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Invalidity Chart for U.S. Patent No. 9,271,243 Based On U.S. Patent No. 7,313,113

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. 7,313,113 ("Hills") was filed April 4, 2003, and issued December 25, 2007. Thus, Hills is prior art under at least pre-AIA 35 U.S.C. § 102(b). Hills anticipates and/or renders obvious the Asserted Claims of U.S. Patent No. 9,271,243, 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 Hills, a person of ordinary skill in the art would have found it obvious to combine the teachings of Hills 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 Hills. 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 Hills "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 Hills. 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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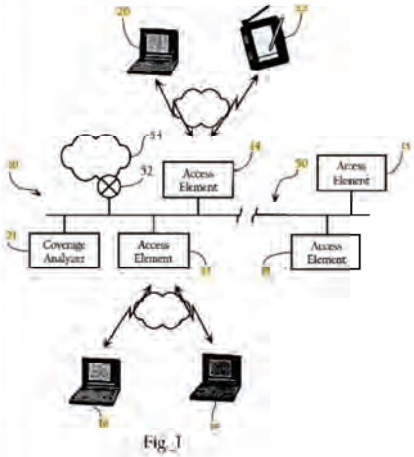
Claim Element	Disclosure of Claim Element in Hills
1[pre] A device for controlling a wireless access point comprising:	To the extent the preamble is limiting, Hills discloses, either expressly or inherently, a device for controlling a wireless access point. *See, e.g.,* Methods, apparatuses and systems facilitating the configuration of transmit power and coverage areas corresponding to access points in a wireless network environment. The present invention in one embodiment facilitates the dynamic configuration of coverage boundaries across a plurality of access points, improving the performance of the wireless network environment. Hills at Abstract  FIG. 1 illustrates a computer network environment including dynamic transmit power configuration functionality according to an embodiment of the present invention. The computer

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Claim Element	Disclosure of Claim Element in Hills
	network environment depicted in FIG. 1 includes access elements 12, 13, 14, 15 deployed across wide area network 50 comprising a plurality of local area network segments 10. In one embodiment, the present invention further includes coverage analyzer 21 to receive coverage data from access elements 12, 13, 14, 15 and process the coverage data to compute transmit power levels for the access elements to optimize the performance of the wireless network environment, as described below. Hills at 3:23–34, Fig. 1. The access elements feature a coverage scanning mode, according to which the access elements monitor their respective coverage areas for wireless traffic associated with neighboring access elements and clients and record data associated with the signal associated with the wireless traffic, such as signal strength. The coverage data can be transmitted to a central management device, such as the coverage analyzer 21 (FIG. 1) or central control element 24 (see description below and FIGS. 2A and 2B) for processing. Hills at 3:52–60. Coverage analyzer 21, in one embodiment, is a network device that receives coverage scan data from the access elements and processes the coverage scan data, in one embodiment, to compute an optimal set of transmit power levels for the access elements. In one embodiment, the functionality of coverage analyzer 21 can be incorporated into a wireless network management platform or appliance. As discussed below, the functionality of coverage analyzer may also be incorporated into one or more central control elements 24, 26 as discussed more fully below. In one embodiment, coverage analyzer 21 includes an access point table storing information relating to known access elements. In one embodiment, the access point table includes an access element identifier field, and a current transmit power field. In 802.11 wireless network environments, the access element identifier is the MAC address corresponding to a given access element, while the service set identifier is the SSID contained in certain management frames, such as beacon frames, probe response frames, and association request frames. The access point table can be manually configured by a network administrator with knowledge of the MAC address and the SSID of the access elements. In another embodiment, the access point table can be automatically populated using layer

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Claim Element	Disclosure of Claim Element in Hills
	2 and/or layer 3 discover mechanisms. In one embodiment, the access elements can be configured to automatically transmit the coverage scan data to coverage analyzer 21 after each coverage scan. In another embodiment, the access elements can store the coverage scan data and transmit them in response to a request from coverage analyzer 21. In addition, coverage analyzer 21 can be configured to execute the coverage analysis functionality at regular, configurable intervals, or on demand. In one embodiment, coverage analyzer 21 maintains, for each access element, a separate table or other data structure for the received coverage scan data. In one embodiment, coverage analyzer 21 can summarize the coverage scan data, for example, by averaging the detected signal strength values associated with packets transmitted from a given access element. Hills at 5:26–64. To the extent Golden Eye argues that Hills 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 Hills with the identified reference(s) for the reasons discussed in the cover pleadings and associated Exhibits.
1[a] a grouping unit configured to group wireless access points using a same channel based on channel use information received from the wireless access points;	Hills discloses, either expressly or inherently, a grouping unit configured to group wireless access points using a same channel based on channel use information received from the wireless access points. *See, e.g.,* As described in the above-identified patent application, central control element 24 operates to perform link layer management functions, such as authentication and association on behalf of access elements 12, 14. For example, the central control element 24 provides processing to dynamically configure a wireless Local Area Network of a system according to the invention while the access elements 12, 14 provide the acknowledgement of communications with the client remote elements 16, 18, 20, 22. The central control element 24 may for example process the wireless LAN network management messages, load control, channel control, and handoff. Among the network management messages are authentication requests of the client wireless access elements 12, 14 and association requests of the client wireless access elements 12, 14. The network management

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Claim Element	Disclosure of Claim Element in Hills
	messages are passed on from the client remote elements 16, 18; 20, 22 via the access elements 12, 14, such as authentication requests and authorization requests, whereas the access elements 12, 14 provide immediate acknowledgment of the communication of those messages without conventional processing thereof. Similarly, the central control element 24 may for example process physical layer information. Still further, the central control element 24 may for example process information collected at the access elements 12, 14 on channel characteristic, propagation, and interference or noise. Central control element 26 and associated access elements 13, 15 operate in a similar or identical manner. Hills at 6:37–64. According to one embodiment, the central control elements 24, 26 may each incorporate the functionality of coverage analyzer 21 (see above) to receive coverage scan data from the access elements to which they are associated and process the coverage scan data to compute an transmit power levels for the access elements. In an exemplary deployment, central control element 24 may be connected to a set of access elements installed on one floor of an enterprise facility, while central control element 26 may be operably connected to a set of access elements installed on a different floor of the facility. Access elements 12-15 are configured, as discussed above, to switch to a scan mode for a scanning period at regular scanning intervals, and transmit coverage scan data to the corresponding central control elements. In one embodiment, the central control elements 24, 26 are configured to automatically discover the access elements to which they are connected by various layer 2 and 3 discovery mechanisms, and populate the access point table. Central control elements 24, 26, in one embodiment, act independently with respect to each other; that is, for deployments where there is no overlap in coverage areas among the access elements 12-15, central control elements 24, 26 need not share access element information. However, in other deployments where there is coverage overlap, sharing of coverage scan and configuration information may be desirable. Hills at 6:65–7:23.

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	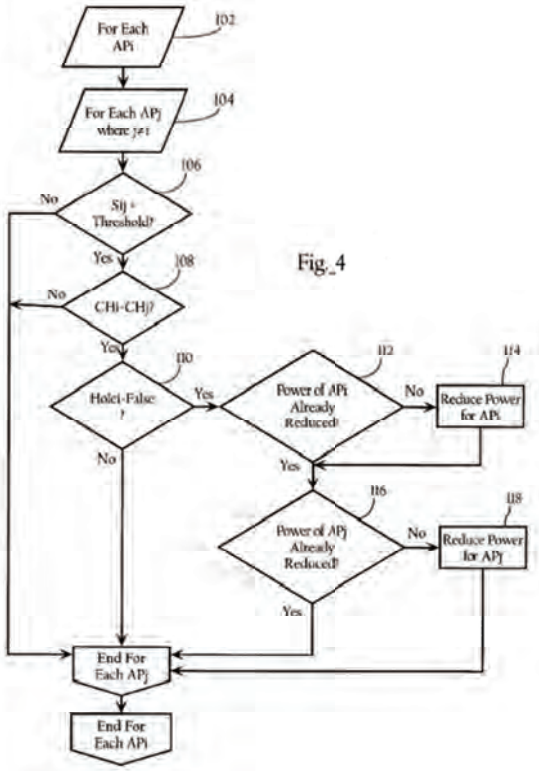 Fig. 4 As discussed above, the dynamic transmit power functionality has access to a database including the signal strength values corresponding to neighboring access elements as detected by each access element. In one embodiment, the database maintains a list or table for each access element of the detected access element(s) and a signal strength value associated with each detected access

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Claim Element	Disclosure of Claim Element in Hills
	element. In one embodiment, coverage analyzer 21 sorts each list or table by largest coverage overlap (i.e., signal strength value). In another embodiment, coverage analyzer 21 assembles a two-dimensional matrix including the detected signal strengths among the access elements. As discussed above, the signal strength values in the coverage matrix can be the average signal strength values corresponding to the packets transmitted by the access elements. FIG. 4 illustrates a method directed to minimizing the coverage overlaps of access elements operating on the same channel. As discussed above, in one embodiment, coverage analyzer 21 maintains an i×j matrix of the signal strengths of the access elements as detected by all other access elements, where i=j and i equals the number of access elements in a given group of access elements. Accordingly, there are no values in the matrix where i equals j. In addition, many values in the matrix may be null or zero values as well, as many access elements may not detect the signals of all other access elements within a group. A group may be all access elements associated with a given central control element 24, or all access elements in a given physical location, such as a floor of a building. Hills at 12:4–32, Fig.4. As FIG. 4 illustrates, in one embodiment, coverage analyzer 21, for each access element (APi) (102), compares the signal strength detected by the access element from all other access elements (APj) in the matrix (104) against a coverage threshold. For example, in one embodiment, coverage analyzer 21 determines whether the signal strength, Sij, detected by APi is greater than a coverage threshold of −85 dBm (106). As FIG. 4 illustrates, coverage analyzer 21 also determines whether APi and APj operate on the same channel (108) and whether a coverage hole has been detected as to APi (110). Assuming all conditions are met, coverage analyzer 21 then reduces the transmit power, or generates an instruction to reduce the transmit power, for APi and APj (114, 118), if the transmit power for APi and/or APj have not already been reduced during this analysis loop (112, 116). In one embodiment, coverage analyzer 21 reduces the transmit power of APi and APj each by 10 dB. As one skilled in the art will recognize, however, the coverage threshold, as well as the amount by which the transmit powers are reduced, can be fully parameterized and configurable by a network administrator. Coverage analyzer 21 repeats this process for all access elements until the entire matrix has been traversed.

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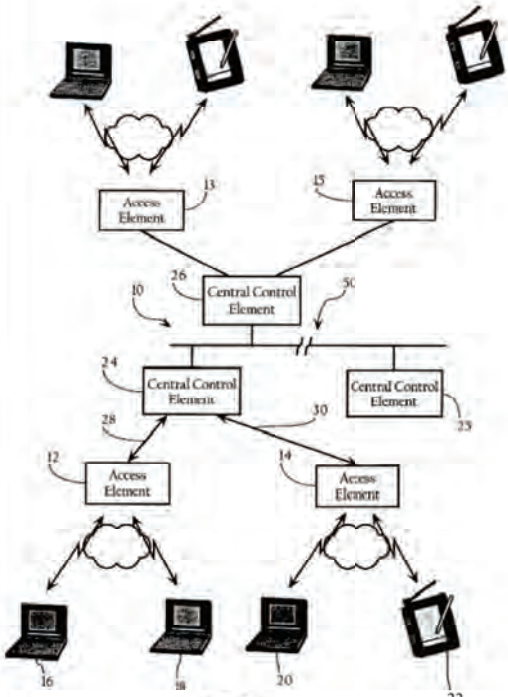
Claim Element	Disclosure of Claim Element in Hills
	Hills at 12:33–54.  Fig. 2A Hills at Fig. 2A.

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Claim Element	Disclosure of Claim Element in Hills
	The 802.11 protocol specifies an optional parameter, the receive signal strength indicator (RSSI). Hills at 5:3–5. Coverage analyzer 21, in one embodiment, is a network device that receives coverage scan data from the access elements and processes the coverage scan data, in one embodiment, to compute an optimal set of transmit power levels for the access elements. In one embodiment, the functionality of coverage analyzer 21 can be incorporated into a wireless network management platform or appliance. As discussed below, the functionality of coverage analyzer may also be incorporated into one or more central control elements 24, 26 as discussed more fully below. In one embodiment, coverage analyzer 21 includes an access point table storing information relating to known access elements. In one embodiment, the access point table includes an access element identifier field, and a current transmit power field. Hills at 5:26–39. In one embodiment, the access elements can be configured to automatically transmit the coverage scan data to coverage analyzer 21 after each coverage scan. In another embodiment, the access elements can store the coverage scan data and transmit them in response to a request from coverage analyzer 21. In addition, coverage analyzer 21 can be configured to execute the coverage analysis functionality at regular, configurable intervals, or on demand. In one embodiment, coverage analyzer 21 maintains, for each access element, a separate table or other data structure for the received coverage scan data. Hills at 5:55–57. Similarly, the central control element 24 may for example process physical layer information. Still further, the central control element 24 may for example process information collected at the access elements 12, 14 on channel characteristic, propagation, and interference or noise. Central control element 26 and associated access elements 13, 15 operate in a similar or identical manner.

