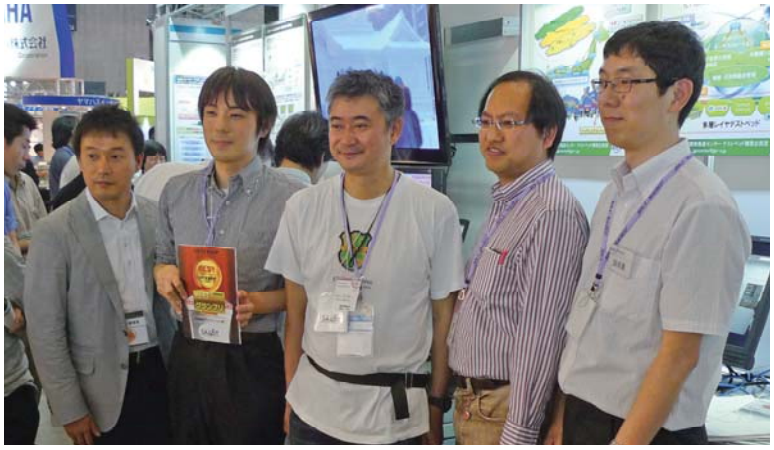


Figure 2●Award-winning moment

BEST OF SHOW AWARD INTEROP グランプリ

FUJITSU / National Institute of Information and Communications Technology
SA46T (Stateless Automatic IPv4 over IPv6 Tunneling)

BEST OF SHOW AWARD INTEROP 特別賞

NEC / National Institute of Information and Communications Technology
Next Generation Data Center Network Solution, "Programmable Flow"

Figure 3●Optical packet and circuit integrated ring system

We introduced the optical packet and circuit integrated network technologies, which capitalize on the advantages of both circuit switching and packet switching to allow smart usage of both systems on optical networks.

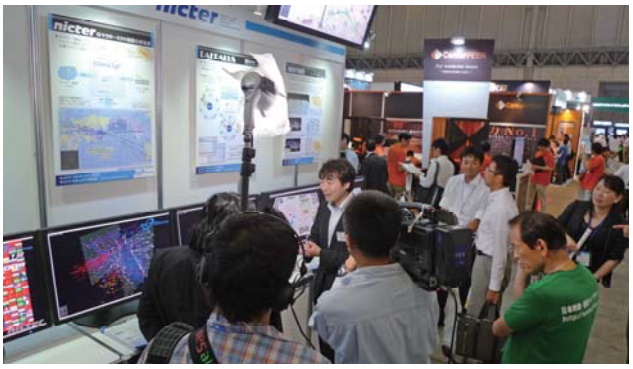


Figure 4●Incident analysis center "nicter"

We presented the "nicter" (Network Incident analysis Center for Tactical Emergency Response), which analyzes incidents that happen on networks, such as attacks and scans in real time, with high precision.
(Being interviewed by a TV station)

Figure 5●Virtualization node project

Figure 6●CoreLab project

We introduced the Virtualization Node and CoreLab, which are "evolving network virtualization technologies", that can freely create the network functions needed for new kinds of network usage, including cloud services, as well as any emerging services.

Figure 7●JGN-X, a new generation communications network test bed

We demonstrated a transmission experiment by broadcasting "The Sapporo Snow Festival" using new generation network technologies and the JGN-X new generation communication network test bed.

Figure 8●Introduction of StarBED³ and its verification technologies

We introduced an emulation environment, the StarBED3, which can be used for testing and verifying internet technologies, ubiquitous environments, and new generation networks.

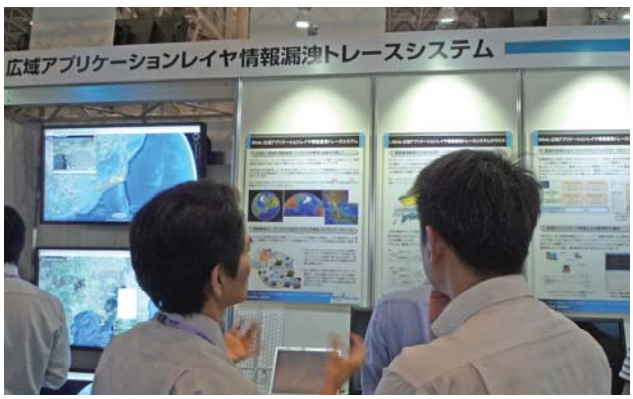


Figure 9●Broad application layer information network monitoring system

We presented a system for observing various types of Internet services and visualizing communications related to information leakages.

