

EXHIBIT B-4 – CHOUDHARY

Invalidity Chart for U.S. Patent No. 9,717,037 Based On U.S. Patent No. 9,161,293

This chart is subject to all reservations, objections, and disclaimers in Cisco's Invalidity Contentions and any amendment, supplement, or modification thereof, which are incorporated herein by reference in their entirety.

U.S. Patent No. 9,161,293 ("Choudhary") was filed on September 28, 2011 and issued on October 13, 2015. Thus, Choudhary is prior art under at least pre-AIA 35 U.S.C. § 102(e). Choudhary anticipates and/or renders obvious the Asserted Claims of U.S. Patent No. 9,717,037, at least as Cisco understands Golden Eye's application of the Asserted Claims in an effort to show infringement.

To the extent Golden Eye argues that any element below is not disclosed by Choudhary, a person of ordinary skill in the art would have found it obvious to combine the teachings of Choudhary with the background knowledge of a person of ordinary skill in the art and/or the additional references, and exemplary teachings, set forth in Cisco's Invalidity Contentions and accompanying charts. The chart below provides representative examples of where each element of each claim is found within Choudhary. Citations are meant to be exemplary, not exhaustive, and Cisco reserves the right to identify and discuss additional portions of the reference in support of their contentions and/or to rebut arguments made by Golden Eye. Citations to figures, drawings, tables, and the like include reference to any accompanying or related text. All internal cross references are meant to incorporate the cross-referenced material as if fully set forth therein. Where Cisco states that Choudhary "discloses" a limitation, that disclosure may be express, implicit, and/or inherent.

It is Cisco's position that Golden Eye's Infringement Contentions have not established that any accused product or service infringes any valid claim. Thus, Cisco's statements below should not be treated as an admission, implication, or suggestion that Cisco agrees with Golden Eye regarding either the scope, construction, or interpretation of any of the Asserted Claims or the infringement theories advanced by Golden Eye in its Infringement Contentions, including whether any Asserted Claim satisfies 35 U.S.C. §§ 101 or 112.

Golden Eye has yet to identify any limitation of the Asserted Claims that they contend is not anticipated and/or rendered obvious by Choudhary. Cisco therefore expressly reserves the right to respond to any such contention, including by identifying additional obviousness combinations, if Golden Eye makes any such contention.

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Claim Element	Disclosure of Claim Element in Choudhary
13[pre] An active scan method performed by an access point, the active scan method comprising:	<p>To the extent the preamble is limiting, Choudhary discloses, either expressly or inherently, an active scan method performed by an access point.</p> <p><i>See, e.g.,</i></p> <p>A method, apparatus and computer program product for using Received Signal Strength Indicator (RSSI) filtering to provide air-time optimization in wireless networks is presented. At least one message is received at an Access Point (AP) from a mobile unit (MU). A determination is made by the AP whether a received Signal Strength indicator (RSSI) associated with the at least one message from an MU is greater than a predetermined threshold. When the RSSI value associated with the at least one message from na MU is greater than to said predetermined threshold, then a response is generated by the AP and sent to the MU.</p> <p>Choudhary at Abstract.</p> <p>A wireless client (also referred to as a mobile device or mobile unit (MU)) scans the presence of desired SSID on a wireless medium on a given RF using active probing or passive scanning. A wireless device may include, but is not limited to a laptop computer, a cellular telephone, a tablet, a Personal Digital Assistant (PDA) or the like. In active probing, an MU sends an 802.11 broadcast probe request at a lowest supported data rate on a specific frequency and listens for a response from AP(s) on that frequency. The broadcast probe request may be heard by multiple APs on a given frequency. All the APs that hear the broadcast probe may send a unicast response to the wireless client that sent the probe request. Probe responses have almost the same information that is present in the AP beacon. The SSID is always present in the probe response. Probe responses are sent at the same data rate as beacons so they take almost the same time to transmit on the air as beacons. Since the probe responses are unicast, an AP may send one or more retries if the probe response is not acknowledged by the client. Probe responses and probe response retries decrease the wireless medium airtime available for application data communication.</p> <p>Choudhary at 1:16–36.</p>

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	<p>All clients must rely on active probing to detect the presence of SSIDs in their RF neighborhood since passive scanning alone may not be sufficient to detect the SSID in some scenarios. Also, because passive scanning time is unpredictable, most client implementations of RF neighborhood scanning depend on active probing. Hiding the SSID in the beacon is an option supported by 802.11 standard that leaves probing as the only option for client to discover presence of SSID in the RF neighborhood.</p> <p>Choudhary at 1:52–60.</p> <p>The received power of an AP signal (RSSI-AP) at an MU falls as it moves away from the AP. Data rates on the downlink depend on RSSI-AP values with higher downlink data rates possible at higher RSSI-AP values. The received power of an MU signal (RSSI-MU) at an AP falls as MU moves away from the AP. Data rates on the uplink depend on the RSSI-MU values with higher uplink data rates possible at higher RSSI-MU values. Data rates on the downlink depend on RSSI-AP values and higher downlink data rates are possible with higher RSSI-AP values.</p> <p>Choudhary at 5:61–6:3.</p> <p>Referring to FIG. 2A, a symmetric link is shown. In this scenario, both the uplink from the MU to the AP and the downlink from the AP to the MU occur at the same data rate. Here, the MU is in the highest data rate of the AP cell, while the AP is in the highest data rate of the MU cell.</p> <p>Choudhary at 6:4–8.</p> <p>Referring now to FIG. 3, an aggressive MU environment is shown. The MU is associated with AP-1 but aggressively probes other channels. The MU keeps sending broadcast/unicast probes to all the APs (AP-2, AP-3 and AP-4) in the neighboring cells. The APs send probe responses at lowest supported data rate consuming wireless medium bandwidth in their cell. Probe responses for 802.11n are very big and can take much longer time to transmit on the air. Each aggressive MU wastes bandwidth in multiple neighboring cells. Multiple MUs can compound this effect.</p> <p>Choudhary at 6:14–23.</p>

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Claim Element	Disclosure of Claim Element in Choudhary
	<p>Referring to FIG. 4, a sticky MU environment is shown. Here the MU is associated with AP-1 even though there is a much better option available (AP-2). The MU sends all communication with AP-1 at the lowest data rate wasting airtime in the AP-1's cell. Other MUs associated with the AP-1 (MU-2 and MU-3) suffer because of the non-aggressive MU. Eliminating lowest supported data rates can solve some of the problems associated with aggressive probing and lazy roaming. Eliminating lowest data rate reduces the effective AP cell size by eliminating outer zones that support lower data rate. Eliminating lowest data rates can completely prevent some clients from associating with the AP(s). Reducing AP radiated power reduces the effective AP cell size, however it also reduces the effective area per cell over which high data rate communication can occur. Reducing AP power makes the AP-MU link asymmetric since clients do not reduce the power (see FIG. 2B).</p> <p>Choudhary at 6:24–40.</p> <p>The presently disclosed invention utilizes RSSI filtering for selectively accepting or responding to an 802.11 frame based on RSSI or some metric derived from RSSI. An AP will respond to probes only when the probe request is received with sufficient RSSI, will accept authentication only when the RSSI is sufficiently high, and will acknowledge received frames based on some criterion derived from RSSI. RSSI filtering may also be used to dissociate clients based on some RSSI derived criterion. RSSI filtering provides additional control for the administrator besides those provided by eligible data rate set, AP power and directional antenna.</p> <p>Choudhary at 7:4–14.</p> <p>An AP radio is configured with an RSSI threshold for sending probe response. Probe responses are not sent if the received probe requests do not meet the required RSSI threshold. Effectively this is a way of testing if the client is close enough to the AP to benefit from associating with the AP. If the client is not close enough then there is no point indicating anything to the client since it won't associate with the AP anyway. Because of restrained probe responses, a client does not detect presence of an AP until it is close enough.</p> <p>Choudhary at 7:15–23.</p>

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Claim Element	Disclosure of Claim Element in Choudhary
	<div data-bbox="457 646 831 1033"></div> <p style="text-align: center;">FIGURE 5</p> <p>Choudhary at Fig. 5.</p> <p>Referring now to FIG. 5, the MU is associated with AP-1 but aggressively probes other channels. The MU keeps sending broadcast/unicast probes to all APs (AP-2, AP-3, and AP-4) in the neighboring cells. The APs send probe responses only if the received probe request is above a configured RSSI threshold. Since probe responses consume more air-time than probe request, selectively pruning out probe responses reduces airtime consumed by aggressive clients for probes. The AP radio is configured with an RSSI threshold for sending probe response. Additionally, it is possible to drop authentication requests that do not meet the required RSSI threshold at AP.</p> <p>Choudhary at 7:24–35.</p>