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Claim Element	Disclosure of Claim Element in Hills
	According to one embodiment, the central control elements 24, 26 may each incorporate the functionality of data from the access elements to which they are associated and process the coverage scan data to compute an transmit power levels for the access elements. Hills at 6:57–7:3. FIG. 7 also shows the packet flow path according to an embodiment of the present invention. In one embodiment, stats collector 84 maintains a histogram of signal strength on a per-access-element basis based on the signal strength information (e.g., SNR, RSSI, dBm) contained in the packet headers traversing central control element 24. Hills at 9:12–16. B.3. Dynamic Transmit Power With Location Information As discussed above, the dynamic transmit power functionality may also take location information into account. In one embodiment, the access point table includes positional coordinates of each access element and further includes a z-axis dimension such as floor height or level, which can be configured by a network administrator or determined automatically through known components, such as a Global Positioning System (GPS) receiver. As FIGS. 6A and 6B illustrate, coverage analyzer 21, in one embodiment, first calculates the coverage overlaps relative to all quadrants for each access element, and then adjusts the transmit power for any access element where there is overlap in all for quadrants. As FIG. 6A shows, coverage analyzer 21, in one embodiment, for all access elements APi (302), uses the positional parameters associated with the access elements to determine whether the current access element APi includes a neighboring access element within a threshold distance in a given quadrant, Q (304, 306). In one embodiment, a neighboring access element is an access element within a threshold distance and on the same floor as the current access element APi. If there are no neighboring access points in a given quadrant, pathloss is set to infinity (307), since the quadrant is at the edge of the network, and reducing transmit power just reduces the edge of the network. Otherwise, coverage analyzer 21 computes the pathloss exponent, ExpPLij, between access

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Claim Element	Disclosure of Claim Element in Hills
	element APi and all neighboring access elements APj (308, 310). Equation 1, below, is a pathloss model, where c=the speed of light, f=frequency, and d=distance. Since the pathloss (PL) between a first access element and a second access element is the difference between the transmit power at the first access element and the receive signal strength at the second access element, the pathloss exponent, ExpPLij, can be derived from Equation (1). $$\mathrm{PL} = 10\log\left[\left(\frac{c}{4 * f * \mathrm{pi} * d}\right)^{\mathrm{ExpPlij}}\right] \quad (1)$$ Hills at 13:20–60. In one embodiment, the access elements each include a scanning daemon that, when invoked at each scanning interval, switches operation of the access element to coverage scan mode. For a scanning period, the scanning daemon monitors for wireless traffic on a given frequency channel and records scan data characterizing any packets detected on the channel. The scanning daemon, in one embodiment, monitors wireless traffic on a given channel and then switches to another frequency channel. The scanning daemon can operate in a variety of manners during the scanning period. For example, the scanning daemon can monitor for wireless traffic on a single frequency channel for the entire scanning period and switch to another frequency channel in a subsequent scanning period. Alternatively, the scanning daemon can scan a plurality of frequency channels during a given scan period. In addition, the scanning daemon can be configured to transmit the coverage scan data directly to a central repository, such as coverage analyzer 21, or store it locally for later transmission in response to a request from the coverage analyzer 21. Hills at 4:14–33. To the extent Golden Eye argues that Hills 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 Hills with the identified reference(s) for the reasons discussed in the cover pleadings and associated Exhibits.

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Claim Element	Disclosure of Claim Element in Hills
1[b] a map generator configured to compute a received signal strength indicator (RSSI) between the grouped wireless access points and an output strength value for each of the grouped wireless access points;	Hills discloses, either expressly or inherently, a map generator configured to compute a received signal strength indicator (RSSI) between the grouped wireless access points and an output strength value for each of the grouped wireless access points. *See, e.g.*, In one embodiment, the access elements each include a scanning daemon that, when invoked at each scanning interval, switches operation of the access element to coverage scan mode. For a scanning period, the scanning daemon monitors for wireless traffic on a given frequency channel and records scan data characterizing any packets detected on the channel. The scanning daemon, in one embodiment, monitors wireless traffic on a given channel and then switches to another frequency channel. The scanning daemon can operate in a variety of manners during the scanning period. For example, the scanning daemon can monitor for wireless traffic on a single frequency channel for the entire scanning period and switch to another frequency channel in a subsequent scanning period. Alternatively, the scanning daemon can scan a plurality of frequency channels during a given scan period. In addition, the scanning daemon can be configured to transmit the coverage scan data directly to a central repository, such as coverage analyzer 21, or store it locally for later transmission in response to a request from the coverage analyzer 21. Hills at 4:14–33. The access elements, such as access elements 12, 14, include functionality allowing for detection of the strength of the received signals. For example, the IEEE 802.11 standard defines a mechanism by which RF energy is to be measured by the circuitry (e.g., chip set) on a wireless network adapter or interface card. The 802.11 protocol specifies an optional parameter, the receive signal strength indicator (RSSI). This parameter is a measure by the PHY sub-layer of the energy observed at the antenna used to receive the current packet. RSSI is measured between the beginning of the start frame delimiter (SFD) and the end of the PLCP header error check (HEC). This numeric value is an integer with an allowable range of 0-255 (a 1-byte value). Typically, 802.11 chip set vendors have chosen not to actually measure 256 different signal levels. Accordingly, each vendor's 802.11-compliant adapter has a specific maximum RSSI value ("RSSI_Max"). Therefore, the RF energy level reported by a particular vendor's wireless network adapter will range between 0 and

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Claim Element	Disclosure of Claim Element in Hills
	RSSI_Max. Resolving a given RSSI value reported by a given vendor's chip set to an actual power value (dBm) can be accomplished by reference to a conversion table. In addition, some wireless networking chip sets actually report received signal strength in dBm units, rather than or in addition to RSSI. The access elements 12, 14 include the detected signal strength value associated with a packet in the coverage scan table. In one embodiment, the scan data fields can also include a time stamp indicating when the packet was detected. Hills at 4:65–5:25. Coverage analyzer 21, in one embodiment, is a network device that receives coverage scan data from the access elements and processes the coverage scan data, in one embodiment, to compute an optimal set of transmit power levels for the access elements. In one embodiment, the functionality of coverage analyzer 21 can be incorporated into a wireless network management platform or appliance. As discussed below, the functionality of coverage analyzer may also be incorporated into one or more central control elements 24, 26 as discussed more fully below. In one embodiment, coverage analyzer 21 includes an access point table storing information relating to known access elements. In one embodiment, the access point table includes an access element identifier field, and a current transmit power field. In 802.11 wireless network environments, the access element identifier is the MAC address corresponding to a given access element, while the service set identifier is the SSID contained in certain management frames, such as beacon frames, probe response frames, and association request frames. The access point table can be manually configured by a network administrator with knowledge of the MAC address and the SSID of the access elements. In another embodiment, the access point table can be automatically populated using layer 2 and/or layer 3 discover mechanisms. In one embodiment, the access elements can be configured to automatically transmit the coverage scan data to coverage analyzer 21 after each coverage scan. In another embodiment, the access elements can store the coverage scan data and transmit them in response to a request from coverage analyzer 21. In addition, coverage analyzer 21 can be configured to execute the coverage analysis functionality at regular, configurable intervals, or on demand. In one embodiment, coverage analyzer 21 maintains, for each access element, a separate table or other data structure for the received coverage scan data. In one embodiment, coverage analyzer 21 can summarize the coverage scan data, for example, by averaging the detected signal strength values associated with packets transmitted from a given access element.

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Claim Element	Disclosure of Claim Element in Hills
	Hills at 5:26–64. As described in the above-identified patent application, central control element 24 operates to perform link layer management functions, such as authentication and association on behalf of access elements 12, 14. For example, the central control element 24 provides processing to dynamically configure a wireless Local Area Network of a system according to the invention while the access elements 12, 14 provide the acknowledgement of communications with the client remote elements 16, 18, 20, 22. The central control element 24 may for example process the wireless LAN network management messages, load control, channel control, and handoff. Among the network management messages are authentication requests of the client wireless access elements 12, 14 and association requests of the client wireless access elements 12, 14. The network management messages are passed on from the client remote elements 16, 18; 20, 22 via the access elements 12, 14, such as authentication requests and authorization requests, whereas the access elements 12, 14 provide immediate acknowledgment of the communication of those messages without conventional processing thereof. Similarly, the central control element 24 may for example process physical layer information. Still further, the central control element 24 may for example process information collected at the access elements 12, 14 on channel characteristic, propagation, and interference or noise. Central control element 26 and associated access elements 13, 15 operate in a similar or identical manner. Hills at 6:37–64. According to one embodiment, the central control elements 24, 26 may each incorporate the functionality of coverage analyzer 21 (see above) to receive coverage scan data from the access elements to which they are associated and process the coverage scan data to compute an transmit power levels for the access elements. In an exemplary deployment, central control element 24 may be connected to a set of access elements installed on one floor of an enterprise facility, while central control element 26 may be operably connected to a set of access elements installed on a different floor of the facility. Access elements 12-15 are configured, as discussed above, to switch to a scan mode for a scanning period at regular scanning intervals, and transmit coverage scan data to the corresponding central control elements. In one embodiment, the central control elements 24, 26 are

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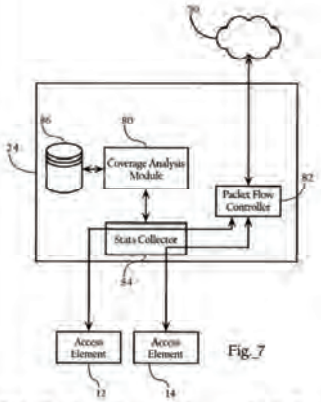
Claim Element	Disclosure of Claim Element in Hills
	configured to automatically discover the access elements to which they are connected by various layer 2 and 3 discovery mechanisms, and populate the access point table. Central control elements 24, 26, in one embodiment, act independently with respect to each other; that is, for deployments where there is no overlap in coverage areas among the access elements 12-15, central control elements 24, 26 need not share access element information. However, in other deployments where there is coverage overlap, sharing of coverage scan and configuration information may be desirable. Hills at 6:65–7:23.  FIG. 7 also shows the packet flow path according to an embodiment of the present invention. In one embodiment, stats collector 84 maintains a histogram of signal strength on a per-access-element basis based on the signal strength information (e.g., SNR, RSSI, dBm) contained in the packet headers traversing central control element 24. For example, the received signal strength (dBm) of a packet received by an access element is recorded in a corresponding histogram having a range of −100 dBm to −10 dBm in increments of 1 dB bins. Of course, the exact range and number of bins may depend on the physical properties of the wireless network protocol and are

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Claim Element	Disclosure of Claim Element in Hills
	also matters of engineering choice. Accordingly, the exact ranges and number of bins set forth herein are not intended to limit the scope of the claimed invention. As the data structure set forth below indicates, stats collector 84 maintains other statistics associated with the signal strength histogram for each access element, such as number of samples, number of unique MAC addresses, etc. As discussed above, coverage analysis module 80 is operative to store the statistics in association with a time stamp in database 86 and reset the statistic values maintained by stats collector 84. Hills at 9:11–32, Fig. 7. As discussed above, the dynamic transmit power functionality has access to a database including the signal strength values corresponding to neighboring access elements as detected by each access element. In one embodiment, the database maintains a list or table for each access element of the detected access element(s) and a signal strength value associated with each detected access element. In one embodiment, coverage analyzer **21** sorts each list or table by largest coverage overlap (i.e., signal strength value). In another embodiment, coverage analyzer **21** assembles a two-dimensional matrix including the detected signal strengths among the access elements. As discussed above, the signal strength values in the coverage matrix can be the average signal strength values corresponding to the packets transmitted by the access elements. Hills at 12:4–18

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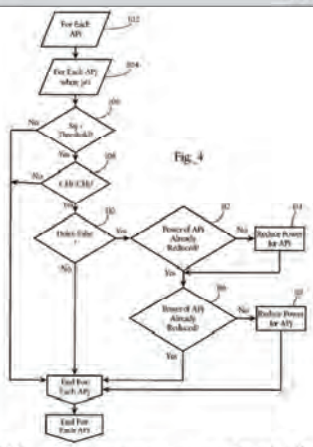
Claim Element	Disclosure of Claim Element in Hills
	 Fig. 4 FIG. 4 illustrates a method directed to minimizing the coverage overlaps of access elements operating on the same channel. As discussed above, in one embodiment, coverage analyzer 21 maintains an i×j matrix of the signal strengths of the access elements as detected by all other access elements, where i=j and i equals the number of access elements in a given group of access elements. Accordingly, there are no values in the matrix where i equals j. In addition, many values in the matrix may be null or zero values as well, as many access elements may not detect the signals of all other access elements within a group. A group may be all access elements associated with a given central control element 24, or all access elements in a given physical location, such as a floor of a building. Hills at 12:19–32, Fig. 4. As FIG. 4 illustrates, in one embodiment, coverage analyzer 21, for each access element (APi) (102), compares the signal strength detected by the access element from all other access elements (APj) in the matrix (104) against a coverage threshold. For example, in one embodiment, coverage analyzer 21 determines whether the signal strength, Sij, detected by APi is greater than a coverage

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	threshold of −85 dBm (106). As FIG. 4 illustrates, coverage analyzer 21 also determines whether APi and APj operate on the same channel (108) and whether a coverage hole has been detected as to APi (110). Assuming all conditions are met, coverage analyzer 21 then reduces the transmit power, or generates an instruction to reduce the transmit power, for APi and APj (114, 118), if the transmit power for APi and/or APj have not already been reduced during this analysis loop (112, 116). In one embodiment, coverage analyzer 21 reduces the transmit power of APi and APj each by 10 dB. As one skilled in the art will recognize, however, the coverage threshold, as well as the amount by which the transmit powers are reduced, can be fully parameterized and configurable by a network administrator. Coverage analyzer 21 repeats this process for all access elements until the entire matrix has been traversed. Hills at 12:33–54. To the extent Golden Eye argues that Hills 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 Hills with the identified reference(s) for the reasons discussed in the cover pleadings and associated Exhibits.
1[c] an extractor configured to extract a wireless access point having a highest RSSI value among the grouped wireless access points, if interference occurs between the grouped wireless access points; and	Hills discloses, either expressly or inherently, an extractor configured to extract a wireless access point having a highest RSSI value among the grouped wireless access points, if interference occurs between the grouped wireless access points. *See, e.g.*, The access elements, such as access elements 12, 14, include functionality allowing for detection of the strength of the received signals. For example, the IEEE 802.11 standard defines a mechanism by which RF energy is to be measured by the circuitry (e.g., chip set) on a wireless network adapter or interface card. The 802.11 protocol specifies an optional parameter, the receive signal strength indicator (RSSI). This parameter is a measure by the PHY sub-layer of the energy observed at the antenna used to receive the current packet. RSSI is measured between the beginning of the start frame delimiter (SFD) and the end of the PLCP header error check (HEC). This numeric value is an integer with an allowable range of 0-255 (a 1-byte value). Typically, 802.11 chip set vendors

