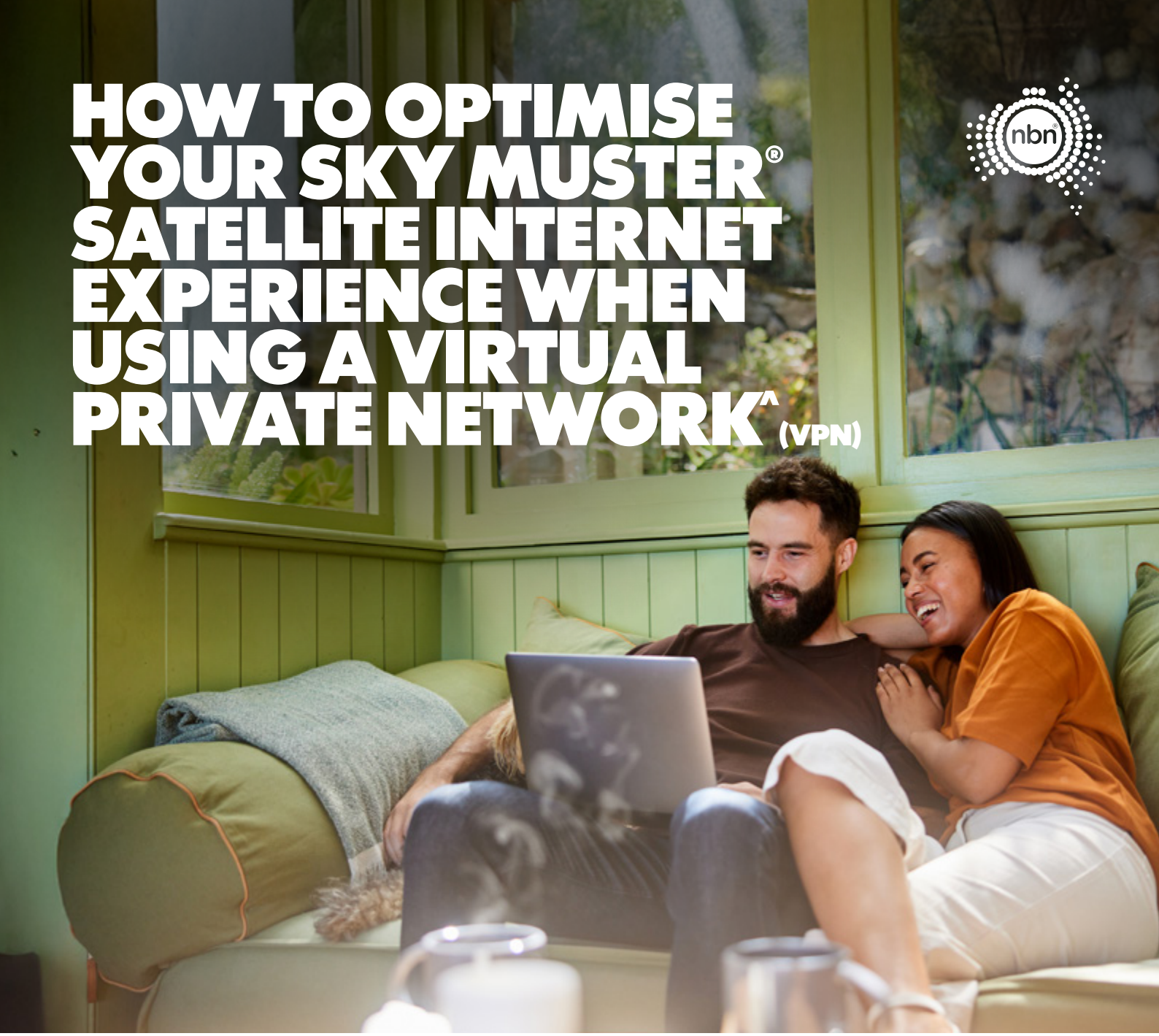
HOW TO OPTIMISE YOUR SKY MUSTER® SATELLITE INTERNET EXPERIENCE WHEN USING A VIRTUAL PRIVATE NETWORK^ (VPN)



WHAT IS THE NBN SKY MUSTER SATELLITE SERVICE?

- The **nbn** Sky Muster satellite service delivers the **nbn** network to homes and businesses in regional and remote Australia, via two state-of-the-art geostationary satellites.
- The **nbn** Sky Muster satellites sit 36,000km in a geo-stationary orbit above the equator and connect Australians across the country and surrounding islands to the internet.
- When the internet is in use, the data travels a round trip of 72,000km from your **nbn** satellite dish, up to the Sky Muster satellites and back down to the **nbn** satellite ground station in order to transmit the signal.

^ Your experience, including the speeds actually achieved over the nbn network, depends on the nbn network technology and configuration over which services are delivered to your premises, whether you are using the internet during the busy period, and some factors outside nbn's control (like your equipment quality, software, broadband plan, signal reception and how your service provider designs its network).

WHAT IS A VIRTUAL PRIVATE NETWORK (VPN)?

- A VPN is a private network software application that accesses the internet over a secure connection. Only authorised parties have access to this network.
- A VPN encrypts the traffic and the information being accessed on the network so it can't be seen by unauthorised parties.
- Using a VPN can cause limitations on your device when using the internet, which means it can slow down the connection.
- All online activity accessed via a Virtual Private Network counts towards your monthly data allowance on Sky Muster. nbn recommends speaking to your provider about nbn Sky Muster Plus Premium plans as these offer uncapped data usage for all internet activities.[#]

WHY IS THE NBN SKY MUSTER SATELLITE SERVICE SLOWER WHEN USING A VPN CONNECTION?

