Mikrotik Implementation for Measuring Quality of Services at Biznet Network

Agus Ariyanto

VP Network

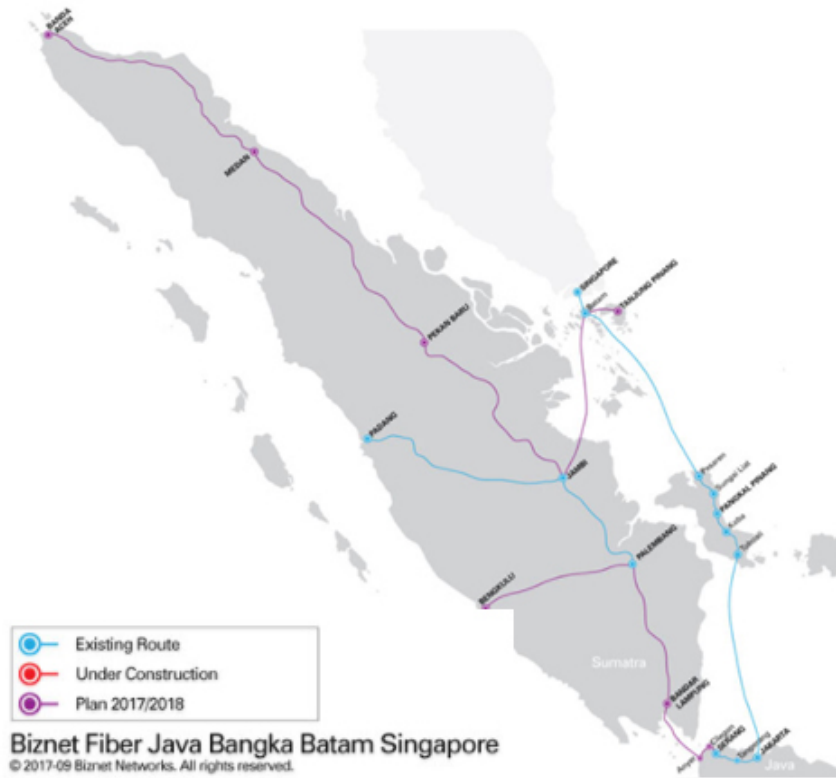agus_ariyanto@biznetnetworks.com

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About Biznet

- Biznet berdiri sejak tahun 2000, bermula dari ISP yang fokus di segmen corporate dan bussines market

- Biznet menyediakan layanan **Network**, **Internet**, **Hosting** dan **Voices**

- Biznet menyediakan layanan **Biznet Metro**, dan menjadi Carrier Grade Metro Ethernet Network pertama di Indonesia (2006)

- Biznet meluncurkan **Biznet Metro FTTH**, jaringan serat optik yang melayani sampai ke wilayah perumahan, pertama di Asia Tenggara (2007)

Biznet

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About Biznet

- Biznet Fiber Singapore - Java Bali

Biznet Fiber Java Bangka Batam Singapore
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- Existing Route
- Under Construction
- Plan 2017/2018

Biznet Fiber Java Bali
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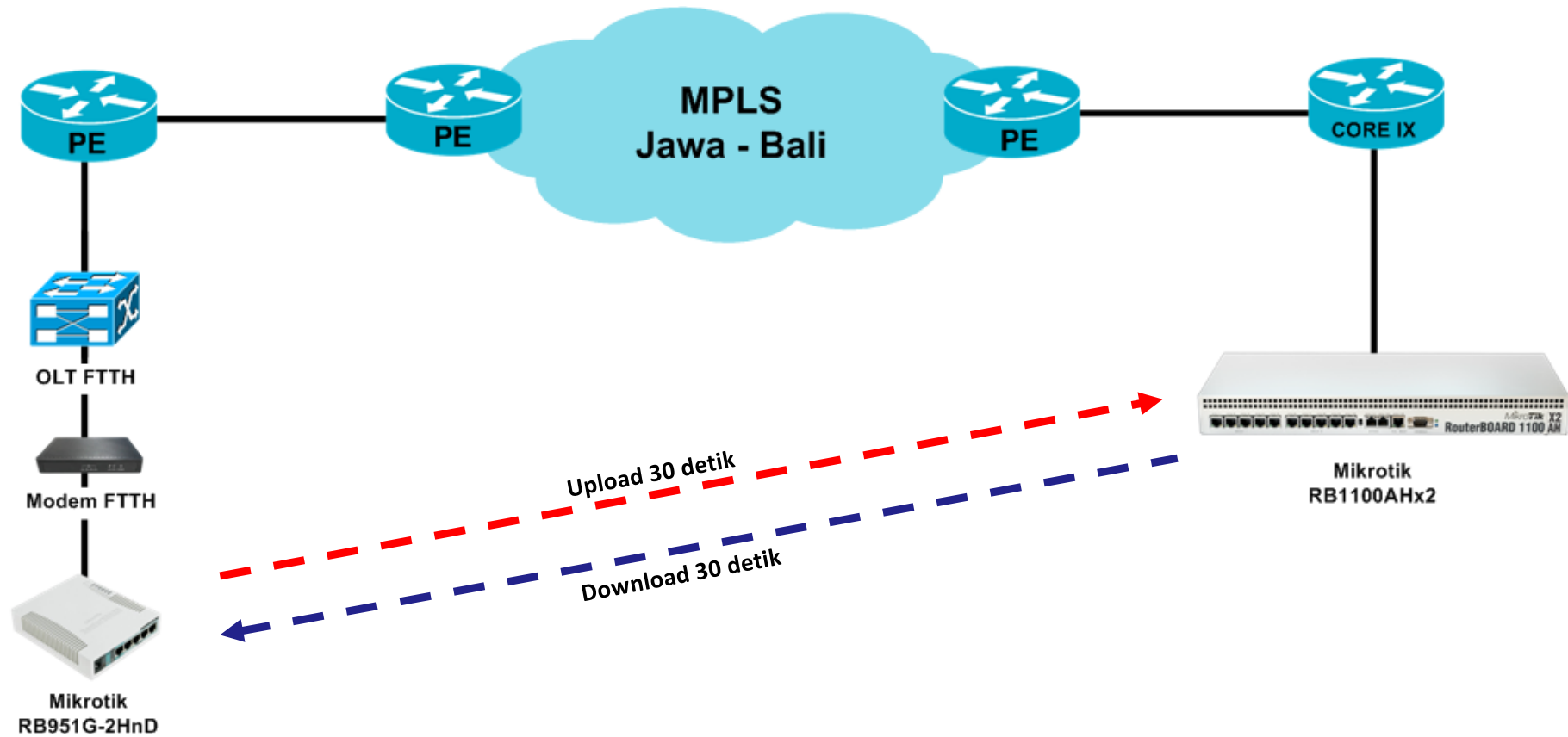
- Existing Route
- Under Construction
- Plan 2017/2018

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Bagaimana mengetahui kualitas service layanan pelanggan lebih dari 50 kota secara akurat ?

