

Wi-Fi Network Report

For

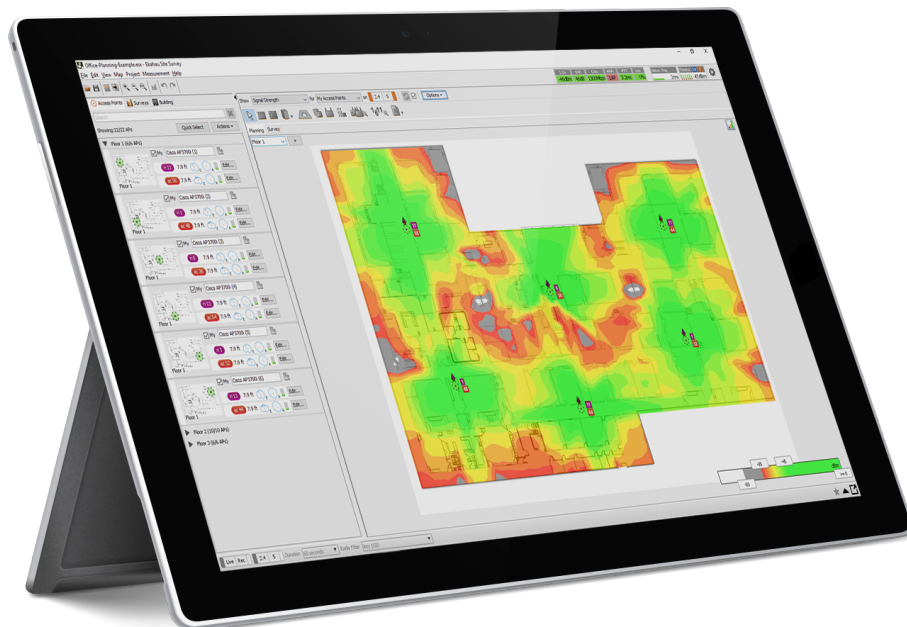
xxxx xxxx S.A.

Tryton Business House

Xx xxxx

80-864 xxxx

Date of survey: DD.MM.YYYY



Wi-Fi Network Report

XXXX_GDA

Survey routes, Coverage Requirement and Access Points localization

Coverage Requirement: Cisco Design Guideline	Signal Strength Min	-66.0 dBm
	Signal-to-noise Ratio Min	25.0 dB
	Data rate Min	12 Mbps
	Number of Access Points Min	2 at min. -75.0 dBm
	Channel Overlap Max	1 at min. -86.0 dBm
	Round Trip Time (RTT) Max	300ms
	Packet Loss Max	2.0 %

Access Points on XXXX_GDA

Measured Access Points on XXXX_GDA

AP #	Access Point			
1	Cisco: PL_GDA_AP1.XXXX			
	802.11n	11	00:81:c4:xxxxxxxx	XXXX-TEMP
	802.11n	11	00:81:c4:xxxxxxxx	XXXX-MOBILE
	802.11n	11	00:81:c4:xxxxxxxx	XXXX
	802.11n	11	00:81:c4:xxxxxxxx	XXXX-GUEST
	802.11ac	36@80	00:81:c4:xxxxxxxx	XXXX-GUEST
	802.11ac	36@80	00:81:c4:xxxxxxxx	XXXX-MOBILE
	802.11ac	36@80	00:81:c4:xxxxxxxx	XXXX
	802.11ac	36@80	00:81:c4:xxxxxxxx	XXXX-TEMP
	Cisco: PL_GDA_AP2.XXXX			
	802.11n	1	00:81:c4:xxxxxxxx	XXXX-MOBILE
	802.11n	1	00:81:c4:xxxxxxxx	XXXX-GUEST
	802.11n	1	00:81:c4:xxxxxxxx	XXXX
	802.11n	1	00:81:c4:xxxxxxxx	XXXX-TEMP
	802.11ac	36@80	00:81:c4:xxxxxxxx	XXXX-TEMP
	802.11ac	36@80	00:81:c4:xxxxxxxx	XXXX
	802.11ac	36@80	00:81:c4:xxxxxxxx	XXXX-GUEST
	802.11ac	36@80	00:81:c4:xxxxxxxx	XXXX-MOBILE
3	Cisco: PL_GDA_AP3.XXXX			

