Prepare Your Network for Mobile Devices and Tablets with Cisco Wireless

Q. Is it recommended to keep voice services on 802.11a, or is it okay to run both voice and data on 802.11 b/g/n?

A. Cisco recommends deploying voice on a 5-GHz band, where there is a significant increase in non-overlapping channels and much less interference.

Q. With wireless carriers offering LTE, 4th Generation, WiMAX, and so on, on most devices, will the demand on the Wi-Fi network go down?

A. Not at all. In fact, many service providers would like to offload Long Term Evolution (LTE) and 3rd Generation/4th Generation (3G/4G) devices to Wi-Fi for non-voice traffic. Instead we will see continued growth in parallel to next-generation mobile operator technologies and the mobile operator technologies (LTE, 3G/4G) dedicated for voice. Bandwidth for high-definition (HD) rich media continues to outstrip the multiuser capabilities of LTE, 4G, and so on. 802.11n provides the speed needed for advancing rich media applications.

Also, Wi-Fi has more than 20 times the throughput and 40 times the spectrum capacity than cellular technologies. Cellular throughput is shared across the tens or hundreds of users within the coverage of the macro tower.

Q. Why does Cisco Radio Resource Management perform its power calculations based on 1-Mbps data rate even if that data rate is disabled?

A. We use the 1-Mbps data rate to get the maximum possible reach out of our encrypted access-point to access-point-neighbor packets. They do not consume much bandwidth and give us the visibility to understand the attenuation between all the access points that can hear each other.

Q. Is it better to keep only native 802.11n clients on the 5-GHz channels, rather than allowing legacy 802.11a clients too?

A. This is a good deployment strategy for three reasons: 1) More non-overlapping channels for higher network capacity; 2) availability of 40-MHz channels for 300-MB data rates; and 3) much less interference. You can use Cisco® BandSelect technology to help move clients to 5 GHz.

Q. We have used a 802.11n access point, but still only get 54 Mbps. What else do we need in our infrastructure to get 802.11n speeds on our laptops?

A. First, check to be sure you have Wi-Fi Multimedia (WMM) enabled. Check that the 802.11n data rates are enabled and whether you are operating in 5 GHz. Be sure that 40 MHz is enabled, and check client capability and similar attributes. To reach 802.11n speeds, you have to use Advanced Encryption Services (AES) encryption (or no encryption). Test by turning off encryption to isolate the problem. Then check client settings to make sure that the client supports two 802.11n spatial streams and that the high throughput (HT) settings are on.

Q. Doesn't Cisco ClientLink also potentially increase co-channel interference?

A. No, it actually creates less channel utilization by allowing non-802.11n clients to operate at a higher data rate. This provides for up to a 60 percent improvement in channel capacity. The beacons are not beam-formed to prevent cell expansion. ClientLink also focuses the information toward the client that it is intended for. The use of ClientLink does not result in any changes to the output power of the access point. In general, it is not a good idea to increase output power due to issues with co-channel interference on neighboring cells.

Q. How does beam forming compare to competitive beam forming technology?

A. Most competitors' beam-forming capabilities improve only the uplink (how well the access point can hear the clients). Cisco ClientLink improves the downlink as well by using a proprietary algorithm to improve the phase/amplitude of multiple Tx beams to the clients. We can also improve channel capacity by 27 percent to support more clients.

Please take a look at the following white paper for details on Cisco ClientLink: http://www.cisco.com/en/US/prod/collateral/wireless/ps5678/ps10092/white_paper_c11-516389.html.

Q. Is there a maximum number of simultaneous clients that can be supported in the Cisco ClientLink queue?

A. You can support beam-forming for up to 15 clients per radio. Note that this does not restrict the total number of clients on the radio or access point but simply the number of 802.11a/g clients that you will simultaneously beam-form to. Cisco ClientLink helps the worst a/g clients, not the "first" that connect.

Q. Does Cisco CleanAir correlate interferers with real 802.11 performance data, or just assume the interferer is causing interference?

A. Cisco CleanAir technology can correlate the same source of interferes seen across multiple access points, so you get a single alert (in contrast to other, noisier spectrum analysis features on competitors' products). CleanAir monitors the severity and impact to Wi-Fi from each interference source. The algorithm is designed to show the performance-impacting effect of the interference source. For example, Bluetooth typically has ~20 percent performance impact, whereas an analog video camera has ~95 percent.

Q. We have had problems with Apple devices connecting to the network. From what I have read, it is due to poor drivers from Apple. Is Cisco working with Apple to resolve these issues?

