


Mapping the Middle East's Financial Industry

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The world's financial industry



- Consumes O(\$150B) in telecom services annually
- Move toward private cloud solutions is accelerating, particularly in emerging markets
- Internet plays an increasingly critical role in connecting employees with data, services with customers
- Shift from 'passive consumers' of Internet transit to 'active entities' with a voice in policy, governance, technical discussions

Our goal today

- **Identify** a set of routed and registered netblocks that represent the financial industry's online presence
- **Geolocate** them, and set aside the Middle Eastern region: TR EG IL LB JO SY IQ IR KW SA AE OM QA BH YE
- **Summarize** their Internet transit patterns: how they are connected to global markets and to each other
- **Compare** the way the Middle Eastern financial sector manages Internet connectivity, compared to other regions

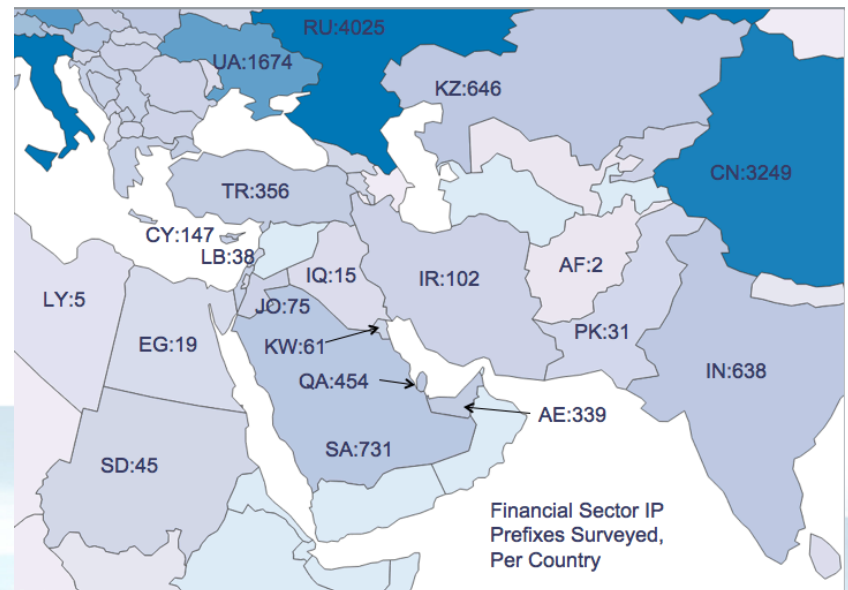
Methodology: Building the Model

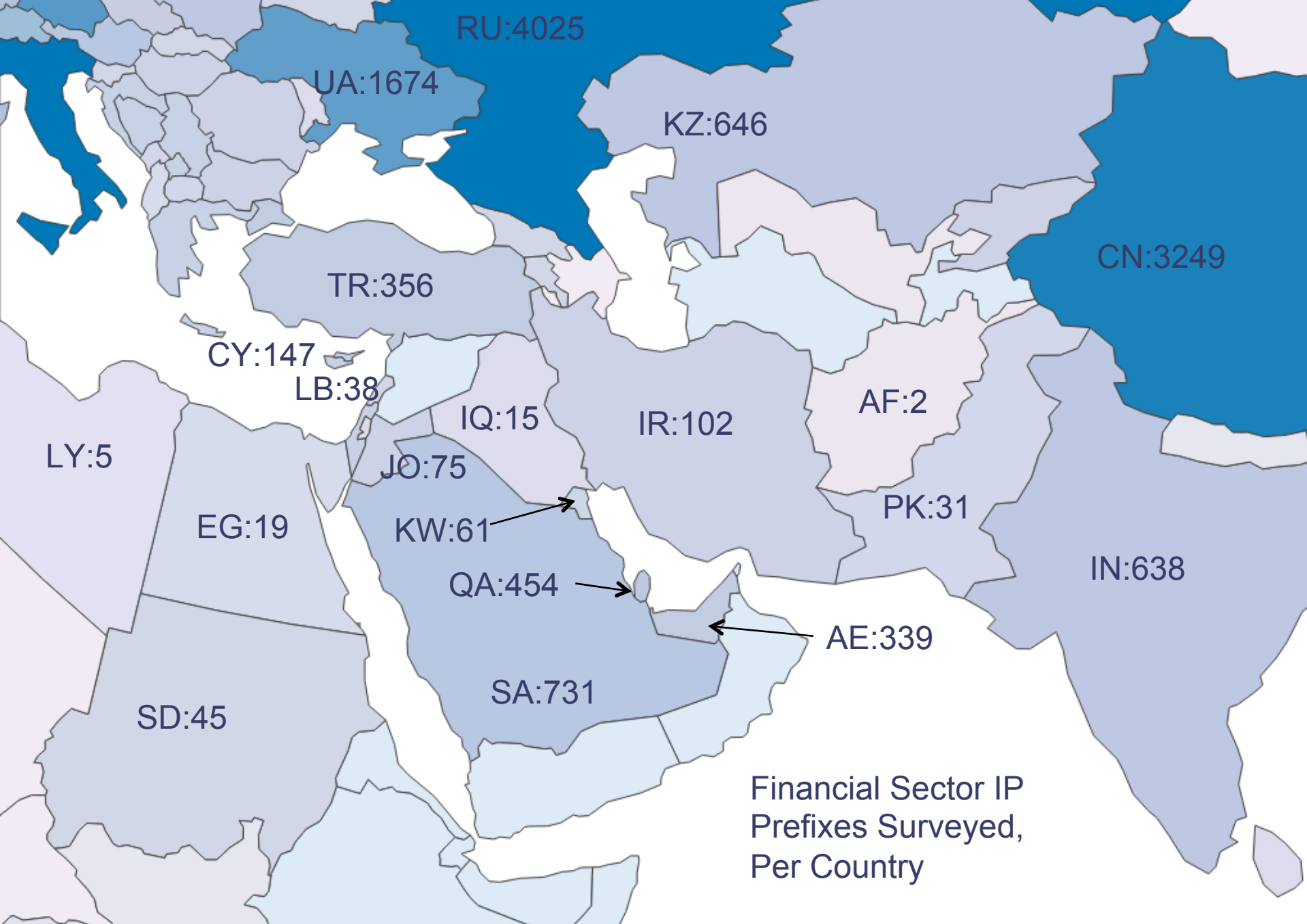
- Search registry data for registered IP prefixes and ASNs belonging to organizations with SWIFT codes, plus obvious keywords (e.g., “*bank*” and “*banc*”)
- Generate initial list of **27,863** IP blocks and **2,816** Autonomous Systems worldwide
- Folding in all originated IP blocks extends the base to **65,918** IP blocks (the “master list”)
- **36%** of these are in the USA
- **3.5% (2,366)** are in the Middle East