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	802.11n	11	00:81:c4:xxxxxxxx	XXXX
	802.11n	11	00:81:c4:xxxxxxxx	XXXX-MOBILE
	802.11n	11	00:81:c4:xxxxxxxx	XXXX-TEMP
	802.11n	11	00:81:c4:xxxxxxxx	XXXX-GUEST
	802.11ac	36@80	00:81:c4:xxxxxxxx	XXXX-MOBILE
	802.11ac	36@80	00:81:c4:xxxxxxxx	XXXX-GUEST
	802.11ac	36@80	00:81:c4:xxxxxxxx	XXXX-TEMP
	802.11ac	36@80	00:81:c4:xxxxxxxx	XXXX
4	Cisco: PL_GDA_AP4.XXXX			
	802.11n	11	00:81:c4:xxxxxxxx	XXXX-MOBILE
	802.11n	11	00:81:c4:xxxxxxxx	XXXX-GUEST
	802.11n	11	00:81:c4:xxxxxxxx	XXXX-TEMP
	802.11n	11	00:81:c4:xxxxxxxx	XXXX
	802.11ac	36@80	00:81:c4:xxxxxxxx	XXXX-GUEST
	802.11ac	36@80	00:81:c4:xxxxxxxx	XXXX-MOBILE
	802.11ac	36@80	00:81:c4:xxxxxxxx	XXXX-TEMP
5	Cisco: PL_GDA_XXXX			
	802.11n	6	00:81:c4:xxxxxxxx	XXXX
	802.11n	6	00:81:c4:xxxxxxxx	XXXX-TEMP
	802.11n	6	00:81:c4:xxxxxxxx	XXXX-MOBILE
	802.11n	6	00:81:c4:xxxxxxxx	XXXX-GUEST
	802.11ac	48@80	00:81:c4:xxxxxxxx	XXXX-MOBILE
	802.11ac	48@80	00:81:c4:xxxxxxxx	XXXX-TEMP
	802.11ac	48@80	00:81:c4:xxxxxxxx	XXXX-GUEST
6	Cisco: PL_GDA_AP6_XXXX			
	802.11n	11	00:81:c4:xxxxxxxx	XXXX-GUEST
	802.11n	11	00:81:c4:xxxxxxxx	XXXX-MOBILE
	802.11n	11	00:81:c4:xxxxxxxx	XXXX-TEMP
	802.11n	11	00:81:c4:xxxxxxxx	XXXX
	802.11ac	36@80	00:81:c4:xxxxxxxx	XXXX
	802.11ac	36@80	00:81:c4:xxxxxxxx	XXXX-MOBILE
	802.11ac	36@80	00:81:c4:xxxxxxxx	XXXX-GUEST
7	Cisco: PL_GDA_AP7_XXXX			
	802.11n	6	00:81:c4:xxxxxxxx	XXXX-MOBILE
	802.11n	6	00:81:c4:xxxxxxxx	XXXX-GUEST
	802.11n	6	00:81:c4:xxxxxxxx	XXXX-TEMP
	802.11n	6	00:81:c4:xxxxxxxx	XXXX
	802.11ac	36@80	00:81:c4:xxxxxxxx	XXXX-GUEST
	802.11ac	36@80	00:81:c4:xxxxxxxx	XXXX-TEMP

