Despite 100GB video games, average download times are decreasing

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- Fig. 1: Dividing average PS4 game file sizes by average broadband speeds shows decreasing download times in recent years.
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- Fig. 2: In the middle of the PS3 era, game file sizes started growing faster than broadband speeds for a while.
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- Fig. 3: In the last few years, growth in average US broadband speeds has vastly outpaced growth in PS4 game sizes.
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- Fig. 4: Raw averages for top-selling PlayStation game file-size.
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- Fig. 5: Raw figures for average US broadband speeds.
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Anyone who downloads games regularly probably has a complaint about just how long it takes to download some of the bigger big-budget titles these days. Unless you want to buy your games on a physical disc or cartridge (or use a streaming gaming service), playing a new game these days means budgeting time for the raw files to get onto your system from

centralized servers.

At a quick glance, it can feel like this problem is getting worse over time. Take a look at *Red Dead Redemption 2* and *Final Fantasy VII*, for instance; two recent high-profile games that each push past a whopping 85GB for their PS4 downloads. The coming release of *The Last of Us Part 2* continues the trend, with marketing materials warning that players will need 100GB of hard drive space. That's a big change from 2013, when a 50GB PS4 game download was considered shockingly large.

Those examples notwithstanding, though, the data shows that US console gamers are generally spending less time than ever downloading popular console games. In fact, an analysis conducted by Ars confirms that average broadband download speeds in the United States have been increasing faster than average game sizes for years now.

The data

To get a handle on the relative shape of modern game download times, first we needed reliable data on just how fast broadband speeds have been over the years. Ookla's Speedtest Global Index provides a great breakdown for this, with data broken out by country and by mobile versus broadband use cases. And Ookla measures the actual bandwidth experienced by users, not the "advertised" bandwidth hyped by the ISPs.

Then we had to figure out just how many gigabytes make up an average modern game these days. For this, we relied on Sony's own regularly updated list of top-selling PlayStation software. For each year, we used each platform's top-10 best-selling games for December as a reasonably representative cross-section of the console's software library for that year (for 2020, we used the list of top sellers for April).

This number doesn't include the size of any subsequent patches or DLC that might be needed to play the game, and download

sizes for games on other platforms may look somewhat different. Still, it provides a good baseline look at how game size has changed over time.

The results

Data in hand, we can see some broad trends in the relative growth of download speed and game size going back to middle of the PS3 era. Back then, the size of top-selling downloads increased sixfold from 2011 to 2015 (Fig. 2). This seems to reflect a transition from players primarily downloading smaller indie darlings to the growing popularity of "full game downloads" for retail releases like the 27GB *The Last of Us* and the 24GB *Destiny* (Fig. 4).

But average broadband speeds in the US only increased threefold in the same time period, meaning total download times for games shot up after 2011* (Fig. 1). While things started to balance out again by 2016, the noisy data doesn't exactly paint a great picture for time spent waiting for games downloads on the PS3.

Enlarge / While *The Last of Us Part 2* might be pushing 100GB to download, generally increasing broadband speeds could still

leave you smiling.
Going into the PS4 era, though, things shook out quite differently. From 2013 to 2015, the growth in broadband speed and PS4 game size matched each other almost perfectly (Fig. 3). Then the growth of top-selling PS4 games starts to plateau a bit, thanks in large part to a functional “ceiling” of a 50GB file size for games packaged on a single Blu-ray disc. The few outliers that blow past that mark only have a small impact on the average, which has topped out just under 50GB in recent years.

Average broadband speeds in the US, meanwhile, have continued growing faster and faster since 2015 (Fig. 5), easily outpacing game-size growth. As a result, average download times* for PS4 games have come down over the years, even as game sizes have generally increased.

(* – The “idealized” game download time metric used in these charts is a very rough estimate made by dividing the raw file size by the reported average bandwidth across the country. Actual results can vary widely based on congestion on Sony’s servers and day-to-day performance of the user’s specific connection.)

The future

It’s too early to say for sure if games on the PS5 and Xbox Series X will be considerably larger than those on current consoles. Based on recent history, though—and the increasing detail of scenes like those in Epic’s recent Unreal Engine 5 demo—we can only imagine console games will routinely blast past a single Blu-ray disc’s de facto 50GB soft limit in the near future.

That said, recent data also shows that these increasing file sizes don’t necessarily mean increased download times for console gamers. In recent years, broadband infrastructure in the United States seems to generally be keeping pace with (or

surpassing) the raw data needs of modern gaming downloads.

Those kinds of averages are of limited use to players stuck on low-speed broadband, of course, whether due to price or sheer lack of availability, especially in the rural parts of the country. And those increasingly massive games are going to have to be stored on increasingly pricey high-speed storage in the next console generation and fit through sometimes stringent data caps, which could be an even greater concern than download times for some.

Taken as a whole, though, the data suggests the hassle of waiting for a new game to download has actually been decreasing over time. Something to think about as you wait for *The Last of Us Part 2* to filter down to your hard drive in the near future.

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