For Information **SSAC Paper 10/2012**
on 9 October 2012

RADIO SPECTRUM AND TECHNICAL STANDARDS ADVISORY COMMITTEE

Update on Development of Next Generation Networks (NGN) (October 2012 Issue)

Introduction

This paper updates members on development of Next Generation Networks (NGN).

Internet of Things[1] Global Standards Initiative (IoT-GSI)

2. The IoT-GSI of the ITU promotes a unified approach to technical standards development enabling the Internet of Things (IoT) on a global scale. The IoT-GSI aims to develop a definition of "IoT", provide a common working platform for IoT-related rapporteur groups and develop the detailed standards necessary for IoT deployment.

3. The recent ITU-T IoT-GSI rapporteur meeting was held in September 2012 with the participation of rapporteur groups from ITU-T SG 13 (NGN and future networks), SG 16 (multimedia) and SG 17 (security). The meeting made progress in the development of the relevant recommendations in the following areas –

(a) requirements of eHealth monitoring system, gateways for IoT applications and IoT devices by SG 13;

(b) network robot platform for USN applications and services, Web of Things (WoT) service architecture, remote device interactions over WoT by SG 16; and

(c) security requirements for wireless sensor network routing by SG 17.

[1] Internet of things (IoT), or Internet of objects, refers to the interconnection of everyday objects. It is often described as a self-configuring wireless network of smart objects that can work autonomously to provide services without human intervention.

Ultra High Definition TV (UHDTV) and 3DTV

4. The recommendation on UHDTV specifies the UHDTV system parameter values in two levels. HDTV pictures today have a resolution of 1920 × 1080 or 1280 × 720, equivalent to 1 to 2 megapixels. The first level of UHDTV picture levels has about 8 megapixels at a resolution of 3840 × 2160, and the next level comes with about 32 megapixels at a resolution of 7680 × 4320. With development in display technology, UHDTV is expected to become available in the near future with larger screens, higher spatial/temporal resolution, wider colour gamut, wider dynamic range, etc.

5. As for the recommendations on 3DTV, they mainly focus on 3DTV programme production and broadcasting in the two formats that are in use worldwide, which are the 720p and the 1080i/p HDTV environments. These recommendations also specify the digital interfaces used in studios for 3DTV programme production, and on the general requirements for 3DTV.

6. At the meeting of May 2012, ITU-R Study Group SG 6 agreed to a draft new recommendation on the technical details for UHDTV and several draft new recommendations on 3DTV. The recommendation is being submitted to the ITU member states for approval. These recommendations are listed out in Annex 1 and they are available from the ITU website at http://www.itu.int/rec/R-REC-BT/en.

Global IPv6 Transition Event

7. ETSI will co-host with the BII Group (a Chinese enterprise) and the University of New Hampshire Interoperability Laboratory (UNH-IOL) the first Global IPv6 Transition Test Event in November 2012 in Beijing. There are several methods for transitioning between IPv4 networks and IPv6 networks, such as IPv6 Rapid Deployment (6Rd), Dual-Stack lite (DS-lite), IPv4-over-IPv6 (4over6), Network Address Translation 64 / Domain Name System 64 (NAT64/DNS64), IPv4/IPv6 translation (IVI). The event will focus on testing these methods in end-to-end configurations. A brief description of these methods is given in Annex 2.

8. The 4-day test event will evaluate the status of vendor support for the various methods of transitioning from IPv4 to IPv6 networks. This event is supported by the Internet Engineering Task Force (IETF), the IPv6 Forum and the Broadband Forum. It helps verify the maturity and readiness of IPv6 transition technologies and promote the transition and adoption of IPv6 worldwide. It is expected that the event would attract network equipment

vendors, specialists in interworking and network interconnection, as well as Internet Service Providers who are in the process of migrating their networks to IPv6.

Leading ICT SDOs launch oneM2M

9. In July 2012, seven of the world's leading information and communications technology (ICT) Standards Development Organisations (SDOs) launched a new global organisation, called oneM2M, to ensure the efficient deployment of machine-to-machine (M2M) communications systems. oneM2M will develop technical specifications and reports with a view to ensuring global M2M communications and allowing the industries to effectively take benefit of this emerging technology. The seven SDOs are –

(a) the Association of Radio Industries and Businesses (ARIB) of Japan;

(b) the Telecommunication Technology Committee (TTC) of Japan;

(c) the Alliance for Telecommunications Industry Solutions (ATIS) of the USA;

(d) the Telecommunications Industry Association (TIA) of the USA;

(e) the China Communications Standards Association (CCSA);

(f) the ETSI; and

(g) the Telecommunications Technology Association (TTA) of Korea.