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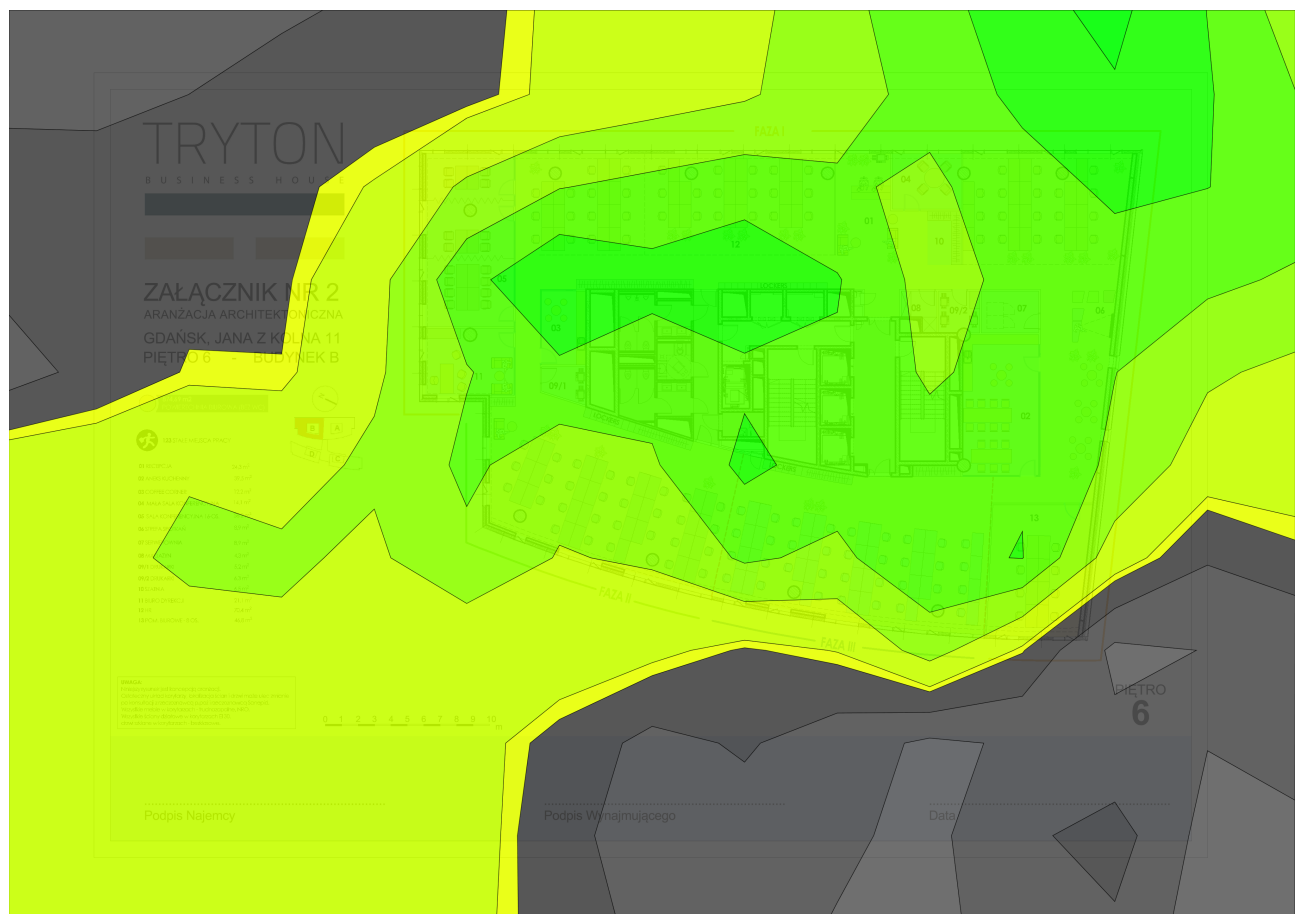
	802.11ac 802.11ac	36@80 36@80	00:81:c4:xxxxxxx 00:81:c4:xxxxxxx	XXXX-MOBILE XXXX
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Signal Strength for XXXX_GDA on 2.4 GHz band

Signal Strength - sometimes called coverage - is the most basic requirement for a wireless network. As a general guideline, low signal strength means unreliable connections, and low data throughput. At this point min Signal Strength was set to -66.0 dBm, which gives us proper performance on Cisco's Access Points.

