

Enterprise Application Integration

Syllabus

Week	Topic	Bibliography	Assignment
Overall Theme: Fundamental Problems in Large-Scale Application Integration			
1	Introduction, Course Motivation and Dynamics.	--	Project #1: <i>"Designing a Screen-Scraper for the Web"</i>
2	Fundamental Problems in Large-Scale Application Integration ("Widgets & Gadgets" Case Study)	[Hohpe03] Ch. 1	
Overall Theme: Service Oriented Architecture			
3	Agnostic Data Representation and Processing in XML and XSLT	[Armstrong+05] Ch. 2, 4, 5, 6 [Harold01]	
4	Service Oriented Architecture (SOA) and Enterprise Service Bus (ESB) – Part 1/2	[Erl09] Ch. 3, 4	Project #2: <i>"Designing a 3-tier System for Integration"</i>
5	Service Oriented Architecture (SOA) and Enterprise Service Bus (ESB) – Part 2/2	[Erl09] Ch. 13, 14, 16	
6	2 nd Generation Web Services (Messaging, Security, Reliability, Transactions, Processes, Metadata)	[Erl09] Ch. 6, 7, 17 [Gailey04]	
Overall Theme: Security in Large-Scale Enterprise Systems			
7	"Why Cryptosystems Fail" – Attack Patterns in Large Organizations	[Anderson03]	
8	Design Principles and Evaluation of Security in Large-Scale Systems	[Howard03] Ch. 1, 3, 14 [STRIDE]	Project #3: <i>"Designing a Service Oriented Architecture"</i>
Overall Theme: Middleware			
9	Distributed Transactions, Two-Phase Commit, Business Activities, and relaxing Isolation	[Coulouris+05] Ch. 14 [Burke+05] Ch. 16	
10	Message Oriented Middleware (MOM)	[Hohpe05] [Hohpe03] Ch. 4, 6, 9, 10	
Overall Theme: Integrating with Business Partners			
11	Integration with Legacy Systems: Challenges and Approaches	[Hohpe03] Ch. 2 [Linthicum99] Ch. 1-5 [Erl04] Ch. 8, 9	
12	Integration with External Partners: Standards RosettaNet, ebXML, UCCNet	[Linthicum99] Ch. 12, 14 [Dournaee04]	Project #4: <i>"Designing Reliable Services on an Enterprise Service Bus"</i>
Overall Theme: Reliability and Fault-Tolerance			
13	"Why Systems Fail and What Can We Do About it?" – Basic Techniques in Reliability and Fault-Tolerance	[Marcus+03] [RELIABILITY] [AVAILABILITY]	
14	Deployment of Large-Scale Systems in the Real World.	[Oppenheimer03] [Patterson+04] Sec. 9.8	
15	<i>Discussion and Wrap Up</i>		

Bibliography

- [Anderson93] R. Anderson, "Why Cryptosystems Fail", in Proc. of the 1st ACM Conference on Computer and Communications Security, Fairfax, Virginia, United States, 1993
- [Armstrong+05] E. Armstrong et al., "The J2EE 1.4 Tutorial", Sun Microsystems, 2005
- [AVAILABILITY] "System Reliability and Availability":
http://www.eventhelix.com/RealtimeMantra/FaultHandling/system_reliability_availability.htm
- [Burke+05] B. Burke and R. Monson-Haefel, "Enterprise JavaBeans 3.0", 5th Ed., O'Reilly, ISBN 059600978X, 2006.
- [Coulouris+05] G. Coulouris, J. Dollimore and T. Kindberg, "Distributed Systems: Concepts and Design", 4th Ed., Addison Wesley, ISBN 0321263545, 2005
- [Dournaee04] B. Dournaee, "Introduction to ebXML":
<http://www.pa.icar.cnr.it/cossentino/ICT/doc/D28.1%20-%20Introduction%20to%20ebXML.pdf>
- [Erl04] T. Erl, "Service-Oriented Architecture: A Field Guide to Integrating XML and Web Services", Prentice Hall, ISBN 0131428985, 2004
- [Erl09] T. Erl, "SOA Design Patterns", Prentice Hall, ISBN 0136135161, 2009
- [Gailey04] J. Gailey, "Understanding Web Services Specifications and the WSE", Microsoft Press, 2004
- [Harold01] E. Harold, "XML 1.1 Bible", 3rd Ed., Wiley, ISBN 0764549863, 2004
- [Howard+03] M. Howard and D. LeBlanc, "Writing Secure Code", 2nd Ed., Microsoft Press, ISBN 0735617228, 2003
- [Hohpe03] G. Hohpe and B. Woolf, "Enterprise Integration Patterns: Designing, Building, and Deploying Messaging Solutions", Addison-Wesley Professional, ISBN 0321200683, 2003
- [Linthicum03] D. Linthicum, "Next Generation Application Integration: From Simple Information to Web Services", Addison-Wesley, ISBN 0201844567, 2003
- [Marcus03] E. Marcus, H. Stern, "Blueprints for High Availability", 2nd, Wiley, ISBN 0471430269, 2003
- [Oppenheimer03] D. Oppenheimer, A. Ganapathi, D. Patterson, "Why do Internet services fail, and what can be done about it?", in Proc. of the 4th USENIX Symposium on Internet Technologies and Systems (USITS'03), 2003
- [Patterson+04] D. Patterson, J. Hennessy, et al., "Computer Organization and Design: The Hardware/Software Interface", 3rd Ed., Morgan Kaufmann, ISBN 1558606041, 2004
- [RELIABILITY] "Reliability and Availability Basics":
http://www.eventhelix.com/RealtimeMantra/FaultHandling/reliability_availability_basics.htm
- [STRIDE] Microsoft's STRIDE method: <http://msdn2.microsoft.com/en-us/library/aa302419.aspx>