NETSHELTER CX

WIRELESS FIDELITY TEST

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AUTHOR

C.HILLIER

INTRODUCTION

This report is to give details on the effect of wireless fidelity (wifi) test done in the NetShelter CX. It will give details of the signal strength from a router placed inside and outside the NetShelter CX cabinet, taken from predetermined points within the test environment.

TABLE OF CONTENTS

DEFINITIONS

WIFI……Wireless Fidelity Device

Netshelter CX……24u Soundproof Cabinet

Router……Wireless ADSL Modem Router

inSSIDer……inSSIDer 2.1 is a software tool for discovering and measuring the wireless networks

dBm……Standard unit for measuring levels of power

Mbs……Megabits per second refers to data transfer speed

TEST OBJECTIVE

The objective of this test is to determine if placing wifi device inside a NetShelter CX will interfere with a routers wifi signal. If the NetShelter CX does interfere, then by what degree is the signal strength reduced.

TEST APPARATUS

TEST APPARATUS		
DESCRIPTION	MODEL No / PART No	QTY
NETSHELTER CX	AR4024A	1
WIRELESS ROUTER	NETGEAR DG834G v3	1
LAPTOP	DELL LATITUDE E6410	1

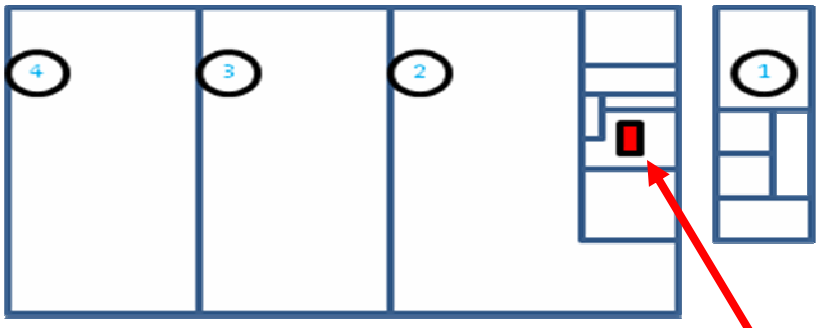
THE TEST

The NetShelter CX was placed in the test lab. The router was placed on top of the cabinet and switched on. The signal was picked up by a laptop running inSSIDer 2.1 software which monitored the signal strength during the test. The laptop was placed within 1 meter of the router for a period of 5 minutes while it logged the signal strength and a snap shot of the results was saved to clipboard. The laptop was then taken to 4 other predetermined locations around the building, logged 5 minutes of signal strength and a snapshot taken of the results. This was repeated with the wireless router placed inside the cabinet.

The 4 locations within the factory are:

1. The Main Office
2. Assembly Area
3. The Machine Shop
4. The Warehouse

FIRST FLOOR



NOT TO SCALE PLAN OF FROME FACILITY

TEST LAB

The distance from the test area to the 4 predetermined points are:

1 = 10 meters

2= 17 meters

3=27 meters

4=38 meters

RESULTS

RSSI – Abbreviation of "Received Signal Strength Indication", which is the amplitude level of the wireless network as seen by a computers' wireless card. The vertical axis of the time graph shows RSSI in dBm (-20 is very strong, -100 is very weak).

The table below shows what is a good RSSI and what is a poor RSSI

QUALITY	Excellent	Good	Fair	Poor	Very Poor	No Signal
dBm	>-51,-53,-55,-57,-59,-61	63,-65,-67,-69,-71,-73	75,-77,-79,-81,-83,-85	87,-89,-91,-93,-95,-97	99,-101,-103,-105,107,109	111,<-113

	ROUTER SIGNAL STRENGTH						
	dBm OUTSIDE OF CABINET	dBm INSIDE OF CABINET	Mbs OUTSIDE CABINET	Mbs INSIDE CABINET	SIGNAL LOSS %	DISTANCE	OBSTACLES
TEST ROOM	-31	-34	54	54	3dBm (9.60%)	1M	NO OBSTACLES
MAIN OFFICE (1)	-52	-72	48	36	20 dBm (38.46%)	10M	2 WALLS 1FLOOR
ASSEMBLY (2)	-61	-62	24	18	1 dBm (1.63%)	17M	2 FIRE DOORS
MACHINE SHOP (3)	-68	-71	24	24	3 dBm (4.41%)	27M	2 FIRE DOORS 1 BLOCK AND PLASTERBOARD WALL
WAREHOUSE (4)	-72	-79	18	18	7 dBm (9.72%)	38M	2 FIRE DOORS, 2 BLOCK AND PLASTERBOARD WALL

The results table shows the average reading over a 5 minute period. The readings are measured in dbm and the percentages show the loss of signal strength between the reading from outside the NetShelter CX and the reading from within the cabinet.

