

**IN THE UNITED STATES PATENT AND TRADEMARK OFFICE**

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**BEFORE THE PATENT TRIAL AND APPEAL BOARD**

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NETFLIX, INC.,

Petitioner,

v.

AVAGO TECHNOLOGIES INTERNATIONAL SALES PTE. LIMITED,

Patent Owner.

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Case No. IPR2021-00303

U.S. Patent 8,270,992

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**PETITIONER’S ORAL HEARING DEMONSTRATIVES**

**NETFLIX, INC.,  
Petitioner,**

**v.**

**AVAGO TECHNOLOGIES INTERNATIONAL  
SALES PTE. LIMITED,  
Patent Owner.**

Case No. IPR2021-00303  
U.S. Patent 8,270,992

**Petitioner's Demonstratives**  
Oral Argument

# Instituted Ground

Ground	Claims	Statutory Basis	Prior Art
1	1-14, 16-19	§ 103	Shaw + Barnes

# '992 Patent – Claim 1

- 1a In a portable system, a method for providing a digital media service to a user, the method comprising:

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- 1b delivering digital media content having a current quality level to a user;

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- 1c determining that a network connection with a second system is available and is characterized by a communication bandwidth that is high enough to provide the digital media content to the user at a quality level higher than the current quality level;

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- 1d using the network connection to obtain the digital media content at the higher quality level from the second system; and delivering the digital media content at the higher quality level to the user instead of the digital media content at the current quality level.



# Issues in dispute

- |    |  |
|----|--|
| 1. | Whether the "quality level" of digital media content excludes considerations of network conditions               |
| 2. | Whether Shaw's teaching of bandwidth affecting stream quality satisfies [1c] and [6c]                            |
| 3. | Whether Shaw's teaching of thinning satisfies [1c] and [6c]  |
| 4. | Whether the combination of Shaw and Barnes satisfies the using and second delivering limitations ([1d] and [6d]) |
| 5. | Whether a POSITA would be motivated to combine Shaw and Barnes to invalidate challenged claims                   |

# How the '992 patent describes “quality”

'992 patent never defined “quality,” and only gave broad and vague examples

Step 150 may comprise communicating information between the first and second systems regarding information sources to which at least one of the first and second systems has access. For example, the second system may have access to higher quality information than the first system. As an example, such higher quality information may include information encoded utilizing a lower loss encoding technique than used to encode the information to which the first system has access. As another example, such higher quality information may include information to which the second system has access and to which the first system has no access.

The quality control modules 440, 460 may, for example, communicate a variety of information over the communication link established between the communication modules 435, 455 make such a determination. Generally, the quality determination may involve any of a large variety of quality metrics (e.g., audio/video output quality, rate of response to user input, duration over which the service may be provided, number of information consumption options available to a user, variety of information that may be accessed, quality of information that may be accessed, rate at which such information may be accessed, etc.). Accordingly, the scope of various aspects of the present invention should not be limited by characteristics of one or more particular service quality metrics.

## Institution Decision:

Specification supports reading the claim language differently; the Specification provides a non-specific, open-ended description of considerations in determining whether a second system could provide a higher quality level than the first system without any specific language that narrows the claim language. See Ex. 1001, 22:16–23 (“the quality determination may involve any of a large variety of quality metrics”); 23:54–24:19 (listing multiple factors considered by quality control modules).

# Barnes: a portable multi-function communications device

Barnes teaches a portable device with internet communication capabilities

**[0034]** The present invention is a multi-function communications device **101** that includes conventional mobile phone and personal digital assistant (PDA) capabilities and preferably one or more of the functional modules shown in **FIG. 1** such as a communications module **105**, a location module **110**, a recorder module **115**, a data management module **120**, an authentication module **125**, an image module **130**, a commerce module **135**, and application modules **140** (e.g., computer programs), such as those described herein, all of which may make use of other modules. As will be discussed in more detail below, each module is comprised of a combination of hardware and software and may share (i.e., may be formed by) hardware and software of other modules as is well known in the art.

**[0044]** As discussed, the software used to implement the communications module **105** is determined, at least in part, by the systems with which the device **101** must communicate. In the preferred embodiment, the device **101** is configured to receive and transmit (and store) conventional digital communications, which include mobile telephone communications, and other data communications including Internet data, mobile videophone communications, and to receive digital television signals, and digital radio signals (e.g., XM® radio signals). Preferably the device **101** is configured to operate with a conventional mobile telephone network or wireless wide area network (WWAN), and one or more other wireless local area networks (wireless LAN or WLAN), wireless Metropolitan Area Networks (MAN), and a wireless personal area networks (PAN) (e.g., a Bluetooth® network). The preferred embodiment of the present invention includes hardware and software for communicating with (or through) a mobile telephone network, a WLAN, and a wireless PAN. In addition, the device **101** includes hardware and software for communicating with another device **101** through a two way radio communication link.

# Barnes teaches providing a multimedia player, such as a RealPlayer Media Player

Barnes teaches providing a media player that supports common media encodings

[0039] As discussed above, the device 101 includes the capability of providing conventional mobile telephone functions such as providing a wireless voice communication link, providing a wireless data communication link (for example, for connecting to the Internet, an email server, or other computer system), and includes applications sometimes found in a PDA such as one or more of an email client, a web browser (preferably Internet Explorer®), text messaging software, short message service (SMS) client or Unstructured Supplementary Services Data (USSD) client, an image viewer, an alarm clock, game software, paging software, a calendar, a word processor, a spreadsheet, a database, and a clock (with alarm capabilities). The device 101 also includes one or more of the functional modules (software and possibly hardware) of a voice recorder (preferably forming part of the recorder module 115), an audio media player, an audio/video player (which may also act as the audio media player), facsimile software (for sending and receiving), an image editor, a terminal service client, a voice recognition module, and a virtual private network client. As will be discussed in more detail below, the specific functional modules and software applications are a design choice based on the external systems, desired functionality, costs, co-existing applications, and other factors. Likewise, depending on the modules and software applications included, embodiments of the present invention may take the form of a laptop or notebook computer, a radio frequency tag, a Smart Card, a PDA, a mobile phone, a computer integrated into another item such as a vehicle, or another suitable configuration.

[0040] Preferably the audio/video player is compatible with the open MPEG-4 (Moving Picture Experts Group) standard format and/or the other digital video compression standards (such as MPEG-2 and MPEG-1). More preferably, the player is RealPlayer Media Player® and can be used to play wav, .avi, .mov, .mpeg, .mp3, .au, and aiff files. While MPEG is preferred over competing formats, such as Video for Windows®, Indeo® and QuickTime®, one or more of these standards could be used instead of, or in addition to, software for processing video received in the one or more MPEG standards. Preferably, the audio player is an MP3 player.



# Barnes' device selects among network connections to improve performance and quality of service

[0070] As discussed, the device 101 of the present invention preferably includes means for communicating via two or more communication networks (e.g., wireless WAN, LAN, and PAN). Thus, when communications with the desired external system may be accomplished by more than one network, the device 101 must determine the available network with which to establish the communication(s). The programmed rules for determining which available network with which to establish a communication (or communications) are stored in memory and based on information of the available networks with which the device 101 is designed to communicate and may also be based on user activity or anticipated user activity. The programmed rules may be designed to provide any desirable result such as increasing efficiency, reducing costs, and/or increasing throughput.

[0071] In this example, the determination of the available network with which to establish one more communications is based on one or more of the available bandwidth of each available network (i.e., the amount of data that can be communicated over a given time period), the anticipated bandwidth necessary, the available capacity or relative available capacity (e.g., how full to capacity a network is), the historical (or anticipated) availability of bandwidth (which may include, for example, use, volume, capacity, and/or speed data for days of the week or times of the day), the communication capabilities of the device, the amount of data to be transmitted, and the cost of using each network (e.g., connection time, per amount of data transmitted).

Barnes selects a network from multiple available networks based on bandwidth.



# Barnes' network selection considers bandwidth and content quality

[0072] For example, if the available WLAN network has a maximum speed of 50K/sec, an available 3G network will likely have greater available bandwidth. If the user desires to download and watch a movie (which may be determined by a user input in response to a prompt or by the user opening an audio/video player for external retrieval of the video file), relatively high bandwidth can be anticipated as being needed. Since the WLAN does not provide enough bandwidth to receive the communication (e.g., movie data file) in a desired manner without buffering, the higher speed network is selected. If both networks have enough available bandwidth, the network is preferably selected based on the costs of use. For example, many Wi-Fi networks are free, while 2G networks have a cost per minute of use. If these two example available networks have enough available bandwidth for the communication, the programming rules determine selection of the Wi-Fi network since it is less expensive to the user. Thus, in this example embodiment the programmed rules will be based on bandwidth availability (anticipated, current), which may be estimated or known (which may be stored as a result of a transmission), and cost.

[0074] Moreover, the device 101 includes programming for switching communication networks. Thus, when network switching conditions arise, the device 101 establishes a communication with the external device via a second network and preferably terminates the communication established through the first network. Network switching conditions may include one or more of 1) changes in network conditions such as failure of a first network or the first network slowing down (due to high use such as multiple users and/or high levels of data being communicated), such as below a predetermined level (e.g., threshold speed), or increases in noise, 2) the user making a request, or attempting to make the request, to communicate data that is more suitable for communication through a second network (e.g., the user requesting a video file or movie), 3) the anticipated request of the user (e.g., based on the user starting a particular application such as a video player), 4) changes in network availability (e.g., a new network becoming available), 5) changes in conditions of the second network (e.g., more bandwidth or less noise), 6) the available capacity or relative available capacity (e.g., how full to capacity a network is), 7) the communication capabilities of the device, and 8) the historical (or anticipated) availability of bandwidth of network(s) (which may include, for example, use, volume, capacity, and/or speed data for days of the week or times of the day). The device 101 may determine any of the above information itself or receive the information in a transmission from remote computers, which monitor the networks.

# Shaw teaches a method for improving a media player

Shaw determines the server that provides the best quality of service and allows switching “on the fly” to maintain or improve quality

(57)

## ABSTRACT

A client player performs a query to a nameserver against a network map of Internet traffic conditions. The query is made asking for a particular service (e.g., RTSP) via a particular protocol (TCP) in a particular domain. In response, the nameserver returns a set of one or more tokens, with each token defining a machine or, in the preferred embodiment, a group of machines, from which the player should seek to obtain the stream. The player may then optionally perform one or more tests to determine which of a set of servers provides a best quality of service for the stream. That server is then used to retrieve the stream. Periodically, the client player code repeats the query during stream playback to determine whether there is a better source for the stream. If a better source exists, the player performs a switch to the better stream source “on the fly” if appropriate to maintain and/or enhance the quality of service. Preferably, the client player publishes data identifying why it selected a particular server, and such data may be used to augment the network map used for subsequent request routing determinations.



