

LAMPIRAN

Lampiran 1

Wawancara dari pihak Pemilik Warnet SweetNet

1. Q : ISP apa yang digunakan?
A : Untuk ISP yang digunakan pada saat ini adalah Telkom Indihome
2. Q : Pernah terjadi gangguan dari pihak ISP?
A : Pernah beberapa kali
3. Q : Ada beberapa komputer di Warnet SweetNet?
A : Ada 14 komputer client, 1 komputer operator, 1 Server diskless.
4. Q : Apa kegunaan dari Server diskless ?
A : Server diskless untuk memberikan layanan sistem operasi terpusat, jadi di komputer klien tidak memakai hardisk di setiap komputer nya.
5. Q : Lokasi SweetNet ada berapa tempat?
A : Ada di Bandar Lampung, Natar dan Lampung Timur
6. Q : Apa permasalahan yang dihadapi Warnet SweetNet ?
A : *bandwidth* Warnet SweetNet besar namun penggunaan *bandwidth* yang belum merata

Lampiran 3

Lampiran data sebelum dan sesudah implementasi Queue Tree dengan metode *Peer Connection Queue (PCQ)*.

Jumlah PC Akses Internet	Metode Bandwidth							
	Tanpa Metode				Dengan PCQ			
	Throughput	Delay	Jitter	Packet Loss	Throughput	Delay	Jitter	Packet Loss
1	94,97%	40	0,421	0,00%	95,52%	40	0,421	0,00%
2	94,97%	40	0,476	0,00%	95,52%	40	0,469	0,00%
3	95,11%	40	0,450	0,00%	95,62%	40	0,406	0,00%
4	95,62%	40	0,397	0,00%	95,42%	40	0,437	0,00%
5	95,07%	40	0,938	0,00%	95,42%	30	0,549	0,00%
6	95,21%	40	0,351	0,00%	95,32%	40	0,446	0,00%
7	95,17%	40	0,449	0,00%	95,19%	30	0,473	0,00%
8	95,11%	40	0,959	0,00%	95,71%	40	0,442	0,00%
9	95,21%	40	0,626	0,00%	95,36%	40	0,583	0,00%
10	95,49%	60	0,490	0,00%	95,81%	40	0,442	0,00%
11	95,21%	40	0,523	0,00%	95,23%	40	0,506	0,00%
12	95,21%	40	0,525	0,00%	95,26%	50	0,535	0,00%
13	95,04%	40	0,483	0,00%	95,20%	40	0,695	0,00%
14	95,00%	40	0,535	0,00%	95,31%	40	0,473	0,00%

Throughput		Delay		Jitter		Packet Loss	
Lama	Baru	Lama	Baru	Lama	Baru	Lama	Baru
94,97%	95,52%	40	40	0,421	0,421	0,00%	0,00%
94,97%	95,52%	40	40	0,476	0,469	0,00%	0,00%
95,11%	95,62%	40	40	0,450	0,406	0,00%	0,00%
95,62%	95,42%	40	40	0,397	0,437	0,00%	0,00%
95,07%	95,42%	40	30	0,938	0,549	0,00%	0,00%
95,21%	95,32%	40	40	0,351	0,446	0,00%	0,00%
95,17%	95,19%	40	30	0,449	0,473	0,00%	0,00%
95,11%	95,71%	40	40	0,959	0,442	0,00%	0,00%
95,21%	95,36%	40	40	0,626	0,583	0,00%	0,00%
95,49%	95,81%	60	40	0,490	0,442	0,00%	0,00%
95,21%	95,23%	40	40	0,523	0,506	0,00%	0,00%
95,21%	95,26%	40	50	0,525	0,535	0,00%	0,00%
95,04%	95,20%	40	40	0,483	0,695	0,00%	0,00%
95,00%	95,31%	40	40	0,535	0,473	0,00%	0,00%

Lampiran 4

Perhitungan *Quality of Service* (QoS) dengan parameter Throughput menggunakan software Microsoft Office Excel.

	Paket Data di terima								
Input ->>	80,9 Mbytes/s		Hasil						
	80900000 bytes/s		95,31664	%					
			Lama Pengelamatan						
	Bandwidth		10 s						
Input ->>	67,9 Mbps								
	67900 Kbps								
			Paket Data Diterima/ Lama Pengamatan						
	THROUGHPUT								
			8090000 bytes/s						
			64720 kbps						