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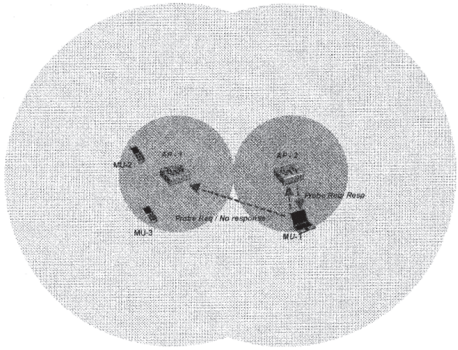
Claim Element	Disclosure of Claim Element in Choudhary
	<p>When a client sends active probes it will receive responses from closest AP(s) only as defined by configured RSSI threshold. If client determines the AP(s) based on passive scanning, then the authentication attempt to a far-away AP would fail. When a client roams away from an AP its RSSI level at the AP would drop. An AP can accumulate an average of some consecutive samples of the RSSI for the received frames from the client. When this average drops below a threshold then the AP radio can dissociate a client or a more advanced radio can deliberately stop 802.11 ACK for uplink frames from the client. A client in this case would either immediately start looking for another AP in its neighborhood (increased retries due to ACK failures) or will be dissociated for bad behavior and discover another AP nearby.</p> <p>Choudhary at 7:36–49.</p>  <p align="center">FIGURE 6</p> <p>Choudhary at Fig. 6.</p> <p>FIG. 6 shows where an MU scans all channels using active broadcast probing. AP-1 does not respond to probe request since the received RSSI is below the configured threshold for probes. AP-2 responds</p>

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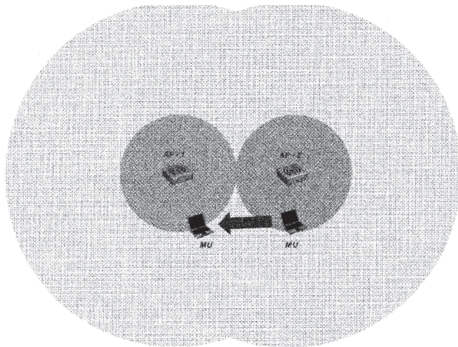
Claim Element	Disclosure of Claim Element in Choudhary
	<p>to the probe request. The MU discovers only AP-2 by active probing. MU-1 authenticates and associates with AP-2 which is the desired AP for MU-1 in this case.</p> <p>Choudhary at 7:50–56.</p> <p>FIG. 7 shows where an MU (MU-1) scans channels passively and hears an AP-1 beacon. The MU attempts to connect to AP-1 right away but fails because it does not meet the RSSI threshold required by AP-1. The MU now moves on to another frequency and discovers AP-2(s) beacon. The MU authenticates and associates with AP-2 which is the ideal AP for MU in this case.</p> <p>Choudhary at 7:57–63.</p> <div data-bbox="467 947 922 1291">A diagram showing a Mobile User (MU-1) represented by a small black rectangle at the bottom center. Two overlapping circles represent the signal range of two Access Points (AP-1 and AP-2). AP-1 is on the left and AP-2 is on the right. MU-1 is positioned between the two circles, closer to AP-1. Arrows point from MU-1 towards both AP-1 and AP-2, indicating scanning or signal reception. The circles overlap in the center, and the MU-1 is located within the overlapping area.</div> <p style="text-align: center;">FIGURE 8</p> <p>Choudhary at Fig. 8.</p>

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Claim Element	Disclosure of Claim Element in Choudhary
	<p>In FIG. 8, the MU is associated to AP-2 and starts roaming away from AP-2 towards AP-1. The RSSI received from MU at AP-2 decreases. The average RSSI over few consecutive samples also decreases. When the average RSSI drops below a threshold value, AP-2 stops sending ACK(s) for uplink 802.11 frames from the MU. It is also possible to penalize the MU for not roaming and simply send a dissociate to the MU. The MU detects an increase in retries on the uplink and probes other channels to find a nearby AP-1. The MU then associates with AP-1 and dissociates with AP-2.</p> <p>Choudhary at 7:64–8:6.</p> <p>Referring to FIG. 10, a particular embodiment of a method 100 for using Received Signal Strength Indicator (RSSI) filtering to provide air-time optimization in wireless networks is shown. This method relates to APs and unassociated mobile units. Method 100 begins with processing block 102 which discloses receiving at the AP at least one message from an unassociated mobile unit (MU) from which RSSI can be determined. As shown in processing block 104, in this embodiment the message comprises a probe request message and wherein the response comprises a probe response message.</p> <p>Choudhary at 9:60–10:3.</p>

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Claim Element	Disclosure of Claim Element in Choudhary
	<pre> graph TD 150 --> 152 152 --> 154 154 --> 156 156 --> 158 158 --> 160 160 --> 162 162 --> 164 164 --> 166 </pre> <p align="center">FIGURE 11</p> <p>Choudhary at Fig. 11.</p> <p>Referring now to FIG. 11 another particular embodiment of a method 150 for using Received Signal Strength Indicator (RSSI) filtering to provide air-time optimization in wireless networks is shown. This method relates to APs and associated mobile units. Method 150 begins with processing block 152 which discloses receiving at the AP at least one message from an associated mobile unit (MU). As</p>

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	<p>further shown in processing block 154 the receiving at the AP at least one message from an MU comprises receiving a predetermined number of consecutive frames from the AP.</p> <p>Choudhary at 10:22–31.</p> <p>Processing block 156 states determining whether a Received Signal Strength indicator (RSSI) associated with the at least one message from the associated MU is greater than a predetermined threshold. As shown in processing block 158, in one embodiment the determining whether an RSSI value associated with the at least one message from an associated MU is greater than a predetermined threshold comprises determining an average RSSI value of RSSI values associated with the predetermined number of consecutive frames from the AP and determining whether the average RSSI value is greater than the predetermined threshold. As shown in processing block 160, in certain deployments such as a pico-cell deployment the threshold is dependent upon a density of APs within an area. As shown in processing block 162, in certain embodiments the threshold is automatically tuned based on at least one criteria.</p> <p>Choudhary at 10:32–47.</p> <p>1.A computer-implemented method in which an Access Point (AP) performs operations comprising: receiving at said AP at least one probe request from an unassociated mobile unit (MU) from which a Received Signal Strength Indicator (RSSI) can be determined; determining whether the RSSI associated with said at least one probe request from the unassociated MU is greater than a RSSI_hi threshold, wherein said RSSI_hi threshold is dependent upon a density of APs within an area and wherein said RSSI_hi threshold is tuned for a pico-cell deployment to provide desired spacing of APs within said pico-cell; and responding to said at least one probe request from the unassociated MU when said RSSI value associated with said at least one probe request from the unassociated MU is greater than said predetermined RSSI_hi threshold.</p> <p>Choudhary at Claim 1.</p>

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Claim Element	Disclosure of Claim Element in Choudhary
	<p>To the extent Golden Eye argues that Choudhary does not disclose this limitation, it would have been obvious in view of the knowledge of a person of ordinary skill in the art and in view of the reference(s) identified in Cisco's Invalidity Contentions and the associated Exhibits, incorporated by reference herein. A person of ordinary skill would have been motivated to combine Choudhary with the identified reference(s) for the reasons discussed in the cover pleadings and associated Exhibits.</p>
<p>13[a] receiving a probe request frame from a station, the probe request frame including signal strength information of the station;</p>	<p>Choudhary discloses, either expressly or inherently, receiving a probe request frame from a station, the probe request frame including signal strength information of the station.</p> <p><i>See, e.g.,</i></p> <p>Embodiments of the invention significantly overcome such deficiencies and provide mechanisms and techniques that provide Received Signal Strength Indicator (RSSI) filtering to provide air-time optimization in wireless networks. In a particular embodiment the method includes receiving at the AP at least one message from a mobile unit (MU). The method further includes determining whether an RSSI value associated with the at least one message from a MU is greater than a predetermined threshold. The method additionally includes responding to the at least one message from a MU when the RSSI value associated with the at least one message from a MU is greater than to the predetermined threshold.</p> <p>Choudhary at 2:63–3:6.</p> <p>The received power of an AP signal (RSSI-AP) at an MU falls as it moves away from the AP. Data rates on the downlink depend on RSSI-AP values with higher downlink data rates possible at higher RSSI-AP values. The received power of an MU signal (RSSI-MU) at an AP falls as MU moves away from the AP. Data rates on the uplink depend on the RSSI-MU values with higher uplink data rates possible at higher RSSI-MU values. Data rates on the downlink depend on RSSI-AP values and higher downlink data rates are possible with higher RSSI-AP values.</p> <p>Choudhary at 5:61–6:3.</p> <p>Referring to FIG. 4, a sticky MU environment is shown. Here the MU is associated with AP-1 even though there is a much better option available (AP-2). The MU sends all communication with AP-1 at</p>