A. Cisco is working with Apple at various levels, and you should see updates in later Apple iOS versions. Starting with Cisco Wireless LAN Controller Software Release 7.0, vendor client devices are published in the release notes to show which have been tested for compatibility by the Cisco AssureWave team.

Q. Is Cisco VideoStream technology supported on the Cisco Aironet® 1142 Access Point?

A. Yes, VideoStream is supported on the Cisco Aironet 1040, 1140, 1250, 1260, 3500, 1130, and 1240 Series access points. For more information, see the release notes for the specific access points you're interested in.

Q. Is Cisco radio resource management (RRM) configured at the controller or WCS?

A. The RRM engine runs on the controller. You can configure it through the command-line interface (CLI), the Wireless LAN Controller (WLC) GUI interface, or WCS.

Q. In the RRM > DCA settings, the default is 10 minutes, I believe. Wouldn't this impact the client if channels were changing that often? Does Cisco recommend changing this?

A. What RRM is doing is looking at the worst access points and a handful of others each tune-up cycle. If the WLC can fix the local RF neighborhood, it will make changes accordingly. It does not cascade changes through the whole network. Some customers run at longer intervals.

Q. How does Cisco ClientLink select the 15 clients to provide beam-forming for? Is it the first 15 devices, the 15 in most need, or do they have to be statically set up for ClientLink?

A. ClientLink works on a per packet basis in an automatic fashion. Please see the white paper on tablets for more details. ClientLink takes action on a per-need basis. Remember: If your client is very close to the access point or there's no interference, it might be getting the best data rate.

Q. Is Cisco developing better management tools to proactively determine client health?

A. We already have client health measurements in our newly designed client screens in Cisco Prime™ Network Control System Series Appliances.

Q. How close are 802.11n access points for performance? Are the Cisco Aironet 11n access points similar to the E3000 Linksys for throughput, coverage, etc? I've heard mixed messages when comparing the two.

A. 802.11n performance is comparable across the Cisco Aironet 1140 and 1260 Series and Aironet 3500 Series, with the difference that the 3500 Series has CleanAir technology. The 1040 Series, on the other hand, provides about 25 percent less in coverage and range support. Linksys 802.11n access points are considerably less robust and not enterprise-ready. Please see the following white paper for 802.11n performance details: http://www.cisco.com/en/US/solutions/collateral/ns340/ns394/ns348/ns767/white_paper_c11-492743_v1.pdf.

Enterprise-ready is defined by Cisco VideoStream, ClientLink, BandSelect, CleanAir support that is introduced in the silicon on access points, versus off-the-shelf, consumer-class wireless chipsets

Q. How many simultaneous multicast streams will Cisco VideoStream technology support?

A. The number of simultaneous video streams changes based on access point model. Currently, internal testing shows about 10 or so for the Cisco Aironet 1040 Series, about 20 for the 1140 Series, and 23 for 3500 Series.

Q. Can alerts be sent notifying of RRM activity? For example, when coverage holes are detected or when channels are being changed?

A. Yes. RRM is fully instrumented. You can see alerts in Cisco Wireless Control System (WCS) or via SNMP/Syslog messages or email. WCS allows you to see a top five access point view showing the access points with the greatest number of coverage holes, which is a good indication of coverage problems.

Q. Suppose you have a classroom with 30 students, each with a laptop, and maybe half of those students with another wireless device. Would a total of 45 devices bog down one access point?

A. It really depends on what these students are doing. If everyone is simply browsing the web, it is not a problem. The important factor is channel utilization. A Cisco Aironet access point is able to support a very large number of devices. The determining factor is the type of application used and the throughput requirements.

Q. Please explain the differences and overlaps between radio resource management and Cisco CleanAir features.

A. Please refer to the following white paper for more details: http://www.cisco.com/en/US/solutions/collateral/ns340/ns394/ns348/ns1070/white_paper_c11-599260.html.

Q. Can we use the Cisco Aironet 1142 Access Point with the "N" capability, or do we have to migrate to the latest 3000 Series access point to support the Cisco Cius™ and iPad affectively for video conferencing?

A. Cisco provides many 802.11n access points to upgrade from the 1142. Our 1040/1140/1260/3500 Series access points are the enterprise access points. The 3000 Series is the consumer grade Linksys product.

