Africa: Regional Insights

AFPIF 2016
Over a billion people - of which 40% are reachable by fibre

Mobile users set to double in the next 5 Years reaching 60% penetration

Improved Metro Connectivity averaging at 100 Mbps in key hubs: Johannesburg, Cape Town, Durban, Lagos, Nairobi, Accra

In Larger economies two-thirds of businesses with 50+ staff have access to broadband

<table>
<thead>
<tr>
<th></th>
<th>TIER 1 TELECOs</th>
<th>CARRIER NEUTRAL DATA CENTRES</th>
<th>FIBRE / CABLE COMPANIES</th>
<th>IT / CLOUD SERVICE PROVIDER / ISPs</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>ESTIMATED NUMBER OF DCs</strong></td>
<td>≈50+</td>
<td>≈7</td>
<td>≈5</td>
<td>≈70+</td>
</tr>
<tr>
<td><strong>ESTIMATED SHARE OF DC WHITE SPACE</strong></td>
<td>47%</td>
<td>≈20%</td>
<td>≈7%</td>
<td>≈26%</td>
</tr>
<tr>
<td><strong>EXAMPLES</strong></td>
<td>MTN, Telkom, Vodacom</td>
<td>Teraco, Rack Centre, Kooba</td>
<td>MainOne, Liquid Telecom, Broadbased</td>
<td>Internet Solutions, BCX, T-Systems, CWG</td>
</tr>
</tbody>
</table>
## Internet Usage Statistics for Africa

* (Africa Internet Usage and 2015 Population Stats)

<table>
<thead>
<tr>
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</tr>
</thead>
<tbody>
<tr>
<td>Total for Africa</td>
<td>1,158,355,663</td>
<td>16.0 %</td>
<td>330,965,359</td>
<td>28.6 %</td>
<td>9.8 %</td>
<td>124,568,500</td>
</tr>
<tr>
<td>Rest of World</td>
<td>6,101,546,580</td>
<td>84.0 %</td>
<td>3,035,295,797</td>
<td>49.7 %</td>
<td>90.2 %</td>
<td>1,390,635,650</td>
</tr>
<tr>
<td>WORLD TOTAL</td>
<td>7,259,902,243</td>
<td>100.0 %</td>
<td>3,366,261,156</td>
<td>46.4 %</td>
<td>100.0 %</td>
<td>1,515,204,150</td>
</tr>
</tbody>
</table>

NOTES: (1) Africa Population data are 2015 mid-year estimates. (2) Africa Internet Usage Statistics in this table are for November 30, 2015. (3) The Facebook subscriber data are for Nov 15, 2015, the last available from FB. (4) CLICK on each region or country name for details for each individual location. (5) For methodology, help and definitions please see the site surfing guide. (6) Population estimates are based mainly on figures from the U.S. Census Bureau and local sources. (7) The Internet usage numbers come mainly from data published by WWW, ITU, the Nielsen Company, Facebook, and other trustworthy sources. (8) Data from this table may be cited, giving the due credit and establishing an active link back to Internet World Stats. Copyright © 2016, Miniwatts Marketing Group. All rights reserved worldwide.
Internet Penetration in Africa
November 30, 2015

- Africa: 28.6%
- World Avg.: 46.4%
- Rest of World: 49.7%

Source: Internet World Stats - www.internetworldstats.com/stats1.htm
330,965,359 estimated Internet users in Africa for Nov 30, 2015
3,366,260,056 Internet users in the World on Nov 30, 2015
Copyright © 2015, Miniwatts Marketing Group
Africa – Small Market BIG Opportunities

Africa Top 10 Internet Countries
November 2015

- Nigeria: 92.7 million users
- Egypt: 48.3 million users
- Kenya: 31.9 million users
- South Africa: 26.8 million users
- Morocco: 20.2 million users
- Sudan: 9.3 million users
- Uganda: 8.5 million users
- Tanzania: 7.6 million users
- Argelia: 7.2 million users
- Tunisia: 5.4 million users

Source: Internet World Stats - www.internetworldstats.com/stats1.htm
330,965,359 Internet Users in Africa estimated for November 30, 2015
Copyright © 2015, Miniwatts Marketing Group
And Changing Quickly... In the News

Winston won’t win this time:

• South Africa’s Largest ISP, Telkom, now known as Openserve (AS5713) has finally opened it’s doors and ready to peer with you as of today!!

