Table 1 Comparing Select Sections of Almeroth Declaration (EX1002) to Corresponding Sections of Petition (Paper 3)

Section/Topic	Almeroth Declaration (EX1002)	Petition re: '564 Patent
Grounds for Unpatentability: Overview and Motion to Combine	78. In my opinion, Chincholi in combination with Choi and Clegg renders claims 1-29 obvious. As discussed in more detail below, Chincholi teaches the same architecture as the '564 patent, including a wireless networking device with multiple transceivers, each having actual MAC and PHY interfaces. Chincholi uses a single "***Opportunistic Multiple-Medium Access Control (MAC) Aggregation layer***," positioned above the actual MAC-PHY layers of each transceiver, to aggregate available bandwidth portions to efficiently meet the requirements of data streams from one or more applications. (EX1005 ¶[0122-0123].) EX1002 ¶ 78.	Chincholi in combination with Choi and Clegg renders claims 1-29 obvious. Chincholi teaches the same architecture as the '564 patent, including a wireless networking device with multiple transceivers, each having actual MAC and PHY interfaces. Chincholi uses a single "***Opportunistic Multiple-Medium Access Control (MAC) Aggregation layer***," above the actual MAC-PHY layers of each transceiver, to aggregate available bandwidth portions to meet the requirements of data streams from applications. (EX1005 ¶[0122-0123]; EX1002 ¶78.) Petition at 13.

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	79. Chincholi teaches continuous monitoring of the "number of available resources on the medium" and techniques for distributing IP packets across the RATs accordingly. (EX1005 ¶[0161].) Chincholi's approach enables the system to respond to bandwidth channels, or portions of bandwidth channels, becoming unavailable during transmission of a data stream. A POSITA would have understood that Chincholi's monitoring and response techniques could be further enhanced by the teachings of Clegg. Clegg teaches techniques for addressing carrier-specific interference within bandwidth channels, allowing for any given channel full usage of the channel bandwidth that is not unavailable for communication. Like Chincholi, Clegg arises in the field 802.11 wireless communication networks and is addressed to increasing bandwidth efficiency. (EX1009 at 1:25-37.) 80. A POSITA would have been motivated to incorporate the teachings of Clegg to improve the Chincholi system by allowing it to more flexibly and efficiently utilize available bandwidth channels that may experience carrier-specific interference within the channels. Chincholi already teaches dynamic allocation of contiguous or non-contiguous channels, and Clegg merely provides additional detail on how to mitigate carrier-specific interference within any given channel. The teachings of Clegg are complementary to Chincholi, and a POSITA would have recognized that Clegg's teachings could be easily implemented into Chincholi without technical challenge. EX1002 ¶ 79-80.	Chincholi teaches continuous monitoring of the "number of available resources on the medium" and techniques for distributing IP packets across the RATs accordingly. (EX1005 ¶[0161].) Chincholi's approach enables the system to respond to bandwidth channels, or portions of bandwidth channels, becoming unavailable during transmission of a data stream. (EX1002 ¶79.) A POSITA would have understood that Chincholi's monitoring and response techniques could be further enhanced by Clegg's teachings. (EX1002 ¶79.) Clegg teaches techniques for addressing carrier-specific interference within bandwidth channels, allowing for any given channel full usage of the channel bandwidth that is not unavailable for communication. Like Chincholi, Clegg arises in the field 802.11 wireless networks and addresses the challenge of bandwidth efficiency. (EX1009 at 1:25-37.) A POSITA would have been motivated to incorporate the teachings of Clegg to improve the Chincholi system by allowing it to more flexibly and efficiently utilize available bandwidth channels that experience carrier-specific interference within the channels. (EX1002 ¶80.) Chincholi already teaches dynamic allocation of contiguous or non-contiguous channels, and Clegg provides additional detail on how to mitigate carrier-specific interference within channels. (EX1002 ¶80.) The teachings of Clegg are complementary to Chincholi, and a POSITA would have recognized that Clegg's teachings could be easily implemented into Chincholi without technical challenge. (EX1002 ¶80.) Petition at 14-15.

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	81. A POSITA would have further understood that Chincholi's monitoring and response techniques could be enhanced by the teachings of Choi. Choi teaches a dynamic frequency selection techniques for addressing interference and reduced quality of WLAN networks by measuring frequency channel characteristics and selecting the frequency channel with minimum interference signal level. This level is based on measured Received Signal Strength Range Index (RSSRI) and Clear Channel Assessment (CCA) value. Like Chincholi, Choi arises in the field 802.11 wireless communication networks and is addressed to increasing bandwidth efficiency and performance of the network. (EX1016 at 1:20-62.) 82. A POSITA would have been motivated to incorporate the teachings of Choi to improve the Chincholi system by allowing it to more flexibly and efficiently utilize available bandwidth channels to minimize mutual interference. Chincholi already teaches identifying available bandwidth channels for communication, receiving feedback information from each RAT, evaluating the identified channel availabilities, and switching from one RAT to another due to superior data transfer characteristics. Choi merely provides additional detail on how to apply this similar methodology to selecting and switching frequency channels. The teachings of Choi are complementary to Chincholi, and a POSITA would have recognized that Choi's teachings could be implemented into Chincholi without technical challenge and with a reasonable expectation of success. 83. In my analysis below, the combined prior art system will be referred to as Chincholi/Choi/Clegg. EX1002 ¶¶ 81-82.	A POSITA would have further understood that Chincholi's monitoring and response techniques could be enhanced by the teachings of Choi. (EX1002 ¶81.) Choi teaches a dynamic frequency selection techniques for addressing interference and reduced quality of WLAN networks by measuring frequency channel characteristics and selecting the channel with minimum interference signal level. This level is based on measured Received Signal Strength Range Index (RSSRI) and Clear Channel Assessment (CCA) value. Like Chincholi, Choi arises in the field 802.11 wireless networks and is addressed to increasing bandwidth efficiency and network performance. (EX1016 at 1:20-62.) A POSITA would have been motivated to incorporate the teachings of Choi to improve the Chincholi system by allowing it to more flexibly and efficiently utilize available bandwidth channels to minimize mutual interference. (EX1002 ¶82.) Chincholi teaches identifying available bandwidth channels for communication, receiving feedback information from each RAT, evaluating the identified channel availabilities, and switching RATs due to superior data transfer characteristics. Choi merely provides additional detail on how to apply this similar methodology to selecting and switching frequency channels. (EX1002 ¶82.) The teachings of Choi are complementary to Chincholi, and a POSITA would have recognized that Choi's teachings could be implemented into Chincholi without technical challenge and with a reasonable expectation of success. (EX1002 ¶82.) In the analysis below, the combined prior art will be referred to as Chincholi/Choi/Clegg. Petition at 15-16.