Breakdown Across the Middle East

Remember, these countries represent *registration geolocations* of IP address space, not *ownership* of the corresponding institutions

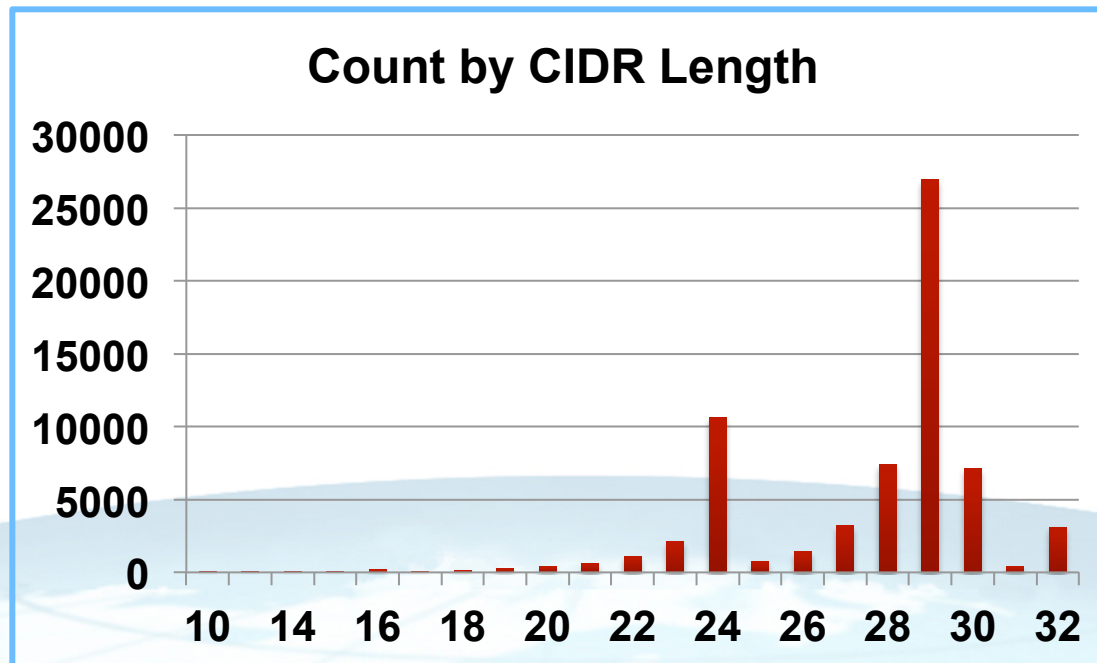
- Saudi Arabia 731
- Qatar 454
- Turkey 356
- UAE 339
- Israel 151
- Iran 102
- *Others* 191





CIDR Block Masklengths Tend To Be Small

- x.x.x.x/29's represent **41%** - small unroutable blocks
- x.x.x.x/24's represent **16%** - larger routable blocks



Top Providers Within the Middle East (Origins)

- ITC (Saudi Arabia, AS35753) 28%
- Etisalat (UAE, AS5384) 15%
- NetVision (Israel, AS1680) 4.4%
- Superonline (Turkey, AS34984) 3.7%
- OrbitSatNet (Saudi Arabia, AS41810) 3.3%
- Jordan Data Comm (Jordan, AS8376) 2.6%
- NourNet (Saudi Arabia, AS29684) 2.5%
- TCI (Iran, AS12880) 2.4%
- du (UAE, AS15802) 2.3%
- ...and 144 others 36%

Patterns of Financial Industry Interconnection

- Incumbent(s) firmly in charge of connectivity
- Incumbent has most, but secondary connections are common
- Incumbent shares with two or three substantial partners
- Incumbent missing from most interactions