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	have chosen not to actually measure 256 different signal levels. Accordingly, each vendor's 802.11-compliant adapter has a specific maximum RSSI value ("RSSI_Max"). Therefore, the RF energy level reported by a particular vendor's wireless network adapter will range between 0 and RSSI_Max. Resolving a given RSSI value reported by a given vendor's chip set to an actual power value (dBm) can be accomplished by reference to a conversion table. In addition, some wireless networking chip sets actually report received signal strength in dBm units, rather than or in addition to RSSI. The access elements 12, 14 include the detected signal strength value associated with a packet in the coverage scan table. In one embodiment, the scan data fields can also include a time stamp indicating when the packet was detected. Hills at 4:65–5:25. Coverage analyzer 21, in one embodiment, is a network device that receives coverage scan data from the access elements and processes the coverage scan data, in one embodiment, to compute an optimal set of transmit power levels for the access elements. In one embodiment, the functionality of coverage analyzer 21 can be incorporated into a wireless network management platform or appliance. As discussed below, the functionality of coverage analyzer may also be incorporated into one or more central control elements 24, 26 as discussed more fully below. In one embodiment, coverage analyzer 21 includes an access point table storing information relating to known access elements. In one embodiment, the access point table includes an access element identifier field, and a current transmit power field. In 802.11 wireless network environments, the access element identifier is the MAC address corresponding to a given access element, while the service set identifier is the SSID contained in certain management frames, such as beacon frames, probe response frames, and association request frames. The access point table can be manually configured by a network administrator with knowledge of the MAC address and the SSID of the access elements. In another embodiment, the access point table can be automatically populated using layer 2 and/or layer 3 discover mechanisms. In one embodiment, the access elements can be configured to automatically transmit the coverage scan data to coverage analyzer 21 after each coverage scan. In another embodiment, the access elements can store the coverage scan data and transmit them in response to a request from coverage analyzer 21. In addition, coverage analyzer 21 can be configured to execute the coverage analysis functionality at regular, configurable intervals, or on demand. In one embodiment, coverage analyzer 21 maintains, for each access element, a separate

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Claim Element	Disclosure of Claim Element in Hills
	table or other data structure for the received coverage scan data. In one embodiment, coverage analyzer 21 can summarize the coverage scan data, for example, by averaging the detected signal strength values associated with packets transmitted from a given access element. Hills at 5:26–64. Still further, the central control element 24 may for example process information collected at the access elements 12, 14 on channel characteristic, propagation, and interference or noise. Central control element 26 and associated access elements 13, 15 operate in a similar or identical manner. Hills at 6:59–64. As discussed above, the dynamic transmit power functionality has access to a database including the signal strength values corresponding to neighboring access elements as detected by each access element. In one embodiment, the database maintains a list or table for each access element of the detected access element(s) and a signal strength value associated with each detected access element. In one embodiment, coverage analyzer **21** sorts each list or table by largest coverage overlap (i.e., signal strength value). In another embodiment, coverage analyzer **21** assembles a two-dimensional matrix including the detected signal strengths among the access elements. As discussed above, the signal strength values in the coverage matrix can be the average signal strength values corresponding to the packets transmitted by the access elements. Hills at 12:4–18.

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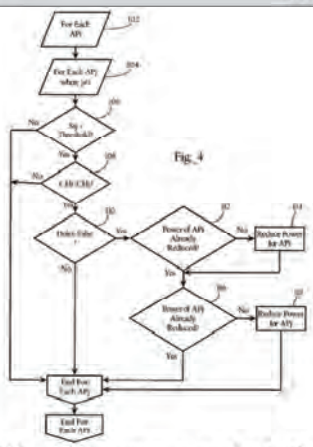
Claim Element	Disclosure of Claim Element in Hills
	 FIG. 4 illustrates a method directed to minimizing the coverage overlaps of access elements operating on the same channel. As discussed above, in one embodiment, coverage analyzer 21 maintains an i×j matrix of the signal strengths of the access elements as detected by all other access elements, where i=j and i equals the number of access elements in a given group of access elements. Accordingly, there are no values in the matrix where i equals j. In addition, many values in the matrix may be null or zero values as well, as many access elements may not detect the signals of all other access elements within a group. A group may be all access elements associated with a given central control element 24, or all access elements in a given physical location, such as a floor of a building. Hills at 12:19–32, Fig. 4.

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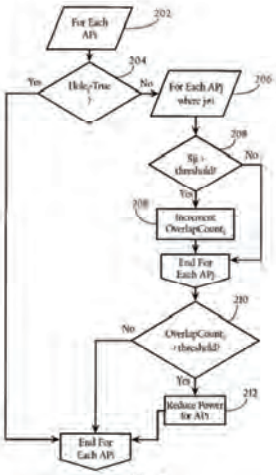
Claim Element	Disclosure of Claim Element in Hills
	 Fig. 5 FIG. 5, for example, illustrates a method directed to minimize the coverage overlap at a given threshold level between all access elements without regard to assigned channels. Rather, as FIG. 5 illustrates, coverage analyzer 21 can be configured to lower the transmit power of an access element where it overlaps above a threshold number coverage areas associated with other access elements. As with the method illustrated in FIG. 4, coverage analyzer 21 traverses an i×j matrix of signal strengths detected by the access elements. Accordingly, coverage analyzer 21, for each access element (APi) (202), first determines whether a coverage hole has been detected as to that access element (204). For each access element APj (206), coverage analyzer 21 compares the strength of the signal Sji, transmitted by APi as detected by APj (208), and increments a counter, OverlapCount, if Sji exceeds a coverage threshold (e.g., −85 dBm) (210). If the OverlapCount exceeds a threshold value (212), coverage analyzer 21 reduces the transmit power of APi (214). Coverage analyzer 21 repeats this process until all access elements in the matrix have been traversed.

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Claim Element	Disclosure of Claim Element in Hills
	Hills at 12:66–13:18, Fig. 5. To the extent Golden Eye argues that Hills 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 Hills with the identified reference(s) for the reasons discussed in the cover pleadings and associated Exhibits.
1[d] an optimal output strength value calculator configured to compute a corrected output strength value based on the highest RSSI value of the extracted wireless access point, a predetermined threshold value of the RSSI between the grouped wireless access points, and a currently used output strength value.	Hills discloses, either expressly or inherently, an optimal output strength value calculator configured to compute a corrected output strength value based on the highest RSSI value of the extracted wireless access point, a predetermined threshold value of the RSSI between the grouped wireless access points, and a currently used output strength value. *See, e.g.*, In one embodiment, the present invention further includes coverage analyzer 21 to receive coverage data from access elements 12, 13, 14, 15 and process the coverage data to compute transmit power levels for the access elements to optimize the performance of the wireless network environment, as described below. Hills at 3:29–34. The access elements, such as access elements 12, 14, include functionality allowing for detection of the strength of the received signals. For example, the IEEE 802.11 standard defines a mechanism by which RF energy is to be measured by the circuitry (e.g., chip set) on a wireless network adapter or interface card. The 802.11 protocol specifies an optional parameter, the receive signal strength indicator (RSSI). This parameter is a measure by the PHY sub-layer of the energy observed at the antenna used to receive the current packet. RSSI is measured between the beginning of the start frame delimiter (SFD) and the end of the PLCP header error check (HEC). This numeric value is an integer with an allowable range of 0-255 (a 1-byte value). Typically, 802.11 chip set vendors have chosen not to actually measure 256 different signal levels. Accordingly, each vendor's 802.11-compliant adapter has a specific maximum RSSI value ("RSSI_Max"). Therefore, the RF energy

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Claim Element	Disclosure of Claim Element in Hills
	level reported by a particular vendor's wireless network adapter will range between 0 and RSSI_Max. Resolving a given RSSI value reported by a given vendor's chip set to an actual power value (dBm) can be accomplished by reference to a conversion table. In addition, some wireless networking chip sets actually report received signal strength in dBm units, rather than or in addition to RSSI. The access elements 12, 14 include the detected signal strength value associated with a packet in the coverage scan table. In one embodiment, the scan data fields can also include a time stamp indicating when the packet was detected. Hills at 4:65–5:25. Coverage analyzer 21, in one embodiment, is a network device that receives coverage scan data from the access elements and processes the coverage scan data, in one embodiment, to compute an optimal set of transmit power levels for the access elements. In one embodiment, the functionality of coverage analyzer 21 can be incorporated into a wireless network management platform or appliance. As discussed below, the functionality of coverage analyzer may also be incorporated into one or more central control elements 24, 26 as discussed more fully below. In one embodiment, coverage analyzer 21 includes an access point table storing information relating to known access elements. In one embodiment, the access point table includes an access element identifier field, and a current transmit power field. In 802.11 wireless network environments, the access element identifier is the MAC address corresponding to a given access element, while the service set identifier is the SSID contained in certain management frames, such as beacon frames, probe response frames, and association request frames. The access point table can be manually configured by a network administrator with knowledge of the MAC address and the SSID of the access elements. In another embodiment, the access point table can be automatically populated using layer 2 and/or layer 3 discover mechanisms. In one embodiment, the access elements can be configured to automatically transmit the coverage scan data to coverage analyzer 21 after each coverage scan. In another embodiment, the access elements can store the coverage scan data and transmit them in response to a request from coverage analyzer 21. In addition, coverage analyzer 21 can be configured to execute the coverage analysis functionality at regular, configurable intervals, or on demand. In one embodiment, coverage analyzer 21 maintains, for each access element, a separate table or other data structure for the received coverage scan data. In one embodiment, coverage

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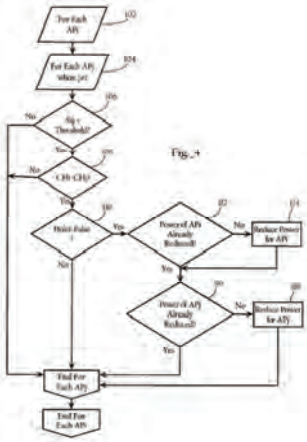
Claim Element	Disclosure of Claim Element in Hills
	analyzer 21 can summarize the coverage scan data, for example, by averaging the detected signal strength values associated with packets transmitted from a given access element. Hills at 5:26–64.  As FIG. 4 illustrates, in one embodiment, coverage analyzer 21, for each access element (APi) (102), compares the signal strength detected by the access element from all other access elements (APj) in the matrix (104) against a coverage threshold. For example, in one embodiment, coverage analyzer 21 determines whether the signal strength, Sij, detected by APi is greater than a coverage threshold of −85 dBm (106). As FIG. 4 illustrates, coverage analyzer 21 also determines whether APi and APj operate on the same channel (108) and whether a coverage hole has been detected as to APi (110). Assuming all conditions are met, coverage analyzer 21 then reduces the transmit power, or generates an instruction to reduce the transmit power, for APi and APj (114, 118), if the transmit power for APi and/or APj have not already been reduced during this analysis loop (112, 116). In one embodiment, coverage analyzer 21 reduces the transmit power of APi and

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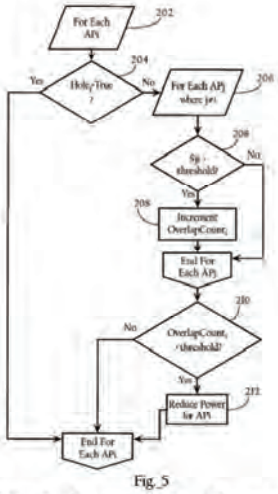
Claim Element	Disclosure of Claim Element in Hills
	APj each by 10 dB. As one skilled in the art will recognize, however, the coverage threshold, as well as the amount by which the transmit powers are reduced, can be fully parameterized and configurable by a network administrator. Coverage analyzer 21 repeats this process for all access elements until the entire matrix has been traversed. Hills at 12:33–54, Fig. 4.  Fig. 5 FIG. 5, for example, illustrates a method directed to minimize the coverage overlap at a given threshold level between all access elements without regard to assigned channels. Rather, as FIG. 5 illustrates, coverage analyzer 21 can be configured to lower the transmit power of an access element where it overlaps above a threshold number coverage areas associated with other access elements. As with the method illustrated in FIG. 4, coverage analyzer 21 traverses an i×j matrix of signal strengths detected by the access elements. Accordingly, coverage analyzer 21, for each

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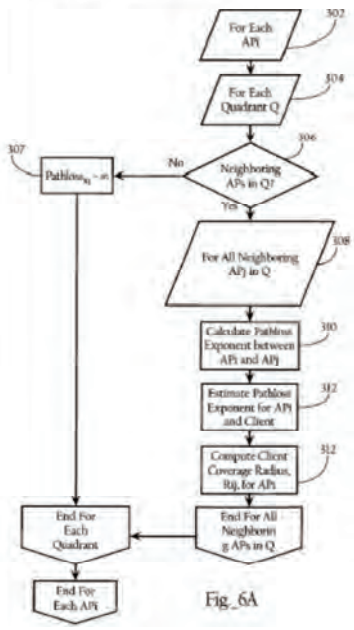
Claim Element	Disclosure of Claim Element in Hills
	access element (APi) (202), first determines whether a coverage hole has been detected as to that access element (204). For each access element APj (206), coverage analyzer 21 compares the strength of the signal Sji, transmitted by APi as detected by APj (208), and increments a counter, OverlapCount, if Sji exceeds a coverage threshold (e.g., −85 dBm) (210). If the OverlapCount exceeds a threshold value (212), coverage analyzer 21 reduces the transmit power of APi (214). Coverage analyzer 21 repeats this process until all access elements in the matrix have been traversed. Hills at 12:66–13:18, Fig. 5.  Fig. 6A

