

# **Desain dan Implementasi Jaringan Berbasis GNU/Linux**

**Seminar Debat Sistem Operasi, Nawa Mitra  
Jogjakarta**

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# Siapa saya?

- ◆ Rimbainux Developer/Packager/Contributor (2001-2003)
- ◆ System and Network Administrator, PT Matra Lintasnet (2001-2002)
- ◆ “Intrusion Reporting System on GNU/Linux Server via Radio Wave” Developer (2002-2003)
- ◆ Diskless Network Consultant (2002-2003)
- ◆ Technical Support, Gamatechno Indonesia (2004-now)

# Overview

- ◆ Desain Jaringan Secara Umum
- ◆ Jaringan Kabel
- ◆ Jaringan Nirkabel
- ◆ Perbandingan Teknologi Wireless
- ◆ Implementasi Jaringan Berbasis GNU/Linux
- ◆ Studi Kasus 1
- ◆ Studi Kasus 2
- ◆ Jaringan Diskless
- ◆ Kesimpulan

# Desain Jaringan Secara Umum

- ◆ Medium Transmisi, kabel atau nirkabel?
- ◆ Bandwith, berapa bandwith yang dapat diberikan?
- ◆ Topologi Jaringan, bus? star? mesh?
- ◆ Protokol, TCP/IP?
- ◆ Perangkat keras, PC? Server? Hub? Switch?
- ◆ Software, GNU/Linux? others?
- ◆ Services, www? ftp? mail?
- ◆ Scalability, seberapa besar jaringan?
- ◆ Expandability
- ◆ Manageability and monitoring, SNMP? remote-access?
- ◆ Keamanan, physical? logical?

# Jaringan Kabel













- ◆ UTP - LAN: Cat 5/5E/6, Fiber optic
- ◆ Bandwith 10/100/1000 Mbps
- ◆ Jangkauan 100 meter
- ◆ Ketersediaan perangkat: ethernet, fast-ethernet, Gigabit ethernet
- ◆ Full-duplex
- ◆ Hub atau switch?
- ◆ Collision domain: switch
- ◆ Broadcast domain: router

# Jaringan Nirkabel

- ◆ Media Udara
- ◆ Bandwith 11/54 Mbps
- ◆ Jangkauan 30-3000 meter, kebutuhan antena
- ◆ Ketersediaan perangkat: Access-point, WLAN card (PCMCIA, USB), standar
- ◆ Half-duplex