# Shaw teaches switching to a better stream on the fly

A “best” content server for a particular client may not remain that way for a given time period. In particular, the notion of “best” can change very quickly given the relatively large size of most streams (and the near-infinite size of all live streams). Thus, in many cases, the “best” server for a given client player receiving a given stream is likely to change before the stream is finished. The present invention provides a method for enabling a client player to identify a best server dynamically and, in addition, to selectively switch to that server to receive the stream or portions thereof. In one embodiment, the present invention is implemented a streaming media client or player, which may be a plug-in to a web browser. The streaming media client is receiving a media stream from a given server, as generally described above. The invention enables the browser and, in particular, the media client, to identify an optimum streaming server for the stream in the first instance and, if appropriate, to selectively switch from a first server to an optimum streaming server “on the fly” so that it continues to receive the best possible service.

As noted above, typically the fastest responding server to the OPTIONS test will be the best server to stream the requested data to the user. This also gives the system a chance to re-assign the stream, e.g., via a redirect message. If the fastest responding server is indeed the correct server to stream from, then the X-CDNSP-Times header can be ignored by the server. Another function provided by the present invention is the ability of the client player (namely, the code running in that player) to identify a “better” source for a stream being received and to switch to that source “on the fly,” i.e., while the stream is being received and rendered on the client. The decision process 308 is used to determine whether the player should switch servers mid-stream. Because it is likely there will be some cost to switching (e.g., perhaps a short interruption in service), a client should only switch servers if it is not getting an acceptable stream from the first server. The decision process 308 makes a decision regarding whether the stream being received is “acceptable,” e.g., a stream that is not currently being thinned by the server, or some other metric. As used herein, “acceptable” does not necessarily mean acceptable quality. It can also mean acceptable from a stream management point of view. For example, the client could be actually told by the server that the stream is unacceptable, e.g., if the server knows it is to be taken down soon (for a software update or other servicing). It could also declare a stream unacceptable if new advertising or newer content (e.g., a fast breaking news story) becomes available. These examples, of course, are merely representative.



# PO's Changing Positions on the '992 Patent

**PO: claims directed to a quality-of-service determination using bandwidth**



**PO: bandwidth not important**

## PO's Position in District Court:

The '992 Patent is directed to improving the functionality of a communication network used to provide digital media services like video or audio streaming. The patent claims a specific technique for evaluating and selecting content sources—using first and second systems—to provide a higher quality of service when delivering digital media.<sup>29</sup>

Without analyzing the claim language, Netflix suggests that the Court “boil down” the technology to “switching from lower- to higher-quality media when available.” See Netflix Memo. at 14. This would be improper, as the patent is not so broad. Rather, claim 1 is specifically directed to (i) a portable system; (ii) digital media; and (iii) use of bandwidth to make the quality-of-service determination. Because the claim is directed to only these narrow criteria, it does not claim the whole abstract idea of switching from lower- to higher-quality service. Instead, it is limited to a specific implementation of that principle: selecting a source of digital media content for delivery to a portable system based on bandwidth.

While the Challenged Claims unquestionably require “a network connection” in providing the “digital media service,” this network connection must only have “a communication bandwidth that is high enough” (Claims 1, 6) or “a minimum determined communication bandwidth” (Claims 11, 16) to obtain/receive the digital media content at the higher quality level. See Ex. 1001 at 26:29-43, 27:21-37.

## Dr. AlRegib Declaration:

media content is the goal of the claims. Therefore, the Challenged Claims improve the overall quality of the digital media service to a user on a portable system by obtaining higher quality digital media content from a second system using a network connection that has a “high enough” or “minimum” bandwidth to obtain this higher quality content and delivering the digital media content at the higher quality level to the user. Other than providing sufficient bandwidth for the higher quality digital media content, the networking aspect of the claims is not of paramount importance.

# Issues in dispute

- |      |  |
|------|--|
| 1. ✓ | <b>Whether the "quality level" of digital media content excludes considerations of network conditions</b>        |
| 2.   | Whether Shaw's teaching of bandwidth affecting stream quality satisfies [1c] and [6c]                            |
| 3.   | Whether Shaw's teaching of thinning satisfies [1c] and [6c]  |
| 4.   | Whether the combination of Shaw and Barnes satisfies the using and second delivering limitations ([1d] and [6d]) |
| 5.   | Whether a POSITA would be motivated to combine Shaw and Barnes to invalidate challenged claims                   |

# '992 Patent – Claim 1

Plain language of the claim refers to the quality level of the media being delivered, provided, obtained

- 1a In a portable system, a method for providing a digital media service to a user, the method comprising:

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- 1b **delivering digital media content** having a current quality level to a user;

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- 1c determining that a network connection with a second system is available and is characterized by a communication bandwidth that is high enough to **provide the digital media content** to the user at a quality level higher than the current quality level;

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- 1d using the network connection to **obtain the digital media content** at the higher quality level from the second system; and **delivering the digital media content** at the higher quality level to the user instead of the digital media content at the current quality level.

# Plain Meaning: “Quality level” refers to the “quality level” of digital media being delivered, provided, and obtained

## Institution Decision:

First, based on the record at this stage of the proceeding, we disagree with Patent Owner’s proposed interpretations of claims 1 and 6. The plain language of the claims refers to the quality level of the digital media being “delivered,” “provided,” and “obtained,” without reference to factors such as the user’s hardware or the user’s ability to appreciate the higher quality level. Specifically, in the Determining Limitation, the claim language requires determining that a second system is “characterized by a communication bandwidth that is high enough to provide the digital media content to the user at a quality level higher than the current quality level.”

# PO's interpretation is circular

## Patent Owner Response:

For example, the second system may have access to **higher quality information** than the first system. As an example, such higher quality information may include information encoded utilizing a lower loss encoding technique than used to encode the information to which the first system has access. As another example, such higher quality information may include information to which the second system has access and to which the first system has no access.

Ex. 1001 at 6:11-18 (emphasis added). Therefore, as this example demonstrates, the "quality" of the information (*e.g.*, digital media content) refers specifically to the quality of the information itself. *Id.* (providing the example that "such **higher quality information** may include information encoded utilizing a **lower loss encoding technique** than used to encode the information to which the first system has access") (emphasis added); *see also* Ex. 2002, ¶ 81.

# PO's expert and sur-reply reveal PO's interpretation

PO seeks to interpret "quality level" in isolation, independent of delivery considerations.

## Dr. AlRegib's Declaration:

82. I observe that the First Delivering Limitation recites, "delivering digital media content having a current quality level to a user." *Id.* at 26:31-32, 26:58-59, 27:23-24, 28:12-13. I note that the "current quality level" of the "digital media content" is defined in the Challenged Claims before a network connection is mentioned. In fact, the example provided in the specification from Fig. 5 states that user may initially be listening on headset 520 to music that is stored locally on PDA 515 – *i.e.*, the digital media content at the current quality level of the Challenged Claims can be delivered to the user without a network connection. *Id.* at 3:25-33. To me, this indicates that the quality level of the media content, as those terms are used in the Challenged Claims, is independent of delivery considerations, such as network quality.

## PO's Sur-Reply:

Petitioner argues that PO's interpretation, "where quality does not refer to the quality of the digital media content being delivered, provided, or obtained, but rather *only* refers to the quality of the digital media content 'itself'" is incorrect. Reply, 8 (emphasis in original). This argument makes no sense. The media quality is what it is. It is not readily apparent why this interpretation should be controversial, nor why it should require any construction. This interpretation is merely the plain meaning of the "quality level" of digital media, which itself has nothing to do with the quality of the network on which the digital media is delivered.



# '992 Patent Does Not Support PO's Interpretation

- The '992 patent's non-limiting example at 6:11-18 is not a lexicography and does not support excluding delivering considerations

## POR

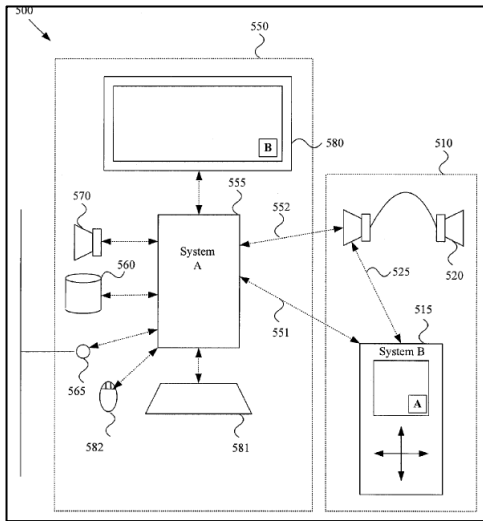
For example, the second system may have access to **higher quality information** than the first system. As an example, such higher quality information may include information encoded utilizing a lower loss encoding technique than used to encode the information to which the first system has access. As another example, such higher quality information may include information to which the second system has access and to which the first system has no access.

Ex. 1001 at 6:11-18 (emphasis added). Therefore, as this example demonstrates, the "quality" of the information (e.g., digital media content) refers specifically to the quality of the information itself. *Id.* (providing the example that "such **higher quality information** may include information encoded utilizing a **lower loss encoding technique** than used to encode the information to which the first system has access") (emphasis added); *see also* Ex. 2002, ¶ 81.

## '992 Patent

Step 150 may comprise communicating information between the first and second systems regarding information sources to which at least one of the first and second systems has access. For example, the second system may have access to higher quality information than the first system. As an example, such higher quality information may include information encoded utilizing a lower loss encoding technique than used to encode the information to which the first system has access. As another example, such higher quality information may include information to which the second system has access and to which the first system has no access.

# PO's argument that media may be played locally also fails



- The '992 patent's Figure 5 is a non-limiting example of local playback and does not support excluding delivering considerations

## POR

The Challenged Claims make this point clear in the First Delivering Limitation that states, "delivering digital media content having a current quality level to a user." Ex. 1001 at 26:31-32, 26:58-59, 27:23-24, 28:12-13. The "current quality level" of the "digital media content" is defined in the Challenged Claims before a network connection is mentioned. In fact, the example provided in the specification from Fig. 5 states that user may initially be listening to music on headset 520 that is stored locally on PDA 515 – i.e., the digital media content at the current quality level of the Challenged Claims can be delivered to the user without a network connection. *Id.* at 3:25-33; Ex. 2002, ¶ 82.

