

Wireless device configuration



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Agenda

- **Types of hardware**
- **General rules and tips**
- **Interfaces of a wireless device**
- **Step-by-step guide**

Types of hardware

- **Wireless devices come with many different names and functionalities**
- **Most devices you find today are more than just access points - they can be routers, bridges, clients, repeaters. Many include an ethernet switch.**
- **Wireless devices can also be self built from standard computer boards (e.g. ITX boards, Soekris, ALIX, etc)**
- **Replacing the original software of a device (the “firmware”) can change the functionality - we call this “flashing”**

General rules and tips

What you need

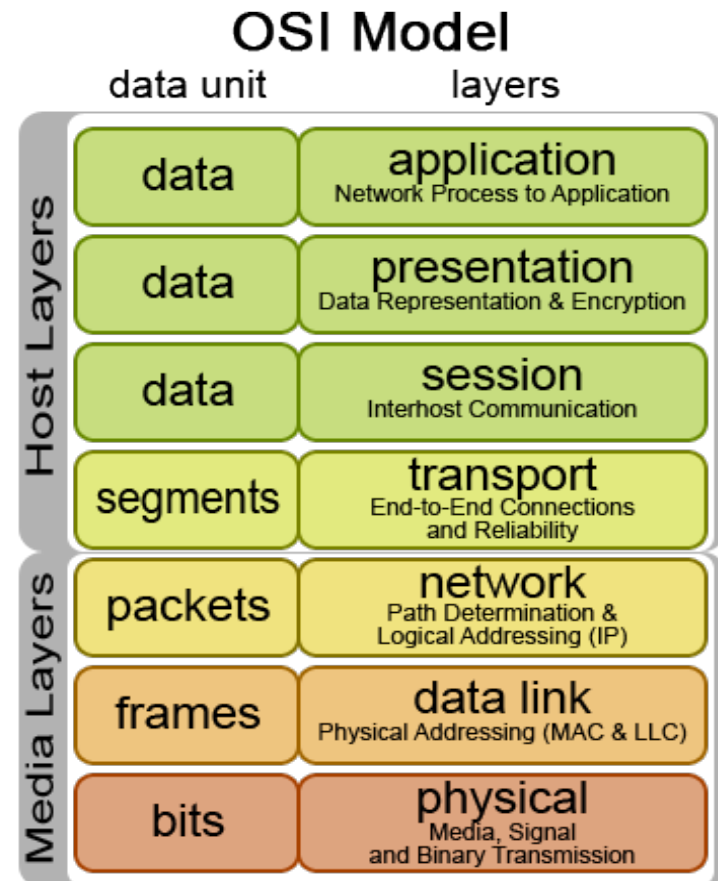
- **a PC / laptop with wireless and ethernet interfaces**
- **standard TCP/IP software tools (ping, route, etc)**
- **maybe vendor specific software**
- **wireless signal/survey software**
- **paper and pen!**

Before you start

- Get to know the device and its default settings. **Read the manual. Make sure you have all information on paper, not online**
- Consider the physical installation: placement, power supply, antennas, weather, temperature, humidity ... and all other factors that are not software related. This includes: people around you! Make a **complete site survey!**
- Make sure you have **stable power supply** – especially when flashing. Power failure during flashing might kill your device. Consider UPS or battery.

