



Wireless Distribution System

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MikroTik Users Meeting 2014
Yogyakarta

Siapakah Saya?

- Praktisi IT
- MikroTik Certified Trainer
- **MTCINE in 4 Desember 2014**
- RedHat Instructor and Examiner in Asia
- Expert in Security



Tentang Kami

- PT NETKROM SOLUSINDO (Bandung)
- IT Consultant and Training



Apakah WDS itu?

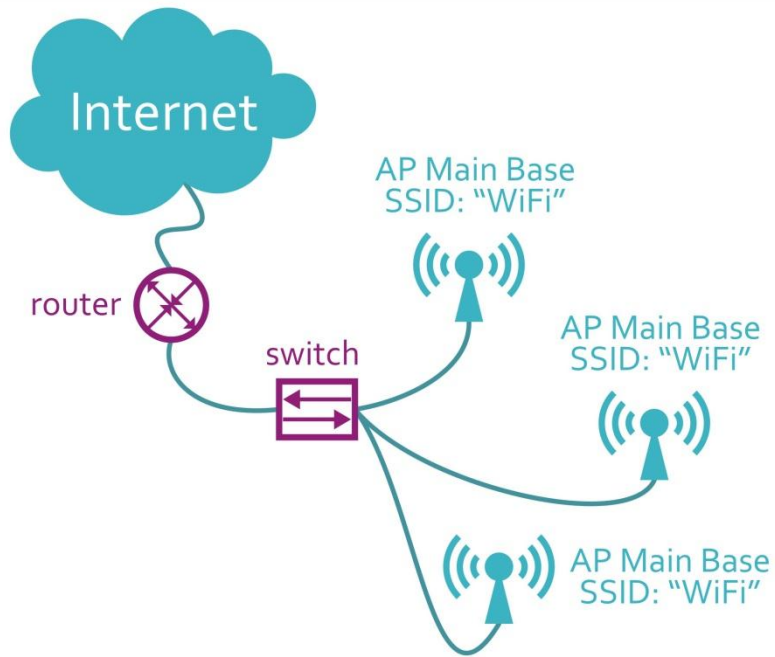
- IEEE 802-11 1999
- Jaringan wireless antar akses point
- Ekspansi jangkauan wireless (repeater)
- Tidak perlu backbone kabel
- Setiap AP yang terlibat harus memiliki konfigurasi channel dan enkripsi yang sama

Penerapan WDS

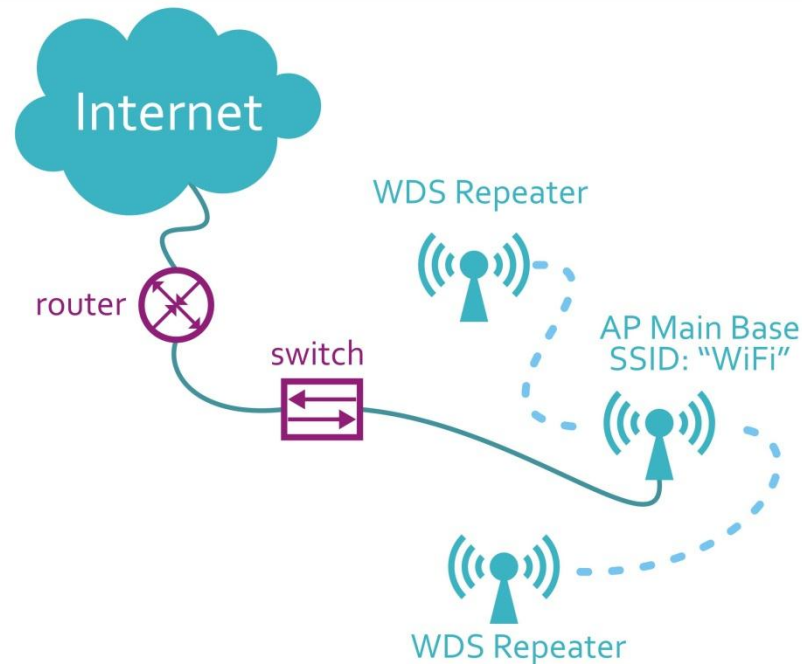
- Gedung bertingkat (hotel, kantor) atau wilayah yang terlalu luas (pabrik, kampus, RT/RW), dll.
- Keperluan untuk membuat jaringan wireless yang luas namun tetap 1 subnet, 1 SSID, dan servis tersentralisasi.