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	<p>the lowest data rate wasting airtime in the AP-1's cell. Other MUs associated with the AP-1 (MU-2 and MU-3) suffer because of the non-aggressive MU. Eliminating lowest supported data rates can solve some of the problems associated with aggressive probing and lazy roaming. Eliminating lowest data rate reduces the effective AP cell size by eliminating outer zones that support lower data rate. Eliminating lowest data rates can completely prevent some clients from associating with the AP(s). Reducing AP radiated power reduces the effective AP cell size, however it also reduces the effective area per cell over which high data rate communication can occur. Reducing AP power makes the AP-MU link asymmetric since clients do not reduce the power (see FIG. 2B).</p> <p>Choudhary at 6:24–40.</p> <p>The presently disclosed invention utilizes RSSI filtering for selectively accepting or responding to an 802.11 frame based on RSSI or some metric derived from RSSI. An AP will respond to probes only when the probe request is received with sufficient RSSI, will accept authentication only when the RSSI is sufficiently high, and will acknowledge received frames based on some criterion derived from RSSI. RSSI filtering may also be used to dissociate clients based on some RSSI derived criterion. RSSI filtering provides additional control for the administrator besides those provided by eligible data rate set, AP power and directional antenna.</p> <p>Choudhary at 7:4–14.</p> <p>An AP radio is configured with an RSSI threshold for sending probe response. Probe responses are not sent if the received probe requests do not meet the required RSSI threshold. Effectively this is a way of testing if the client is close enough to the AP to benefit from associating with the AP. If the client is not close enough then there is no point indicating anything to the client since it won't associate with the AP anyway. Because of restrained probe responses, a client does not detect presence of an AP until it is close enough.</p> <p>Choudhary at 7:15–23.</p>

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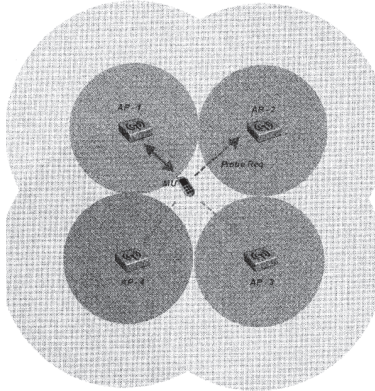
Claim Element	Disclosure of Claim Element in Choudhary
	 <p align="center">FIGURE 5</p> <p>Choudhary at Fig. 5.</p> <p>Referring now to FIG. 5, the MU is associated with AP-1 but aggressively probes other channels. The MU keeps sending broadcast/unicast probes to all APs (AP-2, AP-3, and AP-4) in the neighboring cells. The APs send probe responses only if the received probe request is above a configured RSSI threshold. Since probe responses consume more air-time than probe request, selectively pruning out probe responses reduces airtime consumed by aggressive clients for probes. The AP radio is configured with an RSSI threshold for sending probe response. Additionally, it is possible to drop authentication requests that do not meet the required RSSI threshold at AP.</p> <p>Choudhary at 7:24–35.</p> <p>When a client sends active probes it will receive responses from closest AP(s) only as defined by configured RSSI threshold. If client determines the AP(s) based on passive scanning, then the</p>

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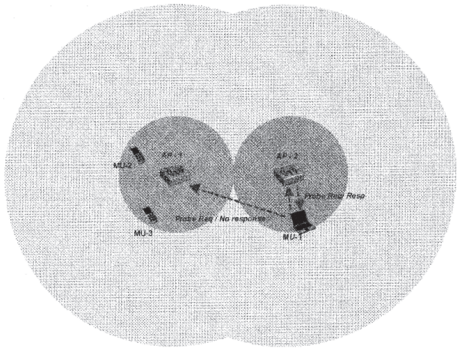
Claim Element	Disclosure of Claim Element in Choudhary
	<p>authentication attempt to a far-away AP would fail. When a client roams away from an AP its RSSI level at the AP would drop. An AP can accumulate an average of some consecutive samples of the RSSI for the received frames from the client. When this average drops below a threshold then the AP radio can dissociate a client or a more advanced radio can deliberately stop 802.11 ACK for uplink frames from the client. A client in this case would either immediately start looking for another AP in its neighborhood (increased retries due to ACK failures) or will be dissociated for bad behavior and discover another AP nearby.</p> <p>Choudhary at 7:36–49.</p>  <p align="center">FIGURE 6</p> <p>Choudhary at Fig. 6.</p> <p>FIG. 6 shows where an MU scans all channels using active broadcast probing. AP-1 does not respond to probe request since the received RSSI is below the configured threshold for probes. AP-2 responds to the probe request. The MU discovers only AP-2 by active probing. MU-1 authenticates and associates with AP-2 which is the desired AP for MU-1 in this case.</p>

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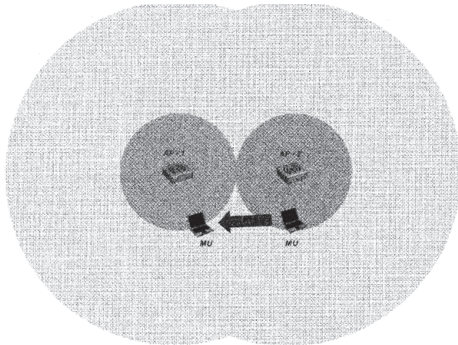
Claim Element	Disclosure of Claim Element in Choudhary
	<p>Choudhary at 7:50–56.</p> <p>FIG. 7 shows where an MU (MU-1) scans channels passively and hears an AP-1 beacon. The MU attempts to connect to AP-1 right away but fails because it does not meet the RSSI threshold required by AP-1. The MU now moves on to another frequency and discovers AP-2(s) beacon. The MU authenticates and associates with AP-2 which is the ideal AP for MU in this case.</p> <p>Choudhary at 7:57–63.</p>  <p style="text-align: center;">FIGURE 8</p> <p>Choudhary at Fig. 8.</p> <p>In FIG. 8, the MU is associated to AP-2 and starts roaming away from AP-2 towards AP-1. The RSSI received from MU at AP-2 decreases. The average RSSI over few consecutive samples also decreases.</p>

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Claim Element	Disclosure of Claim Element in Choudhary
	<p>When the average RSSI drops below a threshold value, AP-2 stops sending ACK(s) for uplink 802.11 frames from the MU. It is also possible to penalize the MU for not roaming and simply send a dissociate to the MU. The MU detects an increase in retries on the uplink and probes other channels to find a nearby AP-1. The MU then associates with AP-1 and dissociates with AP-2.</p> <p>Choudhary at 7:64–8:6.</p> <pre> graph TD 150 --> 152 152 --> 154 154 --> 156 156 --> 158 158 --> 160 160 --> 162 162 --> 164 164 --> 166 </pre> <p align="center">FIGURE 11</p>

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Claim Element	Disclosure of Claim Element in Choudhary
	<p>Choudhary at Fig. 11.</p> <p>Referring to FIG. 10, a particular embodiment of a method 100 for using Received Signal Strength Indicator (RSSI) filtering to provide air-time optimization in wireless networks is shown. This method relates to APs and unassociated mobile units. Method 100 begins with processing block 102 which discloses receiving at the AP at least one message from an unassociated mobile unit (MU) from which RSSI can be determined. As shown in processing block 104, in this embodiment the message comprises a probe request message and wherein the response comprises a probe response message.</p> <p>Choudhary at 9:60–10:3.</p> <p>Referring now to FIG. 11 another particular embodiment of a method 150 for using Received Signal Strength Indicator (RSSI) filtering to provide air-time optimization in wireless networks is shown. This method relates to APs and associated mobile units. Method 150 begins with processing block 152 which discloses receiving at the AP at least one message from an associated mobile unit (MU). As further shown in processing block 154 the receiving at the AP at least one message from an MU comprises receiving a predetermined number of consecutive frames from the AP.</p> <p>Choudhary at 10:22–31.</p> <p>Processing block 156 states determining whether a Received Signal Strength indicator (RSSI) associated with the at least one message from the associated MU is greater than a predetermined threshold. As shown in processing block 158, in one embodiment the determining whether an RSSI value associated with the at least one message from an associated MU is greater than a predetermined threshold comprises determining an average RSSI value of RSSI values associated with the predetermined number of consecutive frames from the AP and determining whether the average RSSI value is greater than the predetermined threshold. As shown in processing block 160, in certain deployments such as a pico-cell deployment the threshold is dependent upon a density of APs within an area. As shown in processing block 162, in certain embodiments the threshold is automatically tuned based on at least one criteria.</p> <p>Choudhary at 10:32–47.</p>

