Dissecting the Speed-of-Internet of Middle East

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What's the Speed-of-Internet?

- The conversion factor from delay to distance is called Speed-of-Internet (SOI)

- The accuracy of active geolocation approaches highly depends on converting delays into distances

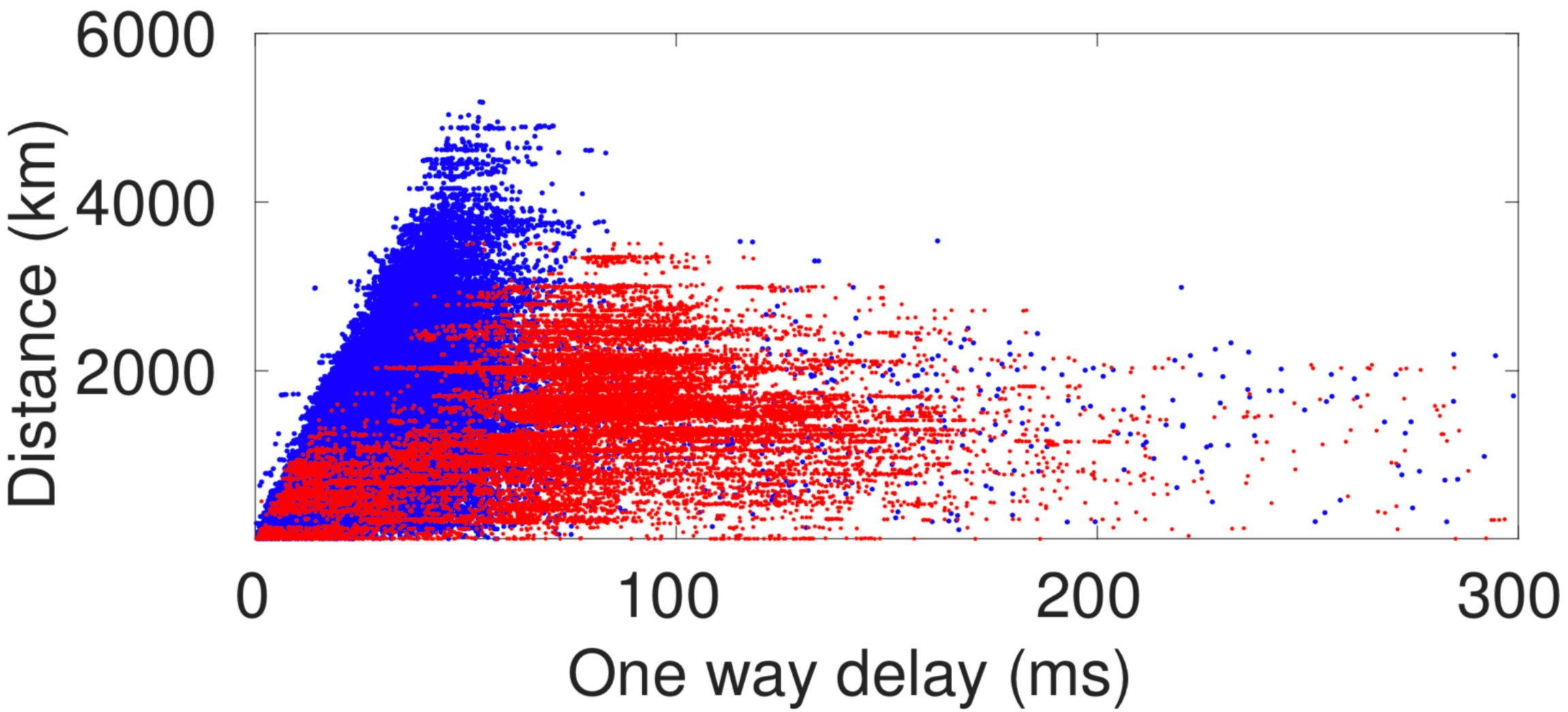
- The SOI is calculated according to the geodetic distance between the two endpoints involved in a measurement
  - Fractions of the speed of light are inaccurate
  - The SOI changes in various regions

What’s wrong with the Speed-of-Internet?

