



**Workshop on the Role of  
Mobile Technologies in  
Fostering Social Development**  
June 2-3 2008, São Paulo, Brazil



Este empreendimento conta  
com o apoio financeiro da  
**FINEP**

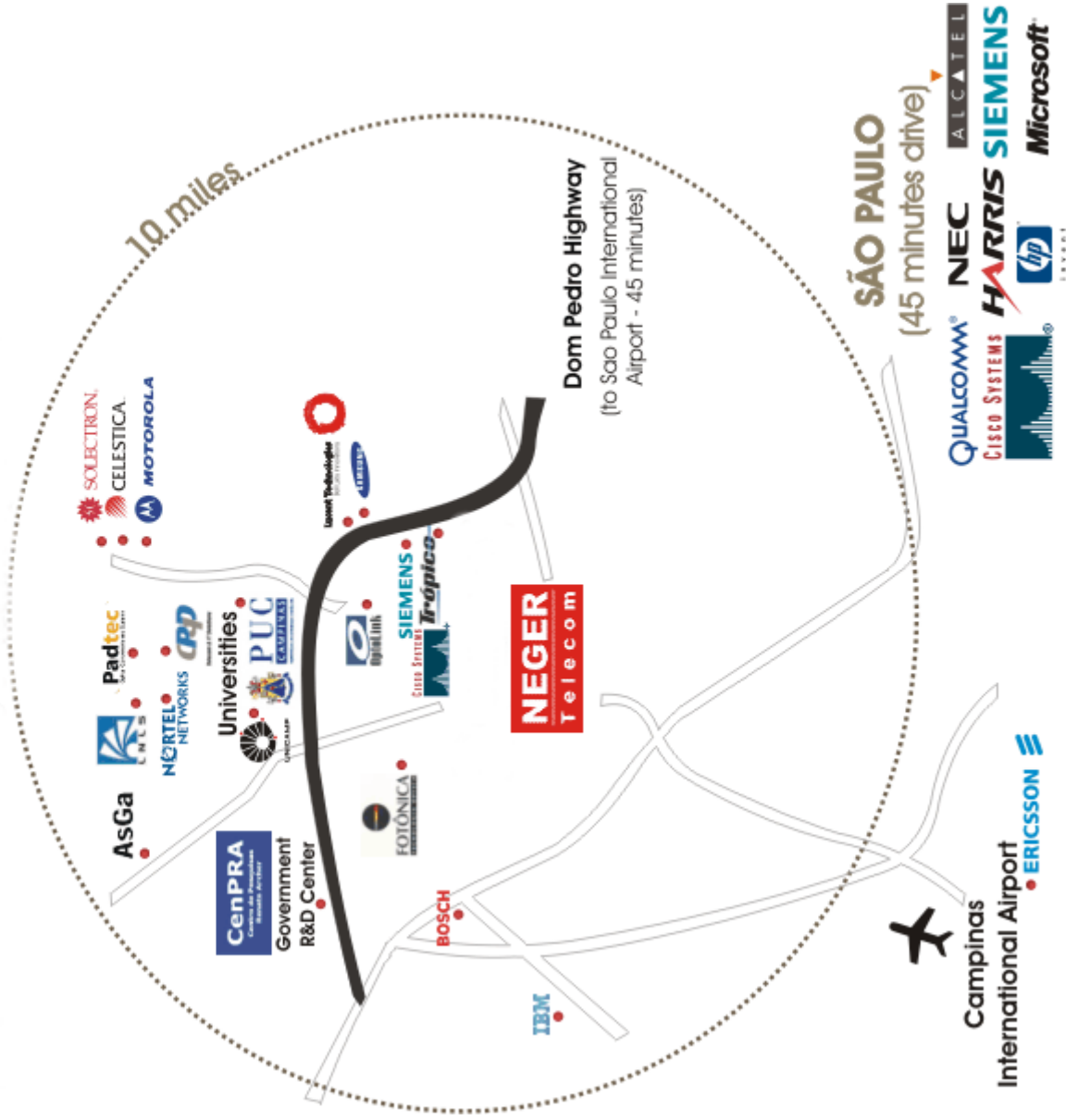


# *Rural*MAX

Low Cost solutions for  
voice and data  
communication in **Rural  
and Remote Areas**



# CAMPINAS - BRAZIL



**NEGER Telecom** is a Brazilian Company specialized in Wireless Telecommunication Engineering.

**RuralMAX**

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Telecom



Founded in 1987  
25 Employees  
US\$ 2 million in revenue in 2007  
Own RF Engineering  
Own R&D Team



- Least Cost Routing (PABX -> Cellular Interface)
- Fixed Cellular Station (CDMA & GSM)
- Rural Telephony (CDMA & GSM)
- Rural WISP (Wi-Fi, GPRS, EDGE, 3G & Satellite)
- RF Repeater Design and Implementation
- EMF Measurements and Regulatory Support