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Grounds for Unpatentability: Preamble	84. In my opinion, Chincholi/Choi/Clegg discloses "[s]ystems, methods, and instrumentalities . . . for managing multiple radio access technology (RAT) interfaces" (EX1005, Abstract; [0003]) and "enabl[ing] opportunistic RAT selection and aggregation for sending data traffic over the RAT interfaces." (EX1005 ¶[0003].) "In multi-RAT systems reception and/or transmission may be performed over multiple RATs. For example, ***a network terminal (NT)*** (e.g., an ***access point (AP)*** . . .) and ***a wireless transmit/receive unit (WTRU)*** . . . may communicate over multiple parallel paths." (EX1005 ¶[0002].) 85. Chincholi discloses that a network terminal ("NT"), such as an access point, or a wireless transmit/receive unit ("WTRU") "may be configured to work in an infrastructure mode or an adhoc mode, for example, in an IEEE802.11 based Wi-Fi system," *i.e.*, both are a ***wireless networking device***. (EX1005 ¶[0115].) Thus, as discussed in the below limitations, Chincholi/Choi/Clegg discloses a wireless networking device. EX1002 ¶¶ 84-85.	Chincholi discloses "[s]ystems, methods, and instrumentalities… for managing multiple radio access technology (RAT) interfaces" (EX1005, Abstract, [0003]) and "enabl[ing] opportunistic RAT selection and aggregation for sending data traffic over the RAT interfaces." (EX1005 ¶[0003]; EX1002 ¶84.) "In multi-RAT systems reception and/or transmission may be performed over multiple RATs. For example, ***a network terminal (NT)*** (e.g., an ***access point (AP)***…) and ***a wireless transmit/receive unit (WTRU)***… may communicate over multiple parallel paths." (EX1005 ¶[0002].) Chincholi discloses that an NT, such as an access point, or a wireless transmit/receive unit ("WTRU") "may be configured to work in an infrastructure mode or an adhoc mode, for example, in an IEEE802.11 based Wi-Fi system," *i.e.*, both are a ***wireless networking device***. (EX1005 ¶[0115].) Thus, Chincholi/Choi/Clegg discloses a wireless networking device. (EX1002 ¶85.) Petition at 16.

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Grounds for Unpatentability: Claim 1(a)	87. ***"application interface being associated with a first application... providing, when the wireless networking device is being used, a first data stream":*** Chincholi discloses that "[u]sing multiple RATs simultaneously may provide the benefit of increased bandwidth for an ***application*** (*e.g.*, an IP flow) as well as increased reliability." (EX1005 ¶[0191].) The first data stream of a first application is referred to as an "IP flow." (EX1005 ¶[0132] ("***A single IP flow may refer to a stream of IP packets belong to a particular application***.").) In an 802.11 embodiment (Figure 5), IP packets associated with an application data stream come from or are destined to an IP layer 504, and thus the IP flow (*i.e.* ***first data stream***) is provided by the application ***when the wireless networking device is being used***. (EX1005 ¶[0138]], Table 1 ("S" interface is for "Incoming/Outgoing IP Packets").) The "[S]" interface from the IP layer for the IP stream is therefore an *application interface associated with a first application.* EX1002 ¶ 87 (identical figure omitted).	***"application interface being associated with a first application... providing, when the wireless networking device is being used, a first data stream":*** Chincholi discloses that "[u]sing multiple RATs simultaneously may provide the benefit of increased bandwidth for an ***application*** (*e.g.*, an IP flow) as well as increased reliability." (EX1005 ¶[0191]; EX1002 ¶¶86-87.) The first data stream of a first application is referred to as an "IP flow." (EX1005 ¶[0132] ("***A single IP flow may refer to a stream of IP packets belong to a particular application***.").) In an 802.11 embodiment (Figure 5), IP packets associated with an application data stream come from or are destined to an IP layer 504, and thus the IP flow (*i.e.* ***first data stream***) is provided by the application ***when the wireless networking device is being used***. (EX1005 ¶[0138]], Table 1 ("S" interface is for "Incoming/Outgoing IP Packets").) The "[S]" interface from the IP layer for the IP stream is therefore an *application interface associated with a first application.* (EX1002 ¶87.) Petition at 16-17.

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	88. ***"a processing interface that is connected to an application interface":*** Chincholi further discloses that its "application interface" is connected to a "processing interface." Chincholi's *processing interface* is referred an "*Opportunistic Multiple-Medium Access Control (MAC) Aggregation (OMMA) layer*." (EX1005 ¶[0003].) A POSITA would have understood that the plain meanings of "interface" and "layer" in the context of the '564 patent are congruent, which is underscored by the specification describing layers having the same functionality as the claimed interfaces, and the prosecution history, where Applicant interchangeably used the terms "layer" and "interface" to describe Figure 1. (EX1017, 8/8/23 Response to Non-Final Office Action). The OMMA layer is a common layer/module between the IP layer/module and the multiple RAT layers/modules. (EX1005 ¶[0137]; *see also id.* ¶[0120] ("[T]he single thin software layer may enable one RAT to operate over industrial scientific medical (ISM) and another RAT to operate over a TVWS band for the same IP flow.").) An exemplary OMMA layer enabling a dual-RAT aggregation device in a 802.11n network is shown in Figure 5: 89. The IP layer is connected to the OMMA layer and provides IP packets that the OMMA layer processes. (EX1005 ¶[0138])) The OMMA "may allow for enhanced throughput and reduced latency for a single IP flow." (EX1005 ¶[0120].) The OMMA layer is therefore a processing layer, which processes IP packets and provides an ***interface*** between the IP layer and actual MAC layers, *i.e.*, a *processing interface*. 90. ***"first application ... having a first wireless bandwidth requirement":*** Chincholi teaches "a bandwidth requirement for an IP flow." (EX1005 ¶[260]) EX1002 ¶¶ 88-90 (identical figure omitted).	***"a processing interface that is connected to an application interface":*** Chincholi further discloses that its "application interface" is connected to a "processing interface." (EX1002 ¶88.) Chincholi's *processing interface* is referred an "*Opportunistic Multiple-Medium Access Control (MAC) Aggregation (OMMA) layer*." (EX1005 ¶[0003].) A POSITA would have understood that the plain meanings of "interface" and "layer" in the context of the '564 patent are congruent—underscored by the specification describing layers having the same functionality as the claimed interfaces, and the prosecution history, where Applicant interchangeably used the terms "layer" and "interface" to describe Figure 1. (EX1002 ¶88; EX1017, 8/8/23 Response to Office Action). The OMMA layer is a common layer/module between the IP layer/module and the multiple RAT layers/modules. (EX1005 ¶[0137]; ¶[0120] ("[T]he single thin software layer may enable one RAT to operate over industrial scientific medical (ISM) and another RAT to operate over a TVWS band for the same IP flow.").) Figure 5 shows an exemplary OMMA layer enabling a dual-RAT aggregation device in a 802.11n network: The IP layer—connected to the OMMA layer—provides IP packets that the OMMA layer processes. (EX1005 ¶[0138]; EX1002 ¶89.) The OMMA "may allow for enhanced throughput and reduced latency for a single IP flow." (EX1005 ¶[0120].) The OMMA layer is therefore a processing layer, which processes IP packets and provides an ***interface*** between the IP layer and actual MAC layers, *i.e.*, a *processing interface*. ***"first application... having a first wireless bandwidth requirement":*** Chincholi teaches "a bandwidth requirement for an IP flow." (EX1005 ¶[260]; EX1002 at ¶90.)

