

Seminar *Grid Computing*

Themen- und Literaturliste

Block 1: Grundlagen

Grundlagen des Grid Computings

Computational / Data / Service Grids, Parallelen zum Web (technisch, inhaltlich), Data-intensive Computing, High-throughput/High-performance Computing

- I. Taylor: *From P2P to Web Services and Grids*. Springer, London, 2005. ISBN 1-85233-869-5. A TAY 35311. S. 57-70.
- J. Joseph, C. Fellenstein: *Grid Computing*. Prentice Hall, Upper Saddle River, 2004. ISBN 0-13-145660-1. D JOS 34166. Kapitel 2.
- P. Plaszczak, R. Wellner: *Grid computing: the savvy manager's guide*. Morgan Kaufmann, Amsterdam, 2006. ISBN 0-12-742503-9. A PLA 36886. S. 25-38.
- I. Foster, C. Kesselman, S. Tuecke: *The Anatomy of the Grid: Enabling Scalable Virtual Organizations*. International J. of Supercomputer Applications, 15(3), 2001.
- J. Joseph, M. Ernest, C. Fellenstein: *Evolution of grid computing architecture and grid adoption models*. In: IBM Systems Journal 43(4), 624-645, 2004.
- S. Bourbonnais, V. M. Gogate, L. M. Haas et. al.: *Towards an information infrastructure for the grid*. In: IBM Systems Journal 43(4), 665-688, 2004.
- I. Foster, C. Kesselman: *Computational Grids*. Kapitel 2 aus "The Grid: Blueprint for a New Computing Infrastructure", Morgan-Kaufman, 1999.
- A. Chervenak, I. Foster, C. Kesselman, C. Salisbury, S. Tuecke: *The Data Grid: Towards an Architecture for the Distributed Management and Analysis of Large Scientific Datasets*. Journal of Network and Computer Applications 23, 187-200, 2001.
- D. Bernholdt, S. Bharathi, D. Brown et. al.: *The Earth System Grid: Supporting the Next Generation of Climate Modeling Research*. In: Proceedings of the IEEE, 93(3), 485-495, March 2005.

Service Grids

grundlegende Eigenschaften, Globus Toolkit, OGSA, OGSi/WSRF, alternative Grid-Architekturen

- Globus: www.globus.org
- *The WS-Resource Framework*, <http://www.globus.org/wsrf/specs/ws-wsrf.pdf>
- *From Open Grid Services Infrastructure to WS-Resource Framework: Refactoring and Evolution*, http://www.globus.org/wsrf/specs/ogsi_to_wsrf_1.0.pdf
- *The Physiology of the Grid*, <http://www.globus.org/alliance/publications/papers/ogsa.pdf>
- *The Open Grid Services Architecture, Version 1.0*, <http://www.gridforum.org/documents/GWD-I-E/GFD-I.030.pdf>
- I. Foster: *Globus Toolkit Version 4: Software for Service-Oriented Systems*. Springer LNCS 3779, pp. 2-13, 2005. <http://www.globus.org/alliance/publications/papers/IFIP-2005.pdf>
- UNICORE: www.unicore.org
- Legion: <http://legion.virginia.edu>

Block 2: Technologien und Konzepte

Aspekte des kommerziellen Grid Computings

Sicherheit (Vertrauen, Autorisierung, Verschlüsselung...), Überwachung (Monitoring) und Abrechnung (Accounting), Zusicherung von Dienstgüte (Assurance/QoS)

- V. Welch, F. Siebenlist, I. Foster, J. Bresnahan, K. Czajkowski, J. Gawor, C. Kesselman, S. Meder, L. Pearlman, S. Tuecke: *Security for Grid Services*. Twelfth International Symposium on High Performance Distributed Computing (HPDC-12), IEEE Press, June 2003.
- Globus Toolkit 4 Security: <http://www.globus.org/toolkit/docs/4.0/security>
- *A Grid Monitoring Architecture*. <http://www-didc.lbl.gov/GGF-PERF/GMA-WG/papers/GWD-GP-16-3.pdf>
- CODE: <http://www.nas.nasa.gov/Resources/Software/Open-Source/code.html>
- S. Andreozzi, N. De Bortoli, S. Fantinel, A. Ghiselli, G.L. Rubini, G. Tortone and M.C. Vistoli: *GridICE: a Monitoring Service for Grid Systems*. In Future Generation Computer Systems Journal, Elsevier, 21(4):559-571, 2005.
- The Distributed Grid Accounting System: <http://www.to.infn.it/grid/accounting/main.html>
- R. Al-Ali, K. Amin, G. von Laszewki, O. Rana, D. Walker, M. Hategan, N. Zaluzec: *Analysis and Provision of QoS for Distributed Grid Applications*. Journal of Grid Computing 2(2), pp. 163-182, 2004.

Grid Computing aus Sicht der Industrie

Grundlagen des unternehmerischen Einsatzes, Blickwinkel der Industrie und existierende Produkte (IBM On Demand, SUN N1 Grid, ...)

