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Middle Eastern Internet Update

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MENOG 8, Al Khobar

14 May 2011

Regional updates since MENOG7

- Eventful six months since Istanbul
- **IPv4** Internet continues to grow
- **IPv6** Internet continues to struggle
- Diversity continues to improve
  - Phase 1: get enough diversity to survive most infrastructure problems ☑
  - Phase 2: cheaper, faster Internet: key input for regional economies ☐

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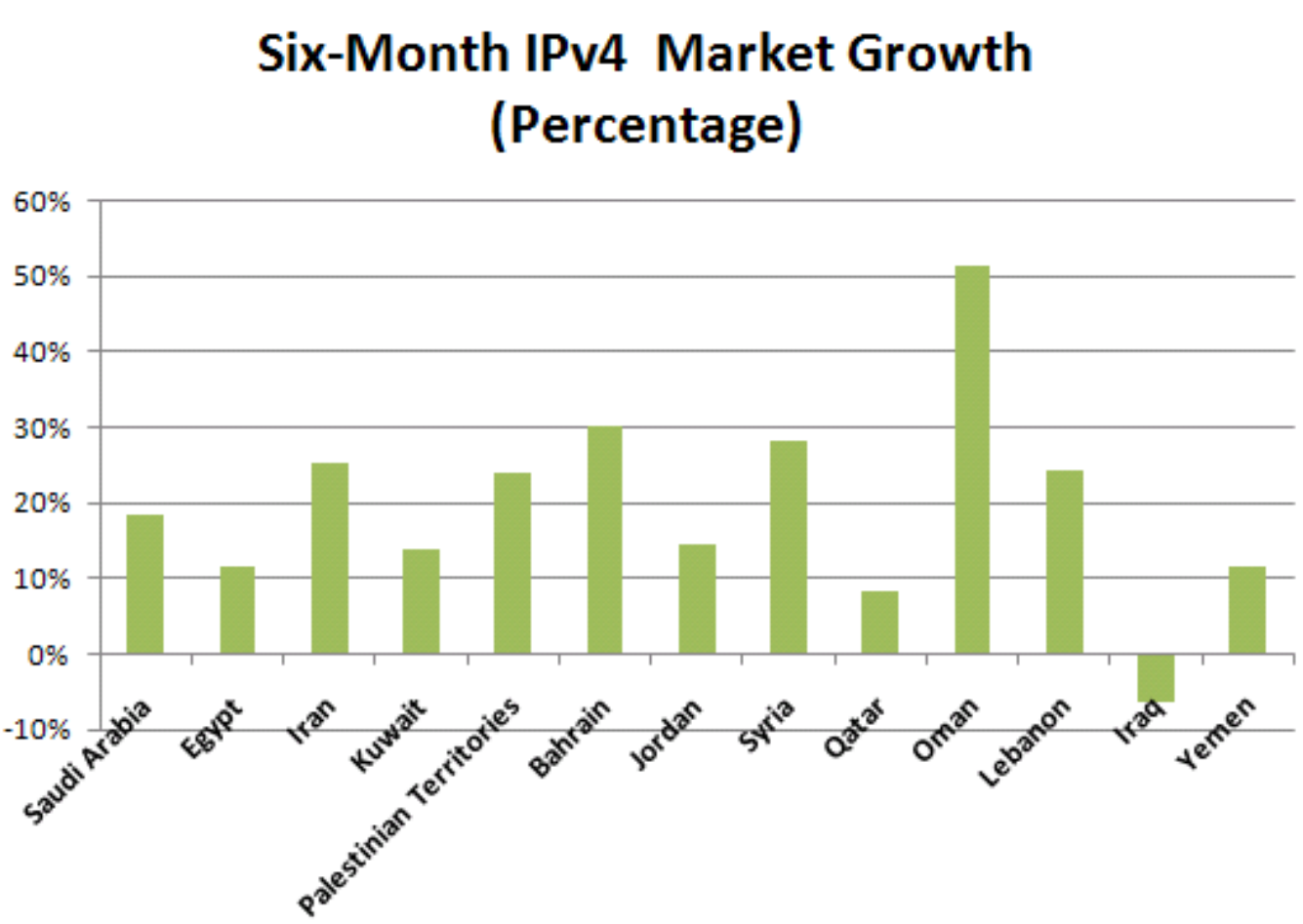
IPv4

Strong growth across the region



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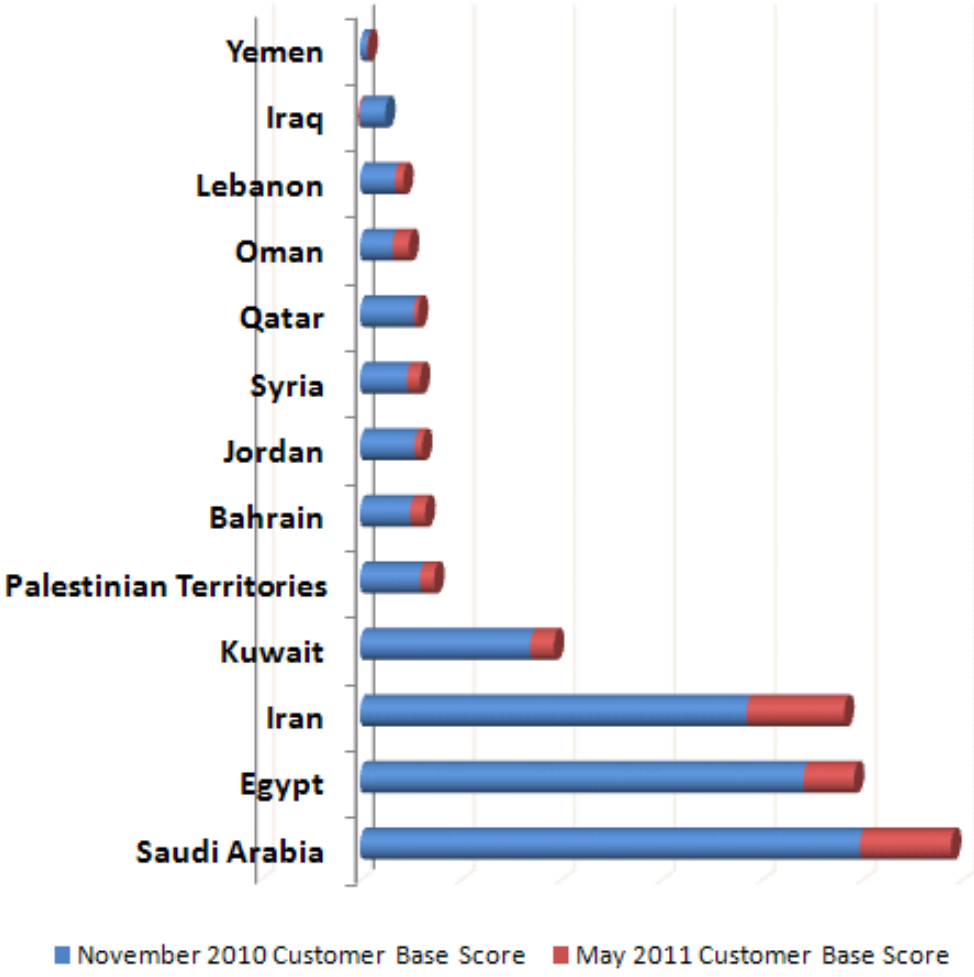
October 2010 – May 2011 in IPv4

- New growth (red)
- More choices for international connectivity
- Providers are adding new customers
- Customers are using more space



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Visualizing IPv4 Provider Diversity

- “Hilbert Curve” folds IPv4 address space into compact 2D representation
- Locality is preserved, and prefixes nest together
- On subsets of the full Internet, we use “packed Hilbert” representations, starting with the largest blocks
- These visualizations show how many paths to the Internet’s core each network uses in 24 hours. Green is good (3+ paths).