Implementasi

Kurang Tepat

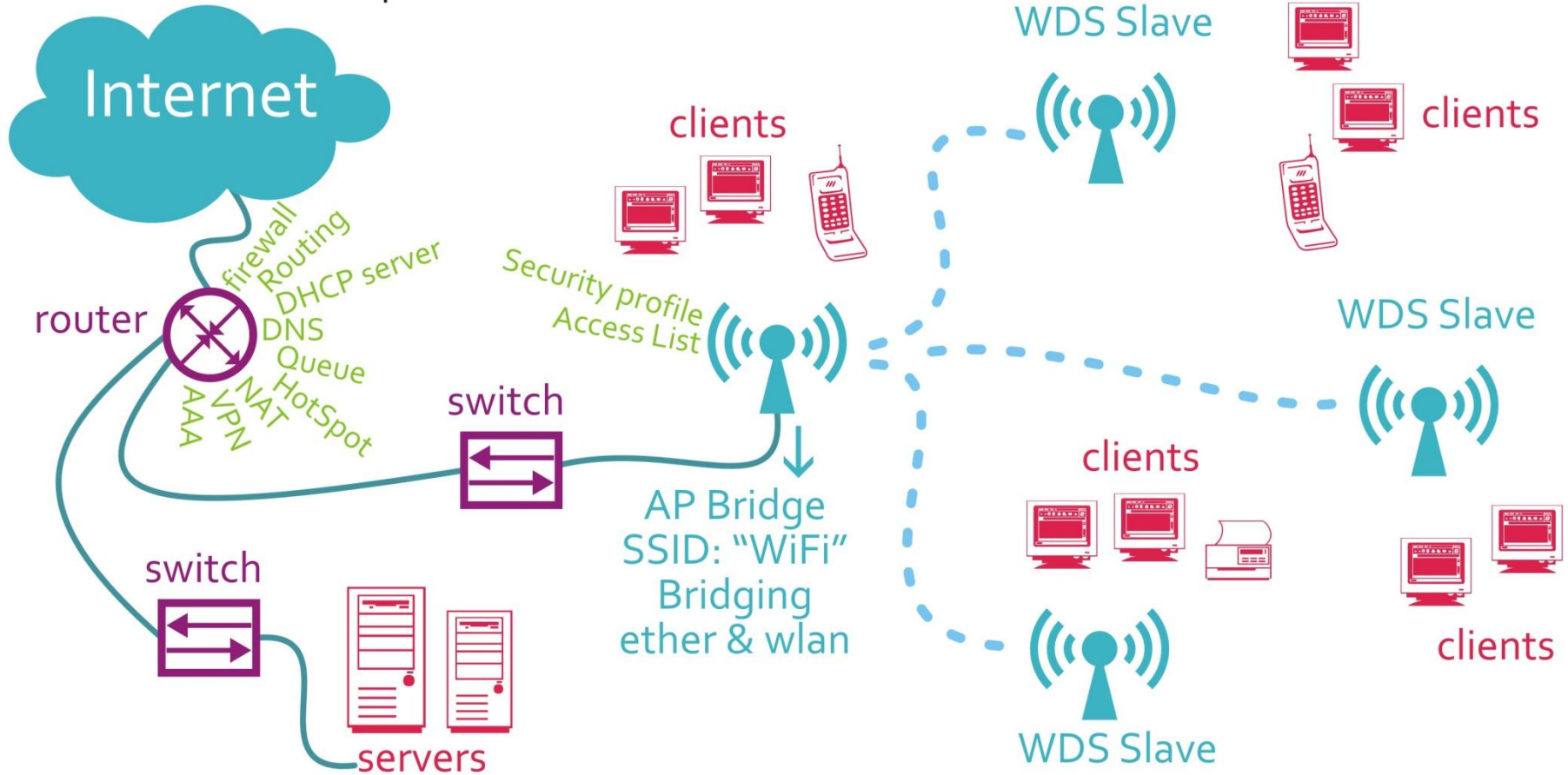


Seharusnya

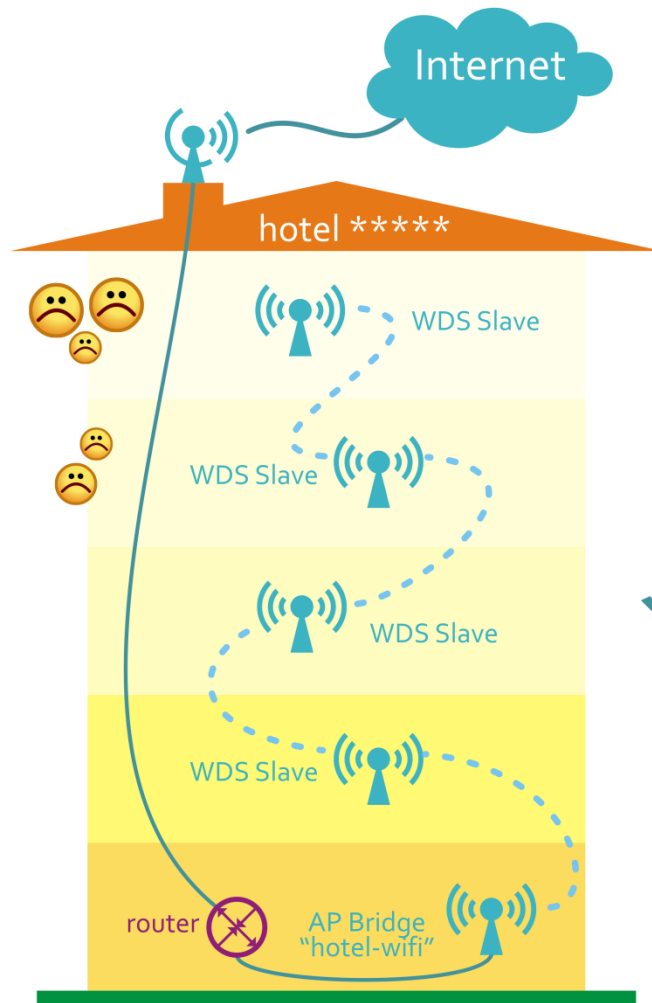


Contoh Infrastruktur WDS

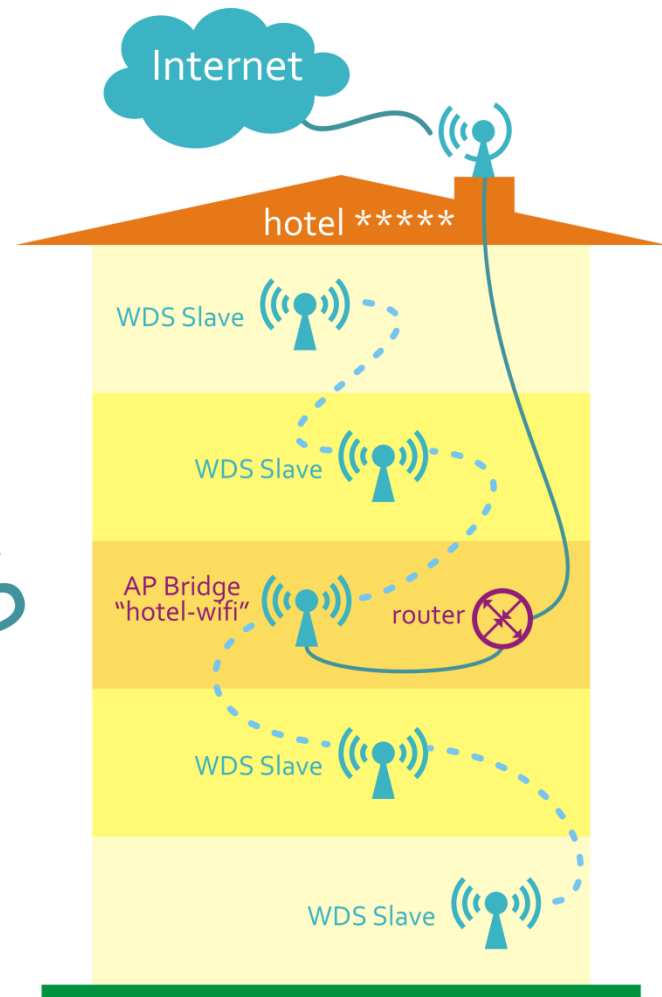
*All routers and access points are MikroTik!



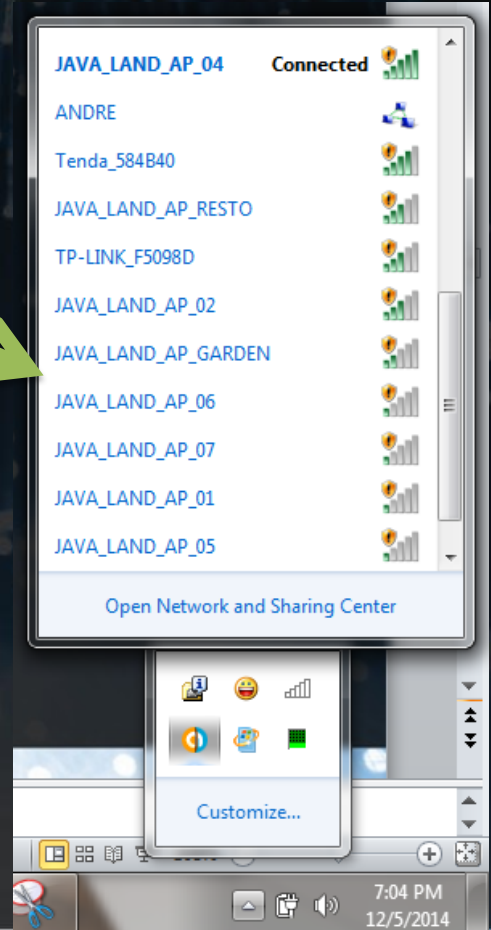
Kasus:
hotel
5 lantai



VS



Kasus yang real di dunia nyata !!!



Cost - Benefit

Keuntungan

- Client berpindah tanpa disconnect (1 SSID)
- Hemat biaya & perangkat
- Mempertahankan MAC address client di semua link

Kelemahan

- Throughput berkurang 50% setiap lompatan (wifi = half duplex)
- Biasanya hanya bisa jika semua alat 1 merk (standarisasi 802.11 1999 tidak jelas)

MikroTik WDS Mode

STATIC

- Admin membangun jaringan repeater (interface WDS) dengan memasukkan MAC address AP
- Jaringan mesh diatur oleh admin

DYNAMIC

- Router membentuk jaringan repeater secara otomatis
- Jaringan mesh diatur oleh router