## '992 Patent

FIG. 5 illustrates an exemplary network scenario 500 where the first system 510 comprises a personal digital assistant ("PDA") 515 initially providing music to a user through a headset 520 communicatively coupled to the PDA 515 through a communication link 525, which may be a tethered or non-tethered link. The user may, for example, have requested at step 110 that the first system 510 provide music to the user from a song play list, which represents a portion of a store of music information local to the PDA 515. It is to be stressed at this point that the following discussion will often refer to the exemplary scenario 500 shown in FIG. 5 as an exemplary illustration of various aspects of the present invention that are in fact of much broader scope than aspects of the exemplary scenario 500 may demonstrate. Accordingly, by no means is the scope of various aspects of the present invention to be limited by characteristics of the exemplary scenario 500 shown in FIG. 5.



# PO's argument that media may be played locally also fails

## Myler Declaration:

quality. Ex. 2002 ¶82. The problem with Dr. AlRegib's analysis is that he has picked an example where the digital media content is not being delivered over a network connection nor is it being streamed. Given that there is no use of a network in the example, it is not surprising that a non-existent network does not impact quality. But, as I explained above, once digital media content is being streamed, network considerations may impact the quality of the digital media content. As one example, streaming media content may be thinned by a server when the network conditions are poor. In that instance, the server removes information from the stream (e.g., frames) from the digital media content before it leaves the server, and thus reduces its quality.

# Well-known that bandwidth affects media quality

## Shaw:

Streaming media quality varies widely according to the type of media being delivered, the speed of the user's Internet connection, network conditions, the bit rate at which the content is encoded, and the format used. In general, streaming audio can be FM quality, but, given typical bandwidth constraints, streaming video is poor by TV standards, with smaller screens, lower resolution, and fewer frames per second. The source for streaming media can be just about any form of media, including VHS or Beta format tapes, audio cassettes, DAT, MPEG video, MP3 audio, AVI, and the like. Prior to streaming, the content must first be encoded, a process which accomplishes four things: conversion of the content from analog to digital form, if necessary; creation of a file in the format recognized by the streaming media server and player; compression of the file to maximize the richness of the content that can be delivered in real-time given limited bandwidth; and, establishing the bit rate at which the media is to be delivered. Content owners typically choose to encode media at multiple rates so that users with fast connections get as good an experience as possible but users with slow connections can also access the content.

# Board observed that both Barnes and Shaw describe bandwidth as one factor affecting streaming quality

## Institution Decision:

On the current record, we are persuaded by Petitioner's arguments that the combined teaching of Barnes and Shaw satisfies the Determining Limitations. As cited by Petitioner, both Barnes and Shaw describe bandwidth as one factor affecting streaming quality. Ex. 1004 ¶¶ 70–72; Ex. 1005, 1:36–54. Further, Shaw describes switching from a first stream source to a second stream source if appropriate “to maintain and/or enhance the quality of service.” Ex. 1005, 3:62–66, 10:30–35, code (57). And Barnes similarly describes selecting and switching sources based on bandwidth among other factors. Ex. 1004 ¶¶ 71–74.

- PO's argument about local playback is irrelevant
- Proper interpretation of “quality level” does not exclude considerations of network delivery

# Claim amendment does not support PO's interpretation

## '992 File History:

38. (Currently Amended) In a portable system, a method for providing a digital media service to a user, the method comprising:

- ~~providing a~~ delivering digital media content having a current quality level service to a user ~~at a current quality level;~~
- determining that a network connection with a second system is available and is characterized by a communication bandwidth that is high enough to provide the digital media ~~service~~ content to the user at a quality level higher than the current quality level;
- and
- ~~in response to at least said determining, utilizing the network connection to provide the digital media service to the user at a quality level higher than the current quality level.~~
- using the network connection to obtain the digital media content at the higher quality level from the second system; and
- delivering the digital media content at the higher quality level to the user instead of the digital media content at the current quality level.

# Jagadeesan's and Kayama's teachings are different from Shaw and Barnes

Jagadeesan and Kayama do not teach obtaining data from a different, better source

## '992 File History:

Jagadeesan generally discloses a method for handing off a call between networks. (Jagadeesan, Abstract). Specifically, Jagadeesan monitors the quality of **communication links** from which a mobile station may communicate, such as a WLAN communication link or a cellular network communication link. (Jagadeesan, paragraphs [0032] and [0033]). However, though Jagadeesan may disclose a mobile station switching between communication links based on link quality, the source of the **content** transmitted across the communication links (*i.e.*, the voice data) remains the same. Indeed, Jagadeesan specifically states “[a] **handoff of the existing call may occur**” if the link quality of a second communication link is greater than the link quality of the communication link currently used by the mobile station. (Jagadeesan, paragraph [0035], Emphasis added). That is, in Jagadeesan, prior to transmission by either the WLAN or the cellular network, the voice data is the same. And as a whole, Jagadeesan fails to disclose or suggest obtaining voice data from another source, let alone obtaining digital media content at a higher quality level from the second system, as recited in claim 38. As such, Jagadeesan also necessary fails to teach, disclose, or suggest delivering the digital media content at the higher quality level to the user instead of the digital media content at the current quality level, as recited in claim 38. Thus, Assignee submits Jagadeesan fails to teach, disclose, or suggest all the features recited in claim 38.

Kayama fails to remedy the deficiencies of Jagadeesan. Kayama generally discloses a method through which a mobile station selects from a plurality of radio base stations to communicate through. (Kayama, Abstract.) Kayama, like Jagadeesan, relates to selection of a communication medium, and fails to disclose, teach, or suggest obtaining digital media content at a higher quality level from the second system, as recited in claim 38. As such, Assignee submits claim 38 is patentable over Jagadeesan and Kayama, taken alone or in combination, and respectfully requests the rejection of claim 38 be withdrawn.



# Jagadeesan's and Kayama's teachings are different from Shaw and Barnes

Unlike Jagadeesan and Kayama, the combination of Shaw and Barnes teaches obtaining data from a different, better source

## Shaw:

As noted above, typically the fastest responding server to the OPTIONS test will be the best server to stream the requested data to the user. This also gives the system a chance to re-assign the stream, e.g., via a redirect message. If the fastest responding server is indeed the correct server to stream from, then the X-CDNSP-Times header can be ignored by the server. Another function provided by the present invention is the ability of the client player (namely, the code running in that player) to identify a "better" source for a stream being received and to switch to that source "on the fly," i.e., while the stream is being received and rendered on the client. The decision process 308 is used to determine whether the player should switch servers mid-stream. Because it is likely there will be some cost to switching (e.g., perhaps a short interruption in service), a client should only switch servers if it is not getting an acceptable stream from the first server. The decision process 308 makes a decision regarding whether the stream being received is "acceptable," e.g., a stream that is not currently being thinned by the server, or some other metric. As used herein, "acceptable" does not necessarily mean acceptable quality. It can also mean acceptable from a stream management point of view. For example, the client could be actually told by the server that the stream is unacceptable, e.g., if the server knows it is to be taken down soon (for a software update or other servicing). It could also declare a stream unacceptable if new advertising or newer content (e.g., a fast breaking news story) becomes available. These examples, of course, are merely representative.

## Myler Declaration:

19. As discussed below, unlike Applicants' arguments concerning Jagadeesan and Kayama, the combination of Barnes and Shaw does identify a new and better source (content server) based on Shaw's express teachings on "the ability of the client player (namely, the code running in that player) to identify a 'better' source for a stream being received and to switch to that source 'on the fly,' i.e., while the stream is being received and rendered on the client." Ex. 1005 (Shaw), 9:14-19. Therefore, unlike Applicants' arguments concerning Jagadeesan and Kayama, the combination of Barnes and Shaw delivers the digital media content at a higher quality level to the user.

# Issues in dispute

1.

Whether the "quality level" of digital media content excludes considerations of network conditions

2. ✓

**Whether Shaw's teaching of bandwidth affecting stream quality satisfies [1c] and [6c]**

3.

Whether Shaw's teaching of thinning satisfies [1c] and [6c]

4.

Whether the combination of Shaw and Barnes satisfies the using and second delivering limitations (1[d] and 6[d])

5.

Whether a POSITA would be motivated to combine Shaw and Barnes to invalidate challenged claims

# Petition explains that Shaw's periodic testing process teaches limitations [1c] and [6c]

## Petition:

As explained for the “Delivering” limitations, Shaw’s client media player selects a server source for a stream to be played or streamed to the user. Shaw also teaches the “Determining” limitations because Shaw teaches periodically determining whether there is a better source for the stream (i.e., the second system):

Periodically, the client player code repeats the DNS SRV query during playback to determine whether there is a better source for the stream. If so, the player is controlled to switch to the better stream source “on the fly” if appropriate to maintain and/or enhance the quality of service.

Ex. 1005, 3:62-66, Abs, 10:16-26. In other words, Shaw teaches that the client player periodically performs the same process of identifying a set of servers from which a stream can be obtained, and performing a test to determine if one of the

servers is available to provide the stream at a better quality level (i.e., the second system). Ex. 1003 ¶67.

When repeating the same process for identifying the (then best) source for the stream, Shaw explains that the client player may also consider additional factors, such as the cost of switching mid-stream, and whether the current source is providing an acceptable stream:

Another function provided by the present invention is the ability of the client player ... to identify a “better” source for a stream being received and to switch to that source “on the fly,” i.e., while the stream is being received and rendered on the client. ... Because it is likely there will be some cost to switching (e.g., perhaps a short interruption in service), a client should only switch servers if it is not getting an acceptable stream from the first server. The decision process 308 makes a decision regarding whether the stream being received is “acceptable,” e.g., a stream that is not currently being thinned by the server, or some other metric. As used herein, “acceptable” does not necessarily mean acceptable quality. It can also mean acceptable from a stream management point of view.

Ex. 1005, 9:14-29; Ex. 1003 ¶68.



# Petition explains that Shaw's periodic testing process satisfies the determining limitations in two ways

## Petition:

*First*, Shaw teaches that the purpose of performing the test is to determine whether there is a “better” source for the current stream. A POSITA would have found it obvious to determine whether the connection between the client and the potential second system has a higher communication bandwidth because Shaw teaches that the communication bandwidth between the client and stream source affects stream quality. *See supra* pp. 32-33; Ex. 1003 ¶¶63-65 (citing Ex. 1005, 1:37-58). Ex. 1003 ¶71.