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		Petition at 17-20 (identical figure omitted).
Grounds for Unpatentability: Claim 1(b)	91. In my opinion, Chincholi/Choi/Clegg discloses this limitation. Chincholi discloses first and second *actual MAC interfaces* connected to the processing interface (*i.e.*, the common OMMA layer). Figure 5, for example, depicts a "dual-RAT aggregation" with the common OMMA layer existing above and connected to two RATs 501a and 501b, which comprise first and second actual MAC interfaces 502, respectively. (EX1005 ¶[0138] (***"The RATs 501a, 501b may comprise a MAC layer/module 502*** and one or more physical layers/modules 503.").) EX1002 ¶ 91 (identical figure omitted).	Chincholi discloses first and second *actual MAC interfaces* connected to the processing interface (*i.e.*, the common OMMA layer). Figure 5 depicts a "dual-RAT aggregation" with the common OMMA layer existing above and connected to two RATs 501a and 501b, which comprise first and second actual MAC interfaces 502, respectively. (EX1005 ¶[0138] (***"The RATs 501a, 501b may comprise a MAC layer/module 502*** and one or more physical layers/modules 503."); EX1002 ¶91.) Petition at 20 (identical figure omitted).
Grounds for Unpatentability: Claim 1(c)	92. In my opinion, Chincholi/Choi/Clegg discloses this limitation. Each RAT in Chincholi comprises *one or more physical layers*. (EX1005 ¶[0138] ("The RATs 501a, 501b may comprise a MAC layer/module 502 and *one or more physical layers/modules 503*.").) The actual PHY layers are respectively connected to the actual MAC interfaces: EX1002 ¶ 92 (identical figure omitted).	Each RAT in Chincholi comprises *one or more physical layers*. (EX1005 ¶[0138] ("The RATs 501a, 501b may comprise a MAC layer/module 502 and *one or more physical layers/modules 503*."); EX1002 ¶92.) The actual PHY layers are respectively connected to the actual MAC interfaces: Petition at 21 (identical figure omitted).
Grounds for Unpatentability: Claim 1(d)	94. ***"first and second wireless transceivers respectively associated with the first and second actual PHY interfaces… suitable for use in a wireless local area network":*** Chincholi Figure 5 illustrates that each actual PHY interface of each RAT is associated with an ***antenna/radio frequency (RF) front-end pair***. (EX1005 ¶[0133].) The ***antenna/radio frequency (RF) front-end pairs*** in Figure 5 include ***first and second transceivers***. EX1002 ¶ 94.	***"first and second wireless transceivers respectively associated with the first and second actual PHY interfaces… suitable for use in a wireless local area network":*** Chincholi Figure 5 illustrates that each actual PHY interface of each RAT is associated with an ***antenna/radio frequency (RF) front-end pair***. (EX1005 ¶[0133]; EX1002 ¶¶93-94.) The ***antenna/radio frequency (RF) front-end pairs*** in Figure 5 include ***first and second transceivers***.

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		Petition at 22-23.
	95. A POSITA would have understood that a "transceiver" is a physical device that can both transmit and receive information. Thus, each of Chincholi's disclosed "antenna/RF front-end pairs" are a transceiver because they operate on wireless protocols that both transmit and receive data, such as IEEE802.11, IEEE802.11ac, IEEE802.11af, LTE, WCDMA, etc. (EX1005 ¶[0134].) 96. A POSITA would have further understood that the transceivers in Figure 5 would be associated with the actual PHY layer of each respective RAT, as the PHY layer is understood as the physical connection between a transceiver and the rest of the RAT. 97. Chincholi also teaches that each RAT may be implemented as a Wi-Fi RAT, and thus their associated transceivers are suitable for use in a wireless local area network. (EX1005 ¶[0134].)	A POSITA would have understood that a "transceiver" is a physical device that can both transmit and receive information. (EX1002 ¶¶94-95.) Each of Chincholi's disclosed "antenna/RF front-end pairs" is a transceiver because they operate on wireless protocols that both transmit and receive data, such as IEEE802.11, IEEE802.11ac, IEEE802.11af, LTE, etc. (EX1005 ¶[0134].) A POSITA would have further understood that the transceivers in Figure 5 would be associated with the actual PHY layer of each respective RAT, as the PHY layer is the physical connection between a transceiver and the rest of the RAT. (EX1002 ¶96.) Chincholi also teaches that each RAT may be implemented as a Wi-Fi RAT, and thus their associated transceivers are suitable for use in a wireless local area network. (EX1005 ¶[0134]; EX1002 ¶97.) Petition at 23-24.

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	98. ***"the first and second wireless transceivers, respectively, (i) have a first and second bandwidth availability up to first and second actual bandwidths":*** A POSITA would have recognized that each transceiver has an "actual" bandwidth (*i.e.*, total bandwidth of the transceiver) with a "bandwidth availability" that may be a subset of the actual bandwidth (*i.e.*, sub-portions of the total bandwidth that are available for use). Indeed, as Chincholi teaches, the RATs associated with each transceiver provide "meta-data feedback" allowing the OMMA layer to split IP packets amongst the RATs based on their available bandwidth. (EX1005 ¶[0138]; ¶[0161] (listing "Channel bandwidth(s)" sent by the PHY layer as an example of "feedback metric[] used by an OMMA layer"); *see also id.* ¶[0167] ("At startup, the OMMA layer may receive the ***available bandwidth of each of the one or more RATs***.").) Thus, Chincholi discloses that each of the two transceivers has a bandwidth availability up to an actual bandwidth. 99. ***"the first and second wireless transceivers, respectively,… (ii) are adapted to emit radio waves in first and second different bands of frequencies":*** Chincholi discloses that each of the transceivers may be adapted to emit radio waves in respective different bands of frequencies. In the context of Figure 4, for example, Chincholi discloses that "[f]or multiple RATs 401, ***each RAT 401 may be operating on a specific band***. For example, a 802.11n PHY/MAC operating over 2.4GHz ISM band, a 802.11af PHY/MAC operating over 512 MHz-698 MHz TVWS band, an LTE RAT operating of a licensed band (*e.g.*, 700 MHz band), a Bluetooth RAT operating on 2.4 GHz ISM band, *etc.*" (EX1005 ¶[0135].) EX1002 ¶¶ 95-99.	***"the first and second wireless transceivers, respectively, (i) have a first and second bandwidth availability up to first and second actual bandwidths":*** A POSITA would have recognized that each transceiver has an "actual" bandwidth (*i.e.*, total bandwidth of the transceiver) with a "bandwidth availability" that may be a subset of the actual bandwidth (*i.e.*, sub-portions of the total bandwidth available for use). (EX1002 ¶98.) As Chincholi teaches, the RATs associated with each transceiver provide "meta-data feedback" allowing the OMMA layer to split IP packets amongst the RATs based on their available bandwidth. (EX1005 ¶[0138]; ¶[0161] (listing "Channel bandwidth(s)" sent by the PHY layer as an example of "feedback metric[] used by an OMMA layer"); ¶[0167] ("At startup, the OMMA layer may receive the ***available bandwidth of each of the one or more RATs***.").) Thus, Chincholi discloses that each of the two transceivers has a bandwidth availability up to an actual bandwidth. (EX1002 ¶98.) ***"the first and second wireless transceivers, respectively,… (ii) are adapted to emit radio waves in first and second different bands of frequencies":*** Chincholi discloses that each of the transceivers may be adapted to emit radio waves in respective different bands of frequencies. In the context of Figure 4, for example, Chincholi discloses that "[f]or multiple RATs 401, ***each RAT 401 may be operating on a specific band***. For example, a 802.11n PHY/MAC operating over 2.4GHz ISM band, a 802.11af PHY/MAC operating over 512 MHz-698 MHz TVWS band, an LTE RAT operating of a licensed band (*e.g.*, 700 MHz band), a Bluetooth RAT operating on 2.4 GHz ISM band, *etc.*" (EX1005 ¶[0135]; EX1002 ¶99.) Petition at 24-25.

