



## Preface

# Toward the Reality of Ubiquitous Networks

A handwritten signature in black ink, appearing to read 'Hiroaki Takeichi'.

Hiroaki Takeichi  
Corporate Vice President  
& Group President,  
Network Systems Group

It was in 1999 that Fujitsu first defined its business slogan as “Everything on the Internet,” and since then we have been actively expanding and deploying our business worldwide in the IT and communication industries. Particularly, in the communication industry, the market share of mobile communications has been drastically increasing compared to other forms of communications. The number of subscribers of mobile communications worldwide has exceeded expectations, surpassing almost 900 million with a positive forecast of 1.9 billion by the end of 2006.

Taking a glance toward the domestic market, it has been reported that the number of cellular telephone subscribers as of October 2002 exceeded 78 million. In addition, it is notable that more than 50 million subscribers are using mobile terminals to access the Internet via mobile Internet services such as NTT DoCoMo’s i-mode<sup>®</sup>, <sup>note</sup> KDDI’s EZweb, and J-PHONE’s J-SKY. In order to further enhance capability and serviceability, the current mobile communication system is moving toward what is called the 3rd generation mobile system, or International Mobile Telecommunication 2000 (IMT-2000). This new system will make mobile multimedia communications a reality and enable any terminal to be used anywhere in the world (this ability is called global roaming). Moreover, research has already been started for systems beyond IMT-2000, especially in Japan and Europe.

Having anticipated these trends in the market environment and technology, Fujitsu conducted a series of proactive field tests from 1993 to 1996, which led to extensive R&D for the constituent technical enablers for Wideband Code Division Multiple Access (W-CDMA). Fujitsu completed the development work for commercialization of a W-CDMA system comprising all the network nodes, for example, the Node Bs,

RNCs, and MMSs, which allowed Fujitsu to start shipping the equipment to NTT DoCoMo in January 2001. The long and hard work we undertook finally came to fruition in the form of an integrated W-CDMA system, and we took the global lead by inaugurating a nationwide, commercial W-CDMA system in Japan.

Moreover, Fujitsu has also been making great contributions to the standardization process. Based on its proactive research work, Fujitsu's delegates and officials have been helping to complete the specification sets for global use by participating in standardization organizations such as the ARIB in Japan and the 3rd Generation Partnership Project (3GPP) in Europe. They are also participating in the 3GPP2, which is a US counterpart to the 3GPP.

This special issue is mainly devoted to some of the major technical themes in the realization of the IMT-2000 system, starting with Fujitsu's approach to the challenge of wireless communications. Then, it gives technical descriptions of the fundamental network nodes necessary for an IMT-2000 system, the radio access technologies, the signaling scheme, and the mobile terminals. It then continues with advanced technologies such as adaptive array antennas and a highly efficient power amplifier and also covers some of the service aspects and standardization activities.

We are particularly proud that, through the marriage of more than a decade of fundamental research and cutting-edge semiconductor technology, Fujitsu was the first in the world to build a highly efficient power amplifier for base stations. Fujitsu's W-CDMA systems are spreading not only in the domestic market but also in the global market, helping to maintain our competitive position in the industry. Backed up by these technologies, Fujitsu now has an excellent reputation in Japan as an important equipment vendor for NTT DoCoMo and KDDI. Fujitsu is also expecting to deploy its IMT-2000 technology in Europe and China through close collaboration with Evolium SAS, which is a joint company of Fujitsu and Alcatel of France.

The world is undergoing a drastic and inevitable shift from legacy technologies to innovative and revolutionary solutions for realizing a broadband Internet and ubiquitous wireless communications. We at Fujitsu believe that IMT-2000 is an important steppingstone towards this goal. I am looking forward to seeing these technological dreams come true and am therefore very pleased to introduce this special issue on IMT-2000. In its pages, you will read about the fruitful outcomes of Fujitsu's R&D of IMT-2000 and related standardization activities. I sincerely hope that this issue will provide you with some exciting visions of the coming IT society.

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note) i-mode is a registered trademark of NTT DoCoMo, Inc.