

with IP/MPLS basis. This network convergence needs Quality of Services (QoS) arrangement and decision on the right LSP MPLS path to get the best performance

Based on research simulation showing that QoS implementation and right decision on LSP path are able to increase network performance and enhance maximum end to end delay from 12,58 second to 0,08 second; and increase the throughput of several location: Banjarmasin 19,46%, Makassar 4,16% and Rungkut 7,92%. But in five year projection, the existing backbone likely unable to receive huge growth (aproximately more than twice) of users of data internet and video streaming. Therefore the backbone capacity must be added by 50 Gbps

Keyword: VoIP, video streaming, IP/MPLS, throughput,

DAFTAR ISI

LEMBAR	
PENGESAHAN	iii
LEMBAR	PERNYATAAN
ORISINALITAS	v
KATA	
PENGANTAR	vii
ABSTRAK	

.....	ix
DAFTAR	
ISI	xi
DAFTAR	
GAMBAR	xv
DAFTAR	
TABEL	xvi
i	
DAFTAR	
SINGKATAN	xix
BAB	I
PENDAHULUAN	1
1.1	Latar
Belakang	1
1.2	Tujuan
Penulisan	2
1.3	Rumusan
Masalah	2
1.4	Batasan
Masalah	3
1.5	
Metodologi	
1.6	Sistematika
Penulisan	4

BAB	II	DASAR
TEORI		7
2.1		OSI
Layer		7
2.2	Internet	Protokol
(IP)		9
2.2.1		Paket
IP		9
2.2.2		
<i>Routing</i>		10
2.2.2.1		
OSPF		10
2.2.2.2		
CSPF.....		11
2.3		
MPLS		
2.3.1		Pengenalan
MPLS		13
2.3.2	Rekayasa	Trafik pada
MPLS		16
2.4	<i>Quality of Service</i>	
(QoS)		17
2.4.1	Parameter	standar
QoS		18
2.4.1.1		

<i>Bandwidth</i>	18
2.4.1.2	
<i>Availability</i>	18
2.4.1.3	
<i>Latency</i>	19
2.4.1.4 <i>Packet Loss</i>	19
2.4.1.5	
<i>Jitter</i>	20
2.4.2 Implementasi QoS pada IP	21
2.4.2.1 <i>Integrated Service</i>	
2.4.2.2 <i>Differentiated Service</i>	
2.4.2.1 Klasifikasi dan <i>Marking</i>	30
2.4.2.2 <i>Metering</i>	33
2.4.2.3	
<i>Shaping</i>	34
2.4.2.4 <i>Policing</i>	37
2.4.2.5. <i>Scheduling</i>	40
2.3.2.5 <i>Dropping</i>	43

2.5	Implementasi	Qos	Pada
MPLS			46
2.5.1	MPLS	dengan	
<i>IntServ</i>			47
2.5.2	MPLS	dengan	
<i>DiffServ</i>			48
2.5.2.1		E-	
LSP			49
2.5.2.2		L-	
LSP			51
BAB	III	MODEL	
SISTEM			53
3.1	Tahapan Penelitian dan	Peancangan	
Simulasi			53
3.1.1		Parameter	
masukan			54
3.1.2		Konfigurasi	
QoS			55
3.1.3		Konfigurasi	
MPLS			57
3.2		Pemodelan	
Jaringan			58
3.2.1		Evaluasi	
Jaringan			58
3.2.2	Pemodelan	Jaringan	pada

Opnet	60
3.2.3 Analisa Hasil Simulasi	62
3.3 Skenario	
BAB IV EVALUASI HASIL SIMULASI	67
4.1 Persiapan Simulasi	67
4.2 Analisa Hasil Simulasi	70
4.2.1 Analisa Hasil Simulasi Tanpa QoS dan MPLS	
4.2.2 Analisa Jalur LSP MPLS	79
4.2.2.1 <i>Delay</i> dan <i>Jitter</i>	
4.2.2.2 Trafik yang Dibangkitkan	
4.2.2.3 <i>Throughput</i>	85
4.2.3 Proyeksi Pertambahan <i>User</i>	89
4.2.3.1 <i>Voice Jitter</i> dan <i>Delay</i>	92
4.2.3.2 Trafik <i>Voice</i> dan Video	94
BAB V KESIMPULAN DAN SARAN	10

3

5.1

Kesimpulan

5.2

Saran

DAFTAR

PUSTAKA