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**UNITED STATES DISTRICT COURT
CENTRAL DISTRICT OF CALIFORNIA
SOUTHERN DIVISION**

INTELLECTUAL PIXELS LIMITED,
Plaintiff,

v.

SONY INTERACTIVE
ENTERTAINMENT LLC;

Defendant.

Case No. 8:20-cv-01422

**AMENDED COMPLAINT FOR
PATENT INFRINGEMENT**

DEMAND FOR JURY TRIAL

SONY 1032
Sony v. IPL
IPR2021-00237

1 1. Plaintiff Intellectual Pixels Limited (“IPL” or “Plaintiff”) hereby submits
2 this Amended Complaint against Defendant Sony Interactive Entertainment LLC
3 (“SIE” or “Defendant”) and states as follows:

4 **NATURE OF THE ACTION**

5 2. Online video gaming is a multi-billion-dollar industry in the United States
6 with tens of millions of Americans playing online games on a variety of devices. As
7 video games have become more sophisticated with higher graphical demands, gaming
8 companies have been searching for new technological solutions to deliver these games
9 to any consumer device, while minimizing user-related issues with regard to
10 compatibility and the playability of the games.

11 3. As a result, video gaming industry leaders have increasingly begun to move
12 their games to the “cloud” so that users can stream games from a server to game
13 consoles and other non-traditional gaming platform devices like tablets and
14 smartphones. Similarly, it has become desirable to offer solutions that enhance the
15 portability of the game, by streaming games from one device, say a game console, to
16 another device, like a smartphone or a tablet.

17 4. Streaming video games from the cloud has a number of advantages. One of
18 those advantages is that players can avoid having to download the games (which can be
19 very large and frequently updated with large software patches) to their local device,
20 saving time and conserving local storage. In addition, the ability to play games streamed
21 from a visual server in the cloud or streamed from a console or a PC at the home allows
22 users to play (or view others playing) those games on devices which would have been
23 underpowered or otherwise simply incompatible with the game software. For example,
24 streaming allows a game specifically designed to run on a high-end, special-purpose
25 game console to be played on a Windows PC or smartphone.

26 5. Cloud-gaming has dominated recent gaming conferences with industry
27 leaders, like SIE and others, competing to top each other with new announcements and
28 rollouts centered on the ability to play video games via the cloud, or to allow steaming

1 of game images from a local device acting as a server to another client device.
2 Streaming games from the cloud or a local device operating as a server at the home
3 (like a game console) have been gaining momentum since around 2014. As reflected in
4 the popular press, the ultimate objective for these industry efforts is to become the
5 “Netflix” for games, allowing games to be streamed to various consumer devices and
6 platforms.

7 6. But decades before SIE and others started touting cloud gaming as the new
8 frontier, pioneers in the field of graphics processing invented the fundamental
9 technologies for enabling cloud gaming and streaming graphics applications.

10 7. 3Dlabs Inc., Ltd. (“3Dlabs”)—a leading developer of graphics processing
11 units (GPUs)—recognized the enormous advantages of being able to stream graphics
12 applications (including games) from a server to a remote client device via the Internet
13 or other wireless network as early as the late 1990s. Excerpts below from confidential
14 3Dlabs presentations from 2000 and 2001 provide an overview of the 3Dlabs’ solution.

15 8. Co-founder and CEO of 3Dlabs, Osman Kent, along with David Baldwin
16 and Nicholas Murphy—3Dlabs’ chief architects of GPUs—developed and patented this
17 groundbreaking technology. The patents now belong to IPL, which is co-owned by the
18 original founders of 3Dlabs.

19 9. The IPL patents are foundational patents in the cloud-gaming and streaming
20 graphics applications space, and have been repeatedly cited in the industry, including in
21 the gaming patents owned by SIE, and in the original patents filed by Gaikai, a company
22 that SIE purchased when it decided to enter the cloud-gaming market.

23 10. SIE has been seeking to capitalize on the revolutionary technology that IPL
24 and the inventors developed.

25 11. And SIE has no plans to stop doing so. It has already announced its
26 intention to release a new PS5 console that will also utilize IPL’s technology.
27
28

THE PARTIES

12. IPL is a company registered in the United Kingdom, with registration number 11840479. IPL's principal place of business is located at St. Anns Court, St. Anns Hill Road, Chertsey, Surrey, UK KT16 9NW.

13. IPL is the assignee and owner of the patent at issue in this action, United States Patent No. 10,681,109 (the "'109 Patent"), which issued on June 9, 2020. IPL alleges infringement of this Patent based on (i) Sony's PlayStation Now gaming service ("PS Now"); (ii) Sony's Remote Play feature provided in each PlayStation 4 ("PS4") console and certain selected client devices, and the vast majority of PlayStation video games; and (iii) Sony's Share Play feature, also supported by PS4 consoles operating as both a server and as a client device, and the vast majority of PlayStation video games. On information and belief, Sony's Remote Play and Share Play features will be provided in the PlayStation 5 console ("PS5") and its associated client devices and supported in associated PlayStation games once the PS5 is publicly released in fall 2020.

14. The technology underlying the Patent-in-Suit was initially developed by 3Dlabs, which was publicly traded on the NASDAQ exchange at the time. 3Dlabs was a prominent developer of graphics processing units (GPUs) in the late 1990s and early 2000s. In 2002, 3Dlabs was acquired by Creative Technology Ltd. ("Creative"), which was also publicly traded on the NASDAQ exchange at that time. Creative, a longtime business partner of 3Dlabs, was and is a leader in the design, manufacture, and distribution of digitized sound and video boards and related multimedia and personal digital entertainment products. The inventors of the Patent-in-Suit were Osman Kent, a co-founder and chief executive officer of 3Dlabs, and David Baldwin and Nicholas Murphy, the chief architects of GPUs at 3Dlabs. The application that lead to the '109 Patent was owned originally by Intellectual Pixels Limited, based in St. Helier, Jersey ("IPL Jersey"), which assigned its rights in the patent application to IPL, the current owner and plaintiff in this action. IPL is co-owned by the original founders of 3Dlabs, Osman Kent and Yavuz Ahiska. Although never commercialized by 3Dlabs, the concept

1 of cloud gaming and streaming other graphics applications from a server or the cloud to
2 a client device was considered one of the most valuable inventions developed by 3Dlabs.

3 15. Sony Interactive Entertainment LLC is a California entity with a registered
4 agent at CSC Lawyers Incorporating Service, 2710 Gateway Oaks Drive, Suite 150N,
5 Sacramento, CA 95833-3505. On information and belief, SIE is a wholly owned
6 subsidiary of Sony Corporation, a Japanese entity with its principal place of business
7 located at 1-7-1 Konan, Minato-Ku, 108-0075, Japan. Sony Corporation is a Japanese
8 multinational conglomerate corporation headquartered in Kōnan, Minato, Tokyo.
9 (<https://www.sony.net/SonyInfo/CorporateInfo/data/>, last visited June 5, 2020).

10 16. SIE “is responsible for the PlayStation brand and family of products and
11 services. PlayStation has delivered innovation to the market since the launch of the
12 original PlayStation in Japan in 1994. The PlayStation family of products and services
13 includes PS4, PlayStation VR, PlayStation Store, PlayStation Plus, PlayStation Video,
14 PlayStation Music, PlayStation Now, and acclaimed PlayStation software titles from
15 SIE Worldwide Studios.” (<https://www.playstation.com/en-us/corporate/about/>, last
16 visited June 5, 2020). PlayStation games are streamed by PlayStation Now servers to
17 Sony PS4 consoles and to PCs that are loaded with suitable client software provided by
18 Sony. PlayStation games also may be streamed from Sony PS4 consoles to Windows-
19 based PCs and Mac computers, the PlayStation Vita handheld game player, Sony Xperia
20 phones and tablets, certain iOS devices, including iPhones and iPads loaded with the
21 Remote Play application provided by Sony, and other PS4 consoles with the Share Play
22 feature provided on PS4s by Sony. Much of this functionality is managed through Sony’s
23 PlayStation Network.

24 17. In addition, Sony Share Play allows users to play PlayStation games
25 together with their PlayStation Network friends, whether they own a copy of the
26 PlayStation game or not. Sony’s Share Play allows a user to let a friend watch her play
27 a PlayStation game by sharing a display screen, allows the friend to take over control of
28

1 the game and try a game himself, or allows the friend to play a multi-player game
2 together with the host PS4 console in a local multiplayer mode.

3 18. Finally, Sony has recently announced that it will release the PS5 console to
4 consumers during the Holiday season in 2020. In its May 15, 2020 Corporate Strategy
5 Meeting, Sony's President and CEO Kenichiro Yoshida announced that the PS5 "is
6 scheduled for the holiday season of this calendar year." To allow sales to end-user
7 customers in that time frame, Sony will begin selling and distributing the PS5 consoles
8 to retail and Internet stores in advance of the release date to consumers. Mr. Yoshida
9 confirmed that the PS5 console will continue to support PS Now, PS Remote Play, and
10 on information and belief, Share Play. In addition, and on information and belief, Sony
11 has imported the PS5 platform into the United States and distributed it to certain entities,
12 including PlayStation game developers. On information and belief, PlayStation game
13 developers have used and are using the PS5 platform to develop and test forthcoming
14 PS5 games.