Demo

- `/interface bridge add name=bridge1 protocol-mode=rstp`
- `/interface bridge port add interface=ether1 bridge=bridge1`
- `/interface bridge port add interface=wlan1 bridge=bridge1`
- `/interface wireless set wlan1 mode=ap-bridge band=2.4ghz-b/g frequency=2437 ssid=mesh wds-mode=dynamic wds-default-bridge=bridge1 disabled=no`
- `/interface wireless security-profiles add name=WPA2 mode=dynamic-keys authentication-types=wpa2-eap unicast-ciphers=aes-ccm group-ciphers=aes-ccm eap-methods=eap-tls tls-mode=no-certificates`
- `/interface wireless connect-list add interface=wlan1 security-profile=WPA2`

Buat interface bridge

WDS SERVER

Bridge

Bridge Ports Filters NAT Hosts

Find

Name	Type	L2 MTU	Tx	Rx	Tx Packet (p/s)	Rx Packet (p/s)	MAC Address	Protoco...
bridge1	Bridge	1600	77.2 kbps	5.2 kbps	10	9	D4:CA:6D:61:6E:10	rstp

Interface <bridge1>

General STP Status Traffic

Name: bridge1

Type: Bridge

MTU: 1500

L2 MTU: 1600

MAC Address: D4:CA:6D:61:6E:10

ARP: enabled

Admin. MAC Address:

OK

Cancel

Apply

Disable

Comment

Copy

Remove

Torch

enabled running slave

WDS SERVER

Masukkan ports untuk bridge1

The screenshot shows the MikroTik WinBox interface. On the left is a sidebar with navigation options: Quick Set, Interfaces, Wireless, Bridge, PPP, Switch, Mesh, IP, MPLS, Routing, System, Queues, Files, Log, Radius, Tools, New Terminal, MetaROUTER, Partition, Make Supout.tif, Manual, and Exit. The main window displays the 'Bridge' configuration page, with the 'Ports' tab selected. A table lists the ports for 'bridge1':

Interface	Bridge	Priority (h...)	Path Cost	Horizon	Role	Root Pat...
ether1	bridge1	80	10		designated port	
wlan1	bridge1	80	10		disabled port	

Below the table, two 'Bridge Port' configuration windows are shown side-by-side. The left window is for 'ether1' and the right is for 'wlan1'. Both windows have the 'General' tab selected. In both, the 'Interface' dropdown is set to 'ether1' (for ether1) or 'wlan1' (for wlan1), and the 'Bridge' dropdown is set to 'bridge1'. The 'Priority' is 80 and 'Path Cost' is 10. The 'OK' button is highlighted in red in both windows. Red arrows point from the 'Ports' tab and the table to these configuration windows.

Ether1 (menuju sumber internet)

Wlan1 (interface WDS)

Wireless Tables

Name	Type	L2 MTU	Tx	Tx Packet (p/s)	Rx
wlan1	Wireless (Atheros AR9...	2290		0	

Interface <wlan1>

General Wireless HT WDS Nst... NV2 Status ... OK Cancel

Mode: ap bridge

Band: 2GHz-B

Channel Width: 20MHz

Frequency: 2412 MHz

SSID: hotel-wifi

Scan List: default

Wireless Protocol: any

Security Profile: default

Bridge Mode: enabled

Default AP Tx Rate: bps

Default Client Tx Rate: bps

☒ Default Authenticate

☒ Default Forward

☐ Hide SSID

Comment

Torch

Scan...

Freq. Usage...

Align...

Sniff...

Snooper...