• Let me know if you need an introduction

More Cables:

• Finally the cables system between Angola and Brazil have commenced!
• Angola Cables and NEC have paired up to build 40Tbps of capacity which is expected to be ready to play with mid 2018
Africa a Young IXP market

- 54 countries in Africa (AU)
- 34 IXPs in 26 countries
- Oldest IXP: 1996
- Newest IXP: 2016 (Gabon-IX)
- IXP Traffic: 160 Gbps+
- Largest: 90 Gbps (South Africa)
- AF-IX Association 3 years old

http://www.af-ix.net/
Varied commercial models per country

- Low capacity ports still available at 90% of exchanges;
- Port fees vary and can be as high as Europe with less value
- Can still get away with high port fees due to high transit costs... Good for the internet growth in Africa?

<table>
<thead>
<tr>
<th>Fees</th>
<th>IXP A USD</th>
<th>IXP B USD</th>
<th>IXP C USD</th>
<th>IXP D</th>
<th>Average</th>
</tr>
</thead>
<tbody>
<tr>
<td>Membership</td>
<td>1250</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>312,5</td>
</tr>
<tr>
<td>10Mbps Port</td>
<td>100</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>25</td>
</tr>
<tr>
<td>100Mbps Port</td>
<td>250</td>
<td>220</td>
<td>0</td>
<td>385</td>
<td>213,75</td>
</tr>
<tr>
<td>1Gbps Port</td>
<td>750</td>
<td>670</td>
<td>0</td>
<td>500</td>
<td>480</td>
</tr>
<tr>
<td>10Gbps</td>
<td>2500</td>
<td>832</td>
<td>0</td>
<td>655</td>
<td>996,75</td>
</tr>
</tbody>
</table>
African Hubs – a Modern Marketplace

The world’s 2\textsuperscript{nd} fastest growing economic region and its growing population

- Southern Africa: 165mil
- Eastern Africa: 300mil
- Northern Africa: 226mil
- Central Africa: 155mil
- Western Africa: 360mil

SADC Example of a Growing Community:
Interconnection: Up and to the right!

2011 – 2015 CAGR: 44.5%

2011:
- 879

2012:
- 1302

2013:
- 1652

2014:
- 3625

2015:
- 5528

African Hubs – a Modern Marketplace
African Internet – Free vs Restricted

- **Restricted**: Sudan and Ethiopia along with Saudi Arabia, Iran, China, Cuba, and Belarus are the most censored countries for internet users.
  - Sudan: 62/100
  - Ethiopia: 79/100

- **Partly Free**: Nigeria, Angola, Zimbabwe, Malawi, Uganda, Rwanda, Egypt, Libya, Tunisia, and Morocco are as regulated as Brazil, Russia, India, and Mexico.
  - Nigeria: 31/100
  - Zambia: 54/100
  - Zimbabwe: 26/100

- **Free**: South Africa and Kenya are with Australia, Japan, Argentina, UK, France, Germany, Italy, and the USA as the freest countries for internet users.
  - South Africa: 26/100
  - Kenya: 28/100
Mobile Penetration driving Growth

Global IP traffic (EB per month) – CAGR 2013-18

- Middle East and Africa: 38%
- Central and Eastern Europe: 23%
- Asia Pacific: 21%
- Latin America: 21%
- North America: 20%
- Western Europe: 18%

Mobile Penetration by Region

- SSA: 64% (2013), 79% (2018)
- Emerging Europe: 131% (2013), 141% (2018)
- Asia Pacific: 83% (2013), 103% (2018)
- Latin America: 104% (2013), 119% (2018)
- MENA: 114% (2013), 126% (2018)
- Western Europe: 131% (2013), 136% (2018)
Africa – Highly concentrated

3 COUNTRIES: KENYA, NIGERIA & SOUTH AFRICA REPRESENT 95% OF TOTAL WHITE SPACE IN AFRICA

A mapping of sub-Saharan Africa’s data centre white space capacity (sqm) - 2015

KENYA ≈ 2000sqm
NIGERIA ≈ 6000sqm
SOUTH AFRICA ≈ 40 000sqm
# Global Comparison

<table>
<thead>
<tr>
<th></th>
<th>Digital Realty</th>
<th>Equinix</th>
<th>Telehouse</th>
<th>Interxion</th>
<th>Telegility Group</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>DC Facilities</strong></td>
<td>131 DC’s</td>
<td>105 DC’s</td>
<td>44 DC’s</td>
<td>39 DC’s</td>
<td>40 DC’s</td>
</tr>
<tr>
<td><strong>IT Power in MW</strong></td>
<td>800 MW</td>
<td>370 MW</td>
<td>400 MW</td>
<td>109 MW</td>
<td>113 MW</td>
</tr>
<tr>
<td><strong>White Space SQM</strong></td>
<td>611 000</td>
<td>323 000</td>
<td>370 000</td>
<td>95 000</td>
<td>120 000</td>
</tr>
</tbody>
</table>

*Source: Company Webpages*
What are the Next Hotpots?

