

Lampiran 1 CN Server Basic Configuration [9]

Characteristic	CN Server version 5.0 – Base Configuration					
	1 With ATM	2 With IP	3 With IP+ATM	4 With ATM	5 With IP	6 With IP+ATM
APZ 212 33C 2 GW, 30 RPB-S	INF 903 0042/1	INF 903 0042/2	INF 903 0042/3	N/A	N/A	N/A
APZ 212 50 8 GW, RPB-S + RPB-E	N/A	N/A	N/A	INF 903 0044/1	INF 903 0044/2	INF 903 0044/3
“Reuse of APZ configuration”*	INF 903 0043/1	INF 903 0043/2	INF 903 0043/3	-	-	-
APG40C	1	1	1	1	1	1
IP based signaling Links with redundancy	0	2+2	1+1	0	2+2	1+1
ATM signaling Links with redundancy	2+2	0	1+1	2+2	0	1+1
GCP-H with redundancy	5+1	5+1	5+1	5+1	5+1	5+1
Simultaneous Call Capacity (SCC) MSC in GSM**	9.972	8.864	9.418	37.659	33.447	35.553
Total number of subscribers MSC in GSM**	591.800	525.300	558.550***	2.248.800	1.996.100	2.122.450***
BHCA**	519.970	461.560	490.765***	1.975.890	1.753.910	1.864.900***
Simultaneous Call Capacity (SCC) MSC in WCDMA**	8.455	7.846	8.150***	31.884	29.593	30.738***
Total number of subscribers MSC in WCDMA**	459.600	426.400	443.000***	1.746.600	1.620.400	1.683.500***
BHCA**	420.400	390.040	405.220***	1.597.530	1.482.140	1.539.835***
Total Number of 15A Fuses (HOD)	12	12	12	8	8	12
Total Power Consumption (kW)	0.80	0.81	0.86	1.97	2.00	2.08
Total Number of Cabinets****	2	2	2	2	2	3
Footprint per Base Configuration m ² (with no Optional Cabinets)	0.48	0.48	0.48	0.48	0.48	0.72

*This base configuration is to be used when an APZ 212 30/33, 33C or APZ 212 40 is reused from an existing node. The APZ 212 30/33 must be equipped with IPN to support APG40C.

** The capacity figures in terms of maximum SCC, maximum Number of Subscribers and BHCA are calculated at 95% processor load. The Default Traffic Profile is used and the capacity figures without IN is shown. In case SSF functionality is added (IN included) the capacity figures will be lower.

*** The figures are calculated by taking the standalone capacity for IP and ATM, adding these together and then divided to get the average value for a mix configuration.

**** APZ 212 50 is defined as two cabinets.

Lampiran 2 MGw Basic Configuration [10]

Description		GMP V3.0 Configurations								
		3001	3002	3003	3004	3005*	3024	3026*	3050	3051
Commercial Product Number: INF 903 0051		/1	/2	/3	/4	/8	/5	/9	/7	/6
Estimated Call Connection Capacity [erlang]	100% WCDMA	2 300 (3 000)	3 600 (4 700)	4 600 (6 000)	7 000 (9 400)	13 800 (13 800)	14 000 (18 600)	23 000 (23 000)	500 (700)	1 000 (1 300)
	WCDMA-GSM 30%-70% Mix	3 900 (3 900)	6 100 (6 100)	7 800 (7 800)	12 200 (12 200)	17 600 (17 600)	18 000 (18 000)	23 000 (23 000)	900 (900)	1 700 (1 700)
	100% GSM	3 900 (3 900)	6 100 (6 100)	7 800 (7 800)	12 200 (12 200)	17 600 (17 600)	18 000 (18 000)	22 600 (22 600)	900 (900)	1 700 (1 700)
Estimated Maximum Call Arrival Rate Capacity [Calls/s]	GSM	220 (220)	220 (220)	370 (440)	370 (440)	370 (660)	370 (740)	370 (740)	370 (370)	
	WCDMA	200 (200)	200 (200)	340 (400)	340 (400)	340 (600)	340 (680)	340 (680)	340 (340)	
Node Signaling Capacity	Broadband Signaling Links (ATM)	100							46	
	Narrowband Signaling Links (TDM)	384			512				128	
	MSU/s	2x(18 000 – 24 000) (2x (13 500 – 17 300))							18 000 – 24 000 (13 500 – 17 300)	
AAL2 Switching Capacity [Calls/s]		900								

* Base Configurations 3005 and 3026 will be available for ordering in M-MGw R4.1 during Q2 2007 and in M-MGw R4.2 at M-MGw R4.2 GA.