Lampiran 5

Konfigurasi Mikrotik IP Firewall Mangle

```
/ip firewall mangle
```

```
add action=mark-connection chain=prerouting comment="Traffic Game"  
disabled=no dst-port=8890 in-interface=Local \
```

```
    new-connection-mark=mark-game passthrough=yes protocol=tcp src-address-  
list=Local
```

```
add action=mark-connection chain=prerouting disabled=no dst-port=9339 in-  
interface=Local new-connection-mark=mark-game \
```

```
    passthrough=yes protocol=tcp src-address-list=Local
```

```
add action=mark-connection chain=prerouting disabled=no dst-port=7200-7210  
in-interface=Local new-connection-mark=\
```

```
    mark-game passthrough=yes protocol=tcp src-address-list=Local
```

```
add action=mark-connection chain=prerouting disabled=no dst-port=7450-7460  
in-interface=Local new-connection-mark=\
```

```
    mark-game passthrough=yes protocol=tcp src-address-list=Local
```

```
add action=mark-connection chain=prerouting disabled=no dst-port=8000 in-  
interface=Local new-connection-mark=mark-game \
```

```
    passthrough=yes protocol=tcp src-address-list=Local
```

```
add action=mark-connection chain=prerouting disabled=no dst-port=64990-65010  
in-interface=Local new-connection-mark=\
```

```
    mark-game passthrough=yes protocol=tcp src-address-list=Local
```

```
add action=mark-connection chain=prerouting disabled=no dst-port=4000 in-  
interface=Local new-connection-mark=mark-game \
```

```
    passthrough=yes protocol=tcp src-address-list=Local
```

```
add action=mark-connection chain=prerouting disabled=no dst-port=26590-26600  
in-interface=Local new-connection-mark=\
```

```
    mark-game passthrough=yes protocol=tcp src-address-list=Local
```

```
add action=mark-connection chain=prerouting disabled=no dst-port=1800-1810  
in-interface=Local new-connection-mark=\
```

```
    mark-game passthrough=yes protocol=tcp src-address-list=Local
```

```

add action=mark-connection chain=prerouting disabled=no dst-port=1845-1860
in-interface=Local new-connection-mark=\
    mark-game passthrough=yes protocol=udp src-address-list=Local
add action=mark-connection chain=prerouting disabled=no dst-port=51700-51715
in-interface=Local new-connection-mark=\
    mark-game passthrough=yes protocol=tcp src-address-list=Local
add action=mark-connection chain=prerouting disabled=no dst-address-list=nice
dst-port=15490-15510 in-interface=Local \
    new-connection-mark=mark-game passthrough=yes protocol=tcp src-address-
list=Local
add action=mark-connection chain=prerouting disabled=no dst-address-
list=Games in-interface=Local new-connection-mark=\
    mark-game passthrough=yes protocol=tcp src-address-list=Local
add action=mark-connection chain=prerouting disabled=no dst-address-
list=Games in-interface=Local new-connection-mark=\
    mark-game passthrough=yes protocol=udp src-address-list=Local
add action=mark-packet chain=prerouting connection-mark=mark-game
disabled=no in-interface=Local new-packet-mark=\
    Upload-Game passthrough=no
add action=mark-packet chain=postrouting connection-mark=mark-game
disabled=no new-packet-mark=Download-Game \
    out-interface=Local passthrough=no
add action=mark-connection chain=prerouting comment="Port Traffic"
disabled=no dst-port=8291 in-interface=Local \
    new-connection-mark=Mark-port passthrough=yes protocol=tcp src-address-
list=Local
add action=mark-connection chain=prerouting disabled=no dst-port=21 in-
interface=Local new-connection-mark=Mark-port \
    passthrough=yes protocol=tcp src-address-list=Local
add action=mark-connection chain=prerouting disabled=no dst-port=22 in-
interface=Local new-connection-mark=Mark-port \
    passthrough=yes protocol=tcp src-address-list=Local

```

```

add action=mark-connection chain=prerouting disabled=no dst-port=5938 in-
interface=Local new-connection-mark=Mark-port \
    passthrough=yes protocol=tcp src-address-list=Local
add action=mark-packet chain=prerouting connection-mark=Mark-port
disabled=no in-interface=Local new-packet-mark=\
    upload-port passthrough=no
add action=mark-packet chain=postrouting connection-mark=Mark-port
disabled=no new-packet-mark=download-port \
    out-interface=Local passthrough=no
add action=mark-connection chain=prerouting comment="UDP Traffic"
disabled=no dst-port=53 in-interface=Local \
    new-connection-mark=Markcon-udp passthrough=yes protocol=udp src-
address-list=Local
add action=mark-packet chain=prerouting connection-mark=Markcon-udp
disabled=no in-interface=Local new-packet-mark=\
    Upload-UDP passthrough=no
add action=mark-packet chain=postrouting connection-mark=Markcon-udp
disabled=no new-packet-mark=Download-UDP \
    out-interface=Local passthrough=no
add action=mark-connection chain=prerouting comment="ICMP Traffic"
disabled=no in-interface=Local new-connection-mark=\
    Markcon-ICMP passthrough=yes protocol=icmp src-address-list=Local
add action=mark-packet chain=prerouting connection-mark=Markcon-ICMP
disabled=no in-interface=Local new-packet-mark=\
    Up-ICMP passthrough=no
add action=mark-packet chain=postrouting connection-mark=Markcon-ICMP
disabled=no new-packet-mark=Down-ICMP out-interface=\
    Local passthrough=no
add action=mark-connection chain=prerouting comment="IIX Traffic"
disabled=no dst-address-list=nice in-interface=Local \
    new-connection-mark=client-IIX-con passthrough=yes src-address-list=Local