SUMMARY

At no point during the test did the signal drop to a level that a wifi signal was not achievable. The result table shows the RSSI remained at excellent RSSI in the test room and the assembly area, in the office it went from excellent to good , remained good in the machine shop and went from to fair in the warehouse.

AREA	SIGNAL SUMMARY	
	ROUTER OUTSIDE CABINET	ROUTER INSIDE CABINET
TEST LAB	EXCELLENT	EXCELLENT
OFFICE	EXCELLENT	GOOD
ASSSEMBLY	EXCELLENT	EXCELLENT
MACHINE SHOP	GOOD	GOOD
WAREHOUSE	GOOD	FAIR

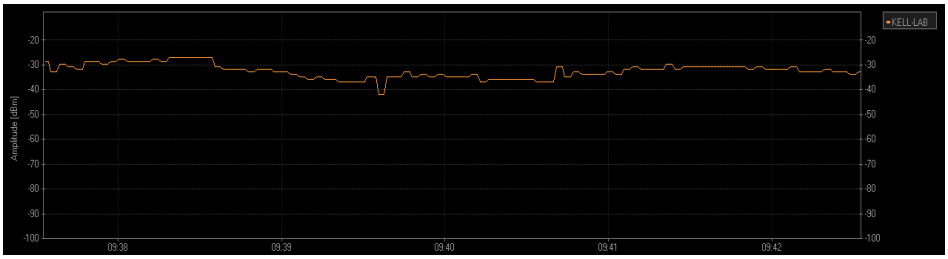
The data transfer rate (Mbs) did not slow in the test lab, machine shop or the warehouse but did slow did slow buy 25% in the office and the assembly area.

CONCLUSION

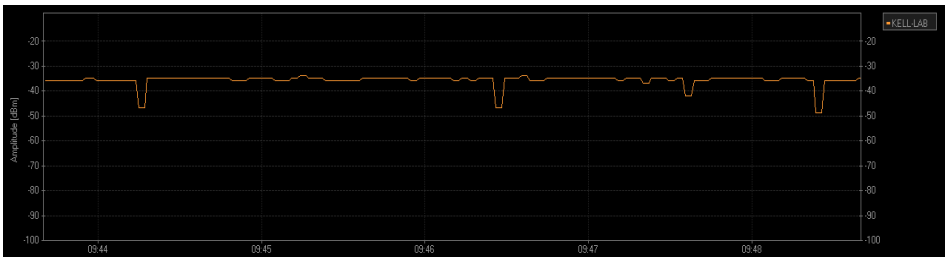
The signal strength was affected by less than 10% in 3 of the test areas and by 38.46% in 1 of the areas. The test results show that the the Office had the greatest signal reduction but only dropped to a Fair signal strength. None of the results indicated a poor or unstable signal.

APPENDIX

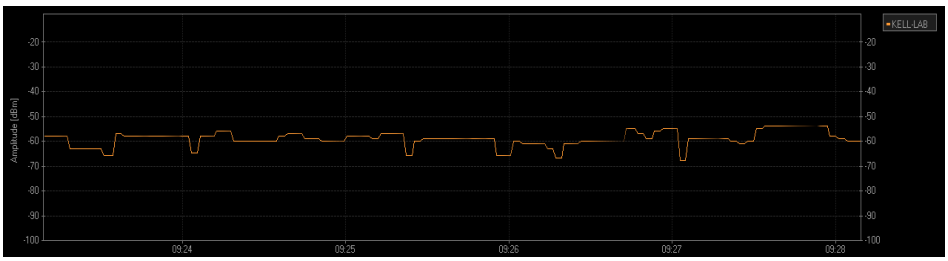
The following graphs indicate the RSSI taken over a 5 minute period taken from predetermined points around the factory.



