Starlink Internet... Time to Get Excited

The State of Remote Area Internet in Australia

Internet connected users in remote Australian locations like Northcliffe have been waiting a long time for better internet options. Our three options right now at NBN Satellite, 4G mobile internet and ADSL internet.

In 2019 NBN upgraded Australia's satellite internet coverage by launching the **Skymuster satellites**. NBN satellite internet is available to everyone however the service suffers from limited download allowances and high latency.

4G mobile internet is available for those close enough to a mobile tower. It can deliver excellent speeds. We use 4G mobile internet at the NCRC when our normal ADSL internet goes down. Unfortunately the download allowance on Telstra 4G plans are too limited for permanent usage at the NCRC.

ADSL internet is what we normally use at the NCRC. It is no longer up to the job of supporting modern internet users. Amongst other problems, ADSL has terrible upload speeds.

Introducing the Starlink Mega-Constellation

The holy grail of rural internet connectivity is now on the horizon, literally. *Starlink* is a first-of-its-kind satellite 'mega-constellation' and will eventually include either 12,000 or 42,000 small satellites. Starlink internet usage has already begun in North America and Australian's can now pay a refundable deposit with service expected to start in mid to late 2021. The advantage of paying a deposit is to secure a place in the queue. NCRC has signed up.

How is Starlink different from NBN Satellite internet?

- Even with less than 10% of the final satellites flying, Starlink is already delivering download speeds between 100–150Mbps and upload speeds of 10-30Mbps. SpaceX plans to double these speeds during 2021. This is 10 to 20 times faster than the our ADSL internet, many times better than NBN Skymuster satellite and several times better than 4G mobile internet.
- At this stage Starlink plans to have no download limits. In contrast NBN Skymuster has strict download limits.
- Starlink satellites are much much closer to Earth (around 700km, compared to the 35,000km distance of the Skymuster satellites). This means lower latency producing a faster internet experience in general, better video conferences, good quality Skype and VOIP phone calls, and online gaming will become possible.
- NBN Skymuster satellite system has 2 satellites. In contract Starlink already has 1141 satellites in orbit, with over 2500 to be launched in 2021. The *Falcon 9* rocket launches 60 Starlink satellites at a time, and the *Starship* rocket will launch 400 at a time.
- Starlink satellites move rapidly across the sky rather than being geostationary (always over the same place in Earth). This requires a new satellite dish technology that tracks and changes seamlessly between satellites using 'beam steering technology' (previously used on fighter jets).
- Starlink equipment is self install (although there may be regulations to follow). The dish initially points itself using motors and then uses invisible 'beam steering'.
- Starlink satellites will be progressively de-orbited and replaced in a three to four year rotating cycle. In contrast traditional satellites have a 15 year or longer lifespan, meaning the hardware in space grows obsolete and overloaded toward the end of it's life.

Potential gotchas

- While many were skeptical about Starlink, early tests in North America have revealed the technology is working well. In addition SpaceX's commitment to get an unprecedented number of satellites into orbit is clear to see. Personally, I'm crossing "maybe it won't work/won't happen" off my *gotchas* list.
- It is expensive. $139 per month. Initial hardware is $700.
- Like NBN satellite internet, the Starlink signal will be effected by excessive cloud cover, or too many trees in the pathway of the dish.
- Starlink is initially classed as a 'beta service' which means they expect some technical problems. Users in North America have reported solid and reliable connections so let's hope we have the same trouble free start here.

Controversies

Perhaps you have heard that Starlink satellites will soon be cluttering up our view of the night sky? This controversy has calmed down a bit over the past 12 months. Here's why:

- Space X has worked with the astronomical community to solve some of the problems with Starlink. Solutions have included sunshades to stop reflections from the satellites, painting the satellites black, and Starlink providing better satellite tracking information to large observatories.
- Starlink should not dramatically effect the ordinary persons view of the night sky, however satellites may be visible close to the horizon around dawn and dusk. Personally, with 10% of the Starlink mega-constellation up in orbit, I have yet to notice them.

Other controversies were probably ill founded:

- Starlink is not likely to make a meaningful contribution to the 'Space junk' problem. This is because Starlink satellites are in a low orbit which causes uncontrolled satellites to quickly descend and burn up in the atmosphere.

Right: a rack of 60 Starlink satellites is launched...

by Graham Evans

Monday, Tuesday, Wednesday 10am to 5pm ● Thursday, Friday 10 am to 6pm

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We are a not-for-profit organisation supported by the Northcliffe Community and DPIRD:

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