15 **JURISDICTION AND VENUE**

16 19. This Court has subject matter jurisdiction pursuant to 28 U.S.C. §§ 1331
17 and 1338(a) because this action arises under the patent laws of the United States, 35
18 U.S.C. §§ 101 *et seq.*

19 20. Venue is proper in the Central District of California, Southern Division
20 because Defendant has committed acts of infringement in Orange County and has a
21 regular and established place of business in Aliso Viejo, California, where the
22 infringing technology relative to PlayStation Now, Sony Remote Play and Sony Share
23 Play was developed and, on information and belief, continues to be managed.
24 Defendant's acts of infringement include making, using, and selling its PlayStation
25 Now game streaming service and hosting PlayStation games on the PlayStation Now
26 server; making, using, and selling the Remote Play feature provided in PS4 consoles
27 and PS5 consoles, PS4 and PS5 games, and various Sony and third party client devices
28 that have the appropriate Sony client software; and making, using, and selling the Share

1 Play feature provided in PS4 consoles and PS5 consoles that operate as both a server
2 and as a client device, and PS4 and PS5 games.

3 21. In 2012, Sony Computer Entertainment (“SCE”) acquired the cloud-based
4 gaming company Gaikai Inc. (“Gaikai”), located in Aliso Viejo, California, for
5 approximately three hundred and eighty (\$380) million. ([https://www.forbes.com/sites/
6 tomiogeron/2012/07/02/sony-to-acquire-cloud-gaming-startup-gaikai-for-380-million/
7 #695731696fbc](https://www.forbes.com/sites/tomiogeron/2012/07/02/sony-to-acquire-cloud-gaming-startup-gaikai-for-380-million/#695731696fbc), last visited June 5, 2020). At the time of the Gaikai acquisition, SCE
8 stated that it would “establish a new cloud service, ensuring that it continues to provide
9 users with truly innovative and immersive interactive entertainment experiences.”
10 ([https://www.forbes.com/sites/johngaudiosi/2012/07/02/sony-computer-
11 entertainment-acquires-cloud-gaming-company-gaikai-for-380-million/
12 #48b849a17703](https://www.forbes.com/sites/johngaudiosi/2012/07/02/sony-computer-entertainment-acquires-cloud-gaming-company-gaikai-for-380-million/#48b849a17703), last visited June 5, 2020). That new cloud service, based on Gaikai
13 streaming technology, was and is marketed as PlayStation Now. ([https://gamerant.com/
14 sony-playstation-now-gaikai-cloud-gaming-ps3-ps4/](https://gamerant.com/sony-playstation-now-gaikai-cloud-gaming-ps3-ps4/), last visited June 15, 2020);
15 ([https://www.geek.com/games/gaikai-streaming-becomes-PlayStation-now-available-
16 this-summer-1581518/](https://www.geek.com/games/gaikai-streaming-becomes-PlayStation-now-available-this-summer-1581518/), last visited July 12, 2019); ([https://www.gamespot.com/
17 gallery/google-stadia-playstation-now-and-more-cloud-gamin/2900-2647/2/](https://www.gamespot.com/gallery/google-stadia-playstation-now-and-more-cloud-gamin/2900-2647/2/), last
18 visited June 15, 2020); (<https://www.wired.com/2014/01/playstation-now/>, last visited
19 July 12, 2019). At that time, SCE’s President promised that the company would “deliver
20 a world-class cloud-streaming service that allows users to instantly enjoy a broad array
21 of content from immersive core games with rich graphics to casual content anytime,
22 anywhere on a variety of internet-connected devices.” ([https://www.prnewswire.com/
23 news-releases/sony-computer-entertainment-to-acquire-gaikai-inc-a-leading-
24 interactive-cloud-gaming-company-161042365.html](https://www.prnewswire.com/news-releases/sony-computer-entertainment-to-acquire-gaikai-inc-a-leading-interactive-cloud-gaming-company-161042365.html), last visited June 5, 2020).

25 22. SIE resulted from the combination of SCE and other Sony properties,
26 centralizing various gaming hardware, software, and services. “In April 2016, Sony
27 Computer Entertainment Inc. (“SCEI”) and Sony Network Entertainment International
28 LLC (“SNEI”) founded Sony Interactive Entertainment LLC (“SIE”), a new company

1 that combined all the business units belonging to SCEI and SNEI, including hardware,
2 software, content and network services operations.” ([https://www.sony.net/SonyInfo/](https://www.sony.net/SonyInfo/IR/library/FY2016_20F_PDF.pdf)
3 [IR/library/FY2016_20F_PDF.pdf](https://www.sony.net/SonyInfo/IR/library/FY2016_20F_PDF.pdf), last visited June 5, 2020). The cloud-streaming
4 service developed by Gaikai underlies the accused functionalities in this case which have
5 been implemented in the PS Now service, PS4 consoles, PS5 consoles, client devices
6 associated with PS Now, Remote Play and Share Play, and the vast majority of PS4 and
7 PS5 games.

8 23. Gaikai is the original assignee of U.S. Patent No. 8,147,339 (the “Gaikai
9 Patent”), titled “Systems and Methods of Serving Game Video.” The Gaikai Patent post-
10 dates the ’109 Patent priority date. SIE is the current assignee of the Gaikai Patent.

11 24. On information and belief, the Defendant’s PlayStation Now, Remote Play,
12 and Share Play incorporate certain technology disclosed in the Gaikai Patent.

13 25. At the time of the acquisition, Gaikai was located in Aliso Viejo, California.
14 On information and belief, Gaikai’s Aliso Viejo facility became a Sony facility, and
15 thereafter, Gaikai employees became SIE employees. SIE currently lists job openings
16 for positions in Aliso Viejo ([https://www.playstation.com/en-us/corporate/about/](https://www.playstation.com/en-us/corporate/about/careers/)
17 [careers/](https://www.playstation.com/en-us/corporate/about/careers/), last visited June 11, 2020), including jobs related to streaming, network storage,
18 and cloud-computing. For example, the job listing for Senior Software Engineer
19 (HSE/Streaming) at Sony Interactive Entertainment PlayStation identifies Aliso Viejo,
20 CA as the location for the position. The listing states in part:

21 Sony Interactive Entertainment is looking for a hardworking software
22 engineer seeking to push the boundaries of cloud gaming. **As part of the**
23 **Hardware and Systems Engineering team, you will be responsible for**
24 **the design of the ground breaking technology powering PlayStation**
25 **Now and other cloud-based services.** As Senior Software Engineer, you
26 will have the opportunity to develop innovative new hardware and software
27 technology for production-grade services. You have broad exposure to
28 Linux / BSD systems and a wide variety of CPU, storage and network
technologies. Never a dull day, this position offers a healthy mix of
production and R&D projects, ensuring that work is both challenging and
rewarding.

(<https://boards.greenhouse.io/sonyinteractiveentertainmentplaystation/jobs/2161816>, last visited June 11, 2020) (emphasis added). The former Gaikai facility has been and continues to be a regular and established place of business of the Defendant in Orange County.

26. The inventor of the Gaikai Patent is David Perry. Mr. Perry served as the CEO of Gaikai at the time it was acquired by SCE. After the acquisition, Mr. Perry served as an employee of Sony Computer Entertainment America LLC until he left the company in June 2017. (<https://www.linkedin.com/in/dperry>, last visited June 9, 2020). In a 2014 interview, Mr. Perry stated, “Just to be very clear, we only do two things for Sony. We focus on cloud gaming and remote play.” (<https://www.gameinformer.com/b/features/archive/2014/09/17/gaikai-playstation-now.aspx?PostPageIndex=1>, last visited June 9, 2020).

27. SIE and IPL are currently involved in litigation over certain related IPL patents in the Central District of California, Southern Division. 8:19-CV-01432-JVS-KES. In that litigation, SIE conceded venue was proper in the Central District of California, Southern Division. Dkt. No. 81 at ¶17.

THE PATENT-IN-SUIT

28. The invention disclosed and claimed in the Patent-in-Suit provides numerous benefits over then-existing graphics rendering systems by implementing an architecture that moves the graphics processing and generation of graphic images to a remotely-located server and away from the client device where the user is playing a video game or utilizing a graphics application.

29. First, the invention allows one or more client devices to share a remote GPU on a server that performs graphics processing and generates images that are compressed and streamed to client devices. Because the generation of the graphic images (which often are produced through three-dimensional graphics processing of 3D geometric objects) are performed at the server rather than on client devices, multiple client devices may use the resources of a single powerful GPU – either concurrently or allocated on a

1 per session basis. This minimizes the time a user's device must spend on graphics
2 processing locally while still providing the benefit of high-performance gaming by
3 leveraging the remote GPU located on a server. As the patent explains, under prior
4 systems, "additional hardware increases the cost of the client hardware as the graphics
5 hardware must be incorporated and integrated therewith." '109 Patent at 3:8-10.