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Claim Element	Disclosure of Claim Element in Choudhary
	<p>1. A computer-implemented method in which an Access Point (AP) performs operations comprising: receiving at said AP at least one probe request from an unassociated mobile unit (MU) from which a Received Signal Strength Indicator (RSSI) can be determined; determining whether the RSSI associated with said at least one probe request from the unassociated MU is greater than a RSSI_{hi} threshold, wherein said RSSI_{hi} threshold is dependent upon a density of APs within an area and wherein said RSSI_{hi} threshold is tuned for a pico-cell deployment to provide desired spacing of APs within said pico-cell; and responding to said at least one probe request from the unassociated MU when said RSSI value associated with said at least one probe request from the unassociated MU is greater than said predetermined RSSI_{hi} threshold.</p> <p>Choudhary at Claim 1. <i>See also</i> Claim 10.</p> <p>To the extent Golden Eye argues that Choudhary does not disclose this limitation, it would have been obvious in view of the knowledge of a person of ordinary skill in the art and in view of the reference(s) identified in Cisco’s Invalidity Contentions and the associated Exhibits, incorporated by reference herein. A person of ordinary skill would have been motivated to combine Choudhary with the identified reference(s) for the reasons discussed in the cover pleadings and associated Exhibits.</p>
<p>13[b] acquiring information about uplink quality based on the signal strength information included in the probe request frame;</p>	<p>Choudhary discloses, either expressly or inherently, acquiring information about uplink quality based on the signal strength information included in the probe request frame.</p> <p><i>See, e.g.,</i></p> <p>The received power of an AP signal (RSSI-AP) at an MU falls as it moves away from the AP. Data rates on the downlink depend on RSSI-AP values with higher downlink data rates possible at higher RSSI-AP values. The received power of an MU signal (RSSI-MU) at an AP falls as MU moves away from the AP. Data rates on the uplink depend on the RSSI-MU values with higher uplink data rates possible at higher RSSI-MU values. Data rates on the downlink depend on RSSI-AP values and higher downlink data rates are possible with higher RSSI-AP values.</p> <p>Choudhary at 5:61–6:3.</p>

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Claim Element	Disclosure of Claim Element in Choudhary
	<p>Referring to FIG. 2A, a symmetric link is shown. In this scenario, both the uplink from the MU to the AP and the downlink from the AP to the MU occur at the same data rate. Here, the MU is in the highest data rate of the AP cell, while the AP is in the highest data rate of the MU cell.</p> <p>Choudhary at 6:4–8.</p> <p>Referring to FIG. 2B, an asymmetric link is shown. AP radiated power is reduced to achieve a smaller cell while client still transmits at its maximum power. In this case uplink transmission can occur at higher data rates compared to downlink transmission.</p> <p>Choudhary at 6:9–13.</p> <p>Referring to FIG. 4, a sticky MU environment is shown. Here the MU is associated with AP-1 even though there is a much better option available (AP-2). The MU sends all communication with AP-1 at the lowest data rate wasting airtime in the AP-1's cell. Other MUs associated with the AP-1 (MU-2 and MU-3) suffer because of the non-aggressive MU. Eliminating lowest supported data rates can solve some of the problems associated with aggressive probing and lazy roaming. Eliminating lowest data rate reduces the effective AP cell size by eliminating outer zones that support lower data rate. Eliminating lowest data rates can completely prevent some clients from associating with the AP(s). Reducing AP radiated power reduces the effective AP cell size, however it also reduces the effective area per cell over which high data rate communication can occur. Reducing AP power makes the AP-MU link asymmetric since clients do not reduce the power (see FIG. 2B).</p> <p>Choudhary at 6:24–40.</p> <p>An AP radio is configured with an RSSI threshold for sending probe response. Probe responses are not sent if the received probe requests do not meet the required RSSI threshold. Effectively this is a way of testing if the client is close enough to the AP to benefit from associating with the AP. If the client is not close enough then there is no point indicating anything to the client since it won't associate with the AP anyway. Because of restrained probe responses, a client does not detect presence of an AP until it is close enough.</p>

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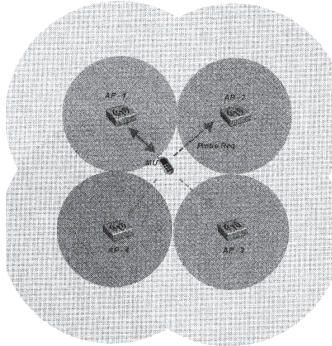
Claim Element	Disclosure of Claim Element in Choudhary
	<p>Choudhary at 7:15–23.</p>  <p style="text-align: center;"><i>FIGURE 5</i></p> <p>Choudhary at Fig. 5.</p> <p>The presently disclosed invention utilizes RSSI filtering for selectively accepting or responding to an 802.11 frame based on RSSI or some metric derived from RSSI. An AP will respond to probes only when the probe request is received with sufficient RSSI, will accept authentication only when the RSSI is sufficiently high, and will acknowledge received frames based on some criterion derived from RSSI. RSSI filtering may also be used to dissociate clients based on some RSSI derived criterion. RSSI filtering provides additional control for the administrator besides those provided by eligible data rate set, AP power and directional antenna.</p> <p>Choudhary at 7:4–14.</p>

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Claim Element	Disclosure of Claim Element in Choudhary
	<p>Referring now to FIG. 5, the MU is associated with AP-1 but aggressively probes other channels. The MU keeps sending broadcast/unicast probes to all APs (AP-2, AP-3, and AP-4) in the neighboring cells. The APs send probe responses only if the received probe request is above a configured RSSI threshold. Since probe responses consume more air-time than probe request, selectively pruning out probe responses reduces airtime consumed by aggressive clients for probes. The AP radio is configured with an RSSI threshold for sending probe response. Additionally, it is possible to drop authentication requests that do not meet the required RSSI threshold at AP.</p> <p>Choudhary at 7:24–35.</p> <p>When a client sends active probes it will receive responses from closest AP(s) only as defined by configured RSSI threshold. If client determines the AP(s) based on passive scanning, then the authentication attempt to a far-away AP would fail. When a client roams away from an AP its RSSI level at the AP would drop. An AP can accumulate an average of some consecutive samples of the RSSI for the received frames from the client. When this average drops below a threshold then the AP radio can dissociate a client or a more advanced radio can deliberately stop 802.11 ACK for uplink frames from the client. A client in this case would either immediately start looking for another AP in its neighborhood (increased retries due to ACK failures) or will be dissociated for bad behavior and discover another AP nearby.</p> <p>Choudhary at 7:36–49.</p>

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Claim Element	Disclosure of Claim Element in Choudhary
	<div data-bbox="462 619 917 955" data-label="Diagram"> </div> <p style="text-align: center;">FIGURE 6</p> <p>Choudhary at Fig. 6.</p> <p>FIG. 6 shows where an MU scans all channels using active broadcast probing. AP-1 does not respond to probe request since the received RSSI is below the configured threshold for probes. AP-2 responds to the probe request. The MU discovers only AP-2 by active probing. MU-1 authenticates and associates with AP-2 which is the desired AP for MU-1 in this case.</p> <p>Choudhary at 7:50–56.</p> <p>FIG. 7 shows where an MU (MU-1) scans channels passively and hears an AP-1 beacon. The MU attempts to connect to AP-1 right away but fails because it does not meet the RSSI threshold required by AP-1. The MU now moves on to another frequency and discovers AP-2(s) beacon. The MU authenticates and associates with AP-2 which is the ideal AP for MU in this case.</p> <p>Choudhary at 7:57–63.</p>

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Claim Element	Disclosure of Claim Element in Choudhary
	<div data-bbox="467 615 927 953" data-label="Diagram"> </div> <p align="center">FIGURE 8</p> <p>Choudhary at Fig. 8.</p> <p>In FIG. 8, the MU is associated to AP-2 and starts roaming away from AP-2 towards AP-1. The RSSI received from MU at AP-2 decreases. The average RSSI over few consecutive samples also decreases. When the average RSSI drops below a threshold value, AP-2 stops sending ACK(s) for uplink 802.11 frames from the MU. It is also possible to penalize the MU for not roaming and simply send a dissociate to the MU. The MU detects an increase in retries on the uplink and probes other channels to find a nearby AP-1. The MU then associates with AP-1 and dissociates with AP-2.</p> <p>Choudhary at 7:64–8:6.</p>

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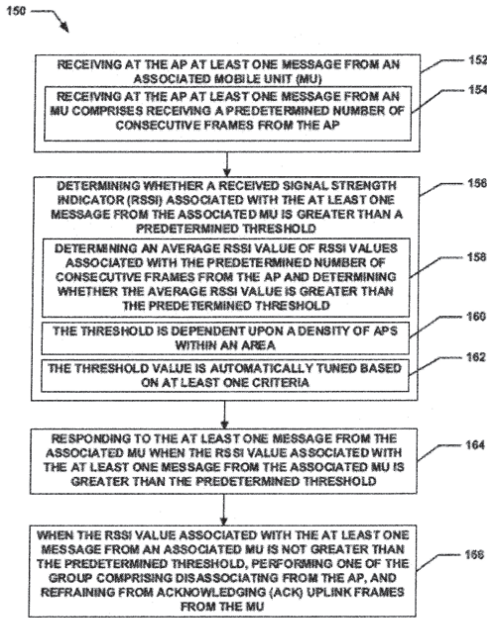
Claim Element	Disclosure of Claim Element in Choudhary
	 <p align="center">FIGURE 11</p> <p>Choudhary at Fig. 11.</p> <p>Referring now to FIG. 11 another particular embodiment of a method 150 for using Received Signal Strength Indicator (RSSI) filtering to provide air-time optimization in wireless networks is shown. This method relates to APs and associated mobile units. Method 150 begins with processing block 152 which discloses receiving at the AP at least one message from an associated mobile unit (MU). As</p>