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Claim Element	Disclosure of Claim Element in Hills
	As FIG. 6A shows, coverage analyzer 21, in one embodiment, for all access elements APi (302), uses the positional parameters associated with the access elements to determine whether the current access element APi includes a neighboring access element within a threshold distance in a given quadrant, Q (304, 306). In one embodiment, a neighboring access element is an access element within a threshold distance and on the same floor as the current access element APi. If there are no neighboring access points in a given quadrant, pathloss is set to infinity (307), since the quadrant is at the edge of the network, and reducing transmit power just reduces the edge of the network. Otherwise, coverage analyzer 21 computes the pathloss exponent, ExpPLij, between access element APi and all neighboring access elements APj (308, 310). Equation 1, below, is a pathloss model, where c=the speed of light, f=frequency, and d=distance. Since the pathloss (PL) between a first access element and a second access element is the difference between the transmit power at the first access element and the receive signal strength at the second access element, the pathloss exponent, ExpPLij, can be derived from Equation (1). $$\mathrm{PL} = 10\log\left[\left(\frac{c}{4 * f * \mathrm{pi} * d}\right)^{\mathrm{ExpPlij}}\right] \quad (1)$$ From the pathloss exponent between access elements APi and APj, a pathloss exponent between access element APi and a remote client element can be estimated (312). In one embodiment, the estimated client pathloss exponent is derived by multiplying the pathloss exponent between access elements, ExpPLij, by a factor, as illustrated in Equation (2). $$\mathrm{ExpClient}_{ij}=\mathrm{ExpPL}_{ij}*\mathrm{Factor} \quad (2)$$ The multiplication factor above can be a configurable parameter and/or experimentally determined by comparing signal strengths detected between access elements with concurrent monitoring of the signal strength of access elements with wireless network testing equipment. With the estimated client pathloss exponent, ExpClientij, coverage analyzer 21 then calculates the radius of the coverage area, Rij, at a threshold signal strength level (e.g., −85 dBm) (312). In one embodiment, this can be done by solving Equation 1 for distance (d), since all other variables are known. Hills at 13:20–14:17, Fig. 6A.

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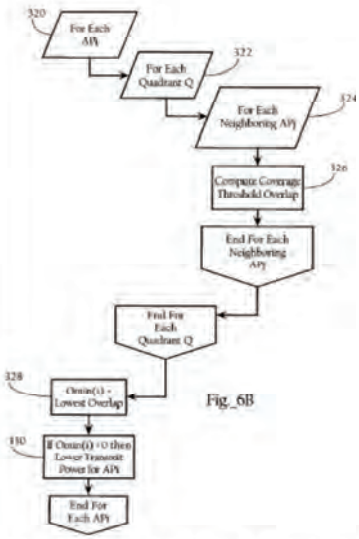
Claim Element	Disclosure of Claim Element in Hills
	 Fig_6B After all threshold level coverage radii have been computed, coverage analyzer 21, in one embodiment, calculates the coverage overlaps in all quadrants relative to each access element, and adjusts the transmit power where there is overlap in all quadrants. As FIG. 6B illustrates, coverage analyzer computes, for each access element (APi) (320), the coverage threshold overlap between all neighboring access elements (APj) in each quadrant relative to each quadrant (322, 324, 326). Equation (3) illustrates how coverage overlap can be computed according to one embodiment of the present invention. $O_{ijq} = d_{ij} - (R_{iq} + R_{jq})$ (3)

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Claim Element	Disclosure of Claim Element in Hills
	The overlap in a given quadrant q between two access elements i and j is the difference between the distance, dij, between the access elements and the sum of their coverage radii, R, at the threshold power level. A negative value indicates no coverage overlap. Hills at 14:17–34, Fig. 6B. As FIG. 6B shows, coverage analyzer 21 determines the lowest computed coverage overlap from the values computed for a given access element (328) and adjusts the transmit power of the access element, APi, if the minimum computed coverage overlap is a positive value (indicating coverage overlap) (330). In one embodiment, coverage analyzer 21 adjusts the transmit power of the access element, APi, if the minimum coverage overlap is greater than a threshold value. Coverage analyzer 21 repeats this process for all desired access elements. Hills at 14:35–44. To the extent Golden Eye argues that Hills 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 Hills with the identified reference(s) for the reasons discussed in the cover pleadings and associated Exhibits.
[2] The device of claim 1, further comprising an output adjustment requester configured to transmit an output strength adjustment request to each of the grouped wireless access points, the output strength adjustment request being related to adjusting a current output strength value based on the	Hills discloses, either expressly or inherently, an output adjustment requester configured to transmit an output strength adjustment request to each of the grouped wireless access points, the output strength adjustment request being related to adjusting a current output strength value based on the corrected output strength value. *See, e.g.*, FIG. 1 illustrates a computer network environment including dynamic transmit power configuration functionality according to an embodiment of the present invention. The computer network environment depicted in FIG. 1 includes access elements 12, 13, 14, 15 deployed across wide area network 50 comprising a plurality of local area network segments 10. In one embodiment, the present invention further includes coverage analyzer 21 to receive coverage data

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Claim Element	Disclosure of Claim Element in Hills
corrected output strength value.	from access elements 12, 13, 14, 15 and process the coverage data to compute transmit power levels for the access elements to optimize the performance of the wireless network environment, as described below. Hills at 3:23–34. According to one embodiment, the central control elements 24, 26 may each incorporate the functionality of coverage analyzer 21 (see above) to receive coverage scan data from the access elements to which they are associated and process the coverage scan data to compute an transmit power levels for the access elements. In an exemplary deployment, central control element 24 may be connected to a set of access elements installed on one floor of an enterprise facility, while central control element 26 may be operably connected to a set of access elements installed on a different floor of the facility. Access elements 12-15 are configured, as discussed above, to switch to a scan mode for a scanning period at regular scanning intervals, and transmit coverage scan data to the corresponding central control elements. In one embodiment, the central control elements 24, 26 are configured to automatically discover the access elements to which they are connected by various layer 2 and 3 discovery mechanisms, and populate the access point table. Central control elements 24, 26, in one embodiment, act independently with respect to each other; that is, for deployments where there is no overlap in coverage areas among the access elements 12-15, central control elements 24, 26 need not share access element information. However, in other deployments where there is coverage overlap, sharing of coverage scan and configuration information may be desirable. Hills at 6:65–7:23. According to another embodiment, central control element 24 (as well as other central control elements not shown) can communicate with access elements 12, 14 over local area network segment 10. In addition, using a virtual local area network (VLAN) technology and protocols, central control element 24 may also communicate with access element 15 over WAN 50. Suitable VLAN protocols include the IEEE 802.1Q (VLAN tagging) protocol or any other protocol allowing for a logic or virtual link layer connection between the central control element and the access elements.

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Claim Element	Disclosure of Claim Element in Hills
	Hills at 7:46–56. Assuming all conditions are met, coverage analyzer 21 then reduces the transmit power, or generates an instruction to reduce the transmit power, for AP, and AP, (114, 118), if the transmit power for AP, and/or AP, have not already been reduced during this analysis loop (112, 116). In one embodiment, coverage analyzer 21 reduces the transmit power of AP, and AP, each by 10 dB. Hills at 12:43–49. To the extent Golden Eye argues that Hills 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 Hills with the identified reference(s) for the reasons discussed in the cover pleadings and associated Exhibits.
[4] The device of claim 1, wherein the map generator is configured to generate a virtual map including RSSI values between the grouped wireless access points and the output strength value of each of the grouped wireless access points.	Hills discloses, either expressly or inherently, wherein the map generator is configured to generate a virtual map including RSSI values between the grouped wireless access points and the output strength value of each of the grouped wireless access points. *See, e.g.*, The access elements, such as access elements 12, 14, include functionality allowing for detection of the strength of the received signals. For example, the IEEE 802.11 standard defines a mechanism by which RF energy is to be measured by the circuitry (e.g., chip set) on a wireless network adapter or interface card. The 802.11 protocol specifies an optional parameter, the receive signal strength indicator (RSSI). This parameter is a measure by the PHY sub-layer of the energy observed at the antenna used to receive the current packet. RSSI is measured between the beginning of the start frame delimiter (SFD) and the end of the PLCP header error check (HEC). This numeric value is an integer with an allowable range of 0-255 (a 1-byte value). Typically, 802.11 chip set vendors have chosen not to actually measure 256 different signal levels. Accordingly, each vendor's 802.11-compliant adapter has a specific maximum RSSI value ("RSSI_Max"). Therefore, the RF energy level reported by a particular vendor's wireless network adapter will range between 0 and

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Claim Element	Disclosure of Claim Element in Hills
	RSSI_Max. Resolving a given RSSI value reported by a given vendor's chip set to an actual power value (dBm) can be accomplished by reference to a conversion table. In addition, some wireless networking chip sets actually report received signal strength in dBm units, rather than or in addition to RSSI. The access elements 12, 14 include the detected signal strength value associated with a packet in the coverage scan table. In one embodiment, the scan data fields can also include a time stamp indicating when the packet was detected. Hills at 4:65–5:25. Coverage analyzer 21, in one embodiment, is a network device that receives coverage scan data from the access elements and processes the coverage scan data, in one embodiment, to compute an optimal set of transmit power levels for the access elements. In one embodiment, the functionality of coverage analyzer 21 can be incorporated into a wireless network management platform or appliance. As discussed below, the functionality of coverage analyzer may also be incorporated into one or more central control elements 24, 26 as discussed more fully below. In one embodiment, coverage analyzer 21 includes an access point table storing information relating to known access elements. In one embodiment, the access point table includes an access element identifier field, and a current transmit power field. In 802.11 wireless network environments, the access element identifier is the MAC address corresponding to a given access element, while the service set identifier is the SSID contained in certain management frames, such as beacon frames, probe response frames, and association request frames. The access point table can be manually configured by a network administrator with knowledge of the MAC address and the SSID of the access elements. In another embodiment, the access point table can be automatically populated using layer 2 and/or layer 3 discover mechanisms. In one embodiment, the access elements can be configured to automatically transmit the coverage scan data to coverage analyzer 21 after each coverage scan. In another embodiment, the access elements can store the coverage scan data and transmit them in response to a request from coverage analyzer 21. In addition, coverage analyzer 21 can be configured to execute the coverage analysis functionality at regular, configurable intervals, or on demand. In one embodiment, coverage analyzer 21 maintains, for each access element, a separate table or other data structure for the received coverage scan data. In one embodiment, coverage analyzer 21 can summarize the coverage scan data, for example, by averaging the detected signal strength values associated with packets transmitted from a given access element.

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	Hills at 5:26–64. FIG. 7 also shows the packet flow path according to an embodiment of the present invention. In one embodiment, stats collector 84 maintains a histogram of signal strength on a per-access-element basis based on the signal strength information (e.g., SNR, RSSI, dBm) contained in the packet headers traversing central control element 24. For example, the received signal strength (dBm) of a packet received by an access element is recorded in a corresponding histogram having a range of −100 dBm to −10 dBm in increments of 1 dB bins. Of course, the exact range and number of bins may depend on the physical properties of the wireless network protocol and are also matters of engineering choice. Accordingly, the exact ranges and number of bins set forth herein are not intended to limit the scope of the claimed invention. As the data structure set forth below indicates, stats collector 84 maintains other statistics associated with the signal strength histogram for each access element, such as number of samples, number of unique MAC addresses, etc. As discussed above, coverage analysis module 80 is operative to store the statistics in association with a time stamp in database 86 and reset the statistic values maintained by stats collector 84. Hills at 9:11–32. As discussed above, the dynamic transmit power functionality has access to a database including the signal strength values corresponding to neighboring access elements as detected by each access element. In one embodiment, the database maintains a list or table for each access element of the detected access element(s) and a signal strength value associated with each detected access element. In one embodiment, coverage analyzer **21** sorts each list or table by largest coverage overlap (i.e., signal strength value). In another embodiment, coverage analyzer **21** assembles a two-dimensional matrix including the detected signal strengths among the access elements. As discussed above, the signal strength values in the coverage matrix can be the average signal strength values corresponding to the packets transmitted by the access elements. Hills at 12:4–18.

