

Mikrotik como solución de alta conurrencia

Caso de Éxito – Peru Set./2011

DESAFÍO

- Garantizar en una área aproximada de 18,000 m² conectividad WIFI concurrente para 1200 usuarios.
- Factores a Considerar:
 - Traslape de frecuencias.
 - Interferencia por exceso de emisión RF
 - Centralización de control de acceso, control de ancho de banda y QoS
 - Alta capacidad de procesamiento de datos.

CONTEXTO:

28/30

Septiembre 2011

LIMA, PERÚ



	EXPOALIMENTARIA			
CARACTERISTICAS	2009	2010	2011	
Area de Exhibición	6,600 m ²	12,000 m ²	18,000 m ²	↑ 50%
Stands Nacionales	195	301	382	↑ 27%
Stands Internacionales	10	99	130	↑ 31%
Países en Exhibición	1	5	23	
Visitantes Nacionales	7,850	19,800	27,273	↑ 38%
Visitantes Internacionales	450	740	1,715	↑ 132%
Países Visitantes			58	
MONTO NEGOCIADO	US\$ 25 M	US\$ 69.1 M	US\$ 471.7 M	↑ 583%

538 empresas expositoras.

148 empresas extranjeras de 22 países: 28% de los expositores fueron internacionales.

390 empresas peruanas.

116 empresas del interior del país.

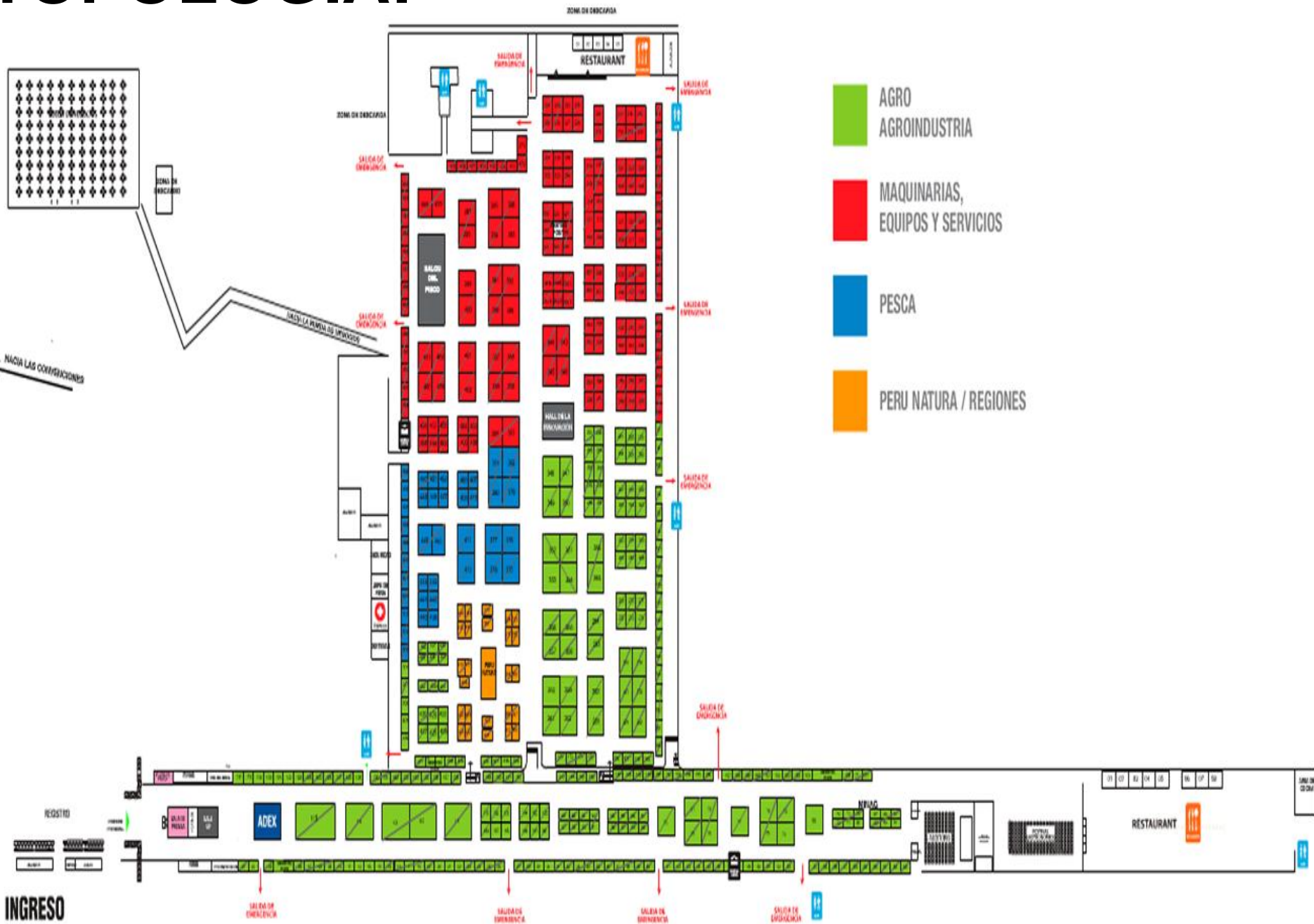
20 regiones del Perú representadas en la feria.

