

UNITED STATES PATENT AND TRADEMARK OFFICE

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BEFORE THE PATENT TRIAL AND APPEAL BOARD

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RED HAT, INC.  
Petitioner

v.

COMPETITIVE ACCESS SYSTEMS, INC.  
Patent Owner

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Case No. IPR2025-01373  
U.S. Patent No. 7,606,156

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**DECLARATION OF DR. STAN MCCLELLAN IN SUPPORT OF PATENT  
OWNER PRELIMINARY RESPONSE**

Competitive Access Systems EX2015  
Red Hat, Inc. v. Competitive Access  
Systems, Inc.  
IPR2025-01373

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I, Dr. Stan McClellan, hereby declare as follows:

**I. Background**

1. I have been retained by Patent Owner Competitive Access Systems, Inc. ("CAS") to provide my opinions in the above-captioned *inter partes* review ("IPR") proceeding involving U.S. Patent No. 7,606,156 (the "'156 Patent," EX1015), which is titled "Residential Communications Gateway (RCG) for Broadband Communications Over a Plurality of Standard POTS Lines, with Dynamic Allocation of Said Bandwidth, that Requires No Additional Equipment or Modifications to the Associated Class 5 Offices or the PTSN At Large." I have been asked to evaluate whether certain references disclose or suggest the features recited in Claims 1-5 of the '156 Patent (the "Challenged Claims"). I understand this declaration will be entered in the above-captioned IPR proceeding, as an exhibit with Patent Owner's Preliminary Response to the Petition for Inter Partes Review (the "Preliminary Response") submitted by CAS.

2. In addition to being retained in the present matter, I was also retained to provide my opinions as to the validity of the claims of U.S. Patent No. 8,228,801 (the "'801 Patent"), 8,861,349 (the "'349 Patent"), 9,350,649 (the "'649 Patent"), 10,868,908 (the "'908 Patent"), 11,418,641 (the "'641 Patent"), and 11,582,343 (the "'343 Patent"), which are each continuations of the '156 Patent. I have and/or will

submit declarations as part of the '801 Patent, '349 Patent, '649 Patent, '908 Patent, '641 Patent, and '343 Patent IPR proceedings.

## **II. Qualifications**

3. I current serve as the Director of the JSC Engineering, Technology and Science Program (JETS) at Texas State University, a partnership with Jacobs Technology Group and NASA's Johnson Space Center (JSC). Previously, I held the following positions at Texas State:

- a. Professor in the Ingram School of Engineering from 2013-2023;
- b. Co-Director of the Connected Infrastructure initiative for Education, Demonstration, and Research (CIEDAR) from 2019 to 2023;
- c. Director of the Ingram School of Engineering from 2013 to 2018;
- d. Associate Director of the Ingram School of Engineering from 2011 to 2013; and
- e. Associate Professor in the Ingram School of Engineering from 2008 to 2013.

4. My research activities at Texas State have involved the development and management of FCC-licensed private 5G and LTE wireless networks, and the management of a regional LoRaWAN wireless network for low-rate, real-time data collection in multiple projects at CIEDAR. During my time as a Professor, I

developed performance enhancements for Internet transport protocols and packet handling based on signal processing and machine learning algorithms, and designed a multi-building "5G-capable" core network to support multiple faculty re-search projects as well as academic priorities. During my time as an Associate Professor, I investigated various Smart Grid systems and advanced technologies for broadband networking (e.g. 40/100Gb Ethernet), developed novel PHY layer for low-frequency communication via power lines, and developed performance enhancements for IP transport protocols.

5. I have prior academic experience as an Associate Professor of Electrical and Computer Engineering at the University of Alabama at Birmingham from 1995 to 2002.

6. I also have technical experience from my time in the private sector. I previously held executive or senior engineering positions at companies including Power Tagging Technologies, ZNYX Networks, SBE, Hewlett Packard, General Dynamics and LTV Aerospace and Defense Company. I have also served as a technical consultant for companies such as Cisco, American Express, 3COM, BellSouth, N.E.T., Alcatel, AT&T, Research in Motion (RIM), F5 Networks, LSU Medical Center, and the U.S. National Science Foundation.

7. I have published dozens of books and peer-reviewed research papers in this field, and have given numerous related technical talks world-wide. I am a named

inventor on fourteen patents and have served as a technical expert witness in numerous patent litigation cases.

8. I received my Ph.D. from Texas A&M University (1995) in Electrical Engineering with a specialization in communication and data processing. I received a M.S. in Electrical Engineering (1991) and a B.S. in Electrical Engineering (1986), both from Texas A&M as well.

9. My qualifications and experience are detailed further in my Curriculum Vitae, which is EX2016.

### **III. Compensation**

10. I am being compensated at the rate of \$350 per hour for the work I conduct related to this proceeding. My compensation does not depend on the content of my opinions or the outcome of the proceeding.

### **IV. Materials Considered**

11. In providing the testimony set out in this declaration, I have reviewed the specification and claims of the '156 Patent, the file history of the '156 Patent, Red Hat's Petition for Inter Partes Review of the '156 Patent (the "Petition"), and the prior art, declarations, and other documents attached to the Petition.

### **V. Legal Principles**

12. I am not an attorney and offer no legal opinions. In forming my opinions, I have been informed by counsel about certain aspects of the law that are relevant to my analysis. My understanding of these principles is summarized below.

13. I understand that in patent law a patent's claims define the scope of protection for the claimed invention.

14. I understand that the first step in an invalidity analysis involves construing the claims, as necessary, to determine their scope. I have also been informed by counsel that claims are generally given their ordinary and custom meaning as understood by a person of ordinary skill in the art ("POSITA") at the time of the invention, in light of the patent's claims, specification and file history. I have additionally been informed by counsel that claim construction is a matter of law and that the final claim constructions for this proceeding will be determined by the Patent Trial and Appeal Board ("PTAB").

15. I understand that the validity of a patent's claims is determined on a claim-by-claim basis.

16. I understand that in this proceeding, Petitioner has the burden of proving that the challenged claims would have been unpatentable over the prior art by a preponderance of the evidence.

17. Ground 1 of the Petition argues that claims 1-5 of the '156 Patent should be invalidated as disclosed or rendered obvious by the "Challener" prior art reference in view of the "Ades" prior art reference. As pertinent to my analysis, these references are described further below.

18. Ground 2 of the Petition argues that claims 1-5 of the '156 Patent should be invalidated as disclosed or rendered obvious by the "Kotzin" prior art reference alone or in combination with the "Ades" prior art reference. As pertinent to my analysis, these references are described further below.

19. I understand that a claim is unpatentable as anticipated if a single prior art reference teaches each limitation of the claim.

20. I understand that a claim is unpatentable as obvious if the differences between the claimed subject matter and the prior art are such that the subject matter, as a whole, would have been obvious to a POSITA at the time of the invention.

21. I understand that the question of obviousness is resolved based on underlying factual determinations, including: (1) the scope and content of the prior art; (2) any differences between the claimed subject matter and the prior art; (3) the level of ordinary skill in the art; and (4) objective evidence of non-obviousness.

22. I further understand that for each of its obviousness grounds, Petitioner must demonstrate a POSITA would have: (1) a motivation to combine the relevant references and (2) a reasonable expectation of success of developing the claimed invention.

