

INTELSAT COMMENTS ON
COMMUNICATIONS ALLIANCE
NBN REFERENCE ARCHITECTURE

Intelsat appreciates the opportunity to provide comment on the Communications Alliance Ltd NBN Reference Architecture Document.

Specific comments / suggestions regarding Section 4

The architecture document focuses on the concept of QoS being provided at Layer 2.

Satellite solutions typically provide QoS at Layer 3 (e.g. IP) and above (e.g. application). Accordingly, the discussion in Sections 4.1 and 4.2 should probably be reversed.

"Wireless/Satellite Layer 3 IP Access" should be inserted first given that today platforms that provide satellite-based Internet access (e.g. HNS HN/HX, ViaSat SurfBeam) either already provide layer 3 IP access and QoS (e.g. IP routing, IP address allocation, NAT, etc.) or plan to implement these features in the near future

The reference architecture document makes a point of highlighting that, for satellite-based access, "these [hub] earth stations may be in very remote locations and will therefore require transport service to more centralized locations".

Intelsat contends that this limitation also applies for wireless base stations – backhaul to the wireless base station will be a driving factor in the network design. However for satellite solutions, depending on the satellite beams and the resulting earth station architecture, the earth stations need not be located in remote locations. For example, if the satellite access network is established on wide beam satellites, the hub earth stations need not be remote.

If wireless (e.g. WiMax, LTE) networks are deployed for NBN in remote areas, then they will have the same issue ("require transport service") and likely to a worse degree than satellite access. With WiMAX and LTE for rural applications, one does not have much leeway (probably a 3 to 5 mile circle around the remote town) on where to place the base station / tower. A hub earth station can be placed anywhere within the satellite beam (be it wide or spot). With that flexibility, one has a greater chance of being able to place the earth station near an existing fiber trunk.

In both sections 4.1.2 and 4.2.2, the document distinguishes between "Wholesale IP NSP" (network service provider) from "Retail Broadband NSP". Experience shows that (e.g. WildBlue), satellite-based access networks are not set up with this architecture. The "Retail Broadband NSP" control is at the "SMTS". End user traffic goes directly from "SMTS" to Internet and/or "Applications & Content". It may go via a "Wholesale ISP or IP NSP" but after transversing the "wholesale NSP" it will not be routed back into the "Retail Broadband NSP" domain. Communications Alliance LTD may already know

this and may have written this document with this different architecture on purpose. The architecture in the document is better suited if one wants to have multiple "retail broadband NSP" utilizing a common, shared NBN infrastructure.

Intelsat would like to highlight that in Canada, Telesat has used the SurfBeam platform (same as used by WildBlue) to establish a network where multiple "retail broadband NSP" utilize a common, shared NBN infrastructure

Hybrid Satellite/Wireless Networks

In the document, satellite is only listed as an option for the "Access" functional domain of their architecture. Satellite is not mentioned as an option for the "Aggregation & Transport" domain; in particular when wireless is used in the "Access" domain.

In such an implementation, satellite could provide the EAS-to-EAS connectivity in Figure 6 and 7. In this architecture document, the EAS-to-EAS connectivity is a "black box [line]". The document does not specify the EAS-to-EAS physical media. Intelsat submits that satellite is an ideal physical media for these connections.

The Intelsat submission to the Senate Select Committee (attached) provides further information on how satellite/wireless hybrid networks could be a solution for the NBN deployment. Intelsat is already working with customers in many parts of the world to provide these services today.

Brief comments / suggestions regarding Section 5

The following bullet points are offered as initial feedback/input on Section 5 topics:

5.1 Sustainability

The NBN should consider the following requirements for the platform:-

- Centralised management
- Platform vendor with high market share and a robust roadmap for future development
- Platform with ease of expansion and augmentation of capacity to cater for growth

5.2 Robustness

- Diverse / redundant backbone
- Multiple switch architecture with hub switching matrix to provide very low mean time between failures

5.3 Security

- Layer 2 separation required between sites, which is an issue for satellite links
- Issue can be resolved with GRE tunnels / headers
- Security is triple realm
 - Physical security at teleport for hub infrastructure
 - Access control layers, IP layer
 - Encryption built into platform

5.4 IPv6

- Need to understand whether requirement is for native support or pass-through
- IPv6 is supported by Intelsat network, but not all platform vendors can support

5.5 Future Proofness

- Roadmap for platform enhancements required
 - DVB-S2 / ACM in short-term, adaptive TDMA in longer term
 - Cisco standards for networking

Other Issues

- The requirement for expansion in a “direct to home” solution
 - “Specing” the terminal for day one to day one thousand requirements
 - Ku, Ka and L-band hybrid support.