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Grounds for Unpatentability: Claim 1(e)	100. In my opinion, Chincholi/Choi/Clegg discloses this limitation. According to the '564 patent, the virtual MAC layers "enable[s] simultaneous allocation of multiple PHY resources for different signal types associated with different applications." (EX1001 at 3:52-54.) The virtual MAC layer comprises the functionality of "decision," "processing," and "ultra streaming" blocks. (EX1001 at 4:49-52.) The patent does not disclose or describe a generic "resource monitoring interface," which as discussed above, *supra* Section IV.A.3, was added to the claim to replace the originally recited "virtual PHY interfaces" in a post-NOA broadening amendment. 101. The patent's description of the "virtual PHY layer" provides that a virtual PHY may include multiple RF blocks, each representing the virtual use of some set of allocated transceiver resources. (EX1001 at 4:52-54; *see also* Fig. 3 (depicting two RF blocks associated with "two sets" of transceiver resources).) "By employing a virtual MAC and virtual PHY between an application layer and an actual MAC and PHY layer, wireless transceiver resources may be allocated more efficiently to handle various data bandwidth requirements from different applications." (EX1001 at 6:4-8.). EX1002 ¶¶ 100-101.	According to the '564 patent, the virtual MAC layers "enable[s] simultaneous allocation of multiple PHY resources for different signal types associated with different applications." (EX1001 at 3:52-54) The virtual MAC layer comprises the functionality of "decision," "processing," and "ultra streaming" blocks. (EX1001 at 4:49-52.) The patent does not disclose or describe a generic "resource monitoring interface," which as discussed above, *supra* Section IV.A.3, was added to the claim to replace the originally recited "virtual PHY interfaces" in a post-NOA broadening amendment. (EX1002 ¶100.) The patent's description of the "virtual PHY layer" provides that a virtual PHY may include multiple RF blocks, each representing the virtual use of some set of allocated transceiver resources. (EX1001 at 4:52-54, Fig. 3 (depicting two RF blocks associated with "two sets" of transceiver resources); EX1002 ¶101) "By employing a virtual MAC and virtual PHY between an application layer and an actual MAC and PHY layer, wireless transceiver resources may be allocated more efficiently to handle various data bandwidth requirements from different applications." (EX1001 at 6:4-8.) Petition at 25-26.

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	102. *First*, Chincholi discloses that the OMMA (*i.e.*, the processing interface) includes the claimed "*virtual MAC interface*" formed within it. Indeed, "OMMA" is an abbreviation for "opportunistic multi-medium access control ***(MAC) aggregation***," which refers to the fact that the OMMA layer aggregates multiple MAC interfaces, as depicted in Figure 5. (EX1005 ¶[0120].) The OMMA layer includes an interface acting as a "virtual MAC interface" because it transparently "distributes and/or combines" packets between the IP layer and the RATs. (EX1005 ¶[0192].) A POSITA would have recognized that this "virtualizes" a MAC interface because the OMMA would effectively appear to the IP layer as a single interface for exchanging packets that are ultimately sent or received by the actual MAC-PHY pairs. 103. Chincholi's OMMA layer also includes all of the functionality that the '564 patent associates with the "virtual MAC interface." Specifically, Figure 6 of Chincholi is a block diagram of an OMMA layer, comprising an IP QoS Scheduler 603, a MAC Resource Reservation module 602, and a Traffic Shaping Module 601. (EX1005 ¶[0139].) EX1002 ¶¶ 102-03 (identical figure omitted).	*First*, Chincholi discloses that the OMMA (*i.e.*, the processing interface) includes the claimed "*virtual MAC interface*" formed within it. Indeed, "OMMA" is an abbreviation for "opportunistic multi-medium access control ***(MAC) aggregation***," referring to how the OMMA layer aggregates multiple MAC interfaces, as depicted in Figure 5. (EX1005 ¶[0120]) The OMMA layer includes a "virtual MAC interface" because it transparently "distributes and/or combines" packets between the IP layer and the RATs. (EX1005 ¶[0192].) A POSITA would have recognized that this "virtualizes" a MAC interface because the OMMA would appear to the IP layer as a single interface for exchanging packets that are ultimately sent or received by the actual MAC-PHY pairs. (EX1002 ¶102.) Chincholi's OMMA layer also includes all of the functionality that the '564 patent associates with the "virtual MAC interface." Figure 6 of Chincholi is a block diagram of an OMMA layer, comprising an IP QoS Scheduler, a MAC Resource Reservation module, and a Traffic Shaping module. (EX1005 ¶[0139]; EX1002 ¶103.) Petition at 26-27 (identical figure omitted).

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	104. The IP QoS Scheduler classifies incoming packets of a packet stream, and may segregate them into distinct IP QoS streams (EX1005 ¶[0143]), which a POSITA would have recognized to fulfill the functionality of the "decision block" (EX1001 at 3:31-34). The MAC Resource Reservation module determines the time duration or spectral fragment/bandwidth required by a packet or set of packets (EX1005 ¶[0142]), which a POSITA would have recognized to fulfill the functionality of the "processing block" (EX1001 at 3:34-36). Finally, the Traffic Shaping module determines the way packets are routed across RATs using either policy based routing or feedback based routing (EX1005 ¶[0139]), which a POSITA would have recognized to fulfill the functionality of the "ultra-streaming block" (EX1001 at 3:36-40). Thus, a POSITA would have recognized that Chincholi's OMMA layer includes a "*virtual MAC interface*." 105. *Second*, Chincholi discloses that its processing interface comprises the "*at least one resource monitoring interface formed in the processing interface*" that, during operation, feeds information regarding the bandwidth availabilities of the first and second wireless transceivers back to the at least one virtual MAC interface. A POSITA would understand that the "resource monitoring interface formed in the processing interface" requires merely a component capable of receiving feedback statistics regarding the available resources of the wireless transceivers.	The IP QoS Scheduler classifies incoming packets of a packet stream, and segregates them into distinct IP QoS streams (EX1005 ¶[0143]), which a POSITA would have recognized to fulfill the functionality of the "decision block" (EX1002 ¶104; EX1001 at 3:31-34). The MAC Resource Reservation module determines the time duration or spectral fragment/bandwidth required by a set of packets (EX1005 ¶[0142]), which a POSITA would have recognized to fulfill the functionality of the "processing block" (EX1002 ¶104; EX1001 at 3:34-36). Finally, the Traffic Shaping module determines the way packets are routed across RATs using either policy based routing or feedback based routing (EX1005 ¶[0139]), which a POSITA would have recognized to fulfill the functionality of the "ultra-streaming block" (EX1002 ¶104; EX1001 at 3:36-40). Thus, a POSITA would have recognized that Chincholi's OMMA layer includes a "*virtual MAC interface*." (EX1002 ¶104.) *Second*, Chincholi discloses that its processing interface comprises the "*at least one resource monitoring interface formed in the processing interface*" that, during operation, feeds information regarding the bandwidth availabilities of the first and second wireless transceivers back to the at least one virtual MAC interface. A POSITA would have understood that the "resource monitoring interface formed in the processing interface" merely requires a component capable of receiving feedback statistics regarding the available resources of the wireless transceivers. (EX1002 ¶105.)

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	106. Chincholi discloses the capability of receiving feedback statistics regarding the available resources of the wireless transceivers. Specifically, the traffic shaping module of the OMMA (*i.e.*, part of the "virtual MAC interface") may determine packet routing using "feedback based routing." (EX1005 ¶[0139].) In feedback based routing, "the OMMA transmitter may use measurement metrics fed back from each RAT," which include "channel quality metrics and the ***number of available resources on the medium***," *i.e.* information regarding bandwidth availabilities. (EX1005 ¶[0161].). 107. Figures 28, 29, and their associated descriptions describe how Chincholi collects feedback from each RAT for the traffic shaping module. Figure 28 illustrates how the OMMA layer includes an OMMA Controller, which interfaces with each RAT to collect metrics regarding the channel quality and number of resources available on the medium. Specifically, using interface A2 in Figure 28, "[a] RAT (*e.g.*, ***each RAT***) may provide feedback metrics (*e.g.*, a vector comprising a value of serving rate, jitter, packet delay, and packet loss rate on its MAC) to the OMMA Controller 2900 ***per device (e.g., WTRU or NT) per access category supported at that RAT***." (EX1005 ¶[0205].).	Chincholi discloses the capability of receiving feedback statistics regarding the available resources of the transceivers. Specifically, the traffic shaping module of the OMMA (*i.e.*, part of the "virtual MAC interface") may determine packet routing using "feedback based routing." (EX1005 ¶[0139].) In feedback based routing, "the OMMA transmitter may use measurement metrics fed back from each RAT," which include "channel quality metrics and the ***number of available resources on the medium***," *i.e.* information regarding bandwidth availabilities. (EX1005 ¶[0161]; EX1002 ¶106.) Figures 28, 29, and their descriptions describe how Chincholi collects feedback from each RAT for the traffic shaping module. (EX1002 ¶107.) Figure 28 illustrates how the OMMA layer includes an OMMA Controller, which interfaces with each RAT to collect metrics regarding the channel quality and number of resources available. Specifically, using interface A2 in Figure 28, "[a] RAT (*e.g.*, ***each RAT***) may provide feedback metrics (*e.g.*, a vector comprising a value of serving rate, jitter, packet delay, and packet loss rate on its MAC) to the OMMA Controller 2900 ***per device (e.g., WTRU or NT) per access category supported at that RAT***." (EX1005 ¶[0205].)