23. In forming my opinions, I have applied the understanding of one of ordinary skill in the art working at the time of the invention claimed in the '156 Patent, i.e., prior to January 2001. In my opinion, a person of ordinary skill in the

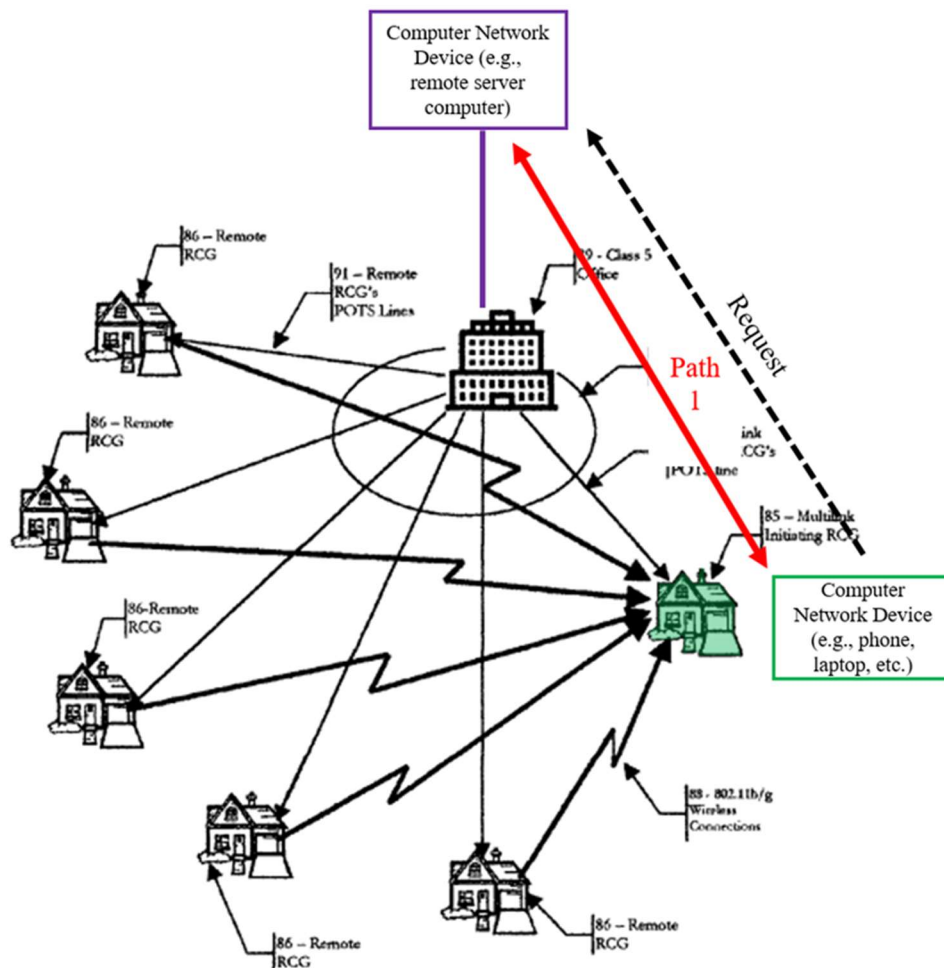
art at this time would have an acquired body of knowledge gained through formal education, or practical experience providing an equivalent to, a Bachelor of Science in Electrical Engineering or Computer Science, or a related/equivalent field, and at least 3 years of work experience in the field of computer networking. I understand that the date of conception of the '156 Patent may be contested. My identification as to the level of skill of the person of ordinary skill in the art would not vary between the date of the conception or the October 15, 2002 filing date of Provisional Application No. 60/418,521.

## **VI. Overview of the '156 Patent and the Invention Claimed in the '156 Patent**

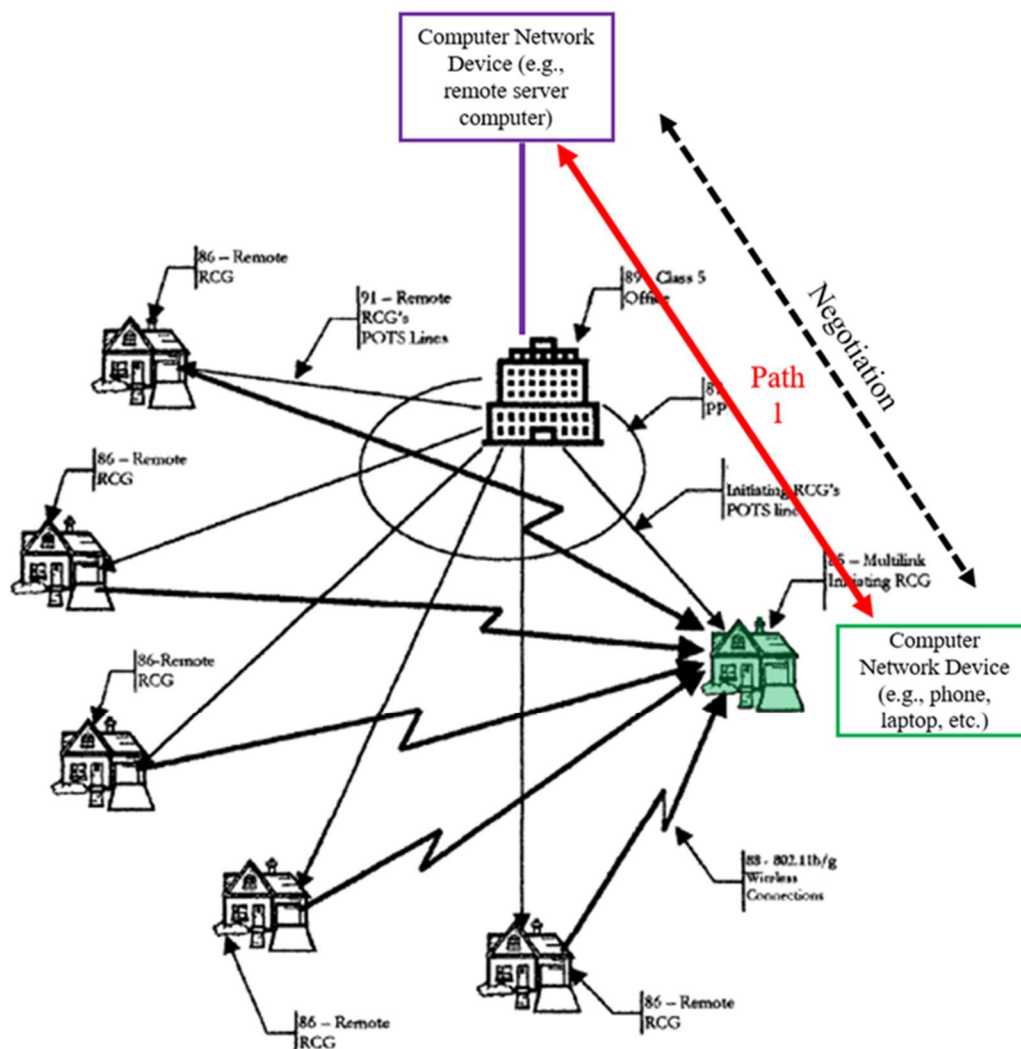
24. The '156 Patent pertains to devices and methods to improve the effective bandwidth between a remote sending device (e.g., a server) and a receiving device by leveraging the bandwidth of at least two separate communication paths to receive the data sent from a remote device.

25. Although specific claims or claim limitations may be directed to only certain aspects of the configuration or to separate, but related embodiments, Figure 7 of the specification of the '156 Patent shows an example network configuration.

