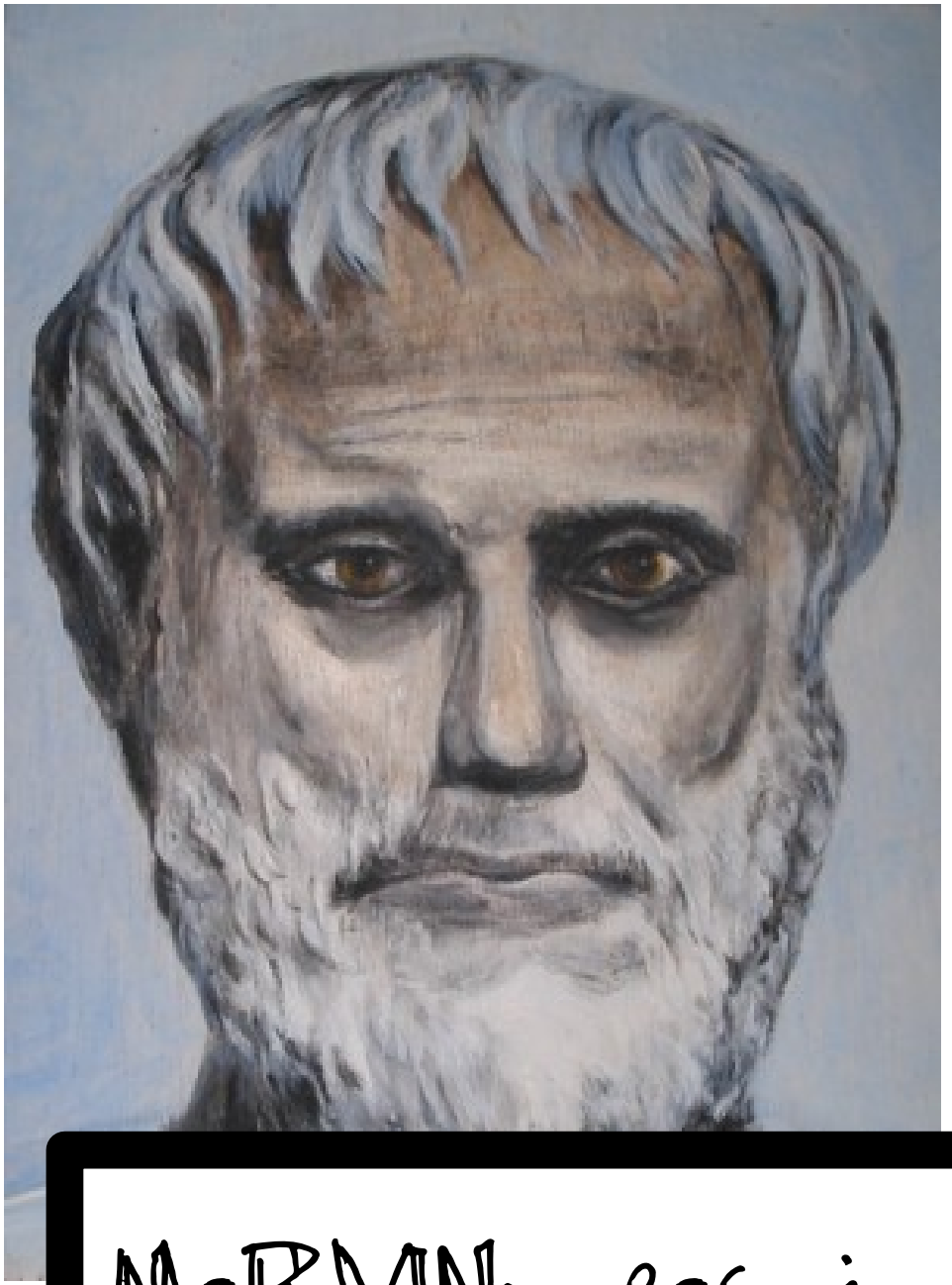