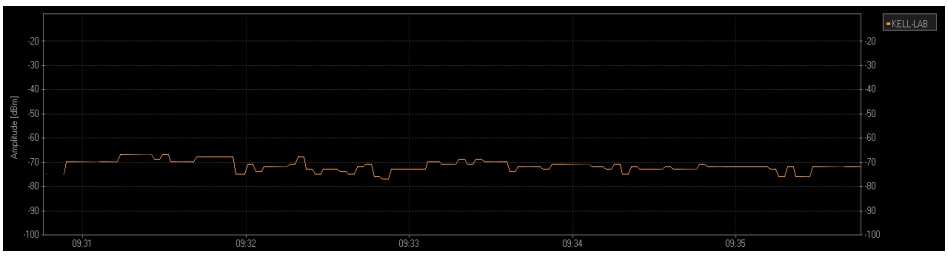
GRAPH #1 SHOWS THE RSSI TAKEN FROM THE TEST LAB WITH THE ROUTER OUTSIDE THE CABINET



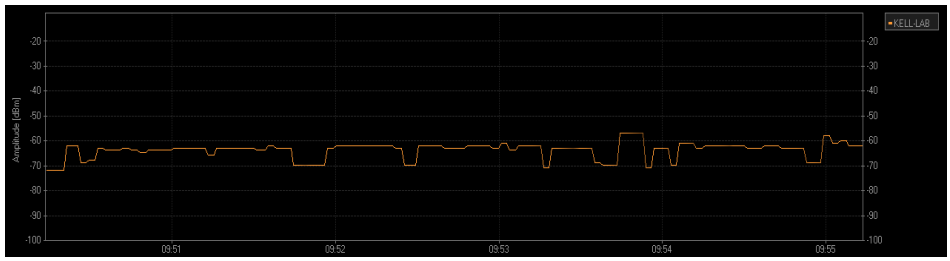
GRAPH #2 SHOWS THE RSSI TAKEN IN THE TEST LAB WITH THE ROUTER INSIDE THE CABINET



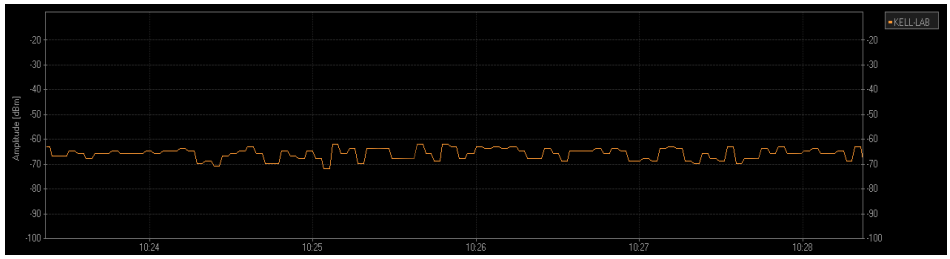
GRAPH #3 SHOWS THE RSSI TAKEN IN THE MAIN OFFICE (1) WITH THE ROUTER OUTSIDE THE CABINET



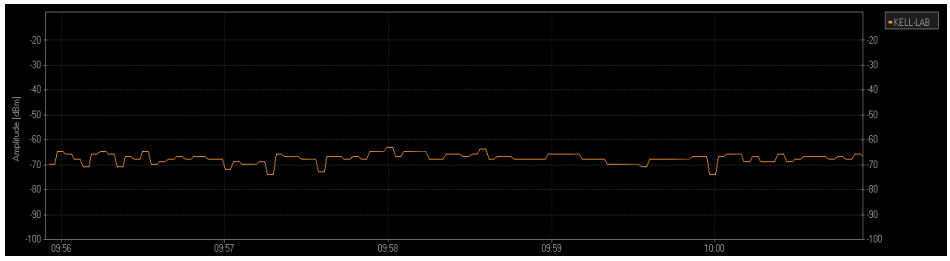
GRAPH #4 SHOWS THE RSSI TAKEN FROM THE MAIN OFFICE (1) WITH THE ROUTER INSIDE THE CABINET



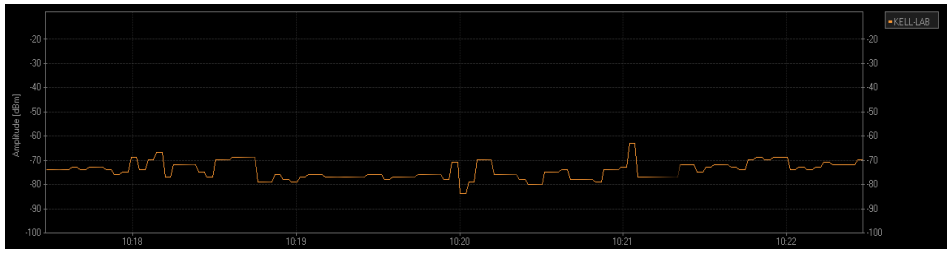
GRAPH #5 SHOWS THE RSSI TAKEN FROM THE ASSEMBLY AREA (2) WITH THE ROUTER OUTSIDE THE CABINET



