

BAB V

KESIMPULAN

Berdasarkan hasil perhitungan dan analisa pada bab sebelumnya, maka dapat diperoleh kesimpulan sebagai berikut:

1. Dari hasil perhitungan volume trafik panggilan *Attempts* tidak mengalami kepadatan trafik pada tiap-tiap BTS, karena berdasarkan perbandingan dengan menggunakan perhitungan tabel erlang disetiap BTS untuk kapasitas trafik BTS cukup untuk mengcover semua panggilan yang masuk.
2. Dari analisis *coverage area* pada masing-masing BTS berdasarkan data lokasi BTS, untuk analisa *coverage area* ini pada CDMA tidak begitu mempunyai pengaruh penting tentang terjadinya *drop call*.
3. Dari hasil perhitungan dengan MS pada posisi *longitude* $110^{\circ}20'39,56''$ LS dan *latitude* $7^{\circ}47'18,40''$ BT didapat nilai perhitungan $\frac{E_c}{I_o}$ sebesar (- 13,686 dB) berada pada tingkatan tidak baik yaitu ($-15 \text{ dB} < E_c / I_o \leq -12 \text{ dB}$).
4. Untuk mengurangi *drop call*, dengan cara menaikkan nilai $\frac{E_c}{I_o}$ dari - 13,686 dB menjadi $> -12 \text{ dB}$ yaitu dengan cara menurunkan besarnya daya pada BTS Kotabaru dan BTS Pugeran sehingga MS yang masuk pada kedua BTS akan turun, maka nilai I_o akan turun.

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LAMPIRAN2
DATA TEKNIK LINK BUDGET

Tabel Data teknis *Link Budget* arah Mundur (dari Samsung)

| | Parameter | Unit | Nilai |
|----|---------------------------------------|-------------|--------------|
| | Pesat informasi | Bps | 9600 |
| | Faktor pemuatan | | 75% |
| a0 | Daya pancar maksimum per kanal trafik | dBm | 23 |
| a1 | Kabel, konektor, dan rugi kombinator | dB | 0 |
| a2 | Gain antena pemancar | dBi | 0 |
| a | Pemancar EIRP per kanal trafik | dBm | 23 |
| b0 | Kerugian badan margin | dB | 2 |
| b1 | Margin interferens | dB | 6 |
| b2 | Pudaran margin log normal | dB | 10 |
| b3 | Rugi penetrasi bangunan | dB | 6 |
| b4 | Gain Soft Handoff | dB | 3 |
| b | Gain dan margin (kanal radio) | dB | 21 |
| c0 | Gain antena penerima | dBi | 18 |
| c1 | Rugi-rugi kabel dan konektor | dB | 3 |
| c | Efek antena BS | dB | 12 |

| | | | |
|----|---------------------------------|--------|------|
| d0 | Kerapatan derau suhu | dBm/Hz | -174 |
| d1 | Derau penerima | dB | 5 |
| d2 | $E_b/(N_o+I_o)$ yang diperlukan | dB | 5,7 |

Lanjutan Tabel

| | | | |
|---|-----------------------|-----|-------|
| d | Sensitivitas penerima | dBm | -119 |
| e | MAPL (a-b+c-d) | dB | 137,4 |

Untuk data teknis CDMA 2000-1x untuk arah maju diperlihatkan pada Tabel 3.4.

Tabel 3.4 Data teknis *Link Budget* arah Maju (dari Samsung)

| | Parameter | Unit | Nilai |
|----|--|------|-------|
| | Pesat informasi | bps | 9600 |
| | Daya Pancar Maksimum | dBm | 43 |
| | Pecahan TCH maksimum dari Total daya, E_c/I_o | dB | -14,6 |
| a0 | Daya pancar maksimum per kanal trafik | dBm | 28,5 |
| a1 | Kabel, konektor, dan rugi kombinator | dB | 3 |
| a2 | Gain antena pemancar | dBi | 18 |
| a | Pancaran EIRP per kanal trafik (a0-a1+a2) | dBm | 40,5 |