Automatic Bandwidth Test
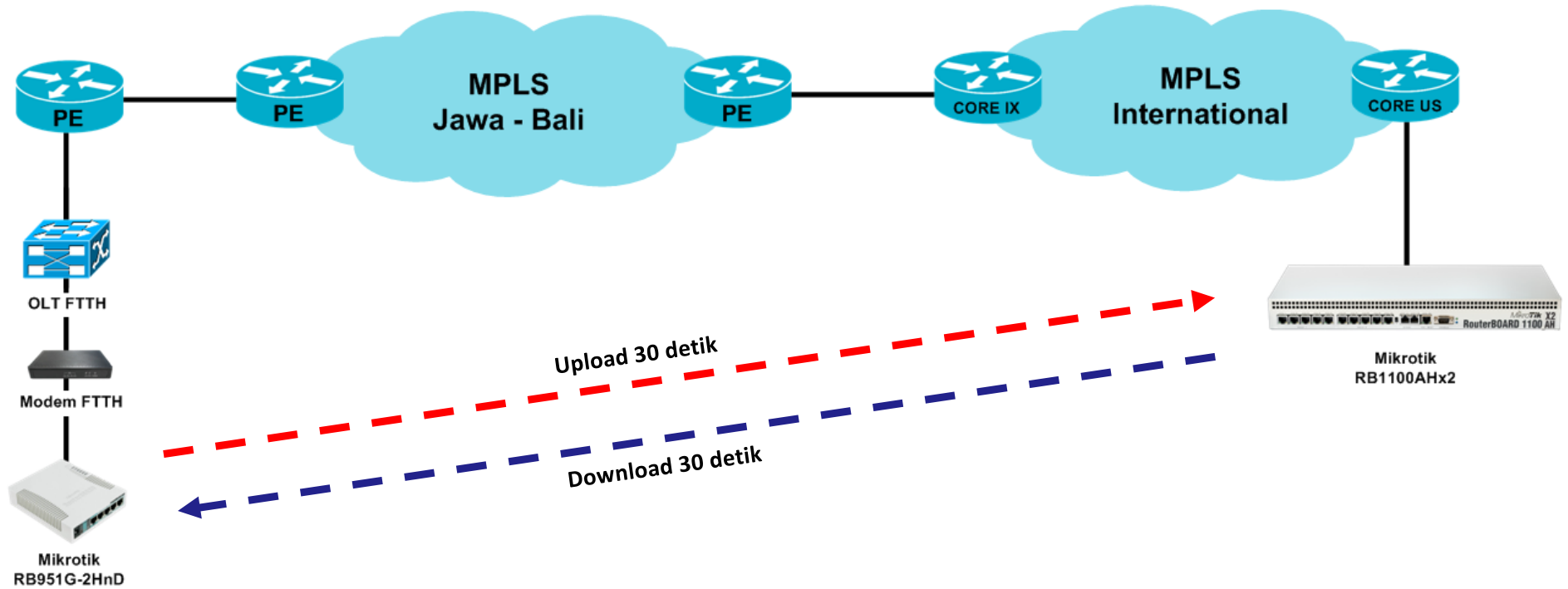
Network Diagram Mikrotik BTest