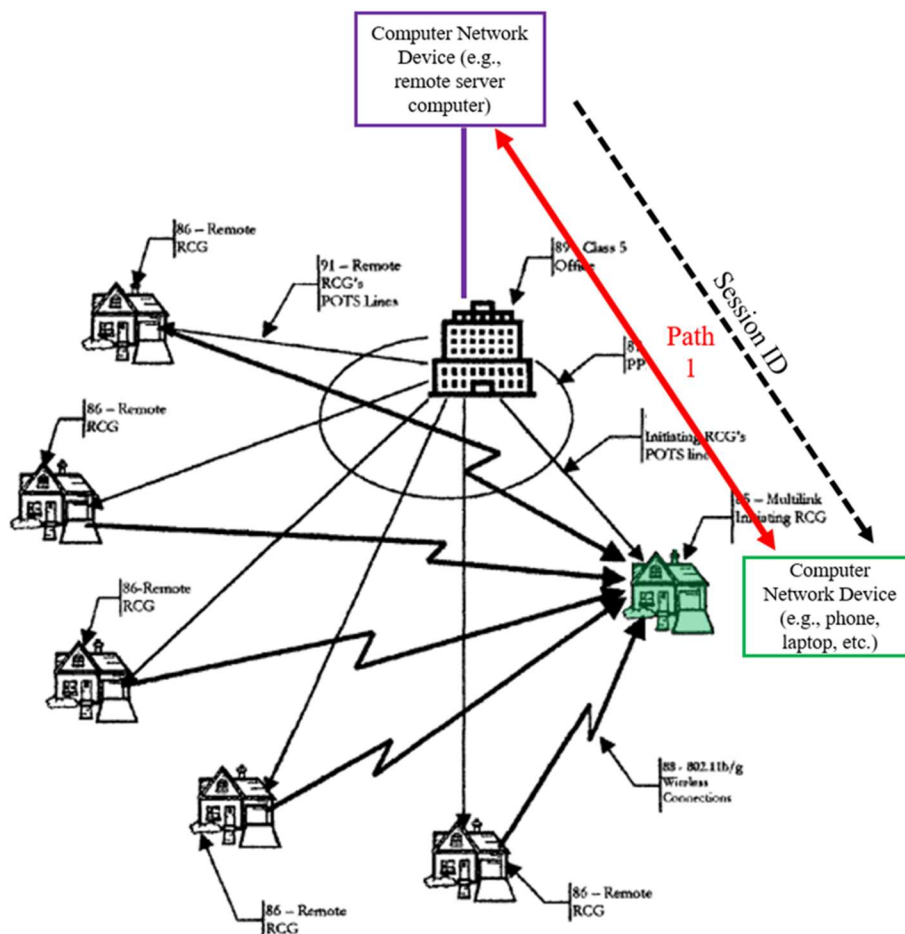
26. In this configuration, a request is sent from a computer network device (e.g., phone, laptop, server, etc.) over a first path (e.g., Path 1) to another computer network device, such as, for example, a remote server computer, for participation in a multilink session. To this end, as depicted and annotated below, the specification states: "Referring to FIG. 7, an RCG-85 that decides to initiate a multilink PPP session with a remote computer i.e. internet URL, requests a multilink PPP session with that URL resource via Link Control Protocol (LCP) session management[.]" EX1015 at 12:5–9.



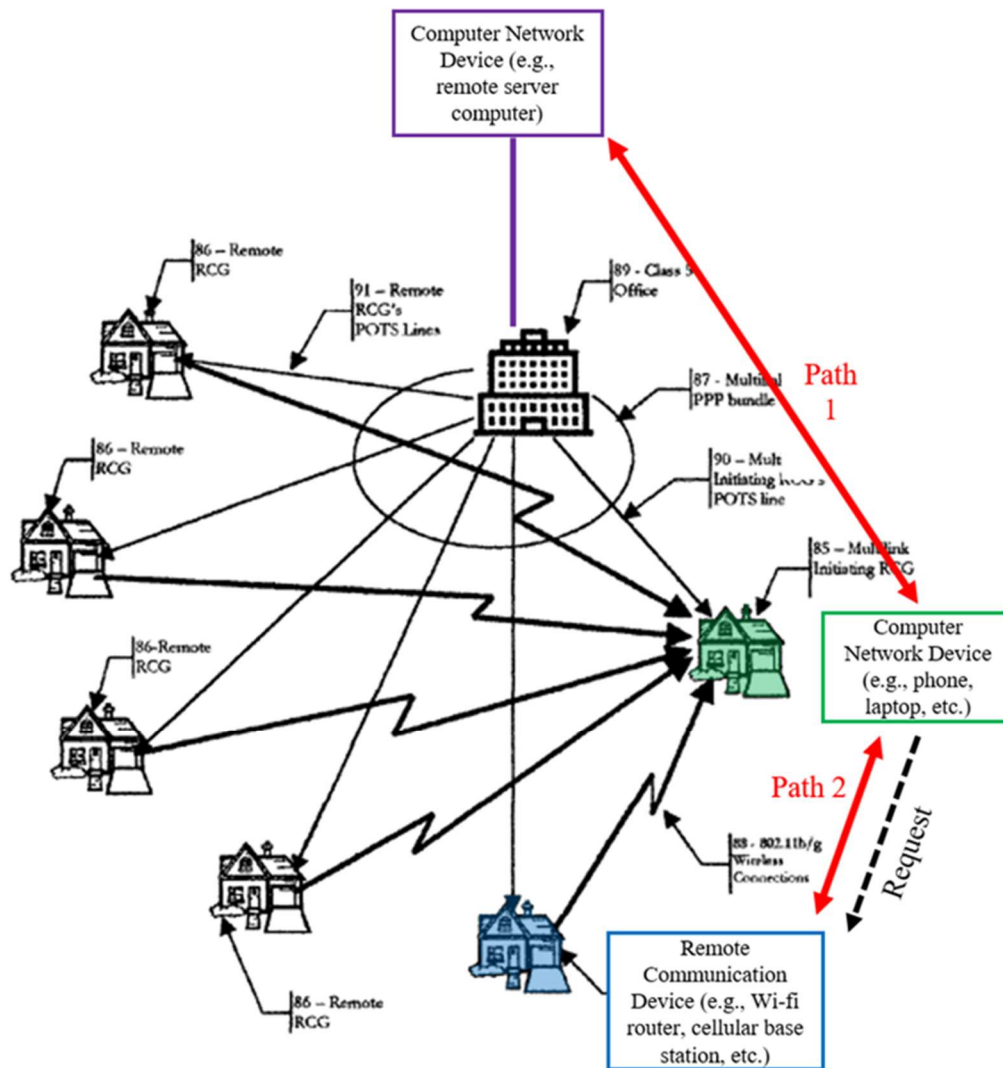
27. The two devices negotiate the pertinent multilink parameters. For example here, as depicted and annotated below, the specification states: "The initiating RCG-85 and the remote server computer (not shown) will negotiate the pertinent multilink parameters such as compression, packet size, sync/async, link quality monitoring, bit stuffing etc." EX1015 at 12:9–12.



28. The multilink session setup is completed including that the remote server computer sends a multilink session ID to the computer network device (e.g., phone, laptop, etc.), which is used to identify this particular multilink session and is also used for adding or removing links from the multilink session. As is also depicted and annotated below, the specification states: "As part of a successful multilink PPP session setup, the initiating RCG-85 receives a multilink PPP session ID, or "magic number", which is used to identify this particular multilink PPP session and is also used for adding or removing links from the multilink bundle-87." EX1015 at 12:12–16.

