How to Become a
Smart IP Transit Buyer

DISCLAIMER

These slides show experience examples of the Init7 / AS13030 backbone over various years. They may work or may not work for you. Please use the methods described with care and at your own risk. Init7 or the author cannot be held responsible for any damage occurred by using the methods described here.

Your Speaker Today…

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The Company Init7

# Init7 operates its own backbone with the AS number 13030

Facts

- Init7 operates an international n*10Gbit IP backbone with AS number 13030 (autonomous system)
- The AS13030 is located at around 20 Internet exchange points, where nearly 1000 further networks are so-called peering partners
- This means that direct interconnections exist with all these other networks, enabling direct contact with approx. 60% of the global routing table
- As a result, we can secure optimal connectivity, latency, capacity and availability
- The remaining approx 40% of the targets are connected via globally distributed upstreams

Advantages

- Full control over the quality of IP Transit Services
- Autonomy from suppliers

Init7 Backbone Europe
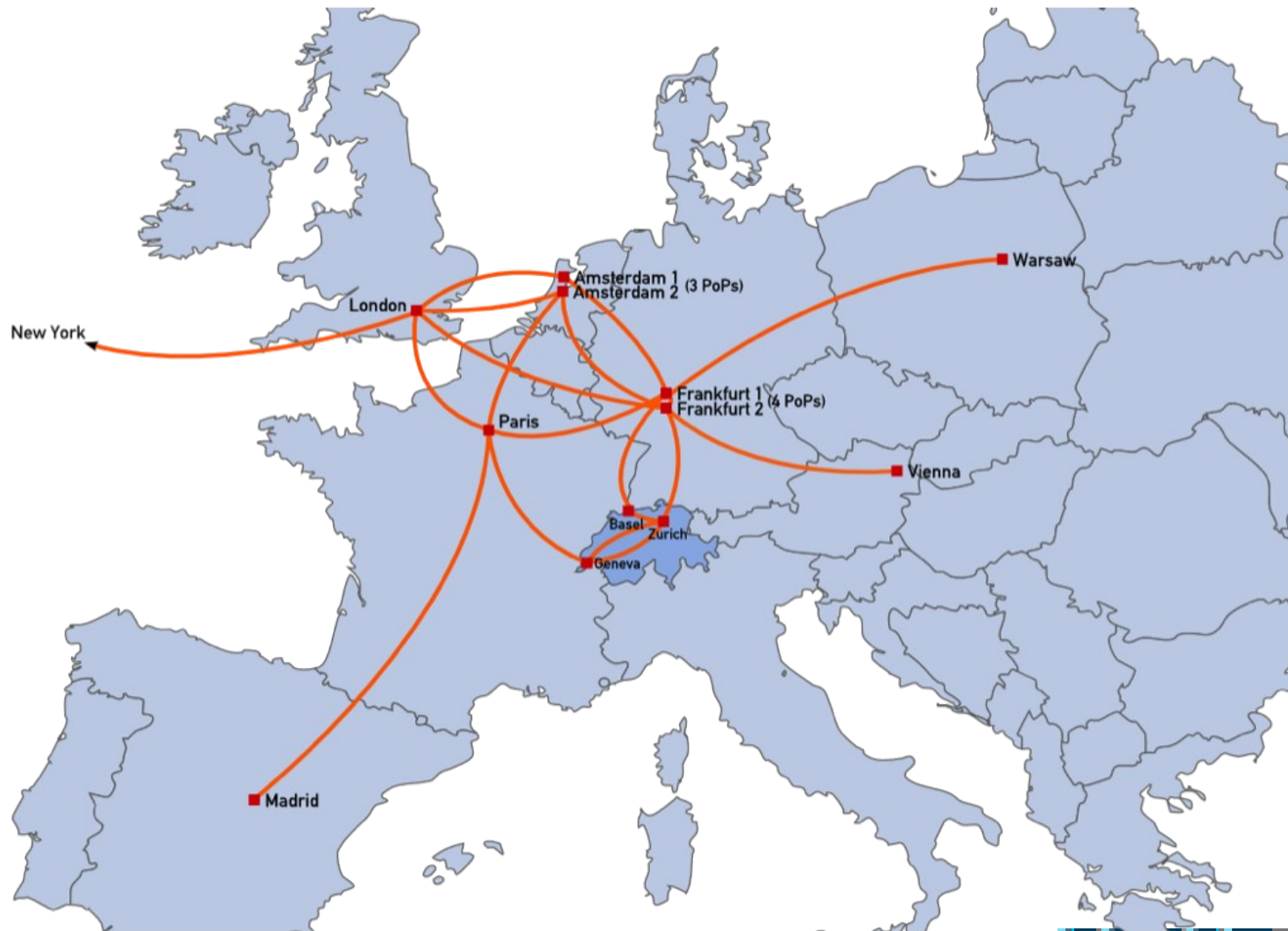
Peering vs. Transit