Biznet

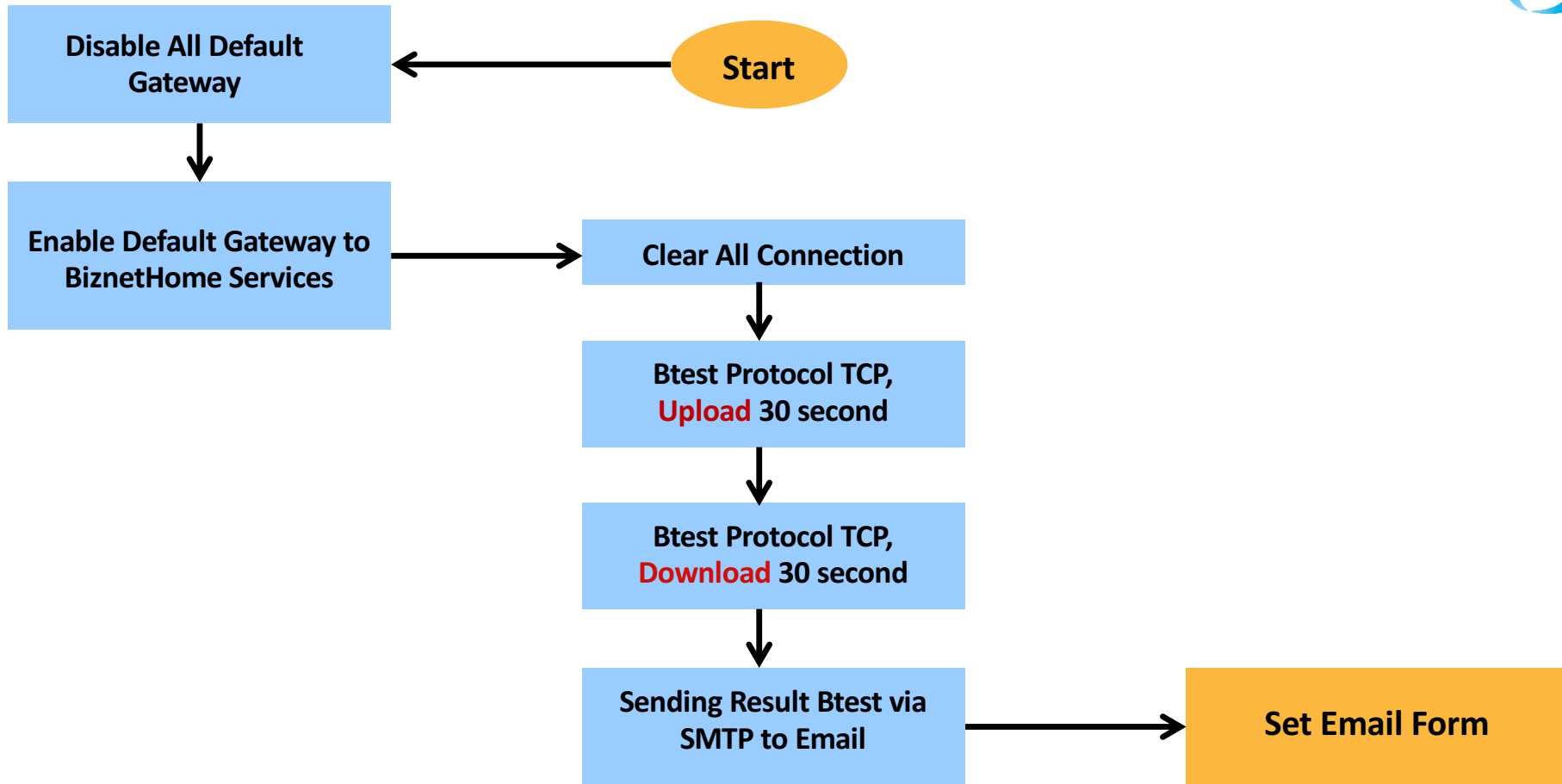Speed Test ke Jakarta

MPLS
Jawa - Bali

PE

PE

PE

CORE IX

OLT FTTH

Modem FTTH

Mikrotik
RB951G-2HnD

RouterBOARD 1100 AH

Mikrotik
RB1100AHx2

Upload 30 detik

Download 30 detik

Network Diagram Mikrotik BTest

Speed Test ke US

Flow Mikrotik Bandwidth Test

Biznet

Start → Disable All Default Gateway

Disable All Default Gateway → Enable Default Gateway to BiznetHome Services

Enable Default Gateway to BiznetHome Services → Clear All Connection

Clear All Connection → Btest Protocol TCP, **Upload** 30 second

Btest Protocol TCP, **Upload** 30 second → Btest Protocol TCP, **Download** 30 second

Btest Protocol TCP, **Download** 30 second → Sending Result Btest via SMTP to Email

Sending Result Btest via SMTP to Email → Set Email Form

Script Sample BiznetHome


```
Script <metrous>

Name:    metrous
Owner:   siddiq
Policy:  ☑ ftp        ☑ reboot
         ☑ read       ☑ write
         ☑ policy     ☑ test
         ☑ password   ☑ sniff
         ☑ sensitive  ☑ romon
         ☐ dude

Last Time Started:  Sep/27/2017 13:54:00
Run Count:  911

Source:
:local kambing
:local kambingA
:local kambingB
:local kambingC
:local sysname [/system identity get name]
:local datetime "$[/system clock get date] $[/system clock get time]"
/ip route disable [ /ip route find comment=gw-home]
:log info "$sysname - Disable Connection Home"
/ip route enable [ /ip route find comment=gw-metro]
:log info "$sysname - Enable Connection Metro"
/tool e-mail set from=speedtest_metro@biznetnetworks.com
:log info "$sysname - Set From speedtest_metro"
/ ip firewall connection {remove [find]}
:log info "$sysname - CLEAR Conection Done"
:log info "$sysname - Bandwidth-test start"
/tool bandwidth-test $ipserver protocol=tcp  tcp-connection-count=100 direction=transmit duration=30s user=admin
password=admin do={
:set ucingA ($"tx-current" / 1000)
:set ucingB ($ucingA / 1000 * 1000)
:set ucingC ($ucingA - $ucingB)
:set ucingB ($ucingB / 1000)
:set ucing "$ucingB.$ucingC"
}
:log info "$sysname - Bandwidth Upload Done"
/tool bandwidth-test $ipserver protocol=tcp direction=receive duration=30s user=admin password=admin do={
```

Buttons: OK, Cancel, Apply, Comment, Copy, Remove, Run Script

1. Disable route semua default route
2. Enable route menggunakan gateway BiznetHome
3. Set email sender menjadi speedtest_home@biznetnetworks.com
4. Clear all connection (mencegah koneksi idle di gateway sebelumnya)
5. Test Download 30 detik
6. Test Upload 30 Detik
7. Mengirimkan hasilnya melalui email via SMTP

Connecting Indonesia.

Script & Scheduler

Client bertugas melakukan pengetesan ke 3 Server yaitu :
- Server US = Setiap 2 Jam
- Server SG = Setiap 1 Jam
- Server JKT = Setiap 1 Jam

Setiap Script minimal memiliki Jeda 1 menit untuk mencegah crash antar script

Timeline

Untuk mencegah bentrokan dalam setiap pengetesan, dan mencegah CPU server yang tinggi, dilakukan pengaturan waktu pengetesan, atau bisa juga disebut antrian

Running Time Execute Script			
TIME	State	SPOP	Service
00:01	Jabar	Bekasi	Metro
00:02	Bali	Ubud	Metro
00:03	Jateng	Kendal	Metro
00:04	Bali	Ubud	Home
00:05	Jateng	Kendal	Home
00:06	Jabar	Sukabumi	Metro
00:07	Jabar	Bekasi	Home
00:08	Jabar	Sukabumi	Home
00:09	Jabar	Cikampek	Metro
00:10	Jabar	Indramayu	Metro
00:11	Jabar	Karawang	Metro
00:12	Jabar	Indramayu	Home
00:13	Jabar	Karawang	Home
00:14	Sumatera	Batam	Metro
00:15	Jateng	Solo	Metro
00:16	Sumatera	Batam	Home
00:17	Jateng	Solo	Home
00:18	Jabar	Bandung	Metro
00:19	Jatim	Banyuwangi	Metro
00:20	Jabar	Bandung	Home
00:21	Jatim	Banyuwangi	Home
00:22	Jabar	Cirebon	Metro
00:23			
00:24	Jabar	Cirebon	Home
00:25	Jateng	Pekalongan	Metro
00:26	Jatim	Kediri	Metro

