IN THE UNITED STATES DISTRICT COURT
FOR THE EASTERN DISTRICT OF TEXAS
MARSHALL DIVISION

DALI WIRELESS, INC., Plaintiff, v. T-MOBILE US, INC., T-MOBILE USA, INC., ERICSSON INC., TELEFONAKTIEBOLAGET LM ERICSSON, COMMSCOPE HOLDING COMPANY, INC., COMMSCOPE INC., and COMMSCOPE TECHNOLOGIES LLC, Defendants.	)	Case No. 2:22cv414 **JURY TRIAL DEMANDED**

COMPLAINT

Plaintiff Dali Wireless, Inc. ("Dali") files this Complaint against Defendants T-Mobile US, Inc. and T-Mobile USA, Inc. (collectively, "T-Mobile"), Ericsson Inc., Telefonaktiebolaget LM Ericsson (collectively, "Ericsson"), CommScope Holding Company, Inc., CommScope, Inc., and CommScope Technologies LLC (collectively, "CommScope").

NATURE OF THE CASE

1. This is an action for the infringement of seven United States Patents: (1) United States Patent No. 10,750,382 (the "'382 patent"), attached as Exhibit 1, (2) United States Patent No. 9,197,358 (the "'358 patent"), attached as Exhibit 2, (3) United States Patent No. 11,026,232 (the "'232 patent"), attached as Exhibit 3, (4) United States Patent No. 10,334,499 (the "'499 patent"), attached as Exhibit 4, (5) United States Patent No. 8,682,338 (the "'338 patent"), attached as Exhibit 5, (6) United States Patent No. 11,006,343 (the "'343 patent"), attached as Exhibit 6, and (7) United States Patent No. 9,820,171 (the "'171 patent"), attached as Exhibit 7, collectively

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T-Mobile Ex. 1048

referred to as the "Patents-in-Suit."

2. T-Mobile and CommScope have been infringing the '382 patent in violation of 35 U.S.C. § 271 by deploying, operating, maintaining, testing, and using T-Mobile's LTE and 5G networks which include equipment relating to small cell wireless solutions, such as CommScope's ION®-E/ERA platform.[1]

3. T-Mobile and Ericsson have been infringing the '382 patent in violation of 35 U.S.C. § 271 by deploying, operating, maintaining, testing, and using T-Mobile's LTE and 5G networks which include small cell wireless solutions such as Ericsson's Radio Dot System.

4. T-Mobile and CommScope have been infringing the '358 patent in violation of 35 U.S.C. § 271 by deploying, operating, maintaining, testing, and using T-Mobile's LTE and 5G networks which include equipment relating to small cell wireless solutions, such as CommScope's OneCell product.

5. T-Mobile and CommScope have been infringing the '232 patent in violation of 35 U.S.C. § 271 by deploying, operating, maintaining, testing, and using T-Mobile's LTE and 5G networks which include small cell wireless solutions such as CommScope's ION®-E/ERA platform.

6. T-Mobile and Ericsson have been infringing the '232 patent in violation of 35 U.S.C. § 271 by deploying, operating, maintaining, testing, and using T-Mobile's LTE and 5G networks which include small cell wireless solutions such as Ericsson's Radio Dot System.

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[1] According to publicly available documents from CommScope, ION®-E and ERA share the same hardware modules, system software, and management systems: "ERA is an extension of the hardware and software architecture that CommScope originally introduced as ION-E. Going forward, all new systems are ERA. Since ION-E and ERA share the same hardware modules, system software and management systems, existing ION-E systems can be updated and expanded using ERA components." https://www.commscope.com/product-type/in-building-cellular-systems/distributed-antenna-systems-das/era/ (last visited October 4, 2022).

7. T-Mobile and CommScope have been infringing the ’499 patent in violation of 35 U.S.C. § 271 by deploying, operating, maintaining, testing, and using T-Mobile’s LTE and 5G networks which include small cell wireless solutions such as CommScope’s ION®-E/ERA platform.

8. T-Mobile and CommScope have been infringing the ’343 patent in violation of 35 U.S.C. § 271 by deploying, operating, maintaining, testing, and using T-Mobile’s LTE and 5G networks which include small cell wireless solutions such as CommScope’s ION®-E/ERA platform.

9. T-Mobile and Ericsson have been infringing the ’499 patent in violation of 35 U.S.C. § 271 by deploying, operating, maintaining, testing, and using T-Mobile’s LTE and 5G networks which include small cell wireless solutions such as Ericsson’s Radio Dot System.

10. T-Mobile and Ericsson have been infringing the ’338 patent in violation of 35 U.S.C. § 271 by deploying, operating, maintaining, testing, and using T-Mobile’s LTE and 5G networks which include small cell wireless solutions such as Ericsson’s Radio Dot System.

11. T-Mobile and Ericsson have been infringing the ’343 patent in violation of 35 U.S.C. § 271 by deploying, operating, maintaining, testing, and using T-Mobile’s LTE and 5G networks which include Ericsson’s Radio Dot System.

12. T-Mobile and Ericsson have been infringing the ’171 patent in violation of 35 U.S.C. § 271 by deploying, operating, maintaining, testing, and using T-Mobile’s LTE and 5G networks which include small cell wireless solutions such as Ericsson’s Radio Dot System.

13. Plaintiff Dali seeks appropriate damages, injunctive relief, and prejudgment and post-judgment interest for Defendants’ infringement of the Patents-in-Suit.

THE PARTIES

14. Plaintiff Dali is a Delaware corporation having its center of operations in Burnaby,

British Columbia, Canada, where all its technical and financial employees, documents, engineering, and product development are based. It also has an address in Menlo Park, California for forwarding of domestic mail and telephone calls to its center of operations.

15. Founded in 2006, Dali began as a designer and manufacturer of power amplifiers used in radio frequency ("RF") communications. Dali is known within the industry as an innovator in providing end-to-end, software defined digital radio distribution solutions that can be implemented in Distributed Antenna Systems ("DAS") used for cellular, public safety, and other RF communications. Dali is a world-wide innovator in digital radio distribution systems and digital predistortion technology that revolutionized in-building and outdoor wireless coverage and capacity. Dali's groundbreaking products have been consistently recognized by industry publications. For example, Dali has been recognized as a "Hot Tech Innovator" by ABI Research and was ranked No. 1 in innovation in the ABI Research report, "In-Building Wireless, DAS Vendor Competitive Assessment." Dali's systems improve upon traditional DAS by allowing the dynamic allocation of wireless coverage and capacity.

16. Defendant T-Mobile US, Inc. is a Delaware corporation with its principal place of business at 12920 SE 38th Street, Bellevue, WA 98006.

17. Defendant T-Mobile USA, Inc. is a Delaware corporation with its principal place of business at 12920 SE 38th Street, Bellevue, WA 98006. On information and belief, T-Mobile USA, Inc. is a wholly owned subsidiary of T-Mobile US, Inc.

18. On information and belief, T-Mobile's operations in the Eastern District of Texas are substantial and varied.

19. T-Mobile operates one or more wireless telecommunications networks to provide wireless telecommunications services, including within the Eastern District of Texas, under brand

names including "T-Mobile."

20. T-Mobile advertises that its 4G LTE and 5G Nationwide networks are available within the Eastern District of Texas. *See Coverage Check*, T-Mobile, https://www.t-mobile.com/coverage/coverage-map (last visited October 4, 2022).

21. T-Mobile maintains multiple facilities in the Eastern District of Texas, including at least T-Mobile retail stores located at 900 E. End Blvd N #100B, Marshall, TX 75670; and 1806 E. End Blvd. Ste. 100, Marshall, TX 75670. *See T-Mobile Store Locator*, T-Mobile, http://t-mobile.com/store-locator (last visited October 4, 2022).

22. On information and belief, T-Mobile USA, Inc. also maintains and operates research and development facilities at 7668 Warren Parkway, Frisco, TX 75034.

23. In other recent actions, T-Mobile has either admitted or not contested that this federal judicial district is a proper venue for patent infringement actions against it. *See, e.g.,* Answer to First Amended Complaint, at 2-3, ¶¶ 7-10, *Fractus, S.A. v. T-Mobile Mobility LLC et al.*, No. 2:18-cv-00135-JRG (E.D. Tex. Dec. 13, 2018); Answer at 2, ¶¶ 4, 5, *Preferential Networks IP, LLC v. T-Mobile US, Inc. et al.*, No. 2:17-cv-00626 (E.D. Tex. Nov. 01, 2017), ECF No. 17; Answer ¶¶ 4, 5, *Traxcell Techs., LLC v. T-Mobile, USA, Inc.*, No. 2:17-cv-00720 (E.D. Tex. Jan. 23, 2018), ECF No. 8; Answer ¶¶ 5, 6, *Kevique Tech., LLC v. T-Mobile USA, Inc.*, No. 2:17-cv-00095 (E.D. Tex. Apr. 11, 2017), ECF No. 10. Defendant T-Mobile USA, Inc. has also admitted or failed to contest that it has transacted business in this district. *See Preferential Networks* at Answer at 2, ¶ 4; *Traxcell Techs.* at Answer ¶ 2; *Kevique Tech.* at Answer ¶¶ 5, 6. *See also Answer ¶¶ 19, 20, Mobile Synergy Sols., LLC v. T-Mobile US, Inc. et al.,* No. 6:16-cv-01223 (E.D. Tex. Feb. 13, 2017), ECF No. 47.

24. By registering to conduct business in Texas and by maintaining facilities in at least

the cities of Marshall and Frisco, T-Mobile has multiple regular and established places of business within the Eastern District of Texas.

25. Defendant CommScope Holding Company, Inc. is a corporation organized and existing under the laws of the State of Delaware, with a place of business at 1100 CommScope Place, SE, Hickory, North Carolina 28602, and can be served through its registered agent, Corporation Service Company, 251 Little Falls Drive, Wilmington, DE 19808.

26. Defendant CommScope Technologies LLC is a limited liability company organized and existing under the laws of the State of Delaware with a principal place of business at 1100 CommScope Place SE, Hickory, North Carolina, 28602. On information and belief, CommScope Technologies LLC is a wholly owned subsidiary of CommScope Holding Company.

27. Defendant CommScope Inc. is a corporation organized and existing under the laws of the State of Delaware, and can be served through its registered agent, United Agent Group Inc., 3411 Silverside Road Tatnall Building #104, Wilmington, DE 19810. On information and belief, CommScope Inc. is a wholly owned subsidiary of CommScope Holding Company.

28. On information and belief, CommScope Technologies LLC, CommScope Inc., and CommScope Holding Company, Inc. operate in the ordinary course of business as a single combined "CommScope" company.

29. On information and belief, CommScope is doing business, either directly or through its agents, on an ongoing basis in this judicial district and has a regular and established place of business in this judicial district. For example, CommScope maintains and offers the CommScope web domain (www.commscope.com) that advertises the accused products and directs customers and/or potential customers in this district as to where to purchase those products.

30. CommScope has admitted in this Court that it "has a regular and established

physical place of business in the Eastern District of Texas."[2] CommScope Inc. maintains a regular and established place of business at 2601 Telecom Parkway, Richardson, Texas 75082, located within this District, that contains employees and/or other individuals that the CommScope Defendants direct or control. This office is a physical place within the district and is CommScope's regular and established place of business.

31. On information and belief, CommScope also has major customers with locations in Texas and this District, including, for example, T-Mobile.

32. Ericsson Inc. is a Delaware corporation with its principal place of business at 6300 Legacy Drive, Plano, Texas 75024.

33. Telefonaktiebolaget LM Ericsson, the parent corporation of Ericsson Inc., is a company organized under the laws of Sweden with its principal place of business at Torshamsgatan 23, Kista, 164 83 Stockholm, Sweden.

34. Ericsson Inc. maintains a significant physical presence in this judicial district. Ericsson Inc.'s headquarters is located at 6300 Legacy Drive, Plano, Texas 75024, which is within this judicial district. On information and belief, Ericsson Inc. is wholly-owned and controlled by Telefonaktiebolaget LM Ericsson and acts as the agent for Telefonaktiebolaget LM Ericsson in making sales, servicing equipment, and otherwise carrying out the operations of Telefonaktiebolaget LM Ericsson in North America. Telefonaktiebolaget LM Ericsson and/or its

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[2] *See SIPCO, LLC v. CommScope Holding Co.*, No. 5:20-CV-00168-RWS-CMC, ECF No. 48 (Amended Complaint) ¶ 24 (E.D. Tex. May 21, 2021) ("Plaintiff is informed and believes, and on that basis alleges, that CommScope has a regular and established physical place of business in the Eastern District of Texas, including at 2601 Telecom Parkway, Richardson Texas 70852 . . . ."); *id.* ECF No. 50 (CommScope's Answer) ¶ 24 (E.D. Tex. June 7, 2021) ("Admitted."); *see also Barkan Wireless IP Holdings, L.P. v. Sprint Corp.*, No. 2:19-CV-00336-JRG, ECF No. 46 (Answer to Amended Complaint) ¶ 16 (E.D. Tex. Jan. 21, 2020) ("CommScope admits that it has a regular and established place of business in this judicial district at 2601 Telecom Parkway, Richardson, Texas 70852.").

affiliates manufacture wireless telecommunications equipment and then arrange with Ericsson Inc. to import those products into the United States for installation in T-Mobile's network. Upon information and belief, representatives of Telefonaktiebolaget LM Ericsson regularly visit this district in their supervisory capacity over Ericsson Inc. At all times relevant hereto, Ericsson Inc. was acting as the agent of Telefonaktiebolaget LM Ericsson.

35. On information and belief, CommScope also has major customers with locations in Texas and this District, including, for example, T-Mobile.

JURISDICTION AND VENUE

36. This is an action for patent infringement arising under the Patent Laws of the United States, Title 35 of the United States Code.

37. This Court has original subject matter jurisdiction under 28 U.S.C. §§ 1331 and 1338(a).

38. This Court has personal jurisdiction over T-Mobile because, *inter alia*, T-Mobile has a continuous presence in, and systematic contact with, this District and has registered to conduct business in the state of Texas.

39. T-Mobile has committed and continues to commit acts of infringement of Dali's Patents-in-Suit in violation of the United States Patent Laws, and has used infringing products within this District. T-Mobile's infringement has caused substantial injury to Dali, including within this District.

40. This Court has personal jurisdiction over CommScope because, *inter alia,* CommScope has a continuous presence in, and systematic contact with, this District and has registered to conduct business in the state of Texas. Moreover, CommScope has also acceded to

this Court's jurisdiction in prior patent cases.[3]

41. CommScope has committed and continues to commit acts of infringement of Dali's Patents-in-Suit in violation of the United States Patent Laws, and has used and sold infringing products within this District. CommScope's infringement has caused substantial injury to Dali, including within this District.

42. This Court has personal jurisdiction over Ericsson because, *inter alia,* Ericsson has a continuous presence in, and systematic contact with, this District and has registered to conduct business in the state of Texas.

43. Ericsson has committed and continues to commit acts of infringement of Dali's Patents-in-Suit in violation of the United States Patent Laws, and has used and sold infringing products within this District. Ericsson's infringement has caused substantial injury to Dali, including within this District.

44. Joinder of T-Mobile, CommScope, and Ericsson in this action is proper under 35 U.S.C. § 299(a). Dali's right to relief against T-Mobile, CommScope, and Ericsson for their infringement of the Patents-in-Suit arises out of the same series of transactions or occurrences, namely their cooperation in planning, developing, testing, operating, and maintaining T-Mobile's Long Term Evolution ("LTE") and 5G networks. No claim is made in this complaint against CommScope in relation to its products or services sold to other wireless carriers.

45. Venue is proper in this judicial district. All of the relevant defendants reside in this

[3] *See, e.g.*, *SIPCO, LLC v. CommScope Holding Co.*, No. 5:20-CV-00168-RWS-CMC, ECF No. 50 (Answer to First Amended Complaint) ¶ 24 (E.D. Tex. June 7, 2021) ("Defendants, for purposes of this case only, will not challenge personal jurisdiction in the Eastern District of Texas."); *see also, e.g., Barkan Wireless IP Holdings, L.P. v. Sprint Corp.*, No. 2:19-CV-00336-JRG, ECF No. 46 (Answer to Amended Complaint) ¶ 14 (E.D. Tex. Jan. 21, 2020) ("For the purposes of this action only, CommScope does not challenge the Court's personal jurisdiction over CommScope.").

judicial district within the meaning of 28 U.S.C. § 1400(b). T-Mobile, CommScope, and Ericsson have committed acts of infringement within this district and have regular and established places of business here.

THE PATENTS-IN-SUIT

46. The ’382 patent is titled “Optimization of Traffic Load in a Distributed Antenna System” and was issued by the United States Patent and Trademark Office to inventors Shawn Patrick Stapleton and Seyed Amin Hejazi on August 18, 2020, and assigned to Dali.

47. Dali is the owner of all right, title, and interest in and to the ’382 patent with the full and exclusive right to bring suit to enforce the ’382 patent.

48. The ’382 patent is valid and enforceable under the United States Patent Laws.

49. The ’358 patent is titled “Method and System for Soft Frequency Reuse in a Distributed Antenna System” and was issued by the United States Patent and Trademark Office to inventors Seyed Amin Hejazi and Shawn Patrick Stapleton on November 24, 2015, and assigned to Dali.

50. Dali is the owner of all right, title, and interest in and to the ’358 patent with the full and exclusive right to bring suit to enforce the ’358 patent.

51. The ’358 patent is valid and enforceable under the United States Patent Laws.

52. The ’232 patent is titled “Remotely Reconfigurable Distributed Antenna System and Methods” and was issued by the United States Patent and Trademark Office to inventors Paul Lemson, Shawn Patrick Stapleton, Sasa Trajkovic, and Albert S. Lee on June 1, 2021, and assigned to Dali.

53. Dali is the owner of all right, title, and interest in and to the ’232 patent with the full and exclusive right to bring suit to enforce the ’232 patent.

54. The ’232 patent is valid and enforceable under the United States Patent Laws.

55. The ’499 patent is titled “Distributed Antenna System” and was issued by the United States Patent and Trademark Office to inventors Shawn Patrick Stapleton, Paul Lemson, Bin Lin, and Albert S. Lee on June 25, 2019, and assigned to Dali.

56. Dali is the owner of all right, title, and interest in and to the ’499 patent with the full and exclusive right to bring suit to enforce the ’499 patent.

57. The ’499 patent is valid and enforceable under the United States Patent Laws.

58. The ’338 patent is titled “Remotely Reconfigurable Distributed Antenna System and Methods” and was issued by the United States Patent and Trademark Office to inventors Paul Lemson, Shawn Patrick Stapleton, Sasa Trajkovic, and Albert S. Lee on March 25, 2014, and assigned to Dali.

59. Dali is the owner of all right, title, and interest in and to the ’338 patent with the full and exclusive right to bring suit to enforce the ’338 patent.

60. The ’338 patent is valid and enforceable under the United States Patent Laws.

61. The ’343 patent is titled “Distributed Antenna System” and was issued by the United States Patent and Trademark Office to inventors Shawn Patrick Stapleton, Paul Lemson, Bin Lin, and Albert S. Lee on May 11, 2021, and assigned to Dali.

62. Dali is the owner of all right, title, and interest in and to the ’343 patent with the full and exclusive right to bring suit to enforce the ’343 patent.

63. The ’171 patent is valid and enforceable under the United States Patent Laws.

64. The ’171 patent is titled “Remotely Reconfigurable Distributed Antenna System and Methods” and was issued by the United States Patent and Trademark Office to inventors Paul Lemson, Shawn Patrick Stapleton, Sasa Trajkovic, and Albert S. Lee on November 14, 2017, and

assigned to Dali.

65. Dali is the owner of all right, title, and interest in and to the '171 patent with the full and exclusive right to bring suit to enforce the '171 patent.

66. The '171 patent is valid and enforceable under the United States Patent Laws.

FIRST CAUSE OF ACTION
(PATENT INFRINGEMENT UNDER 35 U.S.C. § 271 OF THE '382 PATENT BY T-MOBILE AND COMMSCOPE)

67. Dali re-alleges and incorporates by reference all of the foregoing paragraphs.

68. On information and belief, T-Mobile and CommScope have infringed and continue to infringe, either literally or under the doctrine of equivalents, one or more claims, including at least claim 1, of the '382 patent in violation of 35 U.S.C. § 271, et seq., directly and/or indirectly, by deploying, operating, maintaining, testing, and using T-Mobile's LTE and 5G networks which include solutions for in-building wireless coverage, such as CommScope's ION®-E/ERA platform.[4]

69. Claim 1 of the '382 patent provides:

> [Preamble] A system comprising:
>
> [1A] one or more Digital Access Units (DAUs) operable to receive at least one signal from at least one of a first signal source and a second signal source from one or more of a plurality of signal sources, each DAU of the one of more DAUs including an input port configured as an uplink/downlink port and an output port configured as an uplink/downlink port;
>
> [1B] one or more Digital Remote Units (DRUs) connectable to the one or more DAUs and operable to transport signals between one or more of the one or more DRUs and the one or more DAUs;

[4] *See e.g.,* https://howmobileworks.com/wp-content/uploads/2021/06/tmo-byoc-case-study-space-needle-110420.pdf (last visited October 4, 2022) ("T-Mobile designed a unified wireless infrastructure architecture, based on the CommScope ION-E solution, to streamline deployment and minimize equipment needs").

> [1C] a plurality of radio resources formed from the one or more DRUs comprising a first radio resource and a second radio resource different from the first radio resource, each radio resource comprising a subset of the plurality of DRUs; and
>
> [1D] a traffic monitoring unit coupled to at least one of the DAUs, wherein the traffic monitoring unit is configured to:
>
> [1D-1] determine one or more of: one or more key performance indicators (KPIs) and/or a quality of service (QoS) of a network traffic for the one or more DAUs, wherein the QoS is a function of the one or more KPIs; and
>
> [1D-2] reconfigure the plurality of radio resources based on one or more of the one or more KPIs and/or the QoS by allocating at least one DRU from the first radio resource to the second radio resource.

70. On information and belief, T-Mobile's LTE and 5G networks, which include CommScope's ION®-E/ERA platform, satisfy each and every element recited in at least claim 1 of the '382 patent as stated below.

71. On information and belief, T-Mobile's LTE and 5G networks, which include CommScope's ION®-E/ERA platform, meet the preamble of claim 1 of the '382 patent. The preamble of claim 1 refers to "[a] system comprising."

72. For example, CommScope's ION®-E/ERA system provides an "all-digital in-building wireless solution."[5]

73. On information and belief, T-Mobile's LTE and 5G networks, which include CommScope's ION®-E/ERA platform, meet element [1A] of claim 1 of the '382 patent. Element [1A] requires, "one or more Digital Access Units (DAUs) operable to receive at least one signal from at least one of a first signal source and a second signal source from one or more of a plurality of signal sources, each DAU of the one of more DAUs including an input port configured as an

[5] https://www.commscope.com/product-type/in-building-cellular-systems/distributed-antenna-systems-das/era/ (last visited October 4, 2022).

uplink/downlink port and an output port configured as an uplink/downlink port . . .".

74. For example, CommScope's ION®-E/ERA platform includes a "wide-area integration node (WIN)" and "central area node (CAN)," which "digitizes baseband RF signals, combines signals from different operators and distributes them throughout a building or campus."[6] Accordingly, T-Mobile's LTE and 5G networks, which include CommScope's ION®-E/ERA platform, include one or more DAUs operable to receive at least one signal from at least one of a first signal source and a second signal source from one or more of a plurality of signal sources.

75. Further, CommScope's ION®-E/ERA platform includes a "CPRI digital donor (CDD)" module that "receives CPRI digital signals from compatible operator baseband units (BBU)," as well as a "RF donor (RFD) card" that "receives analog RF signals from operator base transceiver stations."[7] CommScope's ION®-E/ERA platform also includes an optical (OPT) and copper (CPT) transport cards" which interface to the transport extension node (TEN) and/or radio access points.[8] Thus, T-Mobile's LTE and 5G networks, which include CommScope's ION®-E/ERA platform, include one or more DAUs, where each DAU includes an input port configured as an uplink/downlink port and an output port configured as an uplink/downlink port.

76. On information and belief, T-Mobile's LTE and 5G networks, which include CommScope's ION®-E/ERA platform, meet element [1B] of claim 1 of the '382 patent. Element [1B] requires, "one or more Digital Remote Units (DRUs) connectable to the one or more DAUs and operable to transport signals between one or more of the one or more DRUs and the one or more DAUs."

77. For example, CommScope's ION®-E/ERA platform includes "[a] range of remote

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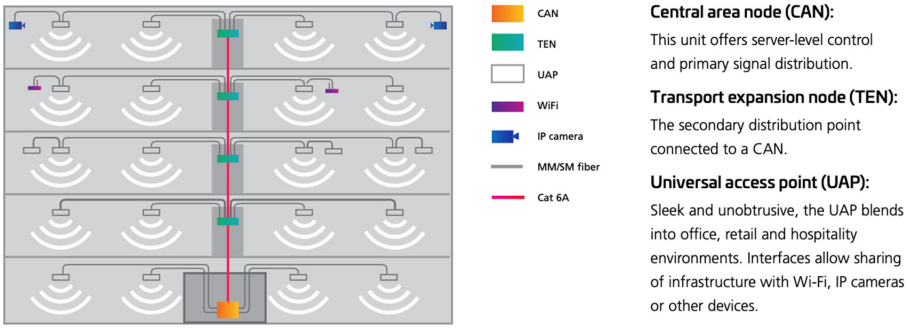
[6] *Id.*
[7] *Id.*
[8] *Id.*

access points that convert the digital signal back to radio frequency (RF) for over-the-air transmission."[9] These remote units include "the carrier access point (CAP)" and "the universal access point (UAP),"[10] which can be connected to the central area node (CAN) directly or indirectly via the transport extension node (TEN) as shown below.[11]

ION-E also features a reduced SKU count that simplifies provisioning and inventory. The key elements are:



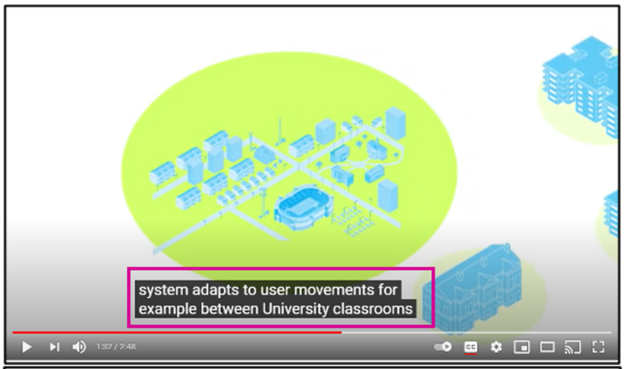
78. Accordingly, T-Mobile's LTE and 5G networks, which include CommScope's ION®-E/ERA platform, include one or more Digital Remote Units (DRUs) connectable to the one or more DAUs and operable to transport signals between one or more of the one or more DRUs and the one or more DAUs.