| | | | |
|----|---|--------|--------|
| b0 | Kerugian badan margin | dB | 2 |
| b1 | Pudaran margin log normal | dB | 10 |
| b2 | Rugipenetrasi bangunan | dB | 6 |
| b3 | Gain diversiti eksplisit | dB | 0 |
| b | Gain dan Margin kanal radio : (b0+b1+b2-b3) | dB | 18 |
| c0 | Gain antena penerima | dBi | 0 |
| c1 | Rugi-rugi kabel dan konektor | dB | 0 |
| c | Efek antena MS (c0-c1) | dB | 0 |
| d0 | Kerapatan derau suhu | dBm/Hz | -174 |
| d1 | Derau penerima | dB | 6,5 |
| | Geometri yang diperlukan | dB | 6 |
| | Kerapatan interferens penerima | dBm | -167,5 |
| | Total derau efektif + interferens kepadatan | dBm | -164,5 |
| d2 | $E_b/(N_0+I_0)$ yang diperlukan | dB | 9,5 |
| d | Sensitivitas penerima (tanpa interferensi) | dBm | -115,1 |
| e | MAPL (a-b+c-d) | dB | 137,6 |

Untuk perhitungan rugi-rugi lintasan dapat dilihat dari data teknis *link budget* di atas.

Data teknis di atas berdasarkan pada spesifikasi Samsung sebagai penjual proyek CDMA 2000-1x untuk PT Telkom Yogyakarta.

LAMPIRAN3

HASIL PARAMETER KELUARAN DRIVE TEST



Telkom Tlca Network Evaluation Report for Yogyakarta Urban Area



3.1.2.3 MS Tx Power

MS Tx Power reflects the reverse coverage performance.

Table 3-4 Legend of MS Tx Power

| MS Tx power [dBm] | Legend color | Description |
|--------------------------|--------------|---|
| $Tx\ Power > 23$ | Black | The coverage is very poor and can hardly be guaranteed. |
| $13 < Tx\ Power \leq 23$ | Dark Grey | The coverage is relatively poor, and the outdoor coverage can not be guaranteed. |
| $5 < Tx\ Power \leq 13$ | Gold | The coverage quality is common, and the indoor coverage can not be guaranteed. |
| $-3 < Tx\ Power \leq 5$ | Red | The coverage is relatively good, and the indoor coverage can generally be guaranteed. |
| $Tx\ Power \leq -3$ | Blue | The coverage quality is good. |

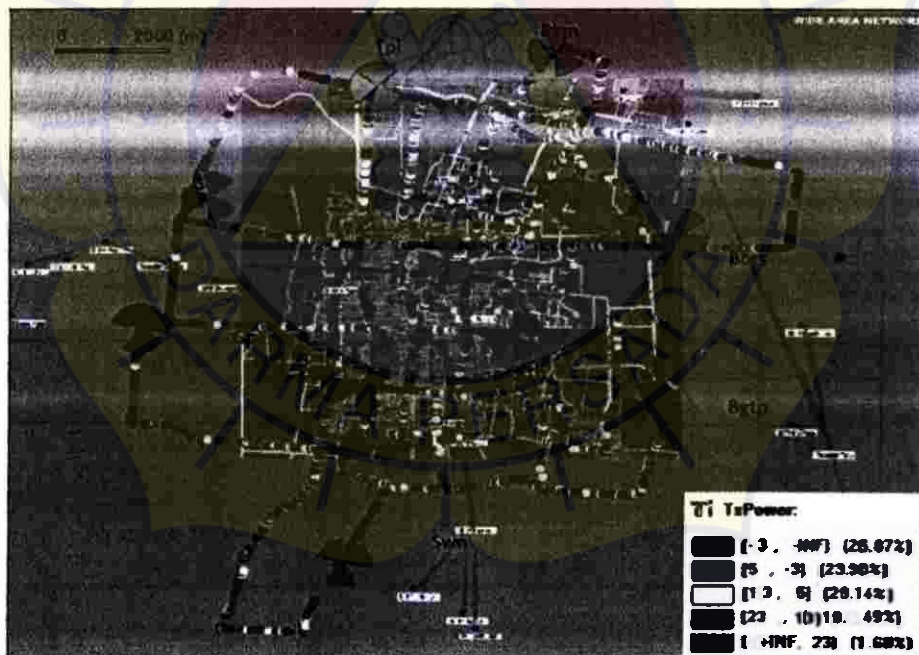


Figure 3-5 MS Tx Power of Network in DT

3.1.2.2 Forward Ec/Io

Ec/Io indicates the quality of the forward signal. This parameter has great influences on both of voice and data services.