1212 USUARIOS

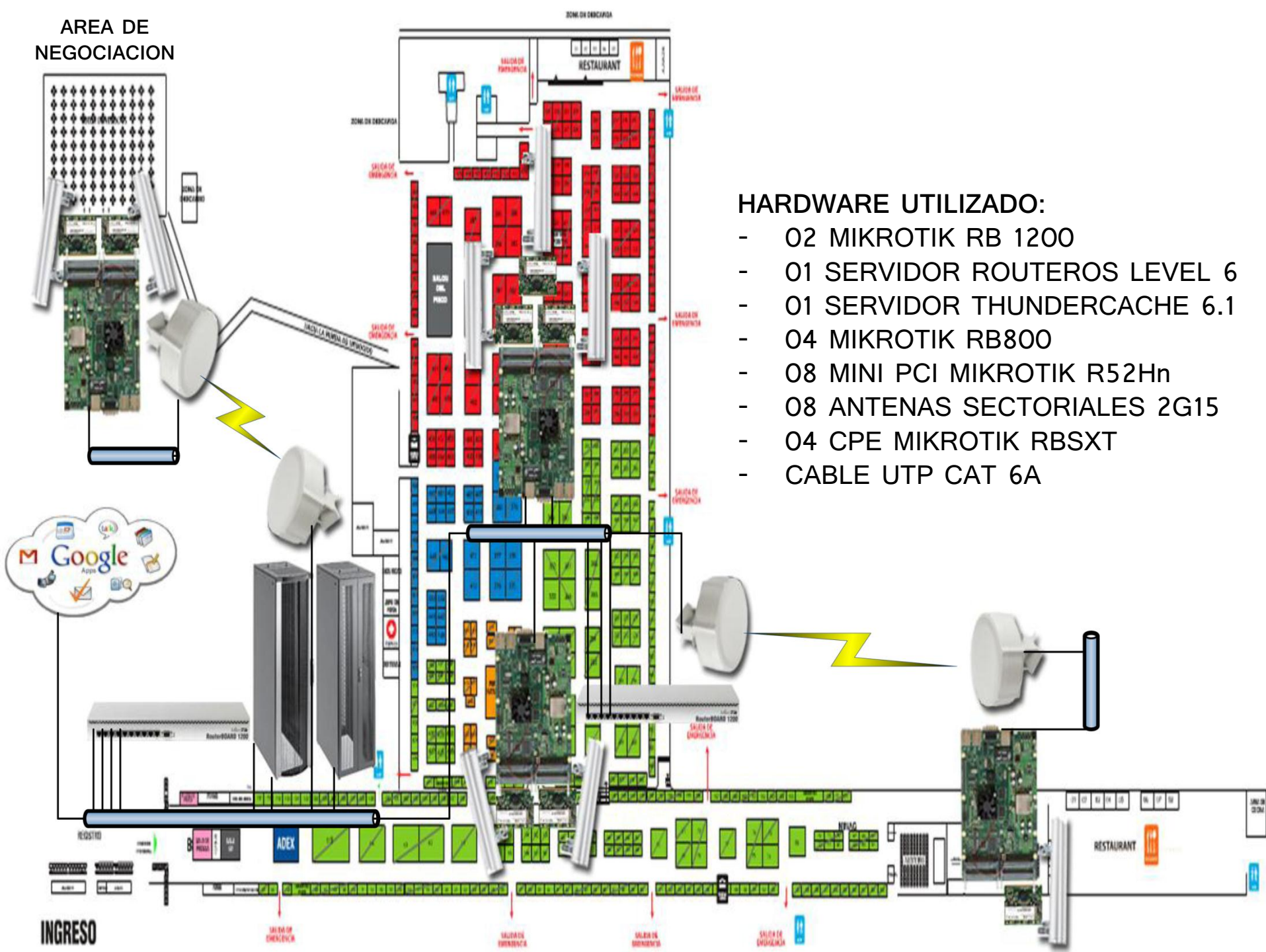


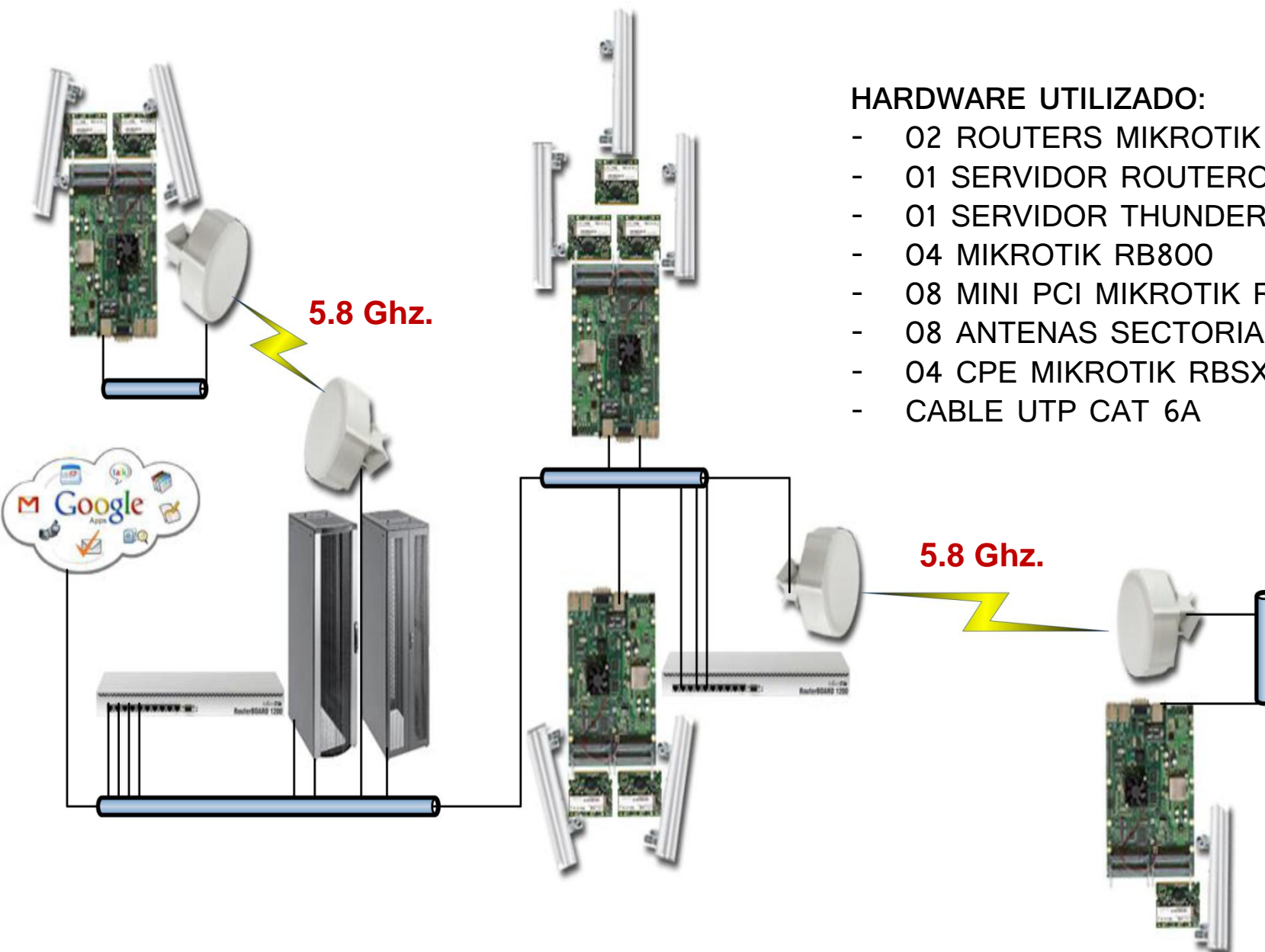
FUENTE: <http://www.expoalimentariaperu.com>

← HACIA LAS CONFINACIONES



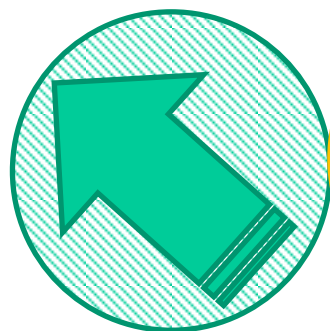
AREA DE NEGOCIACION





HARDWARE UTILIZADO:

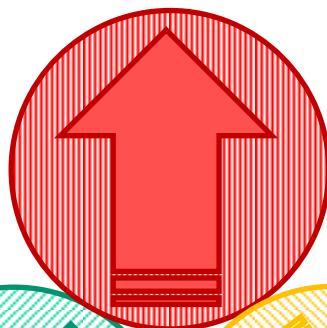
- 02 ROUTERS MIKROTIK RB 1200
- 01 SERVIDOR ROUTEROS LEVEL 6
- 01 SERVIDOR THUNDERCACHE 6.1
- 04 MIKROTIK RB800
- 08 MINI PCI MIKROTIK R52Hn
- 08 ANTENAS SECTORIALES 2G15
- 04 CPE MIKROTIK RBSXT
- CABLE UTP CAT 6A



Canal 6
2.4 Ghz.



