LAMPIRAN 1 SPESIFIKASI PERANGKAT

1. Perangkat pada Server

a. Mikrotik Routerboard RB750

Mikrotik Routerboard RB750 merupakan *router indoor* yang berbentuk *hardware* yang di dalamnya sudah terinstal *MikroTik RouterOS* level 4. Gambar 1 merupakan *mikrotik routerboard750*. Spesifikasi dari *Mikrotik Routerboard750* ditunjukkan pada Tabel 1.



Gambar 1. *Mikrotik Routerboard RB750*. (Sumber: <u>wirelessconnect.eu</u>)

Tabel 1. Spesifikasi Mikrotik Routerboard RB750

No.	Spesifikasi	Keterangan		
1.	Product Code	RB750		
2.	LAN Ports	5 port Ethernet 10/100 Mbps		
3.	Power Jack	10-28 V		
4.	Dimentions	113x89x28 mm		
5.	Operating System	RouterOS Level 4		

(Sumber: <u>www.mikrotik.com</u>)

b. Komputer Server



Gambar 2. Server HP Proliant.

(Sumber: Dokumentasi Laboratorium Komputasi dan Jaringan JTE FT-UB)

No.	Spesifikasi	Keterangan
1.	Processor	Quad Core Intel® Xeon® E3-1220 (3.10GHz/4- core/8MB/80W, 1333, Turbo 1/2/3/4)
2.	RAM	2GB (1x2GB) PC3-10600E DDR3 UB ECC NOTE: Total 4 DIMM slots
3.	Kapasitas Hard Disk	1 x 250GB 3.5" Non-hot plug SATA
4.	Operating System	CentOS 5.5
5.	NIC	10 Gb/detik (2 buah)
6.	VGA	Integrated Matrox G200eH, 16MB video standard 16 bit color: maximum resolution of 1920 x 1200
		32 bit color: <i>maximum resolution of</i> 1280 x 1024
7.	Port USB	Ada, 2 x 4 buah <i>port</i>

Tabel 2. Spesifikasi PC Server HP ML110G7-SATA

(Sumber: Hewlett Packard / HP®)

c. Uninteruptible Power Supply (UPS)

Perangkat UPS adalah perangkat tambahan yang harus dimiliki *server* untuk mengatasi perubahan tegangan yang mungkin terjadi. Selain itu, UPS juga mampu memberikan cadangan energi yang cukup saat pemutusan listrik terjadi dalam waktu

BRAWIJAYA

singkat. Untuk memberikan layanan optimal, UPS memiliki spesifikasi seperti ditunjukkan pada Tabel 3.



Gambar 3. Uninteruptible Power Supply (UPS) (Sumber: www.directindustry.com)

No.	Spesifikasi	Keterangan
1.	Output Power Capacity	700 Watts / 1000 VA
2.	Nominal Output Voltage	230V
3.	Output Voltage Note	Configurable for 220 : 230 or 240 nominal output voltage
4.	Efficiency at Full Load	88.0%
5.	Waveform Type	Sine wave
6.	Nominal Input Voltage	230V, 220V, 240V
7.	Input Frequency	50/60 Hz +/- 5 Hz (auto sensing)
8.	Typical recharge time	3 hour(s)

Tabel 3. Spesifikasi Uninteruptible Power Supply (UPS)

(Sumber: Dokumentasi Laboratorium Komputasi dan Jaringan JTE FT-UB)

d. Kabel UTP dan Konektor RJ-45

Kabel UTP dengan konektor RJ-45 merupakan perangkat keras yang berfungsi sebagai sistem pengkabelan jaringan sistem manajemen *bandwidth* yang digunakan secara umum dengan standart IEEE 802.3. Pengurutan kabel UTP dapat dibedakan menjadi 2 macam:

• Kabel straight

Digunakan untuk hubungan antara PC-PC, hub-hub, switch-switch, router-router.

• Kabel cross

Digunakan untuk hubungan antara PC-*hub*, PC-*Switch*, *Switch-Router*, PC-*Modem*. Pada perancangan ini digunakan kabel UTP Cat.5 dengan konfigurasi *straight* ditunjukkan pada Gambar 4. Spesifikasi kabel UTP ditunjukkan pada tabel 4.