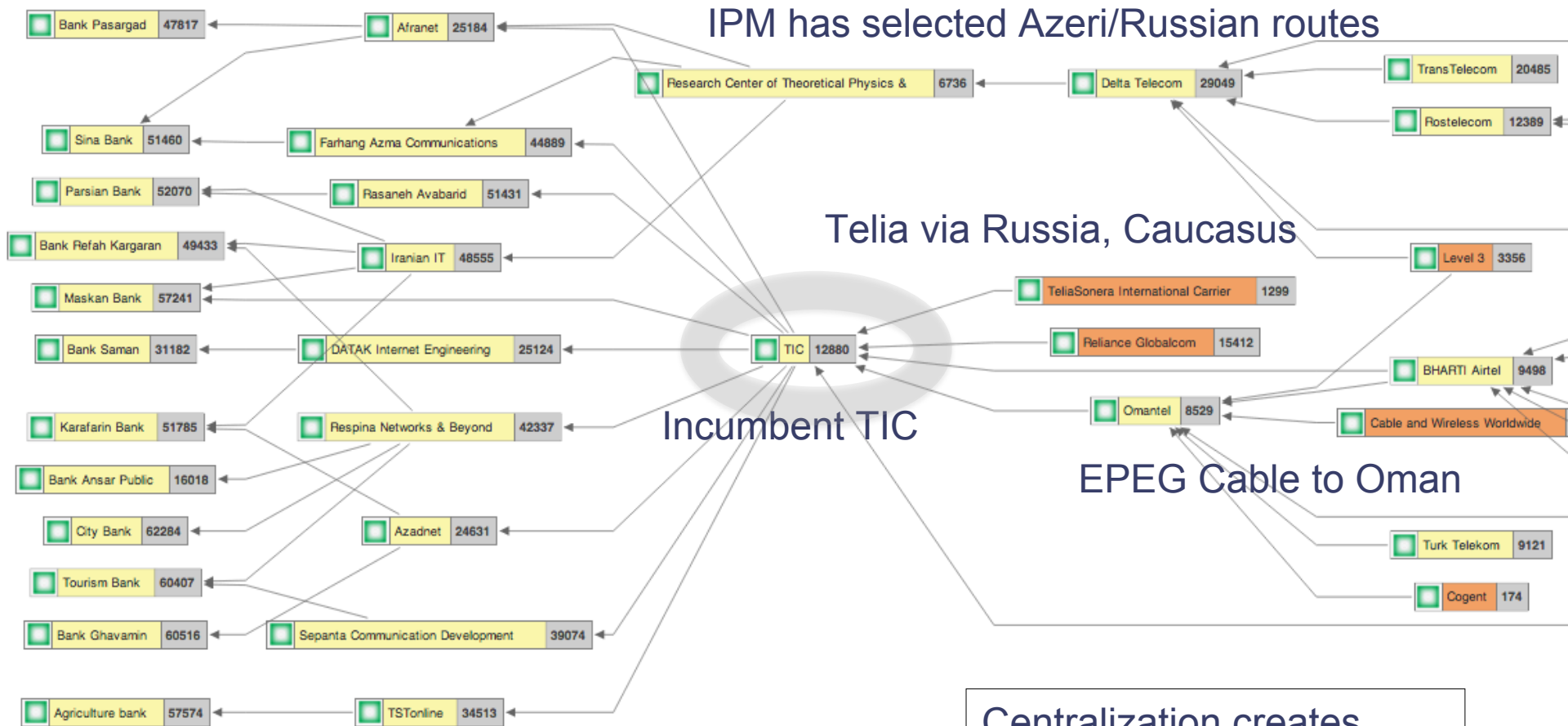
Examples: Iran, UAE

Examples: KSA, Lebanon

Example: Turkey

Example: Egypt

Iranian Banking Industry

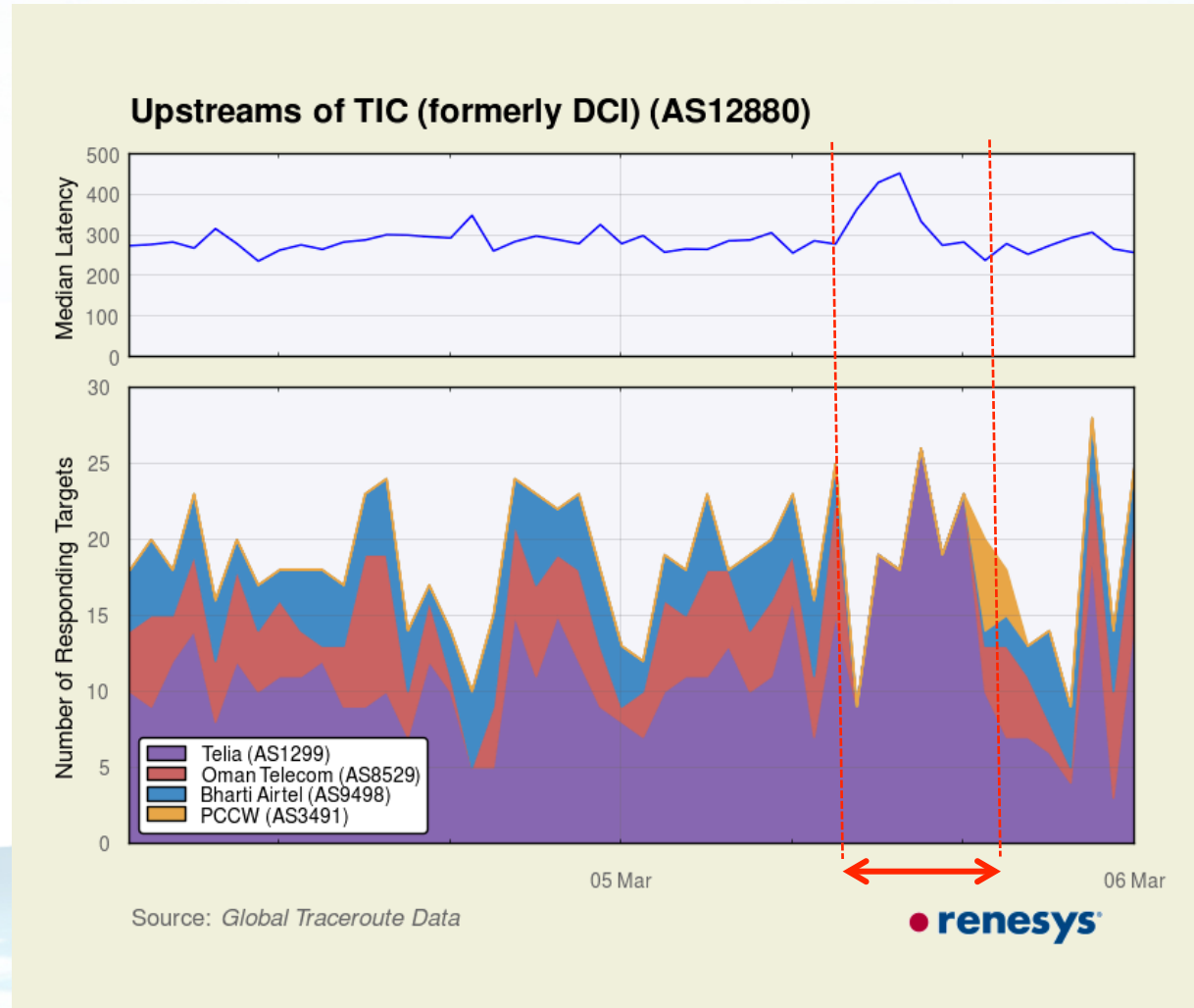


Centralization creates substantial fragilities, makes Internet interruptions more likely.

