Minggu 3
Wireless Network

Objective

- Overview Wireless
- Organisasi Wireless LAN
- Standarisasi Wireless
- Aplikasi Wireless LAN
- Peralatan Wireless
- Mode Konfigurasi
- Antenna
- Wireless Accessories

Overwiew Wireless

- Berasal dari kalangan militer USA
- Harga hardware semakin turun kwalitas semakin naik
- Menawarkan beberapa keuntungan : hemat waktu, fleksibel untuk pindah tempat
- Menggunakan Teknologi Spread Spectrum

Organisasi Wireless LAN

- FCC (Federal Communications Commission)
- IEEE (Institute of Electrical and Electronics Engineers)

FCC

- Federal Communications Commission
- Independent United States government agency, directly responsible to Congress
- Established 1934
- Charge regulation interstate and international
- Area covers are 50 states, District of Columbia, all US possessions such as Puerto Rico, Guam and The Virgin Islands
- Regulate radio frequency spectrum and power
- Specified ISM band and UNII band

IEEE

- Institute of Electrical and Electronics Engineers
- Create standard for most things related information technology but still within the laws created by FCC
- Specifies many technology standard : Public Key Cryptography (IEEE 1363), Fire Wire (IEEE 1394), Ethernet (IEEE 802.3) and wireless Lan (IEEE 802.11)
- Create 4 standards for Wireless Lan operation :
  - ✓ 802.11
  - ✓ 802.11 b
  - ✓ 802.11 a
  - ✓ 802.11 g

Standarisasi Wireless

- IEEE 802.11
  - Kecepatan 1 dan 2 Mbps
  - Frekwensi 2.4 GHz
- IEEE 802.11b
  - Kecepatan 1, 2, 5.5 dan 11 Mbps
  - Frekwensi 2.4 GHz
- IEEE 802.11a
  - Kecepatan 6,9,12,18,24,36,48,54 Mbps
  - Frekwensi 5 GHz
- IEEE 80211g
  - Kecepatan max 54 Mbps
  - Frekwensi 2.4 GHz

Aplikasi Wireless

- Access Role
- Network Ekstention
- Building to building Connectivity
- Last Mile Data Delivery
- Mobility
- Small Office Home Office
- Mobile Office

