

# A case of frostbite in the desert:

Low latency videogaming within the Middle East



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i3D.net – A Ubisoft Company

# A brief history: i3D.net and gaming



A scene from Battlefield V: Devastation of Rotterdam  
i3D.net's original office was ~200m beyond the church

- Founded in 2002, headquartered in Rotterdam, The Netherlands
- Focused on online videogaming since our inception, with small beginnings
- Started to host Xbox/Playstation infrastructure for publishers in 2004
- First non-European locations opened in 2008: Tokyo, Sydney, now many more
- Acquired by Ubisoft in November 2018, but we remain independent and neutral
- New locations are driven by customer demand, usually during launch season
- We operate our own longhaul network



# Technical info: online videogaming



- Not compatible with caching, online videogames are realtime applications:
  - The content is too unpredictable
  - Communities cross borders & ISPs
  - ..and every millisecond counts!
    - In-flight bullets in shooters
    - Football dribbles or penalties
- Videogames use central server clusters to synchronize events between players
- Group playerbase in the wider region, so that matches are always available
- Video rendering happens client-side
- Volumes in Kbps per user, not Mbps

# Starting up in Dubai – as outsiders



- Concepts for a Middle East location since March 2014, but hesitant to build out due to lack of local interconnection
- Business case worked out in Q4 2016
  - Customers asked for Middle East
  - No viable local server providers
  - Therefore: do it ourselves!
- Why Dubai? Convenience and quality
  - Existing contacts with Equinix
  - Existing contacts with DE-CIX
  - ISPs connecting from wider region
- Many introductions by Marco & Bernd!

# Immediate challenges after going live



- “Scenic routing” through Europe:
  - Target: sub-40ms RTT latency
  - Usable: sub-100ms RTT latency
- Occasionally, reactions were negative:
  - “Why not put servers in \$country?”
  - “Built-in VoIP chat? Block IP range!”
  - “Have you heard about our special routed IXP, err, transit product?”
  - “Our videogaming latency through Europe is okay, UAE unnecessary.”
- Attended Capacity Middle East 2017
- Joined several meetings scheduled by UAE-IX, very productive cooperation

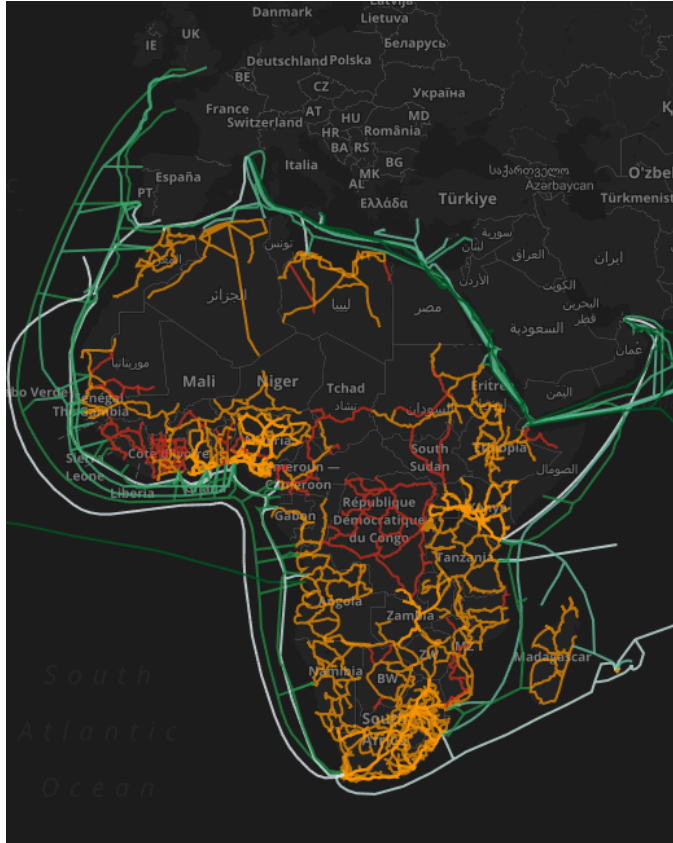


# Protectionism – it's a trap!



- We have come across quite a few “our ecosystem only” sentiments in MENA
- For a healthy and resilient internet, we need fallback paths – local ones
- And not every application can scale to multi-country deployments per region
- If an acceptable experience can't be provided, customers will change ISP
- Please, please, peer across borders; make it easy and affordable to connect to an IXP in a neighboring country!
- New business opportunities for carriers to monetize backbone investments

# Compared to Johannesburg, ZA



- Turned up NAPAfrica peering with most regional networks in 3-4 weeks' time
  - RTT latency lowered by ~200ms
- Accepted offer to join Angonix remotely
- In rare cases, “scenic routing” through Europe still happens – but permanently resolved when reported to the operator
- Incumbent networks often connect to multiple IXPs per country if available
  - Even if those IXPs are deployed in competing datacenter ecosystems
- Many networks peer across borders, or even join Middle East IXPs for peering!