- People sometimes don't distinguish between peering & transit

- Technically the same (BGP4 adjacency)
  – Interconnection between two neighboring AS (eBGP)

Zero Settlement Peering

- No payment – Both partners cover their costs themselves
- Cabling costs are free / low – same location for PNI (Private Network Interconnect / Layer1)
- Internet Exchange in between (Layer2)

Paid Peering

- One Partner pays for the interconnection; usually PNI

Transit

- One Partner pays to reach **all** 3rd party destinations globally

Partial Transit

- One Partner pays to reach **some** 3rd party destinations globally

Routing Analogy: Airlines

Direct Flight ≅ Peering

BJL – DKR
Only limited number of
direct connections from BJL

One Stopover ≅ Transit

BJL – DKR – JNB
Major hubs nearby
to change planes

Routing Analogy: Airlines

Two Stopovers ≅ Transit
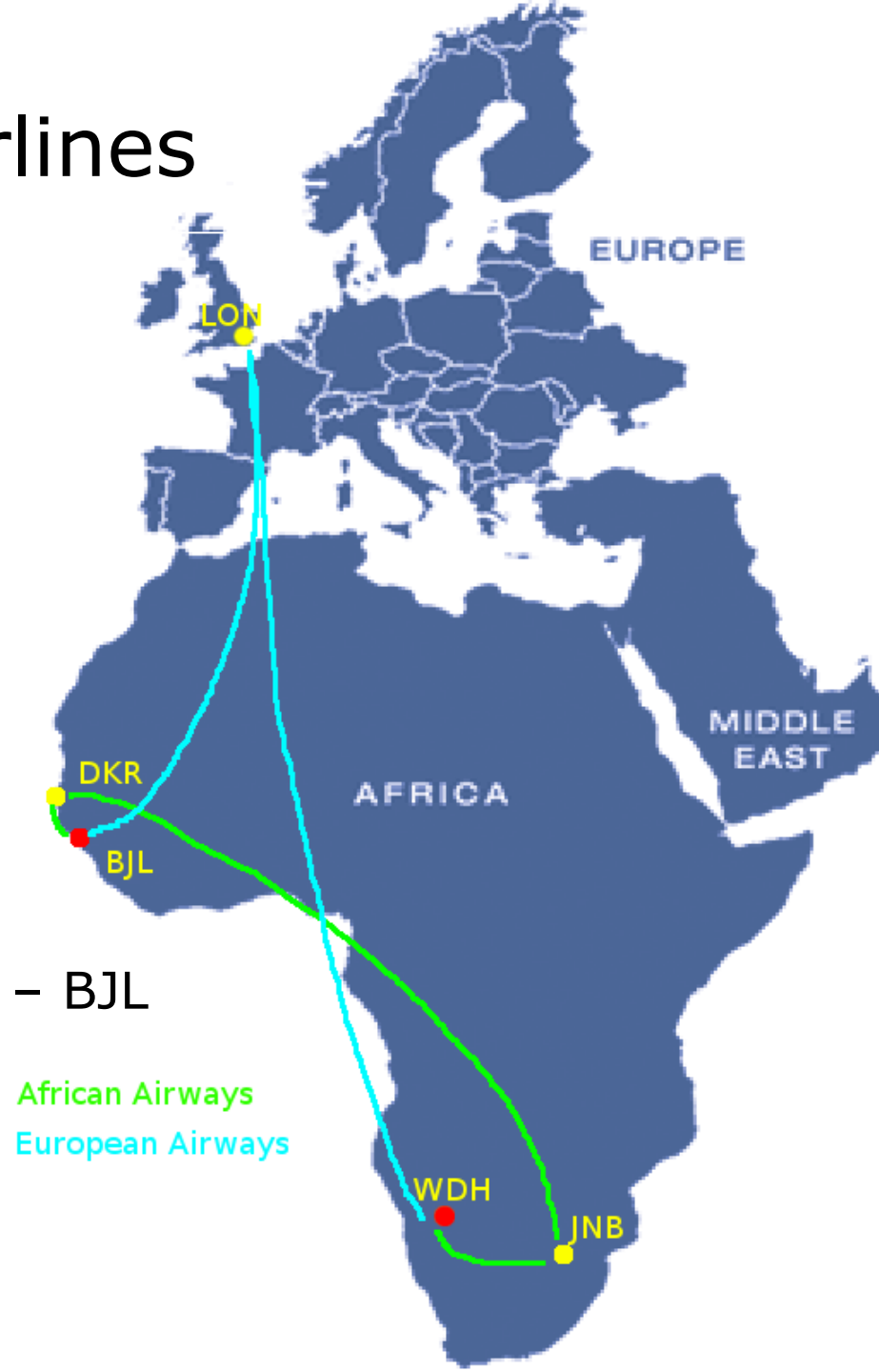
BJL – DKR – JNB – WDH
(African Airways)
or one stopover:
BJL – LON – WDH
(European Airways)
→Better? Longer Latency?
More expensive? Cheaper?

