Chapter 6

ICT Policy Directions

Part 2

Section 1 ICT Industry Trends

1. Comprehensive Strategy Promotions

The Japanese Cabinet decided the Declaration to be the World's Most Advanced IT Nation in June 2013, following a decision by the IT Strategic Headquarters. The IT Strategic Headquarters evaluates the progress of ICT policy measures and reviews strategies on a timely basis. Since the Cabinet decision of the first Japan Revitalization Strategy in June 2013, the strategy has been revised three times. Each of these revisions have recommended Japan move on ICT initiatives to ensure further growth for the country. Examples include addressing the IoT, big data, and AI era, promoting competition in the mobile market, and establishing the world's most advanced communications infrastructure.

Section 2 Developments in Telecommunications Policy

1. Developments in telecommunications policy

(1) Promoting broadband proliferation and fair competition

a. Establishment of broadband infrastructure

The establishment of ultra-high-speed broadband infrastructure is important and essential to revitalizing Japan's regions. To promote infrastructure establishment, MIC is launching the ICT Infrastructure Establishment Promotion Project in FY 2016. The program will help cover a portion of the costs when local governments in disadvantaged regions, such as underpopulated regions or remote islands, undertake the construction of optical fiber or other forms of ultra-high-speed broadband infrastructure.

b. Promotion of mobile services

MIC is engaged in promoting competition between mobile carriers, such as encouraging the unlocking of SIM locks and stimulating the growth of mobile virtual network operators (MVNOs). In 2015 the Task Force on Mobile Phones Charges and Other Service Conditions, operating under the Study Group on the Safety and Security of ICT Services, examined policies to further reduce and simplify mobile phone communications charges from the standpoint of users. Based on the Task Force's examinations, MIC established in December 2015 a policy to lower smartphone charges for users and to correct handset sales practices. The policy encourages carriers to introduce pricing plans that suit the diverse needs of consumers and corrects handset sales practices that oversell plans to consumers.

c. Assurance of adequateness, fairness, and transparency in the provision of NTT East and West FTTH access services and other wholesale telecommunications services

MIC finalized the Guideline on the Application of the Telecommunications Business Act as It Pertains to NTT East and West FTTH Access Services and Other Wholesale Telecommunications Services in February 2015 prior to the launch of FTTH access services and other wholesale services by NTT East and NTT West. The Guideline organizes and classifies acts potentially subject to business improvement orders under the Telecommunications Business Act in order to clarify the application of the Telecommunications Business Act with respect to acts performed by carriers that provide wholesale services, carriers that receive wholesale services, and contracted agents that receive wholesale services. Furthermore, the Act to Partially Amend the Telecommunications Business Act and other Legislation, which went into effect in May 2016, introduced an *ex post* notification system for wholesale telecommunications services, including NTT East and West wholesale services, and a system allowing the Minister for Internal Affairs and Communications to organize and make public the content of such notifications.

d. Conducting market verifications in the telecommunications business field

Because of the profound transformations taking place in the telecommunications market due to the rapid advance of technological innovation, it is necessary to ascertain precisely developments in the market, to allow free competition to function effectively through fair and transparent administration management based on clear rules, and to create new business domains and new services as well as improve user convenience. In view of these necessities, MIC will carry out market verifications from FY 2016 onward that will unify analyses and verifications of market trends and confirmations of the

correctness of operators' business practices.

e. Promoting installation of free public Wi-Fi

Free public Wi-Fi is an effective communications means for sending and receiving information during emergencies and disasters when phone lines are congested. Furthermore, there is strong demand for Wi-Fi installations from overseas visitors, whose numbers are expected to surge leading up to the 2020 Tokyo Olympic and Paralympic Games. From the perspectives of tourism and disaster-preparedness, MIC promotes the establishment of free public Wi-Fi installations that also help regional stimulation. To this end, MIC has been running the Tourism and Disaster-Response Wi-Fi Station Installation Program since FY 2014, and the Free Public Wi-Fi Installation Support Program since FY 2016, for municipalities and third-party sectors.

f. Promoting IPv6 adoption

MIC views IPv6 support as essential, not only to address the imminent global exhaustion of IPv4 addresses, but also to match international developments to accelerate IPv6 support and to construct an IoT-based society in which massive numbers of devices are connected to the Internet. The Study Group on Advanced Internet Use with IPv6, which reconvened in July 2015, put together basic approaches and an action plan for future IPv6 advancement. The Study Group released its fourth report in January 2016.

(2) Ensuring the security and reliability of telecommunications infrastructure

MIC enacted the ICT Network Safety and Reliability Standards to ensure stable provision of communications and to prevent misuse of communications. The criteria provide basic, but comprehensive, indicators spanning all security and reliability aspects of ICT networks, such as necessary hardware and software functionality and system maintenance and operation methods. The criteria are expected to be used as indicators when network constructors plan and implement security and reliability measures. They are also expected to encourage users to implement their own network security and reliability measures.

2. Consumer affairs administration in relation to telecommunications services

(1) Revisions and enhancements to consumer protection rules pertaining to telecommunications services

The Act to Partially Amend the Telecommunications Business Act and other Legislation went into effect in May 2016. Legislation after the amendment add to and enhance the previous obligation on carriers to explain fees and other service conditions prior to signing a contract. The additions are that carriers shall (1) provide explanations to senior citizens, people with physical and mental challenges, and other users adhering to the *principle of suitability*, which is the due consideration of the user's knowledge, experience, and intent in entering the contract; (2) inform users about necessary information in advance of auto-renewals of term-limited contracts; (3) make clear on the contract form provided to the user the details of the contract, including the workings of complicated pricing discounts such as discounts conditional on the purchase of optional paid services or devices, and (4) make optical fiber and other fixed-line Internet services the main target of initial contract cancelation systems.

(2) Proper handling of personal and user information

Smartphones store many forms of user information and apps collect and use this information. In some cases, apps provide collected information to third parties. On the other hand, users have concerns and anxieties because of the difficulty in finding out what information is being collected and used. MIC investigated issues surrounding the widespread use of privacy policies and the promotion of a system for third parties to verify operational and technology aspects of apps. These investigations continued in FY 2014, and in FY 2015 tests were carried out prior to constructing a third-party verification system.