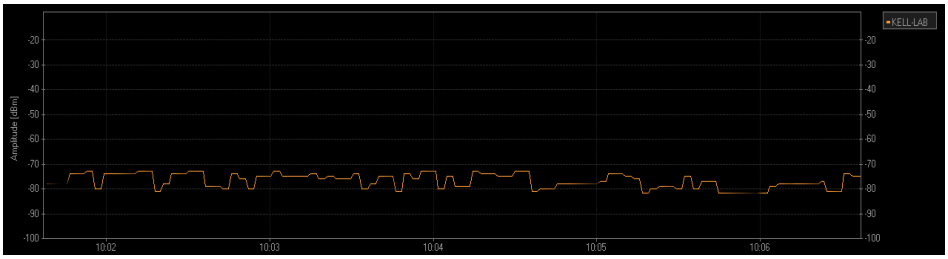
GRAPH #6 SHOWS THE RSSI TAKEN FROM THE ASSEMBLY AREA (2) WITH THE ROUTER INSIDE THE CABINET



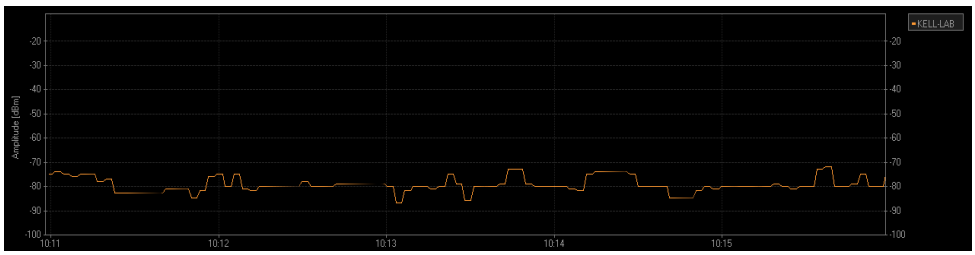
GRAPH #7 SHOWS THE RSSI TAKEN FROM THE MACHINE SHOP (3) WITH THE ROUTER OUTSIDE THE CABINET



GRAPH #8 SHOWS THE RSSI TAKEN FROM THE MACHINE SHOP (3) WITH THE ROUTER INSIDE THE CABINET



GRAPH #9 SHOWS THE RSSI TAKEN FROM THE WAREHOUSE (4) WITH THE ROUTER OUTSIDE THE CABINET

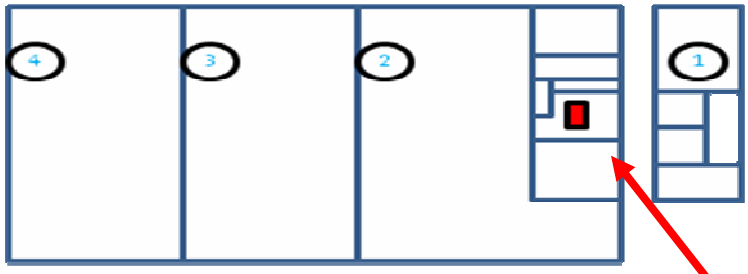


GRAPH #10 SHOWS THE RSSI TAKEN FROM THE WAREHOUSE (4) WITH THE ROUTER INSIDE THE CABINET

CX WIFI TEST AT A GLANCE

A router was set up in test lab and signal strength recorded at predetermined locations throughout the factory. First with the router on top of a NetShelter CX cabinet then with the router placed inside the NetShelter CX cabinet. Below is a plan of the factory with the 4 areas where the test results were taken

FIRST FLOOR



NOT TO SCALE PLAN OF FROME FACILITY

TEST LAB

The distance from the test lab to the 4 predetermined points are:
1 = 10 meters, 2 = 17 meters,3 = 27 meters,4= 38 meters

Signal Summary

AREA	ROUTER OUTSIDE CABINET	ROUTER INSIDE CABINET
TEST LAB	EXCELLENT (-31 dBm)	EXCELLENT (-34 dBm)
1=OFFICE	EXCELLENT (-52 dBm)	GOOD (-72 dBm)
2=ASSSEMBLY	EXCELLENT (-61 dBm)	EXCELLENT (-62 dBm)
3=MACHINE SHOP	GOOD (-68 dBm)	GOOD (-71 dBm)
4=WAREHOUSE	GOOD (-72 dBm)	FAIR (-79 dBm)

Quality	dBm
EXCELLENT	>-51
	-53
	-55
	-57
	-59
	-61
GOOD	-63
	-65
	-67
	-69
	-71
	-73
FAIR	-75
	-77
	-79
	-81
	-83
	-85
POOR	-87
	-89
	-91
	-93
	-95
	-97
VERY POOR	-99
	-101
	-103
	-105
	-107
	-109
NO SIGNAL	-111
	<-113