Return Flight

BJL – LON – WDH – JNB – DKR – BJL
Not the same path!

African Airways
European Airways

Routing Analogy: Airlines – Lesson learned

Redundancy ≅ Alternative Airlines (Partner Networks i.e. Star Alliance)

Issues like strike, tech-issues, regulations, CONGESTION!

Alternatives!
Avoid busy hubs / airports → more expensive / longer journey

Routing Analogy: Buses

Congestion

- **Packet loss (people / packets fall off the bus)**
- **Journey is more comfortable on a less packed bus**

Select one or more transits:

→**PRICE!**

Vendor 1:
Buy 3 for 2 Mbps

Vendor 2:
Buy 1 Mbps for only 4'000 Italian Lira

SILLY!

Know Your Needs / Network in order to select your Transit Supplier

- Traffic Ratio: 10:1 or rather 1:10?

- Volume today / tomorrow

- Know your Budget!

Most important:
Know your top-10 / top-20 traffic sources or sinks!
...depending whether your network is inbound- or outbound-heavy.

Assuming the following Business Model:

- Operation of Webhosting in an African Country „tophosting.africa"

- Colocation servers in a carrier neutral facility/ datacenter; proximity to Internet Exchange

- Local Peering with other national operators

Transit market analysis

- **Buy transit – but from whom?**
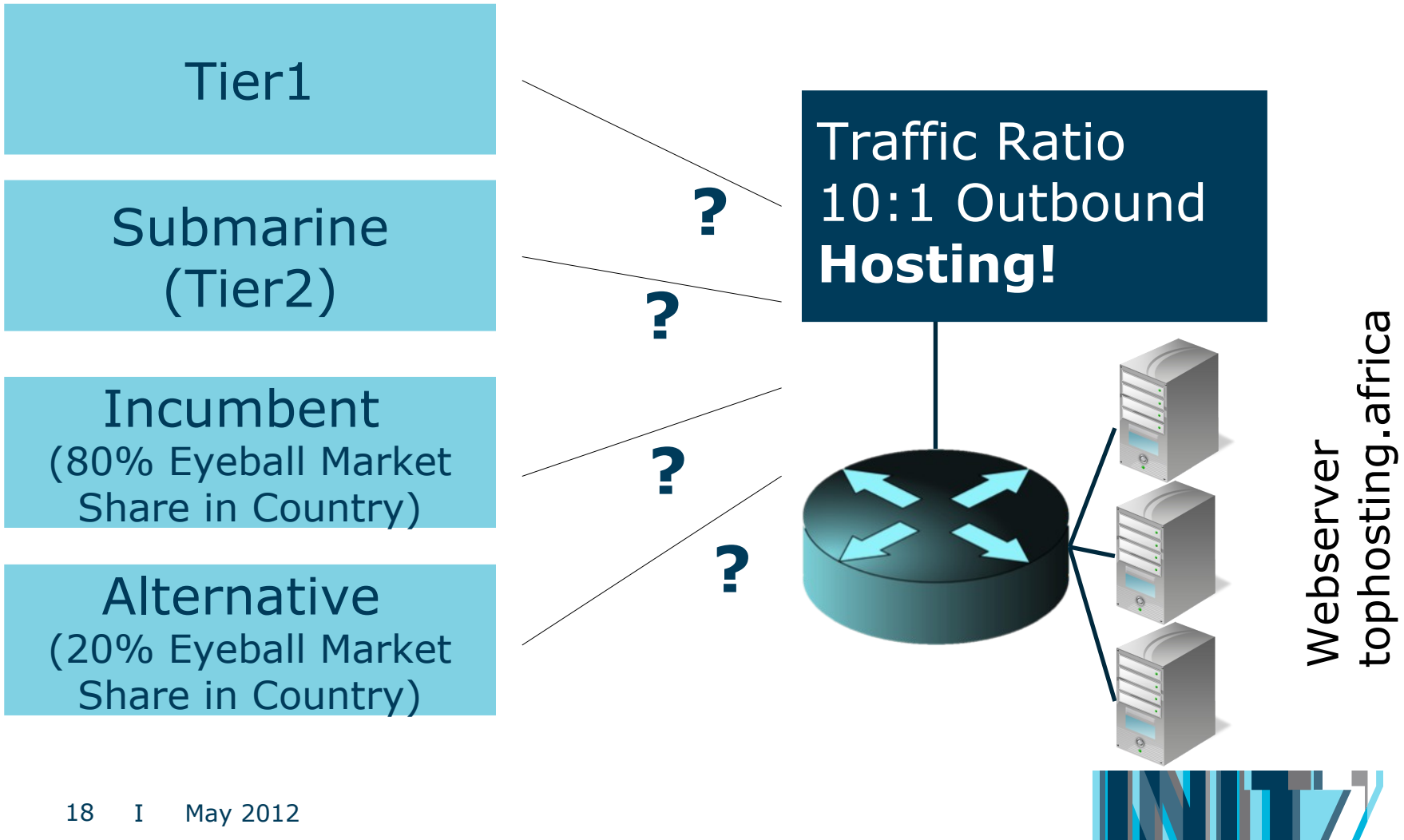 4 vendors are available:

  — Tier1
  — National Incumbent
  — Alternative Mobile Telco
  — Submarine Operator with IP Offering

  Price is
  the same!

Price is <u>not</u> a selection parameter in this example!

Buying IP Transit – The Smart Way! 1/4

Tier1

Submarine
(Tier2)

Incumbent
(80% Eyeball Market
Share in Country)

Alternative
(20% Eyeball Market
Share in Country)

?

?

?

?

Traffic Ratio
10:1 Outbound
Hosting!

Webserver
tophosting.africa

Know Your Vendors!

- Their Network?

- Their Customer base?

- Their Transit?

- Their Peerings?

- Their Traffic Ratio?

