

# Influence of Home Networking Over Online Gaming Experience

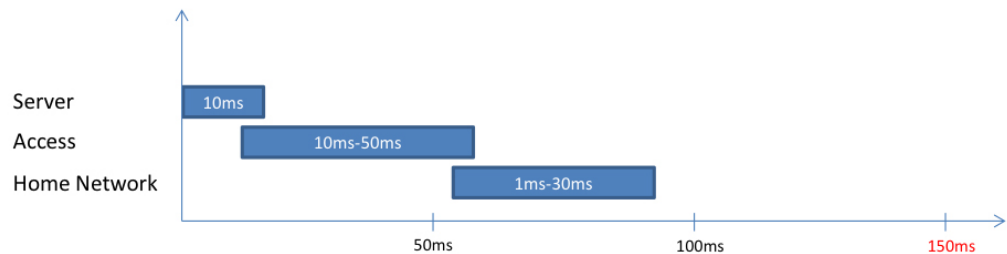
Gamers hate a term that many did not know before starting the online gaming experience: latency. This delay between an action the player intends to perform in the game and its actual effect on the screen can totally ruin the experience. Numbers over 150ms are a total no-go experience while being under 20ms is considered a very good behavior.

The action issued by the player has to go through different network segments until it reaches the game server; it is then processed and the response travels back to the gamer. There are 3 main segments that can influence the latency level:

- **Online Game Servers:** the complexity of the game, the number of users, the graphics and other variables can affect the response time of the server. However, it is also solvable by scaling up the supposed “infinite” processing power in cloud environment.
- **Access Network:** depending on the type of technology used, this latency, which is a result of contention of users to access the network, can vary a lot. An old DSL connection and a low contention ratio FTTH network can have very different numbers.
- **Home Networking:** gamers are not always connected directly or even able to connect directly to the access router to minimize any added latency from this last 5-10m connection. In many cases, therefore, some kind of home network connectivity is between the console and the access router.

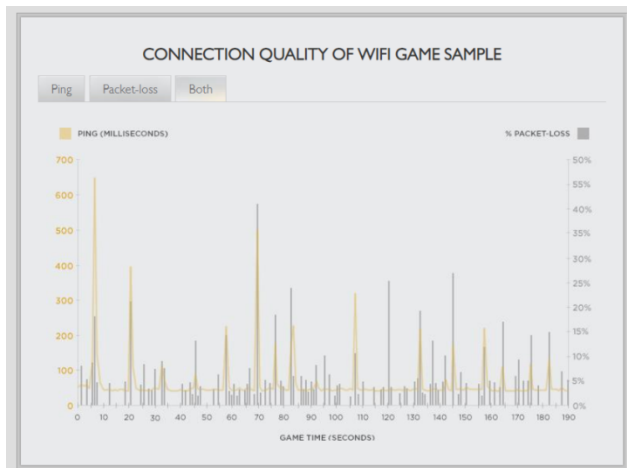
The contribution of each of these segments may vary among providers. As an approximation, servers may have response times under 10ms. Regarding the access network, pings may vary from 10ms to more than 50ms. The home network influence is studied here to determine its impact on the overall experience. Rough numbers vary depending on the technology to use. Average values as low as 1ms up to 30ms could be found.

The number one home network technology used nowadays in any home is Wi-Fi. Its beauty resides in the fact that there is no need to install wires and therefore it can be installed by the user. However, it has some drawbacks that are highlighted when connecting demanding services such as online gaming.



Wi-Fi, as a technology that provides little control over when each node has access to the air, generates loss of packets that are not noticeable for services such as web browsing. But when delivering video related services, these crashes generate peaks of latency, since those packets need to be retransmitted, taking longer time to reach the other end. This is difficult to absorb for many video devices and impacts real time experiences such as online gaming.

The following graph shows instant values of latency and packet loss in a real gamer experience over Wi-Fi. These peaks go well over the acceptable levels for online game experience.