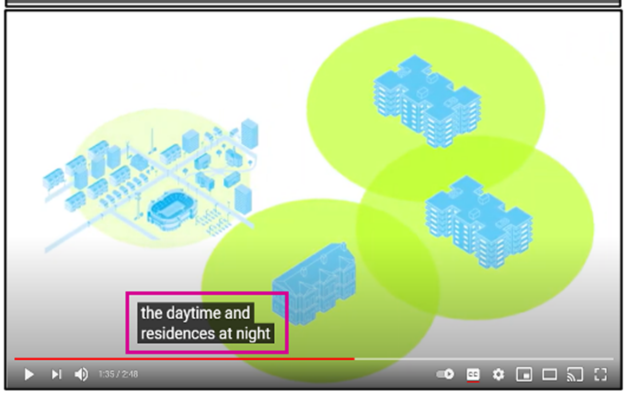
79. On information and belief, T-Mobile's LTE and 5G networks, which include CommScope's ION®-E/ERA platform, meet element [1C] of claim 1 of the '382 patent. Element [1C] requires, "a plurality of radio resources formed from the one or more DRUs comprising a first radio resource and a second radio resource different from the first radio resource, each radio resource comprising a subset of the plurality of DRUs."

80. For example, CommScope's marketing materials describe how radio resources can

[9] *Id.*
[10] *Id.*
[11] ION-E Brochure, available at, https://www.commscope.com/Docs/ION-E_Brochure_BR-111353-EN.pdf at 3 (last visited October 4, 2022).

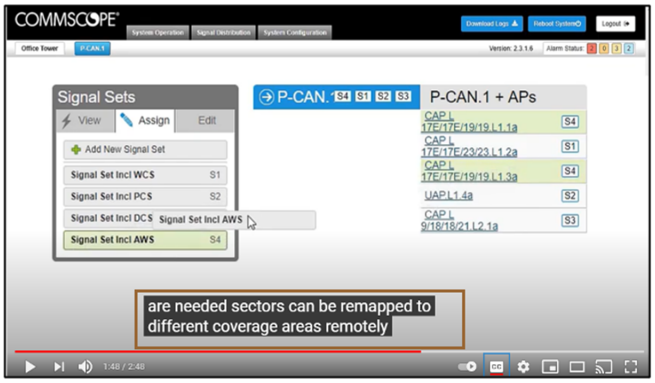
be assigned to radio access points when the majority of users move from one place, like a university classroom, to a second place, like university residences:[12]





Moreover, the same marketing materials describe how sectors can be remapped where radio resources are needed most:[13]

[12] *See,* "CommScope Era™ C-RAN Antenna System," https://www.youtube.com/watch?v=uBRDL7a8_8g (last visited October 4, 2022) (annotation added).
[13] *Id* (annotation added).



Accordingly, T-Mobile's LTE and 5G networks, which include CommScope's ION®-E/ERA platform includes a plurality of radio resources formed from the one or more DRUs comprising a first radio resource and a second radio resource different from the first radio resource.

81. On information and belief, T-Mobile's LTE and 5G networks, which include CommScope's ION®-E/ERA platform, meet element [1D] of claim 1 of the '382 patent. Element [1D] requires, "a traffic monitoring unit coupled to at least one of the DAUs." For example, CommScope's ION®-E/ERA platform "[f]lexibly and dynamically allocates baseband capacity across many buildings" and "adjusts levels to meet variable demand, i.e., based on traffic monitoring.[14] Accordingly, T-Mobile's LTE and 5G networks, which include CommScope's ION®-E/ERA platform includes a traffic monitoring unit coupled to at least one of the DAUs.

82. On information and belief, T-Mobile's LTE and 5G networks, which include CommScope's ION®-E/ERA platform, meet element [1E] of claim 1 of the '382 patent. Element [1E] requires a traffic monitoring unit that is configured to "determine one or more of: one or more key performance indicators (KPIs) and/or a quality of service (QoS) of a network traffic for the

[14] *See,* "CommScope Era™ C-RAN Antenna System," https://www.anixter.com/content/dam/Suppliers/CommScope/Documents/ERA_C-RAN_Antenna_System_BR-112083-EN.pdf at 2, 3 (last visited October 4, 2022).

one or more DAUs, wherein the QoS is a function of the one or more KPIs." For example, T-Mobile's LTE and 5G networks, which include CommScope's ION®-E/ERA platform determine KPIs, as shown below.[15] Accordingly, T-Mobile's LTE and 5G networks, which include CommScope's ION®-E/ERA platform, meet claim element 1[E] of claim 1 of the '382 patent.

LEGACY RF PERFORMANCE CRITERIA T-Mobile

Key Performance Indicator ("KPI")	Target	Area	Verified KPIs
Design signal target values and Dominance: TMUS RSCP UMTS 1900 / UMTS 2100	-104dBm RSCP and 8dB stronger than macro network	>95%	
Design signal target values and Dominance: TMUS RSCP L2100 / L1900 / L700 / L600	-100dBm RSCP and 8dB stronger than macro network	>95%	
Ec/Io (100% Loaded system) - recommended	≥ -15dB	>95%	
SINR L600/L700 Area/Stadium Seating Areas	≥10dB	47%	
SINR Seating Ares L1900 Area/Stadium Seating Areas	≥10dB	69%	
SINR Seating Areas L1200 Area/Stadium Seating Areas	≥10dB	69%	
SINR L600/L700	≥10dB	85%	
SINR L1900	≥10dB	90%	
SINR L2100	≥10dB	90%	
SHO ratio (Soft Handover) – recommended	<30%	NA	

83. On information and belief, T-Mobile's LTE and 5G networks, which include CommScope's ION®-E/ERA platform, meet element [1F] of claim 1 of the '382 patent. Element [1F] requires a traffic monitoring unit that is configured to "reconfigure the plurality of radio resources based on one or more of the one or more KPIs and/or the QoS by allocating at least one DRU from the first radio resource to the second radio resource."

84. For example, as explained above in paragraphs 80-81, CommScope's ION®-E/ERA platform adjusts radio capacity to meet variable traffic. On information and belief, T-Mobile's LTE and 5G networks, which include CommScope's ION®-E/ERA platform, are configured to reconfigure the plurality of radio resources based on one or more of the one or more KPIs and/or the QoS by allocating at least one DRU from the first radio resource to the second radio resource. Accordingly, T-Mobile's LTE and 5G networks, which include CommScope's

[15] https://howmobileworks.com/wp-content/uploads/2021/07/tmo-byoc-design-criteria-120220.pptx (last visited October 4, 2022)

ION®-E/ERA platform, meet claim element 1[F] of claim 1 of the ’382 patent.

85. Thus, on information and belief, T-Mobile’s LTE and 5G networks, which include CommScope’s ION®-E/ERA platform, meet all elements of, and therefore infringe, at least claim 1 of the ’382 patent.

86. On information and belief, CommScope has induced infringement of at least claim 1 of the ’382 patent by T-Mobile pursuant to 35 U.S.C. § 271(b), and committed contributory infringement of at least claim 1 of the ’382 patent pursuant to 35 U.S.C. § 271(c), by providing the hardware and software necessary for T-Mobile to perform the claimed method, along with instructions that induce T-Mobile to perform the claimed method.

87. On information and belief, CommScope takes active steps to induce infringement of at least claim 1 of the ’382 patent by T-Mobile, knowing that those steps will induce, encourage, and facilitate direct infringement by T-Mobile in violation of 35 U.S.C. § 271(b). Such active steps include, but are not limited to, providing T-Mobile with instructions on the use of the above-described remote reconfiguration feature, and participating in the installation, configuration, operation, and maintenance of CommScope’s ION®-E/ERA platform in T-Mobile’s network specifically for the purpose of performing the infringing methods.

88. On information and belief, CommScope knows or should know that such activities induce T-Mobile to infringe at least claim 1 of the ’382 patent by performing the claimed methods from at least the date of the filing of this Complaint.

89. On information and belief, CommScope also contributes to the infringement of at least claim 1 of the ’382 patent by T-Mobile in violation of 35 U.S.C. § 271(c). Acts by CommScope that contribute to the infringement of T-Mobile include providing CommScope ION®-E/ERA platforms that are capable of implementing the above-described remote

reconfiguration feature. The accused remote reconfiguration software is especially adapted for use in the infringing remote reconfiguration feature, and it has no substantial non-infringing uses. On information and belief, CommScope knows or should know that such activities contribute to T-Mobile's infringement of at least claim 1 of the '382 patent by performing the claimed method.

90. By way of this Complaint, CommScope knows of the '382 patent and performs acts that it knows, or should know, induce and/or contribute to the direct infringement of claim 1 of the '382 patent by T-Mobile. Thus, CommScope is indirectly liable for infringement of at least claim 1 of the '382 patent pursuant to 35 U.S.C. §§ 271(b) and 271(c).

91. T-Mobile and CommScope undertook and continue their infringing actions despite an objectively high likelihood that such activities infringe the '382 Patent, which has been duly issued by the PTO and is presumed valid. For example, since at least the filing of this Complaint, T-Mobile and CommScope have been aware of an objectively high likelihood that their actions constituted and continue to constitute infringement of the '382 Patent and that the '382 Patent is valid. On information and belief, T-Mobile and CommScope could not reasonably, subjectively believe that their actions do not constitute infringement of the '382 patent. Despite that knowledge and subjective belief, and the objectively high likelihood that their actions constitute infringement, T-Mobile and CommScope have continued their infringing activities. As such, T-Mobile and CommScope have willfully infringed and/or will continue to willfully infringe the '382 patent.

92. As a result of T-Mobile and CommScope's infringement of the '382 patent, Dali has suffered and continues to suffer substantial injury and is entitled to recover all damages caused by T-Mobile and CommScope's infringement to the fullest extent permitted by the Patent Act, together with prejudgment interests and costs for T-Mobile and CommScope's wrongful conduct.

93. Dali has no adequate remedy at law to prevent future infringement of the '382

patent. Dali suffers and continues to suffer irreparable harm as a result of T-Mobile and CommScope's patent infringement and is, therefore, entitled to injunctive relief to enjoin T-Mobile and CommScope's wrongful conduct.

SECOND CAUSE OF ACTION
(PATENT INFRINGEMENT UNDER 35 U.S.C. § 271 OF THE '382 PATENT BY T-MOBILE AND ERICSSON)

94. Dali re-alleges and incorporates by reference all of the foregoing paragraphs.

95. On information and belief, T-Mobile and Ericsson have infringed and continue to infringe, either literally or under the doctrine of equivalents, one or more claims, including at least claim 1, of the '382 patent in violation of 35 U.S.C. § 271, et seq., directly and/or indirectly, by deploying, operating, maintaining, testing, and using T-Mobile's LTE and 5G networks which include solutions for in-building wireless coverage, such as Ericsson's Radio Dot System.[16]

96. Claim 1 of the '382 patent provides:

> [Preamble] A system comprising:
>
> [1A] one or more Digital Access Units (DAUs) operable to receive at least one signal from at least one of a first signal source and a second signal source from one or more of a plurality of signal sources, each DAU of the one of more DAUs including an input port configured as an uplink/downlink port and an output port configured as an uplink/downlink port;

[16] *See e.g.,* https://static1.squarespace.com/static/56104a4ee4b0ffa1f98ffcfc/t/6092aad7ca3354484239eb52/1620224728469/Partners-newsletter-2021-Q1.pdf (last visited October 5, 2022) ("Partnering with Ericsson, Totem deploys Ericsson's Radio Dot System (aka RDS or 'Dot') to deliver high-performance in0building cellular systems required in modern commercial spaces. Totem deploys systems that support the major operators including Verizon, T-Mobile and T-Mobile"); *see also* https://www.ericsson.com/en/news/2021/1/t-mobile-expands-5g-nationwide (last visited October 5, 2022); https://howmobileworks.com/wp-content/uploads/2022/03/Ericsson-Indoor-Solution-0203221-1.pdf (last visited October 5, 2022) ("T-Mobile indoor coverage brought to you by Ericsson").

> [1B] one or more Digital Remote Units (DRUs) connectable to the one or more DAUs and operable to transport signals between one or more of the one or more DRUs and the one or more DAUs;
>
> [1C] a plurality of radio resources formed from the one or more DRUs comprising a first radio resource and a second radio resource different from the first radio resource, each radio resource comprising a subset of the plurality of DRUs; and
>
> [1D] a traffic monitoring unit coupled to at least one of the DAUs, wherein the traffic monitoring unit is configured to:
>
> [1D-1] determine one or more of: one or more key performance indicators (KPIs) and/or a quality of service (QoS) of a network traffic for the one or more DAUs, wherein the QoS is a function of the one or more KPIs; and
>
> [1D-2] reconfigure the plurality of radio resources based on one or more of the one or more KPIs and/or the QoS by allocating at least one DRU from the first radio resource to the second radio resource.

97. On information and belief, T-Mobile's LTE and 5G networks, which include Ericsson's Radio Dot System, satisfy each and every element recited in at least claim 1 of the '382 patent as stated below.

98. On information and belief, T-Mobile's LTE and 5G networks, which include Ericsson's Radio Dot System, meet the preamble of claim 1 of the '382 patent. The preamble of claim 1 refers to "[a] system comprising." For example, according to Ericsson the Radio Dot System "combines centralized baseband and radio units with visually low-impact antennas. Ericsson innovations enable RF signal, power and control over standard shielded LAN cables for cost-effective deployment with minimal business disruption."[17] Moreover, Ericsson's Radio Dot System includes "centralized radios [which] provide pooled capacity and design flexibility, dynamically meeting demand wherever it occurs in real time while increasing spectral and

[17] *See e.g.,* https://cellantenna.com/wp-content/uploads/2020/08/CellAntenna-Radio-Dot-System-Brochure-2020-01-17-1.pdf (last visited October 5, 2022).

hardware efficiency of the system."[18]

99. On information and belief, T-Mobile's LTE and 5G networks, which include Ericsson's Radio Dot System, meet element [1A] of claim 1 of the '382 patent. Element [1A] requires, "one or more Digital Access Units (DAUs) operable to receive at least one signal from at least one of a first signal source and a second signal source from one or more of a plurality of signal sources, each DAU of the one of more DAUs including an input port configured as an uplink/downlink port and an output port configured as an uplink/downlink port . . .".

100. For example, T-Mobile's LTE and 5G networks provide at least one digital access unit configured to communicate downlink and uplink signals with the one or more remote radio units. For example, Ericsson's Radio Dot System "consists of the Radio Dots, Baseband Units (DU) and Indoor Radio Unit(s) (IRU)."[19] Ericsson describes the DU as the "signal source of the Radio Dot System and provides the pooled baseband resources for the building(s) or area."[20] The "DU and IRU can be connected by fiber or co-located and connected through Digital CPRI cable." In certain circumstances, "the digital unit is centrally located and the IRUs are distributed."[21] On information and belief, the DU is configured to communicate with remote radio units, including Radio Dots and IRUs.

101. Further, Ericsson's Radio Dot System includes "Radio Dots, Baseband Units (DU) and Indoor Radio Unit(s) (IRU)."[22] Ericsson's literature further explains that the DU includes a plurality of interfaces to communicatively couple the baseband unit to the plurality of signal

[18] *Id.*
[19] *Id.*
[20] *Id.*
[21] *Id.*
[22] *Id.*

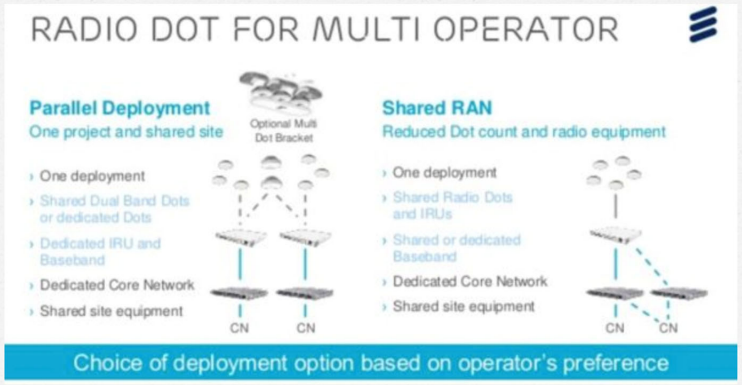
sources:[23]

> The Baseband is the signal source of the Radio Dot System and provides the pooled baseband resources for the building(s) or area. The DU delivers feature parity and roadmap evolution with the macro network and supports key coordination features such as Carrier Aggregation and Combined Cell, vital for multi-antenna indoor deployments. As new features are added to the Ericsson RAN software, they are automatically available in every radio dot system deployment. The Baseband also provides synchronization and transport security functionality, and aggregates the RDS traffic onto a common backhaul connection.

102. Moreover, Ericsson has announced that the Radio Dot System supports multi-operator service in three ways:[24]

[23] *Id.*
[24] https://the-mobile-network.com/2017/08/ericssons-multi-operator-radio-dot-matrix/ (last visited October 5, 2022).

First – parallel deployments with each operator using its own dedicated baseband, IRU and Dots. These Dots can be housed in the same enclosures (the new enclosures known as the multi-dot bracket) to tidy things up a bit.



Parallel or shared RAN options

Secondly – a multi-operator deployment using a shared baseband and IRU, over the same network of distributed radio heads, using MORAN (Multi Operator Radio Access Network) or MOCN (Multi Operator Core Network) network sharing capabilities.

Thirdly, a multi-operator Dot solution where operators provide multiple RF sources to the same Dot system. They do this by feeding baseband capacity to a new access unit from Ericsson, the RF Access Unit (RAU). This new RAU can support three 2×2 MIMO RF inputs, and can be connected on the other side to four IRUs, which then feed the shared Dot remote radioheads.

103. Thus, T-Mobile's LTE and 5G networks, which include Ericsson's Radio Dot System, meets element [1A] of claim 1 of the '382 patent.

104. On information and belief, T-Mobile's LTE and 5G networks, which include Ericsson's Radio Dot System, meet element [1B] of claim 1 of the '382 patent. Element [1B] requires, "one or more Digital Remote Units (DRUs) connectable to the one or more DAUs and operable to transport signals between one or more of the one or more DRUs and the one or more DAUs."

105. For example, T-Mobile's LTE and 5G networks provide at least one digital access unit configured to communicate with the one or more remote radio units. For example, Ericsson's

Radio Dot System "consists of the Radio Dots, Baseband Units (DU) and Indoor Radio Unit(s) (IRU)."[25] Ericsson describes the DU as the "signal source of the Radio Dot System and provides the pooled baseband resources for the building(s) or area."[26] The "DU and IRU can be connected by fiber or co-located and connected through Digital CPRI cable." In certain circumstances, "the digital unit is centrally located and the IRUs are distributed."[27] On information and belief, the DU is configured to communicate with remote radio units, including the IRUs and Radio Dots.

106. Accordingly, T-Mobile's LTE and 5G networks, which include Ericsson's Radio Dot System, include one or more Digital Remote Units (DRUs) connectable to the one or more DAUs and operable to transport signals between one or more of the one or more DRUs and the one or more DAUs.

107. On information and belief, T-Mobile's LTE and 5G networks, which include Ericsson's Radio Dot System, meet element [1C] of claim 1 of the '382 patent. Element [1C] requires, "a plurality of radio resources formed from the one or more DRUs comprising a first radio resource and a second radio resource different from the first radio resource, each radio resource comprising a subset of the plurality of DRUs."

108. According to Ericsson's marketing materials, the Radio Dot System "consists of the Radio Dots, Baseband Units (DU) and Indoor Radio Unit(s) (IRU)."[28] "The Baseband is the signal source of the Radio Dot System and provides the pooled baseband resources for the building(s) or area."[29] Moreover, Ericsson's Radio Dot System assigns subsets of resources to

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[25] *Id.*
[26] *Id.*
[27] *Id.*
[28] *Id.*

[29] *Id.*

different access points depending on traffic: "centralized radios provide pooled capacity and design flexibility, dynamically meeting demand wherever it occurs in real time while increasing spectral and hardware efficiency of the system."[30] Ericsson materials explains that "[t]he capability to configure, scale, and reconfigure logical nodes through software commands enables the RAN to dynamically adjust to changing traffic conditions, hardware faults, as well as new service requirements."[31] Ericsson also states that "[w]ithout RDS, high traffic demand generated indoors consumes a substantial amount of the radio resources of the surrounding outdoor macro cells. Deploying RDS in large high-traffic enterprises offloads the macro layer and serves the indoor users more efficiently.[32] On information and belief, the first subset of radio resources includes more resources than the second subset of radio resources.

109. Accordingly, T-Mobile's LTE and 5G networks, which include Ericsson's Radio Dot System includes a plurality of radio resources formed from the one or more DRUs comprising a first radio resource and a second radio resource different from the first radio resource.

110. On information and belief, T-Mobile's LTE and 5G networks, which include Ericsson's Radio Dot System, meet element [1D] of claim 1 of the '382 patent. Element [1D] requires, "a traffic monitoring unit coupled to at least one of the DAUs."

111. For example, Ericsson's Radio Dot System assigns subsets of resources to different access points depending on monitored traffic: "centralized radios provide pooled capacity and design flexibility, dynamically meeting demand wherever it occurs in real time while increasing

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[30] *Id.*

[31] https://www.ericsson.com/en/reports-and-papers/ericsson-technology-review/articles/4g5g-ran-architecture-how-a-split-can-make-the-difference (last visited October 5, 2022).

[32] https://cellantenna.com/wp-content/uploads/2020/08/CellAntenna-Radio-Dot-System-Brochure-2020-01-17-1.pdf (last visited October 5, 2022).

spectral and hardware efficiency of the system."[33] Ericsson materials explains that "[t]he capability to configure, scale, and reconfigure logical nodes through software commands enables the RAN to dynamically adjust to changing traffic conditions, hardware faults, as well as new service requirements."[34] Accordingly, T-Mobile's LTE and 5G networks, which include Ericsson's Radio Dot System includes a traffic monitoring unit coupled to at least one of the DAUs.

112. On information and belief, T-Mobile's LTE and 5G networks, which include Ericsson's Radio Dot System, meet element [1E] of claim 1 of the '382 patent. Element [1E] requires a traffic monitoring unit that is configured to "determine one or more of: one or more key performance indicators (KPIs) and/or a quality of service (QoS) of a network traffic for the one or more DAUs, wherein the QoS is a function of the one or more KPIs." For example, T-Mobile's LTE and 5G networks, which include Ericsson's Radio Dot System determine KPIs, as shown below.[35] Accordingly, T-Mobile's LTE and 5G networks, which include Ericsson's Radio Dot System, meet claim element 1[E] of claim 1 of the '382 patent.

LEGACY RF PERFORMANCE CRITERIA T-Mobile

Key Performance Indicator ("KPI")	Target	Area	Verified KPIs
Design signal target values and Dominance: TMUS RSCP UMTS 1900 / UMTS 2100	-104dBm RSCP and 8dB stronger than macro network	>95%	
Design signal target values and Dominance: TMUS RSCP L2100 / L1900 / L700 / L600	-100dBm RSCP and 8dB stronger than macro network	>95%	
Ec/Io (100% Loaded system) - recommended	≥ -15dB	>95%	
SINR L600/L700 Area/Stadium Seating Areas	≥10dB	47%	
SINR Seating Ares L1900 Area/Stadium Seating Areas	≥10dB	69%	
SINR Seating Areas L1200 Area/Stadium Seating Areas	≥10dB	69%	
SINR L600/L700	≥10dB	85%	
SINR L1900	≥10dB	90%	
SINR L2100	≥10dB	90%	
SHO ratio (Soft Handover) – recommended	<30%	NA	

[33] *Id.*

[34] https://www.ericsson.com/en/reports-and-papers/ericsson-technology-review/articles/4g5g-ran-architecture-how-a-split-can-make-the-difference (last visited October 5, 2022).

[35] https://howmobileworks.com/wp-content/uploads/2021/07/tmo-byoc-design-criteria-120220.pptx (last visited October 4, 2022)

113. On information and belief, T-Mobile's LTE and 5G networks, which include Ericsson's Radio Dot System, meet element [1F] of claim 1 of the '382 patent. Element [1F] requires a traffic monitoring unit that is configured to "reconfigure the plurality of radio resources based on one or more of the one or more KPIs and/or the QoS by allocating at least one DRU from the first radio resource to the second radio resource."

114. For example, as explained above in paragraphs 108-111, Ericsson's Radio Dot System adjusts radio capacity to meet variable traffic. On information and belief, T-Mobile's LTE and 5G networks, which include Ericsson's Radio Dot System, are configured to reconfigure the plurality of radio resources based on one or more of the one or more KPIs and/or the QoS by allocating at least one DRU from the first radio resource to the second radio resource. Accordingly, T-Mobile's LTE and 5G networks, which include Ericsson's Radio Dot System, meet claim element 1[F] of claim 1 of the '382 patent.

115. Thus, on information and belief, T-Mobile's LTE and 5G networks, which include Ericsson's Radio Dot System, meet all elements of, and therefore infringe, at least claim 1 of the '382 patent.

116. On information and belief, Ericsson has induced infringement of at least claim 1 of the '382 patent by T-Mobile pursuant to 35 U.S.C. § 271(b), and committed contributory infringement of at least claim 1 of the '382 patent pursuant to 35 U.S.C. § 271(c), by providing the hardware and software necessary for T-Mobile to perform the claimed method, along with instructions that induce T-Mobile to perform the claimed method.