Gambar 4. (a) Kabel UTP (b) Konektor RJ-45

(c) Konfigurasi Kabel Crossover dan Straight.

(Sumber: http://www.beldenapac.com/catalogbrochures.html)

No.	Spesifikasi	Keterangan
1.	Impedansi Karakeristik	$100 \ \Omega \pm 15\%$
2.	Kecepatan Propagasi	0.64c m/s
3.	Delay Propagasi	4.8 – 5.3 ns/m
4.	Kapasitansi	5.2 pF/m
5.	Induktansi STAS	525nH/m
6.	Diameter Kabel	0.51054 mm
7.	Ketebalan Isolasi	0.245 mm
8.	Arus Perkonduktor	0.577 A
9.	Temperatur Kerja	-55°C sampai 60°C

Tabel 4.	S	pesifikasi	Kabel	UTP
----------	---	------------	-------	-----

(Sumber: http://www.beldenapac.com/catalogbrochures.html)

2. Redline Base station AN-100U





(Sumber: http://rdlcom.com/)

No.	Spesifikasi	Keterangan
1.	RF Band	3.3-3.5 Ghz
2.	Channel Size	3.5 MHz, 7 MHz
3.	Duplex Technique	TDD(Time DivisionDuplex)HD-FDD (Half Duplex FrequencyDivision Duplex)
4.	Wireless Transmission (PHY)	256 FFT OFDM
5.	Network Connections	10/100 Ethernet (RJ-45)
6.	System Configuration	HTTP (Web) interface and CLI via Telnet
7.	Network Management	SNMP
8.	Power Requirements	110/220/240 VAC 50/60 Hz
9.	Dimension	17 x 12 x 1.75 in

Tabel 5. Spesifikasi Base Station

(Sumber: http://rdlcom.com/)

3. Redline Subscriber Station SU-O



Re

No.	Spesifikasi	Keterangan
1.	Degree	30
2.	Gain (dBi)	3.5 MHz, 7 MHz
3.	Radio Frequency	3.3 – 3.8 Ghz
4.	Polarization	Linear (Vertical or Horizontal)
5.	Input Impedance	50 (Ohm)
6.	Input Power	6 W (max)
7.	Dimension	PCB W162 x L 162 x T 0.88 mm
9.	Dimension	17 x 12 x 1.75 in

 Tabel 6.
 Spesifikasi Subcriber Station

(Sumber: http://rdlcom.com/)

LAMPIRAN 2 INSTALASI PERANGKAT LUNAK

1) Instalasi OpenMCU

Index of /public/OpenMCU-ru/Windows

	Name	Last modified	<u>Size</u> <u>Description</u>
	Parent Directory		-
?	OpenMCU-ru-3.49.5-beta-win32.7z	10-Jun-2014 16:53	13M
ľ	README.txt	18-Jan-2014 11:26	179
?	openmcu-ru-3.46.8-win32.7z	24-Dec-2013 15:53	8.0M
	openmcu-ru-3.46.8-win32_setup.exe	24-Dec-2013 16:41	18M
10 01 10	openmcu-ru-3.48.0-win32_setup.exe	09-May-2014 00:44	16M
10 01 10	openmcu-ru-4.1.3.1417-beta-win32_setup.exe	04-Jun-2015 21:00	18M

Apache/2.2.22 (Debian) Server at openmcu.ru Port 80

Gambar 7. Mengunduh file master OpenMCU 4.1.3

(Sumber: http://openmcu.ru/public/OpenMCU-ru/Windows/)

🖫 OpenMCU-ru Setup 📃 🔲	23
License Agreement Please review the license terms before installing OpenMCU-ru.	
Press Page Down to see the rest of the agreement.	
MOZILLA PUBLIC LICENSE Version 1.0 1. Definitions. 1.1. ``Contributor" means each entity that creates or contributes to the creation of Modifications	
1.2. ``Contributor Version" means the combination of the Original Code, prior	
OpenMCU-ru is released under the Mozilla Public License. Please carefully read the license. Click Accept to continue.	
Nullsoft Install System v3.0a2 Accept Cancel	