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# Our Customers





“In the last few years, the Internet broadband services market in Brazil has experienced a strong growth, even exceeding initial expectations”

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**“However, in spite of the recent proliferation of services, several million people that live in mainly rural zones still lack access to services that allow them to cover their basic communication needs.”**

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“The rural population of Brazil represents 16% of the population of the country, reaching approximately 30 million of inhabitants in total”

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CLUBE DE LÂMPADA  
PRÓ VIDA

ARIA DE  
AÇÕES

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(19) 3237-2121

06

# How far is a countryside area?

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“This project objective is providing Wi-Fi service in all Country Club area, installing 51 Radio Base Stations. It is located in Araçoiaba da Serra, in the São Paulo State countryside”



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PONTO CONCENTRADOR



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Indoor coverage using outdoor devices in 2.4 Ghz. In building penetration loss may demands external antennas, amplifiers or CPEs in less than 10% of the coverage areas.



“The 2.4 GHz RF planning must be focused in indoor coverage (building losses), traffic dimensioning and co-channel and adjacent channel interference”

da Divisão por Células e posição das ERBs no Clube de Campo Pró-Vida

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**PROJETO Pró-Vida**  
**Identificação de Estação**  
**Rádio Base**

Número: 27	Data: 14/11/2007
Latitude: 23 34 39,2	
Longitude: 47 36 19,3	
Tecnologia: IEEE 802.11	Alimentação: 127 V AC + T
Infra: Torre Monotubular 6m, AC, Terra e Base Concreto	



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# AC Power Protection



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**BEFORE (Marking the search ring)**



**AFTER (Implemented Base Station)**

# Fan cooling system





“A C.O.W. (Cell on Wheels) is a practical equipment to test field coverage before the final Radio Base Station implementation”

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The screenshot displays the Mikrotik WinBox interface, specifically the Queue List window. The window is titled 'Hotspot' and has tabs for 'Servers', 'Users', and 'Queue List'. The 'Queue List' tab is active, showing a table of users and their network usage statistics. The table has columns for '#', 'Name', 'Target Address', 'Packet ...', 'Max Upload...', 'Max Down...', 'Upload Rate', 'Download ...', 'Queued Bytes', 'Uploaded B...', and 'Downloade...'. The table lists 40 users, each with their respective network usage statistics. At the bottom of the table, it shows '23.6 KB queued' and '19 packets queued'. The window also shows a taskbar at the bottom with a 'Yahoo! Search' button and a system clock showing '12:55'.