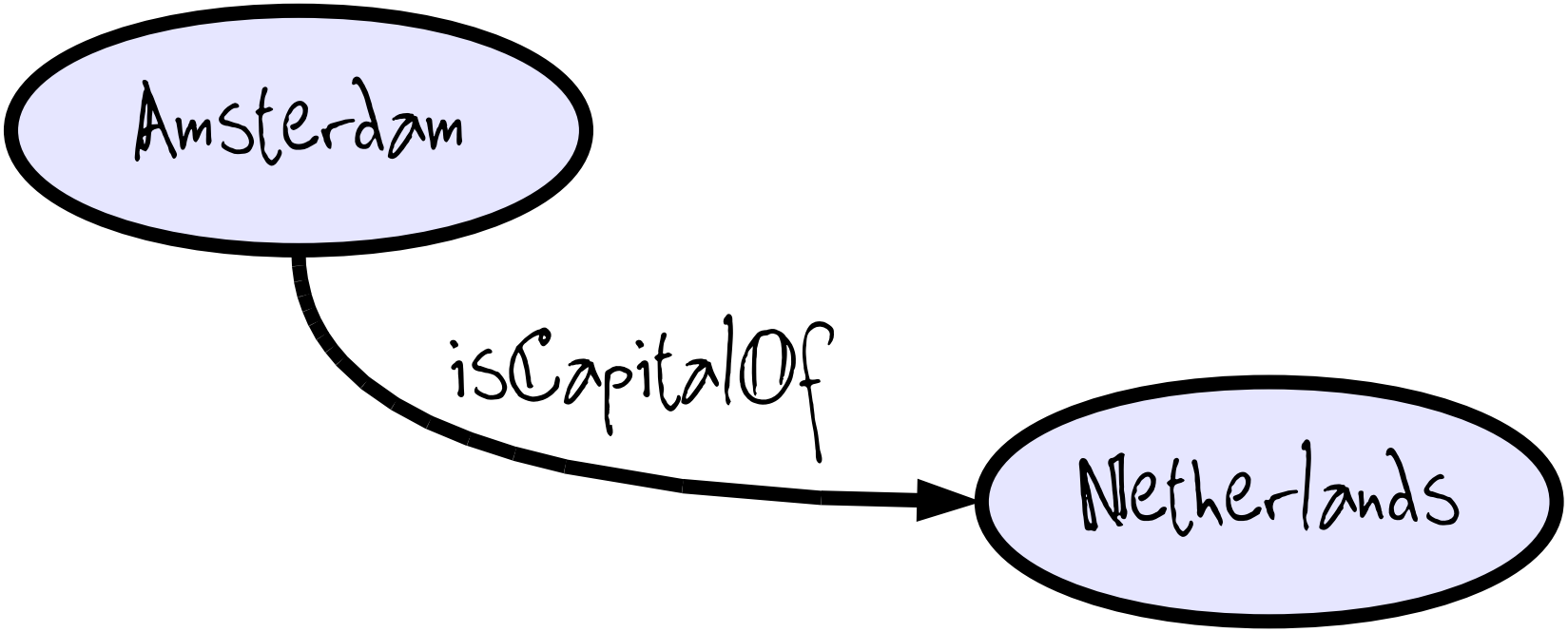