5 Mar 2014: TIC loses EPEG Southern Route

Only paths through Telia survive
(northern route through Azerbaijan)

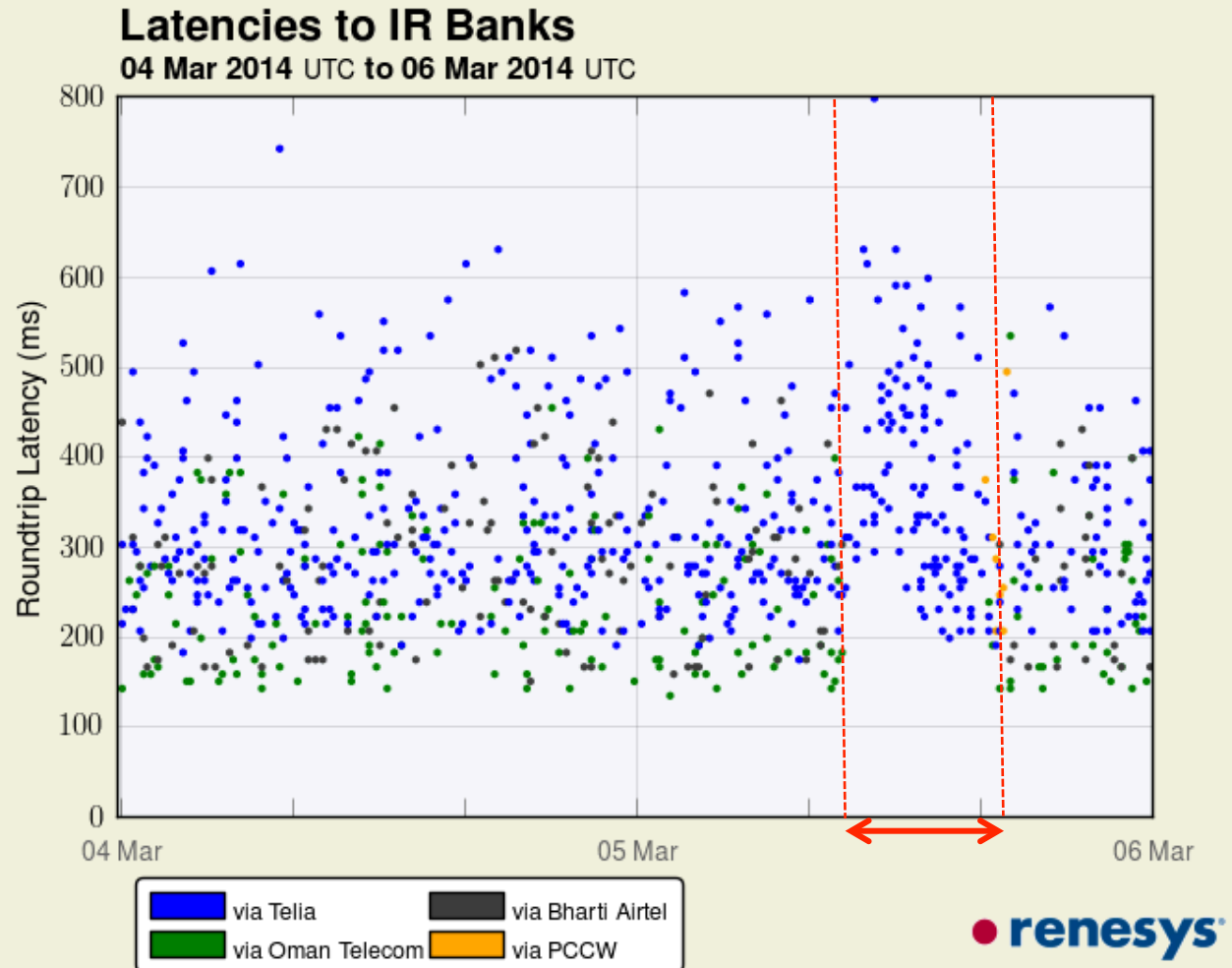
Latencies increase by 150ms



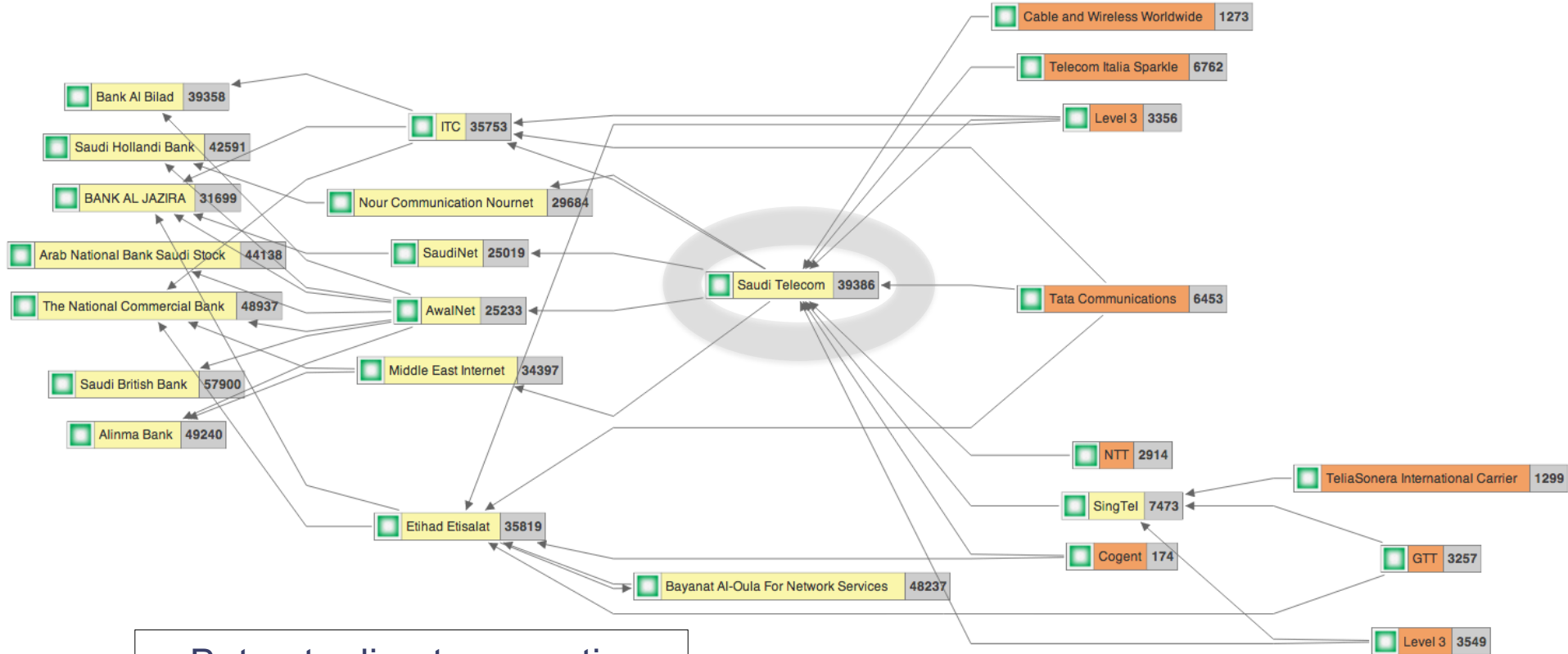
Iranian Banks lose $\frac{3}{4}$ of their upstream diversity

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(northern route through Azerbaijan)