Many of these parameters can be evaluated with the global BGP table
- Routeviews.org
- bgp.he.net

Buying IP Transit – The Smart Way! 2/4
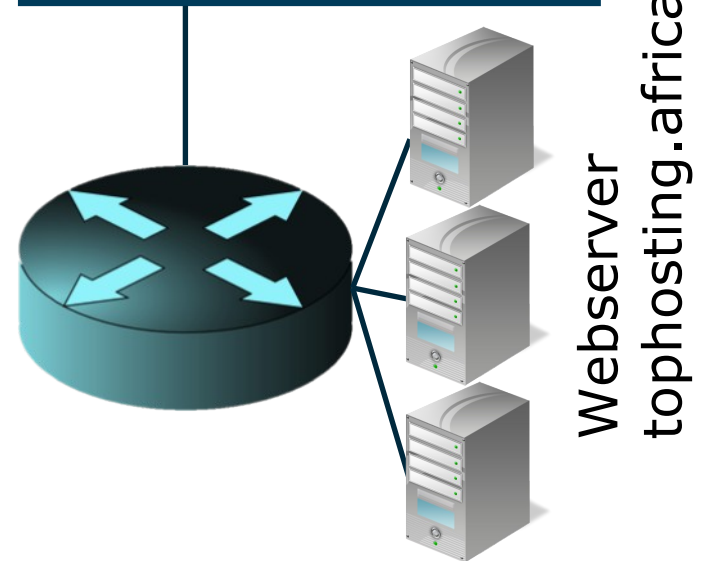
Tier1
Closed peering policy

Submarine (Tier2)
Buys Transit in Europe

Incumbent
Buys Transit from Tier1

Local Peering

Alternative
Buys Transit from remote Vendor with massive peering

Traffic Ratio
10:1 Outbound
Hosting!

Webserver
tophosting.africa

Buying IP Transit – The Smart Way! 3/4

Rest of the World

50%

Main Traffic Destinations
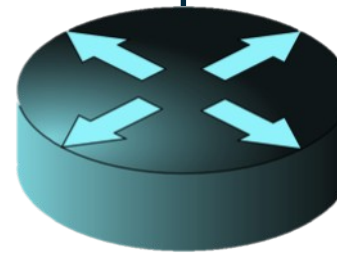
Incumbent
(80% Eyeball Market Share in Country)

40%

Alternative
(20% Eyeball Market Share in Country)

10%

Webserver
tophosting.africa

INIT7

Knowing main traffic destinations

- 50% global – can't be peered away

- 40% national Incumbent

- 10% national Alternative Mobile Telco

National traffic via peering?
- technically yes
- lets assume that the national incumbent is not willing to peer / only paid peering or transit is available
- Peering can be arranged with the Alternative Mobile Telco
- Peering Incumbent-Alternative forced by Regulator

Buying IP Transit – The Smart Way! 4/4

Select two of the four vendors → Redundancy!
Goal: 50/50% traffic load

Tier1

Submarine (Tier2)

Incumbent

Alternative

Traffic Ratio
10:1 Outbound
Hosting!