*Second*, Shaw teaches that a stream is unacceptable if the stream is being “thinned.” Ex. 1005, 9:24-27 (“The decision process 308 makes a decision regarding whether the stream being received is ‘acceptable,’ e.g., a stream that is not currently being thinned by the server...”). This decision process is used to decide whether the client player should switch servers mid-stream. *Id.*, 9:19-24. A

# '992 Patent – Claim 1

- 1a In a portable system, a method for providing a digital media service to a user, the method comprising:

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- 1b delivering digital media content having a current quality level to a user;

---
- 1c determining that a network connection with a second system is available and is characterized by a communication bandwidth that is high enough to provide the digital media content to the user at a quality level higher than the current quality level;

---
- 1d using the network connection to obtain the digital media content at the higher quality level from the second system; and delivering the digital media content at the higher quality level to the user instead of the digital media content at the current quality level.

# Shaw teaches that a content delivery network can provide streams with different quality levels.

Shaw's Teaches that Communication Bandwidth Between the Client and Stream Source Affects Stream Quality

## Shaw:

Streaming media quality varies widely according to the type of media being delivered, the speed of the user's Internet connection, network conditions, the bit rate at which the content is encoded, and the format used. In general, streaming audio can be FM quality, but, given typical bandwidth constraints, streaming video is poor by TV standards, with smaller screens, lower resolution, and fewer frames per second. The source for streaming media can be just about any form of media, including VHS or Beta format tapes, audio cassettes, DAT, MPEG video, MP3 audio, AVI, and the like. Prior to streaming, the content must first be encoded, a process which accomplishes four things: conversion of the content from analog to digital form, if necessary; creation of a file in the format recognized by the streaming media server and player; compression of the file to maximize the richness of the content that can be delivered in real-time given limited bandwidth; and, establishing the bit rate at which the media is to be delivered. Content owners typically choose to encode media at multiple rates so that users with fast connections get as good an experience as possible but users with slow connections can also access the content.

# Petition explains that bandwidth affects stream quality

## Petition at 32-33:

factors. Specifically, Shaw teaches that “[s]treaming media quality varies widely according to the type of media being delivered, the speed of the user’s Internet connection, network conditions, the bit rate at which the content is encoded, and the format used.” Ex. 1005, 1:37-40. In other words, the quality of the stream depends upon parameters used to encode the stream as well as the conditions when the stream is being retrieved and delivered. Ex. 1003 ¶63.

## Petition at 33:

In addition, Shaw teaches that it was common to encode streaming media at different bits so that a user with a lower bandwidth connection can access the stream (albeit at a lower quality), while a user with a higher bandwidth connection can access a higher quality version of the stream. Ex. 1005, 1:54-58. Thus, a POSITA would have understood that the quality level of streaming media content varies according to the encoding format, encoding bit rate, and the connection speed between the media player client and the source server. Furthermore, a POSITA would have found it obvious that a connection with higher available bandwidth supports high speed (fast) connections and streams encoded at higher encoding rates. Ex. 1003 ¶65.

# A POSITA would have known to encode content at multiple bitrates before streaming

Shaw teaches content owners encode at different rates to adapt to different user bandwidths.

## Myler Declaration:

29. Shaw teaches that the typical bandwidth constraints at the time meant that audio streaming could provide a quality of service at the level of FM quality (e.g., commercial broadcast radio), but that video streaming provided poorer quality (e.g., smaller screens, lower resolution, and fewer frames per second) as compared to TV standards (e.g., commercial broadcast TV). *See, id.*, 1:40-44. One way content owners sought to provide a better quality of service was to encode streaming media at multiple bit rates. By doing so, the content could be streamed to a user with a slower connection using a lower bit rate encoding, while the same content could be streamed to a user with a faster connection using a higher bit rate encoding. *Id.*, 1:54-58.



# A POSITA would have known to encode content at multiple bitrates before streaming

## Myler Declaration:

63. A POSITA would have understood that a stream selected in this manner teaches delivering digital media content having a current quality level because a stream is a representation of digital media content, and it was well-known that a given stream has a particular quality level that is dependent upon a number of factors. Specifically, Shaw teaches that “[s]treaming media quality varies widely according to the type of media being delivered, the speed of the user’s Internet connection, network conditions, the bit rate at which the content is encoded, and the format used.” *Id.*, 1:37-40. In other words, the quality of the stream depends upon parameters used to encode the stream as well as the conditions when the stream is being retrieved and delivered.

64. For example, Shaw also teaches that insufficient bandwidth leads to poor streaming video, including lower resolution and few frames per second. See *id.*, 1:40-44 (“In general, streaming audio can be FM quality, but, given typical bandwidth constraints, streaming video is poor by TV standards, with smaller screens, lower resolution, and fewer frames per second.”).

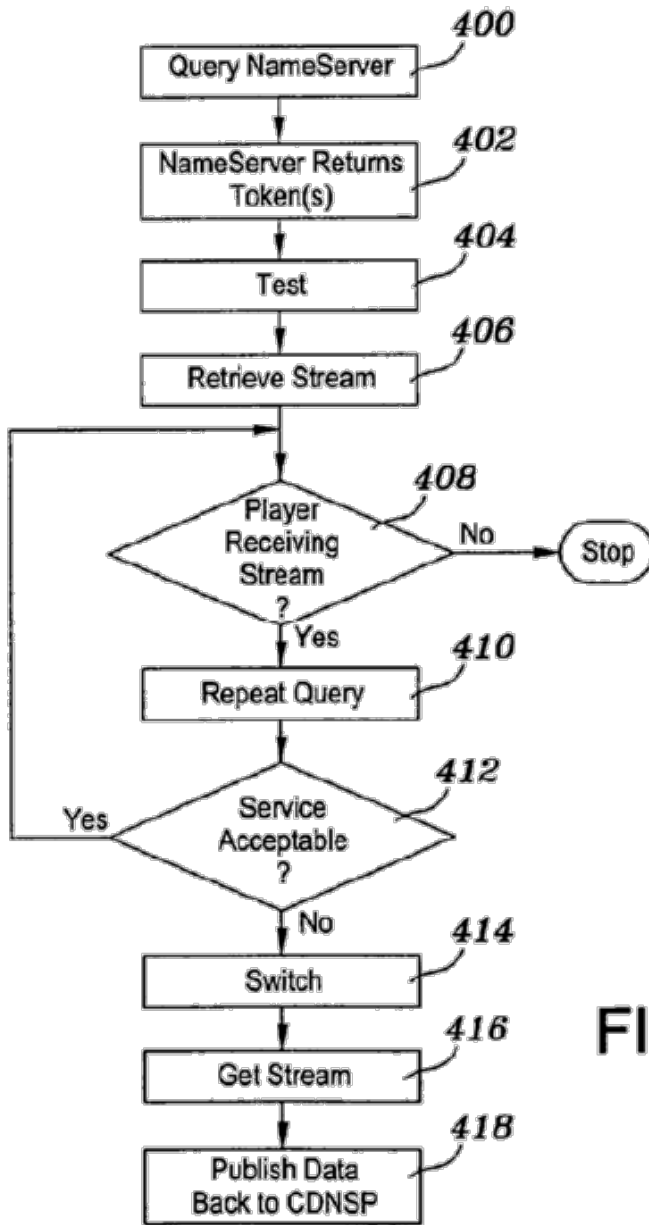


FIG. 4

# PO's expert acknowledged that POSITAs knew that CDNs delivered content at different quality levels

## Dr. AlRegib Deposition:

Q. **Would a POSITA have known by 2003 that one way to vary the quality of media content is to encode the content at different bit rates?**

A. **Yes**, a POSITA at the time who knows about decoding or decoding compression, they would.

Q. **Do you know one way or another whether content delivery networks in 2003 were used to distribute media content at multiple quality levels, the same media content at multiple quality levels?**

A. **Yes, they will have, they will have different content at different bit rates, at different bit rates.** But the main, the main contribution of these networks and what this is very well known for is to bring servers closer to the viewers, to campuses and something like that. So there's minimizing basically going all the way back to a server very far off and that's basically just bringing server closer to the client. So that provides a better quality of service.

# A POSITA would have understood that higher bandwidth supports higher quality

## Myler Declaration:

65. In addition, Shaw teaches that it was common to encode streaming media at different bits so that a user with a lower bandwidth connection can access the stream (albeit at a lower quality), while a user with a higher bandwidth connection can access a higher quality version of the stream:

Content owners typically choose to *encode media at multiple rates* so that users with *fast connections get as good an experience as possible* but users with slow connections can also access the content.

Ex. 1005, 1:54-58. Thus, a POSITA would have understood that the quality level of streaming media content varies according to the encoding format, encoding bit rate, and the connection speed between the media player client and the source server. Furthermore, a POSITA would have found it obvious that a connection with higher available bandwidth supports high speed (fast) connections and streams encoded at higher encoding rates.



# PO and its expert misread Shaw

PO and AlRegib erred in asserting that Shaw only teaches providing identical copies of media content

## POR

With respect to Shaw, the Petitioner confuses the overall quality level of the digital media service with the quality levels of the digital media content itself. *See* Ex. 2002, ¶ 94. As explained in detail above, the entirety of the Shaw disclosure relates to the network – not the quality of the media content transported by the network. *See supra* § II.C.2. Shaw teaches that identical copies of the media content are stored on servers within the CDN. *Id.* As a result, the client browser can switch between servers if it experiences a degradation of network connection with the current server and still receive the same content (*i.e.*, the same "stream"). *Id.* As explained above, Shaw repeatedly states that, if the network switch is done correctly, the user will not notice the switch because the "stream" will seamlessly switch from the first server to the second server. *Id.* If the user cannot tell the difference in the media content after Shaw's client browser switches from the first server to the second server, the client browser certainly did not provide digital media content at a higher quality level from the second system. *See* Ex. 2002, ¶¶ 94-95.