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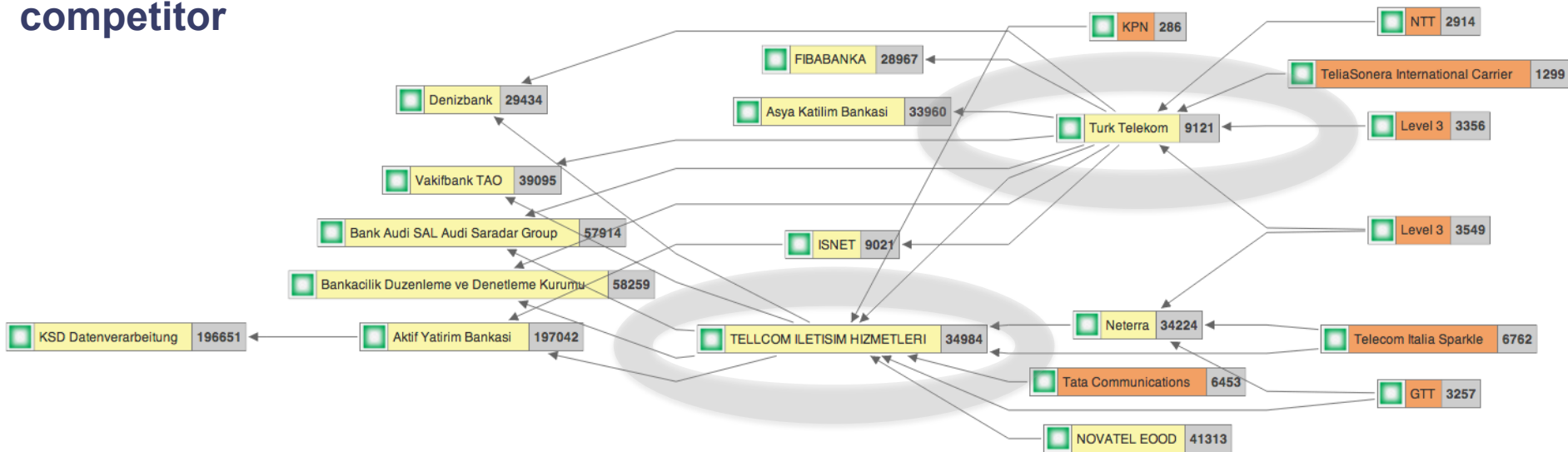
Saudi Arabia: Banks largely transit STC



...But note direct connections from second-tier providers to international carriers like Cogent and Level3

Turkey – Ankara : Competition in Evidence

Banks with ASNS maintain equitable split, dual-home to the incumbent and the primary competitor



