MaRVIN: a distributed platform for massive RDF processing

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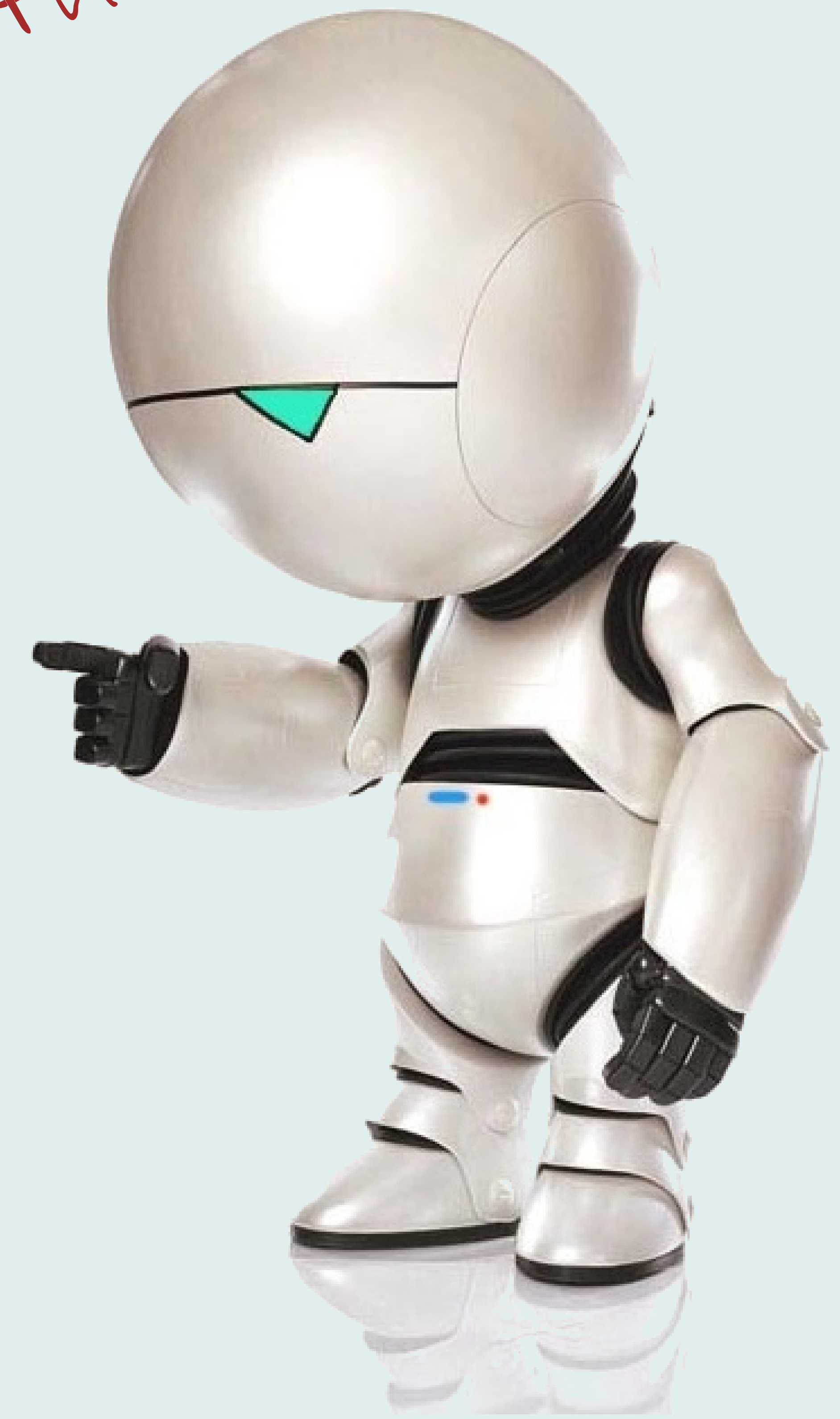
MaRVIN is:
a platform for processing lots of RDF data
(now: computing RDFS/OWL closure)

MaRVIN scales by:
distributing computation over many nodes
approximate (sound but incomplete) reasoning
anytime convergence (more complete over time)

MaRVIN runs on:
in principle: any grid, using Ibis middleware
currently: the DAS-3 distributed supercomputer (300 nodes)
soon: a wide-area a peer-to-peer network

"a brain the size of a planet"