Canal 1
2.4 Ghz.



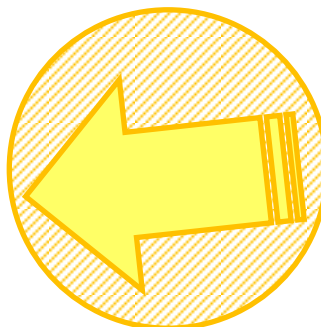
Canal 11
2.4 Ghz.



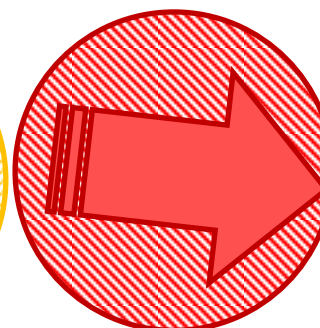
Canal 6
2.4 Ghz.



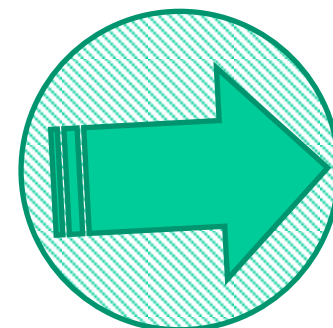
Canal 1
2.4 Ghz.



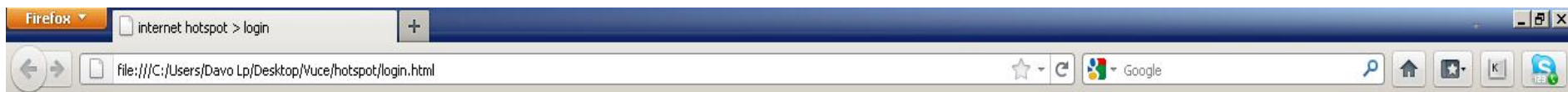
Canal 1
2.4 Ghz.



Canal 11
2.4 Ghz.



Canal 6
2.4 Ghz.



Ingrese el usuario y password correspondiente para ser validado
\$(if trial == 'yes')Free trial available, [click here](#).\$(endif)

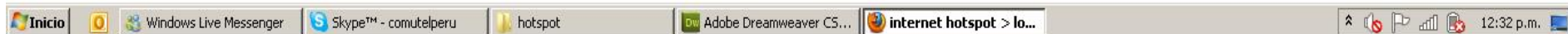
Usuario

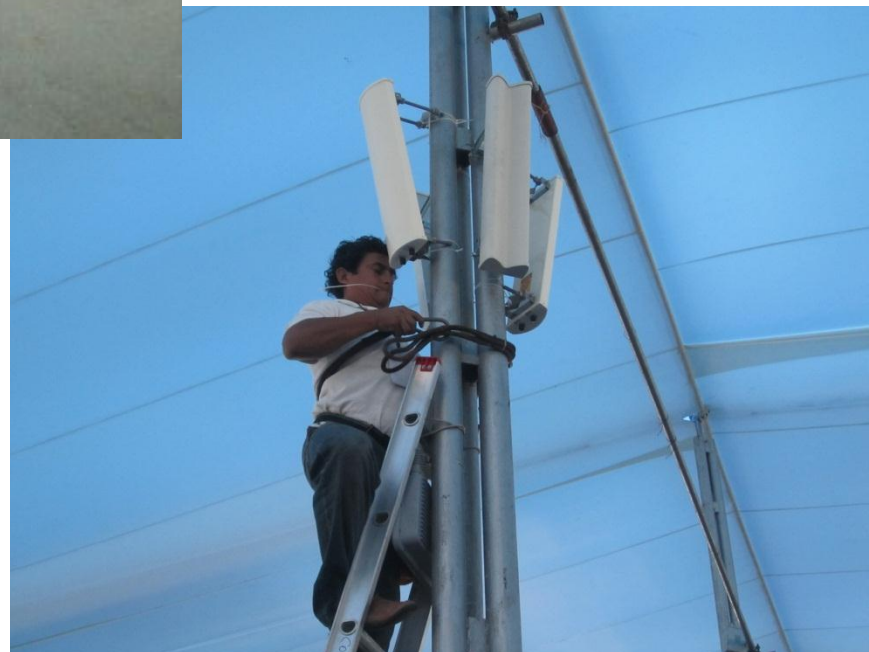
Password

Solucion implementada por:



\$(if error)
\$(error)
\$(endif)









Configuración Lógica: Marcado de contenido

admin@10.111.0.1 (MK-THUNDER) - WinBox v5.7 on x86 (x86)