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Claim Element	Disclosure of Claim Element in Choudhary
	<p>further shown in processing block 154 the receiving at the AP at least one message from an MU comprises receiving a predetermined number of consecutive frames from the AP.</p> <p>Choudhary at 10:22–31.</p> <p>Processing block 156 states determining whether a Received Signal Strength indicator (RSSI) associated with the at least one message from the associated MU is greater than a predetermined threshold. As shown in processing block 158, in one embodiment the determining whether an RSSI value associated with the at least one message from an associated MU is greater than a predetermined threshold comprises determining an average RSSI value of RSSI values associated with the predetermined number of consecutive frames from the AP and determining whether the average RSSI value is greater than the predetermined threshold. As shown in processing block 160, in certain deployments such as a pico-cell deployment the threshold is dependent upon a density of APs within an area. As shown in processing block 162, in certain embodiments the threshold is automatically tuned based on at least one criteria.</p> <p>Choudhary at 10:32–47.</p> <p>1.A computer-implemented method in which an Access Point (AP) performs operations comprising: receiving at said AP at least one probe request from an unassociated mobile unit (MU) from which a Received Signal Strength Indicator (RSSI) can be determined; determining whether the RSSI associated with said at least one probe request from the unassociated MU is greater than a RSSI_hi threshold, wherein said RSSI_hi threshold is dependent upon a density of APs within an area and wherein said RSSI_hi threshold is tuned for a pico-cell deployment to provide desired spacing of APs within said pico-cell; and responding to said at least one probe request from the unassociated MU when said RSSI value associated with said at least one probe request from the unassociated MU is greater than said predetermined RSSI_hi threshold.</p> <p>Choudhary at Claim 1. <i>See also</i> Claim 10.</p>

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Claim Element	Disclosure of Claim Element in Choudhary
	<p>To the extent Golden Eye argues that Choudhary does not disclose this limitation, it would have been obvious in view of the knowledge of a person of ordinary skill in the art and in view of the reference(s) identified in Cisco's Invalidity Contentions and the associated Exhibits, incorporated by reference herein. A person of ordinary skill would have been motivated to combine Choudhary with the identified reference(s) for the reasons discussed in the cover pleadings and associated Exhibits.</p>
<p>13[c] transmitting a probe response frame to the station based on whether the uplink quality satisfies a predetermined standard; and</p>	<p>Choudhary discloses, either expressly or inherently, transmitting a probe response frame to the station based on whether the uplink quality satisfies a predetermined standard.</p> <p><i>See, e.g.,</i></p> <p>The received power of an AP signal (RSSI-AP) at an MU falls as it moves away from the AP. Data rates on the downlink depend on RSSI-AP values with higher downlink data rates possible at higher RSSI-AP values. The received power of an MU signal (RSSI-MU) at an AP falls as MU moves away from the AP. Data rates on the uplink depend on the RSSI-MU values with higher uplink data rates possible at higher RSSI-MU values. Data rates on the downlink depend on RSSI-AP values and higher downlink data rates are possible with higher RSSI-AP values.</p> <p>Choudhary at 5:61–6:3.</p> <p>Referring now to FIG. 3, an aggressive MU environment is shown. The MU is associated with AP-1 but aggressively probes other channels. The MU keeps sending broadcast/unicast probes to all the APs (AP-2, AP-3 and AP-4) in the neighboring cells. The APs send probe responses at lowest supported data rate consuming wireless medium bandwidth in their cell. Probe responses for 802.11n are very big and can take much longer time to transmit on the air. Each aggressive MU wastes bandwidth in multiple neighboring cells. Multiple MUs can compound this effect.</p> <p>Choudhary at 6:14–23.</p> <p>Referring to FIG. 4, a sticky MU environment is shown. Here the MU is associated with AP-1 even though there is a much better option available (AP-2). The MU sends all communication with AP-1 at the lowest data rate wasting airtime in the AP-1's cell. Other MUs associated with the AP-1 (MU-2 and MU-3) suffer because of the non-aggressive MU. Eliminating lowest supported data rates can</p>

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Claim Element	Disclosure of Claim Element in Choudhary
	<p>solve some of the problems associated with aggressive probing and lazy roaming. Eliminating lowest data rate reduces the effective AP cell size by eliminating outer zones that support lower data rate. Eliminating lowest data rates can completely prevent some clients from associating with the AP(s). Reducing AP radiated power reduces the effective AP cell size, however it also reduces the effective area per cell over which high data rate communication can occur. Reducing AP power makes the AP-MU link asymmetric since clients do not reduce the power (see FIG. 2B).</p> <p>Choudhary at 6:24–40.</p> <p>The presently disclosed invention utilizes RSSI filtering for selectively accepting or responding to an 802.11 frame based on RSSI or some metric derived from RSSI. An AP will respond to probes only when the probe request is received with sufficient RSSI, will accept authentication only when the RSSI is sufficiently high, and will acknowledge received frames based on some criterion derived from RSSI. RSSI filtering may also be used to dissociate clients based on some RSSI derived criterion. RSSI filtering provides additional control for the administrator besides those provided by eligible data rate set, AP power and directional antenna.</p> <p>Choudhary at 7:4–14.</p> <p>An AP radio is configured with an RSSI threshold for sending probe response. Probe responses are not sent if the received probe requests do not meet the required RSSI threshold. Effectively this is a way of testing if the client is close enough to the AP to benefit from associating with the AP. If the client is not close enough then there is no point indicating anything to the client since it won't associate with the AP anyway. Because of restrained probe responses, a client does not detect presence of an AP until it is close enough.</p> <p>Choudhary at 7:15–23.</p>

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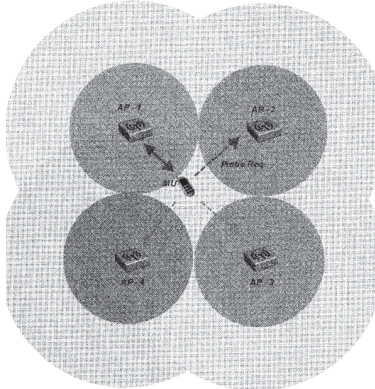
Claim Element	Disclosure of Claim Element in Choudhary
	 <p align="center">FIGURE 5</p> <p>Choudhary at Fig. 5.</p> <p>Referring now to FIG. 5, the MU is associated with AP-1 but aggressively probes other channels. The MU keeps sending broadcast/unicast probes to all APs (AP-2, AP-3, and AP-4) in the neighboring cells. The APs send probe responses only if the received probe request is above a configured RSSI threshold. Since probe responses consume more air-time than probe request, selectively pruning out probe responses reduces airtime consumed by aggressive clients for probes. The AP radio is configured with an RSSI threshold for sending probe response. Additionally, it is possible to drop authentication requests that do not meet the required RSSI threshold at AP.</p> <p>Choudhary at 7:24–35.</p> <p>When a client sends active probes it will receive responses from closest AP(s) only as defined by configured RSSI threshold. If client determines the AP(s) based on passive scanning, then the</p>

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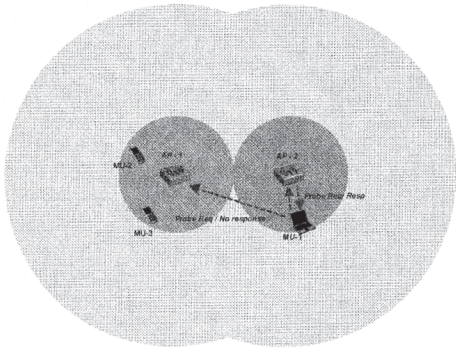
Claim Element	Disclosure of Claim Element in Choudhary
	<p>authentication attempt to a far-away AP would fail. When a client roams away from an AP its RSSI level at the AP would drop. An AP can accumulate an average of some consecutive samples of the RSSI for the received frames from the client. When this average drops below a threshold then the AP radio can dissociate a client or a more advanced radio can deliberately stop 802.11 ACK for uplink frames from the client. A client in this case would either immediately start looking for another AP in its neighborhood (increased retries due to ACK failures) or will be dissociated for bad behavior and discover another AP nearby.</p> <p>Choudhary at 7:36–49.</p>  <p align="center">FIGURE 6</p> <p>Choudhary at Fig. 6.</p> <p>FIG. 6 shows where an MU scans all channels using active broadcast probing. AP-1 does not respond to probe request since the received RSSI is below the configured threshold for probes. AP-2 responds to the probe request. The MU discovers only AP-2 by active probing. MU-1 authenticates and associates with AP-2 which is the desired AP for MU-1 in this case.</p>

