

BAB V

PENUTUP

5.1 Kesimpulan

1. Penggunaan link Wireless LAN PT. Mulia Industrindo yang menghubungkan an PT. Mulia industrindo Cikarang dengan Ware House Jababeka masih belum optimal dilihat dari hasil trafik pemakaian host yang seharusnya link WLAN tersebut masih dapat digunakan host yang jauh lebih banyak dari sekarang ini yaitu pada saluran 1 Mbps yang semula 2 host dapat ditambah 203 host, pada saluran 2 Mbps menjadi 403 host, pada saluran 5,5 Mbps menjadi 630 host dan pada saluran 11 Mbps menjadi 1606 host.
2. Pada sistem setelah dianalisis dapat dirata- ratakan daya pemancar yaitu -12,55 dBm maka daya pemancar yang dibutuhkan untuk setiap saluran cukup 1 mw saja atau 0 dBm dan inipun sudah sangat baik.

5.2 Saran - Saran

1. Untuk pengoptimalan *Link Wire Less Lokal Area Network* maka di Wre House Jababeka dapat ditambah *Host*.
2. Dilihat dari kapasitas yang masih cukup banyak bisa dipergunkan untuk komunikasi suara.

3. Untuk pengoptimalan sistem sebaiknya dilakukan perencanaan yang matang dalam pembuatan *link wireless* LAN, sehingga pada saat digunakan sistem bekerja dengan baik.



DAFTAR PUSTAKA

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6. www.cisco.com

LAMPIRAN 1

Spesifikasi Alat



Data Sheet

Cisco Aironet 350 Series Wireless Bridge



The Cisco Aironet[®] 350 Series Wireless Bridge enables high-speed long-range outdoor links between buildings and is ideal for installations subject to plenum rating and harsh environments. It is designed to meet the requirements of even the most challenging applications, with features including:

- High-speed (11-Mbps), high-power (100-mW) radios, delivering building-to-building links of up to 25 miles (40.2 km)
- A metal case for durability and plenum rating and an extended operating temperature rating for harsh environments
- Supports both point-to-point and point-to-multipoint configurations
- Broad range of supported antennas
- Simplified installation, improved performance, and upgradeable firmware, ensuring investment protection

Fixed Wireless Solution

Designed to connect two or more networks (typically located in different buildings), the Cisco Aironet 350 Series Wireless Bridge delivers high data rates and superior throughput for data-intensive, line-of-sight applications. The bridges connect hard-to-wire sites, noncontiguous floors, satellite offices, school or corporate campus settings, temporary networks, and warehouses. They can be configured for point-to-point or point-to-multipoint applications (see Figures 1 and 2) and allow multiple sites to share a single, high-speed connection to the Internet. For functional flexibility, the wireless bridge may also be configured as an access point.

The high-speed links between the wireless bridges deliver throughput several times faster than E1/T1 lines for a fraction of the cost—eliminating the need for expensive leased lines or difficult-to-install fiber-optic cable. Because bridges have no recurring charges, savings on leased-line services quickly pay for the initial hardware investment. Wireless bridges connect discrete sites into a single LAN, even when they

are separated by obstacles such as freeways, railroads, and bodies of water that are practically insurmountable for copper and fiber-optic cable. Combining powerful 100-mW radios, industry-leading receive sensitivity, installation tools to assist in bridge placement, delay spread capabilities, and a broad array of directional and omnidirectional antennas, Cisco provides a complete solution for a wide variety of fixed wireless applications.

Figure 1: Point-to-Point Wireless Bridge Solution



Figure 2: Point-to-Multipoint Wireless Bridge Solution



A Rugged Design

The Cisco Aironet 350 Series Wireless Bridge features an extended operating temperature range of -20° to 55° C, allowing for placement outdoors in a NEMA enclosure or in harsh indoor environments such as warehouses and factories. With a durable metal case, the Cisco Aironet 350 Series Wireless Bridge is UL 2043 certified, and designed to achieve plenum rating as defined by various municipal fire codes.

Simplified Installation and Optimized Performance

The Cisco Aironet 350 Series Wireless Bridge supports a variety of features designed to simplify installation and improve performance. Like Cisco Aironet 350 Series Access Points, Cisco Aironet 350 Series Wireless Bridges obtain their operating power over the Ethernet cable, eliminating the need to run AC power to what are often remotely located wireless devices. (See Figures 3 through 5.)

Figure 3: The Cisco Aironet 350 Wireless Bridge may obtain power from the Catalyst 3524-PWR-XL Switch

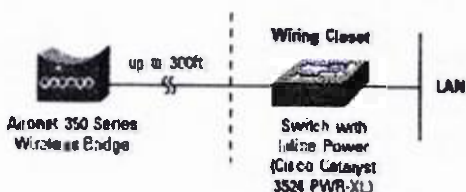


Figure 4: A Cisco Catalyst Inline Power Patch Panel may be used to power the Cisco Aironet 350 Series Wireless Bridge

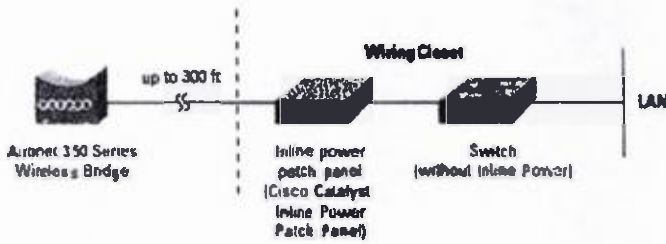
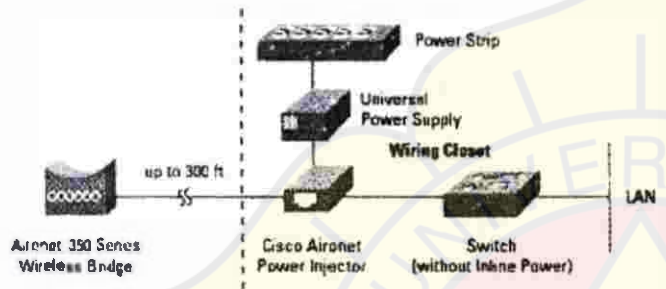


Figure 5: Cisco also offers a power injector to power the Cisco Aironet 350 Series Wireless Bridge



To provide flexibility during installation and configuration, the Cisco Aironet 350 Series Wireless Bridge may be accessed either over the LAN connection or via a console port. The frequency agility option on the Cisco Aironet 350 Series enables the bridges to select the clearest transmission channel, avoiding noise and interference. Frequency agility simplifies installation and, by intelligently avoiding interference and selecting the best transmission channel, maximizes throughput.

Investment Protection

Cisco will continue to add features, functionality, and enhancements to its bridge firmware. To protect user investment, Cisco Aironet 350 Series Wireless Bridges feature enough storage to handle future firmware upgrades.

Data Rates Supported	1, 2, 5.5, and 11 Mbps
Network Standard (in AP mode)	IEEE 802.11b
Uplink	10/100BaseT Ethernet
Frequency Band	2.4 to 2.497 GHz
Wireless Medium	Direct Sequence Spread Spectrum (DSSS)
Media Access Protocol	Carrier sense multiple access with collision avoidance (CSMA/CA)
Modulation	DBPSK @ 1 Mbps DQPSK @ 2 Mbps CCK @ 5.5 and 11 Mbps
Operating Channels	North America: 11 ETSI: 13 Japan: 14
Nonoverlapping Channels	Three
Receive Sensitivity	1 Mbps: -94 dBm 2 Mbps: -91 dBm 5.5 Mbps: -89 dBm 11 Mbps: -85 dBm

require the user to obtain a license for the system according to the Canadian regulations. For further information, contact your local Industry Canada office.

