

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

BEFORE THE PATENT TRIAL AND APPEAL BOARD

ADVANCED MICRO DEVICES, INC. AND PENSANDO SYSTEMS, INC.,

Petitioners,

v.

CONCURRENT VENTURES, LLC AND XTREAMEDGE, INC.,

Patent Owners.

IPR2025-00479

U.S. Patent No. 10,944,634

PETITION FOR *INTER PARTES* REVIEW

OF U.S. PATENT NO. 10,944,634

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EXHIBIT LIST

Exhibit No.	Description
1001	U.S. Patent No. 10,944,634 to Beeson et al. (the '634 patent)
1002	Prosecution History for the '634 patent
1003	Declaration of Mark E. Crovella
1004	U.S. Patent No. 7,742,499 ("Erskine")
1005	U.S. Patent No. 8,000,276 ("Scherzer")
1006	U.S. Patent No. 9,661,553 ("Gillett")
1007	Excerpts from Patent Owner's Infringement Contentions for the '634 Patent
1008	U.S. Patent No. 9,693,276 ("Wuellner")
1009	Computer Networking – A Top-Down Approach, Kurose, Ross (2017)
1010	U.S. Patent No. 8,554,970 ("Suumäki")
1011	U.S. Patent No. 8,977,265 ("Lee")
1012	U.S. Patent No. 9,775,182 ("Gupta")

I. OVERVIEW OF THE TECHNOLOGY

Since the 1990s, client-server architecture has become a widely adopted model in networking and telecommunications. By 2018, this architecture was ubiquitous and well-established. It was the backbone of countless systems, from cloud computing and mobile applications to video streaming and enterprise networks. Ex-1003, ¶3.

Similarly, by 2018, establishing network connections based on information regarding past connections was explored in the field, including in mobile networks, Wi-Fi systems, and Voice over IP (VoIP) services. For example, in VoIP systems, leveraging information from prior calls was a known way to enhance call routing and quality, and initiating network connections based on information from past connections was also known. *See infra* §V.A; Ex-1003, ¶4.

II. THE '634 PATENT

The '634 patent relates to “[a] method for network connection optimization.” Ex-1001, Abstract. The method includes “collecting, at a first endpoint device ... parameter values for determination of effective bandwidth of network connections to further endpoint devices” and “determining that a next network connection from the first endpoint device to a second endpoint device matches a past network connection or a geographical area or a network topology area of the past network connection.” *Id*; Ex-1003, ¶5.

The '634 patent does not purport to invent network communication or the networking frames and protocols that it references, which it admits was preexisting. Ex-1001, Abstract, 1:6-29. Nor does the patent purport to invent generic network components such as tuning servers (also described as tuner servers). *See generally* '634 patent; Ex-1003, ¶6.

The purportedly inventive concept of the '634 patent is determining that a next network connection matches a geographical area of a past network connection. Ex-1001, Abstract. By doing so, the '634 patent claims to reduce time delays in setting up network connections and “increase communication efficiency.” Ex-1001, 1:6-29. However, this idea was known and applied in the field well before the '634 patent. *Supra* §I; Ex-1003, ¶7.

A. Prosecution History

The '634 patent was allowed after two Office Actions. Ex-1002, 000067-81, 000106-127. In response to the second Office Action, the Applicant did not dispute the Examiner's finding that the prior art at issue (Cole) discloses determining that a next network connection matches a geographical area of a past network connection. Ex-1002, 000107-113, 000146-150; Ex-1003, ¶8.

B. Priority Date

Petitioners demonstrate invalidity as of July 15, 2018. Ex-1003, ¶9.

III. FIELD AND LEVEL OF ORDINARY SKILL

The field of the patent is networking and telecommunications. That is the focus of claims and specification and is how the patent describes its field and related art. Ex-1001, 1:33-56, Abstract; Ex-1003, ¶11.

A POSITA would have a bachelor's degree in electrical engineering, computer science, computer engineering, or a similar major with at least two years of experience in the field; or a master's degree with specialization in the field. A person with less education but more relevant practical experience may also meet this standard. Ex-1003, ¶¶12-13.

A POSITA with this background would have had the knowledge and skills to:

- Designing and using systems that include endpoint devices (e.g., client devices) and servers for establishing network connections and data transfer;
- Recognizing and applying the client-server architecture; and
- Using and applying concepts from known telecommunication and networking frameworks, protocols and standards, including TCP/IP, IEEE 802.11, VoIP, cellular systems and other known frameworks and standards.

Ex-1003, ¶14.

IV. CLAIM CONSTRUCTION

A. “geographical area”

In the parallel district court case, Petitioners requested claim construction for the term “geographical area” and proposed a construction of “a physical place such as an apartment complex, neighborhood, city, or state,” which is supported by the intrinsic evidence and presented in view of PO’s infringement positions. However, Petitioners do not believe proposing a construction for the term is necessary in this proceeding because the relied upon teachings of the prior art references are consistent with examples of “geographical area” included in the ’634 patent specification. For example, the ’634 specification includes examples of “geographical area” such as “an apartment complex, neighborhood, or city ... or state” (Ex-1001, 2:50-3:10) and the relied upon art includes examples of “geographical area” such as “geographically distinct zone” (*e.g.*, Ex-1004, 2:59-3:10) and “geographical location [such as] home, office” (*e.g.*, Ex-1005, 10:8-31); Ex-1003, ¶17.

V. INVALIDITY

Petitioners request *inter partes* review and cancellation of the challenged claims on the following grounds:

Grounds	Claims	Statutory Basis	Prior Art ¹
1	1–20	§103	Erskine
2	1–20	§103	Scherzer
3	1–20	§103	Scherzer in view of Gillett

The Grounds render the challenged claims obvious because any differences between the claimed subject matter and the prior art are such that the subject matter, as a whole, was obvious to a POSITA. *KSR Int’l Co. v. Teleflex Inc.*, 550 U.S. 398, 406 (2007).

A. Ground 1

1. U.S. Patent No. 7,742,499 (“Erskine”)

Erskine is AIA §102(a) prior art. Erskine “relates generally to communication systems, and more particularly to an apparatus and method for adaptive bandwidth management for Voice-Over-IP (VOIP) networks.” Ex-1004, 1:6-26, 1:34-42, Fig. 1:

¹ AIA §102 applies.

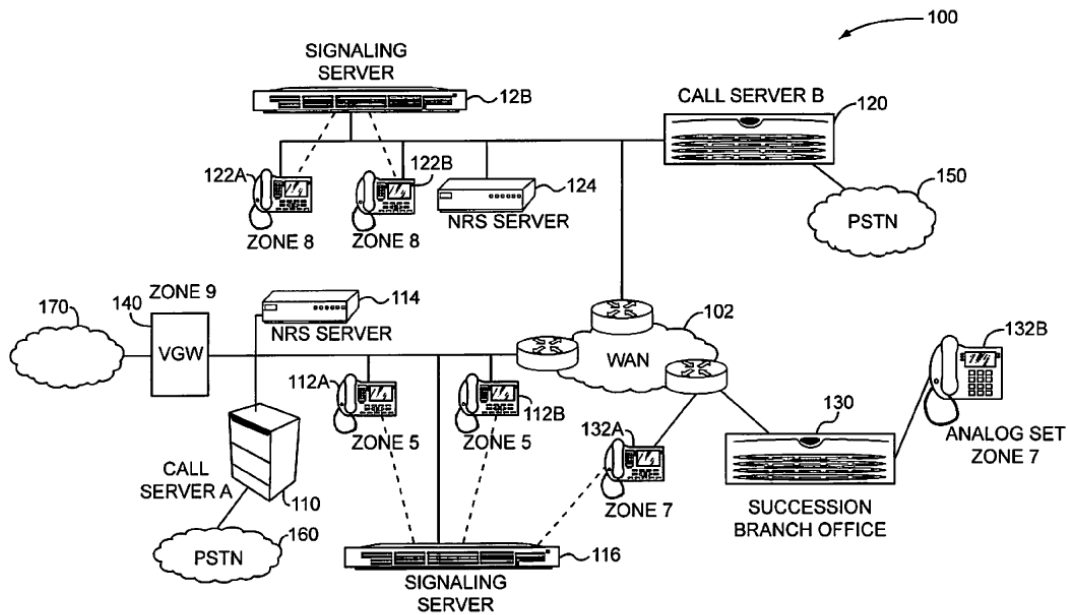


FIG. 1

Ex-1003, ¶¶22-23.

Erskine teaches a communications network system that has various communication devices, where they collect information such as QoS parameters for bandwidth determination. Ex-1004, 3:44-67, 4:51-5:13, 8:52-67, 9:37-59, 10:26-62, Fig. 1. Erskine teaches “bandwidth zone[s] [that are] generally defined as a geographically distinct zone within the network.” Ex-1004, 2:59-3:10. The connections between the communication devices are facilitated by their respective call servers. *E.g.*, Ex-1004, 4:1-20, 1:61-2:5; Ex-1003, ¶24.

Erskine is analogous art in the same field of endeavor and reasonably pertinent to the '634 patent. *See supra* §III; *e.g.*, Ex-1004, 1:6-9, 1:34-42; Ex-1003, ¶25.

2. Independent Claims 1, 8, 15

[1pre]	A method for network connection optimization, comprising:
8[pre]	A tangible, non-transitory, computer-readable media having instructions thereupon which, when executed by a processor, cause the processor to perform a method comprising:
15[pre]	A network connected device, comprising: one or more processors, coupled to a network port and configurable to:

Erskine teaches [1pre].² For example, Erskine teaches “*a method* for adaptive bandwidth management for Voice-Over-IP (VOIP) networks.”³ Ex-1004, 1:6-9, 1:13-26, 1:34-42, 2:22-24, Figs. 1, 3. Erskine uses “[a]daptive bandwidth management based upon quality of serv[ice] (QoS)” to improve and optimize network connection. Ex-1004, Abstract; Ex-1003, ¶¶26-27.

Erskine teaches [8pre]. For example, Erskine teaches that “*a computer program* performing one or more of [its] methods is embodied on *a computer readable medium and operable to be executed by a processor*.” Ex-1004, 1:57-60, 11:16-27; Ex-1003, ¶28.

Erskine teaches [15pre]. Erskine utilizes **a network connected device** (e.g., call server) to facilitate communications over the network. Ex-1004, 4:1-20, 2:35-

² Throughout this petition, Petitioners use “teach” to encompass “teach or suggest,” consistent with the obviousness analysis set forth in *KSR*.

³ All annotations/emphasis added unless otherwise noted.

3:29, 3:37-43. Erskine's call server **comprises one or more processors**. Ex-1004, 1:61-2:5, 3:11-29; Ex-1003, ¶29.

The call server is **coupled to a network port**, through which it connects and communicates with other devices over the network. *E.g.*, Ex-1004, 1:61-2:5 (“[T]here is provided a call server having a network interface.”), 2:35-58, 4:1-20, Fig. 1. To the extent PO argues that Erskine does not explicitly disclose this, a POSITA would have found it obvious because since the 1980s, network ports have been critical and commonly used components in communications networks, allowing servers and other networked devices to establish connections for data transmission and communication. *See* Ex-1004, 4:1-20; Ex-1003, ¶30.

Erskine further teaches that the call server is **configured to perform** operations recited in claims 1, 8, and 15. *Infra* §§V.A.2[1a-c]/[8a-c]/[15a-c]. Erskine therefore teaches the preambles. Ex-1003, ¶31.

[1a]/[8a]/[15a] collect[ing], at a first endpoint device coupled to [a]/[the] network, parameter values for determination of bandwidth of network connections to further endpoint devices;
--

Erskine teaches limitations [1a]/[8a]/[15a]. Erskine teaches **a first endpoint device** (e.g., communication device) that is part of its communications network system. Ex-1004, 3:44-4:20 (“The communication devices 112, 122, 132 are coupled to the respective call server 110, 120 (or branch office 130) and are thus

coupled to the network 102. Similarly, one or more communication devices[] are coupled to the voice gateway 140 via the network 170.”), 3:11-29, Fig. 1:

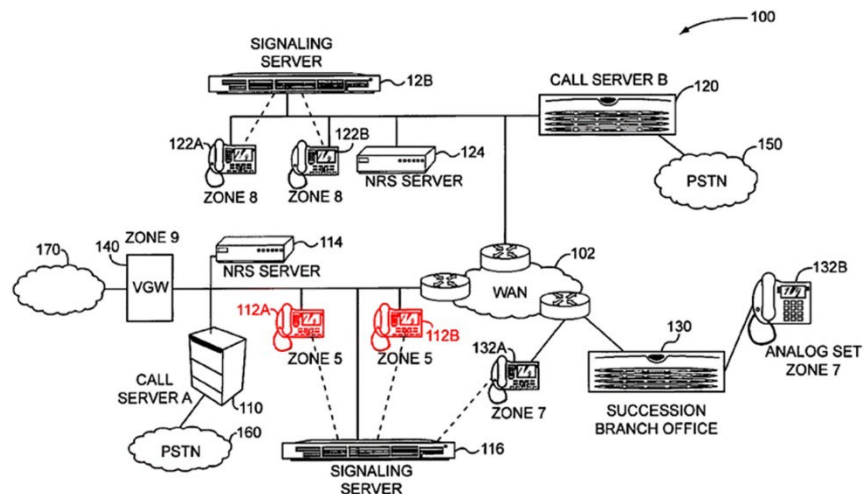


FIG. 1

Ex-1003, ¶32.

Erskine’s communication devices are endpoint devices that “represent devices utilized by users or subscribers during communication sessions over the network,” including, for example, “telephones, videophones, computers, personal digital assistants, and the like.” Ex-1004, 3:44-67. The communication devices are **coupled to a network** via the call servers. *E.g.*, Ex-1004, 4:1-20 (“The communication devices 112, 122, 132 are ... coupled to the network 102.”), 2:35-58; Ex-1003, ¶33.