6 30. Second, the invention allows those end users who have client devices with
7 even minimal graphics computing capabilities access to high-end graphics processing,
8 including three-dimensional real-time graphics processing. By performing graphics
9 processing at the server rather than at the client, there is no need for each client device
10 to have the most recent GPU chip, or in some instances, to have a GPU at all. Without
11 the patented technology, "for reasons of cost, size, and power consumption,
12 sophisticated three-dimensional graphics are not available on common consumer client
13 devices such as personal digital assistants (PDAs) mobile telephones and set-top boxes
14 used to decode cable and satellite television signals." '109 Patent at 3:26-30.

15 31. Third, and relatedly, the invention solves issues related to software
16 compatibility by allowing software to run at the server level when the client devices
17 might not otherwise be able to execute the software because of instruction set or
18 operating system limitations of the client device. For example, the invention provides
19 "the ability to provide access to industry standard software on a device which is unable
20 to execute that software." '109 Patent at 9:45-46. By streaming video game images to a
21 client device, it is not necessary that the client device be at all compatible with the video
22 game or the graphics application that is being run on the server.

23 32. Fourth, the invention allows end users to play games without first needing
24 to download the game to the client device. Downloading games and their frequent large
25 updates requires significant time and storage resources and creates a substantial
26 hindrance to the user enjoying a new game instantly. By maintaining games at the server
27 level and only transmitting the generated images to the client device, time and memory
28 are conserved. Users can maintain control of the game through their user control inputs,

1 while the game processing and image generation is performed remotely on a server. The
2 ability to play games without first downloading or otherwise obtaining a copy of the
3 game also allows prospective purchasers to try a game without having to purchase that
4 game title or use storage space downloading a large game file. This ability to “test-drive”
5 a game without having to first purchase and download or install it provides a significant
6 marketing advantage to entities that sell video games, leading to increased sales volumes
7 and usage numbers for the video game titles.

8 33. Fifth, the Patent-in-Suit centralizes and streamlines GPU and software
9 maintenance. As the patent explains, “the software and hardware used to generate 3D
10 images is in constant flux, and the system must be continually upgraded....” ’109 Patent
11 at 3:11-13. Upgrades on the client devices as faster graphics processing chips and
12 components become commercially available impose additional costs and burdens on
13 users. *Id.* at 3:12-14. Further, “remote hardware impedes the central maintenance and
14 coordination of configurations of client software, which is an important capability and
15 critical to the product viability of many applications.” *Id.* at 3:14-16. The disclosed
16 invention, by maintaining the GPU and associated software at the server, calls for fewer
17 GPUs needed at the client level to monitor, maintain and upgrade, further reducing cost.
18 Further, the user’s experience is enhanced because she does not need to continually
19 update software in order to play the latest version of the game.

20 34. The inventors had to address and overcome a number of technological
21 hurdles in order to transfer graphics processing from a client device to a separate server
22 capable of handling graphics processing for multiple client devices. For example, the
23 inventors needed to address the manner in which latency should be reduced relative to
24 the interactive graphics applications, the manner in which the exchange of user control
25 inputs and images should be synchronized between the client device and server, the
26 manner in which graphics processing for different client devices should be handled, and
27 the manner in which the client and server devices should be configured to support the
28 remote processing of the control inputs and the images produced in response to those

1 inputs. To support the ability to virtualize the GPU (*i.e.*, making a single physical GPU
 2 look like many virtual GPUs), 3Dlabs developed GPUs with very fast context save and
 3 restore capabilities so that application threads associated with different client devices
 4 would behave as if they had exclusive access to the GPU.

5 35. In certain instances, the Asserted Patent specifies that the client device
 6 sends user input signals for the server to generate and send an updated image in response
 7 to updating the state of the interactive software.

8 36. These and other features of the claimed invention provided a significant
 9 advance over the existing approach of requiring each client device to handle its own
 10 graphics processing.

11 **THE PLAYSTATION NOW, SONY REMOTE PLAY, AND SONY SHARE** 12 **PLAY SYSTEMS**

13 37. The PlayStation Now system includes Sony game servers with appropriate
 14 server software located in datacenters at strategic locations that are configured to play a
 15 supported PlayStation video game at the request of one or more client devices equipped
 16 with PlayStation Now client software. Devices that are currently capable of operating as
 17 PlayStation clients include PS4 consoles and PCs equipped with a Sony PlayStation
 18 Now app. On information and belief, the PS5 console also is capable of operating as a
 19 PlayStation Now client. (<https://www.dualshockers.com/ps-now-confirmed-on-ps5/>,
 20 last visited June 16, 2020). Sony charges a subscription fee for customers to play
 21 PlayStation video games using the PlayStation Now system.

22 38. The PlayStation Now system and service is based on technology developed
 23 by Gaikai, which Sony purchased for \$380 million. ([https://www.forbes.com/sites/tomiogeron/2012/07/02/sony-to-acquire-cloud-gaming-startup-gaikai-for-380-million/](https://www.forbes.com/sites/tomiogeron/2012/07/02/sony-to-acquire-cloud-gaming-startup-gaikai-for-380-million/#63aad4c06fbc)
 24 [#63aad4c06fbc](https://www.forbes.com/sites/tomiogeron/2012/07/02/sony-to-acquire-cloud-gaming-startup-gaikai-for-380-million/#63aad4c06fbc), last visited June 9, 2020). PlayStation Now was launched, at least in
 25 part, based on the inability of the newly launched PS4 consoles to play older PS3 games.
 26 (<https://www.geek.com/games/gaikai-streaming-becomes-playstation-now-available->
 27 <https://www.geek.com/games/gaikai-streaming-becomes-playstation-now-available->
 28 <https://www.geek.com/games/gaikai-streaming-becomes-playstation-now-available->

1 this-summer-1581518/feed/, last visited July 21, 2019). Because of this lack of
2 backwards capability with its prior PlayStation games, Sony launched the PlayStation
3 Now system and service so customers of the PS4 consoles would be able to play the
4 older, but much more numerous, PS3 games.

5 39. The PlayStation Now system and service operates by having the
6 PlayStation Now server perform all or substantially all of the graphics processing for a
7 particular game being played on a client device (a PS4 or PC with appropriate Sony
8 software). The image is generated based on the player commands that are generated on
9 separate client devices using a Sony DualShock game controller and transmitted to the
10 remotely-located server via a high-speed Internet connection. Once the updated graphics
11 image is generated by the server, it is compressed and transmitted to the client device.

12 40. The Sony Remote Play and Share Play systems and services include a PS4
13 console acting as a server that streams PlayStation games to a client device. Supported
14 client devices include a PC or Mac with suitable Sony Remote Player software, the Sony
15 Vita handheld game device, Sony Xperia phones and tablets, certain Apple devices
16 (including iPhones and iPads) with compatible Sony Remote Player software, Android
17 devices with compatible Sony Remote Player software, and in the case of Share Play, a
18 PS4 console acting as a Visitor client device. ([https://www.playstation.com/en-us/
19 explore/ps4/remote-play/](https://www.playstation.com/en-us/explore/ps4/remote-play/), last visited June 16, 2020). These client devices accept player
20 commands from a Sony DualShock game controller or through an on-screen interface
21 through which the PlayStation game may be played. The client device in Remote Play
22 and Share Play does not need to have a copy of the game being played on that client
23 device. In the case of Share Play, the ability of a PlayStation console client to play a
24 PlayStation game title without owning it provides a significant marketing advantage
25 leading to increased sales of PlayStation game titles. ([https://www.playstation.com/en-
26 us/explore/ps4/share-play/](https://www.playstation.com/en-us/explore/ps4/share-play/), last visited July 2, 2020).

27 41. The Sony Remote Play and Share Play systems and services are based on
28 Gaikai technology (*see* https://www.gamasutra.com/view/news/187022/How_Sonys_

PlayStation_4_will_leverage_Gaikais_cloud.php, last visited June 9, 2020), except that a PS4 operates as the server and generates images based on player commands from the client devices that are received over a local area network connection, or in some instances, over the Internet. The PS4 console compresses the generated images and transmits them to the client devices over the network connection (the local area network or Internet).

42. On information and belief, Sony will offer the PS5 console for sale in the United States at least by the summer or fall of 2020. (<https://www.playstation.com/en-us/ps5/>, last visited June 9, 2020). Indeed, Sony has already imported PS5 devices into the United States, and those devices are in use by Sony customers and partners. For example, on May 13, 2020, Epic Games, Inc. demonstrated its “Unreal Engine 5” software in “a real-time demo running live on PlayStation 5.” (<https://www.unrealengine.com/en-US/blog/a-first-look-at-unreal-engine-5>, last visited June 11, 2020). This demonstration was presented by Epic’s employees in the United States (<https://vimeo.com/417882964>, last visited June 11, 2020), and on information and belief, the demonstration was conducted on a PS5 located at Epic’s facilities in the United States (*see* <https://vimeo.com/unrealengine>, last visited June 11, 2020 (indicating Unreal Engine’s location as Cary, North Carolina, the same location as Epic’s headquarters)). On information and belief, the PS5 incorporates many of the features of the PS4, including access to PlayStation Now and operating as a Remote Play and Share Play server and as a Share Play Visitor client.

