

## Activities and Standardization Trends in ITU-R SG 9 (Fixed Wireless Service)

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### Abstract

ITU-R SG 9 (International Telecommunication Union Radiocommunication Sector Study Group 9) is carrying out technical studies and producing/maintaining Recommendations concerning technical or operational questions about fixed wireless service systems and networks via terrestrial stations. This article describes recent trends in the activities of SG 9 and outlines the meeting held in Kobe from June 27 to July 5 this year.

### 1. Structure of ITU-R SGs and scope of SG 9

ITU-R [1] is the Radiocommunication Sector of the International Telecommunication Union (ITU [2]),

which is a United Nations organization. It consists of seven Study Groups (SGs), each responsible for a different radio communication system. The structure of ITU-R SGs is shown in **Fig. 1**. Each SG is carrying

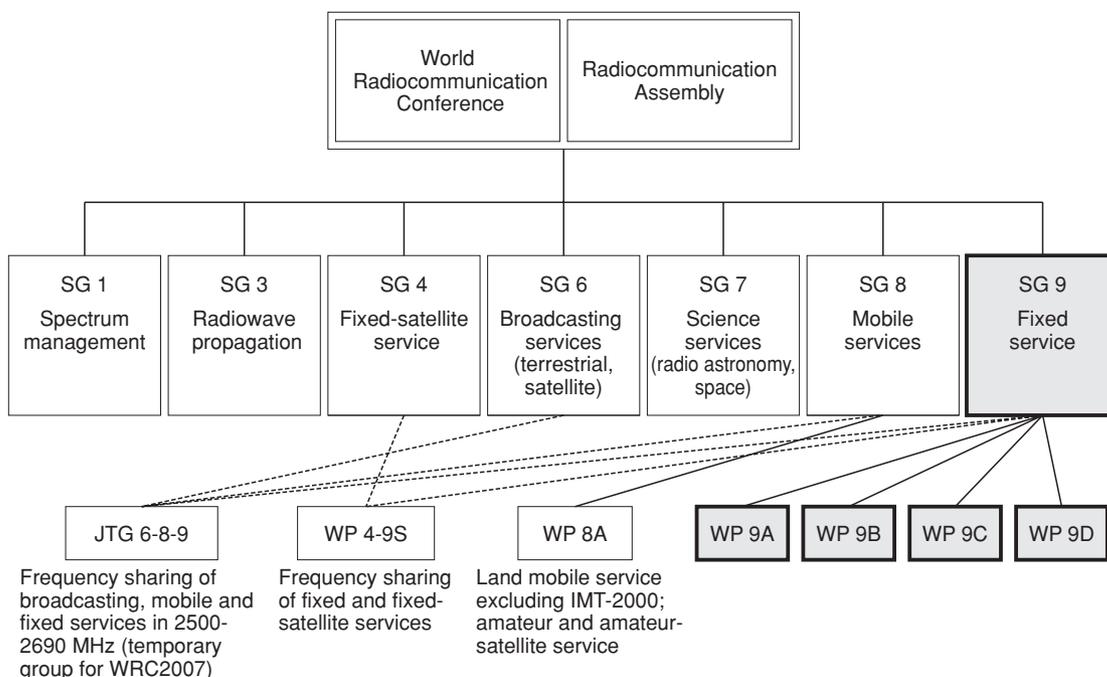


Fig. 1. Structure of ITU-R SGs.

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Table 1. Scope and chairmen of WPs under SG 9. (study period 2003–2007).

	Scope	Chairman (country)
SG 9	Fixed service	V. M. Minkin (Russia)
WP 9A	Performance and availability, interference objectives and analysis, effects of propagation, and terminology	L. Soussi (Tunisia)
WP 9B	Radio-frequency channel arrangements, radio system characteristics, interconnection, maintenance, and various applications	A. Hashimoto (Japan, NTT Docomo)
WP 9C	Systems below 30 MHz (HF and others)	N. M. Serinken (Canada)
WP 9D	Sharing with other services (except for the fixed-satellite service)	K. Medley (USA)

out technical studies to produce or maintain Recommendations that address questions assigned by the Radiocommunication Assembly. Most of this work results in revisions to the Radio Regulations in the World Radiocommunication Conference (WRC). Each SG has Working Parties (WPs) in which practical discussions are held. The scope and chairmen of the WPs under SG 9 are shown in **Table 1**. In addition, Japan's policy in ITU activities is being deliberated by the ITU-R Working Party in the Information Communication Technologies Section Meeting in the Information and Communications Council, which is an advisory panel for the Ministry of Internal Affairs and Communications (MIC). Japan's policy for SG 9 activities is decided by the Fixed Service Committee under this ITU-R Working Party.