Section 3 Developments in Radio Policy

1. Promoting effective radio spectrum use

(1) Studies on how to encourage effective radio spectrum use

MIC set up the Radio Policy 2020 Panel, organized by the Vice Minister for Internal Affairs and Communications, in January 2016, which compiled a report in July. The Panel's purpose is to investigate approaches to the radio usage fee system, which is due to be revised in FY 2017, and to investigate policies to advance Japan's wireless services and boost their international competitiveness leading up to 2020 as well as directions for system revisions that will allow for the introduction of new wireless systems.

(2) Policies for effective radio spectrum use

In view of the 2020 Tokyo Olympic and Paralympic Games, it is important to improve ICT usage conditions for overseas visitors during their stay in Japan. With the Act to Partially Amend the Telecommunications Business Act and other Legislation, which was promulgated in May 2016, MIC has established regulations so mobile phones and Wi-Fi devices brought to Japan by overseas visitors can be used in Japan, provided the devices satisfy certain conditions such as conforming to technical standards equivalent to Japan's technical criteria. Thus,

overseas visitors can now use their own mobile phones and Wi-Fi devices without issue during their stay in Japan.

2. Radio usage advancement and diversification initiatives

(1) Advancements in mobile communications systems

MIC received recommendations from the Radio Policy Vision Panel, set up in FY 2014, on combined industry-academic-administration efforts to introduce fifth-generation (5G) mobile radio communications systems. In response, the 5G Mobile Promotion Forum (5GMF) was established in September 2014 to set the direction of 5G R&D and standardization and to promote 5G implementation. Four 5GMF study groups are now delving into the promotion of international collaborations, R&D and standardization, applications, and 5G network architecture. With the aim of commercializing 5G by 2020, MIC began in FY 2015 full-fledged R&D into technology in such areas as increasing data capacity, communications speeds, and effective use of radio frequencies.

(2) Promoting Intelligent Transport Systems

To realize the safe and convenient movement of people and goods, MIC is pursuing initiatives to reduce traffic accidents and resolve traffic congestion with Intelligent Transport Systems (ITS).

MIC established the Security Guidelines for Constructing Driving Assistance Systems Using the 700 MHz Band in July 2015. The Guidelines' purpose is to ensure the reliability of vehicle-to-vehicle and vehicle-to-road communications between wireless devices installed in vehicles and along roadways as these driving assistance systems are implemented. Driving assistance systems using the 700 MHz band can be used to prevent head-on collisions. Later in October 2015, Japan successfully implemented a car equipped with this system, a world first.

(3) Advancements in disaster-management radio

Disaster administration wireless communications (Simultaneous Broadcast) are an important means of conveying information from disaster-management administration to evacuation sites, disaster-management bases, and homes. Digital formats that enable interactive communications and data communications are being introduced for these wireless systems to make it possible to address diverse information provision needs, such as collecting disaster information via images, exchanging information with evacuation sites, and notifying information from disaster-management administration via text displays. Digital formats are also being introduced for mobile disaster prevention unit, in addition to the previous analog format, that will make it possible to communicate data and images as well as voice.

3. Establishing radio usage environments

(1) Promoting measures to counter bioelectromagnetic environmental issues

MIC promotes initiatives to establish environments where radio waves can be used safely and securely. With regard to the impact of radio waves on humans, MIC has set up radio protection guidelines and safety standards on the strength of radio waves in the Radio regulations. MIC has ensured these standards are equivalent to international guidelines and incorporated the results of many years of studies on the safety of radio waves. With regard to the impact of radio waves on medical devices, MIC conducts the Study Group on the Impact of Radio Waves on Medical Devices each year. Based on the study's findings, MIC reflects any necessary warnings into the Guidelines on the Use of Radio communications Equipment for Implanted Medical Devices.

(2) Promoting measures to counter electromagnetic interference

With the growth in all kinds of electrical and electronic devices, it is increasingly important to take measures to protect wireless applications from unnecessary radio waves emitted by these electrical and electronic devices. The Radio Wave Utilization Environment Committee, established under the Information and Communications Technology Subcommittee at the Information and Communications Council, surveys and studies measures to counter electromagnetic interference and contributes to debates on international standards at CISPR (Comité International Spécial des Perturbations Radioélectriques).

The need for wireless power transfer (WPT) systems that rely on wireless technologies has been mounting in recent years with the move toward smart communities and a sustainable car culture that will address global energy issues. WPT systems will make it possible to quickly and easily recharge home electronic devices and electric vehicles. However, its implementation requires due consideration of the impact on society when WPT interferes with other wireless equipment and of ensuring the health and safety of people.

(3) Ensuring the reliability of radio equipment

a. Registered repair business system

With the rapid growth of smartphones, many third-party repair businesses other than the original manufacturer have appeared offering to repair smartphones and replace parts. The concern is it is unclear whether the performance of mobile phones repaired by third-party repair businesses remain in conformity with the technical standards established under the Radio Act.

Given this situation, MIC established a registered repair business system, under which repair businesses may register with the Minister for Internal Affairs and Communications, and put the relevant ministerial ordi-

nances in effect in April 2015. Under the system, registered repair businesses with proper repair methods and repair locations are permitted to verify independently that repaired wireless equipment remains in compliance with technical standards established under the Radio Act.

b. Registration system for low-power radio devices

Devices are being sold illegally as low-power radio equipment that, in fact, emit stronger radio waves than permitted under the criteria for low-power radio stations stipulated in the Radio Act. These devices have been causing an increasing amount of interference and obstruction with legitimate radio spectrum uses. In view of this situation, the Radio Policy Vision Panel, in its final report (December 2014), recommended that a mechanism be established so that users can easily determine whether a radio equipment conforms with the technical standards stipulated in the Radio Act at the time of purchasing a low-power radio equipment.

In response to this recommendation, the Japan Auto Accessories Manufacturers' Association (JAAMA) started a registration system for low-power radio equipment in June 2015 as a voluntary initiative to counter this problem.