Lampiran 3 CANDI output MGW SW Licenses

MGW SW Licenses				
M-MGW R3, R4 and R5				
Media stream functions				
	Offered traffic (E)	Needed devices	Suggested license	Conf dev 3051
CSD Modem	0	0	32	32
Inmarsat SC	0	0	0	0
Simultaneous call capacity				
	Offered traffic (E)	Needed capacity	Suggested SCC license	PPD cap 3051
SCC total	791	857	900	1700
Media stream channels				
Media stream channels, derived from SCC			1842	

MGW SW Licenses				
M-MGW R3, R4 and R5				
Media stream functions				
	Offered traffic (E)	Needed devices	Suggested license	Conf dev 3051
CSD Modem	0	0	32	32
Inmarsat SC	0	0	0	0
Simultaneous call capacity				
	Offered traffic (E)	Needed capacity	Suggested SCC license	PPD cap 3051
SCC total	942	1013	1100	1700
Media stream channels				
Media stream channels, derived from SCC			2250	

Lampiran 4 CANDI Output for MSC Server

CPU Output

Node configuration:	MSC-S/HLR/SSF/AUC (Layered Architect	Central processor: APZ 212 50
Application system:	VCDMA R5 / GSM R12 (ETSI)	Loadability 95%
Operator, Country:	CAC-Hutch, Indonesia	Traffic peak margin 20% (= dimensioning factor 1.2)
Date:	*****	Usage load 1%
		Idle load 4%
		Dim. avail. traffic load 75.0%
		Max. avail. traffic load 90%

CP load and memory calculation! Input: 350,000 VLR Subscribers and given traffic model:

No. of	CP Load
350,000 VLR subscriber (GSM)	18.1%
190,100 SSF BHCA + SMS	5.2%
700,000 HLR subscriber (GSM 100%, GPRS 100%)	2.2%
700,000 AUC subscriber (GSM 100%, GPRS 100%)	0.1%
Total traffic load: 25.5%	
Total load: 30.5%	

Total BHCA in the node: 364,620	Display
Total Erlang in the node: 3,700	Signalling
Required Simultaneous Call Capacity: 3,758	Bearers

NOTE: BHCA, Erlang, and SCC do not take any traffic peak margin into account

Please check HW results sheet and the respective product package description for exact HW configuration and possible HW bottlenecks

Lampiran 5 Perhitungan *Benefit Cost Ratio (BCR) Softswitch dan Circuit Switch*

Tabel 1. *Discounted Benefit*

Tahun	Income Related with Core Network	f/p	Discounted Income Related with Core Network
Tahun 1	IDR 3,974,894,073.38	0.926	IDR 3,680,457,475.36
Tahun 2	IDR 13,451,513,270.25	0.857	IDR 11,532,504,518.39
Tahun 3	IDR 21,193,751,860.42	0.794	IDR 16,824,283,534.98
Tahun 4	IDR 25,432,502,232.51	0.735	IDR 18,693,648,372.20
Tahun 5	IDR 27,975,752,455.76	0.681	IDR 19,039,827,045.76
Total discounted Income			IDR 69,770,720,946.70

Tabel 2. *Discounted Cost Softswitch*

	CAPEX	OPEX	f/p	Discounted Cost
Initial	15,732,269,198.52		1	15,732,269,198.52
Tahun ke 1	-	7,314,203,011.83	0.926	6,772,410,196.14
Tahun ke 2	-	7,314,203,011.83	0.857	6,270,750,181.61
Tahun ke 3	1,897,250,097.05	7,314,203,011.83	0.794	7,312,348,464.47
Tahun ke 4	-	9,310,159,042.99	0.735	6,843,244,830.88
Tahun ke 5	-	9,310,159,042.99	0.681	6,336,337,806.37
Total Discounted Cost				49,267,360,678.00

Tabel 3. *Discounted Cost Circuit Switch*

	CAPEX	OPEX	f/p	Discounted Cost
Initial	17,916,424,746.03	-	1	17,916,424,746.03
Tahun ke 1	-	8,208,897,425.40	0.926	7,600,830,949.44
Tahun ke 2	-	8,208,897,425.40	0.857	7,037,806,434.67
Tahun ke 3	5,822,593,885.53	8,208,897,425.40	0.794	11,138,650,192.21
Tahun ke 4	-	10,886,719,929.12	0.735	8,002,064,146.94
Tahun ke 5	-	10,886,719,929.12	0.681	7,409,318,654.57
Total Discounted Cost				59,105,095,123.87

Tabel 4. *Benefit Cost Ratio*

	Softswitch	Circuit Switch
Discounted Benefit	Rp 69,770,720,946.70	Rp 69,770,720,946.70
Discounted Cost	Rp 49,267,360,678.00	Rp 59,105,095,123.87
BCR	1.42	1.18

Lampiran 6 Perhitungan *Net Present Value* (NPV)

Tabel 1. Perhitungan *Net Present Value* (NPV) *Softswitch*

	Revenue	CAPEX	OPEX	f/p	Present Value
Initial		15,732,269,198.52	-	1.00	(15,732,269,198.52)
Tahun ke 1	3,974,894,073.38	-	7,314,203,011.83	0.93	(3,091,952,720.79)
Tahun ke 2	13,451,513,270.25	-	7,314,203,011.83	0.86	5,261,754,336.78
Tahun ke 3	21,193,751,860.42	1,897,250,097.05	7,314,203,011.83	0.79	9,511,935,070.51
Tahun ke 4	25,432,502,232.51	-	9,310,159,042.99	0.74	11,850,403,541.32
Tahun ke 5	27,975,752,455.76	-	9,310,159,042.99	0.68	12,703,489,239.39
Net Present Value (NPV)					20,503,360,268.70