43. On information and belief, and as announced by Sony during product introductions, the PS5 console will operate in a manner similar to the PS4 console, as a client device for PlayStation Now; a server device for Remote Play; and both a Host (server) device and as a Visitor (client) device for Share Play.

INFRINGEMENT OF U.S. PATENT NO. 10,681,109

44. On June 9, 2020, U.S. Patent No. 10,681,109 was duly and legally issued for inventions entitled “Image Display System with Visual Server.” IPL is the applicant

1 for the '109 Patent and continues to hold all rights and interests in the '109 Patent. The
2 '109 Patent was filed on June 29, 2017 as Application No. 15/638,020 which is a
3 continuation of Application No. 14/192,789, which is a continuation of Application No.
4 13/296,776, which is a continuation of Application No. 12/538,347, which is a
5 continuation of Application No. 10/037,688, which claims priority to Provisional
6 Application 60/263,854, filed on January 24, 2001. A true and correct copy of the '109
7 Patent is attached hereto as Exhibit 1.

8 45. Defendant has directly infringed and continues to directly infringe at least
9 claims 1-4 and 6-18 of the '109 Patent by its manufacture, use, selling, offering to sell,
10 and importing its PlayStation Now game streaming service, and through its hosting of
11 PlayStation games on the PlayStation Now server. The infringing components include
12 all PlayStation Now servers and server software and associated Sony and PlayStation
13 client devices and other software that supports PlayStation Now. Defendant also
14 performs the claimed methods by making available and hosting PlayStation games via
15 the PlayStation Now service. PlayStation Now is a service that allows subscribers to
16 play various PlayStation games online through an online subscription. Defendant
17 maintains control over both the server and client components of the PlayStation Now
18 network, and in at least some instances, provides both the server-side hardware and
19 software and client-side hardware and software. Individual users may access the
20 PlayStation Now network through either a PS4 console or a compatible PC with a
21 PlayStation DualShock controller. On information and belief, upon release of the PS5
22 and its corresponding DualSense controller, users will also be able to access the
23 PlayStation Now network through the PS5 console. ([https://www.dualshockers.com/ps-
24 now-confirmed-on-ps5/](https://www.dualshockers.com/ps-now-confirmed-on-ps5/), last visited June 16, 2020). Commands entered by game players
25 on their individual client devices are transmitted to central servers, where updated
26 graphics images are generated as an image frame. The generated image frame is
27 compressed, transmitted back to the client devices, decompressed, and displayed. Many
28 such image frames are generated, compressed and transmitted by the PlayStation Now

1 server each second to form a stream of images thereby allowing a remotely-located client
2 device to play an interactive video game using the resources of the PlayStation Now
3 server. The games are hosted by servers operated by and/or controlled by Defendant,
4 and for most client devices, those devices are made and sold by Defendant with the
5 purpose of using those devices with the PlayStation Now service.

6 46. Claim 1 of the '109 Patent is representative for the purposes of this
7 Amended Complaint. Claim 1 requires:

8 a. "A method of hosting an interactive software application
9 comprising:"

10 i. This limitation is met by Sony's PlayStation Now, which
11 provides a method of hosting an interactive software
12 application. PlayStation Now provides a method of hosting
13 interactive games such that they are playable at a client device,
14 such as a PC or a PS4 console. The PlayStation Now client
15 devices (including the PC and PS4) have an associated display
16 on which the game being streamed from the PlayStation Now
17 server is displayed to the user. Defendant advertises that
18 PlayStation Now allows a user to "[s]tream [games] directly
19 to your PS4 or PC." ([https://www.playstation.com/en-ca/
20 explore/playstation-now/](https://www.playstation.com/en-ca/explore/playstation-now/), last visited June 9, 2020).

21 b. "running at a server the interactive software application;"

22 i. This limitation is performed by the PlayStation Now server.
23 The PlayStation Now server runs game applications playable
24 on client devices, such as a PC or PS4 console. The server is
25 the PlayStation Now's game server. ([https://dperry.com/
26 2011/02/06/gaikai_is_live/](https://dperry.com/2011/02/06/gaikai_is_live/), last visited June 11, 2020; [https://
27 www.finder.com.au/gaming/ps4-backwards-compatibility](https://www.finder.com.au/gaming/ps4-backwards-compatibility),
28 last visited June 11, 2020). The PlayStation Now server runs

PlayStation games that are streamed to the client devices as compressed images. (https://dperry.com/2011/02/06/gaikai_is_live/, last visited June 11, 2020; <https://www.finder.com.au/gaming/ps4-backwards-compatibility>, last visited June 11, 2020).

ii. The Gaikai Patent embodies PlayStation Now, Remote Play, and Share Play.

iii. The Gaikai Patent explains that the server runs an interactive software application, such as a game state. 5:11-20, 3:57-59.

c. “receiving at the server user input signals from a client device, wherein the user input signals are used to control updating of the state of the interactive software application;”

i. This limitation is performed by the PlayStation Now server. The sever receives user input signals, such as the DUALSHOCK 4 control inputs, or other types of control inputs, from the client device, such as a PC or PS4 console. The server can receiver user inputs provided to the game via a controller, such as a DUALSHOCK 4 controller. (<https://www.playstation.com/en-us/explore/playstation-now/ps-now-on-pc/>, last visited June 11, 2020; <https://www.playstation.com/en-us/explore/playstation-now/>; last visited June 11, 2020).

ii. The Gaikai Patent—which embodies Sony’s streaming services—explains that the server receives player commands and uses those commands to update the state of the game. 14:8-10. It describes how the server “receiv[es] a command from a first player... [and] updates a game state based on the command received from the first player. *Id.* at 3:37-41. Player

1 inputs include things such as movement commands. *Id.* at
2 15:46-52, Fig. 7.

3 d. “generating at least one updated image at the server in response to
4 updating the state of the interactive software application; and”

5 i. This limitation is performed by the PlayStation Now server
6 executing a PlayStation game. In response to user input
7 signals, such as the DUALSHOCK 4 control inputs, or other
8 types of control inputs, from the client device, such as a PC or
9 PS4 console, the PlayStation game executing on the server
10 updates the state of the video game application, for example,
11 by changing the view angle in response to a control input, and
12 generates updated images in response to the updated game
13 state. Sony’s website explains that PlayStation Now gives
14 users access to more than 800 games without needing to
15 download the games themselves or any additional software or
16 applications. ([https://www.playstation.com/en-us/explore/
17 playstation-now/getting-started/](https://www.playstation.com/en-us/explore/playstation-now/getting-started/), last visited June 16, 2020)
18 (“If you choose to stream a game, it will be streamed from our
19 servers over your internet connection, just like streaming a
20 movie, so you won’t have to download the game.”).

21 ii. The Gaikai Patent—which embodies Sony’s streaming
22 services—explains that server “receiv[es] a command from a
23 first player... [and] updates a game state based on the
24 command received from the first player. 3:37-41. The Game
25 Server has image updating capabilities in the form of an Image
26 Generator. *Id.* at Figs. 2, 3. As the Gaikai Patent explains, the
27 server will at least partially render an image based on the
28

1 current game state, which is updated by the user input received
2 from the client. *Id.* at 15:15-27, Fig. 6.

3 e. “compressing the at least one updated image and transmitting the
4 compressed updated image to the client device, wherein the server
5 transmits the updated image as a compressed frame that can be
6 decompressed and displayed as an updated image at the client
7 device.”

8 i. This limitation is performed by the PlayStation Now server.
9 After generating the updated image, the server compresses the
10 image and transmits it to the client device, such as a PC or PS4
11 console. The updated images are sent as a compressed frame that
12 can be decompressed and displayed as an updated image at the
13 client device. For example, the PlayStation Now server runs
14 PlayStation games that are streamed to the client devices as
15 compressed images. ([https://dperry.com/2011/02/06/
16 gaikai_is_live/](https://dperry.com/2011/02/06/gaikai_is_live/), last visited June 11, 2020; [https://
17 www.finder.com.au/gaming/ps4-backwards-compatibility](https://www.finder.com.au/gaming/ps4-backwards-compatibility), last
18 visited June 11, 2020). The compressed stream of images is
19 transmitted to the client device and decompressed at the client
20 device (PS4 or PC) into images for displaying on the client
21 display. (https://dperry.com/2011/02/06/gaikai_is_live/, last
22 visited June 11, 2020; [https://www.eurogamer.net/articles/
23 digitalfoundry-2014-sony-creates-custom-ps3-for-PlayStation-
24 now](https://www.eurogamer.net/articles/digitalfoundry-2014-sony-creates-custom-ps3-for-PlayStation-now), last visited June 11, 2020).

