

Search query (3): [SP]: block acknowledgement mechanism for acknowledging dl-mu data on ul-mu wireless communication system a method, an apparatus, and a computer-readable medium for wireless communication are provided. the apparatus may be a first user terminal. the first user terminal receives, on a first dl communication channel of multiple dl communication channels, a dl mu ppdu includes mpdus transmitted from an access point to multiple user terminals including the first user terminal on the multiple dl communication channels. the first user terminal obtains an ul channel indication and a ba indication. the first user terminal transmits, on a first ul communication channel of multiple ul communication channels, a first ba to the access point based on the ul channel indication and the ba indication simultaneously or concurrently with a ba transmission from the rest of the multiple user terminals to the access point on the rest of the multiple ul communication channels. the first ba acknowledges one or more of the mpdus. (Results: 14)

Search history

Search PN=(WO2016179307) (Results 1)

1:

Search [SP]: 1. a method of wireless communication by a first user terminal, comprising: receiving, on a first downlink (dl) communication channel of a plurality of dl communication channels, a dl multi-user (mu) physical layer convergence protocol (plcp) protocol data unit (ppdu) transmitted by an access point to a plurality of user terminals including the first user terminal and a second user terminal on the plurality of dl communication channels, wherein the dl mu ppdu includes a plurality of medium access control (mac) protocol data units (mpdus) obtaining an ul channel indication and a ba indication and transmitting, on a first uplink (ul) communication channel of a plurality of ul communication channels, a first block acknowledgement (ba) to the access point concurrently with a transmission of a second ba from the second user terminal to the access point on a second ul communication channel of the plurality of ul communication channels, wherein the first ba acknowledges one or more mpdus of the plurality of mpdus, wherein the transmission of the first ba is based on the ul channel indication and the ba indication. 2. the method of claim 1, further comprising: determining an ul communication channel that is reciprocal to the first dl communication channel based on dl channel allocation parameters, of the first dl communication channel, received in the dl ppdu, wherein the determining comprises: obtaining the dl channel allocation parameters of the first dl communication channel from the dl mu ppdu, and determining ul channel allocation parameters based on the dl channel allocation parameters, wherein the reciprocal ul communication channel is determined based on the ul channel allocation parameters, wherein the ul communication channel is reciprocal to the first dl communication channel when channel configuration of the ul communication channel is the same as the first dl communication channel and traffic is transmitted in a reverse direction of the first dl communication channel, wherein the ul channel indication is a function of the dl channel allocation parameters, wherein the first ul communication channel is the ul communication channel, wherein each mpdu of the plurality of mpdus includes an ack policy that instructs a receiving user terminal to transmit a ba immediately on one of the plurality of ul communication channels, wherein the ba indication includes the ack policy, wherein the first ba is transmitted in response to detecting the ack policy in the plurality of mpdus. 3. the method of claim 1, further comprising: obtaining ul channel allocation parameters of the plurality of ul communication channels based on the received dl mu ppdu, wherein the ul channel allocation parameters allocate equal bandwidth to each of the plurality of ul communication channels, wherein the ul channel indication is determined based on the ul channel allocation parameters included in the received dl mu ppdu and a channel index, wherein the first ul communication channel is determined based on the ul channel allocation parameters, wherein each mpdu of the plurality of mpdus includes an ack policy that instructs a receiving user terminal to transmit a ba immediately on one of the plurality of ul communication channels, wherein the ba indication includes the ack policy, wherein the first ba is transmitted in response to obtaining the ul channel allocation parameters and detecting the ack policy in the plurality of mpdus, and wherein the ul channel allocation parameters are obtained from a preamble of the dl mu ppdu. 4. the method of claim 1, wherein the first user terminal is preconfigured with ul channel allocation parameters of the plurality of ul communication channels, wherein the obtaining the ul channel indication further comprises: determining a dl channel index of the first dl communication channel, wherein the ul channel indication includes the dl channel index and determining a ul channel index of the first ul communication channel based on the dl channel index, wherein the first ul communication channel is determined based on the ul channel allocation parameters and the ul channel index, wherein each mpdu of the plurality of mpdus includes an ack policy that instructs a receiving user terminal to transmit a ba immediately on one of the plurality of ul communication channels, wherein the ba indication includes the ack policy, and wherein the first ba is transmitted in response to detecting the ack policy in the plurality of mpdus and the determination of the ul channel index. 5. the method of claim 1, further comprising obtaining a trigger message from the dl mu ppdu, wherein the trigger message is placed in a preamble of the dl mu ppdu or in an aggregate mpdu (a-mpdu) within the dl mu ppdu addressed to the first user terminal carried in the dl mu ppdu, wherein the trigger message instructs the first user terminal to initiate ul transmission and includes ul channel allocation parameters, wherein the first ul communication channel is determined based on the ul channel allocation parameters, wherein the ul channel indication includes the ul channel allocation parameters, wherein each mpdu of the plurality of mpdus includes an ack policy that instructs a receiving user terminal to transmit a ba immediately on one of the plurality of ul communication channels, wherein the ba indication includes the ack policy and the trigger message, wherein the first ba is transmitted in response to obtaining the trigger message and detecting the ack policy in the plurality of mpdus, and wherein the first user terminal is configured to transmit ul data after sending the first ba on the first ul communication channel. 6. the method of claim 5, wherein the a-mpdu includes a trigger frame that carries the trigger message, wherein the trigger frame does not include a receive address (ra), and wherein the first user terminal is configured to determine the ra of the trigger frame based on an ra of another frame in the a-mpdu. 7. the method of claim 1, further comprising: receiving a trigger ppdu from the access point subsequent to receiving the dl mu ppdu and obtaining a trigger message from the trigger ppdu, wherein the trigger message instructs the first user terminal to initiate ul transmission and includes ul channel allocation parameters, wherein the ul channel indication includes the ul channel allocation parameters, wherein the first ul communication channel is determined based on the ul channel allocation parameters, wherein each mpdu of the plurality of mpdus includes an ack policy that instructs a receiving user terminal to transmit a ba immediately upon receiving a trigger ppdu on one of the plurality of ul communication channels, wherein the ba indication includes the ack policy and the trigger message, wherein the first ba is transmitted in response to obtaining the trigger message and detecting the ack policy in the plurality of mpdus, wherein the trigger ppdu includes a trigger frame that carries the trigger message, and wherein the trigger frame further includes an indication instructing a receiving user terminal to transmit a ba. 8. the method of claim 1, further comprising: receiving a second ppdu from the access point subsequent to receiving the dl mu ppdu obtaining a trigger message from the second ppdu, wherein the trigger message instructs the first user terminal to initiate ul transmission and includes ul channel allocation parameters, wherein the ul channel indication includes the ul channel allocation parameters and obtaining a block acknowledgement request (bar) message from the second ppdu, wherein the bar message instructs the first user terminal to transmit a ba, wherein the first ul communication channel is determined based on the ul channel allocation parameters, wherein each mpdu of the plurality of mpdus includes an ack policy that instructs a receiving user terminal to transmit a ba in response to receiving the bar message, wherein the ba indication includes the ack policy, the trigger message, and the bar message, and wherein the first ba is transmitted in response to obtaining the trigger message and the bar message. 9. the method of claim 8, wherein the trigger message is placed in a preamble of the second ppdu, and wherein the second ppdu includes a bar frame carrying the bar message. 10. the method of claim 8, wherein the second ppdu carries a control wrapper frame, wherein the control wrapper frame wraps a bar frame carrying the bar message, and wherein the trigger message is included in a field of the control frame wrapper. 11. the method of claim 8, wherein the second ppdu carries an a-mpdu, and wherein the a-mpdu includes a trigger frame carrying the trigger message and a bar frame carrying the bar message. 12. a first user terminal for wireless communication, comprising: means for receiving, on a first downlink (dl) communication channel of a plurality of dl communication channels, a dl multi-user (mu) physical layer convergence protocol (plcp) protocol data unit (ppdu) transmitted by an access point to a plurality of user terminals including the first user terminal and a second user terminal on the plurality of dl communication channels, wherein the dl mu ppdu includes a plurality of medium access control (mac) protocol data units (mpdus) (Results 0)

Search [SP]: block acknowledgement mechanism for acknowledging dl-mu data on ul-mu wireless communication system a method, an apparatus, and a computer-readable medium for wireless communication are provided. the apparatus may be a first user terminal. the first user terminal receives, on a first dl communication channel of multiple dl communication channels, a dl mu ppdu includes mpdus transmitted from an access point to multiple user terminals including the first user terminal on the multiple dl communication channels. the first user terminal obtains an ul channel indication and a ba indication. the first user terminal transmits, on a first ul communication channel of multiple ul communication channels, a first ba to the access point based on the ul channel indication and the ba indication simultaneously or concurrently with a ba transmission from the rest of the multiple user terminals to the access point on the rest of the multiple ul communication channels. the first ba acknowledges one or more of the mpdus. (Results 14)

Title: BLOCK ACKNOWLEDGEMENT MECHANISM FOR ACKNOWLEDGING DL-MU DATA ON UL-MU WIRELESS COMMUNICATION SYSTEM

Abstract: A method, an apparatus, and a computer-readable medium for wireless communication are provided. The apparatus may be a first user terminal. The first user terminal receives, on a first DL communication channel of multiple DL communication channels, a DL MU PDU includes MPDUs transmitted from an access point to multiple user terminals including the first user terminal on the multiple DL communication channels. The first user terminal obtains an UL channel indication and a BA indication. The first user terminal transmits, on a first UL communication channel of multiple UL communication channels, a first BA to the access point based on the UL channel indication and the BA indication simultaneously or concurrently with a BA transmission from the rest of the multiple user terminals to the access point on the rest of the multiple UL communication channels. The first BA acknowledges one or more of the MPDUs.

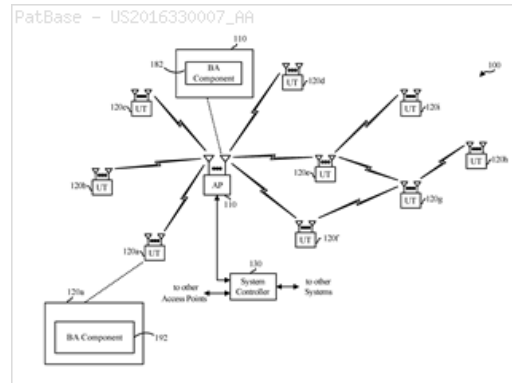
Classifications:

International (IPC 8-9): H04B7/04 H04B7/0452 H04L1/16 H04L1/18

H04L5/00 H04W28/12 H04W72/04 (Advanced/Invention)

CPC: H04L5/0055 H04W72/042 H04W72/0413 H04W72/0453 H04L1/1685 H04L1/1854 H04L1/1861 H04L1/1614 H04B7/0452

US: 370/329



Family:

Publication number	Publication date	Application number	Application date
AU2016257451 AA	20161110	AU20160257451	20160504
CA2980467 AA	20170920	CA20162980467	20160504
CL2017002692 A1	20180406	CL20170002692	20171024
CN107534524 A	20180102	CN201680025531	20160504
CO20170011281 A2	20171110	CO20170011281	20171102
EP3292645 A1	20180314	EP20160724536	20160504
IN201747033750 A	20171006	IN201747033750	20170922
KR20180004136 A	20180110	KR20177032033	20160504
PH2017501744 A	20180319	PH20170501744	20170922
SG11201707667Y A1	20171129	SG20171107667	20160504
TW201640940 A	20161116	TW20160113873	20160504
US2016330007 AA	20161110	US20160145756	20160503
WO16179307 A1	20161110	WO2016US30820	20160504

Priority:

US20150157921P 20150506 US20160145756 20160503 WO2016US30820 20160504

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Designated states: AE AG AL AM AO AT AU AZ BA BB BE BF BG BH BJ BN BR BW BY BZ CA CF CG CH CI CL CM CN CO CR CU CY CZ DE DK DM DO DZ EC EE EG ES FI FR GA GB GD GE GH GM GN GQ GR GT GW HN HR HU ID IE IL IN IR IS IT JP KE KG KM KN KP KR KZ LA LC LI LK LR LS LT LU LV LY MA MC MD ME MG MK ML MN MR MT MW MX MY MZ NA NE NG NI NL NO NZ OM PA PE PG PH PL PT QA RO RS RU RW SA SC SD SE SG SI SK SL SM SN ST SV SY SZ TD TG TH TJ TM TN TR TT TZ UA UG US UZ VC VN ZA ZM ZW

Title: RADIO COMMUNICATION DEVICE, RADIO COMMUNICATION METHOD, AND PROGRAM

Abstract: A radio communication method stores a plurality MAC frames for each of a plurality of destinations. The method decides the longest transmission time of transmission times needed to transmit the plurality of MAC frames to each of the plurality of destinations within a fixed period. The method generates a plurality of physical frames for the plurality of destinations to transmit them at the same time by connecting the plurality of MAC frames and adding additional information to each connected MAC frame so as to be a frame length equivalent to a transmission time equal to the longest transmission time.

Classifications:

International (IPC 8-9): H04B7/04 H04B7/0413 H04B7/0452 H04J99/00 H04K1/10 H04L12/26 H04L29/12 H04L5/00 H04L5/08 H04W24/02 H04W28/06 H04W4/00 H04W84/12 (Advanced/Invention);

H04L5/00 H04W88/06 (Advanced/Non-invention);

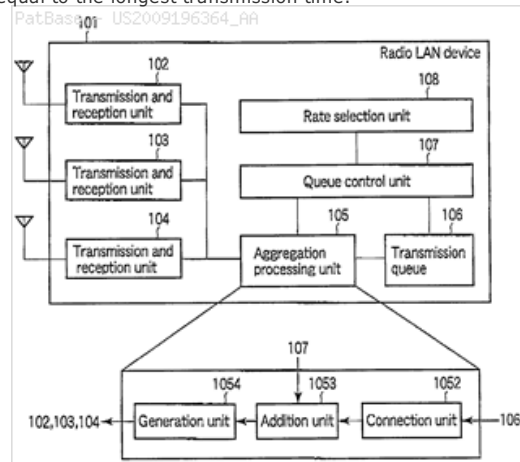
H04B7/04 H04J99/00 H04K1/10 H04W4/00 H04W84/02 (Core/Invention)

CPC: H04B7/0452 H04W24/02 H04W88/06 H04L5/0087 H04L61/6022

H04B7/0413 H04W28/065 H04L5/0046 H04L43/0894

European: H04W28/06D

US: 1/1 370/328 370/328S 375/260 375/260P



Family:

Publication number	Publication date	Application number	Application date
JP2009164751 A2	20090723	JP20070339941	20071228
JP4996451 B2	20120808	JP20070339941	20071228
US2009196364 AA	20090806	US20080343785	20081224
US2015319645 AA	20151105	US20150798963	20150714
US2017163514 AA	20170608	US20170440455	20170223
US9094863 BB	20150728	US20080343785	20081224
US9622112 BB	20170411	US20150798963	20150714
US9930572 BB	20180327	US20170440455	20170223

Priority:

JP20070339941 20071228 US20080343785 20081224 US20150798963 20150714
US20170440455 20170223

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Title: METHODS AND APPARATUS FOR REVERSE LINK ACKNOWLEDGEMENT IN A WIRELESS LOCAL AREA NETWORK (WLAN)

Abstract: Methods and apparatus for reverse link acknowledgement in a wireless local area network. A method includes receiving, at a first node, a data communication over a common channel, the data communication being decodable by other nodes. The method also includes determining transmission resources from the data communication, wherein the transmission resources are different for each node, and transmitting a response over the common channel using the determined transmission resources. An apparatus includes a transmitter configured to transmit to a plurality of nodes a data communication over the common channel, and a receiver configured to receive responses from the plurality of nodes, wherein each response was sent using different transmission resources determined from the data communication.

Classifications:

International (IPC 8-9): B32B37/14 B32B37/26 G01D21/00 G01K3/04 G01N21/78 H04B7/04 H04B7/26 H04J1/00 H04J11/00 H04J13/00 H04J3/00 H04J99/00 H04L1/16 H04L1/18 H04L12/28 H04W28/04 H04W28/06 H04W28/16 H04W72/04 H04W72/12 H04W72/14 H04W74/04 H04W74/06 H04W80/02 H04W84/12 (Advanced/Invention); H04L1/00 H04L1/16 H04L1/18 H04W74/04 H04W84/12 (Advanced/Non-invention);

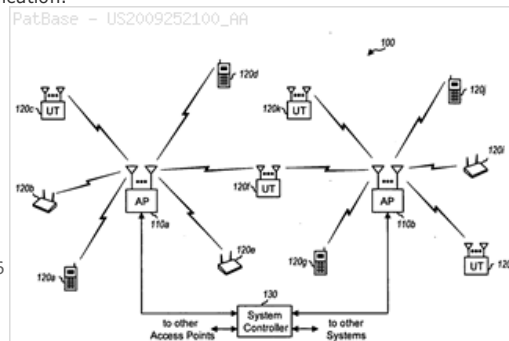
B32B37/14 G01D21/00 H04J1/00 H04J3/00 H04L1/16 H04W28/16 H04W72/00 H04W74/00 (Core/Invention); H04L1/16 H04W72/04 H04W84/02 (Core/Non-invention)

International (IPC 1-7): H04L1/16 H04L1/18 H04W74/04

CPC: G09F3/0341 G09F3/0292 G09F2003/0277 Y10T156/10 H04W72/0406 H04W72/044 H04W72/1263 H04W88/02 H04W88/08 H04L1/1854 H04L1/1614 H04L2001/0093 H04W74/06 H04W84/12

European: G09F3/02D2 H04L1/18R7 H04W72/04 H04W72/04F S09F3/02A18A T04L1/00T1 T04L1/16F1 T04W72/04H T04W72/12D T04W84/12

US: 1/1 116/201 116/207 116/207S 156/60 156/60S 370/329 370/329P 370/330 370/330P 370/336 370/336S 370/338 370/338S 374/102 374/E3.004 436/2



Family:

Publication number	Publication date	Application number	Application date
CN101981855 A	20110223	CN200980110714	20090318
CN102301807 A	20111228	CN201080005830	20100129
CN102301807 B	20160608	CN201080005830	20100129
CN103178946 A	20130626	CN201310142810	20090318
EP22727277 A1	20110126	EP20090728239	20090318
EP2392179 A1	20111207	EP20100702796	20100129
EP2392179 B1	20170802	EP20100702796	20100129
EP2654232 A1	20131023	EP20130020054	20090318
ES2641173 T3	20171108	ES20100702796T	20100129
IN04817CN2011 A	20121116	IN2011CN04817	20110706
IN05690CN2010 A	20110527	IN2010CN05690	20100910
JP2011518495 T2	20110623	JP20110503024T	20090318
JP2012516662 T2	20120719	JP20110548348T	20100129
JP2013192236 A2	20130926	JP20130087528	20130418
JP2014195280 A2	20141009	JP20140096352	20140507
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JP5980837 B2	20160831	JP20140096352	20140507
KR101153022 B1	20120604	KR20107024682	20090318
KR101355162 B1	20140127	KR20117020124	20100129
KR20100126858 A	20101202	KR20107024682	20090318
KR20110114691 A	20111019	KR20117020124	20100129
TW201014256 A	20100401	TW20090108786	20090318
TW201116117 A	20110501	TW20100102720	20100129
US2009252100 AA	20091008	US20080329890	20081208
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Priority:

US20080041670P	20080402	US20080041670	20080402	US20080090419P	20080820
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KNOWLES JONES VINCENT ; GEERT AWATER ; ALOK AGGARWAL ; ABRAHAM SANTOSH ; KANDALA SRINIVAS ; NANDA SANJIV ; PATEL GORDHANBHAI N ; SRIDHARA VINAY

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Designated states: AE AG AL AM AO AT AU AZ BA BB BE BF BG BH BJ BR BW BY BZ CA CF CG CH CI CL CM CN CO CR CU CY CZ DE DK DM DO DZ EC EE EG ES FI FR GA GB GD GE GH GM GN GQ GR GT GW HN HR HU ID IE IL IN IS IT JP KE KG KM KN KP KR KZ LA LC LI LK LR LS LT LU LV LY MA MC MD ME MG MK ML MN MR MT MW MX MY MZ NA NE NG NI NL NO NZ OM PE PG PH PL PT RO RS RU SC SD SE SG SI SK SL SM SN ST SV SY SZ TD TG TH TJ TM TN TR TT TZ UA UG US UZ VC VN ZA ZM ZW

Title: VIDEO TRANSMISSION OVER SDMA

Abstract: Certain aspects of the present disclosure generally relate to communication, and more specifically, to techniques for transmitting data in parallel, such as spatial division multiple access (SDMA) techniques.