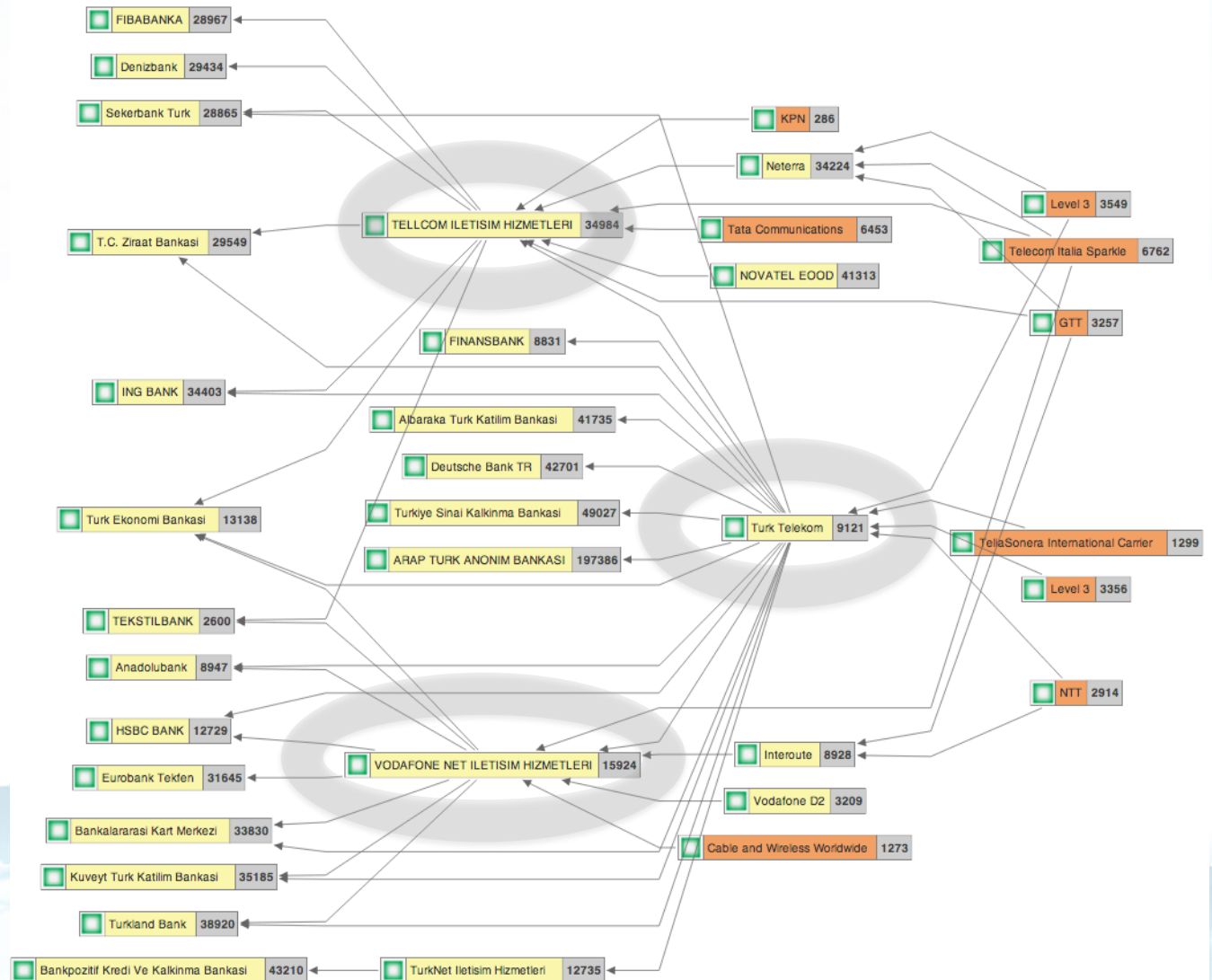
Tellcom/SuperOnline with Tata + Bulgarian transit to Western Europe

Turkey – Istanbul: Three-Way Competition

Tellcom/
Superonline

Turk Telekom

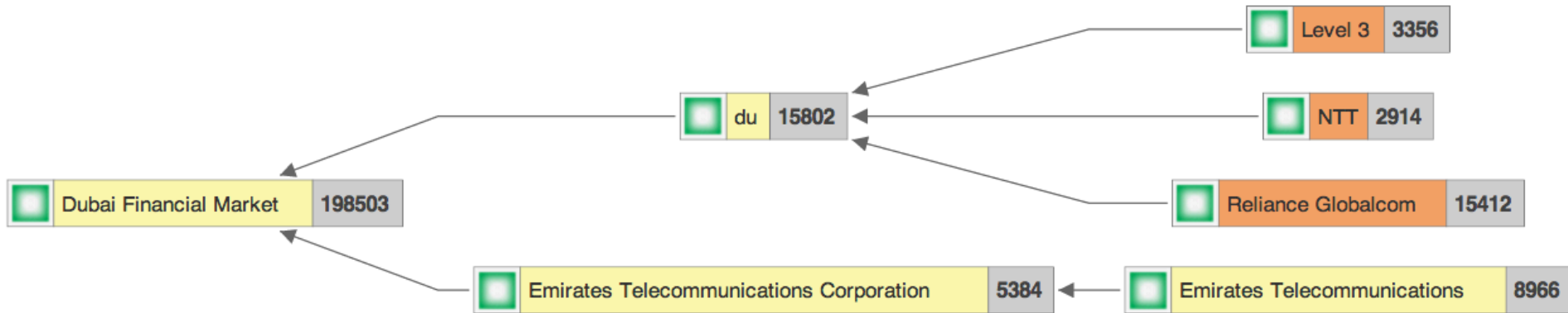
Vodafone/
Cable &
Wireless



UAE has hundreds of financial institutions...