Erskine further teaches that the first endpoint device (e.g., a communication device) is connected to **further endpoint devices** (e.g., other communications devices) over the network. *E.g.*, Ex-1004, 3:44-67 (“During a communication

session[], the communication devices 112, 122, 132 communicate with each other[.]”), 9:37-59, 10:26-62, Fig. 1:

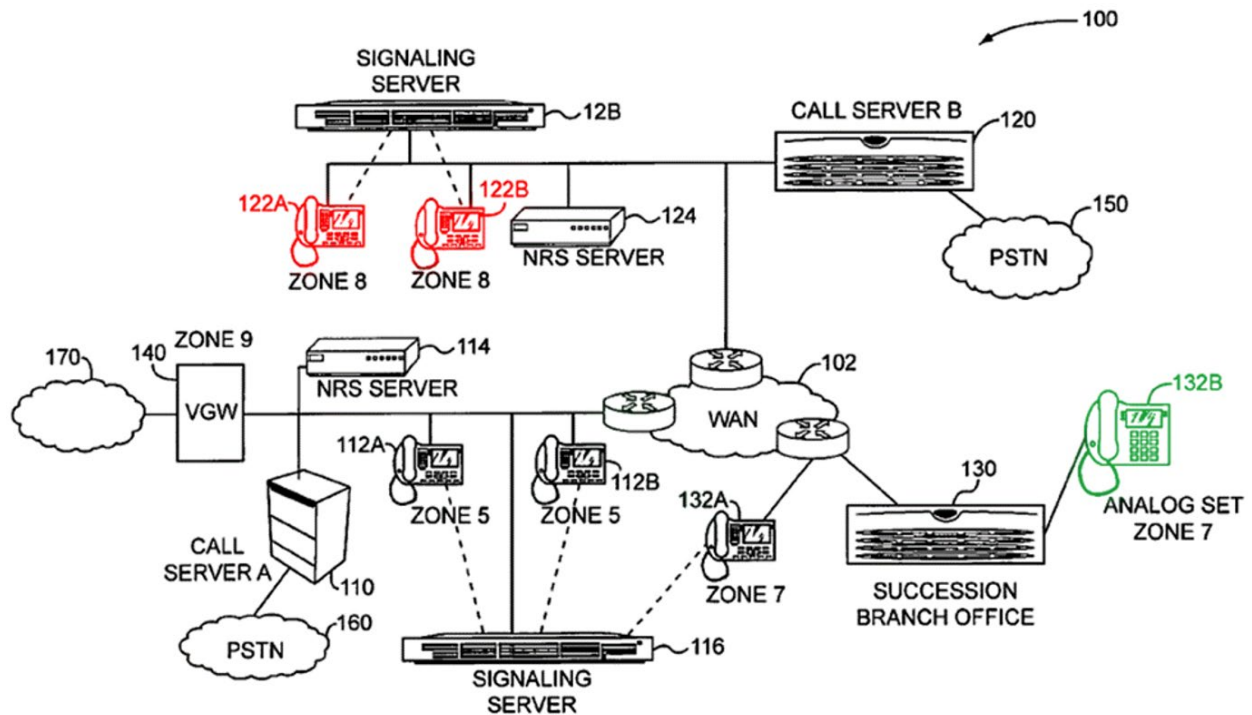


FIG. 1

Ex-1003, ¶34.

Erskine teaches that the connections between the communication devices are facilitated by their respective call servers. *E.g.*, Ex-1004, 4:1-20 (“The call servers 110, 120 ... facilitate communication by and/or between the communication devices 112, 122, 132[.]”), 1:61-2:5; Ex-1003, ¶35.

Erskine’s teachings regarding the communication devices fall within the scope of “endpoint devices” recited by the ’634 patent, which describes the term broadly. *E.g.*, Ex-1001, 2:50-3:25, Figs. 1, 3; Ex-1003, ¶36.

Erskine further teaches **collecting at a first endpoint device** (e.g., a communication device) **parameter values** (e.g., QoS parameters) **for determination of bandwidth of network connections to further endpoint devices** (e.g., other communication devices). Erskine teaches collecting **parameter values** such as QoS parameters (e.g., “packet loss, latency, jitter and R factor”)⁴ at a first endpoint device (e.g., communication device), by generating, monitoring, detecting, and calculating the parameters. Ex-1004, 4:51-64 (*“The communications devices 112, 122, 132 (including VGWs) monitor, detect and/or calculate one or more various QoS parameters at the device, including packet loss, latency, jitter and R factor.”*), 4:65-5:13 (*“[T]he QoS information includes QoS alarms generated by the communications devices (and possibly VGWs) and transmitted to the appropriate signaling server and passed to the corresponding call server.”*), 8:52-67; Ex-1003, ¶37.

⁴ PO’s Infringement Contentions confirm that Erskine’s teachings regarding the QoS parameters satisfy the recited “parameter values,” where PO alleged that “parameters like bytes and packet exchange, delays, jitter, and bandwidth” satisfy the term. Ex-1007, 000003.

Erskine's QoS parameters are **for determination of bandwidth of network connections** between the communication devices. As an initial matter, Erskine discloses communications between communication devices coupled to different zones (also described as "network bandwidth zones"), where a zone represents a "geographically distinct zone within the network." Ex-1004, 2:59-3:10 ("[T]he system 100 may be divided into network bandwidth zones. A bandwidth zone is generally defined as a geographically distinct zone within the network 102. ... [V]arious communications devices are coupled or assigned to, or lie within, the respective network bandwidth zone."), 4:21-40; Ex-1003, ¶38.

For example, as illustrated in Figure 1, communication devices 112a and 112b are coupled with Zone 5, and communicate with communication devices 122a and 122b coupled with Zone 8 by calling 122a and 122b. Ex-1004, 9:37-59 ("[C]all setup (and/or call processing) for a new call from the communication device 112a (in Zone 5) to the communication device 122b (in Zone 8) will now be generally described (peer to peer). ... [T]he communication devices 112a and 122b are IP phones. The communication device 112a originates the call."), Fig. 1:

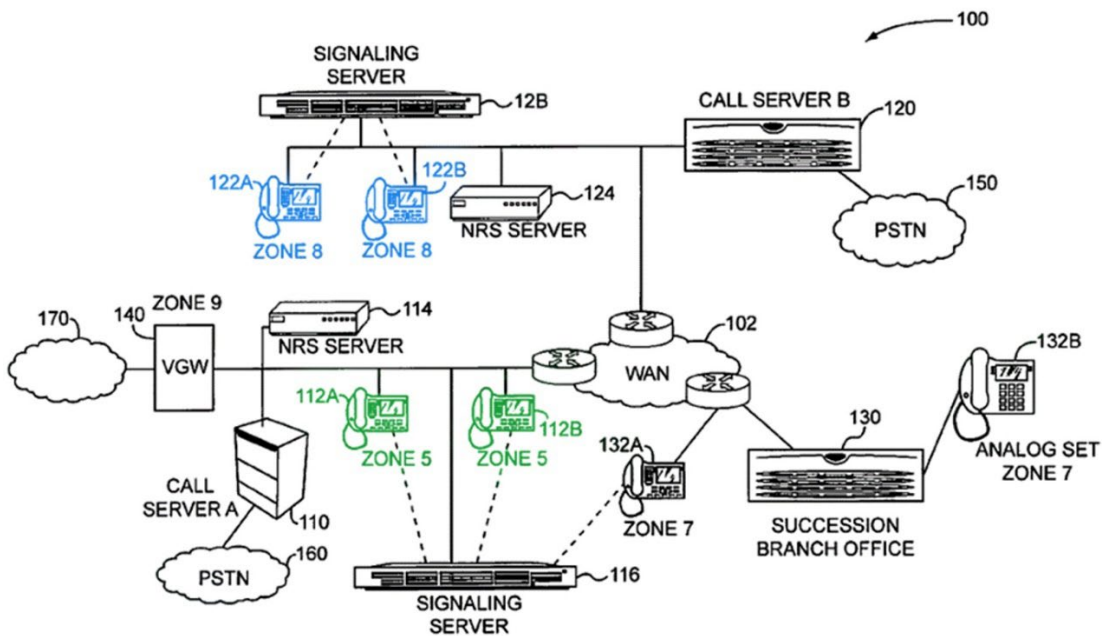


FIG. 1

Ex-1003, ¶39.

Erskine teaches that the QoS parameters are for determination of bandwidth of connections between the communication devices across various zones. Erskine is directed to adaptive bandwidth management for packet-based communications networks such as VoIP networks. Ex-1004, 1:6-9, 1:34-42. Erskine teaches that “[e]ach link between two respective zones has an initial maximum interzone bandwidth that is used as a baseline to calculate a dynamic bandwidth limit between the two bandwidth zones.” Ex-1004, 4:30-40. The initial maximum interzone bandwidth may be reduced to a lower value (e.g., a fraction of the initial value) due to a degrading QoS. *E.g.*, Ex-1004, 4:30-50 (“If the QoS between the two bandwidth zones is degrading, then the maximum interzone bandwidth

between those two zones is reduced as a percentage of the initial value (or prior maximum interzone bandwidth value).”), 8:21-27, Abstract; Ex-1003, ¶40.

Erskine refers to this lower value as a “sliding maximum interzone bandwidth,” and uses it to determine whether new calls between two zones can be initiated or not. Ex-1004, 4:30-40 (“This new value is used as the new maximum interzone bandwidth, may be referred to as a ‘sliding maximum’ interzone bandwidth, and is used for purposes of allowing/disallowing or redirecting any new calls between the two zones.”), 1:43-60. For example, when a communication device in a zone requests for calls to another communication device in another zone, Erskine “determines whether the bandwidth necessary for the new call added to the current bandwidth would exceed the sliding maximum interzone bandwidth for that link.” Ex-1004, 6:55-7:3, 8:36-51, 9:51-59. If the sum of the bandwidth necessary for the new call and the current bandwidth is within the sliding maximum interzone bandwidth for that link, the call proceeds; otherwise, the call is blocked or alternative routing is initiated. Ex-1004, 8:36-51, 6:55-7:3, 9:51-59; Ex-1003, ¶41.

Erskine therefore relies on the sliding maximum interzone bandwidth to determine that only calls of a bandwidth that fit within the sliding maximum interzone bandwidth can be initiated for that link. For example, in the scenario where the sum of the bandwidth necessary for the new call and the current

bandwidth is within the sliding maximum interzone bandwidth for that link, the sliding maximum interzone bandwidth is used to determine that the call can be initiated with a specific bandwidth (e.g., bandwidth necessary for the new call). Erskine thus teaches that the sliding maximum interzone bandwidth is used for determination of bandwidth of network connections from a communication device to other communication devices. Ex-1003, ¶42.

Erskine teaches that the sliding maximum interzone bandwidth is determined, configured, and adjusted based on the QoS parameters. Ex-1004, 4:41-50 (“Various QoS parameters may be used in configuring the sliding maximum interzone bandwidth,[.]”), 4:51-64 (“The QoS information is then used to adjust the then current sliding maximum interzone bandwidth based upon the QoS information, as appropriate.”), 4:65-5:13, 5:38-6:54; Ex-1003, ¶43.

As an example, Erskine determines the sliding maximum interzone bandwidth using the QoS factor, which is calculated based on the QoS parameters. Ex-1004, 4:65-5:13 (“The QoS factor may be based upon the actual received QoS information, and perhaps other parameters. ... The QoS factor is then used to calculate (or recalculate) the sliding maximum interzone bandwidth[.]”), 5:14-6:54, 4:41-64. Erskine thus teaches that the parameter values (e.g., QoS parameters)—based on which the sliding maximum interzone bandwidth are determined, configured, and adjusted—are used for determination of bandwidth of network

connections to further endpoint devices (e.g., communication devices in other zones). Ex-1003, ¶44. Erskine thus teaches [1a]/[8a]/[15a]. Ex-1003, ¶45.

[1b]/[8b] determining at a tuner server,

[15b] determine at the network connected device acting as a tuner server, distinct from the first endpoint device and the further endpoint devices, that a next network connection from the first endpoint device to a second endpoint device matches a geographical area of a past network connection; and

Erskine teaches limitations [1b]/[8b]/[15b]. First, Erskine teaches a **tuner server** (e.g., call server). Erskine teaches a call server that facilitates communications between communication devices across various zones. *Supra* §§V.A.2[1pre-a]/[8pre-a]/[15pre-a]; Ex-1004, 4:1-20, 2:35-3:29, 3:37-43, Fig. 1:

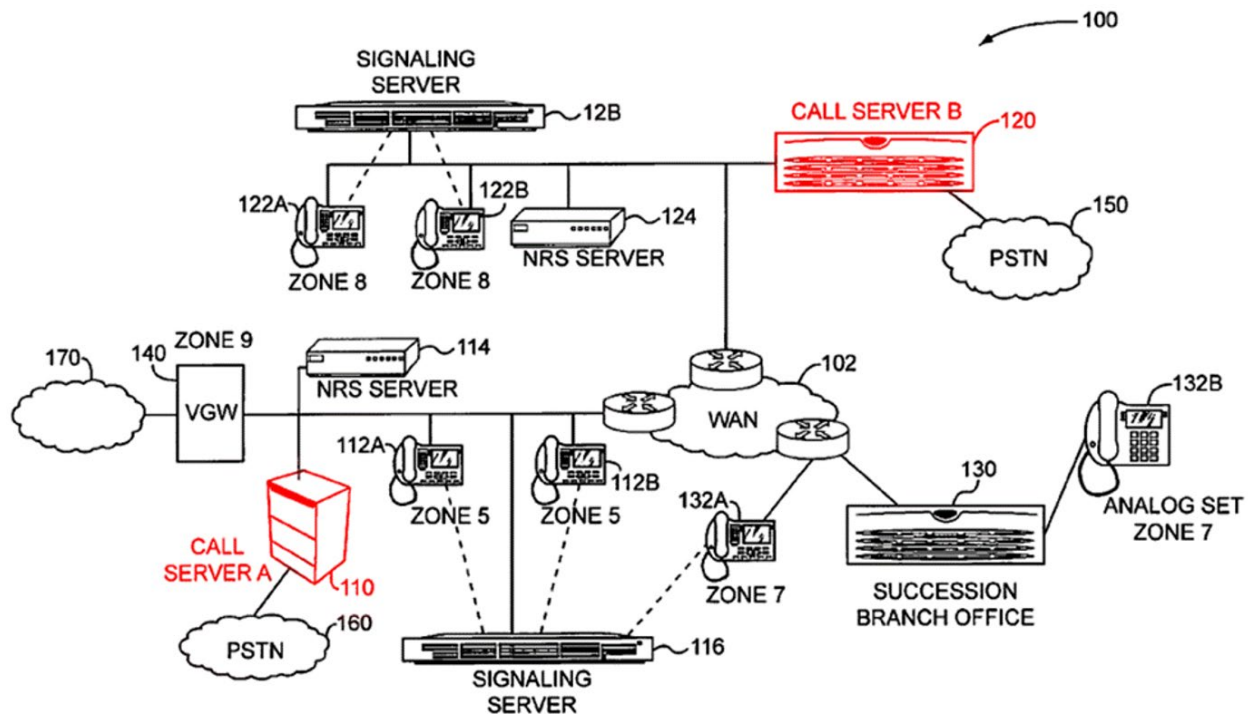


FIG. 1

Erskine's call server is a network connected device. *Supra* §V.A.2[1pre]/[8pre]/[15pre]; Ex-1004, 4:1-20, 2:35-3:29, 3:37-43. Moreover, as explained below, the call server employs adaptive bandwidth management to optimize QoS performance and improve network congestion, maintains and incorporates knowledge of the network topology, and handles routing/rerouting of interzone calls. *Infra* §V.A.8. The '634 patent specification, which describes the tuner/tuning server and its functionalities broadly, confirms that Erskine's teachings regarding the call server fall within the recited "tuner server." *See, e.g.*, Ex-1001, 4:51-5:15, 6:10-38. The call server thus is **a network connected device acting as a tuner server.**⁵ Ex-1003, ¶¶46-47.

Erskine's call servers and communication devices are distinct, separate components that perform their respective roles in the network. *E.g.*, Ex-1004, 3:11-29, 3:44-4:20, Fig. 1. The call server is thus **distinct from the first endpoint device** (e.g., communication device) **and the further endpoint devices** (e.g., communication devices in other zones). Ex-1003, ¶48.