Gambar 8. Tampilan lisensi OpenMCU

Gambar Ketika Welcome Screen muncul, klik "Accept"

👫 OpenMCU-ru Setup	
Choose Install Location Choose the folder in which to install OpenMCU-ru.	
Setup will install OpenMCU-ru in the following folder. To install in a differe Browse and select another folder. Click Next to continue.	ent folder, click
Destination Folder	
C:\Program Files\OpenMCU-ru	Browse
Space required: 45.5MB Space available: 17.3GB	
Nullsoft Install System v3.0a2 — Sack Next	> Cancel
Gambar 9. Lokasi direktori OpenM	ICU
r Pilih lokasi direktori untuk memasang OpenMCU	dengan cara klik
r Pilih lokasi direktori untuk memasang OpenMCU ilih direktori dan klik "Next" untuk lanjut.	dengan cara klik
r Pilih lokasi direktori untuk memasang OpenMCU ilih direktori dan klik "Next" untuk lanjut.	dengan cara klik
r Pilih lokasi direktori untuk memasang OpenMCU ilih direktori dan klik "Next" untuk lanjut.	dengan cara klik
r Pilih lokasi direktori untuk memasang OpenMCU ilih direktori dan klik "Next" untuk lanjut. Choose Components Choose which features of OpenMCU-ru you want to install.	dengan cara klik
ar Pilih lokasi direktori untuk memasang OpenMCU ilih direktori dan klik "Next" untuk lanjut. © OpenMCU-ru Setup Choose Components Choose which features of OpenMCU-ru you want to install. Check the components you want to install and uncheck the components you want	dengan cara klik
ar Pilih lokasi direktori untuk memasang OpenMCU ilih direktori dan klik "Next" untuk lanjut. © OpenMCU-ru Setup Choose Components Choose Which features of OpenMCU-ru you want to install. Check the components you want to install and uncheck the components you install. Click Next to continue. Select components to install: © OpenMCU-ru install Service © Install service	dengan cara klik
ar Pilih lokasi direktori untuk memasang OpenMCU ilih direktori dan klik "Next" untuk lanjut. © OpenMCU-ru Setup Choose Components Choose Which features of OpenMCU-ru you want to install. Check the components you want to install and uncheck the components you install. Click Next to continue. Select components to install: Select com	dengan cara klik
r Pilih lokasi direktori untuk memasang OpenMCU ilih direktori dan klik "Next" untuk lanjut. Choose Components Choose Which features of OpenMCU-ru you want to install. Check the components you want to install and uncheck the components yo install. Click Next to continue. Select components to install: Select components to install: Space required: 45.5MB	dengan cara klik

Gambar 10. Fitur-fitur OpenMCU

Gambar tampilan selanjutnya dan klik Next untuk melanjutkan instalasi program

Some MCU-ru Satur		
Choose Start Menu Folder Choose a Start Menu folder for the Oper	nMCU-ru shortcuts.	
Select the Start Menu folder in which you can also enter a name to create a new for DpenMCU-ru Accessories Administrative Tools Advanced IP Scanner v2 AdventNet ManageEngine VQManager AIMP3 Attractel AVG PC TuneUp 2015 BS.Player Cambridge Canon iP2700 series Canon MP250 series Do not create shortcuts ullsoft Install System v3.0a2	u would like to create the program	m's shortcuts. You
oft Install System v3.0a2		
Gambar 11. Tamp	ilan <i>menu</i> instal Ope	enMCU
Gambar 11. Tamp Impilan selanjutnya dan k	vilan <i>menu</i> instal Ope	enMCU elanjutkan ins
Gambar 11. Tamp Impilan selanjutnya dan k OpenMCU-ru Setup	vilan <i>menu</i> instal Ope	enMCU elanjutkan ins
Gambar 11. Tamp umpilan selanjutnya dan k OpenMCU-ru Setup Installing Please wait while OpenMCU-ru is being in	vilan <i>menu</i> instal Ope klik Instal untuk me	enMCU elanjutkan ins
Gambar 11. Tamp ampilan selanjutnya dan k OpenMCU-ru Setup Installing Please wait while OpenMCU-ru is being in Extract: COPYING 100%	vilan <i>menu</i> instal Ope klik Instal untuk me	enMCU elanjutkan ins
Gambar 11. Tamp ampilan selanjutnya dan k OpenMCU-ru Setup Installing Please wait while OpenMCU-ru is being in Extract: COPYING 100%	bilan <i>menu</i> instal Ope	enMCU elanjutkan ins