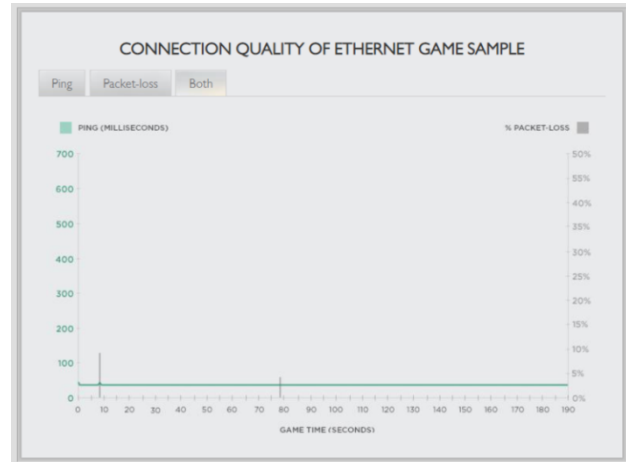


(Source: <https://na.leagueoflegends.com/en/page/ethernet-vs-wifi-ping-packets-playing-better>)

In this situation, running a speed test where latency levels can be measured as Ping value may not show the reality. Those measurements run an average over time. In this case, this average showed a value of 62.4ms. In theory, aggregated values do not surpass the 150ms threshold, but the end user experienced lag. The peaks of latency suffered were clearly justifying the lag experience intermittently.

The same environment but connected over Ethernet directly to the access router changes the picture dramatically. It is not surprising gamers prefer to connect over wires rather than Wi-Fi due to these effects. And this is getting even worse with the rapid increase of multiple Wi-Fi access points in the home (Wi-Fi Mesh).

As a summary, the game provider will do its best to minimize latencies operating their Online Servers.

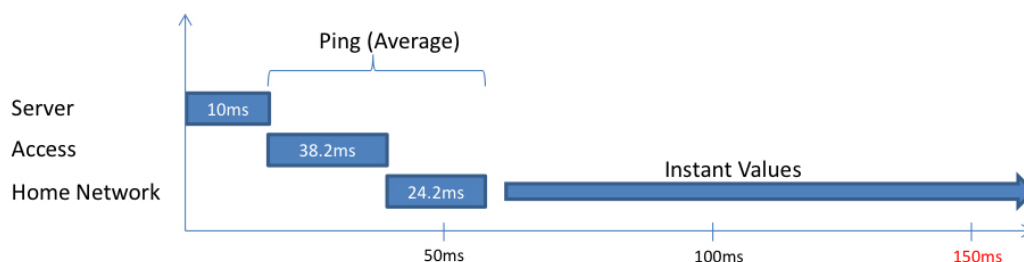


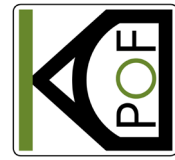
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In the Access Network, providers can try to minimize the added delays and even offer specific packages to gamers to secure quality of their links to do so. The home network actually plays a key role in the whole experience, since it is a part of the whole and therefore remains an area for improvement.

## Wiring as a Preferred Method for Home Connectivity

Wired connectivity is the ideal connection for ensuring that the overall latencies do not go over acceptable levels. However, not all homes are equipped with a wired connection in every room. The alternatives, such as reusing cables like power lines, although not showing such erratic behavior as Wi-Fi, are also exposed to other similar effects such as noise in the electrical network that generate these latency peaks in different ways.





Wires are the perfect match for a good online game experience. But wiring Ethernet in an existing house can be quite a difficult experience. Not only from the time and cost spent to do so, but from the aesthetic impact of having external trunks laid out all around the house. This option is very seldom acceptable to end users.



Due to this, it is not unusual to see situations where the gamer runs a wire from the router to the console while playing, then removes it when done.

## Plastic Optical Fiber: Wires But Not Seen

The ideal option is to keep the wired performance but have the wireless appearance. This is achieved with Plastic Optical Fiber. This fiber is easily installed through the existing conduits of the house: power lines, coaxial, phone lines or data conduits. The fiber goes in-wall and is not seen. Its thin diameter allows it to go through even high populated ducts. It is also very easy to connect just by cutting the wire and inserting it into the connectors. More information can be found here:

<https://www.youtube.com/watch?v=JNFvbtpxoJs>  
[https://www.youtube.com/watch?v=yHVAvN\\_wiBY&t=59s](https://www.youtube.com/watch?v=yHVAvN_wiBY&t=59s)  
[www.kdpof.com](http://www.kdpof.com)

The end result can be seen in the following picture, where gamers can have their preferred home connectivity in a convenient, easy and permanent way.



## Business Opportunities Around Plastic Optical Fiber

As a solution that requires installation, end users need a third party to provide this service. It is a value added one for players, since it can make a key difference in their gaming experience, and thus it is an opportunity to a Service Provider. This provider can be:

- Broadband Service Provider: As part of a tailored package for gamers, POF installation provides a definite plus for the best Quality of Experience (QoE).
- Online Game Provider: Their offering depends on the overall QoE of their users. The home network part is key to achieve this. As a complement to their online game offering, this service is sure to be valued by the players.