Status Indicators	Three indicators on the top panel provide information concerning association status, operation, error/warning, firmware upgrade, and configuration, network/modem, and radio status
Automatic Configuration Support	BOOTP and DHCP
Remote Configuration Support	Telnet, HTTP, FTP, TFTP, and SNMP
Local Configuration	Direct console port (with supplied serial cable)
Bridging Protocol	Spanning Tree
Dimensions	6.74 in. (17.1 cm) wide x 6.25 in. (15.9 cm) deep x 1.31 in. (3.3 cm) high
Weight	1.43 lbs (.648 kg)
Environmental	Temperature: -4° to 131° F (-20° to 55° C) 10 to 90% (noncondensing)
Enclosure	Metal case (for plenum rating); UL 2043 certified
input Power Requirements	24VDC +/- 10% to 60 VDC (Ethernet line power)
Warranty	One year

Delay Spread	<p>1 Mbps: 500 ns</p> <p>2 Mbps: 400 ns</p> <p>5.5 Mbps: 300 ns</p> <p>11 Mbps: 140 ns</p>
Available Transmit Power Settings	<p>100 mW (20 dBm)</p> <p>50 mW (17 dBm)</p> <p>30 mW (15 dBm)</p> <p>20 mW (13 dBm)</p> <p>5 mW (7 dBm)</p> <p>1 mW (0 dBm)</p>
Range (typical, contingent upon antenna type selected)	<p>18 miles (28.9 km) @ 11 Mbps</p> <p>Up to 25 miles (40.2 km) @ 2 Mbps</p>
Compliance	<p>Operates license free under FCC Part 15 and complies as a Class B Device, complies with DOC regulations,¹ complies with ETS 300.328, FTZ 2100, and MPT 1349 standards; complies with UL 2043</p>
SNMP Compliance	<p>MIB I and MIB II</p>
Antenna	<p>Two RP-TNC connectors (antennas optional, none supplied with unit)</p>
Encryption Key Length	<p>128-bit</p>
Security	<p>128-bit WEP in bridge mode</p> <p>IEEE 802.1x (proposal includes EAP and RADIUS) in AP mode</p>

¹The use of this device in a system operating either partially or completely outdoors may

CISCO AIRONET 2.4 GHZ AND 5 GHZ ANTENNAS AND ACCESSORIES-COMPLETE THE WIRELESS SOLUTION

Cisco Systems® offers a complete range of antennas for access point and bridge equipment that enable a customized wireless solution for almost any installation.

CISCO AIRONET ANTENNAS AND ACCESSORIES

Every wireless LAN deployment is different. When engineering an in-building solution, varying facility sizes, construction materials, and interior divisions raise transmission and multipath considerations. When implementing a building-to-building solution, distance, physical obstructions between facilities, and number of transmission points must be taken into account.

Cisco is committed to providing the best access points, client adapters, and bridges in the industry-and is also committed to providing a complete solution for any wireless LAN deployment. Cisco has the widest range of antennas, cable, and accessories available from any wireless manufacturer.

Cisco offers a complete range of 2.4 GHz and 5 GHz antennas for access point and bridge equipment that enable a customized wireless solution for almost any installation (Figure 1).

Figure 1. Cisco 2.4-GHz Antennas and Accessories





With the Cisco FCC-approved directional and omnidirectional antennas, low-loss cable, mounting hardware, and other accessories, installers can customize a wireless solution that meets the requirements of even the most challenging applications.

ACCESS POINT ANTENNAS

Cisco Aironet 2.4-GHz access point antennas are compatible with all Cisco RP-TNC-equipped access points. The antennas are available with different gain and range capabilities, beam widths, and form factors. Coupling the appropriate antenna and access point allows for efficient coverage in any facility, as well as better reliability at higher data rates (Table 1).

Cisco Aironet 5GHz access point antennas have RP-TNC connectors and are compatible with Cisco Aironet 1200 Series and 1230AG Series access points when equipped with a RM22A radic module. Selection of the appropriate antenna should provide optimal coverage for the desired application in the 5 GHz frequency band.





Table 1. Cisco Aironet Access Point Antenna Features

				
Feature	AIR-ANT5959	AIR-ANT2012	AIR-ANT3213	AIR-ANT2410Y-R
Description	Diversity omnidirectional ceiling mount	Diversity patch wall mount	Pillar mount diversity omnidirectional	Yagi mast of wall mount
Application	Indoor unobtrusive antenna, best for	Indoor/outdoor, unobtrusive	Indoor, unobtrusive midrange antenna	Indoor/outdoor directional

	ceiling mount; excellent throughput and coverage solution in high multipath cells and dense user population	midrange antenna		antenna for use with access points or bridges
Gain	Two separate 2-dBi omnidirectional elements; minimum gain of 2.0, maximum gain of 2.35	6.5 dBi with two radiating elements	5.2 dBi with two radiating elements	10 dBi
Frequency	2.4GHz	2.4 GHz	2.4 GHz	2.4GHz
Approximate Indoor Range at 6 Mbps*	295 ft (90 m)	418 ft (127 m)	379 ft (121 m)	548 ft (167 m)
Approximate Indoor Range at 54 Mbps*	88 ft (27 m)	126 ft (38 m)	114 ft (35 m)	165 ft (50 m)
Beam Width	360°H, 80°V	80°H, 55°V	360°H, 30°V	47°H, 55°V
Cable Length	3ft (0.91m)**	3ft (0.91 m)**	3 ft (0.91 m)	3 ft (0.91 m)
Dimensions	5.3 x 2.8 x 0.9 in. (13.5 x 7.1 x 2.3 cm)	4.6 x 6.7 x 0.8 in. (12 x 17 x 2 cm)	10 x 1 in. (25.4 x 2.5 cm)	7.25 x 5 in. (18.4 x 12.7 cm)
Weight	0.3lb (0.14kg)	9.6 oz (272 g)	11b (454 g)	8 oz (227 g)

* All range estimations are based on an external antenna associating with an integrated Intel Centrino client adapter under ideal conditions. The distances referenced here are approximations and should be used for estimation purposes only.




** The cable provided on noted antennas meets UL 2047 certification for plenum rating requirements set by local fire codes and supports installation in environmental air spaces such as areas above suspended ceilings.

				
Feature	AIR-ANT1728	AIR-ANT4941	AIR-ANT3549	AIR-ANT1729
Description	Omnidirectional ceiling mount	2.2-dBi dipole antenna	Patch wall mount	Patch wall mount
Application	Indoor midrange antenna, typically hung from crossbars of drop ceilings	Indoor omnidirectional coverage	Indoor, unobtrusive, long-range antenna (may also be used as a midrange bridge antenna)	Indoor/outdoor, unobtrusive, midrange antenna (may also be used as a midrange bridge antenna)



Gain	5.2 dBi	2.2 dBi	9 dBi	6 dBi
Frequency	2.4 GHz	2.4 GHz	2.4GHz	2.4GHz
Approximate Indoor Range at 6 Mbps*	379 ft (116 m)	300 ft (91 m)	507 ft (155 m)	403 ft (123 m)
Approximate Indoor Range at 54 Mbps*	114 ft (35 m)	90 ft (27 m)	153 ft (47 m)	121 ft (37 m)
Beam Width	360°H, 38°V	360°H, 65°V	60°H, 60°V	75°H, 65°V
Cable Length	3 ft (0.91m)	-	3 ft (0.91 m)	3 ft (0.91 m)
Dimensions	Length: 9 in. (22.9 cm) Diameter: 1 in. (2.5 cm)	5.5 in. (14 cm)	5 x 5 in. (12.7 x 12.7 cm)	4 x 5 in. (10 x 13 cm)
Weight	4.6 oz (130 g)	1.1 oz (31 g)	5.3 oz (150 g)	4.9 oz (139 g)

* All range estimations are based on an external antenna associating with an integrated Intel Centrino client adapter under ideal conditions. The distances referenced here are approximations and should be used for estimation purposes only.

