



ClickMobile

tecnologia e mobilidade



8 dicas para o ponto a ponto perfeito

Dica 1 Planejamento do Enlace

- Sinal - potência



- Variáveis Rádio Frequência

Dica 1 Planejamento do Enlace

**Antena
G1: + 25
dBi**



**Perda espaço livre
5.8 Ghz - 10 Km
L: 128 dB**

$$\text{Tx} + \text{G1} - \text{L} + \text{G2} = \text{RX}$$

**Radio 1
Tx: +
20dBm**

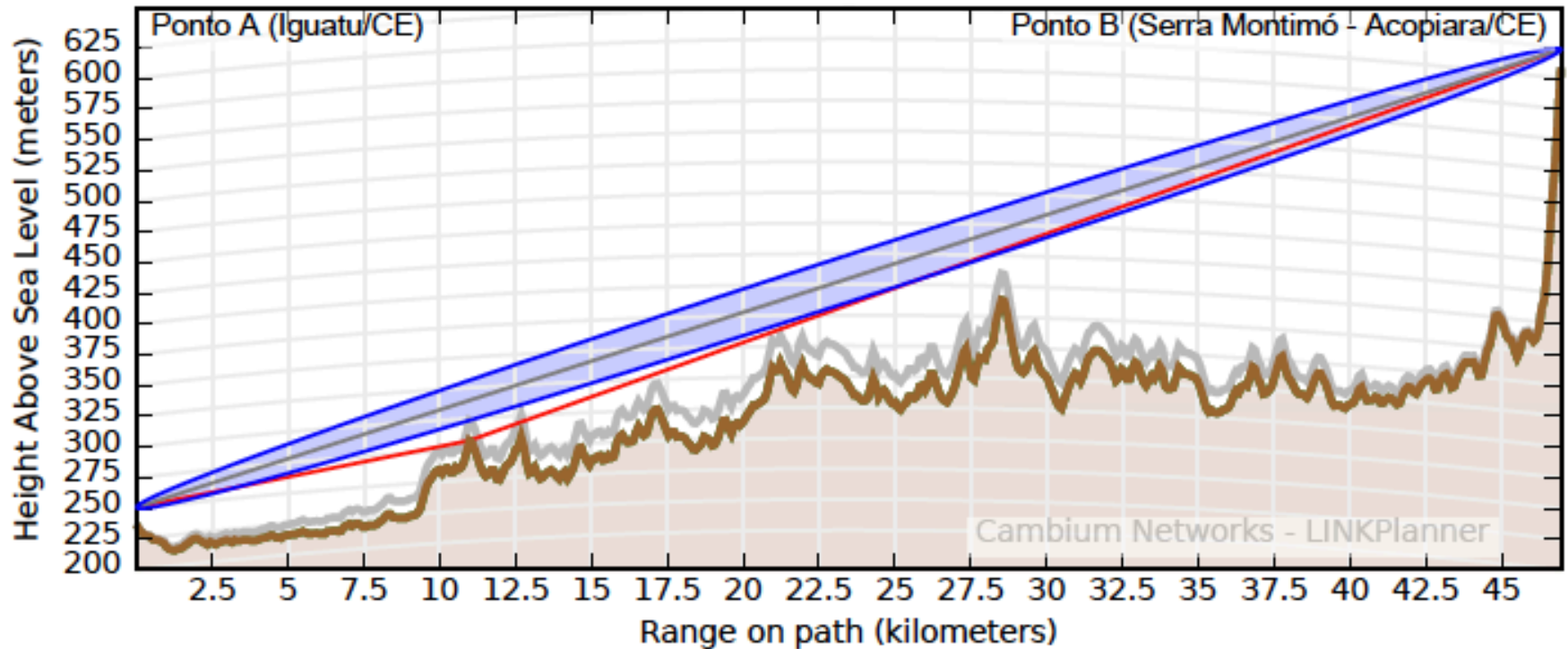
**Antena
G2: +
25dBi**



**Radio 2
Rx: - 58 dBm**

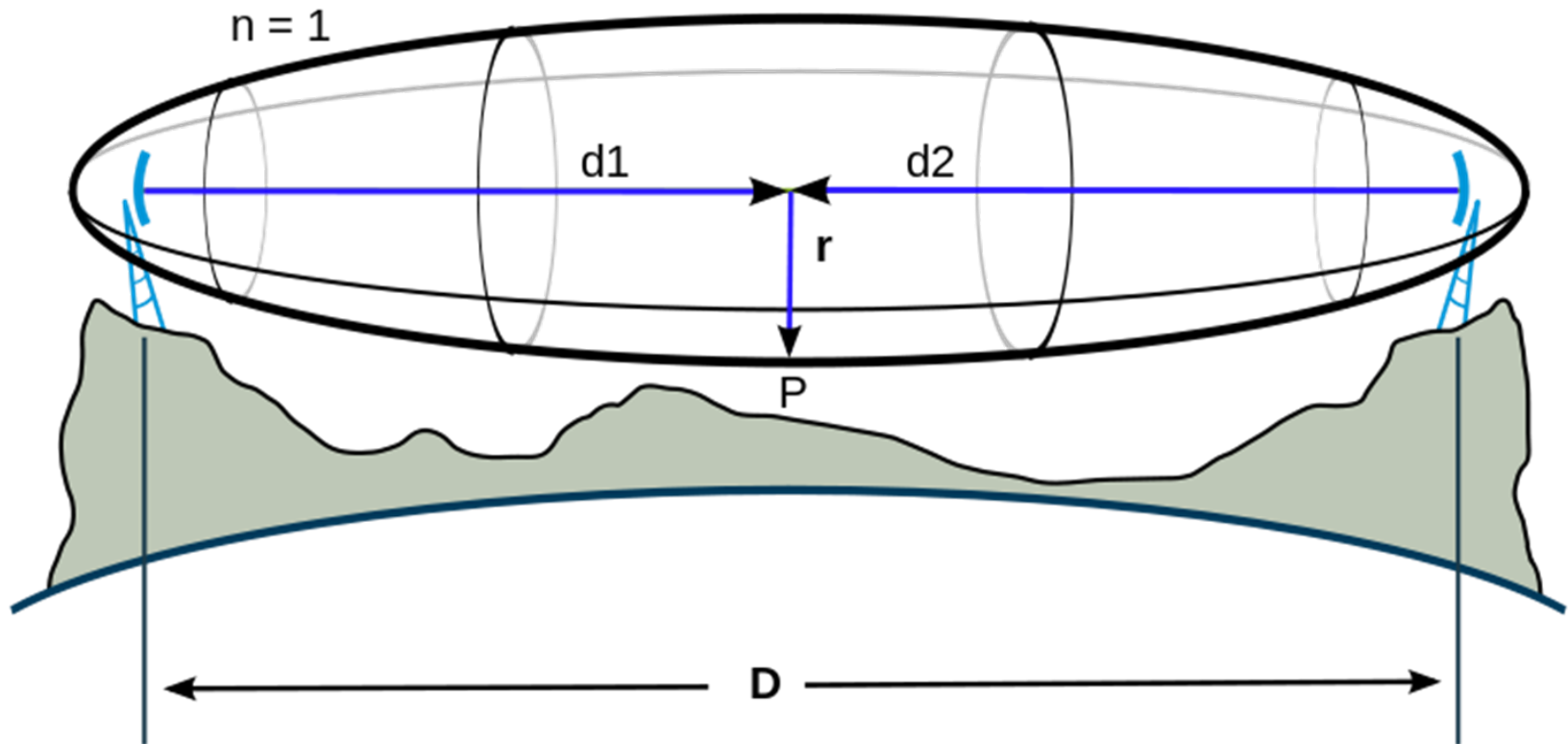
Tipicamente para rádios em 5.8 GHz em 802.11 N é necessário um sinal melhor que -60 dBm para a máxima capacidade de transmissão do rádio

Dica 1 Planejamento do Enlace



Sabendo qual sinal devemos encontrar é a guia para o alinhamento correto!

Dica 2 : Fresnel x altura de torres



Dica 2 : Fresnel x altura de torres

Distancia do enlace (km)	Fresnel @ 1 Km	Fresnel ponto médio do enlace (m)	60% Fresnel ponto médio: Visada mínima (m)
10	6,82	11,37	6,82
20	7,01	16,08	9,65
30	7,07	19,70	11,82
40	7,10	22,74	13,65
50	7,12	25,43	15,26
60	7,13	27,85	16,71
70	7,14	30,09	18,05
80	7,15	32,16	19,30
90	7,15	34,11	20,47
100	7,16	35,96	21,58