(4) Preventing radio interference and obstruction

MIC has been implementing, since FY 2013, radio equipment trial purchase tests. The purpose is to safeguard ordinary consumers from violating the Radio Act (illegally establishing a radio station) by purchasing and using radio equipment that are not compliant with technical standards and to prevent these equipment from interfering or otherwise obstructing other radio stations. For the tests, MIC purchases radio equipment from the market sold as emitting very low power radio waves and measures the actual strength of emissions to see whether they are in conformity with the technical standards stipulated in the Radio Act. MIC publishes the test findings as consumer protection information.

Section 4 Developments in Broadcasting Policy

1. Encouraging distribution of broadcast content

(1) Encouraging overseas expansion of broadcast content

The overseas expansion of broadcast content goes beyond just exporting broadcast programs; Japanese broadcast content is expected to have large spillover effects in terms of boosting exports of regional products and services, including agricultural, forestry, and marine products, and attracting more overseas visitors to Japan. The Broadcast Program Export Association of Japan (BEAJ) was established in August 2013. With a broad range of participating stakeholders, including broadcasters, rights organizations, trading companies, and ad agencies, BEAJ is a joint public-private cross-industry organization that supports the overseas expansion of broadcast content. MIC works closely with BEAJ to enhance initiatives to export broadcast content to overseas markets.

(2) Proper production and trade of broadcast content

MIC established the Guidelines on Proper Production and Trade of Broadcast Content in 2009 in the interest of improving the production environment in the broadcast content field and adding incentives to produce broadcast content. The Guidelines aim to correct production transactions between broadcasters and program production houses. As part of this effort, MIC conducts regular follow-up studies on the Guidelines to determine the current state of broadcast content production transactions.

2. Advancements in broadcast services

(1) 4K and 8K

The Next-Generation Broadcasting Promotion Forum, consisting of broadcasters, receiver manufacturers, communications carriers, and other stakeholders, was established in May 2013. (The Forum merged with the Digital Broadcasting Promotion Association in April 2016 to form the Association for Promotion of Advanced Broadcasting Services.) The Forum has been the central player in promoting verifications of transmission technologies and the study of content production technologies for the early rollout of 4K and 8K broadcast services. MIC launched the Follow-up Meeting on the 4K / 8K Roadmap in February 2014, which released an interim report (roadmap) in September 2014.

The second interim report of the Follow-up Meeting on the 4K / 8K Roadmap, released in July 2015, provided a revised roadmap containing the future prospects of 4K / 8K and extended the roadmap's timeframe to around 2025.

(2) Smart TVs

In July 2013, the IPTV Forum set up the Advanced Smart Television Promotion Center to promote next-generation smart TVs, which differ from smart TVs to date in that they enable new broadcast and communications-linked services. The Center also works to create new business models and stimulate the market. Between January and March 2015, MIC conducted demonstration tests of application transmissions that communicated important public and social information in keeping with regional needs. The transmissions included public and regional information, including emergency and disaster information and tourism information. Based on the results of these demonstration tests, the IPTV Fo-

rum establishes and oversees hybrid-cast technical specifications so that practical services based on the specifications and compatible receivers can be provided.

(3) Cable platforms

Cable television is a key general-purpose ICT media for local regions, with subscribers surpassing a majority (about 29 million) of the nation's households. Nevertheless, more advanced and efficient cable television services are required. Accordingly the Japan Cable and Telecommunications Association has, since FY 2013, led efforts to implement and expand shared cable platforms for cable television. Cable platform operators have been providing, since December 2015, practical 4K broadcasts (cable 4K) along with IP VOD and other services.

3. Strengthening the disaster resilience of broadcast networks

To support the efforts of broadcasters and local public organizations aiming to strengthen the disaster resilience of broadcast networks, MIC, in the FY 2016 budget, is implementing the Assistance Program for Broadcast Network Establishment and the Assistance Program to Eliminate Poor Reception Areas for Commercial Radio.

4. Developing new broadcast media in vacated frequency bands

With the switchover from analog to digital terrestrial TV broadcasts, several frequency bands became available after the termination of analog terrestrial TV broadcasts and the reorganization of digital broadcast channels. MIC is looking to make effective use of these frequencies, such as assigning mobile phones and other devices to the empty frequency bands.

5. Ensuring the safety and reliability of broadcast infrastructure

MIC has developed rules concerning technical standards on broadcasting equipment, reporting major incidents with broadcasting equipment, and other matters in keeping with the June 2011 revised Broadcast Act. The rules have been taken in the interest of preventing broadcast outages and ensuring the safety and reliability of broadcast infrastructure, so that broadcasting fulfills its public mandate. Based on these rules, MIC is now taking proactive measures, such as obliging broadcasters to maintain broadcasting equipment correctly and requiring them to thoroughly investigate the causes of any serious accidents and take effective steps to prevent reoccurrence.

6. Various issues concerning broadcasting policy

MIC set up the Study Group on Broadcasting Issues in November 2015. The purpose of the Study Group is to investigate various issues affecting broadcasting from a mid-to-long term perspective. Examples include: (1) future possibilities for the broadcasting market and services; (2) initiatives to ensure and broaden the interests of viewers; (3) approaches to securing regional media and regional information in broadcasting; and (4) addressing issues surrounding public broadcasting.

Section 5 Handling Disputes between Businesses in the Information and Communications Field

1. Mediation and arbitration by the Telecommunications Dispute Settlement Commission

(1) Overview of the Telecommunications Dispute Settlement Commission

The Telecommunications Dispute Settlement Commission is a specialized organization for quickly and fairly handling increasingly diverse conflicts in the telecom field. The Commission has three functions: (1) performing mediation and arbitration to resolve conflicts between carriers and other businesses; (2) deliberating on and issuing reports in response to inquiries from the Minister for Internal Affairs and Communications when an order or ruling is to be issued; and (3) giving recommendations to the Minister for Internal Affairs and Communications on improvements to competition rules or other matters as part of its mediation, arbitration, and inquiry responses.