117. On information and belief, Ericsson takes active steps to induce infringement of at least claim 1 of the '382 patent by T-Mobile, knowing that those steps will induce, encourage, and facilitate direct infringement by T-Mobile in violation of 35 U.S.C. § 271(b). Such active steps

include, but are not limited to, providing T-Mobile with instructions on the use of the above-described remote reconfiguration feature, and participating in the installation, configuration, operation, and maintenance of Ericsson's Radio Dot System in T-Mobile's network specifically for the purpose of performing the infringing methods.

118. On information and belief, Ericsson knows or should know that such activities induce T-Mobile to infringe at least claim 1 of the '382 patent by performing the claimed methods from at least the date of the filing of this Complaint.

119. On information and belief, Ericsson also contributes to the infringement of at least claim 1 of the '382 patent by T-Mobile in violation of 35 U.S.C. § 271(c). Acts by Ericsson that contribute to the infringement of T-Mobile include providing Ericsson Radio Dot Systems that are capable of implementing the above-described remote reconfiguration feature. The accused remote reconfiguration software is especially adapted for use in the infringing remote reconfiguration feature, and it has no substantial non-infringing uses. On information and belief, Ericsson knows or should know that such activities contribute to T-Mobile's infringement of at least claim 1 of the '382 patent by performing the claimed method.

120. By way of this Complaint, Ericsson knows of the '382 patent and performs acts that it knows, or should know, induce and/or contribute to the direct infringement of claim 1 of the '382 patent by T-Mobile. Thus, Ericsson is indirectly liable for infringement of at least claim 1 of the '382 patent pursuant to 35 U.S.C. §§ 271(b) and 271(c).

121. T-Mobile and Ericsson undertook and continue their infringing actions despite an objectively high likelihood that such activities infringe the '382 Patent, which has been duly issued by the PTO and is presumed valid. For example, since at least the filing of this Complaint, T-Mobile and Ericsson have been aware of an objectively high likelihood that their actions

constituted and continue to constitute infringement of the ’382 Patent and that the ’382 Patent is valid. On information and belief, T-Mobile and Ericsson could not reasonably, subjectively believe that their actions do not constitute infringement of the ’382 patent. Despite that knowledge and subjective belief, and the objectively high likelihood that their actions constitute infringement, T-Mobile and Ericsson have continued their infringing activities. As such, T-Mobile and Ericsson have willfully infringed and/or will continue to willfully infringe the ’382 patent.

122. As a result of T-Mobile and Ericsson’s infringement of the ’382 patent, Dali has suffered and continues to suffer substantial injury and is entitled to recover all damages caused by T-Mobile and Ericsson’s infringement to the fullest extent permitted by the Patent Act, together with prejudgment interests and costs for T-Mobile and Ericsson’s wrongful conduct.

123. Dali has no adequate remedy at law to prevent future infringement of the ’382 patent. Dali suffers and continues to suffer irreparable harm as a result of T-Mobile and Ericsson’s patent infringement and is, therefore, entitled to injunctive relief to enjoin T-Mobile and Ericsson’s wrongful conduct.

THIRD CAUSE OF ACTION
(PATENT INFRINGEMENT UNDER 35 U.S.C. § 271 OF THE ’358 PATENT BY T-MOBILE AND COMMSCOPE)

124. Dali re-alleges and incorporates by reference all of the foregoing paragraphs.

125. On information and belief, T-Mobile and CommScope have directly infringed and continue to directly infringe either literally or under the doctrine of equivalents, one or more claims, including at least claim 7, of the ’358 patent in violation of 35 U.S.C. §§ 271, et seq., by deploying, operating, maintaining, testing, and using T-Mobile’s LTE and 5G networks which include equipment relating to small cell wireless solutions, such as, by way of example,

CommScope's OneCell product.[36] According to the "OneCell Cloud-RAN small cell system" product brochure, "the OneCell baseband controller and multiple radio points form a virtualized 'super cell' that covers the entire area" which eliminates handovers and boundary interference, resulting in "consistent, superior LT performance throughout enterprises and public venues at a dramatically lower cost of deployment than available alternatives."[37]

126. Claim 7 of the '358 patent provides:

> [Preamble] A method of distributing communications frequencies, the method providing:
>
> [7A] providing a set of communications units,
>
> [7B] transmitting and receiving, from a first communications unit of the set of communications units
>
> [7B1] a first set of frequencies characterized by a first frequency band and a first geographic footprint; and
>
> [7B2] a second set of frequencies characterized by a second frequency band different from the first frequency band and a second geographic footprint larger than and at least partially surrounding the first geographic footprint; and
>
> [7C] transmitting, and receiving, from a second communications unit of the set of communications units:
>
> [7C1] a third set of frequencies including one or more frequencies in the first frequency band and a third geographical footprint; and
>
> [7C2] a fourth set of frequencies including one or more frequencies in a third frequency band and a fourth geographical footprint larger than and at least partially surrounding the third geographical footprint.

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[36] *See* https://howmobileworks.com/indoor-coverage/ (last visited October 4, 2022) ("T-Mobile Partner: CommScope … Learn more about 'Middleprise' solutions that partner well with BYOC"); *see also* https://howmobileworks.com/wp-content/uploads/2021/08/ONECELL-for-Enterprise-TMO-Middleprise-pdf-w_link-080321.pdf (last visited October 4, 2022).

[37] *See* OneCell Cloud-RAN Small Cell System, available at https://www.anixter.com/content/dam/Suppliers/CommScope/Documents/OneCell_Cloud_RAN_Brochure_BR-110160-EN.pdf (last accessed October 4, 2022).

127. On information and belief, T-Mobile's LTE and 5G networks, which include CommScope's OneCell product, satisfy each and every limitation of at least claim 7 of the '358 patent as stated below.

128. On information and belief, and to the extent the preamble of claim 7 is determined to be limiting, T-Mobile's LTE and 5G networks provide "[a] method of distributing communication frequencies." For example, CommScope's OneCell system is a "Small Cell Solution" "using a unique C-RAN architecture [that] connects multiple distributed radio points."[38]

CommScope's ONECELL® Product Ideal Small Cell Solution for 5G Migration

ONECELL® is CommScope's award-winning indoor small cell solution. It utilizes a Cloud RAN (C-RAN) architecture to create a single cell across multiple radios for improved performance and simplified deployment. ONECELL® is designed to service medium-sized to large buildings with high capacity and excellent performance.

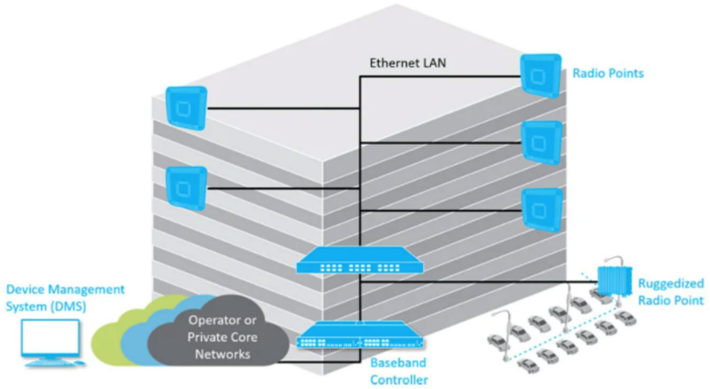
CommScope's ONECELL® illustrates how small cells are evolving to help operators better support wireless users indoors. Using a unique C-RAN architecture, ONECELL® connects multiple distributed radio points via standard Ethernet cabling to a centralized baseband controller.

LTE scheduling takes place in the baseband controller, creating a single physical cell ID across all radio points. This eliminates border interference and the need for handovers within the coverage area.

ONECELL® also employs sophisticated coordination across radio points, enabling simultaneous re-use of physical resource blocks (PRB) in different parts of the building. This increases spectral efficiency and system capacity.

CommScope's OneCell website explains that the OneCell Radio Points transmit and receive radio frequency (RF) signals supporting up to four frequency bands.[39] For example:

[38] *See, e.g.*, https://netechnologypartners.com/commscopes-onecell-product-ideal-small-cell-solution-for-5g-migration/ (last visited on October 4, 2022).
[39] *See, e.g.*, https://www.commscope.com/product-type/in-building-cellular-systems/small-cells/onecell/ (last visited on October 4, 2022).



ONECELL system description

Baseband controller

The Baseband Controller the system signal source, performing baseband processing and scheduling across all Radio Points. Unlike traditional large macro base stations, the ONECELL baseband controller supports up to 1,024 simultaneous users in half of a standard 1U chassis.

Radio Points

Radio points transmit and receive radio frequency (RF) signals over the air. Edge intelligence in the radio points enables advanced features such as cell virtualization, enhanced signal quality and user location awareness for emergency services. ONECELL offers two radio point solutions, both available in indoor and rugged form factors.

RP5000 Series is a multi-carrier, multi-channel solution that supports up to four frequency bands simultaneously. It incorporates programmable logic, allowing operators to convert existing LTE bands to 5G NR via software, and support higher 5G frequencies with an RF module upgrade.

RP2000 Series is a highly compact, single-carrier, single-frequency solution. The frequency is software-selectable, enabling the operator to change frequency bands without touching the hardware.

Thus, to the extent the preamble of claim 7 is limiting, T-Mobile's LTE and 5G networks, which include CommScope's OneCell product, satisfy the preamble of claim 7.

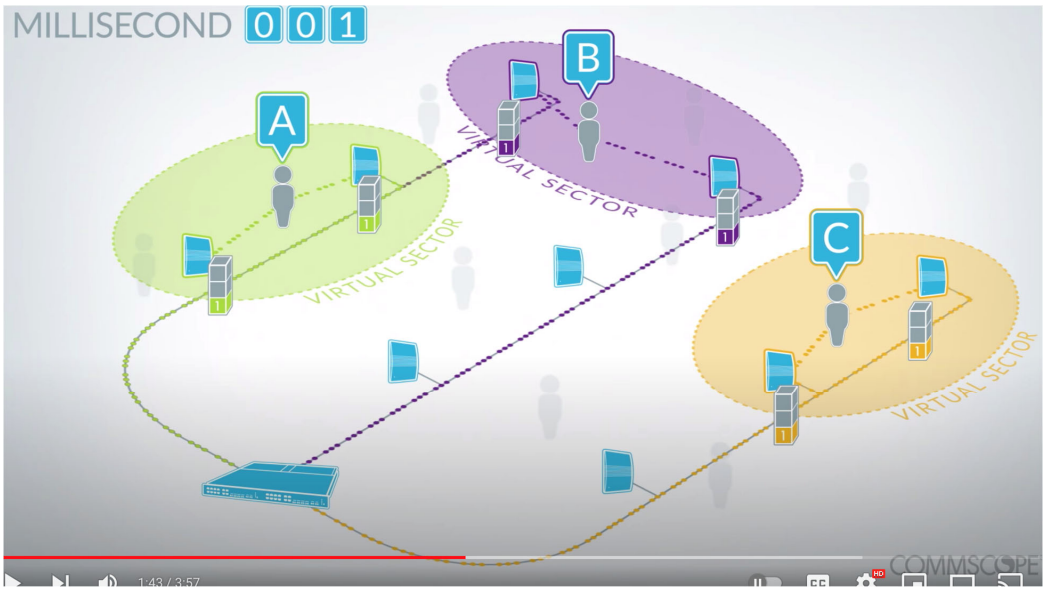
129. On information and belief, T-Mobile's LTE and 5G networks, which include CommScope's OneCell product, meet claim element [7A] of claim 7 of the '358 patent

130. On information and belief, T-Mobile's LTE and 5G networks provide a set of communication units. For example, CommScope's OneCell website describes how the OneCell system includes a set of "Radio Points" which are remote communication units. Therefore, T-Mobile's LTE and 5G networks, which include CommScope's OneCell product, meet element 7[A] of claim 7.

131. On information and belief, T-Mobile's LTE and 5G networks, which include CommScope's OneCell product, meet claim element [7B] of claim 7 of the '358 patent.

132. On information and belief, T-Mobile's LTE and 5G networks transmit and receive,

from a first communications unit of the set of communications units. For example, CommScope's OneCell system architecture includes several distributed Radio Points or communication units in which the "Radio points transmit and receive radio frequency (RF) signals over the air." As shown below in a CommScope video explaining the Cell Virtualization feature of the OneCell system, a first Radio Point, i.e., first communication unit, is illustrated adjacent and to the right of "user A."[40] As such, T-Mobile's LTE and 5G networks, which include CommScope's OneCell product, meet element [7B] of claim 7 of the '358 patent.



133. On information and belief, T-Mobile's LTE and 5G networks, which include CommScope's OneCell product, meet claim element [7B1] of claim 7 of the '358 patent.

134. On information and belief, T-Mobile's LTE and 5G networks transmit and receive, from a first communications unit of the set of communications units, a first set of frequencies characterized by a first frequency band and a first geographic footprint. For example, as shown

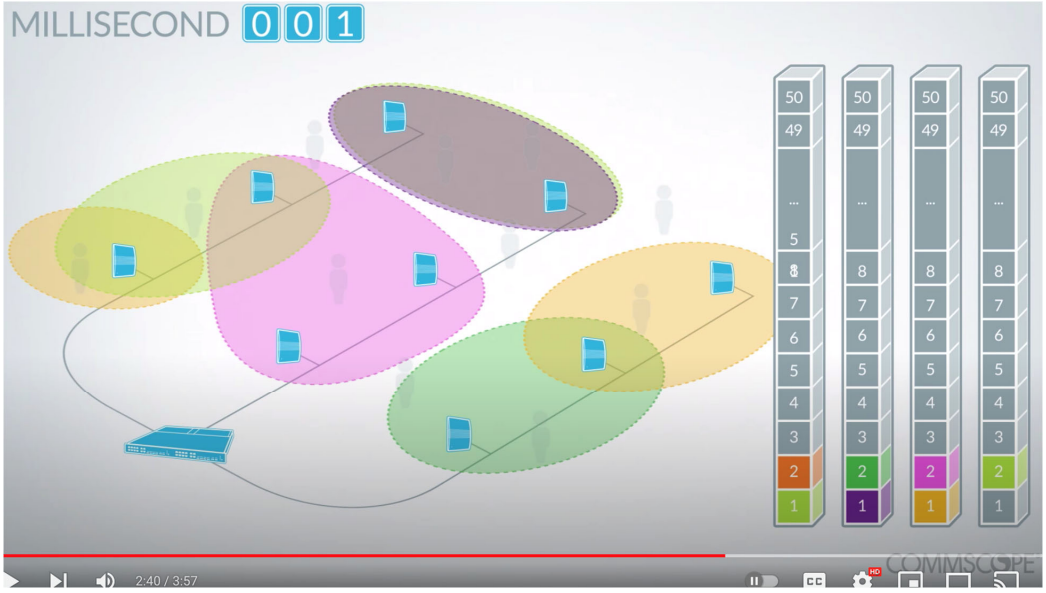
[40] *See, e.g.*, https://www.youtube.com/watch?v=vEsHetvkOVA (last visited on October 4, 2022).

above in the OneCell Cell Virtualization video, the first Radio Point (adjacent to the right of "user A") transmits and receives on Physical Resource Block 1 or "PRB 1," which is a first set of frequencies characterized by a first frequency band and a first geographic footprint, which is depicted in the area shaded in light green. As such, T-Mobile's LTE and 5G networks, which include CommScope's OneCell product, meets element [7B1] of claim 7 of the '358 patent.

135. On information and belief, T-Mobile's LTE and 5G networks, which include CommScope's OneCell product, meet claim element [7B2] of claim 7 of the '358 patent.

136. On information and belief, T-Mobile's LTE and 5G networks transmit and receive, from a first communications unit of the set of communications units, a second set of frequencies characterized by a second frequency band different from the first frequency band and a second geographic footprint larger than and at least partially surrounding the first geographic footprint. For example, the CommScope Cell Virtualization video shows that the first Radio Point also transmits and receives on Physical Resource Block 2 or "PRB 2," which is a second set of frequencies characterized by a second frequency band and a second geographic footprint, which is depicted by the area shaded in pink:[41]

[41] *Id.*



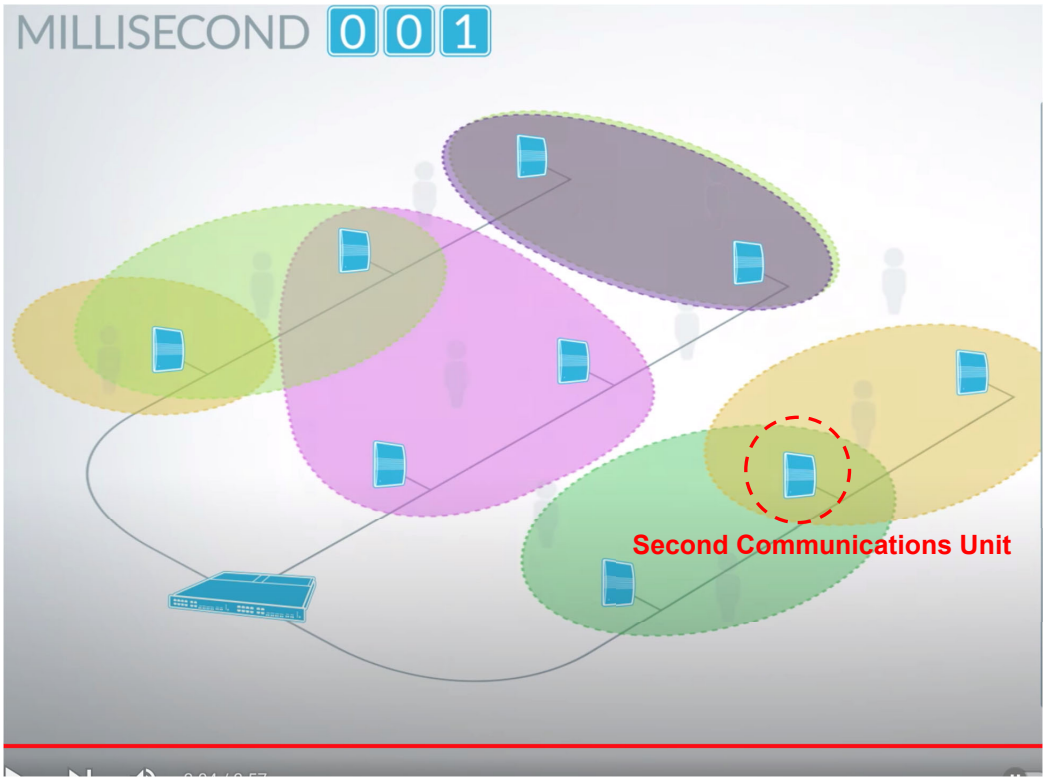
This second area shaded in pink is larger than and at least partially surrounds the first area shaded in light green as shown below. As such, T-Mobile's LTE and 5G networks, which include CommScope's OneCell product, meet element [7B2] of claim 7 of the '358 patent.

137. On information and belief, T-Mobile's LTE and 5G networks, which include CommScope's OneCell product, meet claim element [7C] of claim 7 of the '358 patent.

138. On information and belief, T-Mobile's LTE and 5G networks transmit and receive, from a second communications unit of the set of communications units. For example, the OneCell system architecture includes several distributed Radio Points or communication units in which the "Radio points transmit and receive radio frequency (RF) signals over the air."[42] A second Radio Point, i.e., second communication unit, is depicted and circled in red:[43]

[42] https://www.commscope.com/product-type/in-building-cellular-systems/small-cells/onecell/ (last visited October 4, 2022).

[43] *See* https://www.youtube.com/watch?v=vEsHetvkOVA (last visited October 4, 2022) (annotation added).

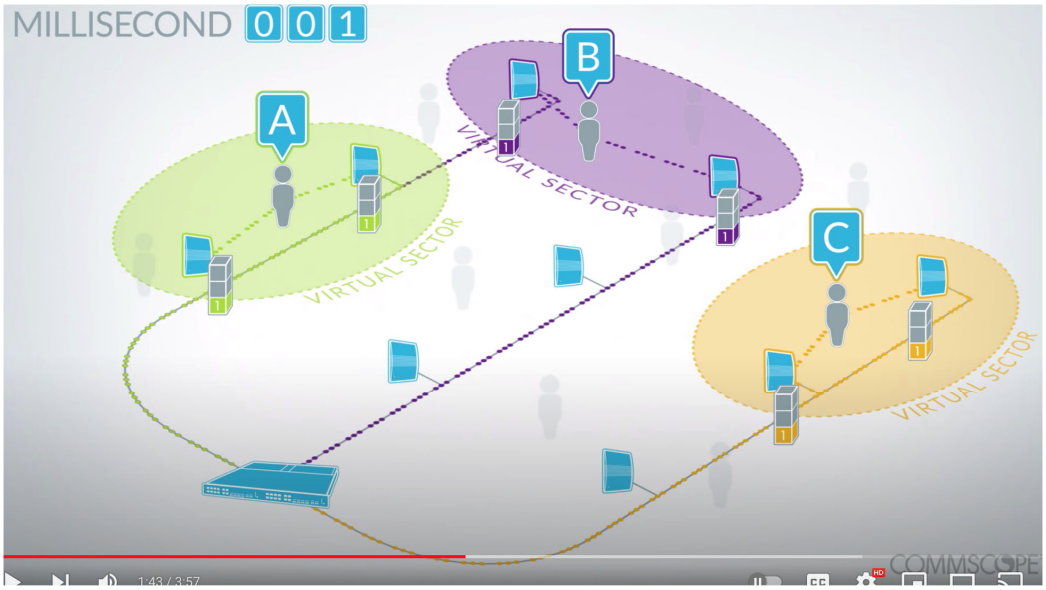


As such, the T-Mobile's LTE and 5G networks, which include CommScope's OneCell product, meet element [7C] of claim 7 of the '358 patent.

139. On information and belief, T-Mobile's LTE and 5G networks, which include CommScope's OneCell product, meet claim element [7C1] of claim 7 of the '358 patent.

140. On information and belief, T-Mobile's LTE and 5G networks transmit and receive, from a second communications unit of the set of communications units a third set of frequencies including one or more frequencies in the first frequency band and a third geographical footprint. For example, the OneCell Cell Virtualization video shows that the second Radio Point transmits and receives on Physical Resource Block 1 or "PRB 1," which includes the first set of frequencies in the first frequency band and a third geographical footprint, which is depicted in the area shaded

in yellow:[44]



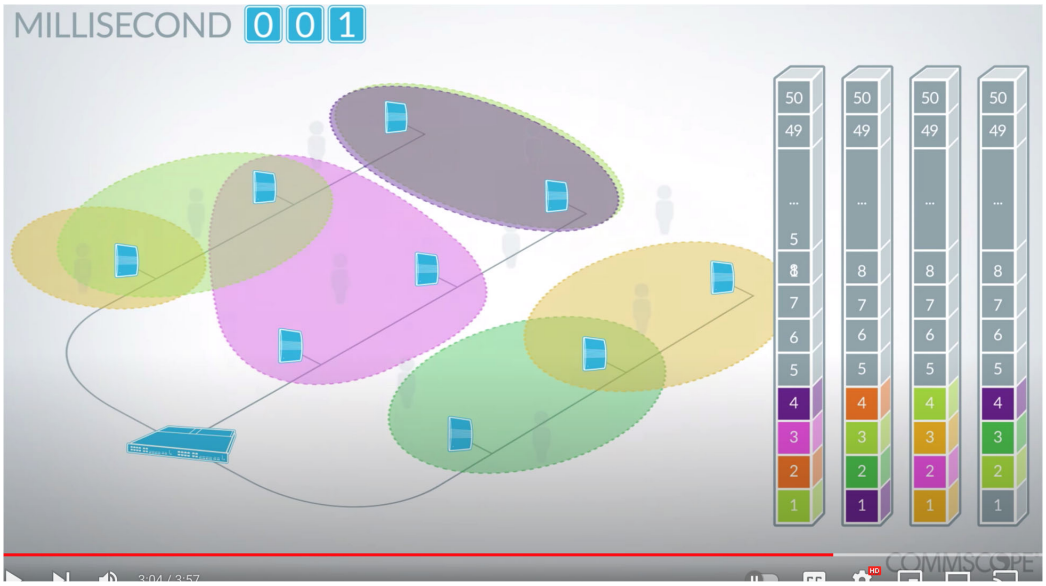
As such, T-Mobile's LTE and 5G networks, which include CommScope's OneCell product, meet element [7C1] of claim 7 of the '358 patent.

141. On information and belief, T-Mobile's LTE and 5G networks, which include CommScope's OneCell product, meet claim element [7C2] of claim 7 of the '358 patent.

142. On information and belief, T-Mobile's LTE and 5G networks transmit and receive, from a second communications unit of the set of communications units a fourth set of frequencies including one or more frequencies in a third frequency band and a fourth geographical footprint larger than and at least partially surrounding the third geographical footprint. For example, the CommScope Cell Virtualization video shows that the second Radio Point also transmits and receives on Physical Resource Block 3 or "PRB 3," which is a fourth set of frequencies including one or more frequencies in a third frequency band and a fourth geographical footprint depicted by

[44] *Id.*

the area shaded in dark green:[45]



This fourth area shaded in dark green is larger than and at least partially surrounds the third area shaded in yellow as shown below. As such, T-Mobile's LTE and 5G networks, which include CommScope's OneCell product, meet element [7C2] of claim 7 of the '358 patent.

143. Accordingly, T-Mobile's LTE and 5G networks, which include CommScope's OneCell product, satisfy each and every limitation of claim 7 of the '358 patent.

144. On information and belief, CommScope has induced infringement of at least claim 7 of the '358 patent by T-Mobile pursuant to 35 U.S.C. § 271(b), and committed contributory infringement of at least claim 7 of the '358 patent pursuant to 35 U.S.C. § 271(c), by providing the hardware and software necessary for T-Mobile to perform the claimed method, along with instructions that induce T-Mobile to perform the claimed method.