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	108. The OMMA Controller includes a *Feedback Device Classifier module 2930*. (EX1005 ¶[0205].) The Feedback Device Classifier collects information regarding the first and second transceiver resources/requirements over the "A2" interfaces in the diagram above so that this information may be fed back to the OMMA Scheduler. Specifically, "[a] RAT (*e.g.*, each RAT) may provide feedback metrics (*e.g.*, a vector comprising a value of serving rate, jitter, packet delay, and packet loss rate on its MAC) to the OMMA Controller 2900 ***per device (e.g., WTRU or NT) per access category supported at that RAT***." A POSITA would have recognized that the ability of the *Feedback Device Classifier* module of the OMMA Controller to collect feedback per device, per access category supported by each RAT discloses the "*resource monitoring interface*" as claimed by the '564 patent. EX1002 ¶¶ 102-08 (identical figures omitted).	The OMMA Controller includes a *Feedback Device Classifier module 2930*. (EX1005 ¶[0205].) The Feedback Device Classifier collects information regarding the first and second transceiver resources/requirements over the "A2" interfaces in the diagram above so that this information may be fed back to the OMMA Scheduler. (*Id.*) A POSITA would have recognized that the ability of the *Feedback Device Classifier* module of the OMMA Controller to collect feedback per device, per access category supported by each RAT discloses the claimed "*resource monitoring interface*." (EX1002 ¶108.) Petition at 25-31 (identical figures omitted).
Grounds for Unpatentability: Claim 1(f)	110. Chincholi discloses that its OMMA layer (*i.e.*, processing interface) is configured to operate in a manner transparent to any higher layer. For example, Chincholi discloses that "[t]he OMMA layer ***may be transparent***, in that it distributes and/or combines packets from different RATs and forwards the packets to the IP layer." (EX1005 ¶[0192], ¶[0126].) This is as opposed to a "non-transparent" configuration in which the OMMA layer would "add[] additional headers at the transmitter, and/or reads and removes the headers at the receiver." (EX1005 ¶[0126].) EX1002 ¶ 110.	Chincholi teaches that its OMMA layer (*i.e.*, processing interface) is configured to operate in a manner transparent to any higher layer. "The OMMA layer ***may be transparent***, in that it distributes and/or combines packets from different RATs and forwards the packets to the IP layer." (EX1005 ¶[0192], ¶[0126]; EX1002 ¶¶109-110) This is as opposed to a "non-transparent" configuration in which the OMMA layer would "add[] additional headers at the transmitter, and/or reads and removes the headers at the receiver." (EX1005 ¶[0126].) Petition at 31.

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Grounds for Unpatentability: Claim 1(g)	112. Chincholi discloses techniques for network terminals and WTRUs to discover one another using active and passive scanning procedures. (EX1005 ¶[0145].) After an authentication procedure, Chincholi discloses that WTRUs may transmit a request to associate with one or more RATs of the network terminal and the network terminal may provide an association response signal accepting or rejecting the request of the WTRU. (EX1005 ¶[0149].) A POSITA would have recognized these scanning procedures disclose the ability of Chincholi's OMMA layer to request or create a first association between a recipient and the first actual MAC and PHY interfaces and a second association between the recipient and the second actual MAC and PHY interfaces. 113. When operating transparently with respect to higher layers, *see* limitation [1f], Chincholi's OMMA layer handles the request/response and creation of associations with WTRUs. (EX1005 ¶[0127] ("[A]ssociation request/response frames may be updated by the OMMA layer to include OMMA device discovery parameters, for example, such as but not limited to OMMA modes, OMMA schemes, OMMA packet distribution modes, etc."). Thus a POSITA would have recognized that the request or creation by Chincholi's OMMA layer of associations between recipients and the actual MAC and PHY interfaces would be performed in a manner transparent to higher level layers. EX1002 ¶¶ 108-09.	Chincholi discloses techniques for NTs and WTRUs to discover one another using active and passive scanning procedures. (EX1005 ¶[0145].) After an authentication procedure, WTRUs may transmit a request to associate with one or more RATs of the NT, and the NT may provide an association response signal accepting or rejecting the request of the WTRU. (EX1005 ¶[0149].) A POSITA would have recognized these scanning procedures disclose the ability of Chincholi's OMMA layer to request or create a first association between a recipient and the first actual MAC and PHY interfaces and a second association between the recipient and the second actual MAC and PHY interfaces. (EX1002 ¶¶111-112.) When operating transparently with respect to higher layers, *see* limitation [1f], Chincholi's OMMA layer handles the request/response and creation of associations with WTRUs. (EX1005 ¶[0127] ("[A]ssociation request/response frames may be updated by the OMMA layer to include OMMA device discovery parameters, for example, such as but not limited to OMMA modes, OMMA schemes, OMMA packet distribution modes, etc."). A POSITA would have recognized that the request or creation by Chincholi's OMMA layer of associations between recipients and the actual MAC and PHY interfaces would be performed in a manner transparent to higher level layers. (EX1002 ¶113.) Petition at 32.

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Grounds for Unpatentability: Claim 1(h)	114. In my opinion, Chincholi/Choi/ Clegg discloses this limitation. Chincholi teaches that NTs and WTRUs communicate with one another over "channels," which are portions of a transceiver bandwidth availability. Specifically, "[t]he NT and WTRU may communicate with each other over a single radio frequency (RF) spectral band, for example, 2.4 GHz ISM band, or 5 GHz ISM band, or TVSWS band, or 60 GHz band, ***using a channel within the band or aggregating multiple contiguous or noncontiguous channels***." (EX1005 ¶[0118]; *see also id.* ¶[0121] ("An 802.1 1 based system may operate in a time division duplexing (TDD) mode, for example, ***on a band over a single 20/40MHz channel in the case of ISM band or a single 5/10/20 MHz channel in television white space (TVWS) band*** using contiguous/non-contiguous carrier aggregation.").). 115. Chincholi also discloses identifying available bandwidth channels for communication. The OMMA layer receives various feedback information from each RAT. (EX1005 ¶[0123].) For example, "the OMMA transmitter may use measurement metrics fed back from each RAT," which include "channel quality metrics and the ***number of available resources on the medium***." (EX1005 ¶[0161].) Amongst the available resources provided as part of the feedback information are the "number of channels" and "channel bandwidth" (*i.e.*, the width of the channel, such as 20/40 MHz in the case of the ISM band). (EX1005 ¶[0161].).	Chincholi teaches that NTs and WTRUs communicate with one another over "channels"—portions of a transceiver bandwidth availability. Specifically, "[t]he NT and WTRU may communicate with each other over a single radio frequency (RF) spectral band,… ***using a channel within the band or aggregating multiple contiguous or noncontiguous channels***." (EX1005 ¶[0118], ¶[0121] ("An 802.11 based system may operate in a time division duplexing (TDD) mode, for example, ***on a band over a single 20/40MHz channel in the case of ISM band or a single 5/10/20 MHz channel in television white space (TVWS) band*** using contiguous/non-contiguous carrier aggregation."); EX1002 ¶114.) Chincholi discloses identifying available bandwidth channels for communication. The OMMA layer receives various feedback information from each RAT. (EX1005 ¶[0123]; EX1002 ¶115) For example, "the OMMA transmitter may use measurement metrics fed back from each RAT," which include "channel quality metrics and the ***number of available resources on the medium***." (EX1005 ¶[0161].) Amongst the available resources provided as part of the feedback information are the "number of channels" and "channel bandwidth" (*i.e.*, the width of the channel, such as 20/40 MHz in the case of the ISM band). (EX1005 ¶[0161].)