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Claim Element	Disclosure of Claim Element in Hills
	FIG. 4 illustrates a method directed to minimizing the coverage overlaps of access elements operating on the same channel. As discussed above, in one embodiment, coverage analyzer 21 maintains an i×j matrix of the signal strengths of the access elements as detected by all other access elements, where i=j and i equals the number of access elements in a given group of access elements. Accordingly, there are no values in the matrix where i equals j. In addition, many values in the matrix may be null or zero values as well, as many access elements may not detect the signals of all other access elements within a group. A group may be all access elements associated with a given central control element 24, or all access elements in a given physical location, such as a floor of a building. Hills at 12:19–32. As FIG. 4 illustrates, in one embodiment, coverage analyzer 21, for each access element (APi) (102), compares the signal strength detected by the access element from all other access elements (APj) in the matrix (104) against a coverage threshold. For example, in one embodiment, coverage analyzer 21 determines whether the signal strength, Sij, detected by APi is greater than a coverage threshold of −85 dBm (106). As FIG. 4 illustrates, coverage analyzer 21 also determines whether APi and APj operate on the same channel (108) and whether a coverage hole has been detected as to APi (110). Assuming all conditions are met, coverage analyzer 21 then reduces the transmit power, or generates an instruction to reduce the transmit power, for APi and APj (114, 118), if the transmit power for APi and/or APj have not already been reduced during this analysis loop (112, 116). In one embodiment, coverage analyzer 21 reduces the transmit power of APi and APj each by 10 dB. As one skilled in the art will recognize, however, the coverage threshold, as well as the amount by which the transmit powers are reduced, can be fully parameterized and configurable by a network administrator. Coverage analyzer 21 repeats this process for all access elements until the entire matrix has been traversed. Hills at 12:33–54. To the extent Golden Eye argues that Hills 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

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Claim Element	Disclosure of Claim Element in Hills
	by reference herein. A person of ordinary skill would have been motivated to combine Hills with the identified reference(s) for the reasons discussed in the cover pleadings and associated Exhibits.
11[pre] A method for controlling an output strength value of a wireless access point by a device for controlling the wireless access point, the method comprising:	To the extent the preamble is limiting, Hills discloses, either expressly or inherently, a method for controlling an output strength value of a wireless access point by a device for controlling the wireless access point. *See. e.g.*, Methods, apparatuses and systems facilitating the configuration of transmit power and coverage areas corresponding to access points in a wireless network environment. The present invention in one embodiment facilitates the dynamic configuration of coverage boundaries across a plurality of access points, improving the performance of the wireless network environment. Hills at Abstract. FIG. 1 illustrates a computer network environment including dynamic transmit power configuration functionality according to an embodiment of the present invention. The computer network environment depicted in FIG. 1 includes access elements 12, 13, 14, 15 deployed across wide area network 50 comprising a plurality of local area network segments 10. In one embodiment, the present invention further includes coverage analyzer 21 to receive coverage data from access elements 12, 13, 14, 15 and process the coverage data to compute transmit power levels for the access elements to optimize the performance of the wireless network environment, as described below. Hills at 3:23–34. Coverage analyzer 21, in one embodiment, is a network device that receives coverage scan data from the access elements and processes the coverage scan data, in one embodiment, to compute an optimal set of transmit power levels for the access elements. In one embodiment, the functionality of coverage analyzer 21 can be incorporated into a wireless network management platform or appliance. As discussed below, the functionality of coverage analyzer may also be incorporated into one or more central control elements 24, 26 as discussed more fully below. In one embodiment,

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Claim Element	Disclosure of Claim Element in Hills
	coverage analyzer 21 includes an access point table storing information relating to known access elements. In one embodiment, the access point table includes an access element identifier field, and a current transmit power field. In 802.11 wireless network environments, the access element identifier is the MAC address corresponding to a given access element, while the service set identifier is the SSID contained in certain management frames, such as beacon frames, probe response frames, and association request frames. The access point table can be manually configured by a network administrator with knowledge of the MAC address and the SSID of the access elements. In another embodiment, the access point table can be automatically populated using layer 2 and/or layer 3 discover mechanisms. In one embodiment, the access elements can be configured to automatically transmit the coverage scan data to coverage analyzer 21 after each coverage scan. In another embodiment, the access elements can store the coverage scan data and transmit them in response to a request from coverage analyzer 21. In addition, coverage analyzer 21 can be configured to execute the coverage analysis functionality at regular, configurable intervals, or on demand. In one embodiment, coverage analyzer 21 maintains, for each access element, a separate table or other data structure for the received coverage scan data. In one embodiment, coverage analyzer 21 can summarize the coverage scan data, for example, by averaging the detected signal strength values associated with packets transmitted from a given access element. Hills at 5:26–64.

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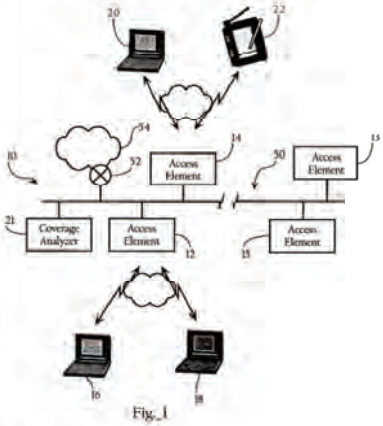
Claim Element	Disclosure of Claim Element in Hills
	 Hills at Fig. 1. According to one embodiment, the central control elements 24, 26 may each incorporate the functionality of coverage analyzer 21 (see above) to receive coverage scan data from the access elements to which they are associated and process the coverage scan data to compute an transmit power levels for the access elements. In an exemplary deployment, central control element 24 may be connected to a set of access elements installed on one floor of an enterprise facility, while central control element 26 may be operably connected to a set of access elements installed on a different floor of the facility. Access elements 12-15 are configured, as discussed above, to switch to a scan mode for a scanning period at regular scanning intervals, and transmit coverage scan data to the corresponding central control elements. In one embodiment, the central control elements 24, 26 are configured to automatically discover the access elements to which they are connected by various layer 2 and 3 discovery mechanisms, and populate the access point table. Central control elements 24, 26, in one embodiment, act independently with respect to each other; that is, for deployments where there is no overlap in coverage areas among the access elements 12-15, central control

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Claim Element	Disclosure of Claim Element in Hills
	elements 24, 26 need not share access element information. However, in other deployments where there is coverage overlap, sharing of coverage scan and configuration information may be desirable. Hills at 6:65–7:23. Other coverage data collection schemes are possible. For example, the access elements can be configured to broadcast management packets at periodic intervals on all available frequency channels for detection by neighboring access elements. In one embodiment, each access element can be configured with knowledge of neighboring access elements and address such packets directly to them. This configuration ensures that coverage data exists for access elements that would otherwise be inactive. The access elements, detecting the broadcasted packets, can be configured to store the MAC address of the broadcasting access element, the signal strength associated with the packet, and optionally a time stamp. Furthermore, the access elements need not go "off channel" to monitor for wireless traffic associated with its neighboring access elements, and can instead receive the packets in a normal access point mode configuration. In addition to sending directly to other access elements, the packets can be sent to a broadcast address or multicast address, where no knowledge of the other access elements is necessary. Hills at 7:66–8:18. To the extent Golden Eye argues that Hills 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 Hills with the identified reference(s) for the reasons discussed in the cover pleadings and associated Exhibits.
11[a] setting a channel for communication, searching for neighboring wireless access points, and transmitting information on the wireless access point	Hills discloses, either expressly or inherently, setting a channel for communication, searching for neighboring wireless access points, and transmitting information on the wireless access point and the searched neighboring wireless access points to the device for controlling the wireless access point, wherein the setting, searching and transmitting is performed by the wireless access point. *See, e.g.*,

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Claim Element	Disclosure of Claim Element in Hills
and the searched neighboring wireless access points to the device for controlling the wireless access point, wherein the setting, searching and transmitting is performed by the wireless access point;	As described in the above-identified patent application, central control element 24 operates to perform link layer management functions, such as authentication and association on behalf of access elements 12, 14. For example, the central control element 24 provides processing to dynamically configure a wireless Local Area Network of a system according to the invention while the access elements 12, 14 provide the acknowledgement of communications with the client remote elements 16, 18, 20, 22. The central control element 24 may for example process the wireless LAN network management messages, load control, channel control, and handoff. Among the network management messages are authentication requests of the client wireless access elements 12, 14 and association requests of the client wireless access elements 12, 14. The network management messages are passed on from the client remote elements 16, 18; 20, 22 via the access elements 12, 14, such as authentication requests and authorization requests, whereas the access elements 12, 14 provide immediate acknowledgment of the communication of those messages without conventional processing thereof. Similarly, the central control element 24 may for example process physical layer information. Still further, the central control element 24 may for example process information collected at the access elements 12, 14 on channel characteristic, propagation, and interference or noise. Central control element 26 and associated access elements 13, 15 operate in a similar or identical manner. Hills at 6:37–64. According to one embodiment, the central control elements 24, 26 may each incorporate the functionality of coverage analyzer 21 (see above) to receive coverage scan data from the access elements to which they are associated and process the coverage scan data to compute an transmit power levels for the access elements. In an exemplary deployment, central control element 24 may be connected to a set of access elements installed on one floor of an enterprise facility, while central control element 26 may be operably connected to a set of access elements installed on a different floor of the facility. Access elements 12-15 are configured, as discussed above, to switch to a scan mode for a scanning period at regular scanning intervals, and transmit coverage scan data to the corresponding central control elements. In one embodiment, the central control elements 24, 26 are configured to automatically discover the access elements to which they are connected by various layer 2 and 3 discovery mechanisms, and populate the access point table. Central control elements

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Claim Element	Disclosure of Claim Element in Hills
	24, 26, in one embodiment, act independently with respect to each other; that is, for deployments where there is no overlap in coverage areas among the access elements 12-15, central control elements 24, 26 need not share access element information. However, in other deployments where there is coverage overlap, sharing of coverage scan and configuration information may be desirable. Hills at 6:65–7:23.

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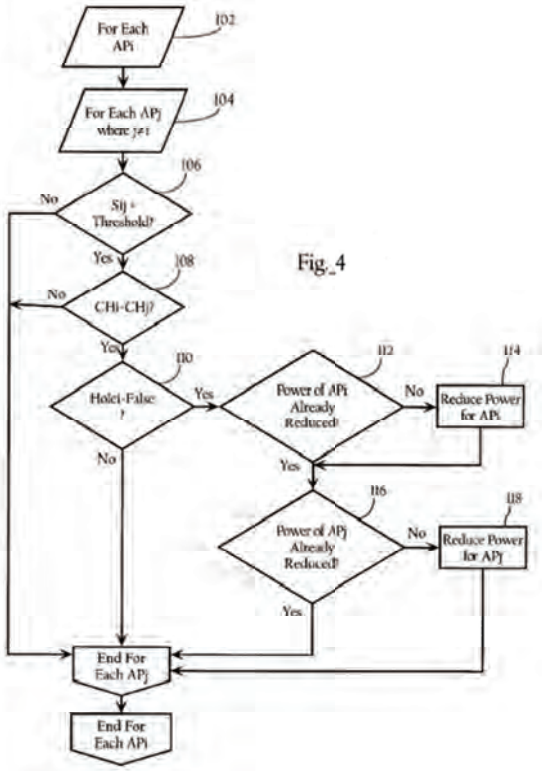
Claim Element	Disclosure of Claim Element in Hills
	 Fig. 4 As discussed above, the dynamic transmit power functionality has access to a database including the signal strength values corresponding to neighboring access elements as detected by each access element. In one embodiment, the database maintains a list or table for each access element of the detected access element(s) and a signal strength value associated with each detected access

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Claim Element	Disclosure of Claim Element in Hills
	element. In one embodiment, coverage analyzer 21 sorts each list or table by largest coverage overlap (i.e., signal strength value). In another embodiment, coverage analyzer 21 assembles a two-dimensional matrix including the detected signal strengths among the access elements. As discussed above, the signal strength values in the coverage matrix can be the average signal strength values corresponding to the packets transmitted by the access elements. FIG. 4 illustrates a method directed to minimizing the coverage overlaps of access elements operating on the same channel. As discussed above, in one embodiment, coverage analyzer 21 maintains an i×j matrix of the signal strengths of the access elements as detected by all other access elements, where i=j and i equals the number of access elements in a given group of access elements. Accordingly, there are no values in the matrix where i equals j. In addition, many values in the matrix may be null or zero values as well, as many access elements may not detect the signals of all other access elements within a group. A group may be all access elements associated with a given central control element 24, or all access elements in a given physical location, such as a floor of a building. Hills at 12:4–32, Fig.4. As FIG. 4 illustrates, in one embodiment, coverage analyzer 21, for each access element (APi) (102), compares the signal strength detected by the access element from all other access elements (APj) in the matrix (104) against a coverage threshold. For example, in one embodiment, coverage analyzer 21 determines whether the signal strength, Sij, detected by APi is greater than a coverage threshold of −85 dBm (106). As FIG. 4 illustrates, coverage analyzer 21 also determines whether APi and APj operate on the same channel (108) and whether a coverage hole has been detected as to APi (110). Assuming all conditions are met, coverage analyzer 21 then reduces the transmit power, or generates an instruction to reduce the transmit power, for APi and APj (114, 118), if the transmit power for APi and/or APj have not already been reduced during this analysis loop (112, 116). In one embodiment, coverage analyzer 21 reduces the transmit power of APi and APj each by 10 dB. As one skilled in the art will recognize, however, the coverage threshold, as well as the amount by which the transmit powers are reduced, can be fully parameterized and configurable by a network administrator. Coverage analyzer 21 repeats this process for all access elements until the entire matrix has been traversed.

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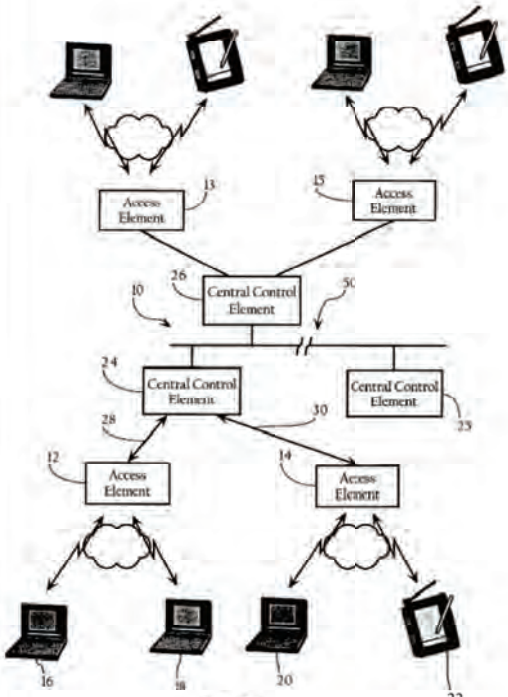
Claim Element	Disclosure of Claim Element in Hills
	Hills at 12:33–54.  Fig. 2A Hills at Fig. 2A.

