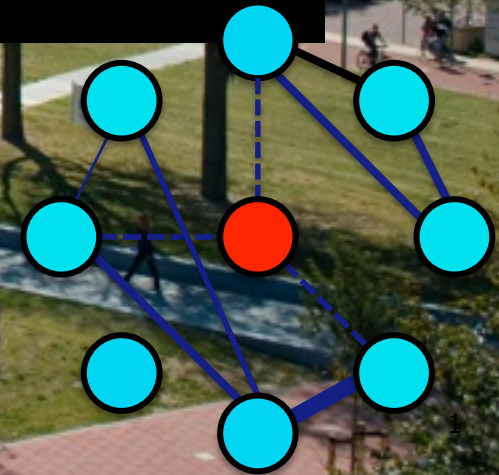


Distributed Systems Group

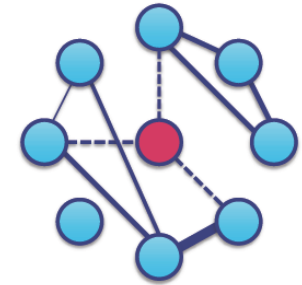
Prof.dr.ir. Dick H.J. Epema

September 2017

September 2017



The Distributed Systems Group: People



Prof. Dick Epema

Cloud Computing
Scheduling
Blockchain



Prof. Alexandru Iosup
(VU A'dam/TUD)

Cloud Computing
Big Data
Online Gaming



Dr. Johan Pouwelse

Reputation systems
Blockchain
Applied Security

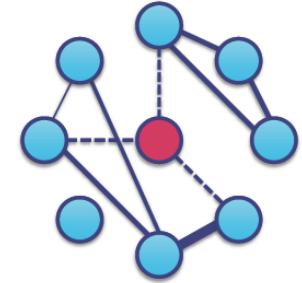


Dr. Jan Rellermeijer

Middleware
Datacenters



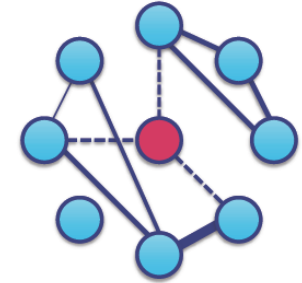
The Distributed Systems Group: Teaching



- **MSc courses:**

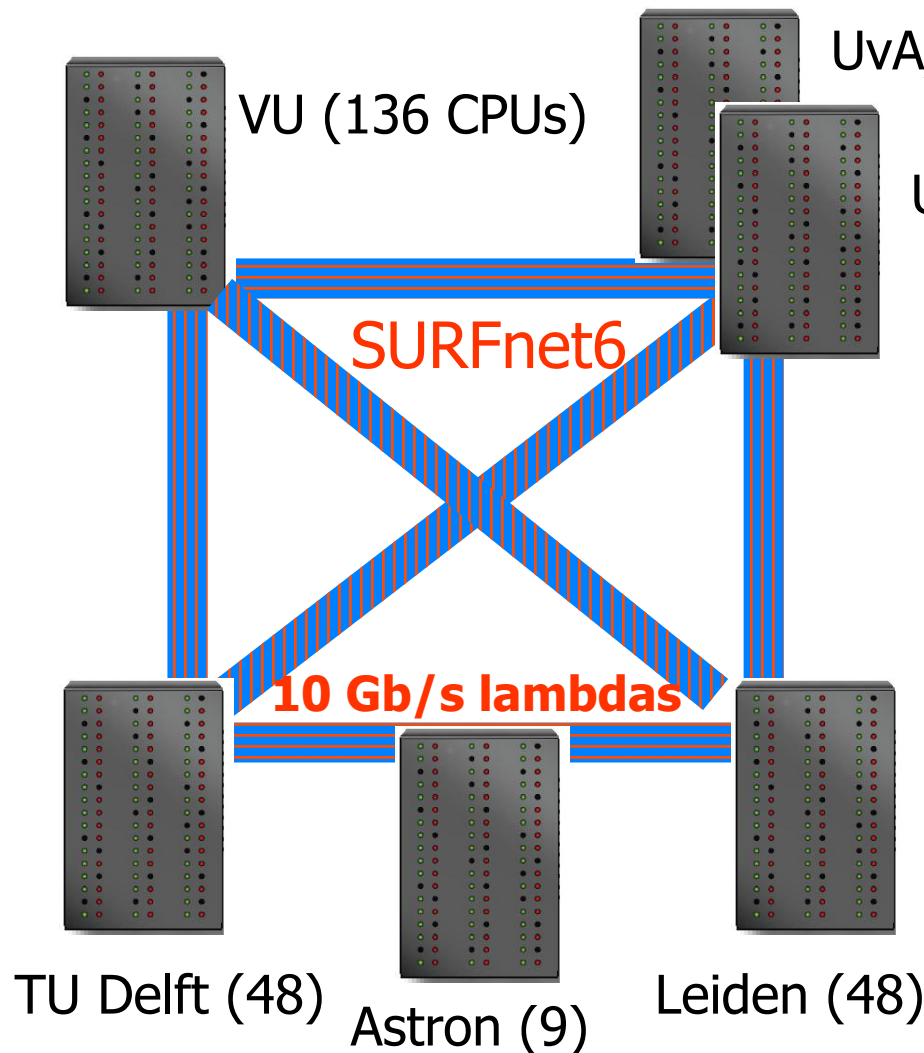
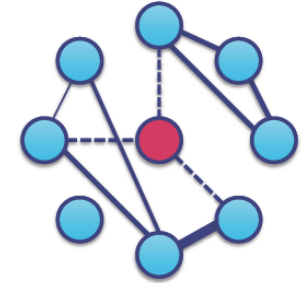
- IN4150: Distributed Algorithms (Q2) (core Software Techn.)
- IN4391: Distributed Computing Systems (Q3) (core Data Sc.&Techn.)
- IN4049: High-Performance Computing (**Q1+Q2**)
- IN4392: Seminar Cloud Computing (**Q1**)
- IN4253: Blockchain Engineering (Q2)