			
Feature	AIR-ANT5135D-R	AIR-ANT5145V-R	AIR-ANT5160V-R
Description	3.5-dBi dipole antenna	4.5-dBi omnidirectional ceiling mount	6 dBi omnidirectional antenna
Application	Indoor omnidirectional coverage	Indoor midrange antenna	Indoor/outdoor midrange antenna
Gain	3.5 dBi	4.5 dBi	6 dBi
Frequency	5 GHz	5 GHz	5 GHz
Approximate indoor Range at 6 Mbps*	675 ft (206 m)	732 ft (223 m)	822 ft (251 mm)
Approximate Indoor Range at 54 Mbps*	75 ft (21 m)	82 ft (25 m)	92 ft (28 m)
Beam Width	360°H, 40°E	360°H, 50°E	360°H, 17°E
Cable Length	-	3ft (0.91 m)	3 ft (0.91 m)

Dimensions	5.3 x 0.6 in. (13.5 x 1.5 cm)	6.75 x 4.2 in. (17.1 x 10.7 cm)	12 in. length; 1 in. diameter (30.5 x 2.5 cm)
Weight	1 oz (28.3 g)	11.5 oz (326 g)	5.3 oz (150 g)






* All range estimations are based on an external antenna associating with an integrated Intel Centrino client adapter under ideal conditions. The distances referenced here are approximations and should be used for estimation purposes only.

** The cable provided on noted antennas meets UL 2043 certification for plenum rating requirements set by local fire codes and supports installation in environmental air spaces such as areas above suspended ceilings.

2.4 GHz BRIDGE ANTENNAS

Cisco Aironet bridge antennas allow for extraordinary transmission distances between two or more buildings. Available in directional configurations for point-to-point transmission and omnidirectional configuration for point-to-multipoint implementations, Cisco has a bridge antenna for every application (Table 2).

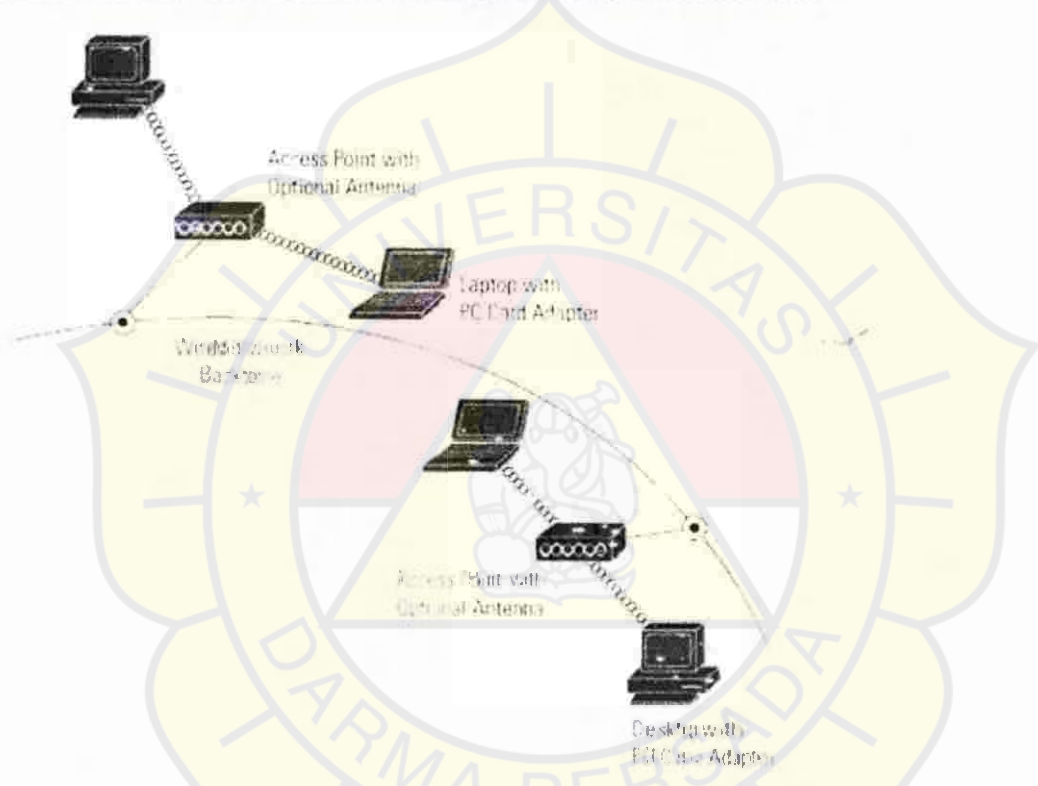
Table 2. Cisco Aironet 2.4 GHz Bridge Antenna Features

					
	AIR-ANT2506	AIR-ANT24120	AIR-ANT2414S-R	AIR-ANT1949	AIR-ANT3338
Description	Omnidirectional mast mount	High-gain omnidirectional mast mount	Vertically polarized sector	Yagi mast mount	Solid dish
Application	Outdoor short-range point-to-multipoint applications	Outdoor midrange point-to-multipoint applications	Outdoor long-range point-to-multipoint applications	Outdoor midrange directional connections	Outdoor long-range directional connections
Gain	5.2 dBi	12 dBi	14 dBi	13.5 dBi	21 dBi
Approximate Range at 2 Mbps*	3.3 miles (5.31 km)	15.81 miles (25.43 km)	16.71 miles (26.89 km)	18.33 miles (29.49 km)	26.49 miles (42.62 km)
Approximate Range at 11 Mbps*	1.66 miles (2.66 km)	7.92 miles (12.75 km)	8.89 miles (14.30 km)	11.19 miles (18.01 km)	20.1 miles (32.33 km)
Approximate Range at 54 Mbps*	.21 miles (.34 km)	1.0 miles (1.6 km)	1.26 miles (2.02 km)	1.41 miles (2.27 km)	4.46 miles (7.17 km)
Beam Width	360°H, 38°V	360°H, 7°V	90°H, 8.5°V	30°H, 25°V	12.4°H, 12.4°V

Cable Length	3 ft (0.91 m)	1 ft (0.30 m)	5 ft (1.5 m)	3 ft (0.91 m)	2 ft (0.61 m)
Dimensions	Length: 13 in. (33 cm) Diameter: 1 in. (2.5 cm)	Length: 42 in. (107 cm) Diameter: 1.5 in. (3.8 cm)	Length: 36 in. (91 cm) Width: 6 in. (15 cm)	Length: 18 in. (45 cm) Diameter: 3 in. (7.6 cm)	Diameter: 24 in. (61 cm)
Weight	6 oz (170 g)	1.5 lb (0.68 kg)	6.5 lb (3 kg)	1.5 lb (0.68 kg)	11 lb (5 kg)

* All range estimations are based on use of a BR 1310 access point and the same type of antenna at each end of the connection under ideal outdoor conditions. The distances referenced here are approximations and should be used for estimation purposes only.

Figure 2. Optional, Higher-Gain Antennas Extend the Range of Access Points



LOW-LOSS/ULTRA-LOW-LOSS CABLES

Low-loss cable extends the length between any Cisco Aironet 2.4 GHz bridge and the antenna. With a loss of 6.7 dB per 100 feet (30 m) for the low-loss cable and 4.4 dB for the ultra-low-loss cable, this provides installation flexibility without a significant sacrifice in range (Table 3).

Table 3. Cisco Aironet Low-Loss Antenna Cable Features

Feature	AIR-CAB020LL-R	AIR-CAB050LL-R	AIR-CAB100ULL-R	AIR-CAB150ULL-R
Cable Length	20 ft (6 m)	50 ft (15 m)	100 ft (30 m)	150 ft (46 m)
Transmission Loss @ 2.4 GHz	1.3 dB	3.4 dB	4.4 dB	6.6 dB

With Cisco Aironet bridge antennas, the right mounting hardware, and qualified installation, wireless links over great distances and obstacles are possible (Figure 3).