Situation in Middle-East

Situation in Middle-East

Comparison Middle-East and Europe



Regional Results

	All		Out of region	
	Middle East	**Europe**	**Middle East**	**Europe**
Traceroutes	33 384	150 559	19 862 (59.5%)	7 482 (5.0%)
Average distance (km)	1 225.0	1 344.4	1 555.6	1 484.4
Average RTT (ms)	150.0	53.2	184.7	63.7
Average # hops	15.7	12.7	17.8	13.6
Average # AS hops	4.7	4.8	5.4	5.2
SOI (km/ms)	27.0	66.2	26.0	61.2

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Regional Results

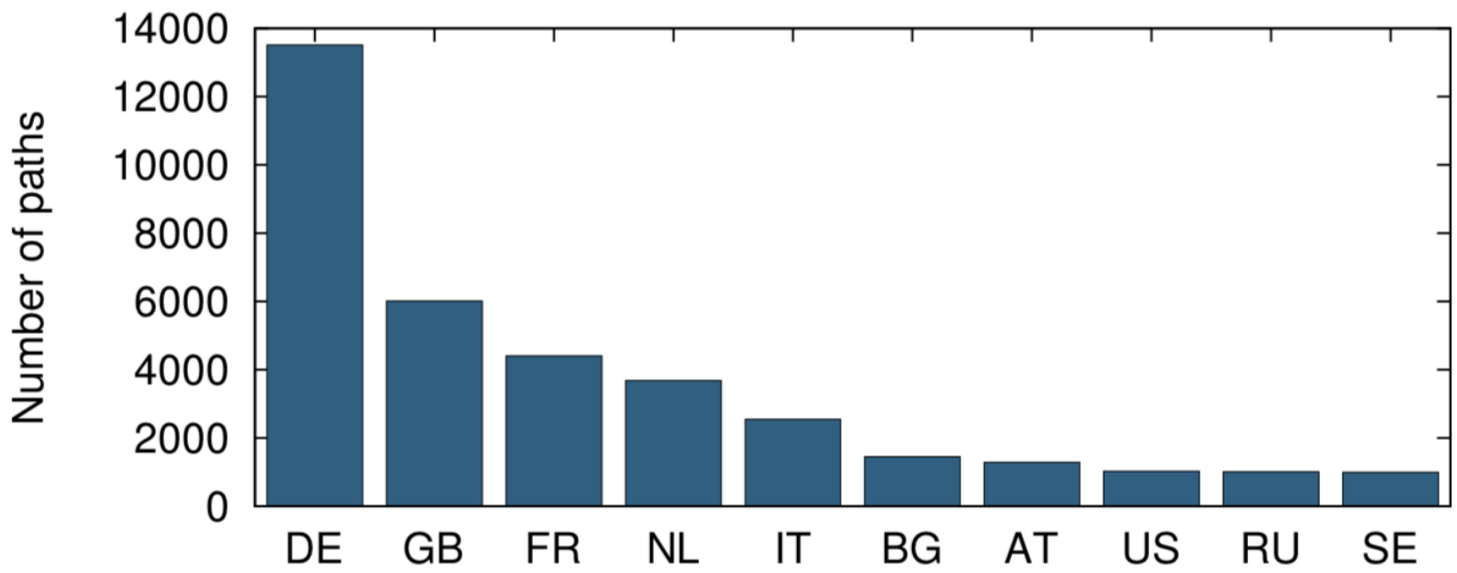
- Hosts in different countries

	All		Out of region	
	Middle East	**Europe**	**Middle East**	**Europe**
Traceroutes	24 588	146 659	19 328 (78.6%)	7 429 (5.1%)
Average RTT (ms)	179.7	54.1	182.8	63.8
Average # hops	17.0	12.8	17.7	13.6
Between Neighbours	5 560	14 589	4 781	546