Safe Mode

Uptime: 09:46:04 Memory: 948.4 MiB CPU: 5% Hide Passwords

RouterOS WinBox

Firewall

Filter Rules NAT Mangle Service Ports Connections Address Lists Layer7 Protocols

Find all

#	Action	Chain	Src. Address	Dst. Address	Proto...	Src. Port	Dst. Port	In. Inter...	Out. Int...	Bytes	Packets
62	mar...	prerouting						Internet		1610.0 KiB	14 338
63	mar...	postrouting							Internet	1756.7 KiB	16 630
Remote Administrator - remote desktop for MS Windows											
64	mar...	prerouting						Internet		0 B	0
65	mar...	postrouting							Internet	0 B	0
Remote Desktop Protocol (used in Windows Terminal Services)											
66	mar...	prerouting						Internet		0 B	0
67	mar...	postrouting							Internet	0 B	0
RTSP - Real Time Streaming Protocol											
68	mar...	prerouting						Internet		0 B	0
69	mar...	postrouting							Internet	0 B	0
SIP - Session Initiation Protocol - INTERNET telephony											
70	mar...	prerouting						Internet		6.7 KiB	10
71	mar...	postrouting							Internet	931.1 KiB	1 519
Skype to phone - UDP voice call											
72	mar...	prerouting						Internet		1447.9 MiB	1 438 236
73	mar...	postrouting							Internet	236.3 MiB	1 174 434
Skype to Skype - UDP voice call											
74	mar...	prerouting						Internet		108.2 MiB	702 888
75	mar...	postrouting							Internet	451.3 MiB	1 015 540
POP3 - Post Office Protocol version 3											
76	mar...	prerouting						Internet		879.6 MiB	723 612
77	mar...	postrouting							Internet	19.0 MiB	426 786
SMTP - Simple Mail Transfer Protocol											
78	mar...	prerouting						Internet		0 B	0
79	mar...	postrouting							Internet	0 B	0
SNMP - Simple Network Management Protocol											
80	mar...	prerouting						Internet		0 B	0
81	mar...	postrouting							Internet	0 B	0
Soulseek - P2P filesharing											
82	mar...	prerouting						Internet		13.0 KiB	34
83	mar...	postrouting							Internet	4513 B	18
SSH - Secure SHell											
84	mar...	prerouting						Internet		0 B	0
85	mar...	postrouting							Internet	0 B	0
SSL and TLS - Secure Socket Layer / Transport Layer Security											
86	mar...	prerouting						Internet		2635.3 MiB	2 754 332
87	mar...	postrouting							Internet	552.6 MiB	2 207 062
vnc											

159 items

RouterOS WinBox

admin@10.111.0.1 (MK-THUNDER) - WinBox v5.7 on x86 (x86)