Figure 10●Adaptive optical transport networks based on high-speed electrical signal processing technologies

We introduced a transmission unit for optical transport networks that can handle sudden increases in communications traffic and can be safely used in a disaster.

※An exhibition of research results by Mitsubishi Electric Corporation, based on NICT's infrastructure technology research promotion system for private sectors.

Introduction of NICT Fellows

NICT has bestowed the title of Fellow on those who have achieved particularly remarkable results in research and development at NICT. On April 21, 2011, the title was granted to Toshio Iguchi, Director General of the Applied Electromagnetic Research Institute, and Zhen Wang, Distinguished Researcher of the Advanced ICT Research Institute.

After receiving his Ph. D. from York University in Canada and serving as a senior researcher at Unisearch Associates Inc., Director General Iguchi joined Radio Research Laboratory, Ministry of Posts and Telecommunications (currently NICT). Since then, he has devoted most of his time to studying remote sensing technologies that utilize radio waves.

As a leading researcher in Japan, he has been engaged in research planning and system development for the three-dimensional precipitation observation project that uses satellites to collect data, starting with the Tropical Rainfall Measuring Mission (TRMM) leading to the Global Precipitation Measurement (GPM) mission.

For TRMM, he developed an algorithm to estimate the three-dimensional distribution of rainfall with high precision from data collected by the space-borne Precipitation Radar system. This algorithm was adopted to create standard products by the National Aeronautics and Space Administration (NASA) and the Japan Aerospace Exploration Agency (JAXA). Processing data with the algorithm has enabled us to obtain an accurate picture of the three-dimensional distribution of rainfall on the oceans and in undeveloped regions, where measurements of rain had been difficult or nonexistent. TRMM has been observing rainfall since 1997 and produced many successful results. The observation results accumulated over the years have not only helped enhance the accuracy of weather and flood forecasts (including alerts) or typhoon and hurricane track predictions, but also promoted a better understanding of rainfall systems in tropical and subtropical regions.

●Toshio Iguchi, Director General of Applied Electromagnetic Research Institute (left) with President Hideo Miyahara

●Zhen Wang, Distinguished Researcher of Advanced ICT Research Institute (left) with President Hideo Miyahara

After completing a doctoral course of Electrical and Electronics information Engineering at the Graduate College of Electrical Engineering, Nagaoka University of Technology, Distinguished Researcher Wang joined Communications Research Laboratory, Ministry of Posts and Telecommunications (currently NICT). He has devoted most of his time to studying the development of superconducting devices .

Among various research subjects, he has played a key role in the studies of thin film and device technologies based on niobium nitride, from research planning to device development and systems application. The technologies were a big breakthrough in the practical use of niobium nitride, which had a narrow application range but excellent properties. As a result, the compound is now widely used in high-sensitivity, low-noise terahertz band receivers, superconducting quantum bit devices, high-speed, low-noise, broadband superconducting nano-wire single-photon detectors, and other devices.

It is particularly notable that he succeeded for the first time in the world in applying the developed superconducting electromagnetic wave receiver based on niobium nitride to radio astronomy observation. Furthermore, a quantum-bit device that uses niobium nitride has achieved the longest decoherence time in the world for a solid-state device. In recent years, he has developed the world's best-performing multichannel superconducting single-photon detection system that incorporates niobium nitride thin film production technologies and nano-level fine processing technologies. He also successfully implemented the first experiment in Japan to use the detector to distribute a quantum cryptographic key, resulting in a world record for quantum cryptographic key distribution. A series of technological developments has significantly advanced the field and is expected to find applications in various fields, including industry.

Introduction of New Members

NICT has welcomed twelve new staff members since July 2010. Wishing them every success in NICT, let us introduce our newcomers and their goals.

Yasuyuki Ichihashi

Ultra-realistic Video Systems Laboratory
Universal Communication Research Institute

I like to take things one step at a time when proceeding with research. I am still young and inexperienced, but I will work hard.