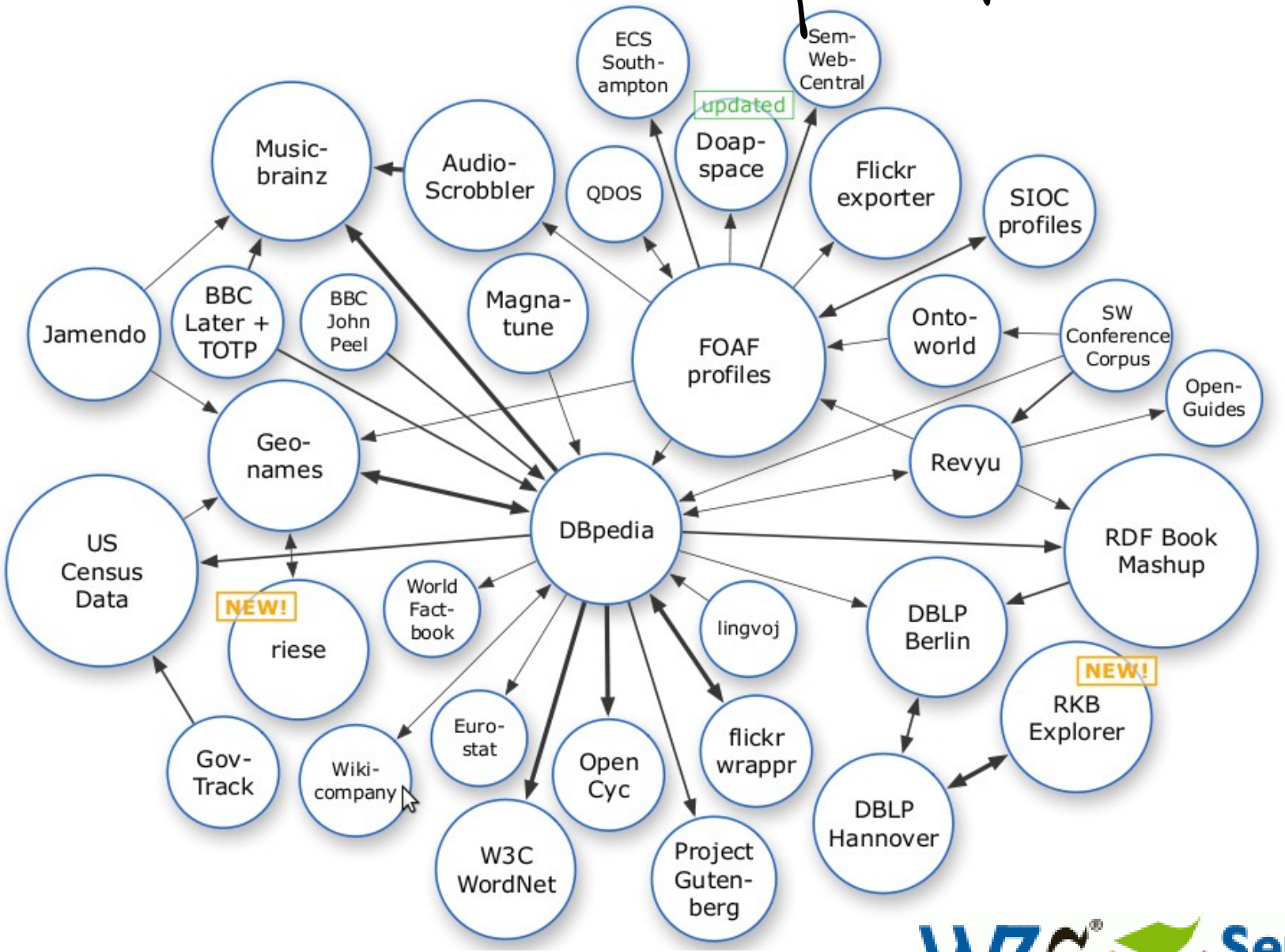