25 ii. Additionally, the Gaikai Patent—which embodies Sony’s
26 streaming services—explains that the server generates
27 compressed images based on commands received from a player
28 via the player interface. 3:46-55, 4:12-21. The compressor 340

1 is illustrated in Figure 3. *See id.* at 11:36-45. The compressed
2 image is delivered from the image generator to the client device.
3 *Id.* at 15:33-38. The client device receives a compressed stream
4 of images from the servers. *Id.* at 11:36-45. Those images are
5 decompressed (12:4-10, 15:53-60) and displayed at the client
6 device. 15:28-38, 16:6-8.

7 47. Claim 2 requires “a first bandwidth for transmitting the user input data
8 between the client device and the server and a second bandwidth for transmitting the
9 compressed updated image from the server to the client device are asymmetric.”

10 a. Sony documents explain that in order to use PlayStation Now, a user
11 needs “a steady broadband Internet connection ranging between 5-
12 12 Mbps...for a good gaming experience.” ([https://](https://support.playstation.com/s/article/PlayStation-Now-Help-FAQ?language=en_US)
13 [support.playstation.com/s/article/PlayStation-Now-Help-FAQ?](https://support.playstation.com/s/article/PlayStation-Now-Help-FAQ?language=en_US)
14 [language=en_US](https://support.playstation.com/s/article/PlayStation-Now-Help-FAQ?language=en_US), last visited June 25, 2020). This connection
15 includes both transmissions from the client to the server (the “first
16 bandwidth”) and from the server to the client (the “second
17 bandwidth”). *See id.* (“data must flow two ways, to provide flawless
18 picture quality and responsive commands”). On information and
19 belief, Sony does not require the first and second bandwidths to be
20 symmetric. Multiple internet service providers support asymmetric
21 bandwidths. *E.g.*, ([https://www.business.att.com/learn/tech-advice/](https://www.business.att.com/learn/tech-advice/symmetric-versus-asymmetric-whats-best-for-you.html)
22 [symmetric-versus-asymmetric-whats-best-for-you.html](https://www.business.att.com/learn/tech-advice/symmetric-versus-asymmetric-whats-best-for-you.html), last visited
23 June 25, 2020; <https://www.xfinity.com/networkmanagement>, last
24 visited June 25, 2020).

25 b. Sony’s PlayStation Now service has indicated a minimum required
26 bandwidth of 5 Mbs, without requiring any minimum upload speed
27 for client transmissions. (*See, e.g.*, [https://www.playstation.com/en-](https://www.playstation.com/en-us/explore/playstation-now/getting-started/)
28 [us/explore/playstation-now/getting-started/](https://www.playstation.com/en-us/explore/playstation-now/getting-started/), last visited July 14,

2020). Industry literature has indicated that download speeds when playing PS Now are significantly faster than the upload speeds. (See, e.g., <https://www.androidcentral.com/what-internet-speeds-are-recommended-stream-playstation-now-games>, last visited July 14, 2020 (download speed is 22 Mbs while upload speed is 4 Mbs)). These requirements and tests show that the download speeds for transmitting compressed images from the PS Now server to the PS console or PC are asymmetric and significantly faster than the bandwidth used to upload user input data from the client device.

48. Claim 3 requires “the server is configured for bidirectional communications with a plurality of client devices, the bidirectional communication including receiving at the server user input signals and transmitting the compressed updated image.”

a. Sony’s PlayStation Now servers allow multiple users to use PlayStation Now simultaneously. (https://support.playstation.com/s/article/PlayStation-Now-Help-FAQ?language=en_US, last visited June 25, 2020). Each individual PlayStation Now player uses his or her own client device, resulting in a plurality of client devices communicating with the PlayStation Now servers. Communications between the plurality of client devices and the PlayStation Now servers are bidirectional. *See id.* (“data must flow two ways, to provide flawless picture quality and responsive commands”).

49. Claim 4 requires “the server is configured to receive user input data and transmit compressed updated images with a plurality of client devices.”

a. Claim 4 is infringed by PlayStation Now for the same reasons identified for claim 3.

50. Claim 6 requires “the client device is a mobile device.”

a. Sony PlayStation Now supports personal computers as client devices. The PC client devices that are supported include laptop

computers, which are mobile devices. (See <https://www.playstation.com/en-us/explore/playstation-now/ps-now-on-pc/>, visited July 14, 2020 (“PS Now is the only place to play incredible PlayStation® exclusive games on your PC or laptop – including Marvel’s Spider-Man*, The Last of Us, Bloodborne, and many more.”); https://www.pushsquare.com/news/2019/07/guide_what_devices_does_playstation_now_support#:~:text=online%20or%20not.,,Windows%20computers%20and%20laptops,when%20and%20where%20you%20play, last visited July 14, 2020).

51. Claim 7 requires “wherein the interactive software application is an interactive game that is configured to run at the server, which is in bidirectional communication with a plurality of client devices, and wherein said updating the state of the software application includes updating the game state of the interactive game.”

- a. The interactive software application covers interactive video games, such as PlayStation games played via the PlayStation Now service on Sony game servers. Sony advertises that PlayStation Now allows a user to “[s]tream [games] directly to your PS4 or PC.” (<https://www.playstation.com/en-ca/explore/playstation-now/>, last visited June 9, 2020; <https://www.playstation.com/en-us/explore/playstation-now/games/#allgames>, last visited June 29, 2020). Communications between the plurality of client devices and the PlayStation Now servers are bidirectional. (https://support.playstation.com/s/article/PlayStation-Now-Help-FAQ?language=en_US, last visited June 25, 2020) (“data must flow two ways, to provide flawless picture quality and responsive commands”). Updates to the software application update the game state, which is what allows a user to play a game via PlayStation

1 Now. ([https://www.playstation.com/en-us/explore/playstation-now/](https://www.playstation.com/en-us/explore/playstation-now/getting-started/)
2 [getting-started/](https://www.techradar.com/reviews/gaming/playstation-now-1213666/), last visited June 25, 2020; [https://](https://www.techradar.com/reviews/gaming/playstation-now-1213666/)
3 www.techradar.com/reviews/gaming/playstation-now-1213666/
4 review, last visited June 25, 2020).

5 52. Claim 8 requires:

- 6 a. An image display system, comprising:
- 7 b. A server having a processor and memory configured to execute an
- 8 interactive software application and further configured for:
- 9 c. Receiving at the server user input signals from a client device,
- 10 wherein the user input signals are used to control updating the state
- 11 of the interactive software application;
- 12 d. Generating at least one updated image at the server in response to
- 13 updating the state of the interactive software application running on
- 14 the server by the user input signals; and
- 15 e. Compressing the at least one updated image and transmitting the
- 16 compressed updated image to the client device, wherein the server
- 17 transmits the updated image as a frame and wherein the client device
- 18 is configured for decompressing of the compressed updated image
- 19 and displaying the updated image on a display coupled to the client
- 20 device.

- 21 i. Claim 8 is infringed by PlayStation Now for the same reasons
- 22 identified for claim 1.

23 53. Claim 9 requires “the user input signals are generated at the client device
24 to update the state of the interactive software application from the state that initiated the
25 current image displayed on the display coupled to the client device.”

- 26 a. Claim 9 is infringed by PlayStation Now for the same reasons
- 27 identified for claim 7.

1 54. Claim 10 requires “the server is configured to exchange user input data and
2 compressed updated images with a plurality of client devices.”

3 a. Claim 10 is infringed by PlayStation Now for the same reasons
4 identified for claim 3 (“plurality of client devices”).

5 55. Claim 11 requires “wherein the interactive software application is a game
6 and wherein at least one of the plurality of client devices is a mobile device.”

7 a. Claim 11 is infringed by PlayStation Now for the same reasons
8 identified for claim 6 (“client device is a mobile device”) and claim
9 7 (“interactive software application is a game”).

10 56. Claim 12 requires “wherein the interactive software application is a game
11 and wherein the client device is a mobile device.”

12 a. Claim 12 is infringed by PlayStation Now for the same reasons
13 identified for claim 11.

14 57. Claim 13 requires:

- 15 a. A method of displaying interactive video, comprising:
16 b. Receiving at a server user input control signals from a client device,
17 wherein the user input control signals are used to control at least one
18 image in a sequence of images generated from the running of a
19 software gaming application on the server;
20 c. Generating a modified image at the server in response to the user
21 input control signals; and
22 d. Transmitting the modified image to the client device for display as
23 compressed data, wherein the transmitting step comprises
24 compressing the at least one modified image and sending the
25 compressed modified image to the client device once the modified
26 image is generated, and wherein the client device is configured for
27 decompressing the compressed modified image and displaying the
28 modified image on a display coupled to the client device.

i. Claim 13 is infringed by PlayStation Now for the same reasons identified for claim 1.

