



Question(s): 6/3

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Abstract: While the transition to IPv6 presents some short-term challenges, the long-term economic benefits are more significant. For the Asia and Oceania region, IPv6 is essential to support the continued growth of the internet, drive innovation, and enable the development of new markets. Governments and businesses should invest in IPv6 now to secure these long-term benefits.

Questionnaire attached during the last meeting aimed to gather information on the current status of IPv6 adoption and the perceived economic impact of the transition from IPv4 to IPv6 in member country, to understand the challenges and opportunities associated with the transition and inform policy recommendations.

IAFI urges member countries in the Asia Oceania region to actively participate in this initiative by providing valuable input. Furthermore, IAFI requests that the ITU establish a definitive shutdown date for IPv4 to further accelerate the global transition to IPv6.

1. Introduction:

During the last meeting of ITU-T SG3 Regional Group for Asia and Oceania (SG3RG-AO), IAFI submitted a contribution (C-35) proposing a survey in the context of work item [TR_IPv6-AO](#), considering some short-term challenges, and significant long-term economic benefits of IPV6. IAFI in the contribution suggested that especially in the Asia and Oceania region, transition to IPv6 transition is very much essential to support the continued growth of the internet, drive innovation, and enable the development of new markets. Governments and businesses should invest in IPv6 now to secure these long-term benefits. Some special features of the Asia-Oceania Region are:

- Most populous region in the world with 4.7 billion people (58% of the world population).
- Region includes most populous countries like India, China, Indonesia and Pakistan etc.
- Rapid urbanization and high population density in urban area.
- Many most developed countries like Japan, Korea, Australia and New Zealand and many developing countries of the world like China, India, Vietnam, Indonesia and many more.
- Most industrialized country of the world – China.

- Largest growing economies.

The transition to IPv6 offers numerous benefits for Asia Oceania region countries, following few advantages are particularly significant.

- a. **Fueling the Growth of IoT and Smart Cities** providing massive connectivity - IPv6's vast address space is crucial for accommodating the explosion of internet-connected devices driving the growth of IoT and smart cities in the region. This enables seamless integration of billions of smart devices, sensors, and infrastructure for improved efficiency, sustainability, and quality of life. It eliminates the need for complex Network Address Translation (NAT) schemes used in IPv4, simplifying network architecture and ensuring every IoT device can have its own globally routable IP address.
- b. **Simplified Network Configuration** - IPv6 supports stateless address auto-configuration (SLAAC), allowing devices to automatically configure their IP addresses without manual intervention or a DHCP server. This simplifies deployment and management of large-scale IoT networks.
- c. **Improved Functionality** - IPv6 offers several improvements over IPv4, such as simplified header format, more efficient routing, and better support for multicast communication. These features can enhance the performance and scalability of IoT networks.
- d. **Supporting the Enhanced Mobile Broadband** - The Asia Oceania region boasts high mobile penetration rates. IPv6 enhances mobile broadband connectivity, enabling faster speeds, lower latency, and improved user experiences for mobile internet users.
- e. **Boosting Economic Growth and Innovation through Digital Transformation** - IPv6 facilitates digital transformation across industries, enabling businesses to leverage new technologies, streamline operations, and improve competitiveness in the global market.
- f. **Strengthening Cyber-security** - IPv6 has built-in security features, such as IPsec, providing authentication, integrity, and confidentiality for IP traffic, so improve protection against cyber-attacks. This is crucial for safeguarding critical infrastructure, sensitive data, and online transactions in the region.

So, IPv6 offers a comprehensive solution for connecting IoT devices, providing a scalable, secure, and efficient foundation for the growing Internet of Things. Its advantages over IPv4 make it the ideal protocol for building future-proof IoT networks.

2. Content of the Chair report of the last meeting on IPv6 contribution:

In para-15, Chair of SG3RG-AO pointed out the following point in the report.

“15 Economic impact of transition from IPv4 to IPv6

15.1 IAFI presented [C35](#) proposing a survey in the context of work item [TR_IPv6-AO](#).

15.2 Delegates mentioned WTSA Resolution 64 “IP protocol address allocation and facilitating the transition to and deployment of IPv6”, the distinct roles of SG2 and SG3 in the area of IPv6 transition, as well as activities in ITU-D and its Regional Development Forums.

15.3 TSB was invited to clarify the status of the implementation of Resolution 64 and its [IPv6 webpage](#), and to investigate whether other ITU surveys (e.g., regulatory survey, ICT statistics) cover IPv6 adoption.

15.4 IAFI was invited to consider other available information on the adoption of IPv6 in the region in future contributions in the context of work item [TR_IPv6-AO](#).”

3. Current information on the adoption of IPV6 in the Region

3.1 Background:

- IPv6 was introduced as a replacement for IPv4 to resolve the problem of address depletion. While IPv4 has a finite address space of approximately 4.3 billion addresses, IPv6 provides an almost unlimited address pool with 340 undecillion unique addresses. This expanded capacity is vital for supporting the growing number of devices connected to the internet, including IoT devices, smart cities, and digital services.
- In the Asia-Pacific region, the rapid growth of internet users, coupled with increased adoption of digital technologies, has led to an urgent need for IPv6 deployment. Many countries in the region have already exhausted their IPv4 address allocations, necessitating a transition to IPv6 to maintain uninterrupted internet growth.