Erskine **determines at the call server that a next network connection from the first endpoint device** (e.g., communication device in a zone) **to a second**

⁵ The '634 patent specification uses the term "tuner server" and "tuning server" interchangeably. *E.g.*, Ex-1001, 2:13-18, 2:50-3:10, 4:35-5:16, 5:65-6:22, Figs. 3, 5.

endpoint device (e.g., communication device in another zone) **matches a geographical area of a past network connection**. Erskine teaches that the corresponding call server (e.g., source call server) for the communication device that initiates a call to a communication device in another zone has “knowledge of both the source zone and the destination zone.” Ex-1004, 6:55-7:3. In the process of establishing a call between the communication devices, the call server (e.g., source call server) consults a QoS data structure to determine if the call can be accommodated. *E.g.*, Ex-1004, 6:55-7:10 (“With knowledge of both the source zone and the destination zone, the source call server consults a QoS data structure ... to determine if an additional call can be accommodated (or allowed) across the interzone link.”), 7:64-8:51, 9:37-10:2, Fig. 2:

SOURCE		DESTINATION		QoS FACTOR	CONFIGURED INTERZONE B/W	SLIDING MAXIMUM B/W	ACTUAL INSTANTANEOUS B/W USED	AVERAGE CALLS/HOUR
ZONE	VPNI	ZONE	VPNI		Kbps	Kbps	Kbps	CALLS/HR
5	33	8	34	100	1000	1000	384	4110
5	33	4	33	100	1000	1000	750	6954
5	33	3	38	45	1000	450	128	1500
5	33	7	44	100	1000	1000	128	1201
5	33	9**	59	100	1000	1000	600	7123
7	44	8	34	100	256	256	109	189
7	44	4	33	100	256	256	0	45
7	44	3	38	55	256	141	128	75
7	44	5	33	100	256	256	128	1201
7	44	9**	59	100	256	256	128	120

FIG. 2

Ex-1003, ¶49.

In this process, as illustrated in the first row of the table in Figure 2, the call server consults the QoS data structure and determines that a next network connection (e.g., a call) from a communication device (e.g., 112a in Zone 5) to another communication device (e.g., 122a in Zone 8) is to be initiated and established over the link between Zone-5 and Zone-8. Ex-1004, 9:37-10:2 (“[C]all setup (and/or call processing) for a new call from the communication device 112a (in Zone 5) to the communication device 122b (in Zone 8) will now be generally described (peer to peer). ... [T]he communication devices 112a and 122b are IP phones. The communication device 112a originates the call. The source call server 110 determines the destination of the call[.]”), 6:55-7:25, 7:64-8:51, Fig. 2, Fig. 1:

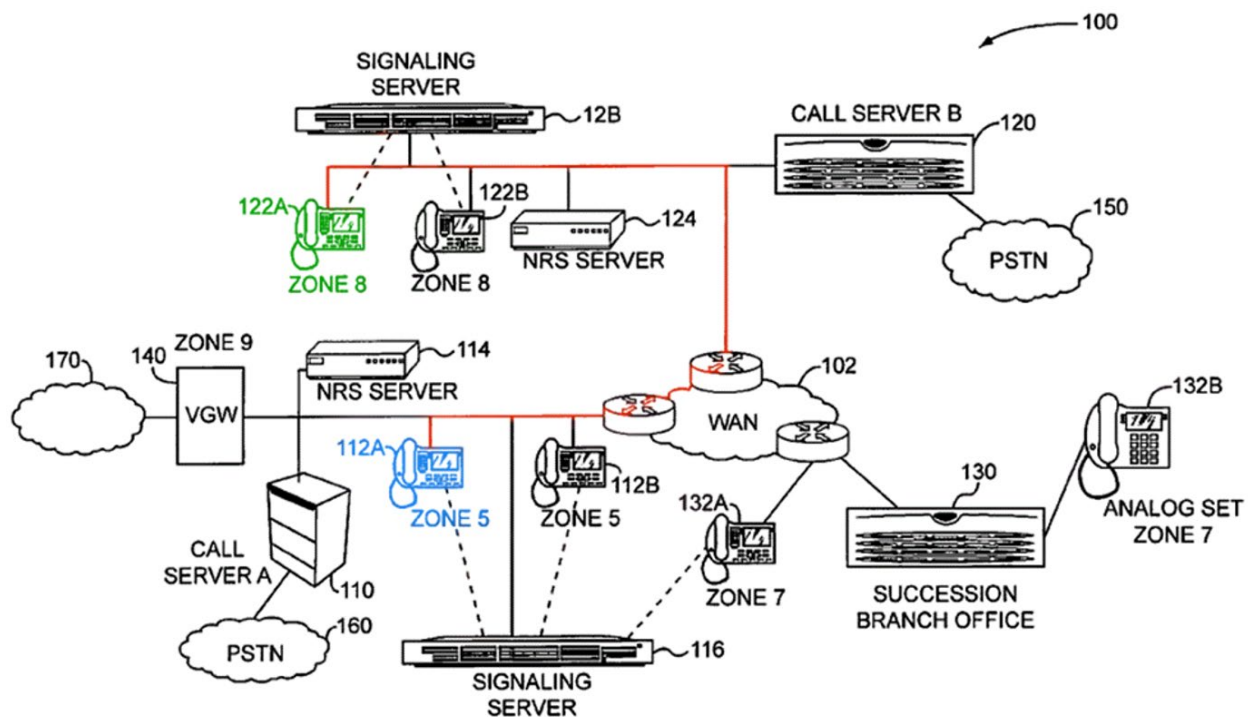


FIG. 1

Ex-1003, ¶50.

Here, the call established over the link between Zone-5 and Zone-8 represents a **past network connection**. The call server “maintains its own QoS data structure table for all the interzone links from its own zone[.]” Ex-1004, 7:11-25, 7:64-8:10, Fig. 2. This includes at least interzone links over which calls have been established in the past. For example, the table in Figure 2 contains information such as “average calls per hour,” which a POSITA would have understood to be based on past network connections (e.g., past calls). Ex-1004, 4:65-5:14, 5:65-67, 6:21-34, 8:11-20, Fig. 2. Erskine therefore teaches that, in the

scenario where a link between two zones (e.g., link between Zone-5 and Zone-8) has been used to establish a past network connection (e.g., a past call), the call over the link represents a past network connection. Ex-1003, ¶51.

In addition, a POSITA would have found it obvious for the table in Figure 2 to include links over which calls have been established before. This is because it was well-known that call servers facilitating communications between devices typically kept records of past connections for purposes such as network management and optimization. Indeed, Erskine explains that the table in Figure 2 “may be referred to as a network bandwidth zone management table” and Erskine teaches using the table to further its method of adaptive network bandwidth management, which entails adapting past bandwidth allocations. *E.g.*, Ex-1004, Abstract, 7:11-25, 7:64-8:10; Ex-1003, ¶52.

Erskine teaches that Zone-5 and Zone-8 each represents a “geographically distinct zone.” Ex-1004, 2:59-3:10 (“A bandwidth zone is generally defined as a geographically distinct zone within the network 102.”), Abstract, 2:59-3:10. A call over the link between two zones (e.g., Zone-5 and Zone-8) thus teaches a geographical area of a past network connection. Ex-1003, ¶53.

By consulting the QoS data structure table and determining that a next call is to be initiated over the link between two zones that matches a link identified in the table (e.g., Zone-5 and Zone-8), the call server determines that the next call

matches a geographical area of a past network connection. The '634 patent specification confirms that Erskine's teachings satisfy the limitation by broadly describing the process of "matching." *E.g.*, Ex-1001, 4:13-17 ("The processor 204 could compare the next network connection 210 to previous network connections 210, 212, 214, *for example by examining the parameters 208 in memory 206, and find that the next network connection 210 matches a previous network connection 210.*"), 5:34-37; Ex-1003, ¶54.

In short, Erskine teaches determining at a tuner server (e.g., call server) that a next network connection (e.g., a call) from the first endpoint device (e.g., 112a in Zone 5) to a second endpoint device (e.g., 122a in Zone 8) matches a geographical area of a past network connection (e.g., a call over the link between Zone-5 and Zone-8). Ex-1003, ¶55. Erskine thus teaches [1b]/[8b]/[15b]. Ex-1003, ¶56.

[1c]/[8c]/[15c] initiat[ing] the next network connection, from the first endpoint device to the second endpoint device, based on the determination at [the tuner server]/[the network connected device acting as the tuner server], with a transmission bandwidth based on the parameter values for the past network connection.
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Erskine teaches limitations [1c]/[8c]/[15c]. First, Erskine teaches **initiating the next network connection from the first endpoint device to the second endpoint device** by initiating a call from a communication device to a communication device in another zone when the bandwidth of the call fits within

the sliding maximum interzone bandwidth. *Supra* §V.A.2[1a]/[8a]/[15a]; Ex-1004, 3:44-67, 6:55-7:3, 8:36-51, 9:51-59; Ex-1003, ¶57.

Erskine further teaches initiating the call **based on the determination at the tuner server** (e.g., call server) ([1c], [8c]). As explained above, Erskine teaches that in the process of initiating a call, the call server determines that the call matches a geographical area of a past network connection (e.g., a call over the link between Zone-5 and Zone-8) and determines that the call can proceed if the bandwidth necessary for the call added to the current bandwidth is within the sliding maximum interzone bandwidth for that link. *Supra* §V.A.2[1b]/[8b]/[15b]. Erskine thus teaches [1c]/[8c]. Erskine also teaches **a network connected device acting as tuner server**. *Supra* §V.A.2[1b]/[8b]/[15b]. Erskine thus teaches initiating the call based on the **determination at the network connected device acting as the tuner server** ([15c]). Ex-1003, ¶58.

Furthermore, Erskine teaches initiating the call **with a transmission bandwidth based on the parameter values for the past network connection**. Erskine determines that a call is to be initiated if the bandwidth necessary for the call added to the current bandwidth is within the sliding maximum interzone bandwidth for that link. *Supra* §V.A.2[1a]/[8a]/[15a]. In this way, the call proceeds with a bandwidth determined based on the sliding maximum interzone bandwidth for that link. Moreover, the sliding maximum interzone bandwidth is determined

based on the QoS parameters. *Supra* §V.A.2[1a]/[8a]/[15a]; Ex-1004, 4:41-5:13, 5:38-6:54. Erskine therefore teaches initiating a call with a bandwidth determined based on the QoS parameters. Ex-1003, ¶59.

Erskine further teaches that the QoS parameters are for the past network connection. As explained above, Erskine teaches a past network connection (e.g., call over the link between Zone 5-and Zone-8). *Supra* §V.A.2[1b]/[8b]/[15b]. As shown in the table in Figure 2, the link between Zone-5 and Zone-8 pertains to QoS parameters for the link, such as the QoS parameters that are used to determine the QoS factor of the link. Ex-1004, 4:41-5:13 (“An algorithm may be used to calculate a QoS factor which defines the relative quality being experienced on the link between the two network bandwidth zones. The QoS factor may be based upon the actual received QoS information, and perhaps other parameters.”), 5:38-6:54, Fig. 2:

SOURCE		DESTINATION		QoS FACTOR	CONFIGURED INTERZONE B/W	SLIDING MAXIMUM B/W	ACTUAL INSTANTANEOUS B/W USED	AVERAGE CALLS/HOUR
ZONE	VPNI	ZONE	VPNI		Kbps	Kbps	Kbps	CALLS/HR
5	33	8	34	100	1000	1000	384	4110
5	33	4	33	100	1000	1000	750	6954
5	33	3	38	45	1000	450	128	1500
5	33	7	44	100	1000	1000	128	1201
5	33	9**	59	100	1000	1000	600	7123
7	44	8	34	100	256	256	109	189
7	44	4	33	100	256	256	0	45
7	44	3	38	55	256	141	128	75
7	44	5	33	100	256	256	128	1201
7	44	9**	59	100	256	256	128	120

FIG. 2

Ex-1003, ¶60.

Because the QoS parameters are for the past network connection, Erskine thus teaches initiating the next network connection (e.g., a call), from the first endpoint device (e.g., communication device) to the second endpoint device (e.g., communication device in another zone), based on the determination at the tuner server/the network connected device acting as the tuner server (e.g., call server), with a transmission bandwidth based on the parameter values (e.g., QoS parameters) for the past network connection (e.g., call over the link between Zone-5 and Zone-8). Erskine therefore teaches [1c]/[8c]/[15c]. Ex-1003, ¶61.

3. Dependent Claims 2, 9, 16⁶

[2a]/[9a] The method of claim [1]/[8], further comprising:

[16a] The network connected device of claim 15, wherein the one or more processors are configurable to:

send[ing] the parameter values for determination of bandwidth[,] from the first endpoint device, to the tuner server that is configured to receive further parameter values for determination of bandwidth of network connections from a plurality of endpoint devices;

Erskine teaches claims 2/9/16. Ex-1003, ¶62.

Erskine teaches parameter values (e.g., QoS parameters) for determination of bandwidth. *Supra* §V.A.2[1a]/[8a]/[15a]. Erskine further teaches **sending the parameters values** (e.g., QoS parameters) **from the first endpoint device** (e.g., communication device in a zone) **to the tuner server** (e.g., call server). *E.g.*, Ex-1004, 4:51-5:13 (“The QoS parameters and information, in one or more formats, is transmitted to the call server associated with that particular communications device.”), 8:52-67; Ex-1003, ¶63.