145. On information and belief, CommScope takes active steps to induce infringement

[45] *Id.*

of at least claim 7 of the ’358 patent by T-Mobile, knowing that those steps will induce, encourage, and facilitate direct infringement by T-Mobile in violation of 35 U.S.C. § 271(b). Such active steps include, but are not limited to, providing T-Mobile with instructions on the use of the above-described communication frequency distribution feature, and participating in the installation, configuration, operation, and maintenance of OneCell products in T-Mobile’s network specifically for the purpose of performing the infringing methods.

146. On information and belief, CommScope knew or should have known that such activities induce T-Mobile to infringe at least claim 7 of the ’358 patent by performing the claimed methods from at least January 7, 2022 when Dali filed a lawsuit for infringement of the ’358 patent by AT&T and CommScope, which alleged that CommScope’s OneCell product infringes the ‘358 patent.[46]

147. On information and belief, CommScope also contributes to the infringement of at least claim 7 of the ’358 patent by T-Mobile in violation of 35 U.S.C. § 271(c). Acts by CommScope that contribute to the infringement of T-Mobile include providing OneCell hardware and software modules that are capable of implementing the above-described communication frequency distribution feature. The accused communication frequency distribution software is especially adapted for use in the infringing communication frequency distribution functions, and it has no substantial non-infringing uses. On information and belief, CommScope knew or should have known that such activities contribute to T-Mobile’s infringement of at least claim 7 of the ’358 patent by performing the claimed method.

148. At least as of January 7, 2022, CommScope knows of the ’358 patent and performs

[46] *See Dali Wireless, Inc. v. AT&T Corp. et al.*, No. 2:22-CV-00012, ECF No. 1 (Complaint) (E.D. Tex. Jan. 7, 2022).

acts that it knows, or should know, induce and/or contribute to the direct infringement of claim 7 of the ’358 patent by T-Mobile. Thus, CommScope is indirectly liable for infringement of at least claim 7 of the ‘358 patent pursuant to 35 U.S.C. §§ 271(b) and 271(c).

149. T-Mobile and CommScope undertook and continue their infringing actions despite an objectively high likelihood that such activities infringe the ’358 Patent, which has been duly issued by the PTO and is presumed valid. Moreover, the PTAB has declined to institute a petition for *inter partes* review against the ’358 patent.[47] For example, CommScope, since at least January 7, 2022, and T-Mobile, since at least the filing of this Complaint, have been aware of an objectively high likelihood that their actions constituted and continue to constitute infringement of the ’358 Patent and that the ’358 Patent is valid. On information and belief, T-Mobile and CommScope could not reasonably, subjectively believe that their actions do not constitute infringement of the ’358 patent. Despite that knowledge and subjective belief, and the objectively high likelihood that their actions constitute infringement, T-Mobile and CommScope have continued their infringing activities. As such, T-Mobile and CommScope have willfully infringed and/or will continue to willfully infringe the ’358 patent.

150. As a result of T-Mobile’s and CommScope’s infringement of the ’358 patent, Dali has suffered and continues to suffer substantial injury and is entitled to recover all damages caused by T-Mobile’s and CommScope’s infringement to the fullest extent permitted by the Patent Act, together with prejudgment interest and costs for T-Mobile’s and CommScope’s wrongful conduct.

151. Dali has no adequate remedy at law to prevent future infringement of the ’358 patent. Dali suffers and continues to suffer irreparable harm as a result of T-Mobile’s and CommScope’s patent infringement and is, therefore, entitled to injunctive relief to enjoin T-

[47] *See* IPR2021-00492, Paper No. 8 (decision denying institution).

Mobile's and CommScope's wrongful conduct.

FOURTH CAUSE OF ACTION
(PATENT INFRINGEMENT UNDER 35 U.S.C. § 271 OF THE '232 PATENT BY T-MOBILE AND COMMSCOPE)

152. Dali re-alleges and incorporates by reference all of the foregoing paragraphs.

153. On information and belief, T-Mobile and CommScope have infringed and continue to infringe, either literally or under the doctrine of equivalents, one or more claims, including at least claim 12, of the '232 patent in violation of 35 U.S.C. § 271, et seq., directly and/or indirectly, by deploying, operating, maintaining, testing, and using T-Mobile's LTE and 5G networks which include solutions for in-building wireless coverage, such as CommScope's ION®-E/ERA platform.[48]

154. Claim 12 of the '232 patent provides:

> [Preamble] A method comprising:
>
> [12A] receiving a plurality of radio resources from an operator hub that operates using a Common Public Radio Interface (CPRI) protocol;
>
> [12B] assigning a first subset of the plurality of radio resources to a first access point included in a plurality of wireless access points and a second subset of the plurality of radio resources to a second access point included in the plurality of wireless access points, the first subset including more radio resources than the second subset;
>
> [12C] and in response to a change in need of a number of wireless subscribers coupled to the second access point and which of the second subset is loaded beyond a threshold, assigning one or more additional radio resources of the plurality of radio resources to the second access point.

155. On information and belief, T-Mobile's LTE and 5G networks, which include

[48] *See e.g.,* https://howmobileworks.com/wp-content/uploads/2021/06/tmo-byoc-case-study-space-needle-110420.pdf (last visited October 4, 2022) ("T-Mobile designed a unified wireless infrastructure architecture, based on the CommScope ION-E solution, to streamline deployment and minimize equipment needs").

CommScope's ION®-E/ERA platform, satisfy each and every element recited in at least claim 12 of the '232 patent as stated below.

156. On information and belief, T-Mobile's LTE and 5G networks, which include CommScope's ION®-E/ERA platform, meet the preamble of claim 12 of the '232 patent. The preamble of claim 1 refers to "[a] method comprising . . .".

157. For example, CommScope's ION®-E/ERA platform provides an "all-digital in-building wireless solution" and allows users to "[t]ake advantage of an all-digital CPRI baseband interface that eliminates the need for analog-to-digital conversions."[49]

158. On information and belief, T-Mobile's LTE and 5G networks, which include CommScope's ION®-E/ERA platform, meet element [12A] of claim 12 of the '232 patent. Element [12A] requires, "receiving a plurality of radio resources from an operator hub that operates using a Common Public Radio Interface (CPRI) protocol . . .".

159. According to publicly available documents, CommScope's ION®-E/ERA platform includes a "CPRI digital donor (CDD)" module.[50] This module "receives CPRI digital signals from compatible operator baseband units (BBU)."[51] Accordingly, T-Mobile's LTE and 5G networks, which include CommScope's ION®-E/ERA platform, receive a plurality of radio resources from an operator hub that operates using a Common Public Radio Interface (CPRI) protocol.

160. On information and belief, T-Mobile's LTE and 5G networks, which include CommScope's ION®-E/ERA, meet element [12B] of claim 12 of the '232 patent. Element [12B] of claim 12 requires "assigning a first subset of the plurality of radio resources to a first access

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[49] https://www.commscope.com/product-type/in-building-cellular-systems/distributed-antenna-systems-das/era/ (last visited October 4, 2022).

[50] *Id.*
[51] *Id.*

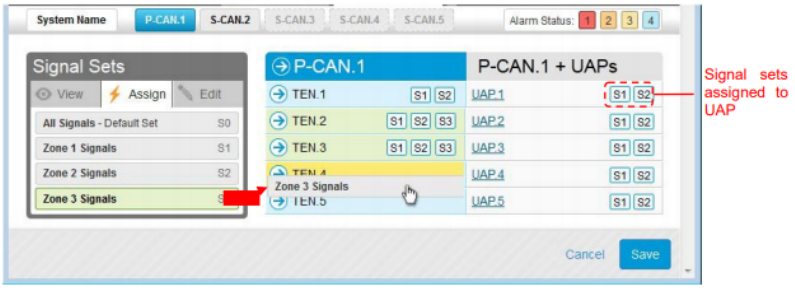
point included in a plurality of wireless access points and a second subset of the plurality of radio resources to a second access point included in the plurality of wireless access points, the first subset including more radio resources than the second subset . . .".

161. According to publicly available documents, CommScope's ION®-E/ERA assigns different subsets of radio resources to different access points:[52]

Assign Signal Sets (Direct signal traffic to TENs and UAPs)

Signal Sets, which are a user-defined set of channels, can be quickly assigned to CANs and all UAPs assigned to them, TENs and all UAPs assigned to them, or to individual UAPs on the *Signal Distribution* page.

1. Click on the *Signal Distribution* tab to open the page.
2. Assign a signal set by:
   - Clicking on a signal set and dragging it onto the a TEN or UAP (set icons adjacent to the device name indicate the sets assigned to a TEN or UAP)
   - Clicking on a signal set to select it (green highlight) and then clicking on each TEN or UAP to which you wish to assign the signal set.



3. Click the *Save* button after you've assigned each signal set

162. Publicly available documents further explain that CommScope's ION®-E/ERA provides customizable signal sets with different numbers of channels.[53] Further, different numbers of signal sets can be assigned to different UAPs or access points:[54]

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[52] https://fccid.io/BCR-IONEUAP/User-Manual/user-manaul-2552804.pdf at 14 (last visited October 4, 2022) (annotation in original).

[53] *Id.*

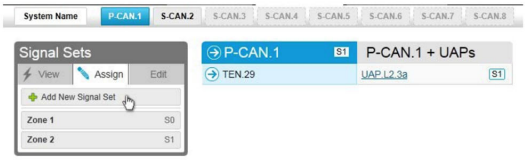
[54] *Id.* at 13-14.

5.5. Signal Distribution

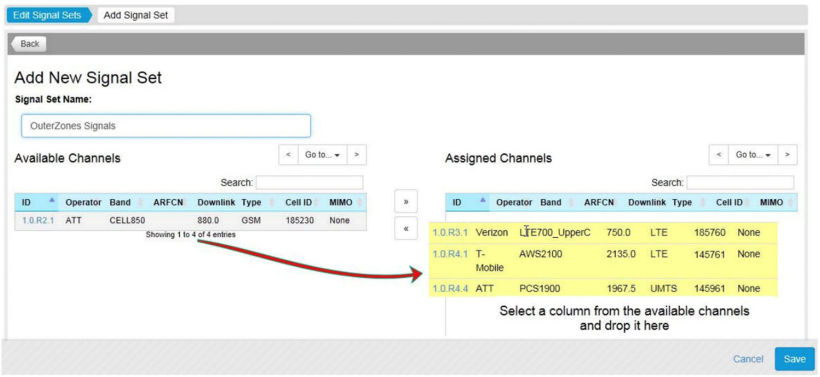
The ION-E uses signal sets to group the detected signals to simplify signal routing to the radiating elements throughout the system. First the user must create and define the signal sets by assigning channels to the sets. The signal sets are then assigned as needed using drag and drop functionality to route the signals to the TENs and UAPs.

Create and Edit Signal Sets

1. Click on the *Signal Distribution* tab to open the page.
2. Select a set from the *Signal Sets* list and click the *Edit* button to edit an existing set.
3. Click on the *Add a New Signal Set* link to open the Add *Signal Set* page to create a new set.



4. Enter a Name for the signal set in the *Signal Set Name* field.
5. Click to select a channel from the *Available Channels* list or shift click to select multiple channels and drag them onto the *Assigned Channels* list.



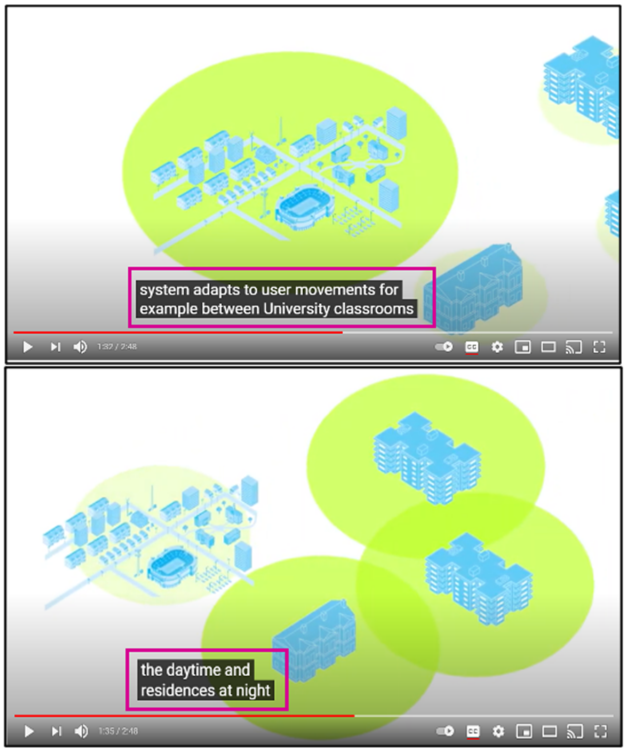
On information and belief, the first subset of the plurality of radio resources includes more radio resources than the second subset. Accordingly, T-Mobile's LTE and 5G networks, which include CommScope's ION®-E/ERA platform, assign a first subset of the plurality of radio resources to a first access point included in a plurality of wireless access points and a second subset of the plurality of radio resources to a second access point included in the plurality of wireless access points, the first subset including more radio resources than the second subset.

163. On information and belief, T-Mobile's LTE and 5G networks, which include CommScope's ION®-E/ERA platform, meet element [12C] of claim 12 of the '232 patent. Element [12C] of claim 12 requires "in response to a change in need of a number of wireless subscribers coupled to the second access point and which of the second subset is loaded beyond a

threshold, assigning one or more additional radio resources of the plurality of radio resources to the second access point."

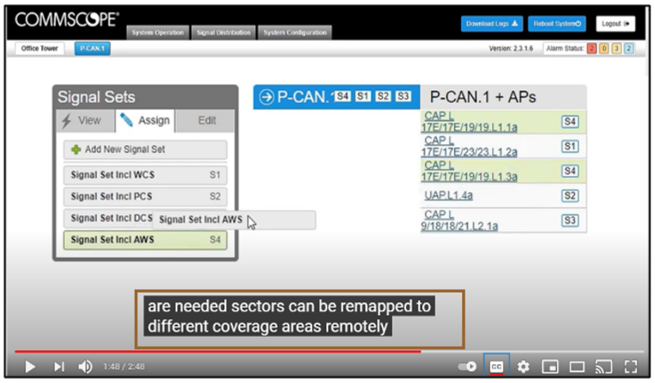
164. On information and belief, CommScope's ION®-E/ERA comprises software that can configure access points by increasing or decreasing the number of resources in the plurality of resources.

165. For example, CommScope's own marketing materials describe how additional resources can be assigned to access points when the majority of users move from one place, like a university classroom, to a second place, like university residences:[55]



[55] https://www.youtube.com/watch?v=uBRDL7a8_8g (last visited October 4, 2022) (emphasis added).

Moreover, the same marketing materials describe how sectors can be remapped where resources are needed most:[56]



On information and belief, CommScope's ION®-E/ERA assigns additional radio resources to an access point when it is loaded beyond a threshold. Accordingly, CommScope's ION®-E/ERA platform assigns one or more additional radio resources of the plurality of radio resources to the second access point in response to a change in need of a number of wireless subscribers coupled to the second access point and which of the second subset is loaded beyond a threshold.

166. As a result, on information and belief, T-Mobile's LTE and 5G networks, which include CommScope's ION®-E/ERA platform, meet all elements of, and therefore infringe, at least claim 12 of the '232 patent.

167. On information and belief, CommScope has induced infringement of at least claim 12 of the '232 patent by T-Mobile pursuant to 35 U.S.C. § 271(b), and committed contributory infringement of at least claim 12 of the '232 patent pursuant to 35 U.S.C. § 271(c), by providing the hardware and software necessary for T-Mobile to perform the claimed method, along with instructions that induce T-Mobile to perform the claimed method.

[56] *Id* (emphasis added).

168. On information and belief, CommScope takes active steps to induce infringement of at least claim 12 of the ’232 patent by T-Mobile, knowing that those steps will induce, encourage, and facilitate direct infringement by T-Mobile in violation of 35 U.S.C. § 271(b). Such active steps include, but are not limited to, providing T-Mobile with instructions on the use of the above-described remote reconfiguration feature, and participating in the installation, configuration, operation, and maintenance of CommScope’s ION®-E/ERA platform in T-Mobile’s network specifically for the purpose of performing the infringing methods.

169. On information and belief, CommScope knew or should have known that such activities induce T-Mobile to infringe at least claim 12 of the ’232 patent by performing the claimed methods from at least January 7, 2022 when Dali filed a lawsuit for infringement of the ’232 patent by AT&T and CommScope, which alleged that CommScope’s ION®-E/ERA platform infringes the ‘232 patent.[57]

170. On information and belief, CommScope also contributes to the infringement of at least claim 12 of the ’232 patent by T-Mobile in violation of 35 U.S.C. § 271(c). Acts by CommScope that contribute to the infringement of T-Mobile include providing CommScope ION®-E/ERA platforms that are capable of implementing the above-described remote reconfiguration feature. The accused remote reconfiguration software is especially adapted for use in the infringing remote reconfiguration feature, and it has no substantial non-infringing uses. On information and belief, CommScope knew or should have known that such activities contribute to T-Mobile’s infringement of at least claim 12 of the ’232 patent by performing the claimed method.

171. At least as of January 7, 2022, CommScope knows of the ’232 patent and performs

[57] *See Dali Wireless, Inc. v. AT&T Corp. et al.*, No. 2:22-CV-00012, ECF No. 1 (Complaint) (E.D. Tex. Jan. 7, 2022).

acts that it knows, or should know, induce and/or contribute to the direct infringement of claim 12 of the ’232 patent by T-Mobile. Thus, CommScope is indirectly liable for infringement of at least claim 12 of the ’232 patent pursuant to 35 U.S.C. §§ 271(b) and 271(c).

172. T-Mobile and CommScope undertook and continue their infringing actions despite an objectively high likelihood that such activities infringe the ’232 Patent, which has been duly issued by the PTO and is presumed valid. For example, CommScope, since at least January 7, 2022, and T-Mobile, since at least the filing of this Complaint, have been aware of an objectively high likelihood that their actions constituted and continue to constitute infringement of the ’232 Patent and that the ’232 Patent is valid. On information and belief, T-Mobile and CommScope could not reasonably, subjectively believe that their actions do not constitute infringement of the ’232 patent. Despite that knowledge and subjective belief, and the objectively high likelihood that their actions constitute infringement, T-Mobile and CommScope have continued their infringing activities. As such, T-Mobile and CommScope have willfully infringed and/or will continue to willfully infringe the ’232 patent.

173. As a result of T-Mobile and CommScope’s infringement of the ’232 patent, Dali has suffered and continues to suffer substantial injury and is entitled to recover all damages caused by T-Mobile and CommScope’s infringement to the fullest extent permitted by the Patent Act, together with prejudgment interests and costs for T-Mobile and CommScope’s wrongful conduct.

174. Dali has no adequate remedy at law to prevent future infringement of the ’232 patent. Dali suffers and continues to suffer irreparable harm as a result of T-Mobile and CommScope’s patent infringement and is, therefore, entitled to injunctive relief to enjoin T-Mobile and CommScope’s wrongful conduct.

FIFTH CAUSE OF ACTION
(PATENT INFRINGEMENT UNDER 35 U.S.C. § 271 OF THE '232 PATENT BY T-MOBILE AND ERICSSON)

175. Dali re-alleges and incorporates by reference all of the foregoing paragraphs.

176. On information and belief, T-Mobile and Ericsson have infringed and continue to infringe, either literally or under the doctrine of equivalents, one or more claims, including at least claim 12, of the '232 patent in violation of 35 U.S.C. § 271, et seq., directly and/or indirectly, by deploying, operating, maintaining, testing, and using T-Mobile's LTE and 5G networks which include small-cell solutions for wireless coverage, such as Ericsson's Radio Dot System.[58]

177. Claim 12 of the '232 patent provides:

> [Preamble] A method comprising:
>
> [12A] receiving a plurality of radio resources from an operator hub that operates using a Common Public Radio Interface (CPRI) protocol;
>
> [12B] assigning a first subset of the plurality of radio resources to a first access point included in a plurality of wireless access points and a second subset of the plurality of radio resources to a second access point included in the plurality of wireless access points, the first subset including more radio resources than the second subset;
>
> [12C] and in response to a change in need of a number of wireless subscribers coupled to the second access point and which of the second subset is loaded beyond a threshold, assigning one or more additional radio resources of the plurality of radio resources to the second access point.

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[58] *See e.g.,* https://static1.squarespace.com/static/56104a4ee4b0ffa1f98ffcfc/t/6092aad7ca3354484239eb52/1620224728469/Partners-newsletter-2021-Q1.pdf (last visited October 5, 2022) ("Partnering with Ericsson, Totem deploys Ericsson's Radio Dot System (aka RDS or 'Dot') to deliver high-performance in0building cellular systems required in modern commercial spaces. Totem deploys systems that support the major operators including Verizon, T-Mobile and T-Mobile"); *see also* https://www.ericsson.com/en/news/2021/1/t-mobile-expands-5g-nationwide (last visited October 5, 2022); https://howmobileworks.com/wp-content/uploads/2022/03/Ericsson-Indoor-Solution-0203221-1.pdf (last visited October 5, 2022) ("T-Mobile indoor coverage brought to you by Ericsson").

178. On information and belief, T-Mobile's LTE and 5G networks, which include Ericsson's Radio Dot System, satisfy each and every element recited in at least claim 12 of the '232 patent as stated below.

179. On information and belief, T-Mobile's LTE and 5G networks, which include Ericsson's Radio Dot System, meet the preamble of claim 12 of the '232 patent. The preamble of claim 1 refers to "[a] method comprising . . .".

180. For example, according to Ericsson the Radio Dot System "combines centralized baseband and radio units with visually low-impact antennas. Ericsson innovations enable RF signal, power and control over standard shielded LAN cables for cost-effective deployment with minimal business disruption."[59] Moreover, Ericsson's Radio Dot System includes "centralized radios [which] provide pooled capacity and design flexibility, dynamically meeting demand wherever it occurs in real time while increasing spectral and hardware efficiency of the system."[60]

181. On information and belief, T-Mobile's LTE and 5G networks, which include Ericsson's Radio Dot System, meet element [12A] of claim 12 of the '232 patent. Element [12A] requires, "receiving a plurality of radio resources from an operator hub that operates using a Common Public Radio Interface (CPRI) protocol . . .".

182. According to Ericsson's marketing material, The Radio Dot System (RDS) "is a complete end-to-end solution including the RF signal source. RDS consists of the Radio Dots, Baseband Units (DU) and Indoor Radio Unit(s) (IRU). The DU and IRU can be connected by fiber or co-located and connected through Digital CPRI cable."[61] Moreover, "[t]he Baseband is the

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[59] *See e.g.,* https://cellantenna.com/wp-content/uploads/2020/08/CellAntenna-Radio-Dot-System-Brochure-2020-01-17-1.pdf (last visited October 4, 2022).
[60] *Id.*
[61] *See* https://cellantenna.com/wp-content/uploads/2020/08/CellAntenna-Radio-Dot-System-Brochure-2020-01-17-1.pdf (last visited October 4, 2022).

signal source of the Radio Dot System and provides the pooled baseband resources for the building(s) or area."[62] Accordingly, on information and belief, T-Mobile's LTE and 5G networks, which include Ericsson's Radio Dot System, receive a plurality of radio resources from an operator hub that operates using a Common Public Radio Interface (CPRI) protocol.

183. On information and belief, T-Mobile's LTE and 5G networks, which include Ericsson's Radio Dot System, meet element [12B] of claim 12 of the '232 patent. Element [12B] of claim 12 requires "assigning a first subset of the plurality of radio resources to a first access point included in a plurality of wireless access points and a second subset of the plurality of radio resources to a second access point included in the plurality of wireless access points, the first subset including more radio resources than the second subset . . .".

184. According to Ericsson's marketing materials, the Radio Dot System "consists of the Radio Dots, Baseband Units (DU) and Indoor Radio Unit(s) (IRU)."[63] "The Baseband is the signal source of the Radio Dot System and provides the pooled baseband resources for the building(s) or area."[64] Moreover, Ericsson's Radio Dot System assigns subsets of resources to different access points depending on traffic: "centralized radios provide pooled capacity and design flexibility, dynamically meeting demand wherever it occurs in real time while increasing spectral and hardware efficiency of the system."[65] Ericsson materials explains that "[t]he capability to configure, scale, and reconfigure logical nodes through software commands enables the RAN to dynamically adjust to changing traffic conditions, hardware faults, as well as new service

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[62] *Id.*

[63] *Id.*

[64] *Id.*

[65] *Id.*

requirements."[66] Ericsson also states that "[w]ithout RDS, high traffic demand generated indoors consumes a substantial amount of the radio resources of the surrounding outdoor macro cells. Deploying RDS in large high-traffic enterprises offloads the macro layer and serves the indoor users more efficiently.[67] On information and belief, the first subset of radio resources includes more resources than the second subset of radio resources. Accordingly, T-Mobile's LTE and 5G networks, which include Ericsson's Radio Dot System, assign a first subset of the plurality of radio resources to a first access point included in a plurality of wireless access points and a second subset of the plurality of radio resources to a second access point included in the plurality of wireless access points, the first subset including more radio resources than the second subset.

185. On information and belief, T-Mobile's LTE and 5G networks, which include Ericsson's Radio Dot System, meet element [12C] of claim 12 of the '232 patent. Element [12C] of claim 12 requires "in response to a change in need of a number of wireless subscribers coupled to the second access point and which of the second subset is loaded beyond a threshold, assigning one or more additional radio resources of the plurality of radio resources to the second access point."

186. On information and belief, Ericsson's Radio Dot System comprises software that can configure access points by increasing or decreasing the number of resources in the plurality of resources. For example, Ericsson's materials explain that the Radio Dot System includes "centralized radios [to] provide pooled capacity and design flexibility, dynamically meeting demand wherever it occurs in real time while increasing spectral and hardware efficiency of the

[66] https://www.ericsson.com/en/reports-and-papers/ericsson-technology-review/articles/4g5g-ran-architecture-how-a-split-can-make-the-difference (last visited October 4, 2022).

