



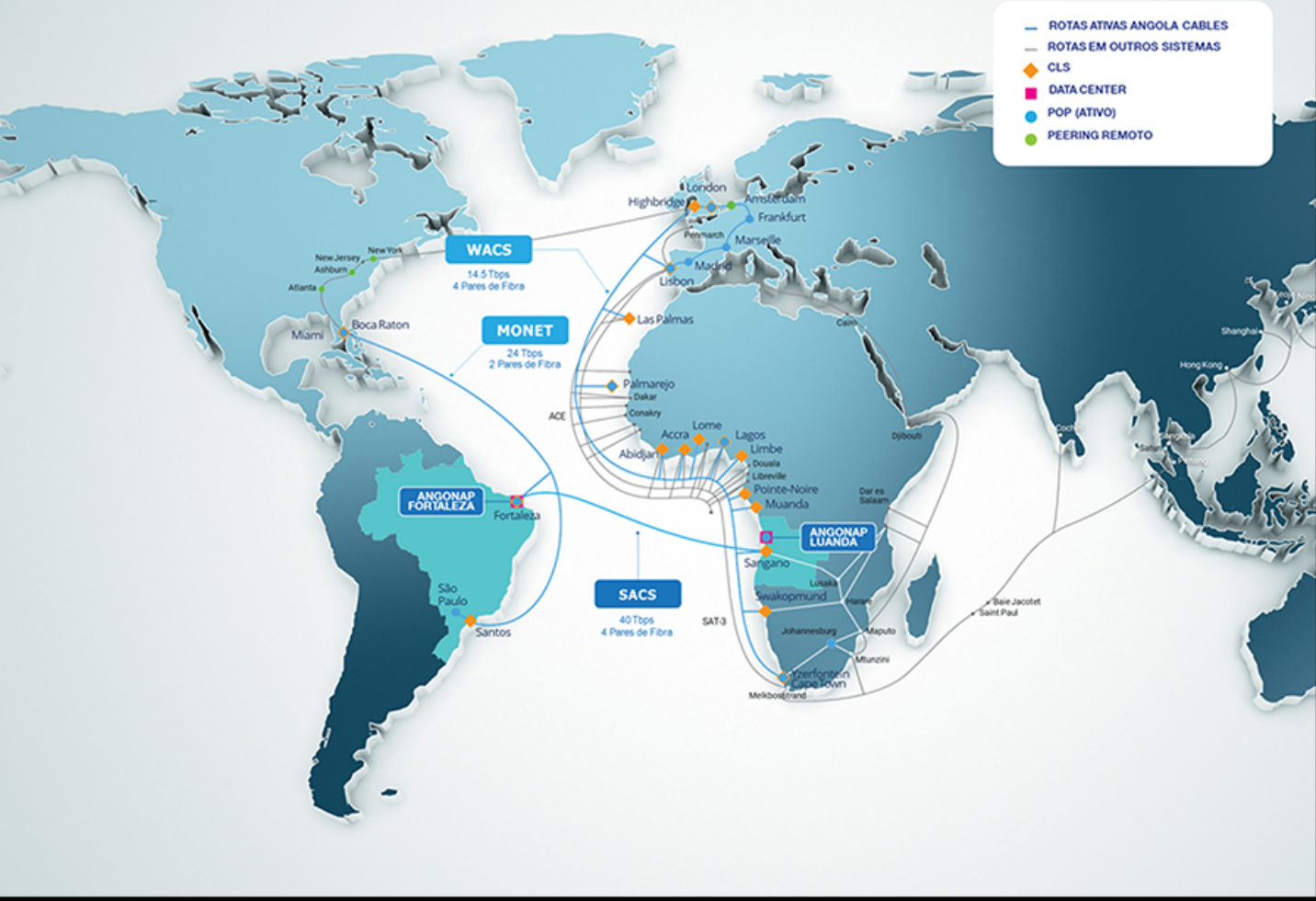
IX FÓRUM 12 – LIGHTNING TALK

South Atlantic Cable System The Impact on the Internet

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AS37468



ANGOLA CABLES GLOBAL NETWORK



MacBook

SUBMARINE Routes



MONET - 60Tbps

SACS - 40Tbps

WACS - 14Tbps

SACS

SOUTH ATLANTIC CABLE SYSTEM

Is the first transatlantic cable system crossing the South Hemisphere, connecting Africa and the Americas

