



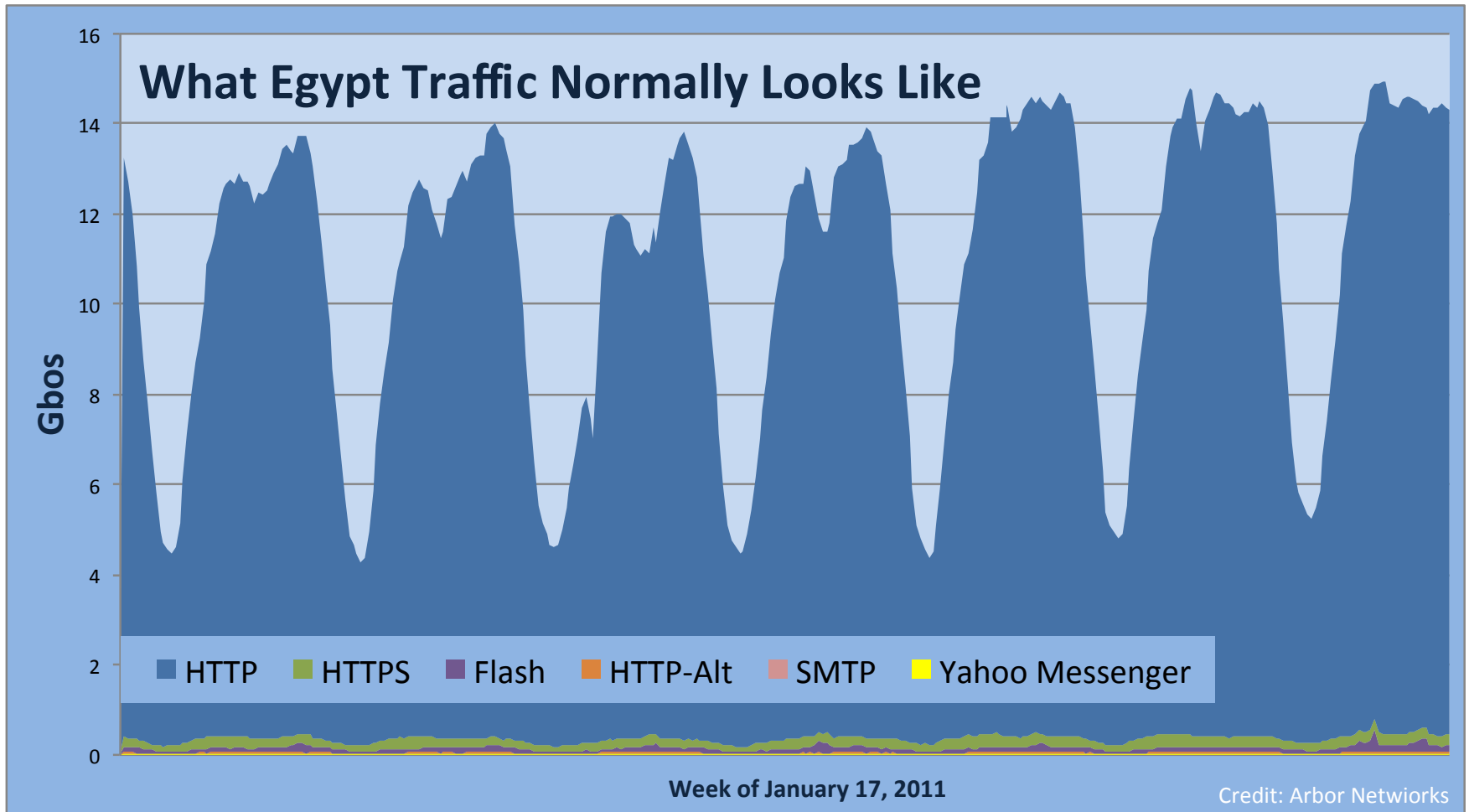
Egypt Leaves The Internet

Jim Cowie

NANOG51, Miami

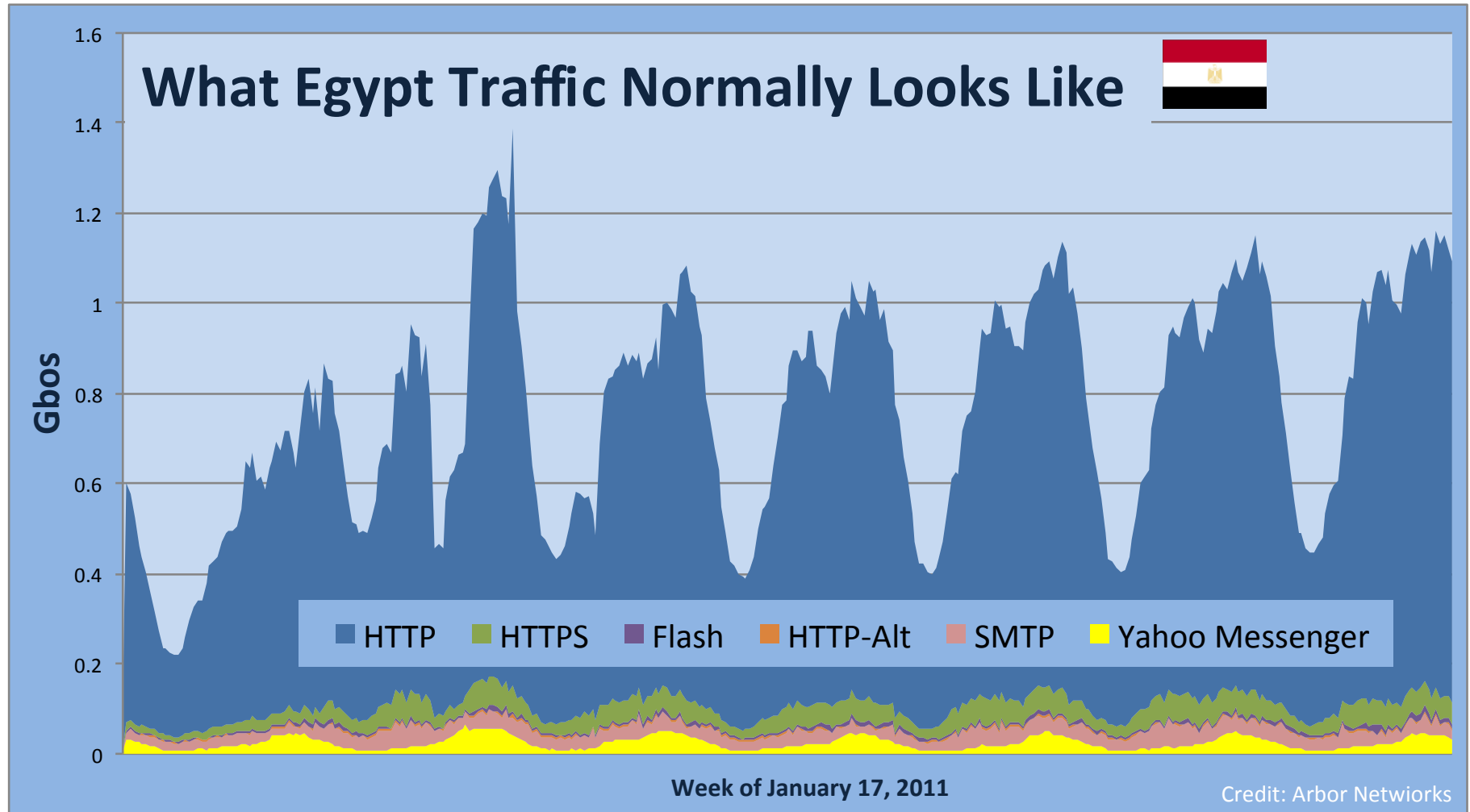
1 February 2011

Traffic Out of Egypt

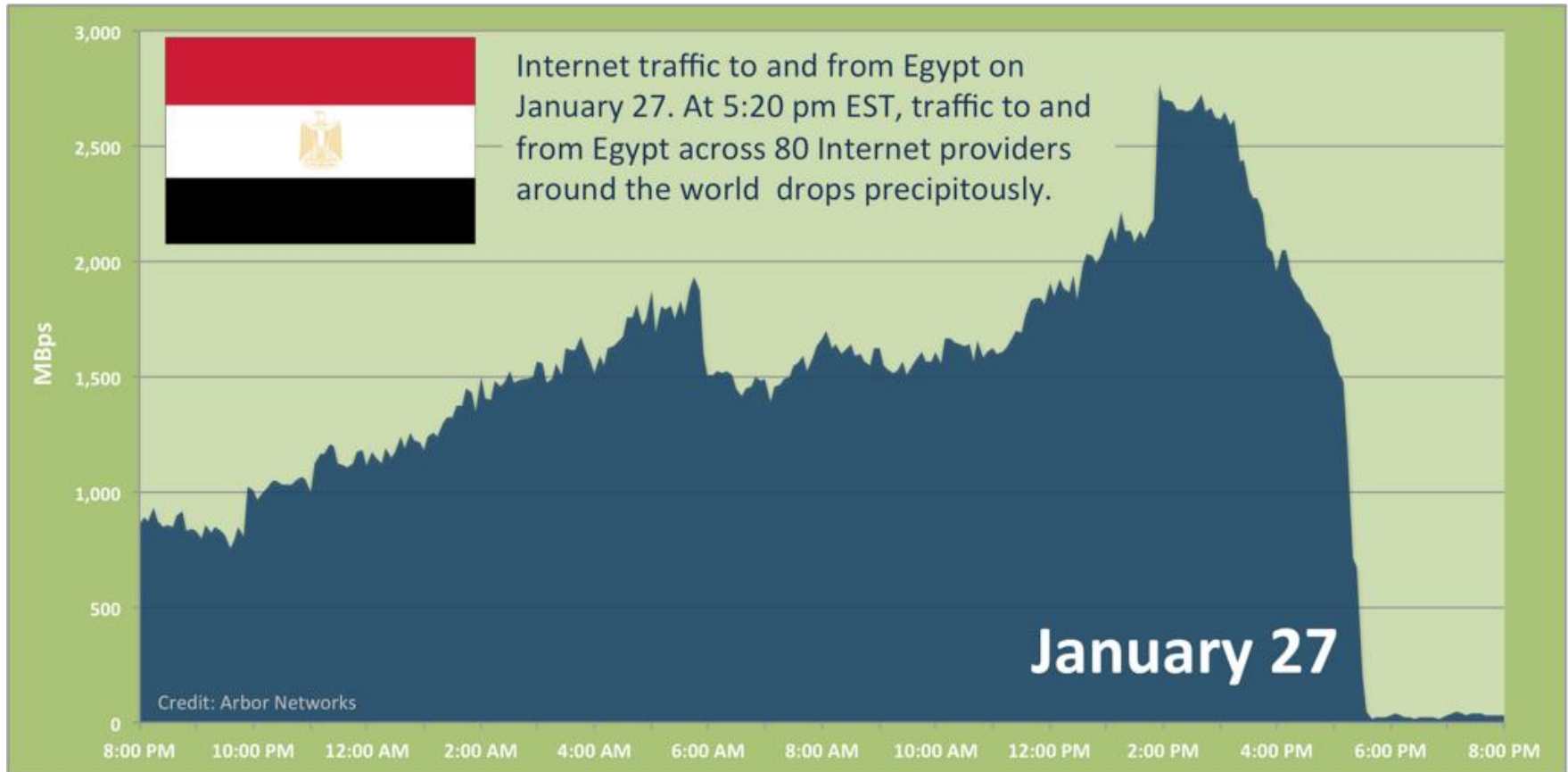


- 10-15 Gbps and almost entirely inbound traffic (95% +)
- Through four upstreams
- Looks like normal consumer network in US / Europe

Traffic In to Egypt



Egypt Traffic Disruption (Day View)