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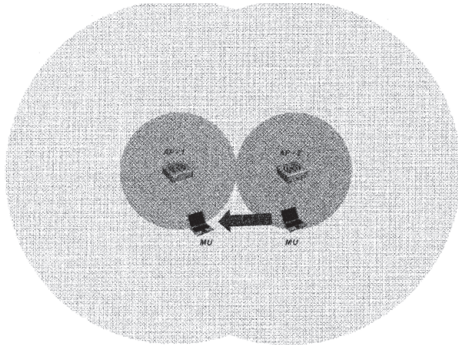
Claim Element	Disclosure of Claim Element in Choudhary
	<p>Choudhary at 7:50–56.</p> <p>FIG. 7 shows where an MU (MU-1) scans channels passively and hears an AP-1 beacon. The MU attempts to connect to AP-1 right away but fails because it does not meet the RSSI threshold required by AP-1. The MU now moves on to another frequency and discovers AP-2(s) beacon. The MU authenticates and associates with AP-2 which is the ideal AP for MU in this case.</p> <p>Choudhary at 7:57–63.</p>  <p align="center">FIGURE 8</p> <p>Choudhary at Fig. 8.</p> <p>In FIG. 8, the MU is associated to AP-2 and starts roaming away from AP-2 towards AP-1. The RSSI received from MU at AP-2 decreases. The average RSSI over few consecutive samples also decreases. When the average RSSI drops below a threshold value, AP-2 stops sending ACK(s) for uplink 802.11 frames from the MU. It is also possible to penalize the MU for not roaming and simply send a dissociate</p>

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Claim Element	Disclosure of Claim Element in Choudhary
	<p>to the MU. The MU detects an increase in retries on the uplink and probes other channels to find a nearby AP-1. The MU then associates with AP-1 and dissociates with AP-2.</p> <p>Choudhary at 7:64-8:6.</p> <pre> graph TD 150 --> 152 152 --> 154 154 --> 156 156 --> 158 158 --> 160 160 --> 162 162 --> 164 164 --> 166 </pre> <p>FIGURE 11</p> <p>Choudhary at Fig. 11.</p>

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Claim Element	Disclosure of Claim Element in Choudhary
	<p>Referring now to FIG. 11 another particular embodiment of a method 150 for using Received Signal Strength Indicator (RSSI) filtering to provide air-time optimization in wireless networks is shown. This method relates to APs and associated mobile units. Method 150 begins with processing block 152 which discloses receiving at the AP at least one message from an associated mobile unit (MU). As further shown in processing block 154 the receiving at the AP at least one message from an MU comprises receiving a predetermined number of consecutive frames from the AP.</p> <p>Choudhary at 10:22–31.</p> <p>Processing block 156 states determining whether a Received Signal Strength indicator (RSSI) associated with the at least one message from the associated MU is greater than a predetermined threshold. As shown in processing block 158, in one embodiment the determining whether an RSSI value associated with the at least one message from an associated MU is greater than a predetermined threshold comprises determining an average RSSI value of RSSI values associated with the predetermined number of consecutive frames from the AP and determining whether the average RSSI value is greater than the predetermined threshold. As shown in processing block 160, in certain deployments such as a pico-cell deployment the threshold is dependent upon a density of APs within an area. As shown in processing block 162, in certain embodiments the threshold is automatically tuned based on at least one criteria.</p> <p>Choudhary at 10:32–47.</p> <p>1. A computer-implemented method in which an Access Point (AP) performs operations comprising: receiving at said AP at least one probe request from an unassociated mobile unit (MU) from which a Received Signal Strength Indicator (RSSI) can be determined; determining whether the RSSI associated with said at least one probe request from the unassociated MU is greater than a RSSI_hi threshold, wherein said RSSI_hi threshold is dependent upon a density of APs within an area and wherein said RSSI_hi threshold is tuned for a pico-cell deployment to provide desired spacing of APs within said pico-cell; and responding to said at least one probe request from the unassociated MU when said RSSI value associated with said at least one probe request from the unassociated MU is greater than said predetermined RSSI_hi threshold.</p>

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Claim Element	Disclosure of Claim Element in Choudhary
	<p>Choudhary at Claim 1. <i>See also</i> Claim 10.</p> <p>To the extent Golden Eye argues that Choudhary does not disclose this limitation, it would have been obvious in view of the knowledge of a person of ordinary skill in the art and in view of the reference(s) identified in Cisco’s Invalidity Contentions and the associated Exhibits, incorporated by reference herein. A person of ordinary skill would have been motivated to combine Choudhary with the identified reference(s) for the reasons discussed in the cover pleadings and associated Exhibits.</p>
<p>13[d] granting access to the station based on the probe response frame and a maximum probe response time,</p>	<p>Choudhary discloses, either expressly or inherently, granting access to the station based on the probe response frame and a maximum probe response time.</p> <p><i>See, e.g.,</i></p> <p>The received power of an AP signal (RSSI-AP) at an MU falls as it moves away from the AP. Data rates on the downlink depend on RSSI-AP values with higher downlink data rates possible at higher RSSI-AP values. The received power of an MU signal (RSSI-MU) at an AP falls as MU moves away from the AP. Data rates on the uplink depend on the RSSI-MU values with higher uplink data rates possible at higher RSSI-MU values. Data rates on the downlink depend on RSSI-AP values and higher downlink data rates are possible with higher RSSI-AP values.</p> <p>Choudhary at 5:61–6:3.</p> <p>Referring now to FIG. 3, an aggressive MU environment is shown. The MU is associated with AP-1 but aggressively probes other channels. The MU keeps sending broadcast/unicast probes to all the APs (AP-2, AP-3 and AP-4) in the neighboring cells. The APs send probe responses at lowest supported data rate consuming wireless medium bandwidth in their cell. Probe responses for 802.11n are very big and can take much longer time to transmit on the air. Each aggressive MU wastes bandwidth in multiple neighboring cells. Multiple MUs can compound this effect.</p> <p>Choudhary at 6:14–23.</p>

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Claim Element	Disclosure of Claim Element in Choudhary
	<p>The presently disclosed invention utilizes RSSI filtering for selectively accepting or responding to an 802.11 frame based on RSSI or some metric derived from RSSI. An AP will respond to probes only when the probe request is received with sufficient RSSI, will accept authentication only when the RSSI is sufficiently high, and will acknowledge received frames based on some criterion derived from RSSI. RSSI filtering may also be used to dissociate clients based on some RSSI derived criterion. RSSI filtering provides additional control for the administrator besides those provided by eligible data rate set, AP power and directional antenna.</p> <p>Choudhary at 7:4–14.</p> <p>An AP radio is configured with an RSSI threshold for sending probe response. Probe responses are not sent if the received probe requests do not meet the required RSSI threshold. Effectively this is a way of testing if the client is close enough to the AP to benefit from associating with the AP. If the client is not close enough then there is no point indicating anything to the client since it won't associate with the AP anyway. Because of restrained probe responses, a client does not detect presence of an AP until it is close enough.</p> <p>Choudhary at 7:15–23.</p>

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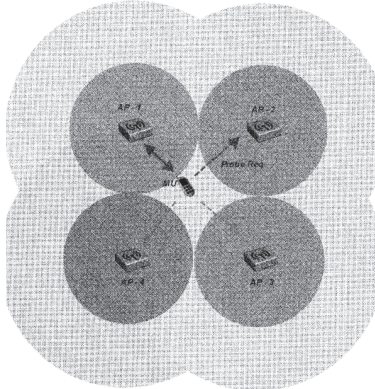
Claim Element	Disclosure of Claim Element in Choudhary
	 <p align="center">FIGURE 5</p> <p>Choudhary at Fig. 5.</p> <p>Referring now to FIG. 5, the MU is associated with AP-1 but aggressively probes other channels. The MU keeps sending broadcast/unicast probes to all APs (AP-2, AP-3, and AP-4) in the neighboring cells. The APs send probe responses only if the received probe request is above a configured RSSI threshold. Since probe responses consume more air-time than probe request, selectively pruning out probe responses reduces airtime consumed by aggressive clients for probes. The AP radio is configured with an RSSI threshold for sending probe response. Additionally, it is possible to drop authentication requests that do not meet the required RSSI threshold at AP.</p> <p>Choudhary at 7:24–35.</p> <p>When a client sends active probes it will receive responses from closest AP(s) only as defined by configured RSSI threshold. If client determines the AP(s) based on passive scanning, then the</p>

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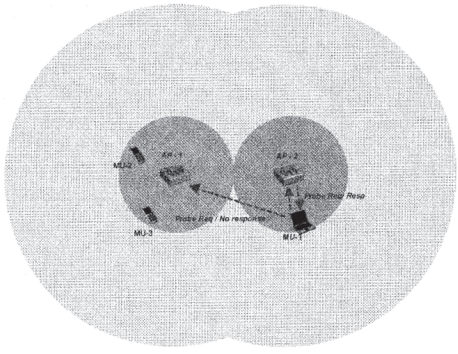
Claim Element	Disclosure of Claim Element in Choudhary
	<p>authentication attempt to a far-away AP would fail. When a client roams away from an AP its RSSI level at the AP would drop. An AP can accumulate an average of some consecutive samples of the RSSI for the received frames from the client. When this average drops below a threshold then the AP radio can dissociate a client or a more advanced radio can deliberately stop 802.11 ACK for uplink frames from the client. A client in this case would either immediately start looking for another AP in its neighborhood (increased retries due to ACK failures) or will be dissociated for bad behavior and discover another AP nearby.</p> <p>Choudhary at 7:36–49.</p>  <p align="center">FIGURE 6</p> <p>Choudhary at Fig. 6.</p> <p>FIG. 6 shows where an MU scans all channels using active broadcast probing. AP-1 does not respond to probe request since the received RSSI is below the configured threshold for probes. AP-2 responds to the probe request. The MU discovers only AP-2 by active probing. MU-1 authenticates and associates with AP-2 which is the desired AP for MU-1 in this case.</p>