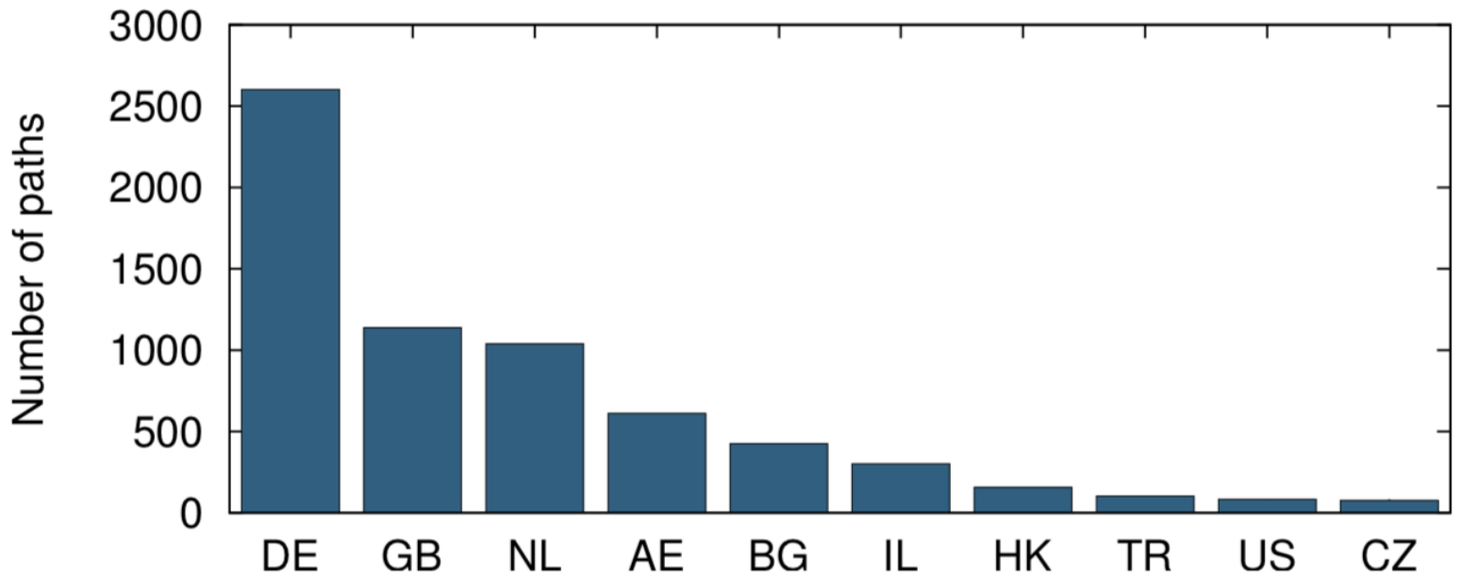
- Hosts in the same country

	Middle East	**Europe**
Traceroutes	8 796	3 900
Average RTT (ms)	67.2	19.2
Average # hops	12.1	8.8
Local traceroutes	8 256	3 185
Average RTT (ms)	55.1	16.8
Average # hops	11.6	8.3
Not local traceroutes	540	715
Average RTT (ms)	252.6	30.0
Average # hops	20.1	10.7
Out of Region	525	53

Where the paths go?



(a) Top ten countries traversed by Middle East traceroutes (number of paths per country).



(b) Top ten countries with an IXP traversed by Middle East traceroutes (number of paths per country).

Conclusions

- Often countries in Middle-East don't "talk" to each other
  - Sometimes even if they share a border
- The RTT of paths going out of region is much higher
  - This can affect P2P traffic
  - Active geolocation, and other applications relying on the SOI, are difficult to achieve
- PEER!

Questions?

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Thanks to my co-authors:
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