The Distributed Systems Group: type of Research



- Our research is:
 - **fundamental:** devise new application-independent concepts in distributed systems
 - **experimental:** show the value of new concepts in prototypes or real deployments

Experimentation: DAS-5

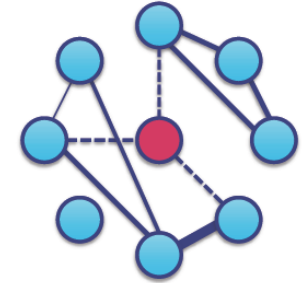


- **System purely for CS research**
- **Operational since June 2015**
- **Specs:**
 - 3,200 cores (8-core CPUs)
 - 2.4 GHz CPUs
 - accelerators (GPUs)
 - 800 TB storage
 - 10 Gb/s Infiniband
 - Gb Ethernet

September 2017

5

The Distributed Systems Group: Research Topics

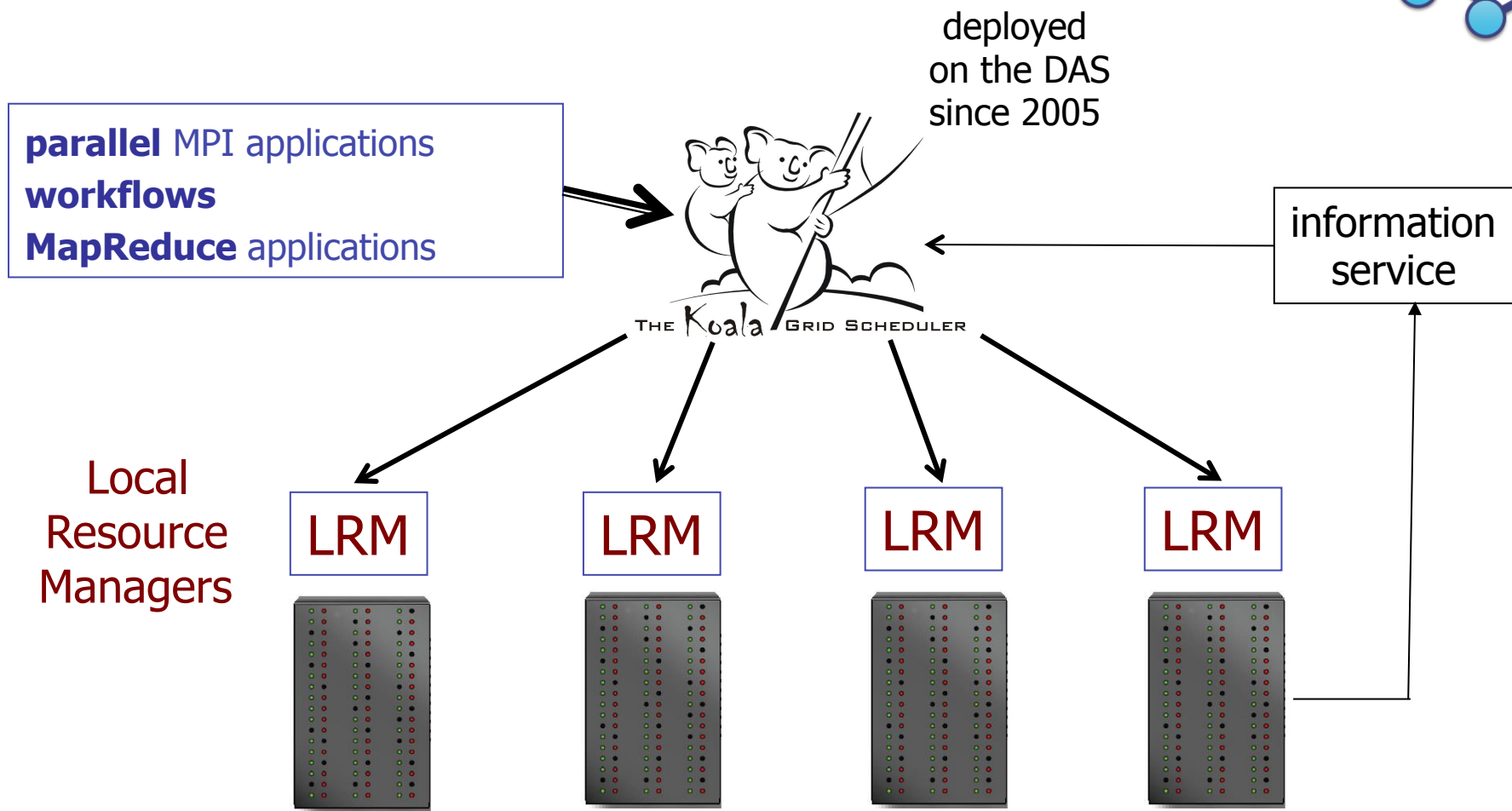
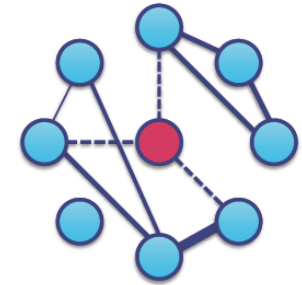