Q. What's needed to implement Cisco AnyConnect® on the Cisco ASA 5520 Adaptive Security Appliance?

A. For additional details on the AnyConnect client, please visit: http://www.cisco.com/en/US/partner/prod/collateral/vpndevc/ps6032/ps6094/ps6120/data_sheet_c78-527494.html.

Q. What is the minimum WLC software level needed to support Cisco Aironet 3500 Series Access Points with Cisco CleanAir technology?

A. The 3500 Series with CleanAir technology is supported on all current controllers that use Cisco WLC Software Release 7.0 or later. What varies is the number of access points each WLC can support. For instance, the 2100 controller can support 3 to 6 access points whereas the 5500 can support up to 500 access points.

Q. Is there a trial version of CleanAir available for download?

A. Cisco CleanAir technology requires Cisco Aironet 3500 Series Access Point in addition to the latest Cisco WLC Software (Release 7.x) on your latest controller. CleanAir is not a software package. It is available only as part of the 3500 Series access point hardware.

Q. Can you talk about channel utilization in regard to throughput? I've heard that channel utilization at around 30 percent (from interference, or other clients) can render the network useless. Are there any general guidelines about this?

A. Generally, as you approach 60 percent channel loading, the capacity to sustain Wi-Fi goes away.

Q. Is there going to be a "how to" on Cisco.com regarding iPad/iPhone enterprise deployments like 802.1x for windows clients?

A. See this white paper: http://www.cisco.com/en/US/solutions/collateral/ns340/ns394/ns348/ns1070/white_paper_c11-599260.html.

Q. Does 802.11b degrade 802.11a?

A. No. 802.11b operates at 2.4 GHz. 802.11a operates at 5 GHz.

Q. Do you require a dedicated access point to run CleanAir?

A. No, the Cisco Aironet 3500 Series Access Point operates in both local data mode and monitor mode

Q. Is the Cisco Mobility Services Engine (MSE) required to use any of the CleanAir features?

A. MSE is not required to use CleanAir technology. The MSE extends the presentation layer to CleanAir (seeing your zone of impact, history playback, and so on).

Q. How many 3500 Series Access Points would I need to take advantage of CleanAir? I already have ten 1142 access points. Could I add one to that group to take advantage of the capabilities of CleanAir or would I need more?

A. You can either operate in dedicated mode with pervasive 3500 Series access points or monitoring mode, generally aiming for a 1:5 ratio. As an overlay to an existing 1140 installation, for instance, CleanAir would be set up in monitoring mode only. You would not be able to react to interference across the access points. We

thus recommend a pervasive Cisco Aironet 3500 Series with CleanAir deployment to take full advantage of RF interference mitigation.

Q. What platforms are currently supported by Cisco AnyConnect?

A. Please refer to the Cisco AnyConnect data sheet for a list of supported platforms at: http://www.cisco.com/en/US/prod/collateral/vpndevc/ps6032/ps6094/ps6120/data_sheet_c78-527494_ps10884_Products_Data_Sheet.html.

Q. Will 3500 Series access points become available as autonomous (non-controller) based?

A. The 3500 Series will never be released in autonomous mode.

Q. If I want to use my iPad to connect to my access point, do I need to configure my access point or does the existing configuration suffice?

A. The existing configuration suffices. Your iPad is just like any other client

Q. Do "N" capabilities only apply to the 5-GHz channels or does this apply to the 2-GHz frequency as well?

A. 802.11n operates in both frequencies 2.4 and 5 GHz. You should use 20 MHz in 2.4 GHz and 40 MHz in 5 GHz. Even with 20 MHz, you will still get some 802.11n benefits in 2.4 GHz with maximal-ratio combining (MRC), aggregation etc.

Q. In order to support b/g/n clients, would you recommend three sets of access points, each taking care of a particular type of clients, or all access points supporting b/g/n and let RRM and CleanAir take care of max throughput?

A. We recommend using a single access point to serve the needs of all your clients. The same access point supports operation in 2.4 GHz band (supporting b/g/n clients) and 5 GHz band (for a/n clients).

Q. Is all of this information covered in the Cisco Site Survey class?

A. All customers considering deploying and supporting rich media devices are strongly encouraged to attend this class and are required to engage Cisco or its certified partners to perform site surveys before deployment.

Q. We have been told to group access points by threes for high-density areas. Have you heard of this practice, and why do it?

A. There is no general practice around this. It really depends on what applications are being used, what the spectrum availability, the number of clients, and such. Loading up 100 clients on one radio will work, but performance will be poor. We provide client load balancing and Cisco BandSelect to help spread out the clients.

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