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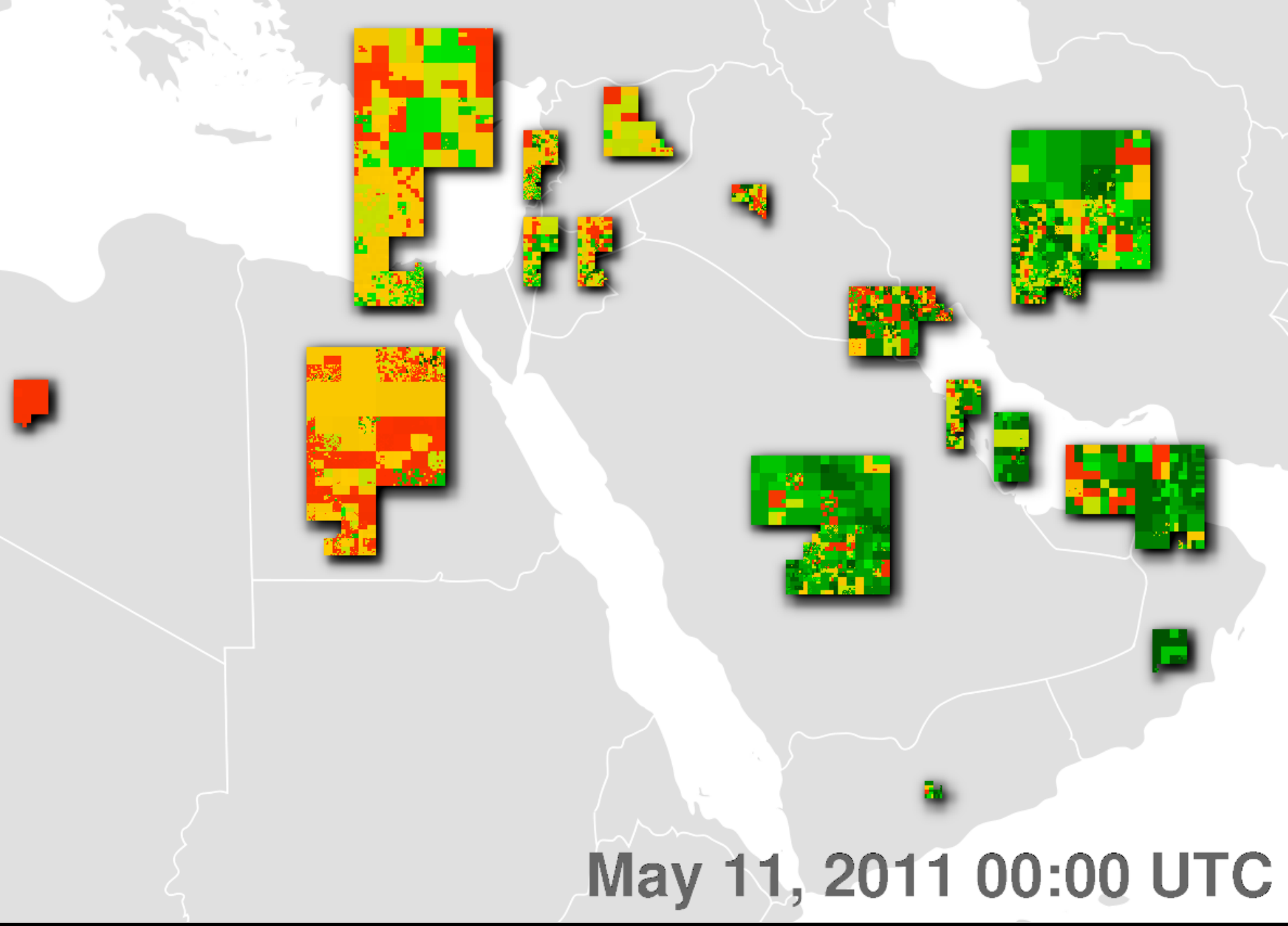
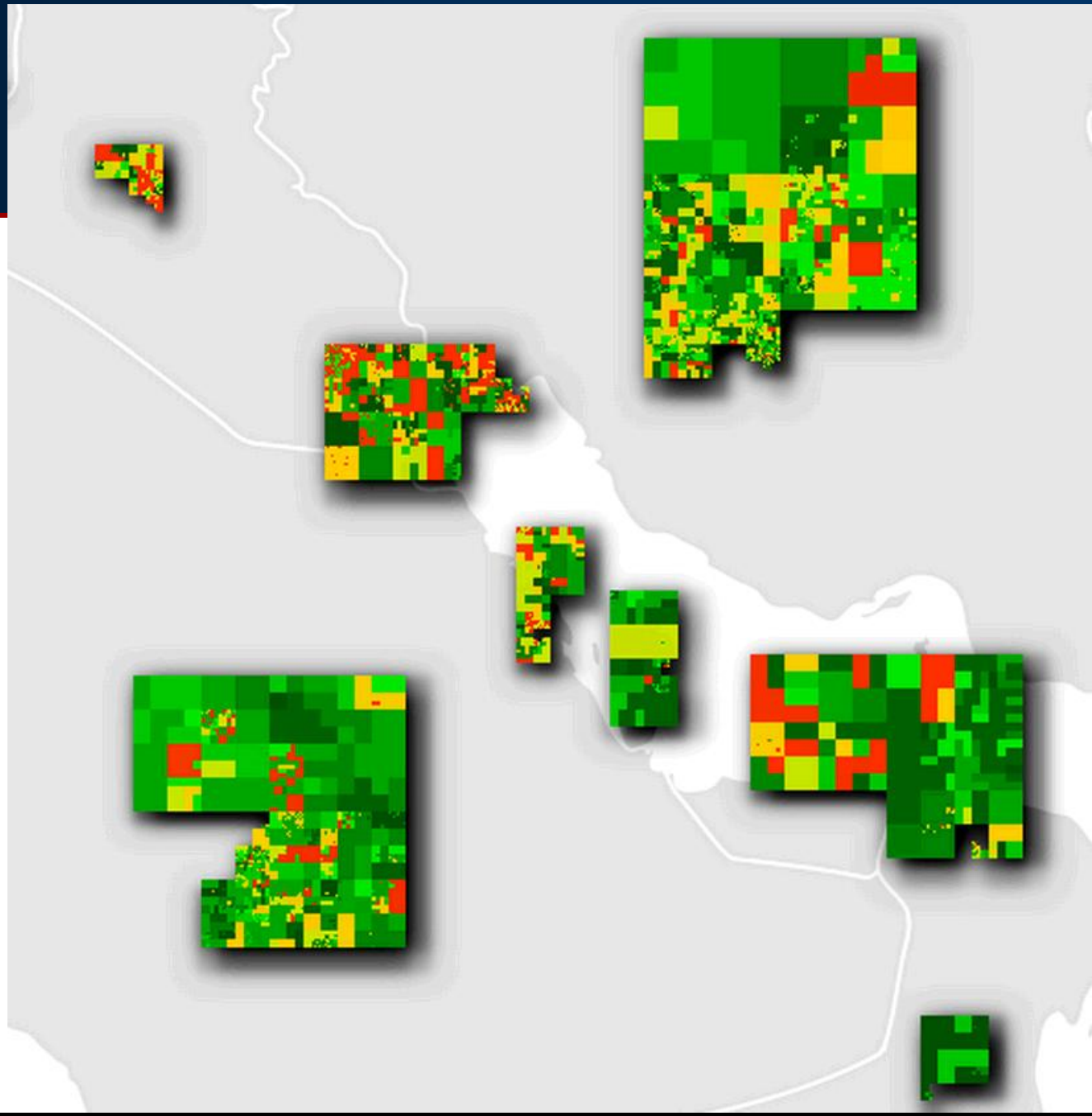


- Most countries have a mix of high-diversity and low-diversity prefixes.
- Gulf states do pretty well now, thanks to SMW3/4 and FLAG



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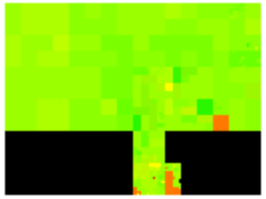
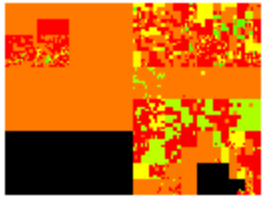
Packed Visualizations of Provider Origins



- AS39386 (STC)

- AS47794 (Etihad Atheeb)

- AS35819 (Mobily)



- AS8452 (Telecom Egypt)

- AS36992 (Etisalat Misr)

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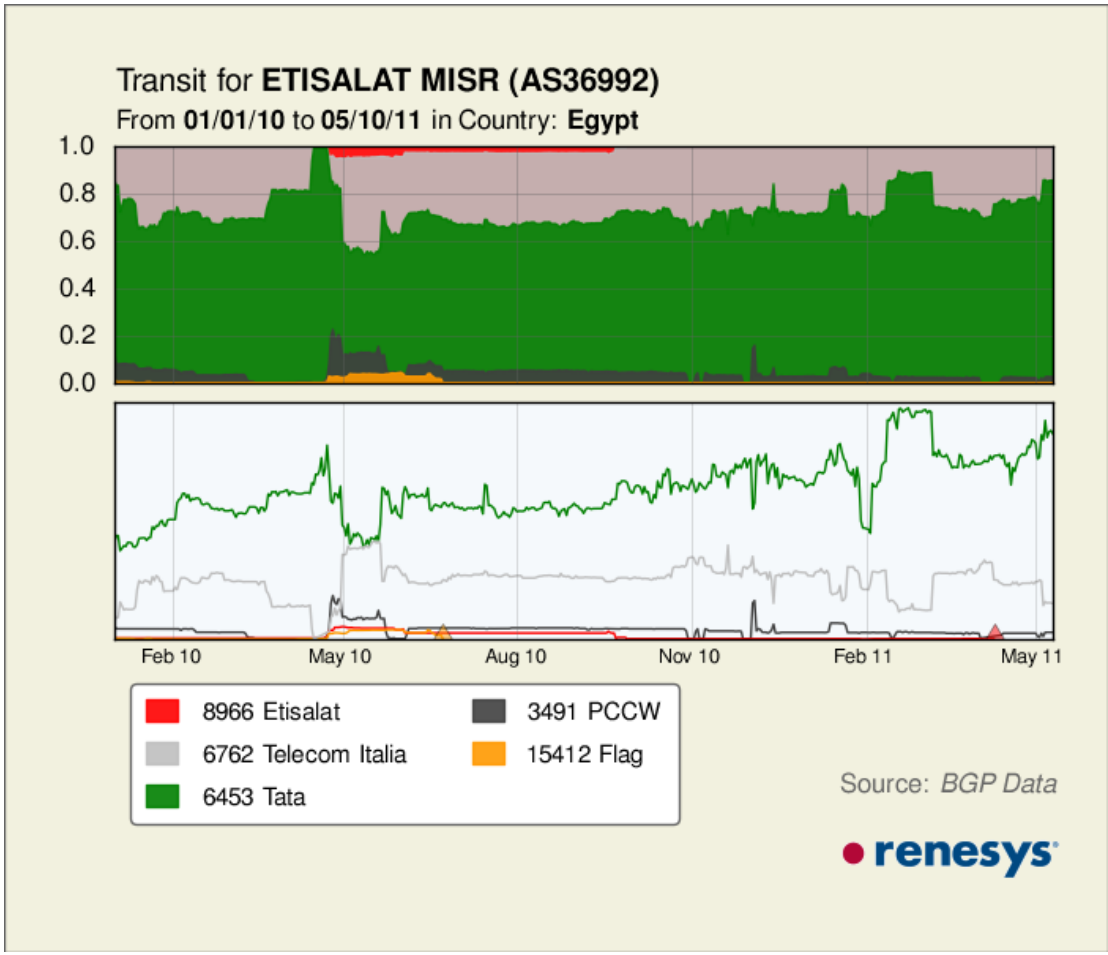
Diversity Can Wane

- Note steady drift upward of transit reliance on Tata
- Other transit providers are present but largely unused
- It works until it doesn't



Some Stories from the Last 6 Months

- Egypt blacks out Internet
- Trends in Kuwaiti transit
- Paltel increases diversity with Level3, Telia
- Syrian Internet minimally impacted
- Bahrain providers utilize more FLAG transit
- Iran transit diversity continues to increase
- Iran, Russia influence waning in Iraq?
- Cogent on the rise in Saudi Arabia?

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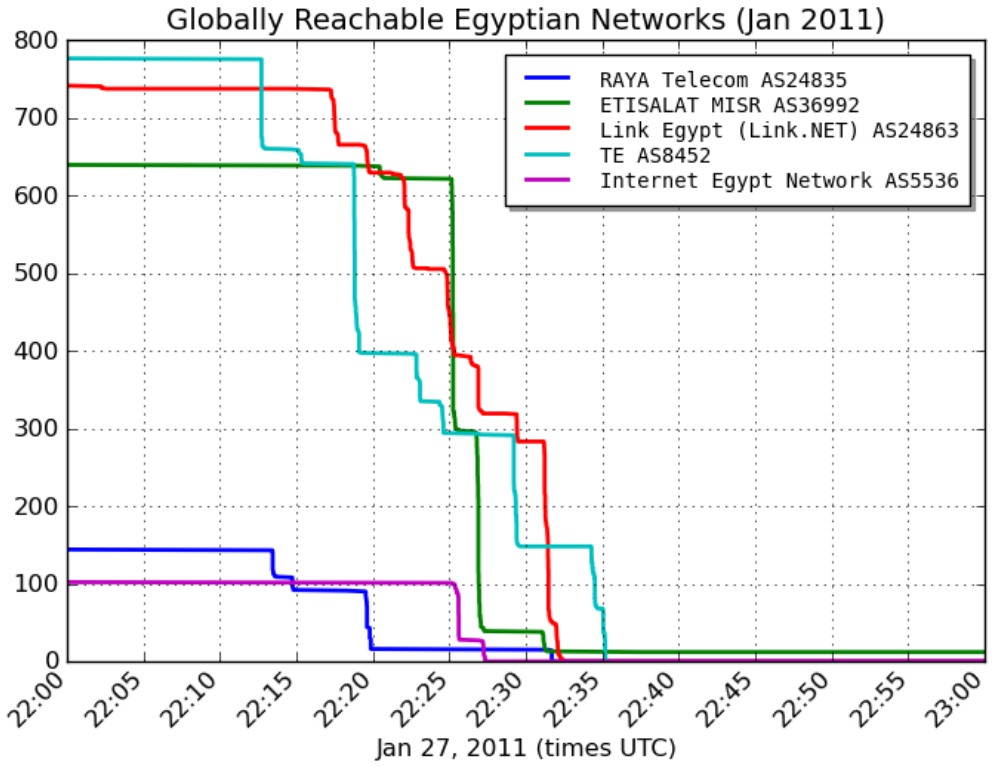
Egypt blacks out Internet

- Outage of all but Noor Group on 27 January
- Staggered downtimes suggested per-provider action
- Power outage at the exchange?