[67] https://cellantenna.com/wp-content/uploads/2020/08/CellAntenna-Radio-Dot-System-Brochure-2020-01-17-1.pdf (last visited October 4, 2022).

system."[68]

187. By way of further example, Ericsson materials explain that "[t]he capability to configure, scale, and reconfigure logical nodes through software commands enables the RAN to dynamically adjust to changing traffic conditions, hardware faults, as well as new service requirements."[69] Ericsson also states that "[w]ithout RDS, high traffic demand generated indoors consumes a substantial amount of the radio resources of the surrounding outdoor macro cells. Deploying RDS in large high-traffic enterprises offloads the macro layer and serves the indoor users more efficiently.[70]

188. On information and belief, Ericsson's Radio Dot System assigns additional radio resources to an access point when it is loaded beyond a threshold. Accordingly, Ericsson's Radio Dot System assigns one or more additional radio resources of the plurality of radio resources to the second access point in response to a change in need of a number of wireless subscribers coupled to the second access point and which of the second subset is loaded beyond a threshold.

189. As a result, on information and belief, T-Mobile's LTE and 5G networks, which include Ericsson's Radio Dot System, meet all elements of, and therefore infringe, at least claim 12 of the '232 patent.

190. On information and belief, Ericsson has induced infringement of at least claim 12 of the '232 patent by T-Mobile pursuant to 35 U.S.C. § 271(b), and committed contributory infringement of at least claim 12 of the '232 patent pursuant to 35 U.S.C. § 271(c), by providing

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[68] *Id.*

[69] https://www.ericsson.com/en/reports-and-papers/ericsson-technology-review/articles/4g5g-ran-architecture-how-a-split-can-make-the-difference (last visited October 4, 2022).

[70] https://cellantenna.com/wp-content/uploads/2020/08/CellAntenna-Radio-Dot-System-Brochure-2020-01-17-1.pdf (last visited October 4, 2022).

the hardware and software necessary for T-Mobile to perform the claimed method, along with instructions that induce T-Mobile to perform the claimed method.

191. On information and belief, Ericsson takes active steps to induce infringement of at least claim 12 of the ’232 patent by T-Mobile, knowing that those steps will induce, encourage, and facilitate direct infringement by T-Mobile in violation of 35 U.S.C. § 271(b). Such active steps include, but are not limited to, providing T-Mobile with instructions on the use of the above-described remote reconfiguration feature, and participating in the installation, configuration, operation, and maintenance of Ericsson’s Radio Dot System in T-Mobile’s network specifically for the purpose of performing the infringing methods.

192. On information and belief, Ericsson knew or should have known that such activities induce T-Mobile to infringe at least claim 12 of the ’232 patent by performing the claimed methods from at least January 7, 2022 when Dali filed a lawsuit for infringement of ’232 patent by AT&T and Ericsson, which alleged that Ericsson’s Radio Dot System infringes the ‘232 patent.[71]

193. On information and belief, Ericsson also contributes to the infringement of at least claim 12 of the ’232 patent by T-Mobile in violation of 35 U.S.C. § 271(c). Acts by Ericsson that contribute to the infringement of T-Mobile include providing Ericsson’s Radio Dot Systems that are capable of implementing the above-described remote reconfiguration feature. The accused remote reconfiguration software is especially adapted for use in the infringing remote reconfiguration feature, and it has no substantial non-infringing uses. On information and belief, Ericsson knows or should know that such activities contribute to T-Mobile’s infringement of at least claim 12 of the ’232 patent by performing the claimed method.

[71] *See Dali Wireless, Inc. v. AT&T Corp. et al.*, No. 2:22-CV-00012, ECF No. 1 (Complaint) (E.D. Tex. Jan. 7, 2022).

194. At least as of January 7, 2022, Ericsson knows of the ’232 patent and performs acts that it knows, or should know, induce and/or contribute to the direct infringement of claim 12 of the ’232 patent by T-Mobile. Thus, Ericsson is indirectly liable for infringement of at least claim 12 of the ’232 patent pursuant to 35 U.S.C. §§ 271(b) and 271(c).

195. T-Mobile and Ericsson undertook and continue their infringing actions despite an objectively high likelihood that such activities infringe the ’232 Patent, which has been duly issued by the PTO and is presumed valid. For example, Ericsson, since at least January 7, 2022, and T-Mobile, since at least the filing of this Complaint, have been aware of an objectively high likelihood that their actions constituted and continue to constitute infringement of the ’232 Patent and that the ’232 Patent is valid. On information and belief, T-Mobile and Ericsson could not reasonably, subjectively believe that their actions do not constitute infringement of the ’232 patent. Despite that knowledge and subjective belief, and the objectively high likelihood that their actions constitute infringement, T-Mobile and Ericsson have continued their infringing activities. As such, T-Mobile and Ericsson have willfully infringed and/or will continue to willfully infringe the ’232 patent.

196. As a result of T-Mobile and Ericsson’s infringement of the ’232 patent, Dali has suffered and continues to suffer substantial injury and is entitled to recover all damages caused by T-Mobile and Ericsson’s infringement to the fullest extent permitted by the Patent Act, together with prejudgment interests and costs for T-Mobile and Ericsson’s wrongful conduct.

197. Dali has no adequate remedy at law to prevent future infringement of the ’232 patent. Dali suffers and continues to suffer irreparable harm as a result of T-Mobile and Ericsson’s patent infringement and is, therefore, entitled to injunctive relief to enjoin T-Mobile and Ericsson’s wrongful conduct.

SIXTH CAUSE OF ACTION
(PATENT INFRINGEMENT UNDER 35 U.S.C. § 271 OF THE '499 PATENT BY T-MOBILE AND COMMSCOPE)

198. Dali re-alleges and incorporates by reference all the foregoing paragraphs.

199. On information and belief, T-Mobile and CommScope have directly infringed and continue to directly infringe either literally or under the doctrine of equivalents, one or more claims, including at least claim 1 of the '499 patent, in violation of 35 U.S.C. § 271, et seq., by deploying, operating, maintaining, testing, and using T-Mobile's LTE and 5G networks which include solutions for in-building wireless coverage, such as CommScope's ION®-E/ERA platform.[72]

200. Claim 1 of the '499 patent provides:

> [Preamble] A system for transporting wireless communications, comprising:
>
> [1A] a baseband unit;
>
> [1B] a plurality of signal sources, including at least a first signal source and a second signal source;
>
> [1C] a plurality of remote units, including at least a first remote unit and a second remote unit;
>
> [1D] wherein the baseband unit comprises a plurality of interfaces to communicatively couple the baseband unit to the plurality of signal sources;
>
> [1E] wherein the baseband unit is configured to receive a plurality of radio resources from the first signal source and the second signal source;
>
> [1F] wherein the baseband unit is configured to send a digital representation of a first set of radio resources to the first remote

[72] *See e.g.,* https://howmobileworks.com/wp-content/uploads/2021/06/tmo-byoc-case-study-space-needle-110420.pdf (last visited October 4, 2022) ("T-Mobile designed a unified wireless infrastructure architecture, based on the CommScope ION-E solution, to streamline deployment and minimize equipment needs").

> unit at a first point in time, the first set of radio resources for transmission at an antenna of the first remote unit;
>
> [1G] wherein the baseband unit is configured to send a digital representation of a second set of radio resources to the first remote unit at a second point in time, the second set of radio resources for transmission at the antenna of the first remote unit;
>
> [1H] wherein a number of radio resources in the first set of radio resources is different from a number of radio resources in the second set of radio resources; and
>
> [1I] wherein the baseband unit is configured to receive digital signals from each of the plurality of remote units.

201. On information and belief, T-Mobile's LTE and 5G networks, which include CommScope's ION®-E/ERA platform, satisfy each and every element recited in at least claim 1 of the '499 patent as stated below.

202. On information and belief, and to the extent the preamble is limiting, T-Mobile's LTE and 5G networks meet the preamble of claim 1 of the '499 patent because CommScope's ION®-E/ERA platform is a system for transporting wireless communications. For example, according to CommScope the "all-digital ERA distributed antenna system makes in-building wireless simpler and more economical. Operating on standard IT infrastructure—Category 6A and fiber—these solutions allow operators, neutral hosts and enterprises to provide high capacity with 'five bars' of in-building coverage."[73] Moreover, "ERA's all-digital, frequency-agnostic system architecture ensures that the system will be able to support new services in existing and new bands including CBRS and sub-6 GHz 5G NR. ERA's multiplexed fiber fronthaul can also be shared with other communication services. And as usage patterns change, capacity can be re-allocated through a web-based drag-and-drop software GUI rather than physical re-wiring."[74]

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[73] https://www.commscope.com/product-type/in-building-cellular-systems/distributed-antenna-systems-das/era/ (last visited October 4, 2022).
[74] *Id.*

203. On information and belief, T-Mobile's LTE and 5G networks, which include CommScope's ION®-E/ERA platform, meet claim element [1A] of claim 1 of the '499 patent.

204. T-Mobile's LTE and 5G networks include a baseband unit. For example, CommScope's ION®-E/ERA platform includes a "CPRI digital donor (CDD)" module.[75] This module "receives CPRI digital signals from compatible operator baseband units (BBU)."[76] Further, CommScope explains that the ION®-E/ERA platform "[t]ake[s] advantage of an all-digital CPRI baseband interface that eliminates the need for analog-to-digital conversions, further reducing head-end size and power requirements."[77] Accordingly, T-Mobile's LTE and 5G networks, which include CommScope's ION®-E/ERA platform, include a baseband unit.

205. On information and belief, T-Mobile's LTE and 5G networks, which include CommScope's ION®-E/ERA platform, meet claim element [1B] of claim 1 of the '499 patent.

206. For example, CommScope's ION®-E/ERA platform includes a "CPRI digital donor (CDD)" module.[78] This module "receives CPRI digital signals from compatible operator baseband units (BBU)."[79] Further, CommScope explains that the ION®-E/ERA platform "[t]ake[s] advantage of an all-digital CPRI baseband interface that eliminates the need for analog-to-digital conversions, further reducing head-end size and power requirements."[80] CommScope also explains that the ION® E/ERA platform includes a "central area node (CAN)," which "digitizes baseband RF signals, combines signals from different operators and distributes them throughout a building or campus."[81] Accordingly, T-Mobile's LTE and 5G networks, which

[75] *Id.*
[76] *Id.*
[77] *Id.*
[78] *Id.*
[79] *Id.*
[80] *Id.*
[81] *Id.*

include CommScope's ION®-E/ERA platform, include a plurality of signal sources, including at least a first signal source and a second signal source.

207. On information and belief, T-Mobile's LTE and 5G networks, which include CommScope's ION®-E/ERA platform, meet claim element [1C] of claim 1 of the '499 patent.

208. For example, CommScope's ION®-E/ERA platform includes "[a] range of remote access points that convert the digital signal back to radio frequency (RF) for over-the-air transmission."[82] These remote units include "the carrier access point (CAP)" and "the universal access point (UAP)."[83] Accordingly, T-Mobile's LTE and 5G networks, which include CommScope's ION®-E/ERA platform, include a plurality of remote units, including at least a first remote unit and a second remote unit.

209. On information and belief, T-Mobile's LTE and 5G networks, which include CommScope's ION®-E/ERA platform, meet claim element [1D] of claim 1 of the '499 patent.

210. For example, CommScope's ION®-E/ERA platform includes a "CPRI digital donor (CDD)" module.[84] This module "receives CPRI digital signals from compatible operator baseband units (BBU)."[85] Further, CommScope explains that the ION®-E/ERA platform "[t]ake[s] advantage of an all-digital CPRI baseband interface that eliminates the need for analog-to-digital conversions, further reducing head-end size and power requirements."[86] CommScope also explains that the ION® E/ERA platform includes a "central area node (CAN)," which "digitizes baseband RF signals, combines signals from different operators and distributes them

[82] *Id.*
[83] *Id.*

[84] *Id.*
[85] *Id.*
[86] *Id.*

throughout a building or campus."[87] Accordingly, T-Mobile's LTE and 5G networks, which include CommScope's ION®-E/ERA platform, include a baseband unit, wherein the baseband unit comprises a plurality of interfaces to communicatively couple the baseband unit to the plurality of signal sources.

211. On information and belief, T-Mobile's LTE and 5G networks, which include CommScope's ION®-E/ERA platform, meet claim element [1E] of claim 1 of the '499 patent.

212. For example, as explained above in paragraphs 209-210, CommScope's ION®-E/ERA platform includes a baseband unit, wherein the baseband unit comprises a plurality of interfaces to communicatively couple the baseband unit to the plurality of signal sources. On information and belief, the baseband unit is configured to receive radio resources from the plurality of signal sources. Accordingly, CommScope's ION®-E/ERA platform includes a baseband unit, wherein the baseband unit is configured to receive a plurality of radio resources from the first signal source and the second signal source.

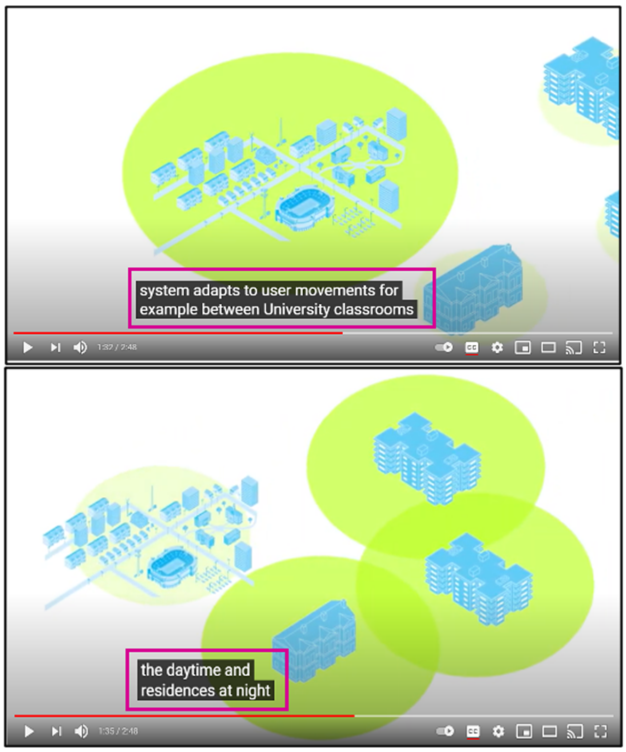
213. On information and belief, T-Mobile's LTE and 5G networks, which include CommScope's ION®-E/ERA platform, meet claim element [1F] of claim 1 of the '499 patent.

214. For example, CommScope's ION®-E/ERA platform includes a "CPRI digital donor (CDD)" module.[88] This module "receives CPRI digital signals from compatible operator baseband units (BBU)."[89] Further, CommScope explains that the ION®-E/ERA platform "[t]ake[s] advantage of an all-digital CPRI baseband interface that eliminates the need for analog-to-digital conversions, further reducing head-end size and power requirements."[90] CommScope

[87] *Id.*
[88] *Id.*
[89] *Id.*
[90] *Id.*

also explains that the ION® E/ERA platform includes a "central area node (CAN)," which "digitizes baseband RF signals, combines signals from different operators and distributes them throughout a building or campus."[91]

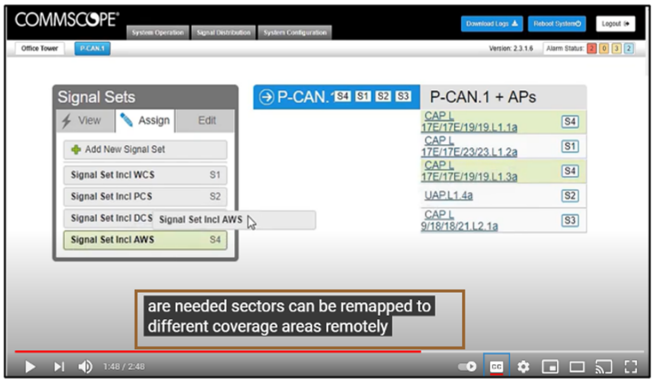
215. By way of further example, CommScope's marketing materials describe how radio resources can be assigned to remote units when the majority of users move from one place, like a university classroom, to a second place, like university residences:[92]



[91] *Id.*

[92] *See,* "CommScope Era™ C-RAN Antenna System," https://www.youtube.com/watch?v=uBRDL7a8_8g (last visited October 4, 2022) (annotation added).

Moreover, the same marketing materials describe how sectors can be remapped where radio resources are needed most:[93]



Accordingly, CommScope's ION®-E/ERA platform includes a baseband unit, wherein the baseband unit is configured to send a digital representation of a first set of radio resources to the first remote unit at a first point in time, the first set of radio resources for transmission at an antenna of the first remote unit.

216. On information and belief, T-Mobile's LTE and 5G networks, which include CommScope's ION®-E/ERA platform, meet claim element 1[G] of claim 1 of the '499 patent.

217. For example, as explained above in paragraphs 214-215, CommScope's ION®-E/ERA platform is configured to send digital representations of radio resources to a remote unit. On information and belief, CommScope's ION®-E/ERA platform is configured to send a digital representation of a second set of radio resources to the first remote unit at a second point in time, the second set of radio resources for transmission at the antenna of the first remote unit. Accordingly, T-Mobile's LTE and 5G networks, which include CommScope's ION®-E/ERA platform, meet claim element 1[G] of claim 1 of the '499 patent.

[93] *Id* (annotation added).

218. On information and belief, T-Mobile's LTE and 5G networks, which include CommScope's ION®-E/ERA platform, meet claim element 1[H] of claim 1 of the '499 patent.

219. For example, as explained above in paragraphs 214-217, CommScope's ION®-E/ERA platform is configured to send a digital representation of a first and second set of radio resources to a remote unit. On information and belief, CommScope's ION®-E/ERA platform is configured to send a number of radio resources in the first set of radio resources that is different from a number of radio resources in the second set of radio resources. Accordingly, T-Mobile's LTE and 5G networks, which include CommScope's ION®-E/ERA platform, meet claim element 1[H] of claim 1 of the '499 patent.

220. On information and belief, T-Mobile's LTE and 5G networks, which include CommScope's ION®-E/ERA platform, meet claim element 1[I] of claim 1 of the '499 patent.

221. For example, as explained above in paragraphs 214-215, CommScope's ION®-E/ERA platform is configured to send digital representations of radio resources to a remote unit. On information and belief, CommScope's ION®-E/ERA platform is also configured to receive digital signals from each of the plurality of remote units. Accordingly, T-Mobile's LTE and 5G networks, which include CommScope's ION®-E/ERA platform, meet claim element [1I] of claim 1 of the '499 patent.

222. On information and belief, CommScope has induced infringement of at least claim 1 of the '499 patent by T-Mobile pursuant to 35 U.S.C. § 271(b) and committed contributory infringement of at least claim 1 of the '499 patent pursuant to 35 U.S.C. § 271(c), by providing the hardware and software necessary for T-Mobile to use the claimed system, along with instructions that induce T-Mobile to use the claimed system.

223. On information and belief, CommScope takes active steps to induce infringement

of at least claim 1 of the ’499 patent by T-Mobile, knowing that those steps will induce, encourage, and facilitate direct infringement by T-Mobile in violation of 35 U.S.C. § 271(b). Such active steps include, but are not limited to, providing T-Mobile with instructions on the use of the above-described distributed antenna system, and participating in the installation, configuration, operation, and maintenance of ION®-E/ERA platforms in T-Mobile’s network specifically for the purpose of using the infringing system.

224. On information and belief, CommScope knew or should have known that such activities induce T-Mobile to infringe at least claim 1 of the ’499 patent by using the claimed systems from at least January 7, 2022 when Dali filed a lawsuit for infringement of the ’499 patent by AT&T and CommScope, which alleged that CommScope’s ION®-E/ERA platform infringes the ‘499 patent.[94]

225. On information and belief, CommScope also contributes to the infringement of at least claim 1 of the ’499 patent by T-Mobile in violation of 35 U.S.C. § 271(c). Acts by CommScope that contribute to the infringement of T-Mobile include providing ION®-E/ERA platform hardware and software modules that comprise the above-described distributed antenna system. The accused hardware and software are especially adapted for use in the infringing distributed antenna system, and they have no substantial non-infringing uses. On information and belief, CommScope knows or should know that such activities contribute to T-Mobile’s infringement of at least claim 1 of the ’499 patent by using the claimed system.

226. At least as of January 7, 2022, CommScope knows of the ’499 patent and performs acts that it knows, or should know, induce and/or contribute to the direct infringement of claim 1

[94] *See Dali Wireless, Inc. v. AT&T Corp. et al.*, No. 2:22-CV-00012, ECF No. 1 (Complaint) (E.D. Tex. Jan. 7, 2022).

of the ’499 patent by T-Mobile. Thus, CommScope is indirectly liable for infringement of at least claim 1 of the ’499 patent pursuant to 35 U.S.C. §§ 271(b) and 271(c).

227. T-Mobile and CommScope undertook and continue their infringing actions despite an objectively high likelihood that such activities infringe the ’499 Patent, which has been duly issued by the PTO and is presumed valid. Moreover, the PTAB has denied institution of at least one petition for *inter partes* review of the ’499 patent.[95] For example, CommScope, since at least January 7, 2022, and T-Mobile, since at least the filing of this Complaint, have been aware of an objectively high likelihood that their actions constituted and continue to constitute infringement of the ’499 Patent and that the ’499 Patent is valid. On information and belief, T-Mobile and CommScope could not reasonably, subjectively believe that their actions do not constitute infringement of the ’499 patent. Despite that knowledge and subjective belief, and the objectively high likelihood that their actions constitute infringement, T-Mobile and CommScope have continued their infringing activities. As such, T-Mobile and CommScope have willfully infringed and/or will continue to willfully infringe the ’499 patent.

228. As a result of T-Mobile and CommScope’s infringement of the ’499 patent, Dali has suffered and continues to suffer substantial injury and is entitled to recover all damages caused by T-Mobile and CommScope’s infringement to the fullest extent permitted by the Patent Act, together with prejudgment interest and costs for T-Mobile and CommScope’s wrongful conduct.

229. Dali has no adequate remedy at law to prevent future infringement of the ’499 patent. Dali suffers and continues to suffer irreparable harm as a result of T-Mobile and CommScope’s patent infringement and is, therefore, entitled to injunctive relief to enjoin T-Mobile and CommScope’s wrongful conduct.

[95] *See* IPR2020-01430, Paper No. 15 (decision denying institution).

SEVENTH CAUSE OF ACTION
(PATENT INFRINGEMENT UNDER 35 U.S.C. § 271 OF THE '499 PATENT BY T-MOBILE AND ERICSSON)

230. Dali re-alleges and incorporates by reference all the foregoing paragraphs.

231. On information and belief, T-Mobile and Ericsson have directly infringed and continue to directly infringe either literally or under the doctrine of equivalents, one or more claims, including at least claim 1 of the '499 patent, in violation of 35 U.S.C. § 271, et seq., by deploying, operating, maintaining, testing, and using T-Mobile's LTE and 5G networks which include small cell equipment such as Ericsson's Radio Dot System.[96]

232. Claim 1 of the '499 patent provides:

> [Preamble] A system for transporting wireless communications, comprising:
>
> [1A] a baseband unit;
>
> [1B] a plurality of signal sources, including at least a first signal source and a second signal source;
>
> [1C] a plurality of remote units, including at least a first remote unit and a second remote unit;
>
> [1D] wherein the baseband unit comprises a plurality of interfaces to communicatively couple the baseband unit to the plurality of signal sources;

[96] *See e.g.,* https://static1.squarespace.com/static/56104a4ee4b0ffa1f98ffcfc/t/6092aad7ca3354484239eb52/1620224728469/Partners-newsletter-2021-Q1.pdf (last visited October 5, 2022) ("Partnering with Ericsson, Totem deploys Ericsson's Radio Dot System (aka RDS or 'Dot') to deliver high-performance in0building cellular systems required in modern commercial spaces. Totem deploys systems that support the major operators including Verizon, T-Mobile and T-Mobile"); *see also* https://www.ericsson.com/en/news/2021/1/t-mobile-expands-5g-nationwide (last visited October 5, 2022); https://howmobileworks.com/wp-content/uploads/2022/03/Ericsson-Indoor-Solution-0203221-1.pdf (last visited October 5, 2022) ("T-Mobile indoor coverage brought to you by Ericsson").

> [1E] wherein the baseband unit is configured to receive a plurality of radio resources from the first signal source and the second signal source;
>
> [1F] wherein the baseband unit is configured to send a digital representation of a first set of radio resources to the first remote unit at a first point in time, the first set of radio resources for transmission at an antenna of the first remote unit;
>
> [1G] wherein the baseband unit is configured to send a digital representation of a second set of radio resources to the first remote unit at a second point in time, the second set of radio resources for transmission at the antenna of the first remote unit;
>
> [1H] wherein a number of radio resources in the first set of radio resources is different from a number of radio resources in the second set of radio resources; and
>
> [1I] wherein the baseband unit is configured to receive digital signals from each of the plurality of remote units.

233. On information and belief, T-Mobile's LTE and 5G networks, which include Ericsson's Radio Dot System, satisfy each and every element recited in at least claim 1 of the '499 patent as stated below.

234. On information and belief, and to the extent the preamble is limiting, T-Mobile's LTE and 5G networks meet the preamble of claim 1 of the '499 patent because Ericsson's Radio Dot System is a system for transporting wireless communications. For example, according to Ericsson the Radio Dot System "combines centralized baseband and radio units with visually low-impact antennas. Ericsson innovations enable RF signal, power and control over standard shielded LAN cables for cost-effective deployment with minimal business disruption."[97] Moreover, Ericsson's Radio Dot System includes "centralized radios [which] provide pooled capacity and design flexibility, dynamically meeting demand wherever it occurs in real time while increasing

[97] *See e.g.,* https://cellantenna.com/wp-content/uploads/2020/08/CellAntenna-Radio-Dot-System-Brochure-2020-01-17-1.pdf (last visited October 4, 2022).

spectral and hardware efficiency of the system."[98]

235. On information and belief, T-Mobile's LTE and 5G networks, which include Ericsson's Radio Dot System, meet claim element [1A] of claim 1 of the '499 patent.

236. T-Mobile's LTE and 5G networks include a baseband unit. For example, Ericsson's Radio Dot System "consists of the Radio Dots, Baseband Units (DU) and Indoor Radio Unit(s) (IRU). The DU and IRU can be connected by fiber or colocated and connected through Digital CPRI cable."[99]

237. On information and belief, T-Mobile's LTE and 5G networks, which include Ericsson's Radio Dot System, meet claim element [1B] of claim 1 of the '499 patent.

