

5G FAQ

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What is 5G?



What is 5G?

5G, or the standard name 5G-NR (5G-New Radio) is the fifth generation mobile network technology which is going to bring a time of unprecedented connectivity and technological advancement. In general, 5G brings three new things to the table: wider channels (speed), lower latency (responsiveness) and more bandwidth (the ability to connect a lot more devices at once). 5G technology is still under development and the whole telecommunication industry is discovering 5G's complete picture.



What is the advantage of the 5G network besides rapid increase in network speed?

5G networks promise to deliver higher multi-Gbps peak data speeds with ultra-low latency. They also provide more reliability and massive network capacity, which lead to increased availability.



How fast is 5G?

The maximum theoretical values of Peplink's 5G network devices are: 4Gb/sec downlink data rate and 700Mb/sec uplink data rate.

Actual customer Internet experience can vary widely due to factors such as the relative position between user and the base stations, the download server resources, Internet traffic conditions, the number of users, users' devices, and other factors that may arise.

How does 5G work?



How does 5G work? What is the difference between 5G and LTE networks?

5G New Radio covers spectrums that have higher frequency and are not used in LTE networks, such as Sub-6 and Millimeter Waves. The high frequency brings the advantage of 5G: rapid increase in speed, ultra-low latency, and more network capabilities.



What is Sub-6? What is mmWave?

5G New Radio has 2 frequency ranges, FR1(Sub-6) and FR2(mmWave).

Sub-6 refers to frequency bands under 6 GHz which includes most LTE bands. Sub-6 bands have similar transmit distances and bandwidths as their LTE-A counterparts. Sub-6 has comparatively faster speed and capacity than normal LTE networks.

Millimeter waves, also known as mmWave, are frequency bands higher than 24 GHz. Their bandwidths are extremely high, but transmission distances are short. With the help of foundation technologies like Small Cell and Massive MIMO, mmWave can overcome problems like short travel distance and obstruction interruption.



Do Peplink 5G devices support Sub-6 or mmWave?

Peplink devices don't support mmWave yet, but we are definitely working on it. We do however already have a number of products that support Sub-6. You can find them [here](#).



What do Standalone (SA) and Non-Standalone (NSA) mean?

Due to the evolution of wireless technology, it is hard to wait until a whole new 5G core network has been completed, therefore engineers figure out an architecture for a period of transition. We call it Non-Standalone (NSA). This technology describes devices and services that utilize existing LTE core networks and infrastructure to connect to 5G cellular networks. There will be a bottleneck in connection speed as the capabilities of the LTE core network do not match the newer 5G technologies. However, 5G NSA will still be faster than 4G LTE.

Standalone, also known as “SA”, is used to describe devices and services that utilize core networks built by ISPs/carriers specifically for 5G services. The high-speed, low-latency 5G technology that the industry has focused on is 5G standalone.



Why can't I feel the latency difference between 5G and LTE?

There are a variety of reasons why you might not feel a difference.

It could be that you don't have an optimal signal strength or signal quality. It may also be limited by your data plan or the Internet Service Provider's speed, or perhaps the difference is just too little to notice. After all, the difference between 1ms (5G) and 20ms (LTE) is still just a fraction of a second.

Peplink and 5G



How many Peplink products support 5G technology?

Peplink currently has six routers with built-in 5G modems: MAX BR1 Pro 5G, MAX Transit 5G, MBX 5G, Balance 310 5G, Balance 310X 5G, and Balance 310 Fiber 5G. Learn more about Peplink's 5G products [here](#).

Balance 20X*, 380X, 580X, SDX, SDX Pro, and EPX are able to support 5G technology with Peplink's FlexModule series.

*Balance 20X's 5G performance with FlexModule may be limited by the router.

Peplink also has the MAX Adapter 5G, a USB dongle product that provides an additional 5G network connection to your device and router. See [here](#) for the list of compatible devices.



If my Peplink device cannot receive a 5G network, will I stay connected?

Yes, of course. All Peplink's products are able to receive LTE CAT-20 network with a 2Gb/sec downlink data rate and 150Mb/sec uplink data rate. The datasheets of Peplink's device show the supported frequency bands.



Can we bond LTE and 5G WANs together?

The SpeedFusion VPN bonding isn't a simple $1+1=2$ equation. While yes, we can configure the VPN to use LTE and 5G together, we do not recommend doing so. This is due to the differences in latency and bandwidth.

If you do choose to do so, you may need to do some fine-tuning of the settings to find the best setting for maximizing the VPN throughput.

Peplink has always strongly recommended using WANs that have similar bandwidth or speed for SpeedFusion VPN bonding.



If LTE and 5G are not recommended to be bonded with each other, why do some Peplink routers come with both 5G and LTE modems?

You can make good use of Peplink's SpeedFusion technology such as Bandwidth Overflow and Traffic Steering with Peplink's 5G routers which are equipped with modems that have differences in latency and bandwidth.