Table 3-3 Legend of Forward Ec/Io

| Forward Ec/Io (dB) | Legend Color | Description |
|------------------------|--------------|--|
| $Ec/Io \leq -15$ | Black | The coverage is very poor and can hardly be achieved. |
| $-15 < Ec/Io \leq -12$ | Dark Green | The coverage is relatively poor. The rate of data service is low, and the quality of the conversation can not be guaranteed. |
| $-12 < Ec/Io \leq -10$ | Green | The coverage of voice service is common, and the rate of data service can not be guaranteed. |
| $-10 < Ec/Io \leq -8$ | Light Green | The coverage of the voice service is relatively good, and the data service can generally reach a relatively higher rate. |
| $Ec/Io > -8$ | Blue | The coverage is good. |

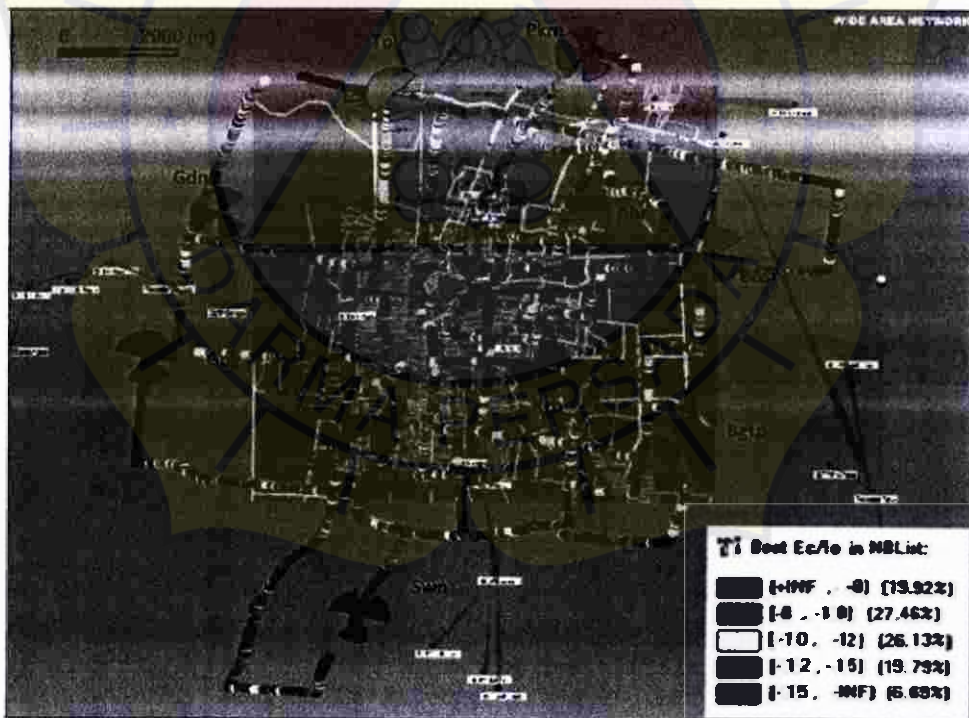


Table 3-2 Legends of Forward Receiving Power

| Forward Receiving Power Rx* dBm* * | Legend Color | Description |
|---------------------------------------|--------------|--|
| Rx Power ≤ -105 | Black | The coverage is very poor and the service areas can not get coverage. |
| -105 < Rx Power ≤ -95 | Yellow | The coverage is poor and can not guarantee the outdoor coverage. |
| -95 < Rx Power ≤ -85 | Golden | The outdoor coverage is common and poor indoor coverage. |
| -85 < Rx Power ≤ -75 | Green | The coverage is relatively good and can guarantee the indoor coverage generally. |
| Rx Power > -75 | Blue | The coverage is good. |