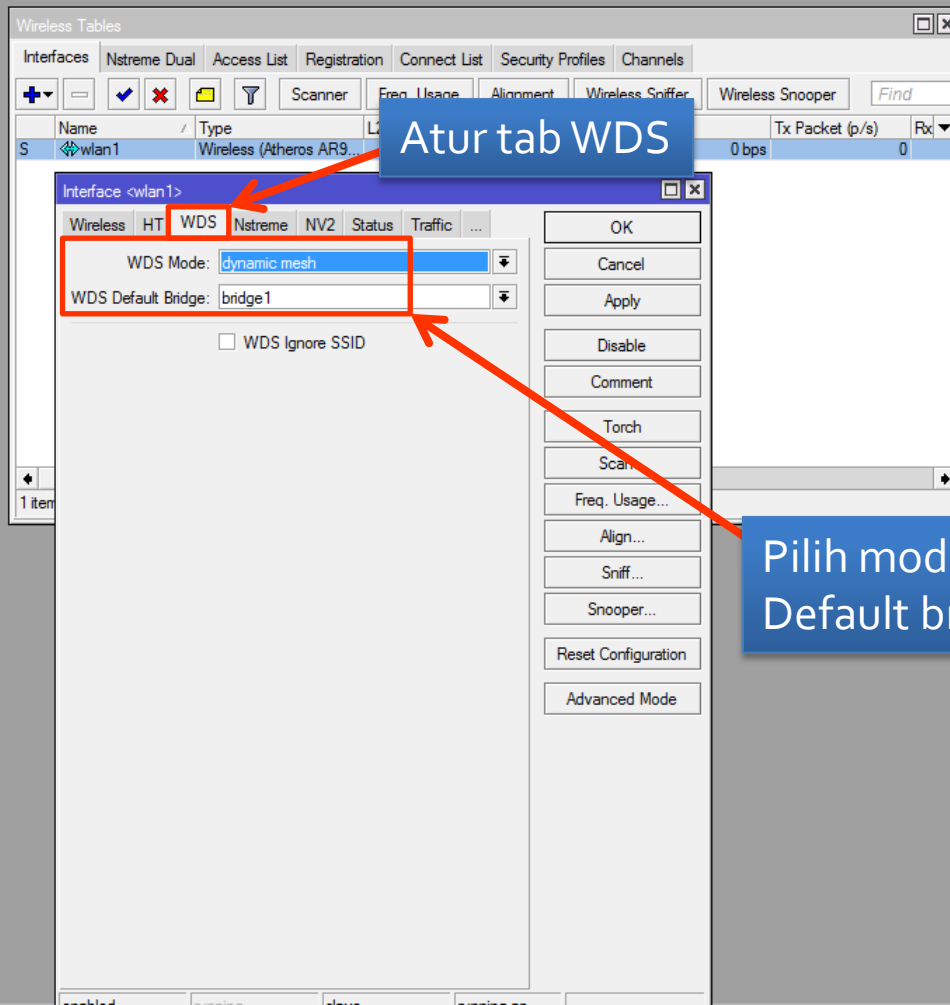
Reset Configuration

Advanced Mode

WDS SERVER

AP BRIDGE

Tentukan nama SSID



WDS SERVER

Atur tab WDS

Pilih mode WDS &
Default bridge: bridge1

WDS SLAVE

Client melakukan scanning

Pilih SSID server WDS

Interface <wlan1>

General Wireless HT HT MCS WDS Nstreme ...

Mode: station bridge

Band: 2GHz-B/G/N

Channel Width: 20MHz

Frequency: 2412 MHz

SSID: MikroTik

Scan List: default

Wireless Protocol: any

Security Profile: default

Bridge Mode: enabled

Default AP Tx Rate: bps

Default Client Tx Rate: bps

☒ Default Authenticate

☒ Default Forward

OK Cancel Apply Disable Comment Launch Scan... Freq. Usage... Align... Sniff... Snooper... Reset Configuration Advanced Mode

Scanner (Running)

Interface: wlan1

Start Stop Close New Window Connect

	Address	SSID	Band	Chan...	Frequ...	Signa...	Noise...	Signa...	Radio Name	Ro
ARWB	D4:CA:6D:61:6E:15	hotel-wifi	2GHz...	20MHz	2412	-9	-110	101	D4CA6D616E15	6.19
APRB	D4:CA:6D:61:6E:15	Sumpah Aktif	2GHz...	20MHz	2412	-62	-110	48	NETKROM-AP	6.4
		A - active, R - routers network, W - wds, B - bridge								
AP	00:11:6B:30:B4:E8	JasaMedika-Rem...	2GHz...	20MHz	2462	-100	-108	8		
AP	F8:1A:67:55:F3:28	Jasamedika-ECG	2GHz...	20MHz	2437	-97	-108	11		