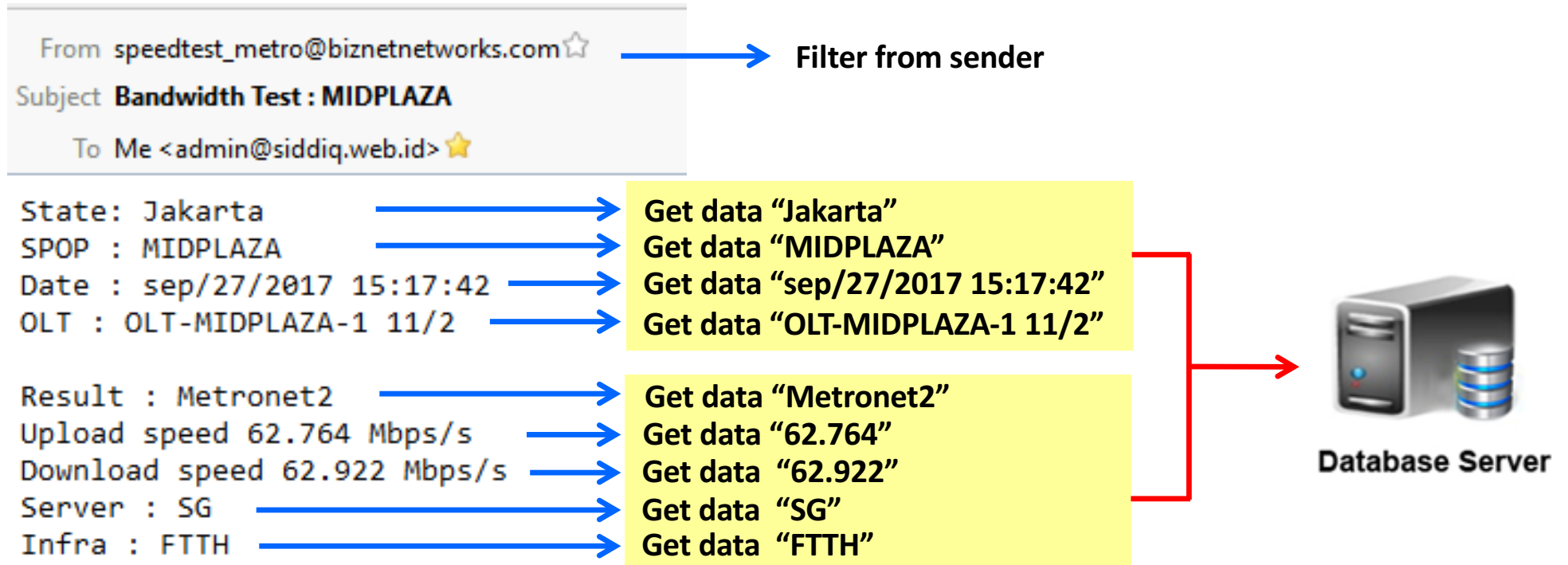| Running Time Execute Script			
TIME	State	SPOP	Service
00:01	Jakarta	Maspion	MEtro
00:02	Jabar	Sukabumi	Metro
00:03	Jakarta	Maspion	Home
00:04	Jabar	Sukabumi	Home
00:05	Jakarta	Kirana	Metro
00:06	Jabar	Bandung	Metro
00:07	Jakarta	Kirana	Home
00:08	Jabar	Bandung	Home
00:09	Jateng	Solo	Metro
00:10	Jakarta	Midplaza	Metro
00:11	Jateng	Solo	home
00:12	Jakarta	Midplaza	Home
00:13	Jateng	Pemalang	Metro
00:14	Jateng	Ungaran	Metro
00:15	Jateng	Pemalang	Home
00:16	Jabar	Cirebon	Home
00:17	Jateng	Ungaran	Home
00:18	Jabar	Cirebon	Metro
00:19	Jabar	Karawang	Metro
00:20	Jatim	Malang	Metro
00:21	Jabar	Karawang	Home
00:22	Jatim	Malang	Home
00:23	Jatim	Muncar	Metro
00:24	Sumatera	Jambi	Metro
00:25	Jatim	Muncar	Home
00:26	Sumatera	Jambi	Home

Proses Email

1. Mikrotik Btest melakukan VPN ke server, untuk menghindari spam di SMTP server
2. Mikrotik Btest mengirimkan hasil bandwidth melalui email ke server
3. Mail Server Menerima Email dari Mikrotik kemudian, kemudian di filter berdasarkan sender kemudian di Proses berdasarkan data yang di inginkan, lalu di input di database
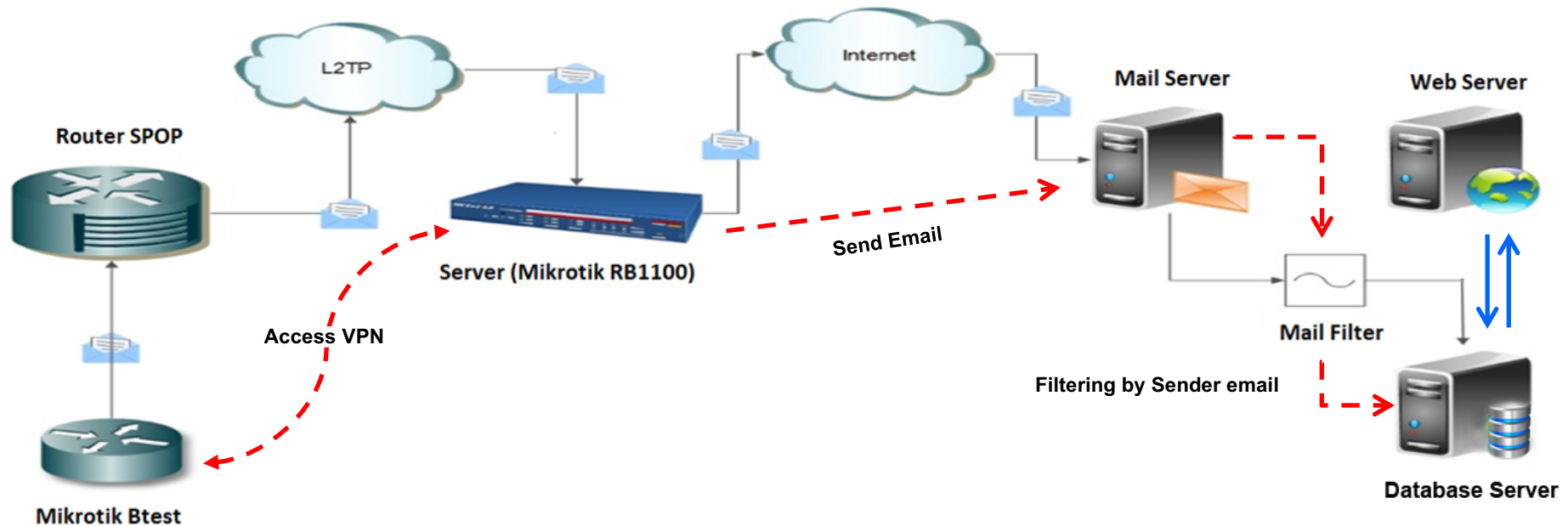
Mail Output & Filtering