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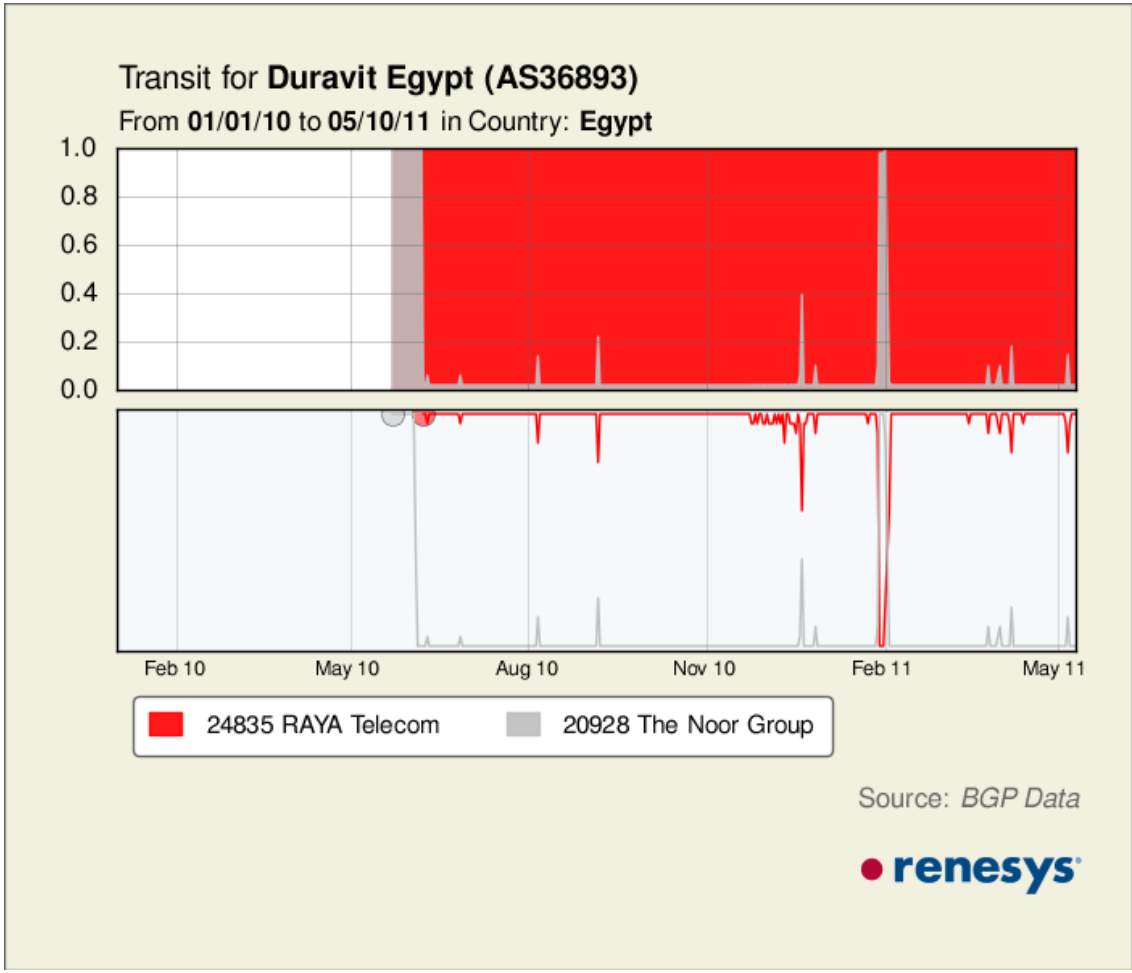
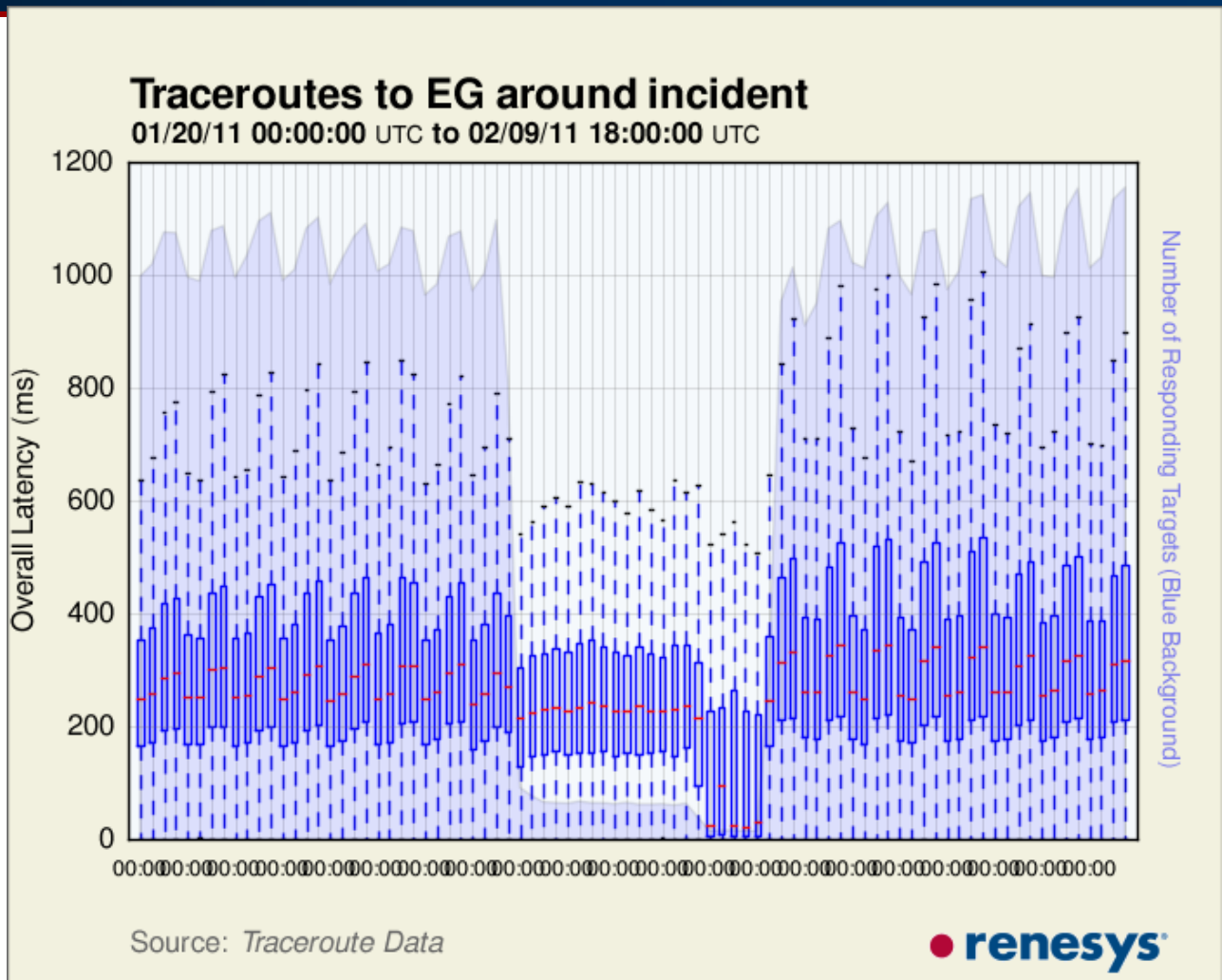
Egypt blacks out Internet

- Companies like Duravit discover how important it is to have a second, maximally diverse transit provider!



Egypt blacks out Internet

- Inbound traceroute success rates plummet
- Statistics tighten as only provider-internal traces complete



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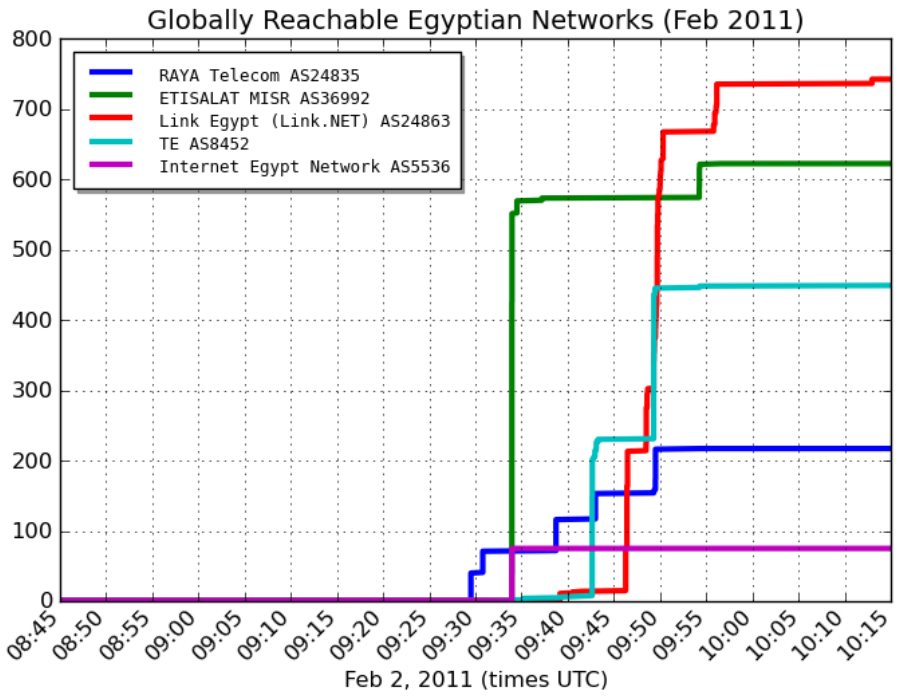
Egypt blacks out Internet

- Restoration on 2nd February
- Noor Group comes back about an hour later than everyone else
- Lesson: physical provider diversity was lower than anyone realized