(2) Negotiation orders and rulings by the Minister for Internal Affairs and Communications

In the telecom field, when negotiations between telecom businesses fall apart on matters such as interconnection or shared use of telecommunications equipment, shared use of structures for telecommunications equipment and installations, or the provision of wholesale telecommunications services, a telecom business, based on the provisions of the Telecommunications Business Act, may apply to the Minister for Internal Affairs and Communications to issue an order to start or resume negotiations or to make a ruling on the matter.

Also, in the broadcast field, if negotiations between terrestrial TV broadcasters and cable TV operators or other businesses fall apart on matters such as rebroadcast agreements, the cable TV operator or other business may apply to the Minister for Internal Affairs and Communications to make a ruling on the matter based on the Broadcast Act (Law No. 132 of 1950).

Section 6 Promoting ICT Use and Application

1. Promoting ICT applications in education, medicine, and other fields

(1) Promoting ICT use and application in the education field

MIC launched the Leading Education System Demonstration Project, together with the Ministry of Education, Culture, Sports, Science and Technology, in FY 2014 in order to promote the further dissemination and deployment of ICT applications in the education field. The Project is working on demonstrating the Education Cloud Platform, which, along with seamlessly connecting schools and homes, will enable various kinds of digital teaching materials to be used. Schools will be able to introduce and operate the Education Cloud Platform at low cost.

(2) Promoting ICT use and application in medical, nursing, and health fields

a. Promotion of PHR

It is of interest to form a society in which citizens can maintain their health longer in later life and have access to quality health, medical, and nursing services. To study ways of enabling individuals to manage and utilize health, medical, and nursing information, and ways for health, medical, and nursing services to take advantage of the latest ICT technologies, such as mobile and 8K, MIC launched the Panel on Medical ICT Approaches for the Cloud Era, together with the Ministry of Health, Labour and Welfare, in June 2015. The Panel completed a report in November 2015.

b. Nationwide expansion of medical and nursing information coordination networks

MIC conducted demonstration trials of information coordination using cloud and other technologies at medical institutions, including the home healthcare and nursing fields, as a step toward realizing high-quality inexpensive medical care and nursing services. MIC compiles the results of these trials and makes them available to the public.

The importance of medical information coordination networks gained prominence in the wake of the Great East Japan Earthquake. The tsunami destroyed clinical records that were stored on paper at hospitals in the affected regions and patients' medical histories and past treatment information were lost. In response, MIC has taken steps since FY 2011 to provide financial assistance for the construction of medical information coordination networks in medical zones in the areas affected by the Great East Japan Earthquake. These steps aim to fulfill the Tohoku Medical Megabank Plan in partnership with the Ministry of Health, Labour and Welfare and the Ministry of Education, Culture, Sports, Science and Technology.

c. Establishment of ICT health models

As Japan faces a super-aged society, we need to respond to the aging population, the changes in the types of illnesses, and the increase in medical care and nursing needs so that citizens can live independently and maintain their health longer into later life. We also need to realize a society in which citizens can obtain the services they need, when they need them, at reasonable costs, while ensuring the sustainability of our social security system.

Since FY 2014, MIC has carried out large demonstration trials of big data analyses, such as medical exam data, to prevent lifestyle diseases. The aim is to extend healthy lives through prevention of the occurrence and worsening of lifestyle diseases.

d. Application of 8K technology to the medical field

8K technology allows the transfer of ultra-high-resolution images with realism almost identical to the real thing. Application of 8K technology in the medical field can lead to the realization of innovative medical services in many different areas.

MIC launched the Study Group on Applying 8K Technology for Intelligent Medicine, which has started looking at how to actualize the potential of medical applications for 8K technology as well as the potential and issues with applications of high-resolution image data in order to use intelligence to innovate in the medical field.

(3) Promoting telework

Telework applies ICT to enable flexible working arrangements that make better use of time and location. Telework is expected to improve the work-life balance of workers and raise the productivity of enterprises. The MIC's Study Group on Utilization of Telework and Wi-Fi to Bring out the Potential of Local Regions has been examining, since October 2014, ways to effectively use telework for local creation. The Study Group put together a recommendation for "hometown teleworking," which allows people to continue to carry out location-independent work previously done in Tokyo in local regions, and thereby maximize the essential characteristics of telework.

To further the widespread use of "hometown teleworking," MIC conducted demonstration trials of "hometown teleworking" approaches in FY 2015 tailored to the characteristics of specific local regions and business processes.

2. Regional development using information and communications infrastructure

(1) Promoting the widespread adoption of ICT best practices that help resolve regional issues

Individual regions are making various efforts to resolve the many issues Japan faces (such as a declining population, a falling birthrate and aging population, shortages of health practitioners, disaster preparedness, and decaying regional economies). MIC awards prizes to many leading examples of ICT use and application submitted by local regions that contribute to local creation. The goal of the awards is to promote the widespread adoption of ICT best practices that help resolve regional issues.

MIC received a total of 85 entries for the awards during October and November 2015 entry period. The Local computerization Award 2015 for contributions to local creation was selected from these entries.

(2) Establishing support systems through the deployment of ICT experts directed at regional stimulation

MIC has been conducting initiatives to build up local economies and communities by making use of ICT since FY 2007. Activities include sending Regional ICT Advisors — experts with knowledge and insight into regional ICT development — to regions motivated to revive their communities through ICT, providing assistance to build success models and propagating the results of these efforts nationwide. MIC dispatched Regional ICT Advisors 242 times in FY 2015.

(3) Contribution to building recovery communities through ICT infrastructure establishment and the restoration of ICT infrastructure

Of the areas struck by the Great East Japan Earthquake, the tsunami washed away or severely damaged local infrastructure in many localities. The construction of recovery communities, including relocating communities to higher ground, is going ahead based on recovery plans by local governments in affected areas, in tandem with other recovery efforts. The local governments in affected areas need to establish ICT infrastructure, including ultra-high-speed broadband, environments for receiving broadcasts, and communications infrastructure and systems for public facilities. ICT infrastructure is necessary to allow citizens to smoothly start new lives and facilitate recovery using ICT infrastructure.