Conclusion:

- In measurement points Signal Strength was above -66.0 dBm so it gives us proper Signal Strength in all demand area.

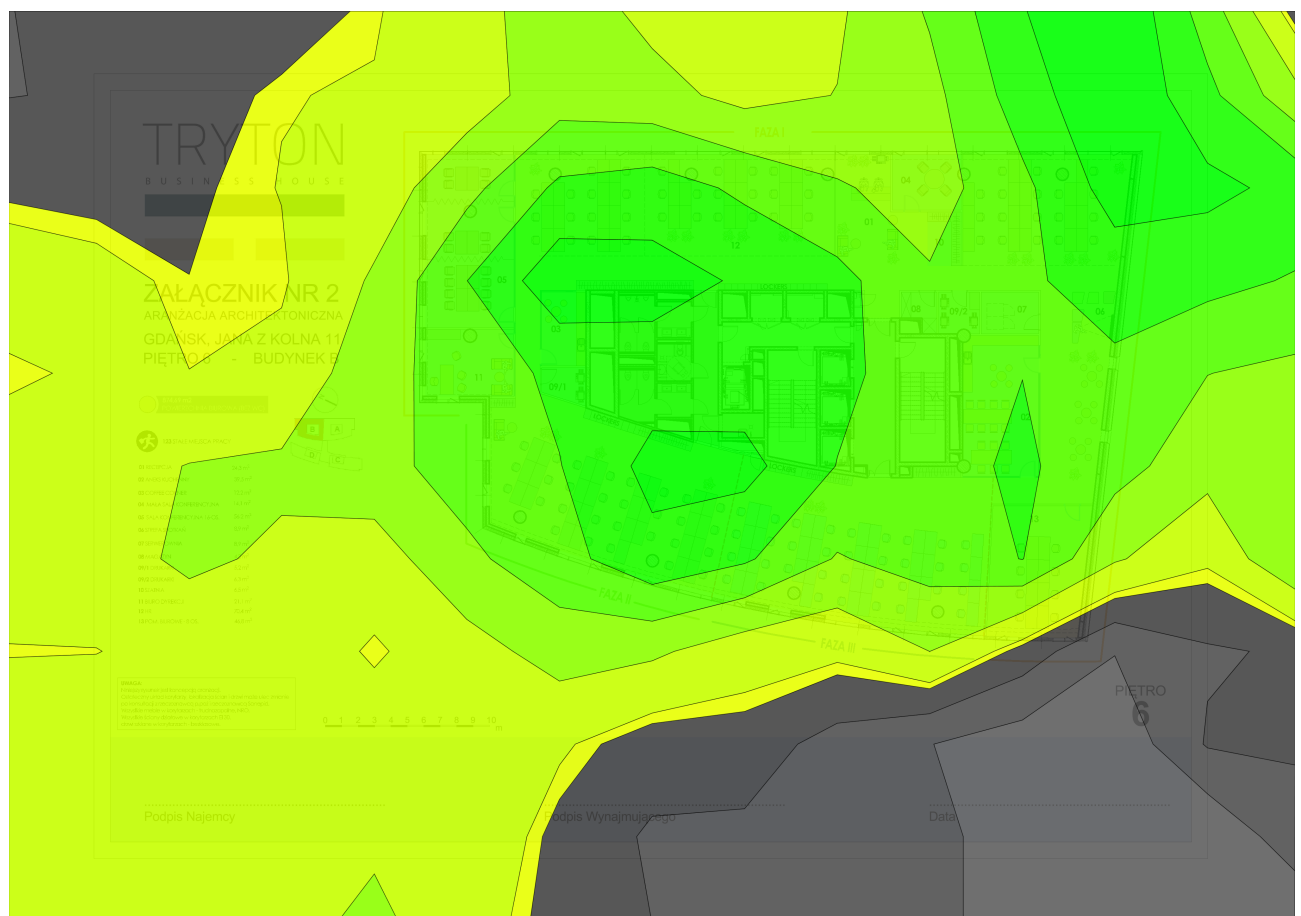


Signal Strength for XXXX_GDA on 5 GHz band

Signal Strength - sometimes called coverage - is the most basic requirement for a wireless network. As a general guideline, low signal strength means unreliable connections, and low data throughput. At this point min Signal Strength was set to -66.0 dBm, which gives us proper performance on Cisco's Access Points.