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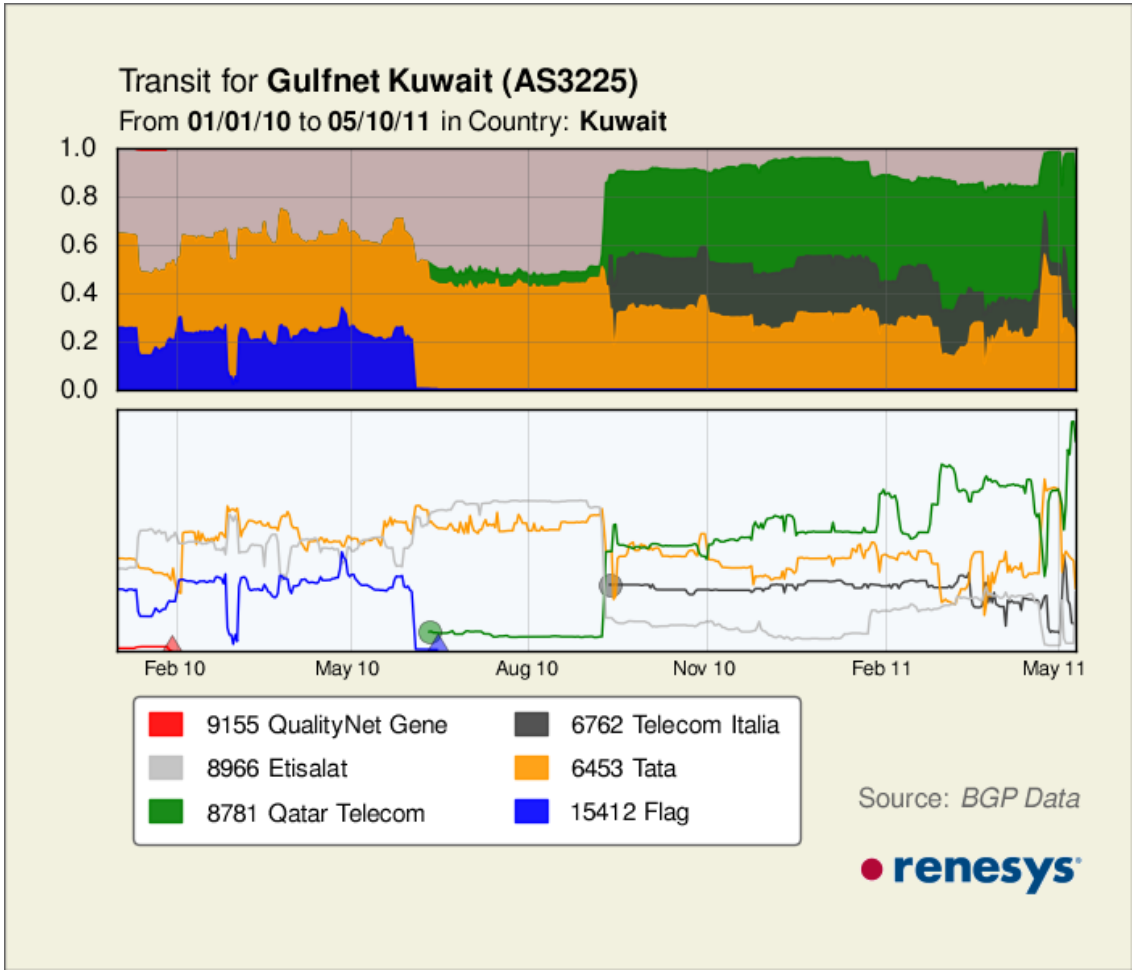
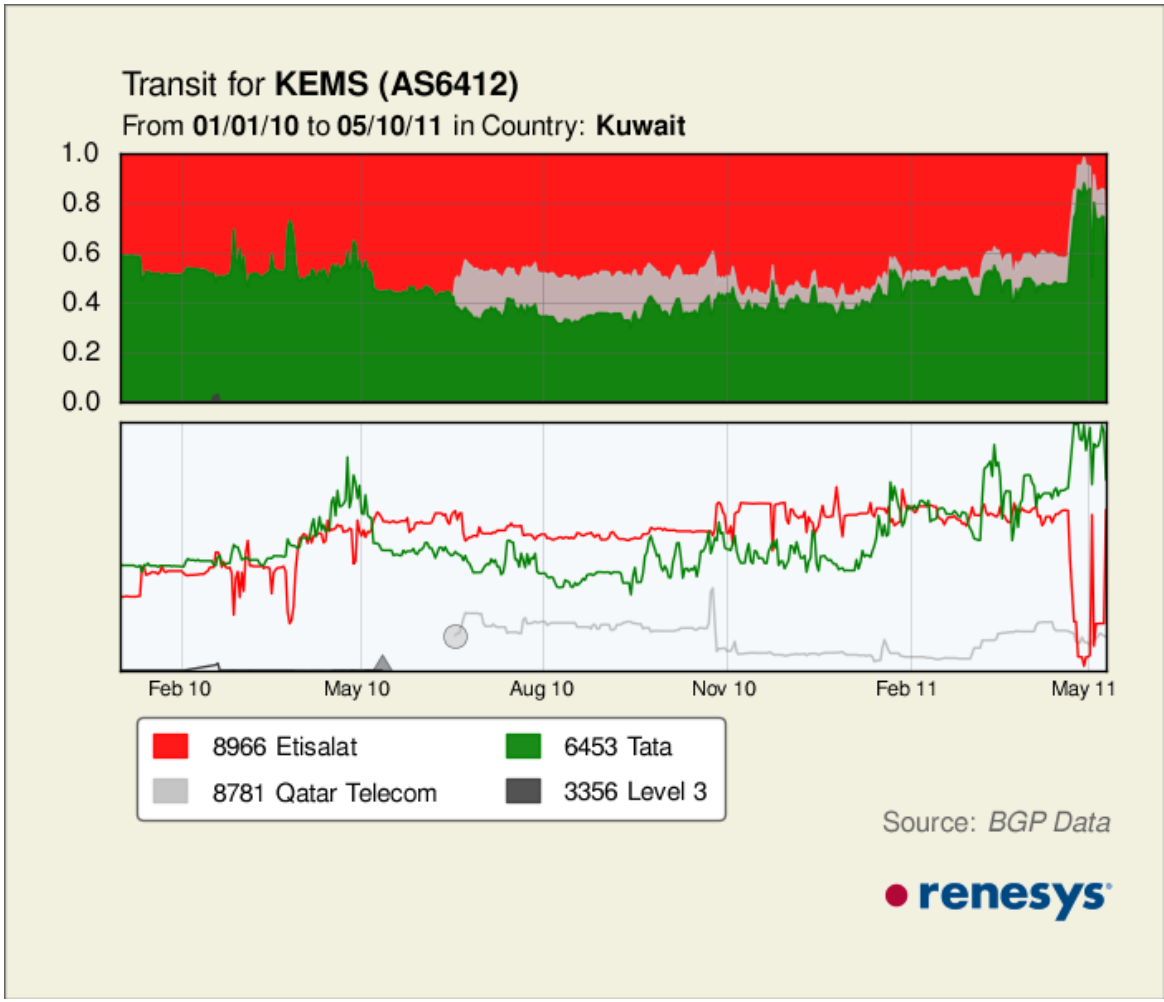
Transit trends in Kuwait

- Observe the rise of Q-tel and TI over the last 6 months, squeezing 8966.
- Part of a pattern?



Transit trends in Kuwait

- Same rise in Qtel, Tata squeezing 8966 as KEMS transit.



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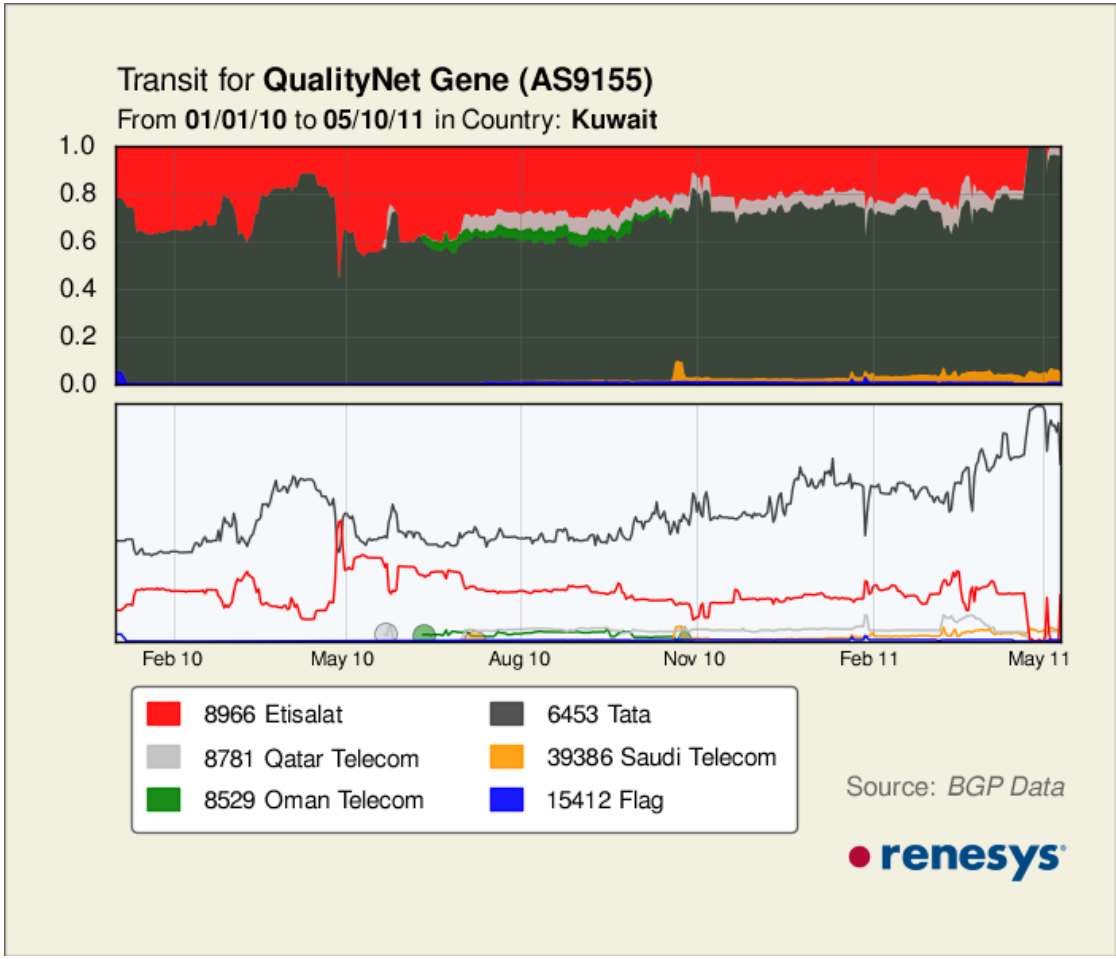
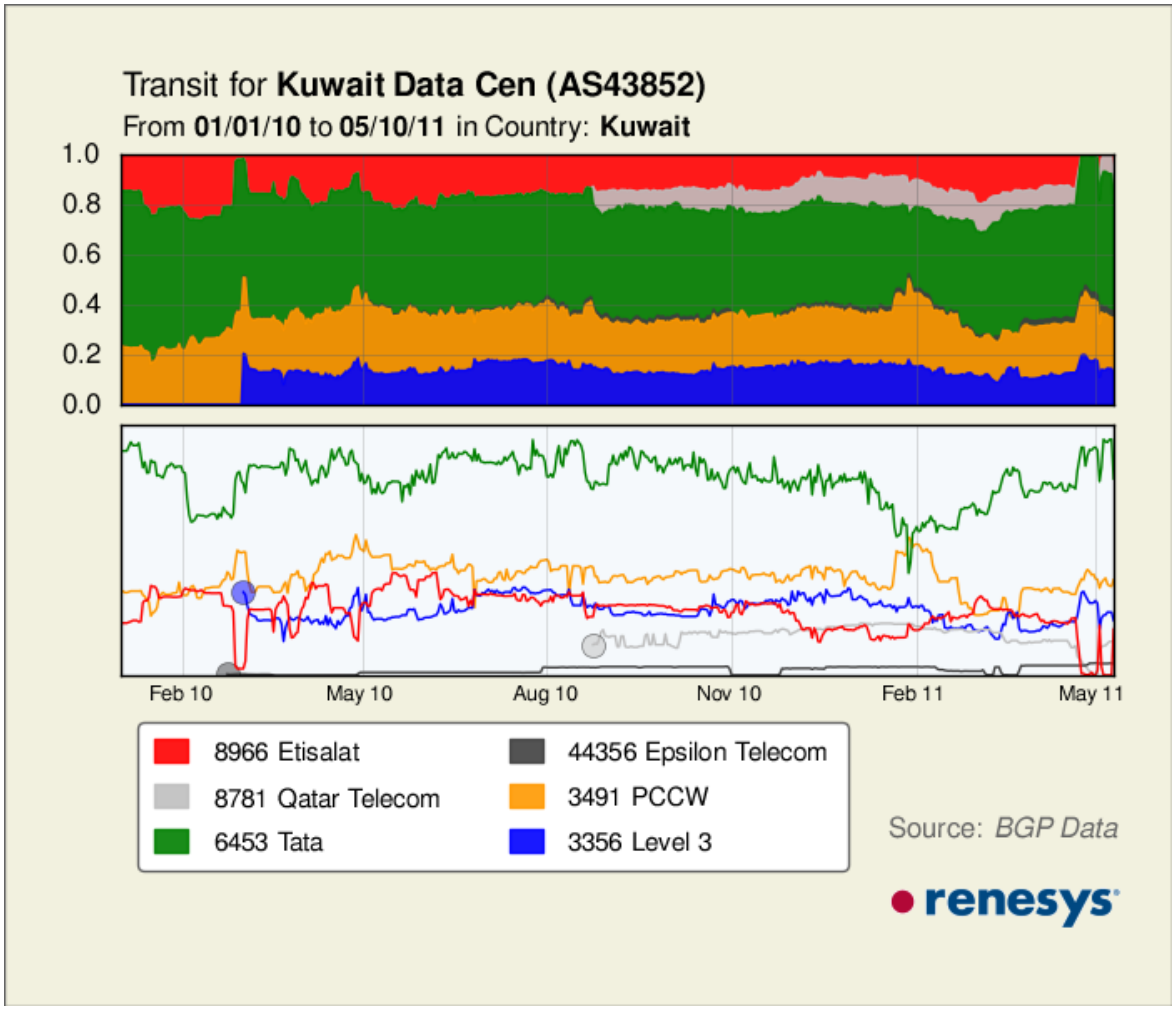
Transit trends in Kuwait