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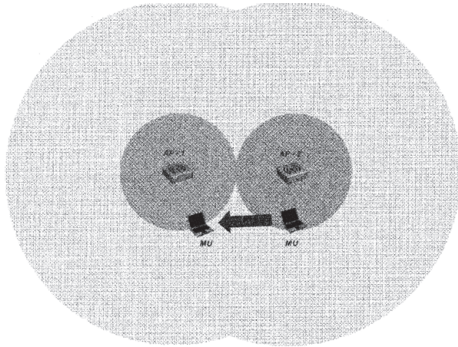
Claim Element	Disclosure of Claim Element in Choudhary
	<p>Choudhary at 7:50–56.</p>  <p style="text-align: center;">FIGURE 8</p> <p>Choudhary at Fig. 8.</p> <p>In FIG. 8, the MU is associated to AP-2 and starts roaming away from AP-2 towards AP-1. The RSSI received from MU at AP-2 decreases. The average RSSI over few consecutive samples also decreases. When the average RSSI drops below a threshold value, AP-2 stops sending ACK(s) for uplink 802.11 frames from the MU. It is also possible to penalize the MU for not roaming and simply send a dissociate to the MU. The MU detects an increase in retries on the uplink and probes other channels to find a nearby AP-1. The MU then associates with AP-1 and dissociates with AP-2.</p> <p>Choudhary at 7:64–8:6.</p>

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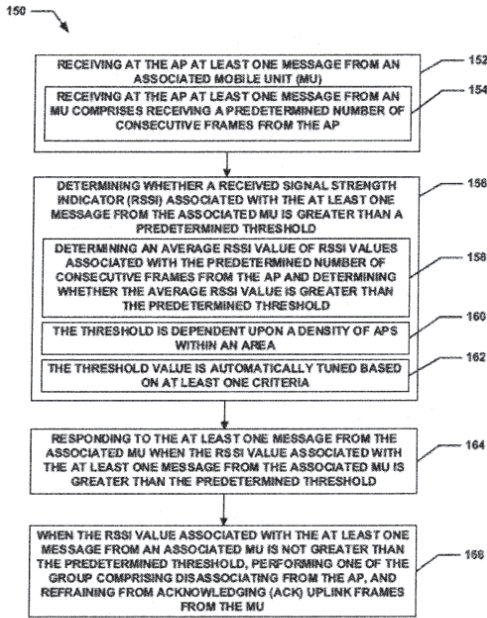
Claim Element	Disclosure of Claim Element in Choudhary
	 <p align="center">FIGURE 11</p> <p>Choudhary at Fig. 11.</p> <p>Referring now to FIG. 11 another particular embodiment of a method 150 for using Received Signal Strength Indicator (RSSI) filtering to provide air-time optimization in wireless networks is shown. This method relates to APs and associated mobile units. Method 150 begins with processing block 152 which discloses receiving at the AP at least one message from an associated mobile unit (MU). As</p>

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Claim Element	Disclosure of Claim Element in Choudhary
	<p>further shown in processing block 154 the receiving at the AP at least one message from an MU comprises receiving a predetermined number of consecutive frames from the AP.</p> <p>Choudhary at 10:22–31.</p> <p>Processing block 156 states determining whether a Received Signal Strength indicator (RSSI) associated with the at least one message from the associated MU is greater than a predetermined threshold. As shown in processing block 158, in one embodiment the determining whether an RSSI value associated with the at least one message from an associated MU is greater than a predetermined threshold comprises determining an average RSSI value of RSSI values associated with the predetermined number of consecutive frames from the AP and determining whether the average RSSI value is greater than the predetermined threshold. As shown in processing block 160, in certain deployments such as a pico-cell deployment the threshold is dependent upon a density of APs within an area. As shown in processing block 162, in certain embodiments the threshold is automatically tuned based on at least one criteria.</p> <p>Choudhary at 10:32–47.</p> <p>1.A computer-implemented method in which an Access Point (AP) performs operations comprising: receiving at said AP at least one probe request from an unassociated mobile unit (MU) from which a Received Signal Strength Indicator (RSSI) can be determined; determining whether the RSSI associated with said at least one probe request from the unassociated MU is greater than a RSSI_hi threshold, wherein said RSSI_hi threshold is dependent upon a density of APs within an area and wherein said RSSI_hi threshold is tuned for a pico-cell deployment to provide desired spacing of APs within said pico-cell; and responding to said at least one probe request from the unassociated MU when said RSSI value associated with said at least one probe request from the unassociated MU is greater than said predetermined RSSI_hi threshold.</p> <p>Choudhary at Claim 1. <i>See also</i> Claim 10.</p>

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Claim Element	Disclosure of Claim Element in Choudhary
	<p>To the extent Golden Eye argues that Choudhary does not disclose this limitation, it would have been obvious in view of the knowledge of a person of ordinary skill in the art and in view of the reference(s) identified in Cisco's Invalidity Contentions and the associated Exhibits, incorporated by reference herein. A person of ordinary skill would have been motivated to combine Choudhary with the identified reference(s) for the reasons discussed in the cover pleadings and associated Exhibits.</p>
<p>13[e] wherein the maximum probe response time comprises a preset maximum time period during which the station is required to wait for probe response frames from the access points.</p>	<p>Choudhary discloses, either expressly or inherently, wherein the maximum probe response time comprises a preset maximum time period during which the station is required to wait for probe response frames from the access points.</p> <p><i>See, e.g.,</i></p> <p>The received power of an AP signal (RSSI-AP) at an MU falls as it moves away from the AP. Data rates on the downlink depend on RSSI-AP values with higher downlink data rates possible at higher RSSI-AP values. The received power of an MU signal (RSSI-MU) at an AP falls as MU moves away from the AP. Data rates on the uplink depend on the RSSI-MU values with higher uplink data rates possible at higher RSSI-MU values. Data rates on the downlink depend on RSSI-AP values and higher downlink data rates are possible with higher RSSI-AP values.</p> <p>Choudhary at 5:61–6:3.</p> <p>Referring to FIG. 2A, a symmetric link is shown. In this scenario, both the uplink from the MU to the AP and the downlink from the AP to the MU occur at the same data rate. Here, the MU is in the highest data rate of the AP cell, while the AP is in the highest data rate of the MU cell.</p> <p>Choudhary at 6:4–8.</p> <p>Referring now to FIG. 3, an aggressive MU environment is shown. The MU is associated with AP-1 but aggressively probes other channels. The MU keeps sending broadcast/unicast probes to all the APs (AP-2, AP-3 and AP-4) in the neighboring cells. The APs send probe responses at lowest supported data rate consuming wireless medium bandwidth in their cell. Probe responses for 802.11n are very big and can take much longer time to transmit on the air. Each aggressive MU wastes bandwidth in multiple neighboring cells. Multiple MUs can compound this effect.</p>

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Claim Element	Disclosure of Claim Element in Choudhary
	<p>Choudhary at 6:14–23.</p> <p>Referring to FIG. 4, a sticky MU environment is shown. Here the MU is associated with AP-1 even though there is a much better option available (AP-2). The MU sends all communication with AP-1 at the lowest data rate wasting airtime in the AP-1's cell. Other MUs associated with the AP-1 (MU-2 and MU-3) suffer because of the non-aggressive MU. Eliminating lowest supported data rates can solve some of the problems associated with aggressive probing and lazy roaming. Eliminating lowest data rate reduces the effective AP cell size by eliminating outer zones that support lower data rate. Eliminating lowest data rates can completely prevent some clients from associating with the AP(s). Reducing AP radiated power reduces the effective AP cell size, however it also reduces the effective area per cell over which high data rate communication can occur. Reducing AP power makes the AP-MU link asymmetric since clients do not reduce the power (see FIG. 2B).</p> <p>Choudhary at 6:24–40.</p> <p>The presently disclosed invention utilizes RSSI filtering for selectively accepting or responding to an 802.11 frame based on RSSI or some metric derived from RSSI. An AP will respond to probes only when the probe request is received with sufficient RSSI, will accept authentication only when the RSSI is sufficiently high, and will acknowledge received frames based on some criterion derived from RSSI. RSSI filtering may also be used to dissociate clients based on some RSSI derived criterion. RSSI filtering provides additional control for the administrator besides those provided by eligible data rate set, AP power and directional antenna.</p> <p>Choudhary at 7:4–14.</p> <p>An AP radio is configured with an RSSI threshold for sending probe response. Probe responses are not sent if the received probe requests do not meet the required RSSI threshold. Effectively this is a way of testing if the client is close enough to the AP to benefit from associating with the AP. If the client is not close enough then there is no point indicating anything to the client since it won't associate with the AP anyway. Because of restrained probe responses, a client does not detect presence of an AP until it is close enough.</p>