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	116. A POSITA would have understood that the ability of Chincholi's OMMA layer to receive from each RAT a number of channels and channel bandwidth is an identification of "at least one first and second portions of the first actual bandwidth" (*i.e.*, available channels, or an aggregation of multiple contiguous or non-contiguous channels) of the first actual bandwidth of the first wireless transceiver. 117. Choi also teaches an identification of first and second bandwidth portions of the first wireless transceiver. The access point of Choi comprises a "transmitter/receiver 24 . . . coupled to an antenna." (EX1016 at 4:5.) This transceiver, like the transceiver of Chincholi, will have a first actual frequency bandwidth. Choi teaches monitoring channels available to the access point transceiver and the "status" of these channels. (EX1016 at 4:16-23, 4:36-37.) Thus, Choi's method involves identifying and monitoring a plurality (at least one first and second) of frequency channels, *i.e.* portions of the first actual bandwidth of the first wireless transceiver. 118. With respect to both Chincholi and Choi, a POSITA would have understood that each identified bandwidth portion is comprised of a number of frequency carriers, which are a set of given resources for the identified channel. EX1002 ¶¶ 114-18.	A POSITA would have understood that the ability of Chincholi's OMMA layer to receive from each RAT a number of channels and channel bandwidth is an identification of "at least one first and second portions of the first actual bandwidth" (*i.e.*, available channels, or an aggregation of multiple contiguous or non-contiguous channels) of the first actual bandwidth of the first wireless transceiver. (EX1002 ¶116.) Choi also teaches an identification of first and second bandwidth portions of the first wireless transceiver. The access point of Choi comprises a "transmitter/receiver 24… coupled to an antenna." (EX1016 at 4:5.) This transceiver, like the transceiver of Chincholi, will have a first actual frequency bandwidth. (EX1002 ¶117.) Choi teaches monitoring channels available to the access point transceiver and the "status" of these channels. (EX1016 at 4:16-23, 4:36-37.) Thus, Choi's method involves identifying and monitoring a plurality (at least one first and second) of frequency channels, *i.e.* portions of the first actual bandwidth of the first wireless transceiver. (EX1002 ¶117.) With respect to both Chincholi and Choi, a POSITA would have understood that each identified bandwidth portion is comprised of a number of frequency carriers, which are a set of given resources for the identified channel. (EX1002 ¶118.) Petition at 33-34.

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Grounds for Unpatentability: Claim 1(i)	119. In my opinion, Chincholi/Choi/Clegg discloses this limitation. Chincholi teaches evaluation of data transfer characteristics through a feedback-based routing mechanism, where "the OMMA transmitter may use measurement metrics fed back from each RAT," which include "channel quality metrics and the number of available resources on the medium" (***the given resources of both the first and second identified bandwidth portions***). (EX1005 ¶[0161].) Table 2 of Chincholi provides examples of feedback metrics used for evaluation, including "Medium Access Delay," "RSSI," "Frame error rate," "Data rate," "Queuing latency," and "End-to-end delay." (EX1005 Table 2.) These metrics are all data transfer characteristics of the identified bandwidth portions of a give RAT that are evaluated by the OMMA layer. 120. Choi provides further detail regarding the technique of evaluating the data transfer characteristics of the given resources of both the first and second bandwidth portions. Choi teaches a method and system for dynamically selecting a communication channel between an access point ("AP") and a plurality of stations ("STAs") in an IEEE 802.11 wireless local area network. (EX1016 Abstract.) Choi teaches a "channel measurement" technique by an AP wherein the AP may directly measure the channel quality, request measurement of the channel by STAs, and/or receive channel measurement reports by STAs. (EX1016 at 4:20-23; *see also id.* at 4:34-39, 5:2-9, 5:56-6:3, Fig. 3 at 100.)	Chincholi teaches evaluation of data transfer characteristics through a feedback-based routing mechanism, where "the OMMA transmitter may use measurement metrics fed back from each RAT," which include "channel quality metrics and the number of available resources on the medium" (***the given resources of both the first and second identified bandwidth portions***). (EX1005 ¶[0161]; EX1002 ¶119) Table 2 of Chincholi provides examples of feedback metrics used for evaluation, including "Medium Access Delay," "RSSI," "Frame error rate," "Data rate," "Queuing latency," and "End-to-end delay." (EX1005 Table 2.) These metrics are data transfer characteristics of the identified bandwidth portions of a RAT evaluated by the OMMA layer. Choi provides further detail regarding evaluating data transfer characteristics of given resources of both the first and second bandwidth portions. Choi teaches a method and system for dynamically selecting a communication channel between an access point ("AP") and a plurality of stations ("STAs") in an IEEE 802.11 wireless local area network. (EX1016 Abstract.) Choi teaches a "channel measurement" technique wherein the AP may directly measure channel quality, request measurement of the channel by STAs, and/or receive channel measurement reports

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	121. Choi's technique creates a "channel quality report," whereby the "channel quality" of a plurality of "candidate" frequency channels is evaluated and measured. The channel quality report may include information regarding other BSSs in the requested frequency channel, measurement of clear channel assessment (CCA) busy periods, received signal strength indications (RSSIs), and/or interference signal levels. (EX1016 at 5:66-6:3, Claims 1, 2, 11, 13, 21, 22.) A POSITA would have recognized that these channel quality report metrics are all examples of "data transfer characteristics" of the given resources of an evaluated channel. 122. Thus, in my opinion, Chincholi in light of the further details disclosed in Choi discloses an evaluation of the data transfer characteristics of the given resources of both the first and second identified bandwidth portions. EX1002 ¶¶ 119-22.	by STAs. (EX1016 at 4:20-23; *see also id.* at 4:34-39, 5:2-9, 5:56-6:3, Fig. 3 at 100; EX1002 ¶120) Choi's technique creates a "channel quality report," whereby the "channel quality" of a plurality of "candidate" frequency channels is evaluated and measured. The channel quality report may include information regarding other BSSs in the requested frequency channel, measurement of clear channel assessment (CCA) busy periods, received signal strength indications (RSSIs), and/or interference signal levels. (EX1016 at 5:66-6:3, Claims 1, 2, 11, 13, 21, 22.) A POSITA would have recognized that these channel quality report metrics are all examples of "data transfer characteristics" of the given resources of an evaluated channel. (EX1002 ¶121.) Chincholi in light of the further details disclosed in Choi discloses an evaluation of the data transfer characteristics of the given resources of both the first and second identified bandwidth portions. (EX1002 ¶122.) Petition at 35-36.