5 items (1 selected)

WDS SLAVE

Wireless Tables

Interfaces Nstreme Dual Access List Registration Connect List Security Profiles Channels

+ - ✓ ✗ 📄 🔍 Scanner Freq. Usage Alignment Wireless Sniffer Wireless Snooper Find

	Name	Type	L2 MTU	Tx	Rx	Tx Packet (p/s)	Rx Packet (p/s)	MAC Address	ARP	Mode	Band	Chann...	Frequen...	SSID
R	wlan1	Wireless (Atheros AR9...	2290		0 bps	424 bps	0	1 D4:CA:6D:B6:CA:39	enabled	wds sl...	2GHz...	20MHz	2412	hotel-w

Interface <wlan1>

General Wireless HT HT MCS **WDS** Nstreme NV2 Status Traffic

WDS Mode: dynamic mesh

WDS Default Bridge: none

☐ WDS Ignore SSID

Pilih mode WDS

OK

Cancel

Apply

Disable

Comment

Torch

Scan...

Freq. Usage...

Align...

Sniff...

Snooper...

Reset Configuration

Advanced Mode

WDS SLAVE

Wireless Tables

Interfaces Nstreme Dual Access List Registration Connect List Security Profiles Channels

+ - ✓ ✗ [icon] [icon] Scanner Freq. Usage Alignment Wireless Sniffer Wireless Snooper Find

	Name	Type	L2 MTU	Tx	Rx	Tx Packet (p/s)	Rx Packet (p/s)	MAC Address	ARP	Mode	Band	Chann...	Frequen...	SSID
R	wlan1	Wireless (Atheros AR9...	2290	0 bps	0 bps	0	0	D4:CA:6D:B6:CA:39	enabled	wds sl...	2GHz-...	20MHz	2412	hotel-wi...
DR	wds3	WDS	2290	0 bps	424 bps	0	1	D4:CA:6D:B6:CA:39	enabled					

Interface <wlan1>

General

Wireless

HT

HT MCS

WDS

Nstreme

...

Mode: wds slave

Band: 2GHz-B/G/N

Channel Width: 20MHz

Frequency: 2412 MHz

SSID: hotel-wifi

Scan List: default

Wireless Protocol: any

Security Profile: default

Bridge Mode: enabled

Default AP Tx Rate: bps

Default Client Tx Rate: bps

☒ Default Authenticate☒ Default Forward☐ Hide SSID

Pilih mode WDS SLAVE

Torch

Scan...

Freq. Usage...

Align...

Sniff...

Snooper...

Reset Configuration

Advanced Mode

WDS SERVER

Wireless Tables

Interfaces Nstreme Dual Access List Registration Connect List Security Profiles Channels

+ - ✓ ✕ [icon] [icon] Scanner Freq. Usage Alignment Wireless Sniffer Wireless Snooper Find

Name	Type	12 MTU	Tx	Rx	Tx Packet (p/s)
RS wlan1	Wireless (Atheros AR9...	2290	3.4 kbps	0 bps	5
DRSA wds3	WDS	2290	3.4 kbps	0 bps	5

D - dynamic, R - running, S - slave, A - active

Bridge

Bridge Ports Filters NAT Hosts


+ - ✓ ✕ [icon] [icon] Find

Interface	Bridge	Priority (h...	Path Cost	Horizon	Role	Root Pat...
ether1	bridge1	80	10		designated port	
D wds3	bridge1	80	131		designated port	
wlan1	bridge1	80	10		designated port	

2 items out of 8

3 items

Interface WDS muncul secara dynamic di interface list dan bridge



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READY : BUTUH CLOUD MikroTik (Data Center Singapore)