## 2. Recent trends in ITU-R SG activities

There have been two recent trends in ITU-R SG activities:

### (1) Intensification of inter-SG study activities

New wireless applications that utilize both fixed and mobile wireless methods are now appearing one after another. It is difficult to classify these integrated applications within the conventional ITU-R SGs. These new applications are creating a need for technical requirement studies on frequency sharing with other wireless systems. These recent trends are intensifying inter-SG study activities. SG 9 is currently conducting inter-SG study activities with:

- SG 4 (fixed-satellite service) on frequency sharing for fixed and fixed-satellite services
- SG 8 (mobile services) on technical characteristics in the integrated application of fixed and mobile services
- SG 3 (radiowave propagation) on the evaluation of radio propagation considering technical characteristics in the integrated application of fixed

and mobile services and

- JTG 6-8-9 (Joint Task Group under SGs 6, 8, and 9; a temporary group for WTC2007) on frequency sharing for broadcasting, mobile, and fixed services in the range of 2500–2690 MHz.
- (2) Harmonization with other standardization organizations

Another recent trend is the harmonization of *de jure* and *de facto* standards. *De facto* standards, produced by standardization organizations in the private sector, such as service vendors, are becoming highly regarded as well as *de jure* standards produced by standardization organizations of public institutions, such as ITU. This harmonization is leading to closely related standards. In line with this trend, SG 9 has adopted ITU-R Recommendation F.1763 “Radio interface standards for broadband wireless access (BWA) systems in the fixed service operating below 66 GHz” based on *de facto* standards IEEE802.16-2004 and ETSI HIPERMAN. Such harmonization is beneficial for both parties as the issuance of an ITU-R Recommendation affects frequency assignment plans and deployment plans for systems and equipment throughout the world.

## 3. SG 9-related WP meetings in Kobe, Japan

SG 9-related WP meetings initiated by the MIC were held in the Kobe Fashion Mart convention center in Kobe from June 27 to July 5, 2006. There were approximately 140 participants (approximately 50 from Japan including 10 from the NTT Group). It has been 15 years since the last ITU-R meeting in Japan (1991). There were approximately 120 input documents, including 19 from Japan, and 70 output documents. There was also an exhibition in the convention center to demonstrate the appeal of Japan's advanced wireless systems and technologies such as WIPAS (wireless IP access system) [3]. There were two main

outputs, as explained below.

### 3.1 Integrated applications of different services

(1) Draft New Report on fixed BWA characteristics and applications

A Draft New Report on the general technical characteristics of fixed BWA has been developed in WP 9B over the last two years. Japan proposed the addi-

tion of two technical notes to the draft in this meeting. One is an interference reduction technique for quasi-millimeter FWA systems as shown in **Fig. 2**, which was developed by NTT Laboratory [4]. The other is an example of integrated BWA application of fixed and mobile systems (Internet access from a moving train), as shown in **Fig. 3**. With these improvements, the draft was adopted as a Draft New Report. (It was

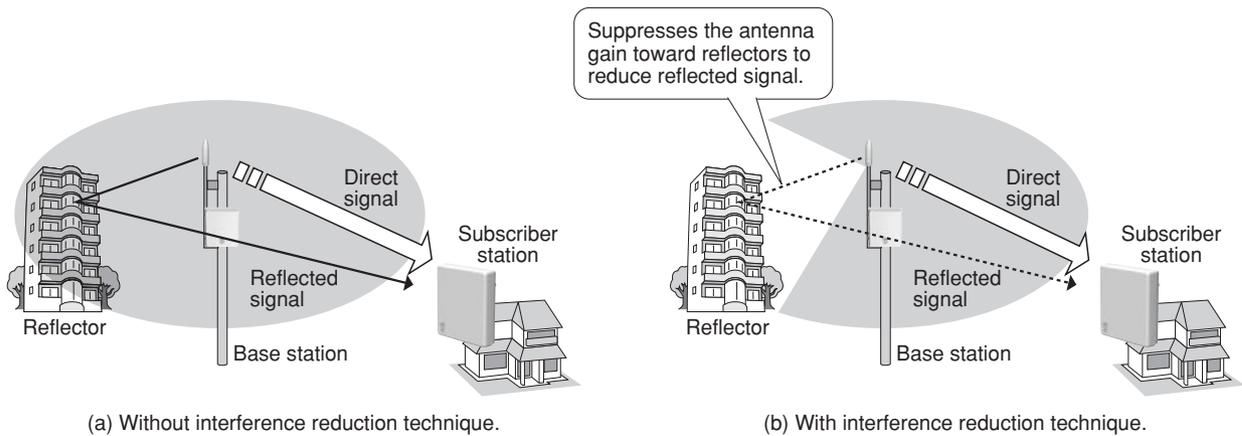


Fig. 2. Interference reduction technique for quasi-millimeter FWA system.