3.2 Current State of IPv6 Adoption - IPv6 adoption in the Asia-Pacific region varies significantly across countries. According to recent statistics:

- **Leaders in IPv6 Deployment:** Economies such as India, Japan, Malaysia, and Australia have made significant strides in IPv6 adoption, driven by proactive policies, industry engagement, and widespread awareness campaigns. For instance, India has emerged as one of the global leaders, with major internet service providers (ISPs) and mobile operators deploying IPv6 on a large scale.
- **Emerging Adopters:** Southeast Asian nations such as Thailand, Indonesia, and the Philippines are making steady progress, but face challenges related to infrastructure readiness and stakeholder awareness.
- **Lagging Countries:** In some developing economies, IPv6 deployment remains limited due to low prioritization, inadequate resources, and a lack of technical expertise.

3.3 Challenges to IPv6 Adoption

Despite its benefits, IPv6 adoption in the Asia-Pacific region faces several challenges:

- **Infrastructure Costs:** Transitioning from IPv4 to IPv6 often requires significant investment in upgrading networks, hardware, and software.
- **Limited Awareness and Expertise:** Many stakeholders, including ISPs, enterprises, and policymakers, lack adequate understanding of IPv6 and its importance.
- **Dual-Stack Complexity:** Operating dual-stack networks (supporting both IPv4 and IPv6) during the transition phase can be technically complex and resource-intensive.
- **Regulatory and Policy Gaps:** In some countries, the absence of clear mandates or incentives for IPv6 adoption has slowed progress.

3.4 Strategies for Accelerating IPv6 Adoption

To overcome these challenges and promote widespread IPv6 adoption, the following strategies could be considered:

- **Policy and Regulation:** Governments should introduce policies that mandate IPv6 adoption for public sector networks and incentivize private sector deployment through subsidies or tax benefits.
- **Capacity Building:** Training programs and workshops should be organized to enhance technical expertise among network engineers, IT professionals, and decision-makers.
- **Public-Private Collaboration:** Governments, ISPs, and technology providers should work together to develop coordinated action plans for IPv6 deployment.

- **Awareness Campaigns:** Initiatives to educate stakeholders about the benefits of IPv6, such as improved security, scalability, and future-proofing, are essential.
- **Regional Cooperation:** The Asia-Pacific region's economies can benefit from sharing best practices and resources through regional forums such as the Asia-Pacific Network Information Centre (APNIC).

3.5 Future Outlook and Recommendations

The adoption of IPv6 is not just a technical upgrade but a foundational step for the region's digital transformation. Key areas of focus for future efforts include:

- **Smart Cities and IoT:** IPv6's vast address space will play a crucial role in supporting the proliferation of IoT devices and smart city initiatives.
- **5G and Beyond:** The rollout of 5G networks in the Asia-Pacific region will accelerate IPv6 adoption, as IPv6 is inherently designed to handle the demands of next-generation networks.
- **Digital Inclusion:** Ensuring that IPv6 deployment benefits all segments of society, including underserved and rural areas, will be critical for bridging the digital divide.

In conclusion, the Asia-Pacific region's transition to IPv6 is a vital step toward achieving sustainable internet growth and unlocking the potential of emerging technologies. Collaborative efforts, strategic investments, and a shared vision will be essential for ensuring a smooth and successful transition to IPv6, securing the region's place in the global digital economy.

4. Regarding Resolution-64 adopted in the WTSA-24:

Resolution 64, adopted by the World Telecommunication Standardization Assembly 2024 (WTSA-24) in New Delhi, prioritizes the transition to and deployment of IPv6. It urges member states and stakeholders to accelerate the adoption of IPv6 to accommodate the growing number of internet-connected devices and ensure the continued growth and stability of the Internet. The resolution acknowledges that IPv6 is crucial for the future of the internet due to its expanded address space and enhanced capabilities and calls upon member states, network operators, equipment manufacturers, and other stakeholders to actively promote and deploy IPv6 in their networks and services. The resolution emphasizes the need for collaboration and information sharing among stakeholders to facilitate a smooth transition to IPv6.

So, the Resolution-64 highlights the urgency of transitioning to IPv6 and outlines actions to overcome challenges and accelerate its adoption globally, with a particular focus on assisting developing countries.

Resolution 64 as adopted by WTSA-24 can be seen [here](#).

Resolution 64 resolved to:

- 1 instruct ITU-T Study Groups 2 and 3, each according to its mandate, to analyse statistics for the purpose of assessing the pace and geography of IPv6 address allocation and registration for interested members and, in particular, developing countries, in collaboration with all relevant stakeholders;*
- 2 to enhance the exchange of experiences and information with all stakeholders regarding all aspects of the deployment of IPv6, with the aim of creating opportunities for collaborative efforts and the enhancement of technical skills, and to ensure that feedback exists to enrich ITU efforts to promote, facilitate and accelerate the transition to and deployment of IPv6,*

It is thus clear that lot of work still needs to be done to implement the decisions of WTSA and hence the proposal by IAFI for this adoption of this questionnaire.

5. IPv6 adoption statistics published by Google and APNIC Lab

Google regularly monitors the IPv6 adoption data of the various countries and as per the latest data published regarding percentage of users adopted IPv6, has reached to more than 45% globally. As per the data published by APNIC Lab¹, more than 25 countries have crossed more than 50% IPv6 adoption. However, there is no official data published by ITU about the adoption of IPV6 in Asia Pacific Countries.

6. Conclusion

While the transition to IPv6 presents some short-term challenges, the long-term economic benefits are more significant. For the Asia and Oceania region, IPv6 is essential to support the continued growth of the internet, drive innovation, and enable the development of new markets. Governments and businesses should invest in IPv6 now to secure these long-term benefits.

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¹ <https://stats.labs.apnic.net/ipv6/>