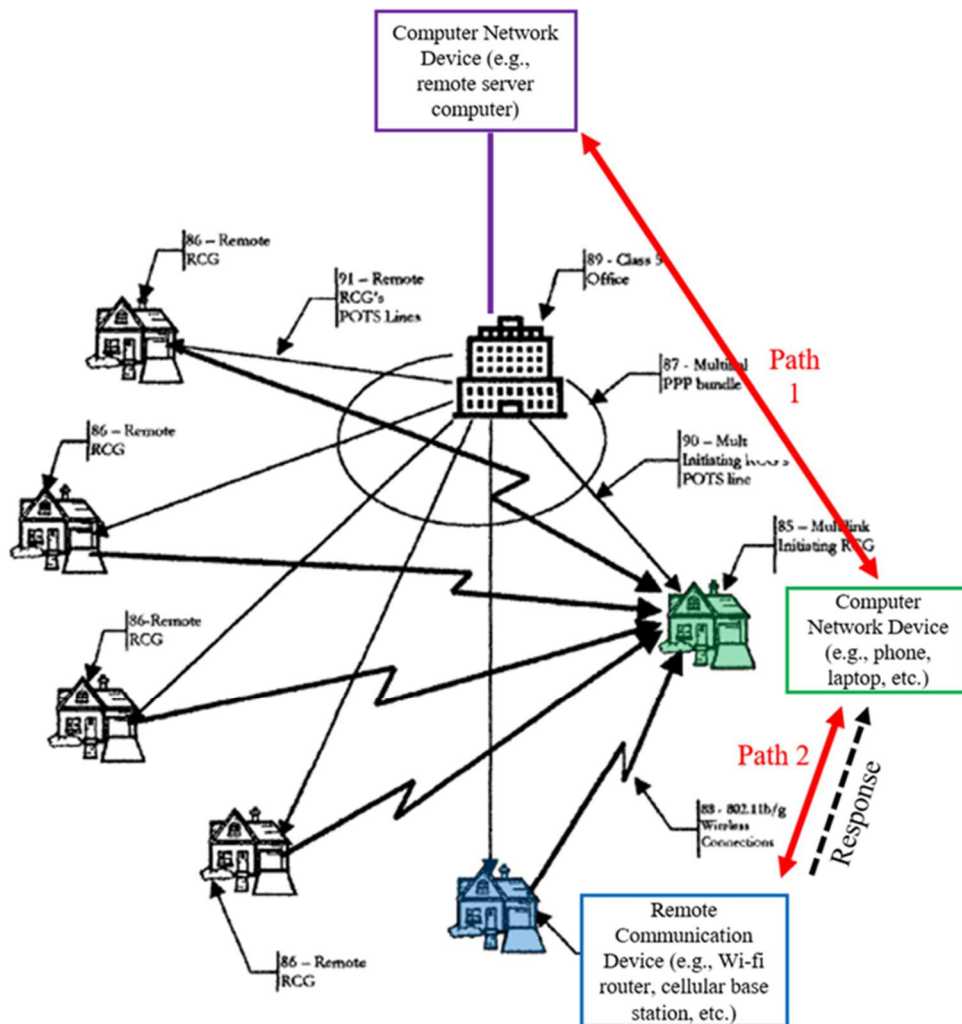


29. The computer network device (e.g., phone, laptop, server etc.) then sends a multilink request over a second path (e.g., Path 2) to one or more remote communications devices such as, for example, a router or base station to participate in the multilink session. As is relevant here, and as depicted and annotated below, the specification states: "The initiating RCG-85 then looks up the addresses of up to 31 (in this embodiment) other RCGs in its router tables to use for the multilink PPP transfer. (If a Neighborhood Access Point is available the RCG could request service through it instead of setting up a Multilink PPP connection—see FIG. 8.) The initiating RCG-85 determines the number of remote RCGs-86 that it wants to use to get the desired bandwidth for the transfer and sends multilink PPP service requests via the 802.11b/g wireless connections-88 to the selected remote RCGs-86." EX1015 at 12:19–28.



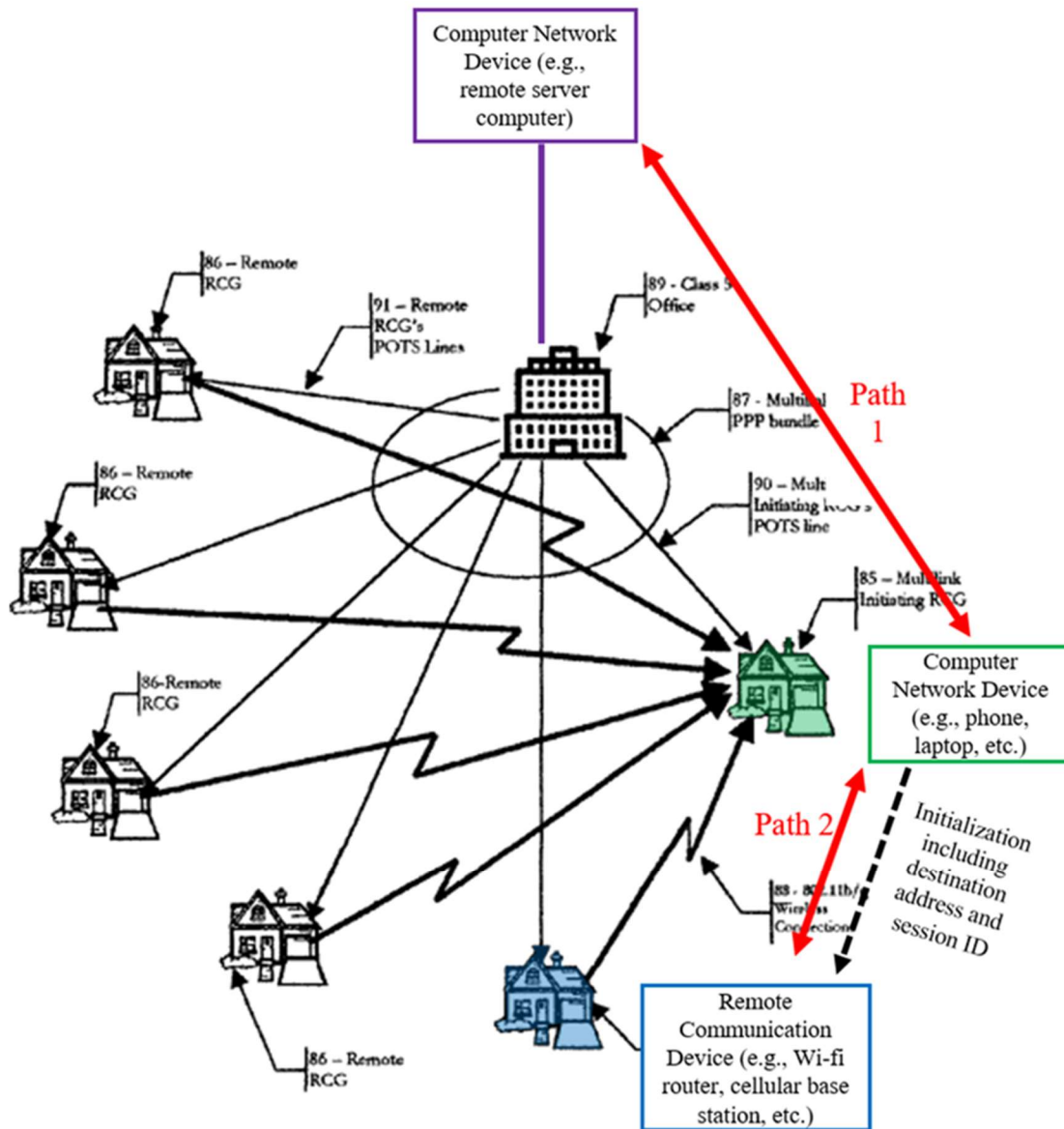
30. The remote communications devices respond back to the computer network device (e.g., phone, laptop, etc.) with acceptance or denial. For example, as depicted and annotated below, the specification states: "The selected remote RCGs-86 respond back to the initiating RCG with either an acceptance or denial of multilink PPP service request. This decision is made based upon the remote RCG's currently available POTS bandwidth and the current local demands for that bandwidth. The remote RCG-86 makes a decision to participate in a multilink PPP

service for an initiating RCG .... If the remote RCG-86 accepts the multilink PPP service request from the initiating RCG-85 it also sends its currently available bandwidth on its POTS line-91 that the initiating RCG-85 will have available to it for the multilink PPP transfers." EX1015 at 12:28 –34; 12:48–52.