MIC is implementing the ICT Infrastructure Establishment Project for Recovery Community Building in FY 2016, as a project to advance the use of ICT in regions affected by the Great East Japan Earthquake. The Project assists local governments that are establishing ICT infrastructure together with new community building toward recovery.

3.Promoting the use of open data

MIC has been implementing the Open Data and Big Data Application Promotion Project since FY 2015. The purpose of the Project is to associate the massive amount of information (big data) existing in society and markets with open data, and thereby contribute to the realization of a society that produces innovation through enterprise activities, consumer behavior, and lifestyles. The Project is engaging in demonstration trials in fields like tourism and community building where needs for data application are high in the private sector. Trials are also ongoing in fields where the advantages of open data are easily transferred to local government bodies and other organizations that possess data.

4.Promoting cyber security policy

(1) Examinations of execution plans for cyber security measures

Based on the Basic Act on Cybersecurity, established in November 2014, the new Cybersecurity Strategic Headquarters was established under the Cabinet in January 2015 to act as the government's control tower for cyber security policy. After examinations by the Headquarters, the Cabinet decided the new Cyber Security Strategy in September 2015.

(2) Strengthening cyber security policy

Since FY 2013, MIC has run CYDER (the CYber Defense Exercise with Recurrence), a hands-on cyber defense exercise that uses a large computer environment to simulate networks in an organization with thousands of employees. CYDER's purpose is to improve the cyber attack response skills of LAN administrators at government administration offices and key infrastructure enterprises.

To address the current situation where users have problems detecting and eliminating malware infections on their own, MIC, in partnership with Internet service providers (ISPs) and security vendors, has been involved with ACTIVE (the Advanced Cyber Threats response InitiatiVE) since FY 2013. ACTIVE is a joint public-private project that prevents and eradicates Internet users' malware infections.

With respect to the IoT, the IoT Security Working Group at the IoT Acceleration Consortium, in partnership with the Ministry of Economy, Trade and Industry, started examining, in January 2016, security guidelines for the design, manufacturing, and network connection of IoT devices, with a special focus on the inherent characteristics of IoT systems. The guidelines were released in July 2016.

At the same time, since cooperation with other countries is essential to establish meaningful cyber security, MIC is advancing ties with a number of countries through specific research projects. One of these proj-

ects is PRACTICE (the Proactive Response Against Cyber-attacks Through International Collaborative Exchange), a research project into technologies that provide early detection of signs of a cyber attack and initiate responses. The project, which ran until FY 2015, was an international collaboration, involving the United States and ASEAN nations. Another project is NECOMA (the Nippon-European Cyberdefense-Oriented Multilayer threat Analysis), a joint research project with Europe to enhance recoverability after a cyber attack.

5. Establishing barrier-free information environments

MIC runs a subsidy program to promote the development and provision of communications and broadcasting services for people with challenges, with the goal of eliminating the digital divide for older people and people with physical and mental challenges. Under the program, MIC assists with necessary funds for enterprises or other organizations developing or providing communications and broadcasting services to people with physical disabilities (such as phone-relay services for hearing-impaired people).

To promote the greater use of broadcasts for people with vision and hearing impairments, MIC established the Guidelines for Government Administration to Promote Broadcasts for the Vision and Hearing Challenged. The Guidelines set targets for the percentage of closed captioned broadcasts and broadcasts with audio commentary so that people with vision and hearing impairments can readily obtain information via broadcasts. MIC also encourages voluntary efforts by private TV broadcasters and assists with the production fees for closed captioned programming and programming with audio commentary.

Furthermore, to promote universal usage conditions, MIC issued guidelines on the operation of public websites in April 2016 to make it easier for everyone, including older people and people with physical and mental challenges, to use the websites of public institutions.

6. Developing ICT personnel

(1) Promoting education in programming

Educating people who can take the reins in the IoT era is important. MIC, in partnership with related ministries, agencies, and organizations, has decided to implement the Program to Promote Youth Programming Education. The Program will expand programming education, from initiatives to have children understand the significance of the programming that is all around them to more expansive initiatives.

(2) Raising ICT literacy

MIC takes actions for the safe and secure use of the Internet by children in partnership with the Ministry of Education, Culture, Sports, Science and Technology and communications organizations. The Ministry runs e-Net Caravans, a series of rotating lectures given across the country to guardians, teachers, and juvenile students. Additionally, it develops and disseminates teaching materials and other resources tailored to the characteristics of different media formats to encourage the sound use of media by children.

MIC developed the Internet Literacy Assessment Indicator for Students (ILAS) in FY 2011 as a test to ascertain accurately the Internet literacy levels among young people. MIC has been using the test on first-year high school students across Japan since FY 2012. For FY 2015, some questions were revised, and, with the large increase in participating schools and students, a questionnaire on the use of smartphones and ICT devices was conducted together with the test measuring the Internet literacy levels of young people. The results of the questionnaire were tabulated and analyzed and were released in November 2015 as the FY 2015 Youth Internet Literacy Indicators.

7. Developing cloud services

(1) ASP-SaaS-Cloud Promotion Council

To promote the expansion of ASP, SaaS, and the cloud, MIC, at the ASP-SaaS-Cloud Spread Promotion Council, which was established jointly with the ASP-SaaS-Cloud Consortium (ASPIC), is examining issues of concern when providing and using ASP, SaaS, and cloud services for the social capital field and other fields.

(2) Promoting regional ICT investment making use of the cloud and other technologies

MIC launched the Study Group on Promoting Regional ICT Investment Using the Cloud in January 2015 to examine specific measures to further advance ICT investments that help revitalize local regions. The Study Group put together a report in July 2015.

The report recommended the establishment of a promotion framework that seeks to revitalize local regions and increase productivity and profitability by switching businesses over to cloud services. In December 2015, eight private enterprises that concur with this recommendation set up the Organization for Cloud Utilization and ICT Investment by local enterprises.

8. Boosting productivity with ICT

(1) Assistance for the creation and growth of ICT ventures

As global competition intensifies, ICT venture companies that create new businesses with cutting-edge and innovative technologies and business models are expected to be the innovators that will further develop Japan's ICT industry. To this end, MIC, in cooperation with related ministries and agencies, takes steps to assist the creation and growth of ICT ventures in such areas as personnel hiring and training and information provision.