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Claim Element	Disclosure of Claim Element in Hills
	The 802.11 protocol specifies an optional parameter, the receive signal strength indicator (RSSI). Hills at 5:3–5. Coverage analyzer 21, in one embodiment, is a network device that receives coverage scan data from the access elements and processes the coverage scan data, in one embodiment, to compute an optimal set of transmit power levels for the access elements. In one embodiment, the functionality of coverage analyzer 21 can be incorporated into a wireless network management platform or appliance. As discussed below, the functionality of coverage analyzer may also be incorporated into one or more central control elements 24, 26 as discussed more fully below. In one embodiment, coverage analyzer 21 includes an access point table storing information relating to known access elements. In one embodiment, the access point table includes an access element identifier field, and a current transmit power field. Hills at 5:26–39. In one embodiment, the access elements can be configured to automatically transmit the coverage scan data to coverage analyzer 21 after each coverage scan. In another embodiment, the access elements can store the coverage scan data and transmit them in response to a request from coverage analyzer 21. In addition, coverage analyzer 21 can be configured to execute the coverage analysis functionality at regular, configurable intervals, or on demand. In one embodiment, coverage analyzer 21 maintains, for each access element, a separate table or other data structure for the received coverage scan data. Hills at 5:55–57. Similarly, the central control element 24 may for example process physical layer information. Still further, the central control element 24 may for example process information collected at the access elements 12, 14 on channel characteristic, propagation, and interference or noise. Central control element 26 and associated access elements 13, 15 operate in a similar or identical manner.

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Claim Element	Disclosure of Claim Element in Hills
	According to one embodiment, the central control elements 24, 26 may each incorporate the functionality of data from the access elements to which they are associated and process the coverage scan data to compute an transmit power levels for the access elements. Hills at 6:57–7:3. To the extent Golden Eye argues that Hills 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 Hills with the identified reference(s) for the reasons discussed in the cover pleadings and associated Exhibits.
11[b] grouping wireless access points using a same channel, based on the information on the wireless access point and the neighboring wireless access points received from the wireless access point, the grouping being performed by the device for controlling the wireless access point;	Hills discloses, either expressly or inherently, grouping wireless access points using a same channel, based on the information on the wireless access point and the neighboring wireless access points received from the wireless access point, the grouping being performed by the device for controlling the wireless access point. *See, e.g.*, As described in the above-identified patent application, central control element 24 operates to perform link layer management functions, such as authentication and association on behalf of access elements 12, 14. For example, the central control element 24 provides processing to dynamically configure a wireless Local Area Network of a system according to the invention while the access elements 12, 14 provide the acknowledgement of communications with the client remote elements 16, 18, 20, 22. The central control element 24 may for example process the wireless LAN network management messages, load control, channel control, and handoff. Among the network management messages are authentication requests of the client wireless access elements 12, 14 and association requests of the client wireless access elements 12, 14. The network management messages are passed on from the client remote elements 16, 18; 20, 22 via the access elements 12, 14, such as authentication requests and authorization requests, whereas the access elements 12, 14 provide immediate acknowledgment of the communication of those messages without conventional processing thereof. Similarly, the central control element 24 may for example process physical layer information. Still further, the central control element 24 may for example process

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Claim Element	Disclosure of Claim Element in Hills
	information collected at the access elements 12, 14 on channel characteristic, propagation, and interference or noise. Central control element 26 and associated access elements 13, 15 operate in a similar or identical manner. Hills at 6:37–64. According to one embodiment, the central control elements 24, 26 may each incorporate the functionality of coverage analyzer 21 (see above) to receive coverage scan data from the access elements to which they are associated and process the coverage scan data to compute an transmit power levels for the access elements. In an exemplary deployment, central control element 24 may be connected to a set of access elements installed on one floor of an enterprise facility, while central control element 26 may be operably connected to a set of access elements installed on a different floor of the facility. Access elements 12-15 are configured, as discussed above, to switch to a scan mode for a scanning period at regular scanning intervals, and transmit coverage scan data to the corresponding central control elements. In one embodiment, the central control elements 24, 26 are configured to automatically discover the access elements to which they are connected by various layer 2 and 3 discovery mechanisms, and populate the access point table. Central control elements 24, 26, in one embodiment, act independently with respect to each other; that is, for deployments where there is no overlap in coverage areas among the access elements 12-15, central control elements 24, 26 need not share access element information. However, in other deployments where there is coverage overlap, sharing of coverage scan and configuration information may be desirable. Hills at 6:65–7:23.

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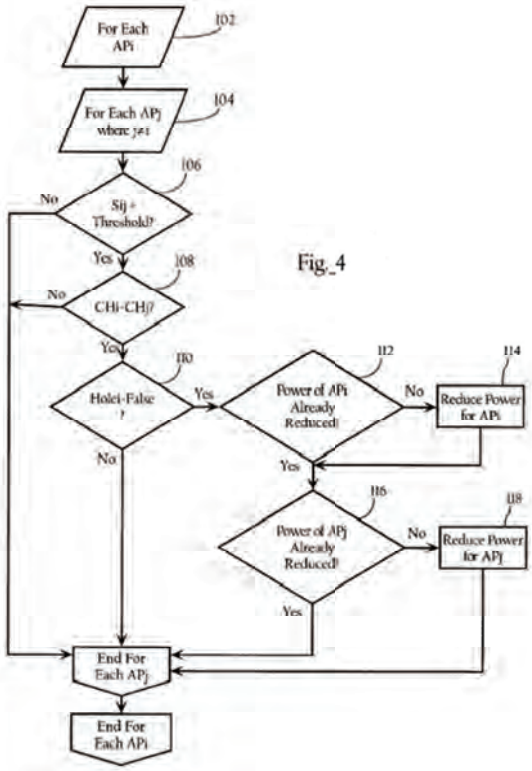
Claim Element	Disclosure of Claim Element in Hills
	 Fig. 4 As discussed above, the dynamic transmit power functionality has access to a database including the signal strength values corresponding to neighboring access elements as detected by each access element. In one embodiment, the database maintains a list or table for each access element of the detected access element(s) and a signal strength value associated with each detected access

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Claim Element	Disclosure of Claim Element in Hills
	element. In one embodiment, coverage analyzer 21 sorts each list or table by largest coverage overlap (i.e., signal strength value). In another embodiment, coverage analyzer 21 assembles a two-dimensional matrix including the detected signal strengths among the access elements. As discussed above, the signal strength values in the coverage matrix can be the average signal strength values corresponding to the packets transmitted by the access elements. FIG. 4 illustrates a method directed to minimizing the coverage overlaps of access elements operating on the same channel. As discussed above, in one embodiment, coverage analyzer 21 maintains an i×j matrix of the signal strengths of the access elements as detected by all other access elements, where i=j and i equals the number of access elements in a given group of access elements. Accordingly, there are no values in the matrix where i equals j. In addition, many values in the matrix may be null or zero values as well, as many access elements may not detect the signals of all other access elements within a group. A group may be all access elements associated with a given central control element 24, or all access elements in a given physical location, such as a floor of a building. Hills at 12:4–32, Fig.4. As FIG. 4 illustrates, in one embodiment, coverage analyzer 21, for each access element (APi) (102), compares the signal strength detected by the access element from all other access elements (APj) in the matrix (104) against a coverage threshold. For example, in one embodiment, coverage analyzer 21 determines whether the signal strength, Sij, detected by APi is greater than a coverage threshold of −85 dBm (106). As FIG. 4 illustrates, coverage analyzer 21 also determines whether APi and APj operate on the same channel (108) and whether a coverage hole has been detected as to APi (110). Assuming all conditions are met, coverage analyzer 21 then reduces the transmit power, or generates an instruction to reduce the transmit power, for APi and APj (114, 118), if the transmit power for APi and/or APj have not already been reduced during this analysis loop (112, 116). In one embodiment, coverage analyzer 21 reduces the transmit power of APi and APj each by 10 dB. As one skilled in the art will recognize, however, the coverage threshold, as well as the amount by which the transmit powers are reduced, can be fully parameterized and configurable by a network administrator. Coverage analyzer 21 repeats this process for all access elements until the entire matrix has been traversed.

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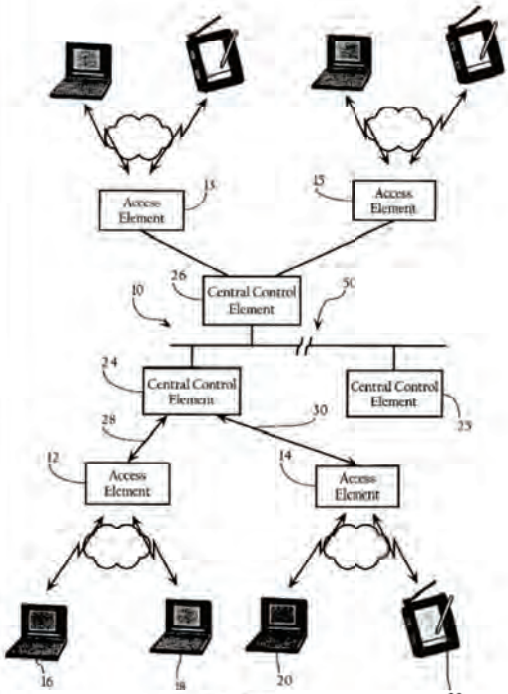
Claim Element	Disclosure of Claim Element in Hills
	Hills at 12:33–54.  Fig. 2A Hills at Fig. 2A.

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Claim Element	Disclosure of Claim Element in Hills
	The 802.11 protocol specifies an optional parameter, the receive signal strength indicator (RSSI). Hills at 5:3–5. Coverage analyzer 21, in one embodiment, is a network device that receives coverage scan data from the access elements and processes the coverage scan data, in one embodiment, to compute an optimal set of transmit power levels for the access elements. In one embodiment, the functionality of coverage analyzer 21 can be incorporated into a wireless network management platform or appliance. As discussed below, the functionality of coverage analyzer may also be incorporated into one or more central control elements 24, 26 as discussed more fully below. In one embodiment, coverage analyzer 21 includes an access point table storing information relating to known access elements. In one embodiment, the access point table includes an access element identifier field, and a current transmit power field. Hills at 5:26–39. In one embodiment, the access elements can be configured to automatically transmit the coverage scan data to coverage analyzer 21 after each coverage scan. In another embodiment, the access elements can store the coverage scan data and transmit them in response to a request from coverage analyzer 21. In addition, coverage analyzer 21 can be configured to execute the coverage analysis functionality at regular, configurable intervals, or on demand. In one embodiment, coverage analyzer 21 maintains, for each access element, a separate table or other data structure for the received coverage scan data. Hills at 5:55–57. Similarly, the central control element 24 may for example process physical layer information. Still further, the central control element 24 may for example process information collected at the access elements 12, 14 on channel characteristic, propagation, and interference or noise. Central control element 26 and associated access elements 13, 15 operate in a similar or identical manner.

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Claim Element	Disclosure of Claim Element in Hills
	According to one embodiment, the central control elements 24, 26 may each incorporate the functionality of data from the access elements to which they are associated and process the coverage scan data to compute an transmit power levels for the access elements. Hills at 6:57–7:3. To the extent Golden Eye argues that Hills 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 Hills with the identified reference(s) for the reasons discussed in the cover pleadings and associated Exhibits.
11[c] determining whether interference has occurred between the grouped wireless access points and transmitting the determination to the device for controlling a wireless access point, the determining and the transmitting the determination being performed by the grouped wireless access points;	Hills discloses, either expressly or inherently, determining whether interference has occurred between the grouped wireless access points and transmitting the determination to the device for controlling a wireless access point, the determining and the transmitting the determination being performed by the grouped wireless access points. *See, e.g.*, The access elements, such as access elements 12, 14, include functionality allowing for detection of the strength of the received signals. For example, the IEEE 802.11 standard defines a mechanism by which RF energy is to be measured by the circuitry (e.g., chip set) on a wireless network adapter or interface card. The 802.11 protocol specifies an optional parameter, the receive signal strength indicator (RSSI). This parameter is a measure by the PHY sub-layer of the energy observed at the antenna used to receive the current packet. RSSI is measured between the beginning of the start frame delimiter (SFD) and the end of the PLCP header error check (HEC). This numeric value is an integer with an allowable range of 0-255 (a 1-byte value). Typically, 802.11 chip set vendors have chosen not to actually measure 256 different signal levels. Accordingly, each vendor's 802.11-compliant adapter has a specific maximum RSSI value ("RSSI_Max"). Therefore, the RF energy level reported by a particular vendor's wireless network adapter will range between 0 and RSSI_Max. Resolving a given RSSI value reported by a given vendor's chip set to an actual power value (dBm) can be accomplished by reference to a conversion table. In addition, some wireless networking chip sets actually report received signal strength in dBm units, rather than or in addition

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Claim Element	Disclosure of Claim Element in Hills
	to RSSI. The access elements 12, 14 include the detected signal strength value associated with a packet in the coverage scan table. In one embodiment, the scan data fields can also include a time stamp indicating when the packet was detected. Hills at 4:65–5:25. Coverage analyzer 21, in one embodiment, is a network device that receives coverage scan data from the access elements and processes the coverage scan data, in one embodiment, to compute an optimal set of transmit power levels for the access elements. In one embodiment, the functionality of coverage analyzer 21 can be incorporated into a wireless network management platform or appliance. As discussed below, the functionality of coverage analyzer may also be incorporated into one or more central control elements 24, 26 as discussed more fully below. In one embodiment, coverage analyzer 21 includes an access point table storing information relating to known access elements. In one embodiment, the access point table includes an access element identifier field, and a current transmit power field. In 802.11 wireless network environments, the access element identifier is the MAC address corresponding to a given access element, while the service set identifier is the SSID contained in certain management frames, such as beacon frames, probe response frames, and association request frames. The access point table can be manually configured by a network administrator with knowledge of the MAC address and the SSID of the access elements. In another embodiment, the access point table can be automatically populated using layer 2 and/or layer 3 discover mechanisms. In one embodiment, the access elements can be configured to automatically transmit the coverage scan data to coverage analyzer 21 after each coverage scan. In another embodiment, the access elements can store the coverage scan data and transmit them in response to a request from coverage analyzer 21. In addition, coverage analyzer 21 can be configured to execute the coverage analysis functionality at regular, configurable intervals, or on demand. In one embodiment, coverage analyzer 21 maintains, for each access element, a separate table or other data structure for the received coverage scan data. In one embodiment, coverage analyzer 21 can summarize the coverage scan data, for example, by averaging the detected signal strength values associated with packets transmitted from a given access element. Hills at 5:26–64.