## Dr. AlRegib's Declaration

57. As Shaw explains, "FIG. 2 is a simplified diagram illustrating how live streaming can be further enhanced by having the CDN send multiple copies of the same stream over different routes from a CDN entry point to the optimal streaming server at the edge of the Internet." *Id.* at 4:23-26. Shaw further explains that in a traditional CDN "a single source stream can be replicated into thousands or more identical copies". *Id.* at 2:27-37. Notably, Shaw provides no disclosure that might indicate that the "source stream" might be transcoded, re-encoded, or modified in any way that might change the quality of the source stream, either before or after it has been "replicated." My opinion, based on the term "replicated," which I take to mean "copied exactly," in the absence of any disclosure to the contrary, is that the clear import of Shaw's teaching indicates that all the replicated streams are the same stream (*i.e.*, the same media content of the same quality level). Dr. Myler's testimony indicates that he agrees with my assessment of Shaw's teachings in this regard. *See* Ex. 2003 at 33:17-34:7.

As will be shown below, Shaw teaches a many-to-many relationship for streams and content providers

# Shaw's teaching are not limited to a single stream

Shaw performs replication for each object of media content

## Shaw:

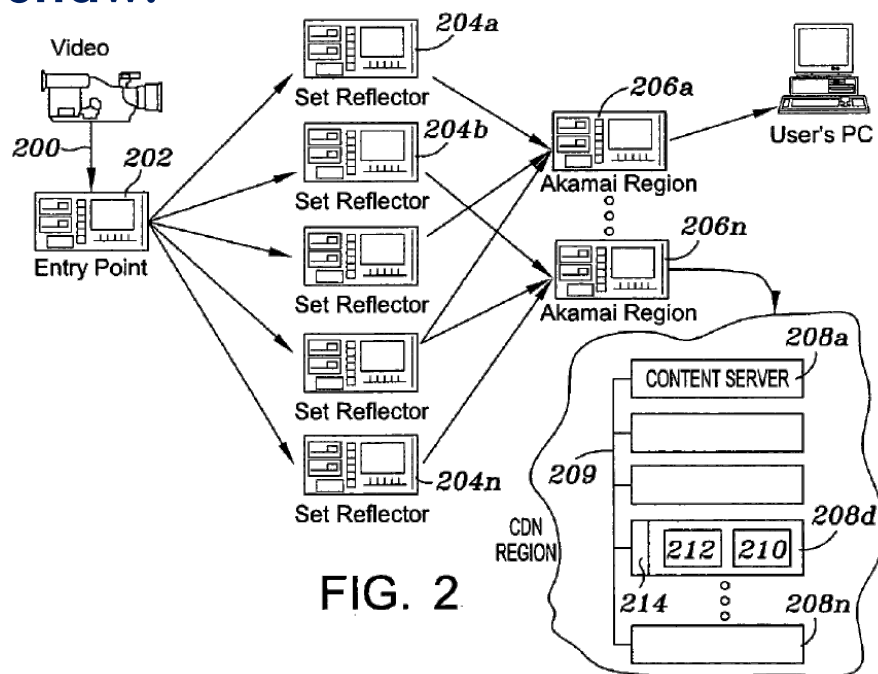


FIG. 2

CDN entry point 202. An entry point, for example, comprises two servers (for redundancy), and each server can handle many streams from multiple content providers. Once the entry point receives the stream, it rebroadcasts copies of the stream to set reflectors 204a-n. The streams are multiplexed and delivered to the set reflectors preferably via UDP (e.g., WMT encapsulated in RTSP encapsulated in UDP over IP). These set reflectors are preferably diverse from a

- A POSITA would have understood the teaching to mean that each entry point server is handling many streams from many content providers. (Myler Reply Decl. ¶13)
- A POSITA would not interpret Shaw's CDN teaching to prevent addressing a common requirement to support multiple formats of content. (Myler Reply Decl. ¶13)
- It was well-known that the replication process would be repeated for each object to be delivered through the network. (Myler Reply Decl. ¶14)

# Issues in dispute

1.	Whether the "quality level" of digital media content excludes considerations of network conditions
2.	Whether Shaw's teaching of bandwidth affecting stream quality satisfies [1c] and [6c]
3. ✓	<b>Whether Shaw's teaching of thinning satisfies [1c] and [6c]</b>
4.	Whether the combination of Shaw and Barnes satisfies the using and second delivering limitations ([1d] and [6d])
5.	Whether a POSITA would be motivated to combine Shaw and Barnes to invalidate challenged claims

# '992 Patent – Claim 1

- 1a In a portable system, a method for providing a digital media service to a user, the method comprising:

---
- 1b delivering digital media content having a current quality level to a user;

---
- 1c determining that a network connection with a second system is available and is characterized by a communication bandwidth that is high enough to provide the digital media content to the user at a quality level higher than the current quality level;

---
- 1d using the network connection to obtain the digital media content at the higher quality level from the second system; and delivering the digital media content at the higher quality level to the user instead of the digital media content at the current quality level.

# PO mischaracterizes thinning

- PO argues that Shaw's thinning teachings do not satisfy the determining limitations because switching to avoid thinning "relates to the quality of the network connection and not to the quality of the digital media content itself." (POR 51)
- PO's argument is premised on the incorrect interpretation of "quality of the digital media content."
  - As discussed above, quality of digital media content is dependent on quality of network connection when streaming media to the user
  - PO also incorrectly dismisses the fact that thinning leads to lowered content quality

# Shaw teaches thinning as a condition to switch servers

Thinning leads to unacceptable stream quality, and  
Shaw teaches switching to a non-thinned source

As noted above, typically the fastest responding server to the OPTIONS test will be the best server to stream the requested data to the user. This also gives the system a chance to re-assign the stream, e.g., via a redirect message. If the fastest responding server is indeed the correct server to stream from, then the X-CDNSP-Times header can be ignored by the server. Another function provided by the present invention is the ability of the client player (namely, the code running in that player) to identify a “better” source for a stream being received and to switch to that source “on the fly,” i.e., while the stream is being received and rendered on the client. The decision process 308 is used to determine whether the player should switch servers mid-stream. Because it is likely there will be some cost to switching (e.g., perhaps a short interruption in service), a client should only switch servers if it is not getting an acceptable stream from the first server. The decision process 308 makes a decision regarding whether the stream being received is “acceptable,” e.g., a stream that is not currently being thinned by the server, or some other metric. As used herein, “acceptable” does not necessarily mean acceptable quality. It can also mean acceptable from a stream management point of view. For example, the client could be actually told by the server that the stream is unacceptable, e.g., if the server knows it is to be taken down soon (for a software update or other servicing). It could also declare a stream unacceptable if new advertising or newer content (e.g., a fast breaking news story) becomes available. These examples, of course, are merely representative.



# Thinning reduces the quality of the content

Experts agree that thinning drops portions of a stream, and that Shaw teaches switching to avoid thinning

## Dr. Myler's Declaration

decide whether the client player should switch servers mid-stream. *Id.*, 9:19-24. A POSITA would have known that "thinning" a stream refers to dropping portions of a stream from transmission at its source so that the client can keep up with the stream. In other words, when a server detects that there is insufficient communication bandwidth between the server and the client, the server may "thin" the stream by dropping information (e.g., frames) from the stream so that the client can keep up. Because thinning is a technique for handling a drop in communication bandwidth, a POSITA would have found it obvious to choose a different source for the stream if there is a higher bandwidth connection between the client and alternate source because it would avoid the need for thinning the stream and therefore provide the stream at a higher quality level. Therefore, Shaw suggests determining the communication bandwidth of the connection between the media player and each source server to pick a better source.

## Dr. AlRegib's Declaration

69. I believe that a POSITA would understand this teaching to mean that the thinning of a stream is a networking consideration, much like other stream management concerns. I understand that Dr. Myler acknowledged that Shaw uses the term "thinned" to mean that "there's an insufficient communication bandwidth between the server and the client," and in response, "the server may . . . 'thin' the stream by dropping information (example: Frames from the stream) so that the client can keep up." Ex. 2003 at 115:3-14 (referring to paragraph 72 of Dr. Myler's declaration (Ex. 1003)). Therefore, as taught by Shaw, the client browser may switch servers to receive a better connection (*i.e.*, a better conduit) to avoid having the server "thin" the stream when the server is transmitting the stream to the client browser. *See, e.g.*, Ex. 2003 at 22:20-23:1, 82:12-23.

# PO's expert admits that there is less information in a thinned stream

## Dr. AlRegib Deposition:

Q. Okay. Now we transmitted it. It's being thinned and it's being stored as a file on the client. Do you understand that so far?

A. Yes.

Q. If I compare the file that is stored at the client with the file that is stored on the server, are they of the same level of quality?

A. When you look at the frames that were delivered, they have the same quality.

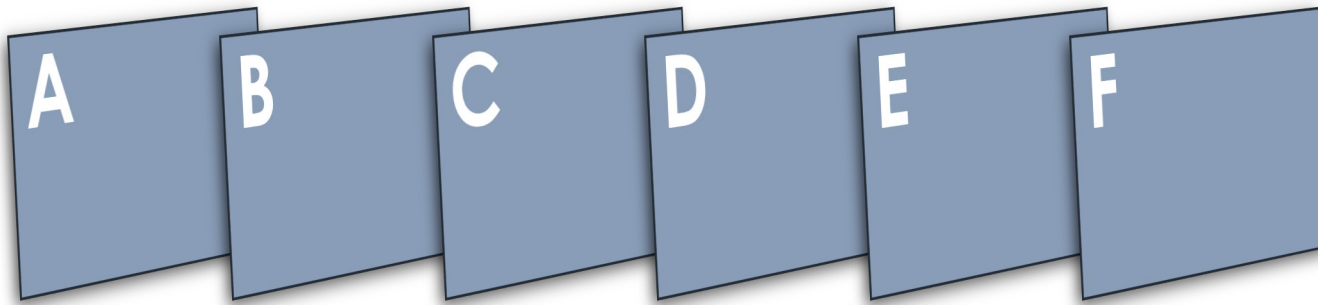
**Those that were dropped basically there's no reference to they were not even sent in that file to the client because that thinning happened. Yes, so basically you have no, they're not there.**

Q. Yes. And the file size of the thinned, **the thinned version that's stored on the client, that's going to be smaller than the non-thinned version stored at the server, correct?**