Figure 3. Crossing Great Distances with Cisco Aironet Bridge Antennas



ACCESSORIES

To complete an installation, Cisco provides accessories that offer increased capabilities, safety, and convenience (Figure 4; Table 5).

Figure 4. Cisco Aironet Antenna Accessories



Table 4. Cisco Aironet Accessory Features

Feature	AIR-ACC2537-060	AIR-ACC3354	AIR-ACC245LA-R	AIR-ACC2652
Description	60 in. (152 cm) bulkhead extender	2.4 GHz lightning arrester	2.4 GHz and 5 GHz lightning arrester	Yagi articulating mount
Application	Flexible antenna cable that extends access point cabling, typically within an enclosure	Helps prevent damage due to lightning-induced surges or static electricity; flexible antenna cable that extends access point cabling, typically within an enclosure	Supports both 2.4 GHz and 5 GHz applications; Helps prevent damage due to lightning-induced surges or static electricity; helps prevent damage due to lightning-induced surges or static electricity	Adds swiveling capability to mast-mounted Yagi antennas

MOUNTING HARDWARE AND ANTENNAS

In addition to the antennas available from Cisco, the Cisco 1300 Series has different mounting options (Figure 5). These optional mounting kits are available for mounting to a roof, wall, or pole. The quick-hang mounting bracket allows a simple one-person installation.

Figure 5. Cisco Aironet 1300 Series Mounting Hardware

MOUNTING KITS FOR CISCO AIRONET 1300 SERIES OUTDOOR ACCESS POINT/BRIDGES

A roof-mount kit is available for use with Cisco Aironet 1300 Series outdoor access points/bridges (integrated antenna and connectorized versions). A wall-mount kit is available for use with Cisco Aironet 1300 Series outdoor access points/bridges with RP-TNC type connectors. The wall-mount kit is for indoor use only. These kits must be ordered separately (Table 5).

Table 5. Mounting Kits for Cisco Aironet 1300 Series Outdoor Access Points/Bridges

Product Number	Product Description
AIR-ACCWAMK1300=	<p>Cisco Aironet 1300 Series Wall-Mount Kit for use with AIR-BR1310G-x-K9-R</p> <p>Kit includes:</p> <ul style="list-style-type: none"> • Two 1-ft RG-59 power injector cables • Wall-mount bracket • Mounting hardware
AIR-ACCRMK1300=	<p>Cisco Aironet 1300 Series Roof-Mount Kit for use with AIR-BR1310G-x-K9</p> <p>Kit includes:</p> <ul style="list-style-type: none"> • Roof-mount mast (pole and mounting base) • Multifunction mount (allows mounting to roof-mount mast, or directly to a wall) • Mounting hardware • 20-ft dual RG-6 cable assembly with F-Type connectors • 50-ft dual RG-6 cable assembly with F-Type connectors • Coaxial sealant • One Cisco Aironet grounding block • Grounding lug • Anticorrosion gel • U-bolts • Coaxial sealant • Optional 100-ft dual RG-6 cable available separately

* An antenna that concentrates transmission power into a direction that increases coverage distance at the expense of coverage angle. Directional antenna types include Yagi, patch, and parabolic dish antennas. A Yagi is a type of cylindrical directional antenna. A patch antenna is a type of flat antenna designed for flush wall mounting that radiates a hemispherical coverage area. A parabolic dish antenna is a concave or dish-shaped object, often referring to dish antennas. Parabolic dish antennas tend to provide the greatest gain and the narrowest beam width, making them ideal for point-to-point transmission over the longest distances.

** An antenna that provides a 360-degree transmission pattern. These types of antennas are used when coverage in all directions is required.

*** A linear measure of the distance that a transmitter can send a signal.

**** A method of increasing the transmission distance of a radio by the concentration of its signal in a single direction, typically through the use of a directional antenna. Gain does not increase the signal strength of a radio, but simply redirects it. Therefore, as gain increases, the decrease in angle of coverage is inversely proportional.

***** The angle of signal coverage provided by an antenna. This angle may be decreased by a directional antenna as gain increases.