Peralatan Wireless

- Wireless Client Devices
- Access Point
- Antenna

Wireless Client Devices

PCMCIA Card

Ethernet and Serial Converter

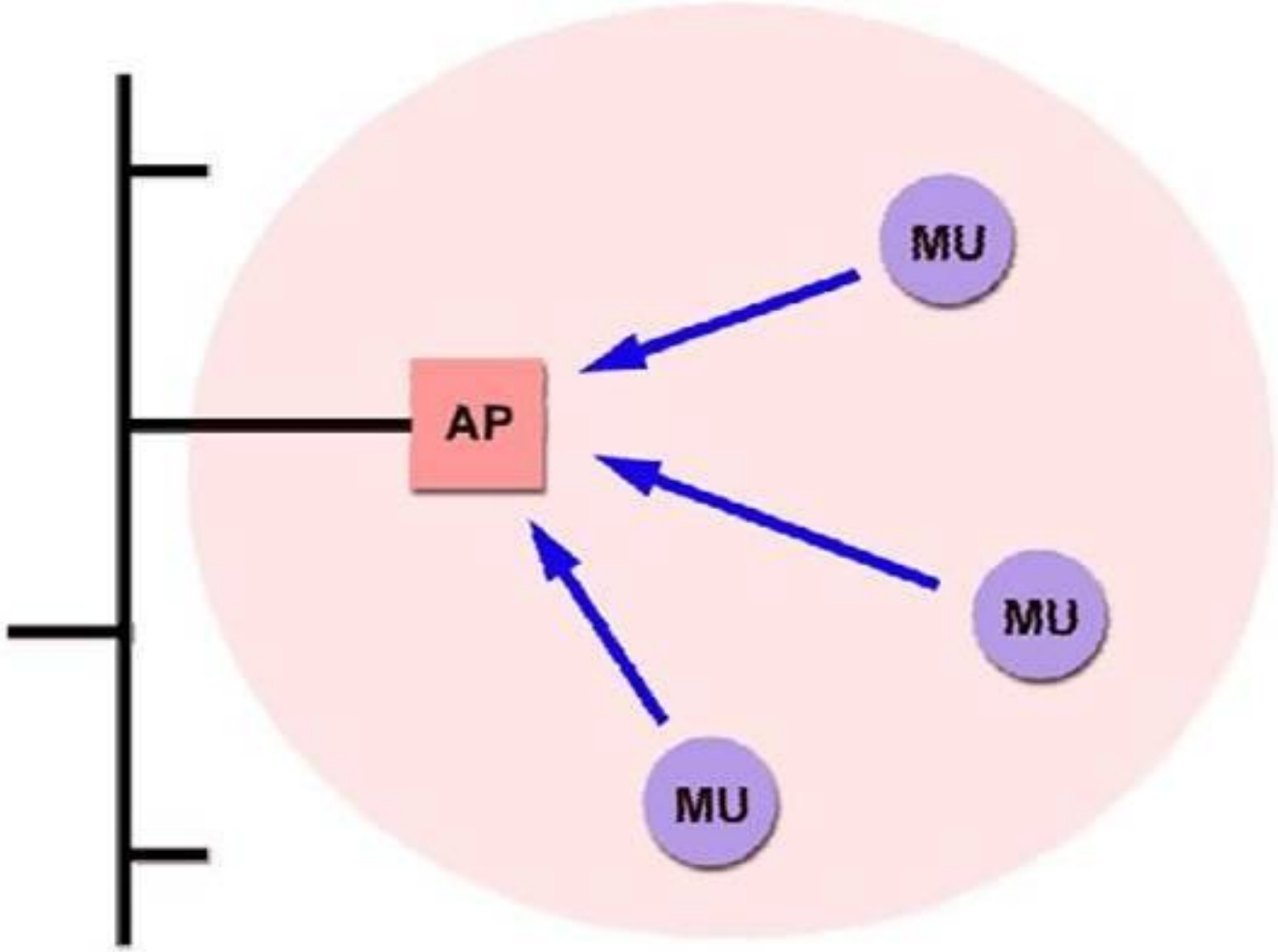
Wireless Client Devices

Access Point

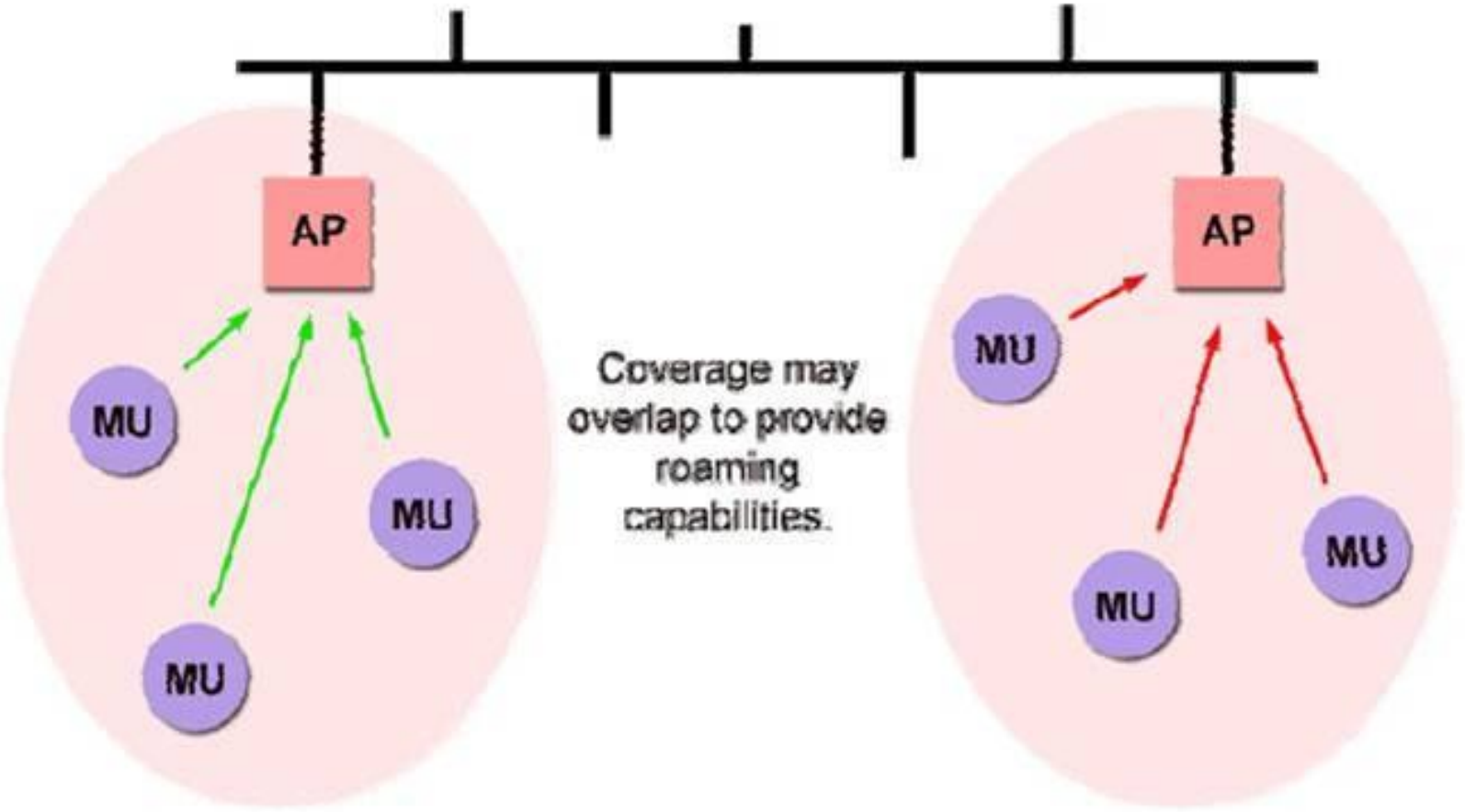
3 Konfigurasi Wireless LAN

1. Basis Service Set (BSS)
2. Extended Service Set (ESS)
3. Independent Basic Service Set (IBSS)

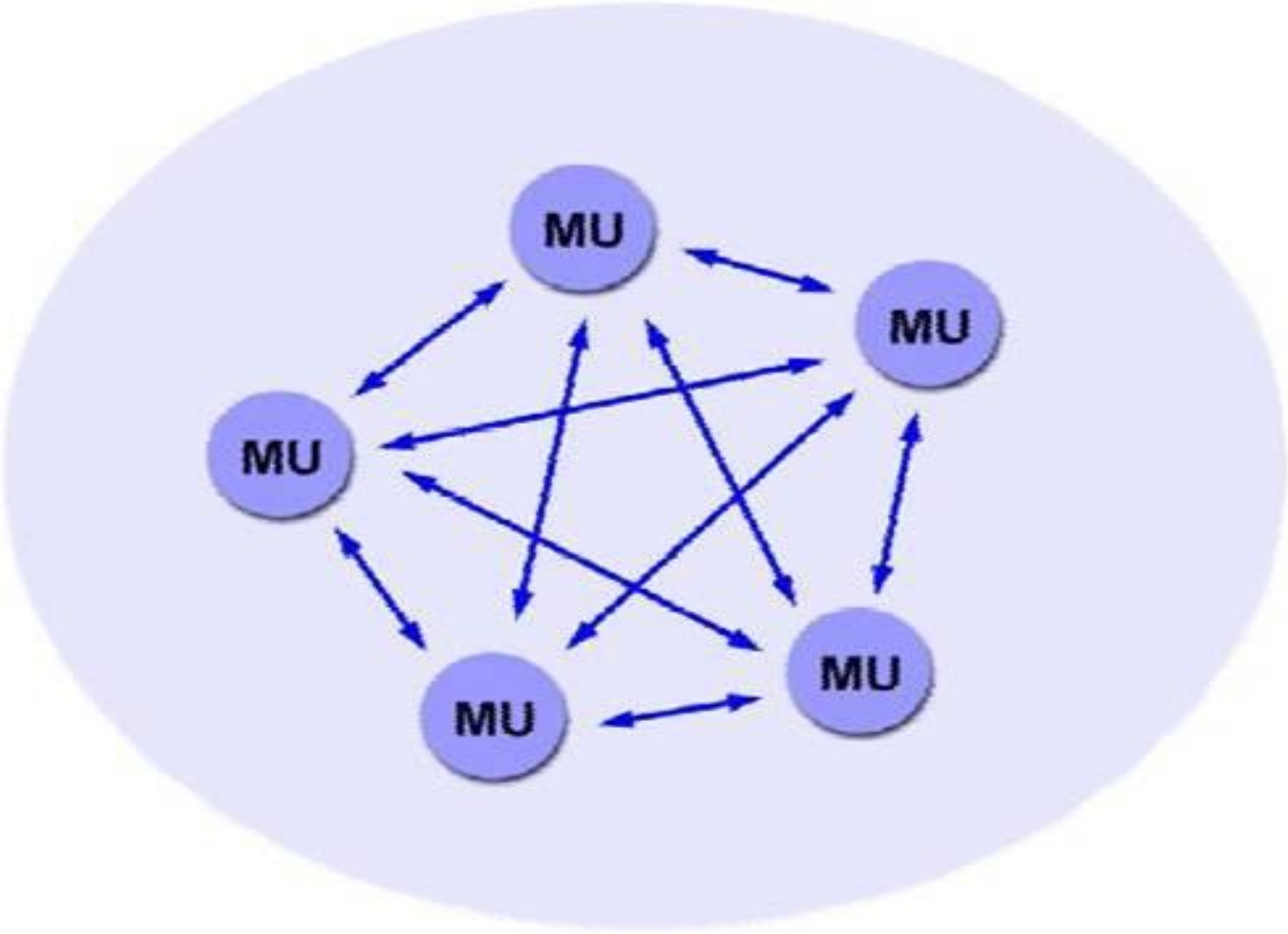
Basic Service Set