10. The number of worldwide M2M connections is increasing exponentially and, according to some forecasts, would be as high as 50 billion by 2020. There are various industries – from healthcare to transportation and energy to agriculture – making use of M2M communications. Communications service providers are positioning their networks to take advantage of the growing demand for M2M services. oneM2M aims to develop specifications to provide a common platform to be used by communications service providers to support applications and services as diverse as smart grid, connected cars, eHealth and telemedicine, enterprise supply chain, home automation and energy management, and public safety.

11. The initial goal of oneM2M is to develop a common M2M Service Layer to be embedded within various hardware and software. With an access independent view of end-to-end services, oneM2M will also develop globally agreed-upon M2M end-to-end specifications. The work of oneM2M will drive multiple industries towards the goals of lowering operating and capital expenses, shortening time-to-market, creating mass-market economies of scale,

simplifying the development of applications, expanding and accelerating global business opportunities, and avoiding standardisation overlap.

Advice Sought

12. Members are invited to note the content of this paper.

Office of the Communications Authority
October 2012

Annex 1

List of draft new recommendations on UHDTV and 3DTV agreed at the ITU-R SG 6 meeting in May 2012

(a) ITU-R BT.[IMAGE-UHDTV] Parameter values for UHDTV systems for production and international programme exchange

(b) ITU-R BT.[3DTV SUBMETH] Subjective methods for the assessment of stereoscopic 3DTV systems

(c) ITU-R BT.[3DTV-REQS] Performance requirements for the production, international exchange and broadcasting of 3DTV Programmes

(d) ITU-R BT.[3D-VID] HDTV digital image systems for the production and international exchange of 3DTV programs for broadcasting

(e) ITU-R BT.[3D-VID_2] 1280 × 720 digital image systems for the production and international exchange of 3DTV programs for broadcasting

(f) ITU-R BT.[3DTV-IF] Serial Digital Interface for production and international exchange of HDTV 3DTV programmes

Annex 2

Methods for transitioning between IPv4 networks and IPv6 networks

(a) IPv6 Rapid Deployment (6rd) is the technique of providing IPv6 over IPv4 tunneling by encapsulating IPv6 packets in IPv4 for transport over IPv4 infrastructure. The 6rd mechanism is described in RFC 5969 of the Internet Engineering Task Force (IETF).

(b) Dual-Stack lite (DS-lite) is the technique of encapsulating private IPv4 packets (with private IPv4 address) within IPv6 for transport over the link between the customer and the Internet Service Provider (ISP). The IPv6 packet can be transported over the IPv6 infrastructure. For transport over the IPv4 infrastructure, the IPv6 packet at the ISP is decapsulated to recover the private IPv4 packet, and the source address of the private IPv4 packet is then translated to the public IPv4 address. DS-lite is specified in IETF RFC 6333.

(c) IPv4-over-IPv6 (4over6) works on the control plane and the data plane for transport of IPv4 packets over IPv6 infrastructure. In the control plane, the 4over6 tunnels are set up in an automatic and scalable manner. In the data plane, IPv4 packets are encapsulated in IPv6 packets. The 4over6 technique is described in IETF RFC 5747.

(d) NAT64/DNS64 is the technique of protocol translation to enable the IPv6 users to access IPv4 services. DNS64 embeds the IPv4 address returned from a query within the last 32 bits of the IPv6 address. The IPv6 address is routed to the NAT64 gateway which then uses the last 32 bits to create mapping to allow IPv6 client to contact IPv4 server. NAT64 and DNS64 are specified in IETF RFC 6146 and RFC 6147 respectively.

(e) IPv4/IPv6 translation (IVI) is the technique to allow communication between IPv4 and IPv6 address families by embedding the IPv4 address within the IPv6 address with a variable length IPv6 prefix and variable length IPv6 suffix. IETF RFC 6144 describes a framework for IPv4/IPv6 translation whereas RFC 6052 describes IPv6 addressing of the IPv4/IPv6 translator.