- Tanzania
- Côte d’Ivoire
- Ghana
- Nigeria
Growth Opportunities

Market Contribution to Africa Colocation Supply – Sq. m - 2015E

Africa Colocation White Space – Five Year Projections*

*Estimated space immediately available for leasing (not shell capacity)

Africa New Data Centers – Sample Projects & Plans – Indicative Only

<table>
<thead>
<tr>
<th>COUNTRY</th>
<th>COMPANY</th>
<th>PROJECT</th>
<th>TIMING</th>
</tr>
</thead>
<tbody>
<tr>
<td>Kenya</td>
<td>Kooba</td>
<td>New data center planned for Nairobi/Limuru</td>
<td>2016</td>
</tr>
<tr>
<td>Tanzania</td>
<td>Kooba</td>
<td>Dar es Salam</td>
<td>2016-17</td>
</tr>
<tr>
<td>Nigeria</td>
<td>Globacom</td>
<td>Ibadan</td>
<td>NA</td>
</tr>
<tr>
<td>Nigeria</td>
<td>MainOne</td>
<td>Sagamu</td>
<td>NA</td>
</tr>
<tr>
<td>Mozambique</td>
<td>Vaninga</td>
<td>Beira, Pemba/Tete</td>
<td>2016</td>
</tr>
</tbody>
</table>
## The Economic Drive

<table>
<thead>
<tr>
<th>CITY</th>
<th>ESTIMATED GDP ($ bn)</th>
<th># OF MULTITENANT DC WITH &gt;250 SQM WHITE SPACE</th>
</tr>
</thead>
<tbody>
<tr>
<td>Johannesburg</td>
<td>141</td>
<td>&gt;10</td>
</tr>
<tr>
<td>Lagos</td>
<td>120</td>
<td>&gt;5</td>
</tr>
<tr>
<td>Cape Town</td>
<td>70</td>
<td>&gt;5</td>
</tr>
<tr>
<td>Durban</td>
<td>60</td>
<td>&gt;3</td>
</tr>
<tr>
<td>Ibadan</td>
<td>25</td>
<td>0</td>
</tr>
<tr>
<td>Nairobi</td>
<td>28</td>
<td>1</td>
</tr>
<tr>
<td>Dar es Salam</td>
<td>5.60</td>
<td>0</td>
</tr>
<tr>
<td>Abidjan</td>
<td>9</td>
<td>0</td>
</tr>
<tr>
<td>Kano</td>
<td>30</td>
<td>0</td>
</tr>
<tr>
<td>Kinshasa</td>
<td>7.5</td>
<td>N/A**</td>
</tr>
<tr>
<td>Accra</td>
<td>5</td>
<td>N/A**</td>
</tr>
</tbody>
</table>

***Sources: TZS, NBS, Stats SA, World Bank, KNBS, Departement des Statistiques de Cote-d’Ivoire***
### Summary: Benchmarking

<table>
<thead>
<tr>
<th>Enterprise Addressable Market Size/GDP</th>
<th>Key Verticals</th>
<th>Tech Startup Ecosystem</th>
<th>Electric Power Availability</th>
<th>Availability of Affordable Metro &amp; DLD Fiber</th>
<th>Availability of Affordable International Fiber</th>
</tr>
</thead>
<tbody>
<tr>
<td>Johannesburg</td>
<td>Financial Services, Tourism, Mining, Media, Tech</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Lagos</td>
<td>Financial Services, Manufacturing, Tech, Media</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Cape Town</td>
<td>Financial Services, Tourism, Tech, Media</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Nairobi</td>
<td>Financial Services, Tourism, Media</td>
<td></td>
<td></td>
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<td></td>
</tr>
<tr>
<td>Abidjan</td>
<td>Financial Services, Tech</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Ibadan/Oyo State</td>
<td>Trade, Media, Tech, Academic Research</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Dar es Salaam</td>
<td>Financial Services, Tourism, Tech, Media</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
Thank you – Questions?

andrew@teraco.co.za