Gambar 12. Proses instalasi OpenMCU





2) Instalasi MyPhone3

Index of /public/myphone3

	<u>Name</u>	Last modi	<u>fied</u>	<u>Size</u>	Description
•	Parent Directory			-	
?	MyPhone3.0.15.7z	24-Dec-2013	18:05	5.9M	
10 01 10	MyPhone3.0.15_setup.exe	24-Dec-2013	18:58	8.9M	
?	MyPhone3.0.16.7z	28-Jan-2014	12:50	5.9M	
ľ	README.txt	18-Jan-2014	11:26	175	
	archive/	24-Dec-2013	19:02	-	
	<u>nsis/</u>	04-Jan-2014	20:59	-	

Apache/2.2.22 (Debian) Server at openmcu.ru Port 80

Gambar 14. Mengunduh *file master* MyPhone3 (Sumber: <u>http://openmcu.ru/public/myphone3/</u>)

() MyPhone Setup	
License Agreement Please review the license terms before installing MyPhone.	(٢)
Press Page Down to see the rest of the agreement.	
MOZILLA PUBLIC LICENSE Version 1.0	
1. Definitions.	
1.1. ``Contributor" means each entity that creates or contribute Modifications.	s to the creation of
1.2. ``Contributor Version" means the combination of the Origina	l Code, prior 👻
MyPhone is released under the Mozilla Public License. Please carefull Accept to continue.	y read the license. Click
Nullsoft Install System v2.46-7	
	Cancel
	7
() MyPhone Setup	
() MyPhone Setup Choose Install Location Choose the folder in which to install MyPhone.	
MyPhone Setup Choose Install Location Choose the folder in which to install MyPhone. Setup will install MyPhone in the following folder. To install in a differ and select another folder. Click Next to continue.	ent folder, dick Browse
MyPhone Setup Choose Install Location Choose the folder in which to install MyPhone. Setup will install MyPhone in the following folder. To install in a differ and select another folder. Click Next to continue. Destination Folder	ent folder, dick Browse
MyPhone Setup Choose Install Location Choose the folder in which to install MyPhone. Setup will install MyPhone in the following folder. To install in a differ and select another folder. Click Next to continue. Destination Folder C:\Program Files\MyPhone	ent folder, dick Browse
 MyPhone Setup Choose Install Location Choose the folder in which to install MyPhone. Setup will install MyPhone in the following folder. To install in a differ and select another folder. Click Next to continue. Destination Folder C:\Frogram Files\MyPhone Space required: 20.8MB Space available: 24.5GB 	ent folder, dick Browse
MyPhone Setup Choose Install Location Choose the folder in which to install MyPhone. Setup will install MyPhone in the following folder. To install in a differ and select another folder. Click Next to continue. Destination Folder C:\Program Files\MyPhone Space required: 20.8MB Space available: 24.5GB Nullsoft Install System v2.46-7	ent folder, click Browse
MyPhone Setup Choose Install Location Choose the folder in which to install MyPhone. Setup will install MyPhone in the following folder. To install in a differ and select another folder. Click Next to continue. Destination Folder C:\Program Files\MyPhone Space required: 20.8MB Space available: 24.5GB Nullsoft Install System v2.46-7	ent folder, dick Browse Browse