Conclusion:

1. In measurement points Signal Strength was above -66.0 dBm so it's gives us proper Signal Strength in all demand area.

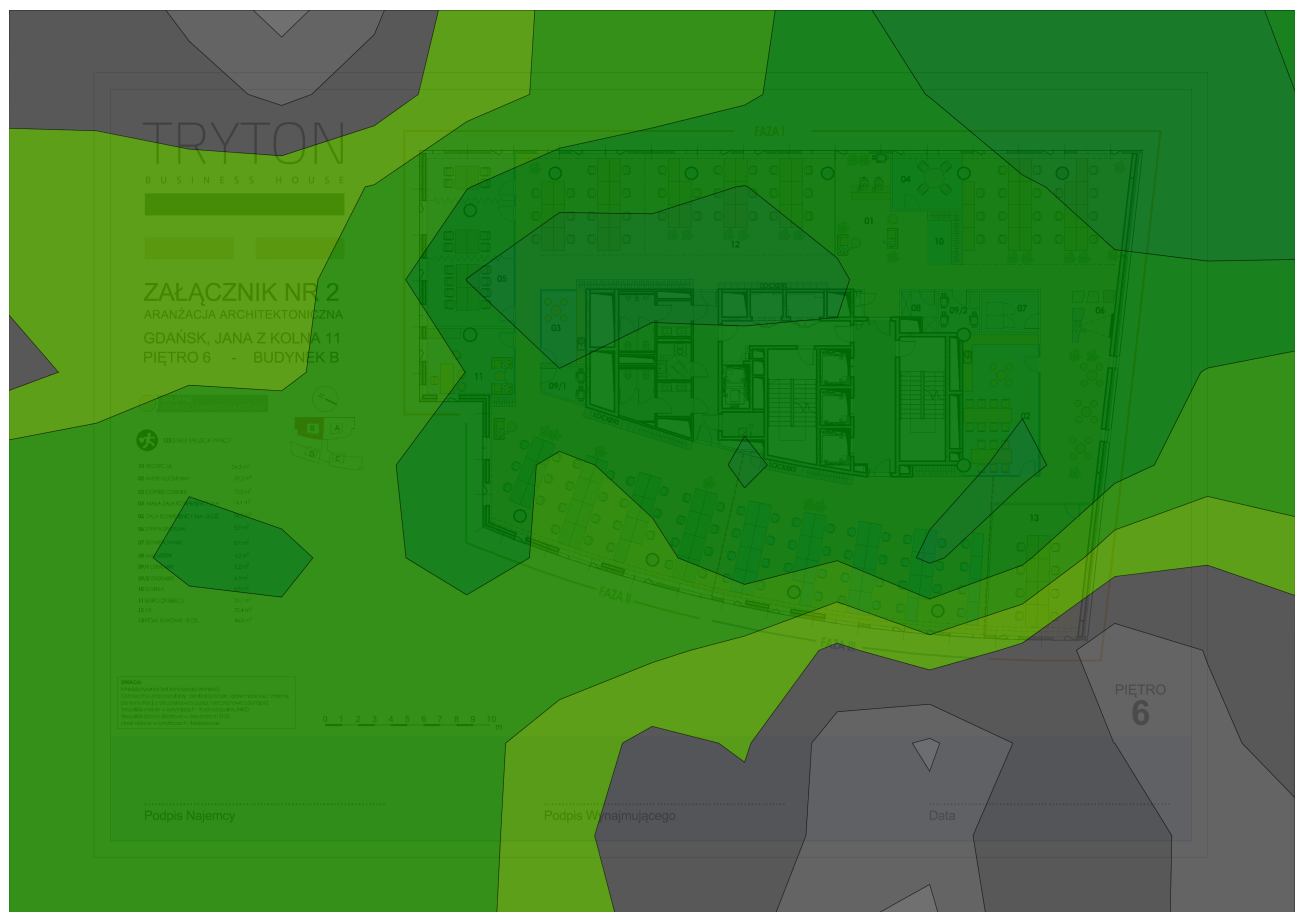


Signal To Noise Ratio (SNR) for XXXX_GDA on 2.4 GHz band

Signal-To-Noise Ratio indicates how much the signal strength is stronger than the noise (co-channel interference). Signal must be stronger than noise (SNR greater than zero) for data transfer to be possible. If the signal is only barely stronger than noise, you may encounter occasional connection drop-offs. At this point minimum Signal-to-noise Ratio Min was set to 25.0 dB which gives us proper performance on Cisco's Access Points.

Conclusion:

2. In measurement points SNR was above 25.0 dB so it's gives us proper Signal Strength in all demand area.
3. WARNING: At this point we were measuring only "noise" ratio from external 802.11 system not co-channel interference from customer's system