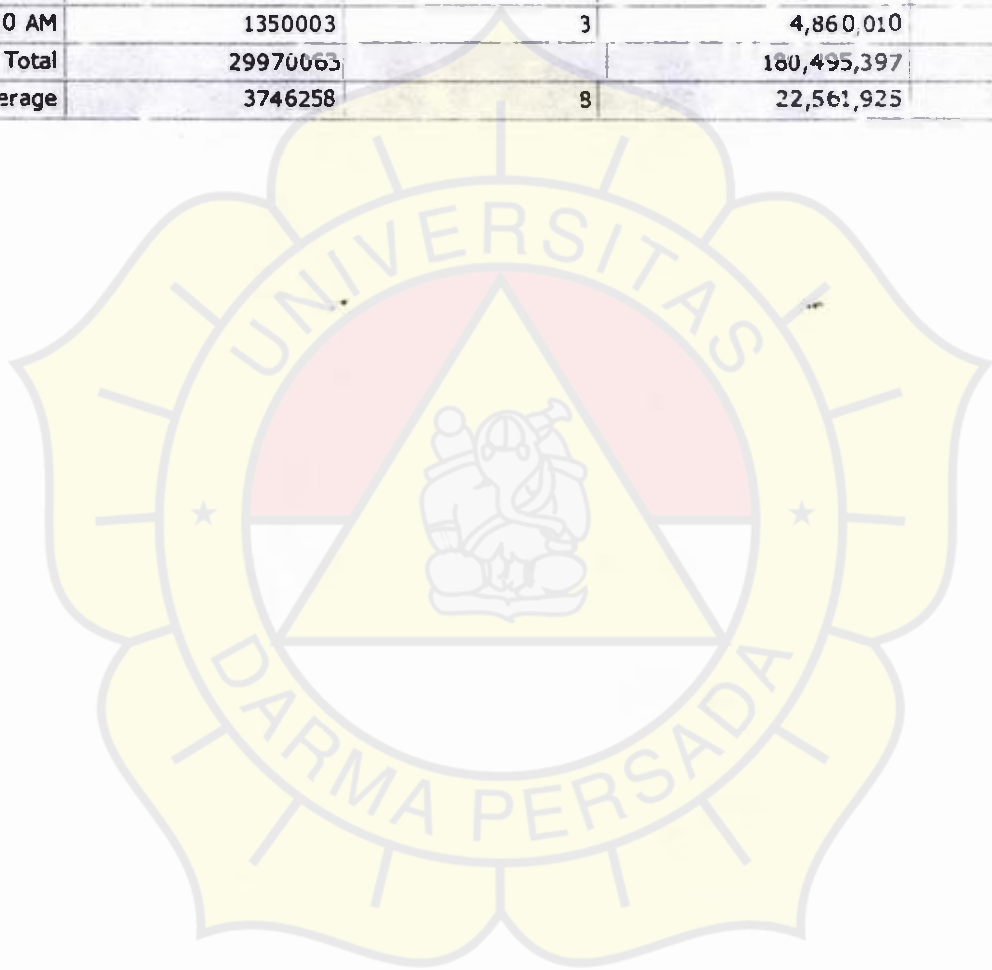
LAMPIRAN 2

Data Trafik



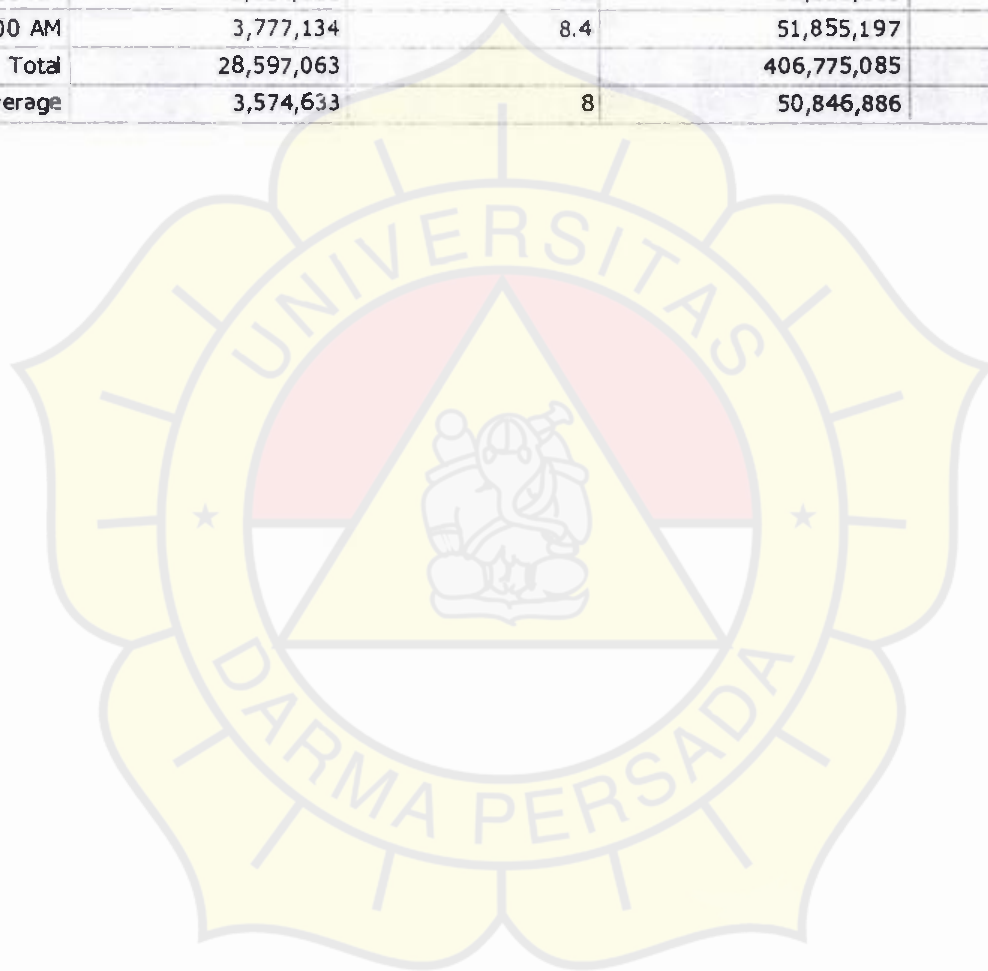
Hessler Router Traffic Grapher

	Traffic IN [bytes]	[kilobit/second]	Traffic OUT [bytes]	[kilobit/second]
7/4/2005 4:00:00 PM	990002	2.2	4,230,009	9.4
7/4/2005 3:00:00 PM	11025024	24.5	40,410,089	89.8
7/4/2005 2:00:00 PM	2520005	5.6	20,970,046	46.6
7/4/2005 1:00:00 PM	6165013	13.7	29,925,066	66.5
7/4/2005 12:00:00 PM	1845004	4.1	25,740,057	57.2
7/4/2005 11:00:00 AM	4005008	8.9	22,185,049	49.3
7/4/2005 10:00:00 AM	2070004	4.6	32,175,071	71.5
7/4/2005 9:00:00 AM	1350003	3	4,860,010	10.8
Total	29970063		180,495,397	
Average	3746258	8	22,561,925	50



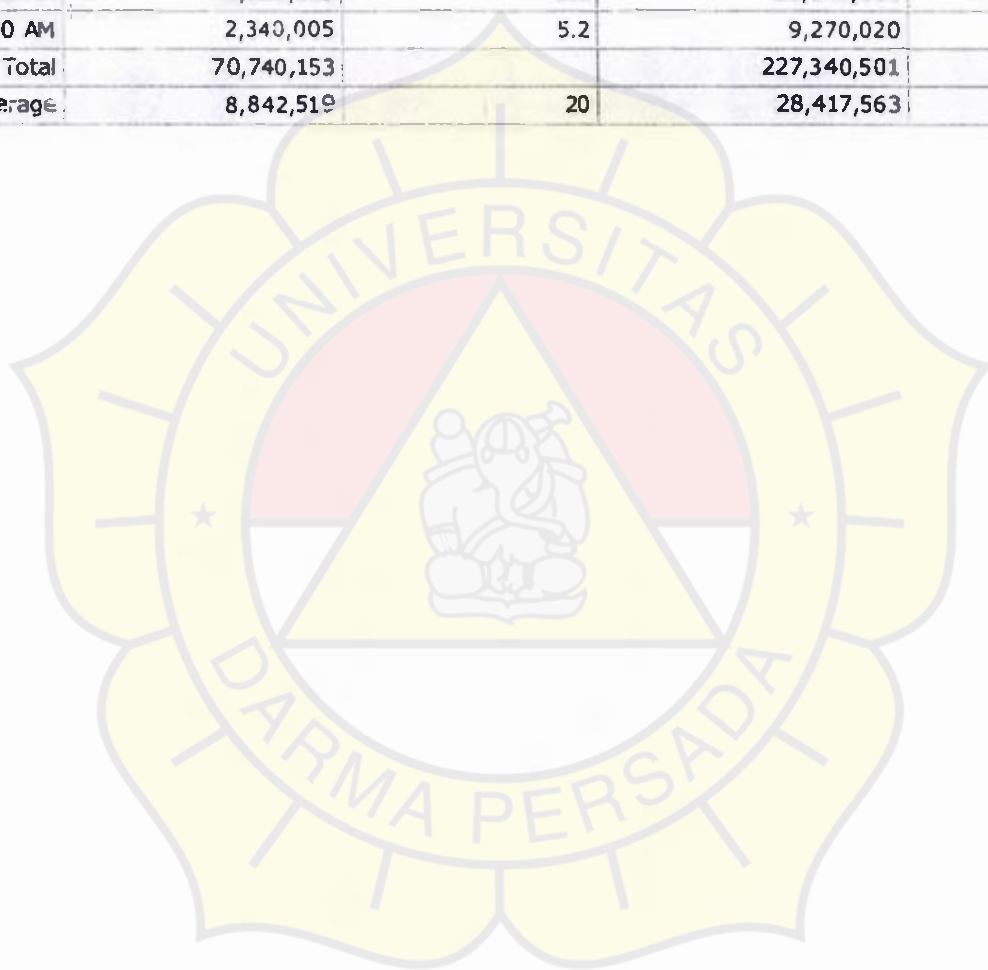
essler Router Traffic Grapher

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7/5/2005 4:00:00 PM	1,647,319	3.7	36,112,135	80.2
7/5/2005 3:00:00 PM	6,995,131	15.5	50,808,061	112.9
7/5/2005 2:00:00 PM	6,653,638	14.8	54,843,633	121.9
7/5/2005 1:00:00 PM	5,813,675	12.9	50,859,680	113
7/5/2005 12:00:00 PM	151,554	0.3	45,167,474	100.4
7/5/2005 11:00:00 AM	323,961	0.7	52,118,066	115.8
7/5/2005 10:00:00 AM	3,234,651	7.2	65,010,839	144.5
7/5/2005 9:00:00 AM	3,777,134	8.4	51,855,197	115.2
Total	28,597,063		406,775,085	
Average	3,574,633	8	50,846,886	113