Extended Service Set



Independent Basic Service Set



Antenna

- Digunakan untuk mengkonversi signal high frekwensi (RF) dalam transmisinya sebagai gelombang di udara
- 3 Jenis antena RF
  - Omni-directional
  - Semi-directional
  - Highly-directional

Omni-directional (Dipole) Antennas

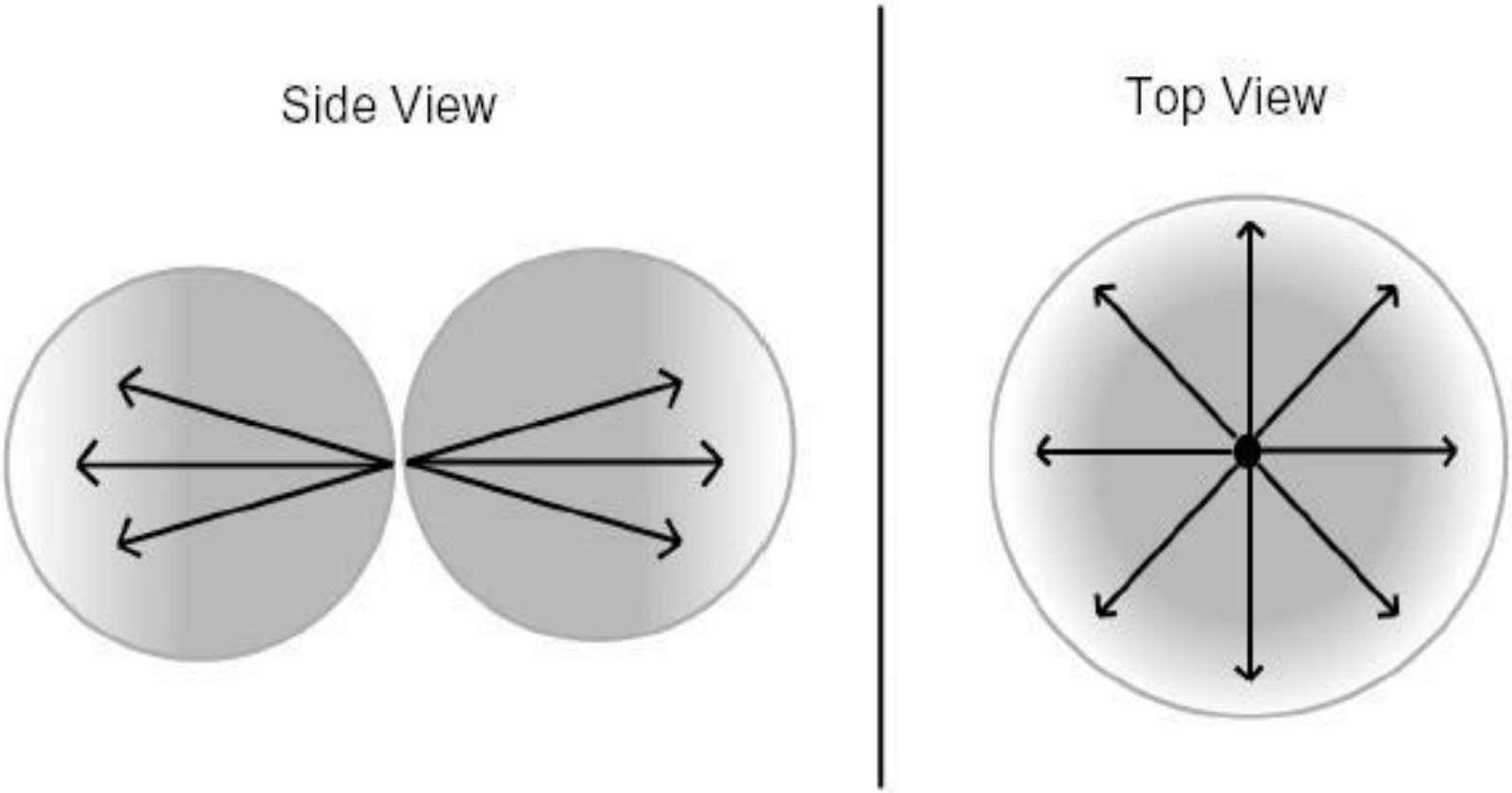
- Antena yang paling banyak digunakan oleh wireless
- Disebut dipole karena meradiasikan energiny ke semua arah

