Technical Specification Group – Core Network **TSG CN#19(03) NP-030136**
Meeting #19, Birmingham, UK, 12th – 14th March 2003

Source: **mmO2**

Title: **Discussion on IPv6 utilisation within IMS**

Document for: **Discussion/Comment**

Agenda Item: **8.1**

Introduction

The IP Multi-media Subsystem (IMS) is a key enabler for the support of advance mobile multi-media services, and its early deployment is expected to make a significant impact upon the overall success of 3G.

IPv6 represents the next generation of Internet Protocol (IP), offering technical improvements over the existing IPv4 upon which the Internet is currently based. The introduction of, and migration to IPv6 represents a significant challenge for operators, vendors and application developers in view of the large embedded IPv4 base.

The IP Multi-media Subsystem (IMS), initially specified as part of 3GPP Release 5 (June 2002), has been specified to mandate the exclusive use of IPv6, the key objectives being to fully exploit the additional capabilities that it offers and to minimise future migration problems.

Recent informal discussion with both vendors and operators has, however, highlighted the need to review the scenarios for the near-term use of IPv6 in the context of it facilitating the early introduction of IMS.

It should be noted that this contribution is addressing the need for a review and is not advocating a reversal of the previous 3GPP decisions relating to the use of IPv6 in 3GPP specifications.

Background

The Internet Protocol (IP) provides the basic transport capability of the Internet and is the basis for all existing Internet applications. It is the universal feature, which has lead to the enormous growth of the Internet. Current network deployments of IP are based upon Version 4 of the IETF specifications. There is, however, a perceived need to migrate to a more advanced and newer version of the protocol, known as IPv6, in view of the limitations of IPv4.

IPv6 offers enhancements, which include increased addressing capacity and capabilities, QoS control, mobility (Mobile IPv6), built in IPSEC security and improved routing efficiency. Most of these features have been added to IPv4 since it was first released and higher addressing capacity is now seen as the main driver for adopting the new protocol. The rapid growth of the mobile market and the convergence of telecomms, mobile and internet technologies are factors which have caused concerns over the shortage of IPv4 addressing space and are seen to justify the need to migrate to IP v6.

Mobile operators have recently introduced IP based services using GPRS – an IP based solution for GSM networks which has also been adopted for 3G UMTS, and is being initially implemented using IPv4. The 3GPP specifications for GPRS allow the use of either IPv4 or IPv6; there are currently however, no commercial GPRS networks in public service featuring IPv6.

In the medium term IP based Multi-media services are expected to be launched on 3G networks. These will be supported using the IP Multi-media Sub-system (IMS), which is specified as part of 3GPP Release 5 (June 2002). The IMS operates over GPRS IP packet transport capabilities and the specifications mandate the exclusive use of IPv6 within the IMS. It should be noted, however, that the supporting GPRS network could be either IPv4 or IPv6 based; the IPv6 based IMS can make use of, and co-exist with, existing IPv4 based GPRS deployments.

During the development of IMS, the principal reasons for adopting IPv6 exclusively included the "always on" paradigm combined with the rapid growth in cellular devices and the potential lack of public IPv4 addresses. Additionally, adopting IPv6 from the outset eliminates the need for future migration.

Contact: Steve.Mecrow@O2.com

Recent Developments

In the intervening period since the 3GPP decision to mandate the exclusive use of IPv6 for the IMS, the telecommunications and ".com" industries have experienced significant change, resulting in considerably slower growth and delay in the expected deployment of 3G and subsequent IMS services. Additionally the demand for the use of IPv6 in the Internet appears to be significantly slower than originally anticipated; there are arguments that IPv4 will be capable of meeting the anticipated growth into the foreseeable future.

Off-line discussions with some 3GPP delegates indicate that the lack of overall demand for IPv6 based products is reflected in the slower development of IPv6 based IMS, and some initial IMS deployments will make use of IPv4 (that will therefore not conform to 3GPP Release 5 specifications).

These developments highlight the need for the 3GPP to review the exclusive and "mandatory" use of IPv6 for IMS in the 3GPP specifications in order to meet the dual objectives of:

?? Enabling the early deployment of commercially viable IMS based mobile multi-media services; and

?? Facilitating the cost effective introduction of IPv6 in mobile systems.

Proposal

It is proposed that TSG SA initiates a review to confirm that the existing 3GPP decisions and scenarios for the use of IPv6 as part of the IMS are in line with the overall industry trends and is in the best interests of both operators and vendors. The review needs to consider:

?? The continued validity of the original assumptions, scenarios and drivers for adopting IPv6;

?? The likely timescales for the availability of IMS products (Network, User Equipment, Applications), which will fully meet the Release 5 mandatory requirements for using IPv6;

?? The current timescales and drivers for industry wide migration to IPv6;

?? The lack of progress to date within 3GPP regarding the specification of interworking between IMS and IPv4 based SIP applications;

?? The interworking/roaming implications of non-standard IPv4 IMS deployments upon 3GPP specification development,

?? The impacts to the current Release 5 and Release 6 specifications if the review proposed a change to the existing 3GPP decisions relating to the use of IPv6.

End