

RECOMMENDATION ITU-R M.1822

Framework for services supported by IMT

(2007)

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1 Introduction

International Mobile Telecommunications-Advanced (IMT-Advanced) systems are mobile systems that include the new capabilities of IMT that go beyond those of IMT-2000. Such systems provide access to a wide range of telecommunication services including advanced mobile services, supported by mobile and fixed networks, which are increasingly packet-based.

IMT-Advanced systems support low to high mobility applications and a wide range of data rates in accordance with user and service demands in multiple user environments. IMT-Advanced also has capabilities for high-quality multimedia applications within a wide range of services and platforms providing a significant improvement in performance and quality of service.

The key features of IMT-Advanced are:

- a high degree of commonality of functionality worldwide while retaining the flexibility to support a wide range of services and applications in a cost efficient manner;
- compatibility of services within IMT and with fixed networks;
- capability of interworking with other radio access systems;
- high-quality mobile services;
- user equipment suitable for worldwide use;
- user-friendly applications, services and equipment;
- worldwide roaming capability;
- enhanced peak data rates to support advanced services and applications (100 Mbit/s for high and 1 Gbit/s for low mobility were established as targets for research)¹.

These features enable IMT-Advanced to address evolving user needs.

The capabilities of IMT-Advanced systems are being continuously enhanced in line with user trends and technology developments.

The framework and overall objectives of the future development of IMT-2000 and systems beyond IMT-2000 are described in Recommendation ITU-R M.1645. Furthermore, based on Recommendation ITU-R M.1645, ITU-R had developed IMT-Advanced related documents such as Reports ITU-R M.2072 and ITU-R M.2074.

IMT-Advanced is expected to be a platform that could provide novel services, which are either a profound improvement of present ones or a revolution that leads to applications that might change people's lives. Therefore, one of the most important tasks is to provide a framework for the high-level requirements for services to be delivered by IMT from end-user's point of view and illuminate the requirements from other perspectives on this basis.

2 Scope

This Recommendation addresses the high-level requirements for telecommunication services and applications to be supported by IMT, including the future development of IMT-2000 and IMT-Advanced. It includes service parameters and service classifications of IMT. This Recommendation also includes examples of telecommunication services that may be supported by IMT.

¹ Data rates sourced from Recommendation ITU-R M.1645.

3 Related ITU documents

List of related ITU-R Recommendations and Reports:

- 1 [Recommendation ITU-R M.816-1](#) – Framework for services supported on International Mobile Telecommunications-2000 (IMT-2000).
- 2 [Recommendation ITU-R M.1645](#) – Framework and overall objectives of the future development of IMT-2000 and systems beyond IMT-2000.
- 3 [Report ITU-R M.2072](#) – World mobile telecommunication market forecast.
- 4 [Report ITU-R M.2074](#) – Radio aspects for the terrestrial component of IMT-2000 and systems beyond IMT-2000.
- 5 [Recommendation ITU-R M.1079-2](#) – Performance and quality of service requirements for International Mobile Telecommunications-2000 (IMT-2000) access networks.

List of related ITU-T Recommendations:

- 1 [ITU-T Recommendation Q.1702](#) – Long-term vision of network aspects for systems beyond IMT-2000.
- 2 [ITU-T Recommendation Q.1703](#) – Service and network capabilities framework of network aspects for systems beyond IMT-2000.
- 3 [ITU-T Recommendation Y.2001](#) – General overview of NGN.
- 4 [ITU-T Recommendation Y.2011](#) – General principles and general reference model for Next Generation Networks.

4 List of definitions, acronyms and abbreviations

4.1 Definitions

None.