238. For example, Ericsson's Radio Dot System "consists of the Radio Dots, Baseband Units (DU) and Indoor Radio Unit(s) (IRU)."[100] Ericsson describes the DU as the "signal source of the Radio Dot System and provides the pooled baseband resources for the building(s) or area."[101] The "DU and IRU can be connected by fiber or colocated and connected through Digital CPRI cable."[102] In certain circumstances, the "the digital unit is centrally located and the IRUs are distributed."[103] Accordingly, T-Mobile's LTE and 5G networks, which include Ericson's Radio Dot System, include a plurality of signal sources, including at least a first signal source and a second signal source.

239. On information and belief, T-Mobile's LTE and 5G networks, which include Ericson's Radio Dot System, meet claim element [1C] of claim 1 of the '499 patent.

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[98] *Id.*
[99] *Id.*
[100] *Id.*
[101] *Id.*
[102] *Id.*
[103] *Id.*

240. For example, Ericsson's Radio Dot System includes "Radio Dots, Baseband Units (DU) and Indoor Radio Unit(s) (IRU)."[104] Further, the IRU "is frequency independent and supports remote software upgrades. It supports and provides power for up to eight Radio Dots, corresponding to an equivalent of 70,000 square feet of floor space coverage in a typical office building. Individual Dots can be connected with up to 650 feet of LAN cable."[105] Accordingly, T-Mobile's LTE and 5G networks, which include Ericson's Radio Dot System, include a plurality of remote units, including at least a first remote unit and a second remote unit.

241. On information and belief, T-Mobile's LTE and 5G networks, which include Ericson's Radio Dot System, meet claim element [1D] of claim 1 of the '499 patent.

242. For example, Ericsson's Radio Dot System includes "Radio Dots, Baseband Units (DU) and Indoor Radio Unit(s) (IRU)."[106] Ericsson's literature further explains that the DU includes a plurality of interfaces to communicatively couple the baseband unit to the plurality of signal sources:[107]

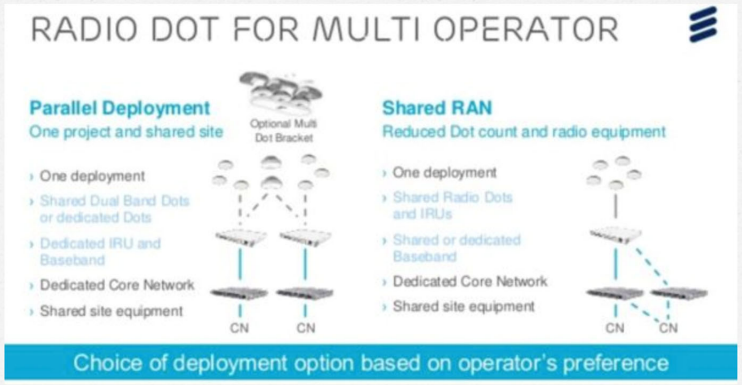
> The Baseband is the signal source of the Radio Dot System and provides the pooled baseband resources for the building(s) or area. The DU delivers feature parity and roadmap evolution with the macro network and supports key coordination features such as Carrier Aggregation and Combined Cell, vital for multi-antenna indoor deployments. As new features are added to the Ericsson RAN software, they are automatically available in every radio dot system deployment. The Baseband also provides synchronization and transport security functionality, and aggregates the RDS traffic onto a common backhaul connection.

243. Moreover, Ericsson has announced that the Radio Dot System supports multi-

[104] *Id.*
[105] *Id.*
[106] *Id.*
[107] *Id.*

operator service in three ways:[108]

First – parallel deployments with each operator using its own dedicated baseband, IRU and Dots. These Dots can be housed in the same enclosures (the new enclosures known as the multi-dot bracket) to tidy things up a bit.



Parallel or shared RAN options

Secondly – a multi-operator deployment using a shared baseband and IRU, over the same network of distributed radio heads, using MORAN (Multi Operator Radio Access Network) or MOCN (Multi Operator Core Network) network sharing capabilities.

Thirdly, a multi-operator Dot solution where operators provide multiple RF sources to the same Dot system. They do this by feeding baseband capacity to a new access unit from Ericsson, the RF Access Unit (RAU). This new RAU can support three 2×2 MIMO RF inputs, and can be connected on the other side to four IRUs, which then feed the shared Dot remote radioheads.

Accordingly, T-Mobile's LTE and 5G networks, which include Ericson's Radio Dot System, include a baseband unit, wherein the baseband unit comprises a plurality of interfaces to communicatively couple the baseband unit to the plurality of signal sources.

244. On information and belief, T-Mobile's LTE and 5G networks, which include Ericson's Radio Dot System, meet claim element [1E] of claim 1 of the '499 patent.

245. For example, as explained above in paragraphs 242-243, Ericsson's Radio Dot

[108] https://the-mobile-network.com/2017/08/ericssons-multi-operator-radio-dot-matrix/ (last visited October 4, 2022).

System includes a baseband unit, wherein the baseband unit is configured to receive a plurality of radio resources from the first signal source and the second signal source.

246. On information and belief, T-Mobile's LTE and 5G networks, which include Ericson's Radio Dot System, meet claim element [1F] of claim 1 of the '499 patent.

247. For example, Ericsson's marketing materials explain that the DU of the Ericsson Radio Dot system "is the signal source of the Radio Dot System and provides the pooled baseband resources for the building(s) or area."[109] These materials further explain that "centralized radios provide pooled capacity and design flexibility, dynamically meeting demand wherever it occurs in real time while increasing spectral and hardware efficiency of the system."[110] On information and belief, the DU is configured to send a digital representation of a first set of radio resources to the first remote unit at a first point in time, the first set of radio resources for transmission at an antenna of the first remote unit. Accordingly, T-Mobile's LTE and 5G networks, which include Ericson's Radio Dot System, meet element [1F] of claim 1 of the '499 patent.

248. On information and belief, T-Mobile's LTE and 5G networks, which include Ericson's Radio Dot System, meet claim element 1[G] of claim 1 of the '499 patent.

249. For example, as explained above in paragraph 247, the DU is configured to send digital representations of radio resources to a remote unit. On information and belief, the DU is configured to send a digital representation of a second set of radio resources to the first remote unit at a second point in time, the second set of radio resources for transmission at the antenna of the first remote unit. Accordingly, T-Mobile's LTE and 5G networks, which include Ericson's Radio Dot System, meet claim element 1[G] of claim 1 of the '499 patent.

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[109] https://cellantenna.com/wp-content/uploads/2020/08/CellAntenna-Radio-Dot-System-Brochure-2020-01-17-1.pdf (last visited October 4, 2022).
[110] *Id.*

250. On information and belief, T-Mobile's LTE and 5G networks, which include Ericson's Radio Dot System, meet claim element 1[H] of claim 1 of the '499 patent.

251. For example, as explained above in paragraph 247, the DU is configured to send digital representations of radio resources to a remote unit. On information and belief, the DU is configured to send a number of radio resources in the first set of radio resources that is different from a number of radio resources in the second set of radio resources. Accordingly, T-Mobile's LTE and 5G networks, which include Ericson's Radio Dot System, meet claim element 1[H] of claim 1 of the '499 patent.

252. On information and belief, T-Mobile's LTE and 5G networks, which include Ericson's Radio Dot System, meet claim element 1[I] of claim 1 of the '499 patent.

253. For example, as explained above in paragraph 247, the DU is configured to send digital representations of radio resources to a remote unit. On information and belief, the DU is also configured to receive digital signals from each of the plurality of remote units. Accordingly, T-Mobile's LTE and 5G networks, which include Ericson's Radio Dot System, meet claim element [1I] of claim 1 of the '499 patent.

254. On information and belief, Ericsson has induced infringement of at least claim 1 of the '499 patent by T-Mobile pursuant to 35 U.S.C. § 271(b) and committed contributory infringement of at least claim 1 of the '499 patent pursuant to 35 U.S.C. § 271(c), by providing the hardware and software necessary for T-Mobile to use the claimed system, along with instructions that induce T-Mobile to use the claimed system.

255. On information and belief, Ericsson takes active steps to induce infringement of at least claim 1 of the '499 patent by T-Mobile, knowing that those steps will induce, encourage, and facilitate direct infringement by T-Mobile in violation of 35 U.S.C. § 271(b). Such active steps

include, but are not limited to, providing T-Mobile with instructions on the use of the above-described distributed antenna system, and participating in the installation, configuration, operation, and maintenance of Radio Dot Systems in T-Mobile's network specifically for the purpose of using the infringing system.

256. On information and belief, Ericsson knew or should have known that such activities induce T-Mobile to infringe at least claim 1 of the '499 patent by using the claimed systems from at least January 7, 2022 when Dali filed a lawsuit for infringement of the '499 patent by AT&T and Ericsson, which alleged that Ericsson's Radio Dot System infringes the '499 patent.[111]

257. On information and belief, Ericsson also contributes to the infringement of at least claim 1 of the '499 patent by T-Mobile in violation of 35 U.S.C. § 271(c). Acts by Ericsson that contribute to the infringement of T-Mobile include providing Radio Dot System hardware and software modules that comprise the above-described distributed antenna system. The accused hardware and software are especially adapted for use in the infringing distributed antenna system, and they have no substantial non-infringing uses. On information and belief, Ericsson knows or should know that such activities contribute to T-Mobile's infringement of at least claim 1 of the '499 patent by using the claimed system.

258. At least as of January 7, 2022, Ericsson knows of the '499 patent and performs acts that it knows, or should know, induce and/or contribute to the direct infringement of claim 1 of the '499 patent by T-Mobile. Thus, Ericsson is indirectly liable for infringement of at least claim 1 of the '499 patent pursuant to 35 U.S.C. §§ 271(b) and 271(c).

259. T-Mobile and Ericsson undertook and continue their infringing actions despite an

[111] *See Dali Wireless, Inc. v. AT&T Corp. et al.*, No. 2:22-CV-00012, ECF No. 1 (Complaint) (E.D. Tex. Jan. 7, 2022).

objectively high likelihood that such activities infringe the '499 Patent, which has been duly issued by the PTO and is presumed valid. Moreover, the PTAB has denied institution of at least one petition for *inter partes* review of the '499 patent.[112] For example, Ericsson, since at least January 7, 2022, and T-Mobile, since at least the filing of this Complaint, have been aware of an objectively high likelihood that their actions constituted and continue to constitute infringement of the '499 Patent and that the '499 Patent is valid. On information and belief, T-Mobile and Ericsson could not reasonably, subjectively believe that their actions do not constitute infringement of the '499 patent. Despite that knowledge and subjective belief, and the objectively high likelihood that their actions constitute infringement, T-Mobile and Ericsson have continued their infringing activities. As such, T-Mobile and Ericsson have willfully infringed and/or will continue to willfully infringe the '499 patent.

260. As a result of T-Mobile and Ericsson's infringement of the '499 patent, Dali has suffered and continues to suffer substantial injury and is entitled to recover all damages caused by T-Mobile and Ericsson's infringement to the fullest extent permitted by the Patent Act, together with prejudgment interest and costs for T-Mobile and Ericsson's wrongful conduct.

261. Dali has no adequate remedy at law to prevent future infringement of the '499 patent. Dali suffers and continues to suffer irreparable harm as a result of T-Mobile and Ericsson's patent infringement and is, therefore, entitled to injunctive relief to enjoin T-Mobile and Ericsson's wrongful conduct.

EIGHTH CAUSE OF ACTION
(PATENT INFRINGEMENT UNDER 35 U.S.C. § 271 OF THE '338 PATENT BY T-MOBILE AND ERICSSON)

262. Dali re-alleges and incorporates by reference all the foregoing paragraphs.

[112] *See* IPR2020-01430, Paper No. 15 (decision denying institution).

263. On information and belief, T-Mobile and Ericsson have directly infringed and continue to directly infringe either literally or under the doctrine of equivalents, one or more claims, including at least claim 1 of the '338 patent, in violation of 35 U.S.C. § 271, et seq., by deploying, operating, maintaining, testing, and using T-Mobile's LTE and 5G networks which include small cell equipment such as Ericsson's Radio Dot System. [113]

264. Claim 1 of the '338 provides:

> [Preamble] A method for routing and switching RF signals comprising:
>
> [1A] providing one or more remote radio units, each remote radio unit configured to transmit one or more downlink RF signals and to receive one or more uplink RF signals;
>
> [1B] providing at least one digital access unit configured to communicate with the one or more remote radio units;
>
> [1C] translating the uplink and downlink signals between RF and base band as appropriate;
>
> [1D] packetizing the uplink and downlink base band signals, wherein the packetized signals correspond to a plurality of carriers;
>
> [1E] configuring each remote radio unit to receive or transmit a respective subset of the plurality of carriers, each respective subset of the plurality of carriers including a number of carriers;
>
> [1F] reconfiguring each remote radio unit by: determining a load percentage for each remote radio unit; and increasing or decreasing

[113] *See e.g.,* https://static1.squarespace.com/static/56104a4ee4b0ffa1f98ffcfc/t/6092aad7ca3354484239eb52/1620224728469/Partners-newsletter-2021-Q1.pdf (last visited October 5, 2022) ("Partnering with Ericsson, Totem deploys Ericsson's Radio Dot System (aka RDS or 'Dot') to deliver high-performance in0building cellular systems required in modern commercial spaces. Totem deploys systems that support the major operators including Verizon, T-Mobile and T-Mobile"); *see also* https://www.ericsson.com/en/news/2021/1/t-mobile-expands-5g-nationwide (last visited October 5, 2022); https://howmobileworks.com/wp-content/uploads/2022/03/Ericsson-Indoor-Solution-0203221-1.pdf (last visited October 5, 2022) ("T-Mobile indoor coverage brought to you by Ericsson").

> the number of carriers in the respective subset of the plurality of carriers based on the load percentage; and
>
> [1G] routing and switching the packetized signals among the one or more remote radio units via the at least one digital access unit according to a result of the reconfiguring.

265. On information and belief, T-Mobile's LTE and 5G networks, which include Ericsson's Radio Dot System, satisfy each and every limitation recited in at least claim 1 of the '338 patent as stated below.

266. On information and belief, and to the extent the preamble is limiting, T-Mobile's LTE and 5G networks meet the preamble of claim 1 of the '338 patent because Ericsson's Radio Dot System routes and switches RF signals. For example, according to Ericsson the Radio Dot System "combines centralized baseband and radio units with visually low-impact antennas. Ericsson innovations enable RF signal, power and control over standard shielded LAN cables for cost-effective deployment with minimal business disruption."[114] Moreover, Ericsson's Radio Dot System includes "centralized radios [which] provide pooled capacity and design flexibility, dynamically meeting demand wherever it occurs in real time while increasing spectral and hardware efficiency of the system."[115]

267. On information and belief, T-Mobile's LTE and 5G networks, which include Ericsson's Radio Dot System, meet claim element [1A] of claim 1 of the '338 patent.

268. T-Mobile's LTE and 5G networks include one or more remote radio units, each remote radio unit configured to transmit one or more downlink RF signals and to receive one or more uplink RF signals. For example, Ericsson's Single Band Radio Dot includes RF hardware that provides "2x2 MIMO, Tx/Rx diversity" and Ericsson's Dual Band Radio Dot includes RF

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[114] *See e.g.,* https://cellantenna.com/wp-content/uploads/2020/08/CellAntenna-Radio-Dot-System-Brochure-2020-01-17-1.pdf (last visited October 5, 2022).
[115] *Id.*

hardware that provides "2x2 MIMO, Tx/Rx diversity (per band)."[116] The functionality of Ericsson's Radio Dot RF hardware includes transmitting downlink RF signals and receiving uplink RF signals.

269. On information and belief, T-Mobile's LTE and 5G networks, which include Ericsson's Radio Dot System, meet claim element [1B] of claim 1 of the '338 patent.

270. T-Mobile's LTE and 5G networks provide at least one digital access unit configured to communicate with the one or more remote radio units. For example, Ericsson's Radio Dot System "consists of the Radio Dots, Baseband Units (DU) and Indoor Radio Unit(s) (IRU)."[117] Ericsson describes the DU as the "signal source of the Radio Dot System and provides the pooled baseband resources for the building(s) or area."[118] The "DU and IRU can be connected by fiber or co-located and connected through Digital CPRI cable." In certain circumstances, "the digital unit is centrally located and the IRUs are distributed."[119] On information and belief, the DU is configured to communicate with remote radio units, including Radio Dots and IRUs.

271. On information and belief, T-Mobile's LTE and 5G networks, which include Ericson's Radio Dot System, meet claim element [1C] of claim 1 of the '338 patent.

272. On information and belief, T-Mobile's LTE and 5G networks translate the uplink and downlink signals between RF and base band as appropriate. For example, Ericsson's Radio Dot System "consists of the Radio Dots, Baseband Units (DU) and Indoor Radio Unit(s) (IRU)."[120] Ericsson describes the DU as the "signal source of the Radio Dot System and provides the pooled

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[116] *Id.*

[117] *Id.*
[118] *Id.*
[119] *Id.*
[120] *Id.*

baseband resources for the building(s) or area."[121] Ericsson's Single Band Radio Dot includes RF hardware that provides "2x2 MIMO, Tx/Rx diversity" and Ericsson's Dual Band Radio Dot includes RF hardware that provides "2x2 MIMO, Tx/Rx diversity (per band)."[122] The functionality of Ericsson's Radio Dot RF hardware includes transmitting downlink RF signals and receiving uplink RF signals. On information and belief, the DU, Radio Dots, and IRU translate uplink and downlink signals between RF and base band as appropriate.

273. On information and belief, T-Mobile's LTE and 5G networks, which include Ericsson's Radio Dot, meet claim element [1D] of claim 1 of the '338 patent.

274. On information and belief, T-Mobile's LTE and 5G networks packetize the uplink and downlink base band signals, wherein the packetized signals correspond to a plurality of carriers. For example, Ericsson's Radio Dot System within T-Mobile's LTE and 5G networks packetize signals for transport over CAT6/CAT6A LAN cables to the Radio Dots.[123]

275. On information and belief, T-Mobile's LTE and 5G networks, which include Ericsson's Radio Dot System, meet claim element [1E] of claim 1 of the '338 patent.

276. On information and belief, T-Mobile's LTE and 5G networks configure each remote radio unit to receive or transmit a respective subset of the plurality of carriers, each respective subset of the plurality of carriers including a number of carriers. For example, Ericsson's Radio Dot System supports LTE and 5G technologies.[124] "Ericsson has addressed the

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[121] *Id.*
[122] *Id.*

[123] *Id.*
[124] *See e.g.,* https://cellantenna.com/wp-content/uploads/2020/08/CellAntenna-Radio-Dot-System-Brochure-2020-01-17-1.pdf (last visited October 5, 2022); *see also* https://mediabank.ericsson.net/deployedFiles/ericsson.com/Taking%20the%20next%20step%20in%20the%20indoor%20revolution.pdf (last visited October 5, 2022).

5G mid-band and high-band coverage limitations by developing a flexible 5G Carrier Aggregation solution which supports control and data traffic on the uplink using a lower frequency band which increases coverage, and on the downlink with a mid or high-frequency band which increases capacity and data throughput."[125] As a result, Ericsson's Radio Dot System can be configured to receive or transmit a respective subset of the plurality of carriers, with each respective subset of the plurality of carriers including a number of carriers.

277. On information and belief, T-Mobile's LTE and 5G networks, which include Ericsson's Radio Dot System, meet claim element [1F] of claim 1 of the '338 patent.

278. On information and belief, T-Mobile's LTE and 5G networks reconfigure each remote radio unit by: determining a load percentage for each remote radio unit; and increasing or decreasing the number of carriers in the respective subset of the plurality of carriers based on the load percentage. For example, Ericsson's Radio Dot System can dynamically adjust to maintain efficiency: "centralized radios provide pooled capacity and design flexibility, dynamically meeting demand wherever it occurs in real time while increasing spectral and hardware efficiency of the system."[126] Moreover, Ericsson explains that "[t]he capability to configure, scale, and reconfigure logical nodes through software commands enables the RAN to dynamically adjust to changing traffic conditions, hardware faults, as well as new service requirements."[127] Ericsson also states that "[w]ithout RDS, high traffic demand generated indoors consumes a substantial amount of the radio resources of the surrounding outdoor macro cells. Deploying RDS in large high-traffic

[125] https://www.ericsson.com/en/ran/carrier-aggregation (last visited October 5, 2022); *see also* https://www.ericsson.com/en/news/2020/2/radio-dot-update (last visited October 5, 2022).
[126] https://cellantenna.com/wp-content/uploads/2020/08/CellAntenna-Radio-Dot-System-Brochure-2020-01-17-1.pdf (last visited October 5, 2022).
[127] https://www.ericsson.com/en/reports-and-papers/ericsson-technology-review/articles/4g5g-ran-architecture-how-a-split-can-make-the-difference (last visited October 5, 2022).

enterprises offloads the macro layer and serves the indoor users more efficiently.[128] Consequently, on information and belief, Ericsson's Radio Dot System reconfigures each remote radio unit by: determining a load percentage for each remote radio unit; and increasing or decreasing the number of carriers in the respective subset of the plurality of carriers based on the load percentage.

279. On information and belief, T-Mobile's LTE and 5G networks, which include Ericsson's Radio Dot System, meet claim element [1G] of claim 1 of the '338 patent.

280. On information and belief, T-Mobile's LTE and 5G networks route and switch the packetized signals among the one or more remote radio units via the at least one digital access unit according to a result of the reconfiguring. For example, Ericsson's Radio Dot System provides pooled capacity that is managed by the DU and which can be reassigned based on network requirements: "centralized radios provide pooled capacity and design flexibility, dynamically meeting demand wherever it occurs in real time while increasing spectral and hardware efficiency of the system."[129] Moreover, the DU "is the signal source of the Radio Dot System and provides the pooled baseband resources for the building(s) or area."[130] This allows for reconfiguring the routing and switching of packetized signals among the one or more Radio Dots through the DU.

281. Accordingly, on information and belief, T-Mobile's LTE and 5G networks, which include Ericsson's Radio Dot System, meet all elements of, and therefore infringe at least claim 1 of the '338 patent.

282. On information and belief, Ericsson has induced infringement of at least claim 1 of the '338 patent by T-Mobile pursuant to 35 U.S.C. § 271(b), and committed contributory

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[128] https://cellantenna.com/wp-content/uploads/2020/08/CellAntenna-Radio-Dot-System-Brochure-2020-01-17-1.pdf (last visited October 5, 2022).
[129] https://cellantenna.com/wp-content/uploads/2020/08/CellAntenna-Radio-Dot-System-Brochure-2020-01-17-1.pdf (last visited October 5, 2022).
[130] *Id.*

infringement of at least claim 1 of the ’338 patent pursuant to 35 U.S.C. § 271(c), by providing the hardware and software necessary for T-Mobile to perform the claimed method, along with instructions that induce T-Mobile to perform the claimed method.

283. On information and belief, Ericsson takes active steps to induce infringement of at least claim 1 of the ’338 patent by T-Mobile, knowing that those steps will induce, encourage, and facilitate direct infringement by T-Mobile in violation of 35 U.S.C. § 271(b). Such active steps include, but are not limited to, providing T-Mobile with instructions on the use of the above-described routing and switching feature, and participating in the installation, configuration, operation, and maintenance of Radio Dot Systems in T-Mobile’s network specifically for the purpose of performing the infringing methods.

284. On information and belief, Ericsson knew or should have known that such activities induce T-Mobile to infringe at least claim 1 of the ’338 patent by using the claimed systems from at least January 7, 2022 when Dali filed a lawsuit for infringement of the ’338 patent by AT&T and Ericsson, which alleged that Ericsson’s Radio Dot System infringes the ‘338 patent.[131]

285. On information and belief, Ericsson also contributes to the infringement of at least claim 1 of the ’338 patent by T-Mobile in violation of 35 U.S.C. § 271(c). Acts by Ericsson that contribute to the infringement of T-Mobile include providing Radio Dot System hardware and software modules that comprise the above-described distributed antenna system. The accused hardware and software are especially adapted for use in the infringing distributed antenna system, and they have no substantial non-infringing uses. On information and belief, Ericsson knows or should know that such activities contribute to T-Mobile’s infringement of at least claim 1 of the

[131] *See Dali Wireless, Inc. v. AT&T Corp. et al.*, No. 2:22-CV-00012, ECF No. 1 (Complaint) (E.D. Tex. Jan. 7, 2022).

’338 patent by using the claimed system.

286. At least as of January 7, 2022, Ericsson knows of the ’338 patent and performs acts that it knows, or should know, induce and/or contribute to the direct infringement of claim 1 of the ’338 patent by T-Mobile. Thus, Ericsson is indirectly liable for infringement of at least claim 1 of the ’338 patent pursuant to 35 U.S.C. §§ 271(b) and 271(c).

287. T-Mobile and Ericsson undertook and continue their infringing actions despite an objectively high likelihood that such activities infringe the ’338 Patent, which has been duly issued by the PTO and is presumed valid. Moreover, the PTAB has denied institution of at least one petition for *inter partes* review of the ’338 patent.[132] For example, Ericsson, since at least January 7, 2022, and T-Mobile, since at least the filing of this Complaint, have been aware of an objectively high likelihood that their actions constituted and continue to constitute infringement of the ’338 Patent and that the ’338 Patent is valid. On information and belief, T-Mobile and Ericsson could not reasonably, subjectively believe that their actions do not constitute infringement of the ’338 patent. Despite that knowledge and subjective belief, and the objectively high likelihood that their actions constitute infringement, T-Mobile and Ericsson have continued their infringing activities. As such, T-Mobile and Ericsson have willfully infringed and/or will continue to willfully infringe the ’338 patent.

288. As a result of T-Mobile’s and Ericsson’s infringement of the ’338 patent, Dali has suffered and continues to suffer substantial injury and is entitled to recover all damages caused by T-Mobile’s and Ericsson’s infringement to the fullest extent permitted by the Patent Act, together with prejudgment interest and costs for T-Mobile’s and Ericsson’s wrongful conduct.