Omni Ceiling Mount Antenna

Omni Ground Plane Antenna

Omni Pillar Mount Antenna

Omni-directional Antenna Radiation Pattern

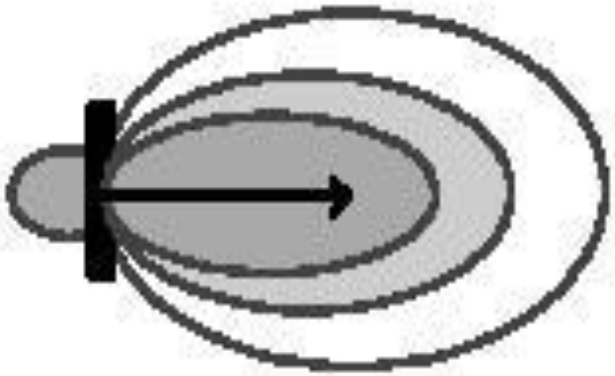


Semi-directional Antennas

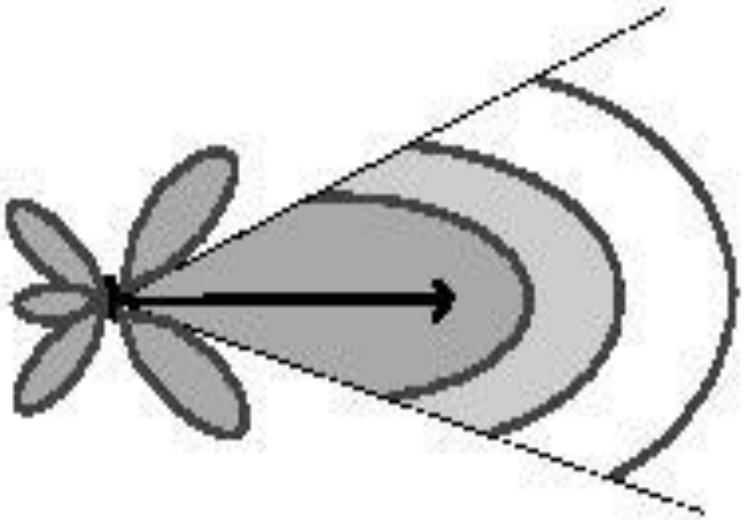
- Beberapa diantaranya adalah Patch, Pane dan Yagi
- Semua antena pada umumnya flat dan dirancang ditempatkan di tembok
- Radiasinya dalam bentuk hemispherical

Semi-directional Antenna Radiation Pattern

Directional Patch Antenna



Directional Yagi Antenna



Highly-directional Antennas

- Memancarkan dalam arah (beam) yang paling sempit diantara tipe yang lain
- Menghasilkan gain paling tinggi
- Sangat ideal bagi situasi jarak jauh
- Beberapa model yang direferensikan adalah parabolic dishes
- Model yang lain adalah grid antenna untuk mengurasi kekuatan angin
- Untuk point-to-point bisa mencapai jarak 42km

Highly-directional Dish Antennas

Highly-directional Grid Antennas

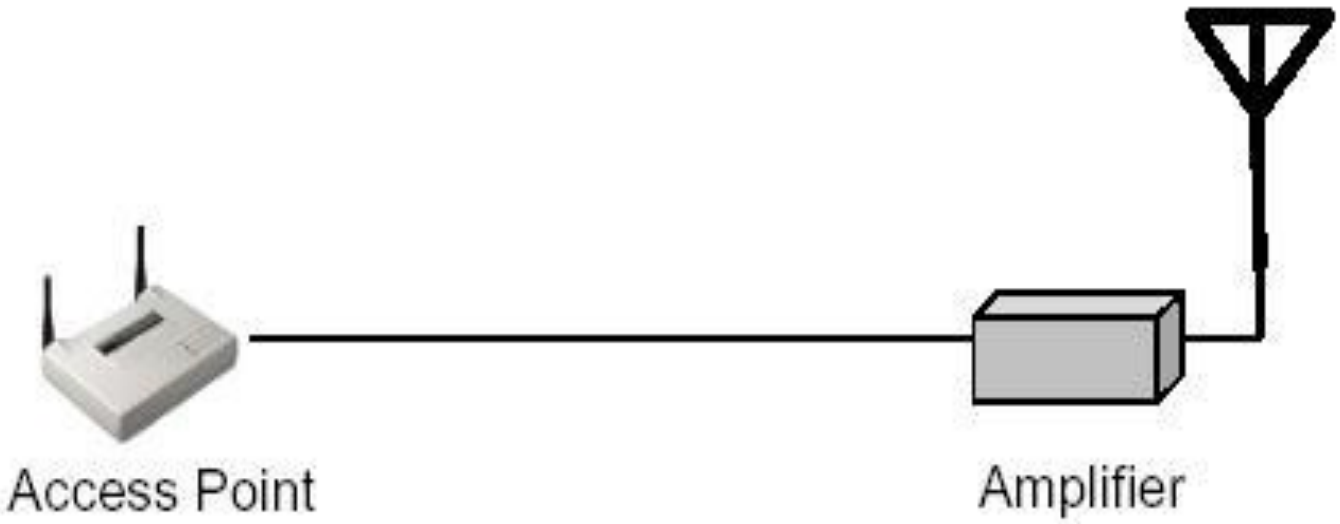
Highly-directional Dish Antenna Radiation Pattern