Classifications:

International (IPC 8-9): G06F15/16 H04B7/04 H04B7/10 H04J99/00 H04L1/16 H04L1/18 H04L29/06 H04W16/28 H04W28/18 H04W40/00

H04W74/04 H04W84/12 (Advanced/Invention);

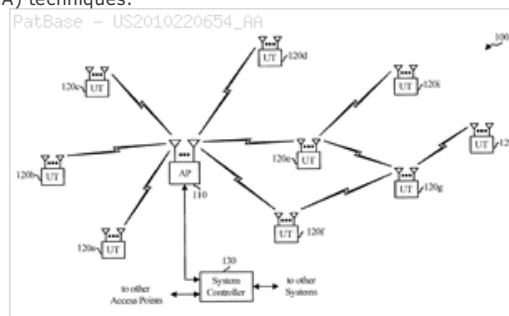
G06F15/16 H04W40/00 (Core/Invention);

H04L1/16 (Core/Non-invention)

CPC: H04B7/0417 H04L1/1685 H04L1/1854 H04W72/1289 H04B7/0697 H04W88/02 H04W88/08

European: H04B7/04M1 H04L1/16F17 H04L1/18R7 T04W72/12F4

US: 370/328 370/328P 709/231 709/231S



Family:

Publication number	Publication date	Application number	Application date
BRPI1007838 A2	20180227	BR2010PI07838	20100226
CN102326352 A	20120118	CN201080008720	20100226
CN105846964 A	20160810	CN201610289415	20100226
EP2401829 A2	20120104	EP20100740039	20100226
IN05571CN2011 A	20121109	IN2011CN05571	20110802
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JP2014147083 A2	20140814	JP20140049090	20140312
JP5784774 B2	20150924	JP20140049090	20140312
JP5931446 B2	20160608	JP20110552203T	20100226
KR101259440 B1	20130430	KR20117022671	20100226
KR201110122210 A	20111109	KR20117022671	20100226
TW201119281 A	20110601	TW20100105881	20100226
US2010220654 AA	20100902	US20100711725	20100224
WO10099491 A2	20100902	WO2010US25664	20100226
WO10099491 A3	20110414	WO2010US25664	20100226

Priority:

US20090156402P 20090227 US20100711725 20100224 CN201080008720 20100226
JP20110552203 20100226 WO2010US25664 20100226 JP20110552203T 20100226

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Designated states: AE AG AL AM AO AT AU AZ BA BB BE BF BG BH BJ BR BW BY BZ CA CF CG CH CI CL CM CN CO CR CU CY CZ DE DK DM DO DZ EC EE EG ES FI FR GA GB GD GE GH GM GN GQ GR GT GW HN HR HU ID IE IL IN IS IT JP KE KG KM KN KP KR KZ LA LC LI LK LR LS LT LU LV LY MA MC MD ME MG MK ML MN MR MT MW MX MY MZ NA NE NG NI NL NO NZ OM PE PG PH PL PT RO RS RU SC SD SE SG SI SK SL SM SN ST SV SY SZ TD TG TH TJ TM TN TR TT TZ UA UG US UZ VC VN ZA ZM ZW

Title: PIGGYBACKING INFORMATION IN TRANSMIT OPPORTUNITIES

Abstract: Aspects of the present disclosure provide techniques for aggregating certain frame types in uplink and/or downlink transmit opportunities. Such techniques may improve wireless communications system performance by reducing the overall number of transmit opportunities required.

Classifications:

International (IPC 8-9): H04B7/04 H04J99/00 H04L1/16 H04W16/28

H04W28/16 H04W72/12 (Advanced/Invention);

H04W74/08 (Advanced/Non-invention);

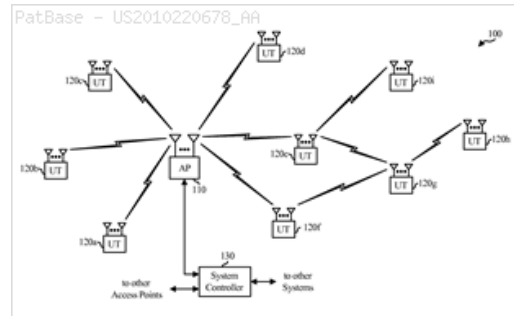
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H04W72/12 (Core/Non-invention)

CPC: H04W74/006 H04W72/1289 H04W72/1284 H04W74/085 H04W74/04
H04B7/0697 H04L1/1614 H04L1/1685

European: H04W72/12F4 T04W72/12F2 T04W74/08D2B

US: 370/329 370/329P 370/330



Family:

Publication number	Publication date	Application number	Application date
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■ EP2401887 A1	20120104	EP20100708042	20100226
■ IN05572CN2011 A	20121109	IN2011CN05572	20110802
■ JP2012519426 T2	20120823	JP20110552207T	20100226
■ JP5318974 B2	20131016	JP20110552207T	20100226
■ KR101357706 B1	20140206	KR20117022531	20100226
■ KR20110120973 A	20111104	KR20117022531	20100226
■ TW201127159 A	20110801	TW20100105883	20100226
■ US2010220678 AA	20100902	US20100711861	20100224
■ US8976741 BB	20150310	US20100711861	20100224
■ WO10099496 A1	20100902	WO2010US25672	20100226

Priority:

US20090156353P 20090227 US20100711861 20100224 WO2010US25672 20100226

Probable Assignee: QUALCOMM INC

Assignee(s): (std): QUALCOMM INC ; WENTINK MAARTEN MENZO

Inventor(s): (std): MENZO WENTINK MAARTEN ; WENTINK MAARTEN MENZO

Agent(s): SCHMIDBAUER ANDREAS KONRAD; QUALCOMM INC; KEVIN T; HO ERIC

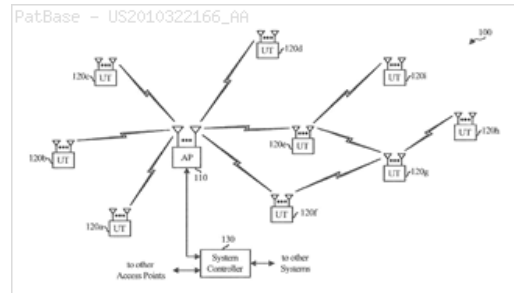
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Title: MULTI-USER MULTIPLE INPUT MULTIPLE OUTPUT WIRELESS COMMUNICATIONS**Abstract:** Certain aspects of the present disclosure relate to a method for enhanced multi-user multiple input multiple output (MU-MIMO) wireless communications. The proposed method may reduce and/or eliminate stringent frequency and time synchronization requirements for stations (STAs) to participate in a downlink MU-MIMO transaction by utilizing deterministic scheduling.**Classifications:****International (IPC 8-9):** H04B7/04 H04B7/06 H04J99/00 H04W16/28

H04W28/04 H04W4/00 H04W52/14 H04W72/04 H04W72/12

H04W74/08 (Advanced/Invention);

H04L27/28 (Advanced/Non-invention)

CPC: H04B7/0417 H04B7/0452 H04B7/0632 H04W72/1284 H04W52/146 H04W72/121**European:** H04W72/12B2**US:** 1/1 370/312 370/329 370/329P 375/260 375/260S**Family:**

Publication number	Publication date	Application number	Application date
■ CN102461003 A	20120516	CN201080026365	20100616
■ CN102461003 B	20150422	CN201080026365	20100616
■ CN104703287 A	20150610	CN201510126272	20100616
■ EP2443765 A1	20120425	EP20100739732	20100616
■ IN09128CN2011 A	20130315	IN2011CN09128	20111207
■ IN295239 B	20180406	IN2011CN09128	20111207
■ JP2012531105 T2	20121206	JP20120516236T	20100616
■ JP2015029292 A2	20150212	JP20140180187	20140904
■ JP6141810 B2	20170607	JP20140180187	20140904
■ KR20120033333 A	20120406	KR20127001378	20100616
■ KR20130137250 A	20131216	KR20137030914	20100616
■ KR20160139064 A	20161206	KR20167033306	20100616
■ US2010322166 AA	20101223	US20100692134	20100122
■ US2015341955 AA	20151126	US20150819102	20150805
■ US9137815 BB	20150915	US20100692134	20100122
■ WO10148076 A1	20101223	WO2010US38805	20100616

Priority:

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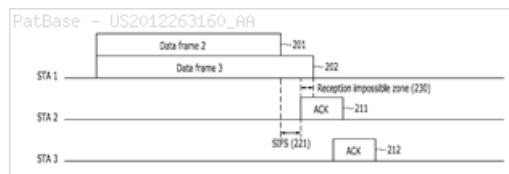
Probable Assignee: QUALCOMM INC**Assignee(s):** (std): ABRAHAM SANTOSH P ; JONES IV VINCENT KNOWLES ; QUALCOMM INC ; SAMPATH HEMANTH ; WENTINK MAARTEN MENZO**Assignee(s):** QUALCOMM INCORPORATED**Inventor(s):** (std): ABRAHAM SANTOSH P ; HEMANTH SAMPATH ; JONES IV VINCENT KNOWLES ; KNOWLES JONES IV VINCENT ; MAARTEN MENZO WENTINK ; MENZO WENTINK MAARTEN ; SAMPATH HEMANTH ; SANTOSH P ABRAHAM ; VINCENT KNOWLES JONES IV ; WENTINK MAARTEN MENZO ; JONES VINCENT KNOWLES**Agent(s):** CARSTENS DIRK WILHELM; QUALCOMM INC; STEVEN R; VO DANG M**Designated states:** AE AG AL AM AO AT AU AZ BA BB BE BF BG BH BJ BR BW BY BZ CA CF CG CH CI CL CM CN CO CR CU CY CZ DE DK DM DO DZ EC EE EG ES FI FR GA GB GD GE GH GM GN GQ GR GT GW HN HR HU ID IE IL IN IS IT JP KE KG KM KN KP KR KZ LA LC LI LK LR LS LT LU LV LY MA MC MD ME MG MK ML MN MR MT MW MX MY MZ NA NE NG NI NL NO NZ OM PE PG PH PL PT RO RS RU SC SD SE SG SI SK SL SM SN ST SV SY SZ TD TG TH TJ TM TN TR TT TZ UA UG US UZ VC VN ZA ZM ZW

Title: METHOD FOR SENDING/ RECEIVING DATA IN A WIRELESS PACKET COMMUNICATION SYSTEM IN WHICH THERE IS SIMULTANEOUS COMMUNICATION WITH VARIOUS TERMINALS

Abstract: A method and apparatus for transmitting a frame to at least one receiver in a wireless communication system is provided. The apparatus determines at least one data length in accordance with each receiver based on a number of symbol for the frame to be transmitted, determines a maximum data length among the at least one data length, and determines a length of the frame in time domain based on the maximum data length. The apparatus generates the frame in accordance with the length of the frame, the frame including a first signal field and at least one second signal field. The first signal field indicates the length of the frame and each second signal field indicates each data length.

Classifications:

International (IPC 8-9): H04B5/00 H04B7/04 H04B7/26 H04L1/00 H04L1/18 H04L12/18 H04L12/28 H04L12/70 H04L29/06 H04L5/00 H04W16/28 H04W28/04 H04W28/06 H04W84/12 (Advanced/Invention)
CPC: H04L1/0083 H04L2001/0093 H04L1/0028 H04L29/06 H04L12/18 H04B5/00 H04L5/0055 H04B7/0452 H04W88/08 H04W84/12 H04L1/1887
European: H04L1/00F2 H04L1/18T7 T04L1/00T1
US: 1/1 370/312 370/328 370/338



Family:

Publication number	Publication date	Application number	Application date
■ CN102656822 A	20120905	CN201080057551	20101216
■ CN102656822 B	20150114	CN201080057551	20101216
■ CN104506286 A	20150408	CN201410779198	20101216
■ CN104506286 B	20180216	CN201410779198	20101216
■ DE112010004877 B4	20151022	DE201011004877T	20101216
■ DE112010004877 T5	20130110	DE201011004877T	20101216
■ DE112010006113 A5	20151210	DE201011006113T	20101216
■ DE112010006113 B4	20160929	DE201011006113T	20101216
■ DE602010023873 D1	20150521	DE201060023873T	20101216
■ DE602010038157 D1	20161229	DE201060038157T	20101216
■ EP2515452 A2	20121024	EP20100837900	20101216
■ EP2515452 A4	20130109	EP20100837900	20101216
■ EP2515452 B1	20150408	EP20100837900	20101216
■ EP2903181 A1	20150805	EP20150156239	20101216
■ EP2903181 B1	20161116	EP20150156239	20101216
■ ES2538503 T3	20150622	ES20100837900T	20101216
■ JP2013514715 T2	20130425	JP20120544391T	20101216
■ JP2014079024 A2	20140501	JP20140021284	20140206
■ JP2016006960 A2	20160114	JP20150124868	20150622
■ JP2017103820 A2	20170608	JP20170038401	20170301
■ JP5475891 B2	20140416	JP20120544391T	20101216
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■ KR101234004 B1	20130218	KR20100129416	20101216
■ KR20110070806 A	20110624	KR20100129416	20101216
■ US2012263160 AA	20121018	US20120525220	20120615
■ US2012320896 AA	20121220	US20120596328	20120828
■ US2016197737 AA	20160707	US20160067178	20160311
■ US8995343 BB	20150331	US20120596328	20120828
■ US9288017 BB	20160315	US20120525220	20120615
■ WO11074904 A2	20110623	WO2010KR09039	20101216
■ WO11074904 A3	20111103	WO2010KR09039	20101216

Priority:

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JP20150124868	20101216	WO2010KR09039	20101216	US20120525220	20120615
US20120596328	20120828	US20160067178	20160311	JP20170038401	20170301

Probable Assignee: ELECTRONICS AND TELECOMMUNICATIONS RESEARCH INST

Assignee(s): (std): CHOI JEEYON ; ELECT AND TELECOMM RESEARCH INST ; ELECTRONICS AND TELECOMMUNICATIONS RES INST ; LEE SOK KYU ; KOREA ELECTRONICS TELECOMM ; ELECTRONICS AND TELECOMMUNICATIONS RESEARCH INST KOREA

Assignee(s): ELECTRONICS AND TELECOMMUNICATIONS RESEARCH INSTITUTE ; ELECTRONICS AND TELECOMMUNICATIONS RESEARCH INST

Inventor(s): (std): SOK KYU LEE ; OH JONG EE ; LEE SOK KYU ; LEE SEOK KYU ; JEEYON CHOI ; CHOI JEEYON ; CHOI JEE YON

Agent(s): BETTEN AND RESCH PATENT U RECHTSANWALTE PARTGMBB; ESSLINGER ALEXANDER; BETTEN AND RESCH; SUGRANES PEDRO; NAGAI HIROSHI; SHINSUNG PATENT FIRM

Designated states: AE AG AL AM AO AT AU AZ BA BB BE BF BG BH BJ BR BW BY BZ CA CF CG CH CI CL CM CN CO CR CU CY CZ DE DK DM DO DZ EC EE EG ES FI FR GA GB GD GE GH GM GN GQ GR GT GW HN HR HU ID IE IL IN IS IT JP KE KG KM KN KP KZ LA LC LI LK LR LS LT LU LV LY MA MC MD ME MG MK ML MN MR MT MW MX MY MZ NA NE NG NI NL NO NZ OM PE PG PH PL PT RO RS RU SC SD SE SG SI SK SL SM SN ST SV SY SZ TD TG TH TJ TM TN TR TT TZ UA UG US UZ VC VN ZA ZM ZW

Title: WIRELESS COMMUNICATION METHOD, BASE STATION, WIRELESS COMMUNICATION SYSTEM, AND COMMUNICATION APPARATUS

Abstract: Provided are a wireless communication method, a base station, a wireless communication system and a communication apparatus whereby an interference power is calculated from an estimated propagation channel estimation result and the transmission power is controlled based on the interference power or the interference is suppressed by controlling the directivity, thereby increasing the transmission capacity. A propagation channel estimation circuit performs propagation channel estimation from a response signal transmitted from a terminal station and estimates a propagation channel estimation result. An interference power calculation circuit measures each interference power from a signal of each sub-carrier received by each of wireless units, and calculates an interference power for each sub-carrier from the propagation channel estimation result estimated by the propagation channel estimation circuit. When the calculated interference power is equal to or more than a predetermined threshold, an interference suppression signal generation circuit changes the transmission power and generates an interference suppression signal.

Classifications:

International (IPC 8-9): G01R31/08 H04B17/00 H04B17/345 H04B5/00 H04B7/04 H04J11/00 H04J99/00 H04L5/00 H04W16/28 H04W28/18 H04W52/24 H04W72/04 H04W72/08 H04W88/08 (Advanced/Invention); H04W72/04 (Advanced/Non-invention)

CPC: H04B5/00 H04W52/243 H04W72/0453 H04L5/0055 H04W72/082 H04B7/0452 H04B17/345

European: H04B17/00B1F H04B5/00 H04B7/04M5

US: 1/1 370/252 370/310 370/328 370/329 370/338 455/403 455/422.1 455/434

PatBase - US2013039205-00

INTERFERENCE POWER [DB]	TRANSMISSION POWER [DB]
0	-20
5	-15
10	-10
20	0
30	10
40	20
50	30

Family:

Publication number	Publication date	Application number	Application date
■ CN102792743 A	20121121	CN201180012980	20110310
■ CN102792743 B	20151021	CN201180012980	20110310
■ EP2547155 A1	20130116	EP20110753437	20110310
■ EP2547155 A4	20151028	EP20110753437	20110310
■ JP2011111779 A1	20130627	JP20120504514T	20110310
■ JP5461685 B1	20140402	JP20120504514T	20110310
■ JP5461685 B2	20140402	JP20120504514T	20110310
■ US2013039205 AA	20130214	US20110583340	20110310
■ US2015036634 AA	20150205	US20140518215	20141020
■ US8897163 BB	20141125	US20110583340	20110310
■ US9370013 BB	20160614	US20140518215	20141020
■ WO11111779 A1	20110915	WO2011JP55653	20110310

Priority:

JP20100054633 20100311 JP20100176568 20100805 WO2011JP55653 20110310
JP20120504514 20110310 US20120583340 20120907 US20140518215 20141020

Probable Assignee: NIPPON TELEGRAPH AND TELEPHONE CORP

Assignee(s): (std): ASAI YUSUKE ; ICHIKAWA TAKEO ; KUDO RIICHI ; MATSUI MUNEHICO ; MIZOGUCHI MASATO ; NIPPON TELEGRAPH AND TELEPHONE ; MURAKAMI TOMOKI ; TAKATORI YASUSHI

Assignee(s): NIPPON TELEGRAPH AND TELEPHONE CORP

Inventor(s): (std): ASAI YUSUKE ; ICHIKAWA TAKEO ; KUDO RIICHI ; MATSUI MUNEHICO ; MIZOGUCHI MASATO ; MURAKAMI TOMOKI ; TAKATORI YASUSHI ; YUSUKE ASAI ; YASUSHI TAKATORI ; TOMOKI MURAKAMI ; TAKEO ICHIKAWA ; RIICHI KUDO ; MUNEHICO MATSUI ; MASATO MIZOGUCHI

Agent(s): ILGART JEAN CHRISTOPHE; SHIGA INT PATENT OFFICE; HARNESS DICKEY AND PIERCE PLC; SHIGA MASATAKE ET AL

Designated states: AE AG AL AM AO AT AU AZ BA BB BE BF BG BH BJ BR BW BY BZ CA CF CG CH CI CL CM CN CO CR CU CY CZ DE DK DM DO DZ EC EE EG ES FI FR GA GB GD GE GH GM GN GQ GR GT GW HN HR HU ID IE IL IN IS IT JP KE KG KM KN KP KR KZ LA LC LI LK LR LS LT LU LV LY MA MC MD ME MG MK ML MN MR MT MW MX MY MZ NA NE NG NI NL NO NZ OM PE PG PH PL PT RO RS RU SC SD SE SG SI SK SL SM SN ST SV SY SZ TD TG TH TJ TM TN TR TT TZ UA UG US UZ VC VN ZA ZM ZW

Title: METHODS AND APPARATUS FOR MULTIPLE USER UPLINK

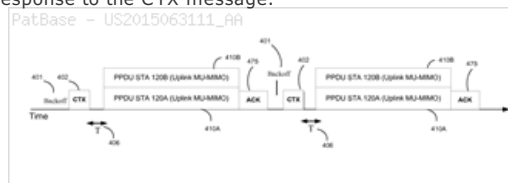
Abstract: Methods and apparatus for multiple user uplink are provided. In one aspect, a method of wireless communication is provided. The method includes transmitting a quality of service (QoS) message to a device. The QoS message includes a request for a transmission opportunity for sending uplink data to the device. The QoS message includes at least one of a sequence control field or a QoS control field. The method further includes receiving a clear to transmit (CTX) message in response to the QoS message. The method further includes transmitting data to the device in response to the CTX message.