MaRVIN: reasoning over a billion triples

What's a triple?



What are lots of triples?



W3C Semantic Web

How much is one billion?

Let's say this is one triple

[Vrandecic, 2007]

This

Suez: 10^7 triples

(10 million)

[Vrandecic, 2007]

The moon: 10^8 triples
[Vrandecic, 2007]

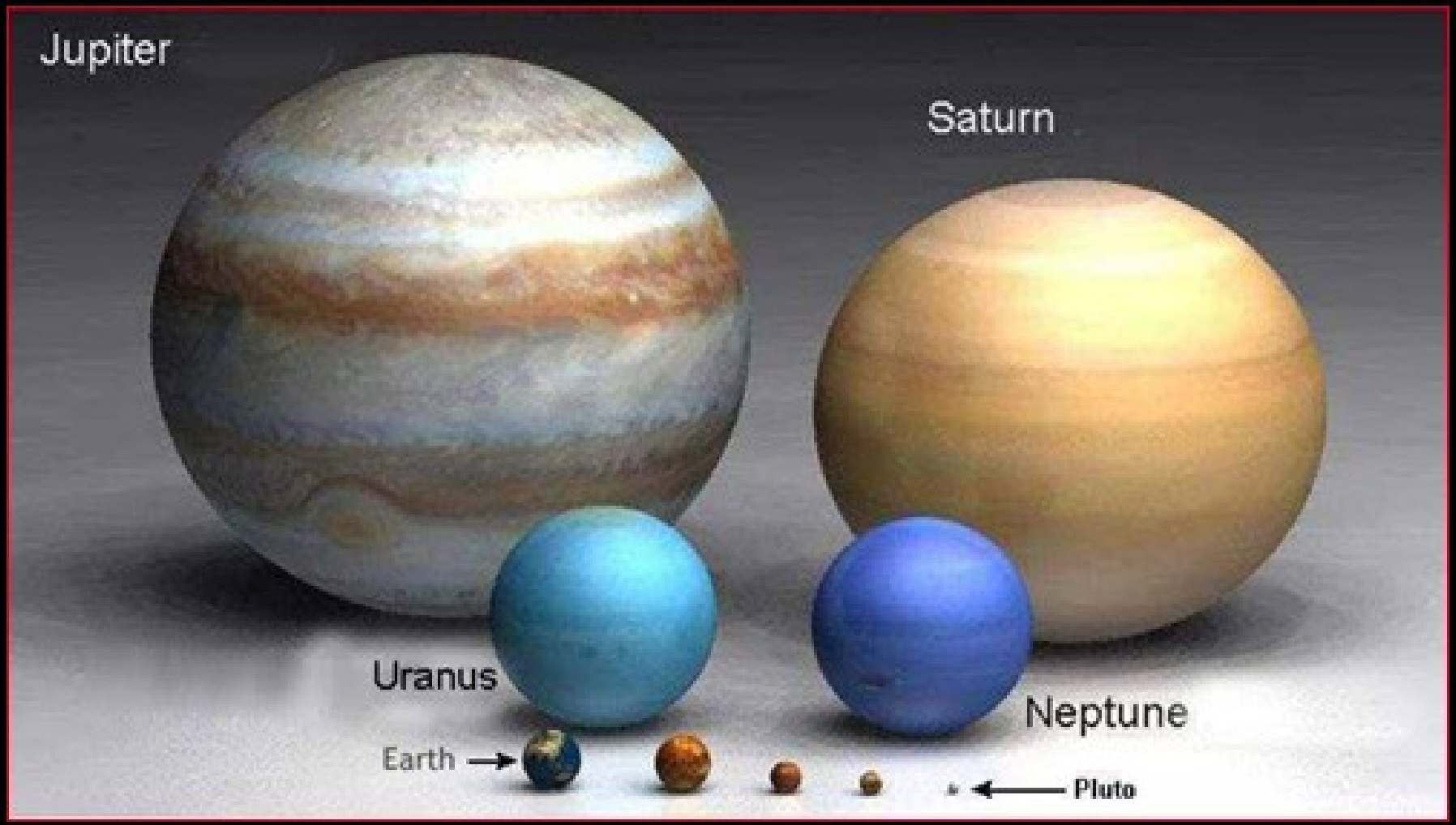
The earth: 10^9 triples

(1 billion)

[Vrandecic, 2007]

Jupiter: 10^10 triples

(1 triple per webpage)



[Vrandecic, 2007]

We need to scale

We need to scale what?

We need to scale reasoning

What is reasoning?