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Grounds for Unpatentability: Claim 1(j)	123. In my opinion, Chincholi/Choi/Clegg discloses this limitation. Chincholi discloses the OMMA layer allocates bandwidth resources to the transceiver resources. As Chincholi teaches, "the OMMA layer may determine a time duration and a bandwidth requirement for an IP flow." (EX1005 ¶[260].) With knowledge of this total bandwidth requirement, as well as the feedback information indicating the number of channels available on each RAT, Chincholi teaches how its "OMMA layer may intelligently manage data traffic across multiple RATs as a function of the link quality of each RAT." (EX1005 ¶[0194].) [1] In my opinion, "better than" is indefinite. *See* infra IX.B. 124. Specifically, Chincholi discloses how the OMMA layer may request resources on a RAT "based on the time duration and the bandwidth requirement for the first IP packet and the second IP packet of the IP flow." (EX1005 ¶[0260].) "The resources are characterized by the time duration and the bandwidth requirement." (EX1005 ¶[0260].) This functionality may be performed, for example, by a "MAC Resource Reservation module 602" of the OMMA layer, which "determine[s] an amount of time duration and/or spectral fragment/bandwidth required by a packet or a set of packets." (EX1005 ¶[0142].) A POSITA would have recognized from Chincholi that the MAC Resource Reservation module would select between available channels on the basis of data transfer characteristics and thereby use the first identified bandwidth portion of the first wireless transceiver for a data stream when the data transfer characteristics of the first bandwidth portion were better than those of the second bandwidth portion.	Chincholi's OMMA layer allocates bandwidth resources to the transceiver resources. As Chincholi teaches, "the OMMA layer may determine a time duration and a bandwidth requirement for an IP flow." (EX1005 ¶[260].) With knowledge of this total bandwidth requirement and the feedback information indicating the number of channels available on each RAT, Chincholi teaches its "OMMA layer may intelligently manage data traffic across multiple RATs as a function of the link quality of each RAT." (EX1005 ¶[0194]; EX1002 ¶123.) Specifically, Chincholi discloses how the OMMA layer may request resources on a RAT "based on the time duration and the bandwidth requirement for the first IP packet and the second IP packet of the IP flow." (EX1005 ¶[0260]; EX1002 ¶124) "The resources are characterized by the time duration and the bandwidth requirement." (EX1005 ¶[0260].) This functionality may be performed by a "MAC Resource Reservation module 602" of the OMMA layer, which "determine[s] an amount of time duration and/or spectral fragment/bandwidth required by a packet or a set of packets." (EX1005 ¶[0142].) A POSITA would have recognized that the MAC Resource Reservation module would select between available channels on the basis of data transfer characteristics and thereby use the first identified bandwidth portion of the first wireless transceiver for a data stream when the data transfer characteristics of the first bandwidth portion were better than those of the second bandwidth portion. (EX1002 ¶124.)

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	125. Choi provides further detail about the ability to dynamically select between available channels of a first wireless transceiver based on the evaluation of channel data transfer characteristics. After generating the "channel quality report" for a plurality of "candidate" channels, Choi teaches the ability of the AP to select a channel based on the interference signal level measurements. (EX1016 at 4:17-18; *see also id.* Fig. 3 at 200.) This step may entail, for example, "determin[ing] whether all channels are scanned… [and] [i]f so, the channel with the least RSSRI and/or CCA value is selected." (EX1016 at 8:18-20; Fig. 7 at 24 ("Select channel with (RSSRI and/or CCA) min").) Based on this selection, Choi then teaches " movement into a new channel is performed by changing the carrier frequency of a 802.11a OFDM PHY." (EX1016 at 8:44:45.) 126. Thus, in my opinion, a POSITA would have recognized that the combined teachings of Chincholi and Choi disclose using the first bandwidth portion of the first wireless transceiver to transmit the first data stream if the data transfer characteristics of the first bandwidth portion are better than those of the second bandwidth portion.	Choi provides further detail about dynamically selecting between available channels of a first wireless transceiver based on the evaluation of channel data transfer characteristics. (EX1002 ¶125.) After generating the "channel quality report" for a plurality of "candidate" channels, Choi teaches the ability of the AP to select a channel based on the interference signal level measurements. (EX1016 at 4:17-18, Fig. 3 at 200.) This step may entail "determin[ing] whether all channels are scanned… [and] [i]f so, the channel with the least RSSRI and/or CCA value is selected." (EX1016 at 8:18-20; Fig. 7 at 24 ("Select channel with (RSSRI and/or CCA) min").) Based on this selection, Choi teaches "movement into a new channel is performed by changing the carrier frequency of a 802.11a OFDM PHY." (EX1016 at 8:44:45.) Thus, a POSITA would have recognized that the combined teachings of Chincholi and Choi disclose using the first bandwidth portion of the first wireless transceiver to transmit the first data stream if the data transfer characteristics of the first bandwidth portion are better than those of the second bandwidth portion. (EX1002 ¶126.)

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	127. A POSITA would have also recognized the ability to send the first data stream to the recipient using a subset of frequences corresponding to only the given resources of the first identified bandwidth portion that are available for communication. For example, Clegg teaches an 802.11 network terminal capable of evaluating the interference levels of each carrier comprising a frequency channel. Specifically, Clegg teaches "notching out" specific OFDM subcarriers that suffer an unduly high amount of interference. (EX1009 at 7:15-19.) The remaining carriers, which are suitable for communication, are selected to comprise a "cluster of carriers for communication." (EX1009 at 4:9-10.) The cluster of carriers may comprise: "1) contiguous carriers in a single sub-channel, 2) contiguous carriers spanning across more than one sub-channel, 3) discontinuous carriers in a single sub-channel, or 4) discontinuous carriers spanning across more than one sub-channel." (Ex. 1009 at 4:11-15.) A POSITA would have recognized that Clegg's selection of a cluster of carriers enables transmission of the first data stream using only the subset of frequencies/given resources of the first identified bandwidth portion that are not unavailable. 128. The Chincholi/Choi/Clegg combination would not "require" disassociation of a recipient from either or both of the actual MAC and PHY interfaces during the bandwidth management operations described above. For example, when Chincholi's system switches from one RAT to another due to superior data transfer characteristics, it maintains the association across the RATs. This is evidenced by Chincholi's disclosure that when a RAT switch occurs, "the OMMA sender may duplicate packets across the RATs to avoid out-of-order packet reception at the OMMA receiver." (EX1005 ¶[0255].) This duplication process would be unnecessary if the system required disassociation when switching between RATs.	A POSITA would have also recognized the ability to send the first data stream to the recipient using a subset of frequences corresponding to only the given resources of the first identified bandwidth portion that are available for communication. (EX1002 ¶127.) Clegg teaches an 802.11 network terminal capable of evaluating the interference levels of each carrier comprising a frequency channel. Specifically, Clegg teaches "notching out" specific OFDM subcarriers that suffer an unduly high amount of interference. (EX1009 at 7:15-19.) The remaining carriers, which are suitable for communication, are selected to comprise a "cluster of carriers for communication." (EX1009 at 4:9-10.) The cluster of carriers may comprise: "1) contiguous carriers in a single sub-channel, 2) contiguous carriers spanning across more than one sub-channel, 3) discontinuous carriers in a single sub-channel, or 4) discontinuous carriers spanning across more than one sub-channel." (EX1009 at 4:11-15.) A POSITA would have recognized that Clegg's selection of a cluster of carriers enables transmission of the first data stream using only the subset of frequencies/given resources of the first identified bandwidth portion that are not unavailable. (EX1002 ¶127.) The Chincholi/Choi/Clegg combination would not "require" disassociation of a recipient from either or both of the actual MAC and PHY interfaces during the bandwidth management operations described above. For example, when Chincholi's system switches from one RAT to another due to superior data transfer characteristics, it maintains the association across the RATs. This is evidenced by Chincholi's disclosure that when a RAT switch occurs, "the OMMA sender may duplicate packets across the RATs to avoid out-of-order packet reception at the OMMA receiver." (EX1005 ¶[0255].) This duplication process would be

