

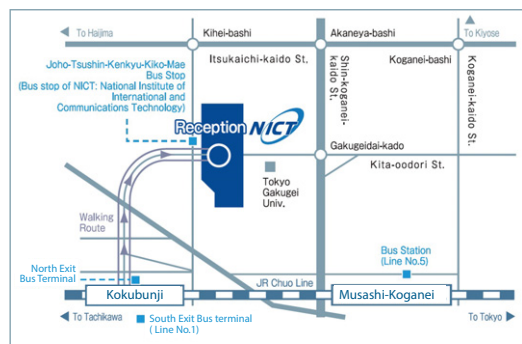
Access

R&D Base



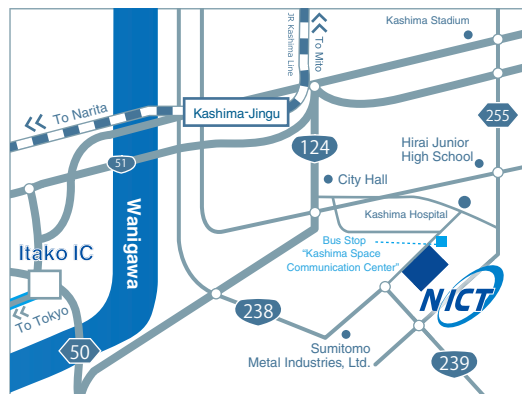
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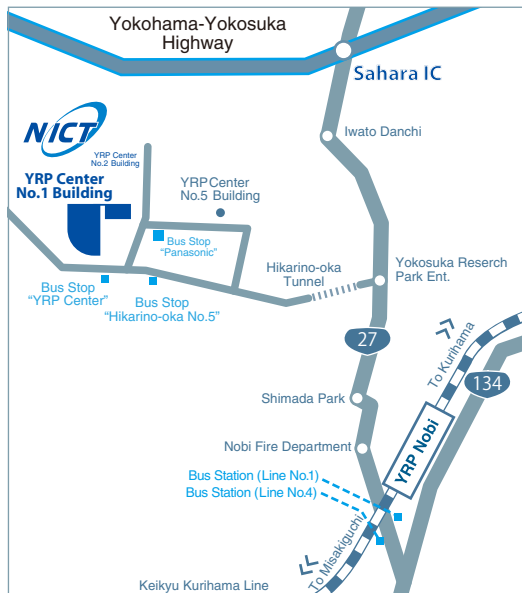
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Creating our future and our today
with wireless



Wireless Network Research Institute



Speed, Capacity, Reliability and Scalability

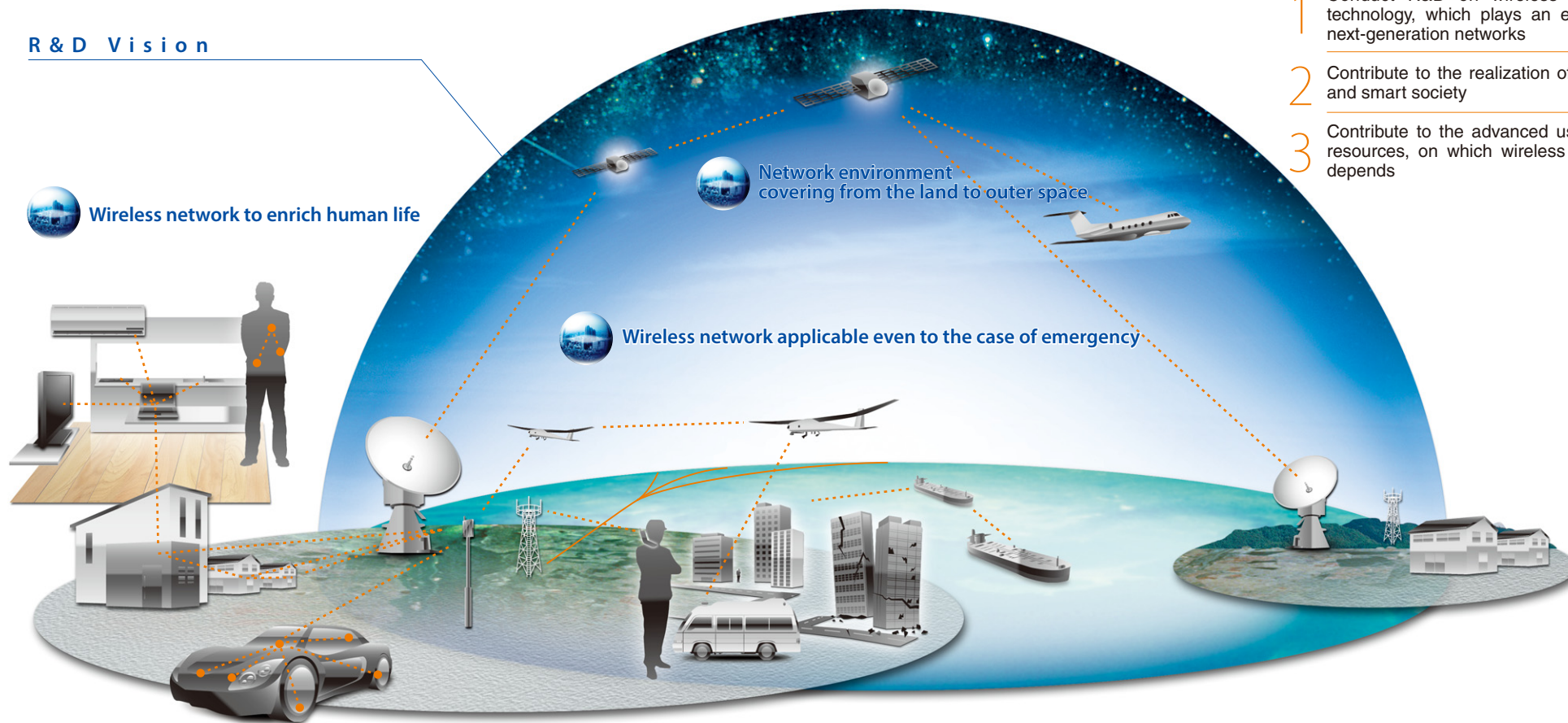
We lead in the development of wireless communications to realize a more secure, safer, and smarter society.