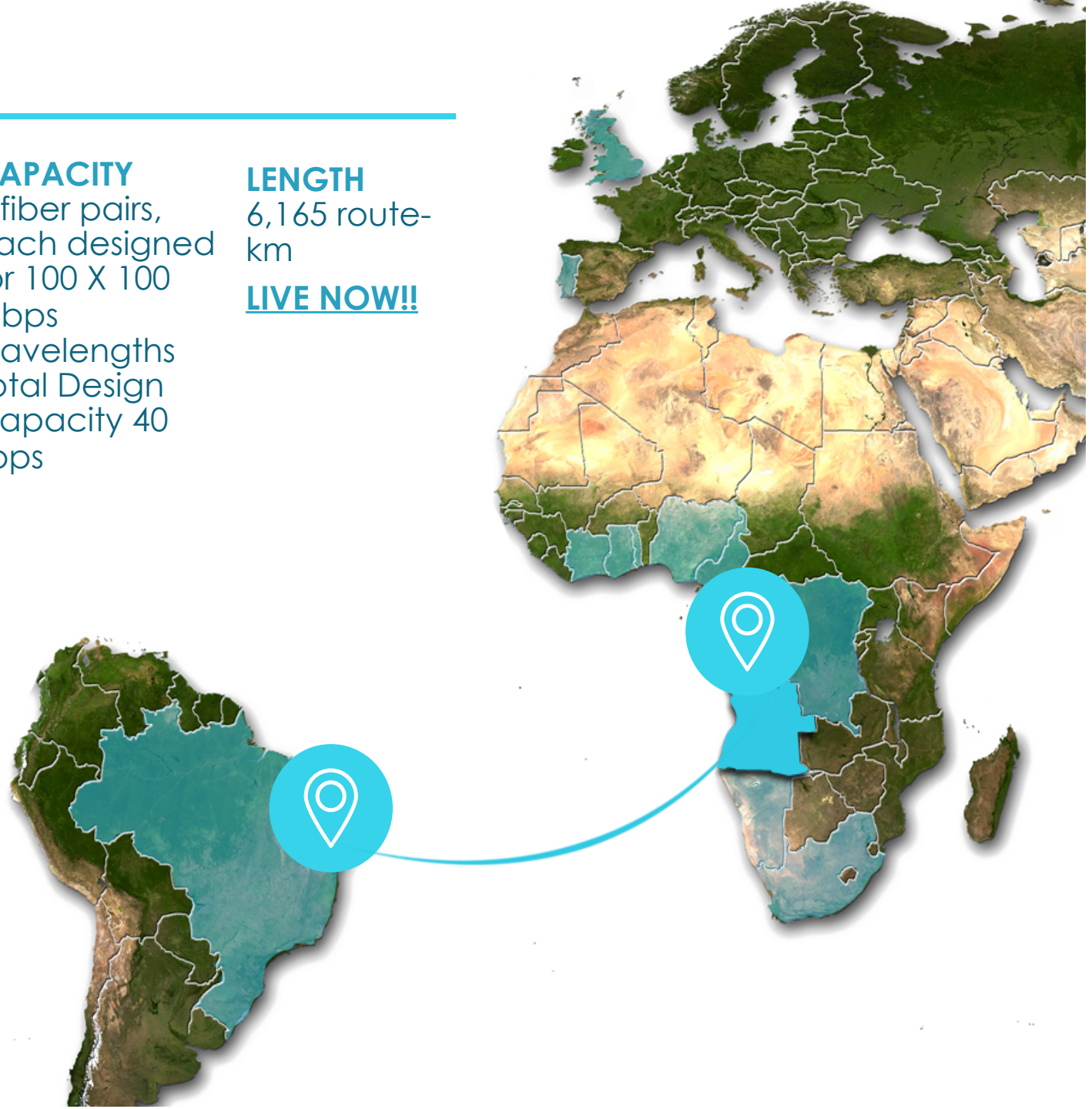
SACS - Allows for low latency between North and South Hemisphere

Redundancy path for **North bound trans-Atlantic** routes

Shortest path between **Africa** and **Americas**

CAPACITY
4 fiber pairs,
each designed
for 100 X 100
Gbps
wavelengths
Total Design
Capacity 40
Tbps

LENGTH
6,165 route-
km
LIVE NOW!!