Wireless LAN Accessories

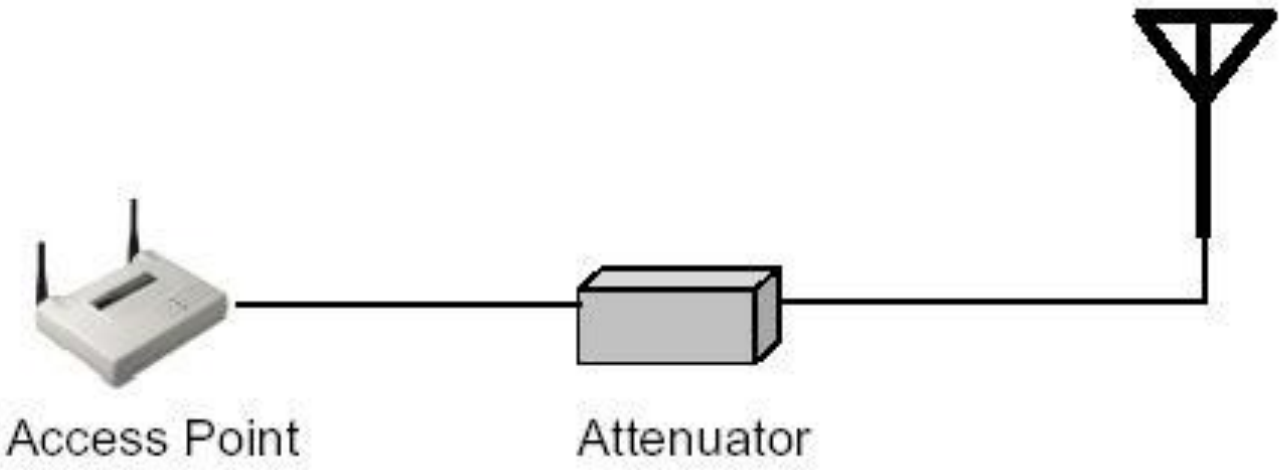
- RF Amplifiers
- RF Attenuators
- Lightning Arrestors
- RF Connectors
- RF Cables
- RF Splitters