- Amsterdam is a city
- All cities are big
- Thus, Amsterdam is big

Reasoning is: combining pieces of data

MaRVIN

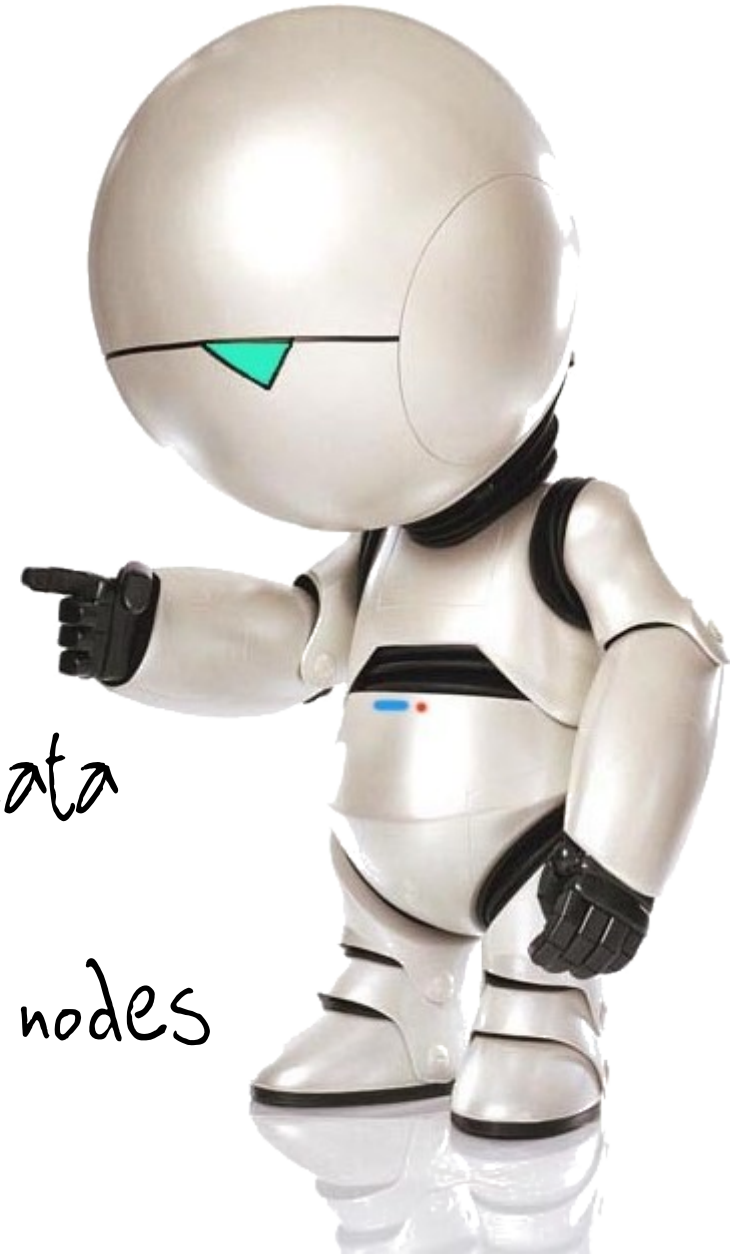
1) we have many compute nodes

2) each gets piece of data

3) does all reasoning on that data

4) swaps some data with other nodes

5) and goes back to 2)



What's hard about MaRVIN?