31. The computer network device (e.g., phone, laptop, server, etc.) sends a multilink initialization packet containing the address of the destination as well as the multilink session ID (magic number) and any other pertinent information required

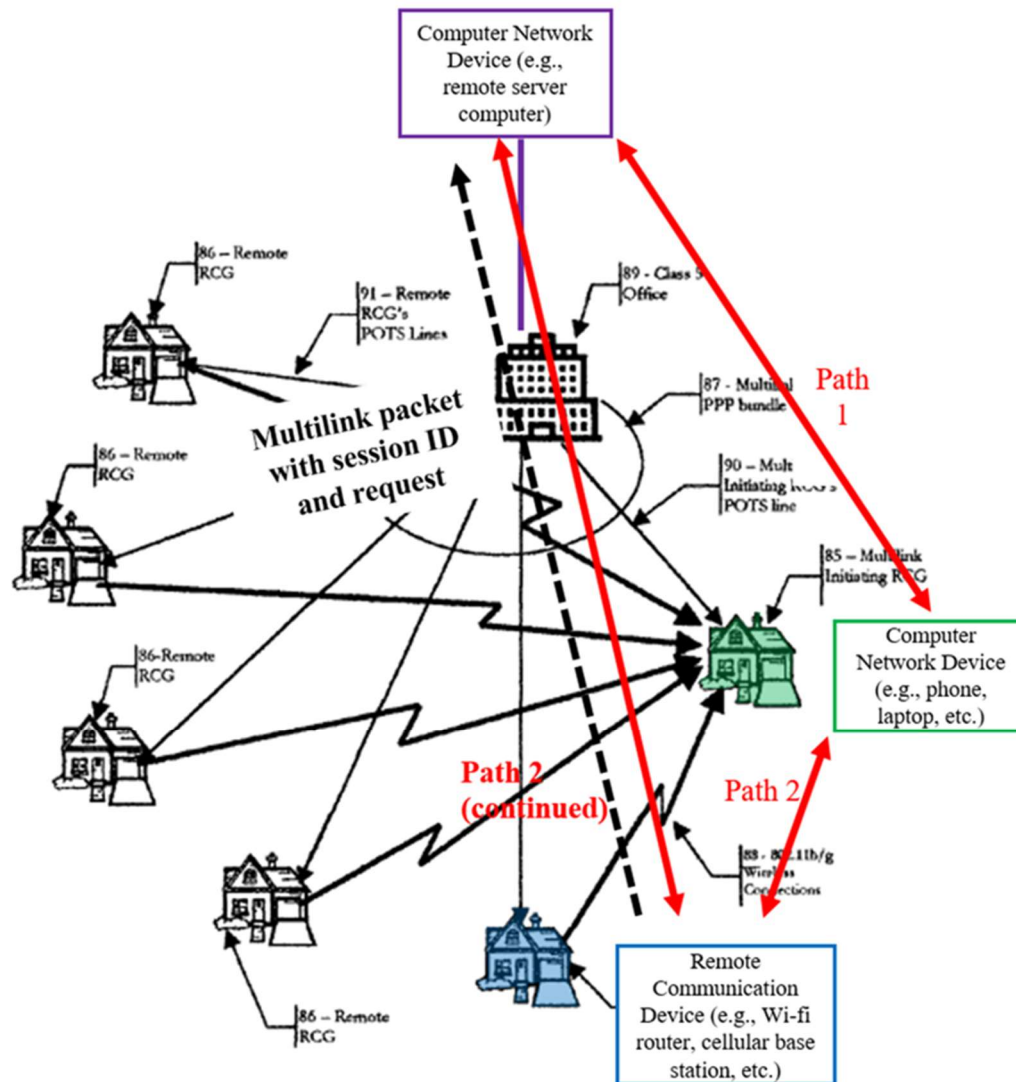
for the remote communications device to join in the existing multilink session. Here, as depicted and annotated below, the specification states: "The initiating RCG then selects which of the responding remote RCGs-86 it will use for the multilink PPP bundle-87 and sends them a multilink initialization packet containing the URL of the destination as well as the multilink PPP session ID (magic number) and any other pertinent information required for the remote RCG to join in the existing multilink PPP bundle-87. Each remote RCG POTS interface-91 participating in a multilink PPP bundle, represents a logical "link" in the initiating RCG's multilink PPP bundle-87." EX1015 at 12:52–60.



32. Each of the participating remote communications devices sends a multilink packet to the remote server computer with the multilink session ID and requests to be added to the multilink session. For example, as depicted and annotated below, the specification states: "The remote RCGs-86 then send a multilink PPP packet (over their respective POTS lines-91) to the destination URL with the

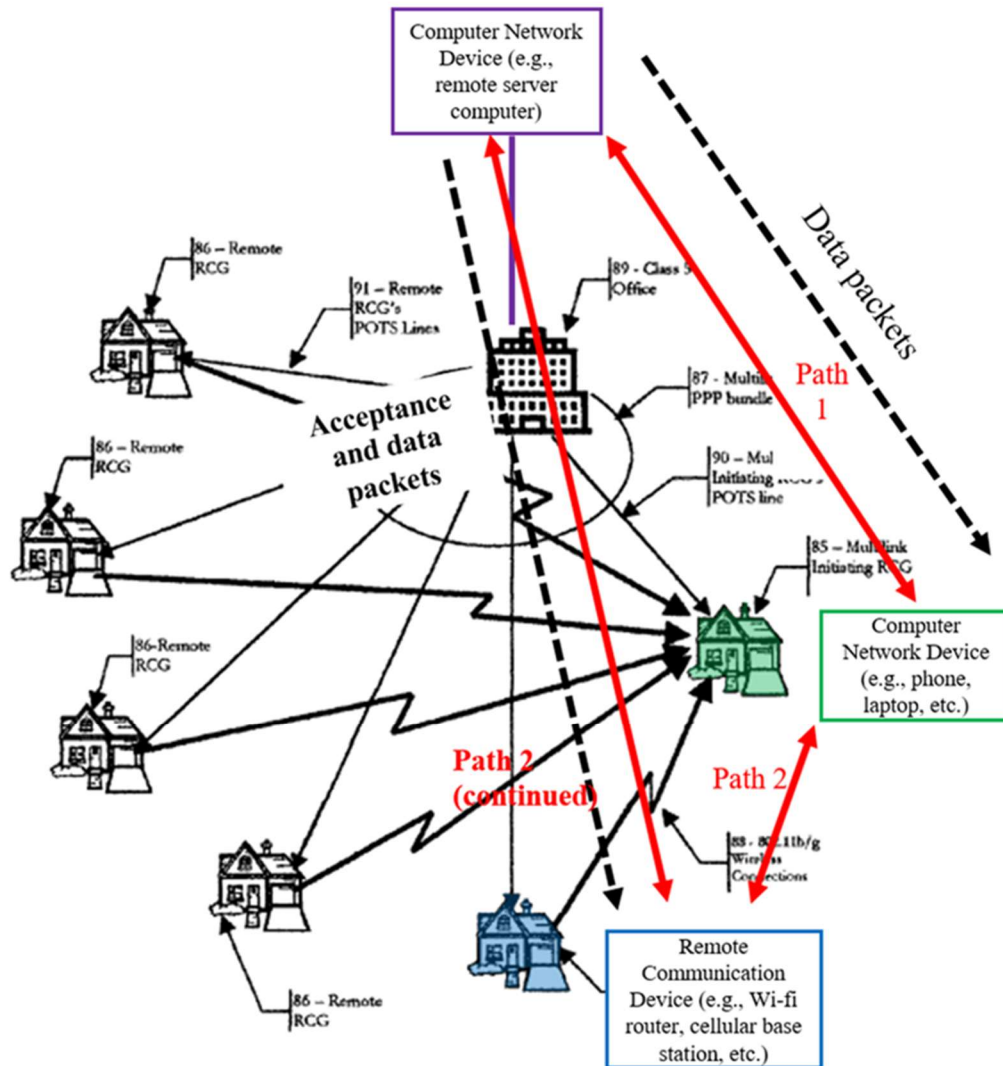
multilink PPP session ID and request to be added to that multilink PPP bundle-87."

EX1015 at 12:61-64.