```



```
add action=mark-packet chain=prerouting connection-mark=client-IIX-con
disabled=no in-interface=Local new-packet-mark=\
upload-IIX-con passthrough=no
add action=mark-packet chain=postrouting connection-mark=client-IIX-con
disabled=no new-packet-mark=download-IIX-con \
out-interface=Local passthrough=no
add action=mark-connection chain=prerouting comment="IX Traffic" disabled=no
in-interface=Local new-connection-mark=\
client-IX-con passthrough=yes src-address-list=Local
add action=mark-packet chain=prerouting connection-mark=client-IX-con
disabled=no in-interface=Local new-packet-mark=\
upload-IX-con passthrough=no
add action=mark-packet chain=postrouting connection-mark=client-IX-con
disabled=no new-packet-mark=download-IX-con \
out-interface=Local passthrough=no
```

Lampiran 6

Konfigurasi Mikrotik Queue Tree

```
/queue tree
```

```
add burst-limit=0 burst-threshold=0 burst-time=0s disabled=no limit-at=0 max-  
limit=100M name=ALL-DOWNLOAD packet-mark="" \
```

```
    parent=global-out priority=8
```

```
add burst-limit=0 burst-threshold=0 burst-time=0s disabled=no limit-at=0 max-  
limit=50M name=ALL-UPLOAD packet-mark="" \
```

```
    parent=global-in priority=8
```

```
add burst-limit=0 burst-threshold=0 burst-time=0s disabled=no limit-at=5M max-  
limit=100M name="Traffic DNS Down" \
```

```
    packet-mark=Download-UDP    parent=ALL-DOWNLOAD    priority=2  
queue=pcq_down
```

```
add burst-limit=0 burst-threshold=0 burst-time=0s disabled=no limit-at=5M max-  
limit=100M name="Traffic ICMP Down" \
```

```
    packet-mark=Down-ICMP    parent=ALL-DOWNLOAD    priority=2  
queue=pcq_down
```

```
add burst-limit=0 burst-threshold=0 burst-time=0s disabled=no limit-at=2M max-  
limit=100M name="Traffic IX Down" \
```

```
    packet-mark=download-IX-con    parent=ALL-DOWNLOAD    priority=3  
queue=pcq_down
```

```
add burst-limit=0 burst-threshold=0 burst-time=0s disabled=no limit-at=2M max-  
limit=100M name="Traffic IIX Down" \
```

```
    packet-mark=download-IIX-con    parent=ALL-DOWNLOAD    priority=4  
queue=pcq_down
```

```
add burst-limit=0 burst-threshold=0 burst-time=0s disabled=no limit-at=7M max-  
limit=100M name="Traffic Port Down" \
```

```
    packet-mark=download-port    parent=ALL-DOWNLOAD    priority=2  
queue=pcq_down
```

```
add burst-limit=0 burst-threshold=0 burst-time=0s disabled=no limit-at=5M max-  
limit=100M name="Traffic Game Down" \
```

```
packet-mark=Download-Game parent=ALL-DOWNLOAD priority=1
queue=pcq_down
add burst-limit=0 burst-threshold=0 burst-time=0s disabled=no limit-at=7M max-
limit=50M name="Traffic Game Up" \
packet-mark=Upload-Game parent=ALL-UPLOAD priority=1 queue=pcq_up
add burst-limit=0 burst-threshold=0 burst-time=0s disabled=no limit-at=7M max-
limit=50M name="Traffic Port Up" \
packet-mark=upload-port parent=ALL-UPLOAD priority=2 queue=pcq_up
add burst-limit=0 burst-threshold=0 burst-time=0s disabled=no limit-at=5M max-
limit=50M name="Traffic DNS Up" \
packet-mark=Upload-UDP parent=ALL-UPLOAD priority=2 queue=pcq_up
add burst-limit=0 burst-threshold=0 burst-time=0s disabled=no limit-at=5M max-
limit=50M name="Traffic ICMP Up" \
packet-mark=Up-ICMP parent=ALL-UPLOAD priority=2 queue=pcq_up
add burst-limit=0 burst-threshold=0 burst-time=0s disabled=no limit-at=2M max-
limit=50M name="Traffic IX Up" packet-mark=\
upload-IX-con parent=ALL-UPLOAD priority=3 queue=pcq_up
add burst-limit=0 burst-threshold=0 burst-time=0s disabled=no limit-at=2M max-
limit=50M name="Traffic IIX Up" packet-mark=\
upload-IIX-con parent=ALL-UPLOAD priority=4 queue=pcq_up
```