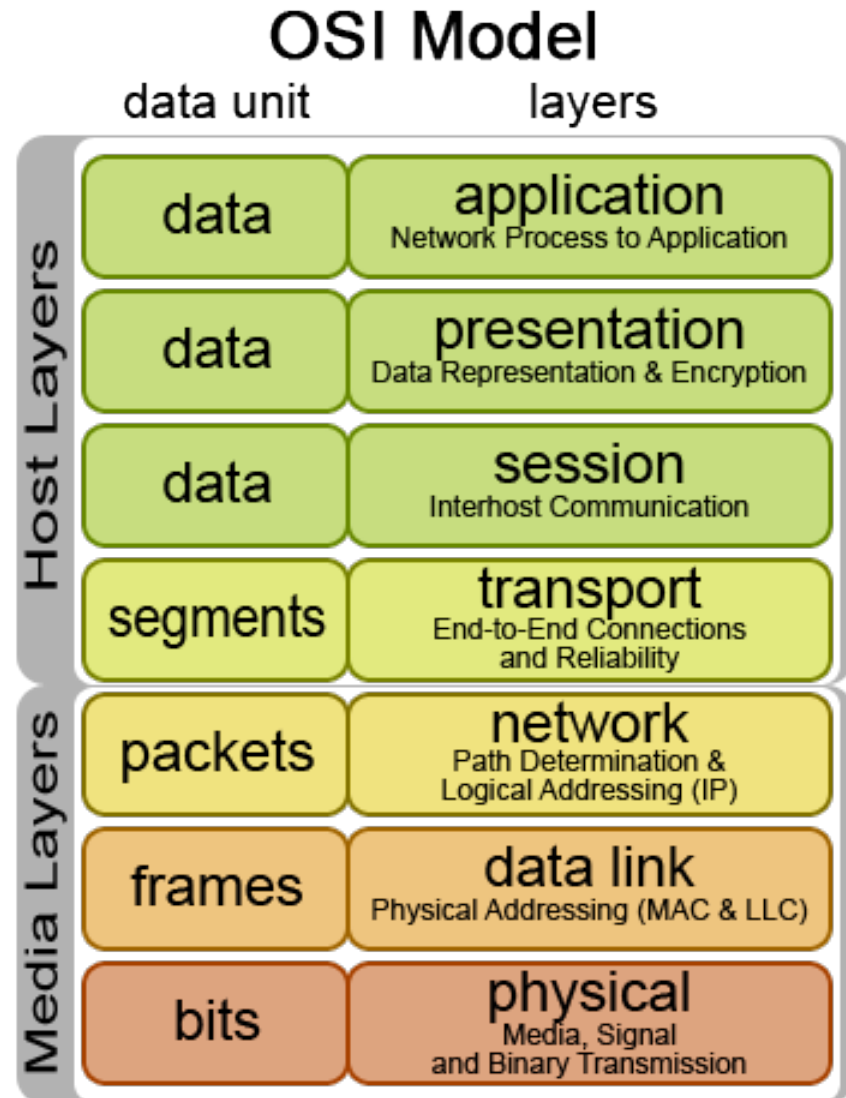
Remember the 7 layers

- The 7 layer OSI model - always remember which layer you are on, in what you are doing.
- This will also be important in troubleshooting!



Settings & their layers

- **Physical Layer**
Channel, TX Power, Speed
- **Link Layer**
Mode, SSID, MAC filter,
Beacon interval, RTS/CTS,
Fragmentation
- **IP Layer**
IP settings
- **Application Layer**



Interfaces of a wireless device

Interfaces

- Typically you find:
- **the ethernet side:** often called WAN - typically to an ISP, an internet connection, or a LAN. A pure Access Point only has this one ethernet port.
- **the wireless side:** often called WLAN - to local network / wireless clients. Sometimes called the radio side.
- Often you find Wireless Routers/Gateways - they have additional ethernet ports on the local network side (LAN) and do more than pure Access Points. Don't confuse the interfaces!

Interfaces of a wireless device

- let us look at some devices and identify interfaces.

Step-by-step guide

Web interfaces

- The interfaces look different from vendor to vendor, from model to model, and they change all the time - but they all contain the same basic elements.
- Try to remember those basic principles, not what they look like

Get started

- **Make a plan** for all settings, and a drawing.
- **Take notes** (on paper!) about every step, especially when changing passwords, IP numbers and network settings

Step-by-step, Part 1: Basics

- **Reset the device**, if you are uncertain whether it is in default state.
- **Connect** your computer to it - **wired** or wireless
- **First thing: change** the default Admin **password**. Do it!
- **Do it Now! :) Now!**
- If your device can be more than a pure Access Point, then **set the mode**: Access Point, Bridge, Client, Repeater, Gateway?