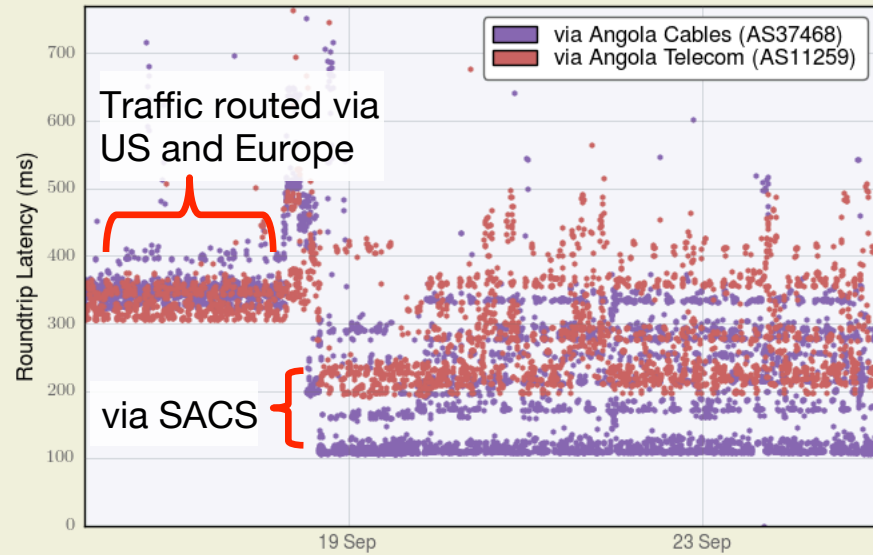
RTT - Router to router São Paulo to the world...

Origin	Destination	~RTT (ms) Before SACS	~RTT (ms) After SACS	Gain RTT (ms)
Fortaleza	London (UK)	172	150	-22
Fortaleza	Cape Town (ZA)	337	100	-237
Fortaleza	Luanda	350	63	-287
São Paulo	Frankfurt (DE)	222	200	-22
São Paulo	Johannesburg (ZA)	384	157	-227
São Paulo	Cape Town (ZA)	395	140	-255
São Paulo	Luanda	380	106	-274

Latency measurements between our servers in various Brazilian cities and Luanda, Angola decreased from over 300ms to as low as 100ms.