- Increase inTata squeezing 8966 as QualityNet transit.



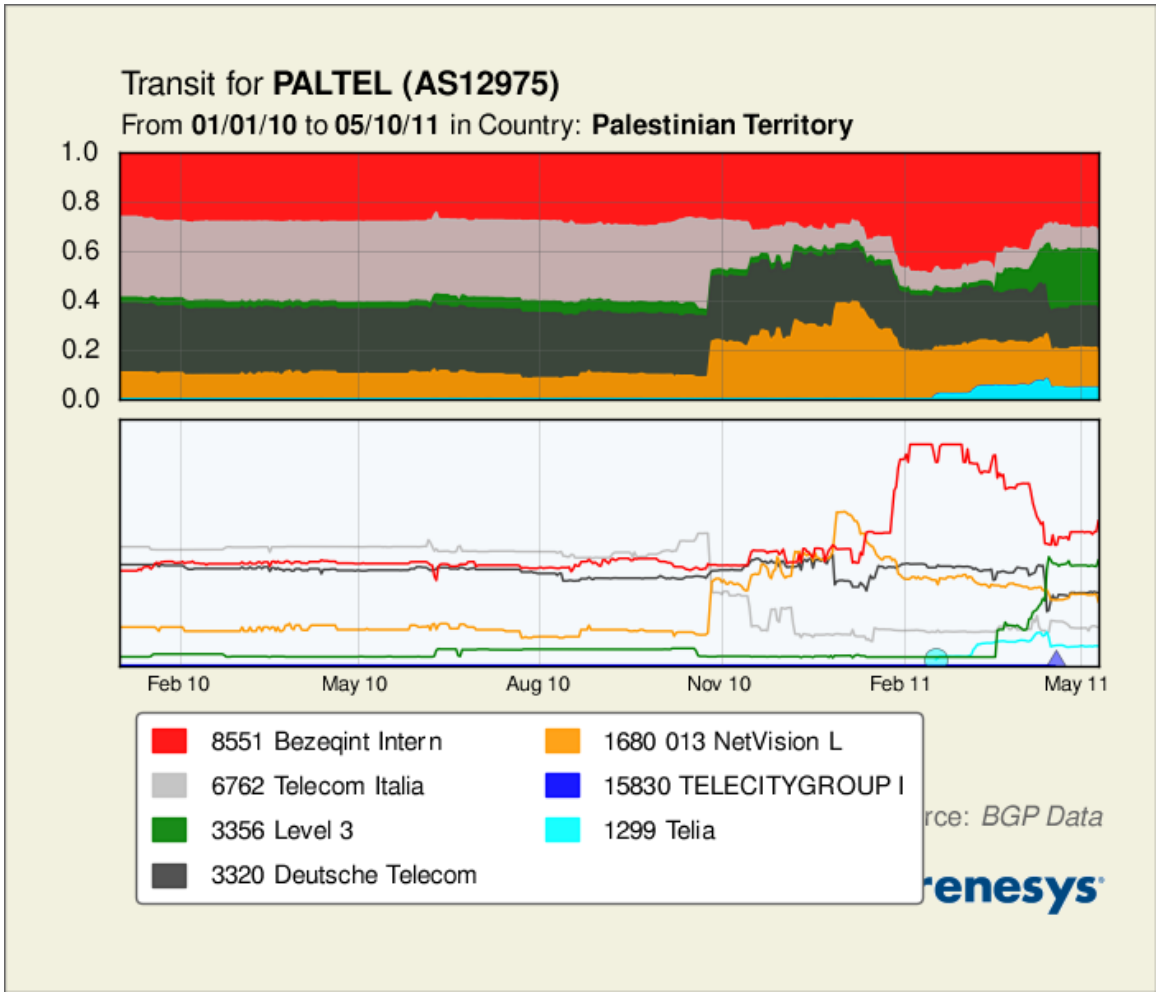
Transit trends in Kuwait

- Increase inTata squeezing 8966 as KDC transit.
- Significant drop in recent weeks.
- What's up here?



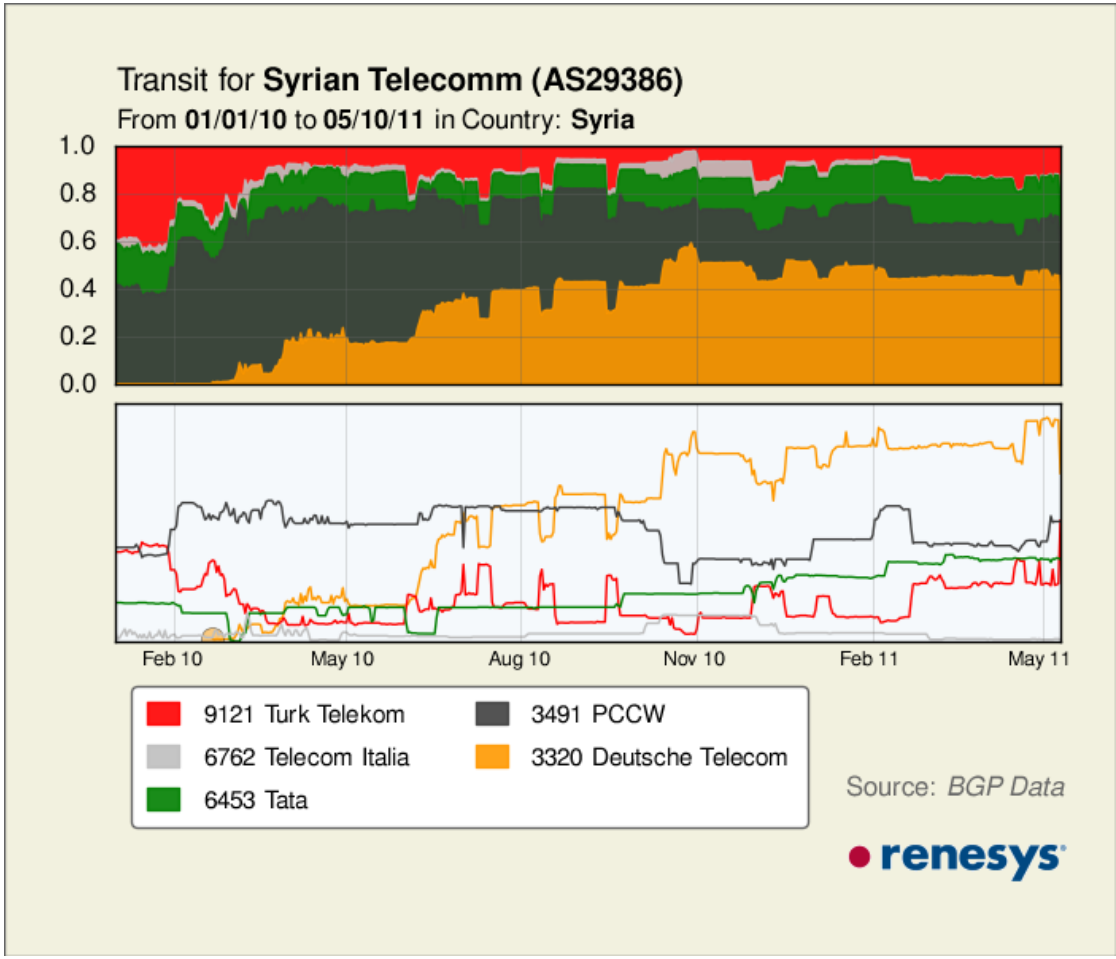
Paltel increases diversity with L3, Telia

- Observe market entry of Telia, increase in Level3
- Paltel seeks direct cx through Jordan, access to FLAG FEA landings