Classifications:

International (IPC 8-9): H04B H04B7/04 H04B7/0413 H04B7/0452 H04B7/26 H04H20/71 H04J1/00 H04J3/16 H04J99/00 H04L H04L1/00 H04L1/16 H04L1/18 H04L12/801 H04L12/851 H04L27/26 H04L29/08 H04L5/00 H04W H04W16/28 H04W28/02 H04W28/04 H04W28/06 H04W28/24 H04W4/00 H04W52/14 H04W72/04 H04W72/12 H04W72/14 H04W74/00 H04W74/04 H04W74/06 H04W74/08 H04W76/02 H04W80/02 H04W84/12 (Advanced/Invention); H04B7/04 H04L1/00 H04L1/16 H04W28/06 H04W28/24 H04W72/02 H04W72/12 H04W74/04 H04W74/08 (Advanced/Non-invention); H04L1/18 H04W74/08 (Core/Invention); H04B H04L H04W (Subclass/Invention)

CPC: H04L47/14 H04L47/24 H04L5/0037 H04W72/0446 H04W72/0413 H04B7/2621 H04L5/003 H04W52/146 H04L5/0005 H04W72/0453 H04W72/1268 H04B7/0413 H04L5/0007 H04W72/1226 H04W28/0278 H04L5/005 H04L1/1607 H04L1/1854 H04L2001/0093 H04W28/06 H04W28/24 H04W72/12 H04W72/121 H04W72/1289 H04W74/006 H04W74/008 H04W74/04 H04W74/08 H04W74/085 H04L1/1858 H04L1/1861 H04L47/12 H04B7/0452 H04L5/0055 H04W72/0406 H04L1/1887 H04W72/042 H04W72/1284 H04L69/323 H04L1/0061 H04L1/1614 H04L1/0008 H04N7/17309

US: 1/1 370/235 370/312 370/329 370/330 370/336

**Family:**

Publication number	Publication date	Application number	Application date
AU2014311308 AA	20150305	AU20140311308	20140827
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WO15031502 A1	20150305	WO2014US52958	20140827
WO16011198 A1	20160121	WO2015US40645	20150715
ZA201601341 A	20171220	ZA20160001341	20160226

Priority:

US20130871269P	20130828	US20140024989P	20140715	US20140028250P	20140723
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US20170483943	20170410	US20170791327	20171023	US20170791300	20171023

Probable Assignee: QUALCOMM INC

Assignee(s): (std): QUALCOMM INC

Assignee(s): VERMANI SAMEER ; SAMPATH HEMANTH ; QUALCOMM INC SAN DIEGO ; BARRIAC GWENDOLYN DENISE ; COVIDIEN AG ; MERLIN SIMONE

Inventor(s): (std): BARRIAC GWENDOLYN D ; BARRIAC GWENDOLYN DENISE ; BARRIAC GWENDOLYN DENISE GD ; DENISE BARRIAC GWENDOLYN ; DING GANG ; HEMANTH SAMPATH ; SAMEER VERMANI ; SAMPATH HEMANTH ; SAMPATH HEMANTH H ; SIMONE MERLIN ; VERMANI SAMEER ; VERMANI SAMEER S ; MERLIN SIMONE ; MERLIN SIMONE S ; WENTINK MAARTEN MENZO

Inventor(s): MERLIN SIMONE SAN DIEGO ; VERMANI SAMEER SAN DIEGO ; SAMPATH HEMANTH SAN DIEGO ; MAARTEN MENZO WENTINK ; GWENDOLYN DENISE BARRIAC ; BARRIAC GWENDOLYN DENISE SAN DIEGO

Agent(s): MADDERNS PATENT AND TRADE MARK ATTORNEYS; SMART AND BIGGAR; ESTUDIO CLARKE MODET AND CO CHILE LTDA; BARDEHLE PAGENBERG PARTNERSCHAFT MBB PATENTANWAELTE RECHTSANWAELTE; WEGNER HANS; DORA AM BADAR SPSI; ANNISA AM BADAR SH LLM; NADIA AM BADAR SH; NABILA AM BADAR SH LLM; DORA AM BADAR S PSI; KNOBBE MARTENS OLSON AND BEAR LLP; ARNO THOMAS R; ABUMER MARK M; ARNO THOMAS R ET AL; NELSON ERIC M; FULLER MICHAEL L; GELFOUND CRAIG A ET AL

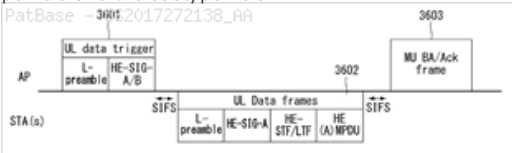
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Title: METHOD FOR UPLINK MULTI-USER TRANSMISSION IN WIRELESS COMMUNICATION SYSTEM AND APPARATUS THEREFOR

Abstract: In the present invention, disclosed is a method for uplink multi-user transmission in a wireless communication system and an apparatus therefor. Specifically, a method for performing, by a station (STA), uplink (UL) multi-user (MU) transmission in a wireless communication system comprises the steps of: receiving, from an access point (AP), a trigger frame including information for UL MU transmission; and transmitting an UL MU PPDU on the basis of the information for UL MU transmission, wherein the trigger frame is a medium access control (MAC) frame, a MAC header of the trigger frame includes a type field and a subtype field, and the type of the trigger frame may be indicated by the type field and the subtype field.

Classifications:

International (IPC 8-9): H04B7/0452 H04B7/06 H04L1/00 H04L1/06
H04L29/08 H04W74/00 (Advanced/Invention)
CPC: H04L29/08 H04B7/0613 H04B7/0452 H04W74/006 H04L1/0643
H04L69/323 H04W72/042 H04B7/063 H04B7/0669 H04B7/0695
H04L1/0031 H04L1/0083 H04L1/1614 H04L1/1685



Family:

Publication number	Publication date	Application number	Application date
US2017272138 AA	20170921	US20150505561	20150824
WO16028131 A1	20160225	WO2015KR08845	20150824

Priority:

US20140040431P 20140822 US20140049368P 20140912 US20150120883P 20150226
WO2015KR08845 20150824 US20150505561 20150824

Probable Assignee: LG ELECTRONICS INC

Assignee(s): (std): LG ELECTRONICS INC

Inventor(s): (std): CHO HANGYU ; CHO JINSOO ; CHUN JINYOUNG ; KIM SUHWOOK ; LEE WOOKBONG ; RYU KISEON

Agent(s): ROYAL PATENT AND LAW OFFICE

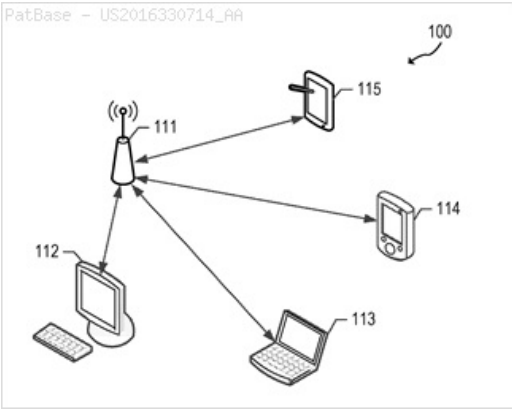
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ST SV SY SZ TD TG TH TJ TM TN TR TT TZ UA UG US UZ VC VN ZA ZM ZW

Title: MULTIPLEXING ACKNOWLEDGMENT MESSAGES IN RESPONSE TO DOWNLINK FRAMES

Abstract: In an example of multi-user wireless communications, an access point may send a downlink frame to multiple stations. Some or all of the stations may generate and transmit their respective uplink frames. The uplink frames from the stations may be aggregated or multiplexed to form a final uplink frame that is received by the access point. The uplink frames may be block acknowledgment or acknowledgment (BA or ACK) frames. Uplink response scheduling may be located in a payload of the downlink frame, in which the uplink response scheduling indicates one or more resource units assigned to the multiple stations for transmitting the uplink frames. In some examples, the uplink response scheduling is in a control field of the payload, in a trigger frame as part of the payload. In some aspects, the downlink frame is part of a multicast transmission. Other methods, apparatus, and computer-readable media are also disclosed.

Classifications:

International (IPC 8-9): H04B7/04 H04L1/16 H04L5/00 H04W72/00 H04W72/12 (Advanced/Invention)
CPC: H04W72/1289 H04L5/0007 H04W84/12 H04W72/1268 H04L1/1621 H04L2001/0093 H04B7/0452
US: 370/312



Family:

Publication number	Publication date	Application number	Application date
US2016330714 AA	20161110	US20160151433	20160510

Priority:

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US20150193305P 20150716	US20160151433 20160510	

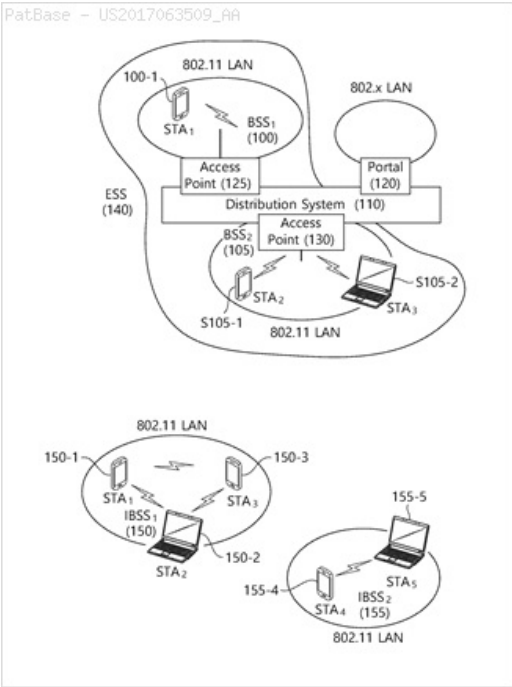
Probable Assignee:	NEWRACOM INC
Assignee(s): (std):	NEWRACOM INC
Inventor(s): (std):	HEDAYAT AHMAD REZA

Title: METHOD AND APPARATUS FOR PROCESSING ACK SIGNAL IN A WIRELESS LOCAL AREA NETWORK SYSTEM

Abstract: An ACK signal processing method that can be used in a wireless LAN system is proposed. Various information that can be used for a downlink MU PPDU for multiple receiving stations may be proposed, and, for example, in order to omit the re-transmission of the related art, information requesting an ACK or Block ACK corresponding to previously transmitted data may be included. If an immediate acknowledgement (ACK) frame fails to be received after the MU-PPDU is transmitted from the AP, a Block ACK may be requested. In this case, while a Block ACK is requested, a radio resource through which a Block ACK is delivered may be allocated.

Classifications:

International (IPC 8-9): H04L5/00 H04W72/04 (Advanced/Invention)
CPC: H04L5/0055 H04W84/12 H04L1/0031 H04L1/1614 H04L1/1621 H04L1/1685
US: 370/329



Family:

Publication number	Publication date	Application number	Application date
US2017063509 AA	20170302	US20160246104	20160824

Priority:

US20150209325P 20150824 US20150237584P 20151006 US20160246104 20160824

Probable Assignee: LG ELECTRONICS INC

Assignee(s): (std): LG ELECTRONICS INC

Inventor(s): (std): CHO HANGYU ; KIM JEONGKI ; RYU KISEON ; KIM SUHWOOK

Title: TRIGGER INFORMATION EXCHANGE BETWEEN WIRELESS SYSTEMS

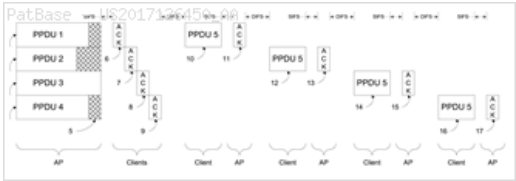
Abstract: Systems and methods are disclosed herein to provide efficient support for the exchange of trigger information between wireless data communication devices and systems, including Multi-User Multiple Input Multiple Output (MU-MIMO) devices and systems that may utilize Orthogonal Frequency Division Multiple Access (OFDMA). In accordance with one or more embodiments, a trigger information exchange mechanism is disclosed that transfers trigger data as part of a pre-existing data frame handshake. Such a system may offer improved capabilities such as a reduced channel overhead incurred due to the trigger information exchange.

Classifications:

International (IPC 8-9): H04B7/04 H04L27/26 H04L5/00

H04W74/00 (Advanced/Invention)

CPC: H04L27/2613 H04W84/12 H04B7/26



Family:

Publication number	Publication date	Application number	Application date
US2017126450 AA	20170504	US20150927365	20151029

Priority:

US20150927365 20151029

Probable Assignee: IXIA

Assignee(s): (std): IXIA

Assignee(s): KEYSIGHT TECHNOLOGIES SINGAPORE HOLDINGS PTE LTD

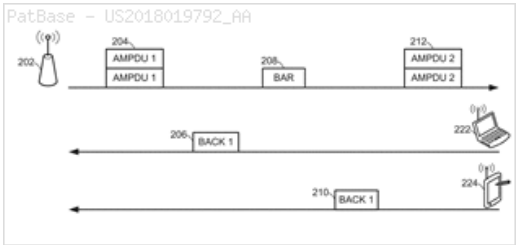
Inventor(s): (std): STOTT LESTER NOEL

Title: REVERSE DIRECTION FOR MULTI-USER MULTIPLE INPUT MULTIPLE OUTPUT COMMUNICATIONS

Abstract: This disclosure describes systems, methods, and devices related to reverse direction multi-user multiple input multiple output (MU-MIMO). A device may determine a reverse direction indication to be included in a frame for transmission to one or more first devices in a MU-MIMO communication. The device may cause to wirelessly transmit the frame to a first device of the one or more first devices. The device may identify an acknowledgment frame from the at least one of the first devices based at least in part on the reverse direction indication

Classifications:

International (IPC 8-9): H04W72/04 H04W74/08 (Advanced/Invention)
CPC: H04B7/0452 H04W72/042 H04W72/0446 H04W74/0816 H04W84/12 H04L1/1628 H04L1/1664 H04L1/1685



Family:

Publication number	Publication date	Application number	Application date
US2018019792 AA	20180118	US20160394029	20161229
US2018020480 AA	20180118	US20160393408	20161229

Priority:

US20160363596P 20160718 US20160380672P 20160829 US20160394029 20161229
US20160393408 20161229

Probable Assignee: INTEL CORP

Assignee(s): (std): INTEL CORP ; INTEL IP CORP

Inventor(s): (std): CARIOU LAURENT ; CORDEIRO CARLOS ; GHOSH CHITTABRATA ; KEDEM OREN ; TRAININ SOLOMON ; YANG OU

Search history

Search PN=(WO2016179307) (Results 1)

1:

Search [SP]: 1. a method of wireless communication by a first user terminal, comprising: receiving, on a first downlink (dl) communication channel of a plurality of dl communication channels, a dl multi-user (mu) physical layer convergence protocol (plcp) protocol data unit (ppdu) transmitted by an access point to a plurality of user terminals including the first user terminal and a second user terminal on the plurality of dl communication channels, wherein the dl mu ppdu includes a plurality of medium access control (mac) protocol data units (mpdus) obtaining an ul channel indication and a ba indication and transmitting, on a first uplink (ul) communication channel of a plurality of ul communication channels, a first block acknowledgement (ba) to the access point concurrently with a transmission of a second ba from the second user terminal to the access point on a second ul communication channel of the plurality of ul communication channels, wherein the first ba acknowledges one or more mpdus of the plurality of mpdus, wherein the transmission of the first ba is based on the ul channel indication and the ba indication. 2. the method of claim 1, further comprising: determining an ul communication channel that is reciprocal to the first dl communication channel based on dl channel allocation parameters, of the first dl communication channel, received in the dl ppdu, wherein the determining comprises: obtaining the dl channel allocation parameters of the first dl communication channel from the dl mu ppdu, and determining ul channel allocation parameters based on the dl channel allocation parameters, wherein the reciprocal ul communication channel is determined based on the ul channel allocation parameters, wherein the ul communication channel is reciprocal to the first dl communication channel when channel configuration of the ul communication channel is the same as the first dl communication channel and traffic is transmitted in a reverse direction of the first dl communication channel, wherein the ul channel indication is a function of the dl channel allocation parameters, wherein the first ul communication channel is the ul communication channel, wherein each mpdu of the plurality of mpdus includes an ack policy that instructs a receiving user terminal to transmit a ba immediately on one of the plurality of ul communication channels, wherein the ba indication includes the ack policy, wherein the first ba is transmitted in response to detecting the ack policy in the plurality of mpdus. 3. the method of claim 1, further comprising: obtaining ul channel allocation parameters of the plurality of ul communication channels based on the received dl mu ppdu, wherein the ul channel allocation parameters allocate equal bandwidth to each of the plurality of ul communication channels, wherein the ul channel indication is determined based on the ul channel allocation parameters included in the received dl mu ppdu and a channel index, wherein the first ul communication channel is determined based on the ul channel allocation parameters, wherein each mpdu of the plurality of mpdus includes an ack policy that instructs a receiving user terminal to transmit a ba immediately on one of the plurality of ul communication channels, wherein the ba indication includes the ack policy, wherein the first ba is transmitted in response to obtaining the ul channel allocation parameters and detecting the ack policy in the plurality of mpdus, and wherein the ul channel allocation parameters are obtained from a preamble of the dl mu ppdu. 4. the method of claim 1, wherein the first user terminal is preconfigured with ul channel allocation parameters of the plurality of ul communication channels, wherein the ul channel allocation parameters allocate equal bandwidth to each of the plurality of ul communication channels, wherein the obtaining the ul channel indication further comprises: determining a dl channel index of the first dl communication channel, wherein the ul channel indication includes the dl channel index and determining a ul channel index of the first ul communication channel based on the dl channel index, wherein the first ul communication channel is determined based on the ul channel allocation parameters and the ul channel index, wherein each mpdu of the plurality of mpdus includes an ack policy that instructs a receiving user terminal to transmit a ba immediately on one of the plurality of ul communication channels, wherein the ba indication includes the ack policy, and wherein the first ba is transmitted in response to detecting the ack policy in the plurality of mpdus and the determination of the ul channel index. 5. the method of claim 1, further comprising obtaining a trigger message from the dl mu ppdu, wherein the trigger message is placed in a preamble of the dl mu ppdu or in an aggregate mpdu (a-mpdu) within the dl mu ppdu addressed to the first user terminal carried in the dl mu ppdu, wherein the trigger message instructs the first user terminal to initiate ul transmission and includes ul channel allocation parameters, wherein the first ul communication channel is determined based on the ul channel allocation parameters, wherein the ul channel indication includes the ul channel allocation parameters, wherein each mpdu of the plurality of mpdus includes an ack policy that instructs a receiving user terminal to transmit a ba immediately upon receiving a trigger ppdu on one of the plurality of ul communication channels, wherein the ba indication includes the ack policy and the trigger message, wherein the first ba is transmitted in response to obtaining the trigger message and detecting the ack policy in the plurality of mpdus, and wherein the first user terminal is configured to transmit ul data after sending the first ba on the first ul communication channel. 6. the method of claim 5, wherein the a-mpdu includes a trigger frame that carries the trigger message, wherein the trigger frame does not include a receive address (ra), and wherein the first user terminal is configured to determine the ra of the trigger frame based on an ra of another frame in the a-mpdu. 7. the method of claim 1, further comprising: receiving a trigger ppdu from the access point subsequent to receiving the dl mu ppdu and obtaining a trigger message from the trigger ppdu, wherein the trigger message instructs the first user terminal to initiate ul transmission and includes ul channel allocation parameters, wherein the ul channel indication includes the ul channel allocation parameters, wherein the first ul communication channel is determined based on the ul channel allocation parameters, wherein each mpdu of the plurality of mpdus includes an ack policy that instructs a receiving user terminal to transmit a ba immediately upon receiving a trigger ppdu on one of the plurality of ul communication channels, wherein the ba indication includes the ack policy and the trigger message, wherein the first ba is transmitted in response to obtaining the trigger message and detecting the ack policy in the plurality of mpdus, wherein the trigger ppdu includes a trigger frame that carries the trigger message, and wherein the trigger frame further includes an indication instructing a receiving user terminal to transmit a ba. 8. the method of claim 1, further comprising: receiving a second ppdu from the access point subsequent to receiving the dl mu ppdu obtaining a trigger message from the second ppdu, wherein the trigger message instructs the first user terminal to initiate ul transmission and includes ul channel allocation parameters, wherein the ul channel indication includes the ul channel allocation parameters and obtaining a block acknowledgement request (bar) message from the second ppdu, wherein the bar message instructs the first user terminal to transmit a ba, wherein the first ul communication channel is determined based on the ul channel allocation parameters, wherein each mpdu of the plurality of mpdus includes an ack policy that instructs a receiving user terminal to transmit a ba in response to receiving the bar message, wherein the ba indication includes the ack policy, the trigger message, and the bar message, and wherein the first ba is transmitted in response to obtaining the trigger message and the bar message. 9. the method of claim 8, wherein the trigger message is placed in a preamble of the second ppdu, and wherein the second ppdu includes a bar frame carrying the bar message. 10. the method of claim 8, wherein the second ppdu carries a control wrapper frame, wherein the control wrapper frame wraps a bar frame carrying the bar message, and wherein the trigger message is included in a field of the control frame wrapper. 11. the method of claim 8, wherein the second ppdu carries an a-mpdu, and wherein the a-mpdu includes a trigger frame carrying the trigger message and a bar frame carrying the bar message. 12. a first user terminal for wireless communication, comprising: means for receiving, on a first downlink (dl) communication channel of a plurality of dl communication channels, a dl multi-user (mu) physical layer convergence protocol (plcp) protocol data unit (ppdu) transmitted by an access point to a plurality of user terminals including the first user terminal and a second user terminal on the plurality of dl communication channels, wherein the dl mu ppdu includes a plurality of medium access control (mac) protocol data units (mpdus) (Results 0)