58. Claim 14 requires “a first bandwidth available for receiving user input control signals at the server and a second bandwidth available for transmitting the modified image to the client device is asymmetric with the second bandwidth available for transmitting the modified image from the server being greater than the first bandwidth.”

a. Claim 14 is infringed by PlayStation Now for the same reasons identified for claim 2. As illustrated in the documents cited in claim 2, the download bandwidth (the “second bandwidth”) is greater than the upload bandwidth (the “first bandwidth”).

59. Claim 15 requires “the server is configured to exchange user input data and compressed modified images with a plurality of client devices.”

a. Claim 15 is infringed by PlayStation Now for the same reasons identified for claims 3 and 4.

60. Claim 16 requires “at least two of the plurality of client devices include different platforms.”

a. PlayStation Now users can play on a PS4 or a PC, which are different platforms. (<https://www.playstation.com/en-us/explore/playstation-now/>, last visited June 25, 2020). Previously, users could use PlayStation Now on additional platforms, such as the PlayStation Vita and the Sony Xperia phones and tablets.

61. Claim 17 requires “wherein the interactive software application is a game running on the server and wherein updating of the state of the interactive game software application includes changing the game state.”

a. Claim 17 is infringed by PlayStation Now for the same reasons as claim 7.

1 62. Claim 18 requires “the user input control signals are used to control a
2 plurality of images in the sequence of images generated from the running of a software
3 gaming application on the server.”

4 a. Claim 18 is infringed by PlayStation Now for the same reasons as
5 claim 7.

6 63. On information and belief, the features identified above relative to the PS4
7 console will also be made available on the PS5 consoles, and its corresponding
8 DualSense controller, that Sony is releasing into the United States, with the PS5 console
9 capable of operating as a client device for the PS Now network. On information and
10 belief, the PS5 console will operate in a manner similar to the PS4 console, as described
11 above.

12 64. In addition to infringement occurring through making, using, offering for
13 sale, and selling access to the PlayStation Now network, Defendant has directly
14 infringed and continues to directly infringe at least claims 1, 6, 8, 9, 11, 13, 17, and 18
15 of the ’109 Patent by making, using, selling, offering to sell or importing its PlayStation
16 Remote Play, Share Play, and Remote Play application. Remote Play and Share Play are
17 features included with the PlayStation PS4 console and PlayStation video games that
18 allows Sony PlayStation PS4 consoles to transmit their video output to a PC or Mac
19 computer or laptop, another PS4 console (in the case of Share Play), a PlayStation Vita
20 handheld video game console or a PlayStation TV, Sony Xperia phones and tablets, and
21 Apple’s iPhones and iPads. ([https://www.playstation.com/en-us/explore/ps4/remote-](https://www.playstation.com/en-us/explore/ps4/remote-play/)
22 [play/](https://www.playstation.com/en-us/explore/ps4/share-play/), last visited June 9, 2020; [https://www.playstation.com/en-us/explore/ps4/share-](https://www.playstation.com/en-us/explore/ps4/share-play/)
23 [play/](https://www.playstation.com/en-us/explore/ps4/share-play/), last visited June 9, 2020). On information and belief, these features also will be
24 available on the PS5 consoles upon its release to the United States market later in 2020,
25 with the PS5 console capable of operating as either a server device for Remote Play; a
26 Host device for Share Play; or as a Visitor client device for Share Play. Similarly,
27 PlayStation users can connect a DualShock controller to various devices, including
28 Android devices, Apple computers, Windows PCs, PlayStation devices including the PS

Vita and PS TV, and iOS devices. Both the PS4 console and the user device are connected to a local area network, including a Wifi network or an Ethernet network, and in some instances, the Internet. Defendant maintains control over both the client and server components of the Remote Play and Share Play network. Commands entered by game players on their individual devices are transmitted to a PS4 console, which acts as a server running the game application. The server-console receives those game inputs, updates the games state based on the commands, and generates corresponding updated images. The generated images are then compressed and streamed back to the client devices and displayed. The PlayStation games are hosted by Defendant's PS4 consoles.

65. Claim 1 of the '109 Patent is representative for the purposes of this Amended Complaint. Claim 1 requires:

- a. A method of hosting an interactive software application comprising
 - i. This limitation is met by Sony's Remote Play and Share Play features, which provide a method of hosting an interactive software application—a PlayStation game—on a PS4 console. The PS4 console hosts the interactive PlayStation games that are playable at a client device, such as a PC or Mac, a Sony Vita or Xperia phone or tablet, a PS TV, an iOS device, or another PS4 console operating as a Visitor client device for Share Play. Defendant advertises that Remote Play allows a user to “stream and play your PS4 ... on any compatible device that's connected to your broadband network.” (<https://www.playstation.com/en-us/explore/ps4/remote-play/>, last visited June 9, 2020). Similarly, Defendant advertises that Share Play allows users to “let a friend watch you play your favorite game by sharing your screen, let them take over control of the action and try the game for themselves, or even jump into a local multiplayer coop or versus game.” (<https://www.playstation.com/en-us/explore/ps4/share-play/>, last visited June 9, 2020).

1 www.playstation.com/en-us/explore/ps4/share-play/, last
2 visited June 9, 2020).

3 b. running at a server the interactive software application

4 i. This limitation is performed by the Remote Play and Share
5 Play functionality provided in the PS4 consoles. Using these
6 functions, the PS4 console operating as a server runs
7 PlayStation game applications that are playable on client
8 devices, such as a PC or Mac, a Sony Vita or Xperia phone or
9 tablet, an iOS device, or in the case of Share Play, another PS4
10 console operating as a Visitor device. The server is the PS4
11 console, which runs a PlayStation game. (*see* [https://](https://www.playstation.com/en-us/explore/ps4/remote-play/)
12 www.playstation.com/en-us/explore/ps4/remote-play/, last
13 visited June 9, 2020; [https://www.playstation.com/en-us/](https://www.playstation.com/en-us/explore/ps4/share-play/)
14 [explore/ps4/share-play/](https://www.playstation.com/en-us/explore/ps4/share-play/), last visited June 9, 2020).

15 ii. The Gaikai Patent embodies PlayStation Now, Remote Play,
16 and Share Play.

17 iii. The Gaikai Patent explains that the server runs an interactive
18 software application, such as a game state. Gaikai 5:11-20;
19 3:57-59.

20 c. receiving at the server user input signals from a client device,
21 wherein the user input signals are used to control updating of the
22 state of the interactive software application.

23 i. This limitation is performed by the PS4 console operating as
24 a Remote Play or Share Play server. ([https://](https://www.playstation.com/en-us/explore/ps4/remote-play/)
25 www.playstation.com/en-us/explore/ps4/remote-play/, last
26 visited June 16, 2020). The server console receives user input
27 signals, such as the DUALSHOCK 4 controller inputs, or
28 other types of control inputs, from the client device, such as a

1 PC or Mac, a Sony Vita or Xperia phone or tablet, an iOS
 2 device, or in the case of Share Play, another PS4 console. The
 3 PS4 can receive user inputs provided to the game via a
 4 controller, such as a DUALSHOCK 4 controller. ([https://](https://www.playstation.com/en-us/explore/ps4/remote-play/)
 5 www.playstation.com/en-us/explore/ps4/remote-play/, last
 6 visited June 9, 2020; [https://www.playstation.com/en-us/](https://www.playstation.com/en-us/explore/ps4/share-play/)
 7 [explore/ps4/share-play/](https://www.playstation.com/en-us/explore/ps4/share-play/), last visited June 9, 2020).

8 ii. The Gaikai Patent—which embodies Sony’s streaming
 9 services—explains that the server receives player commands
 10 and uses those commands to update the state of the game.
 11 14:8-10. It describes how the server “receiv[es] a command
 12 from a first player... [and] updates a game state based on the
 13 command received from the first player. 3:37-41. Player
 14 inputs include things such as movement commands. Id. at
 15 15:46-52, Fig. 7.

16 d. generating at least one updated image at the server in response to
 17 updating the state of the interactive software application; and

18 i. This limitation is performed by the PS4 console operating as
 19 a Remote Play or Share Play server. In response to user input
 20 signals, such as the DUALSHOCK 4 controller inputs, or
 21 other types of control inputs, from the client device, such as a
 22 PC or Mac, a Sony Vita or Xperia phone or tablet, an iOS
 23 device, or in the case of Share Play, another PS4 console, the
 24 server updates the state of the game application, for example,
 25 by changing the view angle in response to a control input, and
 26 generates updated images in response to the updated game
 27 state. ([https://www.playstation.com/en-us/explore/ps4/](https://www.playstation.com/en-us/explore/ps4/remote-play/)
 28 [remote-play/](https://www.playstation.com/en-us/explore/ps4/remote-play/), last visited June 16, 2020) (“PS4 Remote Play

1 for PS4 lets you stream and play your PS4 games, switch
 2 between games, view your PS4 home screen and browse the
 3 console's menus, on any compatible device that's connected
 4 to your broadband network.”).