Step-by-step, Part 2: IP/network settings

- IP Address(es)
- Netmask
- Gateway
- DNS server
- DHCP server - maybe
- then adjust your computers settings, if needed

Web interfaces / OpenWRT - Network

Nepal Wireless
OpenWrt

OpenWrt Firmware
Kamikaze (r14417)
Load: 0.10 0.05 0.01
Hostname: OpenWrt

Overview **Network** System Administration **Essentials**

Network

Status

Network	MAC-Address Hardware Address	IPv4-Address	IPv4-Netmask	Traffic transmitted / received	Errors TX / RX
wan	00:23:69:3b:00:89			869.09 KB / 0.00 B	0 / 0
lan	00:23:69:3b:00:89	192.168.0.2	255.255.255.0	1.06 MB / 891.21 KB	0 / 0

Local Network

IPv4-Address

IPv4-Netmask

IPv4-Gateway (optional)

DNS-Server (optional)

Internet Connection

Protocol

You need to install 'ppp-mod-pppoe' for PPPoE or 'pptp' for PPTP support

Clamp Segment Size Fixes problems with unreachable websites, submitting forms or other unexpected behaviour for some ISPs.

Powered by LuCI 0.8.6 Release (v0.8.6)

Web interfaces / Ubiquiti - Network



Main Link Setup **Network** Advanced Services System

Network Mode: Bridge
Disable Network: None

NETWORK SETTINGS

Bridge IP Address: DHCP Static

IP Address: 192.168.0.3
Netmask: 255.255.255.0
Gateway IP: 192.168.0.1
Primary DNS IP: 202.79.32.4
Secondary DNS IP:
DHCP Fallback IP: 192.168.1.20
Spanning Tree Protocol:

Auto IP Aliasing:
IP Aliases:

FIREWALL SETTINGS

Enable Firewall:

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Step-by-step, Part 3: wireless settings

- Channel
- SSID
- Wireless Mode (a/b/g)
- Output Power
- Data rate
- Security settings: WEP, WPA, etc

Web interfaces / OpenWRT - Wireless

Nepal Wireless

OpenWrt


OpenWrt Firmware
Kamikaze (r14417)
Load: 0.08 0.02 0.01
Hostname: OpenWrt

Overview **Network** System Administration **Essentials**

Wifi

Here you can configure installed wifi devices.

Networks

Link	ESSID	BSSID	Channel	Protocol	Mode	Encr.	Power	Scan
0	nepal-wireless	-	11		ap	psk	27 dBm	

Devices

enable

Channel

Local Network

Network Name (ESSID)

Mode

Encryption
WPA-Encryption requires wpa_supplicant (for client mode) or hostapd (for AP and ad-hoc mode) to be installed.

Key

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Web interfaces / Ubiquiti - Wireless



Main Link Setup Network Advanced Services System

BASIC WIRELESS SETTINGS

Wireless Mode: Hide SSID

SSID:

Country Code:

IEEE 802.11 Mode:

Channel Spectrum Width: Max Datarate: 54Mbps

Channel Shifting:

Channel:

Output Power: dBm Obey Regulatory Power

Data Rate, Mbps: Auto

WIRELESS SECURITY

Security:

Authentication Type: Open Shared Key

WEP Key Length: Key Type:

WEP Key:

WPA Preshared Key: Key Index:

MAC ACL: Enabled Policy:

Step-by-step, Part 4: advanced settings

- There is more – for example the advanced wireless settings. So go through all other settings, and at least try to understand what they do – even if you do not use them.
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Sources: this presentation from
<http://wirelessu.org/node/148>