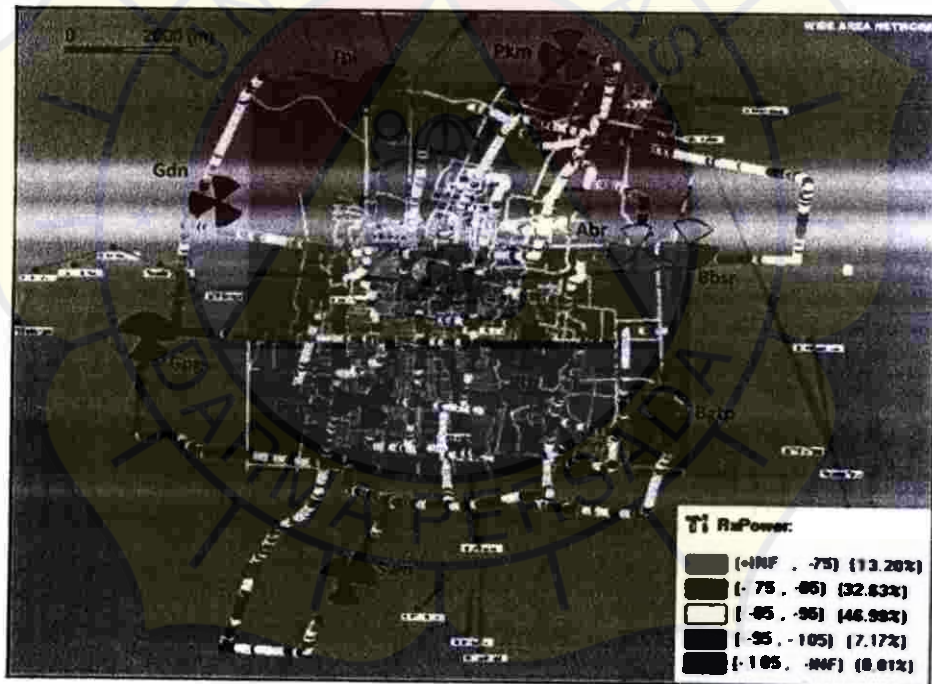
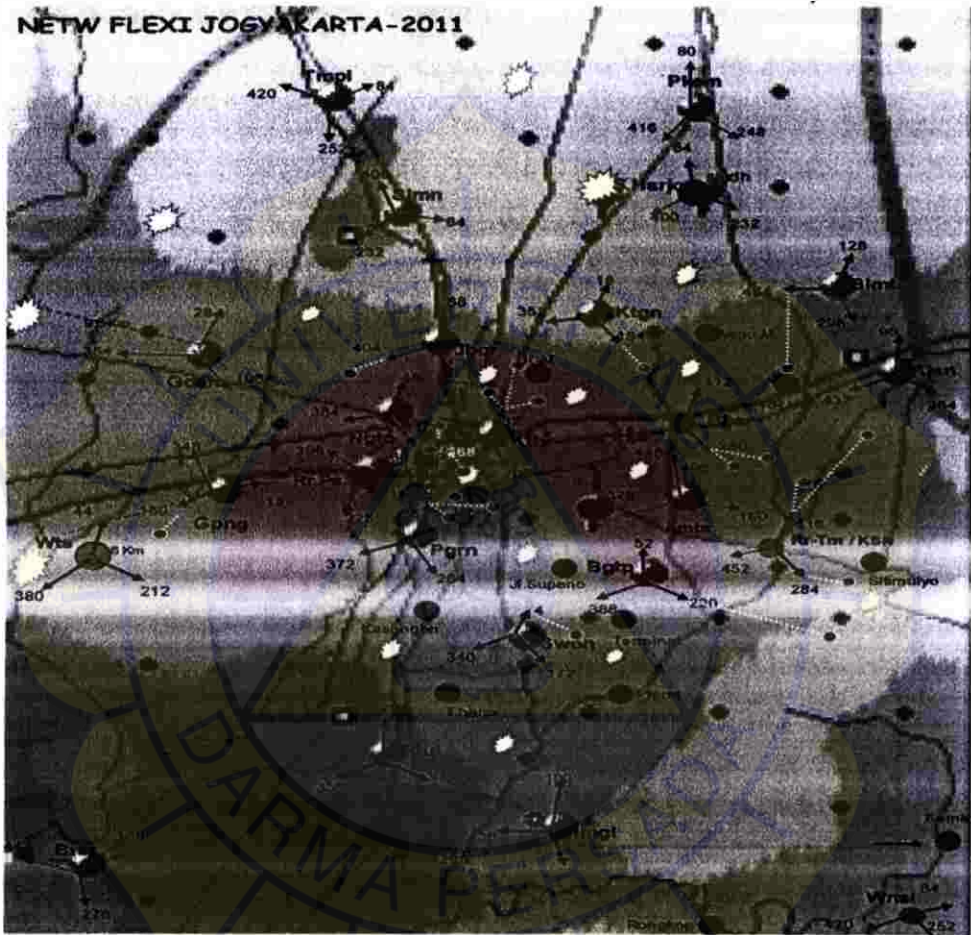