5 ii. The Gaikai Patent—which embodies Sony's streaming
 6 services—explains that server “receiv[es] a command from a
 7 first player... [and] updates a game state based on the
 8 command received from the first player. 3:37-41. The Game
 9 Server has image updating capabilities in the form of an Image
 10 Generator. *Id.* at Figs. 2, 3. As the Gaikai Patent explains, the
 11 server will at least partially render an image based on the
 12 current game state, which is updated by the user input received
 13 from the client. *Id.* at 15:15-27, Fig. 6.

14 e. compressing the at least one updated image and transmitting the
 15 compressed updated image to the client device, wherein the server
 16 transmits the updated image as a compressed frame that can be
 17 decompressed and displayed as an updated image at the client device.

18 i. This limitation is performed by the PS4 console operating as
 19 a Remote Play or Share Play server. After generating the
 20 updated image, the server compresses the image and transmits
 21 it to the client device, such as a PC or Mac, a Sony Vita or
 22 Xperia phone or tablet, an iOS device, or in the case of Share
 23 Play, another PS4 console. The updated images are sent as a
 24 compressed frame that can be decompressed and displayed as
 25 an updated image at the client device. For example, the PS4
 26 runs PlayStation games that are streamed to the client devices
 27 as compressed images. ([https://www.eurogamer.net/articles/](https://www.eurogamer.net/articles/digitalfoundry-sony-mandates-vita-remote-play-for-ps4-)
 28 [digitalfoundry-sony-mandates-vita-remote-play-for-ps4-](https://www.eurogamer.net/articles/digitalfoundry-sony-mandates-vita-remote-play-for-ps4-)

games, last visited June 9, 2020) The compressed stream of images is transmitted to the client device and decompressed at the client device into images for displaying on the client display. (<https://www.eurogamer.net/articles/digitalfoundry-sony-mandates-vita-remote-play-for-ps4-games>, last visited June 9, 2020). On information and belief, Share Play uses the same or similar compression as Remote Play because Remote Play and Share Play are related.

- ii. Additionally, the Gaikai Patent—which embodies Sony’s streaming services—explains that the server generates compressed images based on commands received from a player via the player interface. 3:46-55, 4:12-21. The compressor 340 is illustrated in Figure 3. *See id.* at 11:36-45. The compressed image is delivered from the image generator to the client device. *Id.* at 15:33-38. The client device receives a compressed stream of images from the servers. *Id.* at 11:36-45. Those images are decompressed (12:4-10, 15:53-60) and displayed at the client device. 15:28-38, 16:6-8.

66. Claim 6 requires “the client device is a mobile device.”

- a. Remote Play satisfies this claim because Remote Play supports a variety of mobile client devices, including Android smartphones and tablets, iPhones and iPads, Sony Vita, Sony Xperia phones or tablets, and PC and Mac laptop computers, which are mobile devices. (<https://www.playstation.com/en-us/explore/ps4/remote-play/>, last visited June 25, 2020).

67. Claim 8 requires:

- a. An image display system, comprising:

- b. A server having a processor and memory configured to execute an interactive software application and further configured for:
- c. Receiving at the server user input signals from a client device, wherein the user input signals are used to control updating the state of the interactive software application;
- d. Generating at least one updated image at the server in response to updating the state of the interactive software application running on the server by the user input signals; and
- e. Compressing the at least one updated image and transmitting the compressed updated image to the client device, wherein the server transmits the updated image as a frame and wherein the client device is configured for decompressing of the compressed updated image and displaying the updated image on a display coupled to the client device.
- f. Claim 8 is infringed by Remote Play and Share Play for the same reasons identified for claim 1.

68. Claim 9 requires “the user input signals are generated at the client device to update the state of the interactive software application from the state that initiated the current image displayed on the display coupled to the client device.”

- a. Remote Play and Share Play satisfy this limitation because the client device generates user input signals in the form of inputs from the user that are used to update the state of the game running on the PS4 (which is acting as the server). (<https://www.playstation.com/en-us/explore/ps4/remote-play/>, last visited June 25, 2020) (“PS4 Remote Play for PS4 lets you stream and play your PS4 games, switch between games, view your PS4 home screen and browse the console’s menus, on any compatible device that’s connected to your broadband network.”); (<https://www.playstation.com/en-us/>

1 explore/ps4/share-play/, last visited June 25, 2020) (“With Share
 2 Play, let a friend anywhere in the world watch you play, hand
 3 controls over to them, or let them join your 2-player game – and they
 4 don’t even need to own the game!”).

5 69. Claim 11 requires “wherein the interactive software application is a game
 6 and wherein the client device is a mobile device.”

7 a. Remote Play satisfies this limitation because the interactive software
 8 application running on the PS4 server is a video game. ([https://](https://www.playstation.com/en-us/explore/ps4/remote-play/)
 9 www.playstation.com/en-us/explore/ps4/remote-play/, last visited
 10 June 25, 2020). Remote Play also permits various mobile devices,
 11 including phones and tablets, to serve as client devices. *See* claim 6.

12 70. Claim 13 requires:

- 13 a. A method of displaying interactive video, comprising:
 14 b. Receiving at a server user input control signals from a client device,
 15 wherein the user input control signals are used to control at least one
 16 image in a sequence of images generated from the running of a
 17 software gaming application on the server;
 18 c. Generating a modified image at the server in response to the user
 19 input control signals; and
 20 d. Transmitting the modified image to the client device for display as
 21 compressed data, wherein the transmitting step comprises
 22 compressing the at least one modified image and sending the
 23 compressed modified image to the client device once the modified
 24 image is generated, and wherein the client device is configured for
 25 decompressing the compressed modified image and displaying the
 26 modified image on a display coupled to the client device.

27 i. Claim 13 is infringed by Remote Play and Share Play for the
 28 same reasons identified for claim 1.

1 71. Claim 17 requires “wherein the interactive software application is a game
2 running on the server and wherein updating of the state of the interactive software
3 application includes changing the game state.”

4 a. Remote Play satisfies this limitation because the interactive
5 application running on the PS4 server is a PlayStation game. ([https://](https://www.playstation.com/en-us/explore/ps4/remote-play/)
6 www.playstation.com/en-us/explore/ps4/remote-play/, last visited
7 June 25, 2020) (“PS4 Remote Play for PS4 lets you stream and play
8 your PS4 games, switch between games, view your PS4 home
9 screen and browse the console’s menus, on any compatible device
10 that’s connected to your broadband network.”). By updating the
11 state of the interactive software application, the game state is
12 changed. *See id.*

13 b. Share Play satisfies this limitation because the interactive
14 application running on the PS4 server is a PlayStation game. ([https://](https://www.playstation.com/en-us/explore/ps4/share-play/)
15 www.playstation.com/en-us/explore/ps4/share-play/, last visited
16 June 25, 2020) (“With Share Play, let a friend anywhere in the world
17 watch you play, hand controls over to them, or let them join your 2-
18 player game – and they don’t even need to own the game!”). By
19 updating the state of the interactive software application, the game
20 state is changed. *See id.*

21 72. Claim 18 requires “the user input control signals are used to control a
22 plurality of images in the sequence of images generated from the running of a software
23 gaming application on the server.”

24 a. Remote Play satisfies this limitation because the user input controls
25 signals control images generated by the software and game running
26 on the PS4 console server. ([https://www.playstation.com/en-us/](https://www.playstation.com/en-us/explore/ps4/remote-play/)
27 [explore/ps4/remote-play/](https://www.playstation.com/en-us/explore/ps4/remote-play/), last visited June 25, 2020) (“PS4 Remote
28 Play for PS4 lets you stream and play your PS4 games, switch

1 between games, view your PS4 home screen and browse the
 2 console's menus, on any compatible device that's connected to your
 3 broadband network.'').

- 4 b. Share Play satisfies this limitation because the user input controls
 5 signals control images generated by the software and game running
 6 on the PS4 console server ([https://www.playstation.com/en-us/
 7 explore/ps4/share-play/](https://www.playstation.com/en-us/explore/ps4/share-play/), last visited June 25, 2020) ("With Share
 8 Play, let a friend anywhere in the world watch you play, hand
 9 controls over to them, or let them join your 2-player game – and they
 10 don't even need to own the game!").

11 73. On information and belief, these features also will be available on the PS5
 12 consoles, and corresponding DualSense controller, that Sony is releasing into the United
 13 States market later in 2020, with the PS5 console capable of operating as either a server
 14 device for Remote Play; a Host device for Share Play; or a Visitor client device for Share
 15 Play.