RF Amplifiers

Using RF Amplifiers

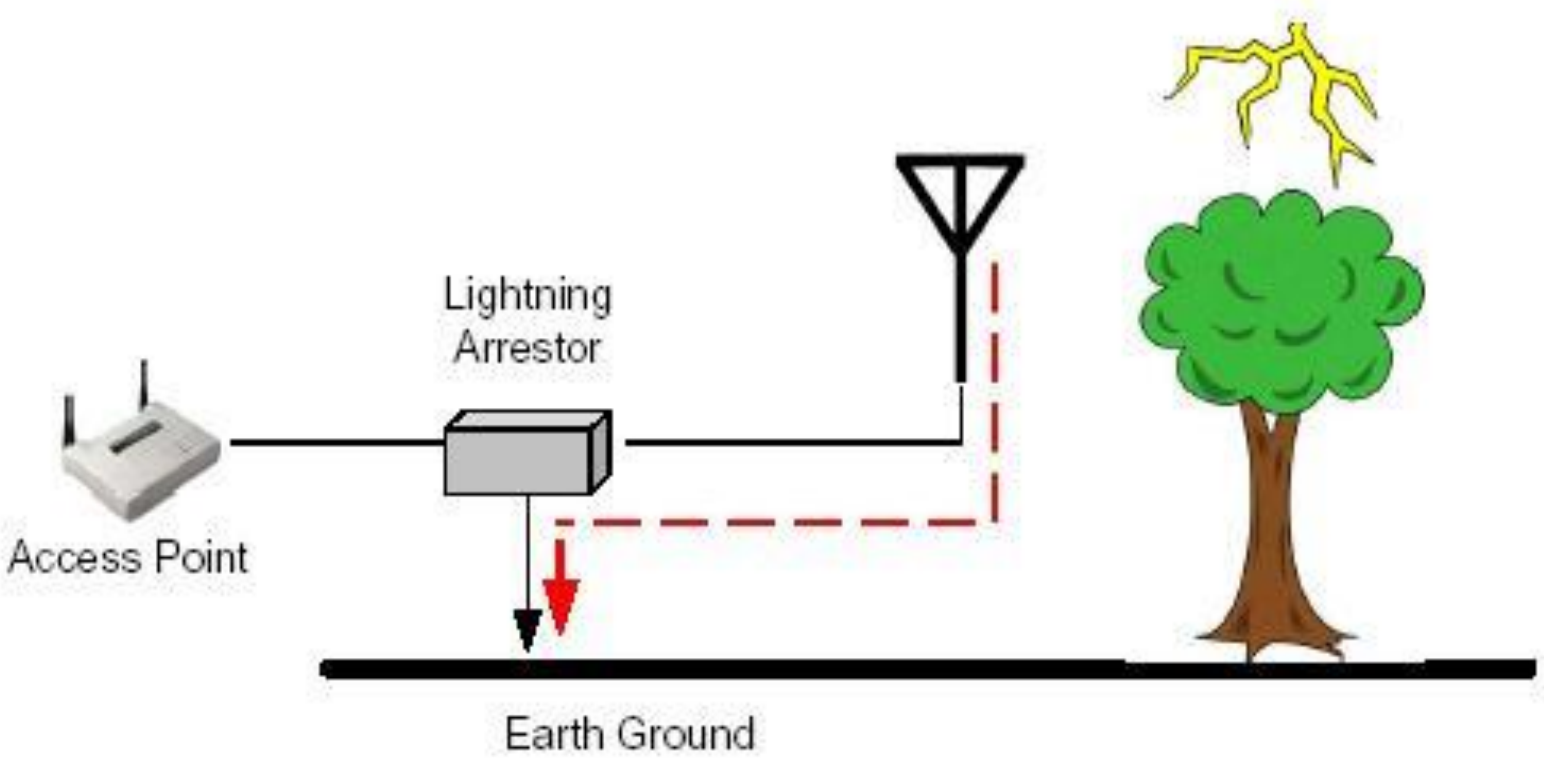


Using RF Attenuators



Lightning Arrestors

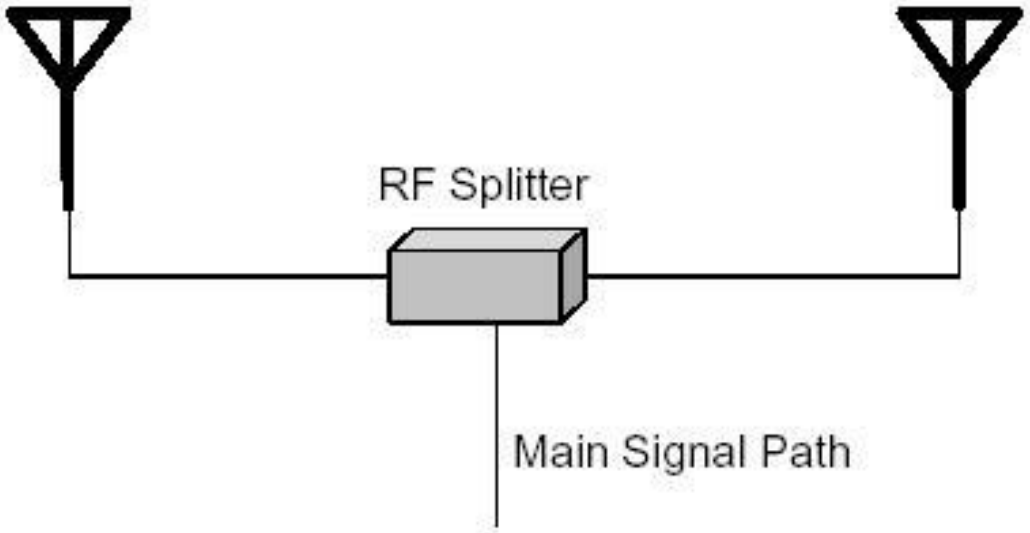
Using Lightning Arrestors



RF Splitters

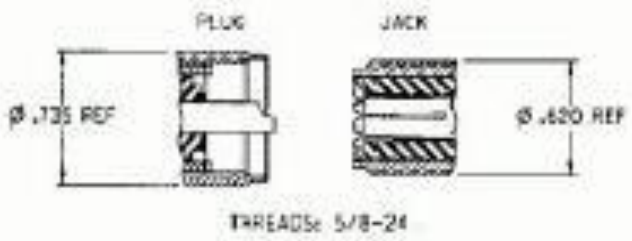
Mounted on a Pole

Using RF Splitters

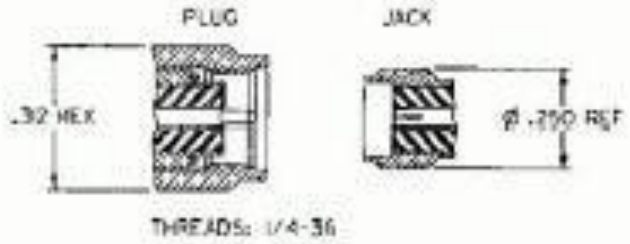