# Trouble: harmful transit engineering

- Ingress path via local transit towards an i3D.net peering in Dubai
- For capacity or cost management reasons, ISP sends selective more specific prefix announcements to some backhauled transits
- Result: i3D.net can't select a local path for outbound traffic to the affected prefixes, even with LocalPref, forcing a European detour

One-way local transit: 147ms RTT latency



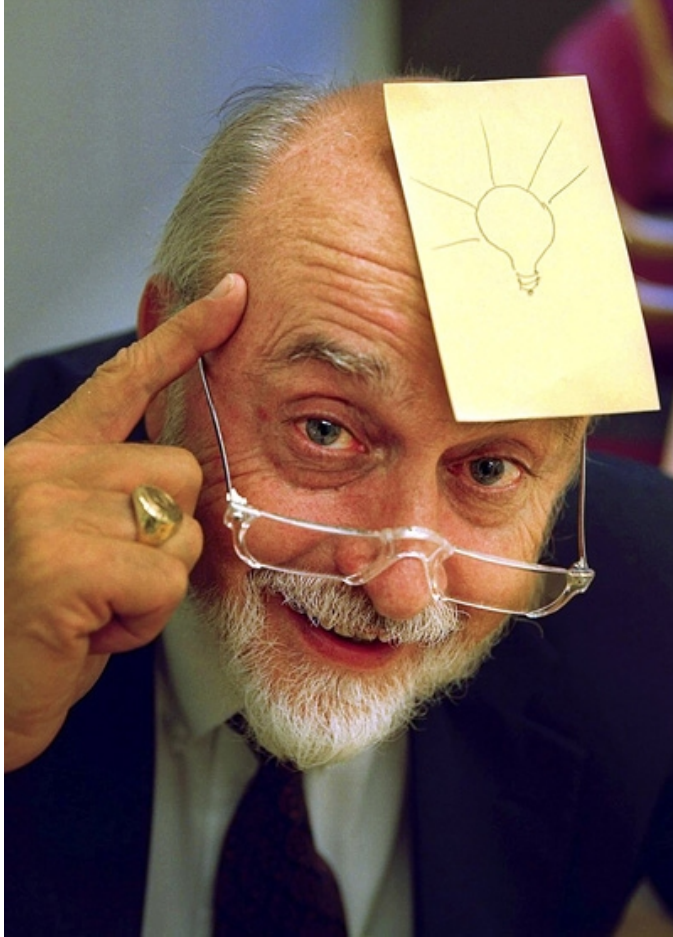
Two-way local transit: 22ms RTT latency



22ms  
VS  
147ms  
↓  
670%



# Alternative: BGP Communities



- “Sticky notes” for BGP routes
- Supported by nearly all router vendors
- May be forwarded to your friendly neighborhood network operator(s)
- Blank slate, user defines meaning
- That meaning may be an instruction
- Or it might carry certain information
- Widely implemented by transit carriers, so ask yours for their documentation!
  - i3D.net publicly releases this info
  - OneStep collects documentation, but 3<sup>rd</sup> party info may be outdated

# BGP Communities: instructions



- Traffic engineering without completely removing paths via your local transit
- Provides the ability to influence some BGP behaviour selectively, such as:
  - Request an artificial increase of your AS path length to “nudge” inbound traffic over another link
  - Request a router to stop sending your route to an adjacent network
  - Request a non-standard route preference in a remote network
- Example: send 8529:10590 to Omantel to stop announcing the route to Netflix

# Better yet: peer videogaming directly!

- This will give you full control over what is sent to which neighbor
- Try to send all customer routes to videogaming network peerings
- Low traffic volumes: videogaming won't congest your transport
- IX route-servers have BGP communities too – check the website
- Need some help with your routing policy? IXP team can assist!

One-way peer: 130ms RTT latency



Two-way peer: 16ms RTT latency

16ms  
VS  
130ms  
↓  
810%





# Progress in MENA since Nov 2018



- Regional transits peer more, explicitly requested by downstream customers
- ISPs from Iran, Kuwait, Oman, and Pakistan optimized announcements for 100% local routing to i3D.net Dubai!
- New IXPs in KSA, Kuwait – but tax on backhaul from Kuwait kills cross-border peering business case for ISP/content
- i3D.net reached agreement to extend backbone to Fujairah to join SH-IX
- Tom Clancy's The Division 2 released on 15 March, full Arabic localization *and* in-region servers from day one

# Concluding, more local videogaming!



- Online videogaming is coming to the Middle East, and will keep growing
- Ask publishers of popular games why there are no servers near your country
- Centralized infrastructure, no caches
- Small traffic volumes with large impact
- Traffic engineering; collateral damage?
- We can help investigate high latencies
- IXPs are there to help you connect with networks that matter for your business
- Peer across borders wherever possible and connect to multiple regional hubs



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