16 74. In addition, with knowledge of IPL's '109 Patent (discussed below),
 17 Defendant has induced business partners to design PlayStation games with Remote Play
 18 and Share Play capabilities and has induced customers to use the Remote Play and Share
 19 Play service provided with the PS4 (and the soon to be released PS5) consoles and with
 20 the various client devices executing the Sony Remote Play and Share Play client
 21 software. These client devices in many instances constitute Sony products, such as the
 22 PlayStation Vita and the Sony Xperia products. ([https://www.playstation.com/en-au/
 23 get-help/help-library/apps---features/playstation-apps---features/ps4--remote-play-for-
 24 pc-and-mac/](https://www.playstation.com/en-au/get-help/help-library/apps---features/playstation-apps---features/ps4--remote-play-for-pc-and-mac/), last visited June 11, 2020; [https://www.unrealengine.com/en-US/blog/a-
 25 first-look-at-unreal-engine-5](https://www.unrealengine.com/en-US/blog/a-first-look-at-unreal-engine-5), last visited June 11, 2020). In fact, on information and
 26 belief, Defendant has required that all PS4 games must provide support for Remote Play
 27 except in the limiting case where the game requires the use of a stereoscopic camera on
 28 the client device (known as the PS4 Eye). (<https://www.eurogamer.net/articles/>

1 digitalfoundry-sony-mandates-vita-remote-play-for-ps4-games, last visited June 11,
 2 2020). In addition to the Sony remote client devices supported by Remote Play, Sony
 3 also has induced its business partners, including Apple, to include software to support
 4 Remote Play on certain iOS devices, including Apple iPhone and iPad devices. Like
 5 PlayStation Now, and on information and belief, the Sony Remote Play and Share Play
 6 feature also is based on Gaikai technology. ([https:// www.gamasutra.com/view/news/
 7 187022/How_Sonys_PlayStation_4_will_leverage_Gaikais_cloud.php](https://www.gamasutra.com/view/news/187022/How_Sonys_PlayStation_4_will_leverage_Gaikais_cloud.php), last visited June
 8 11, 2020).

9 75. Since the filing of IPL's initial complaint on July 31, 2020, Sony has
 10 continued to induce its business partners and customers to continue to directly infringe
 11 the '109 Patent, as described above. For example, Sony added new games to PSNow in
 12 each of August and September 2020. (<https://blog.playstation.com/tag/ps-now/>;
 13 <https://www.playstation.com/en-us/explore/playstation-now/games/>; [https://www.psu.
 14 com/news/ps-now-august-2020-lineup-includes-hitman-2-dead-cells/#:~:text=The%20
 15 PS%20Now%20August%202020,be%20coming%20to%20PS%20Now](https://www.psu.com/news/ps-now-august-2020-lineup-includes-hitman-2-dead-cells/#:~:text=The%20PS%20Now%20August%202020,be%20coming%20to%20PS%20Now); [https://www.
 16 psu.com/news/ps-now-september-2020-games-leaked-includes-resident-evil-7/](https://www.psu.com/news/ps-now-september-2020-games-leaked-includes-resident-evil-7/); each
 17 last visited October 2, 2020). And Sony continued throughout August, September, and
 18 October 2020 to promote the infringing PSNow, RemotePlay, and SharePlay products
 19 and instruct Sony's customers how to use those infringing products.
 20 (<https://www.playstation.com/en-us/explore/playstation-now/>;
 21 [https://www.playstation
 22 .com/en-us/explore/ps4/remote-play/](https://www.playstation.com/en-us/explore/ps4/remote-play/); [https://www.playstation.com/en-us/explore/ps4
 /share-play/](https://www.playstation.com/en-us/explore/ps4/share-play/); each last visited October 2, 2020).

23 76. The acts of infringement by Defendant have caused and continue to cause
 24 damage to IPL, and IPL is entitled to recover from Defendant the damages sustained by
 25 IPL as a result of Defendant's wrongful acts in an amount subject to proof at trial. The
 26 infringement of IPL's exclusive rights under the '109 Patent by Defendant has damaged
 27 and will continue to damage IPL, causing irreparable harm, for which there is no
 28 adequate remedy at law, unless enjoined by this Court.

DEFENDANT’S KNOWLEDGE OF THE PATENT-IN-SUIT

77. SIE had knowledge of the ’109 Patent at least as of the date of the filing of IPL’s initial complaint, July 31, 2020.

78. Sony also had knowledge of the ’109 Patent before the filing of IPL’s initial complaint, upon information and belief. The ’109 Patent is related to four other IPL patents asserted against Sony in July 2019 during an earlier litigation. As part of that earlier litigation, Sony monitored IPL’s related patent filings, including the application that issued as the ’109 Patent. For example, the ’109 application has been publicly-available via the Patent Office’s Public PAIR website. The ’109 application was also published on December 21, 2017. By monitoring the prosecution of the ’109 application, Sony knew that the Patent Office allowed the claims of the ’109 Patent on April 27, 2020. Sony also knew from monitoring the ’109 prosecution that, on May 20, 2020, the Patent Office notified the public that the ’109 Patent would issue soon thereafter. And Sony knew that the Patent Office issued the ’109 Patent on June 9, 2020.

79. IPL also alerted Sony of its related patent applications—like the related ’109 application—well before the filing of IPL’s July 2020 initial complaint. For example, on April 3, 2015, IPL’s founder Osman Kent notified Sony employee David Perry of four IPL patents, as well as “additional applications” related to those four IPL patents. David Perry then forwarded this information to other Sony employees. Thus, Sony has been aware of IPL’s related patent applications—like the ’109 application—for many years.

80. IPL also specifically alerted Sony of the ’109 application before asserting it in this litigation. During a prior litigation involving related patents, IPL produced to Sony 134 documents listing the ’109 application, including the ’109 application itself and portions of the ’109 prosecution history. IPL-0008408-57; IPL-0004153-74. And Sony even produced a document to IPL listing the ’109 application. SIE-00397545-68. Thus, Sony knew of the ’109 application and resulting ’109 Patent before this lawsuit.

SONY'S WILLFUL INFRINGEMENT

81. IPL put Sony on notice of its infringement theories against the accused PlayStation Now and Remote Play products on July 25, 2019 with the filing of its initial complaint in an earlier lawsuit involving related patents. IPL provided further details of those infringement theories against PlayStation Now and Remote Play on October 7, 2019 via its infringement contentions and on January 7, 2020 via its amended complaint in that earlier lawsuit. IPL added even further details of those infringement theories against PlayStation Now and Remote Play on April 10, 2020 and June 19, 2020 via its amended infringement contentions in that earlier lawsuit.

82. Although the '109 Patent claims are not identical to the patent claims asserted in the earlier lawsuit, there are substantial similarities. Sony recognized those substantial similarities and knew that its PlayStation Now and Remote Play products satisfied all the limitations of the '109 Patent per IPL's infringement theories before IPL filed the present lawsuit on July 31, 2020. Sony also knew that the '109 Patent claims had none of the limitations upon which Sony based its non-infringement defenses; for example, none of the '109 Patent claims require "image-modifying data" or that the "client device does not perform 3-dimensional graphics processing." Thus, Sony knew before IPL filed this present lawsuit that its accused products infringed IPL's '109 Patent and that it had no viable non-infringement defenses.

83. Sony also knew that the '109 Patent was not invalid because the '109 Patent cites to all of Sony's prior art. The Patent Office explicitly considered all of Sony's prior art during prosecution of the '109 Patent and determined the '109 claims were patentably distinct. Thus, Sony knew before IPL filed this present lawsuit that it had no viable invalidity defenses.

84. With full knowledge that its accused PlayStation Now and Remote Play products infringed IPL's '109 Patent, and having no viable defenses, Sony made, used, sold, and offered to sell those accused products. Sony continues to make, use, sell, and offer to sell those accused products, as well as Share Play.

85. With full knowledge that its accused PlayStation Now and Remote Play products infringed IPL's '109 Patent, and having no viable defenses, Sony also induced its customers to use Sony's accused products in an infringing manner, as described above. Sony continues to induce its customers to use Sony's products in an infringing manner, as well as continues to induce its customers to use Share Play in an infringing manner.

86. This egregious and wanton conduct shows that Sony willfully infringes IPL's '109 Patent.

JURY DEMAND

87. IPL demands a trial by jury on all issues.

PRAYER FOR RELIEF

88. IPL requests entry of judgment in its favor and against Defendant as follows:

- a. A declaration that Defendant has infringed and is infringing U.S. Patent No. 10,681,109;
- b. A declaration that Defendant's infringement of the Patent-in-Suit was willful;
- c. An order preliminarily and permanently enjoining Defendant, its respective officers, agents, employees, and those acting in privity with it, from further direct and/or indirect infringement of U.S. Patent No. 10,681,109;
- d. An award of damages to IPL arising out of Defendant's infringement of U.S. Patent No. 10,681,109, including enhanced damages pursuant to 35 U.S.C. § 284, together with prejudgment and post-judgment interest, in an amount according to proof;
- e. An award of attorneys' fees pursuant to 35 U.S.C. § 285 or as otherwise permitted by law; and

1 f. Granting IPL its costs and further relief as the Court may deem just
2 and proper.
3
4

5 Dated: October 9, 2020

By: /s/ Kalpana Srinivasan

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CERTIFICATE OF SERVICE

I hereby certify that a copy of the foregoing document was served on all attorneys of record via ECF on October 9, 2020.

/s/ Kalpana Srinivasan

Kalpana Srinivasan