MyPhone Setup		
Choose Components Choose which features of MyPI	hone you want to install.	()
Check the components you wa install. Click Next to continue.	nt to install and uncheck the comp	onents you don't want to
Select components to install:	Visual C++ redistributable	Description Position your mouse over a component to see its description.
Space required: 20.8MB	۰ <u>۱۱۱</u> ۲	
Jullsoft Install System v2,46-7 —		
	< Back	Next > Cancel
Gambar 2 MyPhone Setup	17. Lokasi direktori N	AyPhone3
Gambar 2 MyPhone Setup Choose Start Menu Folder Choose a Start Menu Folder for	17. Lokasi direktori N	AyPhone3
Gambar MyPhone Setup Choose Start Menu Folder Choose a Start Menu folder for Select the Start Menu folder in can also enter a name to creats ())/Phone Accessories Administrative Tools Adobe Adobe Master Collection CSS Advanced IP Scanner v2 ArcSoft WebCam Companion 3 AVira Bluetooth Devices	17. Lokasi direktori N the MyPhone shortcuts. which you would like to create the a new folder.	AyPhone3
Gambar MyPhone Setup Choose Start Menu Folder Choose a Start Menu folder for Select the Start Menu folder in can also enter a name to creatu MyChone Accessories Administrative Tools Adobe Adobe Master Collection CSS Advanced IP Scanner v2 ArcSoft WebCam Companion 3 AVG PC TuneUp 2015 Avira Bluetooth Devices Canon MP250 series Catalyst Control Center	17. Lokasi direktori N the MyPhone shortcuts. which you would like to create the a new folder.	AyPhone3
Gambar MyPhone Setup Choose Start Menu Folder Choose a Start Menu folder for Select the Start Menu folder in can also enter a name to create MyChone Accessories Administrative Tools Adobe Master Collection CSS Advanced IP Scanner v2 ArcSoft WebCam Companion 3 AVG PC TuneUp 2015 Avira Bluetooth Devices Canon MP250 series Catalyst Control Center Do not create shortcuts Jisoft Install System v2,46-7	17. Lokasi direktori N the MyPhone shortcuts. which you would like to create th e a new folder.	AyPhone3
Gambar MyPhone Setup Choose Start Menu Folder Choose a Start Menu folder for Select the Start Menu folder in can also enter a name to creats MyChone Accessories Administrative Tools Adobe Adobe Master Collection CSS Advanced IP Scanner v2 ArcSoft WebCam Companion 3 AVG PC TuneUp 2015 Avira Bluetooth Devices Catalyst Control Center Do not create shortcuts Isoft Install System v2,46-7 —	17. Lokasi direktori N the MyPhone shortcuts. which you would like to create the a new folder.	AyPhone3