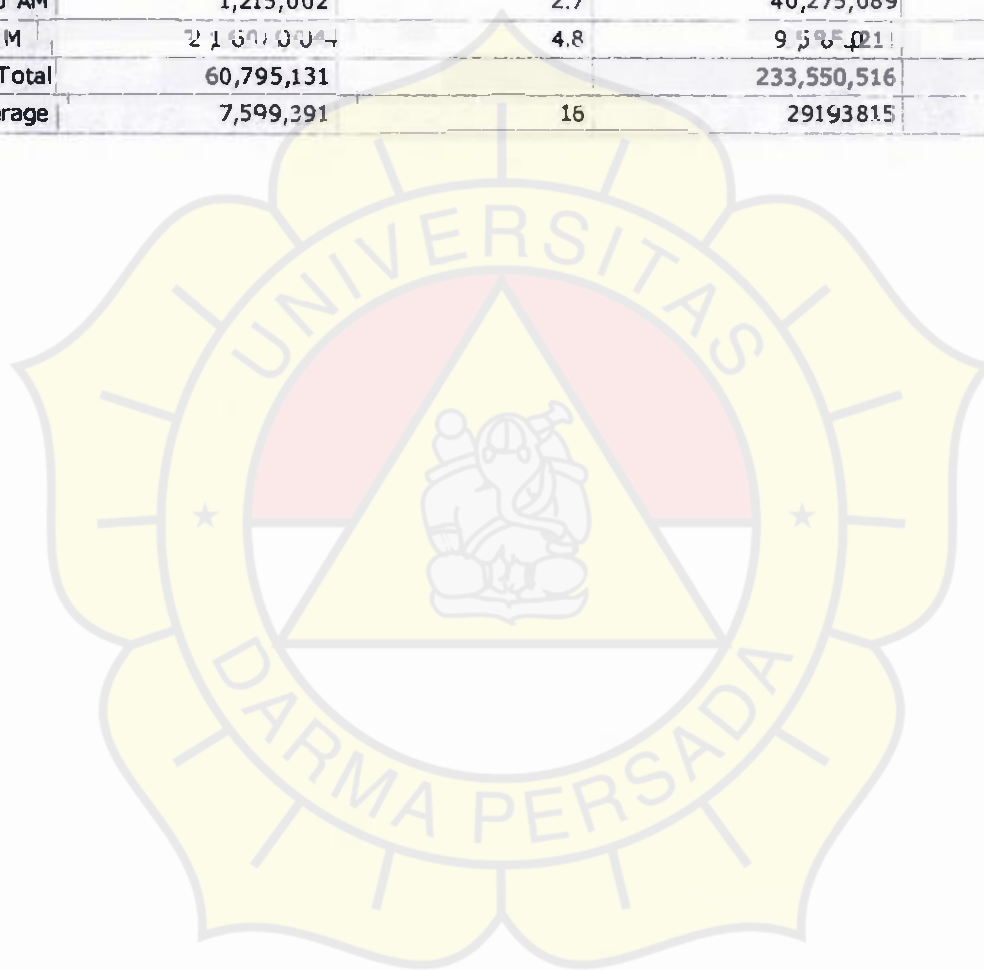
essler Router Traffic Grapher

	Traffic IN [bytes]	[kilobit/second]	Traffic OUT [bytes]	[kilobit/second]
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7/6/2005 3:00:00 PM	9,540,021	21.2	42,525,094	94.5
7/6/2005 2:00:00 PM	20,655,045	45.9	25,920,057	57.6
7/6/2005 1:00:00 PM	15,525,034	34.5	43,965,097	97.7
7/6/2005 12:00:00 PM	11,520,025	25.6	30,960,068	68.8
7/6/2005 11:00:00 AM	5,310,011	11.8	34,380,077	77.4
7/6/2005 10:00:00 AM	1,620,003	3.6	36,045,080	80.1
7/6/2005 9:00:00 AM	2,340,005	5.2	9,270,020	20.6
Total	70,740,153		227,340,501	
Average	8,842,519	20	28,417,563	63



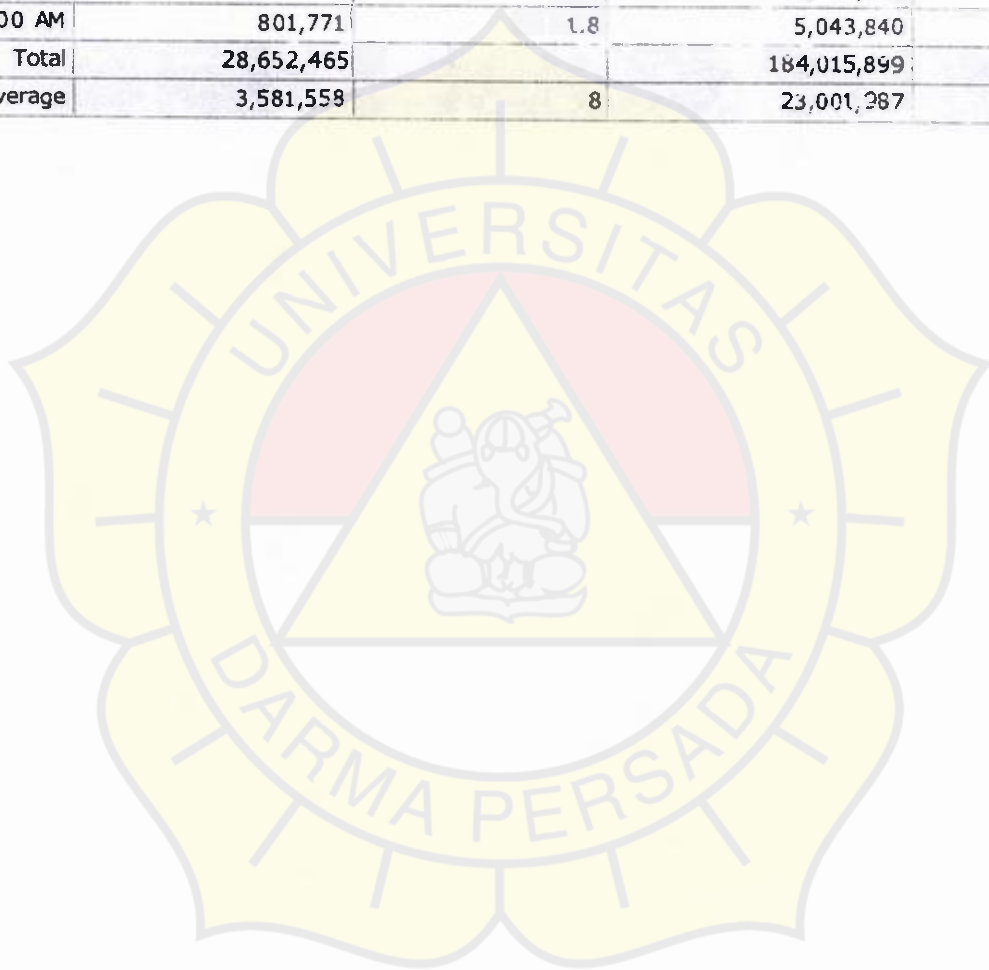
essler Router Traffic Grapher

	Traffic IN [bytes]	[kilobit/second]	Traffic OUT [bytes]	[kilobit/second]
7/7/2005 4:00:00 PM	4,635,010	10.3	3,195,007	7.1
7/7/2005 3:00:00 PM	16,065,035	35.7	40,140,089	89.2
7/7/2005 2:00:00 PM	10,575,023	23.5	23,760,052	52.8
7/7/2005 1:00:00 PM	13,995,031	31.1	39,555,087	87.9
7/7/2005 12:00:00 PM	5,670,012	12.6	46,440,103	103.2
7/7/2005 11:00:00 AM	6,480,014	14.4	30,600,068	68
7/7/2005 10:00:00 AM	1,215,002	2.7	40,275,089	89.5
7/7/2005 9:00:00 AM	2,160,004	4.8	9,585,021	21.3
Total	60,795,131		233,550,516	
Average	7,599,391	16	29193815	65