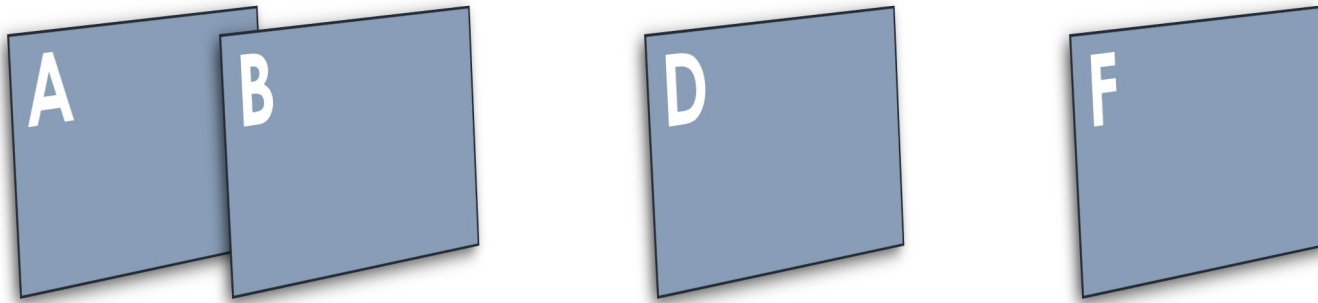
A. **Yes. I mean that's typical of the thinning outcome.**

# Content Thinning

**Digital Media Content Delivered without Thinning:**



**Digital Media Content Delivered with Thinning:**



# Thinning results in dropping frames and reduced quality

## Myler Reply Declaration:

the relative quality of the thinned stream and the original stream. Dr. AlRegib acknowledges that the frame rate of video relates to the quality of the digital media content. AlRegib Dep. 21:19-23:2, 118:3-22. Because the thinned stream has less frames, the frame rate of the video is reduced. A client player typically handles a missing frame in one of two ways. First, the player may advance to the next available frame in place of the skipped frame. In that instance, the playback of the video has sped up in that instant before resuming to normal speed – it's like having pressed fast-forward for an instant. This would be an undesirable playback artifact. Second, the player may preserve the time order and just not change what is displayed when a frame is missing. This would be perceived as the video having been frozen for an instant, which is also undesirable.

# When thinning a stream, the server reduces media quality before sending the stream

## Myler Reply Declaration:

7. As I previously explained (at least in paragraph 72), thinning is a technique for handling a degraded communications channel from the server side and it involves dropping information, such as frames, at the stream's source before the stream is transmitted. Ex. 1003 ¶72. Dropping information from the stream before it is transmitted over a network reduces the quality of the digital media content being delivered, provided or obtained because, even if the user successfully receives every single bit of the stream transmitted over the network, the digital media content has less information as compared to its original quality.

8. In the context where a client can obtain the same digital media content from two servers, where the first server can provide a thinned stream of the digital media content and the second server can provide the stream without thinning, even if the streaming client receives every bit of information sent by the first server, the thinned stream being sent by the first server is at a lower quality level than what the client could receive from the second server that is not thinning the stream.

# Issues in dispute

1.	Whether the "quality level" of digital media content excludes considerations of network conditions
2.	Whether Shaw's teaching of bandwidth affecting stream quality satisfies [1c] and [6c]
3.	Whether Shaw's teaching of thinning satisfies [1c] and [6c]
4. ✓	<b>Whether the combination of Shaw and Barnes satisfies the using and second delivering limitations ([1d] and [6d])</b>
5.	Whether a POSITA would be motivated to combine Shaw and Barnes to invalidate challenged claims



# '992 Patent – Claim 1

- 1a In a portable system, a method for providing a digital media service to a user, the method comprising:

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- 1b delivering digital media content having a current quality level to a user;

---
- 1c determining that a network connection with a second system is available and is characterized by a communication bandwidth that is high enough to provide the digital media content to the user at a quality level higher than the current quality level;

---
- 1d using the network connection to obtain the digital media content at the higher quality level from the second system; and delivering the digital media content at the higher quality level to the user instead of the digital media content at the current quality level.

## The combination of Shaw and Barnes satisfy both the using limitation and the second delivery limitation

- PO argues that neither Barnes or Shaw discloses the Second Delivering Limitation (POR, 52).
  - PO argues that Petitioner attempts to improperly eliminate the Second Delivering Limitation (POR, 53).
- Petitioner and Dr. Myler addressed both limitations under one heading.

# Shaw teaches both the using limitation and the second delivery limitation

## Petition on Shaw

from the second system. For example, Shaw teaches “the ‘best’ [server] can change very quickly given the relatively large size of most streams (and the near-infinite size of all live streams). Thus, in many cases, the ‘best’ server for a given client player receiving a given stream is likely to change before the stream is finished.” Ex. 1005, 3:33-39. Shaw further teaches that “[i]t would be desirable to enable a client player to identify a best server dynamically and, when appropriate, to enable the player to selectively switch from one server to another during the process of downloading and outputting a given stream or other large file.” Ex. 1005, 3:40-44; Ex. 1003 ¶79.

Shaw reinforces this teaching by declaring that “[a]nother function provided by the present invention is the ability of the client player (namely, the code running in that player) to identify a ‘better’ source for a stream being received and to switch to that source ‘on the fly,’ i.e., while the stream is being received and rendered on the client.” Ex. 1005, 9:14-19; *see also* 9:37-40 (“If the decision process determines that another server is a better source than a current source, control is passed to the stream switch process 310, which is the process that makes the actual switch from one server to another.”). *As described for the Determining*

## Myler Declaration on Shaw

79. A POSITA would have understood that Shaw contemplates using the network connection to obtain the digital media content at the higher quality level from the second system. For example, Shaw teaches “the ‘best’ [server] can change very quickly given the relatively large size of most streams (and the near-infinite size of all live streams). Thus, in many cases, the ‘best’ server for a given

82. Based on Shaw’s teachings above, a POSITA would have found it obvious that the purpose of the seamless switch is to use the new and better stream source to continue delivery of the digital media content to the user at the higher quality level without any break or interruption. Therefore, Shaw’s teachings render the Using Limitation obvious.

# Barnes teaches both the using limitation and the second delivery limitation

## Petition on Barnes

To the extent Patent Owner argues that Shaw does not teach this limitation, Barnes also teaches using the network connection to obtain the digital media content at the higher quality level from the second system because Barnes teaches a client device that switches from a first network to a second network if a second network has higher bandwidth when network switching conditions arise, “the device 101 establishes a communication with the external device via a second network and preferably terminates the communication established through the first network.” Ex. 1004, [0074]. A POSITA would have found it obvious that a client device that is rendering digital media content to a user but switches from a first network to a second available network due to changed network conditions would then use the second network to obtain media content after the switch and continue to deliver media content to the user. Ex. 1003 ¶83.

7:3, 9:14-20; 10:18-34). Thus, the combination involves using a known technique (Shaw’s teachings on how to improve the operation of a media player such as a RealPlayer) to improve a similar device (Barnes’ teaching of a portable device that includes a media player such as a RealPlayer). Ex. 1003 ¶39.

## Myler Declaration on Barnes

22. The device is provided with applications, such as a web browser (e.g., Internet Explorer) and an audio/video player. *Id.* [0039]. The audio/video player supports well-known digital video compression standards (e.g., MPEG-1, MPEG-2, and MPEG-4), competing video compression schemes (e.g., Windows® Media, Indeo®, and QuickTime®), and well-known audio/video formats (e.g., .wav, .avi, .mov, .mpeg, .mp3, .au, and aiff files). *Id.* [0040]. Barnes teaches that the audio/media player could be a “RealPlayer Media Player®.” *Id.*

39. Both Barnes and Shaw teach using a media player to deliver streaming media content to a user. Shaw teaches that the best server from which to obtain a stream may change over time and that it would be advantageous for the media player to identify the best server dynamically and switch from one server to another when appropriate. Ex. 1005, 3:32-44. Shaw teaches implementing his

# The second delivering limitation does not require exchanging information

## POR

As part of the Determining Limitation, as explained above, the two systems share information, including the various processing capabilities (e.g. decoding capabilities) of the two systems. *See supra* § V.A.2.a). This exchange of information between the two systems helps ensure that, if the higher quality digital media content can be obtained from the second system, the portable system will be able to deliver it to the user. *See id.*; *supra* § II.B.1; *see also* Ex. 1001 at 5:18-52, 5:3-17 (explaining that the "Step 150 may comprise communicating information between the first and second systems of whether the first or second system has processing capability, which if utilized, would result in the current service being provided to the user at a higher level of quality than the current quality level. For example and without limitation, the first and second systems may communicate information of data decoding and processing capability. Such processing capability may be, for example, related to available hardware or software resources.") (emphasis added); *accord* Ex. 2002, ¶ 104.

## Sur-Reply

POR, however, provides full context for Dr. Myler's testimony, which establishes that, without knowledge of a device's processing capabilities, it would be impossible to deliver higher quality content to the user. POR, 53-54 (quoting EX-2003, 181:24-183:2). As Dr. Myler himself stated, when questioned about substantially the same language as the Second Delivering Limitation in Claim 1, "Well, delivering – I think I talked about that in my report. Delivering business – delivering means that you are providing that content in a form that the user can use." POR, 53 (quoting EX-2003, 225:19-24) (emphasis in original) (emphasis added). This is a far cry from "non-limiting examples from the specification." As Dr. Myler concedes, without determining whether the user can use the content at a higher level, there can be no delivering of the content to the user (which the structure of the claims require). *See* POR, 55-56 (citing *id.*, §§ II.B.1, V.A.2a). Nothing in the Reply rebuts POR's argument about the Second Delivering Limitation.

**PO argues that the second delivery limitation requires communicating information on processing capabilities. As will be shown, this argument has no merit.**

# The second delivery limitation does not require exchanging information

Exchanging processing capabilities is not recited in the claim

- 1a In a portable system, a method for providing a digital media service to a user, the method comprising:

---
- 1b delivering digital media content having a current quality level to a user;

---
- 1c determining that a network connection with a second system is available and is characterized by a communication bandwidth that is high enough to provide the digital media content to the user at a quality level higher than the current quality level;

---
- 1d using the network connection to obtain the digital media content at the higher quality level from the second system; and delivering the digital media content at the higher quality level to the user instead of the digital media content at the current quality level.