5.0dB

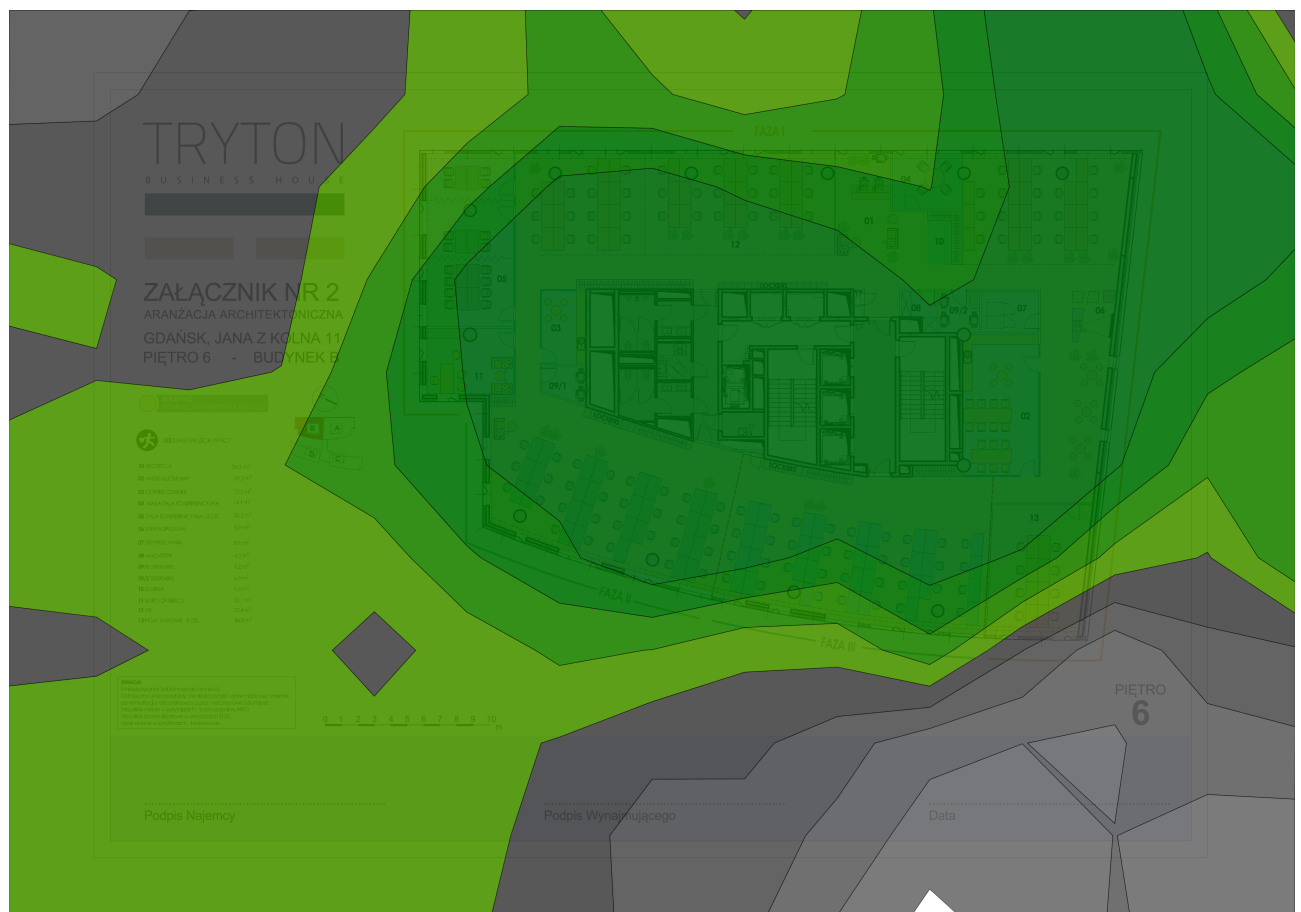
≥ 40.0dB

Signal To Noise Ratio (SNR) for XXXX_GDA on 5 GHz band

Signal-To-Noise Ratio indicates how much the signal strength is stronger than the noise (co-channel interference). Signal must be stronger than noise (SNR greater than zero) for data transfer to be possible. If the signal is only barely stronger than noise, you may encounter occasional connection drop-offs. At this point minimum Signal-to-noise Ratio Min was set to 25.0 dB which gives us proper performance on Cisco's Access Points.

Conclusion:

4. In measurement points SNR was above 25.0 dB so it's gives us proper Signal Strength in all demand area.
5. WARNING: At this point we were measuring only "noise" ratio from external 802.11 system not co-channel interference from customer's system



5.0dB

≥ 40.0dB

Channel Overlap for XXXX_GDA on 2.4 GHz band

Channel overlap indicates the number of access points audible at each location in a single channel.

Conclusion:

6. In demand area was no measurement area where we had no channel overlap form external and internal 802.11 systems.



Channel Overlap for XXXX_GDA on 5 GHz band

Channel overlap indicates the number of access points audible at each location in a single channel.

Conclusion:

7. In demand area was no measurement area where we had no channel overlap form external and internal 802.11 systems.



Number of APs for XXXX_GDA on 2.4 GHz band

Number of Access Points indicates the number of access points audible at each location.