Yuji Kaneko

Budget Group, Finance Office
Financial Affairs Department

I will try to think and act for myself. I will do my best to learn as much as possible so that I can be of service to many people.

Kiyonori Otake

Strategic Planning Office
Strategic Planning Department

By making a difference every day, I am helping to create an attractive society based on information and communications technologies.

Taro Watanabe

Multilingual Translation Laboratory
Universal Communication Research Institute

I hope to do such research and development that will lead the world in the area of machine translation.

Kim Kyoung-Sook

Information Services Platform Laboratory
Universal Communication Research Institute

I would like to contribute to the advancement of basic technologies for the Human-centered Knowledge Society as promoted by NICT by establishing underlying technologies for large-scale information control.

Takeshi Takahashi

Security Architecture Laboratory
Network Security Research Institute

I make every effort to study and standardize cyber security, which is indispensable for protecting people's property.

Yasushi Naruse

Brain ICT Laboratory
Advanced ICT Research Institute

I hope to contribute to the creation of future information and communications technologies that use brain functions in the information and communications area.

Chang Woo Pyo

Smart Wireless Laboratory
Wireless Network Research Institute

I would like to contribute to the development of a smarter communications environment and a safer and more secure society through wireless technologies.

Kentaro Ishizu

Smart Wireless Laboratory
Wireless Network Research Institute

I will seek and create new possibilities leading to a bigger goal so that the information and communications technologies will be of service to society.

Song Jungsuk

Cybersecurity Laboratory
Network Security Research Institute

I will do my best every day to help develop the world's best security technologies.

Yuki Kageyama

International Cooperation Office
International Affairs Department

My goal for this year is to make every effort to be of help to others as soon as possible.

Takahiro Kasama

Cybersecurity Laboratory
Network Security Research Institute

I am still young and inexperienced, but I will work hard so that I can play a part in achieving a safe and secure network society, which is what NICT is working toward.

NICT's Facilities' Open House 2011

Admission Free

This year's planned open house at Koganei headquarters has been cancelled due to the current power shortages this summer.

● Kashima Space Technology Center – Radio Waves and Satellite Connect Earth and Space –

Place: Kashima Space Technology Center
893-1 Hirai, Kashima, Ibaraki 314-8501
http://ksrc.nict.go.jp/visit/visit_j.html

Contact: +81-0299-82-1211

Time and Date: 10:00 - 16:00, Saturday, July 30, 2011 (Reception close at 15:00)

※Although the Kashima Space Technology Center suffered great damage in the Tohoku Region Pacific Coast Earthquake, we will not let the disaster stop us from holding an event this year, albeit at a somewhat smaller scale. We look forward to your visit.

● Advanced ICT Research Institute – Experience the future of information and communications!! –

Place: Advanced ICT Research Institute
588-2 Iwaokacho, Iwaoka, Koubeshinishi-ku, Hyogo 651-2492
http://www-karc.nict.go.jp/ippankoukai/2011/

Contact: +81- 078-969-2100

Time and Date: 10:00 -16:00, Saturday, July 30, 2011 (Reception closes at 15:30)

Permanent-staff Recruiting Information for FY 2012

The National Institute of Information and Communications Technology promotes the full spectrum of research and development in information and communications technologies, from basic to applied research, with an integrated perspective. In this way, NICT helps create an affluent and safe society and promotes the advancement of Japan as an intellectual nation that leads the international community.
For further promote research and development in information and communications technologies, NICT is now looking for brilliant and enthusiastic researchers, as well as office workers, who are interested in science technologies and willing to support our researchers.

Start●April 1, 2012 (in principle)

Recruiting●Several positions as permanent researchers and general work staff

For more details, including the application acceptance period, please visit NICT's web page and look for recruiting information.
http://www.nict.go.jp/employment/

Contact●Personnel Affairs Group, Personnel Affairs Office, General Affairs Department, National Institute of Information and Communications Technology
4-2-1 Nukui-Kitamachi, Koganei, Tokyo 184-8795
Tel: +81-042-327-7630; Email: jinjig@ml.nict.go.jp

NICT National Institute of Information and Communications Technology

Information for Readers

The next issue will cover diverse topics, including the development of a safety system that wirelessly communicates information to visually-impaired people by means of a sensor attached to the person's sunglasses, wristwatch, or walking cane.

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