Biznet

Mail Server menjalankan script secara rutin (Crontab) untuk mengambil data email dari Sender dan men filter body email kemudian di INSERT ke dalam database (SQL)

From speedtest_metro@biznetnetworks.com ☆   → **Filter from sender**

Subject **Bandwidth Test : MIDPLAZA**

To Me <admin@siddiq.web.id> ☆

```
State: Jakarta
SPOP : MIDPLAZA
Date : sep/27/2017 15:17:42
OLT : OLT-MIDPLAZA-1 11/2

Result : Metronet2
Upload speed 62.764 Mbps/s
Download speed 62.922 Mbps/s
Server : SG
Infra : FTTH
```

→ **Get data "Jakarta"**
→ **Get data "MIDPLAZA"**
→ **Get data "sep/27/2017 15:17:42"**
→ **Get data "OLT-MIDPLAZA-1 11/2"**

→ **Get data "Metronet2"**
→ **Get data "62.764"**
→ **Get data "62.922"**
→ **Get data "SG"**
→ **Get data "FTTH"**

Database Server

Database Bandwidth Test

Biznet

Setelah data masuk ke dalam Database maka dapat di tampilan ke website

Server: localhost » Database: speedtest » Table: new_data

Browse | Structure | SQL | Search | Insert | Export | Import | Operations | Triggers

+ Options

	id	state	spop	olt	piu	profile	upload	download	date	hour	server	infra
Edit Copy Delete	566954	Jakarta	SAHARJO	OLT-SAHARJO-1	7/2	METRONET2	63.749	64.440	2017-10-24	14:58:00	SG	FTTH
Edit Copy Delete	566953	JawaTimur	MOJOKERTO	ONB-MOJOKERTO-1	0/1/13	METRONET2	63.984	4.706	2017-10-24	14:57:00	US	FTTH
Edit Copy Delete	566952	Bali	UBUD	OLT-UBUD-1	0/1/1	METRONET2	62.147	62.602	2017-10-24	14:57:00	JKT-2	FTTH
Edit Copy Delete	566951	JawaTengah	PURWOSARI	OLT-PURWOSARI-1	3/1	METRONET2	61.638	53.900	2017-10-24	14:56:00	US	FTTH
Edit Copy Delete	566950	JawaBarat	INDRAMAYU	OLT-INDRAMAYU-1	11/13	METRONET2	61.959	62.530	2017-10-24	14:56:00	JKT-1	HFC
Edit Copy Delete	566949	JawaTimur	MADIUN	ONB-PANDEAN-1	0/12	METRONET2	63.270	18.160	2017-10-24	14:55:00	SG	HFC
Edit Copy Delete	566948	Jakarta	PERWATA	OLT-PERWATA-2	12/1	METRONET2	62.103	62.913	2017-10-24	14:55:00	SG	FTTH
Edit Copy Delete	566947	JawaTengah	KENDAL	OLT-KENDAL-1	0/0/1	METRONET2	61.860	61.815	2017-10-24	14:55:00	JKT-1	FTTH
Edit Copy Delete	566946	JawaTimur	BANYUWANGI	OLT-BANYUWANGI-1	0/1/3	METRONET2	63.770	4.112	2017-10-24	14:54:49	US	FTTH

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Intranet Website

Speed Test Prepaid

Speed Test Prepaid Daily - POP Bandung
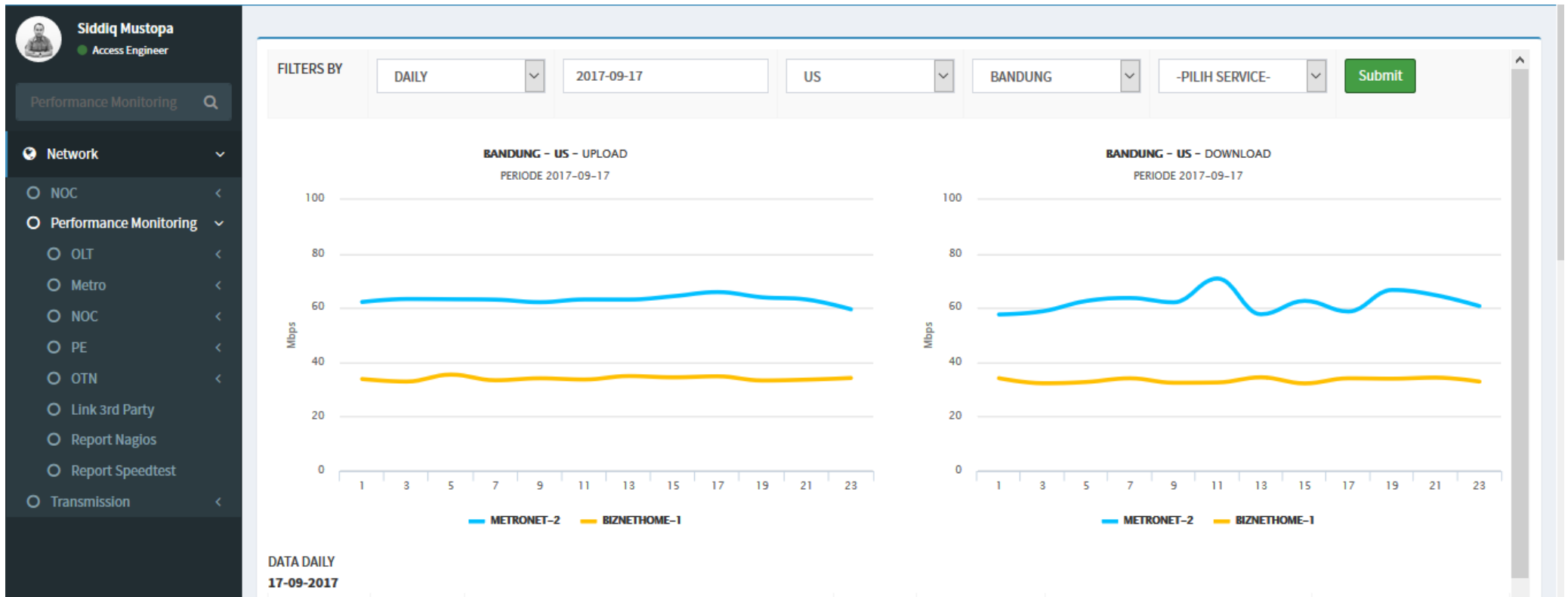
Speed Test Prepaid Weekly - POP Denpasar