289. Dali has no adequate remedy at law to prevent future infringement of the ’338

[132] *See* IPR2020-01430, Paper No. 15 (decision denying institution).

patent. Dali suffers and continues to suffer irreparable harm as a result of T-Mobile's and Ericsson's patent infringement and is, therefore, entitled to injunctive relief to enjoin T-Mobile's and Ericsson's wrongful conduct.

NINTH CAUSE OF ACTION
(PATENT INFRINGEMENT UNDER 35 U.S.C. § 271 OF THE '343 PATENT BY T-MOBILE AND ERICSSON)

290. Dali re-alleges and incorporates by reference all the foregoing paragraphs.

291. On information and belief, T-Mobile and Ericsson have directly infringed and continue to directly infringe either literally or under the doctrine of equivalents, one or more claims, including at least claim 1 of the '343 patent, in violation of 35 U.S.C. § 271, et seq., by deploying, operating, maintaining, testing, and using T-Mobile's LTE and 5G networks which include Ericsson's Radio Dot System. [133] Ericsson also infringes the '343 patent, in violation of 35 U.S.C. § 271, et seq., by selling, or offering for sale, to T-Mobile, Ericsson's Radio Dot System.

292. Claim 1 of the '343 patent provides:

> [Preamble] A system for transporting wireless communications, comprising:
>
> [1A] a digital access unit;
>
> [1B] a plurality of signal sources, including at least a first signal source and a second signal source;

[133] *See e.g.,* https://static1.squarespace.com/static/56104a4ee4b0ffa1f98ffcfc/t/6092aad7ca3354484239eb52/1620224728469/Partners-newsletter-2021-Q1.pdf (last visited October 5, 2022) ("Partnering with Ericsson, Totem deploys Ericsson's Radio Dot System (aka RDS or 'Dot') to deliver high-performance in0building cellular systems required in modern commercial spaces. Totem deploys systems that support the major operators including Verizon, T-Mobile and T-Mobile"); *see also* https://www.ericsson.com/en/news/2021/1/t-mobile-expands-5g-nationwide (last visited October 5, 2022); https://howmobileworks.com/wp-content/uploads/2022/03/Ericsson-Indoor-Solution-0203221-1.pdf (last visited October 5, 2022) ("T-Mobile indoor coverage brought to you by Ericsson").

> [1C] a plurality of remote units, including at least a first remote unit and a second remote unit;
>
> [1D] wherein the digital access unit comprises a plurality of interfaces to communicatively couple the digital access unit to the plurality of signal sources;
>
> [1E] wherein the digital access unit is configured to receive a plurality of radio resources from the first signal source and the second signal source;
>
> [1F] wherein the digital access unit is configured to send a digital representation of a first set of radio resources to the first remote unit at a first point in time, the first set of radio resources for transmission at an antenna of the first remote unit;
>
> [1G] wherein the digital access unit is configured to send a digital representation of a second set of radio resources to the first remote unit at a second point in time, the second set of radio resources for transmission at the antenna of the first remote unit;
>
> [1H] wherein a number of radio resources in the first set of radio resources is different from a number of radio resources in the second set of radio resources at least based on dynamic load balancing and resource management; and
>
> [1I] wherein the digital access unit is configured to receive digital signals from each of the plurality of remote units.

293. On information and belief, T-Mobile's LTE and 5G networks, which include Ericsson's Radio Dot System, satisfy each and every element recited in at least claim 1 of the '343 patent as stated below.

294. On information and belief, and to the extent the preamble is limiting, T-Mobile's LTE and 5G networks meet the preamble of claim 1 of the '343 patent because Ericsson's Radio Dot System is a system for transporting wireless communications. For example, according to Ericsson the Radio Dot System "combines centralized baseband and radio units with visually low-impact antennas. Ericsson innovations enable RF signal, power and control over standard shielded

LAN cables for cost-effective deployment with minimal business disruption."[134] Moreover, Ericsson's Radio Dot System includes "centralized radios [which] provide pooled capacity and design flexibility, dynamically meeting demand wherever it occurs in real time while increasing spectral and hardware efficiency of the system."[135]

295. On information and belief, T-Mobile's LTE and 5G networks, which include Ericsson's Radio Dot System, meet claim element [1A] of claim 1 of the '343 patent. Claim element [1A] requires "a digital access unit."

296. T-Mobile's LTE and 5G networks include a digital access unit. For example, Ericsson's Radio Dot System "consists of the Radio Dots, Baseband Units (DU) and Indoor Radio Unit(s) (IRU). The DU and IRU can be connected by fiber or colocated and connected through Digital CPRI cable."[136]

297. On information and belief, T-Mobile's LTE and 5G networks, which include Ericsson's Radio Dot System, meet claim element [1B] of claim 1 of the '343 patent. Claim element 1[B] requires "a plurality of signal sources, including at least a first signal source and a second signal source."

298. For example, Ericsson's Radio Dot System "consists of the Radio Dots, Baseband Units (DU) and Indoor Radio Unit(s) (IRU)."[137] Ericsson describes the DU as the "signal source of the Radio Dot System and provides the pooled baseband resources for the building(s) or area."[138] The "DU and IRU can be connected by fiber or colocated and connected through Digital CPRI

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[134] *See e.g.,* https://cellantenna.com/wp-content/uploads/2020/08/CellAntenna-Radio-Dot-System-Brochure-2020-01-17-1.pdf (last visited October 5, 2022).
[135] *Id.*
[136] *Id.*

[137] *Id.*
[138] *Id.*

cable."[139] In certain circumstances, the "the digital unit is centrally located and the IRUs are distributed."[140] Accordingly, T-Mobile's LTE and 5G networks, which include Ericsson's Radio Dot System, include a plurality of signal sources, including at least a first signal source and a second signal source.

299. On information and belief, T-Mobile's LTE and 5G networks, which include Ericsson's Radio Dot System, meet claim element [1C] of claim 1 of the '343 patent. Claim element [1C] requires "a plurality of remote units, including at least a first remote unit and a second remote unit."

300. For example, Ericsson's Radio Dot System includes "Radio Dots, Baseband Units (DU) and Indoor Radio Unit(s) (IRU)."[141] Further, the IRU "is frequency independent and supports remote software upgrades. It supports and provides power for up to eight Radio Dots, corresponding to an equivalent of 70,000 square feet of floor space coverage in a typical office building. Individual Dots can be connected with up to 650 feet of LAN cable."[142] Accordingly, T-Mobile's LTE and 5G networks, which include Ericsson's Radio Dot System, include a plurality of remote units, including at least a first remote unit and a second remote unit.

301. On information and belief, T-Mobile's LTE and 5G networks, which include Ericsson's Radio Dot System, meet claim element [1D] of claim 1 of the '343 patent. Claim element [1D] requires "wherein the digital access unit comprises a plurality of interfaces to communicatively couple the digital access unit to the plurality of signal sources."

302. For example, Ericsson's Radio Dot System includes "Radio Dots, Baseband Units

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[139] *Id.*
[140] *Id.*
[141] *Id.*
[142] *Id.*

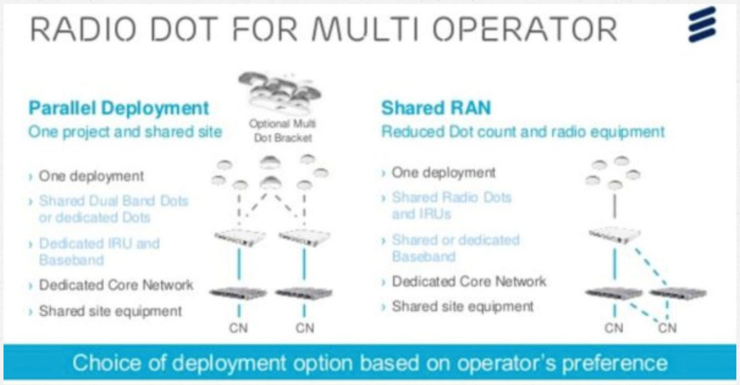
(DU) and Indoor Radio Unit(s) (IRU)."[143] Ericsson's literature further explains that the DU includes a plurality of interfaces to communicatively couple the digital access unit to the plurality of signal sources:[144]

> The Baseband is the signal source of the Radio Dot System and provides the pooled baseband resources for the building(s) or area. The DU delivers feature parity and roadmap evolution with the macro network and supports key coordination features such as Carrier Aggregation and Combined Cell, vital for multi-antenna indoor deployments. As new features are added to the Ericsson RAN software, they are automatically available in every radio dot system deployment. The Baseband also provides synchronization and transport security functionality, and aggregates the RDS traffic onto a common backhaul connection.

303. Moreover, Ericsson has announced that the Radio Dot System supports multi-operator service in three ways:[145]

[143] *Id.*
[144] *Id.*
[145] https://the-mobile-network.com/2017/08/ericssons-multi-operator-radio-dot-matrix/ (last visited October 5, 2022).

First – parallel deployments with each operator using its own dedicated baseband, IRU and Dots. These Dots can be housed in the same enclosures (the new enclosures known as the multi-dot bracket) to tidy things up a bit.



Parallel or shared RAN options

Secondly – a multi-operator deployment using a shared baseband and IRU, over the same network of distributed radio heads, using MORAN (Multi Operator Radio Access Network) or MOCN (Multi Operator Core Network) network sharing capabilities.

Thirdly, a multi-operator Dot solution where operators provide multiple RF sources to the same Dot system. They do this by feeding baseband capacity to a new access unit from Ericsson, the RF Access Unit (RAU). This new RAU can support three 2×2 MIMO RF inputs, and can be connected on the other side to four IRUs, which then feed the shared Dot remote radioheads.

Accordingly, T-Mobile's LTE and 5G networks, which include Ericsson's Radio Dot System, include a digital access unit, wherein the digital access unit comprises a plurality of interfaces to communicatively couple the digital access unit to the plurality of signal sources.

304. On information and belief, T-Mobile's LTE and 5G networks, which include Ericsson's Radio Dot System, meet claim element [1E] of claim 1 of the '343 patent. Claim element [1E] requires "wherein the digital access unit is configured to receive a plurality of radio resources from the first signal source and the second signal source."

305. For example, as explained above in paragraphs 295-298, Ericsson's Radio Dot System includes a digital access unit, wherein the digital access unit is configured to receive a

plurality of radio resources from the first signal source and the second signal source.

306. On information and belief, T-Mobile's LTE and 5G networks, which include Ericsson's Radio Dot System, meet claim element [1F] of claim 1 of the '343 patent. Claim element [1F] requires "wherein the digital access unit is configured to send a digital representation of a first set of radio resources to the first remote unit at a first point in time, the first set of radio resources for transmission at an antenna of the first remote unit."

307. For example, Ericsson's marketing materials explain that the DU of the Ericsson Radio Dot system "is the signal source of the Radio Dot System and provides the pooled baseband resources for the building(s) or area."[146] These materials further explain that "centralized radios provide pooled capacity and design flexibility, dynamically meeting demand wherever it occurs in real time while increasing spectral and hardware efficiency of the system."[147] On information and belief, the DU is configured to send a digital representation of a first set of radio resources to the first remote unit at a first point in time, the first set of radio resources for transmission at an antenna of the first remote unit. Accordingly, T-Mobile's LTE and 5G networks, which include Ericsson's Radio Dot System, meet element [1F] of claim 1 of the '343 patent.

308. On information and belief, T-Mobile's LTE and 5G networks, which include Ericsson's Radio Dot System, meet claim element 1[G] of claim 1 of the '343 patent. Claim element [1G] requires "wherein the digital access unit is configured to send a digital representation of a second set of radio resources to the first remote unit at a second point in time, the second set of radio resources for transmission at the antenna of the first remote unit."

309. For example, as explained above in paragraph 307, the DU is configured to send

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[146] https://cellantenna.com/wp-content/uploads/2020/08/CellAntenna-Radio-Dot-System-Brochure-2020-01-17-1.pdf (last visited October 5, 2022).
[147] *Id.*

digital representations of radio resources to a remote unit. On information and belief, the DU is configured to send a digital representation of a second set of radio resources to the first remote unit at a second point in time, the second set of radio resources for transmission at the antenna of the first remote unit. Accordingly, T-Mobile's LTE and 5G networks, which include Ericsson's Radio Dot System, meet claim element 1[G] of claim 1 of the '343 patent.

310. On information and belief, T-Mobile's LTE and 5G networks, which include Ericsson's Radio Dot System, meet claim element 1[H] of claim 1 of the '343 patent. Claim element [1H] requires "wherein a number of radio resources in the first set of radio resources is different from a number of radio resources in the second set of radio resources at least based on dynamic load balancing and resource management."

311. For example, as explained above in paragraph 307, the DU is configured to send digital representations of radio resources to a remote unit. On information and belief, the DU is configured to send a number of radio resources in the first set of radio resources that is different from a number of radio resources in the second set of radio resources.

312. Moreover, Ericsson's Radio Dot System can dynamically adjust to maintain efficiency: "centralized radios provide pooled capacity and design flexibility, dynamically meeting demand wherever it occurs in real time while increasing spectral and hardware efficiency of the system."[148] For example, Ericsson explains that "[t]he capability to configure, scale, and reconfigure logical nodes through software commands enables the RAN to dynamically adjust to changing traffic conditions, hardware faults, as well as new service requirements."[149] Ericsson also

[148] https://cellantenna.com/wp-content/uploads/2020/08/CellAntenna-Radio-Dot-System-Brochure-2020-01-17-1.pdf (last visited October 5, 2022).
[149] https://www.ericsson.com/en/reports-and-papers/ericsson-technology-review/articles/4g5g-ran-architecture-how-a-split-can-make-the-difference (last visited October 5, 2022).

states that "[w]ithout RDS, high traffic demand generated indoors consumes a substantial amount of the radio resources of the surrounding outdoor macro cells. Deploying RDS in large high-traffic enterprises offloads the macro layer and serves the indoor users more efficiently."[150] Accordingly, T-Mobile's LTE and 5G networks, which include Ericsson's Radio Dot System, meet claim element 1[H] of claim 1 of the '343 patent.

313. On information and belief, T-Mobile's LTE and 5G networks, which include Ericsson's Radio Dot System, meet claim element 1[I] of claim 1 of the '343 patent. Claim element [1I] requires "wherein the digital access unit is configured to receive digital signals from each of the plurality of remote units."

314. For example, as explained above in paragraph 307, the DU is configured to send digital representations of radio resources to a remote unit. On information and belief, the DU is also configured to receive digital signals from each of the plurality of remote units. Accordingly, T-Mobile's LTE and 5G networks, which include Ericsson's Radio Dot System, meet claim element [1I] of claim 1 of the '343 patent.

315. As a result, on information and belief, T-Mobile's LTE and 5G networks, which include Ericsson's Radio Dot System, meet all elements of, and therefore infringe, at least claim 1 of the '343 patent.

316. On information and belief, Ericsson has induced infringement of at least claim 1 of the '343 patent by T-Mobile pursuant to 35 U.S.C. § 271(b), and committed contributory infringement of at least claim 1 of the '343 patent pursuant to 35 U.S.C. § 271(c), by providing the hardware and software necessary for T-Mobile to perform the claimed method, along with

[150] https://cellantenna.com/wp-content/uploads/2020/08/CellAntenna-Radio-Dot-System-Brochure-2020-01-17-1.pdf (last visited October 9, 2022).

instructions that induce T-Mobile to perform the claimed method.

317. On information and belief, Ericsson takes active steps to induce infringement of at least claim 1 of the ’343 patent by T-Mobile, knowing that those steps will induce, encourage, and facilitate direct infringement by T-Mobile in violation of 35 U.S.C. § 271(b). Such active steps include, but are not limited to, providing T-Mobile with instructions on the use of the above-described routing and switching feature, and participating in the installation, configuration, operation, and maintenance of Radio Dot Systems in T-Mobile’s network specifically for the purpose of performing the infringing methods.

318. On information and belief, Ericsson knew or should have known that such activities induce T-Mobile to infringe at least claim 1 of the ’343 patent by using the claimed systems from at least January 27, 2022 when Dali filed a lawsuit for infringement of the ’343 patent by Verizon and Ericsson, which alleged that Ericsson’s Radio Dot System infringes the ‘343 patent.[151]

319. On information and belief, Ericsson also contributes to the infringement of at least claim 1 of the ’343 patent by T-Mobile in violation of 35 U.S.C. § 271(c). Acts by Ericsson that contribute to the infringement of T-Mobile include providing Radio Dot System hardware and software modules that comprise the above-described distributed antenna system. The accused hardware and software are especially adapted for use in the infringing distributed antenna system, and they have no substantial non-infringing uses. On information and belief, Ericsson knows or should know that such activities contribute to T-Mobile’s infringement of at least claim 1 of the ’338 patent by using the claimed system.

320. At least as of January 27, 2022, Ericsson knows of the ’343 patent and performs

[151] *See Dali Wireless, Inc. v. Cellco Partnership D/B/A Verizon Wireless et al.*, No. 6:22-CV-00104, ECF No. 1 (Complaint) (W.D. Tex. Jan. 27, 2022).

acts that it knows, or should know, induce and/or contribute to the direct infringement of claim 1 of the ’343 patent by T-Mobile. Thus, Ericsson is indirectly liable for infringement of at least claim 1 of the ’343 patent pursuant to 35 U.S.C. §§ 271(b) and 271(c).

321. T-Mobile and Ericsson undertook and continue their infringing actions despite an objectively high likelihood that such activities infringe the ’343 Patent, which has been duly issued by the PTO and is presumed valid. For example, Ericsson, since at least January 27, 2022, and T-Mobile, since at least the filing of this Complaint, have been aware of an objectively high likelihood that their actions constituted and continue to constitute infringement of the ’343 Patent and that the ’343 Patent is valid. On information and belief, T-Mobile and Ericsson could not reasonably, subjectively believe that their actions do not constitute infringement of the ’343 patent. Despite that knowledge and subjective belief, and the objectively high likelihood that their actions constitute infringement, T-Mobile and Ericsson have continued their infringing activities. As such, T-Mobile and Ericsson have willfully infringed and/or will continue to willfully infringe the ’343 patent.

322. As a result of T-Mobile and Ericsson’s infringement of the ’343 patent, Dali has suffered and continues to suffer substantial injury and is entitled to recover all damages caused by T-Mobile and Ericsson’s infringement to the fullest extent permitted by the Patent Act, together with prejudgment interest and costs for T-Mobile and Ericsson’s wrongful conduct.

323. Dali has no adequate remedy at law to prevent future infringement of the ’343 patent. Dali suffers and continues to suffer irreparable harm as a result of T-Mobile and Ericsson’s patent infringement and is, therefore, entitled to injunctive relief to enjoin T-Mobile and Ericsson’s wrongful conduct.

TENTH CAUSE OF ACTION
(PATENT INFRINGEMENT UNDER 35 U.S.C. § 271 OF THE ’343 PATENT

BY T-MOBILE AND COMMSCOPE)

324. Dali re-alleges and incorporates by reference all the foregoing paragraphs.

325. On information and belief, T-Mobile and CommScope have directly infringed and continue to directly infringe either literally or under the doctrine of equivalents, one or more claims, including at least claim 1 of the '343 patent, in violation of 35 U.S.C. § 271, et seq., by deploying, operating, maintaining, testing, and using T-Mobile's LTE and 5G networks which include solutions for in-building wireless coverage, such as CommScope's ION®-E/ERA platform.[152]

326. Claim 1 of the '343 patent provides:

> [Preamble] A system for transporting wireless communications, comprising:
>
> [1A] a digital access unit;
>
> [1B] a plurality of signal sources, including at least a first signal source and a second signal source;
>
> [1C] a plurality of remote units, including at least a first remote unit and a second remote unit;
>
> [1D] wherein the digital access unit comprises a plurality of interfaces to communicatively couple the digital access unit to the plurality of signal sources;
>
> [1E] wherein the digital access unit is configured to receive a plurality of radio resources from the first signal source and the second signal source;
>
> [1F] wherein the digital access unit is configured to send a digital representation of a first set of radio resources to the first remote unit at a first point in time, the first set of radio resources for transmission at an antenna of the first remote unit;

[152] *See e.g.,* https://howmobileworks.com/wp-content/uploads/2021/06/tmo-byoc-case-study-space-needle-110420.pdf (last visited October 4, 2022) ("T-Mobile designed a unified wireless infrastructure architecture, based on the CommScope ION-E solution, to streamline deployment and minimize equipment needs").

> [1G] wherein the digital access unit is configured to send a digital representation of a second set of radio resources to the first remote unit at a second point in time, the second set of radio resources for transmission at the antenna of the first remote unit;
>
> [1H] wherein a number of radio resources in the first set of radio resources is different from a number of radio resources in the second set of radio resources at least based on dynamic load balancing and resource management; and
>
> [1I] wherein the digital access unit is configured to receive digital signals from each of the plurality of remote units.

327. On information and belief, T-Mobile's LTE and 5G networks, which include CommScope's ION®-E/ERA platform, satisfy each and every element recited in at least claim 1 of the '343 patent as stated below.

328. On information and belief, and to the extent the preamble is limiting, T-Mobile's LTE and 5G networks meet the preamble of claim 1 of the '343 patent because CommScope's ION®-E/ERA platform is a system for transporting wireless communications. For example, according to CommScope the "all-digital ERA distributed antenna system makes in-building wireless simpler and more economical. Operating on standard IT infrastructure—Category 6A and fiber—these solutions allow operators, neutral hosts and enterprises to provide high capacity with 'five bars' of in-building coverage."[153] Moreover, "ERA's all-digital, frequency-agnostic system architecture ensures that the system will be able to support new services in existing and new bands including CBRS and sub-6 GHz 5G NR. ERA's multiplexed fiber fronthaul can also be shared with other communication services. And as usage patterns change, capacity can be re-allocated through a web-based drag-and-drop software GUI rather than physical re-wiring."[154]

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[153] https://www.commscope.com/product-type/in-building-cellular-systems/distributed-antenna-systems-das/era/ (last visited October 4, 2022).
[154] *Id.*

329. On information and belief, T-Mobile's LTE and 5G networks, which include CommScope's ION®-E/ERA platform, meet claim element [1A] of claim 1 of the '343 patent.

330. T-Mobile's LTE and 5G networks include a digital access unit. For example, CommScope's ION®-E/ERA platform includes a "CPRI digital donor (CDD)" module.[155] This module "receives CPRI digital signals from compatible operator baseband units (BBU)."[156] Further, CommScope explains that the ION®-E/ERA platform "[t]ake[s] advantage of an all-digital CPRI baseband interface that eliminates the need for analog-to-digital conversions, further reducing head-end size and power requirements."[157] Accordingly, T-Mobile's LTE and 5G networks, which include CommScope's ION®-E/ERA platform, include a digital access unit.

331. On information and belief, T-Mobile's LTE and 5G networks, which include CommScope's ION®-E/ERA platform, meet claim element [1B] of claim 1 of the '343 patent.

332. For example, CommScope's ION®-E/ERA platform includes a "CPRI digital donor (CDD)" module.[158] This module "receives CPRI digital signals from compatible operator baseband units (BBU)."[159] Further, CommScope explains that the ION®-E/ERA platform "[t]ake[s] advantage of an all-digital CPRI baseband interface that eliminates the need for analog-to-digital conversions, further reducing head-end size and power requirements."[160] CommScope also explains that the ION® E/ERA platform includes a "central area node (CAN)," which "digitizes baseband RF signals, combines signals from different operators and distributes them throughout a building or campus."[161] Accordingly, T-Mobile's LTE and 5G networks, which

[155] *Id.*
[156] *Id.*
[157] *Id.*
[158] *Id.*
[159] *Id.*
[160] *Id.*
[161] *Id.*

include CommScope's ION®-E/ERA platform, include a plurality of signal sources, including at least a first signal source and a second signal source.

333. On information and belief, T-Mobile's LTE and 5G networks, which include CommScope's ION®-E/ERA platform, meet claim element [1C] of claim 1 of the '343 patent.

334. For example, CommScope's ION®-E/ERA platform includes "[a] range of remote access points that convert the digital signal back to radio frequency (RF) for over-the-air transmission."[162] These remote units include "the carrier access point (CAP)" and "the universal access point (UAP)."[163] Accordingly, T-Mobile's LTE and 5G networks, which include CommScope's ION®-E/ERA platform, include a plurality of remote units, including at least a first remote unit and a second remote unit.

335. On information and belief, T-Mobile's LTE and 5G networks, which include CommScope's ION®-E/ERA platform, meet claim element [1D] of claim 1 of the '343 patent.

336. For example, CommScope's ION®-E/ERA platform includes a "CPRI digital donor (CDD)" module.[164] This module "receives CPRI digital signals from compatible operator baseband units (BBU)."[165] Further, CommScope explains that the ION®-E/ERA platform "[t]ake[s] advantage of an all-digital CPRI baseband interface that eliminates the need for analog-to-digital conversions, further reducing head-end size and power requirements."[166] CommScope also explains that the ION® E/ERA platform includes a "central area node (CAN)," which "digitizes baseband RF signals, combines signals from different operators and distributes them

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[162] *Id.*
[163] *Id.*

[164] *Id.*
[165] *Id.*
[166] *Id.*

throughout a building or campus."[167] Accordingly, T-Mobile's LTE and 5G networks, which include CommScope's ION®-E/ERA platform, include a digital access unit, wherein the digital access unit comprises a plurality of interfaces to communicatively couple the baseband unit to the plurality of signal sources.

337. On information and belief, T-Mobile's LTE and 5G networks, which include CommScope's ION®-E/ERA platform, meet claim element [1E] of claim 1 of the '343 patent.

338. For example, as explained above in paragraphs 335-336, CommScope's ION®-E/ERA platform includes a digital access unit, wherein the digital access unit comprises a plurality of interfaces to communicatively couple the digital access unit to the plurality of signal sources. On information and belief, the digital access unit is configured to receive radio resources from the plurality of signal sources. Accordingly, CommScope's ION®-E/ERA platform includes a digital access unit, wherein the digital access unit is configured to receive a plurality of radio resources from the first signal source and the second signal source.