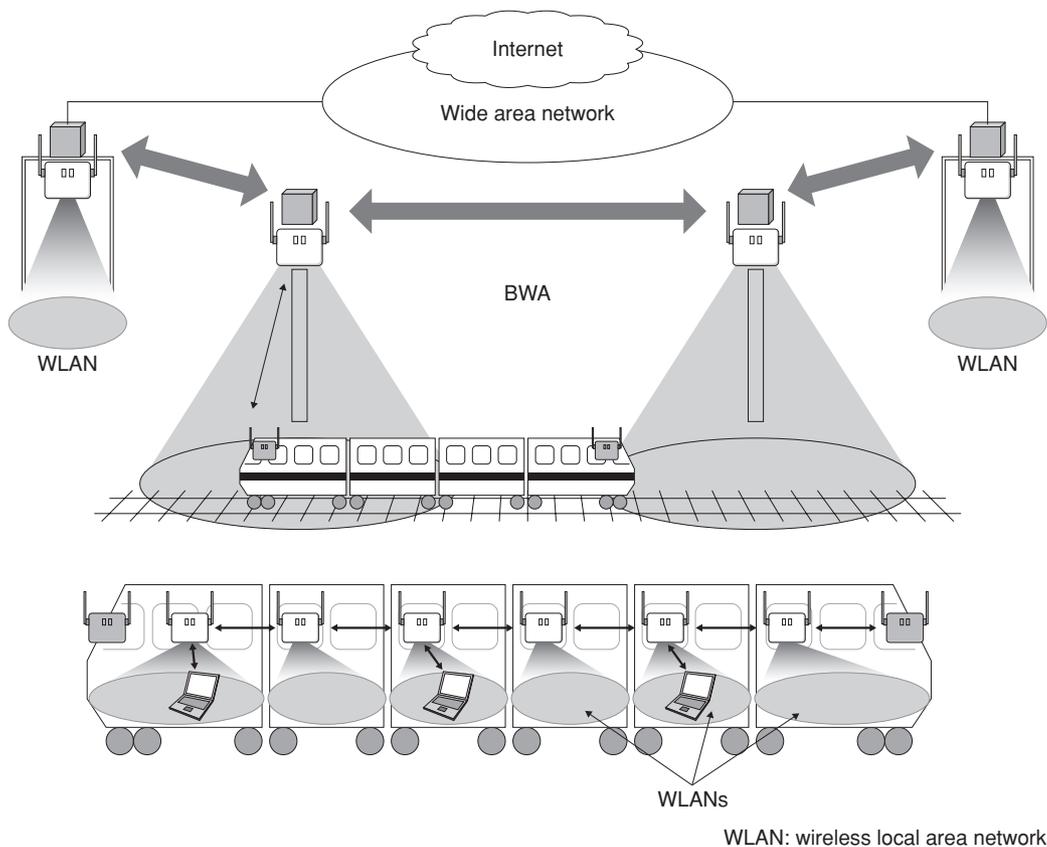


Fig. 3. Example of integrated BWA application of fixed and mobile systems.

adopted at the SG 9 meeting in September 2006 as well.)

- (2) Exchange of views with WP 8A on wireless access

WP 8A is the subsidiary of SG 8 that deals with general mobile services. It is also studying BWA as a mobile service. WP 9B and WP 8A have exchanged views on frequency sharing studies, the drafting of a New Recommendation/Report, and revisions to Recommendations about BWA systems.

### 3.2 Frequency sharing

- (1) Revision of Recommendation F.1336 on reference radiation patterns of antennas in sharing studies

The selection of antenna reference radiation pattern models is important in evaluating the interference accurately in sharing studies. WP 9D has been studying improvements in the antennas radiation pattern models used for base stations of fixed and mobile wireless access systems for several years. At the Kobe meeting, Japan (NTT Group) proposed the addition of measured antenna patterns and an optimal formula model that matches the measured antenna patterns in the Recommendation. With these modifications, the draft was adopted as a Draft Revision of the Recommendation. (It was adopted at the SG 9

meeting in September 2006 as well.)

- (2) Revision of Recommendation F.758 on fixed system parameters used in frequency sharing

To evaluate the effect of interference on error performance more accurately, it was proposed to add to this recommendation some consideration of i) the relationship between interference and the degradation of error performance and ii) system parameters used in frequency sharing studies.

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### 4. Future activities in ITU-R SG 9

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We will continue to promote standardization activities in ITU-R SG 9 to enhance the international competitiveness of the wireless access systems developed by NTT Group R&D.

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### References

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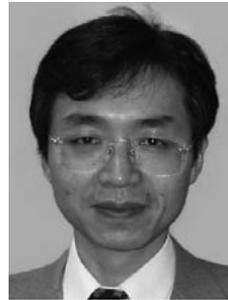
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