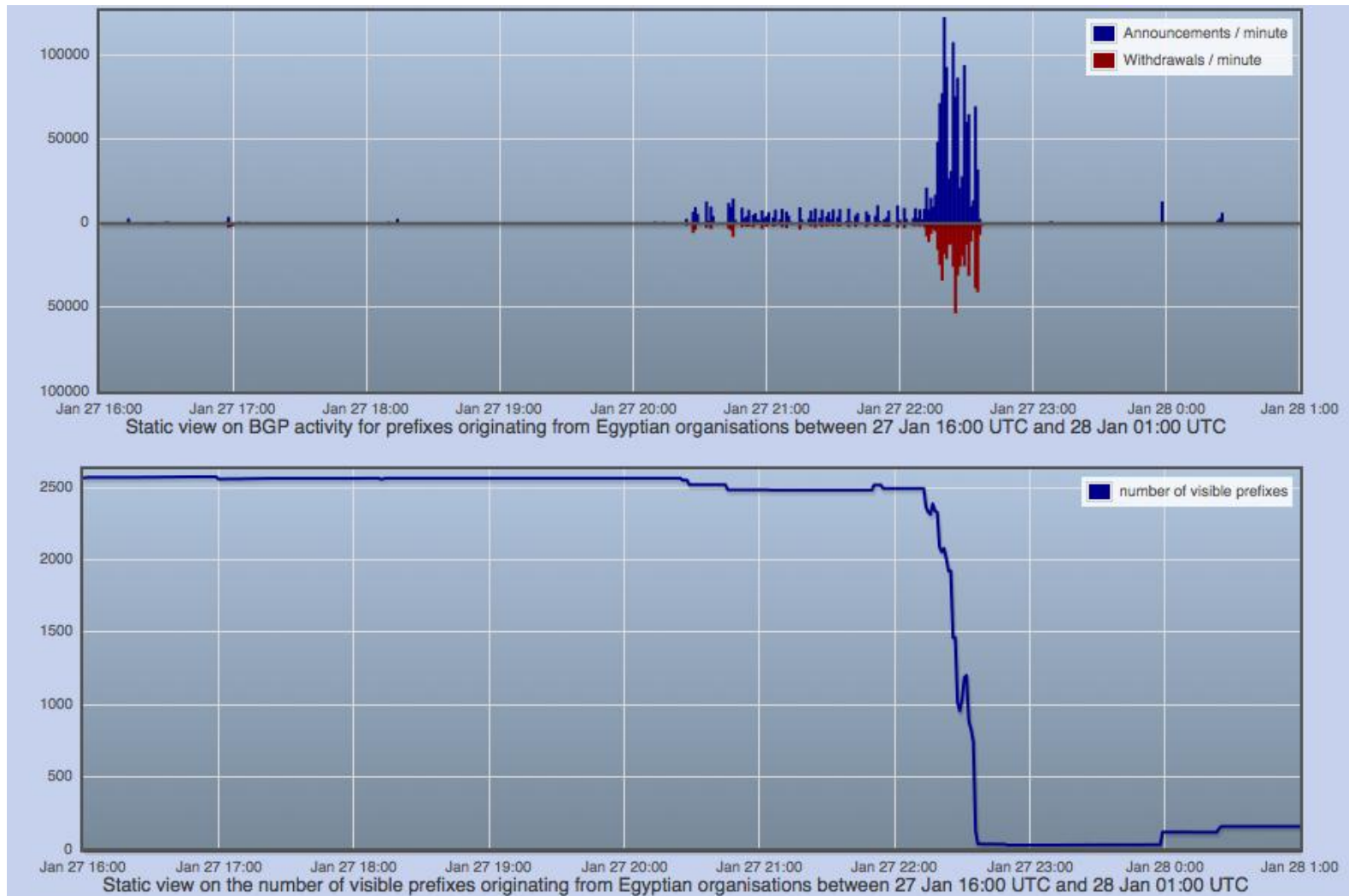


- Normally estimate 3-5 Gbps of traffic
- Dropped to several hundred Mbps January 27
- Further dropped to tens of Mbps last night

Underlying Problem: What Happened?

- Shortly after midnight Friday in Cairo, Renesys observed EG providers withdrawing BGP routes from the global table
- Egypt went from appx 3500 routed prefixes to about 150 routed prefixes in the space of 20min
- Global BGP convergence on the order of 30-60 seconds
- Interprovider spacings of first onset were longer: a minute to several minutes apart