(2) Assistance through the Small Business Innovation Research program

The Small Business Innovation Research (SBIR) program aims to promote new business activities by SMEs. The program attempts to broaden the opportunities for SMEs to participate in national R&D projects and helps SMEs commercialize the resulting R&D outcomes from these projects. Seven ministries, including MIC, have earmarked specific subsidies for the program.

Section 7 Promoting ICT Research and Development

1. Promoting research and development strategies

The Information and Communications Council delivered an interim report, completed in July 2015, recommending priority R&D fields and topics, as well as a policy on promoting them, that the central government and the National Institute of Information and Communications Technology (NICT) should pursue. Based on the interim report, MIC decided to move ahead with R&D measures starting in FY 2016. In addition, the IoT Acceleration Consortium was set up in October 2015 as an industry-government-academia IoT promotion framework. Technology Development Working Group (Smart IoT Acceleration Forum), established under the Consortium, is making efforts to promote the development, demonstration, and standardization of IoT technologies.

2. Enhancing research and development to realize cutting-edge ICT in all parts of society

(1) Establishment and demonstration of common IoT platform technologies

MIC decided to conduct research and development, starting in FY 2016, on common platform technologies, such as technologies to quickly and efficiently connect massive numbers of IoT devices and technologies to consolidate IoT devices and services with different wireless standards and to connect and accommodate them in networks efficiently and securely. Also, MIC will conduct state-of-the-art pilot projects under industry-government-academia promotion frameworks and will enhance efforts toward international standardization of common IoT platform technologies in cooperation with smart city and other demonstration projects in Europe and the United States.

(2) Promoting research and development and pilot programs of autonomous mobility systems (autonomous driving and autonomous control technologies)

One of MIC's aims is the early implementation and widespread adoption of autonomous mobility systems in society. Therefore, MIC decided to promote, starting in FY 2016, unified R&D and public demonstrations of technologies that make communications networks more accurate and reliable and technologies that update and distribute advanced map databases with high efficiency.

(3) Promoting research and development into next-generation optical network technologies

NICT is researching and developing the base technologies to make possible fast, high-capacity, low-power networks (all-optical networks) with all signal transmissions and conversions done optically.

For its part, MIC is engaged in research and development laying the groundwork for products and markets relying on those base technologies, created through NICT research and development, with early commercialization potential.

(4) Promoting research and development and pilot programs of multilingual voice-based translation technology

MIC, under a five-year plan that began in FY 2015, is working to implement multilingual voice-based translation systems. This project necessitates other initiatives, such as research and development into noise-reduction technologies so that conversations can be recognized correctly in noisy environments. The performance of such technologies must be evaluated in real-world settings such as hospitals, commercial establishments, trains, and taxis.

(5) Research aiming to realize next-generation artificial intelligence

NICT's Universal Communications Research Institute is mainly working on research and development of technologies to analyze big data and multilingual voice-based translation technologies. NICT's Center for Information and Neural Networks (CiNet) is working to elucidate brain mechanisms and conducting research and development into network control technologies that make use of these mechanisms and into technologies to measure brain functions.

(6) Construction and application of test beds to accelerate the public implementation of research findings

NICT constructed the Japan Gigabit Network (JGN), an R&D test bed network, in FY 1999. The test bed has been made available to a wide range of domestic and overseas research institutes and has helped advance research and development into cutting-edge network technologies and testing of many applications. NICT started operating StarBED, a large-scale general-purpose Internet simulator in FY 2002. And in FY 2011, NICT began providing StarBED[3], a large-scale emulation platform, as a test bed for verifying many kinds of technology.

3. Assistance for creating innovation using competitive funding

(1) Strategic Information and Communications R&D Promotion Programme (SCOPE)

The Strategic Information and Communications R&D Promotion Programme (SCOPE) is a competitive funding program for research and development projects in the ICT field. Under SCOPE, research and development themes with originality and novelty are undertaken in order to attain the strategic, priority research and development targets set by MIC. The objectives of SCOPE are to create innovation in ICT, boost the R&D skills of researchers and research institutions, and create world-leading intellectual property.

(2) ICT Innovation Creation Challenge Program

The ICT Innovation Creation Challenge Program (I-Challenge!) was launched in FY 2014 to stimulate made-in-Japan innovation in the ICT field. I-Challenge!, which accepts submissions anytime, encourages universities and venture businesses to commercialize technologies and assists them in creating new business domains. The Program pushes for unification of research and development support and venture incubation support, making use of the private sector's commercialization expertise and know-how.

(3) Innovation Program

MIC has instituted the Innovation Program, which aims to discover creative talent in the ICT field where existing value and accepted practices do not necessary apply. The Program provides assistance to creative people who are taking on risky challenges with great potential in order to produce destructive, global-scale value in the ICT field. Under the Program, challenges with ambitious targets, using revolutionary approaches and productive failures that clarify the path to eventual success, are highly regarded.

4. Research and development programs promoting international collaborations in the ICT field

(1) Strategic international joint research in cooperation with foreign governments

MIC, in partnership with the European Commission, has been providing funding for joint research proposals from universities, private corporations, and other research institutes in Japan and Europe since FY 2012, based on an agreement from the May 2012 Japan-Europe Ministerial Meeting. In FY 2015, MIC solicited proposals for joint Japan-European research in two new areas: 5G and ICT robotics.

(2) Promoting international exchanges between researchers

NICT runs the International Exchange Program, which facilitates exchanges between researchers in different countries working in advanced communications and broadcasting fields. The Program promotes the sharing of the latest technology and research information, elevating technology levels, and developing human resources as well as contributes to furthering research and development and international cooperation.

5. Contributions to more resilient public infrastructure

MIC is pushing research and development and international standardization in the area of highly reliable, low-power communications technology that will collect and transmit data on seismic strains, vibrations, and other phenomena measured with sensors in order to make it possible to manage and maintain public infrastructure efficiently and effectively using sensors and other forms of ICT.