Webserver
tophosting.africa
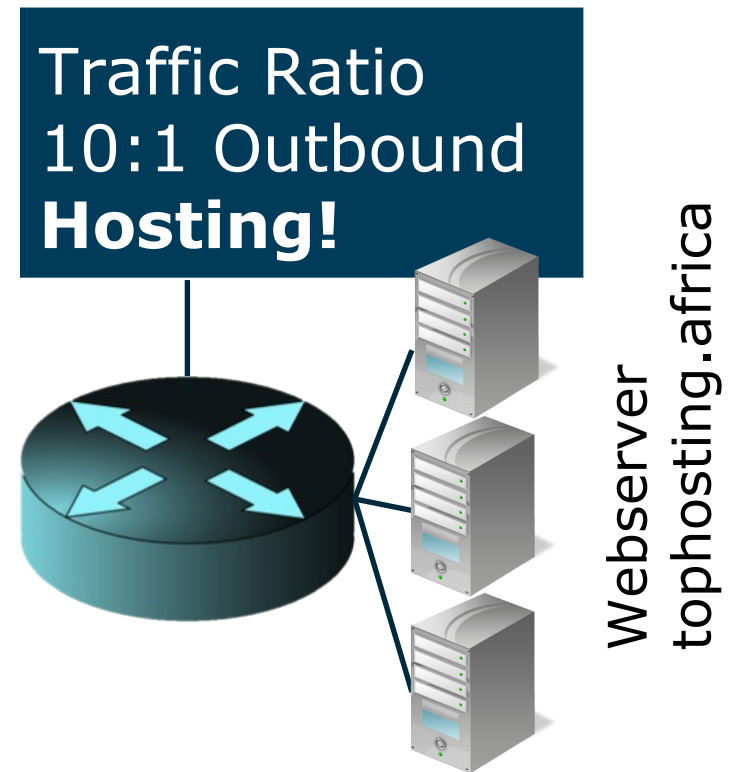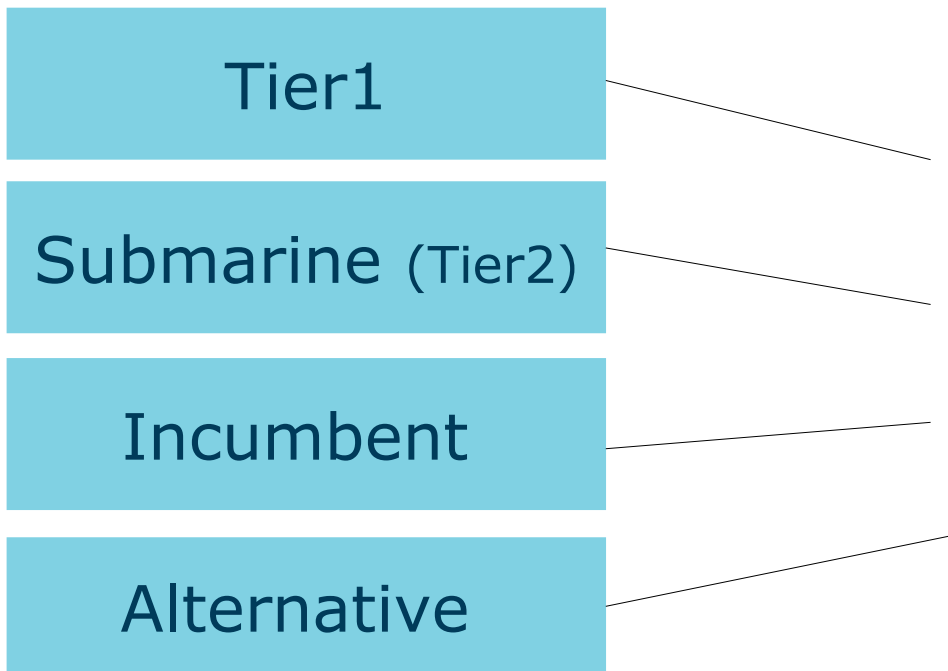
IP Transit Selection criteria 1/3

- National traffic must flow locally (latency / capacity consideration)

- Paid Peering sucks – do you want to support closed peering policies? - buying from these vendors will strengthen Anti-Peering on a global scale

IP Transit Selection criteria 2/3

- Big names don't promise anything – TIER-1 is not a quality tag

- Layer-2 Vendor (Submarine) has not necessarily much routing / Layer-3 expertise

- Buying from a vendor with inverse traffic pattern might be smart to avoid congestion

IP Transit Selection criteria 3/3

- Test Drive: ask your potential vendor for a free-of-charge test for 1 week / 1 month before signing a multi year contract

- Ask fellow network engineers for recommendations and experience

- (last but not least: price)

Buying IP Transit – the result 1/2

- Incumbent (40% Traffic) reached via Alternative's local Peering + 10% Traffic destined =~ 50% load

Tier1 ❓

Submarine (Tier2) ❓

Incumbent ❌

Alternative ✅

Traffic Ratio
10:1 Outbound
Hosting!