<http://stat.ripe.net/egypt>



Egypt's Internet Embedding: IPv4 Space

- Grey: routed
- Black: unrouted
- Orange: Egypt



Before and After: A Hole In The Internet

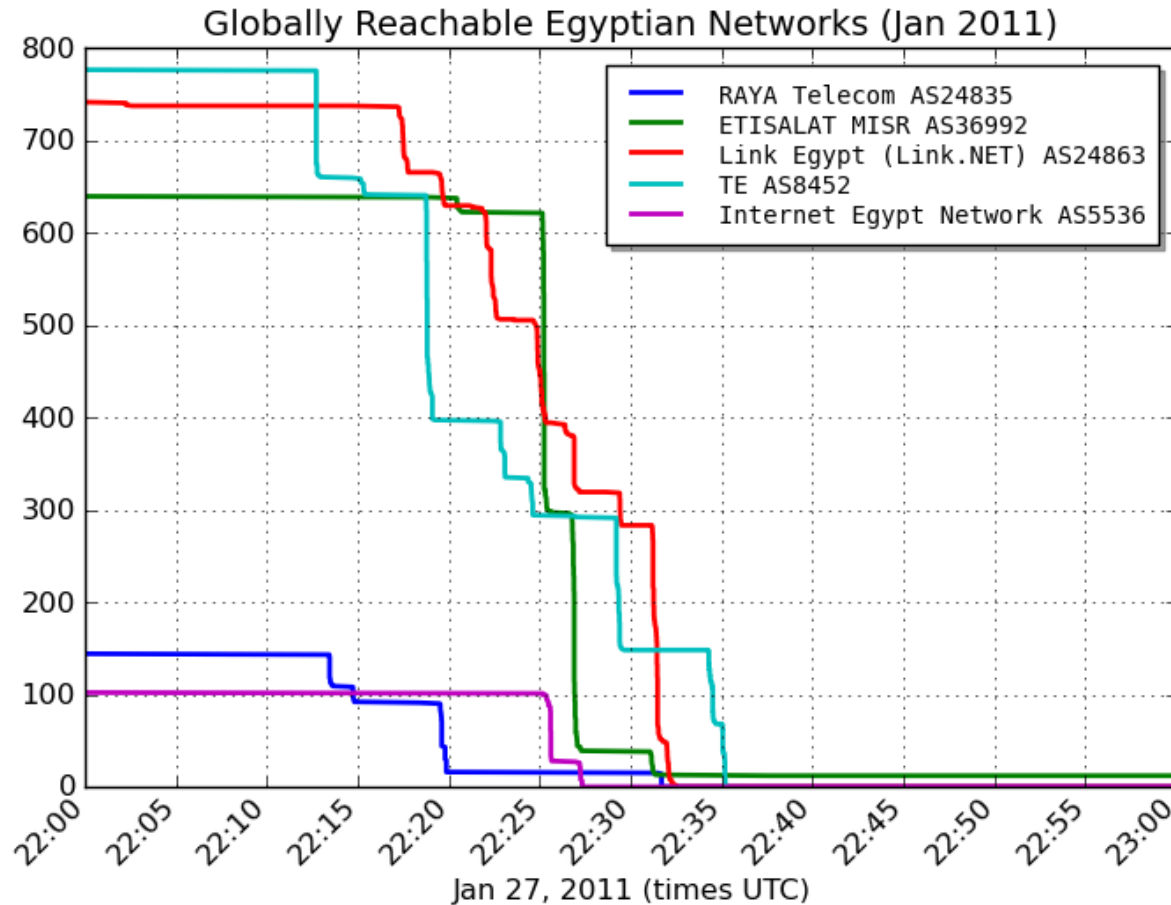


26 January 2011

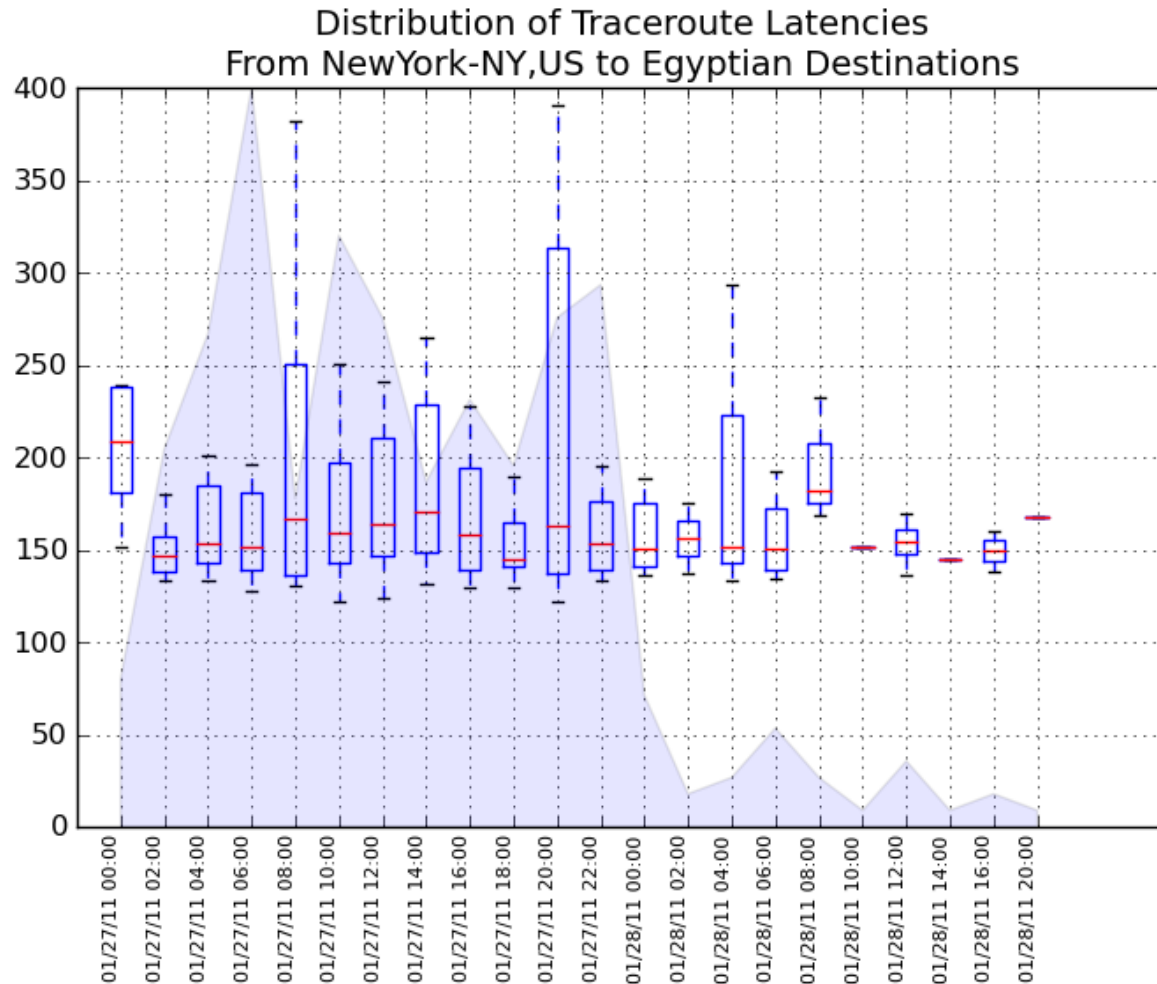


1 February 2011

Staggered downtimes: no kill switch?