Dica 3 : Antenas

PS-5800-22-03-DP



Até 10 Km



PS-5800-29-06-DP



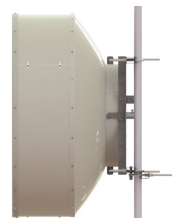
Até 35 km



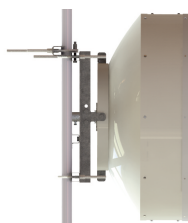
PS-5800-32-09-DP



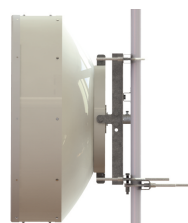
Até 55 km



PS-5800-34-12-DP



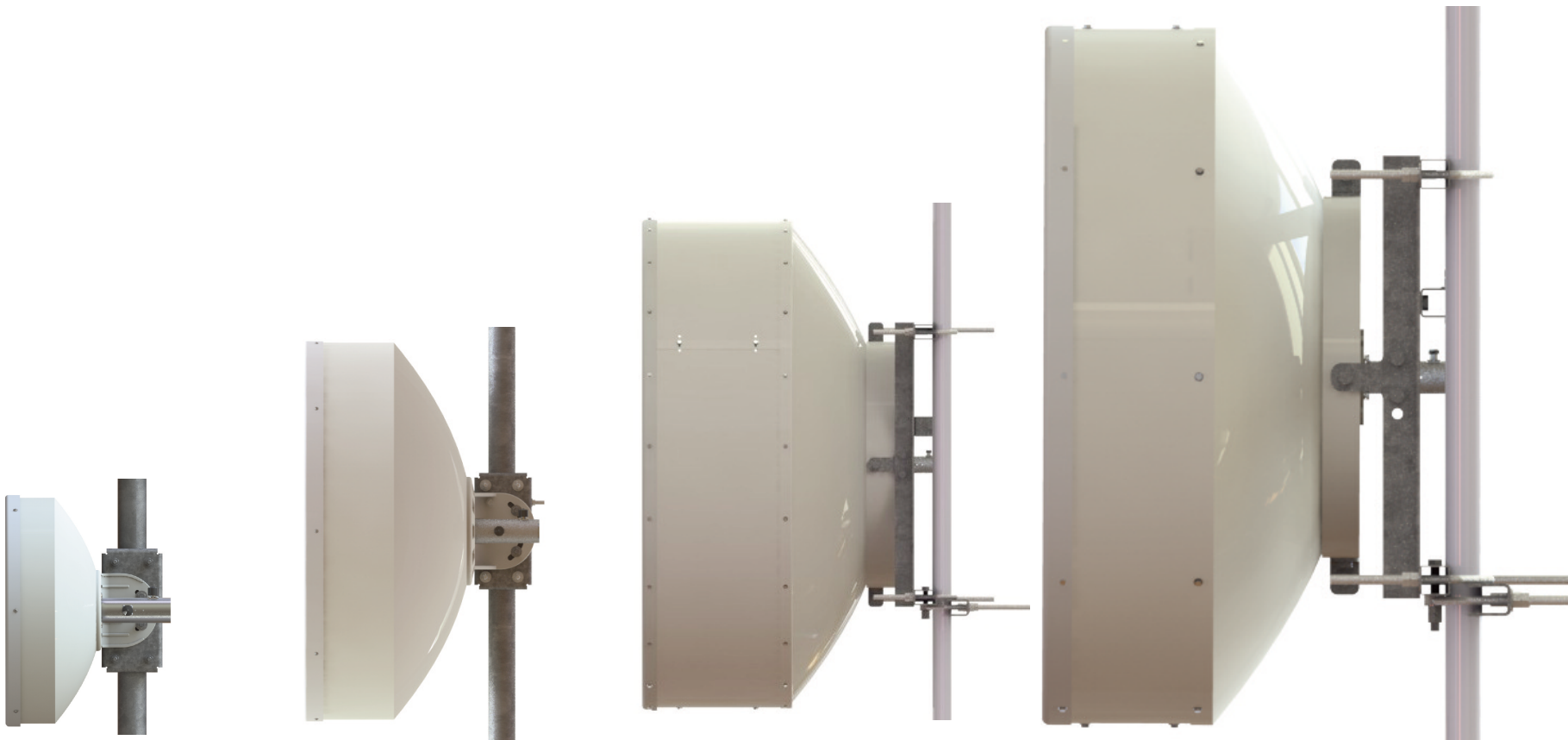
Até 80 km



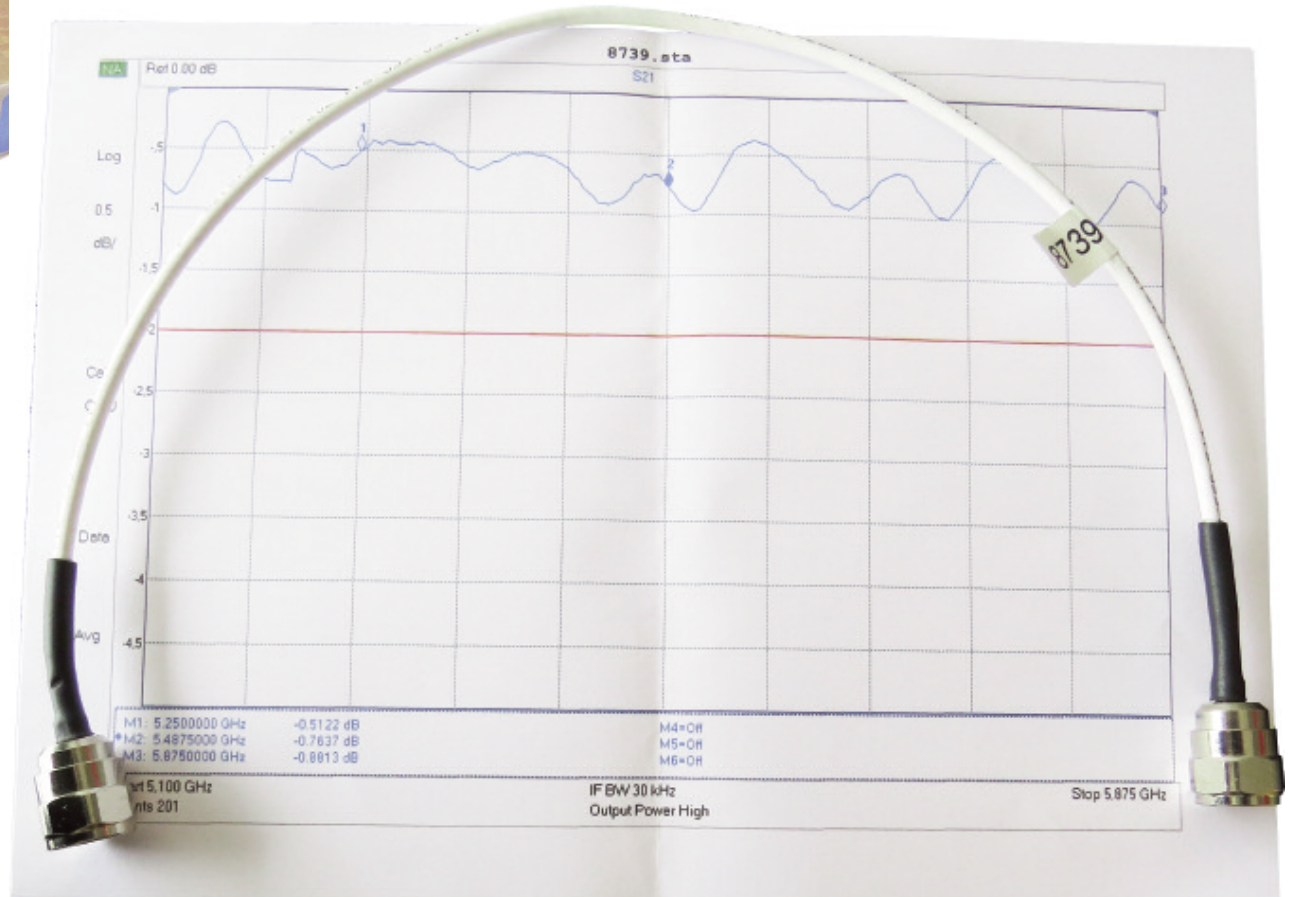
Dica 3 : Antenas SEM radome



Dica 3 : Antenas DIFERENTES



Dica 4 : Pigtails certificados



Dica 5 : Configuração Mikrotik

Interface <wlan1>

General	Wireless	Data Rates	Advanced	HT	HT MCS	WDS	Natreme	NV2	Tx Power	Curve
Mode: bridge										
Band: 5GHz-only-AC										
Channel Width: 20/40/80MHz eeCe										
Frequency: 6060										
SSID: PD5_PMA_MGC_JPB										
Radio Name: D4CA6D8823D										
Scan List: default										
Wireless Protocol: nv2										
Security Profile: Security										
Frequency Mode: superchannel										
Country: no_country_set										
Antenna Gain: 0										
DFS Mode: none										
Proprietary Extensions: post-2.9.25										
Bridge Mode: enabled										
VLAN Mode: no tag										
VLAN ID: 1										
Default AP Tx Rate:										
Default Client Tx Rate:										
☒ Default Authenticate										
☒ Default Forward										
Multicast Helper: default										