6. Other research and development programs

(1) Space communications technologies

MIC is conducting R&D into next-generation satellite communications technology for marine resource surveys as well as developing a next-term Engineering test satellite capable of large-capacity transmissions. NICT is running R&D programs looking at advancing satellite remote sensing, in addition to R&D into optical communications technologies.

(2) Future base ICT technologies

MIC and NICT are researching and developing new ultra-high-frequency ICT technologies. NICT is researching and developing quantum communications technology based on quantum cryptography and quantum signal processing as well as nano ICT technology and base electromagnetic sensing technology.

Section 8 Promoting International Strategies for ICT

1. Priority promotion themes for international policy

(1) Promoting overseas deployment of Japanese ICT

To promote overseas expansion activities by Japanese enterprises in the ICT field, MIC assists the overseas deployment of terrestrial digital TV broadcasting and the deployment of disaster-response and other ICT systems to ASEAN and Central and South American countries.

In the broadcasting field, the government and private sector are working together to further adoption of the Japanese ISDB-T standard for terrestrial digital TV. As of May 2016, the adoption of the Japanese standard had expanded to a total of 18 countries.

To take advantage of the opportunity presented by the export of the Japanese terrestrial digital TV standard, MIC urges countries that have not adopted a system to choose the Japanese standard. In countries that have adopted the Japanese standard, MIC helps Japanese enterprises enter the countries' broadcasting equipment markets as well as assists the expansion of businesses in other fields by making use of personal connections.

In November 2015, the Fund Corporation for the Overseas Development of Japan's ICT and Postal Services (Japan ICT Fund) was established. The public-private fund provides assistance, in the form of long-term risk money and the provision of experts, to enterprises engaged in telecommunications businesses, broadcasting businesses, or postal service businesses in other countries.

(2) Developing an environment for ICT overseas deployment and developing an environment for smooth distribution of information

MIC stresses two points in constructing international rules for cyber space: (1) the maximum regard must be given to the freedom to distribute information, not only to sustain democracy but also because information is the engine of economic growth and the source of innovation, and (2) the participation of the private sector, including private enterprises and civil society who actually use the Internet in their activities and manage networks, (a multi-stakeholder framework) is essential to ensure adequate cyber security. From this perspective, MIC actively participates in debates at bilateral and multilateral meetings.

2. Initiatives in international frameworks

(1) Asia-Pacific Economic Cooperation (APEC)

MIC serves as the chair of the Liberalisation Steering Group at APEC-TEL (Telecommunications and Information Working Group) meeting. While serving and contributing as the chair, MIC presents Japan's ICT policies and actively pushes forward ICT-related activities at APEC, such as advocating that universal broadband access be set as a shared goal for APEC member economies. TEL 54 was held in Kyoto Prefecture (at Kansai Science City, also known as Keihanna Science City) between October and November 2016.

(2) Asia-Pacific Telecommunity (APT)

The APT coordinates regional policies on human resources development, standardization, and wireless communications through training courses and seminars in order to develop information and telecommunications infrastructure in the Asia-Pacific region in a balanced manner.

MIC, using Japan's Extra budgetary Contributions, has accepted trainees in the ICT fields that are Japan's forte and assisted exchanges between ICT engineers and researchers.

(3) Association of Southeast Asian Nations (ASEAN)

Japan, as a dialogue partner country of ASEAN, exchanges opinions and proposals to strengthen Japan-ASEAN cooperation, making use of opportunities for dialog at the Japan-ASEAN Telecommunications and IT Ministers Meeting and the Conference of ASEAN Ministers responsible for Information (AMRI). Regarding the proposal of a workshop agreed to by both parties, Japan makes use of the Japan-ASEAN ICT Fund, established with contributions from Japan, to run the workshops.

(4) International Telecommunication Union (ITU)

The ITU carries out many activities including allocating frequencies, standardizing telecommunications technology, and aiding development in the telecommunications field in developing countries. Japan is an active contributor to ITU, obtaining chair and vice-chair positions in study groups in many different fields, taking leadership posts for various research topics, and making recommendations and proposals.

(5) World Trade Organization's Doha Round of negotiations

The telecommunications field is one of the most important trade-in-services fields at the Doha Round of negotiations at the World Trade Organization (WTO). Active negotiations are ongoing on further deregulation in the telecommunications field. Japan's telecommunications sector is one of the most deregulated in the WTO. As such, Japan is pushing other countries to eliminate or relax foreign capital regulations and other restrictions in the telecommunications sector.

(6) Organisation for Economic Co-operation and Development (OECD)

The OECD carries out studies and examinations of government policy issues related to information and

communications and their impact on economies and society through the exchange of opinions among member countries at the Committee on Digital Economy Policy (CDEP).

Section 9 Promoting ICT Applications in Government Services and Disaster Preparedness

1. Promoting e-government

(1) Promoting the widespread adoption of regional information platforms

Regional information platforms are a set of operational and technical rules (standard specifications) that make it possible to interconnect various information systems (for the exchange of digital information, etc.) owned by local governments. The Association for Promotion of Public Local Information and Communication (APPLIC) publishes and operates the Regional Information Platform Standard Specifications that cover 26 types of internal local government systems.

(2) Constructing local government ICT infrastructure that is resilient against disasters and accidents

The Local Government Cloud is an initiative that enables local governments to make use of system hardware, software, and data, via networks, that are managed and operated at an external data center. In other cases, information systems from multiple local governments are consolidated and shared between the local governments. The Local Government Cloud saves local governments from having to manage and operate system hardware, software, and data at their own offices.

MIC announced the Ten Guidelines to Accelerate E-Local Government Initiatives in March 2014. The purpose of the Guidelines is to further promote e-government initiatives by local governments that have started adopting the Local Government Cloud. In November 2014, MIC launched the Follow-up Study Group on the Ten Guidelines to Accelerate E-Local Government Initiatives, consisting of experts in the field and officials from local governments.

Considering the lessons of the Great East Japan Earthquake, MIC released an initial version sample of the Business Continuity Plans for ICT Units in Local Governments (ICT-BCP) in order to ensure the fluid execution of emergency response operations by preparing ICT units for crises. The plans focus on initial-response operations during the first 72 hours or so after the occurrence of a disaster. MIC has decided to provide support to local governments with ICT-BCP establishment and work to strengthen and enhance local governments' crisis-response abilities.