Erskine further teaches that the call server **receives further parameter values for determination of bandwidth of network connections from a**

⁶ Petitioners contend that claim 16 is indefinite in the preliminary proposed claim constructions in the parallel district court litigation. To the extent the claim is deemed not to be indefinite, this petition explains how Grounds 1–3 render the claim obvious.

plurality of endpoint devices. As explained above, Erskine teaches the QoS parameters received from the communication device are used by the call server for determination of bandwidth of connections between communication devices across various zones. *Supra* §V.A.2[1a]/[8a]/[15a]. Erskine teaches that a call server may be coupled to and associated with a plurality of communication devices. Ex-1004, 3:11-29 (“The call server 110 has coupled thereto communication devices 112a, 112b, ... the call server 120 has coupled thereto communication devices 122a, 122b[.]”), 11:9-15, 4:1-20, 4:51-64, 7:11-25, 8:28-35, Fig. 1:

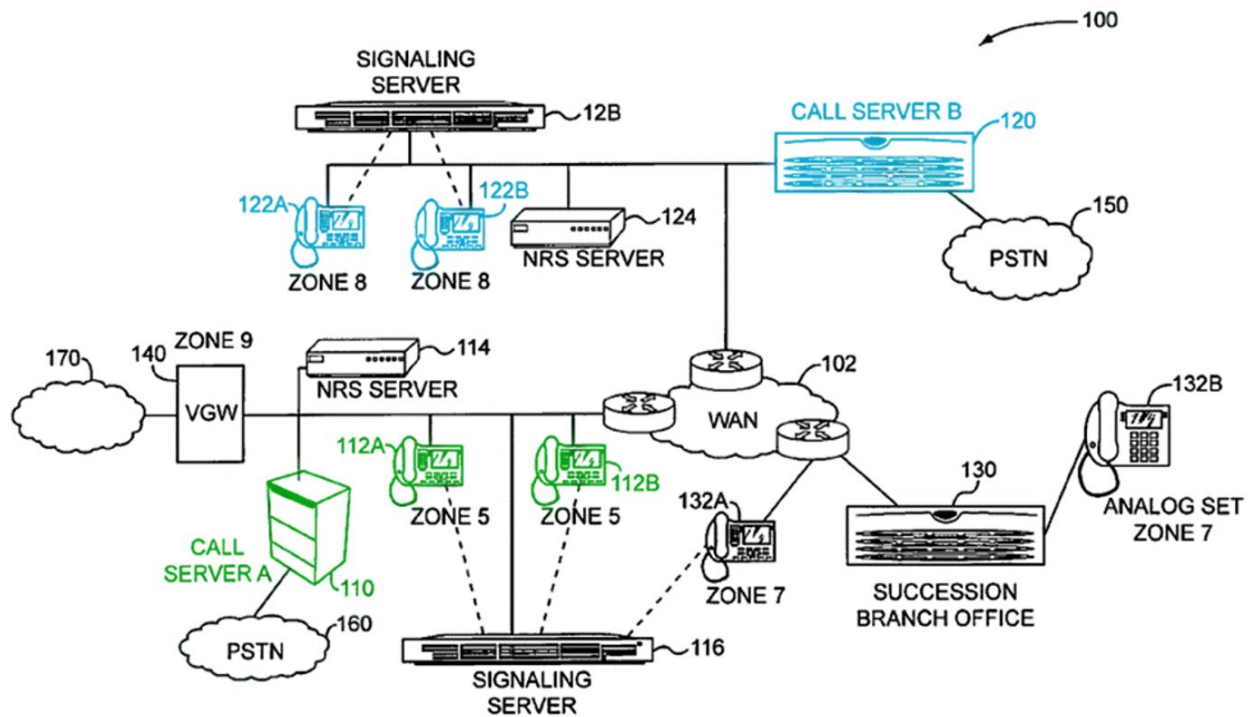


FIG. 1

Ex-1003, ¶64.

The call server facilitates communications for the plurality of communication devices coupled to it, including initiating calls to communication devices in other zones. *E.g.*, Ex-1004, 4:1-20 (“The call servers 110, 120 and branch office 130 (and VGW 140) facilitate communication by and/or between the communication devices 112, 122, 132 (and any devices coupled to the PSTN 160, 170 or the VGW 140) over the network 102.”), 7:11-25, 8:28-35; Ex-1003, ¶65.

In this process, the call server receives QoS parameters from the communication devices coupled to it. *E.g.*, Ex-1004, 4:51-5:13 (“The QoS parameters and information[] is transmitted to the call server associated with that particular communications device.”), 8:28:35, Fig. 1; Ex-1003, ¶66.

The call server receives **further parameter values** (e.g., one or more QoS parameters) from the communication devices coupled to it. As explained above, Erskine teaches various QoS parameters such as “packet loss, latency, jitter and R factor” and “[o]ther parameters providing information about the communications session and/or link may be utilized,” each of which is received by the call server.

Supra §V.A.2[1a]/[8a]/[15a]; *e.g.*, Ex-1004, 4:51-5:13, 8:52-67.⁷ The ’634 patent

⁷ PO’s Infringement Contentions confirm that Erskine’s teachings regarding the QoS parameters satisfy the recited “further parameter values,” alleging that “parameters such as bytes and packet exchange, delays, jitter and bandwidth ... are sent from the first endpoint device to the tuner server[, which] is configured to

specification confirms that Erskine's teachings satisfy the limitation. Ex-1001, 6:39-7:4. Since the QoS parameters are for determination of bandwidth of connections between communication devices (*supra* §§V.A.2[1b-c]/[8b-c]/[15b-c]), Erskine thus teaches that the call server **receives further parameter values for determination of bandwidth of network connections from a plurality of endpoint devices**. Ex-1003, ¶67.

Moreover, since Erskine teaches that the network connected device (e.g., call server) has one or more processors (*supra* §V.A.2[15pre]) that are configurable to perform the operations performed by the call server, including operations discussed above. Ex-1004, 1:61-2:5, 3:11-29, 4:1-20. Erskine therefore teaches [16a]. Erskine thus teaches [2a]/[9a]/[16a]. Ex-1003, ¶68.

[2b]/[9b]/[16b] send[ing], from the first endpoint device to the tuner server, connection information for the next network connection, wherein the tuner server performs the determining and derives one or more parameter values for the transmission bandwidth; and

Erskine teaches limitations [2b]/[9b]/[16b]. Erskine teaches **sending from the first endpoint device** (e.g., communication device) **to the tuner server** (e.g., call server), **connection information for the next network connection** (e.g., a call setup message that requests a new call). For example, Erskine teaches a

receive each of the parameters values, 'further parameter values.'" Ex-1007, 000004.

communication device sending a request for a new call to the call server. Ex-1004, 1:61-2:5 (“[T]here is provided a call server having a network interface. The network interface ... *receives a call setup message from a first communications device requesting a new call over the communications link between the first zone and the second zone.*”), 1:34-42 (“*A request for a new call is received between the two zones, and the new call is rejected in response to the received QoS information.*”), 9:15-59, 8:36-51. The call setup message and the request for a new call constitute **connection information** since they provide information about establishing a network connection between two communication devices.⁸ Ex-1003, ¶69.

Erskine further teaches that **the tuner server** (e.g., call server) **performs the determining and derives one or more parameter values** (e.g., sliding maximum interzone bandwidth) **for the transmission bandwidth**. As explained above, the call server determines that calls between communication devices are initiated with a bandwidth that fits within the sliding maximum interzone bandwidth for that link.

⁸ The ’634 patent specification confirms that Erskine’s teachings satisfies the recited “connection information” by describing the term broadly. *E.g.*, Ex-1001, 4:35-5:16 (“[T]he tuning server 302 sending bandwidth information 308 to one of the endpoints 103 in response to receiving *connection information 306 about a next network connection 304 from that endpoint 103.*”), 6:10-38.

Supra §V.A.2[1c]/[8c]/[15c]. In this process, the call server derives one or more parameter values (e.g., sliding maximum interzone bandwidth) for the transmission bandwidth. For example, the call server uses QoS parameters received from the communication devices, such as R-factor, packet loss, delay and jitter, to calculate and derive the sliding maximum interzone bandwidth, based on which the bandwidth for a new call is determined. *Supra* §V.A.2[1a]/[8a]/[15a]. Erskine therefore teaches [2b]/[9b]/[16b]. Ex-1003, ¶70.

[2c]/[9c]/[16c] receiv[ing], at the first endpoint device, from the tuner server, the one or more [parameter] values for the transmission bandwidth.

Erskine teaches limitations [2c]/[9c]/[16c].⁹ As explained above, Erskine teaches that the call server determines whether a new call between communication devices can be initiated or not. *Supra* §V.A.2. Erskine further teaches that when a new call is to proceed, the communication device receives information from the call server, confirming that the call can be initiated.¹⁰ *E.g.*, Ex-1004, 3:44-67, 6:55-7:3, 8:36-51, 9:51-59; Ex-1003, ¶71.

⁹ “[T]he one or more para values” of claim 2 of the ’634 patent appears to be a typographical error. Ex-1001, 14:26. The petition assumes that the claim recites “parameters values” instead of “para values.”

¹⁰ PO’s Infringement Contentions confirm that Erskine’s teachings satisfy the limitation. PO alleged that the limitation is satisfied where, in the process of

A POSITA would have found it obvious that the information received at the communication device from the call server includes information such as the sliding maximum interzone bandwidth because in the process of initiating a new call, the communication device would have received information pertaining to transmission bandwidth for it to initiate the call with a suitable bandwidth. For example, Erskine teaches that the communication devices may include a “camera and/or a display to capture and play video information,” and that a communication session may include a “videophone call,” and that the communication devices may exchange “audio, video, graphical, or other information during a communication session.” Ex-1004, 3:44-67. It was well-known and a POSITA would have understood that the exchange of video can occur at different rates based on the choice of encoding scheme, and it would have been obvious to a POSITA that knowledge of the sliding maximum interzone bandwidth would be needed by the communication device in order to ensure that the encoding scheme used for the video did not allow

initiating a next connection, the accused tuner server “forwards the relevant packet to initiate the next network connection from the first endpoint device (e.g., a server) to the second endpoint device (e.g., another server), ... In this process, ... the first endpoint device receives the parameter values for the transmission bandwidth.” Ex-1007, 000005-6.

the transmission to exceed the available bandwidth. Erskine therefore teaches limitations [2c]/[9c]/[16c]. Ex-1003, ¶72.

In addition, since Erskine focuses on enhancing QoS performance for network communications, a POSITA would have found receiving information such as the sliding maximum interzone bandwidth at the communication devices obvious such that the communication device would operate within specific bandwidth limits to maintain call quality. Ex-1004, Abstract (“When QoS between two zones degrades, the allowable bandwidth for new calls between the two zones is lowered to a point that assists in increasing the QoS back to an acceptable level (i.e., by blocking new calls or rerouting them).”), 1:13-30, 7:26-40 (“Real-time QoS measurements and call processing information at each end may, therefore, indicate one end has a higher/lower QoS than the other end, or the configured bandwidth at each end may be different, etc.”); Ex-1003, ¶73.

Moreover, Erskine teaches rerouting calls over an alternative link when a new call is rejected. Ex-1004, Abstract, 6:55-7:10, 8:21-9:26, Fig. 3. A POSITA would have found it obvious that the communication device would have received information pertaining to transmission bandwidth (e.g., sliding maximum interzone bandwidth) in this process, allowing it to initiate the call over an alternative link and adapt to the characteristics of the new route. *E.g.*, Ex-1004, 4:30-40, 6:55-7:10, 8:21-9:26. Erskine therefore teaches limitations [2c]/[9c]/[16c]. Ex-1003, ¶74.

4. Dependent Claims 3, 10, 17

3/10. The method of claim [1]/[8], wherein the initiating is executed by the first endpoint device.

17. The network connected device of claim 15, wherein the initiating is executed by the first endpoint device and wherein the first endpoint device is contained within the network connected device.

Erskine teaches claims 3/10/17. Ex-1003, ¶75.

First, as explained above, the call server determines whether a call can be initiated. *Supra* §§V.A.2[1a-b]/[8a-b]/[15a-b]. A POSITA would have understood that Erskine's teachings include at least two scenarios—the initiating is executed by the communication device, or by the call server. Erskine teaches that, in the scenario where **the initiating is executed by the first endpoint device** (e.g., communication device) (claims 3, 10, 17), the communication device originates the call to the communication device in another zone. *Supra* §§V.A.2[1a, c]/[8a, c]/[15a, c]; Ex-1004, 10:26-38 (“The communication device 112a originates the call.”), 3:44-67, 6:55-7:3, 8:36-51, 9:37-59; Ex-1003, ¶76.

Erskine further teaches that **the first endpoint device** (e.g., communication device) **is contained within the network connected device** (e.g., call server) (claim 17). While Erskine teaches that the call server and the communication device are distinct, separate components that perform their respective roles (*supra* §V.A.2[1b]/[8b]/[15b]), Erskine's teachings include at least two scenarios: (1) the communication device is integrated into the call server, where the two components

share the same physical housing; (2) the communication device is located as a physically independent component outside the call server.¹¹ Ex-1003, ¶77.

Indeed, Erskine teaches that the communication devices are associated with the call servers, and the phrase “associated with” includes “contain” or “be[ing] contained within.” Ex-1004, 4:51-64 (“The QoS parameters and information[] is transmitted to the call server associated with that particular communications device.”), 11:28-44 (“The phrases ‘associated with’ and ‘associated therewith,’ as well as derivatives thereof, may mean to include, be included within, interconnect with, *contain*, *be contained within*, ... or the like.”); Ex-1003, ¶78.

Moreover, a POSITA would have recognized the benefits of having the configuration in the first scenario—that the communication device is within the same housing as the call server. For example, combining both components in a single unit would have eliminated the need for separate physical installations, reducing the time and effort required for deployment. In addition, maintenance tasks would have been streamlined since both components are housed together, making them accessible at the same location. Moreover, since communication between the communication device and the call servers happens internally, such configuration may reduce delays associated with external network links and

¹¹ Erskine explains that the configuration shown in Fig. 1 is only “one exemplary configuration.” See Ex-1004, 2:28-3:10.

minimize communication latency. Erskine thus teaches claims 3/10/17. Ex-1003, ¶79.

5. Dependent Claims 4, 11, 18

4/11. The method of claim [1]/[8],
18. The network connected device of claim 15,
wherein the determining and the initiating are executed external to the first endpoint device and communicated to the first endpoint device.

Erskine teaches claims 4/11/18. Ex-1003, ¶80.

Erskine's teachings include the scenario where **the determining is executed** by the call server. *Supra* §V.A.2. Erskine further teaches the example scenario where **the initiating is executed** by the call server. *Supra* §V.A.4. For example, Erskine teaches that the call server establishes and initiates the call between communication devices by monitoring the traffic between the communication devices (*infra* §§V.A.6–7), determining that a new call can proceed when the bandwidth of the call fits within the sliding maximum interzone bandwidth, and rerouting the call if desired (*supra* §V.A.2). Ex-1003, ¶81.

Moreover, Erskine teaches that the call server is **external to the first endpoint device** (e.g., communication device). As explained above, Erskine's teachings include the scenario where the call server and the communication device are physically separate components performing their respective roles. *Supra*

§§V.A.2[1b]/[8b]/[15b], V.A.4. The call server is external to the communication device in this example scenario. Ex-1003, ¶82.

Erskine further teaches that the call server **communicates** the determining and initiating **to the first endpoint device** (e.g., communication device). A POSITA would have found this obvious because the communication device would have originated the call to a communication device in another zone only after being informed by the call server that the call may proceed. *E.g.*, Ex-1004, 8:21-51, 9:37-50. In this process, the call server would have communicated to the communication device about the determining and initiating. Erskine therefore teaches claims 4/11/18. Ex-1003, ¶83.

6. Dependent Claims 5, 12, 19

5/12. The method of claim [1]/[8], further comprising:

19. The method of claim 15, further comprising the network connected device configurable to:

monitor[ing] network traffic between the first endpoint device and the second endpoint device; and

adjust[ing] the transmission bandwidth based on the monitoring.

Erskine teaches claims 5/12/19.¹² Ex-1003, ¶84.

¹² The “method of claim 15” recited in claim 19 appears to be a typographical error. Ex-1001, 16:31. The correct term should be “network connected device of claim 15.”

Erskine teaches that the call server **monitors network traffic between the first endpoint device** (e.g., communication device) **and the second endpoint device** (e.g., communication device in another zone). As explained above, Erskine teaches that the allowable bandwidth for calls between communication devices may be affected by a degrading QoS. *Supra* §V.A.2[1a]/[8a]/[15a]; Ex-1004, Abstract, 4:30-50, 8:21-27. Erskine teaches that the call server measures and monitors the QoS performance, where the call server receives and processes real-time QoS parameters and information, and determines whether a call can proceed. *Supra* §§V.A.2[1a-c]/[8a-c]/[15a-c]; e.g., Ex-1004, 8:53-67 (“The QoS information may take the form of QoS measurements made at one or more points in the interzone link ... the QoS information may be communicated directly to the call server, or to one or more other network devices (such as a signaling server) before reaching the call server. As will be appreciated, the QoS information/measurements are real-time (or substantially real-time) measurements.”), 6:55-7:10, 7:26-8:51, 9:37-10:2, Fig. 2. The call server therefore monitors network traffic between the communication devices in this process. Ex-1003, ¶85.