4







UAU	Settings		?
	Call to (host/IP/alias):	▼ [Book
BRA	Call	R	efuse
		2	
U.	ERROR! MyPhone3 could not open liste	ener interface: *.	
Ś	Your text messages(Ctrl+Enter to send])	*
			T
2	Your IP: 192.168.88.54 - WARNINGI You Gambar 21. Tampila	u could be behind an MyPhone3	
alasi Wire	Your IP: 192.168.88.54 · WARNINGI You Gambar 21. Tampila	a could be behind an MyPhone3	ーゲー
) lasi Wire	Your IP: 192.168.88.54 · WARNING! You Gambar 21. Tampila eshark Wireshark-win32	u could be behind an MyPhone3 -1.10.5	
Si Wire	Your IP: 192.168.88.54 · WARNINGI You Gambar 21. Tampila eshark Wireshark-win32 Wireshark installe	a could be behind an MyPhone3 -1.10.5 er for 32-bit V	
) alasi Wire	Your IP: 192.168.88.54 · WARNING! You Gambar 21. Tampila eshark Wireshark-win32 Wireshark installe Wireshark develo	an MyPhone3 -1.10.5 er for 32-bit V	
si Wire	Your IP: 192.168.88.54 • WARNING! You Gambar 21. Tampila eshark Wireshark-win32 Wireshark installe Wireshark develo	an MyPhone3 -1.10.5 er for 32-bit V opment team	→
si Wire	Your IP: 192.168.88.54 - WARNINGI You Gambar 21. Tampila eshark Wireshark-win32 Wireshark installe Wireshark develo Gambar 22. Tampila	an MyPhone3 -1.10.5 er for 32-bit V opment team an Wireshark	→ Vin
i Wire	Your IP: 192.168.88.54 · WARNING! You Gambar 21. Tampila eshark Wireshark-win32 Wireshark installe Wireshark develo Gambar 22. Tampila (Sumber: https://www.wiresha	a could be behind an MyPhone3 -1.10.5 er for 32-bit V opment team an Wireshark ark.org/downlo	→ Vin
si Wire	Your IP: 192.168.88.54 - WARNINGI You Gambar 21. Tampila eshark Wireshark-win32 Wireshark installe Wireshark develo Gambar 22. Tampila (Sumber: https://www.wireshar	a could be behind an MyPhone3 -1.10.5 ar for 32-bit V pment team an Wireshark ark.org/downlo	→ Vin
i Wire	Your IP: 192.168.88.54 · WARNING! You Gambar 21. Tampila eshark Wireshark of Wireshark installe Wireshark develo Gambar 22. Tampila (Sumber: https://www.wireshark (Sumber: https://www.wireshark)	a could be behind an MyPhone3 -1.10.5 er for 32-bit V opment team an Wireshark ark.org/downlo	→ Vin
Wire	Your IP: 192.168.88.54 - WARNING! You Gambar 21. Tampila eshark Wireshark of the second Wireshark installe Wireshark develop Gambar 22. Tampila Sumber: https://www.wireshark Sumber: https://www.wireshark	a could be behind an MyPhone3 -1.10.5 er for 32-bit V opment team an Wireshark ark.org/downlo	→ Vin
i Wire	Your IP: 192.168.88.54 - WARNINGI You Gambar 21. Tampila eshark Wireshark mina2 Wireshark installe Wireshark develo Gambar 22. Tampila Sumber: https://www.wiresha Sumber: https://www.wiresha Sumber: https://www.wiresha	an MyPhone3 -1.10.5 ar for 32-bit V pment team an Wireshark an Wireshark an Wireshark an Wireshark an Wireshark	→ Vin
si Wire	Your IP: 192.168.88.54 · WARNINGI You Gambar 21. Tampila eshark Wireshark of the second Wireshark installe Wireshark develop Gambar 22. Tampila Sumber: https://www.wiresha Sumber: https://www.wiresha Sumber: https://www.wiresha Sumber: https://www.wiresha	an MyPhone3	→ Vin

Gambar 23. Tampilan lisensi Wireshark

Choose which features of Wire	shark 1.10.5 (32-bit) you want to install.
The following components are a	available for installation.
Select components to install:	V Wrechark V TShark G V Plugins / Extensions V Tools V User's Guide
Space required: 90.4MB	Description Position your mouse over a component to see its description.
Jullsoft Install System v2.46	

Gambar 24. Tampilan direktori Wireshark

Select Additional Tasks		
Which additional tasks should be done?	_	
Create Shortcuts		
Start Menu Item		- 11
Desktop Icon		- 11
Quex cauter teen		- 11
File Extensions		- 11
Associate trace file extensions to	Wireshark (5vw, acp, apc, atc, bfr,	- 11
cap, enc, erf, fdc, out, pcap, pcap	ong, pkt, rf5, snoop, syc, tpc, tr1,	- 11
trace, trc, vwr, wpc, wpz)		- 11
		- 11
		- 11
		- 11
		- 11
ullsoft Install System v2.46		- 11
		- UP
	< Back Next > Cancel	1.11.

Gambar 25. Tampilan komponen instalasi Wireshark

Choose Install Location Choose the folder in which to install Wireshark 1.10.5 (32-bit).
Choose a directory in which to install Wireshark.
Destination Folder
Space required: 90.4MB Space available: 149.508 Nullsoft Install System v2.46

Gambar 26. Tampilan *menu folder* Wireshark

Install WinPcap? WinPcap is required to capture live netw	work data. Should WinPcap be installed?
Currently installed WinPcap version	
Install	
Use Add/Remove Programs first	to uninstall any undetected old WinPcap versions)
What is WinPcap?	
lisort Install System V2.46	

Gambar 27. Tampilan wincap pada Wireshark

2

NIJAL V

Completing the Wireshark 1.10.5 (32-bit) Setup Wizard
Wireshark 1.10.5 (32-bit) has been installed on your computer.
Click Finish to close this wizard.
Run Wireshark 1.10.5 (32-bit)
Show News
< Back Finish Cancel

Gambar 28. Tampilan Wireshark telah terinstal