Latencies to TVCABO Angola (AS36907) from Brazil

16 Sep 2018 through 24 Sep 2018



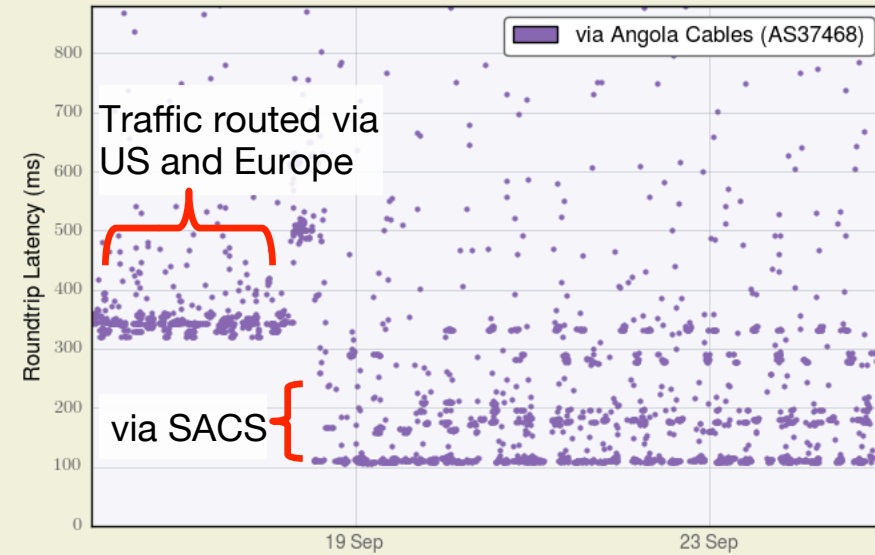
Source: Traceroute Data

Dyn

ORACLE

Latencies to Movitel Telecom (AS37081) from Brazil

16 Sep 2018 through 24 Sep 2018



Source: Traceroute Data

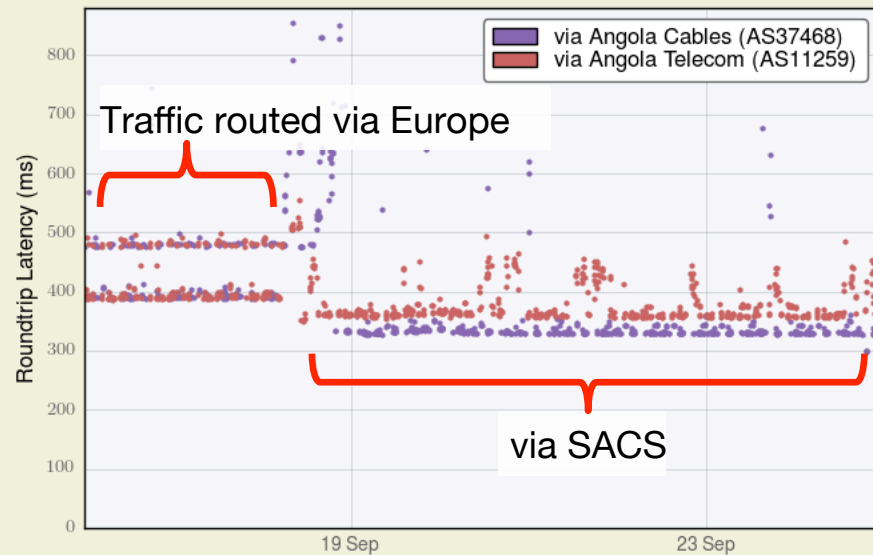
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ORACLE

Latencies to Angola from other locations outside Brazil also experienced improvements upon activation of the SACS cable

Latencies to TVCABO Angola (AS36907) from Tokyo

16 Sep 2018 through 24 Sep 2018

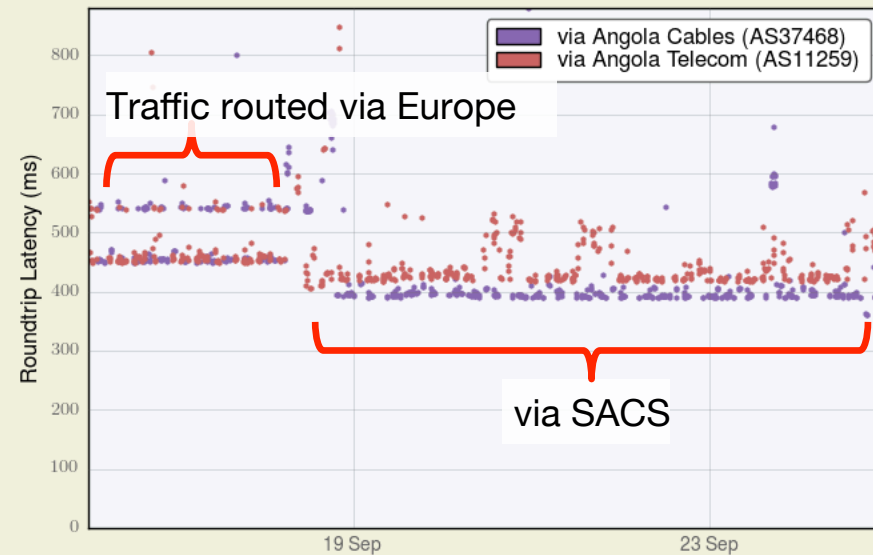


Source: Traceroute Data



Latencies to TVCABO Angola (AS36907) from Singapore

16 Sep 2018 through 24 Sep 2018



Source: Traceroute Data



Customer Traceroute to reach São Paulo from Angola



Before SACS

1 4 ms 192.168.100.1
2 <1 ms 172.20.0.9
3 1 ms 192.168.0.3
4 2 ms 197.149.149.1
5 3 ms pe2-nc021.ang.lua.as37468.angolacables.ao
[197.149.151.4]
6 4 ms pe2-nc025.ang.sgn.as37468.angolacables.ao
[197.149.149.154]
7 157 ms pe2-nce022.pt.lis.as37468.angolacables.ao
[185.148.112.22]
8 188 ms pe1-nce014.uk.lon.as37468.angolacables.ao
[185.148.112.101]
9 348 ms pe2-nce011.us.bca.as37468.angolacables.ao
[170.238.232.45]
10 361 ms 170.238.232.9
11 389 ms pe1-nce012.br.spa.as37468.angolacables.ao
[170.238.232.22]
12 429 ms as16509.saopaulo.sp.ix.br [187.16.218.79]