1. Resource Management and Scheduling
2. Big Data Processing (e.g., Graph Processing)
3. Cooperative Systems

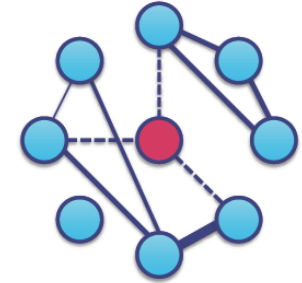
See research pages and annual report 2015 at

<http://www.ds.ewi.tudelft.nl>

The KOALA multicluster scheduler



Big Data Processing



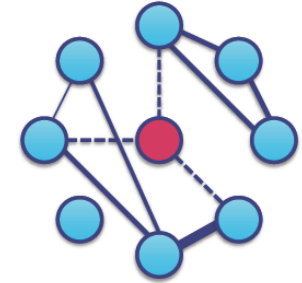
graph processing



Graphalytics
graphalytics.ewi.tudelft.nl/

LinkedIn

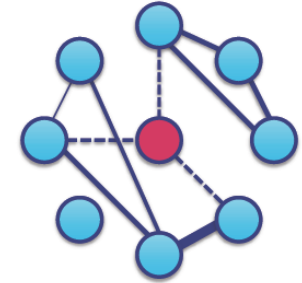
Cooperative Systems (1): Tribler



- Is based on the **BitTorrent P2P** file-sharing system
- Uses an **epidemic protocol** for peer and content discovery
- Was **first released** on 17 March 2006 (1,500,000+ downloads)
- Enables **video-on-demand** and **live streaming**
- Is our **research vehicle** for P2P, Online Social Network, reputation systems, blockchain
- **Current focus:** reputation, trust, cybercurrencies
- **Download** at www.tribler.org



Cooperative Systems (2): trust/reputation



- **Problems:**

- why help others downloading in P2P systems?
- why contribute to Wikipedia?
- why trust money without central banks?

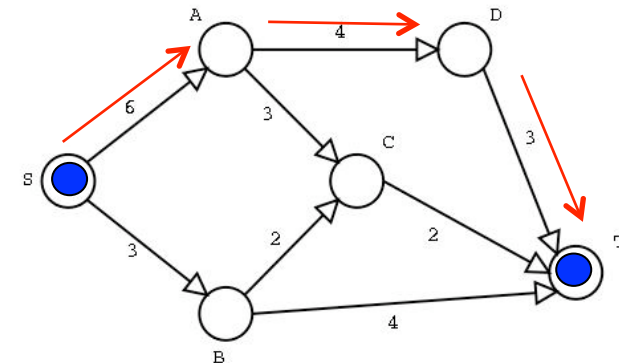


- **Solution:** create a trust system **without central control**

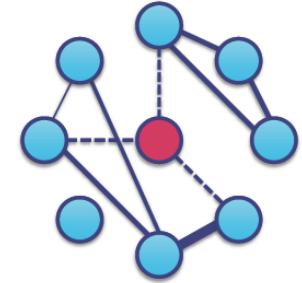
- record decentralized interaction history
- disseminate this history in an attack-resilient way