# PO relies on a non-limiting example

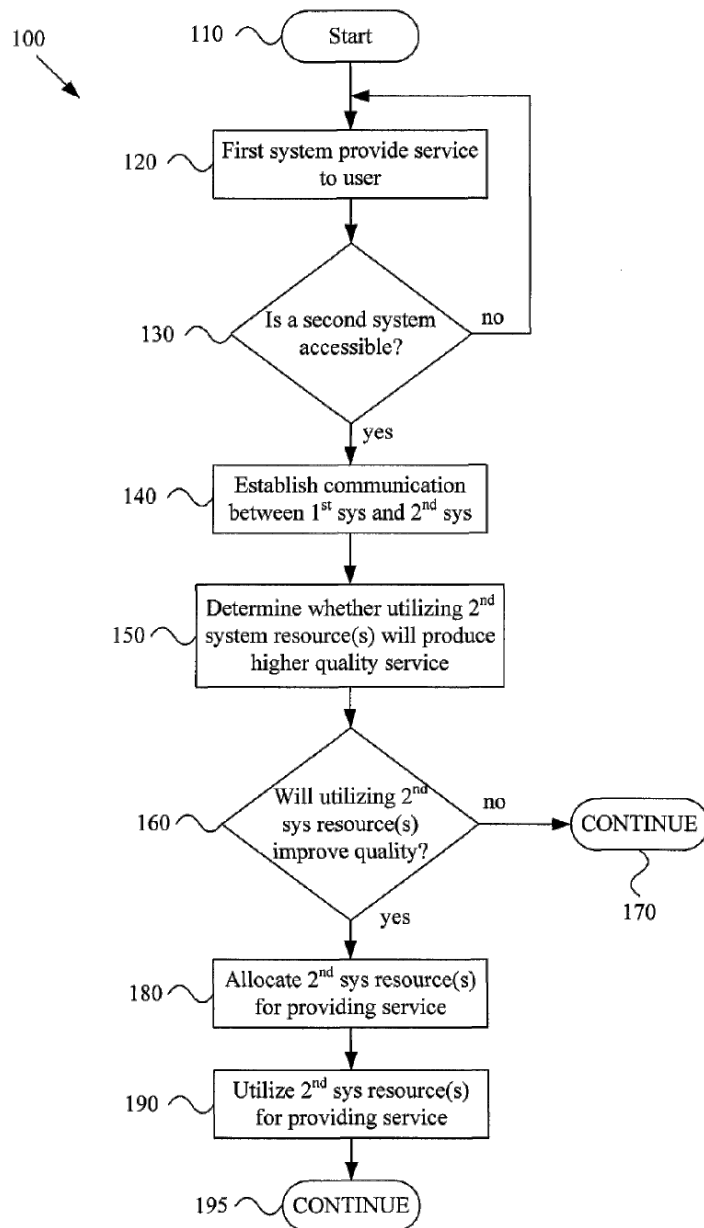


Figure 1

Referring back to FIG. 1, the method 100, at step 150, may determine whether utilizing the second system (or various resources thereof) will increase the quality at which the current service is being provided to the user. The first system and second system may, for example, communicate a variety of information over the communication link established at step 140 to make such a determination. Generally, the quality determination may involve any of a large variety of quality metrics (e.g., audio/video output quality, rate of response to user input, duration over which the service may be provided, number of information consumption options available to a user, variety of information that may be accessed, quality of information that may be accessed, rate at which such information may be accessed, etc.). Accordingly, the scope of various aspects of the present invention should not be limited by characteristics of one or more particular service quality metrics.

# '992 patent gives a number of non-limiting examples of information other than processing capabilities

Referring back to FIG. 1, step 150 may comprise communicating quality of service information between the first system and the second system. Such quality of service information may take any of a variety of forms. For example and without limitation, the quality of service information may include information of the quality of the current service being provided to the user by the first system or the potential quality at which the current service may be provided to the user by utilizing various resources of the second system.

Referring back to FIG. 1, step 150 may, for example, comprise the first and second systems communicating information of communication capability. The first and/or second system may utilize such information to determine whether utilizing various resources of the second system will result in the current service being provided to the user at a higher quality level than the current quality level. For example, providing the current service to the user at a higher quality level than the current quality level may require a communication channel between the first and second system to have a minimum communication bandwidth. Also, for example, provid-

Referring back to FIG. 1, step 150 may comprise communicating access control information between the first and second systems. Such access control information may, for example, comprise digital certificate, certificate authority (CA) key, management/access control, CA verification information, and a variety of user or system identification information.

# Issues in dispute

- |      |  |
|------|--|
| 1.   | Whether the "quality level" of digital media content excludes considerations of network conditions               |
| 2.   | Whether Shaw's teaching of bandwidth affecting stream quality satisfies [1c] and [6c]                            |
| 3.   | Whether Shaw's teaching of thinning satisfies [1c] and [6c]  |
| 4.   | Whether the combination of Shaw and Barnes satisfies the using and second delivering limitations ([1d] and [6d]) |
| 5. ✓ | <b>Whether a POSITA would be motivated to combine Shaw and Barnes to invalidate challenged claims</b>            |

# A POSITA would have had multiple reasons to combine Shaw and Barnes

## Petition:

Both Barnes and Shaw teach using a media player to deliver streaming media content to a user. Shaw teaches that the best server from which to obtain a stream may change over time and that it would be advantageous for the media player to identify the best server dynamically and switch from one server to another when appropriate. Ex. 1005, 3:32-44. Shaw teaches implementing his inventive method for identifying an optimum server to obtain streaming content as a software enhancement to then-existing media client players, such as the well-known RealPlayer. *Id.*, 7:4-25. Just as Barnes teaches switching to a network with a higher bandwidth or better condition network (*see* Ex. 1004, [0070-74]), Shaw teaches that the client player can identify a “better” source for a stream and to switch that source “on the fly” while the stream is being received and provided to the client to provide a better quality of service (*see* Ex. 1005, Abs., 3:50-66, 6:57-7:3, 9:14-20; 10:18-34). Thus, the combination involves using a known technique (Shaw’s teachings on how to improve the operation of a media player such as a RealPlayer) to improve a similar device (Barnes’ teaching of a portable device that includes a media player such as a RealPlayer). Ex. 1003 ¶39.

To find a better server, Shaw teaches that “the player may then optionally perform one or more tests to determine which of a set of servers provides a best quality of service for the stream.” Ex. 1005, Abs., 3:58-64, 8:6-10. Like Barnes (*see* Ex. 1004, [0071-74]), Shaw suggests that the “best” server can be selected based on bandwidth. For example, Shaw teaches that “[s]treaming media quality varies widely according to the type of media being delivered, the speed of the user’s Internet connection, network conditions” (Ex. 1005, 1:37-40) and bandwidth constraints (*id.*, 1:40-44). A POSITA would have found it obvious to use Barnes’ bandwidth test (selecting a better network based on higher bandwidth) (Ex. 1004, [0071-74]) as one of the tests used by Shaw to selecting a better server. Barnes’ bandwidth test is a known technique that can be readily applied as improvement to Shaw’s player, as both Barnes and Shaw contains media player, to yield predictable results (e.g., selecting better servers with a high communication bandwidth). Ex. 1003 ¶40.

In addition, the prior art references themselves suggest the proposed combination because Barnes teaches including a media player, such as a RealPlayer, on its portable device (Ex. 1004, [0039-0040]), and Shaw teaches that its inventive method improves the operation of media player and may be implemented as a software enhancement to a media player such as a RealPlayer (Ex. 1005, 7:4-25). Ex. 1003 ¶41.



# Shaw improves Barnes' media player

Barnes: teaches a media player



Shaw: improves a media player

[0040] Preferably the audio/video player is compatible with the open MPEG-4 (Moving Picture Experts Group) standard format and/or the other digital video compression standards (such as MPEG-2 and MPEG-1). More preferably, the player is RealPlayer Media Player® and can be used to play wav, .avi, .mov, .mpeg, .mp3, .au, and aiff files. While MPEG is preferred over competing formats, such as Video for Windows®, Indeo® and QuickTime®, one or more of these standards could be used instead of, or in addition to, software for processing video received in the one or more MPEG standards. Preferably, the audio player is an MP3 player.

A client machine includes a media player provisioned to perform a query to a CDNSP nameserver having a network map of Internet traffic conditions. In a preferred embodiment, the query is a DNS SRV lookup and includes an identification of the client player. The query is made asking for a particular service (e.g., RTSP) via a particular protocol (TCP) in a particular CDNSP domain. In response, the nameserver returns a set of one or more tokens, with each token defining a machine or, in the preferred embodiment, a group of machines, from which the player should seek to obtain given content (e.g., a stream). The player may then optionally perform one or more tests to determine which one of a set of returned servers provides a best quality of service for the content delivery. That server is then used to retrieve the content. Periodically, the client player code repeats the DNS SRV query during playback to determine whether there is a better source for the stream. If so, the player is controlled to switch to the better stream source “on the fly” if appropriate to maintain and/or enhance the quality of service.

# PO does not respond to rationales for motivation to combine

## POR

The above quotation from Dr. Myler's deposition is lengthy, but important. Tellingly, in this entire portion of Dr. Myler's deposition, the word "quality" is never mentioned. As shown in the file history of the '992 Patent, the Applicant specifically amended the Challenged Claims to emphasize the importance of obtaining digital media content at a higher quality level from the second system. *See supra* § II.B.3. Given the clear importance of the quality level of the digital media content to the patentability of the Challenged Claims, it is surprising that Dr. Myler never mentioned this aspect of the Challenged Claims in this entire, lengthy testimony concerning the alleged combination of the Barnes and Shaw references. Therefore, assuming *arguendo* that a POSITA would seek to combine the teachings of the Barnes and Shaw references – a point the Patent Owner absolutely does not concede – any such combination would not teach the limitation of the Challenged Claims as evidenced by Dr. Myler's disregard of one of the threshold teachings of the '992 Patent encompassed in the Challenged Claims concerning higher quality digital media content. *See Ex. 2002, ¶¶ 112-13.*

## Sur-Reply

POR amply demonstrates why Shaw and Barnes cannot be combined. POR, 58-63. This argument is based, in large part, on Dr. Myler's own testimony, as well as the testimony of Dr. AlRegib. *Id.* The only real argument in the Reply on this issue essentially argues that the Petition notes that both references mention the RealPlayer application, and that the Board found this persuasive (on an undeveloped record). Reply, 22-23. The Reply then argues that Dr. Myler's testimony should be discounted because PO somehow did not ask Dr. Myler the correct questions. *Id.*, 23-24. This rebuts nothing in POR, and Dr. Myler's testimony speaks for itself. Moreover, other than a subject heading arguing that "the combination would invalidate Challenged Claims" (*id.*, 22), the Reply completely disregards POR's demonstration that even if combined, Shaw and Barnes would not disclose the Challenged Claims. *See* POR, 62-63. This half-effort cannot rebut the arguments of POR with regard to the combinability of Shaw and Barnes.