Wireless technologies work out of sight to allow people to carry out rich communications with peace of mind. For example, wireless technologies are used in most communication devices around us, including mobile phones, TV sets, radios, and GPS devices. Further, satellite communications and mobile phones are the most essential as means of communication in places such as mountainous areas and island nations, where optical cables are difficult to be laid, and in times of disaster. We were again reminded of the effectiveness of wireless communication technologies during the Great East Japan Earthquake. Wireless communication technologies have become indispensable to our daily lives.

The Wireless Network Research Institute of the National Institute of Information and Communications Technology (NICT) conducts research and development of wireless communication and wireless network technology to allow people and things to flexibly and reliably communicate under any kinds of situations through the effective use of frequency and energy resources.

R & D Vision



Background

The history of wireless research at the National Institute of Information and Communications Technology (NICT) dates back to when the Radio Telegraph Research Division of the Electrotechnical Laboratory under the Ministry of Communications began radio telegraph research in 1896. This marked the commencement of Japan's wireless communication research.

Over the next one hundred and ten years or so, wireless communication technology evolved dramatically, but as use of the Internet and mobile phones is spreading and services are becoming increasingly diversified, the volume of traffic has been growing explosively and frequencies are now in short supply.

Mission

- 1 Conduct R&D on wireless communication technology, which plays an essential role in next-generation networks
- 2 Contribute to the realization of a secure, safe and smart society
- 3 Contribute to the advanced use of frequency resources, on which wireless communication depends

Sowing seeds of technology and making them bear fruit

Activities to bring research results to society

We carry out social contribution activities, aiming to promote awareness among Japanese citizens about the results of our research and have them used effectively in society.



1. Promotion of standardization

The adoption of technologies originating from Japan as international standards gives rise to new industries and contributes to the growth of the Japanese economy. NICT actively conducts strategic standardization activities at international standardization organizations (ITU-R, IEEE, etc.) and domestic standardization organizations (ARIB, TTC, etc.), as well as at various forums.

[Major international standardization achievements (Apr.2006 to Mar. 2012)]

- ▼IEEE802.15.4a "Direct Spread Ultra-Wideband (UWB) Wireless System"(Mar. 2007):This system simultaneously supports low-speed communication and ranging and positioning using impulse UWB. It supports sensor networks, etc.
- ▼IEEE1900.4/6 "Cognitive Radio System" (Feb. 2009/Jun. 2011):This standard defines wireless network configurations to improve total throughput and service quality in existing environments, where multiple wireless technologies coexist, along with an interface for frequency sensing in cognitive radio systems.
- ▼IEEE802.15.3c "Wireless Medium Access Control (MAC) and Physical Layer (PHY)Specifications for High Rate Wireless Personal Area Networks (WPANs)" (Sep. 2009):These specifications realize high-speed communication of 2 Gbps or higher using millimeter waves in the 60 GHz band with a communication radius smaller than approximately 10 m. One of the aims is the delivery of high-definition uncompressed video in the home.
- ▼IEEE802.22 "Cognitive Wireless Regional Area Networks (WRAN) for Operation in TV Bands" (Jul. 2011):This technology allows wireless communication at a maximum speed of 22 Mbps in a radius of 100 km using the VHF and UHF bands. It allows the provision of broadband communications over wide areas at low cost.
- ▼IEEE802.15.6 "Wireless Body Area Networks (WBAN)" (Feb. 2012):These are short-range wireless networks built with various types of sensors and devices placed around the human body. In addition to the medical field, potential fields of application include music players.
- ▼IEEE802.15.4g/4e "Smart Utility Networks (SUN)" (Mar. 2012/Mar. 2012) These define specifications for physical and MAC layers for realizing Smart Utility Networks (SUN) to effectively perform automatic meter reading for gas, electricity and water using smart meters.

2. Research collaborations

In addition to joint research with universities, companies, and research organizations both overseas and in Japan, and also commissioned research, we actively carry out funded research for the effective usage of radio frequency resources supported by the spectrum user fee, and we also take in trainees and conduct internships.

3. Public relations activities

We put out information such as research outcomes and activity statuses on an ongoing basis through press releases and the Internet. Our PR activities include also symposia, seminars and other events, along with exhibits.

4. Technology transfer and commercialization

We perform technology transfers of intellectual property including patents, programs, databases, and know-how, to industry.

[Actual examples]



5. Release of research outcomes

Various information about our research outcomes, such as research papers, oral presentations, and awards received, is released through the online NICT Research Results Disclosure System, leading to actual use in the private sector.