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Claim Element	Disclosure of Claim Element in Hills
	Still further, the central control element 24 may for example process information collected at the access elements 12, 14 on channel characteristic, propagation, and interference or noise. Central control element 26 and associated access elements 13, 15 operate in a similar or identical manner. Hills at 6:59–64. As discussed above, the dynamic transmit power functionality has access to a database including the signal strength values corresponding to neighboring access elements as detected by each access element. In one embodiment, the database maintains a list or table for each access element of the detected access element(s) and a signal strength value associated with each detected access element. In one embodiment, coverage analyzer **21** sorts each list or table by largest coverage overlap (i.e., signal strength value). In another embodiment, coverage analyzer **21** assembles a two-dimensional matrix including the detected signal strengths among the access elements. As discussed above, the signal strength values in the coverage matrix can be the average signal strength values corresponding to the packets transmitted by the access elements. Hills at 12:4–18.

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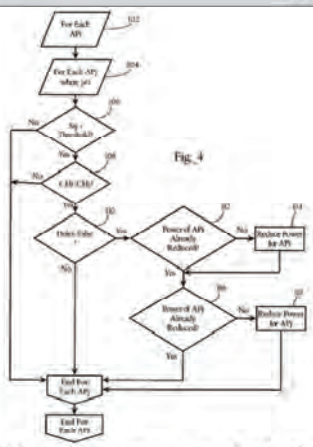
Claim Element	Disclosure of Claim Element in Hills
	 Fig. 4 FIG. 4 illustrates a method directed to minimizing the coverage overlaps of access elements operating on the same channel. As discussed above, in one embodiment, coverage analyzer 21 maintains an i×j matrix of the signal strengths of the access elements as detected by all other access elements, where i=j and i equals the number of access elements in a given group of access elements. Accordingly, there are no values in the matrix where i equals j. In addition, many values in the matrix may be null or zero values as well, as many access elements may not detect the signals of all other access elements within a group. A group may be all access elements associated with a given central control element 24, or all access elements in a given physical location, such as a floor of a building. Hills at 12:19–32, Fig. 4.

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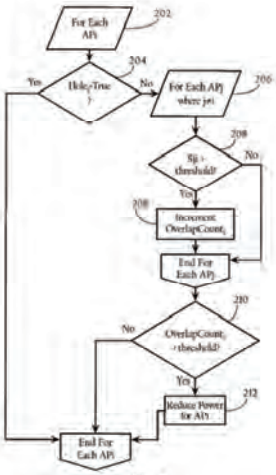
Claim Element	Disclosure of Claim Element in Hills
	 Fig. 5 FIG. 5, for example, illustrates a method directed to minimize the coverage overlap at a given threshold level between all access elements without regard to assigned channels. Rather, as FIG. 5 illustrates, coverage analyzer 21 can be configured to lower the transmit power of an access element where it overlaps above a threshold number coverage areas associated with other access elements. As with the method illustrated in FIG. 4, coverage analyzer 21 traverses an i×j matrix of signal strengths detected by the access elements. Accordingly, coverage analyzer 21, for each access element (APi) (202), first determines whether a coverage hole has been detected as to that access element (204). For each access element APj (206), coverage analyzer 21 compares the strength of the signal Sji, transmitted by APi as detected by APj (208), and increments a counter, OverlapCount, if Sji exceeds a coverage threshold (e.g., −85 dBm) (210). If the OverlapCount exceeds a threshold value (212), coverage analyzer 21 reduces the transmit power of APi (214). Coverage analyzer 21 repeats this process until all access elements in the matrix have been traversed.

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Claim Element	Disclosure of Claim Element in Hills
	Hills at 12:66–13:18, Fig. 5. To the extent Golden Eye argues that Hills 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 Hills with the identified reference(s) for the reasons discussed in the cover pleadings and associated Exhibits.
11[d] computing a corrected output strength value for reducing the interference and transmitting the corrected output strength value to the wireless access point, the computing and the transmitting the corrected output strength being performed by the device for controlling the wireless access point; and	Hills discloses, either expressly or inherently, computing a corrected output strength value for reducing the interference and transmitting the corrected output strength value to the wireless access point, the computing and the transmitting the corrected output strength being performed by the device for controlling the wireless access point. *See, e.g.,* In one embodiment, the present invention further includes coverage analyzer 21 to receive coverage data from access elements 12, 13, 14, 15 and process the coverage data to compute transmit power levels for the access elements to optimize the performance of the wireless network environment, as described below. Hills at 3:29–34. The access elements, such as access elements 12, 14, include functionality allowing for detection of the strength of the received signals. For example, the IEEE 802.11 standard defines a mechanism by which RF energy is to be measured by the circuitry (e.g., chip set) on a wireless network adapter or interface card. The 802.11 protocol specifies an optional parameter, the receive signal strength indicator (RSSI). This parameter is a measure by the PHY sub-layer of the energy observed at the antenna used to receive the current packet. RSSI is measured between the beginning of the start frame delimiter (SFD) and the end of the PLCP header error check (HEC). This numeric value is an integer with an allowable range of 0-255 (a 1-byte value). Typically, 802.11 chip set vendors have chosen not to actually measure 256 different signal levels. Accordingly, each vendor's 802.11-compliant adapter has a specific maximum RSSI value ("RSSI_Max"). Therefore, the RF energy level reported by a particular vendor's wireless network adapter will range between 0 and

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Claim Element	Disclosure of Claim Element in Hills
	RSSI_Max. Resolving a given RSSI value reported by a given vendor's chip set to an actual power value (dBm) can be accomplished by reference to a conversion table. In addition, some wireless networking chip sets actually report received signal strength in dBm units, rather than or in addition to RSSI. The access elements 12, 14 include the detected signal strength value associated with a packet in the coverage scan table. In one embodiment, the scan data fields can also include a time stamp indicating when the packet was detected. Hills at 4:65–5:25. Coverage analyzer 21, in one embodiment, is a network device that receives coverage scan data from the access elements and processes the coverage scan data, in one embodiment, to compute an optimal set of transmit power levels for the access elements. In one embodiment, the functionality of coverage analyzer 21 can be incorporated into a wireless network management platform or appliance. As discussed below, the functionality of coverage analyzer may also be incorporated into one or more central control elements 24, 26 as discussed more fully below. In one embodiment, coverage analyzer 21 includes an access point table storing information relating to known access elements. In one embodiment, the access point table includes an access element identifier field, and a current transmit power field. In 802.11 wireless network environments, the access element identifier is the MAC address corresponding to a given access element, while the service set identifier is the SSID contained in certain management frames, such as beacon frames, probe response frames, and association request frames. The access point table can be manually configured by a network administrator with knowledge of the MAC address and the SSID of the access elements. In another embodiment, the access point table can be automatically populated using layer 2 and/or layer 3 discover mechanisms. In one embodiment, the access elements can be configured to automatically transmit the coverage scan data to coverage analyzer 21 after each coverage scan. In another embodiment, the access elements can store the coverage scan data and transmit them in response to a request from coverage analyzer 21. In addition, coverage analyzer 21 can be configured to execute the coverage analysis functionality at regular, configurable intervals, or on demand. In one embodiment, coverage analyzer 21 maintains, for each access element, a separate table or other data structure for the received coverage scan data. In one embodiment, coverage analyzer 21 can summarize the coverage scan data, for example, by averaging the detected signal strength values associated with packets transmitted from a given access element.

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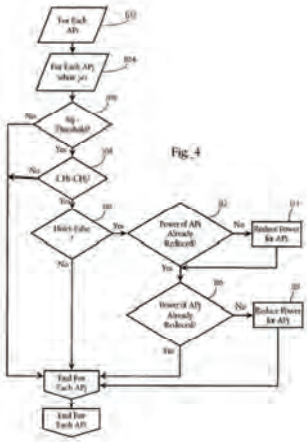
Claim Element	Disclosure of Claim Element in Hills
	Hills at 5:26–64.  As FIG. 4 illustrates, in one embodiment, coverage analyzer 21, for each access element (APi) (102), compares the signal strength detected by the access element from all other access elements (APj) in the matrix (104) against a coverage threshold. For example, in one embodiment, coverage analyzer 21 determines whether the signal strength, Sij, detected by APi is greater than a coverage threshold of −85 dBm (106). As FIG. 4 illustrates, coverage analyzer 21 also determines whether APi and APj operate on the same channel (108) and whether a coverage hole has been detected as to APi (110). Assuming all conditions are met, coverage analyzer 21 then reduces the transmit power, or generates an instruction to reduce the transmit power, for APi and APj (114, 118), if the transmit power for APi and/or APj have not already been reduced during this analysis loop (112, 116). In one embodiment, coverage analyzer 21 reduces the transmit power of APi and APj each by 10 dB. As one skilled in the art will recognize, however, the coverage threshold, as well as the amount by which the transmit powers are reduced, can be fully parameterized and

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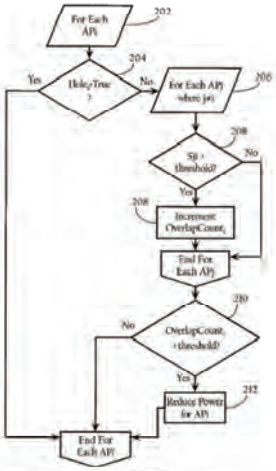
Claim Element	Disclosure of Claim Element in Hills
	configurable by a network administrator. Coverage analyzer 21 repeats this process for all access elements until the entire matrix has been traversed. Hills at 12:33–54, Fig. 4.  Fig. 5 FIG. 5, for example, illustrates a method directed to minimize the coverage overlap at a given threshold level between all access elements without regard to assigned channels. Rather, as FIG. 5 illustrates, coverage analyzer 21 can be configured to lower the transmit power of an access element where it overlaps above a threshold number coverage areas associated with other access elements. As with the method illustrated in FIG. 4, coverage analyzer 21 traverses an i×j matrix of signal strengths detected by the access elements. Accordingly, coverage analyzer 21, for each access element (APi) (202), first determines whether a coverage hole has been detected as to that access element (204). For each access element APj (206), coverage analyzer 21 compares the

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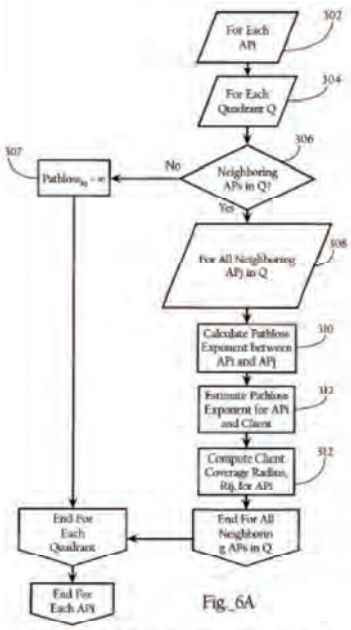
Claim Element	Disclosure of Claim Element in Hills
	strength of the signal Sji, transmitted by APi as detected by APj (208), and increments a counter, OverlapCount, if Sji exceeds a coverage threshold (e.g., −85 dBm) (210). If the OverlapCount exceeds a threshold value (212), coverage analyzer 21 reduces the transmit power of APi (214). Coverage analyzer 21 repeats this process until all access elements in the matrix have been traversed. Hills at 12:66–13:18, Fig. 5.  Fig. 6A As FIG. 6A shows, coverage analyzer 21, in one embodiment, for all access elements APi (302), uses the positional parameters associated with the access elements to determine whether the current

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Claim Element	Disclosure of Claim Element in Hills
	access element APi includes a neighboring access element within a threshold distance in a given quadrant, Q (304, 306). In one embodiment, a neighboring access element is an access element within a threshold distance and on the same floor as the current access element APi. If there are no neighboring access points in a given quadrant, pathloss is set to infinity (307), since the quadrant is at the edge of the network, and reducing transmit power just reduces the edge of the network. Otherwise, coverage analyzer 21 computes the pathloss exponent, ExpPLij, between access element APi and all neighboring access elements APj (308, 310). Equation 1, below, is a pathloss model, where c=the speed of light, f=frequency, and d=distance. Since the pathloss (PL) between a first access element and a second access element is the difference between the transmit power at the first access element and the receive signal strength at the second access element, the pathloss exponent, ExpPLij, can be derived from Equation (1). $$\mathrm{PL} = 10\log\left[\left(\frac{c}{4 * f * \mathrm{pi} * d}\right)^{\mathrm{ExpPlij}}\right] \quad (1)$$ From the pathloss exponent between access elements APi and APj, a pathloss exponent between access element APi and a remote client element can be estimated (312). In one embodiment, the estimated client pathloss exponent is derived by multiplying the pathloss exponent between access elements, ExpPLij, by a factor, as illustrated in Equation (2). $$\mathrm{ExpClient}_{ij}=\mathrm{ExpPL}_{ij}*\mathrm{Factor} \quad (2)$$ The multiplication factor above can be a configurable parameter and/or experimentally determined by comparing signal strengths detected between access elements with concurrent monitoring of the signal strength of access elements with wireless network testing equipment. With the estimated client pathloss exponent, ExpClientij, coverage analyzer 21 then calculates the radius of the coverage area, Rij, at a threshold signal strength level (e.g., −85 dBm) (312). In one embodiment, this can be done by solving Equation 1 for distance (d), since all other variables are known. Hills at 13:20–14:17, Fig. 6A.