**Avago did not respond to rationale to combine. Instead, they backed their position with the alleged absence of the word "quality" in a section of the deposition of Myler.**



# PO's argument on the lack of motivation to combine has no merit

## POR

The above quotation from Dr. Myler's deposition is lengthy, but important. Tellingly, in this entire portion of Dr. Myler's deposition, the word "quality" is never mentioned. As shown in the file history of the '992 Patent, the Applicant specifically amended the Challenged Claims to emphasize the importance of obtaining digital media content at a higher quality level from the second system. See *supra* § II.B.3. Given the clear importance of the quality level of the digital media content to the patentability of the Challenged Claims, it is surprising that Dr. Myler never mentioned this aspect of the Challenged Claims in this entire, lengthy testimony concerning the alleged combination of the Barnes and Shaw references. Therefore, assuming *arguendo* that a POSITA would seek to combine the teachings of the Barnes and Shaw references – a point the Patent Owner absolutely does not concede – any such combination would not teach the limitation of the Challenged Claims as evidenced by Dr. Myler's disregard of one of the threshold teachings of the '992 Patent encompassed in the Challenged Claims concerning higher quality digital media content. See Ex. 2002, ¶¶ 112-13.

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**Aside from recycling their old argument on quality of content, Avago brought up no argument to support their alleged inability for the combination to disclose challenged claims.**

# PO's argument on the lack of motivation to combine has no merit

Avago never asked about Dr. Myler's opinion of the relevant part in his declaration:

40. To find a better server, Shaw teaches that “the player may then optionally perform one or more tests to determine which of a set of servers provides a best quality of service for the stream.” Ex. 1005, Abs., 3:58-64, 8:6-10. Like Barnes (*see* Ex. 1004, [0071-74]), Shaw suggests that the “best” server can be selected based on bandwidth. For example, Shaw teaches that “[s]treaming media quality varies widely according to the type of media being delivered, the speed of the user’s Internet connection, network conditions” (Ex. 1005, 1:37-40) and bandwidth constraints (*id.*, 1:40-44). A POSITA would have found it obvious to use Barnes’ bandwidth test (selecting a better network based on higher bandwidth) (Ex. 1004, [0071-74]) as one of the tests used by Shaw to selecting a better server. Barnes’ bandwidth test is a known technique that can be readily applied as improvement to Shaw’s player, as both Barnes and Shaw contains media player, to yield predictable results (e.g., selecting better servers with a high communication bandwidth).

## PO's argument on the lack of motivation to combine has no merit

Even in the portion cited in POR, Dr. Myler discussed enhancing real-time streaming and delivering better overall performance.

Q. So what would the improvement or the enhancement of Shaw be to Barnes?

A. Well, I think what -- if memory serves, Barnes really doesn't talk about RTSP, which is a mechanism by which the POSITA would know could be used to **enhance real-time streaming**. And those techniques could be used in making these decision processes in Barnes as to -- the information gleaned from those could come into these program criteria that Barnes is talking about.

Q. Do you believe that the opinions or the -- network switching conditions of Shaw are -- are limited to RTSP?

A. No, I didn't see any specific limitations in terms of the claims that you would -- it was just RT -- what RTSP basically did for me with Shaw was it placed Shaw in terms of the mind of the POSITA. And at the time of Shaw, which we know was in the right time frame, it allowed me to get into the mind of the POSITA. And -- and being aware of how the access of RTSP could **deliver a better overall performance**, let's say, from Barnes and Barnes saying, okay, you can look at this network and look at this network and look at this network. It would be very clear to a POSITA that that is very understandable how to do that and -- but what probably is more important is the negotiations that are taking place in the sense of the device talking to the network, talking to the server, and getting information back in order to make a decision, and then being aware of what networks are out there and what they can provide.

# PO misreads Shaw for allowing only a single stream

Shaw teaches a many-to-many relationship for streams and content providers.

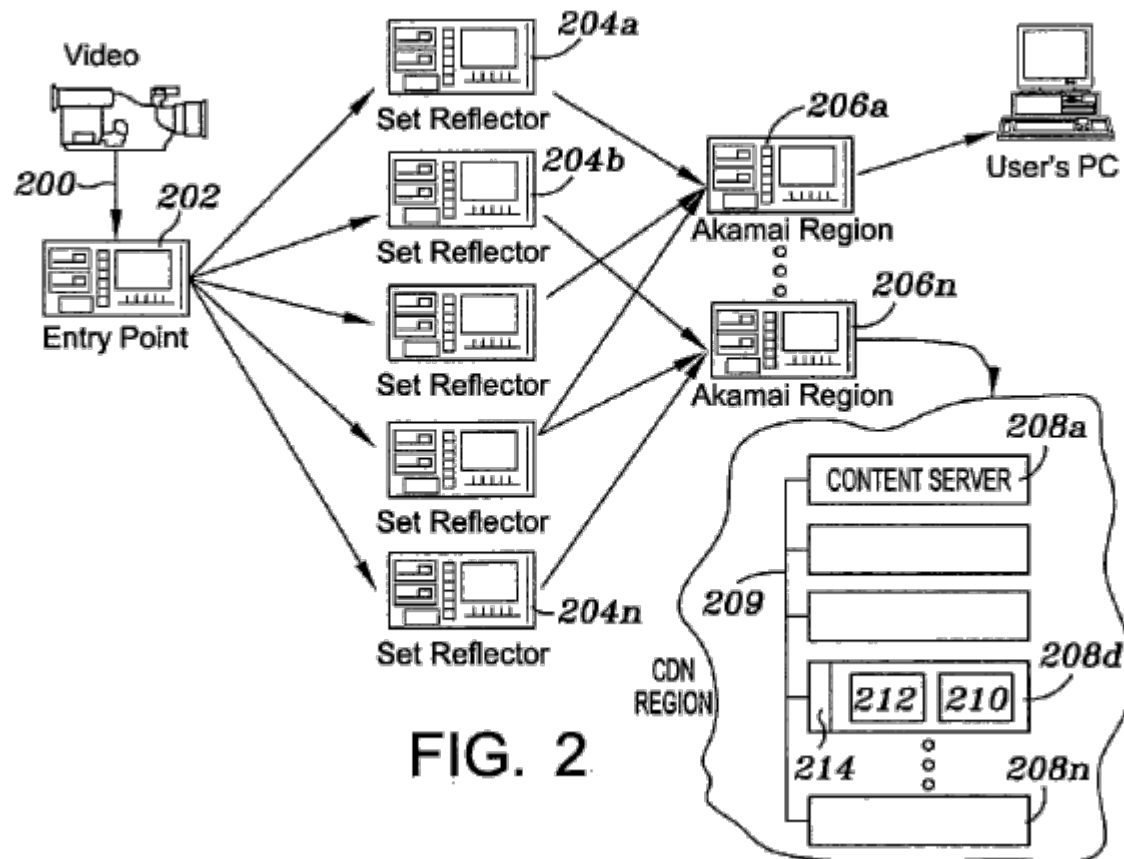


FIG. 2

## POR:

As Shaw explains, "FIG. 2 is a simplified diagram illustrating how live streaming can be further enhanced by having the CDN send **multiple copies of the same stream** over different routes from a CDN entry point to the optimal streaming server at the edge of the Internet." *Id.* at 4:23-26 (emphasis added); *see also id.* at 2:27-37 (explaining that in a traditional CDN "a **single source stream** can be replicated into thousands or more identical copies") (emphasis added). *See* Ex. 2002, ¶¶ 56-57.

## Shaw's description of Fig. 2:

streaming server to the end users. FIG. 2 illustrates this process in more detail. A broadcast stream 200 is sent to a CDN entry point 202. An entry point, for example, comprises two servers (for redundancy), and each server can handle many streams from multiple content providers. Once the entry point receives the stream, it rebroadcasts copies of the stream to set reflectors 204a-n. The streams are multiplexed and delivered to the set reflectors preferably via UDP (e.g., WMT encapsulated in RTSP encapsulated in UDP over IP). These set reflectors are preferably diverse from a



# Shaw teaches switching to a better stream on the fly

A client machine includes a media player provisioned to perform a query to a CDNSP nameserver having a network map of Internet traffic conditions. In a preferred embodiment, the query is a DNS SRV lookup and includes an identification of the client player. The query is made asking for a particular service (e.g., RTSP) via a particular protocol (TCP) in a particular CDNSP domain. In response, the nameserver returns a set of one or more tokens, with each token defining a machine or, in the preferred embodiment, a group of machines, from which the player should seek to obtain given content (e.g., a stream). The player may then optionally perform one or more tests to determine which one of a set of returned servers provides a best quality of service for the content delivery. That server is then used to retrieve the content. Periodically, the client player code repeats the DNS SRV query during playback to determine whether there is a better source for the stream. If so, the player is controlled to switch to the better stream source “on the fly” if appropriate to maintain and/or enhance the quality of service. Preferably, the client player publishes data back to the CDNSP identifying the results that were obtained during the testing process. This data provides the CDNSP with feedback regarding why the client player selected a particular server. Such data may then be used to augment the network map that is used by the CDNSP for subsequent request routing determinations.

Shaw switches to a better source “on the fly” if there is a need to maintain or enhance the quality of service.

# Switching to a non-thinned source improves quality of content

## Myler Declaration:

the actual switch from one server to another.”). As described for the Determining Limitations [1c] and [6c], Shaw teaches that one reason to switch to a different server is that the currently obtained stream is being “thinned” and therefore provides unacceptable quality. Ex. 1005, 9:24-27. Because thinning is a technique for handling a drop in communication bandwidth, a POSITA would have found it obvious to switch to a different source for the stream if there is a higher bandwidth connection between the client and alternate source because it would avoid the need for thinning the stream and therefore provide the stream at a higher quality level. *See, id.*, 1:37-40 and 1:47-58 (describing well-known practice of encoding streams at multiple bits so that higher quality streams can be provided to users with faster connections and lower quality streams can be provided to users with slower connections). Thus, a POSITA would have found it obvious from this teaching in Shaw that switching to a better source provides a higher quality level than the current quality level. *See also* Ex. 1005, Abs. (“If a better source exists, the player performs a switch to the better stream...if appropriate to maintain and/or enhance the quality of service.”), 3:64-66.



Dated: March 16, 2022

Respectfully submitted,

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**CERTIFICATE OF SERVICE**

The undersigned hereby certifies that on March 16, 2022, complete copies of the foregoing document were served via email to all parties to this proceeding at the addresses indicated:

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