Day with industrial partners
About me

• 2000 – 2005 Faculty of Applied Mathematics and Informatics, Ivan Franko National University of Lviv (Mgr.)

• 2005 – 2012 Faculty of Informatics, Masaryk University (Mgr. and Ph.D.)

• 2012 Researcher and coordinator of cooperation with academia at Y Soft

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Presentation

• **Is about**
  – Y Soft SafeQ
  – Research areas interesting for Y Soft
  – Examples of cooperation with other students
  – Information how you can get involved

• **Is not about**
  – Our history & our Brno Headquarter
  – Our branches all over the world
  – Number of our well known and well established partners
  – Large number of our customers

http://www.ysoft.com/
About YSoft SafeQ
About YSoft SafeQ (cont.)

• Hundreds of servers
  – Distributed over different countries
• Thousands of printers
• Tens of thousands of users
• Several millions of printed jobs per month
About YSoft SafeQ (cont.)

• How to ensure high availability?
• How to make it more efficient?
• How to make it more scalable?
• How to make it robust?
• How to make it secure?
• How to test it before deployment?
Research Areas & Examples of Cooperation
Distributed DB

- Availability
- Fault tolerance
CAP theorem

It is not possible for a distributed DB to simultaneously provide consistency, availability and partition tolerance guarantees.
Traditional (distributed) DB

- Atomicity
- Consistency
- Isolation
- Durability

Low R/W availability
New (distributed) DB

- Trade-off between Availability and Consistency
- Fault tolerance is usually “switched on”
- Amazon
- LinkedIn
- …
Riak NoSQL DB

• Study of documentation and source codes
  – Consistent Hashing, Eventual Consistency, Vector Clocks

• Analysis and verification of its key properties
  – Does DB return consistent data?
  – How long does it take to return consistent data?
  – How long does it take to write data?
  – How long does it take to read data?

• Analysis and evaluation of border and rare cases

• How different setting influence its key properties?

• Find trade-off between C and A for our purposes
Riak NoSQL DB

• Who is involved?
  – Developers from Y Soft
  – Part-timer student
  – New student (starts in July)

• We will not restrict ourselves to Riak only
• Do you want to experiment with distributed DB within scope of your thesis? Tell us!
Distributed Systems

• Defended BT: Indexing and Searching in Hybrid Peer-to-Peer Networks
  – Funded student position

• Running MT: Locking in distributed environment of YSoft SafeQ printing solution
  – Paxos, Raft, ...

• Open MT: Distributed processing of printing jobs using Akka

• If you want to experiment with some system for distributed storage, processing or message passing in your thesis, let us know!
Security

• Defended MT: Implementation of payment protocol on smartcards (NFC-enabled mobile phone)

• Running BT: Tools for static and dynamic code analysis
  – FindBugs, FxCop

• If you want to experiment with penetration tools, vulnerability assessing, password guessing tools within your thesis, let us know!
Testing

• Defended BT: Configuration tool for stress testing of the YSoft SafeQ print management solution

• Running BT: Adding support of IPP to YSoft Virtual Printer tool
  • Student got proposal of part-time job

• Open BT: Load balancing using HAProxy
Linux related

• Defended BT: Implementation of a native Mac OS X YSoft SafeQ printing client
  – Part-time job

• Defended MT: Porting of YSoft SafeQ Device server for Linux environment
  – Part-time job
  – Full-time job after defense

• Open MT: Linux client for Y Soft SafeQ
How you can get involved?
Competition for talented students

• Intended for 1\textsuperscript{st} and 2\textsuperscript{nd} year bachelor students
• Student will be involved in one of research laboratories at Faculty
• Regular financial reward
• This year, we will sponsor one position (congratulation to Martin Šalata)
• If you are hardworking and willing to study, go for that!
Bachelor or master theses

• List of available topics at: [http://ysoft.com/O-nas/University-Relations/For-MU-Students](http://ysoft.com/O-nas/University-Relations/For-MU-Students)

• Currently, 7 available topics (5 bachelor and 2 master theses)

• 3 bachelor and 7 master theses are occupied

• Some of them came in package with a part-time job at Y Soft

• Follow our pages, contact me personally or by e-mail
Thank you for your attention
Visit us at our stall

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