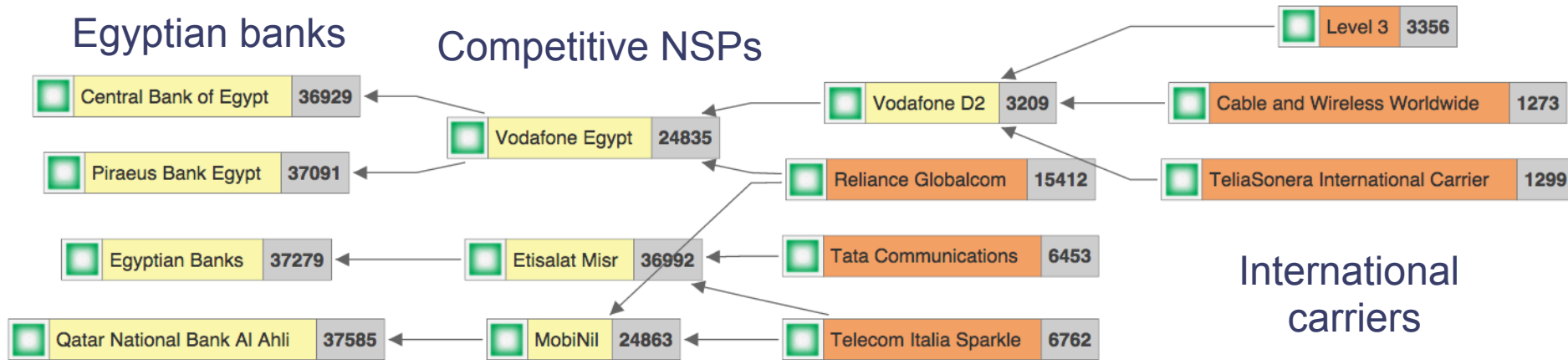
Abn Amro Bank
Abu Dhabi Commercial Bank
Abudhabi Commercial Bank
Abu Dhabi Islamic Bank
Afghan United Bank
Ajman Bank
Al Ansari Exchange - Al Ain
Al Ansari Exchange - Dhaid
Al Ansari Exchange - Dubai
Alfa Exchange
Al Fardan Exchange Co
Al Hilal Bank
Allianz Versicherungs
Al Mal Capital Pjsc
American Express
Arab Bank
Arab Bank For Investment And Foreign Trade
Arab Emirates Investment Bank Pjsc
Arabemiratesinvtkbank
Arqaam Capital – Investment
Arqaam Capital Limited
Audi Bank
Australia And New Zealand Bankin
Bank Julius Baer
Bank Melli Iran , Regional Office
Bank Of Ajman
Bank Of Bahrain And Kuwait
Bank Of Baroda
Bank Of Baroda, Sharjah
Bank Of New York Mellon
Bank Of Sharjah
Bank Saderat Iran
Bank Sarasin - Alpen Capital
Bank Sarasin Alpen Limited
Banque De Commerce Et De Placements
Banque Du Caire
Barclays Bank
Barclays Bank - Dhcc
Blackrock Advisors Uk Limited
Blom Bank France
Calyon Bank
Calyon Corporate & Investment Bank
Central Bank
Central Bank Of The UAE
City Exchange Llc
Commercial Bank International
Commercial Bank Of Dubai
Commercial Bank Of Dubai P.S.C
Commerical Bank International
Commerzbank Ag
Commerzbank Ag Dubai Branch
Credit Agricole Corporate
Credit Europe Bank
Credit Europe Bank (Dubai) Ltd
Credit Lyonnais
Credit Suisse Ag
Credit Suisse - Auh Office
Credit Suisse - Rep Office
Doha Bank
Dpi Bank
Dresdner Bank
Dubai Bank
Dubai Islamic Bank
Economic Exchange Centre
Efg Bank
El Nilen Bank
Emaar It - Noor Bank
Emaar It – Noor Bank
Emaar It Noor Bank
Emirates Bank
Emirates Bank Group
Emirates Bank International
Emirates Bank International Limited
Emirates Bank International, Pjsc
Emirates Data Clearing House
Emirates India International Exchange
Emirates Industrial Bank
Emirates Institute For Banking
And Financial Studies
Emirates Investment Bank
Es Bankers Dubai Ltd
Euram Bank Asia Ltd
Faisal Shares & Bonds Broker.
Falcon Private Bank Limited
First Gulf Bank
Fortis Banque
Gfi Securities Ltd
Glencore International Ag
Gulf International Bank
Habib Bank
Habib Bank Ag Zurich
Habib Bank Ltd
Hdfc Bank Ltd
Henyep Investment Bank
Hsbc Bank Middle East
Hsbc Bank Middle East Limited
Icici Bank
Icici Bank Limited
Ifc - World Bank Group
Industrial And Commercial Bank Of China
Industrial And Commercial Bank Of China Limited
Industrial And Commercial Bank Of China Middle East
Ing Investment Management
Ing Investment Management Dubai Ltd
Intesa Sanpaolo Dubai Branch
Invest Bank
Julius Baer Middle East Ltd
Julius Bar Bank
Kabul Bank
Kaupthing Bank
Lari Exchange Head Office
Liechtensteinische Landes Bank
Lloyds Bank
Lloyds Tsb Bank
Lloyds Tsb Bank Plc
Louis Dreyfus Commodities Middle East
Lulu International Exchange
Macquarie Capital Middle East Llc
Mashreqbank
Mashreq Bank
Mashreq Bank Doz
Mashreq Bank Pjsc
Mashreqbank Psc
Merrill Lynch
Merrill Lynch International %26 Co.C.V
Middle East Bank
Misys International Banking Systems
Mizuho Corporate Bank Ltd Dubai Branch
Morgan Stanley Capital International Limited
Multinet Trust Exchange Llc
National Bank Of Abu Dhabi
National Bank Of Dubai
National Bank Of Fujairah
National Bank Of Kuwait
National Bank Of Rak
National Bank Of Ras Al Khaimah
National Bank Of Sharjah
National Bank Of Umm Al Quwain
Nomura International Plc
Noor Islamic Bank
Old Mutual International Ltd
Orient Exchange Co Llc
Persia International Bank Pls
Qbe Insurance Europe Limited
Rakbank
Rak Bank
Real Esate Bank
Real State Bank
Redha Al Ansari Exchange
Royal Bank Of Canada
Royal Skandia Life Assurance
Samba Financial Group
Sharjah Islamic Bank
Standard Bank Plc
Standard Chartered Bank
State Street Bank
Tha National Bank Of Ral Al Khaimah (P.S.C)
The Bank Of Tokyo
The Bank Of Tokyo-Mitsubishi Ltd
The National Bank Of Rak
The Royal Bank Of Scotland
UAE Central Bank
UAE Exchange Centre Llc
Union De Banques Arabes Et Francaises
Union National Bank
United Arab Bank
United Bank Limited
Universal Exchange Center
Upm Kymmene Middle East
Vtb Capital Plc
Westdeutsche Landesbank Representative Office Dubai

...but UAE financials don't have ASNs?



- 339 registered IP prefixes
- 221 organizational registrants
- Only 36 routed prefixes
- One ASN: Dubai Financial Market (AS198503)
- **86% of registered are originated by AS5384 (Etisalat)**
- 13% of registered are originated by AS15802 (du)
- <1% through satellite (IABG) or independently (DFM)

Do Banks Avoid Telecom Egypt?