Uptime:09:40:15

Memory:947.7 MiB

CPU:5%

Hide Passwords

RouterOS WinBox

Interfaces

Queue List

Simple Queues

Interface Queues

Queue Tree

Queue Types

+

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✓

✗

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🔍

Reset Counters

00 Reset All Counters

Find

	Name	Parent	Packet ...	Limit At (b...	Max Limit ...	Avg. R...	Queued Bytes	Bytes	Packets
Wireless	INTERNET...	global-in		24M	24M	4.0 Mbps	126 B	15.7 GiB	14 178 4...
Bridge	100ba...	INTERNET_IN	100ba...		5k	0 bps	0 B	0 B	0
PPP	DC_p2...	INTERNET_IN	DC_p2...		5k	0 bps	0 B	0 B	0
Mesh	DNS_in	INTERNET_IN	DNS_in			1912 bps	0 B	32.2 MiB	108 996
IP	aim_m...	INTERNET_IN	aim_me...			0 bps	0 B	956 B	4
IPv6	aim_m...	INTERNET_IN	aim_me...			0 bps	0 B	0 B	0
MPLS	appleju...	INTERNET_IN	appleju...			0 bps	0 B	0 B	0
Routing	ares_p...	INTERNET_IN	ares_p...		5k	0 bps	0 B	0 B	0
System	bitto...	INTERNET_IN	bitto...		5k	0 bps	0 B	1452.2 KiB	6 376
Queues	dhcp_in	INTERNET_IN	dhcp_in			0 bps	0 B	0 B	0
Files	edonk...	INTERNET_IN	edonk...		5k	0 bps	0 B	574.0 KiB	5 913
Log	fasttra...	INTERNET_IN	fasttra...		5k	0 bps	0 B	0 B	0
Radius	ftp_in	INTERNET_IN	ftp_in			0 bps	0 B	2197 B	21
Tools	gnu_p...	INTERNET_IN	gnu_p2...		5k	0 bps	0 B	0 B	0
New Terminal	gnutell...	INTERNET_IN	gnutell...		5k	0 bps	0 B	114.5 KiB	148
ISDN Channels	gobog...	INTERNET_IN	gobog...		5k	0 bps	0 B	0 B	0
KVM	h323_...	INTERNET_IN	h323_v...			0 bps	0 B	0 B	0
Make Spout.nif	http_in	INTERNET_IN	http_in			1994.1 ...	0 B	10.7 GiB	8 352 724
Manual	httptr...	INTERNET_IN	httptrsp...			0 bps	0 B	0 B	0
Exit	ident_in	INTERNET_IN	ident_in			0 bps	0 B	0 B	0
	imap_in	INTERNET_IN	imap_in			0 bps	0 B	33.1 MiB	42 638
	imesh...	INTERNET_IN	imesh...		5k	0 bps	0 B	0 B	0
	irc_in	INTERNET_IN	irc_in			0 bps	0 B	0 B	0
	msn_in	INTERNET_IN	msn_in			4.3 kbps	0 B	7.6 MiB	22 072
	msnfile...	INTERNET_IN	msnfile...			0 bps	0 B	0 B	0
	mute...	INTERNET_IN	mute_p...		5k	0 bps	0 B	0 B	0
	napste...	INTERNET_IN	napster...		5k	0 bps	0 B	0 B	0
	netbios...	INTERNET_IN	netbios...			0 bps	0 B	0 B	0
	nntp_in	INTERNET_IN	nntp_in			0 bps	0 B	0 B	0
	ntp_in	INTERNET_IN	ntp_in			0 bps	0 B	1608.7 KiB	14 325
	pop3_in	INTERNET_IN	pop3_in			0 bps	0 B	879.7 MiB	736 090
	radmin...	INTERNET_IN	radmin_in			0 bps	0 B	0 B	0
	rdp_in	INTERNET_IN	rdp_in			0 bps	0 B	0 B	0
	rtsp_in	INTERNET_IN	rtsp_in			0 bps	0 B	0 B	0
	sip_in	INTERNET_IN	sip_in			0 bps	0 B	0 B	0
	skype2...	INTERNET_IN	skype2...			43.0 kb...	0 B	107.1 MiB	693 989
	skypeo...	INTERNET_IN	skypeo...			546.0 k...	0 B	1422.2 MiB	1 442 186
	smtp_in	INTERNET_IN	smtp_in			0 bps	0 B	0 B	0
	snmp_in	INTERNET_IN	snmp_in			0 bps	0 B	0 B	0

91 items out of 94

126 B queued

0 packets queued

Configuración Lógica: HotSpot

admin@10.111.0.1 (MK-THUNDER) - WinBox v5.7 on x86 (x86)

Safe Mode Uptime: 09:40:39 Memory: 717.7 MiB CPU: 24% Hide Passwords

Interfaces

Wireless

Bridge

PPP

Mesh

IP

IPv6

MPLS

Routing

System

Queues

Files

Log

Radius

Tools

New Terminal

ISDN Channels

KVM

Make Supout.tif

Manual

Exit

Hotspot

Servers Server Profiles Users User Profiles Active Hosts IP Bindings Service Ports Walled Garden Walled Garden IP List Cookies