- Internet activity such as browsing the web, sending emails and downloading documents uses a system which acknowledges when data has been received before sending more.
- On the nbn satellite network, this acknowledgement is delayed due to latency.
- To combat this, (when not using a VPN), nbn uses acceleration to acknowledge the data received mid-way through the network, rather than at the end. This helps ensure the data can be sent with as little delay as possible.
- When data is encrypted by a VPN, the acceleration is not possible. This reintroduces latency into the network, resulting in slower download and upload speeds; or network responsiveness.

WHAT CAN I DO TO HELP OPTIMISE MY INTERNET CONNECTION?

Firstly, check and compare your service's speed with and without a VPN over the nbn network.[^] This helps identify whether your slower speeds are due to the VPN connection, or if another factor is at play. To do this, perform a speed test using the following steps:

1. Connect your device to your nbn connection box using an Ethernet cable rather than connecting with Wi-Fi. Refer to your nbn user guide for help with connecting to the nbn connection box.
2. Turn off the VPN and perform a speed test without being connected to the VPN. You can check your speed through your preferred internet provider or by using a publicly available speed test service as a guide. nbn recommends nbn Sky Muster Plus Premium customers use plustest.nbnco.com.au, which makes results available to your provider for troubleshooting. Make a note of your download and upload speed results from the test.
3. Turn on the VPN and perform another speed test whilst being connected to the VPN. Use the same speed test service used in Step 2. Make a note of your download and upload speed results from this test.
4. Compare the download and upload speeds on both tests. If you notice a poor result without being connected to the VPN, contact your service provider for assistance.

If your two speed tests are close in numbers, or the test not connected to the VPN is the lower number, contact your service provider for assistance.

[#]Fair Use Policy and Shaping continue to apply.
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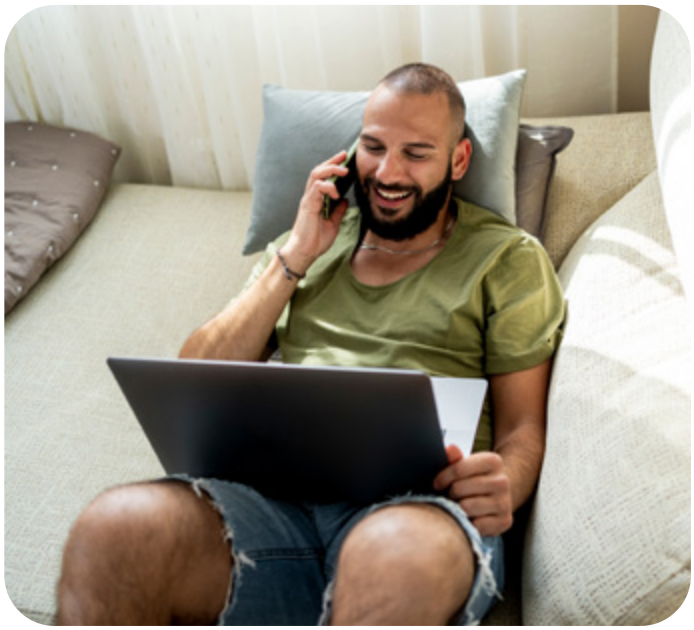
Now that you've checked your service, here are some tips to help you, and possibly your employer, troubleshoot issues and further optimise your experience.^

TIPS FOR USING A VPN:

- Only use a VPN when required. In general, not every work application requires a VPN. Check with your IT department for applications that don't require a VPN connection. Here are some examples of work applications that might not need a VPN connection:
  - Websites that begin with https:// (or show the padlock symbol) indicate secure browsing.
  - Email services such as Microsoft Outlook and Gmail use Secure Mail Transfer Protocol (SMTP).
  - Cloud based services are inherently secured. This includes Office 365 applications (OneNote, OneDrive, SharePoint etc.), Google Suite applications (Google Docs, Sheets, Drive etc.), Salesforce, Oracle, Slack, WhatsApp and more.
- Avoid using a VPN for video conferencing if you can. Video conferencing services such as MS Teams, Signal and Google Meet. should not require a VPN as they are typically secure. On **nbn** Sky Muster Plus Premium plans, all internet activities are uncapped#, including VPN use.
- Where possible, use an ethernet cable to connect devices such as smart TVs, computers and laptops directly to the nbn connection box. This can usually provide a stronger connection.
- Keep personal devices such as laptops, computers and phones up to date by performing software updates regularly. This can help applications run smoothly and protect your devices from malicious cyber-attacks.

TIPS FOR EMPLOYERS/IT DEPARTMENTS:

- Assess all applications used on the corporate network and determine which ones require VPN access and which ones don't. Compile and share a list of VPN applications with employees so they can turn off the VPN when it's not required and can avoid using it unnecessarily.
- Check the type of VPN being used. If your VPN is a 'split tunnel' VPN, it can be configured so that only the necessary applications tunnel through the VPN. Other applications will not tunnel through the VPN even whilst connected.
- Check the encryption type being used by the VPN – encrypted headers vs. encrypted payload. TLS/SSL based VPNs only encrypt the payload (secure) but do not encrypt the header, so satellite acceleration processes can help speed up the connection. IPSec based VPNs encrypt both the payload and the headers which prevents this acceleration.



For medium and large businesses, speak to a participating provider for more information about eligibility for the nbn Sky Muster Plus Premium plans.

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FOR HELP AND SUPPORT

For more information on nbn Sky Muster satellite services visit nbn.com.au/SkyMusterPlusPremium or contact your preferred phone and internet provider

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