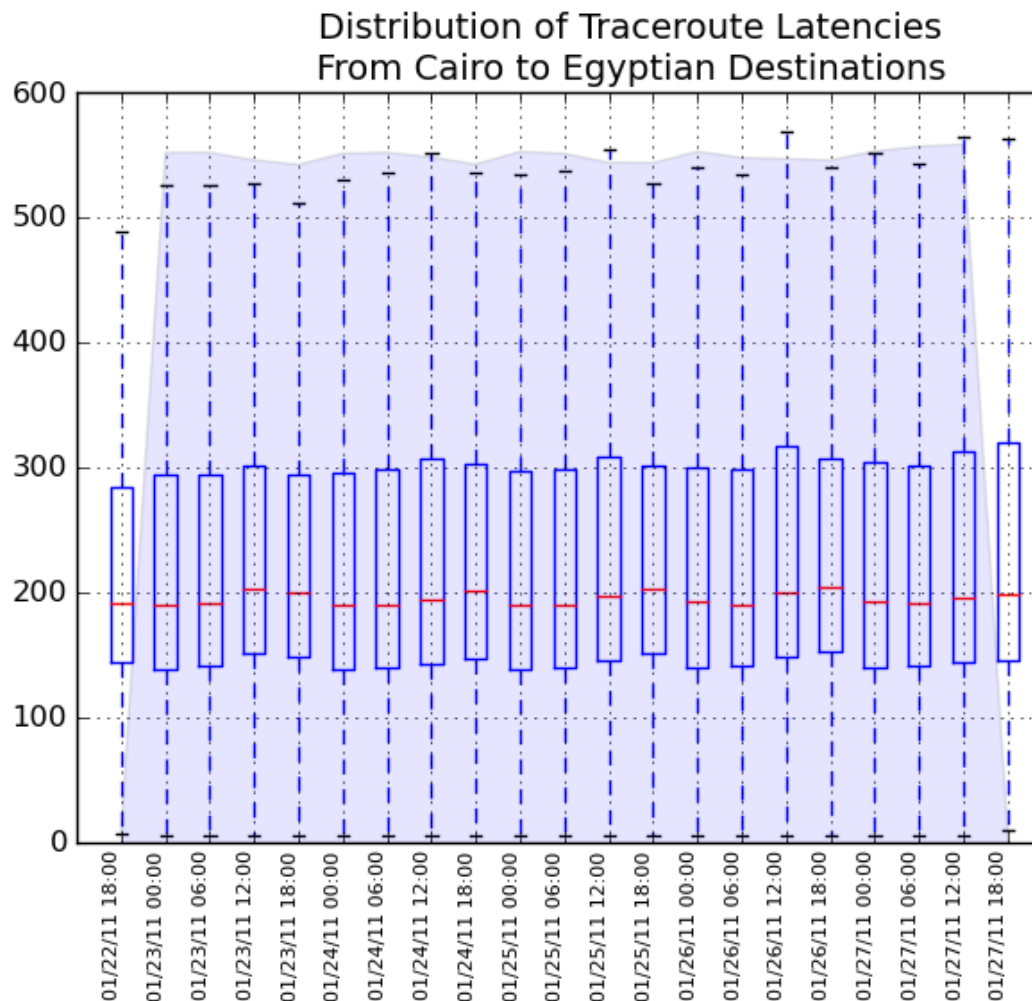


No clear signs of congestion beforehand



Same view from the inside

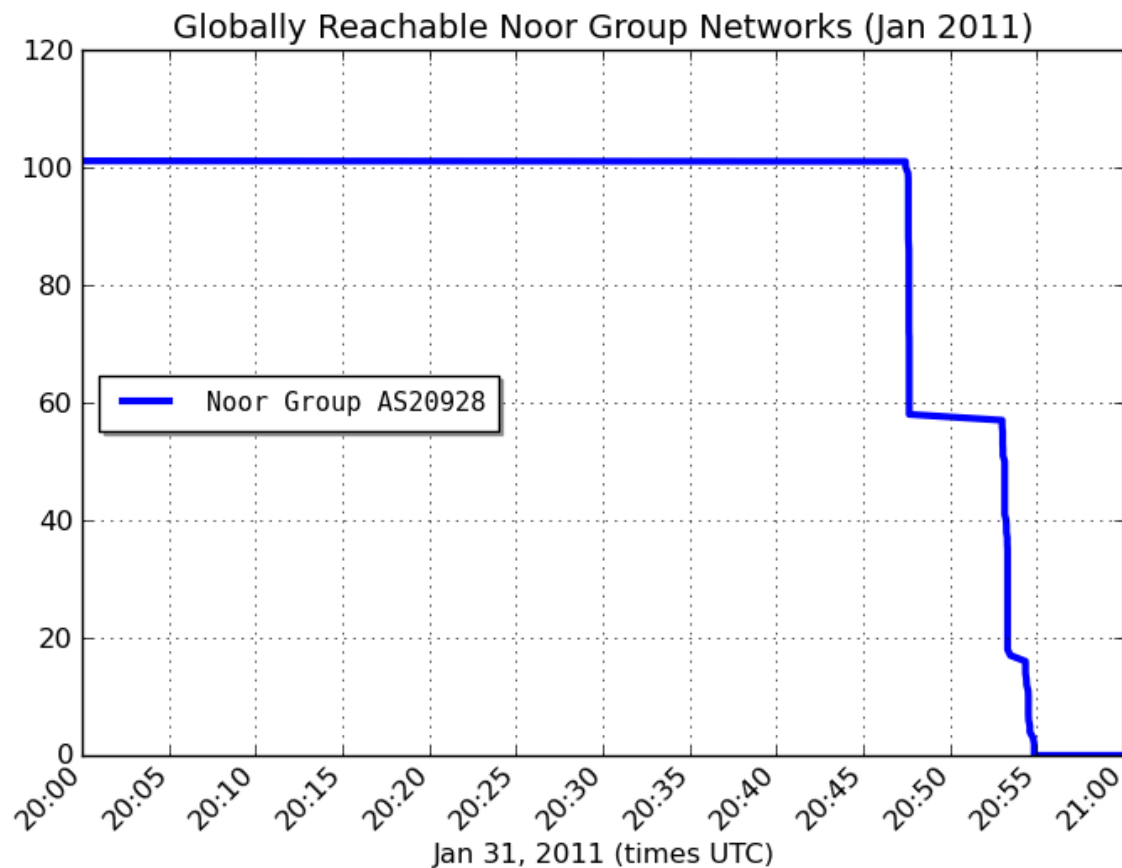
**Note 180ms
median
latencies for
domestic
routes under
NORMAL
conditions**