Find

Server	User	Domain	Address	Uptime	Idle Time	Session Time ...	Rx R...	Tx Rate
hotspot1	asiser		10.111.2.45	00:04:09	00:00:01		49.0 kb...	3.0 Mbps
hotspot1	kossodo		10.111.2.84	01:15:19	00:00:00		15.6 kb...	1076.8 kbps
hotspot1	meetpoint10		10.111.2.136	00:02:27	00:00:01		24.5 kb...	941.8 kbps
hotspot1	silval2		10.111.1.108	02:24:24	00:00:00		7.9 kbps	535.4 kbps
hotspot1	adex2		10.111.2.128	03:41:48	00:00:00		19.9 kb...	173.6 kbps
hotspot1	admin		10.111.1.187	02:15:35	00:00:01		24.5 kb...	102.6 kbps
hotspot1	tensid		10.111.1.94	06:44:50	00:00:01		118.8 k...	46.9 kbps
hotspot1	istecex		10.111.0.172	00:15:29	00:00:01		9.7 kbps	24.1 kbps
hotspot1	buyer		10.111.2.186	01:50:35	00:00:00		6.6 kbps	11.5 kbps
hotspot1	sierra		10.111.0.46	08:36:34	00:00:00		11.1 kb...	1980 bps
hotspot1	gian		10.111.0.183	04:20:04	00:00:00		580 bps	1976 bps
hotspot1	union		10.111.0.138	01:43:12	00:00:00		2.0 kbps	1729 bps
hotspot1	ar		10.111.1.240	05:32:01	00:00:00		40.1 kb...	1256 bps
hotspot1	akufu		10.111.1.155	01:57:53	00:00:00		26.4 kb...	986 bps
hotspot1	bcenter1		10.111.2.5	07:25:58	00:00:00		1033 bps	850 bps
hotspot1	cepibo		10.111.0.174	03:44:30	00:00:00			
hotspot1	mistral		10.111.1.151	02:48:16	00:00:00			
hotspot1	siuva		10.111.0.32	08:11:48	00:00:00			
hotspot1	sun		10.111.2.73	01:46:02	00:00:00			
hotspot1	cedepa2		10.111.2.32	00:26:41	00:00:01			
hotspot1	aduan		10.111.1.3	00:20:42	00:00:00			
hotspot1	cacesf		10.111.0.233	05:13:49	00:00:00			
hotspot1	adexprensa4		10.111.255.254	09:28:36	00:00:01			
hotspot1	embajadafr...		10.111.0.199	05:41:43	00:00:00			
hotspot1	quimsa2		10.111.0.169	00:19:45	00:00:00			
hotspot1	frio		10.111.0.110	02:02:08	00:00:00			
hotspot1	imo		10.111.0.245	00:06:59	00:00:00			
hotspot1	geodis		10.111.2.75	04:44:00	00:00:00			
hotspot1	domiruth		10.111.0.238	04:53:12	00:00:00			
hotspot1	lactom2		10.111.1.159	00:15:35	00:00:00			
hotspot1	piura2		10.111.2.207	00:16:57	00:00:01			
hotspot1	lactom		10.111.2.56	00:08:54	00:00:01			
hotspot1	adex1		10.111.0.181	06:18:08	00:02:02			
hotspot1	adex10		10.111.0.182	07:27:05	00:01:52			
hotspot1	adex6		10.111.1.122	01:25:29	00:00:16			
hotspot1	adex8		10.111.0.243	01:23:49	00:00:01			
hotspot1	adex9		10.111.0.194	06:09:57	00:00:07			
hotspot1	adexprensa1		10.111.0.84	09:28:55	00:00:27			

1147 items

Interface List

Interface Ethernet EoIP Tunnel IP Tunnel GRE Tunnel VLAN VRRP Bonding

Find

Name	Type	L2 MTU	Tx	Rx	Tx Pac...	Rx Pac...	Tx Drops	Rx Drops	Tx Errors
R Internet	Ethernet		538.6 kbps	8.6 Mbps	469	672	0	0	0
R LOCAL	Ethernet	16383	15.4 Mbps	460.2 kbps	591	431	0	0	0
R THUNDER	Ethernet	16383	13.4 Mbps	2.8 Mbps	422	437	0	25	0

3 items

RouterOS WinBox

Configuración Lógica: Canales no traslapados

admin@00:15:6D:69:59:09 (EMISOR 4 SECTORIALES) - WinBox v.5.7 on RB800 (powerpc)

Safe Mode

Uptime: 11:48:16 Memory: 224.7 MiB CPU: 2% Hide Passwords

Interfaces

Wireless

Bridge

PPP

Switch

Mesh

IP

IPv6

MPLS

Routing

System

Queues

Files

Log

Radius

Tools

New Terminal

MetaROUTER

Make Supout.tif

Manual

Exit

Wireless Tables

Interfaces Nstreme Dual Access List Registration Connect List Security Profiles

Scanner Freq. Usage Alignment Wireless Sniffer Wireless Snooper

Find

	Name	Type	L2 MTU	Tx	Rx	Tx Pac...	Rx Pac...	Tx Drops	Rx Drops	Tx Errors	Rx Errors	MAC Address	ARP	Mode	Band	Chann...	Frequen...	SSID
R	wlan5	Wireless (Atheros AR5...	2290	112.3 kbps	51.9 kbps	63	55	0	0	0	0	00:15:6D:69:55:86	enabled	ap bri...	2GHz...	20MHz	2462	ADEX-EX...
R	wlan6	Wireless (Atheros AR5...	2290	110.6 kbps	36.4 kbps	90	57	0	0	0	0	00:15:6D:69:59:05	enabled	ap bri...	2GHz...	20MHz	2412	ADEX-EX...
R	wlan7	Wireless (Atheros AR5...	2290	82.9 kbps	2.4 kbps	40	3	0	0	0	0	00:15:6D:69:59:09	enabled	ap bri...	2GHz...	20MHz	2437	ADEX-EX...