- **In Tribler:**

- maintain records of uploads and downloads
- compute reputations from resulting graph

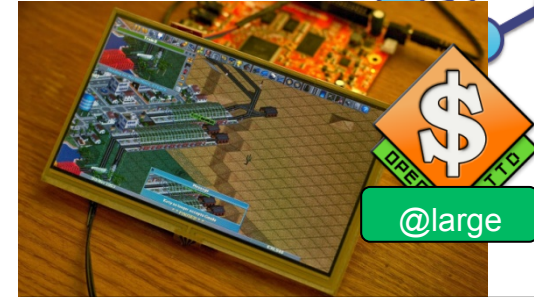
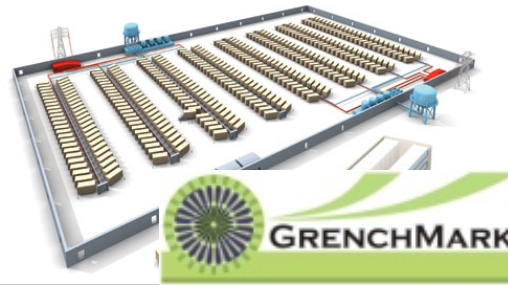
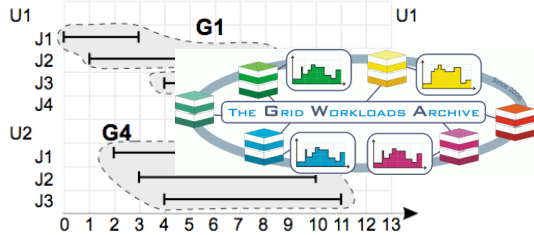
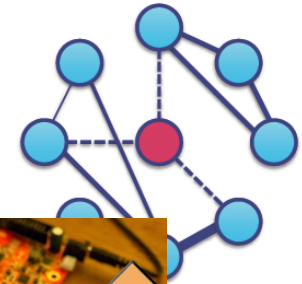


Doing your MSc in the DS Group



- requires you to do **at least two** of the DS MSc courses
- is **hard work** (experiments!!), we're not easily satisfied
- will push you to a **high grade** (or, higher than you expected)
- let's you **collaborate** with other MSc and PhD students
- learns you to become an **independent engineer/researcher**
- can be done **within or outside the university** (institutes (NIKHEF)/companies (Solvinity))
- may lead to a **conference paper**, but much depends on you

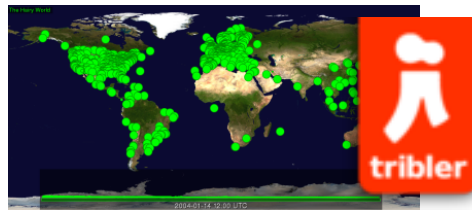
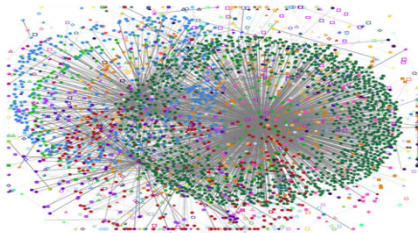
Some MSc Research Topics for You



Data Center Workloads

Cloud Res.Man. Management

Gaming @large



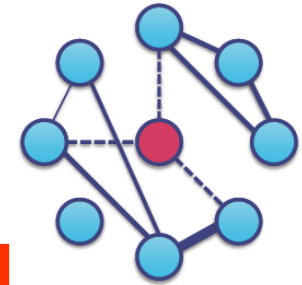
Big Data: Graphs

Blockchain / Tribler

Big Data: Elastic MapRed

More information

- **MSc coordinator:** Johan Pouwelse
- **Some previous MSc theses:**
 - www.ds.ewi.tudelft.nl/epema/teaching
- **DS publications**
 - <http://publications.st.ewi.tudelft.nl>
- **Home pages:**
 - www.ds.ewi.tudelft.nl
 - www.ds.ewi.tudelft.nl/epema
 - www.ds.ewi.tudelft.nl/~iosup
 - www.ds.ewi.tudelft.nl/pouwelse
- **Web sites:**
 - KOALA: www.st.ewi.tudelft.nl/koala
 - DAS5: www.cs.vu.nl/das5
 - Tribler: www.tribler.org



DS Tag Cloud