Common RF Connectors

The *N* Connector



The *SMA* Connector

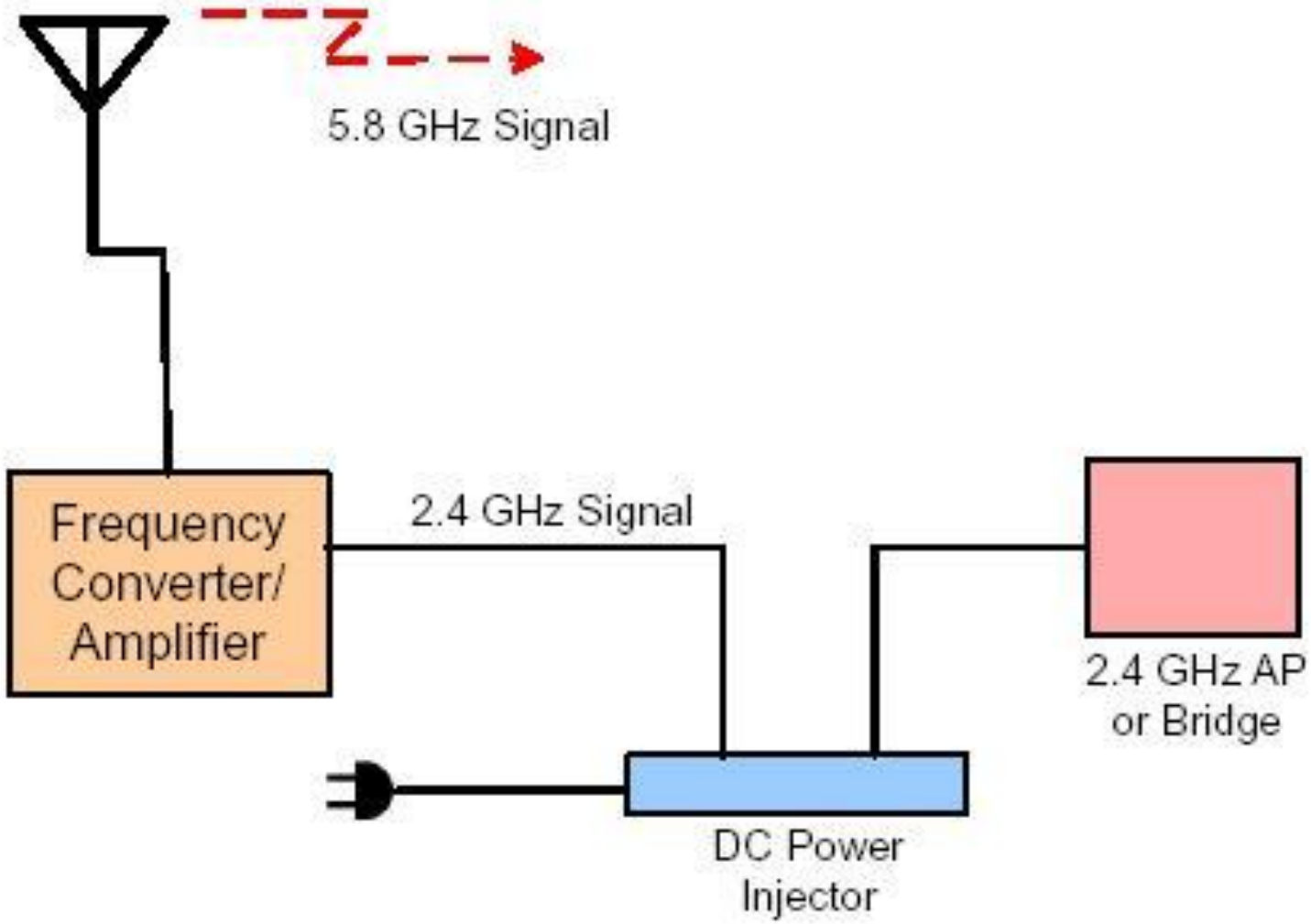


RF “Pigtail” Adapter Cable

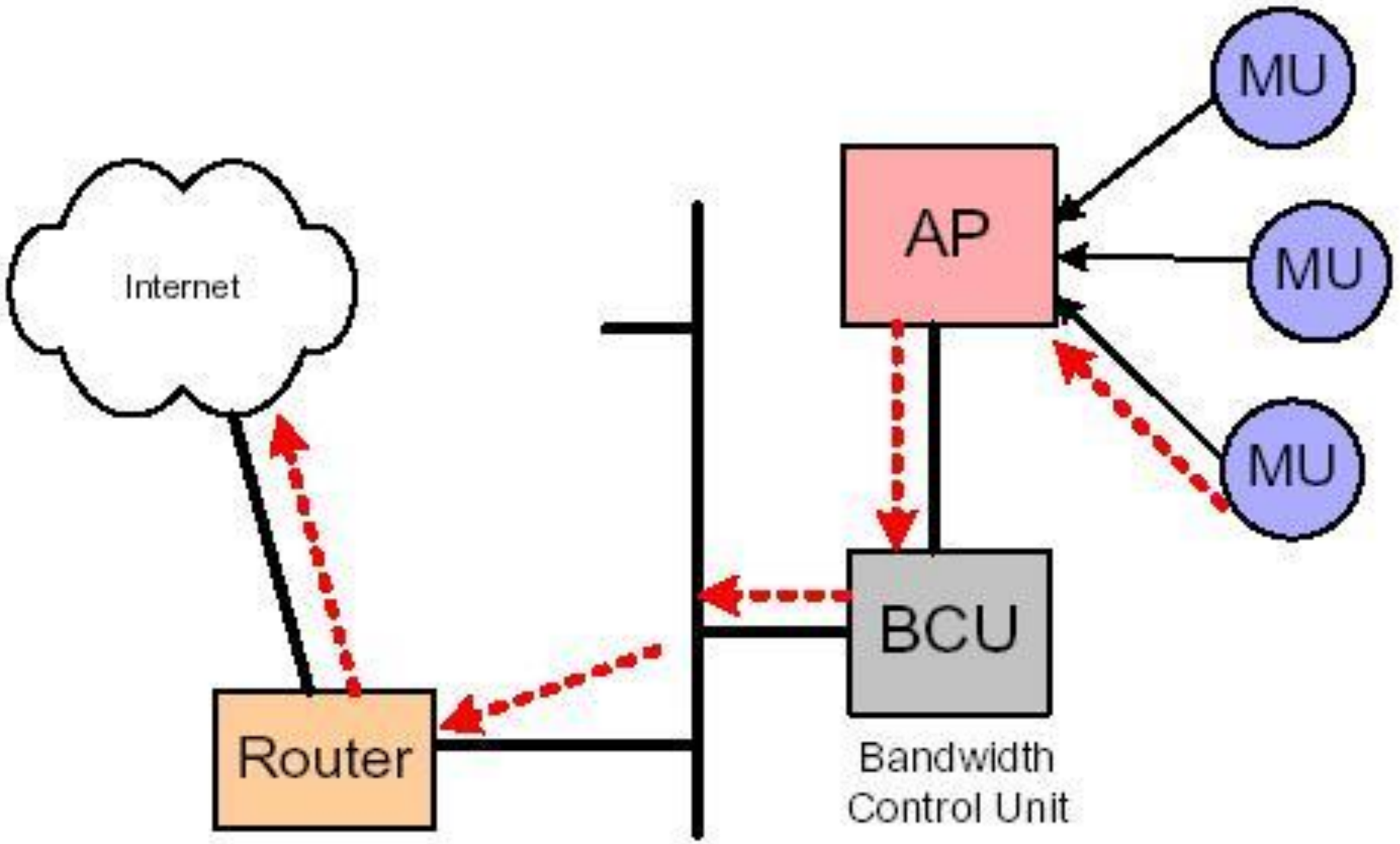
- Frequency converter digunakan untuk mengkonversi satu frekwensi ke frekwensi yang lain dengan tujuan menghilangkan sebuah frekwensi agar tidak menggangu frekwensi lain