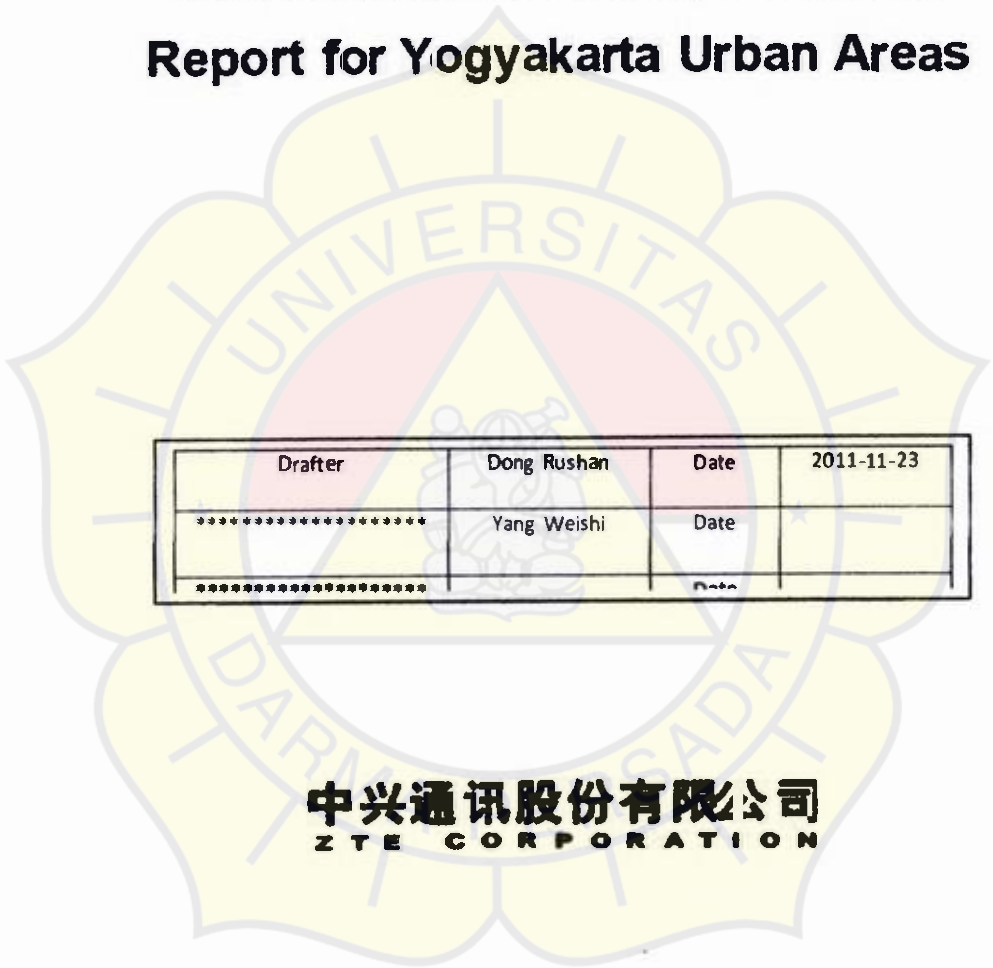
Figure 3-1 Forward Receiving Power of Network in DT