Dica 5 : Configuração Mikrotik

Interface <wlan1>

General Wireless Data Rates Advanced HT HT MCS WDS Natreme NV2 Tx Power Current Tx Power Status Traffic

Tx Chains: ☒ chain0 ☒ chain1
Rx Chains: ☒ chain0 ☒ chain1

AMSDU Limit: 8192
AMSDU Threshold: 8192

Guard Interval: any

- AMPDU Priorities

☒ 0	☒ 1	☒ 2	☒ 3
☒ 4	☒ 5	☒ 6	☒ 7

Interface <wlan1>

General Wireless Data Rates Advanced HT HT MCS WDS Natreme NV2 Tx Power Current Tx Power Status Traffic

WDS Mode: dynamic

WDS Default Bridge: brd-wds

WDS Default Cost: 100
WDS Cost Range: 50-150

☐ WDS Ignore SSID

300 M de banda é possível!

- Interface wireless já está madura
- Necessidade de maior nível de sinal
- Travamentos de porta Lan:
 - Watchdog
 - SPF

Dica 7 : SFP

Wireless Tables

Interfaces Nstreme Dual Access List Registration Connect List Security Profiles Channels

+ - ✓ ✗ CAP Scanner Freq. Usage Alignment Wireless Sniffer Wireless Snooper

Name	Type	L2 MTU	Tx	Rx	Tx Packet (p/s)	Rx Packet (p/s)
RS wlan1	Wireless (Atheros AR9...	1600	222.4 Mbps	39.7 Mbps	25 636	16 898
DRS wds9	WDS	1600	222.4 Mbps	39.7 Mbps	25 635	16 898

Interface List

Interface Ethernet EoIP Tunnel IP Tunnel GRE Tunnel VLAN VRRP Bonding LTE

+ - ✓ ✗

Name	Type	L2 MTU	Tx	Rx	Tx Packet (p/s)	Rx Packet (p/s)
R brd-wds	Bridge	1600	45.0 kbps	4.2 kbps	9	7
R ether1	Ethernet	1600	0 bps	0 bps	0	0
RS sfp1	Ethernet	1600	39.8 Mbps	222.4 Mbps	16 905	25 639
RS wlan1	Wireless (Atheros AR9...	1600	222.4 Mbps	39.7 Mbps	25 636	16 898
DRS wds9	WDS	1600	222.4 Mbps	39.7 Mbps	25 635	16 898

5 items (1 selected)

sent=700 received=628 packet-loss=10% min-rtt=1ms avg-rtt=1ms

Interface <sfp1>

General SFP Ethernet Overall Stats Rx Stats ...

SFP Rate Select: **high**

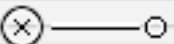
☒ Module Present
☐ Rx Lose
☐ Tx Fault

Connector Type: LC

Link Length Sum: 20000 m

Link Length 50um:

Link Length 62um:

Link Length Copper: 

Vendor Name: Mikrotik

Vendor Part Number: S-35LC200

Vendor Revision:

Vendor Serial: SG35241700694

Manufacturing Date: 14-05-27

Wavelength: 131000 nm

Temperature: 66 C

Supply Voltage: 3.266 V

Tx Bias Current: 25 mA

Tx Power: -5 dBm

Rx Power: -10 dBm

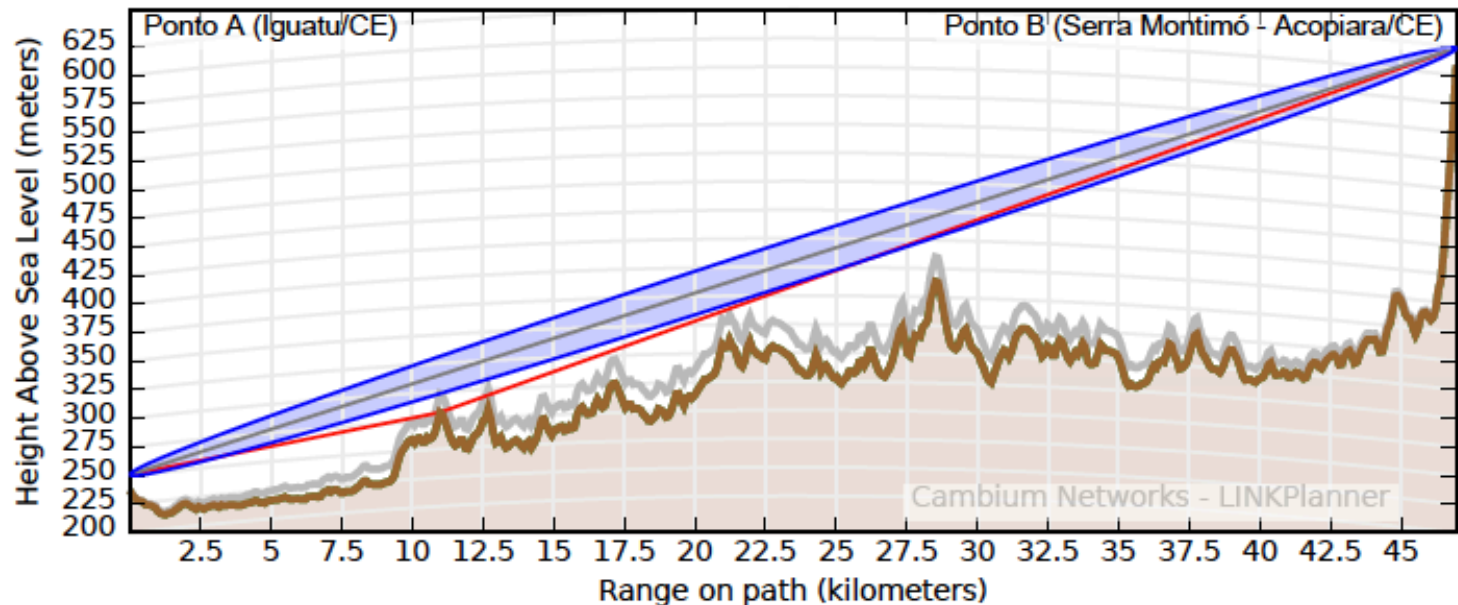
enabled running slave link ok

Dica 8: SNR

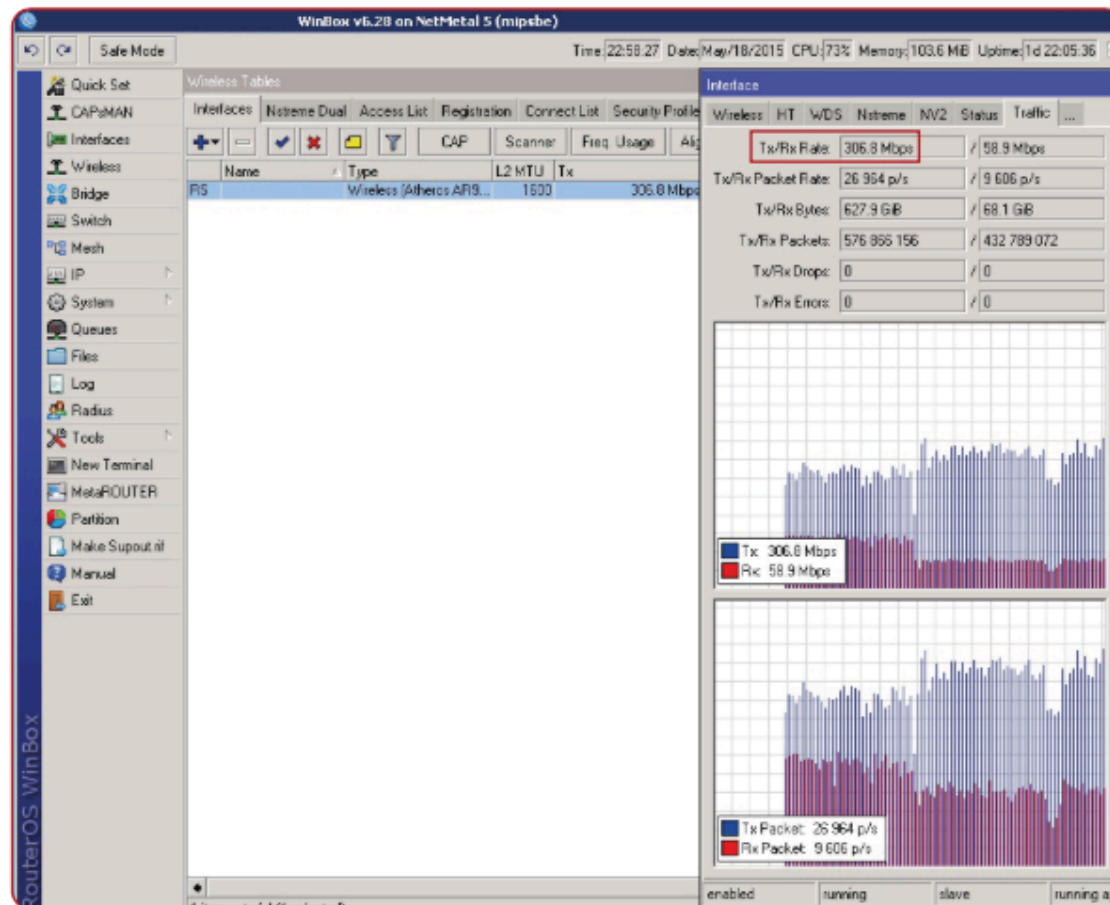
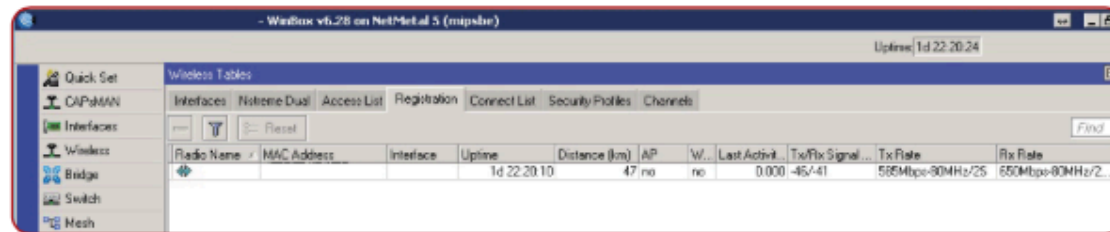
- 802.11 N – SNR melhor que 30 dB
- 802.11 AC – SNR melhor que 40 dB

Resultados

- Provenet Ceará 300 M @ 50 KM
- Antena ALGCom 1.2 M – 35.8 Dbi + RB922
- Porta SFP



- Provenet
Ceará
350 M @
50 KM



- IDC 350 M @ 11 KM
- Local EXTREMAMENTE ruidoso
- ALGcom 90 cm + RB922



- IDC 350 M @ 10 KM

Wireless Tables

Interfaces: Nstreme Dual | Access List | Registration | Connect List | Security Profiles | Channels

Buttons: CAP | Scanner | Freq. Usage | Alignment | Wireless Sniffer | Wireless Snooper

	Name	Type	L2 MTU	Tx	Rx	Tx Packet (p/s)	Rx Packet (p/s)	M
RS	wlan1	Wireless (Atheros AR9...	1600	346.2 Mbps	45.6 Mbps	35 885	23 925	D4