4.2 Acronyms and abbreviations

ID: Identification

IMAP: Internet message access protocol

IMT: International Mobile Telecommunications

IP: Internet protocol

IT: Information technologies

ITS: Intelligent transport systems

LAN: Local area network

MMS: Multimedia messaging service

MOS: Mean opinion score

PDA: Personal digital assistants

POP: Post office protocol

PSAP: Public safety answering point

PTT: Push-to-talk

QoS: Quality of service

RX: Receive
 SMS: Short messaging service
 TX: Transmit
 URL: Uniform resource locator
 VoIP: Voice over IP

5 Considerations

The ITU-R Radiocommunication Assembly,

considering

- a) the possible involvement of several types of networks;
- b) the increasing technical developments and opportunities;
- c) the need of many users for services which are not bounded by geography or operators;
- d) the necessity of priority services (e.g. emergency calls shall be supported as higher priority than other commercial services);
- e) that the services supported by IMT will be operated in an environment which requires recognition of the following factors:
 - e-1) *Low cost*: Users want diverse, affordable, and convenient mobile services. Such demands will be realized by development of technology that will reduce the cost per packet.
 - e-2) *High data rate*: Services such as video phone, streaming, and video-on-demand, which are currently available via wired networks will be required to be supported via wireless networks with higher broadband capacity with anytime, anywhere availability.
 - e-3) *Convergence*: The rapid development of information technology (IT), including the Internet, has resulted in the aggregation and convergence of various networks and digital devices. In addition to the aggregation of data and voice, the integration of wired and wireless communications is ongoing.
 - e-4) *Personalization*: As society becomes diversified, user-customized, personalized services will need to be provided in lieu of the existing standardized services.
 - e-5) *Wide range of terminals*: A wide range of terminals is desired for future mobile services. Some users may need an affordable voice-centric terminal while other users would prefer a versatile mobile phone that could provide not only traditional functions like telephony, but also utilities such as a digital camera, music and movie player, map guidance, e-Wallet, etc. For connecting to the electric, electronic, and mechanical machine surrounding user, short-range communication devices could be merged to the terminals.
 - e-6) *Multiple profile*: Services should support multiple profiles in various environments. For example, voice telephony may support many different quality levels. In some cases, a voice call has a typical data rate of 12.2 kbit/s, while in other cases, a voice call may have a data rate of 40 kbit/s. From a user's viewpoint, voice telephony is one single service, but may support multiple profiles in multiple environments.
 - e-7) *Multi-application support*: Users will simultaneously use several services. One example is that a user could make a phone call while continuing to walk under the guidance of a real-time map downloaded to the same device.

- e-8) *Environment awareness*: The services will support an environment-awareness function. This means that the services can automatically adapt to different environments. Users will not need to change the settings of the application manually. Environment information can be acquired, understood and handled by the services themselves;
- f) that the following technology trends are contributing to the development of new and novel services for wireless applications:
 - f-1) *Personal networking*: Connecting different electronic devices within a person's immediate surroundings to facilitate real-time communication of data (e.g. multimedia, file transfer, connection to Internet).
 - f-2) *Home networking*: Connecting the different electronic devices and appliances in a household by way of a local area network (LAN) to allow for real-time communication of data (e.g. multimedia, remote control, connection to Internet, file transfer).
 - f-3) *Intelligent transportation and vehicular networking*: Broad range of diverse technologies applied to transportation to make systems safer, more efficient, more reliable and more environmentally friendly.
 - f-4) *Virtual communities*: A virtual or online community is a group of people who primarily or initially communicate or interact via the Internet.
 - f-5) *Context awareness*: It is expected that the integration and convergence of information technology, telecommunications, and content will result in new service delivery dynamics and a new paradigm in telecommunications where value-added services, such as those which are location dependent, will provide significant benefits to both the end users and the service providers;
- g) that the list of examples in Annex 1 may be supported by IMT systems.

6 Recommendation

The ITU Radiocommunication Assembly,

recommends

- 1 that the following high-level requirements should be used for the telecommunication services and applications to be supported by IMT, taking into account that the requirements may be different from one service offering to another.

Seamless connectivity

Seamless handover to support user mobility was stated as a requirement for IMT-2000. It remains a requirement for IMT-Advanced. In addition, IMT-Advanced should support seamless handover to at least one of the IMT-2000 family members. Requirements of various seamless services are shown in ITU-T Recommendations Q.1703, Y.2001 and Y.2011. It is necessary to take into consideration the factors shown below.

Mobility management

- As described in Recommendation ITU-R M.1645, IMT is needed to continue service under nomadic, slow and high mobility conditions without conscious cooperation of the users.

Interoperability

- When users are in multimodal service with IMT and other services, the users should not need to be aware of the type of system.