All Locations BTS





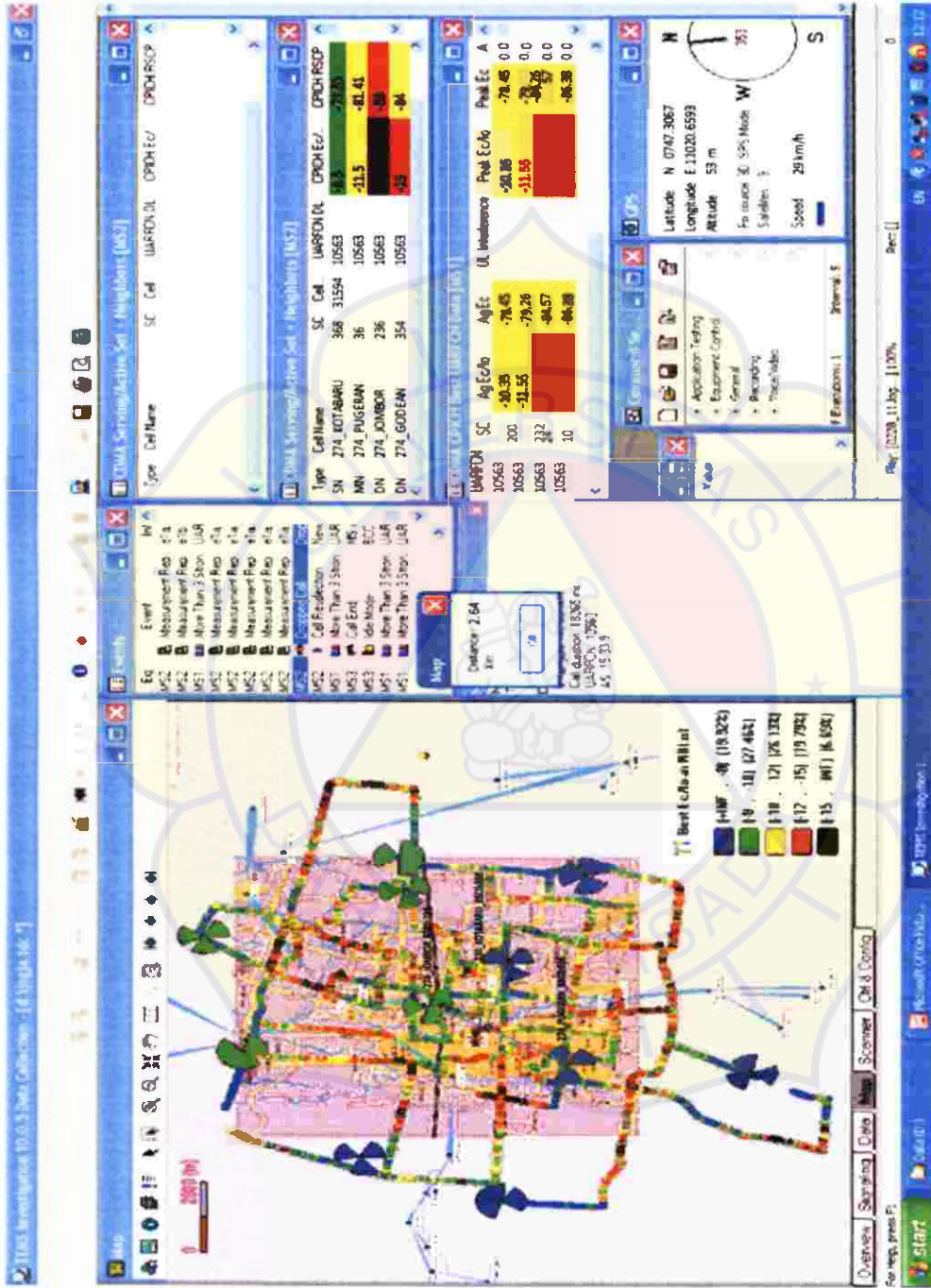
Telkom Flexi Network Evaluation Report for Yogyakarta Urban Areas



| | | | |
|---------|-------------|------|------------|
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LAMPIRAN 4
 TITIK TERJADINYA DROP CALL DAERAH YOGYAKARTA