Frequency Converter

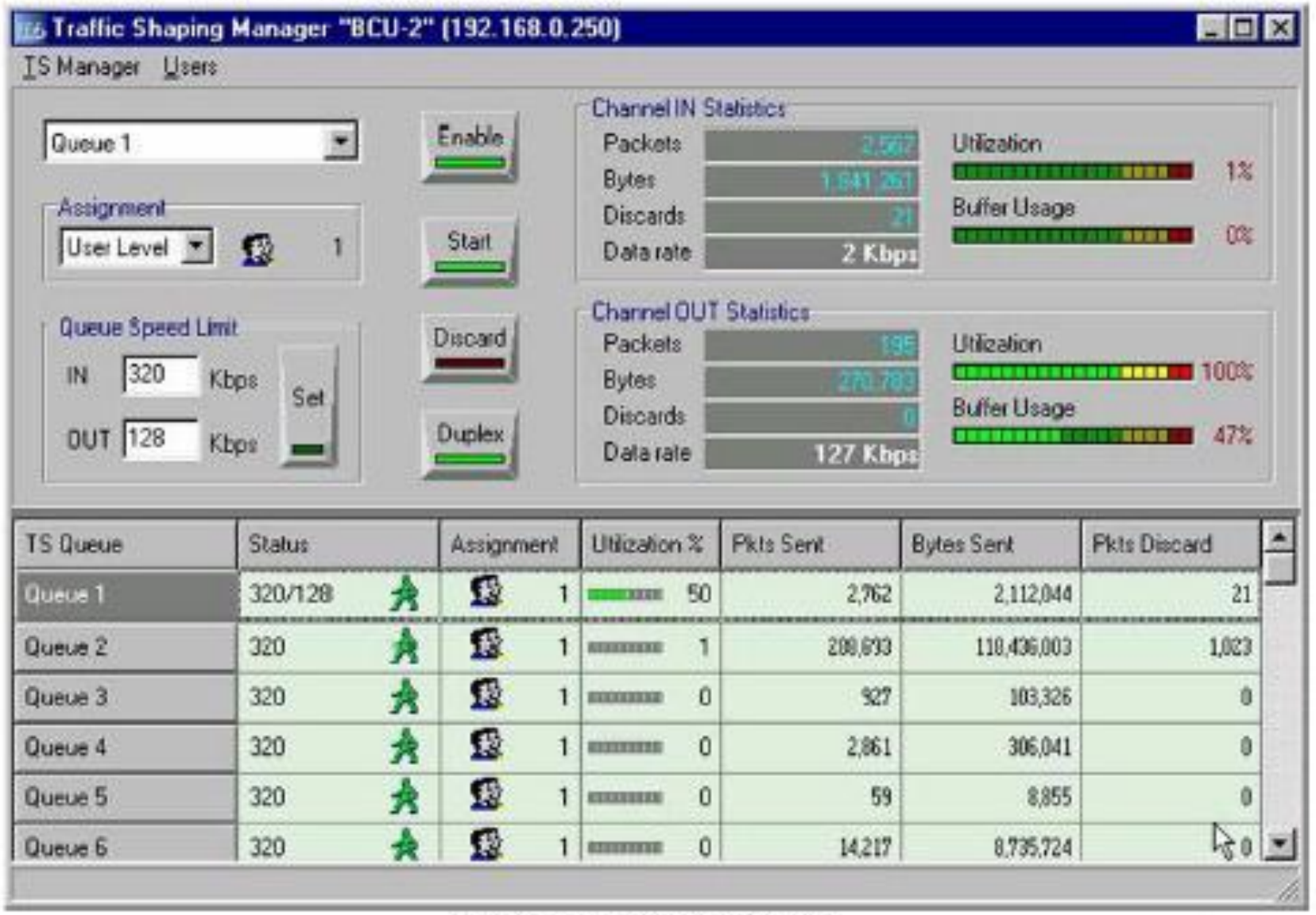
Using Frequency Converters



Bandwidth Control Unit



BCU Manager



Test Kit

- It’s used for testing cables and connectors

Kesimpulan

- Kita telah mempelajari :
  - Sejarah Wireless
  - Standarisasi Wireless
  - Aplikasi Wireless LAN
  - Peralatan Wireless
  - Mode Konfigurasi
  - Antenna
  - Wireless Accessories

Latihan Soal

1. Sebutkan sifat RF (Radio Frekwensi) !
2. Sebutkan 2 teknologi spread spectrum yang digunakan oleh wireless !
3. Sebutkan jenis antena berdasarkan bentuk pancaran !
4. Sebutkan cara mengamankan koneksi wireless !
5. Sebutkan beberapa tindak kejahatan yang ada di dunia wireless !