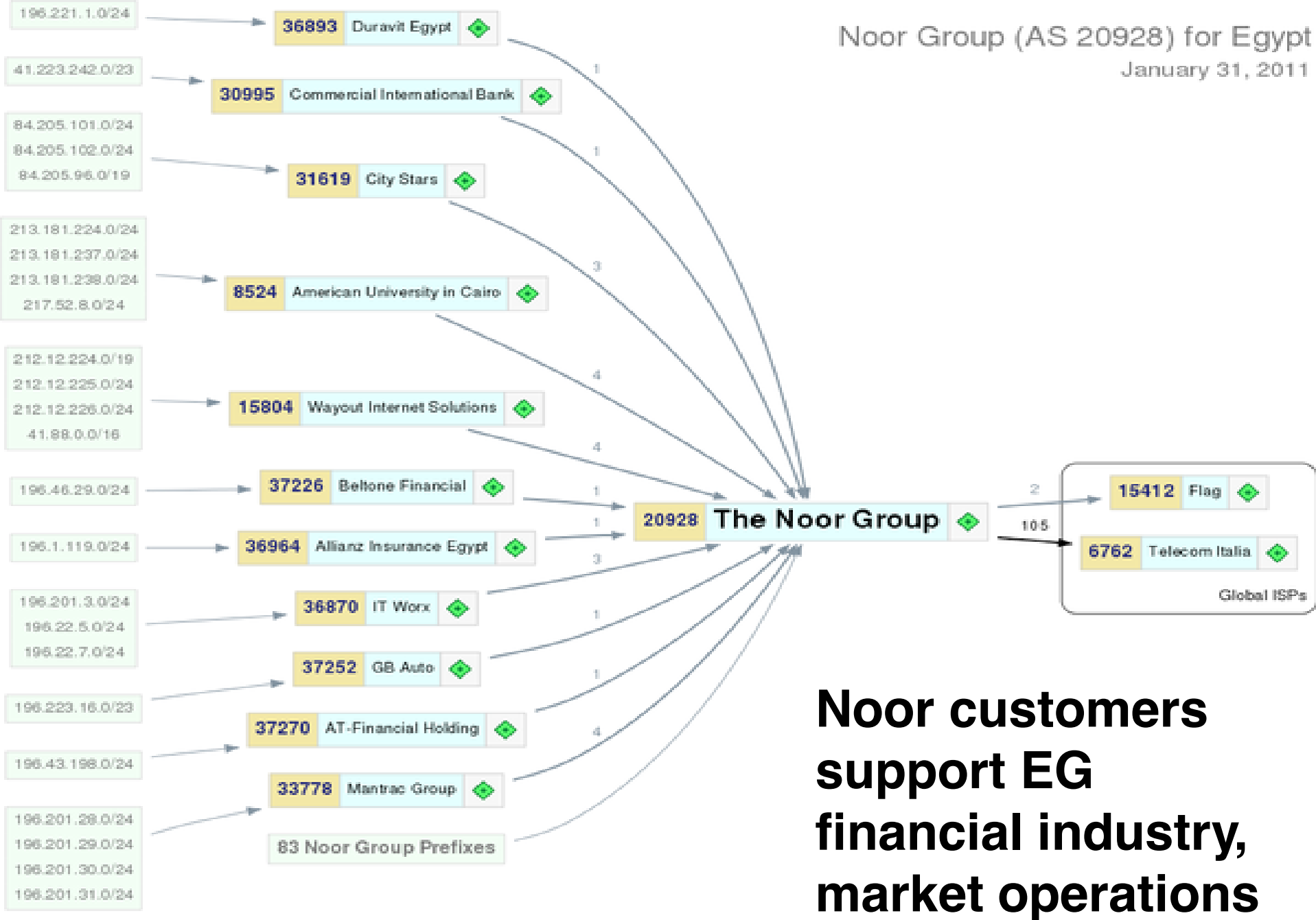


Who was left?

- Prefixes remained alive from several sources
- Traffic continued to flow at minimal levels
- Inbound traces to routed blocks now die on Seabone at Palermo, suggesting additional problems; routing not sufficient for connectivity
- Lots of sites have DNS issues and other reachability issues, even if routes remain
- Eg., stock exchange up, settlement down
- Some IPv6 remained (nobody noticed)

Monday, 20:27 UTC: Noor Group down





Noor customers support EG financial industry, market operations

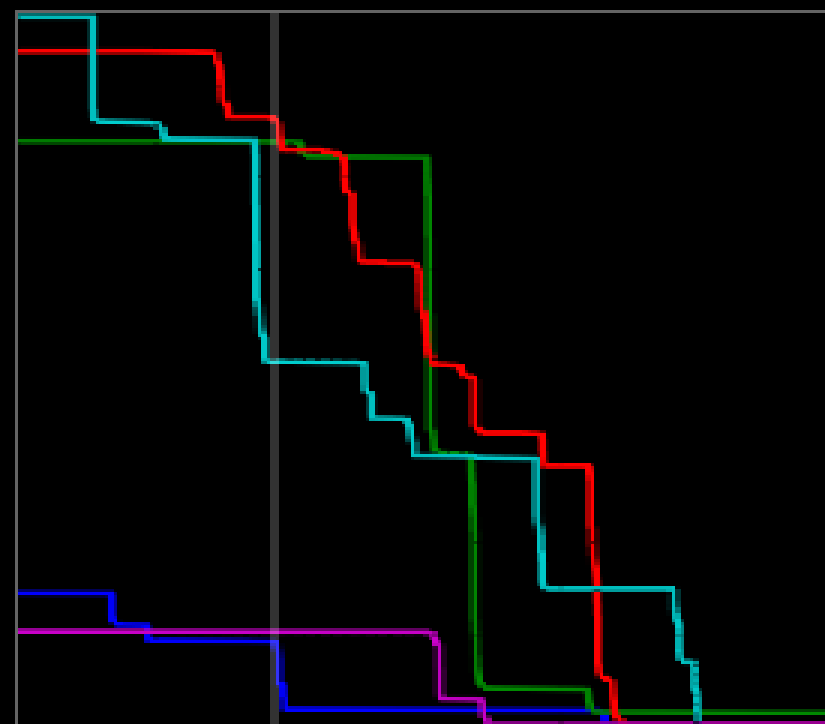
Tuesday Status

- About 75 prefixes still up, but most traceroutes die at Palermo on Seabone
- Telecom Egypt's Jordanian customers are still online and reachable
- This is very different from an Egyptian cable cut
- No signs of problems on SMW3, SMW4, FLAG, etc. for regional providers downstream
- Renesys continuing to monitor regional networks carefully for signs of instability or outage

Visualization: Egypt Outage

- http://www.youtube.com/watch?v=b_jRcxuemtg
- 60x playback; one second per minute
- Announced routes depicted per origin ASN
- Withdrawal events flash white
- Piecewise Hilbert curve map depicts actual prefixes within Egypt's IPv4 allocations
- Individual providers are color-coded
- Fades to black as Egypt leaves the Internet

22:19:30



Raya Telecom (AS25835)



Etisalat Misr (AS36992)



Link Egypt (AS24863)



Telecom Egypt (AS8452)



Internet Egypt (AS5536)



Other Providers





Thank You!

www.renesys.com