With SACS

1 4ms pe2-nc026.ang.sgn.as37468.angolacables.ao
(197.149.149.162)
2 61ms 170.238.232.149 (170.238.232.149)
3 64ms pe1-nc013.br.ftz.as37468.angolacables.ao
(170.238.232.81)
4 106ms pe2-nce022.br.spa.as37468.angolacables.ao
(170.238.232.69)
5 106ms pe1-nce014.br.spa.as37468.angolacables.ao
(170.238.232.61)
6 109ms as16509.saopaulo.sp.ix.br (187.16.218.79)

~

**-300ms gained with
-6 hops less**



Population – 29,78M

Webmasters AS (37697) Traceroute to reach São Paulo from Mozambique



MZB To Fortaleza before SACS:

```
1 *
2 10.217.0.217 (10.217.0.217) 72.369 ms * 0.516 ms
3 10.217.0.217 (10.217.0.217) 1.248 ms
4 41.220.204.133 (41.220.204.133) 989.833 ms 1195.533 ms 1199.381
5 10.215.34.140 (10.215.34.140) 225.849 ms 996.156 ms 1004.272 ms
6 41.220.165.137 (41.220.165.137) 266.939 ms 1119.595 ms 1123.454
7 41.220.160.89 (41.220.160.89) 170.096 ms 1311.941 ms 1314.566
8 196.250.232.70 (196.250.232.70) 502.051 ms * 0.329 ms
9 196.250.232.70 (196.250.232.70) 1.211 ms
  196.60.8.60 (196.60.8.60) 268.215 ms *
10 196.60.8.60 (196.60.8.60) 0.104 ms 0.983 ms
  102.130.68.5 (102.130.68.5) 320.880 ms
11 102.130.68.5 (102.130.68.5) 1.090 ms 5.710 ms
  pe2-nc029.ang.sgn.as37468.angolacables.ao (197.149.151.198)
367.176
12 pe2-nc029.ang.sgn.as37468.angolacables.ao (197.149.151.198) 1.256
ms 5.184 ms 170.238.232.145 (170.238.232.145) 578.635 ms
13 170.238.232.145 (170.238.232.145) 0.189 ms 0.896 ms
  pe1-nc013.br.ftz.as37468.angolacables.ao (170.238.232.81) 856.726
14 pe1-nc013.br.ftz.as37468.angolacables.ao (170.238.232.81) 1.253 ms
5.517 ms pe2-nce021.br.spa.as37468.angolacables.ao (170.238.232.65)
484.998 ms
```

MZB To Fortaleza after SACS:

```
1: gateway 0.200ms
1: gateway 0.152ms
2: border.webmasters.co.mz 0.378ms
3: 197.149.148.17 32.225ms
4: 102.130.68.1 50.674ms
5: pe2-nc028.ang.sgn.as37468.angolacables.ao 94.309ms
6: 170.238.232.149 146.631ms
7: pe1-nc013.br.ftz.as37468.angolacables.ao 145.486ms
8: pe2-nce022.br.spa.as37468.angolacables.ao 189.380ms
9: pe1-nce013.br.spa.as37468.angolacables.ao 186.422ms
```

~

**-298ms gained with
5 hops less**



Population – 29,67M

South African - Gaming Community Evonet AS (328239) to Brazil



Pings to Fortnite Servers

Server Location	Min	Max	Average
Europe	177	193	183
Brazil	160	369	227
North America	269	310	281
Korea	357	476	384
Japan	396	448	408
Oceania	472	624	523



Population - 56,72M

Conclusion

- SACS represents an unprecedented achievement to the Internet community in Africa and Brazil;
- Dramatic change in the landscape of the commercial Internet Ecosystem;
- Brings new business opportunities to networks in both continents e.g (Gaming, Research and Education, Enterprise and other sectors);
- New R&E alliances opportunities between Americas and Africa as well to Europe.



> **Obrigado!**

Estamos ligados ao futuro.

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