Webserver
tophosting.africa
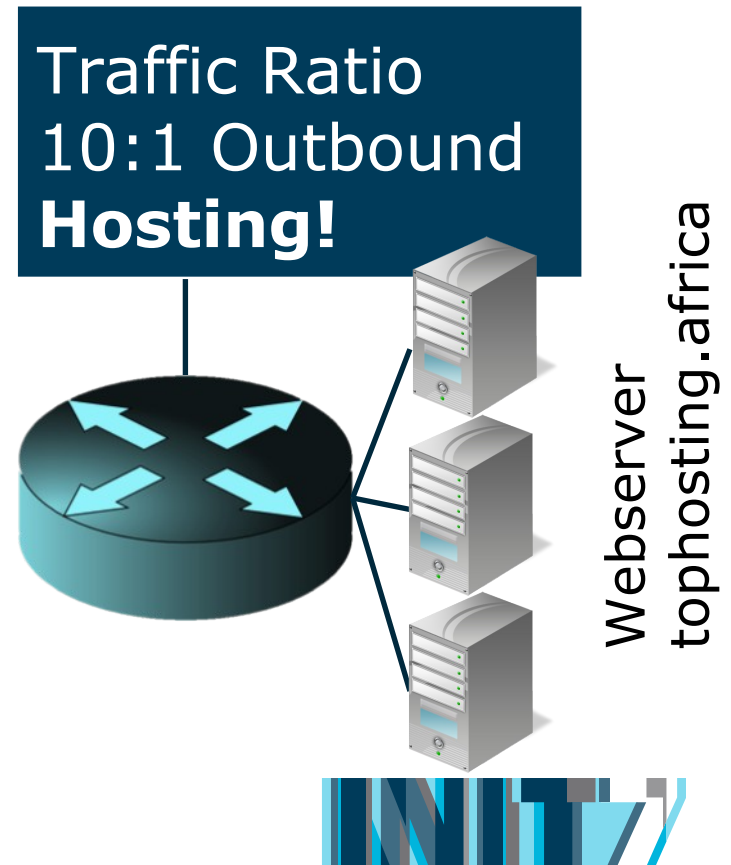
Buying IP Transit – the result 2/2

- World Traffic (50% Traffic) reached via Tier1 or Tier2 – more or less equal choice – must be further evaluated.

Tier1	❓ ❌
Submarine (Tier2)	❓ ✅
Incumbent	❌
Alternative	✅

Traffic Ratio
10:1 Outbound
Hosting!

Webserver
tophosting.africa
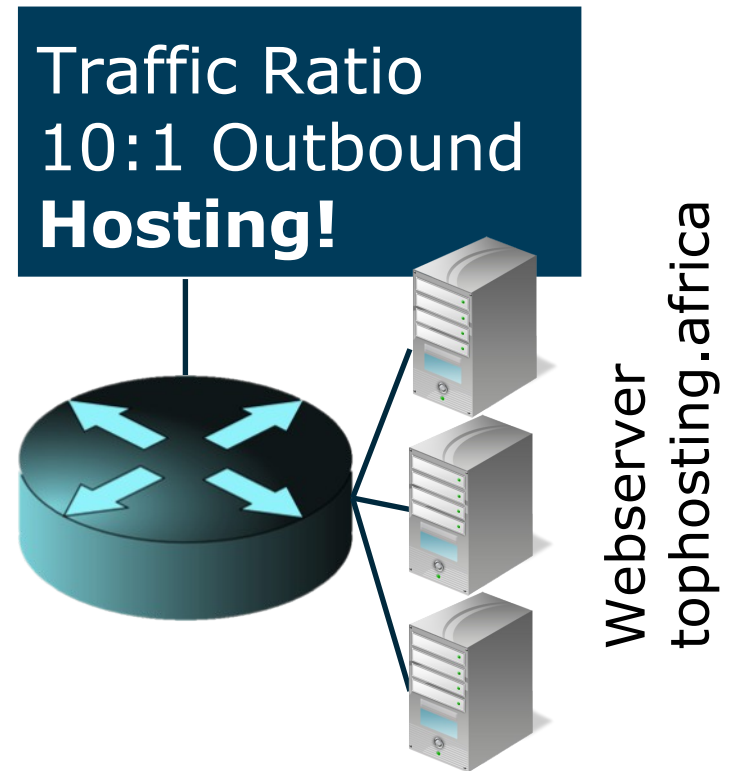
Expert buying!

- Alternative Mobile Telco could be asked for Partial Transit only: local routes + emergency default route = much lower price!

  Normal operation would not use international capacity, only in case of a failure of the other transit. This would actually balance the load 50/50%.

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