Inquiry into the rollout of the NBN in rural and regional areas

March 27, 2018

Joint Standing Committee on the National Broadband Network

Submission by Viasat Australia

Executive Summary

Viasat Australia appreciates the opportunity to provide this submission to the Joint Standing Committee's inquiry into the rollout of the nbn™ in rural and regional areas.

Viasat is a global communications company with more than 5,000 employees and 26 offices worldwide working to connect the entire globe with high quality, secure, affordable, fast connections anywhere in the world—on the ground, in the air or at sea. For more than 30 years, Viasat has helped shape how consumers, businesses, governments and militaries around the world communicate.

Viasat provides the ground segment for nbn's Sky Muster satellite network as well as the in-flight Wi-Fi capability for the Qantas domestic fleet.

Viasat has an extended history deploying satellite based networks in both U.S. domestic and international settings. Worldwide, Viasat networks support over 850,000 subscribers using its Surfbeam platform in Europe, Saudi Arabia, Canada, and Australia. In the U.S., Viasat's network currently serves around 600,000 subscribers on its own satellites.

We believe there are realistic and feasible steps nbn can take to make satellite broadband a more attractive and robust service than is currently offered, with the impact of accelerating the take-up in Australia's most rural areas and more effectively closing the Digital Divide. A better customer internet experience will drive adoption and increase the value of the program to rural communities. These steps can be taken without impacting nbn's economic return on the Sky Muster satellites.

To achieve this, near- and long-term planning of customer and network needs is required. This planning would consider how to make prudent investments in the current program to improve the service, accommodate expected increases in internet usage, allow for multiple usage types (including premium services that boost the business case) and chart a path for the next 5 to 10 years of service at speeds and service quality that meet Australians' broadband interests on an ongoing and growing basis. Without a long-term plan to improve the service, quality will lag consumers' needs and become less relevant as a robust internet option supporting all activities such as home offices, education and video service, and short-term changes will be more expensive to nbn than would otherwise be needed.

As part of a satellite plan, we recommend that nbn consider the following:

Near-Term: Invest in Technology Improvements for the Sky Muster Network

Making the satellite service as high quality as it can be for Australia's rural households should be a top priority in the program. Improving the service in a cost effective manner; however, will require incremental investment and the ability to operate the network in an optimised way. We recommend implementing a Layer 3 network management program on the Sky Muster

network, which could double the amount of data that could be consumed by customers while preserving the service quality, at the same economics to nbn as today's service.

Long-Term: Consider Options to Provide New Satellite Bandwidth

Satellite programs have long lead times and to bring new capacity to market, by the time the Sky Muster satellites are at capacity or end-of-life, planning should begin in earnest now. Recent developments in satellite technology allow nbn to tailor its long term plan to allow for 250+Mbps services with capacity concentrated in areas with the highest demand. Further, the assurance of new bandwidth in the future will allow nbn to better plan new service offerings today, as well as assist in optimising capacity utilisation on its Sky Muster satellites.

Viasat would be pleased to discuss its proposals with the Committee.

Invest in Technology Improvements for the Sky Muster Network.

In the past few years, the ability to manage wireless and satellite networks has dramatically improved due to the availability of increasingly sophisticated network tools. These tools allow operators to create innovate service plans that offer higher service levels to customers, while lessening the burden on the scarce satellite resource. Much like a highway in Sydney without speed limits or lanes, internet traffic over a Layer 2 satellite network is inefficient and can be unnecessarily congested. The benefits of a managed Layer 3 network will allow the network to operate far more efficiently and can carry more traffic if managed properly. In particular, we believe a managed Layer 3 network will provide the following benefits at the same economics to nbn as today:

- Creation of service plans that offer better service
- A substantially better experience to customers in off-peak hours
- A better quality of service during peak hours via traffic and congestion management
- Doubling the quantity of video hours able to be consumed with similar data caps via media optimisation techniques

In particular, we note that nbn still uses hard data caps (i.e. service is unusable or virtually unusable for most activities after a data cap is exceeded) as its primary method of controlling capacity utilisation during the daytime/evening (peak) hours. While this type of management was common practice for both satellite and wireless operators, consumers have increasingly indicated that hard data caps are obsolete in a world where internet is a necessity. As a result, most U.S. wireless and satellite operators (including Viasat) do not utilise hard data caps due to the poor customer experience. In fact many interesting plan options, that offer a good customer experience and near unlimited feel to the service, can be developed without sacrificing bandwidth. These include soft caps, video optimisation techniques, expanded free zones and unlimited non-video usage. The traffic management techniques to create these plan options include usage metering, rate limiting, application awareness, device-type awareness, time of day policy modification, media compression, and zero-rating. These are only available with a Layer 3 network.