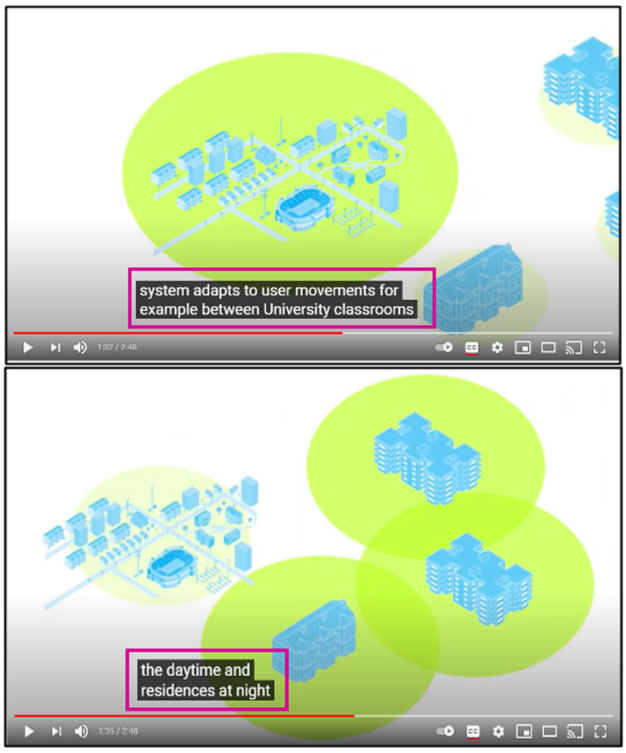
339. On information and belief, T-Mobile's LTE and 5G networks, which include CommScope's ION®-E/ERA platform, meet claim element [1F] of claim 1 of the '343 patent.

340. For example, CommScope's ION®-E/ERA platform includes a "CPRI digital donor (CDD)" module.[168] This module "receives CPRI digital signals from compatible operator baseband units (BBU)."[169] Further, CommScope explains that the ION®-E/ERA platform "[t]ake[s] advantage of an all-digital CPRI baseband interface that eliminates the need for analog-to-digital conversions, further reducing head-end size and power requirements."[170] CommScope

[167] *Id.*
[168] *Id.*
[169] *Id.*
[170] *Id.*

also explains that the ION® E/ERA platform includes a "central area node (CAN)," which "digitizes baseband RF signals, combines signals from different operators and distributes them throughout a building or campus."[171]

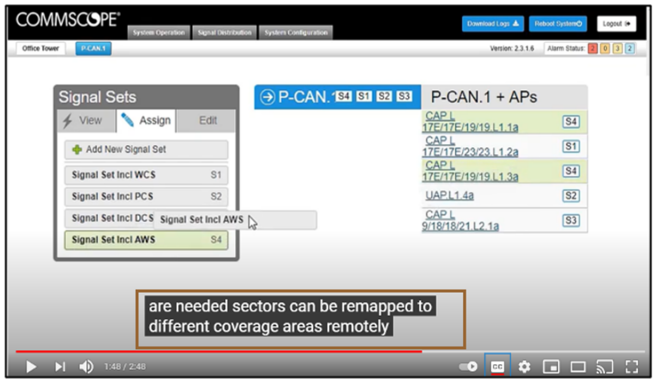
341. By way of further example, CommScope's marketing materials describe how radio resources can be assigned to remote units when the majority of users move from one place, like a university classroom, to a second place, like university residences:[172]



[171] *Id.*

[172] *See,* "CommScope Era™ C-RAN Antenna System," https://www.youtube.com/watch?v=uBRDL7a8_8g (last visited October 4, 2022) (annotation added).

Moreover, the same marketing materials describe how sectors can be remapped where radio resources are needed most:[173]



Accordingly, CommScope's ION®-E/ERA platform includes a digital access unit, wherein the digital access unit is configured to send a digital representation of a first set of radio resources to the first remote unit at a first point in time, the first set of radio resources for transmission at an antenna of the first remote unit.

342. On information and belief, T-Mobile's LTE and 5G networks, which include CommScope's ION®-E/ERA platform, meet claim element 1[G] of claim 1 of the '343 patent.

343. For example, as explained above in paragraphs 340-341, CommScope's ION®-E/ERA platform is configured to send digital representations of radio resources to a remote unit. On information and belief, CommScope's ION®-E/ERA platform is configured to send a digital representation of a second set of radio resources to the first remote unit at a second point in time, the second set of radio resources for transmission at the antenna of the first remote unit. Accordingly, T-Mobile's LTE and 5G networks, which include CommScope's ION®-E/ERA platform, meet claim element 1[G] of claim 1 of the '343 patent.

[173] *Id* (annotation added).

344. On information and belief, T-Mobile's LTE and 5G networks, which include CommScope's ION®-E/ERA platform, meet claim element 1[H] of claim 1 of the '343 patent.

345. For example, as explained above in paragraphs 340-343, CommScope's ION®-E/ERA platform is configured to send a digital representation of a first and second set of radio resources to a remote unit. On information and belief, CommScope's ION®-E/ERA platform is configured to send a number of radio resources in the first set of radio resources that is different from a number of radio resources in the second set of radio resources at least based on dynamic load balancing and resource management. Accordingly, T-Mobile's LTE and 5G networks, which include CommScope's ION®-E/ERA platform, meet claim element 1[H] of claim 1 of the '343 patent.

346. On information and belief, T-Mobile's LTE and 5G networks, which include CommScope's ION®-E/ERA platform, meet claim element 1[I] of claim 1 of the '343 patent.

347. For example, as explained above in paragraphs 340-341, CommScope's ION®-E/ERA platform is configured to send digital representations of radio resources to a remote unit. On information and belief, CommScope's ION®-E/ERA platform is also configured to receive digital signals from each of the plurality of remote units. Accordingly, T-Mobile's LTE and 5G networks, which include CommScope's ION®-E/ERA platform, meet claim element [1I] of claim 1 of the '343 patent.

348. On information and belief, CommScope has induced infringement of at least claim 1 of the '343 patent by T-Mobile pursuant to 35 U.S.C. § 271(b) and committed contributory infringement of at least claim 1 of the '343 patent pursuant to 35 U.S.C. § 271(c), by providing the hardware and software necessary for T-Mobile to use the claimed system, along with instructions that induce T-Mobile to use the claimed system.

349. On information and belief, CommScope takes active steps to induce infringement of at least claim 1 of the ’343 patent by T-Mobile, knowing that those steps will induce, encourage, and facilitate direct infringement by T-Mobile in violation of 35 U.S.C. § 271(b). Such active steps include, but are not limited to, providing T-Mobile with instructions on the use of the above-described distributed antenna system, and participating in the installation, configuration, operation, and maintenance of ION®-E/ERA platforms in T-Mobile’s network specifically for the purpose of using the infringing system.

350. On information and belief, CommScope knew or should have known that such activities induce T-Mobile to infringe at least claim 1 of the ’343 patent by using the claimed systems from at least the date of the filing of this Complaint.

351. On information and belief, CommScope also contributes to the infringement of at least claim 1 of the ’343 patent by T-Mobile in violation of 35 U.S.C. § 271(c). Acts by CommScope that contribute to the infringement of T-Mobile include providing ION®-E/ERA platform hardware and software modules that comprise the above-described distributed antenna system. The accused hardware and software are especially adapted for use in the infringing distributed antenna system, and they have no substantial non-infringing uses. On information and belief, CommScope knows or should know that such activities contribute to T-Mobile’s infringement of at least claim 1 of the ’343 patent by using the claimed system.

352. By way of this Complaint, CommScope knows of the ’343 patent and performs acts that it knows, or should know, induce and/or contribute to the direct infringement of claim 1 of the ’343 patent by T-Mobile. Thus, CommScope is indirectly liable for infringement of at least claim 1 of the ’343 patent pursuant to 35 U.S.C. §§ 271(b) and 271(c).

353. T-Mobile and CommScope undertook and continue their infringing actions despite

an objectively high likelihood that such activities infringe the ’343 Patent, which has been duly issued by the PTO and is presumed valid. For example, since at least the filing this Complaint, T-Mobile and CommScope have been aware of an objectively high likelihood that their actions constituted and continue to constitute infringement of the ’343 Patent and that the ’343 Patent is valid. On information and belief, T-Mobile and CommScope could not reasonably, subjectively believe that their actions do not constitute infringement of the ’343 patent. Despite that knowledge and subjective belief, and the objectively high likelihood that their actions constitute infringement, T-Mobile and CommScope have continued their infringing activities. As such, T-Mobile and CommScope have willfully infringed and/or will continue to willfully infringe the ’343 patent.

354. As a result of T-Mobile and CommScope’s infringement of the ’343 patent, Dali has suffered and continues to suffer substantial injury and is entitled to recover all damages caused by T-Mobile and CommScope’s infringement to the fullest extent permitted by the Patent Act, together with prejudgment interest and costs for T-Mobile and CommScope’s wrongful conduct.

355. Dali has no adequate remedy at law to prevent future infringement of the ’343 patent. Dali suffers and continues to suffer irreparable harm as a result of T-Mobile and CommScope’s patent infringement and is, therefore, entitled to injunctive relief to enjoin T-Mobile and CommScope’s wrongful conduct.

ELEVENTH CAUSE OF ACTION
(PATENT INFRINGEMENT UNDER 35 U.S.C. § 271 OF THE ’171 PATENT BY T-MOBILE AND ERICSSON)

356. Dali re-alleges and incorporates by reference all the foregoing paragraphs.

357. On information and belief, T-Mobile and Ericsson have directly infringed and continue to directly infringe either literally or under the doctrine of equivalents, one or more claims, including at least claim 1 of the ’171 patent, in violation of 35 U.S.C. § 271, et seq., by

deploying, operating, maintaining, testing, and using T-Mobile's LTE and 5G networks which include small cell equipment such as Ericsson's Radio Dot System.[174]

358. Claim 1 of the '171 provides:

> [Preamble] A method for routing and switching signals comprising:
>
> [1A] providing a plurality of remote radio units, each remote radio unit configured to transmit one or more downlink signals and to receive one or more uplink signals
>
> [1B] providing at least one digital access unit configured to communicate with the plurality of remote radio units;
>
> [1C] translating the uplink and downlink signals between RF and base band;
>
> [1D] packetizing the uplink and downlink base band signals, wherein the packetized signals correspond to a plurality of carriers, each remote radio unit configured to receive or transmit a respective subset of the plurality of carriers;
>
> [1E] routing and switching the packetized signals among the plurality of remote radio units via the at least one digital access unit;
>
> [1F] reconfiguring at least one of the plurality of remote radio unit by increasing or decreasing the number of carriers in the respective subset of the plurality of carriers; and thereafter
>
> [1G] routing and switching the packetized signals among the plurality of remote radio units via the at least one digital access unit according to a result of the reconfiguring.

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[174] *See e.g.,* https://static1.squarespace.com/static/56104a4ee4b0ffa1f98ffcfc/t/6092aad7ca3354484239eb52/1620224728469/Partners-newsletter-2021-Q1.pdf (last visited October 5, 2022) ("Partnering with Ericsson, Totem deploys Ericsson's Radio Dot System (aka RDS or 'Dot') to deliver high-performance in0building cellular systems required in modern commercial spaces. Totem deploys systems that support the major operators including Verizon, T-Mobile and T-Mobile"); *see also* https://www.ericsson.com/en/news/2021/1/t-mobile-expands-5g-nationwide (last visited October 5, 2022); https://howmobileworks.com/wp-content/uploads/2022/03/Ericsson-Indoor-Solution-0203221-1.pdf (last visited October 5, 2022) ("T-Mobile indoor coverage brought to you by Ericsson").

359. On information and belief, T-Mobile's LTE and 5G networks, which include Ericsson's Radio Dot System, satisfy each and every limitation recited in at least claim 1 of the '171 patent as stated below.

360. On information and belief, and to the extent the preamble is limiting, T-Mobile's LTE and 5G networks meet the preamble of claim 1 of the '171 patent because Ericsson's Radio Dot System routes and switches signals. For example, according to Ericsson the Radio Dot System "combines centralized baseband and radio units with visually low-impact antennas. Ericsson innovations enable RF signal, power and control over standard shielded LAN cables for cost-effective deployment with minimal business disruption."[175] Moreover, Ericsson's Radio Dot System includes "centralized radios [which] provide pooled capacity and design flexibility, dynamically meeting demand wherever it occurs in real time while increasing spectral and hardware efficiency of the system."[176]

361. On information and belief, T-Mobile's LTE and 5G networks, which include Ericsson's Radio Dot System, meet claim element [1A] of claim 1 of the '171 patent.

362. T-Mobile's LTE and 5G networks include a plurality of remote radio units, each remote radio unit configured to transmit one or more downlink RF signals and to receive one or more uplink RF signals. For example, Ericsson's Single Band Radio Dot includes RF hardware that provides "2x2 MIMO, Tx/Rx diversity" and Ericsson's Dual Band Radio Dot includes RF hardware that provides "2x2 MIMO, Tx/Rx diversity (per band)."[177] The functionality of Ericsson's Radio Dot RF hardware includes transmitting downlink RF signals and receiving uplink

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[175] *See e.g.,* https://cellantenna.com/wp-content/uploads/2020/08/CellAntenna-Radio-Dot-System-Brochure-2020-01-17-1.pdf (last visited October 5, 2022).
[176] *Id.*
[177] *Id.*

RF signals.

363. On information and belief, T-Mobile's LTE and 5G networks, which include Ericsson's Radio Dot System, meet claim element [1B] of claim 1 of the '171 patent.

364. T-Mobile's LTE and 5G networks provide at least one digital access unit configured to communicate with the plurality of remote radio units. For example, Ericsson's Radio Dot System "consists of the Radio Dots, Baseband Units (DU) and Indoor Radio Unit(s) (IRU)."[178] Ericsson describes the DU as the "signal source of the Radio Dot System and provides the pooled baseband resources for the building(s) or area."[179] The "DU and IRU can be connected by fiber or co-located and connected through Digital CPRI cable." In certain circumstances, "the digital unit is centrally located and the IRUs are distributed."[180] On information and belief, the DU is configured to communicate with remote radio units, including Radio Dots and IRUs.

365. On information and belief, T-Mobile's LTE and 5G networks, which include Ericson's Radio Dot System, meet claim element [1C] of claim 1 of the '171 patent.

366. On information and belief, T-Mobile's LTE and 5G networks translate the uplink and downlink signals between RF and base band. For example, Ericsson's Radio Dot System "consists of the Radio Dots, Baseband Units (DU) and Indoor Radio Unit(s) (IRU)."[181] Ericsson describes the DU as the "signal source of the Radio Dot System and provides the pooled baseband resources for the building(s) or area."[182] Ericsson's Single Band Radio Dot includes RF hardware that provides "2x2 MIMO, Tx/Rx diversity" and Ericsson's Dual Band Radio Dot includes RF

[178] *Id.*
[179] *Id.*
[180] *Id.*
[181] *Id.*
[182] *Id.*

hardware that provides "2x2 MIMO, Tx/Rx diversity (per band)."[183] The functionality of Ericsson's Radio Dot RF hardware includes transmitting downlink RF signals and receiving uplink RF signals. On information and belief, the DU, Radio Dots, and IRU translate uplink and downlink signals between RF and base band.

367. On information and belief, T-Mobile's LTE and 5G networks, which include Ericsson's Radio Dot, meet claim element [1D] of claim 1 of the '171 patent.

368. On information and belief, T-Mobile's LTE and 5G networks packetize the uplink and downlink base band signals, wherein the packetized signals correspond to a plurality of carriers, and each remote radio unit is configured to receive or transmit a respective subset of the plurality of carriers. For example, Ericsson's Radio Dot System within T-Mobile's LTE and 5G networks packetize signals for transport over CAT6/CAT6A LAN cables to the Radio Dots.[184]

369. Furthermore, on information and belief, T-Mobile's LTE and 5G networks configure each remote radio unit to receive or transmit a respective subset of the plurality of carriers. For example, Ericsson's Radio Dot System supports LTE and 5G technologies.[185] "Ericsson has addressed the 5G mid-band and high-band coverage limitations by developing a flexible 5G Carrier Aggregation solution which supports control and data traffic on the uplink using a lower frequency band which increases coverage, and on the downlink with a mid or high-frequency band which increases capacity and data throughput."[186] As a result, Ericsson's Radio

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[183] *Id.*

[184] *Id.*

[185] *See e.g.,* https://cellantenna.com/wp-content/uploads/2020/08/CellAntenna-Radio-Dot-System-Brochure-2020-01-17-1.pdf (last visited October 5, 2022); *see also* https://mediabank.ericsson.net/deployedFiles/ericsson.com/Taking%20the%20next%20step%20in%20the%20indoor%20revolution.pdf (last visited October 5, 2022).

[186] https://www.ericsson.com/en/ran/carrier-aggregation (last visited October 5, 2022); *see also* https://www.ericsson.com/en/news/2020/2/radio-dot-update (last visited October 5, 2022).

Dot System can be configured to receive or transmit a respective subset of the plurality of carriers.

370. Therefore, on information and belief, T-Mobile's LTE and 5G networks, which include Ericsson's Radio Dot System, meet claim element [1D] of claim 1 of the '171 patent.

371. On information and belief, T-Mobile's LTE and 5G networks, which include Ericson's Radio Dot System, meet claim element [1E] of claim 1 of the '171 patent.

372. On information and belief, T-Mobile's LTE and 5G networks route and switch the packetized signals among the plurality of remote radio units via the at least one digital access unit as explained above in paragraph 360. Thus, on information and belief, Ericsson's Radio Dot System meets claim element 1[E] of claim 1 of the '171 patent.

373. On information and belief, T-Mobile's LTE and 5G networks, which include Ericsson's Radio Dot System, meet claim element [1F] of claim 1 of the '171 patent.

374. On information and belief, T-Mobile's LTE and 5G networks reconfigure each remote radio unit by increasing or decreasing the number of carriers in the respective subset of the plurality of carriers. For example, Ericsson's Radio Dot System can dynamically adjust to maintain efficiency: "centralized radios provide pooled capacity and design flexibility, dynamically meeting demand wherever it occurs in real time while increasing spectral and hardware efficiency of the system."[187] Moreover, Ericsson explains that "[t]he capability to configure, scale, and reconfigure logical nodes through software commands enables the RAN to dynamically adjust to changing traffic conditions, hardware faults, as well as new service requirements."[188] Ericsson also states that "[w]ithout RDS, high traffic demand generated indoors consumes a substantial amount of the

[187] https://cellantenna.com/wp-content/uploads/2020/08/CellAntenna-Radio-Dot-System-Brochure-2020-01-17-1.pdf (last visited October 5, 2022).
[188] https://www.ericsson.com/en/reports-and-papers/ericsson-technology-review/articles/4g5g-ran-architecture-how-a-split-can-make-the-difference (last visited October 5, 2022).

radio resources of the surrounding outdoor macro cells. Deploying RDS in large high-traffic enterprises offloads the macro layer and serves the indoor users more efficiently.[189] Consequently, on information and belief, Ericsson's Radio Dot System reconfigures each remote radio unit by increasing or decreasing the number of carriers in the respective subset of the plurality of carriers.

375. On information and belief, T-Mobile's LTE and 5G networks, which include Ericsson's Radio Dot System, meet claim element [1G] of claim 1 of the '171 patent.

376. On information and belief, T-Mobile's LTE and 5G networks route and switch the packetized signals among the plurality of remote radio units via the at least one digital access unit according to a result of the reconfiguring. For example, Ericsson's Radio Dot System provides pooled capacity that is managed by the DU and which can be reassigned based on network requirements: "centralized radios provide pooled capacity and design flexibility, dynamically meeting demand wherever it occurs in real time while increasing spectral and hardware efficiency of the system."[190] Moreover, the DU "is the signal source of the Radio Dot System and provides the pooled baseband resources for the building(s) or area."[191] This allows for reconfiguring the routing and switching of packetized signals among the one or more Radio Dots through the DU.

377. Accordingly, on information and belief, T-Mobile's LTE and 5G networks, which include Ericsson's Radio Dot System, meet all elements of, and therefore infringe at least claim 1 of the '171 patent.

378. On information and belief, Ericsson has induced infringement of at least claim 1 of the '171 patent by T-Mobile pursuant to 35 U.S.C. § 271(b), and committed contributory

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[189] https://cellantenna.com/wp-content/uploads/2020/08/CellAntenna-Radio-Dot-System-Brochure-2020-01-17-1.pdf (last visited October 5, 2022).
[190] https://cellantenna.com/wp-content/uploads/2020/08/CellAntenna-Radio-Dot-System-Brochure-2020-01-17-1.pdf (last visited October 5, 2022).
[191] *Id.*

infringement of at least claim 1 of the ’171 patent pursuant to 35 U.S.C. § 271(c), by providing the hardware and software necessary for T-Mobile to perform the claimed method, along with instructions that induce T-Mobile to perform the claimed method.

379. On information and belief, Ericsson takes active steps to induce infringement of at least claim 1 of the ’171 patent by T-Mobile, knowing that those steps will induce, encourage, and facilitate direct infringement by T-Mobile in violation of 35 U.S.C. § 271(b). Such active steps include, but are not limited to, providing T-Mobile with instructions on the use of the above-described routing and switching feature, and participating in the installation, configuration, operation, and maintenance of Radio Dot Systems in T-Mobile’s network specifically for the purpose of performing the infringing methods.

380. On information and belief, Ericsson knew or should have known that such activities induce T-Mobile to infringe at least claim 1 of the ’171 patent by using the claimed systems from at least the date of the filing of this Complaint.

381. On information and belief, Ericsson also contributes to the infringement of at least claim 1 of the ’171 patent by T-Mobile in violation of 35 U.S.C. § 271(c). Acts by Ericsson that contribute to the infringement of T-Mobile include providing Radio Dot System hardware and software modules that comprise the above-described distributed antenna system. The accused hardware and software are especially adapted for use in the infringing distributed antenna system, and they have no substantial non-infringing uses. On information and belief, Ericsson knows or should know that such activities contribute to T-Mobile’s infringement of at least claim 1 of the ’171 patent by using the claimed system.

382. By way of this Complaint, Ericsson knows of the ’171 patent and performs acts that it knows, or should know, induce and/or contribute to the direct infringement of claim 1 of the

’171 patent by T-Mobile. Thus, Ericsson is indirectly liable for infringement of at least claim 1 of the ’171 patent pursuant to 35 U.S.C. §§ 271(b) and 271(c).

383. T-Mobile and Ericsson undertook and continue their infringing actions despite an objectively high likelihood that such activities infringe the ’171 Patent, which has been duly issued by the PTO and is presumed valid. Moreover, the PTAB has denied institution of at least one petition for *inter partes* review of the ’171 patent.[192] For example, since at least the filing of this Complaint, T-Mobile and Ericsson have been aware of an objectively high likelihood that their actions constituted and continue to constitute infringement of the ’171 Patent and that the ’171 Patent is valid. On information and belief, T-Mobile and Ericsson could not reasonably, subjectively believe that their actions do not constitute infringement of the ’171 patent. Despite that knowledge and subjective belief, and the objectively high likelihood that their actions constitute infringement, T-Mobile and Ericsson have continued their infringing activities. As such, T-Mobile and Ericsson have willfully infringed and/or will continue to willfully infringe the ’171 patent.

384. As a result of T-Mobile’s and Ericsson’s infringement of the ’171 patent, Dali has suffered and continues to suffer substantial injury and is entitled to recover all damages caused by T-Mobile’s and Ericsson’s infringement to the fullest extent permitted by the Patent Act, together with prejudgment interest and costs for T-Mobile’s and Ericsson’s wrongful conduct.

385. Dali has no adequate remedy at law to prevent future infringement of the ’171 patent. Dali suffers and continues to suffer irreparable harm as a result of T-Mobile’s and Ericsson’s patent infringement and is, therefore, entitled to injunctive relief to enjoin T-Mobile’s and Ericsson’s wrongful conduct.

[192] *See* IPR2020-01432, Paper No. 16 (decision denying institution).

PRAYER FOR RELIEF

WHEREFORE, Dali respectfully requests judgment against Defendants as follows:

A. that this Court adjudge that T-Mobile and CommScope, to the extent not enjoined, infringe the ’382 patent, the ’358 patent, the ’232 patent, ’499 patent, and the ’343 patent;

B. that the Court enter an injunction prohibiting T-Mobile, CommScope, and their agents, officers, servants, employees and all persons in active concert or participation with T-Mobile or CommScope from deploying, operating, maintaining, testing, and using small cell wireless solutions in T-Mobile’s LTE and 5G Networks, including CommScope’s OneCell and ION®-E/ERA products, and from otherwise infringing any of the Patents-in-Suit;

C. that this Court adjudge that T-Mobile and CommScope, to the extent not enjoined, willfully infringe the ’382 patent, the ’358 patent, the ’232 patent, ’499 patent, and the ’343 patent;

D. that this Court adjudge that T-Mobile and Ericsson, to the extent not enjoined, infringe the ’382 patent, the ’232 patent, ’499 patent, ’338 patent, ’343 patent and the ’171 patent;

E. that the Court enter an injunction prohibiting T-Mobile, Ericsson, and their agents, officers, servants, employees and all persons in active concert or participation with T-Mobile or CommScope from deploying, operating, maintaining, testing, and using small cell wireless solutions in T-Mobile’s LTE and 5G Networks, including Ericsson’s Radio DOT System, and from otherwise infringing any of the Patents-in-Suit;

F. that this Court adjudge that T-Mobile and Ericsson, to the extent not enjoined, willfully infringe the ’382 patent, the ’358 patent, the ’232 patent, ’499 patent, ’338 patent, ’343 patent, and the ’171 patent;

G. that this Court ascertain and award Dali damages under 35 U.S.C. § 284 sufficient to compensate for Defendants' infringement, including but not limited to infringement occurring before the filing of this lawsuit;

H. that this Court ascertain and award Dali any post-judgment ongoing royalties under 35 U.S.C. § 284 as may be appropriate;

I. that this Court award Dali any applicable pre-judgment and post-judgment interest;

J. that this Court award Dali such other relief at law or in equity as the Court deems just and proper.

JURY DEMAND

Dali requests that all claims and causes of action raised in this Complaint against Defendants be tried to a jury to the fullest extent possible.

Date: October 21, 2022

Respectfully submitted,

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