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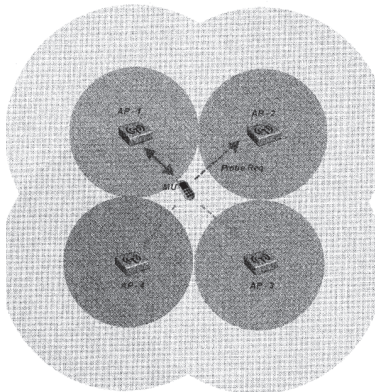
Claim Element	Disclosure of Claim Element in Choudhary
	<p>Choudhary at 7:15–23.</p>  <p align="center">FIGURE 5</p> <p>Choudhary at Fig. 5.</p> <p>Referring now to FIG. 5, the MU is associated with AP-1 but aggressively probes other channels. The MU keeps sending broadcast/unicast probes to all APs (AP-2, AP-3, and AP-4) in the neighboring cells. The APs send probe responses only if the received probe request is above a configured RSSI threshold. Since probe responses consume more air-time than probe request, selectively pruning out probe responses reduces airtime consumed by aggressive clients for probes. The AP radio is configured with an RSSI threshold for sending probe response. Additionally, it is possible to drop authentication requests that do not meet the required RSSI threshold at AP.</p> <p>Choudhary at 7:24–35.</p>

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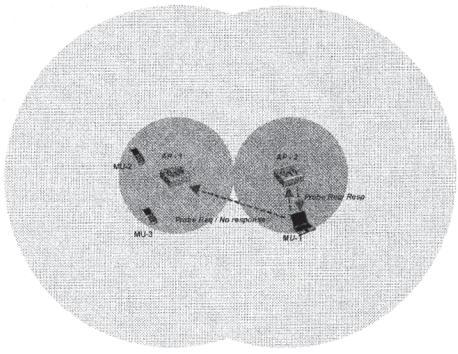
Claim Element	Disclosure of Claim Element in Choudhary
	<p>When a client sends active probes it will receive responses from closest AP(s) only as defined by configured RSSI threshold. If client determines the AP(s) based on passive scanning, then the authentication attempt to a far-away AP would fail. When a client roams away from an AP its RSSI level at the AP would drop. An AP can accumulate an average of some consecutive samples of the RSSI for the received frames from the client. When this average drops below a threshold then the AP radio can dissociate a client or a more advanced radio can deliberately stop 802.11 ACK for uplink frames from the client. A client in this case would either immediately start looking for another AP in its neighborhood (increased retries due to ACK failures) or will be dissociated for bad behavior and discover another AP nearby.</p> <p>Choudhary at 7:36–49.</p>  <p align="center">FIGURE 6</p> <p>Choudhary at Fig. 6.</p> <p>FIG. 6 shows where an MU scans all channels using active broadcast probing. AP-1 does not respond to probe request since the received RSSI is below the configured threshold for probes. AP-2 responds</p>

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Claim Element	Disclosure of Claim Element in Choudhary
	<p>to the probe request. The MU discovers only AP-2 by active probing. MU-1 authenticates and associates with AP-2 which is the desired AP for MU-1 in this case.</p> <p>Choudhary at 7:50–56.</p> <p>FIG. 7 shows where an MU (MU-1) scans channels passively and hears an AP-1 beacon. The MU attempts to connect to AP-1 right away but fails because it does not meet the RSSI threshold required by AP-1. The MU now moves on to another frequency and discovers AP-2(s) beacon. The MU authenticates and associates with AP-2 which is the ideal AP for MU in this case.</p> <p>Choudhary at 7:57–63.</p> <div data-bbox="467 951 922 1293"><p>The diagram shows a large, light-gray oval representing a scanning area. Inside this area are two smaller, dark-gray circles representing access points, labeled 'AP-1' and 'AP-2'. Below each access point is a small black rectangle representing a mobile unit (MU). An arrow points from the MU under AP-1 to the MU under AP-2, indicating a transition or association. The MU under AP-1 is slightly larger than the MU under AP-2.</p></div> <p style="text-align: center;">FIGURE 8</p> <p>Choudhary at Fig. 8.</p>

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Claim Element	Disclosure of Claim Element in Choudhary
	<p>In FIG. 8, the MU is associated to AP-2 and starts roaming away from AP-2 towards AP-1. The RSSI received from MU at AP-2 decreases. The average RSSI over few consecutive samples also decreases. When the average RSSI drops below a threshold value, AP-2 stops sending ACK(s) for uplink 802.11 frames from the MU. It is also possible to penalize the MU for not roaming and simply send a dissociate to the MU. The MU detects an increase in retries on the uplink and probes other channels to find a nearby AP-1. The MU then associates with AP-1 and dissociates with AP-2.</p> <p>Choudhary at 7:64–8:6.</p> <p>Referring to FIG. 10, a particular embodiment of a method 100 for using Received Signal Strength Indicator (RSSI) filtering to provide air-time optimization in wireless networks is shown. This method relates to APs and unassociated mobile units. Method 100 begins with processing block 102 which discloses receiving at the AP at least one message from an unassociated mobile unit (MU) from which RSSI can be determined. As shown in processing block 104, in this embodiment the message comprises a probe request message and wherein the response comprises a probe response message.</p> <p>Choudhary at 9:60–10:3.</p>

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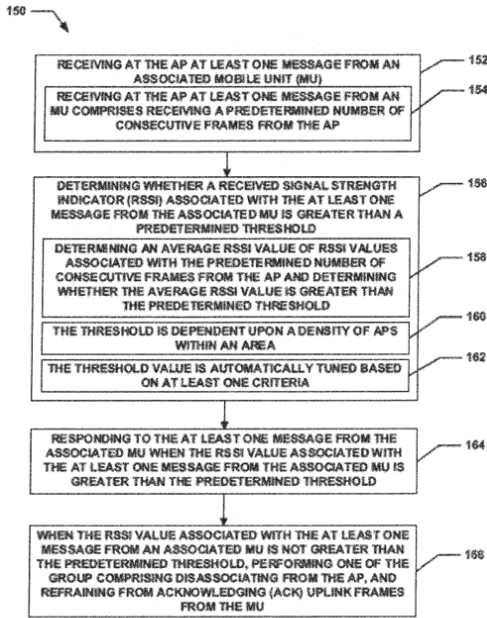
Claim Element	Disclosure of Claim Element in Choudhary
	 <pre> graph TD 150 --> 152 152 --> 154 154 --> 156 156 --> 158 158 --> 160 160 --> 162 162 --> 164 164 --> 166 </pre> <p align="center">FIGURE 11</p> <p>Choudhary at Fig. 11.</p> <p>Referring now to FIG. 11 another particular embodiment of a method 150 for using Received Signal Strength Indicator (RSSI) filtering to provide air-time optimization in wireless networks is shown. This method relates to APs and associated mobile units. Method 150 begins with processing block 152 which discloses receiving at the AP at least one message from an associated mobile unit (MU). As</p>

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Claim Element	Disclosure of Claim Element in Choudhary
	<p>further shown in processing block 154 the receiving at the AP at least one message from an MU comprises receiving a predetermined number of consecutive frames from the AP.</p> <p>Choudhary at 10:22–31.</p> <p>Processing block 156 states determining whether a Received Signal Strength indicator (RSSI) associated with the at least one message from the associated MU is greater than a predetermined threshold. As shown in processing block 158, in one embodiment the determining whether an RSSI value associated with the at least one message from an associated MU is greater than a predetermined threshold comprises determining an average RSSI value of RSSI values associated with the predetermined number of consecutive frames from the AP and determining whether the average RSSI value is greater than the predetermined threshold. As shown in processing block 160, in certain deployments such as a pico-cell deployment the threshold is dependent upon a density of APs within an area. As shown in processing block 162, in certain embodiments the threshold is automatically tuned based on at least one criteria.</p> <p>Choudhary at 10:32–47.</p> <p>1.A computer-implemented method in which an Access Point (AP) performs operations comprising: receiving at said AP at least one probe request from an unassociated mobile unit (MU) from which a Received Signal Strength Indicator (RSSI) can be determined; determining whether the RSSI associated with said at least one probe request from the unassociated MU is greater than a RSSI_hi threshold, wherein said RSSI_hi threshold is dependent upon a density of APs within an area and wherein said RSSI_hi threshold is tuned for a pico-cell deployment to provide desired spacing of APs within said pico-cell; and responding to said at least one probe request from the unassociated MU when said RSSI value associated with said at least one probe request from the unassociated MU is greater than said predetermined RSSI_hi threshold.</p> <p>Choudhary at Claim 1. <i>See also</i> Claim 10.</p>

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