Interface List

Interface Ethernet EoIP Tunnel IP Tunnel GRE Tunnel VLAN VRRP Bonding

Find

	Name	Type	L2 MTU	Tx	Rx	Tx Pac...	Rx Pac...	Tx Drops	Rx Drops	Tx Errors	Rx Errors
R	bridge1	Bridge	1600	79.2 kbps	75.2 kbps	11	41	0	0	0	0
R	ether1	Ethernet	1600	0 bps	0 bps	0	0	0	0	0	0
R	ether2	Ethernet	1600	170.0 kbps	149.3 kbps	126	117	0	0	0	0
R	ether3	Ethernet	1600	0 bps	0 bps	0	0	0	0	0	0
R	wlan5	Wireless (Atheros AR5...	2290	112.3 kbps	51.9 kbps	63	55	0	0	0	0
R	wlan6	Wireless (Atheros AR5...	2290	110.6 kbps	36.4 kbps	90	57	0	0	0	0
R	wlan7	Wireless (Atheros AR5...	2290	82.9 kbps	2.4 kbps	40	3	0	0	0	0

7 items

3 items out of 7

RouterOS WinBox

Inicio Bandeja de ... Windows Li... Skype™ - c... Banco de Cr... Banco de Cr... Conexiones... ThunderCe... admin@10... admin@00... admin@00... Documento...

06:09 p.m.

Configuración Lógica: Servidor ThunderCache

ThunderCenter

THUNDERCACHE
PROFISSIONAL

ThunderCache Service: **Running**

SystemStatisticsMonitoringSettingsUsersAboutLogout (admin)

ThunderCenter System

CPU Model

Cores

Temperature

Intel(R) Core(TM) i7 CPU 870 @ 2.93GHz

8

25 °C

Total Memory

Used Memory

Free Memory

7941MB

7169MB (90.28%)

768MB

Plan (Threads)

In Use

Thunder Mensal (100000)

57

SWAP Total

SWAP Used

SWAP Free

15508MB

0MB (0%)

15508MB

Uptime

CPU Use

Disks Load

Platform

07:43:22

1%

0%

64 bit

Internet

Intranet

Cache

5.7 Mbps

5.65 Mbps

0 bps

Version ControlGraphicsOverall TrafficDynamic TrafficStatic Traffic

Version Control

Version Control					
ThunderCenter		ThunderCache		Service Pack	
Current	Available	Current	Available	Current	Available
3.1.2	3.1.2	809	809	2.1	2.1

ThunderCenter

THUNDERCACHE
PROFISSIONAL

ThunderCache Service: **Running**

SystemStatisticsMonitoringSettingsUsersAboutLogout (admin)

ThunderCenter Statistics Domains

Domain	Cache Static	Internet Static	HIT Static	MISS Static	Effic. (%) Static	Cache Dynamic	Internet Dynamic	HIT Dynamic	MISS Dynamic	Effic. (%) Dynamic	Total Requests
megaupload.com	326.22KB	475.23KB	11	73	68.65	1.93GB	902.89MB	6	6	219.21	96
youtube.com	46.01KB	151.62MB	3	170	0.03	519MB	5.13GB	43	513	9.88	729
windowsupdate.com	0B	1.58GB	0	9007	0.00	128MB	418.23MB	3347	2824	30.61	15178
eset.com_nod32	0B	73.62KB	0	190	0.00	85.02MB	53.49MB	96	95	158.92	381
kaspersky.com	4.84MB	2.73MB	72	53	177.53	40.8MB	21.74MB	3948	1733	187.67	5806
vk.com	0B	0B	0	0	0.00	13.7MB	12.97MB	5	1	105.60	6
pornhub.com_videos	0B	0B	0	0	0.00	5.7MB	5.57MB	6	12	102.27	18
terra.com_TerraTV	0B	572.29KB	0	7	0.00	4.33MB	61.74MB	2	20	7.01	29
redtube.com_videos	0B	0B	0	0	0.00	3.88MB	206.74MB	2	16	1.88	18
avast.com	0B	263.77KB	0	20	0.00	3.33MB	7.75MB	246	231	42.95	497
googleearth.com_extension	0B	0B	0	0	0.00	2.37MB	625.57KB	4	6	387.37	10
av.com_avo.cz	0B	0B	0	0	0.00	521.87KB	3.91MB	44	53	13.02	97
focdn.net	46.73MB	332.27MB	2207	11107	14.06	0B	0B	0	0	0.00	13314
elcomercio.63.pe	159.76MB	151.31MB	6870	1556	105.58	0B	0B	0	0	0.00	8426
facebook.com	44.53MB	1.36MB	3123	68	3275.23	0B	0B	0	0	0.00	3191
adobe.com	1.13MB	428.34MB	36	3103	0.26	0B	0B	0	0	0.00	3139
videotron.ca	0B	0B	0	2207	0.00	0B	0B	0	0	0.00	2207
adexparu.org.pe	97.07MB	17.31MB	937	1231	560.84	0B	0B	0	0	0.00	2168
vtm.com	63.8MB	21.93MB	905	1188	290.94	0B	0B	0	0	0.00	2093
s-msn.com	18.59MB	18.44MB	866	860	100.71	0B	0B	0	0	0.00	1726

GRACIAS.