LAMPIRAN 6

DATA TRAFIK PERFORMA BULAN NOVEMBER



| NO | ANALISIS | DRIVE | ANALISIS | DRIVE | ANALISIS | DRIVE | ANALISIS | DRIVE | ANALISIS | DRIVE | ANALISIS | DRIVE | ANALISIS | DRIVE | ANALISIS | DRIVE | ANALISIS | DRIVE | ANALISIS | DRIVE | ANALISIS | DRIVE | ANALISIS | DRIVE | ANALISIS | DRIVE | ANALISIS | DRIVE | ANALISIS | DRIVE | ANALISIS | DRIVE | ANALISIS | DRIVE | ANALISIS | DRIVE | ANALISIS | DRIVE | ANALISIS | DRIVE | ANALISIS | DRIVE | ANALISIS | DRIVE | ANALISIS | DRIVE | ANALISIS | DRIVE |
|----|----------|--------|----------|-------|----------|-------|--------------|----------|----------|-------|----------|-------|----------|---------|----------|-------|----------|-------|----------|-------|----------|-------|----------|-------|----------|-------|----------|-------|----------|-------|----------|-------|----------|-------|----------|-------|----------|-------|----------|-------|----------|-------|----------|-------|----------|-------|----------|-------|
| 30 | A | SURABV | 4 | ZM | 1 | AM | KERTUNG | 222833 | 107049 | 46.3 | 2884 | 14700 | 77.84 | 928429 | 893710 | 95.44 | 24298 | 1.05 | 18777 | 0.95 | 1.37 | 37.41 | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 31 | A | SURABV | 4 | ZM | 1 | AM | BUNTIL | 1195910 | 518238 | 43.0 | 8259 | 6604 | 79 | 523259 | 500138 | 97.03 | 14483 | 0.84 | 7830 | 0.76 | 1.36 | 32.57 | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 32 | A | SURABV | 4 | ZM | 1 | AM | HULSEH | 817730 | 266640 | 43.8 | 5796 | 4884 | 80.81 | 200398 | 212739 | 93.75 | 22633 | 2.06 | 12015 | 1.89 | 1.33 | 28.5 | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 33 | A | SURABV | 4 | ZM | 1 | AM | SEMAM | 427347 | 207237 | 41.76 | 7189 | 5915 | 82.28 | 457815 | 436606 | 95.41 | 25246 | 1.81 | 13510 | 1.63 | 1.35 | 33.66 | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 34 | A | SURABV | 4 | ZM | 1 | AM | BONGRE | 1010390 | 304707 | 30.08 | 6033 | 4820 | 80.36 | 463207 | 427293 | 92.31 | 19306 | 1.29 | 9183 | 1.12 | 1.31 | 29.98 | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 35 | A | SURABV | 4 | ZM | 1 | AM | SEMAM | 2798889 | 1202311 | 46.73 | 19521 | 14782 | 75.82 | 1081320 | 997103 | 92.19 | 38384 | 1.03 | 20740 | 0.9 | 1.38 | 37.73 | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 36 | A | SURABV | 4 | ZM | 1 | AM | NOCOTR | 814704 | 200860 | 47.8 | 7776 | 6122 | 78.73 | 307089 | 338873 | 94.9 | 18175 | 1.54 | 10295 | 1.37 | 1.37 | 42.83 | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 37 | A | SURABV | 4 | ZM | 1 | AM | SELONG | 2188703 | 1013425 | 47.94 | 14548 | 11512 | 79.12 | 794353 | 727513 | 91.98 | 30940 | 1.07 | 17828 | 1.01 | 1.36 | 37.89 | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 38 | A | SURABV | 4 | ZM | 1 | AM | RUMBA | 1980328 | 904055 | 45.9 | 15660 | 12283 | 77.06 | 815982 | 761197 | 93.32 | 48802 | 1.73 | 25860 | 1.94 | 1.36 | 37.23 | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 39 | A | SURABV | 4 | ZM | 1 | AM | SJAMRO | 1222110 | 582988 | 48.07 | 11241 | 9129 | 81.4 | 438171 | 439909 | 98.08 | 20399 | 1.10 | 11238 | 1.13 | 1.37 | 36.18 | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 40 | A | SURABV | 4 | ZM | 1 | AM | SANANDK | 912710 | 353208 | 38.6 | 9738 | 5325 | 55.06 | 307247 | 379881 | 94.62 | 14629 | 1.12 | 7011 | 0.95 | 1.22 | 28.99 | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 41 | A | SURABV | 4 | ZM | 1 | AM | WATRES | 604439 | 259471 | 42.8 | 5505 | 4238 | 86.45 | 312313 | 300277 | 96.18 | 9837 | 1.03 | 4270 | 0.76 | 1.31 | 35.61 | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 42 | YA | SURABA | 4 | ZM | 1 | ARI | WONOS 106189 | 3 474726 | 44.71 | 7508 | 6239 | 83.1 | 879610 | 851853 | 96.95 | 14828 | 0.76 | 6996 | 0.52 | 1.29 | 34.54 | | | | | | | | | | | | | | | | | | | | | | | | | | | |