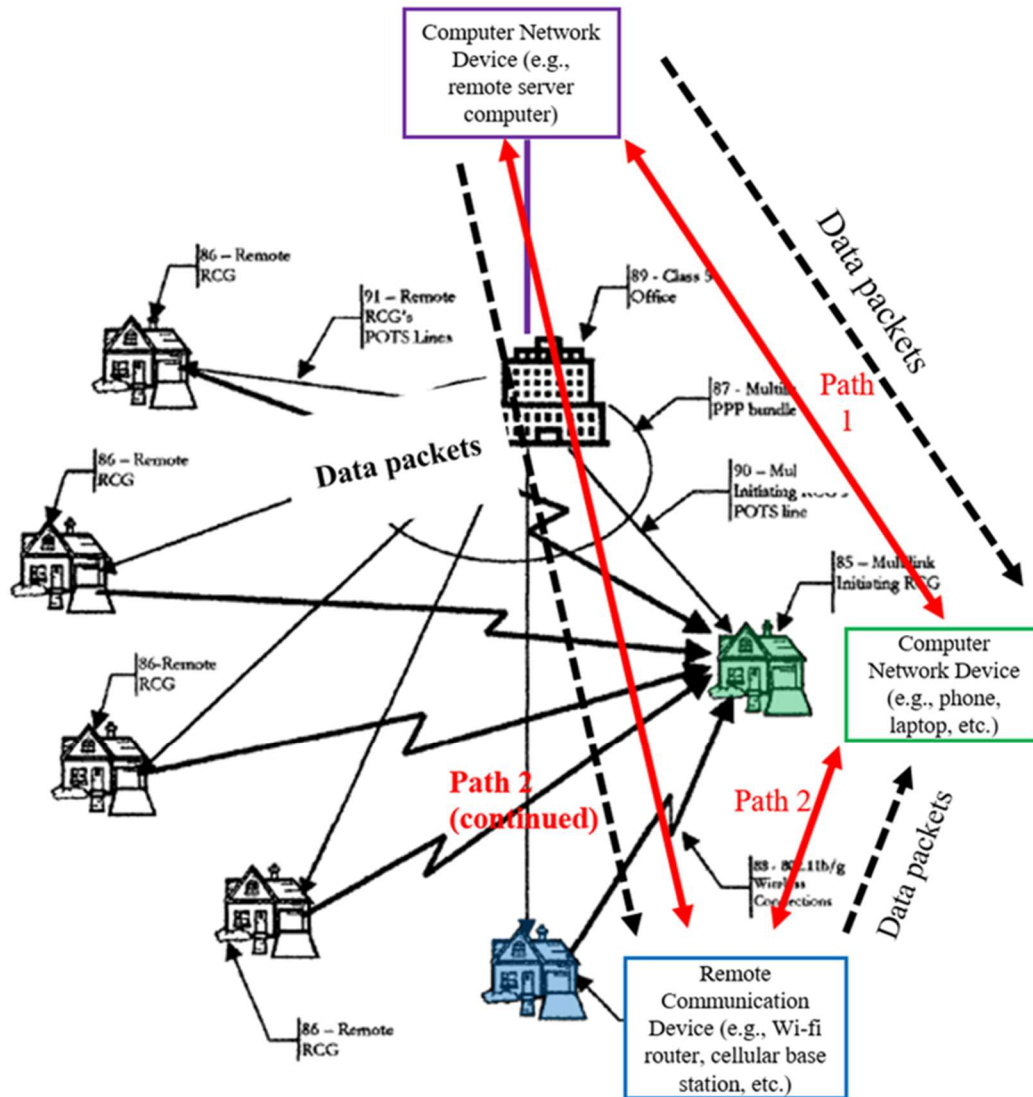
33. The remote server computer accepts the request and begins sending data packets to each of the remote communications devices over their respective paths or links. As an example, as depicted and annotated below, the specification states: "The destination URL accepts the request of each of the remote RCGs-86 and

begins sending data packets to each over their respective POTS lines-91." EX1015 at 12:64-66.



34. The remote communications device relays the data packets to the computer network device (e.g., phone, laptop, etc.). In this instance, as depicted and annotated below, the specification states: "When the remote RCGs-86 receive data packets sent over their respective POTS lines-91, that are destined for the multilink

PPP bundle-87, they simply relay the data packets over their 802.11b/g interface-88 to the initiating RCG-85." EX1015 at 12:67–13:3.



35. The use of the additional links as claimed in the '156 Patent thus results in increased bandwidth, data throughput, quality of service, and/or connection reliability. For example, as explained in the specification: "An RCG that is transferring a very large file can request the services of 31 (in this embodiment) other

RCGs to assist in the file transfer using their respective POTS lines. A single RCG can therefore gain the combined bandwidth of up to 32 POTS lines transferring data at as much as 56 Kbps each to transfer information. This is roughly equivalent to a transfer rate of 1.79 Mbps in the inbound direction (towards the RCG) and approximately 1.075 Mbps in the outbound direction (towards the PSTN)." EX1015 at 11:50–59.

36. The claims of the '156 Patent are limited to particular configuration and/or operation of computer network devices involved in an exchange of data designed to enable technological improvements such as increasing bandwidth, data throughput, quality of service, and/or connection reliability.

37. Specifically, claim 1 of the '156 Patent recites the following:

A method for aggregating, sharing and dynamically routing and allocating bandwidth from a plurality of wired and wireless networks that are geographically disbursed over a wide area, and providing some or all of the aggregated bandwidth to any user on an on-demand basis, the method comprising the steps of:

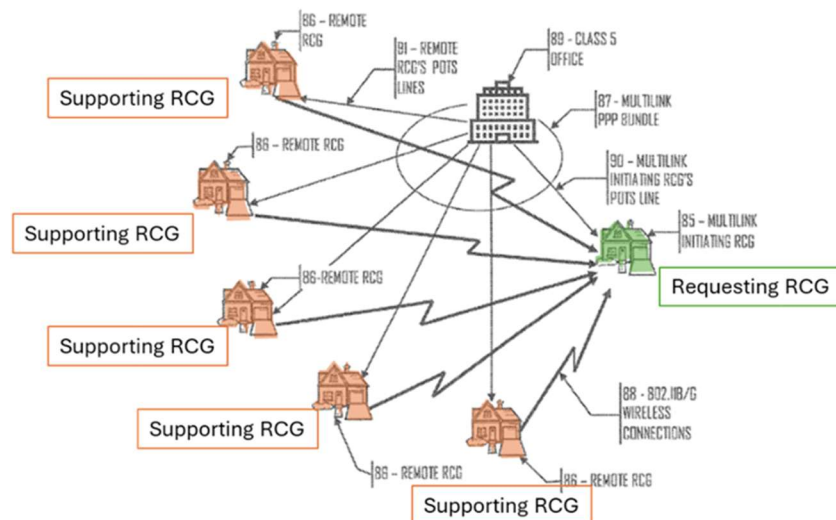
developing and updating a network table that comprises a list of nearby RCGs, their bandwidth capabilities over local, remote and wireless connections, and their location with respect to a requesting RCG;

determining an optimum amount of bandwidth needed for an immediate data transfer needs of the requesting RCG;

determining which of the nearby RCGs should be contacted for access to unused bandwidth to support a transfer of the requesting RCG, based upon their unused local bandwidth capacity, and a distance and a number of hops between the RCGs and the requesting RCG;

relinquishing the bandwidth of each of the selected RCGs.

38. Using Figure 7 as an exemplary, non-exclusive example, this claimed configuration can be depicted as shown below:



39. The inventions recited in the claims of the '156 Patent and its family members also improve upon the prior art. The typical and representative prior art configurations and computer network device operations involved in exchanging data included the following: a Plain Old Telephone Service ("POTS") lines, cable lines, or DSL lines to connect two computer network devices.

40. The problems with the prior art configurations and methods included low bandwidth, data throughput, quality of service, and reliability and substantial costs.

41. For example, as highlighted in the specification, DSL and cable lines require tremendous infrastructure costs, suffer from high costs associated with purchase, installation, and maintenance, required expensive modems at the customer's end, were difficult to deploy, were too complicated for the average user, and were not available to many customers. EX1015 at 2:11–18 ("DSL or Cable services [] require tremendous infrastructure costs on behalf of the CLEC."); *id.* at 2:26–50 ("The high-speed services require expensive infrastructure enhancements to the local telephone companies' facilities and cable plants, as well as expensive modems at the customer's end ...").

42. As another example, POTS lines had very limited bandwidth. *See also* EX1015 at 10:61–11:22 ("... standard POTS lines can only guarantee a maximum of 56 Kbps transfer rate under the best conditions ... DSL, however, suffers from

the very high costs associated with the purchase, installation, maintenance, floor lease costs, etc. ...").