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	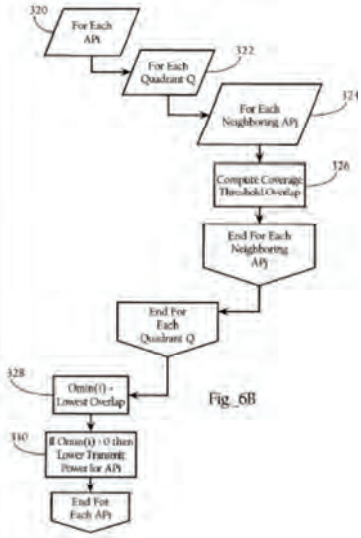 Fig_6B After all threshold level coverage radii have been computed, coverage analyzer 21, in one embodiment, calculates the coverage overlaps in all quadrants relative to each access element, and adjusts the transmit power where there is overlap in all quadrants. As FIG. 6B illustrates, coverage analyzer computes, for each access element (APi) (320), the coverage threshold overlap between all neighboring access elements (APj) in each quadrant relative to each quadrant (322, 324, 326). Equation (3) illustrates how coverage overlap can be computed according to one embodiment of the present invention. $$O_{ijq} = d_{ij} - (R_{iq} + R_{jq}) \qquad (3)$$ The overlap in a given quadrant q between two access elements i and j is the difference between the distance, dij, between the access elements and the sum of their coverage radii, R, at the threshold power level. A negative value indicates no coverage overlap.

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Claim Element	Disclosure of Claim Element in Hills
	Hills at 14:17–34, Fig. 6B. As FIG. 6B shows, coverage analyzer 21 determines the lowest computed coverage overlap from the values computed for a given access element (328) and adjusts the transmit power of the access element, APi, if the minimum computed coverage overlap is a positive value (indicating coverage overlap) (330). In one embodiment, coverage analyzer 21 adjusts the transmit power of the access element, APi, if the minimum coverage overlap is greater than a threshold value. Coverage analyzer 21 repeats this process for all desired access elements. Hills at 14:35–44. To the extent Golden Eye argues that Hills 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 Hills with the identified reference(s) for the reasons discussed in the cover pleadings and associated Exhibits.
11[e] adjusting a current output strength value based on the corrected output strength value, the adjusting being performed by the wireless access point.	Hills discloses, either expressly or inherently, adjusting a current output strength value based on the corrected output strength value, the adjusting being performed by the wireless access point. *See, e.g.*, In one embodiment, the present invention further includes coverage analyzer 21 to receive coverage data from access elements 12, 13, 14, 15 and process the coverage data to compute transmit power levels for the access elements to optimize the performance of the wireless network environment, as described below. Hills at 3:29–34. The access elements, such as access elements 12, 14, include functionality allowing for detection of the strength of the received signals. For example, the IEEE 802.11 standard defines a mechanism by which RF energy is to be measured by the circuitry (e.g., chip set) on a wireless network adapter

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Claim Element	Disclosure of Claim Element in Hills
	or interface card. The 802.11 protocol specifies an optional parameter, the receive signal strength indicator (RSSI). This parameter is a measure by the PHY sub-layer of the energy observed at the antenna used to receive the current packet. RSSI is measured between the beginning of the start frame delimiter (SFD) and the end of the PLCP header error check (HEC). This numeric value is an integer with an allowable range of 0-255 (a 1-byte value). Typically, 802.11 chip set vendors have chosen not to actually measure 256 different signal levels. Accordingly, each vendor's 802.11-compliant adapter has a specific maximum RSSI value ("RSSI_Max"). Therefore, the RF energy level reported by a particular vendor's wireless network adapter will range between 0 and RSSI_Max. Resolving a given RSSI value reported by a given vendor's chip set to an actual power value (dBm) can be accomplished by reference to a conversion table. In addition, some wireless networking chip sets actually report received signal strength in dBm units, rather than or in addition to RSSI. The access elements 12, 14 include the detected signal strength value associated with a packet in the coverage scan table. In one embodiment, the scan data fields can also include a time stamp indicating when the packet was detected. Hills at 4:65–5:25. Coverage analyzer 21, in one embodiment, is a network device that receives coverage scan data from the access elements and processes the coverage scan data, in one embodiment, to compute an optimal set of transmit power levels for the access elements. In one embodiment, the functionality of coverage analyzer 21 can be incorporated into a wireless network management platform or appliance. As discussed below, the functionality of coverage analyzer may also be incorporated into one or more central control elements 24, 26 as discussed more fully below. In one embodiment, coverage analyzer 21 includes an access point table storing information relating to known access elements. In one embodiment, the access point table includes an access element identifier field, and a current transmit power field. In 802.11 wireless network environments, the access element identifier is the MAC address corresponding to a given access element, while the service set identifier is the SSID contained in certain management frames, such as beacon frames, probe response frames, and association request frames. The access point table can be manually configured by a network administrator with knowledge of the MAC address and the SSID of the access elements. In another embodiment, the access point table can be automatically populated using layer 2 and/or layer 3 discover mechanisms. In one embodiment, the access elements can be configured

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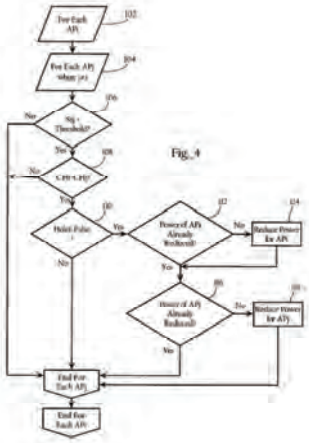
Claim Element	Disclosure of Claim Element in Hills
	to automatically transmit the coverage scan data to coverage analyzer 21 after each coverage scan. In another embodiment, the access elements can store the coverage scan data and transmit them in response to a request from coverage analyzer 21. In addition, coverage analyzer 21 can be configured to execute the coverage analysis functionality at regular, configurable intervals, or on demand. In one embodiment, coverage analyzer 21 maintains, for each access element, a separate table or other data structure for the received coverage scan data. In one embodiment, coverage analyzer 21 can summarize the coverage scan data, for example, by averaging the detected signal strength values associated with packets transmitted from a given access element. Hills at 5:26–64.  Fig. 4 As FIG. 4 illustrates, in one embodiment, coverage analyzer 21, for each access element (APi) (102), compares the signal strength detected by the access element from all other access elements (APj) in the matrix (104) against a coverage threshold. For example, in one embodiment, coverage analyzer 21 determines whether the signal strength, Sij, detected by APi is greater than a coverage

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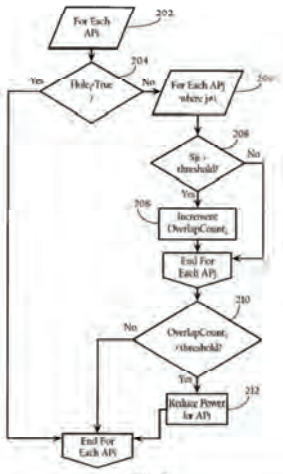
Claim Element	Disclosure of Claim Element in Hills
	threshold of −85 dBm (106). As FIG. 4 illustrates, coverage analyzer 21 also determines whether APi and APj operate on the same channel (108) and whether a coverage hole has been detected as to APi (110). Assuming all conditions are met, coverage analyzer 21 then reduces the transmit power, or generates an instruction to reduce the transmit power, for APi and APj (114, 118), if the transmit power for APi and/or APj have not already been reduced during this analysis loop (112, 116). In one embodiment, coverage analyzer 21 reduces the transmit power of APi and APj each by 10 dB. As one skilled in the art will recognize, however, the coverage threshold, as well as the amount by which the transmit powers are reduced, can be fully parameterized and configurable by a network administrator. Coverage analyzer 21 repeats this process for all access elements until the entire matrix has been traversed. Hills at 12:33–54, Fig. 4.  Fig. 5

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Claim Element	Disclosure of Claim Element in Hills
	FIG. 5, for example, illustrates a method directed to minimize the coverage overlap at a given threshold level between all access elements without regard to assigned channels. Rather, as FIG. 5 illustrates, coverage analyzer 21 can be configured to lower the transmit power of an access element where it overlaps above a threshold number coverage areas associated with other access elements. As with the method illustrated in FIG. 4, coverage analyzer 21 traverses an i×j matrix of signal strengths detected by the access elements. Accordingly, coverage analyzer 21, for each access element (APi) (202), first determines whether a coverage hole has been detected as to that access element (204). For each access element APj (206), coverage analyzer 21 compares the strength of the signal Sji, transmitted by APi as detected by APj (208), and increments a counter, OverlapCount, if Sji exceeds a coverage threshold (e.g., −85 dBm) (210). If the OverlapCount exceeds a threshold value (212), coverage analyzer 21 reduces the transmit power of APi (214). Coverage analyzer 21 repeats this process until all access elements in the matrix have been traversed. Hills at 12:66–13:18, Fig. 5.

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	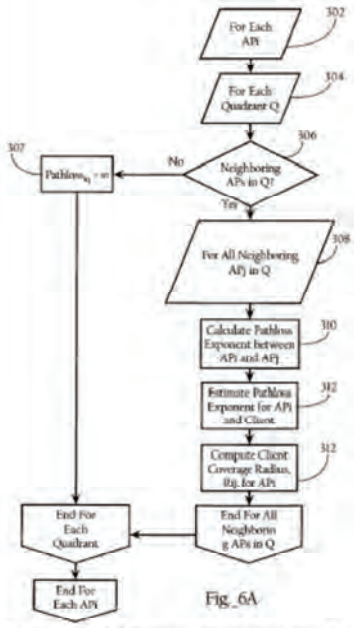 Fig_6A As FIG. 6A shows, coverage analyzer 21, in one embodiment, for all access elements APi (302), uses the positional parameters associated with the access elements to determine whether the current access element APi includes a neighboring access element within a threshold distance in a given quadrant, Q (304, 306). In one embodiment, a neighboring access element is an access element within a threshold distance and on the same floor as the current access element APi. If there are no neighboring access points in a given quadrant, pathloss is set to infinity (307), since the quadrant is at the edge of the network, and reducing transmit power just reduces the edge of the network. Otherwise, coverage analyzer 21 computes the pathloss exponent, ExpPLij, between access element APi and all neighboring access elements APj (308, 310). Equation 1, below, is a pathloss model, where c=the speed of light, f=frequency, and d=distance. Since the pathloss (PL) between

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Claim Element	Disclosure of Claim Element in Hills
	a first access element and a second access element is the difference between the transmit power at the first access element and the receive signal strength at the second access element, the pathloss exponent, ExpPLij, can be derived from Equation (1). $$\mathrm{PL} = 10\log\left[\left(\frac{c}{4 * f * \mathrm{pi} * d}\right)^{\mathrm{ExpPlij}}\right] \quad (1)$$ From the pathloss exponent between access elements APi and APj, a pathloss exponent between access element APi and a remote client element can be estimated (312). In one embodiment, the estimated client pathloss exponent is derived by multiplying the pathloss exponent between access elements, ExpPLij, by a factor, as illustrated in Equation (2). $$\mathrm{ExpClient}_{ij}=\mathrm{ExpPL}_{ij}*\mathrm{Factor} \quad (2)$$ The multiplication factor above can be a configurable parameter and/or experimentally determined by comparing signal strengths detected between access elements with concurrent monitoring of the signal strength of access elements with wireless network testing equipment. With the estimated client pathloss exponent, ExpClientij, coverage analyzer 21 then calculates the radius of the coverage area, Rij, at a threshold signal strength level (e.g., −85 dBm) (312). In one embodiment, this can be done by solving Equation 1 for distance (d), since all other variables are known. Hills at 13:20–14:17, Fig. 6A.

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	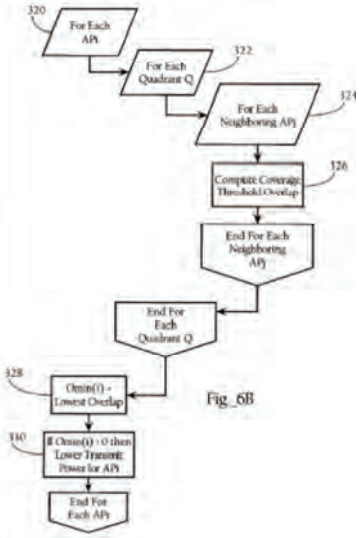 Fig_6B After all threshold level coverage radii have been computed, coverage analyzer 21, in one embodiment, calculates the coverage overlaps in all quadrants relative to each access element, and adjusts the transmit power where there is overlap in all quadrants. As FIG. 6B illustrates, coverage analyzer computes, for each access element (APi) (320), the coverage threshold overlap between all neighboring access elements (APj) in each quadrant relative to each quadrant (322, 324, 326). Equation (3) illustrates how coverage overlap can be computed according to one embodiment of the present invention. $$O_{ijq} = d_{ij} - (R_{iq} + R_{jq}) \qquad (3)$$ The overlap in a given quadrant q between two access elements i and j is the difference between the distance, dij, between the access elements and the sum of their coverage radii, R, at the threshold power level. A negative value indicates no coverage overlap.

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	Hills at 14:17–34, Fig. 6B. As FIG. 6B shows, coverage analyzer 21 determines the lowest computed coverage overlap from the values computed for a given access element (328) and adjusts the transmit power of the access element, APi, if the minimum computed coverage overlap is a positive value (indicating coverage overlap) (330). In one embodiment, coverage analyzer 21 adjusts the transmit power of the access element, APi, if the minimum coverage overlap is greater than a threshold value. Coverage analyzer 21 repeats this process for all desired access elements. Hills at 14:35–44. To the extent Golden Eye argues that Hills 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 Hills with the identified reference(s) for the reasons discussed in the cover pleadings and associated Exhibits.