Hessier Router Traffic Grapher

	Traffic IN [bytes]	[kilobit/second]	Traffic OUT [bytes]	[kilobit/second]
7/8/2005 4:00:00 PM	1,462,770	3.3	21,53,698,844	8.2
7/8/2005 3:00:00 PM	9,667,911	21.5	34,109,034	75.8
7/8/2005 2:00:00 PM	3,544,985	7.9	26,475,175	58.8
7/8/2005 1:00:00 PM	5,739,705	12.8	34,061,553	75.7
7/8/2005 12:00:00 PM	1,720,621	3.8	24,172,177	53.7
7/8/2005 11:00:00 AM	1,673,048	3.7	25,824,114	57.4
7/8/2005 10:00:00 AM	4,041,654	9	30,631,162	58.1
7/8/2005 9:00:00 AM	801,771	1.8	5,043,840	11.2
Total	28,652,465		184,015,899	
Average	3,581,558	8	23,001,287	51



LAMPIRAN3

Local Area Network Pada PT.Mulia Industrindo

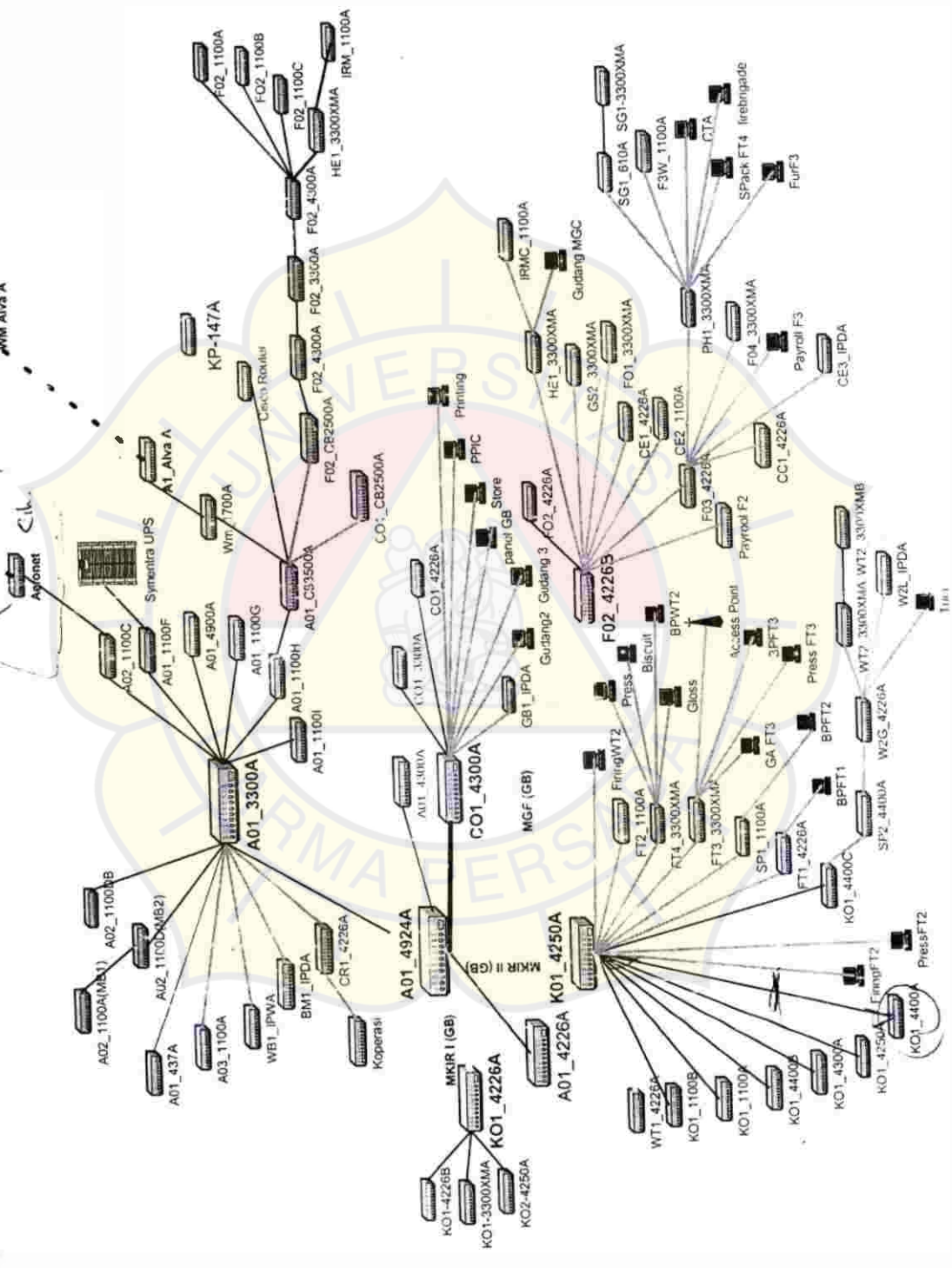


Wisma Mulia
 WM_4226A
 WM_1700A
 WM Alva A

Jababeka
 Aeronet
 Aglonet

Bridge Aeronet Cisco 2621 3 Com S33300XMA

Switch PSN Bridge Aeronet



LAMPIRAN 4

IEEE 802.11



STANDARD	DIGITAL CORDLESS TELEPHONE	PERSONAL HANDY PHONE SYSTEM	ZIGBEE	Bluetooth	HomeRF SWAPICA	IEEE 802.11 Wireless LAN	FTTH/RAIN HighSpeed LAN
MOBILE FREQUENCY RANGE	CT2: 864/868 MHz	1895-1918 MHz	2.402 - 2.480 GHz (N. America, 10 channels 100 mW/100 Power Alternates)	2.402 GHz - 2.480 GHz (N. America & Europe 75 hopping channels)	2.402 GHz - 2.480 GHz (N. America, 10 channels 100 mW/100 Power Alternates)	5.150 GHz - 5.250 GHz (USA & Europe, 10 channels 100 mW/100 Power Alternates)	5.150 GHz - 5.250 GHz, 2.5mW/100 5.250 GHz - 5.350 GHz, 12.5mW/100 5.350 GHz - 5.825 GHz, 50mW/100 USA U-NII Band
	CT2+: 946/958 MHz		2.412 GHz - 2.472 GHz (N. America, 10 channels 100 mW/100 Power Alternates)	2.412 GHz - 2.472 GHz (Japan)	2.412 GHz - 2.472 GHz (Japan)	5.350 GHz - 5.350 GHz (USA & Europe, 10 channels 100 mW/100 Power Alternates)	5.350 GHz - 5.350 GHz, 200 mW 5.470 GHz - 5.725 GHz, 1000 mW 5.725 GHz - 5.825 GHz, 250 mW Europe HighSpeed LAN and ISM
MULTIPLE ACCESS METHOD	TDMA/FDM	TDMA/FDM	TDMA	Frequency Hopping	Frequency Hopping	CSMA/CA	TDMA
	DD	TD	FDD	FDD	TDD	TDD	TDD
USERS PER CHANNEL	1	4	255	7 active, 200 inactive	8 active	127	127
CHANNEL SPACING	100 kHz	300 kHz	4 MHz	1 MHz	1 MHz, 3.5 MHz	FHSS: 1 MHz DSSS: 25 MHz	OFDM: 20 MHz
	GFSK (0.5 Gaussian Filter)	π/4 DQPSK	GFSK (0.5 Gaussian Filter)	Shaped Binary FM (0.5 Gaussian Filter)	FHSS: GFSK (0.5 Gaussian Filter) DSSS: DQPSK (1 MHz) DQPSK (2 MHz) CCG: QPSK (11 Mb/s)	FHSS: GFSK (0.5 Gaussian Filter) DSSS: DQPSK (1 MHz) DQPSK (2 MHz) CCG: QPSK (11 Mb/s)	OFDM: QPSK, QAM (0.5 Gaussian Filter) OFDM: BPSK (0.5 MHz) OFDM: 16QAM (2.4, 2.8 MHz) OFDM: 64QAM (4.8, 5.4 MHz)
CHANNEL BIT RATE	72 kbps	306 kbps	250 / 20 kbps	1 Mb/s symbol rate, 721 kbps raw data, 56 kbps return	1 Mb/s symbol rate, 1.6, 10 Mb/s	12 Mb/s symbol rate, 5.8 - 54 Mb/s	12 Mb/s symbol rate, 6 - 54 Mb/s