43. In addition, prior art configurations and methods also suffered from poor quality of service. EX1015 at 2:33–37 ("Internet based VoIP services suffer from Internet delays caused by a lack of true Quality of Service (QOS) capabilities across the Internet.").

## **VII. The Prior Art**

### **A. Challenger**

44. U.S. Patent Application Publication No. 2004/0001512 A1 ("Challenger") (EX1017) discloses a method and apparatus for sharing bandwidth among a plurality of end users to increase the bandwidth available to each user as depicted in its Figure 2.

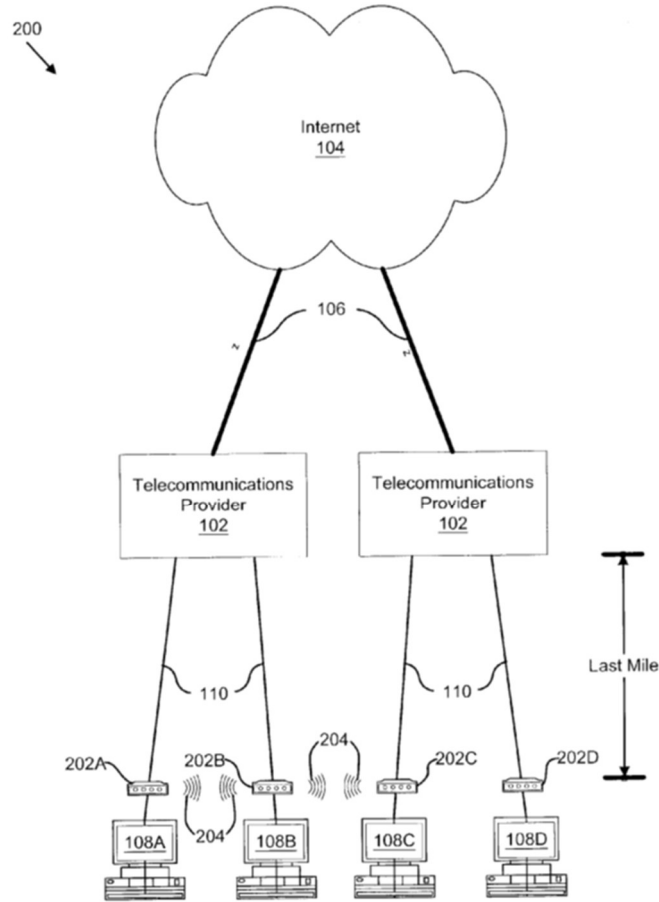


Fig. 2

EX1017 at FIG. 2.

45. Challenger also discloses the following sequence by which data is sent from a remote site through at least two bandwidth sharing devices (one device acting as a master device and the other acting as slave device) in its Figure 7.

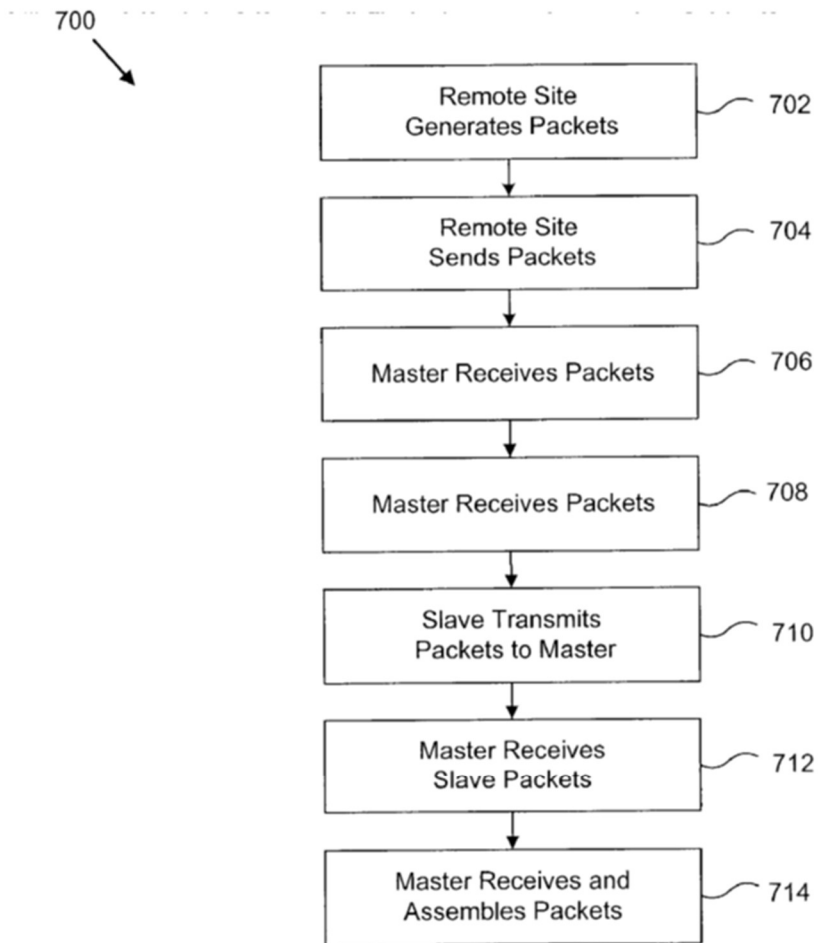
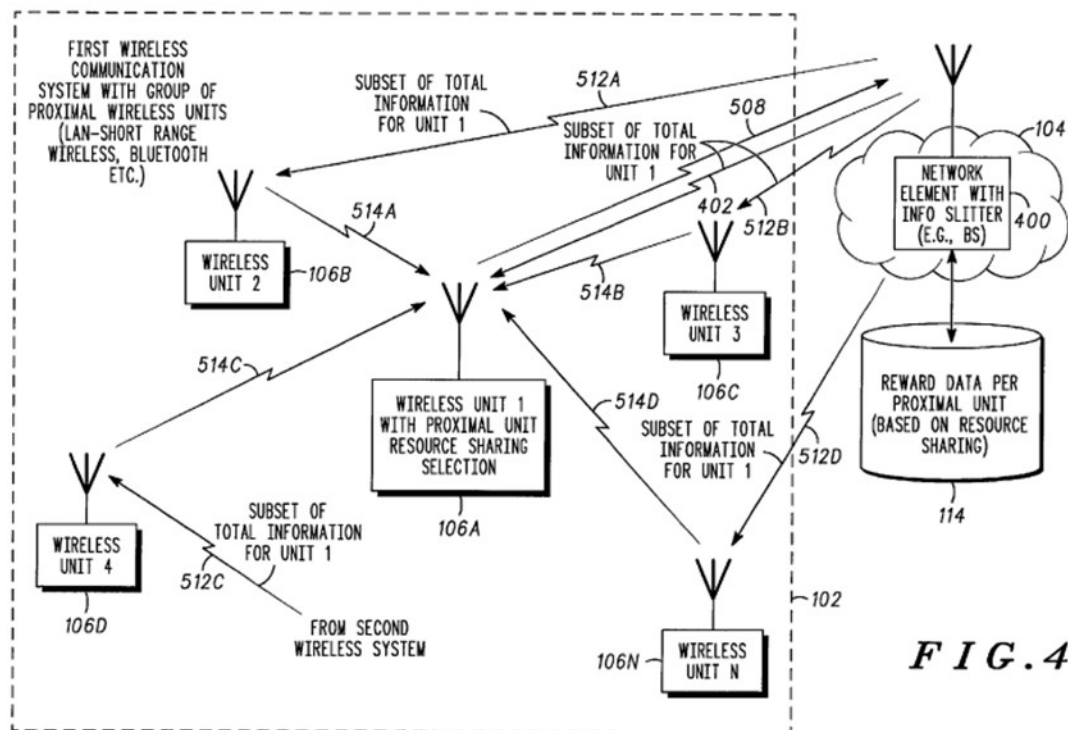


Fig. 7

EX1017 at FIG. 7.