An illustrative example of the bandwidth efficiencies using one of the techniques (media compression) is shown below:
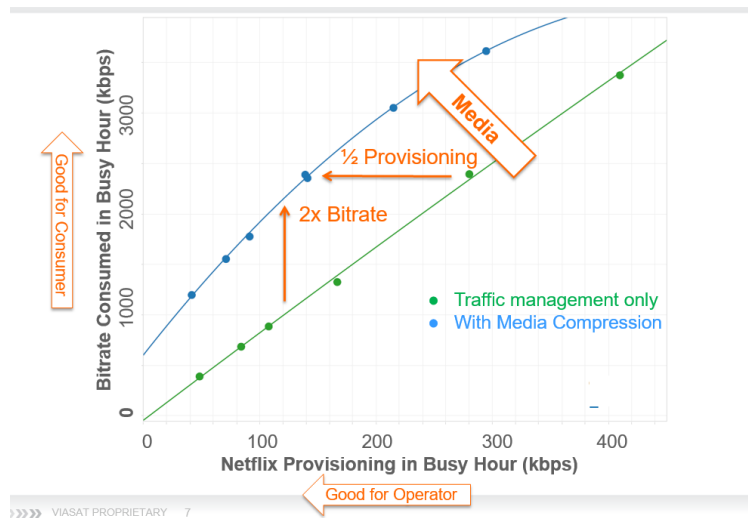
What would it mean to implement Layer 3 management on the Sky Muster access network?

First the service could be provided by nbn, or more cost effectively, as a Managed Service by a service provider that already has these tools developed and is experienced in this type of network management.

Second, making the most out of Layer 3 management requires implementation of tools that shape/priortise traffic and collect and analyse network data. Policies must be developed that optimise and prioritise traffic and reduce the satellite load where possible, according to policies and congestion practices defined by nbn. Those policies are continually updated to improve the customer experience based on analytics of network data. In short, with Layer 2, all bits are equal – peer-to-peer traffic, latency-sensitive traffic and overprovisioned video streams, often lead to unnecessary congestion and over-provisioning. With Layer 3, bits are identified and prioritised/transmitted in the way that makes for the best customer experience and the least burden on the network.

The improvement in service plan quality under a Layer 3 program would likely be quite dramatic. For example, we believe the higher-end retail service provider (RSP) plans could offer a much better experience with only a modest increase in bandwidth utilisation. nbn could use an approach where video speeds are tailored to a device type (e.g. tablet versus UHDTV). It is also possible to de-prioritise services (or only certain applications) versus automatically slowing down service as is the case today, which can seem abrupt and dramatic to the end-user. De-prioritisation of service would only occur after a subscriber met a very high data usage

threshold and only in peak congestion periods. In the U.S., it was only possible for Viasat to remove the data caps and offer unlimited plans by using Layer 3 techniques.

Consider Longer-Term Options to Provide New Satellite Bandwidth.

Additional satellite capacity should be considered as part of an ongoing long-term plan to serve nbn's rural customers. nbn can take advantage of the latest advances in satellite technology to both keep pace with usage demands as well as offer far higher speeds and improved reliability and quality. Indeed, next generation satellites will likely support 100-500 Mbps download speeds – in keeping pace with cable and fibre networks.

nbn could chose to procure their own additional satellites and own them as today; however, that would have an impact on Peak Funding. An alternative would be to procure additional third-party commercial capacity as required funded by Opex.

nbn has developed a wealth of knowledge relating to its experience with the Sky Muster satellites. Allowing those satellites to remain the sole source of capacity into the 2020s, and hence less able to handle the heavier usage demands projected for that time period, may risk obsolescence of the program and squander nbn's investment and experience in satellite programs.