- P. Plaszczak, R. Wellner: *Grid computing: the savvy manager's guide*. Morgan Kaufmann, Amsterdam, 2006. ISBN 0-12-742503-9. A PLA 36886.
- IBM Grid computing: www.ibm.com/grid
- IBM On Demand: <http://www.ibm.com/e-business>
- Sun N1 Grid Engine: <http://www.sun.com/software/n1/gridsystem/index.xml>
- Oracle Grid Computing: <http://www.oracle.com/technologies/grid>

Semantic Grid

Anreicherung von Grid-Inhalten mit Semantik, Metadaten, Ontologien, Anwendungen

- D. De Roure, N. Jennings, N. Shadbolt: *The Semantic Grid: A Future e-Science Infrastructure*. In: F. Berman, G. Fox, T. Hey: *Grid Computing*, pp. 437-470. Wiley, 2003.
- De Roure, D., Jennings, N.R., Shadbolt, N.R.: *The Semantic Grid: Past, Present, and Future*, Proceedings of the IEEE, Volume 93, Issue 3, March 2005, Pages 669-681, ISSN: 0018-9219
- H. Tangmunarunkit, S. Decker, C. Kesselman: *Ontology-Based Resource Matching in the Grid – The Grid Meets the Semantic Web*. Proceedings of the 2nd International Semantic Web Conference (ISWC2003), pp. 706-721, 2003.
- OWL-S: Semantic Markup for Web Services, <http://www.daml.org/services/owl-s/1.1/overview>
- P. Lord, C. Wroe, R. Stevens, C. Goble, S. Miles, L. Moreau, K. Decker, T. Payne and J. Papay: *Semantic and Personalized Service Discovery*. IEEE Workshop on Knowledge Grid and Grid Intelligence (KGGI 03), Halifax, Canada.

Autonomic Computing

Selbstkonfigurierende, -optimierende, -heilende Systeme: Grundlagen, Umsetzung, Beispiele

- J. Kephart, D. Chess: *The Vision of Autonomic Computing*. Computer Magazine, pp.41-50, IEEE, 2003.
- M. Parashar, S. Hariri: *Autonomic Computing: An Overview*. UPP 2004, Mont Saint-Michel, France. LNCS, Springer Verlag, Vol. 3566, pp. 247–259, 2005.
- M. Parashar, Z. Li, H. Liu, V. Matossian, C. Schmidt: *Enabling Autonomic Grid Applications: Requirements, Models and Infrastructures*. Self-Star Properties in Complex Information Systems, LNCS, Springer Verlag, Vol. 3460, 2005.
- G. Deen, T. Lehman, J. Kaufman: *The Almaden OptimalGrid Project*. 5th Annual International Workshop on Active Middleware Services, Seattle, USA, 2003.
- IBM Autonomic Computing: www.ibm.com/autonomic

Block 3: Datenzugriff

DAIS, OGSA-DAI und OGSA-DQP

Standardisierungsarbeiten und Referenzumsetzungen für Datenquellennutzung in Grids

- DAIS Working Group: <http://forge.gridforum.org/projects/dais-wg>
- The OGSA-DAI Project: <http://ogsadai.org.uk>
- M. Antonioletti, A. Krause, N. W. Paton, A. Eisenberg, S. Laws, S. Malaika, J. Melton, D. Pearson: *The WS-DAI Family of Specifications for Web Service Data Access and Integration*. ACM SIGMOD Record, Vol 35, No 1, pp. 48-55, 2006.
- M. Antonioletti, M.P. Atkinson, R. Baxter et.al.: *The Design and Implementation of Grid Database Services in OGSA-DAI*. Concurrency and Computation: Practice and Experience, Volume 17, Issue 2-4, Pages 357-376, February 2005.
- M.N. Alpdemir, A. Mukherjee, A. Gounaris, N.W.Paton, P. Watson, A.A.A. Fernandes, J. Smith: *OGSA-DQP: A Service-Based Distributed Query Processor for the Grid*. Proceedings of the UK e-Science All Hands Meeting 2003.
- M. N. Alpdemir, A. Mukherjee, N.W. Paton, P.Watson, A. A. Fernandes, A. Gounaris, J. Smith: *Service-based distributed querying on the grid*. Proceedings of the First International Conference on Service Oriented Computing, pages 467-482. Springer, 2003.

Datenintegration in Grid-Umgebungen

Forschungsprojekte, Aspekte dynamischer Integration

- V. Raman, I. Narang, C. Crone, L. Haas, S. Malaika, T. Mukai, D. Wolfson, C. Baru: *Data Access and Management Services on Grid*. Global Grid Forum (GGF) 5, Edinburgh, 2002.
- A. D. Jhingran, N. Mattos, H. Pirahesh: *Information integration: A research agenda*. IBM Systems Journal 41(4), pp. 555-562, 2002.
- R. Moore, A. Jagatheesan: *Data Grid Management Systems*. 21st IEEE/NASA Conference on Mass Storage Systems and Technologies (MSST), 2004.
- R. Tuchinda, S. Thakkar, Y. Gil, E. Deelman: *Artemis: Integrating Scientific Data on the Grid*. Nineteenth National Conference on Artificial Intelligence, pp. 892-899, 2004.
- P. Brezany, A. Tjoa, H. Wanek, A. Wöhrer: *Mediators in the Architecture of Grid Information Systems*. Parallel Processing and Applied Mathematics: 5th International Conference, LNCS 3019, pp. 788-795, 2004.