# Why Choose? A vs B vs G

## Wireless Technology Comparison Chart

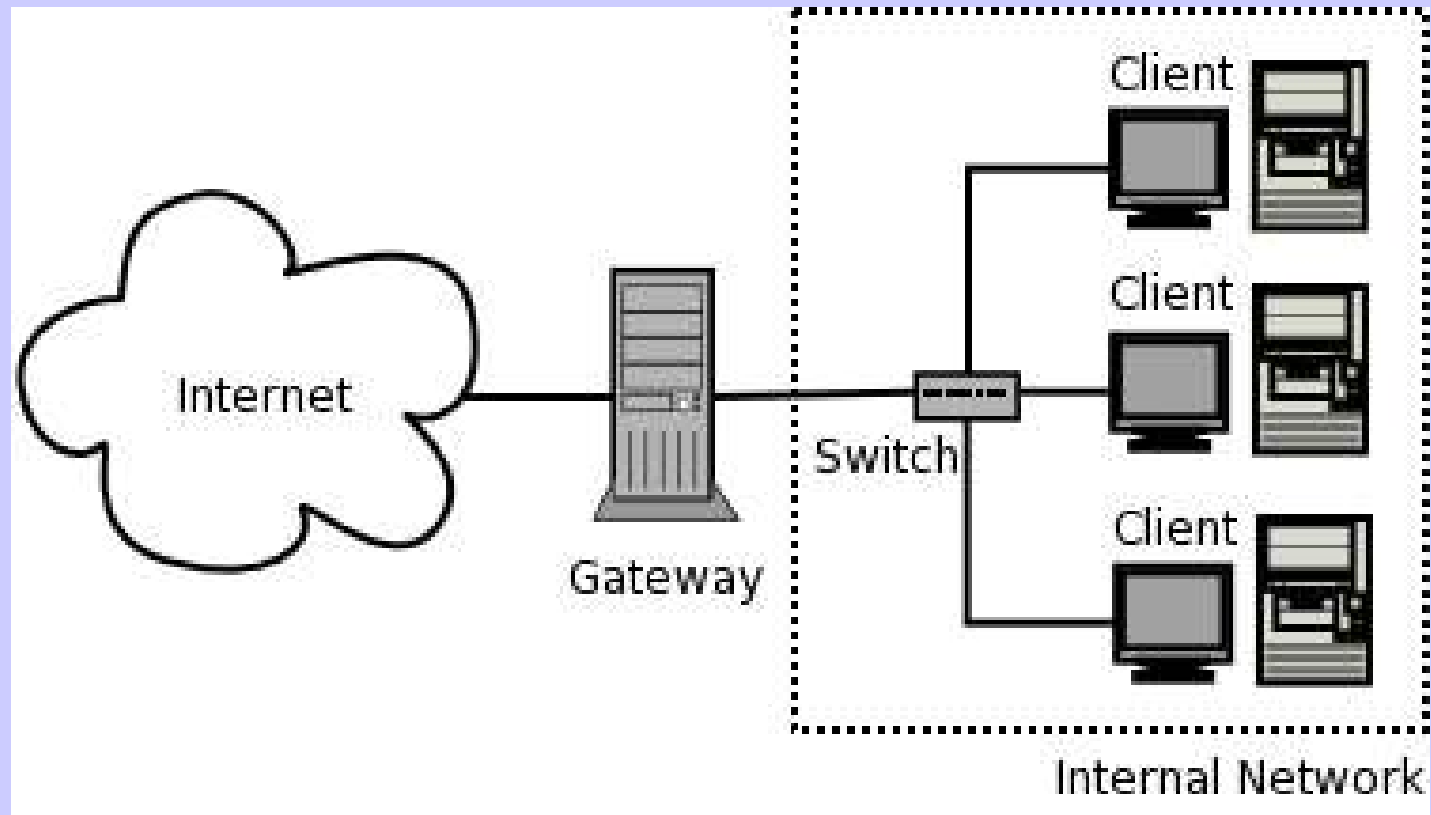
| Wireless Standard | 802.11b   | 802.11a   | 802.11g  |
|-------------------|---|---|--|
| Popularity        |  Widely adopted. Readily available everywhere.   |  New technology.   |  New technology with rapid growth expected.   |
| Speed             | <b>11 Mbps</b><br>Up to 11Mbps (note: cable modem service typically averages no more than 4 to 5Mbps).  | <b>54 Mbps</b><br>Up to 54Mbps (5X greater than 802.11b).   | <b>54 Mbps</b><br>Up to 54Mbps (5X greater than 802.11b).  |
| Relative Cost     |  Inexpensive.  |  Relatively more expensive.  |  Relatively inexpensive.  |
| Frequency         | <b>2.4 GHz</b><br>More crowded 2.4GHz band. Some conflict may occur with other 2.4GHz devices like cordless phones, microwave ovens, etc.   | <b>5 GHz</b><br>Uncrowded 5GHz band can coexist with 2.4 GHz networks without interference.   | <b>2.4 GHz</b><br>More crowded 2.4GHz band. Some conflict may occur with other 2.4GHz devices like cordless phones, microwave ovens, etc.  |
| Range             |  <b>100-150</b><br>Good Range. Typically up to 100-150 feet indoors, depending on construction, building materials, room layout.                                |  <b>25-75</b><br>Shorter range than 802.11b & 802.11g. Typically 25 to 75 feet indoors. |  <b>100-150</b><br>Good Range. Typically up to 100-150 feet indoors, depending on construction, building materials, room layout.         |
| Public Access     |  The number of public "hotspots" is growing rapidly, allowing wireless connectivity in many airports, hotels, college campuses, public areas, and restaurants. |  None at this time.  |  Compatible with current 802.11b hotspots (at 11Mbps). Also, it is expected that most 802.11b hotspots will quickly convert to 802.11g. |
| Compatibility     | <b>OK</b><br>802.11b<br>Widest adoption.  | <b>OK</b><br>802.11a<br>Incompatible with 802.11b or 802.11g.   | <b>OK</b><br>802.11b<br>802.11g<br>Interoperates with 802.11b networks (at 11Mbps). Incompatible with 802.11a.   |