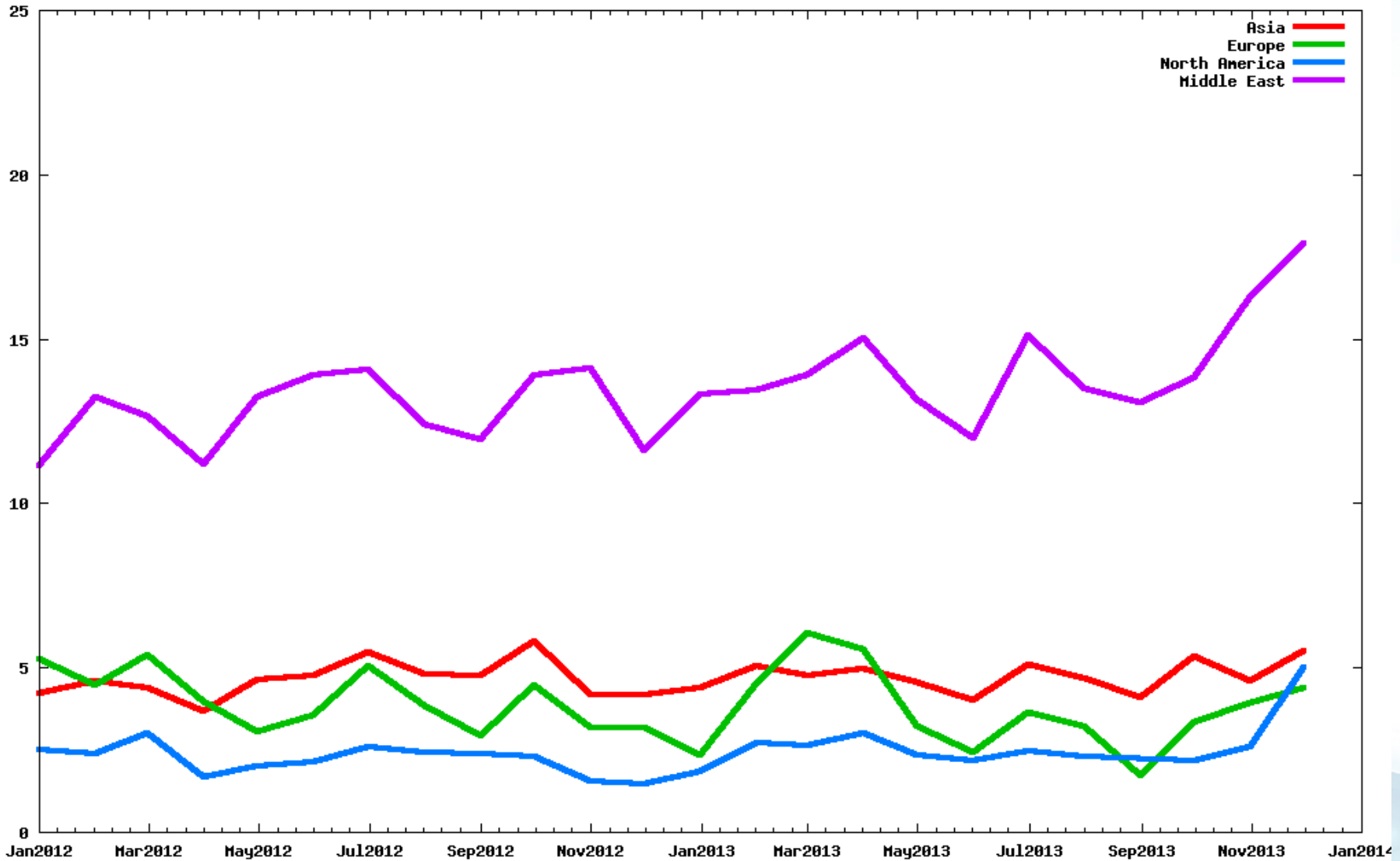


- Of Egypt's 19 other registered financial services IP blocks, only 2 (a /28 and a more-specific /30 used by Deutsche Bank) are originated by Telecom Egypt
- Egypt is unique within the region in this sense

Measuring Outcomes: BGP Instability

- Observe all IPv4 prefixes in a given country over a period of several years
- Count the average number of prefixes that suffer from BGP instability (path change) each day
- Compute the percentage affected
- Lower percentages are better (more stable)
- **Do banks make better/more stable transit choices than the population at large?**

Middle East's BGP Instability is 3x Asia's Avg



Instability Varies by Country, But Banks Do Better

	2012	2013	2012-Banks	2013-Banks	Sector vs Country
Middle East	12.78	14.2	9.91	9.19	More Stable
Iran	35.72	38.26	30.08	31.88	More Stable
Iraq	27.39	33.66	18.67	9.87	More Stable
Yemen	25.12	15.72	--	--	--
Jordan	9.13	14.39	10.92	13.26	Similar
Saudi Arabia	13.37	12.99	8.87	9.15	More Stable
Egypt	10.52	10.55	8.23	10.07	Similar
Syria	8.57	9.42	--	--	--
Kuwait	7.83	8.25	5.07	5.21	More Stable
Lebanon	11.87	7.96	9.1	5.31	More Stable
Oman	11.53	7.08	--	--	--
Bahrain	6.08	3.91	5.02	1.51	More Stable
Qatar	1.92	2.79	1.54	1.37	More Stable
UAE	2.43	2.41	1.01	1.17	More Stable
Turkey	3.08	2.2	2.23	2.15	Similar
Israel	2.08	1.85	1.71	1.54	More Stable

Summary

- The global financial industry are “late movers”
- Financial service providers in the Middle East lag the industry globally in getting an ASN, moving out of PA space, and setting up provider redundancy
- This creates significant fragility and risks of Internet outage – ME financials are more stable than most in the region, but not as stable as financials in Europe, East Asia, and the Americas

Thank you!

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