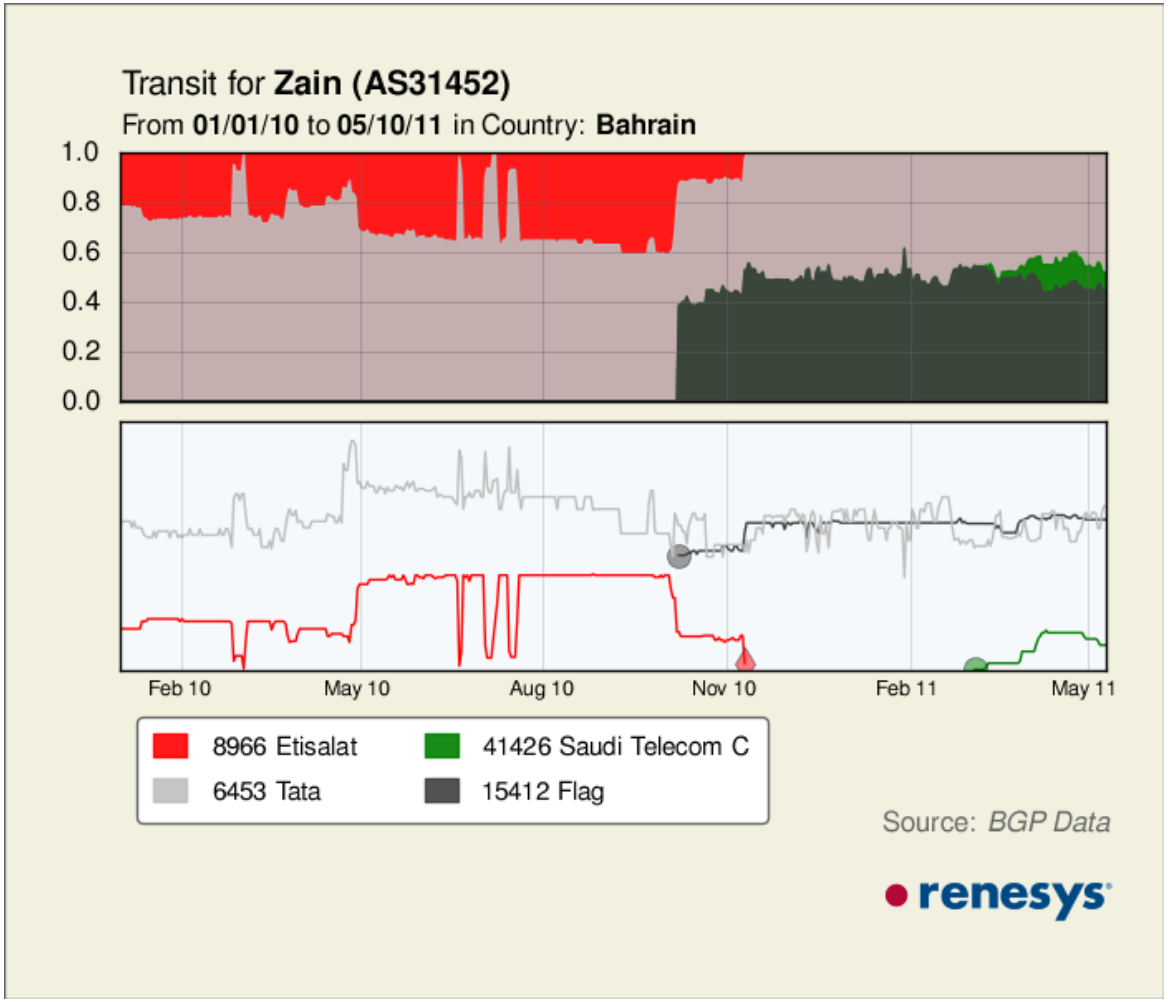
Syrian Internet Largely Unimpacted

- Transit blend of 29386 has remained remarkably stable in 2011
- No significant changes evident in recent months



Bahrain providers utilize more FLAG transit

- Note Flag coming online as new provider to Zain in October
- STC added in March as extra diversity
- Tata continues as key provider



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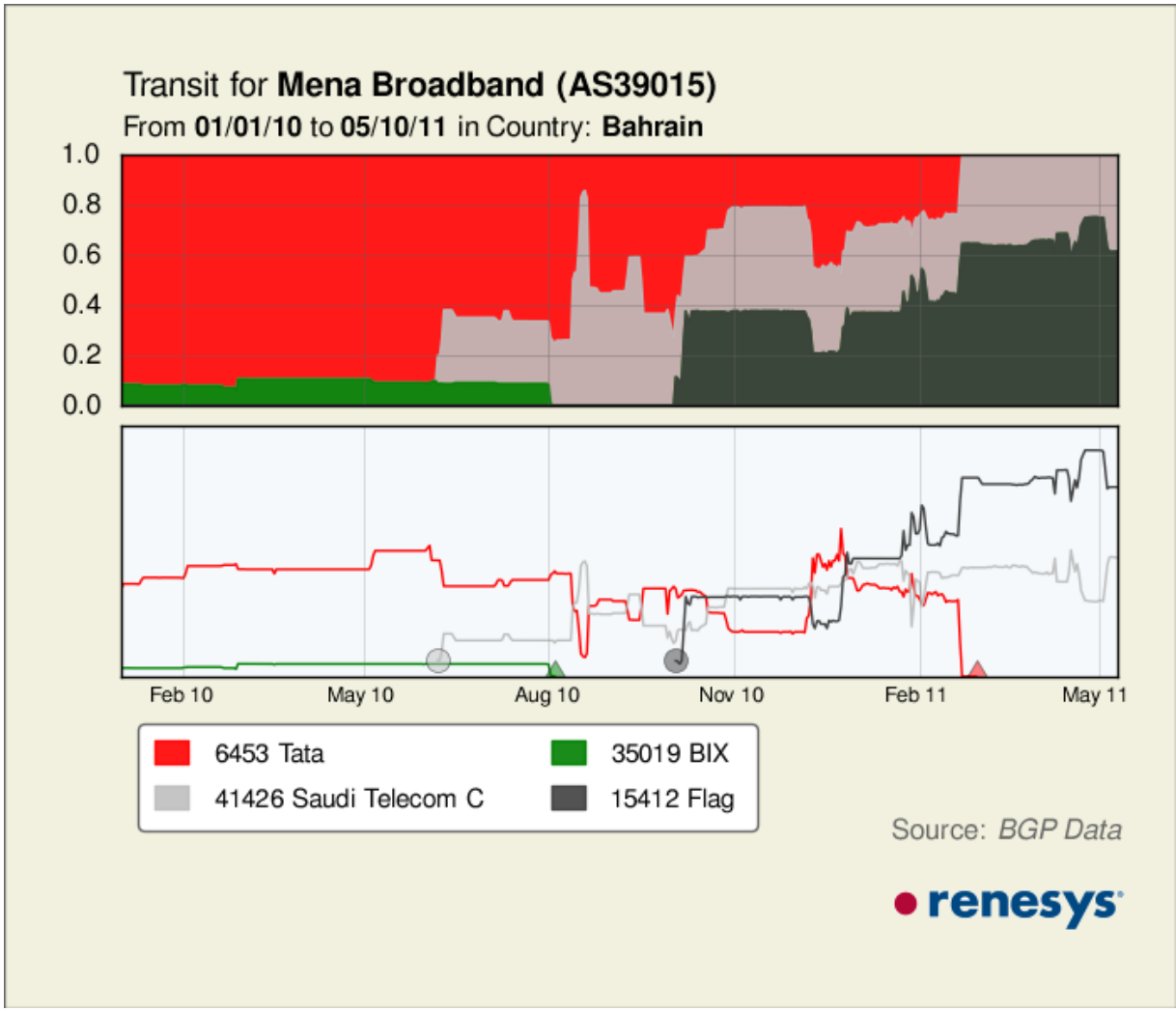
Bahrain providers utilize more FLAG transit

- Mena Broadband picks up Flag transit at the same time
- This time, Tata and the BIX get squeezed
- STC transit remains



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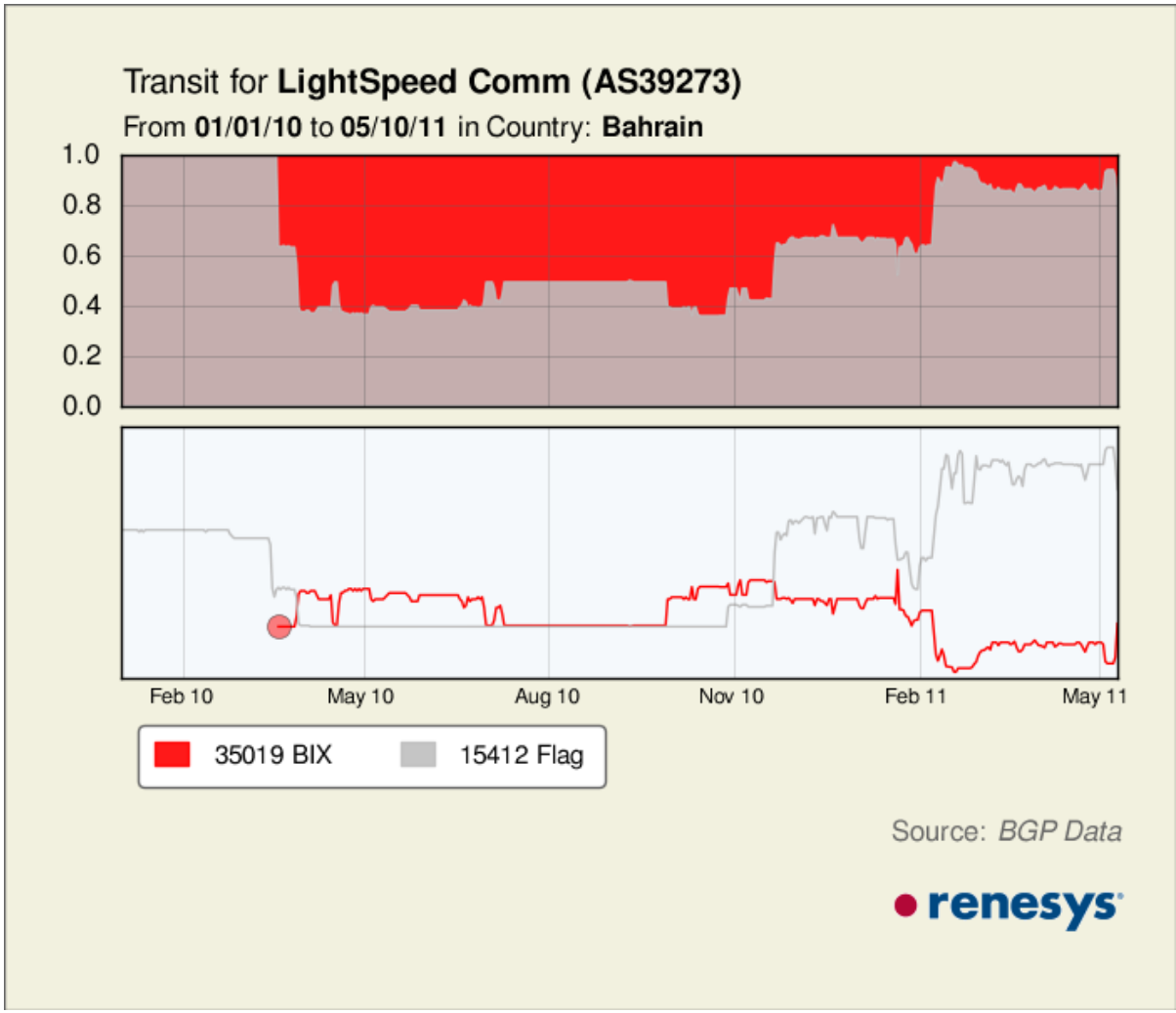
Bahrain providers utilize more FLAG transit

- Lightspeed led this trend in 2009
- Called in BIX for diversity
- Has reduced that hedge over time



