

Desain dan Implementasi Jaringan Berbasis GNU/Linux

**Seminar Debat Sistem Operasi, Nawa Mitra
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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

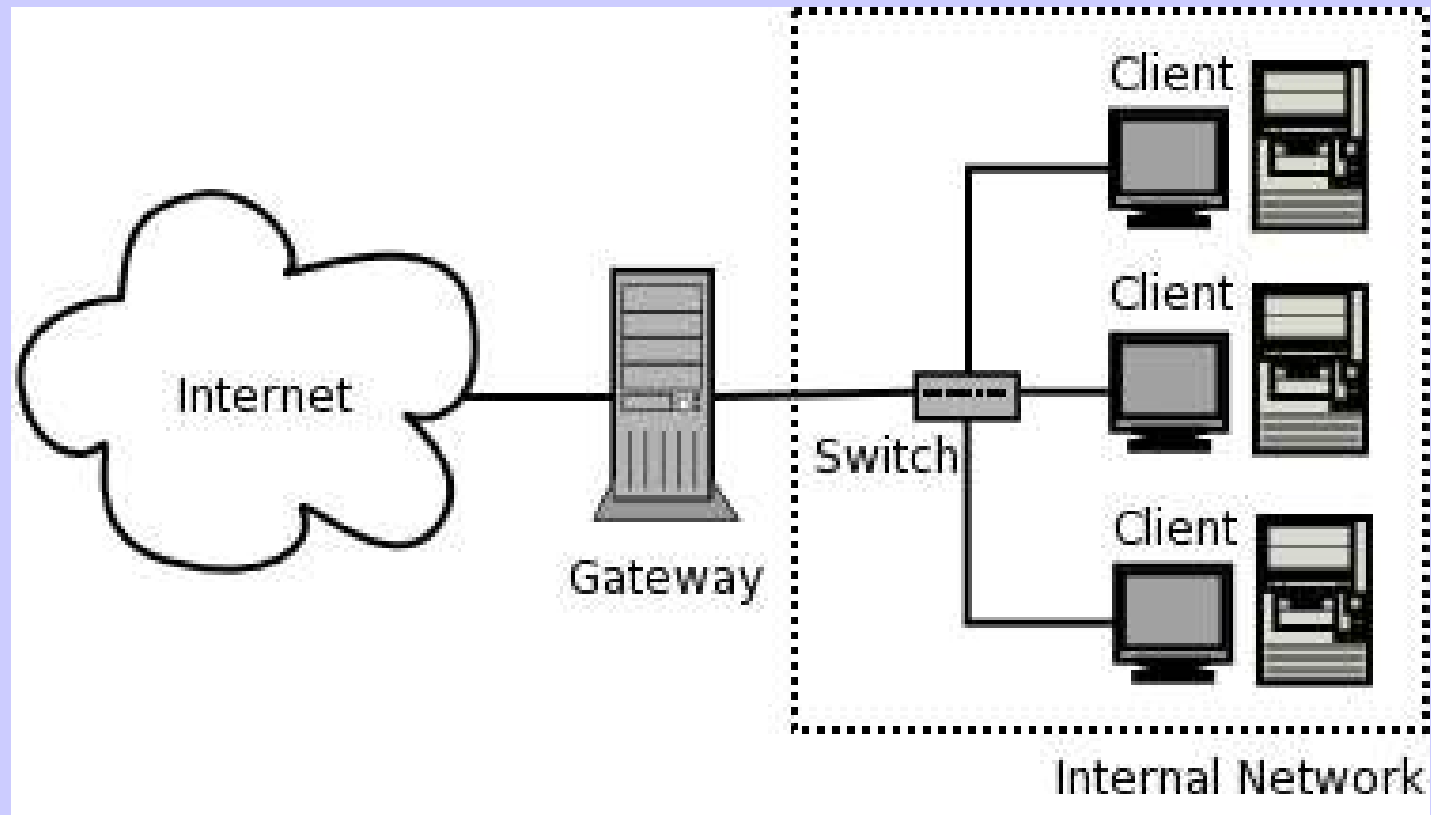
Wireless Technology Comparison Chart

Wireless Standard	802.11b		802.11a		802.11g	
Popularity		Widely adopted. Readily available everywhere.		New technology.		New technology with rapid growth expected.
Speed	11 Mbps	Up to 11Mbps (note: cable modem service typically averages no more than 4 to 5Mbps).	54 Mbps	Up to 54Mbps (5X greater than 802.11b).	54 Mbps	Up to 54Mbps (5X greater than 802.11b).
Relative Cost		Inexpensive.		Relatively more expensive.		Relatively inexpensive.