Biznet

| FILTERS BY | WEEKLY ▼ | 2017-08-14 | JKT-1 ▼ | DENPASAR ▼ | -PILIH SERVICE- ▼ | Submit |

DENPASAR - JKT-1 - UPLOAD

DENPASAR - JKT-1 - DOWNLOAD

Connecting Indonesia.
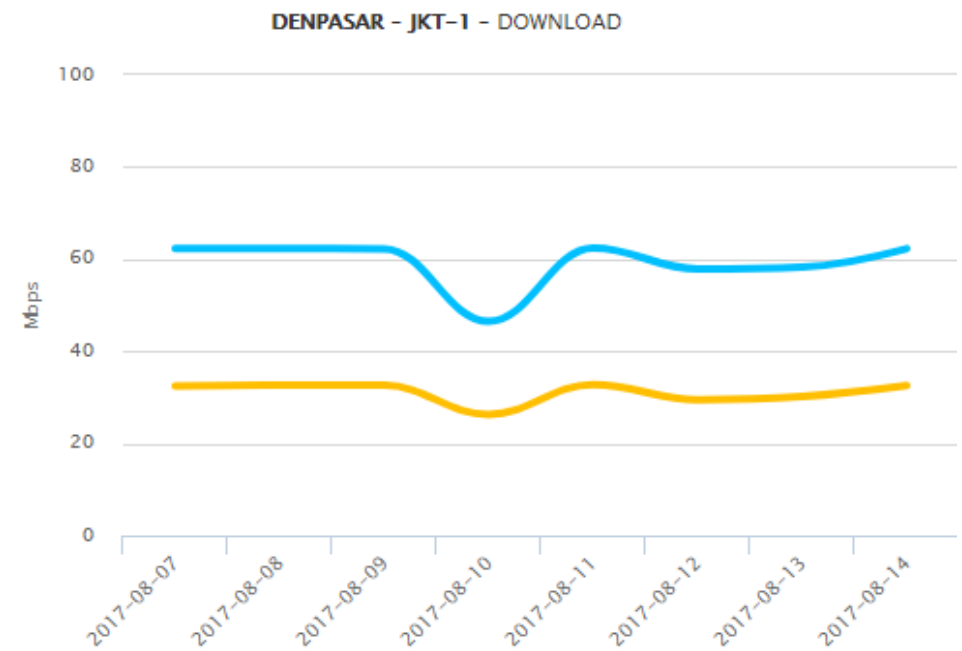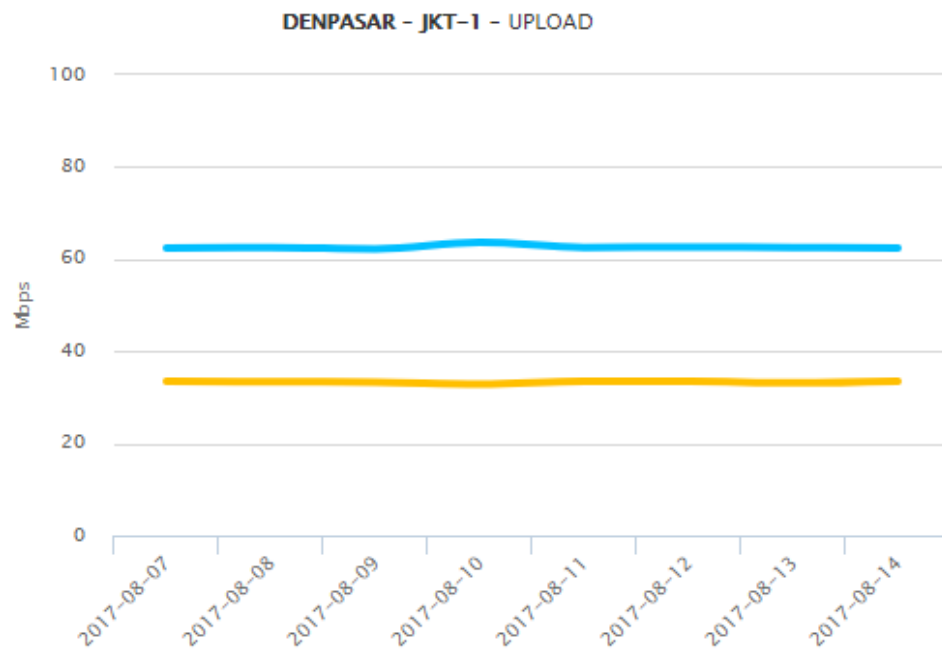