The call server **adjusts the transmission bandwidth based on the monitoring**. As explained above, Erskine teaches that the call server monitors the QoS performance and uses the received QoS parameters and information to

determine, configure, and adjust the sliding maximum interzone bandwidth. *Supra* §V.A.2[1a]/[8a]/[15a]; Ex-1004, 4:51-5:28, 5:38-6:54; Ex-1003, ¶86.

In this process, based on the monitoring, the call server adjusts the transmission bandwidth, including by reducing the allowable bandwidth between the communication devices in order to maintain an acceptable QoS, or, alternatively, allocating zero bandwidth for the call. Ex-1004, 5:14-28

(“Depending on the desired algorithm, the allowable bandwidth between two network bandwidth zones (for a communications link therebetween) is reduced in order to preserve or maintain an acceptable QoS between the two zones.”),

Abstract (“Adaptive bandwidth management based upon quality of server (QoS) measurement between two zones is utilized to dynamically raise or lower the maximum allowable bandwidth limit for the link between the two zones. When QoS between two zones degrades, the allowable bandwidth for new calls between the two zones is lowered to a point that assists in increasing the QoS back to an acceptable level (i.e., by blocking new calls or rerouting them).”), 4:41-64, 5:38-6:54, 9:51-59; Ex-1003, ¶87.

PO’s Infringement Contentions confirm that Erskine’s teachings satisfy this limitation, where PO alleged that the load balancing functionalities of the accused products—similar to Erskine’s disclosures regarding adjusting allowable

bandwidth for the connections—satisfy the claim. *See* Ex-1007, 000007, 000008.

Erskine therefore teaches claims 5/12/19. Ex-1003, ¶88.

7. Dependent Claims 6, 13, 20¹³

6/13. The method of claim [1]/[8], further comprising:

20. The network connected device of claim 15, further comprising the network connected device configurable to:

monitor[ing] network traffic between the first endpoint device and the second endpoint device;

transmitt[ing] data associated with the network traffic from the first endpoint to the [tuner server]/[network connected device];

determin[ing], at the [tuner server]/[network connected device], an adjustment to the transmission bandwidth is desired;

receiv[ing] data for adjusting the transmission bandwidth from the [tuner server]/[network connected device]; and

adjust[ing] the transmission bandwidth responsive to the receiving.

Erskine teaches claims 6/13/20. First, as explained above, Erskine teaches **monitoring network traffic between the first endpoint device and the second endpoint device and adjusting the transmission bandwidth.** *Supra* §V.A.6; Ex-1003, ¶89.

¹³ Petitioners contend that claim 20 is indefinite in the preliminary proposed claim constructions in the parallel district court litigation. To the extent the claim is deemed not to be indefinite, this petition explains how Grounds 1–3 render the claim obvious.

Erskine further teaches **transmitting data associated with the network traffic from the first endpoint** (e.g., the communication device) **to the tuner server/network connected device** (e.g., call server). For example, as explained above, the communication device collects QoS parameters and transmit them to the call server for determination of interzone transmission bandwidth. *Supra* §§V.A.2[1a-c]/[8a-c]/[15a-c], V.A.6. A POSITA would have recognized that the QoS parameters (e.g., packet loss, latency, jitter and R factor) are **data associated with the network traffic** because they relate to network traffic, specify the network performance criteria, and are used for network traffic management. Ex-1003, ¶90.

Erskine further teaches that, upon receiving the QoS parameters, the call server **determines that an adjustment to the transmission bandwidth is desired**. For example, as explained above, when the network's QoS performance is degrading, the call server determines that the transmission bandwidth needs to be adjusted (e.g., reduced) to maintain QoS performance and call quality. *Supra* §V.A.4; e.g., Ex-1004, Abstract, 4:41-64, 5:14-6:54, 9:51-59; Ex-1003, ¶91.

Erskine further teaches **receiving data for adjusting the transmission bandwidth** (e.g., QoS factor) **from the tuner server/network connected device** (e.g., call server) **and adjusting the transmission bandwidth responsive to the receiving**. For example, as explained above, the call server calculates and derives

the QoS factor, in response to which the transmission bandwidth is adjusted. *Supra* §V.A.2[1a]/[8a]/[15a]; *e.g.*, Ex-1004, 4:65-5:13 (“The QoS factor is then used to calculate (or recalculate) the sliding maximum interzone bandwidth[.]”), 1:34-60, 4:41-64, 5:14-6:54, 9:51-59. For reasons explained above, Erskine teaches claims 6/13/20. Ex-1003, ¶92.

8. Dependent Claims 7, 14

**7/14. The method of claim [6]/[13],
wherein the tuner server incorporates knowledge of a network topology for the determining.**

Erskine teaches claims 7/14. Ex-1003, ¶93.

As explained above, Erskine teaches that the call server employs adaptive bandwidth management to optimize QoS performance, improve network congestion, and determine bandwidth needed for interzone communications. *Supra* §V.A.2; *e.g.*, Ex-1004, Abstract, 1:34-42, 3:37-43, 4:1-20; Ex-1003, ¶94.

A POSITA would have understood that, in doing so, the call server maintains and **incorporates knowledge of the network topology**, including information regarding source/destination zones across the network and information regarding interzone bandwidth. *E.g.*, Ex-1004, 6:55-7:3 (“With knowledge of both the source zone and the destination zone, the source call server consults a QoS data structure[] to determine if an additional call can be accommodated (or allowed) across the interzone link.”), 9:60-10:2 (“[E]ach call server stores information[]

about the current interzone bandwidth usage, QoS Factors, and sliding maximum for each interzone link.”), 7:11-25 (“[E]ach call server maintains its own QoS data structure table for all the interzone links from its own zone[.]”); Ex-1003, ¶95.

In addition, Erskine teaches that the call server handles routing/rerouting of interzone calls, where it “communicate[s] with NRS servers which function to assist in the resolution of unknown addresses.” Ex-1004, 3:11-29, 6:55-7:10, 8:36-51, 9:15-50, 10:3-38, Figs. 1, 3. A POSITA would have understood and found it obvious that the call server incorporates knowledge of the network topology from its interaction with the NRS server. For example, by querying the NRS server and determining the destinations of calls, the call server would have incorporated network topology related information and used the information for call routing and handling. Ex-1003, ¶96.

The ’634 patent specification confirms that Erskine’s teachings regarding the call server satisfy the limitation. Ex-1001, 4:51-5:16 (“[T]he tuning server 302 has a higher level view of the network traffic and not only offloads the calculations but can also incorporate knowledge of the higher level view of the network topology to enhance congestion control over/among the network(s).”). Erskine therefore teaches claims 7, 14. Ex-1003, ¶97.

B. Grounds 2–3

1. U.S. Patent No. 8,000,276 (“Scherzer”)

Scherzer is AIA §102(a) prior art. Scherzer “relates to wireless services and wireless access points.” Ex-1005, 1:13-14. It teaches a client/server system that contains various clients. Ex-1005, 5:9-46, Fig. 1:

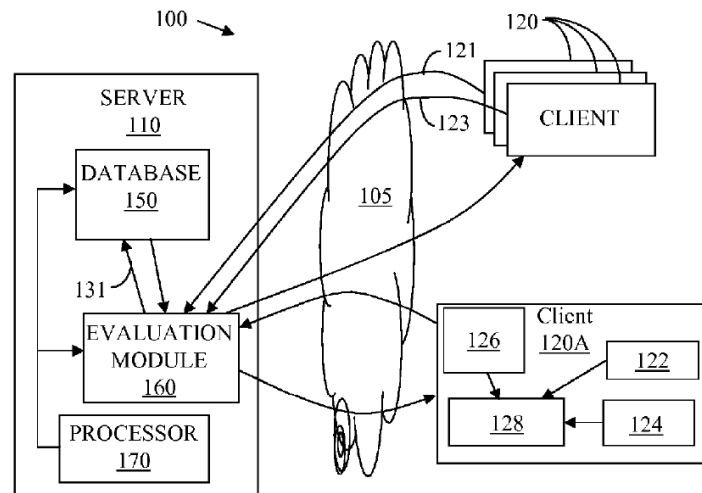


Figure 1

The client connects to a wireless network via access points and thereby further connects with other devices in the network. Ex-1005, 3:44-54, 10:32-67, 12:21-64; Ex-1003, ¶¶99-100.

Scherzer teaches a server that facilitates communications for the clients over the network. Ex-1005, Abstract, 2:42-50, 5:34-46, 6:4-45, Fig. 1. The server sends to the client information regarding a preferred access point for the location where the client is. Ex-1005, Abstract, 2:42-3:21, 5:9-33, 5:58-7:23, Fig. 2; Ex-1003, ¶101.

Scherzer is analogous art in the same field of endeavor and reasonably pertinent to the '634 patent. *See supra* §III; *e.g.*, Ex-1005, 1:13-14; Ex-1003, ¶102.

2. U.S. Patent No. 9,661,553 (“Gillett”)

Gillett is AIA §102(a) art. Gillett is directed to network connections and communications, where the mobile terminals gain access to the network and communicate with each other through access points. *E.g.*, Ex-1006, Abstract, 2:3-26, 7:46-8:53, Fig. 1; Ex-1003, ¶¶104-106.

Gillett is analogous art in the same field of endeavor and reasonably pertinent to the '634 patent. *See supra* §III; *e.g.*, Ex-1006, Abstract, 2:3-26; Ex-1003, ¶107.

3. Independent Claims 1, 8, 15

1[pre]/8[pre]/15[pre] ...

Grounds 2 (Scherzer) and 3 (Scherzer and Gillett) teach the preambles. Scherzer teaches [1pre]. For example, Scherzer teaches “a *method* for improving wireless connectivity to the Internet by utilizing a social network.” Ex-1005, 2:51-4:32; Ex-1003, ¶¶108-109.

Scherzer teaches [8pre]. For example, Scherzer teaches that its system may be implemented using software program. Ex-1005, 13:54-14:17 (“Those skilled in the art will appreciate that many different combinations of hardware, software, and firmware will be suitable for practicing the present invention. For example, the

described methods and systems may be implemented in a wide variety of programming or scripting languages[.]”); Ex-1003, ¶110.

Scherzer’s system contains a processor to perform its method. Ex-1005, 5:34-46, 3:55-67, Fig. 1:

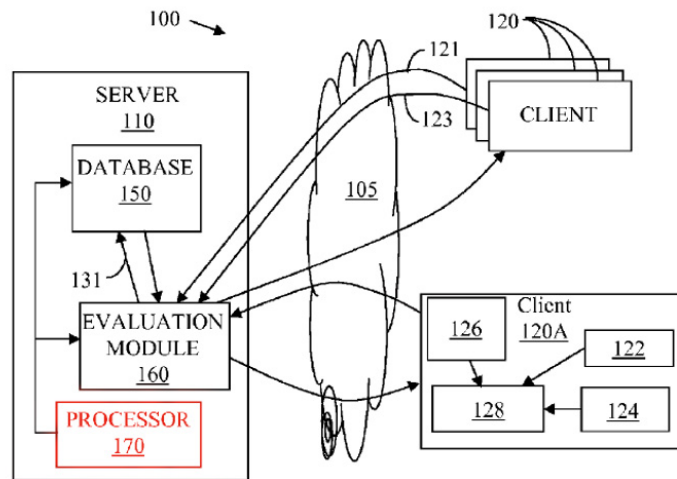


Figure 1

A POSITA would have found this obvious because it was well-known that a processor was the central component responsible for executing instructions that enable a system’s functionalities and operations. Scherzer therefore teaches [8pre]. Ex-1003, ¶¶111-112.

Scherzer utilizes **a network connected device** (e.g., server) to facilitate communications for the clients over the network. *E.g.*, Ex-1005, Abstract, 2:42-50, 5:34-46, 6:4-45, Fig. 1. Scherzer’s server **comprises one or more processors**. Ex-1005, 5:34-46, Fig. 1; Ex-1003, ¶113.

The server is **coupled to a network port**, through which it connects and communicates with clients and other devices over the network. *E.g.*, Ex-1005, 5:34-46, 2:42-50, 3:22-29, Abstract, Fig. 1. To the extent PO argues that Scherzer does not explicitly disclose that the server is coupled to a network port, a POSITA would have found this obvious because since the 1980s, network ports have been critical and commonly used components in communications networks, allowing servers and other networked devices to establish connections for data transmission and communication. *See* Ex-1005, 13:54-14:17; Ex-1003, ¶114.

Scherzer further teaches that the network connected device (e.g., server) is configured to perform operations recited in claims 1/8/15. *Infra* §§V.B.3[1a-c]/[8a-c]/[15a-c]. Grounds 2–3 therefore teach the preambles. Ex-1003, ¶115.

[1a]/[8a]/[15a] ...

Grounds 2–3 teach limitations [1a]/[8a]/[15a]. Scherzer teaches a **first endpoint device** (e.g., client). Scherzer teaches a client/server system that contains various clients. *E.g.*, Ex-1005, 5:9-46 (“In FIG. 1, various clients 120 and 120A communicate with server 110 via network 105, such as the Internet.”), Fig. 1:

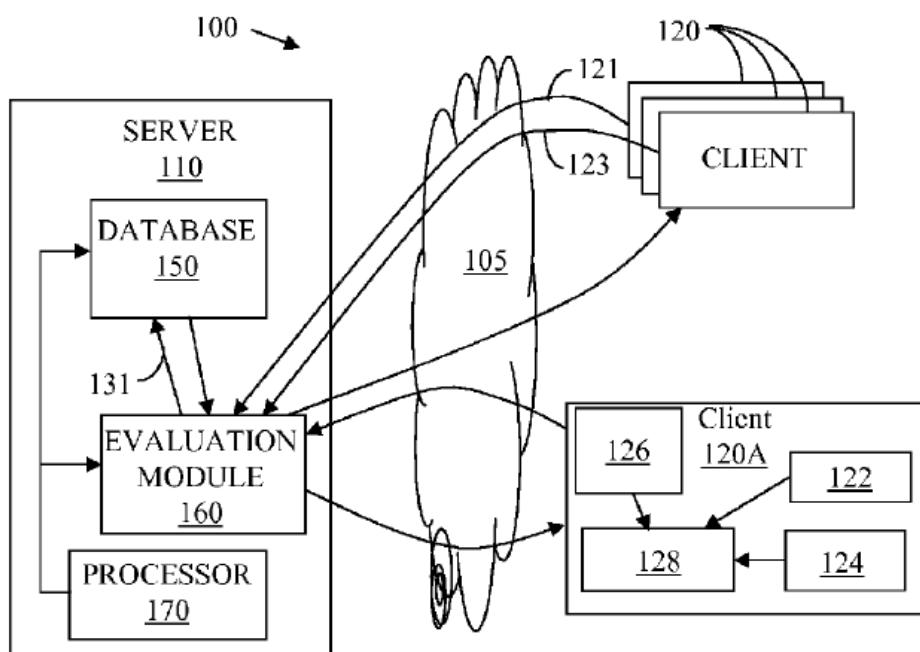


Figure 1

Ex-1003, ¶116.