LAMPIRAN 7

DATA TRAFIK PERFORMA UNTUK SATU HARI BULAN NOVENBER PADA A1BSC

| No | STasiun | Desain | R | M | Bandwidth | THRU | RTS | RTS | RTS | RTS | RTS | RTS | RTS | RTS | RTS | RTS | RTS | RTS | RTS | RTS | RTS |
|----|---------|--------|---|---|-----------|------|------|-----|-----|-----|-----|------|------|-----|------|-----|-----|-----|-----|-----|-----|
| 1 | SIAMBA | DESIGN | R | 1 | 24-HOUR | 9134 | 4195 | 474 | 580 | 137 | 678 | 3078 | 3584 | 912 | 3171 | 11 | 747 | 158 | 179 | 478 | |
| 2 | SIAMBA | DESIGN | R | 1 | 24-HOUR | 9134 | 4195 | 474 | 580 | 137 | 678 | 3078 | 3584 | 912 | 3171 | 11 | 747 | 158 | 179 | 478 | |
| 3 | SIAMBA | DESIGN | R | 1 | 24-HOUR | 9134 | 4195 | 474 | 580 | 137 | 678 | 3078 | 3584 | 912 | 3171 | 11 | 747 | 158 | 179 | 478 | |
| 4 | SIAMBA | DESIGN | R | 1 | 24-HOUR | 9134 | 4195 | 474 | 580 | 137 | 678 | 3078 | 3584 | 912 | 3171 | 11 | 747 | 158 | 179 | 478 | |
| 5 | SIAMBA | DESIGN | R | 1 | 24-HOUR | 9134 | 4195 | 474 | 580 | 137 | 678 | 3078 | 3584 | 912 | 3171 | 11 | 747 | 158 | 179 | 478 | |
| 6 | SIAMBA | DESIGN | R | 1 | 24-HOUR | 9134 | 4195 | 474 | 580 | 137 | 678 | 3078 | 3584 | 912 | 3171 | 11 | 747 | 158 | 179 | 478 | |
| 7 | SIAMBA | DESIGN | R | 1 | 24-HOUR | 9134 | 4195 | 474 | 580 | 137 | 678 | 3078 | 3584 | 912 | 3171 | 11 | 747 | 158 | 179 | 478 | |
| 8 | SIAMBA | DESIGN | R | 1 | 24-HOUR | 9134 | 4195 | 474 | 580 | 137 | 678 | 3078 | 3584 | 912 | 3171 | 11 | 747 | 158 | 179 | 478 | |
| 9 | SIAMBA | DESIGN | R | 1 | 24-HOUR | 9134 | 4195 | 474 | 580 | 137 | 678 | 3078 | 3584 | 912 | 3171 | 11 | 747 | 158 | 179 | 478 | |
| 10 | SIAMBA | DESIGN | R | 1 | 24-HOUR | 9134 | 4195 | 474 | 580 | 137 | 678 | 3078 | 3584 | 912 | 3171 | 11 | 747 | 158 | 179 | 478 | |
| 11 | SIAMBA | DESIGN | R | 1 | 24-HOUR | 9134 | 4195 | 474 | 580 | 137 | 678 | 3078 | 3584 | 912 | 3171 | 11 | 747 | 158 | 179 | 478 | |
| 12 | SIAMBA | DESIGN | R | 1 | 24-HOUR | 9134 | 4195 | 474 | 580 | 137 | 678 | 3078 | 3584 | 912 | 3171 | 11 | 747 | 158 | 179 | 478 | |
| 13 | SIAMBA | DESIGN | R | 1 | 24-HOUR | 9134 | 4195 | 474 | 580 | 137 | 678 | 3078 | 3584 | 912 | 3171 | 11 | 747 | 158 | 179 | 478 | |