Tabel 2. Perhitungan *Net Present Value* (NPV) *Circuit Switch*

	Revenue	CAPEX	OPEX	f/p	Present Value
Initial		17,916,424,746.03	-	1.00	(17,916,424,746.03)
Tahun ke 1	3,974,894,073.38	-	8,208,897,425.40	0.93	(3,920,373,474.09)
Tahun ke 2	13,451,513,270.25	-	8,208,897,425.40	0.86	4,494,698,083.72
Tahun ke 3	21,193,751,860.42	5,822,593,885.53	8,208,897,425.40	0.79	5,685,633,342.77
Tahun ke 4	25,432,502,232.51	-	10,886,719,929.12	0.74	10,691,584,225.27
Tahun ke 5	27,975,752,455.76	-	10,886,719,929.12	0.68	11,630,508,391.19
Net Present Value (NPV)					10,665,625,822.83

Lampiran 7 Perhitungan *Payback Periode* (PBP)

Tabel 1 Total Biaya

	CAPEX	OPEX	Biaya
Initial	15,732,269,198.52	-	15,732,269,198.52
Tahun ke 1	-	7,314,203,011.83	7,314,203,011.83
Tahun ke 2	-	7,314,203,011.83	7,314,203,011.83
Tahun ke 3	1,897,250,097.05	7,314,203,011.83	9,211,453,108.88
Tahun ke 4	-	9,310,159,042.99	9,310,159,042.99
Tahun ke 5	-	9,310,159,042.99	9,310,159,042.99
Total Biaya			58,192,446,417.05

Tabel 2 Rata – rata Proyeksi Pendapatan setiap Kategori

Tahun ke-	Pendapatan Softwitch		
	Pelanggan Pesimis (IDR)		
	25%	35%	45%
Tahun ke 1	1,472,182,990	2,061,056,186	2,649,929,382
Tahun ke 2	4,982,041,952	6,974,858,733	8,967,675,514
Tahun ke 3	7,849,537,726	10,989,352,817	14,129,167,907
Tahun ke 4	9,419,445,271	13,187,223,380	16,955,001,488
Tahun ke 5	10,361,389,798	14,505,945,718	18,650,501,637
Jumlah	34,084,597,738	47,718,436,833	61,352,275,928
Rata-rata	6,816,919,548	9,543,687,367	12,270,455,186
	Pelanggan Moderate (IDR)		
	25%		
	25%	35%	45%
Tahun ke 1	2,208,274,485	3,091,584,279	3,974,894,073
Tahun ke 2	7,473,062,928	10,462,288,099	13,451,513,270
Tahun ke 3	11,774,306,589	16,484,029,225	21,193,751,860
Tahun ke 4	14,129,167,907	19,780,835,070	25,432,502,233
Tahun ke 5	15,542,084,698	21,758,918,577	27,975,752,456
Jumlah	51,126,896,607	71,577,655,250	92,028,413,892
Rata-rata	10,225,379,321	14,315,531,050	18,405,682,778
	Pelanggan Optimis (IDR)		
	25%		
	25%	35%	45%
Tahun ke 1	2,944,365,980	4,122,112,372	5,299,858,765
Tahun ke 2	9,964,083,904	13,949,717,465	17,935,351,027
Tahun ke 3	15,699,075,452	21,978,705,633	28,258,335,814
Tahun ke 4	18,838,890,543	26,374,446,760	33,910,002,977
Tahun ke 5	20,722,779,597	29,011,891,436	37,301,003,274
Jumlah	68,169,195,476	95,436,873,666	122,704,551,856
Rata-rata	13,633,839,095	19,087,374,733	24,540,910,371

Lampiran 7 Perhitungan *Payback Periode* (PBP).....(sambungan)

Tabel 3 *Payback Periode* (PBP)

Tahun ke-	PBP		
	Pelanggan Pesimis (IDR)		
	25%	35%	45%
Total Cost	58,192,446,417	58,192,446,417	58,192,446,417
Rata-rata Pendapatan	6,816,919,548	9,543,687,367	12,270,455,186
PBP	8.54	6.10	4.74
	Pelanggan Moderate (IDR)		
	25%	35%	45%
	Tahun ke 1	58,192,446,417	58,192,446,417
Tahun ke 2	10,225,379,321	14,315,531,050	18,405,682,778
PBP	5.69	4.06	3.16
	Pelanggan Optimis (IDR)		
	25%	35%	45%
	Tahun ke 1	58,192,446,417	58,192,446,417
Tahun ke 2	13,633,839,095	19,087,374,733	24,540,910,371
PBP	4.27	3.05	2.37

CURICULUM VITAE



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PENDIDIKAN

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PENGALAMAN KERJA

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