Bandwidth Overflow monitors network bandwidth usage and switches to the most suitable connection as bandwidth usage changes. This allows network users to access high bandwidth connections or switch to less costly connections when bandwidth usage is low;

While Traffic Steering gives you granular control of how different kinds of traffic travels within your network. You can give priority to certain kinds of traffic while throttling or even blocking others depending on your deployment.

SpeedFusion and 5G



Why would I need SpeedFusion if I already have this super fast 5G?

As mentioned above, we do not have the complete picture of 5G as it is still under development. There are a number of limitations when we try to employ 5G for daily use.

First, 5G is using radio waves with higher frequencies which can bring higher speed, lower latency and more capability. However, the high frequency is inversely proportional to the radio wave's travel distance, which causes limitations to the 5G cover area.

In addition, the high frequency radio waves will be easily obstructed by trees and walls, making them unsuitable for many mobile applications or working in rural and suburban areas.

Third, since more and more devices can take advantage of 5G's low latency and high speed, 5G is going to face a lot of network congestion as a result of bringing more devices online.

Even though 5G is being rolled out right now, it still needs a few more years for 5G to be fully developed and ready to completely replace 4G networks. This means that while we wait for telecommunication companies to finish deploying their 5G networks, customers will be caught in a limbo between 4G and 5G. For the time being, pairing our SpeedFusion technology with your 5G ready product will lead you to a smooth transition from 4G to 5G.



Does the 5G network work with Peplink's PepVPN and SpeedFusion technology?

Yes. A 5G network can work with Peplink's PepVPN and SpeedFusion technology. You can enjoy SpeedFusion technology like Hot Failover, WAN Smoothing, Bandwidth Overflow, etc. with a 5G network. Click [here](#) to learn more about SpeedFusion technology.



How does Hot Failover relate to 5G?

SpeedFusion Hot Failover allows you to seamlessly transfer the connection to an alternative WAN, ensuring your connection is protected from sudden interruption and breaks. Another benefit of using 5G as a failover is that you can take advantage of the wider bandwidth to handle high volume of users, that is something 4G LTE cannot achieve.



How does WAN Smoothing relate to 5G?

Although the 5G network promises super high speed and significantly lower latency (1ms), it doesn't prevent packet loss on its own. 5G will also still have jitter.

WAN Smoothing makes sure your sessions are jitter-free. It utilizes intelligent algorithms to detect packet loss and to immediately replace the lost packets. Other methods of mitigating packet loss such as FEC are also deployed to ensure that your sessions are completely jitter-free.



How does Bandwidth Overflow relate to 5G?

Bandwidth Overflow monitors network bandwidth usage and switches to the most suitable connection as bandwidth usage changes. This allows network users to access high bandwidth connections or switch to less costly connections when bandwidth usage is low.



How does Bandwidth Bonding relate to 5G?

Bandwidth Bonding is a SpeedFusion function that we are not suggesting you use with 5G connections. Bandwidth Bonding combines data at the packet level, enabling you to combine the speed of multiple connections. In the above question “Can we bond LTE and 5G WANs together?”, we point out that bonding connections with different latency and bandwidth requires complicated settings and time to optimize for the best performance. That is why we do not recommend you use Bandwidth Bonding with 5G connections.

Antennas



Why are external antennas better for 5G?

Considering the existent limitation of 5G transmission such as short travel distance and easily obstructed by environment, having external antennas will help to increase the signal strength and quality.



Is there a single antenna that can cover the full 5G spectrum or do we need to have an array to get the range between sub 1GHz and mmWaves?

No. There is no Peplink antenna that can cover the full 5G spectrum as the whole range from Sub-1 Network to mmWaves is 1 GHz to 300 GHz.

Currently the highest frequency Peplink’s router can cover is 6 GHz. The antenna comes with a Peplink 5G device (ACW-235) that is able to cover frequencies from 600 MHz to 6000 MHz.

On the other hand, our Mobility, and Maritime series antennas can cover the same frequency range with higher peak gain (dBi).



Are Mobility antennas compatible with 5G?

Yes, Mobility antennas are great fits for 5G because they cover from 600 MHz all the way up to 6 GHz. It also supports Band 71, widening the network coverage.

Click [here](#) to learn more about Peplink's Mobility antenna series.



Are Maritime antennas compatible with 5G?

Yes, Maritime antennas are great fits for 5G because they cover from 400 MHz all the way up to 6 GHz.

Click [here](#) to learn more about Peplink's Maritime antenna series.



Can I connect only 2 antennas instead of 4 for a 5G modem?

Peplink's 5G products come with 4 RF connectors for connecting antennas. The connectors are named as A, B, C, and D. For the best performance and reliability, all 4 RF connectors must be connected to the same type and performance antennas.

In [firmware 8.3.0](#), 2x antenna mode is being added for 5GH or CAT-20 cellular modules, which allow these modules to connect with 2 RF connectors only.