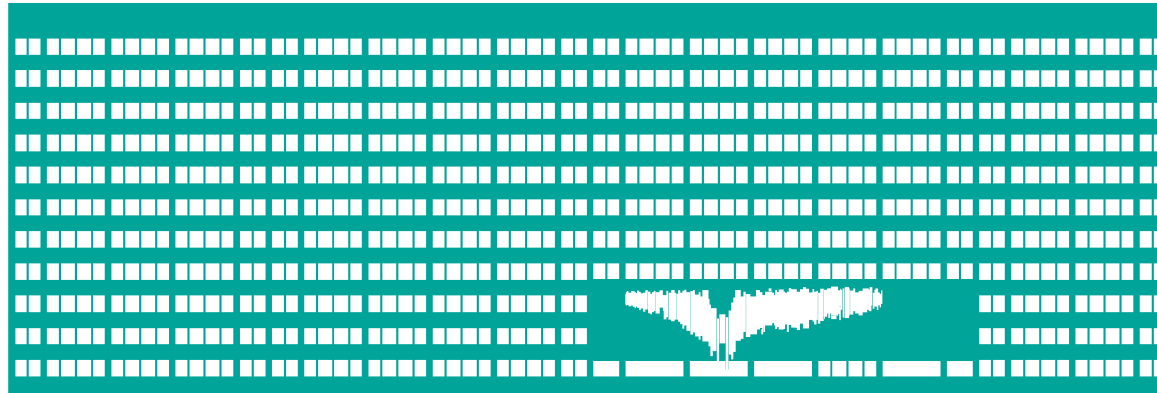


# Wi-Fi



## Computer Networks Seminar 14

# Configuring a client in Linux

- Wireless Tools
  - iwconfig - basic parameters configuration
  - iwlist - scanning, frequency's output, encryption
- WPA supplicant
  - WPA, WPA2, WEP support
- NetworkManager
- KWifiManager
- WiFi-Radar

# WiFi - Ad-hoc mode

- Interconnecting computers as peer-to-peer
- Stations need to be in mutual range
- SSID - Service Set Identifier, max. 32 ch.

```
iwconfig <interface> mode ad-hoc  
      essid mojesit  
      channel 7
```

- Set IP addresses (**ifconfig**)

# WiFi - Infrastructure mode

- List of interfaces capable of scanning
  - **iwlist scanning**
- Available speed modes
  - **iwlist <interface> rate**
- Finding the networks in range
  - **iwlist <interface> scan**
- Connecting to unsecured network
  - **iwconfig <interface> mode managed  
essid kavarna**

# WiFi - Secured connections

- WEP encryption
  - 64bit WEP - 40 bit key
  - 128bit WEP - 104 bit key
- Encryption key setting
  - By ASCII string
    - **iwconfig <interface> enc s:1234abcde**
  - By key value
    - **iwconfig eth1 enc 7365676166**

# WiFi - WPA Supplicant

- For networks with WPA-EAP security
- Key management CCMP, TKIP, WEP, RADIUS

```
wpa_supplicant -D <driver>  
                -i <interface>  
                -c wpa_supplicant.conf
```

- Supported drivers :  
hostap, hermes, madwifi, atmel, wext,  
ndiswrapper, broadcom, ipw, wired, ndis

# WiFi - WPA Supplicant

- Configuration with no encryption

```
network={  
    ssid="WITHOUTENCRYPTION"  
    scan_ssid=1  
    priority=5  
    key_mgmt=NONE }
```

- WEP encryption

```
wep_key0=<key>  
wep_tx_keyidx=0
```

# Basic configuration of Cisco Aironet

- SSID creation

```
(config)#dot11 ssid <nazev>
```

```
(config-ssid)#authentication open
```

```
(config-ssid)#guest-mode
```

(otherwise the ssid is hidden)

- Wireless interface configuration

```
(config)#interface dot11radio 0
```

```
(config-if)#ssid <name>
```

```
(config-if)#channel {n|least-congested}
```

```
(config-if)#no shutdown
```



# State outputs

- To see associated clients  
**#show dot11 associations [all-client]**
- Workload of the channels  
**#dot11 dot11radio 0 carrier busy**
- Amount of data transferred from clients  
**#show dot11 statistics client-traffic**

# Authentication and encryption

- Open – without authentication
  - **(config)#dot11 ssid <name>**
  - **(config-ssid)#authentication open**
- Shared – typically with WEP key
  - **(config)#dot11 ssid <name>**
  - **(config-ssid)#authentication shared**
- As part of WPA
  - **(config)#dot11 ssid <name>**
  - **(config-ssid)#authentication key-management wpa**
  - **wpa-psk ascii <password>**

# WEP - do NOT use outside lab

- WEP key encryption
  - **(config)#interface dot11radio 0**
  - **(config-if)#encryption mode cipher wep40 |wep128**
  - **(config-if)#encryption key 1 size 40bit <password=10 hex numbers>**
- Authentication with WEP key
  - **(config)#dot11 ssid <name>**
  - **(config-ssid)#no authentication open**
  - **(config-ssid)#authentication shared**

# WPA

- WPA encryption
  - **(config)#interface dot11radio 0**
  - **(config-if)#encryption mode cipher tkip**
  - **(config)#dot11 ssid <name>**
  - **(config-ssid)#authentication open**
  - **(config-ssid)#authentication key-management wpa**
  - **(config-if)#wpa-psk ascii <password>**
- Attention: Delete WEP configuration commands first
  - **(config-if)#no encryption key 1**
  - **(config-if)#no encryption mode**
  - **(config-ssid)#no authentication shared**