State of African Interconnection & Peering

RIPE 2015
The Good News

<table>
<thead>
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<th>The Good News</th>
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<tr>
<td>• 30 Operational Exchanges in 22 countries out of 54</td>
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<td>• Combined Peak Traffic of 52 Gbps</td>
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<td>• Large Regional Networks e.g. Liquid Telecoms, Seacom, CMC Networks, Telkom, Internet Solutions</td>
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<td>• Over 700,000km of terrestrial fibre</td>
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<td>• Reaching 40% of the population</td>
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<td>• Multiple cables providing over 24 Tbps of landed capacity reaching major business hubs including South Africa, Kenya, Nigeria</td>
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<td>• Neutral facilities are now a reality</td>
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<td>• IXP community starting to work together</td>
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<td>• AF-IX key to this!</td>
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Regional Exchanges are a Reality

- Multiple IXP’s in key hubs including South Africa, Kenya and Nigeria
- Larger traffic & members in the Capitals than at the landing stations
- Yes these exchanges are finally up and to the rights!
Who owns the IXPs?

- Industry Association: 35%
- University: 20%
- Government/Regulator: 5%
- Private/Not-for-profit: 40%
Peering Options

Peering Models

- **Multi-lateral** (route server, use not mandatory)
- **Layer 3 peering** (networks connect via layer 3 to IXP route server)
- **Mandatory multi-lateral** (all networks forced to peer openly)
- **Bi-lateral** (networks peer at own discretion)
Commercial Models – IXP’s adding Value

Does the IXP charge fees?

- 35% No fees (plans to implement in future)
- 25% No fees (no plans to implement in future)
- 30% Monthly port fees
- 10% Annual port fees
The Bad….

• Cost of bandwidth still high but dropping rapidly;

• Majority of “eye balls” do not have technical skills or assets therefore still heavily reliant on transit

• Majority of countries still operate as a monopoly managed by governments

• Limited marketplace to obtain members – new members generally need to be convinced to let go of existing transit arrangements

• Existing ASN application process very slow and expensive for new entrants

• Interconnection costs high and slow delivery in non neutral environments e.g. Djibouti $18000.00 1Gbps fibre non redundant, Nigeria $2000.00 per cross connect, Kenya $300 per cross connect

• Government involved in Regional Exchange points – Market should decide where best to peer

• Council power a limited resource e.g. Nigeria, South Africa, Kenya primarily relies on wood fuel & coal;
The Ugly.... Southern African Example

**Power, Power Power......**

- Eskom – Services Southern Africa Region e.g. South Africa, Swaziland, Lesotho etc.
  - Ongoing Load Shedding – No leadership and 3x over their budget
- Two years behind maintenance e.g. Silo collapsed November 2014
- Medupi power station was meant to go live in 2013, only at full capacity in 2018 with 6x800MW Turbines – only just meet current demand;
- Annual power Cost of power estimated more than CPI;
- Reality is additional Council power only ready in 2019 which can only meet current demand
The Ugly.... Kenya Example

Already at 80% of power demand with underestimated annual growth

### Load Forecasting

**Projected Peak and Annual Energy Demand**

<table>
<thead>
<tr>
<th>Year</th>
<th>12/13</th>
<th>13/14</th>
<th>14/15</th>
<th>15/16</th>
<th>16/17</th>
<th>17/18</th>
<th>18/19</th>
<th>19/20</th>
<th>20/21</th>
<th>21/22</th>
<th>22/23</th>
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<tbody>
<tr>
<td>% Gth in Basic Demand</td>
<td>5%</td>
<td>6%</td>
<td>6%</td>
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<td>6%</td>
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<tr>
<td>Basic Demand (MW)</td>
<td>1,354</td>
<td>1,435</td>
<td>1,521</td>
<td>1,613</td>
<td>1,709</td>
<td>1,812</td>
<td>1,921</td>
<td>2,036</td>
<td>2,158</td>
<td>2,288</td>
<td>2,425</td>
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<td>VISION &quot;2030&quot; FL. SH</td>
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<td>ICT Cities</td>
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<td>Lamu Port/Lapset</td>
<td>10</td>
<td>30</td>
<td>40</td>
<td>60</td>
<td>80</td>
<td>100</td>
<td>120</td>
<td>150</td>
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<td>Railways</td>
<td>10</td>
<td>20</td>
<td>30</td>
<td>40</td>
<td>60</td>
<td>80</td>
<td>100</td>
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<td>Mining Industries</td>
<td>20</td>
<td>40</td>
<td>60</td>
<td>70</td>
<td>80</td>
<td>90</td>
<td>100</td>
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<tr>
<td>Other Industries</td>
<td>10</td>
<td>20</td>
<td>40</td>
<td>60</td>
<td>80</td>
<td>100</td>
<td>120</td>
<td>150</td>
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<tr>
<td>Total Demand (MW)</td>
<td>1,354</td>
<td>1,435</td>
<td>1,521</td>
<td>1,643</td>
<td>1,809</td>
<td>1,982</td>
<td>2,171</td>
<td>2,356</td>
<td>2,558</td>
<td>2,778</td>
<td>3,025</td>
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<td>Ann. Energy (GWh)</td>
<td>8,124</td>
<td>8,611</td>
<td>9,128</td>
<td>9,856</td>
<td>10,856</td>
<td>11,892</td>
<td>13,024</td>
<td>14,135</td>
<td>15,348</td>
<td>16,665</td>
<td>18,149</td>
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**Av. Annual Load Growth = 8.3%**
The Ugly…. Nigeria Example

- Roadmap provides for 40,000MW by 2020, were 200,000MW is actually required to sustain growth
- Currently delivering 4,400MW which peaks at 4,517 MW with a short fall of over 1,482MW
- Alternative Energy is key to the survival
Massive opportunity but always double check

- Put your SLA to the test on power and Interconnection
- Truly Neutral Data Centres key to IXP growth
- Work together with Data Centre operators for best transport costs
- Reduced IP transit fees – innovation required
Thank you – Questions?
andrew@teraco.co.za