## B. Kotzin

46. U.S. Patent Application Publication No. 2003/0026221 ("Kotzin") (EX1018) discloses "[a] method and apparatus splits information into subsets of information to be communicated for a wireless apparatus." EX1018 at Abstract.



EX1018 at FIG. 4.

47. Kotzin also discloses in its Figure 5 the following sequence by which participation of wireless units are requested and the data is sent from the network communication system through the multiple wireless units to the recipient wireless unit.

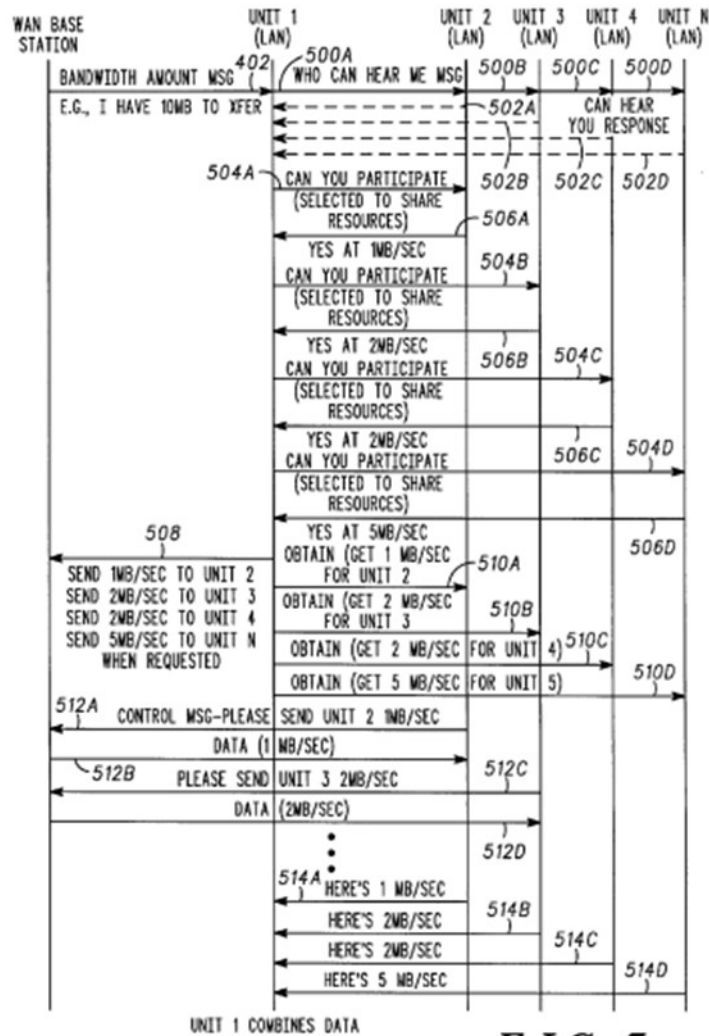


**FIG. 5**

EX1018 at FIG. 5.

## VIII. Opinions on Ground 1 (Challenger in View of Ades)

48. Addressing claim 1, limitation [1.3], I understand Red Hat to assert that Challenger teaches determining which nearby RCGs to contact "based upon their unused local bandwidth capacity, and a distance and a number of hops." Challenger provides no support for such a determination. Instead, Challenger discusses "detecting the availability of any and all other last mile telecommunications lines 110 that are

connected to operational bandwidth sharing devices" and does not discuss considering distance or number of hops when determining bandwidth sharing (EX1017 ¶[0047]).

49. A person of ordinary skill would recognize that Challener's system would not base determinations on distance or the number of hops. Challener's wireless communications occur between devices that are "immediately adjacent" and communicate on a single wireless domain; all devices are separated by one hop or one network link. This is evident at least from Challener's Fig. 2 which does not indicate the presence of a network structure (e.g. as in Internet 104) between devices 202A and 202B or 202B and 202C which are "nearby" [0038].

50. Challener repeatedly indicates that connections between the master and slave BSDs are direct, for example: "master bandwidth sharing device wirelessly communicates with slave bandwidth sharing devices" (EX1017 Abstract); "Through wireless communications, the master device detects other bandwidth sharing devices" (EX1017 ¶[0020]); "bandwidth sharing performs all functions necessary ... using wireless transmission techniques" (EX1017 ¶[0021]); and "releases the wireless connection between the master and slave devices" (EX1017 ¶[0022]). See also EX1017 ¶¶[0012], [0014], [0038], [0039], [0042], [0044], [0052], [0053], [0056], [0061], [0063], [0066], Figs. 2, 5, and Claims 1, 3, 11, 12, 20, 21, 22, 23.

51. Accordingly, it is my opinion that Challenger does not disclose the hop/distance-based determination required by limitation [1.3].

52. Regarding claim 1, limitation [1.7] ("contacting the selected RCGs with control information for sending data to the requesting RCG"), Red Hat cites Challenger's statements that "[t]he operations of the slave devices are determined by the commands from the master device" and that "the logic unit [is] capable of controlling a sharing of available bandwidth" (EX1017 ¶[0017]; Claim 21).

53. In Challenger, each slave device simply relays data between the master and a remote node in an architecture where each master/slave connection is "appended" to a separate, end-to-end session between the slave and the remote node. Figures 6 and 7 concisely depict slaves "receiving" (606, 708 [sic]) and "sending" (608, 710) packets. Because the slaves are already offering spare bandwidth to the master device making the request, the master does not need to distribute independent "control information" (e.g., destination or session parameters) to coordinate participation by separate, independent remote devices.

54. For these reasons, Challenger in view of Ades fails to disclose or render obvious the contacting-with-control-information requirement of limitation [1.7], and Ground 1 does not demonstrate each limitation of claim 1.

## **IX. Opinions on Ground 2 (Kotzin Alone or in Combination with Ades)**

55. Addressing claim 1, limitation [1.3], Red Hat relies on Kotzin's use of query messages to determine which wireless apparatuses are within range.

56. In my opinion, Kotzin does not disclose considering the number of hops when determining bandwidth sharing as required by limitation [1.3].

57. Accordingly, Kotzin does not disclose the claimed hop/distance-based determination.

58. Regarding claim 1, limitation [1.10] ("relinquishing the bandwidth of each of the selected RCGs"), Red Hat acknowledges Kotzin does not discuss relinquishing bandwidth of each selected wireless unit (Units 2–N in Figure 5) but argues that session-based, on-demand sharing implies relinquishment.

59. Technically, Kotzin's entire process is open-loop and participatory. Recruitment of Units 2–N is voluntary, and Unit 1 performs a double-sided "confirmation" to the WAN (508) and to participants (510) (see EX1018 Claims 3, 6: "notifying the wide area network" for "facilitating communication" and "sending to each participating wireless unit").

60. Actual data transmission is set up by participants independently confirming directly to the WAN (512) their participation. Even if confirmations are contained in other messages (e.g., 508, 510), units are not required to transmit the final confirmation (e.g., 512A leading to the actual transfer at 512B). The subsequent

round (e.g., 514) would continue using established connections between Units 2–N and the WAN system.

61. Notably, Kotzin never discusses managing or monitoring status or quality of communications between the WAN and participating units. Instead, Kotzin merely mentions "obtain a complete communication" (e.g. Claim 3, 6) which does not appear to mean anything other than "swallow the designated amount of data" with the next steps completely unspecified.

62. If the transfer was "too lengthy" some of the units would likely "get busy" and need to disconnect. Kotzin is silent on this aspect, just as he is silent on the "optimization" aspect if there is too much or too little bandwidth.

63. It is therefore my opinion that Kotzin does not disclose a "relinquishment" process, and Kotzin alone or in combination with Ades fails to disclose or render obvious the relinquishment-of-bandwidth requirement of claim 1.

I declare under penalty of perjury that the foregoing is true and correct.

Executed this 6<sup>th</sup> day of November, 2025.

By Dr. Stan McClellan: 