Search [SP]: block acknowledgement mechanism for acknowledging dl-mu data on ul-mu wireless communication system a method, an apparatus, and a computer-readable medium for wireless communication are provided. the apparatus may be a first user terminal. the first user terminal receives, on a first dl communication channel of multiple dl communication channels, a dl mu ppdu includes mpdus transmitted from an access point to multiple user terminals including the first user terminal on the multiple dl communication channels. the first user terminal obtains an ul channel indication and a ba indication. the first user terminal transmits, on a first ul communication channel of multiple ul communication channels, a first ba to the access point based on the ul channel indication and the ba indication simultaneously or concurrently with a ba transmission from the rest of the multiple user terminals to the access point on the rest of the multiple ul communication channels. the first ba acknowledges one or more of the mpdus. (Results 14)

Search fn=(63944653 or 65078469 or 65568057 or 68242960 or 43590048 or 43811787 or 46711996 or 46712010 or 47898887 or 49119762 or 49574328 or 58630683 or 61747664) (Results 13)

Search METHOD* AND (DEVICE* OR APPARATUS*) AND WIRELESS AND (UPLINK OR up) AND (DOWNLINK OR DL) AND (PPDU OR MPDU OR PDU) AND PLCP AND (MULTI-USER OR mu) AND MAC AND ACK AND BA AND BAR AND CHANNEL* (Results 106)

Search 5 AND PD<20150506 (Results 27)

6:

Title: METHODS AND SYSTEMS FOR A MOBILE, BROADBAND, ROUTABLE INTERNET

Abstract: In embodiments of the present invention improved capabilities are described for forming a mobile ad hoc network having a plurality of wireless communication links connecting a plurality of wireless mobile nodes. The present invention may apply a dynamic spectrum awareness algorithm to facilitate effective utilization of the available communications spectrum in an environment of the mobile ad hoc network, support both delay-sensitive and delay-tolerant traffic types on the mobile ad hoc network, and provide a defined quality of communications service for both the delay-sensitive and the delay-tolerant traffic.

Classifications:

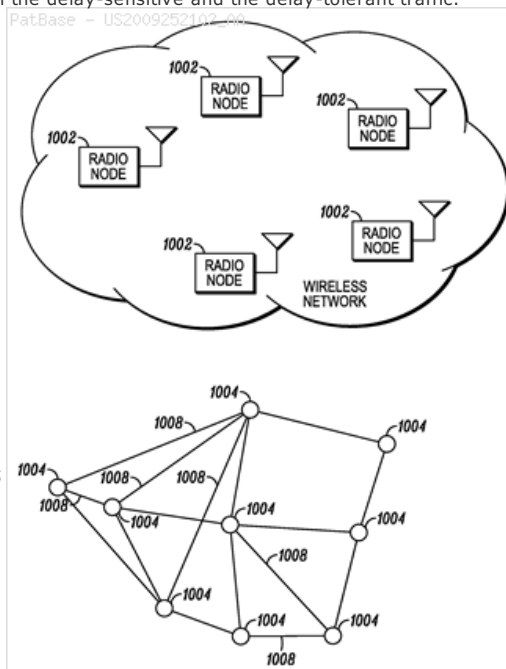
International (IPC 8-9): G06F15/16 H04B1/713 H04B15/00 H04B7/005 H04B7/212 H04B7/26 H04H20/71 H04J3/00 H04L1/00 H04L12/28 H04L12/56 H04L29/06 H04L29/12 H04N7/173 H04N7/20 H04W16/14 H04W16/18 H04W28/16 H04W4/00 H04W4/02 H04W40/00 H04W40/02 H04W40/04 H04W40/08 H04W40/12 H04W40/18 H04W40/20 H04W52/00 H04W56/00 H04W72/00 H04W72/04 H04W74/08 H04W80/02 H04W84/02 H04W84/18 H04W92/00 (Advanced/Invention); G06F15/16 H04B7/212 H04L12/28 H04L12/56 H04L29/06 H04W4/02 H04W40/04 H04W40/12 H04W40/18 H04W40/20 H04W84/18 (Advanced/Non-invention); H04B7/005 H04B7/26 H04J3/00 H04L12/28 H04N7/173 H04N7/20 H04W16/00 H04W4/00 H04W40/00 H04W40/02 H04W72/00 H04W84/18 (Core/Invention); G06F15/16 (Core/Non-invention)

International (IPC 1-7): H04B7/26 H04W84/18

CPC: H04W40/026 H04W40/02 H04W74/002 H04W74/0833 H04N21/4126 H04N21/43615 H04N21/43637 H04N21/6143 H04N21/6175 H04W56/0035 H04W56/0075 C02F1/4691 C02F1/283 C02F1/46114 C02F2001/46133 C02F2001/46161 C02F2201/46145 C02F2209/02 C02F2209/05 C02F2209/06 C02F2303/16 H04W48/14 H04J13/16 H04L25/0226 H04L25/03006 H04L27/2613 H04B17/345 H04W48/08 H04W72/12 H04W92/18 H04W40/08 H04L1/0002 H04L1/0003 H04L1/0009 H04L1/0015 H04L45/123 H04L45/308 H04L2001/0097 H04W16/18 H04W84/22 H04W40/20 Y02D70/1222 Y02D70/1224 Y02D70/1262 Y02D70/142 Y02D70/146 Y02D70/164 Y02D70/22 Y02D70/23 Y02D70/324 Y02D70/38 Y02D70/122 Y02D70/20 H04W84/18 H04W4/20

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**Family:**

Publication number	Publication date	Application number	Application date
CA2753536 AA	20090903	CA20092753536	20090227
CA2757647 AA	20091203	CA20092757647	20090403
EP2248387 A2	20101110	EP20090715862	20090227
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EP2266365 A2	20101229	EP20090755494	20090403
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Probable Assignee: POWERWAVE COGNITION INC

Assignee(s): (std): COPELAND GREGORY C ; COPELAND GREGORY CLARK ; ELSON BRIAN B ; LARGE BRIAN C ; SEIDEL SCOTT Y ; SCHLICHT LUDGER ; SMITH JEFFREY E ; PATACA VICTOR M T ; MISHRA RAJESH K ; POWERWAVE COGNITION INC ; ATWAL PETER ; NORMAN PETER

Assignee(s): CHARLES A STANZIALE JR IN HIS CAPACITY CHAPTER 7 TRUSTEE OF POWERWAVE TECHNOLOGIES INC AS ; PATACA VICTOR MT

Inventor(s): (std): COPELAND GREGORY C ; COPELAND GREGORY CLARK ; ARTWAL PETER ; ATWAL PETER ; MISHRA RAJESH K ; PATACA VICTOR M T ; SCHLICHT LUDGER ; SEIDEL SCOTT Y ; SMITH JEFFREY E ; NORMAN PETER ; LARGE BRIAN C ; ELSON BRIAN B

Inventor(s): VICTOR M T PATACA ; VICTOR MT PATACA ; SMITH JEFFREY ; SCOTT Y SEIDEL ; SEIDEL SCOTT ; PATACA VICTOR MT ; PETER ARTWAL ; PETER ATWAL ; RAJESH K MISHRA ; PATACA VICTOR ; COPELAND GREGORY ; GREGORY C COPELAND ; JEFFREY E SMITH ; LUDGER SCHLICHT ; MISHRA RAJESH

Agent(s): SMART AND BIGGAR; NAISMITH ROBERT STEWART; STRATEGIC PATENTS PC; NORTRUP JOHN H ET AL; LEWKOWICZ PAUL E ET AL

Designated states: AE AG AL AM AO AT AU AZ BA BB BE BF BG BH BJ BR BW BY BZ CA CF CG CH CI CL CM CN CO CR CU CY CZ DE DK DM DO DZ EC EE EG ES FI FR GA GB GD GE GH GM GN GQ GR GT GW HN HR HU ID IE IL IN IS IT JP KE KG KM KN KP KR KZ LA LC LI LK LR LS LT LU LV LY MA MC MD ME MG MK ML MN MR MT MW MX MY MZ NA NE NG NI NL NO NZ OM PE PG PH PL PT RO RS RU SC SD SE SG SI SK SL SM SN ST SV SY SZ TD TG TH TJ TM TN TR TT TZ UA UG US UZ VC VN ZA ZM ZW

Title: MULTI-USER PARALLEL CHANNEL ACCESS IN WLAN SYSTEMS

Abstract: A method and apparatus may provide multi-user parallel channel access (MU-PCA) and/or single-user parallel channel access (SU-PCA) using transmit and/or receive with symmetrical bandwidth, in the downlink (DL), uplink (UL), or combined DL and UL. SU-PCA and MU-PCA may support unequal modulation and coding schemes (MCS) and unequal transmit power. Medium access control (MAC) layer, Physical layer (PHY), and mixed and PHY layer methods and procedures may support UL, DL and combined UL and DL SU-PCA and MU-PCA using transmit and/or receive with symmetrical bandwidth. MU-PCA and/or SU-PCA may also be supported by MAC and PHY layer designs and procedures for downlink, uplink and combined uplink and downlink using transmit/receive with asymmetrical bandwidth.

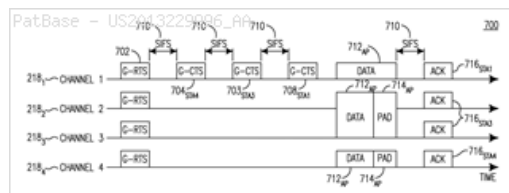
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H04W74/00 H04W74/02 H04W74/04 H04W74/08
H04W84/12 (Advanced/Invention);

H04B17/318 H04W84/12 (Advanced/Non-invention)

CPC: H04W72/04 H04W74/004 H04W74/006 H04B17/318 H04L1/0025
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US: 1/1 370/329 370/338

**Family:**

Publication number	Publication date	Application number	Application date
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Priority:

US20120605538P	20120301	US20120669505P	20120709	US20120684051P	20120816
EP20130709670	20130228	JP20140560037T	20130228	WO2013US28302	20130228
US20130781909	20130301	US20160097048	20160412	JP20170068257	20170330
US20170581261	20170428	US20170826818	20171130		

Probable Assignee: INTERDIGITAL PATENT HOLDINGS INC**Assignee(s):** (std): INTERDIGITAL PATENT HOLDINGS INC ; INTERDIGITAL PATENT HOLDINGS ; INTERDIGITAL PATENT HOLDINGS INC**Assignee(s):** INTERDIGITAL PATENT HOLDINGS INC WILMINGTON**Inventor(s):** (std): GHOSH MONSHA ; LOU HAN QING ; LOU HANQING ; LOU HANQNG ; MURAS RONALD ; MURIAS RONALD G ; GHOSH MONISHA ; SHAH NIRAV B ; SHAH NRAV B ; WANG XAOFE ; WANG XIAOFEI ; RONALD G MURIAS ; NIRAV B SHAH ; MONISHA GHOSH ; MURIAS RONALD ; ZHANG GUO DONG ; ZHANG GUODONG**Inventor(s):** ZHANG GUODONG SYOSSET ; WANG XIAOFEI CEDAR GROVE ; SHAH NIRAV B SAN DIEGO ; GHOSH MONISHA CHAPPAQUA ; MURIAS RONALD G CALGARY ; LOU HANQING SYOSSET**Agent(s):** JOHANSSON MAGNUS; AWAPATENT AB; TANI AND ABE PC; VOLPE AND KOENIG PC; WALSH CHRISTINA R**Designated states:** AE AG AL AM AO AT AU AZ BA BB BE BF BG BH BJ BN BR BW BY BZ CA CF CG CH CI CL CM CN CO CR CU CY CZ DE DK DM DO DZ EC EE EG ES FI FR GA GB GD GE GH GM GN GQ GR GT GW HN HR HU ID IE IL IN IS IT JP KE KG KM KN KP KR KZ LA LC LI LK LR LS LT LU LV LY MA MC MD ME MG MK ML MN MR MT MW MX MY MZ NA NE NG NI NL NO NZ OM PA PE PG PH PL PT QA RO RS RU RW SC SD SE SG SI SK SL SM SN ST SV SY SZ TD TG TH TJ TM TN TR TT TZ UA UG US UZ VC VN ZA ZM ZW

Title: SYSTEMS AND METHODS FOR REUSE OF A WIRELESS MEDIUM FOR HIGH EFFICIENCY WIFI

Abstract: Systems and method for concurrent communication using high efficiency wifi are disclosed. One aspect is a method of transmitting a wireless message on a medium utilizing carrier sense multiple access (CSMA). The method includes receiving, via a first wireless device, at least a portion of a first wireless message from a second wireless device, the message including an indication of a basic service set of the second wireless device. The method also includes determining whether to defer transmission of a second wireless message based, at least in part, on the basic service set of the second wireless device.

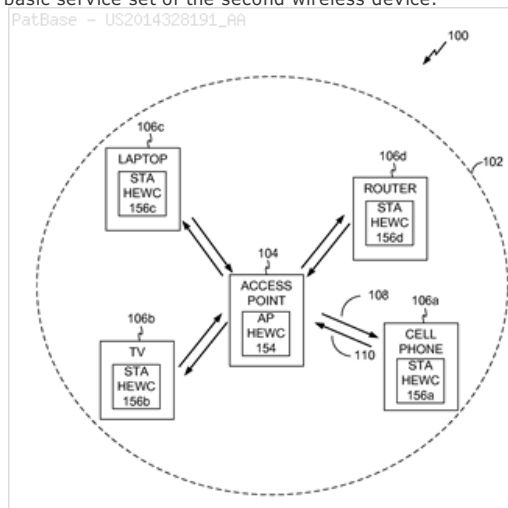
Classifications:

International (IPC 8-9): H04B1/00 H04B15/00 H04B5/00 H04B7/00 H04B7/04 H04J1/14 H04J1/16 H04J11/00 H04J13/00 H04J99/00 H04L27/00 H04L29/02 H04L5/00 H04W16/28 H04W24/08 H04W28/02 H04W4/00 H04W52/24 H04W72/02 H04W72/04 H04W72/08 H04W72/12 H04W74/00 H04W74/02 H04W74/04 H04W74/08 H04W76/00 H04W84/12 H04W84/18 (Advanced/Invention);

H04W72/04 H04W74/04 H04W74/08 (Advanced/Non-invention)

CPC: H04W52/241 H04W72/048 H04L5/0073 H04J1/14 H04L5/0005 H04J1/16 H04W24/08 H04W74/04 H04W72/0493 H04W74/0816 H04W84/12 H04W72/046 H04W74/006 H04W84/18 H04W74/08 H04W74/002 H04W72/02 H04L27/0006 H04W72/042 H04W72/082 H04W74/0808 Y02B60/50

US: 1/1 370/252 370/312 370/329 370/330

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Priority:

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Probable Assignee: QUALCOMM INC

Assignee(s): (std): QUALCOMM INC

Assignee(s): TIAN BIN ; VERMANI SAMEER ; BAIK EUGENE JONG HYON ; MERLIN SIMONE

Inventor(s): (std): ABRAHAM SANTOSH PAUL ; BAIK EUGENE JONG HYON ; BARRIAC GWENDOLYN DENISE ; H ZHU ; KATAR SRINIVAS ; MERLIN SIMONE ; TANDRA RAHUL ; TIAN BIN ; VERMAIN SAMEER ; VERMANI SAMEER ; YONGE III LAWRENCE WINSTON ; YONGE LAWRENCE WINSTON ; YONGE LAWRENCE WINSTON III ; ZHOU YAN ; ZHU HAO ; ZOU CHAO ; C ZOU ; CHERIAN GEORGE ; SAMPATH HEMANTH

Inventor(s): SIMONE MERLIN ; EUGENE JONG HYONBAIK ; SAMEER VERMANI ; BIN TIAN

Agent(s): SMART AND BIGGAR; WEGNER HANS; ANNISA AM BADAR SH LLM; DORA AM BADAR SPSI; TOLER LAW GROUP; KNOBBE MARTENS OLSON AND BEAR LLP; TOLER LAW GROUP PC; ABUMERI MARK M; TOLER JEFFREY G

Designated states: AE AG AL AM AO AT AU AZ BA BB BE BF BG BH BJ BN BR BW BY BZ CA CF CG CH CI CL CM CN CO CR CU CY CZ DE DK DM DO DZ EC EE EG ES FI FR GA GB GD GE GH GM GN GQ GR GT GW HN HR HU ID IE IL IN IR IS IT JP KE KG KM KN KP KR KZ LA LC LI LK LR LS LT LU LV LY MA MC MD ME MG MK ML MN MR MT MW MX MY MZ NA NE NG NI NL NO NZ OM PA PE PG PH PL PT QA RO RS RU RW SA SC SD SE SG SI SK SL SM SN ST SV SY SZ TD TG TH TJ TM TN TR TT TZ UA UG US UZ VC VN ZA ZM ZW

Title: DEVICE, SYSTEM AND METHOD OF SECURING WIRELESS COMMUNICATION

Abstract: Some demonstrative embodiments of the invention include methods, devices and/or systems to secure a wireless transmission. The method may include, for example, transmitting a noise transmission to be received by one or more destinations other than an intended destination of a packet during a time period corresponding to a duration of the packet. Other embodiments are described and claimed.