Scherzer’s client is an endpoint device that represents a user terminal such as a user’s device. *E.g.*, Ex-1005, 2:51-3:29, 5:9-33, Fig. 1. The client is **coupled to a network**. *E.g.*, Ex-1005, 5:34-46, 4:17-32, 5:9-33, Fig. 1; Ex-1003, ¶¶117-118.

Scherzer further teaches that the first endpoint device (e.g., client) is connected to **further endpoint devices** (e.g., other clients) in the network. *E.g.*, Ex-1005, 5:9-33 (“The system employs client/server architecture: ... executes radio measurements and report to the network server that shares this information with other user’s clients.”), 5:34-46, 6:46-58, Fig. 1. As explained below, a

POSITA would have understood and found it obvious that this includes at least the scenario where a client connects to other clients via access points. Ex-1003, ¶119.

First, Scherzer teaches that the client connects to a wireless network via access points and thereby further connects with other devices in the network. *E.g.*, Ex-1005, 10:32-67 (“Connecting to wireless network starts by scanning the neighborhood for candidate connections (802.11 scan). The 802.11 scan produces a list of access points in reach; ... Next, the client selects the most favorable access point for connection[.]”), 12:21-64 (“The user generally is able to access the Internet 305 by connecting device 320 to access point 370d wirelessly. As is known, access point 370d operates to a certain range, which may generally allow other users to receive the signal of access point 370d.”), 3:44-54, 6:46-58; Ex-1003, ¶120.

A POSITA would have understood and found this obvious because access points have been well-known and widely used as intermediaries that connect multiple devices such as client devices to a shared network infrastructure, which were designed to facilitate data exchange between the connected devices. Such functionality is a fundamental characteristic of networks employing access points, as they not only provide internet access but also support intra-network communication, enabling tasks such as file sharing, collaborative work, and resource access. *See, e.g.*, Ex-1008, 5:39-47, 4:43-50, Fig. 1. For example, it was

well-known that in wireless communication, infrastructure mode allows clients communicate with each other via access points, which manage and relay data between connected devices. Ex-1009, 000580-582, Fig. 7.1; Ex-1010, 6:48-55 (“Conventional Wi-Fi networks include an access point to which are connected one or more computers and peripheral devices by wired and wireless connections. Wi-Fi networks are typically set up as infrastructure networks, where the access point is a central hub to which Wi-Fi capable devices are connected. The devices do not communicate directly with one another, but communicate indirectly through the access point.”); Ex-1011, 1:57-59; Ex-1012, 1:20-24 (“Some wireless networks are configured as managed or infrastructure networks, using an access point to control communications between devices on the network.”). A POSITA would therefore have recognized that a client device may interact with other clients in the network via access points, as this reflects standard network behavior. Ex-1003, ¶121.

To the extent Scherzer does not explicitly disclose a client connecting with other clients in the network via access points, Gillett teaches endpoint devices connecting with each other via access points. *E.g.*, Ex-1006, Abstract, 2:3-26, 7:46-8:14, Fig. 1; Ex-1003, ¶122.

Gillett teaches an endpoint device (e.g., user terminal) connects and communicates with another endpoint device (e.g., another user terminal) via access points. *E.g.*, Ex-1006, 7:46-52 (“[A] plurality of mobile user terminals 102 are

arranged to communicate over the networks 101, 103 and/or 106. The user terminals 102 may comprise for example laptop computers, tablets or other mobile terminals such as mobile phones. Each user terminal 102 comprises one or more transceivers for accessing the one or more networks 101, 103, 106.”), 7:53-8:14 (“Each user terminal 102 comprises a short-range wireless transceiver (e.g. wi-fi) for accessing the Internet 101 via the wireless access points 106. In some places, a WLAN may be formed of a single short-range access point 106. ... Either way, a mobile terminal 102 connecting to one of the local access points 106 is provided with a route for accessing the internet 101.”), 8:28-53, Fig. 1; Ex-1003, ¶123.

For example, Gillett teaches that a user terminal connecting and communicating with another user terminal via access points by performing a VoIP call, sending/receiving IM messages, or transferring files. *E.g.*, Ex-1006, 9:57-10:5 (“This means the communication client application running on the processing apparatus 112 can be kept aware of what networks are available for internet access, and hence select one of the WLANs or select between a WLAN and WWAN as a means for accessing the internet 101, *e.g. for performing a real-time VoIP call with another user terminal 102 over the internet 101. Other examples are to view a website or send an email via a server of the internet 101, or send or receive an IM message or file transfer to or from another user 102.*”), 8:28-53 (“[T]he communications code comprises a communication client application for

performing communications such as voice or video calls with other user terminals 102 over the Internet 103, via the short-range wireless transceiver 115 and wireless access points 106[.]”), 6:62-67, 7:46-8:14, Fig. 1:

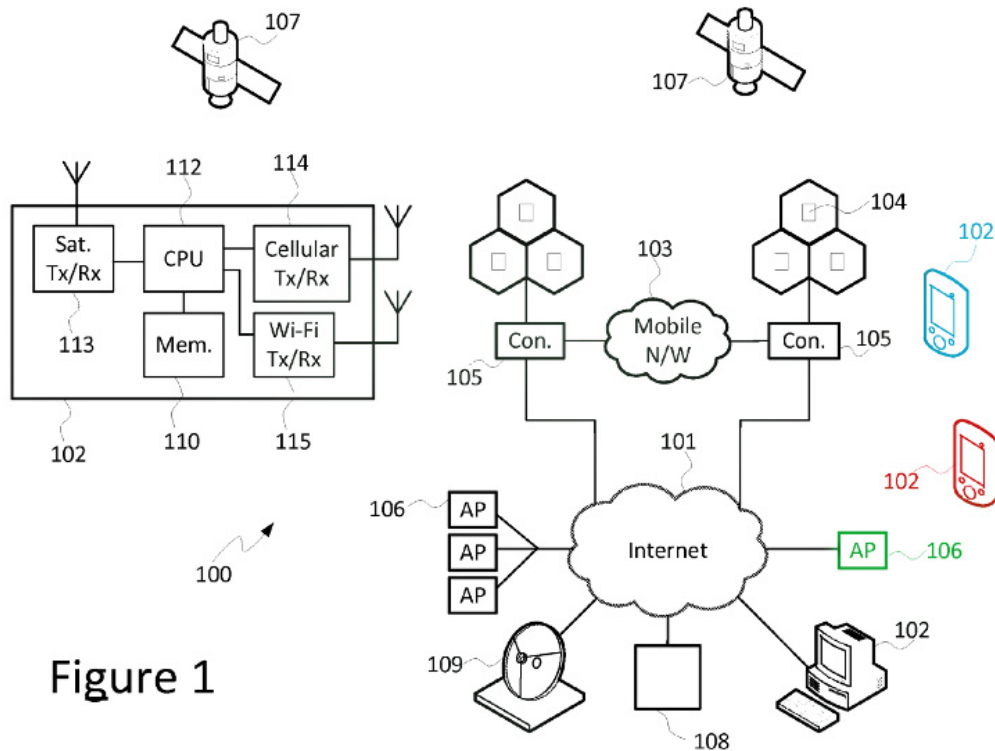


Figure 1

Ex-1003, ¶124.

Scherzer and Gillett’s teachings satisfy “endpoint device” as the term is used in the ’634 patent, which describes the term broadly. *E.g.*, Ex-1001, 2:50-25, Figs. 1, 3; Ex-1003, ¶125.

A POSITA would have found it obvious and been motivated to apply Gillett’s teachings with Scherzer such that a first endpoint device (e.g., client) connects to further endpoint devices (e.g., other clients) via access points. This would not have changed the principle of operation of either reference. A POSITA

would have been motivated to apply Gillett's teachings regarding user terminals connecting and communicating with each other via access points to Scherzer because doing so would have allowed the access points to coordinate traffic and distribute load effectively, ensuring efficient communication and reducing data collisions. In addition, doing so would have enabled adding more clients to the network without requiring direct client-to-client configuration, thereby improving network scalability. Last but not least, it would have provided extended range for the inter-clients connections, where the clients do not need to be within direct range of each other as long as they are within range of the access points. Ex-1003, ¶126.

Furthermore, as explained above, Scherzer teaches the client connects to a wireless network via access points and contemplates the scenario where the client further connects with other devices in the network via the access point. *E.g.*, Ex-1005, 3:44-54, 5:9-46, 10:32-67, 12:21-64, Fig. 1. Gillett expressly describes the scenario where a user terminal connects and communicates with another user terminal via access points. *E.g.*, Ex-1006, 6:62-67, 7:46-8:14, 8:28-53, 9:57-10:5, Fig. 1. Thus, a POSITA would have found Gillett's teachings regarding user terminals connecting and communicating with each other via access point to be readily applicable to Scherzer. Doing so would have been nothing more than applying a known technique (e.g., Gillett's teachings regarding user terminals

connecting and communicating with each other via access points) to a known system (e.g., Scherzer's client/server system) to yield predictable results. Since clients connecting and communicating with each other via access points was conventional and well-known and Scherzer contemplates the scenario explicitly taught by Gillett, a POSITA would have had a reasonable expectation of success in combining Scherzer and Gillett. Ex-1003, ¶127.

Scherzer, as well as the combination of Scherzer and Gillett, further teaches **collecting at the first endpoint device (e.g., client) parameter values for determination of bandwidth of network connections to further endpoint devices (e.g., other clients)**. For example, Scherzer teaches that the client collects parameter values such as backhaul quality. *E.g.*, Ex-1005, 7:49-62 (“[T]he following parameters are *collected and reported by clients* as a result of a ‘measurement trip’: *Backhaul quality (estimated bandwidth connection to Internet)*; ...”), 9:5-20. Scherzer teaches radio resource such as Wi-Fi access points that provide internet access to the clients. *E.g.*, Ex-1005, 5:9-33, 6:46-58. Scherzer teaches that the client collects and reports the backhaul quality as a result of a measurement trip, through which the client conducts radio resource survey and collects relevant information. Ex-1005, 7:24-48; Ex-1003, ¶128.

A POSITA would have understood that backhaul quality is for determination of bandwidth of network connections to other clients because it represents

estimated bandwidth of the client's connection to the internet, which constrains and determines the bandwidth available for the connections between the clients. As explained above, Scherzer, as well as the combination of Scherzer and Gillett, teaches the scenario where the clients connect to each other via access points. A POSITA would have understood that in this scenario, the bandwidth of the connection of a client's connection to other clients is limited and determined by the bandwidth of the client's internet connection. For example, the maximum bandwidth for communication between a client and other clients is limited by the bandwidth allocated by the access point to the client. Ex-1003, ¶129.

The prosecution history of the '634 patent confirms that Scherzer and Gillett's teachings satisfy this limitation. During prosecution, the Examiner found that teachings of prior art Cole render the limitation of "collecting, at a first endpoint device coupled to a network, parameter values for determination of bandwidth of network connections to further endpoint devices" obvious. Specifically, the Examiner relied on Cole's teachings where a mobile device establishes connection to a remote network via a communication interface, similar to Scherzer and Gillett's teachings where the client connects to internet and other clients through access points. Ex-1002, 000108-113. The applicant did not dispute that Cole's teachings satisfy this limitation and only argued that Cole fails to

disclose another limitation of claim 1. Ex-1002, 000146-147. Grounds 2–3 thus teach [1a]/[8a]/[15a]. Ex-1003, ¶130.

[1b]/[8b]/[15b]...

Grounds 2–3 teach limitations [1b]/[8b]/[15b]. First, Scherzer teaches **a tuner server** (e.g., server) that facilitates communications for the clients over the network. *Supra* §§V.B.3[1pre-a]/[8pre-a]/[15pre-a]; Ex-1005, Abstract, 2:42-50, 5:34-46, 6:4-45, Fig. 1:

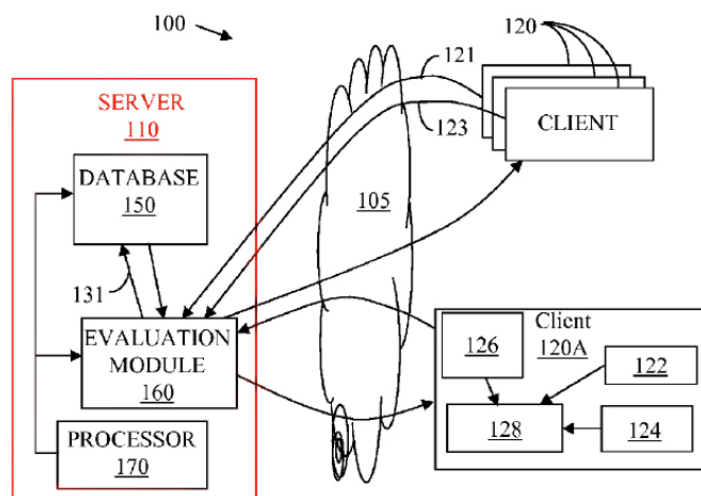


Figure 1

Scherzer’s server is a network connected device. *Supra*

§V.B.3[1pre]/[8pre]/[15pre]. Scherzer’s server thus is **a network connected device acting as a tuner server**.¹⁴ Ex-1003, ¶¶131-132.

¹⁴ The ’634 patent specification uses the term “tuner server” and “tuning server” interchangeably. *E.g.*, Ex-1001, 2:13-18, 2:50-3:10, 4:35-5:16, 5:65-6:22, Figs. 3,

Scherzer's server and clients are distinct, separate components that perform their respective roles in the network. *E.g.*, Ex-1005, 2:42-50, 5:9-46, 6:4-27. The server is thus **distinct from the first endpoint device** (e.g., client) **and the further endpoint devices** (e.g., other clients). Ex-1003, ¶133.

Scherzer, as well as the combination of Scherzer and Gillett, **determines at the server that a next network connection from the first endpoint device** (e.g., client) **to a second endpoint device** (e.g., another client) **matches a geographical area of a past network connection**. First, as explained above, Grounds 2–3 teach **a next network connection from the first endpoint device** (e.g., client) **to a second endpoint device** (e.g., another client) established via access points. For example, Scherzer teaches that the client queries a database to obtain information regarding a preferred access point for the location where the client is and connects to the access point and other clients if the access point is available. *E.g.*, Ex-1005, 5:9-33, 5:58-6:27 (“In order to connect to a broadband network, in Step 200 the client 120A queries its local database 124 to obtain the best available AP for the particular location the clients is located at. At Step 210 the

5. The '634 patent specification describes the tuner/tuning server and its functionalities very broadly, thereby confirming that Scherzer's teachings regarding the server fall within the recited “tuner server.” *See, e.g.*, Ex-1001, 4:51-5:15, 6:10-38.

client inspects all available radio signals in the area. Then, at Step 220 the client checks whether the preferred AP for that location is available. If not, the next best AP is selected and again it is checked whether that one is available, and so on, until at Step 230 the client connects to an AP.”), 6:59-7:23, 2:42-3:21, Abstract, Fig. 2; Ex-1003, ¶134.