In Australia, as is true globally, per-customer internet usage continues to rise each year and average monthly usage is currently over 150GBs on terrestrial networks, and median usage is approximately 60GBs per month. Usage increases – where not limited by data caps – are often at least 20-30% on an annual basis. At this rate, the Sky Muster satellites will be at maximum capacity by 2020 assuming a competitive level of service is offered (e.g. 150 GBs per month). By 2025, assuming normal year-over-year usage increases continue, we estimate that natural demand by customers will be approximately 325 GBs by 2025 – far exceeding what Sky Muster can offer.

By moving to Layer 3 network management, we estimate nbn can buy two additional years of offering service, but to launch a satellite in time to meet demand by 2022, planning for the follow-on capacity should begin immediately.

Bandwidth Needed Over Time to Support Satellite Customers
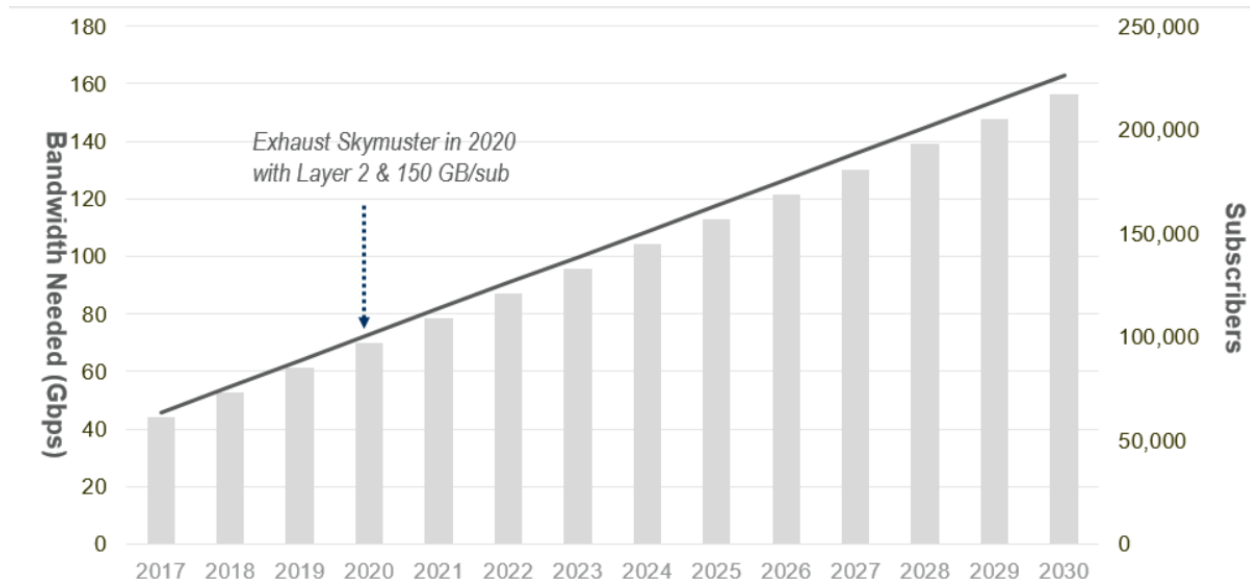
By planning for additional capacity, nbn would realise a number of benefits. First, and most immediately, nbn would be able to create plans and project capacity exhaustion on Sky Muster, without having the uncertainty of its ability to meet growth beyond 2022. Second, nbn's experience with the Sky Muster satellites can be used to define a capacity configuration (or portion of a payload) that is targeted to geographically meet demand. Australia's demand is heavily concentrated in the southeast part of the country, so the footprint and capacity should focus on these areas. Third, nbn will have certainty that it can cost-effectively meet demand wherever it arises in covered areas, and the service quality would be sufficient to address demand in areas where copper infrastructure may be retired.

Finally, the market for premium services, such as high-capacity maritime, nomadic and non-commercial mobility services has had significant investment over the past few years by technology companies. These services will be coming online over the next few years and will continue to augment the Internet of Things (IoT) market. With additional follow-on capacity, nbn can begin to launch new service capabilities in these markets, and would be well-equipped to serve these important markets in an enduring way.

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nbn has made great strides in its satellite program over the past few years, but like all networks, continued, well-considered investment in both near-term upgrades and long-term capacity additions will keep Australia's rural and remote customers connected with speeds, quality and data volumes commensurate with their urban peers.