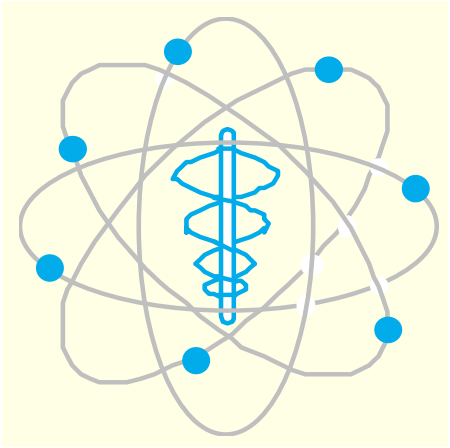
PROCOPE – High Availability DSM



- PROCOPE Goals & Results
- Lessons learned from PROCOPE
- Plurix Checkpointing Status & Outlook
- Conclusion & Future Work

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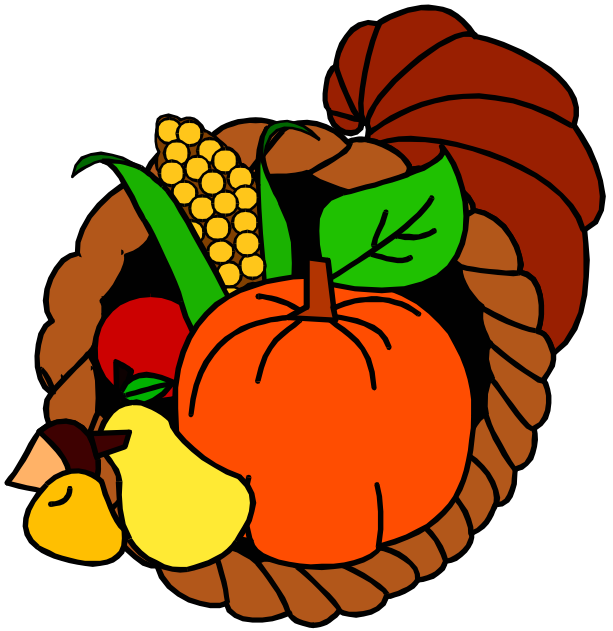
PROCOPE Goals & Results

- PROCOPE goal: comparison of checkpointing & recovery
  - in Mome, Kerrighed, and Plurix,
  - running selected parallel applications.
- Results in 2004:
  - Applications have been implemented: SOR, MGS, Ray Tracer.
  - DSM performance comparison has been done.
- Results in 2005:
  - A joint paper has been presented at ICA3PP.
  - We wrote the XtreemOS project proposal (FP6).

Lessons Learned from PROCOPE

- We were to ambitious when writing the PROCOPE proposal.
  - Checkpointing and error recovery has not been studied.
- Transactional consistency is comfortable but:
  - for parallel applications needs a lot of manual tuning,
  - transactions must be able to commit within loops,
  - barriers must use a write update protocol,
  - an optimizing compiler is mandatory.
- Monitoring tools are needed to simplify:
  - false sharing identification & resolution,
  - support of transaction partitioning.



Plurix Checkpointing Status & Outlook

- Stable version of PageServer is up and running.
- PageServer can collect pages in a proactive way.
- Reset and recovery times are very short (~250ms per node).
- More Information see PhD thesis, Stefan Frenz, 2006.
- DTDOS – funded by the German Science Foundation
  (1 PhD student for 2 years, starting in 2006):
  - distributed PageServer,
  - concurrent error detection,
  - reset-strategies (may be to older checkpoints),
  - reset only affected nodes (dependency tracking),
  - evaluation with distributed and parallel applications.

Conclusion & Future Work

- We learned a lot from the PROCOPE cooperation.
- We hope to learn even more within the XtreemOS project:
  - data sharing & checkpointing,
  - at the cluster-, federation- and grid-level,
  - running our virtual world with a Grid environment.
- Future Work: **XtreemOS**
  - data sharing (page based) & checkpointing on federation level,
  - data sharing (object based) on the grid level,
  - demonstrator: virtual presence,
  - security & infrastructure
    (Franz Hauck).