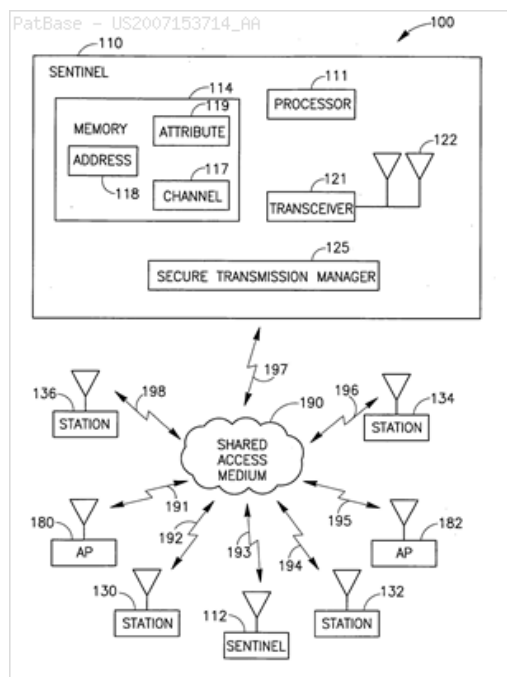
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US: 1/1 370/252 370/252P 370/310 370/310P 370/328 370/329 370/338 370/338P 370/348 370/350 375/146 375/260 375/299 455/101 455/273 455/502 455/522 455/525 455/63.4 455/69

**Family:**

Publication number	Publication date	Application number	Application date
US2007153714 AA	20070705	US20060386879	20060323
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WO07074453 A3	20090409	WO2006I01491	20061227

Priority:

US20050319526	20051229	US20050319659	20051229	US20060386879	20060323
US20060430134	20060509	US20060430136	20060509	US20100371951P	20100809
US20110081233	20110406	US20110206018	20110809	US20130022292	20130910

Probable Assignee: CELENO COMMUNICATIONS LTD**Assignee(s):** (std): CELENO COMM ISRAEL LTD ; CELENO COMM LTD ; ROZEN GILAD ; SHAPIRA NIR ; SHANY YARON ; KIRSHENBERG GILAD**Assignee(s):** CELENO COMMUNICATIONS (ISRAEL) LTD ; CELENO COMMUNICATIONS ISRAEL LTD ; CELENO COMMUNICATIONS LTD**Inventor(s):** (std): KIRSHENBERG GILAD ; ROZEN GILAD ; SHANY YARON ; SHAPIRA NIR**Agent(s):** PEARL COHEN ZEDEK LATZER LLP; PEARL COHEN ZEDEK LATZER BARATZ LLP; PEARL COHEN ZEDEK LATZER ET AL

Designated states: AE AG AL AM AT AU AZ BA BB BE BF BG BJ BR BW BY BZ CA CF CG CH CI CM CN CO CR CU CY CZ DE DK DM DZ EC EE EG ES FI FR GA GB GD GE GH GM GN GQ GR GT GW HN HR HU ID IE IL IN IS IT JP KE KG KM KN KP KR KZ LA LC LK LR LS LT LU LV LY MA MC MD MG MK ML MN MR MW MX MY MZ NA NE NG NI NL NO NZ OM PG PH PL PT RO RS RU SC SD SE SG SI SK SL SM SN SV SY SZ TD TG TJ TM TN TR TT TZ UA UG US UZ VC VN ZA ZM ZW

Title: ACKNOWLEDGEMENT (ACK) TYPE INDICATION AND DEFERRAL TIME DETERMINATION

Abstract: Certain aspects of the present disclosure provide methods and apparatus for indicating a type of response for acknowledging a protocol data unit. One example method for wireless communications by a first apparatus generally includes transmitting a physical layer convergence protocol (PLCP) protocol data unit (PPDU) to a second apparatus and setting at least one bit in a PLCP header of the PPDU to indicate a type of response expected from the second apparatus responsive to the transmitted PPDU.

Classifications:

International (ipc 8-9): H04J99/00 H04L1/12 H04L1/16 H04L1/18 H04L29/02 H04L29/06 H04L5/00 H04W28/04 H04W28/06 H04W76/02 H04W80/02 H04W84/12 (Advanced/Invention); H04L1/16 (Advanced/Non-invention)

CPC: H04L5/0055 H04L69/22 H04L1/1621 H04L1/1614 H04L1/1685 H04L1/1854 H04L1/188 H04L1/1896 H04W84/12 H04W74/085

US: 1/1 370/329 370/338

PatBase - US2014233478_AA

ACK indication in SRG	Response Type	Aggregation field in SRG	EOF of first MPDU indicator with Length = 0	Response	ERP	Comments
0	No response	0		No response	0	Non-NDP Data, Management or Control Frames that do not solicit a response
1	NDP response	0		NDP ACK	SIFS/NDP+DIFS	Single MPDU < 512 Bytes. The NDP ACK can also be an NDP CTS, but duration is the same
		1		NDP ACK	SIFS/NDP+DIFS	VHT single MPDU > 512 Bytes. Signals NDP ACK for VHT single MPDU
2	Normal Control response			NDP BA	SIFS/NDP+DIFS	A-MPDU with NDP Block Ack
		0		Normal ACK	SIFS+ACK+DIFS	Single MPDU < 512 Bytes. The ACK MCS is determined on the MCS signaled in the SRG (assuming mandatory MCS as basic MCS) with The Normal ACK can also be a Normal CTS, but duration is the same
		1	0	Not allowed		VHT single MPDU > 512 Bytes. Could signal Normal ACK for VHT single MPDU, but ERP can not be determined due to confusion with Normal Block Ack. NDP ACK is the only response type supported for VHT single MPDU
3	Long response			Normal BA	SIFS+BA+DIFS	A-MPDU with normal Block Ack. BA MCS determined on the MCS signaled in the SRG (assuming mandatory MCS as basic MCS) with
				RDG	SIFS+Max PPDU+DIFS	Reverse Direction Grant. Must be followed up by a truncating transmission with ACK indication = 3, such as an NDP ACK, after the response PPDU. This ERP is truncated by reception of another ACK indication field (as opposed to the ERP for ACK indication = 3, which are never truncated)

Family:

Publication number	Publication date	Application number	Application date
BR112015020129 A2	20170718	BR20151120129	20140220
CN104919743 A	20150916	CN201480004894	20140220
CN104937872 A	20150923	CN201480004883	20140220
CN104937872 B	20180508	CN201480004883	20140220
EP2959623 A1	20151230	EP20140709070	20140220
EP2959624 A1	20151230	EP20140710109	20140220
IN04244CN2015 A	20160701	IN2015CN04244	20150715
IN04272CN2015 A	20160701	IN2015CN04272	20150716
JP2016511999 T2	20160421	JP20150558226T	20140220
JP2016513415 T2	20160512	JP20150558227T	20140220
JP6158357 B2	20170705	JP20150558226T	20140220
KR101699413 B1	20170124	KR20157025299	20140220
KR20150119328 A	20151023	KR20157025299	20140220
TW201438430 A	20141001	TW20140105896	20140221
TW201438431 A	20141001	TW20140105898	20140221
TWI556598 B	20161101	TW20140105898	20140221
TWI562561 B	20161211	TW20140105896	20140221
US2014233478 AA	20140821	US20140184698	20140219
US2014233551 AA	20140821	US20140184562	20140219
US9191469 BB	20151117	US20140184562	20140219
US9853794 BB	20171226	US20140184698	20140219
WO14130694 A1	20140828	WO2014US17437	20140220
WO14130702 A1	20140828	WO2014US17446	20140220

Priority:

US20130767240P 20130220	US20130769718P 20130226	US20130805402P 20130326
US20130809716P 20130408	US20130810663P 20130410	US20130820133P 20130506
US20130843906P 20130709	US20130844008P 20130709	US20130866991P 20130816
US20140184562 20140219	US20140184698 20140219	WO2014US17437 20140220
WO2014US17446 20140220		

Probable Assignee: QUALCOMM INC

Assignee(s): (std): QUALCOMM INC

Inventor(s): (std): ALFRED ASTERJADHI ; ASTERJADHI ALFRED ; MAARTEN MENZO WENTINK ; WENTINK MAARTEN MENZO

Agent(s): CARSTENS DIRK WILHELM; PATTERSON AND SHERIDAN LLP; READ RANDOL W ET AL

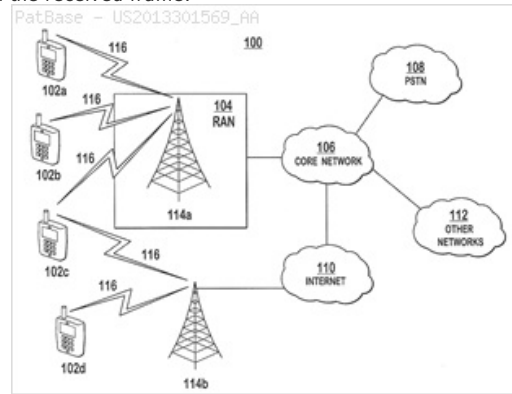
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Title: METHOD AND APPARATUS FOR TRANSMITTING ACKNOWLEDGEMENTS IN RESPONSE TO RECEIVED FRAMES

Abstract: A method and apparatus for transmitting acknowledgements in response to data packets in wireless communication are disclosed. A recipient may receive a plurality of data packets from a plurality of stations and transmit acknowledgements for the data packets to the originating stations in a single transmission. The acknowledgements may be transmitted using multi-user multiple-input multiple-output (MU-MIMO). Alternatively, the acknowledgements may be aggregated and transmitted in the single transmission. A short acknowledgement (ACK) frame may be sent in response to a received frame. The short ACK frame may include an ACK sequence corresponding to a sequence identity (ID) included in the received frame. The short ACK frame may include a short training field (STF) and the ACK sequence. The short ACK frame may be transmitted with a short ACK indication. The short ACK frame may be sent in response to an indication included in the received frame.

Classifications:

International (IPC 8-9): H04B7/04 H04J99/00 H04L1/00 H04L1/12
H04L1/16 H04L1/18 H04L5/00 H04W16/28 H04W28/06
H04W84/12 (Advanced/Invention);
H04L1/00 (Advanced/Non-invention)
CPC: H04L5/0055 H04L1/1607 H04L1/1671 H04L1/1854 H04L1/1864
H04L2001/0093
US: 370/329



Family:

Publication number	Publication date	Application number	Application date
CN104321995 A	20150128	CN201380024671	20130510
EP2847909 A1	20150318	EP20130725014	20130510
JP2015525017 T2	20150827	JP20150511739T	20130510
JP2017073791 A2	20170413	JP20160217262	20161107
KR20150007334 A	20150120	KR20147034125	20130510
TW201407991 A	20140216	TW20130116685	20130510
TW201810983 A	20180316	TW20170123384	20130510
US2013301569 AA	20131114	US20130890833	20130509
US2017155490 AA	20170601	US20170430656	20170213
US9608789 BB	20170328	US20130890833	20130509
WO13170136 A1	20131114	WO2013US40529	20130510

Priority:

US20120646040P	20120511	US20120669390P	20120709	US20120699531P	20120911
US20120724466P	20121109	US20130890833	20130509	JP20150511739T	20130510
WO2013US40529	20130510	JP20160217262	20161107	US20170430656	20170213

Probable Assignee: INTERDIGITAL PATENT HOLDINGS INC

Assignee(s): (std): INTERDIGITAL PATENT HOLDINGS ; INTERDIGITAL PATENT HOLDINGS INC

Inventor(s): (std): GHOSH MONISHA ; GRANDHI SUDHEER A ; LOU HAN QING ; LOU HANQING ; WANG XIAOFEI ; MONISHA GHOSH

Agent(s): JOHANSSON MAGNUS; TANI AND ABE PC; VOLPE AND KOENIG PC; HWANG YONG BEOM

Designated states: AE AG AL AM AO AT AU AZ BA BB BE BF BG BH BJ BN BR BW BY BZ CA CF CG CH CI CL CM CN CO CR CU CY CZ DE DK DM DO DZ EC EE EG ES FI FR GA GB GD GE GH GM GN GQ GR GT GW HN HR HU ID IE IL IN IS IT JP KE KG KM KN KP KR KZ LA LC LI LK LR LS LT LU LV LY MA MC MD ME MG MK ML MN MR MT MW MX MY MZ NA NE NG NI NL NO NZ OM PA PE PG PH PL PT QA RO RS RU RW SC SD SE SG SI SK SL SM SN ST SV SY SZ TD TG TH TJ TM TN TR TT TZ UA UG US UZ VC VN ZA ZM ZW

Title: METHOD FOR REPORTING CHANNEL INFORMATION BASED ON LINK ADAPTATION IN WIRELESS LOCAL AREA NETWORK AND THE APPARATUS FOR THE SAME

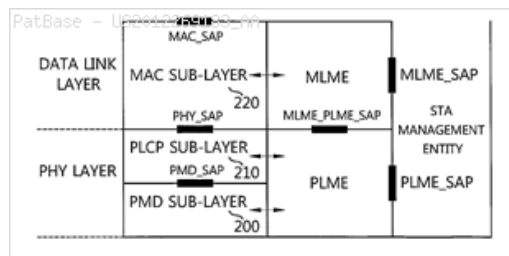
Abstract: A method for reporting channel information in a wireless local area network system is provided. The method includes receiving a data block for requesting a modulation and coding scheme (MCS) feedback from a requesting station, the data block including a data field and a stream indicator indicating a number of at least one spatial stream in the data field; determining, the MCS feedback based on the data block; and, transmitting the MCS feedback to the requesting station, the MCS feedback including a recommended MCS and a recommended stream indicator indicating a number of at least one recommended spatial stream. The number of the at least one recommended spatial stream in the MCS feedback is equal or less than the number of the at least one spatial stream in the data block.

Classifications:

International (IPC 8-9): H04B7/04 H04B7/26 H04J99/00 H04L1/00 H04L1/06 H04W16/28 H04W24/00 H04W24/10 H04W4/00 H04W72/04 H04W84/12 (Advanced/Invention)

CPC: H04L1/0026 H04L1/0027 H04L1/06 H04W24/10 H04L1/0025 H04B7/0626 H04B7/0417 H04B7/0452 H04L1/0003 H04W72/04

US: 1/1 370/241 370/252 370/310 370/329 370/338



Family:

Publication number	Publication date	Application number	Application date
AU2011304258 AA	20120614	AU20110304258	20111123
AU2011304258 BB	20140213	AU20110304258	20111123
CA2772468 AA	20120526	CA20112772468	20111123
CA2772468 C	20151027	CA20112772468	20111123
CN102696182 A	20120926	CN201180003956	20111123
CN102696182 B	20150826	CN201180003956	20111123
EP2643935 A1	20131002	EP20110822859	20111123
EP2643935 A4	20150603	EP20110822859	20111123
JP2013520131 T2	20130530	JP20120553827T	20111123
JP5690850 B2	20150325	JP20120553827T	20111123
KR101424368 B1	20140801	KR20127021490	20111123
KR20120117881 A	20121024	KR20127021490	20111123
US2012269183 AA	20121025	US20110500352	20111123
US2014293916 AA	20141002	US20140297483	20140605
US2016127076 AA	20160505	US20160993363	20160112
US8787341 BB	20140722	US20110500352	20111123
US9258799 BB	20160209	US20140297483	20140605
US9520964 BB	20161213	US20160993363	20160112
WO12070872 A1	20120531	WO2011KR08993	20111123

Priority:

US20100417284P 20101126 US20110500352 20111123 WO2011KR08993 20111123
US20120500352 20120405 US20140297483 20140605 US20160993363 20160112

Probable Assignee: LG ELECTRONICS INC

Assignee(s): (std): KANG BYEONG WOO ; LEE DAE WON ; LG ELECTRONICS INC ; SEOK YONG HO ; SOHN ILL SOO ; SONG KYOUNG YOUNG

Inventor(s): (std): BYEONG WOO KANG ; DAE WON LEE ; ILL SOO SOHN ; KANG BYEONG WOO ; KYOUNG YOUNG SONG ; LEE DAE WON ; SEOK YONG HO ; SOHN ILL SOO ; SONG KYOUNG YOUNG ; YONG HO SEOK

Agent(s): WATERMARK PATENT AND TRADE MARKS ATTORNEYS; WATERMARK INTELLECTUAL PROPERTY PTY LTD; SMART AND BIGGAR; KATERLE AXEL; BIRCH STEWART KOLASCH AND BIRCH LLP; YANG MOON OCK

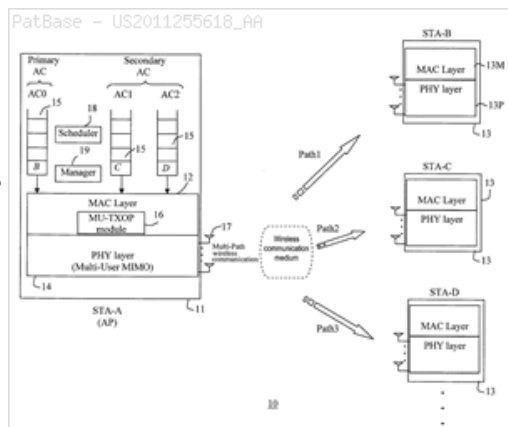
Designated states: AE AG AL AM AO AT AU AZ BA BB BE BF BG BH BJ BR BW BY BZ CA CF CG CH CI CL CM CN CO CR CU CZ DE DK DM DO DZ EC EE EG ES FI FR GA GB GD GE GH GM GN GQ GR GT GW HN HR HU ID IE IL IN IS IT JP KE KG KM KN KP KR KZ LA LC LI LK LR LS LT LU LV LY MA MC MD ME MG MK ML MN MR MT MW MX MY MZ NA NE NG NI NL NO NZ OM PE PG PH PL PT QA RO RS RU RW SC SD SE SG SI SK SL SM SN ST SV SY SZ TD TG TH TJ TM TN TR TT TZ UA UG US UZ VC VN ZA ZM ZW

Title: METHOD AND SYSTEM FOR MULTI-USER TRANSMIT OPPORTUNITY FOR MULTI-USER MULTIPLE-INPUT-MULTIPLE-OUTPUT WIRELESS NETWORKS

Abstract: Wireless communication in a wireless system using a multiple user transmission opportunity is provided. Data blocks at a wireless station are transmitted to multiple wireless receivers over a shared wireless communication medium. The data blocks are organized in order of transmission priority based on access categories. Contention for access to the communication medium during a transmission opportunity period is based on a backoff timer of each access category and the transmission priority. Upon successful contention for a transmission opportunity period, during the transmission opportunity period, a data block of a primary access category is wirelessly transmitted from the wireless station to one or more primary destination wireless receivers. Simultaneously, a data block of a secondary access category is wirelessly transmitted from the wireless station to one or more secondary destination wireless receivers.

Classifications:

International (IPC 8-9): H04B7/04 H04J99/00 H04L12/26 H04L27/00 H04L27/28 H04W16/28 H04W52/02 H04W72/10 H04W72/12 H04W74/08 H04W84/12 (Advanced/Invention); H04W72/00 H04W72/12 H04W84/12 (Advanced/Non-invention)
CPC: H04B7/0452 H04W74/0841 H04W72/1242 H04W72/005 H04W72/10 H04B7/0413 H04W74/08
European: H04W74/08 H04W74/08D2 T04W72/00B T04W72/12B6
US: 1/1 370/216 370/216P 370/230 370/230S 370/329 375/260 375/260P 375/316 375/316S



Family:

Publication number	Publication date	Application number	Application date
CN102859895 A	20130102	CN201180019875	20110124
CN102859895 B	20150708	CN201180019875	20110124
EP2561625 A1	20130227	EP20110772136	20110124
EP2561625 A4	20161130	EP20110772136	20110124
JP2013531404 T2	20130801	JP20130506061T	20110124
JP5695183 B2	20150401	JP20130506061T	20110124
KR101768072 B1	20170814	KR20110030139	20110401
KR20110116978 A	20111026	KR20110030139	20110401
US2011255618 AA	20111020	US20110030070	20110217
US2012008490 AA	20120112	US20110177386	20110706
US2016119957 AA	20160428	US20160987311	20160104
US2016248486 AA	20160825	US20160143848	20160502
US9232543 BB	20160105	US20110177386	20110706
US9332571 BB	20160503	US20110030070	20110217
US9565704 BB	20170207	US20160987311	20160104
WO11132847 A1	20111027	WO2011KR00470	20110124

Priority:

US20100325762P 20100419 US20100362280P 20100707 WO2011KR00470 20110124
US20110030070 20110217 US20110177386 20110706 US20160987311 20160104
US20160143848 20160502

Probable Assignee: SAMSUNG ELECTRONICS CO LTD

Assignee(s): (std): KIM YOUNGSOO ; SAMSUNG ELECTRONICS CO LTD ; ZHU CHUNHUI

Assignee(s): SAMSUNG ELECTRONICS CO

Inventor(s): (std): KIM YOUNGSOO ; ZHU CHUN HUI ; ZHU CHUNHUI ; ZHU CHUNHUI ALLAN ; KIM YOUNG SOO

Agent(s): DHALLEWEYN NELE VEERLE TREES GERTRUDIS; NSIP LAW; MUHANN PATENT AND LAW FIRM

Designated states: AE AG AL AM AO AT AU AZ BA BB BE BF BG BH BJ BR BW BY BZ CA CF CG CH CI CL CM CN CO CR CU CY CZ DE DK DM DO DZ EC EE EG ES FI FR GA GB GD GE GH GM GN GQ GR GT GW HN HR HU ID IE IL IN IS IT JP KE KG KM KN KP KR KZ LA LC LI LK LR LS LT LU LV LY MA MC MD ME MG MK ML MN MR MT MW MX MY MZ NA NE NG NI NL NO NZ OM PE PG PH PL PT RO RS RU SC SD SE SG SI SK SL SM SN ST SV SY SZ TD TG TH TJ TM TN TR TT TZ UA UG US UZ VC VN ZA ZM ZW

Title: RANGE EXTENSION IN WIRELESS LOCAL AREA NETWORKS

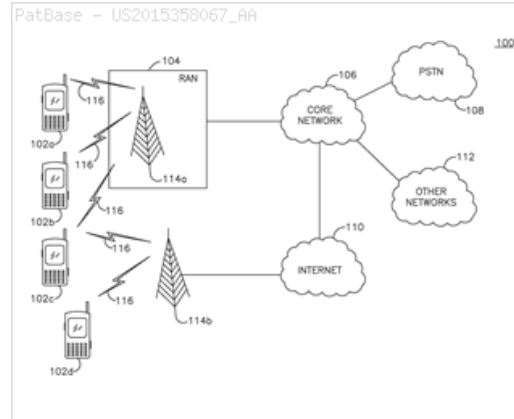
Abstract: A method for associating a new end-station (end-STA) with a relay access point (R-AP) in a relay transmission. An assignment of a new identifier is transmitted to the new end-STA, wherein traffic indication map indications for the new end-STA in a beacon from the R-AP follows the transmission of the new identifier assignment. A message is sent to a root access point (AP), the message including an indication of a number of information fields in the message and at least one information field, each of the at least one information fields including an identifier of one end-STA associated with the R-AP. An acknowledgement is received from the root AP on a condition that the root AP correctly receives the message and associates an identifier of the end-STA with an identifier of the R-AP.