#	Name	Target Address	Packet ...	Max Upload...	Max Down...	Upload Rate	Download ...	Queued Bytes	Uploaded B...	Downloade...
D	<hotspot-Roberta>	192.168.1.135	128k	128k	8.5 kbps	23.4 kbps	0 B/0 B	23.7 KB	66.9 KB	
D	<hotspot-Murilo>	192.168.1.14	256k	256k	5.7 kbps	8.8 kbps	0 B/0 B	54.0 KB	85.1 KB	
D	<hotspot-Jasion2>	192.168.1.128	256k	256k	640 bps	22.8 kbps	0 B/0 B	86.8 KB	1835.5 KB	
D	<hotspot-Donizeti>	192.168.1.199	256k	256k	0 bps	0 bps	0 B/0 B	27.7 KB	64.6 KB	
D	<hotspot-Carlos Villar>	192.168.1.205	256k	256k	1752 bps	10.4 kbps	0 B/0 B	1176.4 KB	3528.1 KB	
D	<hotspot-danilo>	192.168.1.140	800k	800k	1488 bps	47.2 kbps	0 B/0 B	157.5 KB	2062.8 KB	
D	<hotspot-Jasion1>	192.168.1.182	256k	256k	0 bps	0 bps	0 B/0 B	210.3 KB	2206.4 KB	
D	<hotspot-ACC>	192.168.1.183	256k	256k	256 bps	1864 bps	0 B/0 B	221.5 KB	1057.7 KB	
D	<hotspot-Silverio1>	192.168.1.177	256k	256k	240 bps	256 bps	0 B/0 B	1206.5 KB	23.5 MiB	
D	<hotspot-Lourdes>	192.168.1.83	256k	256k	1768 bps	4.9 kbps	0 B/0 B	739.8 KB	2684.0 KB	
D	<hotspot-MPA>	192.168.1.146	256k	256k	217.4 kbps	150.8 kbps	0 B/13.2 KB	16.9 MiB	10.5 MiB	
D	<hotspot-Ferri>	192.168.1.165	256k	256k	104 bps	256 bps	0 B/0 B	1434.1 KB	5.3 MiB	
D	<hotspot-Campitalma2>	192.168.1.191	256k	256k	168 bps	56 bps	0 B/0 B	17.7 MiB	38.8 MiB	
D	<hotspot-Flavia Tarciana>	192.168.1.67	256k	256k	672 bps	30.6 kbps	0 B/0 B	1704.0 KB	19.1 MiB	
D	<hotspot-Greyton>	192.168.1.112	256k	256k	4.2 kbps	1448 bps	0 B/0 B	658.3 KB	4625.3 KB	
D	<hotspot-Susi>	192.168.1.68	256k	256k	1336 bps	20.9 kbps	0 B/0 B	2596.1 KB	17.8 MiB	
D	<hotspot-andre.rivera>	192.168.1.139	256k	256k	1672 bps	65.8 kbps	0 B/0 B	3818.4 KB	65.9 MiB	
D	<hotspot-Guillermo2>	192.168.1.132	256k	256k	112 bps	88 bps	0 B/0 B	606.9 KB	1213.8 KB	
D	<hotspot-Nelson3>	192.168.1.196	256k	256k	5.8 kbps	53.0 kbps	0 B/0 B	4447.7 KB	24.3 MiB	
D	<hotspot-Alene Ferraz>	192.168.1.160	256k	256k	5.3 kbps	8.6 kbps	0 B/0 B	13.5 MiB	197.0 MiB	
D	<hotspot-Angela>	192.168.1.98	256k	256k	16 bps	24 bps	0 B/0 B	559.8 KB	2634.9 KB	
D	<hotspot-Silverio>	192.168.1.129	256k	256k	16 bps	8 bps	0 B/0 B	933.4 KB	7.3 MiB	
D	<hotspot-Darci>	192.168.1.186	256k	256k	200 bps	272 bps	0 B/0 B	1819.2 KB	28.8 MiB	
D	<hotspot-Nelson2>	192.168.1.150	256k	256k	16 bps	16 bps	0 B/0 B	5.5 MiB	21.8 MiB	
D	<hotspot-Squadrus2>	192.168.1.155	256k	256k	6.3 kbps	240.5 kbps	0 B/13.3 KB	4105.8 KB	23.4 MiB	
D	<hotspot-Abud2>	192.168.1.178	256k	256k	80 bps	224 bps	0 B/0 B	1657.5 KB	5.8 MiB	
D	<hotspot-Squadrus>	192.168.1.197	256k	256k	16 bps	96 bps	0 B/0 B	1509.8 KB	25.3 MiB	
D	<hotspot-Belluco>	192.168.1.27	256k	256k	256 bps	352 bps	0 B/0 B	7.5 MiB	30.7 MiB	
D	<hotspot-Gilson>	192.168.1.89	256k	256k	544 bps	2.2 kbps	0 B/0 B	3658.3 KB	11.3 MiB	
D	<hotspot-Nelson>	192.168.1.156	256k	256k	176 bps	0 bps	0 B/0 B	10.2 MiB	38.2 MiB	
D	<hotspot-Furiani>	192.168.1.99	256k	256k	0 bps	0 bps	0 B/0 B	1504.3 KB	37.3 MiB	
D	<hotspot-Camillo>	192.168.1.102	256k	256k	48 bps	24 bps	0 B/0 B	6.2 MiB	122.9 MiB	
D	<hotspot-elis2>	192.168.1.176	256k	256k	128 bps	0 bps	0 B/0 B	2335.4 KB	4.8 MiB	
D	<hotspot-606>	192.168.1.200	256k	256k	424 bps	0 bps	0 B/0 B	1587.9 KB	2510.8 KB	
D	<hotspot-Abud>	192.168.1.189	256k	256k	144 bps	240 bps	0 B/0 B	5.1 MiB	28.7 MiB	
D	<hotspot-Advocacia>	192.168.1.202	256k	256k	272 bps	80 bps	0 B/0 B	926.1 KB	5.5 MiB	
D	<hotspot-Jasion>	192.168.1.184	256k	256k	0 bps	0 bps	0 B/0 B	2091.2 KB	6.8 MiB	

Strong Network Management for limited resources (low bandwidth backhaul) and high trusted stable platform.

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admin@200.162.114.70 (MikroTik) - WinBox v2.9.50

RouterOS WinBox

Interfaces  
Wireless  
PPP  
Bridge  
IP  
Routing  
Ports  
Queues  
Drivers  
System  
Files  
Log  
SNMP  
Users  
Radius  
Tools  
New Terminal  
Telnet  
Password  
Certificate  
Make Supout.tif  
ISDN Channels  
Manual  
Exit

Queue List

Simple Queues Interface Queues Queue Tree Queue Types

+ - [ ] [X] 00 Reset Counters 00 Reset All Counters

Name	Parent	Packet Mark	Limit At	Max Limit	Rate	Queued Bytes	Bytes	Packets
LIMITE DE P2P	global-in	p2p	0	200k	189.0 k...	7.7 KiB	1821.3 ...	3 727 4...
p2p reduzido	global-out	p2p	0	200k	189.2 k...	0 B	1806.8 ...	3 676 6...

51.6 KiB queued    56 packets queued

Windows taskbar: Yahoo! Search, 11:39

Pear to Pear bandwidth control !



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