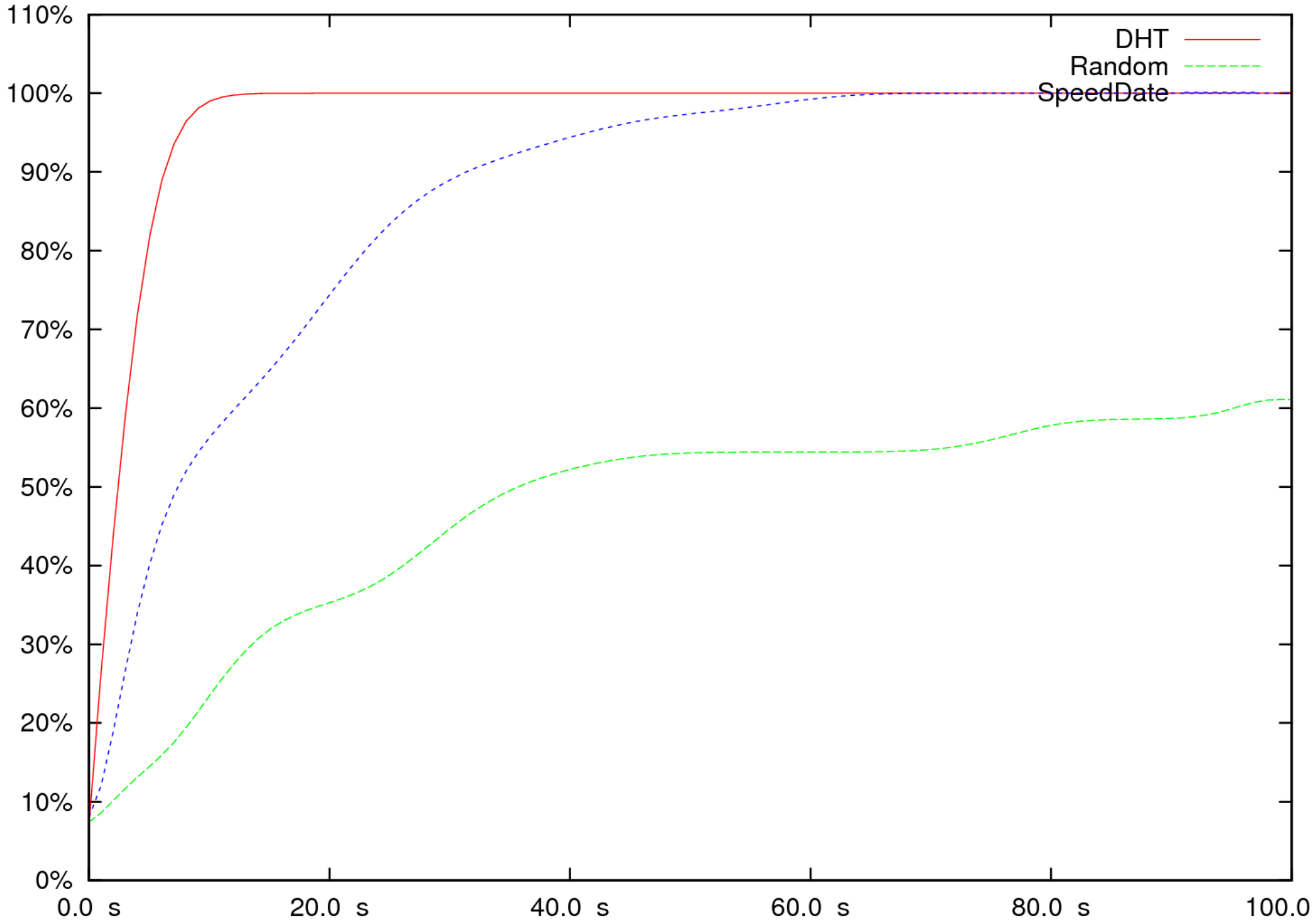
- not all combinations of data are useful
  (Amsterdam isa City & all Dogs are Animals)
- randomly exchanging data is inefficient
- centralised coordination expensive
- want: decentralised, efficient, and loadbalance

Let's experiment ...

- Random: each triple sent to random peer
- DHT: each triple sent to responsible peer, based on hashcode of triple (push)
- SpeedDating: each peer gets triples closest to the area he's responsible for (pull)

Let's see some animations

- Random
- DHT
- SpeedDating


110%
100%
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40%
30%
20%
10%
0%
0.0 s
20.0 s
40.0 s
60.0 s
80.0 s
100.0 s
DHT
Random
SpeedDate

Summary

- billions of triples is a lot
- reasoning over them is not trivial
- we invent & experiment with distribution
- see http://larkc.eu/marvin