DRS	wds9	WDS	1600	346.2 Mbps	45.6 Mbps	35 884	23 925	D4

2 items out of 5 (1 selected)

Terminal

```

610 10.155.0.115          56 64 12ms
611 10.155.0.115          56 64 10ms
612 10.155.0.115          56 64 7ms
613 10.155.0.115          56 64 5ms
614 10.155.0.115          56 64 4ms
615 10.155.0.115          56 64 6ms
616 10.155.0.115          56 64 5ms
617 10.155.0.115          56 64 3ms
618 10.155.0.115          56 64 5ms
619 10.155.0.115          56 64 3ms
    sent=620 received=553 packet-loss=10% min-rtt=1ms avg-rtt=15ms
    max-rtt=663ms
SEQ HOST                SIZE TTL TIME  STATUS
620 10.155.0.115          56 64 5ms
621 10.155.0.115          56 64 13ms
622 10.155.0.115          56 64 5ms
623 10.155.0.115          56 64 3ms
624 10.155.0.115          56 64 4ms
625 10.155.0.115          56 64 4ms
626 10.155.0.115          56 64 4ms
627 10.155.0.115          56 64 4ms
628 10.155.0.115          56 64 4ms
629 10.155.0.115          56 64 3ms
  
```

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100 % Gratuito