Resource Discovery

Auffinden und Anbinden von Datenquellen und sonstigen Ressourcen im Grid

- K. Vanthournout, G. Deconinck, R. Belmans: A Taxonomy for Resource Discovery. International Conference on Architecture of Computing Systems, 2004.
- A. Iamnitchi, I. Foster: *On Fully Decentralized Resource Discovery in Grid Environments*. International Workshop on Grid Computing, Denver, CO, November 2001.
- A. Iamnitchi, I. Foster: *A Peer-To-Peer Approach to Resource Location in Grid Environments*. In: J. Weglarz, J. Nabrzyski, J. Schopf, M. Stroinski eds.: *Grid Resource Management*, Kluwer Publishing, 2003.
- H. Tangmunarunkit, S. Decker, C. Kesselman: *Ontology-Based Resource Matching in the Grid – The Grid Meets the Semantic Web*. International Conference on Web Services, 2003.
- F. Heine, M. Hovestadt, O. Kao: *Towards Ontology-Driven P2P Grid Resource Discovery*. Fifth IEEE/ACM International Workshop on Grid Computing, 2004.

Peer Data Management

P2P-Ansätze zur Datenverwaltung im Vergleich zum Grid

- I. Foster, A. Iamnitchi: *On Death, Taxes, and the Convergence of Peer-to-Peer and Grid Computing*. Second International Workshop on Peer-to-Peer Systems, Berkeley, CA, USA, February 21-22, 2003.
- J. Kubiawicz, D. Bindel, Y. Chen et al.: *OceanStore: an architecture for global-scale persistent storage*. Ninth International Conference on Architectural Support for Programming Languages and Operating Systems (ASPLOS2000), 2000.
- A. Halevy, Z. Ives, D. Suciu, I. Tatarinov: *Schema mediation for large-scale semantic data sharing*. VLDB Journal 14, pp. 68-83, 2005.
- I. Tatarinov, A. Halevy: *Efficient Query Reformulation in Peer Data Management Systems*. ACM SIGMOD International Conference on Management of Data, Paris, France, 2004.

Block 4: Applikationen und Prozesse

Service-oriented Computing

Service-oriented Architecture, Service Composition, verteilte modulare Applikationen

- M. Papazoglou: *Service-oriented computing: concepts, characteristics and directions*. Fourth International Conference on Web Information Systems Engineering, 2003.
- D. Kuroopka, M. Weske: *Die Adaptive Services Grid Plattform: Motivation, Potential, Funktionsweise und Anwendungsszenarien*. Emisa Forum 26(1), pp. 13-25, 2006.
- Adaptive Services Grid: <http://asg-platform.org>
- J. Rao, X. Su: *A Survey of Automated Web Service Composition Methods*. First International Workshop on Semantic Web Services and Web Process Composition, 2004.
- L. Aversano, G. Canfora, A. Ciampi: *An algorithm for Web service discovery through their composition*. International Conference on Web Services (ICWS), 2004.
- M. Smith, T. Friese, B. Freisleben: *Towards a Service-Oriented Ad Hoc Grid*. Third International Workshop on Algorithms, Models and Tools for Parallel Computing on Heterogeneous Networks, 2004.

Prozesse in Grid-Umgebungen

Workflows, Transaktionsunterstützung

- The WfMC Workflow Reference Model:
<http://www.wfmc.org/standards/docs/tc003v11.pdf>
- WfMC Terminology and Glossary:
http://www.wfmc.org/standards/docs/TC-1011_term_glossary_v3.pdf
- J. Yu, R. Buyya: *A Taxonomy of Workflow Management Systems for Grid Computing*. Journal of Grid Computing 3(3-4), pp. 171–200, 2006.
- C. Türker, K. Haller, C. Schuler, H. Schek: *How can we support Grid Transactions? Towards Peer-to-Peer Transaction Processing*. Second Biennial Conference on Innovative Data Systems Research, Asilomar, CA, USA, 2005, pp. 174-185.
- S. Venugopal, R. Buyya, L. Winton: *A Grid Service Broker for Scheduling Distributed Data-Oriented Applications on Global Grids*. 2nd workshop on Middleware for grid computing, 2004.
- J. Cao, S. Jarvis, S. Saini, G. Nudd: *GridFlow: Workflow Management for Grid Computing*. 3rd International Symposium on Cluster Computing and the Grid, 2003.
- L. Catuogno, P. Faruolo, U. Ferraro Petrillo, I. Visconti: *Reliable Accounting in Grid Economic Transactions*. GCC 2004 Workshops, LNCS 3252, pp. 514-521, 2004.