Number of APs for XXXX_GDA on 5 GHz band

Number of Access Points indicates the number of access points audible at each location.



Audit Conclusion

1. 6 of 7 Access Point at 5Ghz radio have set one channel 36 with 80Mhz wide it causes interference in whole system. Band steering in all WLANs forces clients connection to 5Ghz radio, which is proper feature, but with proper 5Ghz channel configuration.

Solution:

- In Wireless -> 802.11a/n/ac -> DCA
 - Set Channel Assignment Method - Automatic
 - Set Channel Width 40 MHz (instead of 80 Mhz)
 - Set DCA Channel List – Select 36, 40, 44, 48, 52, 56, 60, 64
 - In Wireless - > 802.11a/n/ac -> TPC
 - TPC Version – set to Interference Optimal Mode (TPCv2)
 - Power Level Assignment Method – set to Automatic
2. To many radios on 2,4Ghz cause interference in 2,4Ghz

Solution

- In Wireless -> 802.11b/g/n -> DCA
 - Set Channel Assignment Method - Automatic
 - Set DCA Channel List – Select 3,8,13
 - In Wireless - > 802.11a/n/ac -> TPC
 - TPC Version – set to Interference Optimal Mode (TPCv2)
 - Power Level Assignment Method – set to Automatic
 - Disable 2,4Ghz on AP no. 5 and no. 1
Or
Disable 2,4Ghz on AP no. 5 and move AP no 1 closer to conference room
3. During audit we were able to attack XXXX_GUEST network with simple methods and even disconnect clients form the network sending deauth packets. WLAN is also not prevented by Hot Spot using.

Solution – proper configuration of Cisco Clean Air engine and IDS/IPS modules.