Scherzer further teaches that the client selects and connects to the preferred AP to connect with another device (e.g., client device) based on information from the server. *E.g.*, Ex-1005, 2:42-50 (“Clients receive updates about relevant access points from the server and use the information to connect to the preferred access point.”), 2:51-3:29, Abstract, 5:58-6:45, Fig. 2; Ex-1003, ¶135.

In the process of providing the client information regarding the preferred access point, the server **determines** that a next network connection from the client to another client via the access point **matches a geographical area of a past network connection**. Scherzer teaches that the server includes a database that stores data regarding various access points, including “data on all radio access points (WiFi and others) that have been discovered or registered by the users community.” *E.g.*, Ex-1005, 2:42-50, 5:34-46, 6:28-45, 8:64-9:20, Abstract, Fig. 1; Ex-1003, ¶136.

For each client, the server transmits selected data from its database to the client, where the “selected data for each of the clients may correspond to access

points in a geographical proximity to the corresponding client.” *E.g.*, Ex-1005, 3:30-43, 3:55-67 (“[A] system for enhancing connectivity to radio access points is provided, comprising: ... sending updates to each of the clients, said updates comprising selected data from the database, said selected data relates to access points in a selected geographical region. The selected geographical region may comprise a locale in which each client is present. The selected geographical region may comprise a locale indicated by each client.”), 11:28-50 (“The network server uses the clients’ reports to determine AP accessibility and potential service quality. ... These entries are stored at the network server database 150 based on location coordinates sorted to ‘wireless regions.’ Radio resources regions are geographical areas such as cities, parks, groups of cities, states and other geographical areas of interest.”), 6:28-45, 6:59-66; Ex-1003, ¶137.

Moreover, the selected data transmitted from the server to the client includes data for a **past network connection**, such as historical data about access points used to establish a past connection. *E.g.*, Ex-1005, 5:34-46 (“Server 110 includes database 150, which stores historical data about radio broadband access resources.”), 8:64-9:20 (“The radio resource database 150 stores data on all radio access points (WiFi and others) that have been discovered or registered by the users community. ... The database 150 includes list of APs reported during

previous scans, measurement trips, and user AP registration (user registering an AP can set the percentage bandwidth that can be shared).”), 13:13-40. Ex-1003, ¶138.

A POSITA would have understood that, in the process of providing the client selected data regarding access points within the client’s geographical proximity, including historical data for access points that have been used to establish a past connection, Scherzer’s server determines that the client’s next connection (e.g., connection to another client) via the access points matches a geographical area of a past network connection (e.g., geographical area of a past network connection established via the access points). Therefore, for reasons explained above (*see also supra* §V.B.3[1a]/[8a]/[15a] (explaining motivation to combine Scherzer and Gillett)), Grounds 2–3 teach [1b]/[8b]/[15c]. Ex-1003, ¶139.

[1c]/[8c]/[15c] ...

Grounds 2–3 teach limitations [1c]/[8c]/[15c]. First, Grounds 2–3 teach initiating the next network connection from the first endpoint device to the second endpoint device via access points. *Supra* §§V.B.3[1a-b]/[8a-b]/[15a-b]. Ex-1003, ¶140.

Scherzer further teaches initiating the connection based on the determination at the tuner server (e.g., server) ([1c], [8c]). As explained above, Scherzer, as well as the combination of Scherzer and Gillett, teaches the server determining that the client’s connection to another client via the access points matches a geographical

area of a past network connection and transmitting selected data to the client, based on which the client selects a preferred access point for initiating a connection.

Supra §§V.B.3[1a-b]/[8a-b]/[15a-b]. Grounds 2–3 thus teach initiating the connection based on the determination at the server. Moreover, Scherzer teaches a network connected device acting as tuner server. *Supra* §V.B.3[1b]/[8b]/[15b].

Grounds 2–3 thus teach initiating the call based on the determination at the network connected device acting as the tuner server ([15c]). Ex-1003, ¶141.

Furthermore, Scherzer, as well as the combination of Scherzer and Gillett, teaches initiating the connection with a transmission bandwidth based on the parameter values for the past network connection. As explained above, Scherzer teaches that the client collects parameter values such as backhaul quality. *Supra* §V.B.3[1a]/[8a]/[15a]. Scherzer teaches utilizing the backhaul quality and analyzing the backhaul performance when selecting the preferred access points. Ex-1005, 3:15-21 (“In the method, selecting the preferred radio resource may comprise analyzing at least one of: ... backhaul performance[.]”), 9:29-53 (“For example, when the terminal knows which of multiple APs has a good backhaul it can select the right AP for connection, thereby avoiding connection testing and ‘re-tries’.”), 8:64-9:20, 7:49-62; Ex-1003, ¶142.

The backhaul quality is associated with the past network connections. For example, it is collected and reported by the client “during previous scans [and]

measurement trips,” through which the client conducts radio resource survey and collects relevant information regarding the access points, including access points that have been used to establish the past connections. *Supra* §V.B.3[1b]/[8b]/[15b]; Ex-1005, 9:5-20 (“The database 150 includes list of APs reported during previous scans, measurement trips, and user AP registration (user registering an AP can set the percentage bandwidth that can be shared).”), 7:24-58. A POSITA would thus have understood that the backhaul quality is associated with the past network connections. Ex-1003, ¶143.

Scherzer teaches that each access point has a corresponding bandwidth. Ex-1005, 5:34-46 (“Server 110 also includes an evaluation module 160, which evaluates accessibility and *bandwidth of various AP’s*, and stored the information as an update in database 150[.]”), 9:5-20 (“The database 150 includes list of APs reported during previous scans, measurement trips, and user AP registration (user registering an AP can set *the percentage bandwidth that can be shared*). Each database entry is indexed by SSID and MAC address and may include: ... Percentage allowable shared bandwidth.”), 12:21-49 (“When the owner registers access point 370d as member of the social network, the owner may specify *the amount of bandwidth the owner is willing to allocate to third parties who are in the vicinity of the access point 370d.*”), 7:39-58. Scherzer therefore teaches initiating the next network connection via a preferred access point based on the

determination at the server, where the preferred access point has a corresponding bandwidth based on the backhaul quality. Grounds 2–3 thus teach [1c]/[8c]/[15c]. Ex-1003, ¶144.

4. Dependent Claims 2, 9, 16

Grounds 2–3 teach claims 2/9/16. Ex-1003, ¶145.

Scherzer teaches parameter values (e.g., backhaul quality) for determination of bandwidth. *Supra* §V.B.2[1a]/[8a]/[15a]. Scherzer further teaches **sending the parameters values** (e.g., backhaul quality) **from the first endpoint device** (e.g., client) **to the tuner server** (e.g., server). For example, Scherzer teaches that the client collects and reports the backhaul quality to the server, which stores the received information in the radio resource database. *E.g.*, Ex-1005, 8:64-9:20 (“Each database entry ... may include: Backhaul quality (estimated bandwidth connection to Internet)[.]”), 7:49-58, 5:34-46, 6:28-45 (“The server 110 uses the measurements from the clients to update the database 150.”), Fig. 1; Ex-1003, ¶146.

Scherzer further teaches that the server **receives further parameter values for determination of bandwidth of network connections from a plurality of endpoint devices**. Scherzer teaches that the server communicates with **a plurality of endpoint devices** (e.g., a plurality of clients) and receives information such as backhaul quality from the plurality of clients. Ex-1005, 3:55-67 (“[A] system ...

comprising: ... an evaluation module receiving connectivity reports *from a plurality of clients*[.]”), 3:30-43, 5:34-57, 7:49-58, 8:64-9:20; Ex-1003, ¶147.

Scherzer teaches that the server receives **further parameter values** from the clients coupled to it. For example, the server receives estimated location of the clients from the clients. Ex-1005, 8:64-9:20 (“Each database entry is indexed by SSID and MAC address and may include: ... Estimated location (when the client determined its own location)[.]”), 7:49-58. The estimated location for a client is a parameter for determination of bandwidth of network connections because it is used to determine the preferred access points in the geographical proximity of the client, which has a corresponding bandwidth. *Supra* §V.B.3[1c]/[8c]/[15c]; *e.g.*, Ex-1005, 5:58-6:3, 3:30-43 (“The selected data for each of the clients may correspond to access points in a geographical proximity to the corresponding client.”), 10:8-31; Ex-1003, ¶148.

As another example, the server receives percentage allowable shared bandwidth from the clients. Ex-1005, 8:64-9:20 (“Each database entry is indexed by SSID and MAC address and may include: ... Percentage allowable shared bandwidth.”), 5:47-57. A POSITA would have understood that the percentage allowable shared bandwidth constitutes a parameter value for determination of bandwidth of network connections because it sets a limit on the bandwidth allowable for a connection and is thereby used to determine the bandwidth of a

network connection.¹⁵ The '634 patent specification confirms that Scherzer's teachings satisfy the limitation. Ex-1001, 6:39-7:4; Ex-1003, ¶149.

Moreover, Scherzer teaches that the network connected device (e.g., server) has one or more processors (*supra* §V.B.3[15pre]), which are configurable to perform the operations performed by the server, including operations discussed above. Ex-1005, 5:34-46, 3:55-67, Fig. 1. Scherzer therefore teaches [16a]. Grounds 2–3 thus teach [2a]/[9a]/[16a]. Ex-1003, ¶150.

[2b]/[9b]/[16b] send[ing], from the first endpoint device to the tuner server, connection information for the next network connection, wherein the tuner server performs the determining and derives one or more parameter values for the transmission bandwidth; and

Grounds 2–3 teach limitations [2b]/[9b]/[16b]. Scherzer teaches **sending from the first endpoint device (e.g., client) to the tuner server (e.g., server), connection information for the next network connection.** For example, Scherzer teaches that the client sends to the server a set of data “to analyze radio resources

¹⁵ PO's Infringement Contentions confirm that Scherzer's teachings regarding the estimated locations of clients and percentage allowable shared bandwidth satisfy the recited “further parameter values,” alleging that “parameters such as bytes and packet exchange, delays, jitter and bandwidth ... are sent from the first endpoint device to the tuner server[, which] is configured to receive each of the parameters values, ‘further parameter values.’” Ex-1007, 000004.

in reach.” Ex-1005, 2:51-3:4 (“[A] method ... comprising: generating *first set of data* by using the user terminal to analyze radio resources in reach[.]”), 3:22-29 (“The method may further comprise transmitting the first set of data to a service server over the Internet.”). Here, the first set of data constitutes connection information for the network connection because it is used to analyze radio resource in reach. In particular, the first set of data is combined with another set of data “to select preferred radio resource for connection.” Ex-1005, 2:51-3:29. The first set of data therefore constitutes **connection information for the next network connection** because it is used to select the preferred access point, through which the next network connection is established.¹⁶ Ex-1003, ¶151.

Scherzer further teaches that **the tuner server** (e.g., server) **performs the determining and derives one or more parameter values for the transmission bandwidth**. Scherzer teaches that the server determines that the next network connection is established via a preferred access point that has a corresponding bandwidth. *Supra* §V.B.3[1c]/[8c]/[15c]. Scherzer further teaches that the server derives parameter values for the transmission bandwidth. For example, the server generates and transmits a set of data to the client “to select preferred radio resource

¹⁶ The ’634 patent specification confirms that Scherzer’s teachings satisfies the recited “connection information” by describing the term broadly. *E.g.*, Ex-1001, 4:35-5:16, 6:10-38.

for connection.” Ex-1005, 2:51-3:4 (“[A] method ... comprising: ... generating a third set of data from the second set of data; and combining the first and third sets of data to select preferred radio resource for connection.”), 3:5-14, 3:22-29 (“The method may further comprise transmitting the third set of data from the service server to the user terminal.”). Here, the third set of data sent by the server to the client constitutes **parameter values for the transmission bandwidth** because it is used to select the preferred access point, which has a corresponding transmission bandwidth. A POSITA would also have understood that the third set of data constitutes parameter values for the transmission bandwidth because it includes parameter values for determination of transmission bandwidth of network connections such as available bandwidth. Grounds 2–3 therefore teach [2b]/[9b]/[16b]. Ex-1003, ¶152.

[2c]/[9c]/[16c] receiv[ing], at the first endpoint device, from the tuner server, the one or more [parameter] values for the transmission bandwidth.
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The first endpoint device (e.g., client) receives from the tuner server (e.g., server) the one or more parameter values for the transmission bandwidth (e.g.,

third set of data).¹⁷ *Supra* §V.B.4[2b]/[9b]/[16b]. Grounds 2–3 therefore teach [2c]/[9c]/[16c]. Ex-1003, ¶153.

5. Dependent Claims 3, 10, 17

Grounds 2–3 teach claims 3/10/17. Ex-1003, ¶154.

First, Scherzer’s server determines that the next network connection is established via a preferred access point that has a corresponding bandwidth. *Supra* §V.B.3[1c]/[8c]/[15c]. A POSITA would have understood that Scherzer’s teachings include at least two scenarios—the initiating is executed by the client, or by the server. Scherzer, as well as the combination of Scherzer and Gillett, teaches that, in the scenario where the initiating is executed by the first endpoint device (e.g., client) (claims 3, 10, 17), the client connects to another client via the preferred access point. *Supra* §V.B.3[1c]/[8c]/[15c]; Ex-1003, ¶155.

Scherzer further teaches that **the first endpoint device** (e.g., client) **is contained with the network connected device** (e.g., server) (claim 17). While Scherzer teaches that the server and the client are distinct, separate components that perform their respective roles (*supra* §V.B.3[1b]/[8b]/[15b]), its teachings include at least two scenarios: (1) the client is integrated into the server, where the

¹⁷ “[T]he one or more para values” of claim 2 of the ’634 patent appears to be a typographical error. Ex-1001, 14:26. This petition assumes that the claim recites “parameters values” instead of “para values.”

two components share the same physical housing; (2) the client is located as a physically independent component outside the server.¹⁸ Ex-1003, ¶156.

Moreover, as explained above for Ground 1, a POSITA would have recognized the benefits of having the configuration in the first scenario—that the client is within the same housing as the server. *Supra* §V.A.2. Grounds 2–3 thus teach claims 3/10/17. Ex-1003, ¶157.

6. Dependent Claims 4, 11, 18

Grounds 2–3 teach claims 4/11/18. Ex-1003, ¶158.

Scherzer’s teachings include the scenario where **the determining is executed** by the server. *Supra* §V.B.3. Scherzer further teaches the example scenario where **the initiating is executed** by the server. *Supra* §V.B.5. For example, Scherzer teaches that the server initiates the network connections by determining quality and accessibility of available access points, sending relevant updates to the client, based on which the client selects a preferred access point for the next network connection. *Supra* §V.B.3[1c]/[8c]/[15c]; Ex-1003, ¶159.

Moreover, Scherzer teaches that the server is **external to the first endpoint device** (e.g., client), in the example scenario where the server and the client are physically separate components performing their respective roles. *Supra*

¹⁸ Scherzer explains that the configurations shown in its figures are merely exemplary. *See* Ex-1005, 4:36-50, 14:3-17.

§§V.B.3[1b]/[8b]/[15b], §V.B.5; Ex-1005, 2:42-50, 5:9-46, 6:4-27, Fig. 1; Ex-1003, ¶160.