Classifications:

International (IPC 8-9): A62C13/62 B05B1/28 B05B7/02 B05B7/06 B05B7/08 B05B7/12 B05B7/24 B05D1/02 B05D7/00 B05D7/24 H04B7/155 H04J1/10 H04W40/24 H04W52/02 H04W84/04 H04W88/04 H04W88/08 (Advanced/Invention); H04W84/12 (Advanced/Non-invention)

CPC: H04W84/047 H04W36/08 H04W84/12 H04W40/244 B05B7/066 B05B7/12 B05B7/247 B05B7/2478 B05D1/02 B05D7/53 B05B7/0815 B05B7/2429 H04W52/0216 H04W52/0229 Y02D70/1226 Y02D70/1242 Y02D70/1244 Y02D70/1246 Y02D70/1262 Y02D70/1264 Y02D70/142 Y02D70/144 Y02D70/146 Y02D70/164 Y02D70/23 H04B7/15507 Y02B60/50 Y02D70/00

US: 239/418 370/315 427/372.2 427/402 427/421.1 427/427.2

**Family:**

Publication number	Publication date	Application number	Application date
CN104919889 A	20150916	CN201480004653	20140110
CN105451824 A	20160330	CN201480032589	20140610
EP2944156 A1	20151118	EP20140702362	20140110
EP3003506 A2	20160413	EP20140807971	20140610
EP3003506 A4	20170222	EP20140807971	20140610
JP2016524532 T2	20160818	JP20160517697T	20140610
TW201440567 A	20141016	TW20140100939	20140110
US2015358067 AA	20151210	US20140760103	20140110
US2016121347 AA	20160505	US20140896140	20140610
US2018054250 AA	20180222	US20170784992	20171016
US9793975 BB	20171017	US20140760103	20140110
WO14110361 A1	20140717	WO2014US11031	20140110
WO14195794 A2	20141211	WO2014IB01011	20140610
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Priority:

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US20130832102P 20130606	US20130832192P 20130607	US20130832194P 20130607
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US20140896140 20140610	US20150760103 20150709	US20170784992 20171016

Probable Assignee: INTERDIGITAL PATENT HOLDINGS INC

Assignee(s): (std): AXALTA COATING SYSTEMS IP CO ; INTERDIGITAL PATENT HOLDINGS INC ; INTERDIGITAL PATENT HOLDINGS ; COATINGS FOREIGN IP CO LLC

Assignee(s): AXALTA COATING SYSTEMS IP CO LLC ; BARCLAYS BANK PLC COLLATERAL AGENT AS ; COATINGS FOREIGN IP CO

Inventor(s): (std): GRANDHI SUDHEER ; GRANDHI SUDHEER A ; LOU HAN QING ; LOU HANQING ; WANG XIAOFEI ; ZHANG GUO DONG ; ZHANG GUODONG ; DELSARD BERT

Agent(s): BADEL XAVIER CLAUDE YVES; MAIWALD PATENTANWALTS GMBH; INO SARI; NISHIJIMA TAKAKI; MATSUSHITA MITSURU; KURASAWA ICHIRO; DESHIMARU TAKESHI; VOLPE AND KOENIG PC; GELMAN STEVEN J; HENSCHIED DEBORAH K ET AL

Designated states: AE AG AL AM AO AT AU AZ BA BB BE BF BG BH BJ BN BR BW BY BZ CA CF CG CH CI CL CM CN CO CR CU CY CZ DE DK DM DO DZ EC EE EG ES FI FR GA GB GD GE GH GM GN GQ GR GT GW HN HR HU ID IE IL IN IR IS IT JP KE KG KM KN KP KR KZ LA LC LI LK LR LS LT LU LV LY MA MC MD ME MG MK ML MN MR MT MW MX MY MZ NA NE NG NI NL NO NZ OM PA PE PG PH PL PT QA RO RS RU RW SA SC SD SE SG SI SK SL SM SN ST SV SY SZ TD TG TH TJ TM TN TR TT TZ UA UG US UZ VC VN ZA ZM ZW

Title: METHOD AND APPARATUS FOR SENDING VERY HIGH THROUGHPUT WLAN ACKNOWLEDGMENT FRAMES

Abstract: One of a normal acknowledgement (ACK) and block ACK may be selectively enabled for wireless transmissions using a Very High Throughput Physical Layer Protocol Data Unit (PPDU). At least one designated bit may be set in a Physical Layer header of the PPDU for transmission from a transmitter to a receiver to indicate an ACK type selected from at least two of a normal ACK, a Block ACK, or no ACK. The PPDU may be transmitted in a Very High Throughput frame to the receiver where the designated bit can be used to provoke a normal ACK or Block ACK response to the PPDU, depending on the bit value.

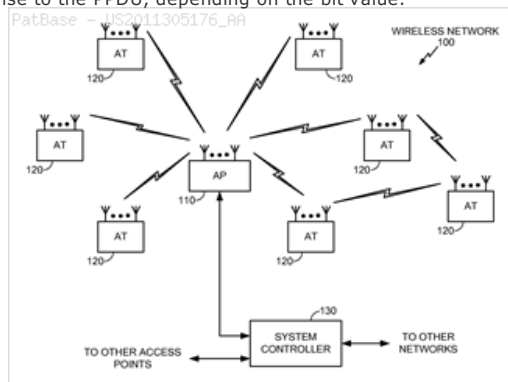
Classifications:

International (IPC 8-9): H04J3/24 H04L1/16 H04L1/18 H04L12/801 H04L29/08 H04W28/04 H04W28/06 H04W28/12 H04W80/00 (Advanced/Invention)

CPC: H04L47/14 H04W28/12 H04L1/1607 H04L1/1621 H04L1/1812 H04L1/1861

European: H04L1/16F

US: 1/1 370/310 370/310P 370/474 370/474S



Family:

Publication number	Publication date	Application number	Application date
CN102948101 A	20130227	CN201180029419	20110615
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EP2583401 A1	20130424	EP20110728133	20110615
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JP2013536599 T2	20130919	JP20130515489T	20110615
JP2015097389 A2	20150521	JP20140228458	20141110
JP5680748 B2	20150304	JP20130515489T	20110615
JP6092178 B2	20170308	JP20140228458	20141110
KR101509127 B1	20150407	KR20137000954	20110615
KR101685073 B1	20161209	KR20147021807	20110615
KR20130021442 A	20130305	KR20137000954	20110615
KR20140103359 A	20140826	KR20147021807	20110615
US20111305176 AA	20111215	US20110160398	20110614
US9337961 BB	20160510	US20110160398	20110614
WO11159831 A1	20111222	WO2011US40575	20110615

Priority:

US20100355114P 20100615 US20110160398 20110614 JP20130515489 20110615
JP20130515489T 20110615 WO2011US40575 20110615

Probable Assignee: QUALCOMM INC

Assignee(s): (std): QUALCOMM INC ; WENTINK MAARTEN MENZO

Assignee(s): QUALCOMM INCORPORATED

Inventor(s): (std): WENTINK MAARTEN MENZO ; MAARTEN MENZO WENTINK

Agent(s): HOWE STEVEN; KEVIN T; KETCHUM JOHN J

Designated states: AE AG AL AM AO AT AU AZ BA BB BE BF BG BH BJ BR BW BY BZ CA CF CG CH CI CL CM CN CO CR CU CY CZ DE DK DM DO DZ EC EE EG ES FI FR GA GB GD GE GH GM GN GQ GR GT GW HN HR HU ID IE IL IN IS IT JP KE KG KM KN KP KR KZ LA LC LI LK LR LS LT LU LV LY MA MC MD ME MG MK ML MN MR MT MW MX MY MZ NA NE NG NI NL NO NZ OM PE PG PH PL PT RO RS RU SC SD SE SG SI SK SL SM SN ST SV SY SZ TD TG TH TJ TM TN TR TT TZ UA UG US UZ VC VN ZA ZM ZW

Title: METHOD AND APPARATUS FOR RECEIVING DOWNLINK FRAME IN WIRELESS LAN

Abstract: A method and an apparatus for receiving a downlink frame in a wireless LAN are disclosed. The method and apparatus for receiving a downlink frame in a wireless LAN may comprises the steps of: an STA receiving from an AP a downlink frame via a downlink dedicated channel; and the STA transmitting to the AP a response frame related to the downlink frame via the downlink dedicated channel. The downlink dedicated channel allows transmission only of a contention-free downlink frame by the AP and a response frame by the STA, and restricts transmission of an independent uplink frame by the STA, wherein the independent uplink frame may be an uplink frame other than a response frame among uplink frames that are transmitted from the STA to the AP.

Classifications:

International (IPC 8-9): H04W72/04 H04W72/14 H04W74/00 H04W74/04

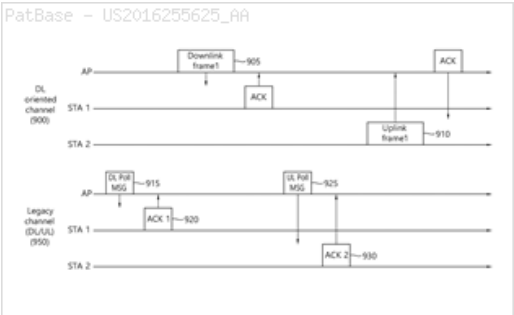
H04W84/12 (Advanced/Invention);

H04W84/12 (Advanced/Non-invention)

CPC: H04W74/002 H04W84/12 H04W74/004 H04W72/14 H04W72/042

H04W72/0446 H04W74/006 H04W74/04

US: 370/336



Family:

Publication number	Publication date	Application number	Application date
■ KR20160070065 A	20160617	KR20167009306	20141010
■ US2016255625 AA	20160901	US20140026210	20141010
■ US9820300 BB	20171114	US20140026210	20141010
■ WO15053581 A1	20150416	WO2014KR09521	20141010

Priority:

US20130889537P 20131011 US20130895375P 20131024 US20130901406P 20131107
WO2014KR09521 20141010 US20140026210 20141010

Probable Assignee: LG ELECTRONICS INC

Assignee(s): (std): LG ELECTRONICS INC

Inventor(s): (std): CHO HANGYU ; KIM JEONGKI ; KIM SUHWOOK ; PARK GIWON ; RYU KISEON

Agent(s): LEE HONG DEGERMAN KANG AND WAIMEY PC; S AND IP PATENT AND LAW FIRM

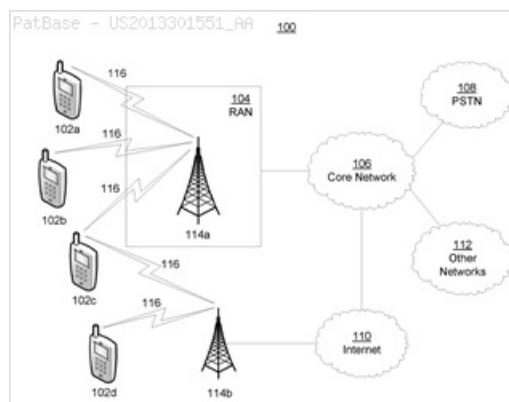
Designated states: AE AG AL AM AO AT AU AZ BA BB BE BF BG BH BJ BN BR BW BY BZ CA CF CG CH CI CL CM CN CO CR CU CY CZ DE DK DM DO DZ EC EE EG ES FI FR GA GB GD GE GH GM GN GQ GR GT GW HN HR HU ID IE IL IN IR IS IT JP KE KG KM KN KP KR KZ LA LC LK LR LS LT LU LV LY MA MC MD ME MG MK ML MN MR MT MW MX MY MZ NA NE NG NI NL NO NZ OM PA PE PG PH PL PT QA RO RS RU RW SA SC SD SE SG SI SK SL SM SN ST SV SY SZ TD TG TH TJ TM TN TR TT TZ UA UG US UZ VC VN ZA ZM ZW

Abstract: WTRUs, access points (APs) and methods thereon are disclosed. A method on a WTRU may include receiving a message from an AP that comprises a beamformer capability element; sending a second message to the AP that comprises a beamformer capability element; and receiving, from the AP, a third message in response to the second message that indicates a group to which the WTRU is assigned. The group may be based on the beamformer capability element and the group may indicate UL transmission information to be used by the WTRU. A method on an AP may include determining a group for multiple WTRUs based on a received beamformer capability element. A method on a WTRU may include sending to an AP a message with a low overhead preamble for UL MU-MIMO. The low overhead preamble may include LTFs that enable the AP to distinguish the WTRU from other WTRUs.

International (pc 8-9): H04B1/38 H04B17/00 H04B7/04 H04B7/0408 H04B7/0413 H04B7/0452 H04B7/0456 H04B7/06 H04B7/08 H04J99/00 H04L1/06 H04L27/26 H04W16/28 H04W4/08 H04W52/14 H04W52/36 H04W72/04 H04W72/12 H04W8/24 H04W84/12 H04W88/08 H04W88/10 H04W88/12 (Advanced/Invention)

CPC: H04B7/0404 H04B7/0628 H04B7/0643 H04W52/146 H04W52/365
H04W56/004 H04B17/12 H04B7/0408 H04B7/0413 H04B7/0851
H04B7/066 H04L27/266 H04W88/08 H04W84/12 H04B7/0452
H04W72/042

US: 370/329



Publication number	Publication date	Application number	Application date
CN104272605 A	20150107	CN201380024144	20130315
CN104272605 B	20170929	CN201380024144	20130315
CN107579761 A	20180112	CN201710791811	20130315
EP2853036 A1	20150401	EP20130714426	20130315
JP2015522974 T2	20150806	JP20150511466T	20130315
JP2017005739 A2	20170105	JP20160153588	20160804
JP2018023117 A2	20180208	JP20170160583	20170823
JP5986298 B2	20160906	JP20150511466T	20130315
KR20150008470 A	20150122	KR20147034577	20130315
KR20160149295 A	20161227	KR20167034201	20130315
KR20170089937 A	20170804	KR20177020571	20130315
TW201407973 A	20140216	TW20130109249	20130315
TW201810965 A	20180316	TW20170116189	20130315
US2013301551 AA	20131114	US20130838915	20130315
US2017294953 AA	20171012	US20170628096	20170620
WO13169389 A1	20131114	WO20130532321	20130315

US20120644872P	20120509	CN201380024144	20130315	JP20150511466T	20130315
JP20160153588	20130315	US20130838915	20130315	WO2013US23231	20130315
JP20160153588	20160804	US20170628096	20170620	JP20170160583	20170823

Assignee(s): (std): INTERDIGITAL PATENT HOLDINGS ; INTERDIGITAL PATENT HOLDINGS INC

Inventor(s): (std): FRANK LE THETA ; GHOSH MONISHA ; H LIU ; LA SITA FRANK ; LOU HAN QING ; LOU HANQING ; MONISHA GHOSH ; NIRAV B SHAH ; SHAH NIRAV B ; WANG XIAOFEI ; X WANG ; ZHANG GUO DONG ; ZHANG GUODONG

Agent(s): KOCI MAGNUS LOVE FRITIOF; TANI AND ABE PC; GRACE GREGORY R

Designated states: AE AG AL AM AO AT AU AZ BA BB BE BF BG BH BJ BN BR BW BY BZ CA CF CG CH CI CL CM CN CO CR CU CY CZ DE DK DM DO DZ EC EE EG ES FI FR GA GB GD GE GH GM GN GQ GR GT GW HN HR HU ID IE IL IN IS IT JP KE KG KM KN KP KR KZ LA LC LI LK LR LS LT LU LV LY MA MC MD ME MG MK ML MN MR MT MW MX MY MZ NA NE NG NI NL NO NZ OM PA PE PG PH PL PT QA RO RS RU SC SD SE SG SI SK SL SM SN ST SV SY SZ TD TG TH TJ TM TR TT TZ UA UG US UZ VC VN ZA ZM ZW

Title: METHOD AND APPARATUS FOR SUPPORTING COORDINATED ORTHOGONAL BLOCK-BASED RESOURCE ALLOCATION (COBRA) OPERATIONS

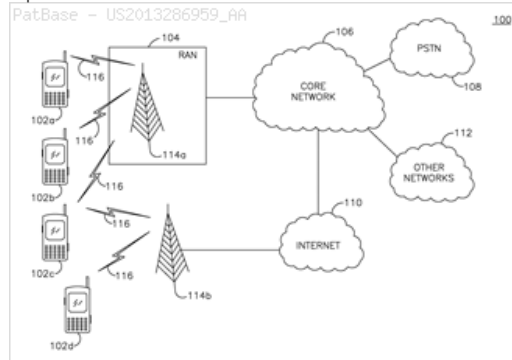
Abstract: A method and apparatus may be configured to support coordinated orthogonal block-based resource allocation (COBRA) operations. An access point (AP) may be configured to indicate to a plurality of stations (STA)s that it may support COBRA. Each WTRU may be configured to indicate to the AP that it can support COBRA as well. The AP may be configured to transmit a COBRA controller information element (IE) comprising a plurality of fields to each of the WTRUs. Each WTRU may be configured to transmit a COBRA controller IE comprising a plurality of fields. STA grouping management, group maintenance, channel access, beamforming, sounding and frequency and synchronization procedures are also described.