Frequency	2.4 GHz	More crowded 2.4GHz band. Some conflict may occur with other 2.4GHz devices like cordless phones, microwave ovens, etc.	5 GHz	Uncrowded 5GHz band can coexist with 2.4 GHz networks without interference.	2.4 GHz	More crowded 2.4GHz band. Some conflict may occur with other 2.4GHz devices like cordless phones, microwave ovens, etc.
Range	 100-150	Good Range. Typically up to 100-150 feet indoors, depending on construction, building materials, room layout.	 25-75	Shorter range than 802.11b & 802.11g. Typically 25 to 75 feet indoors.	 100-150	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	OK 802.11b	Widest adoption.	OK 802.11a	Incompatible with 802.11b or 802.11g.	OK 802.11b 802.11g	Interoperates with 802.11b networks (at 11Mbps). Incompatible with 802.11a.

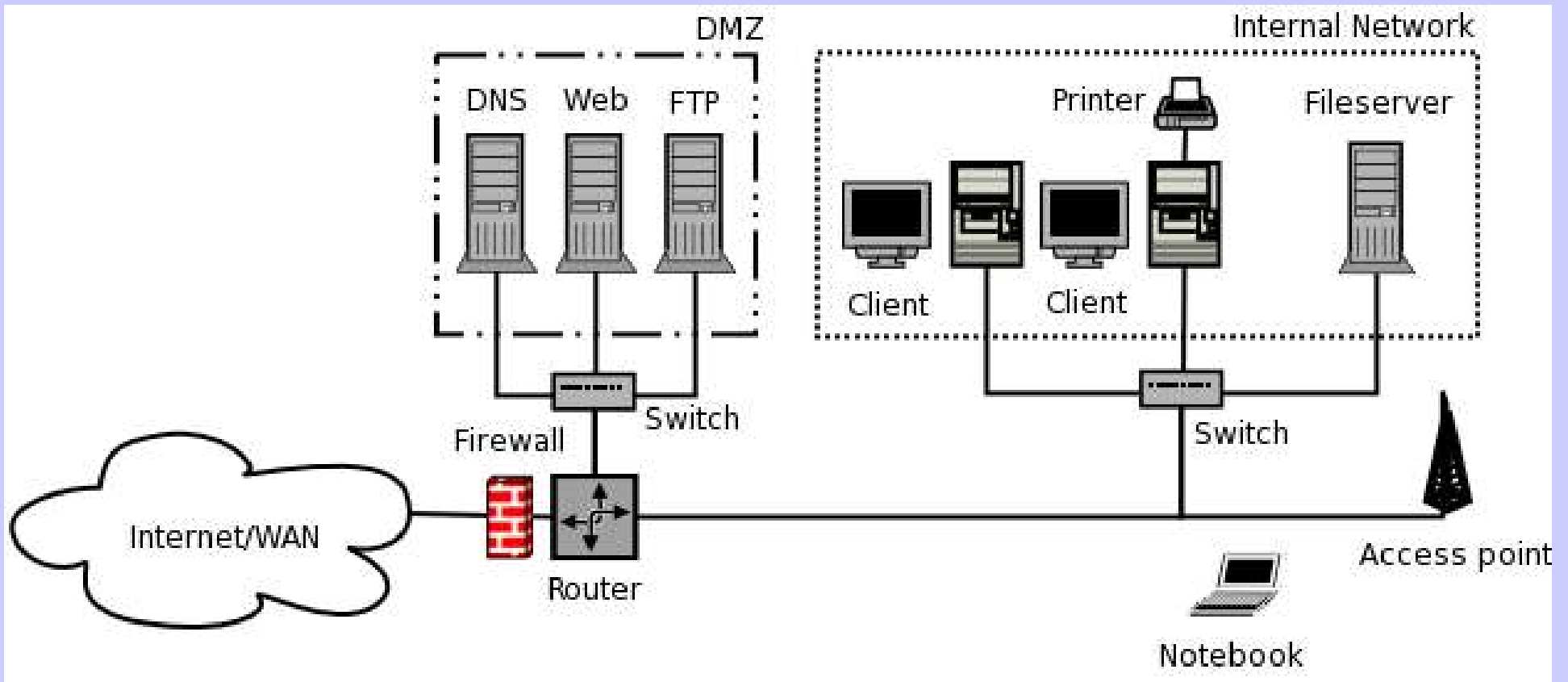
Implementasi Jaringan GNU/Linux

- ◆ 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?