Scherzer further teaches that the server **communicates** the determining and initiating **to the first endpoint device** (e.g., client). For example, the server determines determining quality and accessibility of available access points and sends relevant updates to the client. *E.g.*, Ex-1005, Abstract (“The server uses the reports to update its database, and send corresponding updates to the clients.”), 2:42-50, 12:21-13:40. In this process, the server communicates the determining and initiating to the client. Grounds 2–3 therefore teach claims 4/11/18. Ex-1003, ¶161.

7. Dependent Claims 5, 12, 19

Grounds 2–3 teach claims 5/12/19.¹⁹ Ex-1003, ¶162.

Scherzer, as well as the combination of Scherzer and Gillett, teaches that the server **monitors network traffic between the first endpoint device** (e.g., client) **and the second endpoint device** (e.g., another client). For example, Scherzer teaches that the server receives information regarding network traffic from the clients, including “Internet connection available capacity.” Ex-1005, 2:51-3:29.

¹⁹ The “method of claim 15” recited in claim 19 appears to be a typographical error. Ex-1001, 16:31. The correct term should be “network connected device of claim 15.”

Moreover, the server “continuously update[s]” its database “to include up to date data on any [access points] that were newly put to service, modified, or removed from service.” Ex-1005, 6:28-45. During this process, the server continuously tracks traffic behavior and connection variations. A POSITA would thus have understood that, by receiving information such as Internet connection available capacity and continuously updating its database with information about access points used to connect the clients, the server monitors network traffic because it gathers and analyzes information regarding the various access points, including data regarding which access points are active, how they are being used, the connections established through them, and potential congestion points. Ex-1003, ¶163.

Scherzer further teaches the server **adjusting the transmission bandwidth based on the monitoring**. For example, Scherzer teaches that based on information provided by the server, the clients “automatically switch connection to a better radio resource.” Ex-1005, 6:59-7:23 (“[C]lients are able to: ... If current connection quality gets below minimum level, automatically switch connection to a better radio resource. ... [T]he system executes automatic Internet connection (AutoConnect). The automatic connection can be implemented by continuously or periodically executing the loop of Step 235 of FIG. 2.”), 5:58-6:27, 11:28-50, Fig. 2. Since each access point has a corresponding bandwidth (*supra*

§V.B.3[1c]/[8c]/[15c]), the server therefore adjusts the bandwidth by updating clients regarding available access points and enabling the clients to automatically switch connection to a better access point that has better bandwidth performance. Grounds 2–3 therefore teaches claims 5/12/ 19. Ex-1003, ¶164.

8. Dependent Claims 6, 13, 20

Grounds 2–3 teach claims 6/13/20. First, Grounds 2–3 teach **monitoring network traffic between the first endpoint device and the second endpoint device and adjusting the transmission bandwidth**. *Supra* §V.B.7; Ex-1003, ¶165.

Scherzer further teaches **transmitting data associated with the network traffic from the first endpoint (e.g., client) to the tuner server/network connected device (e.g., server)**. For example, the client collects backhaul quality and transmits the data to the server. *Supra* §§V.B.3[1a-c]/[8a-c]/[15a-c]. A POSITA would have recognized that the backhaul quality (e.g., estimated bandwidth connection to Internet) is **data associated with the network traffic** because it relates to network traffic, specifies the capacity of the connection to handle data flows, and is used for network traffic management. Ex-1003, ¶166.

Scherzer further teaches that, upon receiving the backhaul quality reported by the clients, the server **determines that an adjustment to the transmission bandwidth is desired**. For example, the server receives backhaul quality reported

by clients, determines that the network connection is established via a preferred access point (*supra* §§V.B.3[1a, c]/[8a, c]/[15a, c]) and enables the clients to automatically switch connection to a better access point that has better bandwidth performance when “current connection quality gets below minimum level” (*supra* §V.B.8; Ex-1005, 6:59-7:23). In this process, the server determines that an adjustment to the transmission bandwidth is desired. Ex-1003, ¶167.

Scherzer further teaches that the server generates and transmits a set of data to the client “to select preferred radio resource for connection.” *Supra* §V.B.4; Ex-1005, 2:51-3:14, 3:22-29. Upon receiving the data, the client selects and switches to a preferred access point, which has a corresponding transmission bandwidth. *Supra* §V.B.4. Scherzer thus teaches **receiving data for adjusting the transmission bandwidth from the tuner server/network connected device (e.g., server) and adjusting the transmission bandwidth responsive to the receiving.** Grounds 2–3 therefore teach claims 6/13/20. Ex-1003, ¶168.

9. Dependent Claims 7, 14

Grounds 2–3 claims 7/14. Ex-1003, ¶169.

As explained above, Scherzer teaches that the server receives reports from clients and maintains a database that contains information for various access points, including accessibility and bandwidth of the access points. *Supra* §V.B.3[1b]/[8b]/[15b]; Ex-1005, 6:28-45 (“The server 110, on the other hand,

continuously receives measurements from various clients that are connected to access points. The server 110 uses the measurements from the clients to update the database 150. In this manner, the database 150 is enhanced and continuously updated to include up to date data on any AP's that were newly put to service, modified, or removed from service.”), 2:42-50, 5:34-46, 8:64-9:20, Abstract, Fig. 1; Ex-1003, ¶170.

A POSITA would have understood that, in this process, the server maintains and **incorporates knowledge of the network topology**, including information regarding available access points in the network. *E.g.*, Ex-1005, 6:46-58 (“The client’s measurements reports are relayed to network server, so that the historical radio resources database (i.e., slow varying data) is gradually expanded and updated at the network server.”), Abstract, 2:42-50, 5:9-46, 6:28-45, 13:13-26. Grounds 2–3 therefore teach claims 7/14. Ex-1003, ¶171.

VI. STANDING

Petitioners certify they are not barred or estopped from requesting this IPR, and the '634 patent is eligible for it.

VII. DISCRETIONARY ANALYSIS FOR REVIEW

Discretionary denial is unwarranted. This Petition’s merits are compelling, which “alone demonstrates that the PTAB should not discretionarily deny institution under *Fintiv*.” *See* June 21, 2022 Director’s Memo, 3-5. The Grounds

present compelling obviousness theories that, “if unrebutted in trial, would plainly lead to a conclusion that one or more claims are unpatentable by a preponderance of the evidence.” *Id.*, 4.

Fintiv. The factors favor institution. The district court case is in its early stages—claim construction has not been briefed. The trial date is currently May 18, 2026. The Court has not ruled on Petitioners’ pending motions to transfer and dismiss; hearings have not been scheduled.

Advanced Bionics. Denial under §325(d) is unwarranted because Erskine, Scherzer, and Gillett were not cited or considered during prosecution. This is the only IPR filed against the challenged claims to date. *General Plastic* factors do not weigh against institution.

VIII. MANDATORY NOTICES AND FEES

1. **Real Party In Interest**: The real parties-in-interest here are Advanced Micro Devices, Inc. and Pensando Systems, Inc. No other parties directed, controlled, or funded this IPR.

2. **Related Matters**: *Concurrent Ventures, LLC et al. v. Advanced Micro Devices, Inc. et al.*, Case No. 1-24-cv-00335 (W.D. Tex.)

3. **Lead and Backup Counsel**: Pursuant to 37 C.F.R. §42.8(b)(3) and 42.10(a), Petitioners designate Harper Batts (Reg. No. 56,160) as lead counsel and

Chris Ponder (Reg. No. 77,167) and Jeffrey Liang (Reg. No. 69,043) as back-up counsel, each of Sheppard, Mullin, Richter & Hampton LLP.

4. **Service Information:** Petitioners consent to service by electronic mail addressed to:

HBatts@sheppardmullin.com;
CPonder@sheppardmullin.com;
JLiang@sheppardmullin.com; and
LegalTM-AMD-Concurrent@sheppardmullin.com

5. Petitioners' counsel may also be served by mail or hand delivery at Sheppard, Mullin, Richter & Hampton LLP, 1540 El Camino Real Suite 120, Menlo Park, CA 94025. Petitioners' counsel may be reached by telephone at (650) 815-2673 and by facsimile at (650) 815-4668.

6. Fees: The Office is authorized to charge fees for this Petition to Deposit Account 50-4561, Ref. 71EY-388593.

Respectfully submitted,

SHEPPARD, MULLIN,
RICHTER & HAMPTON LLP

/Harper Batts/

Harper Batts (Reg. No. 56,160)
Attorney for Petitioners

CLAIM APPENDIX

1[pre] A method for network connection optimization, comprising:

[1a] collecting, at a first endpoint device coupled to a network, parameter values for determination of bandwidth of network connections to further endpoint devices;

[1b] determining at a tuner server, distinct from the first endpoint device and the further endpoint devices, that a next network connection from the first endpoint device to a second endpoint device matches a geographical area of a past network connection; and

[1c] initiating the next network connection, from the first endpoint device to the second endpoint device, based on the determination at the tuner server, with a transmission bandwidth based on the parameter values for the past network connection.

[2a] The method of claim 1, further comprising: sending the parameter values for determination of bandwidth; from the first endpoint device, to the tuner server that is configured to receive further parameter values for determination of bandwidth of network connections from a plurality of endpoint devices;

[2b] sending, from the first endpoint device to the tuner server, connection information for the next network connection, wherein the tuner server performs the

determining and derives one or more parameter values for the transmission bandwidth; and

[2c] receiving, at the first endpoint device, from the tuner server, the one or more para values for the transmission bandwidth.

3. The method of claim 1, wherein the initiating is executed by the first endpoint device.

4. The method of claim 1, wherein the determining and the initiating are executed external to the first endpoint device and communicated to the first endpoint device.

5. The method of claim 1, further comprising: monitoring network traffic between the first endpoint device and the second endpoint device; and adjusting the transmission bandwidth based on the monitoring.

6. The method of claim 1, further comprising: monitoring network traffic between the first endpoint device and the second endpoint device; transmitting data associated with the network traffic from the first endpoint to the tuner server; determining, at the tuner server, an adjustment to the transmission bandwidth is desired; receiving data for adjusting the transmission bandwidth from the tuner server; and adjusting the transmission bandwidth responsive to the receiving.

7. The method of claim 6, wherein the tuner server incorporates knowledge of a network topology for the determining.

8[pre] A tangible, non-transitory, computer-readable media having instructions thereupon which, when executed by a processor, cause the processor to perform a method comprising:

[8a] collecting, at a first endpoint device coupled to a network, parameter values for determination of bandwidth of network connections to further endpoint devices;

[8b] determining at a tuner server, distinct from the first endpoint device and the further endpoint devices, that a next network connection from the first endpoint device to a second endpoint device matches a geographical area of a past network connection; and

[8c] initiating the next network connection, from the first endpoint device to the second endpoint device, based on the determination at the tuner server, with a transmission bandwidth based on the parameter values for the past network connection.

[9a] The method of claim 8, further comprising: sending the parameter values for determination of bandwidth, from the first endpoint device, to the tuner

server that is configured to receive further parameter values for determination of bandwidth of network connections from a plurality of endpoint devices;

[9b] sending, from the first endpoint device to the tuner server, connection information for the next network connection, wherein the tuner server performs the determining and derives one or more parameter values for the transmission bandwidth; and

[9c] receiving, at the first endpoint device, from the tuner server, the one or more parameter values for the transmission bandwidth.

10. The method of claim 8, wherein the initiating is executed by the first endpoint device.

11. The method of claim 8, wherein the determining and the initiating are executed external to the first endpoint device and communicated to the first endpoint device.

12. The method of claim 8, further comprising: monitoring network traffic between the first endpoint device and the second endpoint device; and adjusting the transmission bandwidth based on the monitoring.

13. The method of claim 8, further comprising: monitoring network traffic between the first endpoint device and the second endpoint device; transmitting data associated with the network traffic from the first endpoint to the tuner server;

determining, at the tuner server, an adjustment to the transmission bandwidth is desired; receiving data for adjusting the transmission bandwidth from the tuner server; and adjusting the transmission bandwidth responsive to the receiving.

14. The method of claim 13, wherein the tuner server incorporates knowledge of a network topology for the determining.

15[pre] A network connected device, comprising: one or more processors, coupled to a network port and configurable to:

[15a] collect; at a first endpoint device coupled to the network; parameter values for determination of bandwidth of network connections to further endpoint devices;

[15b] determine at the network connected device acting as a tuner server, distinct from the first endpoint device and the further endpoint devices, that a next network connection from the first endpoint device to a second endpoint device matches a geographical area of a past network connection; and

[15c] initiate the next network connection, from the first endpoint device to the second endpoint device, based on the determination at the network connected device acting as the tuner server, with a transmission bandwidth based on the parameter values for the past network connection.

[16a] The network connected device of claim 15, wherein the one or more processors are configurable to: send the parameter values for determination of bandwidth, from the first endpoint device, to the tuner server that is configured to receive further parameter values for determination of bandwidth of network connections from a plurality of endpoint devices;

[16b] send, from the first endpoint device to the tuner server, connection information for the next network connection, wherein the tuner server performs the determining and derives one or more parameter values for the transmission bandwidth; and

[16c] receive, at the first endpoint device, from the tuner server, the one or more parameter values for the transmission bandwidth.

17. The network connected device of claim 15, wherein the initiating is executed by the first endpoint device and wherein the first endpoint device is contained within the network connected device.

18. The network connected device of claim 15, wherein the determining and the initiating are executed external to the first endpoint device and communicated to the first endpoint device.

19. The method of claim 15, further comprising the network connected device configurable to: monitor network traffic between the first endpoint device

and the second endpoint device; and adjust the transmission bandwidth based on the monitoring.

20. The network connected device of claim 15, further comprising the network connected device configurable to: monitor network traffic between the first endpoint device and the second endpoint device; transmit data associated with the network traffic from the first endpoint to the network connected device; determine, at the network connected device, an adjustment to the transmission bandwidth is desired; receive data for adjusting the transmission bandwidth from the network connected device; and adjust the transmission bandwidth responsive to the receiving.

CERTIFICATE OF SERVICE

The undersigned hereby certifies that on January 30, 2025, true and correct copies of the foregoing Petition for *Inter Partes* Review of U.S. Patent No. 10,944,634 and Exhibits 1001-1012 were served in entirety on the Patent Owner at the following addresses of record as listed on PAIR, via Priority Mail Express®:

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The undersigned certifies that true and correct copies of the Petition for *Inter Partes* Review of U.S. Patent No. 10,944,634 and Exhibits 1001-1012 were also sent via electronic mail to the attorneys of record for Plaintiff in the concurrent litigation matter(s):

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**CERTIFICATE OF COMPLIANCE WITH
TYPE-VOLUME LIMITATION, TYPEFACE REQUIREMENTS,
AND TYPE STYLE REQUIREMENTS**

1. This Petition complies with the type-volume limitation of 14,000 words, comprising 13,779 words, as counted using the Microsoft Word software that was used to prepare this paper, excluding the parts exempted by 37 C.F.R. § 42.24(a).

2. This Petition complies with the general format requirements of 37 C.F.R. § 42.6(a) and has been prepared using Microsoft® Word in 14-point Times New Roman.

Respectfully submitted,

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