Classifications:

International (IPC 8-9): H04J11/00 H04J99/00 H04L27/01 H04L5/00 H04W28/04 H04W72/04 H04W74/00 H04W74/04 H04W74/08 H04W84/12 (Advanced/Invention)

CPC: H04W72/04 H04L5/0023 H04L5/003 H04L5/0055 H04W74/006 H04W72/042

US: 370/329 370/338

**Family:**

Publication number	Publication date	Application number	Application date
CN104321998 A	20150128	CN201380022857	20130314
EP2845342 A1	20150311	EP20130714102	20130314
JP2015520973 T2	20150723	JP20150510269T	20130314
JP2016154340 A2	20160825	JP20160041523	20160303
JP5898376 B2	20160406	JP20150510269T	20130314
JP6251762 B2	20171220	JP20160041523	20160303
KR20150013640 A	20150205	KR20147033475	20130314
KR20170001730 A	20170104	KR20167036200	20130314
TW201352039 A	20131216	TW20130109128	20130314
US2013286959 AA	20131031	US20130826402	20130314
WO13165582 A1	20131107	WO2013US31388	20130314

Priority:

US20120640219P 20120430 US20120724438P 20121109 US20130751453P 20130111
JP20150510269T 20130314 US20130826402 20130314 WO2013US31388 20130314
JP20160041523 20160303

Probable Assignee: INTERDIGITAL PATENT HOLDINGS INC

Assignee(s): (std): INTERDIGITAL PATENT HOLDINGS ; INTERDIGITAL PATENT HOLDINGS INC

Inventor(s): (std): FRANK LE THETA ; HANQING LOU ; LOU HAN QING ; MONISHA GHOSH ; NIRAV B SHAH ; ROBERT L OLSEN ; RONALD G MURIAS ; ZHANG GUO DONG ; ZHANG GUODONG ; WANG XIAOFEI ; SHAH NIRAV B ; OLESEN ROBERT L ; MURIAS RONALD G ; LOU HANQING ; LA SITA FRANK ; GHOSH MONISHA

Agent(s): JOHANSSON MAGNUS; TANI AND ABE PC; MASKERI NEIL C

Designated states: AE AG AL AM AO AT AU AZ BA BB BE BF BG BH BJ BN BR BW BY BZ CA CF CG CH CI CL CM CN CO CR CU CY CZ DE DK DM DO DZ EC EE EG ES FI FR GA GB GD GE GH GM GN GQ GR GT GW HN HR HU ID IE IL IN IS IT JP KE KG KM KN KP KR KZ LA LC LI LK LR LS LT LU LV LY MA MC MD ME MG MK ML MN MR MT MW MX MY MZ NA NE NG NI NL NO NZ OM PA PE PG PH PL PT QA RO RS RU RW SC SD SE SG SI SK SL SM SN ST SV SY SZ TD TG TH TJ TM TN TR TT TZ UA UG US UZ VC VN ZA ZM ZW

Title: METHOD, APPARATUS, AND COMPUTER PROGRAM PRODUCT FOR WIRELESS SIGNALING

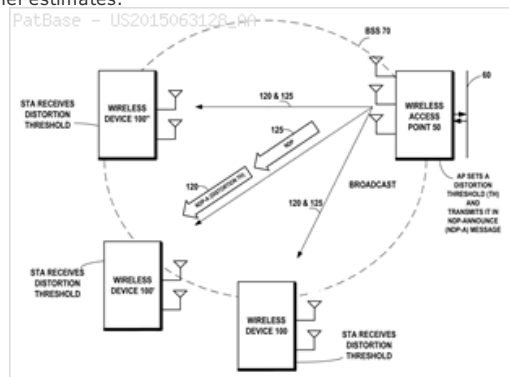
Abstract: Embodiments of the invention provide signaling mechanisms for wireless networks composed of a large number of stations. An example method embodiment comprises: storing, by a wireless device, a prior channel estimate that was previously transmitted to another wireless device in a wireless network; receiving, by the wireless device, a request message from the other device, to determine a distortion between a current channel estimate and the prior channel estimate and compare the determined distortion to a distortion threshold value, the request message being a broadcast request message or a measurement request message and the distortion value being either included in the request message, received in another message, or a preconfigured value; determining, by the wireless device, the distortion between the current channel estimate and the prior channel estimate and comparing the determined distortion to the distortion threshold value; and transmitting, by the wireless device, one or more parallel or sequential messages to the other device, indicating presence of the determined distortion greater than the distortion threshold value or indicating an inability to determine a distortion in channel estimates.

Classifications:

International (IPC 8-9): H04B1/00 H04W24/08 (Advanced/Invention)

CPC: H04B7/0417 H04B7/0452 H04B7/063 H04L25/0202

US: 370/252 370/312 370/346 370/432 370/449 370/462 375/141 375/219 375/267



Family:

Publication number	Publication date	Application number	Application date
US2015063128 AA	20150305	US20130010921	20130827
US9008152 BB	20150414	US20130010921	20130827

Priority:

US20130010921 20130827

Probable Assignee: NOKIA TECHNOLOGIES OY

Assignee(s): (std): NOKIA CORP ; NOKIA TECHNOLOGIES OY

Inventor(s): (std): CHOUDHURY SAYANTAN ; GARIKIPATI KRISHNA C

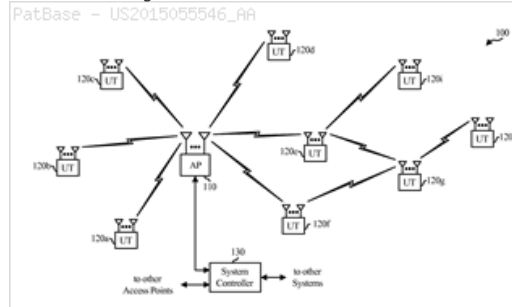
Agent(s): BANNER AND WITCOFF LTD

Title: TRANSMIT OPPORTUNITY (TXOP) SHARING

Abstract: Certain aspects of the present disclosure provide methods and apparatus for indicating whether or not transmit opportunity (TXOP) sharing is allowed. An exemplary method generally includes generating a frame; indicating, via a value of at least one bit of a field of the frame, whether to allow transmit opportunity (TXOP) sharing during which a relay is allowed to forward the frame in the same TXOP in which the frame was transmitted; and transmitting the frame.

Classifications:

International (IPC 8-9): H04B7/15 H04B7/155 H04J11/00 H04L1/00 H04L1/18 H04L5/00 H04W28/02 H04W28/06 H04W28/16 H04W72/04 H04W74/04 H04W80/02 H04W84/12 H04W88/04 H04W92/10 (Advanced/Invention);
H04L1/00 H04L1/18 H04W84/12 (Advanced/Non-invention)
CPC: H04B7/15528 H04W72/042 H04L5/0055 H04W72/0446 H04L1/1887 H04L2001/0097 H04L1/18 H04W28/02 H04W28/16 H04W84/12
US: 370/315 370/329

**Family:**

Publication number	Publication date	Application number	Application date
CN105474690 A	20160406	CN201480046111	20140821
DE602014005891 D1	20170216	DE201460005891T	20140821
EP3036934 A2	20160629	EP20140759083	20140821
EP3036934 B1	20161228	EP20140759083	20140821
EP3125605 A1	20170201	EP20160182604	20140821
ID201705323 A	20170519	ID2016P0001322	20140821
IN201647002154 A	20160708	IN201647002154	20160120
JP2016534634 T2	20161104	JP20160536434T	20140821
JP6321174 B2	20180509	JP20160536434T	20140821
KR101800401 B1	20171122	KR20167006468	20140821
KR20160044508 A	20160425	KR20167006468	20140821
US2015055546 AA	20150226	US20140464542	20140820
WO15027016 A2	20150226	WO2014US52007	20140821
WO15027016 A3	20150416	WO2014US52007	20140821

Priority:

US20130868578P 20130821 US20130869061P 20130822 US20130871303P 20130828
US20140464542 20140820 EP20140759083 20140821 WO2014US52007 20140821

Probable Assignee: QUALCOMM INC

Assignee(s): (std): QUALCOMM INC

Assignee(s): QUALCOMM INC SAN DIEGO

Inventor(s): (std): JAFARIAN AMIN ; ASTERJADHI ALFRED

Inventor(s): JAFARIAN AMIN PRINCETON ; ASTERJADHI ALFRED SAN DIEGO

Agent(s): WAGNER AND GEYER PARTNERSCHAFT MBB PATENT U RECHTSANWALTE; WAGNER AND GEYER; ANNISA AM BADAR SH LLM; READ RANDOL W ET AL

Designated states: AE AG AL AM AO AT AU AZ BA BB BE BF BG BH BJ BN BR BW BY BZ CA CF CG CH CI CL CM CN CO CR CU CY CZ DE DK DM DO DZ EC EE EG ES FI FR GA GB GD GE GH GM GN GQ GR GT GW HN HR HU ID IE IL IN IR IS IT JP KE KG KM KN KP KR KZ LA LC LI LK LR LS LT LU LV LY MA MC MD ME MG MK ML MN MR MT MW MX MY MZ NA NE NG NI NL NO NZ OM PA PE PG PH PL PT QA RO RS RU RW SA SC SD SE SG SI SK SL SM SN ST SV SY SZ TD TG TH TJ TM TN TR TT TZ UA UG US UZ VC VN ZA ZM ZW

Title: ASSOCIATION LIMIT IN RELAY NETWORK

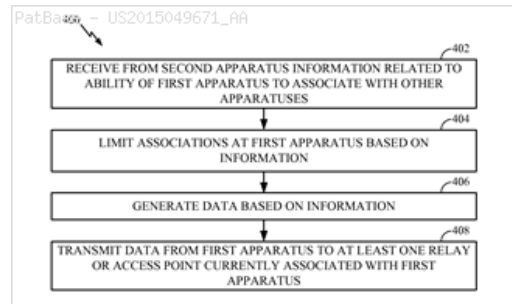
Abstract: A method, an apparatus, and a computer program product for wireless communication are provided. In aspect, a first apparatus receives from a second apparatus information related to an ability of the second apparatus to associate with other apparatuses, and limits associations at the first apparatus based on the information. In another aspect, the first apparatus associates with a second apparatus, and transmits to the second apparatus information that indicates a number of desirable associations at the second apparatus.

Classifications:

International (IPC 8-9): H04B1/16 H04B7/15 H04B7/26 H04J99/00
H04W28/10 H04W40/22 H04W40/24 H04W76/02 H04W84/22
H04W88/04 (Advanced/Invention)

CPC: H04W28/10 H04B1/16 H04B7/2606 H04W40/24 H04W40/22
H04W76/023 H04W76/10

US: 370/328

**Family:**

Publication number	Publication date	Application number	Application date
BR112016003602 A2	20170801	BR20161103602	20140812
CA2918128 AA	20160112	CA20142918128	20140812
CN105474559 A	20160406	CN201480045647	20140812
EP3036842 A1	20160629	EP20140758027	20140812
ID201708407 A	20170804	ID2016P0000876	20140812
IN201647001146 A	20160805	IN201647001146	20160112
JP2016534630 T2	20161104	JP20160536298T	20140812
KR20160044507 A	20160425	KR20167006465	20140812
US2015049671 AA	20150219	US20140457056	20140811
WO15026560 A1	20150226	WO2014US50657	20140812

Priority:

US20130867586P 20130819 US20140457056 20140811 WO2014US50657 20140812

Probable Assignee: QUALCOMM INC

Assignee(s): (std): QUALCOMM INC

Assignee(s): TIMARIU LUIZA ; ABRAHAM SANTOSH PAUL ; CHERIAN GEORGE ; JAFARIAN AMIN ; PATIL ABHISHEK PRAMOD

Inventor(s): (std): ABRAHAM SANTOSH PAUL ; CHERIAN GEORGE ; JAFARIAN AMIN ; PATIL ABHISHEK PRAMOD ; TIMARIU LUIZA

Inventor(s): ABHISHEK PRAMOD PATIL ; SANTOSH PAUL ABRAHAM ; LUIZA TIMARIU ; GEORGE CHERIAN ; AMIN JAFARIAN

Agent(s): SMART AND BIGGAR; KLANG ALEXANDER H; NADIA AM BADAR SH; GELFOUND CRAIG A ET AL

Designated states: AE AG AL AM AO AT AU AZ BA BB BE BF BG BH BJ BN BR BW BY BZ CA CF CG CH CI CL CM CN CO CR CU CY CZ DE DK DM DO DZ EC EE EG ES FI FR GA GB GD GE GH GM GN GQ GR GT GW HN HR HU ID IE IL IN IR IS IT JP KE KG KM KN KP KR KZ LA LC LI LK LR LS LT LU LV LY MA MC MD ME MG MK ML MN MR MT MW MX MY MZ NA NE NG NI NL NO NZ OM PA PE PG PH PL PT QA RO RS RU RW SA SC SD SE SG SI SK SL SM SN ST SV SY SZ TD TG TH TJ TM TN TR TT TZ UA UG US UZ VC VN ZA ZM ZW

Title: METHOD AND SYSTEM FOR ENHANCED CONTENTION AVOIDANCE IN MULTI-USER MULTIPLE-INPUT-MULTIPLE-OUTPUT WIRELESS NETWORKS

Abstract: Wireless medium reservation for simultaneous transmission of multiple downlink spatial streams to multiple receiver wireless stations during a multi-user transmit opportunity over a wireless medium, is provided. Such a reservation includes reserving a transmission period for simultaneously transmitting data from a transmitting station to multiple intended receiving stations on multiple downlink spatial streams over a wireless communication medium. Reserving the transmission period includes transmitting a multi-user request-to-send (MU-RTS) frame to the multiple receiving stations, the RTS frame including a receiver address (RA) field comprising compressed addresses for the multiple receiving stations. The MU-RTS frame includes an indication field that indicates the RTS frame as an MU-RTS without altering the RTS frame type/subtype.

Classifications:

International (IPC 8-9): H04L12/413 H04W72/04 H04W74/08

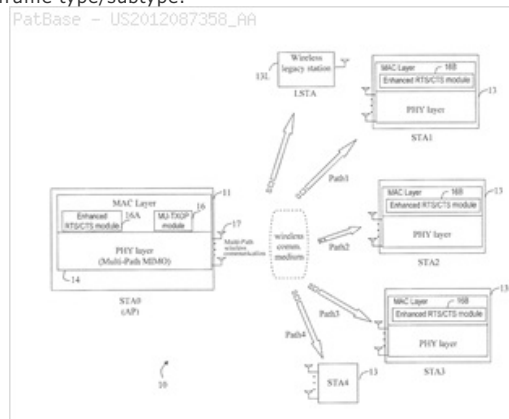
H04W92/00 (Advanced/Invention);

H04L12/43 H04W72/00 H04W74/00 (Advanced/Non-invention)

CPC: H04W72/042 H04W74/006 H04W72/005 H04W72/0413 H04W74/0816

European: H04W74/08B2 T04W72/00B T04W72/04F2

US: 370/338 370/338P 370/445 370/447 370/458 370/461 370/462



Family:

Publication number	Publication date	Application number	Application date
US2012087358 AA	20120412	US20110253926	20111005
US8917743 BB	20141223	US20110253926	20111005

Priority:

US20100390559P 20101006 US20110253926 20111005

Probable Assignee: SAMSUNG ELECTRONICS CO LTD

Assignee(s): (std): ABOUL MAGD OSAMA ; KIM YOUNGSOO ; SAMSUNG ELECTRONICS CO LTD ; ZHU CHUNHUI

Assignee(s): SAMSUNG ELECTRONICS CO

Inventor(s): (std): ABOUL MAGD OSAMA ; KIM YOUNGSOO ; ZHU CHUNHUI

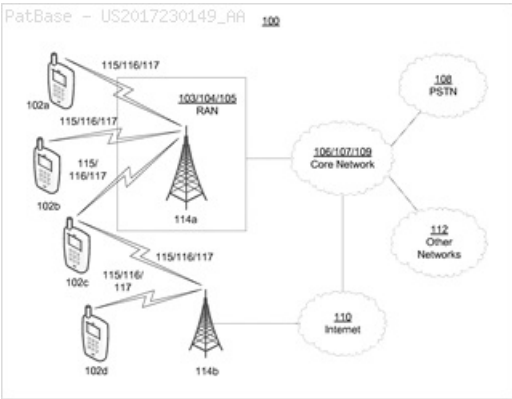
Agent(s): MICHAEL; SHERMAN AND ZARRABIAN LLP; KENNETH L

Title: SYSTEMS AND METHODS FOR SMART HARQ FOR WIFI

Abstract: Systems, methods, and instrumentalities are provided to implement a method of communicating a feedback in a wireless local area network (WLAN). A WLAN device may receive a data frame with a hybrid automatic repeat request (HARQ) data indicator in a frame header. The WLAN device may send an acknowledgement frame when the data frame is correctly received and decoded. The WLAN device may send a negative acknowledgement frame when the data frame is not correctly received and decoded.

Classifications:

International (IPC 8-9): H04L1/00 H04L1/06 H04L1/12 H04L1/16 H04L1/18 H04L12/70 H04W72/04 (Advanced/Invention)
CPC: H04L1/1614 H04L1/0057 H04L1/0618 H04L1/1664 H04L1/1819 H04L1/1822 H04L1/1864 H04L1/188 H04W84/12



Family:

Publication number	Publication date	Application number	Application date
TW201519596 A	20150516	TW20140123952	20140711
US2017230149 AA	20170810	US20140903620	20140711
WO15006640 A1	20150115	WO2014US46274	20140711

Priority:

US20130845092P 20130711 US20130845101P 20130711 WO2014US46274 20140711
US20140903620 20140711

Probable Assignee: INTERDIGITAL PATENT HOLDINGS INC

Assignee(s): (std): INTERDIGITAL PANTENT HOLDINGS INC ; INTERDIGITAL PATENT HOLDINGS ; INTERDIGITAL PATENT HOLDINGS INC

Inventor(s): (std): WANG XIADFEI ; ZHANG GUODONG ; ZHANG GUO DONG ; XIA PENGFEI ; XIA PENG FEI ; WANG XIAOFEI ; SHAH NIRAV B ; OTERI OGHENEKOME ; OLESEN ROBERT L ; LOU HANQING ; LOU HAN QING ; GHOSH MONISHA

Agent(s): ROCCIA VINCENT J ET AL

Designated states: AE AG AL AM AO AT AU AZ BA BB BE BF BG BH BJ BN BR BW BY BZ CA CF CG CH CI CL CM CN CO CR CU CY CZ DE DK DM DO DZ EC EE EG ES FI FR GA GB GD GE GH GM GN GQ GR GT GW HN HR HU ID IE IL IN IR IS IT JP KE KG KM KN KP KR KZ LA LC LK LR LS LT LU LV LY MA MC MD ME MG MK ML MN MR MT MW MX MY MZ NA NE NG NI NL NO NZ OM PA PE PG PH PL PT QA RO RS RU RW SA SC SD SE SG SI SK SL SM SN ST SV SY SZ TD TG TH TJ TM TN TR TT TZ UA UG US UZ VC VN ZA ZM ZW

Title: MULTI-USER TRANSMISSION DURING REVERSE DIRECTION GRANT

Abstract: Certain aspects of the present disclosure provide methods and apparatus for multiuser transmission during a grant to utilize unused portion of a transmit opportunity (TXOP) that is assigned to an initiator device. A responder device may receive, from an initiator device, at least one grant to utilize unused portion of the TXOP. In response to the grant and during the unused portion of the TXOP, The responder device may transmit a first message intended for the to the initiator device, and one or more messages intended for one or more other stations using multi-user transmission schemes. The messages transmitted to stations other than the initiator device may include an indication that the station does not need to respond (e.g., with an acknowledgment) upon receipt of the message.

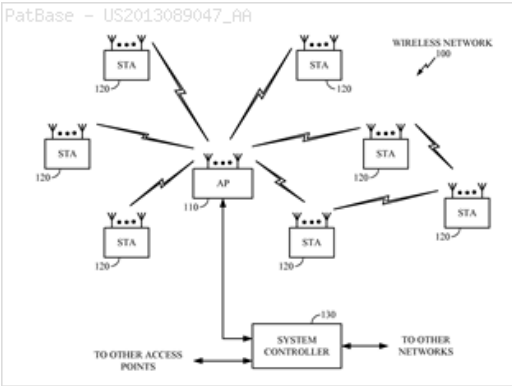
Classifications:

International (IPC 8-9): H04W72/04 H04W72/14

H04W74/06 (Advanced/Invention)

CPC: H04W74/06

US: 1/1 370/329



Family:

Publication number	Publication date	Application number	Application date
US2013089047 AA	20130411	US20120648873	20121010
US9179476 BB	20151103	US20120648873	20121010
WO13055943 A1	20130418	WO2012US59791	20121011

Priority:

US20110545799P 20111011 US20120648873 20121010

Probable Assignee: QUALCOMM INC

Assignee(s): (std): QUALCOMM INC

Inventor(s): (std): WENTINK MAARTEN MENZO

Agent(s): DANG M; VO DANG M

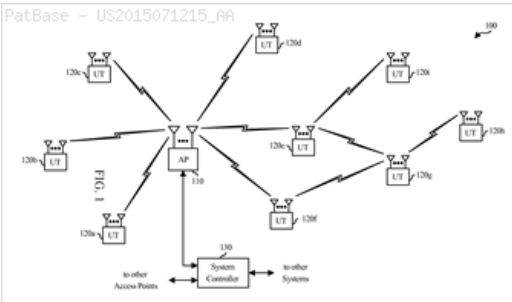
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Title: MIDPACKET DETECTION SCHEMES FOR CLEAR CHANNEL ASSESSMENT (CCA)

Abstract: Certain aspects of the present disclosure provide methods and apparatus for detecting ongoing transmissions and assessing channel state, based on midpacket detection. One example method generally includes receiving signals on a primary channel; detecting, based on the received signals, occurrence or non-occurrence of a first ongoing packet transmission on a primary channel; and generating at least one of a busy signal or an idle signal based on the detection. In this manner, collisions may be avoided.