Speed Test Prepaid Weekly ke US - POP Bandung
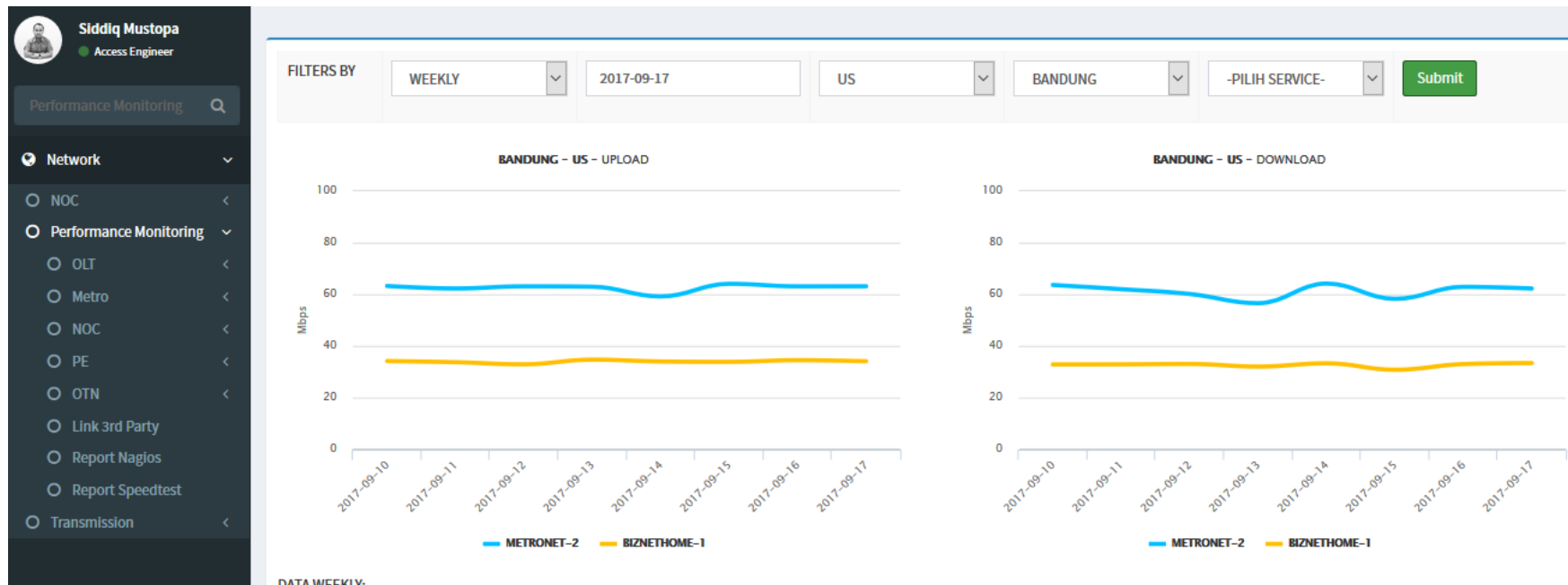
Graph Speedtest Drop
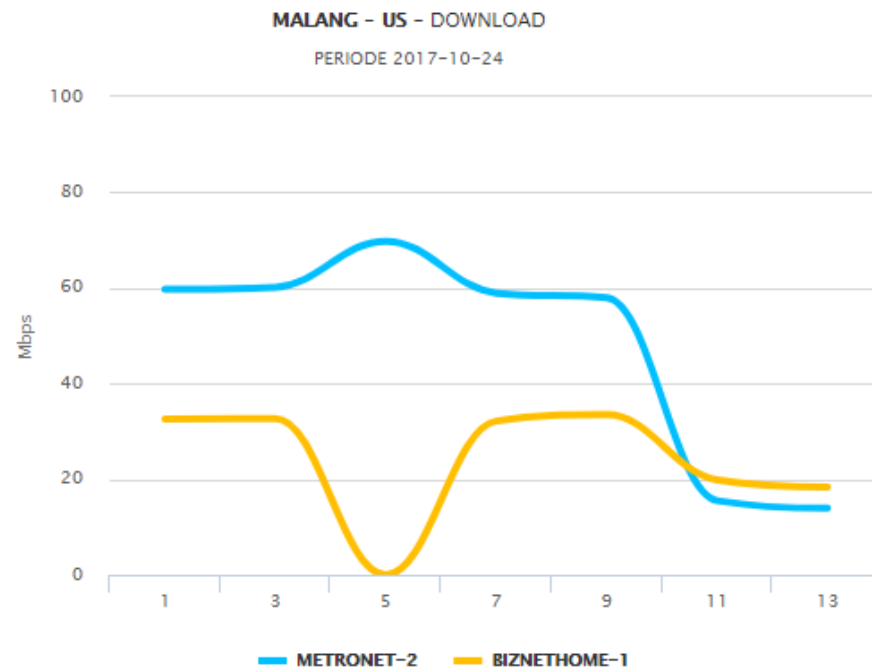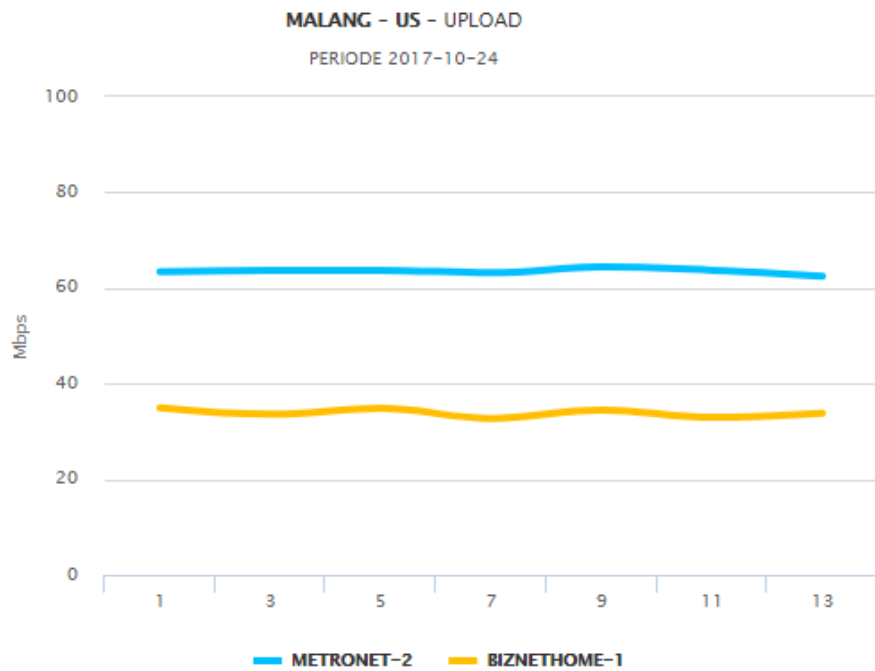
Speed Test Checklist