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	129. Indeed, a POSITA would have recognized the desirability of implementing Chincholi combined with the teachings of Choi and Clegg to transmit the first data stream to the recipient without requiring "disassociation" of the recipient from either or both of the first and second actual MAC and PHY interfaces. For example, in the field of 802.11 systems—where each associated terminal is assigned a unique association identifier ("AID")—it was well-known that avoiding disassociation after initial association was desirable, as repeatedly re-forming associations was inefficient and disruptive. (EX1008 ("Wang") at 24:42-43 ("This approach is undesirable, can be blunt and can disrupt the on-going services (e.g., requires disassociation), at 24:57-62 ("The lack of update/change of the AID values . . . after an initial AID assignment is inherently inflexible and can prevent the realization power saving, among other considerations, that an update/change of the AID values can provide.") Recognizing this issue, background prior art reference Wang described techniques in a multiple transceiver/MIMO system for effectuating an update to a recipient's unique association identifier ("AID") through various interactions with the system without requiring a disassociation of a wireless device from an access point. (EX1008 at 24:63-25:57.) 130. In light of this background art, a POSITA would have recognized that in implementing the Chincholi/Choi/Clegg combination, it would be desirable implement known dynamic AID reassignment techniques to avoid disassociation of recipients during operation including throughout any process of reallocating transceiver, channel, and/or bandwidth resources to a recipient. EX1002 ¶¶ 123-130.	unnecessary if the system required disassociation when switching between RATs. (EX1002 ¶128.) Indeed, a POSITA would have recognized the desirability of implementing Chincholi combined with Choi and Clegg to transmit the first data stream to the recipient without requiring "disassociation" of the recipient from either or both of the first and second actual MAC and PHY interfaces. For example, in the field of 802.11 systems—where each associated terminal is assigned a unique association identifier ("AID")—it was well-known that avoiding disassociation after initial association was desirable, as repeatedly re-forming associations was inefficient and disruptive. (EX1002 ¶129; EX1008 ("Wang") at 24:42-43 ("This approach is undesirable, can be blunt and can disrupt the on-going services (e.g., requires disassociation), at 24:57-62 ("The lack of update/change of the AID values… after an initial AID assignment is inherently inflexible and can prevent the realization power saving, among other considerations, that an update/change of the AID values can provide.") Recognizing this issue, background prior art Wang described techniques in a multiple transceiver/MIMO system for effectuating an update to a recipient's unique association identifier ("AID") through various interactions with the system without requiring a disassociation of a wireless device from an access point. (EX1008 at 24:63-25:57.) Thus, a POSITA would have recognized that in implementing the Chincholi/Choi/Clegg combination, it would be desirable to implement known dynamic AID reassignment techniques to avoid disassociation of recipients during operation including throughout any process of reallocating transceiver, channel, and/or bandwidth resources to a recipient. (EX1002 ¶130.) Petition at 37-41.

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Grounds for Unpatentability: Claim 1(k)	131. Limitation 1[k] is identical to limitation 1[j], except which portion has the better data transfer characteristics is reversed, and the subset of frequences corresponding to the given resources of the second identified bandwidth portion is used instead of the first. In my opinion, a POSITA would have recognized from the analysis in limitation 1[j] that the Chincholi/Choi/Clegg combination discloses limitation 1[j]. EX1002 ¶ 131.	Limitation 1[k] mirrors limitation 1[j], only reversing which portion has the better data transfer characteristics, and using the subset of frequencies corresponding to the given resources of the second identified bandwidth portion instead of the first. A POSITA would have recognized from the analysis in limitation 1[j] that Chincholi/Choi/Clegg discloses limitation 1[k]. (EX1002 ¶131.) Petition at 41.
Grounds for Unpatentability: Claim 1(l)	132. In my opinion, Chincholi/Choi/Clegg discloses this limitation. Chincholi discloses examples of "***multi-WTRU*** multi-IP flow cases." (EX1005 ¶[0328].) For example, "[a] system may comprise ***multiple WTRUs***, a single NT, and multiple IP flows from the NT to one or more WTRUs." (EX1005 ¶[0328].) This is disclosed, for example in Figure 3.	Chincholi discloses examples of "***multi-WTRU*** multi-IP flow cases." (EX1005 ¶[0328]; EX1002 ¶132.) For example, "[a] system may comprise ***multiple WTRUs***, a single NT, and multiple IP flows from the NT to one or more WTRUs." (EX1005 ¶[0328].) This is disclosed, for example in Figure 3.

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	133. To manage data flows for multiple WTRUs, Chincholi teaches techniques for queuing packets according to their access categories and/or WTRU addresses and optimizing the distribution of packets of multiple streams for multiple WTRUs across multiple RATs. (EX1005 ¶¶[0351]-[0356].) For example, Chincholi discloses a MAC layer of a given transceiver may implement multiple transmission buffers, denoted Q_{ik}, where "i" refers to the WTRU for which a group of packets is designated and "k" refers to the IP flow associated with the group of packets. (EX1005 ¶[352].) 134. Chincholi further discloses how utilization of the available transceiver bandwidth for one WTRU does not prevent other WTRUs from utilizing a range of frequencies corresponding to the remaining transceiver bandwidth at the same time. As discussed above, Chincholi's OMMA layer receives feedback metrics from each RAT. (EX1005 ¶[0161].) Amongst the feedback metrics are the "MAC Type," for example "OFDMA." (EX1005 ¶[0161] & Table 2.) OFDMA stands for "Orthogonal Frequency Division Multiple Access," which was a known wireless communication technique for dividing an available bandwidth into smaller subcarriers (*i.e.* frequency ranges) which are then allocated to different users. These subcarriers are described as orthogonal because they do not interfere with each other when simultaneously transmitted. A POSITA would have recognized that OFDMA techniques would allow multiple WTRUs to access different channels of the transceiver resources simultaneously and without interference. 135. Because Chincholi's RATs may provide feedback to the OMMA indicating that they are operating as an OFDMA MAC Type, a POSITA would have recognized that Chincholi discloses the capability to allow multiple WTRUs to simultaneously utilize different portions of a transceiver's available bandwidth.	To manage data flows for multiple WTRUs, Chincholi teaches techniques for queuing packets according to their access categories and/or WTRU addresses and optimizing the distribution of packets of multiple streams for multiple WTRUs across multiple RATs. (EX1005 ¶¶[0351]-[0356]; EX1002 ¶133.) For example, Chincholi discloses a MAC layer of a given transceiver may implement multiple transmission buffers, denoted Q_{ik}, where "i" refers to the WTRU for which a group of packets is designated and "k" refers to the IP flow associated with the group of packets. (EX1005 ¶[352].) Chincholi further discloses how utilization of the available transceiver bandwidth for one WTRU does not prevent other WTRUs from utilizing a range of frequencies corresponding to the remaining transceiver bandwidth at the same time. As discussed above, Chincholi's OMMA layer receives feedback metrics from each RAT. (EX1005 ¶[0161].) Amongst the feedback metrics are the "MAC Type," for example "OFDMA." (EX1005 ¶[0161], Table 2.) OFDMA stands for "Orthogonal Frequency Division Multiple Access"—a known wireless communication technique for dividing an available bandwidth into subcarriers (*i.e.* frequency ranges) which are then allocated to different users. (EX1002 ¶134.) These subcarriers are "orthogonal" because they do not interfere with each other when simultaneously transmitted. A POSITA would have recognized that OFDMA techniques would allow multiple WTRUs to access different channels of the transceiver resources simultaneously and without interference. (EX1002 ¶134.)

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	EX1002 ¶¶ 132-35 (identical figure omitted).	Because Chincholi's RATs may provide feedback to the OMMA indicating they are operating as an OFDMA MAC Type, a POSITA would have recognized that Chincholi discloses the capability to allow multiple WTRUs to simultaneously utilize different portions of a transceiver's available bandwidth. (EX1002 ¶135.) Petition at 42-44 (identical figure omitted).