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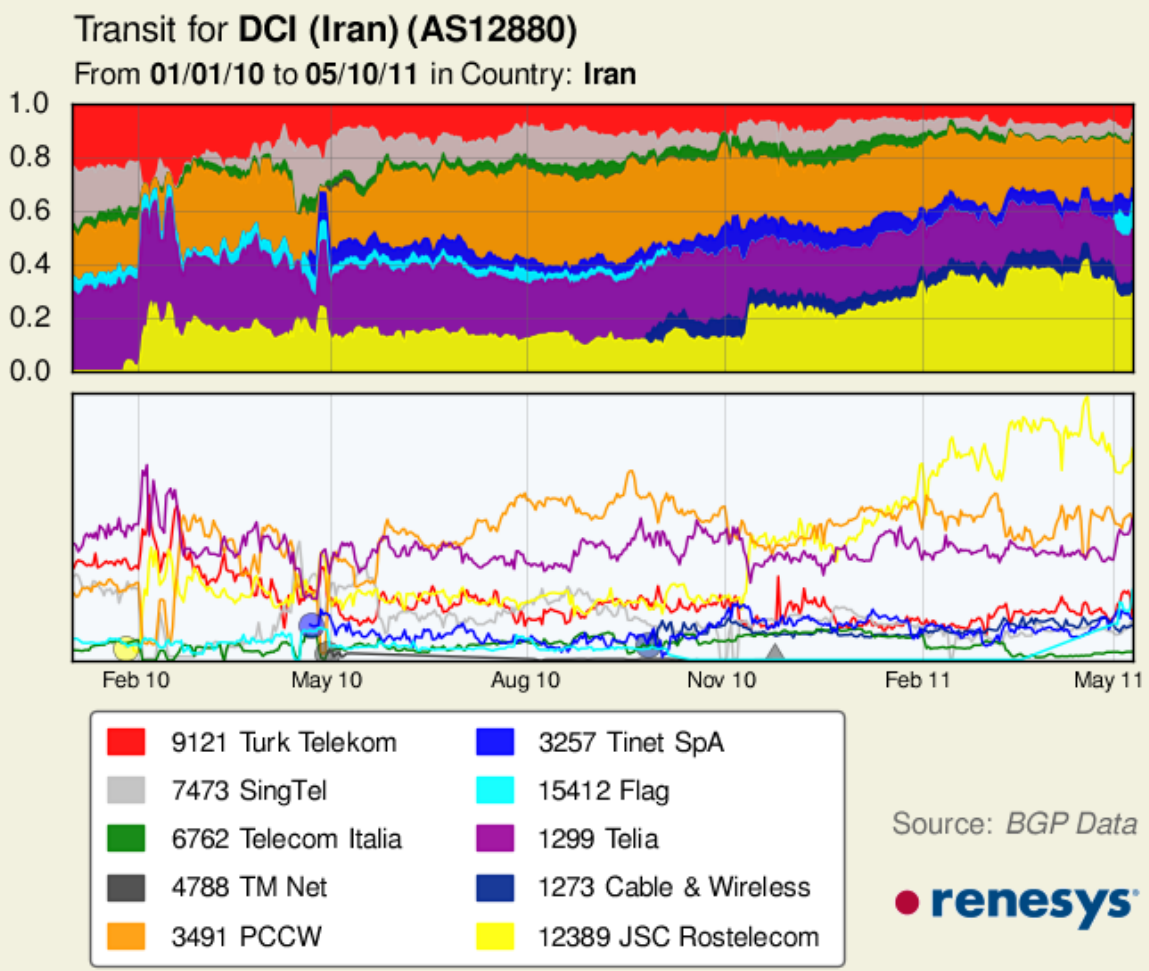
Iran transit diversity

- DCI does a really good job of balancing all competing transit alternatives
- Note return of Flag after months of absence
- Russian transit peaks at ~40%
- Turkish, TI transit waning?



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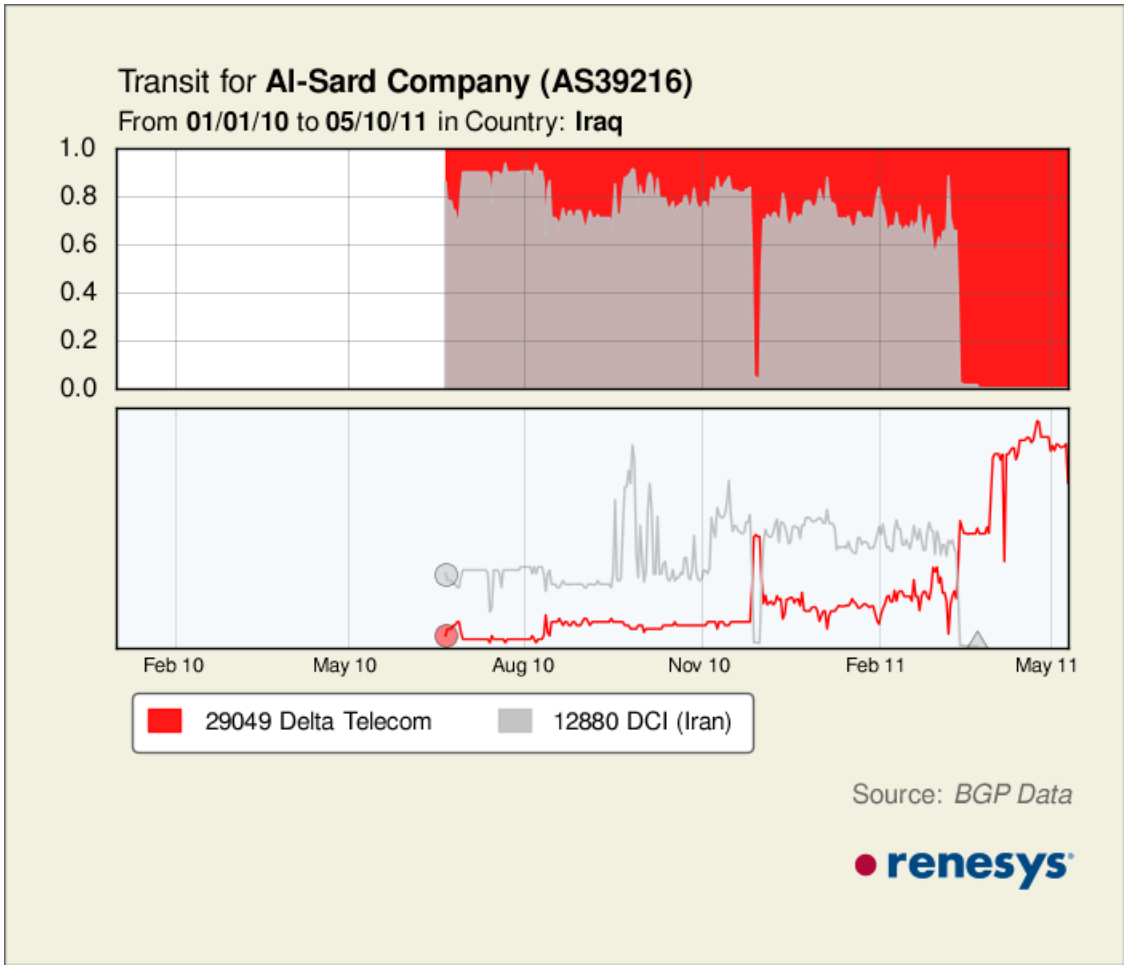
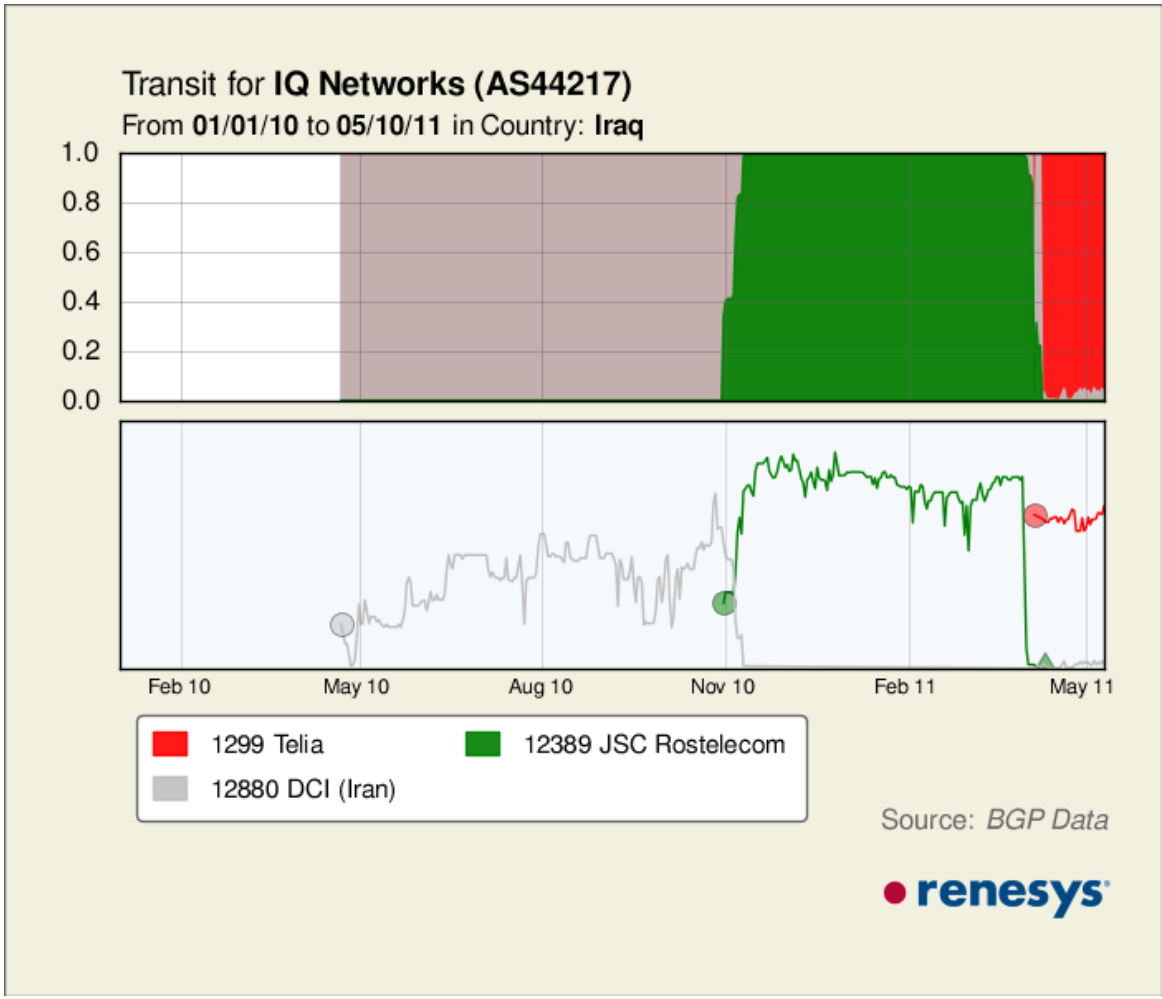
Iran transit waning in Iraq?

- Iran exports Internet to neighboring Iraqi Kurdistan, Afghanistan
- DCI is out, Delta Telecom (Azerbaijan, with Rostelecom transit) is in at Al-Sard group
- Rostelecom's Iraq customer base score up nearly 400% in 6 months on the back of this deal alone



Iran/Russian transit waning in Iraq?

- Telia walks in and takes business from Rostelecom
- DCI's remaining contribution is very small
- DCI's overall Iraq customer base score dropped by **90%** in the last 6 months



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Iran transit waning in Iraq?