Main loop: divide-conquer-and-swap

1. *divide*: split input data in chunks
2. *conquer*: each node:

   reads some chunks,

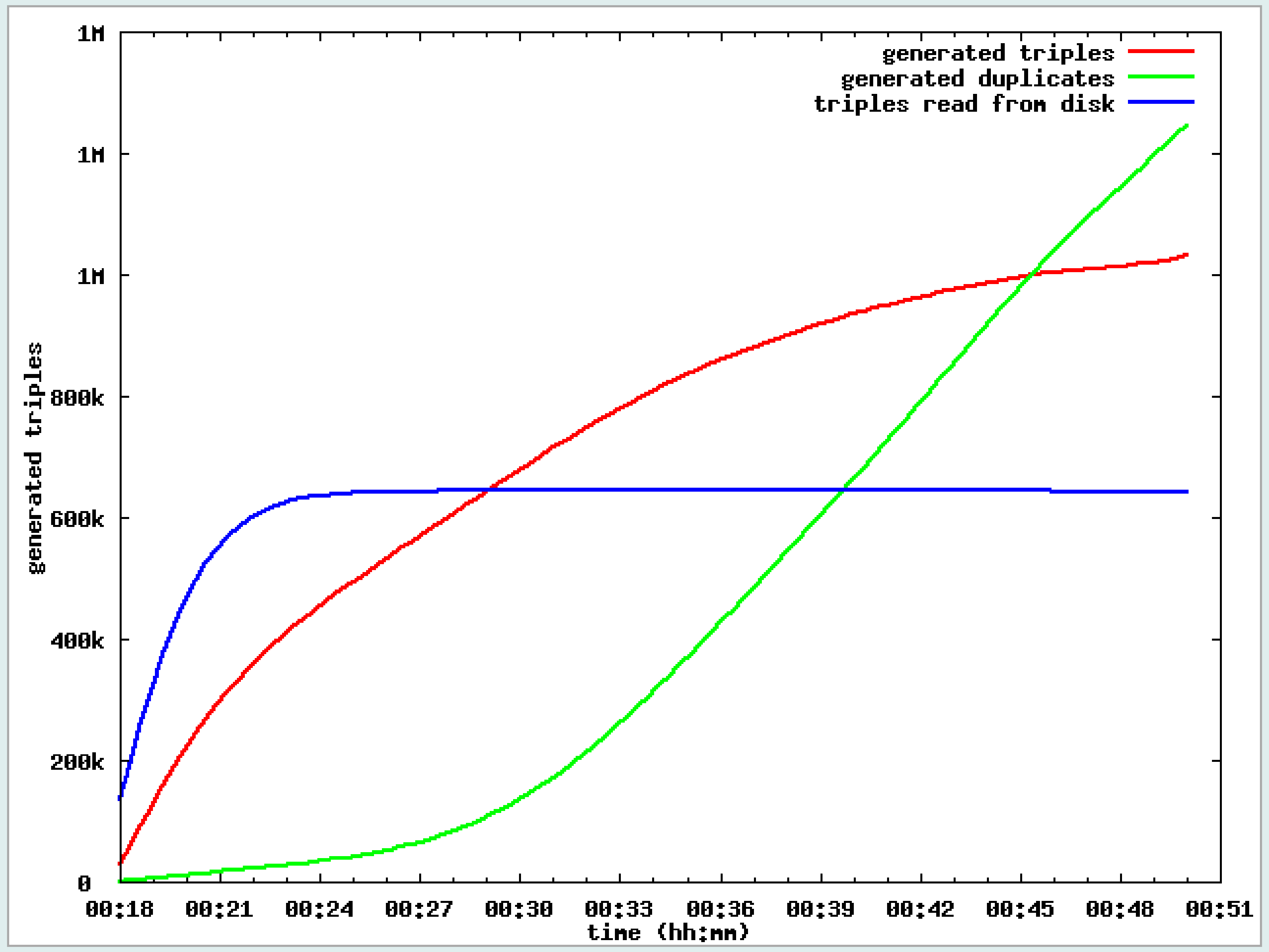
   DO: computes closure.
3. *swap*: each node:

   removes all triples:

   sends some to central storage,

   sends other to some peer

repeat 2-3 ad infinitum



anytime incremental results

Currently:

- running on DAS-3, a five-cluster grid system
- max. 271 machines, 791 cores (2.4Ghz, 4Gb RAM)
- suffering from growing pains
- reading data @100ktps/min/node (1B in 1hr, on 100 nodes)
- producing data @15-25ktps/min/node

Closure on the dataset (computed) just one example:
Infrastructure for experiments over massive RDF data

Questions:

- network overhead vs benefit?
- scalability (nodes and data)?
- output quality (anytime behaviour)?
- routing policy?

- modular architecture:
  - change initial data distribution
  - change functionality of node
  - change routing policy
  - ...
- real-time logging, visualisation, analysis

EXPERIMENT AND EVALUATE
A TOOL FOR THE RESEARCH COMMUNITY

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