(3) Enhancing infrastructure to achieve citizen-centered e-government and more efficient administrative procedures

a. Application of the Basic Resident Registration Network System

The Basic Resident Registration Network System (Juki-Net) is a local government system that networks basic resident registries. The system enables the provision of personal identification records (name, address, date of birth, gender, Individual Number, resident register code, and update information) to government institutions and the administrative processing of basic resident registers between municipal boundaries. The Basic Resident Registration Network System has operated stably for over 13 years since it went into operation in August 2002, and it has assumed a pivotal role in improving convenience to residents and as infrastructure for e-government and e-local government.

Municipalities issued My Number cards starting in January 2016, and citizens can now obtain various forms of ID and certificates at convenience stores with their My Number card.

b. Public Certification Service for Individuals provided by the Japan Agency for Local Authority Information Systems

The Japan Agency for Local Authority Information Systems provides the Public Certification System for Individuals based on the Act on Certification Affairs of the Japan Agency for Local Authority Information Systems Pertaining to Electronic Signatures (Law No. 153 of FY 2002) to improve convenience for residents and help make administrative operations simpler and more efficient. Applications and procedures that can be done with the Public Certification Service for Individuals include filing tax returns and property registrations. As of April 1, 2016, the Public Certification System for Individuals was being used for procedures from 9 central government ministries and agencies and all prefectural and municipal governments.

2. Promoting ICT applications in the disaster preparedness field

(1) Establishing resilient fire, safety, and disaster preparedness communications networks

Currently, five major communications networks making up the fire, safety, and disaster preparedness communications networks connecting the national government, the Fire and Disaster Management Agency, local governments, and residents have been constructed.

The five networks are: (1) a central disaster administration wireless network for collecting and transmitting information within government; (2) a fire-prevention and disaster wireless network that connects the Fire and Disaster Management Agency and prefectural governments; (3) prefectural disaster administration wireless networks that connect prefectures with municipalities; (4) municipal disaster administration wireless networks that connect municipalities with residents; and (5) a sat-

ellite communications network that connects the national government with municipalities and municipalities with each other.

(2) Deploying mobile communications equipment for disaster responses

MIC lends out mobile communications equipment for disaster responses (300 satellite phones, 280 MCA radios, and 900 convenience radios have been deployed to Regional Bureaus of Telecommunications nationwide) in response to requests from local governments and other agencies to ensure they have communications in disaster-affected zones even when mobile phones and other forms of communications are lost.

(3) Ensuring emergency communication means during disasters

In consideration of the lessons from the Great East Japan Earthquake, MIC launched the Study Group on Approaches to Emergency Communications Means during Large-Scale Disasters in November 2015. The Study Group is examining approaches to emergency communications means that are essential for medical care and relief work, based on the assumption that mobile phones and other communications means will be interrupted or congested during a disaster.

Furthermore, given that telecommunication services provided over public communications networks will be difficult to use during a disaster, MIC began in FY 2016 deploying, at Regional Bureaus of Telecommunications and other facilities, attaché-case-sized ICT units developed by MIC. MIC has also established systems to ensure local governments and other agencies have necessary communications means, such as lending out the ICT units in response to requests from disaster-response authorities at local governments and other agencies.

(4) Establishment of a national early-warning system (J-ALERT)

MIC's Fire and Disaster Management Agency is establishing J-ALERT, a national early-warning system that instantly communicates emergency information to residents. Using J-ALERT satellites and terrestrial links, the national government (from the Cabinet Secretariat or Meteorological Agency via the Fire and Disaster Management Agency) transmits tsunami warnings, earthquake early warnings, ballistic missile launch notices, and other information that requires immediate action. J-ALERT also automatically activates municipal (broadcast) disaster-management administration radio systems.

(5) Promotion of disaster preparedness x ICT

MIC is tackling the nationwide rollout of L Alert (a disaster-information sharing system) as a shared platform connecting local governments and lifeline operators that issue evacuation instructions and orders and other public information with broadcasters and communications carriers that transmit public information. L Alert is hoped to be a shared platform both during times of disasters and during the reconstruction period. L Alert can be used to immediately provide residents with necessary public information via various kinds of media, including TV, radio, smartphones, and the Internet.

Furthermore, MIC is promoting coordination between L Alert and G-space information and encouraging local governments to implement L Alert in their disaster-preparedness information systems. These initiatives are being taken to effectively deploy the outcomes of the G-Space Disaster-Preparedness System and, thereby, realize a secure society resilient against disasters. (The G-Space Disaster-Preparedness System was a result of the G-Space City Construction Project and is a cutting-edge disaster-preparedness system constructed using quasi-zenith satellites and other technologies for large-scale disasters, such as earthquakes and tsunami, where damages cover large areas and emergency responses are necessary.)

Section 10 Developments in Postal Service Administration

1. Promoting postal service administration

The 2012 amendment to the Postal Service Privatization Act (Law No. 97 of 2005) expanded the scope of universal service, which had been limited to postal mail service, to cover basic savings and insurance services. The revision also mandated that these services all be made available at post offices. In September 2015, MIC received a final report from the Information and Communications Council, which laid out a direction for measures to ensure the universality of postal services.

2. Promoting postal service administration in the international field

As emerging and developing countries tackle modernizing and advancing their postal operations, MIC is working to deploy Japanese-style postal infrastructure systems to these countries. By providing Japan's superb knowledge and technology in the area of postal operations, we hope to further social and economic development in partner countries and strengthen bilateral ties.

3. Promoting the correspondence delivery business

The Act on Correspondence Delivery by Private-Business Operators (Law No. 99 of 2002) paved the way for

private enterprises to enter the correspondence delivery business, which had been monopolized by the state.

Correspondence delivery falls into two categories: general correspondence delivery businesses, which provide general correspondence services nationwide, and specified correspondence delivery businesses, which offer limited correspondence delivery services that do not undermine the provision of universal postal mail services. As of March 31, 2016, 469 operators had entered the specified correspondence delivery business.