Engineer di wajibkan untuk mengecek dan mengisi form Action jika ada Btest Spop yang alarm

Form Check List Speed Test

✏ Input Action

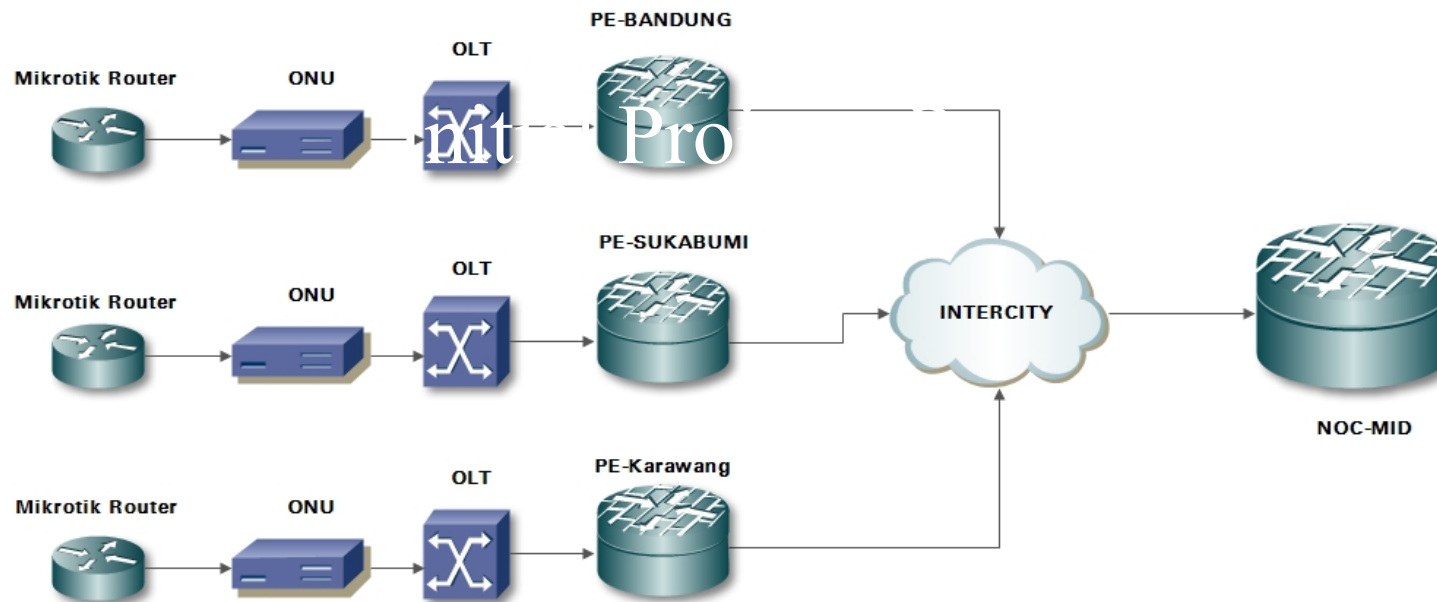|		
Tanggal	🗓	2017-08-15
Engineer	👤	Twk Faisal Fahmi
SPOP	🗄	BATANG
Profile	✦	BIZNETHOME1
Server	☰	JKT-2
Problem		Cut BB segmen Cirebon <> Tegal
Action		Link otomatis reroute via backup
Status	⇄	Open ▾

Save

Project Awal

Jawa Barat

- Server menggunakan mikrotik RB450G, lokasi Jakarta
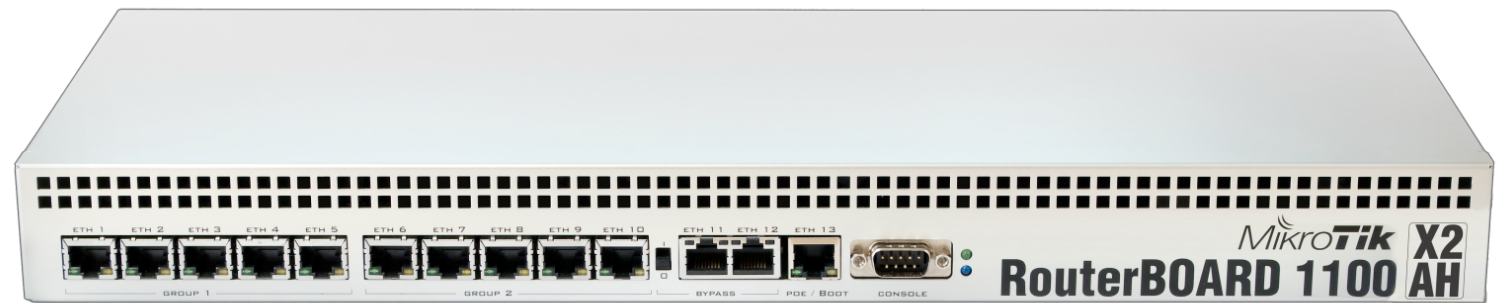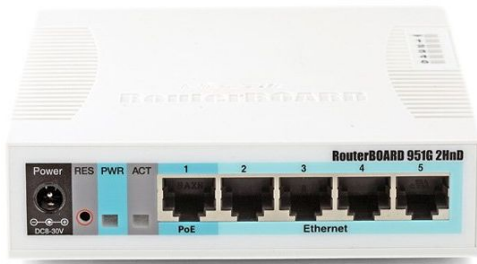- Client menggunakan mikrotik RB951G-2HnD, lokasi (Bandung, Sukabumi dan Karawang)

Jawa , Bali , Sumatera dan Batam

- Server menggunakan mikrotik RB1100AHx2 , lokasi Jakarta, Technovilage, Singapore dan Equinix Palo Alto (US)
- Lebih dari 50 miktrotik test menggunakan mikrotik RB951G-2HnD

Thank You

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