- Delta Telecom's Azeri transit (with Russian upstream) is still via Iranian physical path
- DCI's role as logical provider of visible Internet transit (BGP adjacency) to neighbors may be shifting

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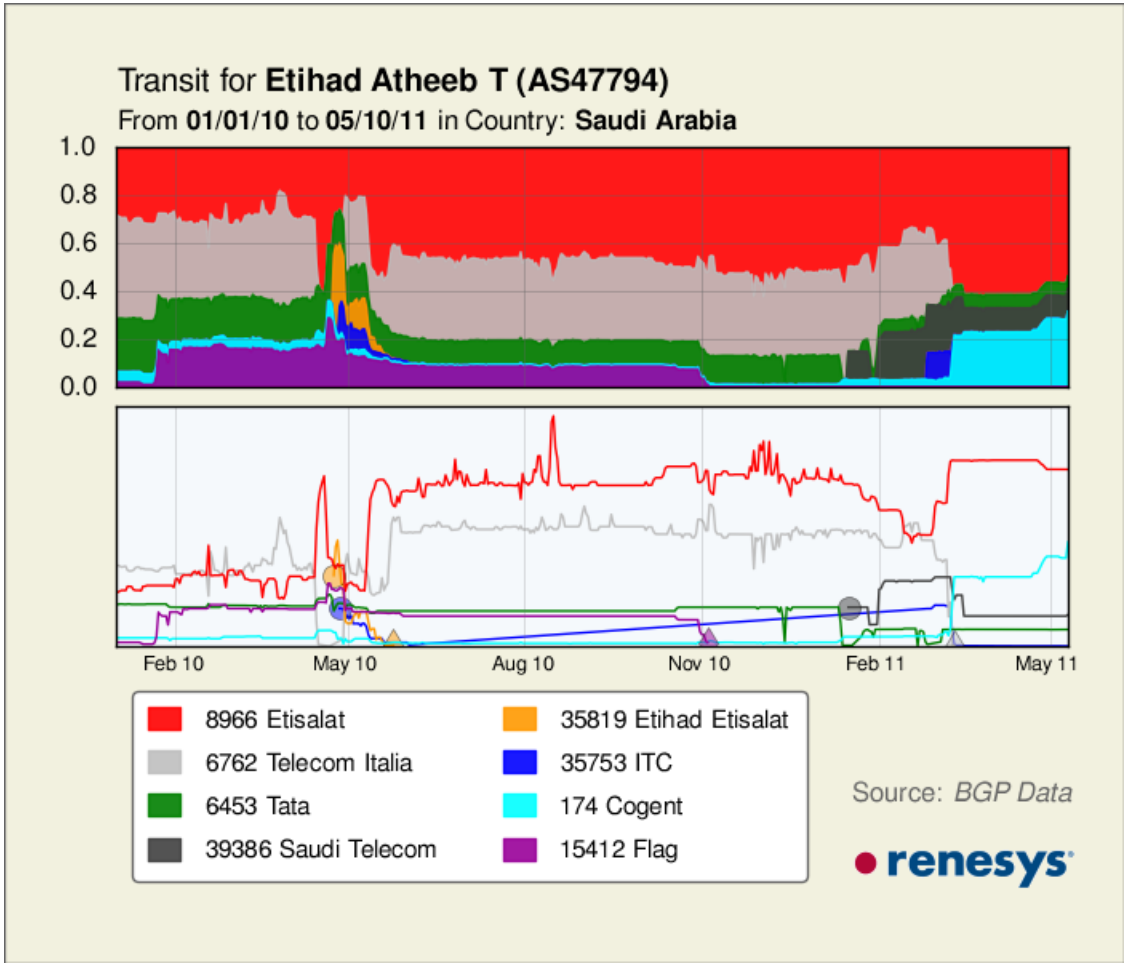
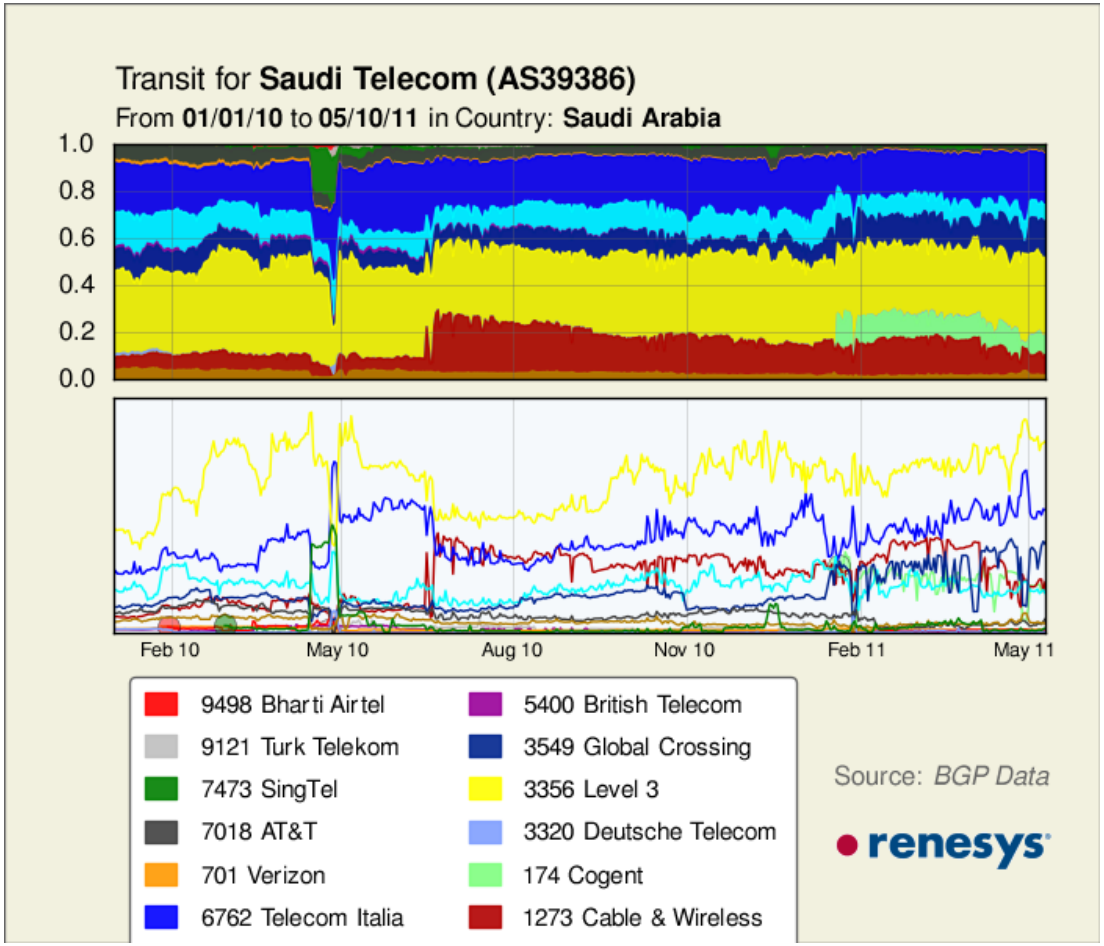
Cogent on the rise in Saudi Arabia?

- Etihad Atheeb increases Cogent's transit share significantly in March 2011



Cogent on the rise in Saudi Arabia?

- Cogent now appears as a significant contributor to STC transit, since February 2011



IPv6

Who's Doing IPv6 in the Middle East?

Saudi Arabia

8895 King Abdul Aziz City for Science and Technology
29684 Nour Communication Co.Ltd - Nournet
30857 Communications and Information Technology Commission (CITC)
31416 Applied Technologies Co
35819 Etihad Etisalat Company (Mobily)
39386 Saudi Telecom Company
39458 Real Hosts Limited
41176 Sahara Net Main NOC

Palestinian Territories

47253 Bnet

Kuwait

47442 Mada Communications

Egypt

2561 Egyptian Universities Network (EUN)
8452 TE
24863 Link Egypt (Link.NET)
31065 Ministry of Communications and Information Technology

Jordan

8697 Jordan Telecom
8934 National Information Technology Center
28730 Broadband Communications

Syria, Yemen, Iraq

(None known)

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Who's Doing IPv6 in the Middle East?

Iran

6736 IRANET/IPM
15696 Arian
24631 Azadnet
30783 Rased Maral Ava Jonoob JSC
31732 Parsun Network Solutions, IR
39308 Andishe Sabz Khazar
42440 Rayaneh Danesh Golestan Complex P.J.S. Co.
43395 Afrooz Network Solutionss
43965 Tehran University of Medical Science
44285 Shahrad Net Company Ltd.
44498 Touse Rasan Pasargad Co. P.J.S
47262 Hamara System Tabriz Engineering Company
48431 Bozorg Net-e Aria
49103 Asre Enteghal Dadeha
50530 Shabdiz Telecom Network JSC
51074 Gostaresh Ertebatate Mabna Co. Ltd.
51469 Petiak System
51541 Sepehr Ava Data Processing Company (LTD)

UAE

47201 Telecommunications Regulatory Authority
47862 ANKABUT (U.A.E REN)
51182 United Arab Emirates University

Oman

8529 Oman Telecommunications Company - OmanTel

Qatar

8781 Qatar Telecom (Qtel) Q.S.C.

Lebanon

9051 IDM
41833 Moscanet (WISE)

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IPv6 advertisement rates still very low

	/32	/34	/40	/43, /44	/48	Total
Iran	16				2	18
Saudi Arabia	8				2	10
UAE	2			2		4
Jordan	2	1				3
Lebanon	2					2
Egypt	1			1	21	23
Kuwait	1					1
Oman	1					1
Qatar	1		1		1	3
Palestinian Territories	0				1	1

IPv6 participation in the Middle East

(SY|YE|PS|IQ|
OM|LB|QA|BH|JO|
KW|IR|EG|SA|AE)

Participation rates appear to be roughly **half that of IPv4.**

	IPv4	IPv6
Worldwide	408102	5800
Middle East	10105	66
Percentage	2.48%	1.14%

These numbers are **very small** and therefore the errors are potentially **quite large**. IPv6 traffic levels are still negligible. Many countries haven't even started yet.

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Preparing for IPv4 Exhaustion

What "Should" Happen?

- Access and content networks transition promptly
- All of the resources available at today's 400,000 routed prefixes and 38,000 independent autonomous systems are made available behind brand new IPv6 prefixes
- Everyone gives back reclaimed/unused space
- IPv4 Internet decommissioned by 2015
- Routing table size drops by 50%
- RIR governance model goes on functioning
- **Internet economy continues to grow and flourish**

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What Will *Probably* Happen ?

- Lacking clear economic drivers, most outside the Internet's core will still refuse to take the crisis seriously
  - It's likely that **the majority of ASNs will still not be advertising IPv6 prefixes** in May 2012 (today, it's about 90%)
- Secondary markets will open for IPv4 address space trading. The registries' role will be significantly reduced.
  - Most companies will turn to these markets to get space.
  - Prices will be comparable to existing fees.
- Prefixes as long as /26 will be common in IPv4 routing table (800K prefixes) by 2014.
- **Internet economy continues to grow and flourish**

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Thanks To:

- Bahrain TRA as a supportive partner for our analysis of regional diversity

- MENOG organizing team for providing a forum to share this information with the community

- Mobily for providing hospitality on short notice

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