# Implementasi Jaringan GNU/Linux

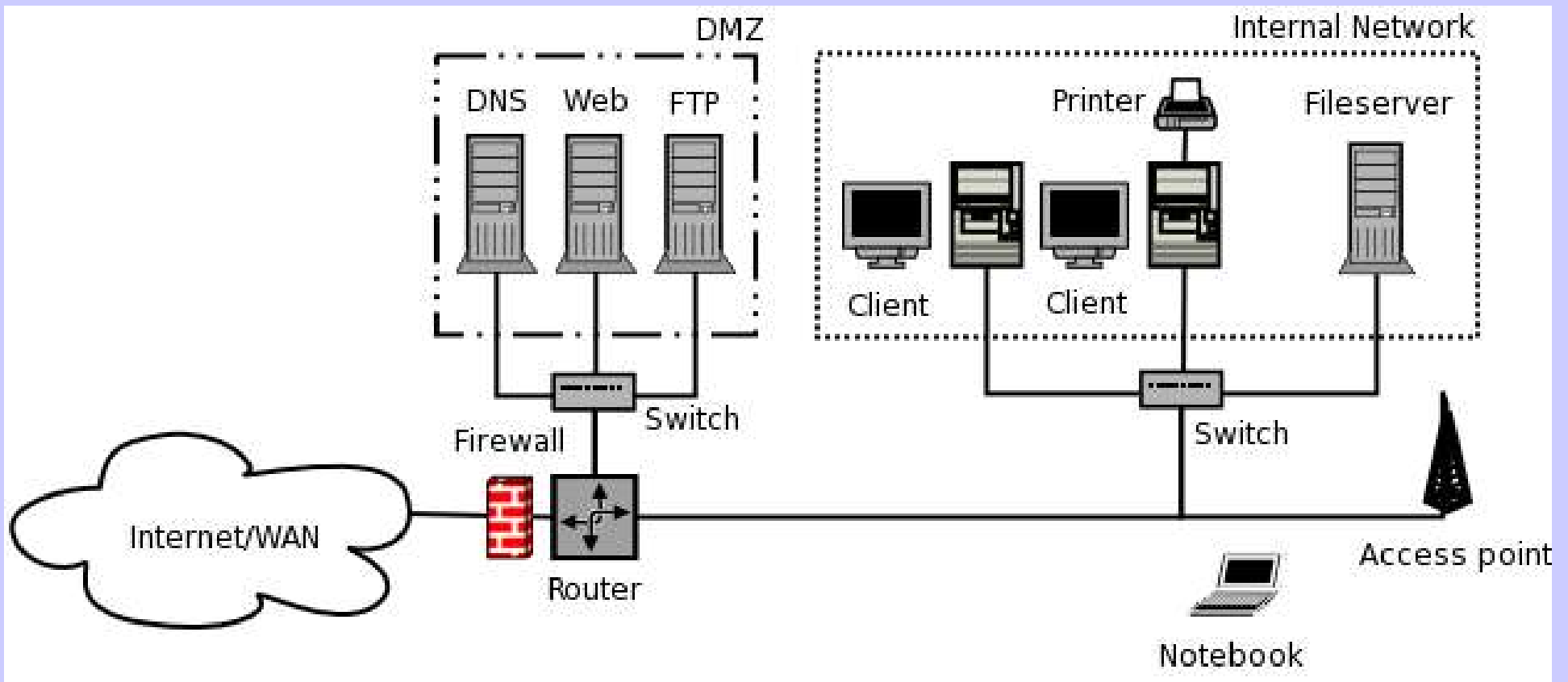
- ◆ Internet is UNIXes
- ◆ GNU/Linux sebagai “UNIX clone”
- ◆ The Power of GNU/Linux
- ◆ Aplikasi, fitur dan dukungan yang tersedia:
  - ✓ Web server: apache
  - ✓ DNS server: BIND, djbdns
  - ✓ FTP server: wu-ftp, proftpd, vsftpd
  - ✓ Firewall dan packet-filtering: ipchains, iptables
  - ✓ Proxy: squid, wwwoffle
  - ✓ VPN: FreeSwan
  - ✓ Dll



# Studi Kasus 1



# Studi Kasus 2



# Jaringan Diskless

- ◆ Kebutuhan solusi murah
- ◆ Penggunaan perangkat tua/bekas
- ◆ Optimasi jaringan
- ◆ Kemudahan administrasi dan pemeliharaan
- ◆ Langkah-langkah:
  - Boot dari jaringan
  - Mendapatkan alamat IP
  - Download kernel image
  - Load dan jalankan kernel
  - Mount filesystem via NFS
  - Shell atau Window/Dekstop Manager
  - Menjalankan Aplikasi

# Summary

- ◆ Desain Jaringan adalah penting
- ◆ Mengapa tidak memilih GNU/Linux sebagai platform Anda?