Classifications:

International (IPC 8-9): H04L27/00 H04L5/00 H04W24/08 H04W4/00
H04W52/02 H04W74/08 (Advanced/Invention);
H04L5/00 H04W84/12 (Advanced/Non-invention)
CPC: H04W24/08 H04L5/001 H04L27/0006 H04W52/0216 H04W52/0229
H04W74/0825 H04W84/12 Y02D70/142 Y02D70/164 Y02D70/00
US: 1/1 370/329



Family:

Publication number	Publication date	Application number	Application date
US2015071215 AA	20150312	US20140466031	20140822
US9439091 BB	20160906	US20140466031	20140822
WO15034700 A1	20150312	WO2014US52491	20140825

Priority:

US20130874972P 20130906 US20140466031 20140822

Probable Assignee: QUALCOMM INC

Assignee(s): (std): QUALCOMM INC

Inventor(s): (std): BAIK EUGENE JONG HYON ; TIAN BIN ; TIAN TAO ; VERMANI SAMEER

Agent(s): PATTERSON AND SHERIDAN LLP; READ RANDOL W ET AL

Designated states: AE AG AL AM AO AT AU AZ BA BB BE BF BG BH BJ BN BR BW BY BZ CA CF CG CH CI CL CM CN CO CR CU CY CZ DE DK DM DO DZ EC EE EG ES FI FR GA GB GD GE GH GM GN GQ GR GT GW HN HR HU ID IE IL IN IR IS IT JP KE KG KM KN KP KR KZ LA LC LK LR LS LT LU LV LY MA MC MD ME MG MK ML MN MR MT MW MX MY MZ NA NE NG NI NL NO NZ OM PA PE PG PH PL PT QA RO RS RU RW SA SC SD SE SG SI SK SL SM SN ST SV SY SZ TD TG TH TJ TM TN TR TT TZ UA UG US UZ VC VN ZA ZM ZW

Title: METHOD AND APPARATUS FOR RESPONSE SCHEDULING IN A DOWNLINK MULTIPLE-USER MULTIPLE INPUT MULTIPLE OUTPUT NETWORK

Abstract: Embodiment and methods and apparatus for scheduling one or more responses for multiple stations (STAs) in a downlink multiple-user multiple-input-multiple-output (MIMO) network transmission are provided.

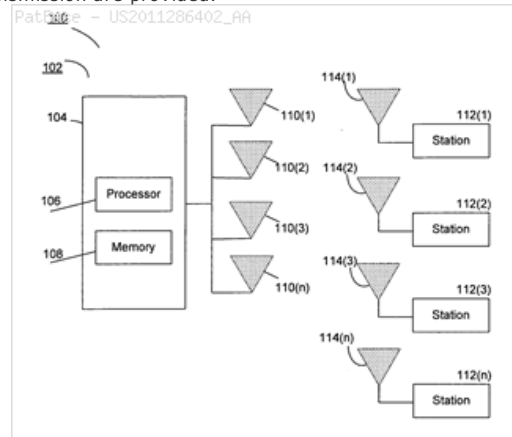
Classifications:

International (IPC 8-9): H04B7/04 H04J99/00 H04L1/00 H04L1/02 H04L1/06 H04L1/16 H04L1/18 H04W16/28 H04W28/02 H04W72/04 H04W72/12 H04W72/14 H04W80/02 (Advanced/Invention); H04L1/00 (Advanced/Non-invention)

CPC: H04W72/1231 H04L1/1685 H04W28/0268 H04W72/1294 H04B7/0413 H04B7/0697 H04L1/1887 H04L1/1896 H04L2001/0093 H04W72/1221 H04W72/1236 H04W72/1268 H04W72/1289 H04L1/1664 H04L1/1854

European: H04L1/16F17 H04L1/18T13 H04L1/18T7 H04W72/12B5D T04L1/00T1 T04W72/12B4 T04W72/12D2 T04W72/12F4

US: 370/230 370/329 370/329P 375/267 375/267S



Family:

Publication number	Publication date	Application number	Application date
CN102256368 A	20111123	CN201110141419	20110518
CN102256368 B	20150325	CN201110141419	20110518
EP2572550 A2	20130327	EP20110783918	20110425
EP2572550 A4	20170913	EP20110783918	20110425
JP2012015996 A2	20120119	JP20110110609	20110517
JP5532444 B2	20140625	JP20110110609	20110517
KR101422985 B1	20140723	KR20127030031	20110425
KR20130010013 A	20130124	KR20127030031	20110425
US2011286402 AA	20111124	US20100800558	20100518
US2015003239 AA	20150101	US20140326702	20140709
US8855063 BB	20141007	US20100800558	20100518
US9661648 BB	20170523	US20140326702	20140709
WO11146204 A2	20111124	WO2011US33773	20110425
WO11146204 A3	20120419	WO2011US33773	20110425

Priority:

US20100800558 20100518 WO2011US33773 20110425 US20140326702 20140709

Probable Assignee: INTEL CORP

Assignee(s): (std): GONG MICHELLE X ; GONG MICHELLE XIAOHONG ; INTEL CORP

Inventor(s): (std): GONG MICHELLE X ; GONG MICHELLE XIAOHONG ; MICHAEL XIAHONG GONG ; XIAOHONG GONG ; GONG XIAOHONG

Agent(s): HARRISON GODDARD FOOTE; RYUKA IP LAW FIRM; FOREFRONT IP LAWGROUP PLLC; FOREFRONT IP LAWGROUP OF CHRISTIE AND RIVERA PLLC; LEE LEWIS ET AL

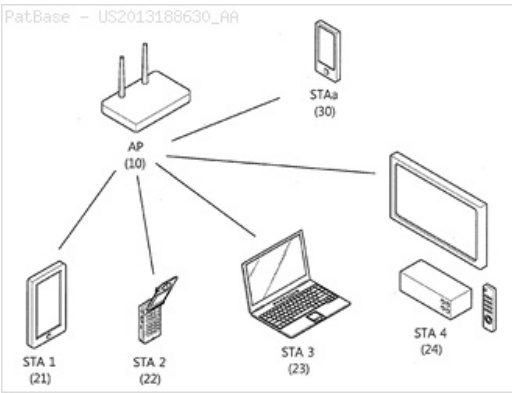
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Title: METHOD OF LINK ADAPTATION IN WIRELESS LOCAL AREA NETWORK AND APPARATUS FOR THE SAME

Abstract: A method of link adaptation in a wireless local area network is provided. The method includes requesting, by a requester, modulation and coding scheme (MCS) feedback to a plurality of responders, by transmitting a MCS request (MRQ) indicator, and, receiving, by the requester, feedback frames from each of the plurality of responders, wherein each of the feedback frame comprises MCS feedback (MFB) information.

Classifications:

International (IPC 8-9): H04B7/04 H04L1/16
H04W84/12 (Advanced/Invention);
H04L1/00 (Advanced/Non-invention)
CPC: H04W84/12 H04L1/0025 H04L1/1671 H04L1/1685
European: H04L1/16F15 H04L1/16F17 T04L1/00A9A
US: 370/338



Family:

Publication number	Publication date	Application number	Application date
US2013188630 AA	20130725	US20110878173	20111007
US9674890 BB	20170606	US20110878173	20111007
WO12047067 A2	20120412	WO2011KR07457	20111007
WO12047067 A3	20120531	WO2011KR07457	20111007

Priority:

US20100391092P 20101008 US20100394352P 20101019 US20100405199P 20101020
WO2011KR07457 20111007 US20110878173 20111007

Probable Assignee: LG ELECTRONICS INC

Assignee(s): (std): LEE DAE WON ; LG ELECTRONICS INC ; SEOK YONG HO ; SONG KYOUNG YOUNG

Inventor(s): (std): LEE DAE WON ; SEOK YONG HO ; SONG KYOUNG YOUNG

Agent(s): BIRCH STEWART KOLASCH AND BIRCH LLP; YANG MOON OCK

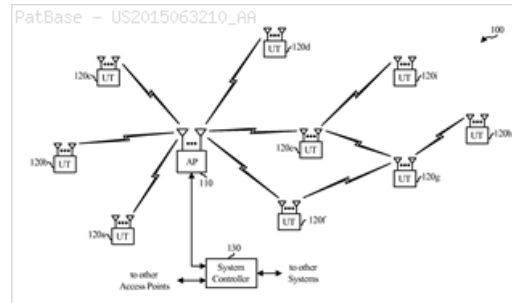
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Title: SPEED FRAME EXCHANGE RULES

Abstract: Certain aspects of the present disclosure provide methods and apparatus that may determine operation for speed frame exchange. According to certain aspects, a method for wireless communications by an apparatus is provided. The operations may be performed by a station, for example, by an access point initiating a speed frame exchange. The method generally includes indicating, via a value of at least one bit of a field of a frame of a sequence of frames being exchanged between the apparatus and a device, whether the apparatus is initiating a subsequent exchange of a sequence of frames, and transmitting the frame to the device.

Classifications:**International (IPC 8-9):** H04B7/26 H04J99/00 H04L12/931 H04W28/06

H04W52/02 H04W72/04 H04W72/12 H04W84/20 (Advanced/Invention)

CPC: H04B7/26 H04L49/20 H04W52/0229 H04W72/1278 H04W52/0216 Y02D70/00 Y02D70/142 Y02D70/164 Y02D70/449**US:** 370/328**Family:**

Publication number	Publication date	Application number	Application date
■ CN105493576 A	20160413	CN201480047137	20140829
■ EP3039920 A1	20160706	EP20140771437	20140829
■ ID201708909 A	20170818	ID2016P0001868	20140829
■ IN201647004045 A	20160831	IN201647004045	20160204
■ JP2016530825 T2	20160929	JP20160537880T	20140829
■ KR20160048900 A	20160504	KR20167008049	20140829
■ US2015063210 AA	20150305	US20140472019	20140828
■ WO15031715 A1	20150305	WO2014US53340	20140829

Priority:US20130872706P 20130831
WO2014US53340 20140829

US20130872721P 20130901

US20140472019 20140828

Probable Assignee: QUALCOMM INC**Assignee(s):** (std): QUALCOMM INC**Inventor(s):** (std): ASTERJADHI ALFRED ; JAFARIAN AMIN**Agent(s):** WIMMER HUBERT; READ RANDOL W ET AL

Designated states: AE AG AL AM AO AT AU AZ BA BB BE BF BG BH BJ BN BR BW BY BZ CA CF CG CH CI CL CM CN CO CR CU CY CZ DE DK DM DO DZ EC EE EG ES FI FR GA GB GD GE GH GM GN GQ GR GT GW HN HR HU ID IE IL IN IR IS IT JP KE KG KM KN KP KR KZ LA LC LI LK LR LS LT LU LV LY MA MC MD ME MG MK ML MN MR MT MW MX MY MZ NA NE NG NI NL NO NZ OM PA PE PG PH PL PT QA RO RS RU RW SA SC SD SE SG SI SK SL SM SN ST SV SY SZ TD TG TH TJ TM TN TR TT TZ UA UG US UZ VC VN ZA ZM ZW

Title: METHOD AND DEVICE FOR PROCESSING UPLINK SIGNAL IN WLAN SYSTEM

Abstract: Provided are a method and device for processing an uplink (UL) signal in a WLAN system. An access point (AP) receives a request to send (RTS) frame from one station (STA) among a plurality of STAs, transmits a group identifier (ID) of a group to which STAs for performing UL multi user multiple-input multiple-output (MU-MIMO) transmission together with the one STA, among group IDs of a group to which the one STA belongs, and receives UL signals from the STAs which perform the UL MU-MIMO transmission such that the received UL signals are processed.

Classifications:

International (IPC 8-9): H04B7/04 H04B7/26 H04L27/26 H04W4/00

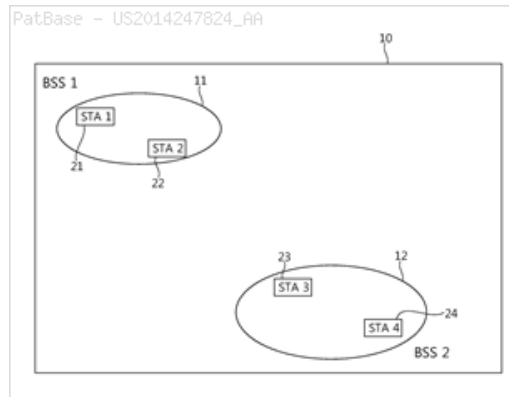
H04W74/00 (Advanced/Invention);

H04B7/0452 H04W8/18 (Advanced/Non-invention)

CPC: H04L27/2601 H04B7/2612 H04B7/0413 H04B7/0452 H04W8/186

H04W74/002

US: 370/338



Family:

Publication number	Publication date	Application number	Application date
KR20140084171 A	20140704	KR20147012749	20121011
US2014247824 AA	20140904	US20120351134	20121011
US9729367 BB	20170808	US20120351134	20121011
WO13055117 A2	20130418	WO2012KR08246	20121011
WO13055117 A3	20130704	WO2012KR08246	20121011

Priority:

US20110547048P 20111014

US20120351134 20121011

WO2012KR08246 20121011

Probable Assignee: LG ELECTRONICS INC

Assignee(s): (std): LG ELECTRONICS INC ; UNIV KOREA RES AND BUS FOUND

Assignee(s): KOREA UNIV RESEARCH AND BUSINESS ; KOREA UNIV RESEARCH AND BUSINESS FOUNDATION ; KOREA UNIVERSITY RESEARCH AND BUSINESS ; KOREA UNIVERSITY RESEARCH AND BUSINESS FOUNDATION

Inventor(s): (std): LEE INKYU ; SONG CHANG ICK ; SOHN ILL SOO ; SEOK YONG HO ; PARK HAE WOOK ; LEE IN KYU ; KONG HAN BAE

Agent(s): LEE HONG DEGERMAN KANG WAIMEY; S AND IP PATENT AND LAW FIRM

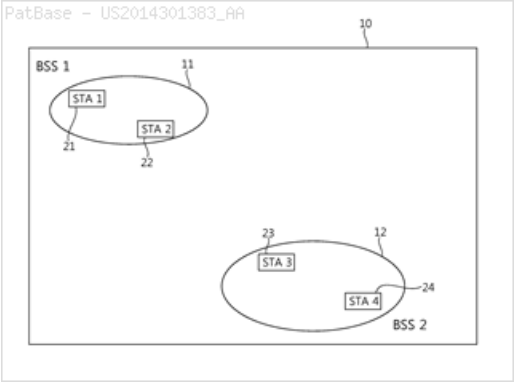
Designated states: AE AG AL AM AO AT AU AZ BA BB BE BF BG BH BJ BN BR BW BY BZ CA CF CG CH CI CL CM CN CO CR CU CY CZ DE DK DM DO DZ EC EE EG ES FI FR GA GB GD GE GH GM GN GQ GR GT GW HN HR HU ID IE IL IN IS IT JP KE KG KM KN KP KR KZ LA LC LK LR LS LT LU LV LY MA MC MD ME MG MK ML MN MR MT MW MX MY MZ NA NE NG NI NL NO NZ OM PA PE PG PH PL PT QA RO RS RU RW SC SD SE SG SI SK SL SM SN ST SV SY SZ TD TG TH TJ TM TN TR TT TZ UA UG US UZ VC VN ZA ZM ZW

Title: METHOD AND APAPRTUS FOR TRANSMITTING A FRAME IN A WIRELESS LAN SYSTEM

Abstract: The present invention relates to a method and apparatus for transmitting a frame in a wireless LAN system. An access point (AP) receives a single orthogonal frequency division multiplexing (OFDM) symbol from each of a plurality of stations (STA) and a single-tone request to send (sRTS) frame through a single subcarrier, selects STAs for performing uplink (UL) multiuser (MU)-multiple input multiple output (MIMO) transmission, and transmits to the plurality of STAs a single-tone clear to send (sCTS) frame allocated to the same subcarrier as a subcarrier to which the sRTS frames received from the selected STAs are allocated.

Classifications:

International (IPC 8-9): H04B7/04 H04B7/06 H04B7/26 H04J11/00
H04L27/26 H04Q9/00 (Advanced/Invention);
H04W84/12 (Advanced/Non-invention)
CPC: H04L27/2626 H04W84/12 H04B7/2612 H04J11/0069 H04J2011/0003
H04B7/0452 H04B7/0456 H04B7/0617 H04B7/0619
US: 1/1 370/338



Family:

Publication number	Publication date	Application number	Application date
KR20140095059 A	20140731	KR20147012750	20121016
US2014301383 AA	20141009	US20120352633	20121016
US9306785 BB	20160405	US20120352633	20121016
WO13058512 A1	20130425	WO2012KR08419	20121016

Priority:

US20110547756P 20111017 US20120352633 20121016 WO2012KR08419 20121016

Probable Assignee: KOREA UNIV RESEARCH AND BUSINESS FOUNDATION

Assignee(s): (std): LG ELECTRONICS INC ; UNIV KOREA RES AND BUS FOUND

Assignee(s): KOREA UNIV RESEARCH AND BUSINESS ; KOREA UNIV RESEARCH AND BUSINESS FOUNDATION ; KOREA UNIVERSITY RESEARCH AND BUSINESS ; KOREA UNIVERSITY RESEARCH AND BUSINESS FOUNDATION

Inventor(s): (std): KONG HAN BAE ; LEE IN KYU ; LEE INKYU ; PARK HAE WOOK ; SOHN ILL SOO ; SONG CHANG ICK

Agent(s): LEE HONG DEGERMAN KANG AND WAIMEY; S AND IP PATENT AND LAW FIRM

Designated states: AE AG AL AM AO AT AU AZ BA BB BE BF BG BH BJ BN BR BW BY BZ CA CF CG CH CI CL CM CN CO CR CU CY CZ DE DK DM DO DZ EC EE EG ES FI FR GA GB GD GE GH GM GN GQ GR GT GW HN HR HU ID IE IL IN IS IT JP KE KG KM KN KP KR KZ LA LC LK LR LS LT LU LV LY MA MC MD ME MG MK ML MN MR MT MW MX MY MZ NA NE NG NI NL NO NZ OM PA PE PG PH PL PT QA RO RS RU RW SC SD SE SG SI SK SL SM SN ST SV SY SZ TD TG TH TJ TM TN TR TT TZ UA UG US UZ VC VN ZA ZM ZW

Title: METHOD AND SYSTEM FOR BLOCK ACKNOWLEDGEMENT MECHANISM FOR MULTI-USER TRANSMISSIONS

Abstract: The present invention relates to the field of wireless communication and more particularly to acknowledgement mechanism for multi-user wireless network. An access point (AP) in a cellular wireless network group associated stations (STAs) to facilitate Multi User (MU) MIMO to achieve Very High Throughputs (VHT) in downlink. The AP transmits frames to multiple STAs simultaneously by using a beam forming technique. These transmissions need to solicit a Block Acknowledgement (BA) frames from multiple STAs. However the multiple STAs do not have knowledge to schedule transmission of their BA frames to the AP. The proposed invention provides a method and system to solicit BA from multiple STAs without any collision in MU MIMO transmission. Further the proposed invention provides an error recovery mechanism at the AP when any of the associated STA fails to receive MU MIMO transmission.

Classifications:

International (IPC 8-9): H04L1/00 (Advanced/Invention)

Family:

Publication number	Publication date	Application number	Application date
IN04040CH2011 A	20130621	IN2011CH04040	20111123

Probable Assignee: SAMSUNG INDIA SOFTWARE OPERATIONS PRIVATE LTD

Assignee(s): SAMSUNG INDIA SOFTWARE OPERATIONS PRIVATE LTD

Inventor(s): BHATT ANIRUDH ; DWARAKANATH PRADEEP ; KIM YOUNGSOO ; NANIYAT ARUN ; PATIL SANDHYA