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LAMPIRAN 5

Perbandingan BER (bit error rate) Terhadap E_b/N_0



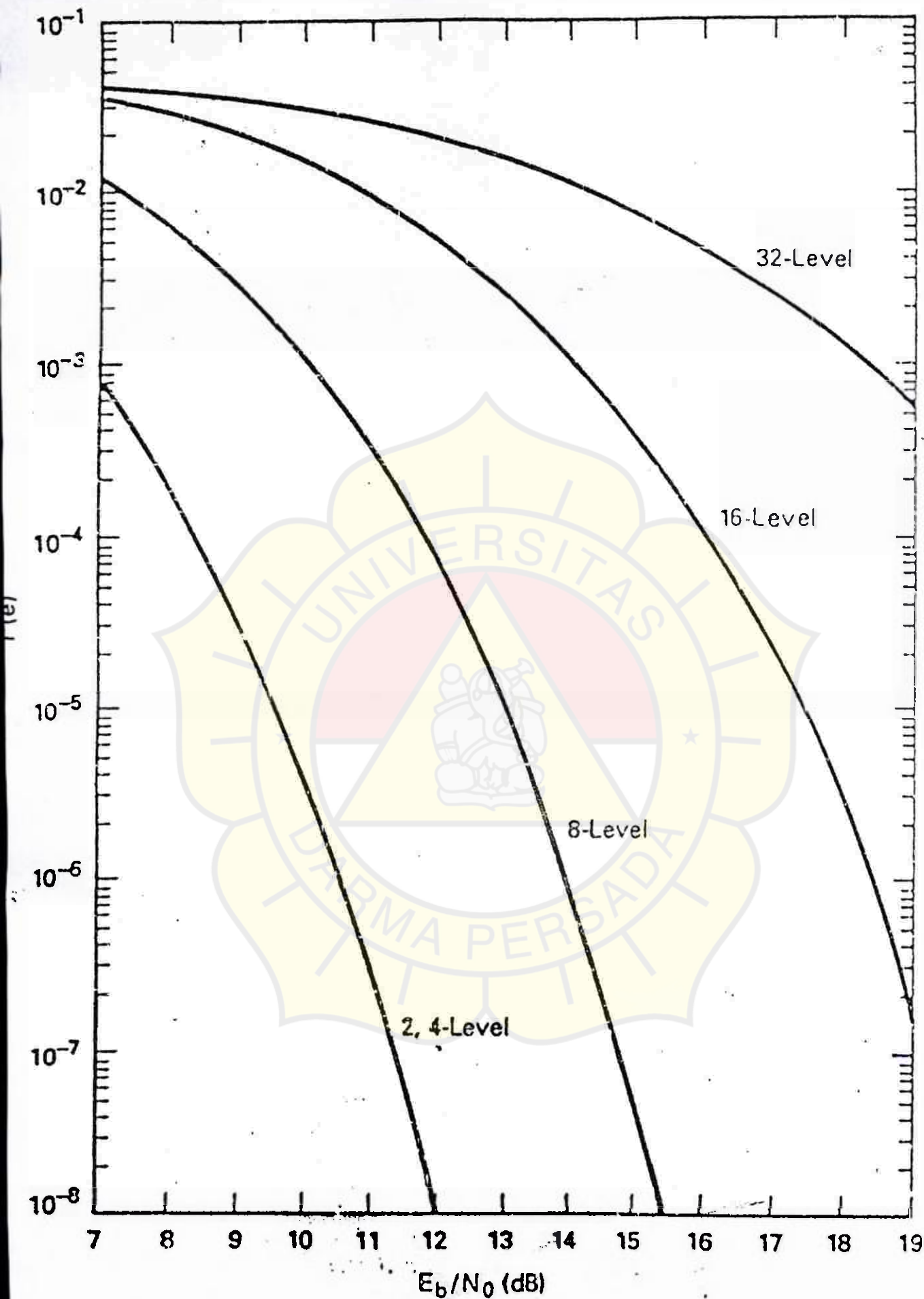
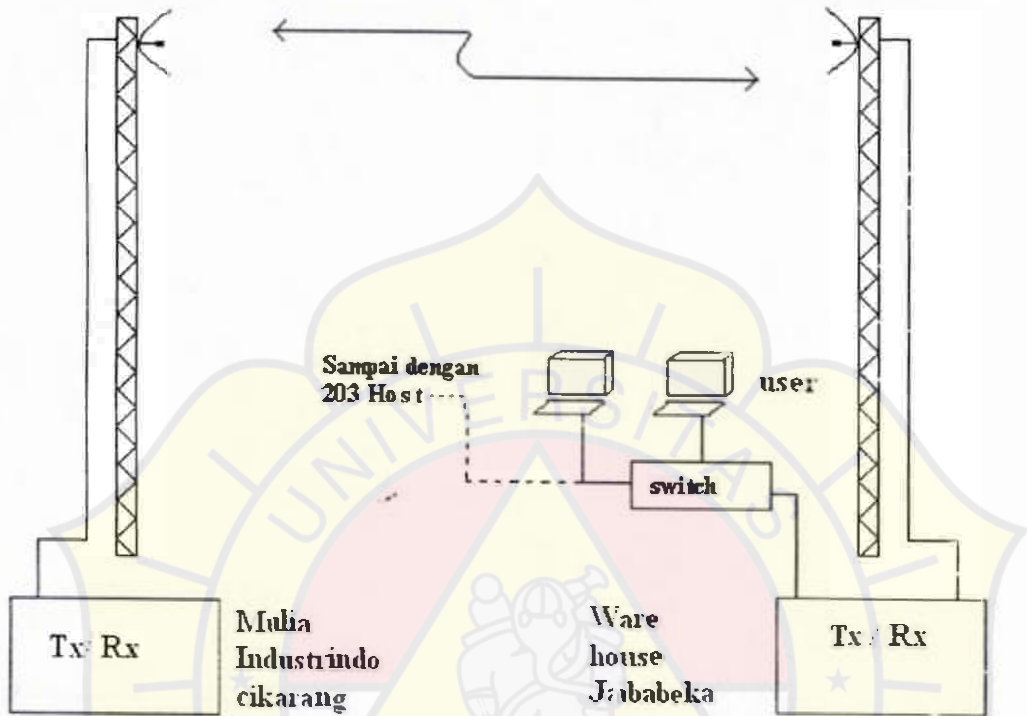


Figure 1-42 Error rates of PSK modulation systems.

LAMPIRAN 6

Gambar Usulan Penambahan Host Di Ware House Jababeka





Gambar Usulan Penambahan Host Di Ware House Jababeka

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Agama : Kristen
Kebangsaan : Indonesia

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2001 - 2005 : S - 1 Teknik Elektro Universitas Darma Persada, Jakarta.

Jakarta, Juli 2005

Hormat Saya

ANGGAWIJAYA