

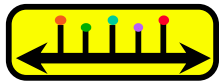


Object Services and Consulting, Inc.

OMG-DARPA Workshop on Compositional Software Architectures

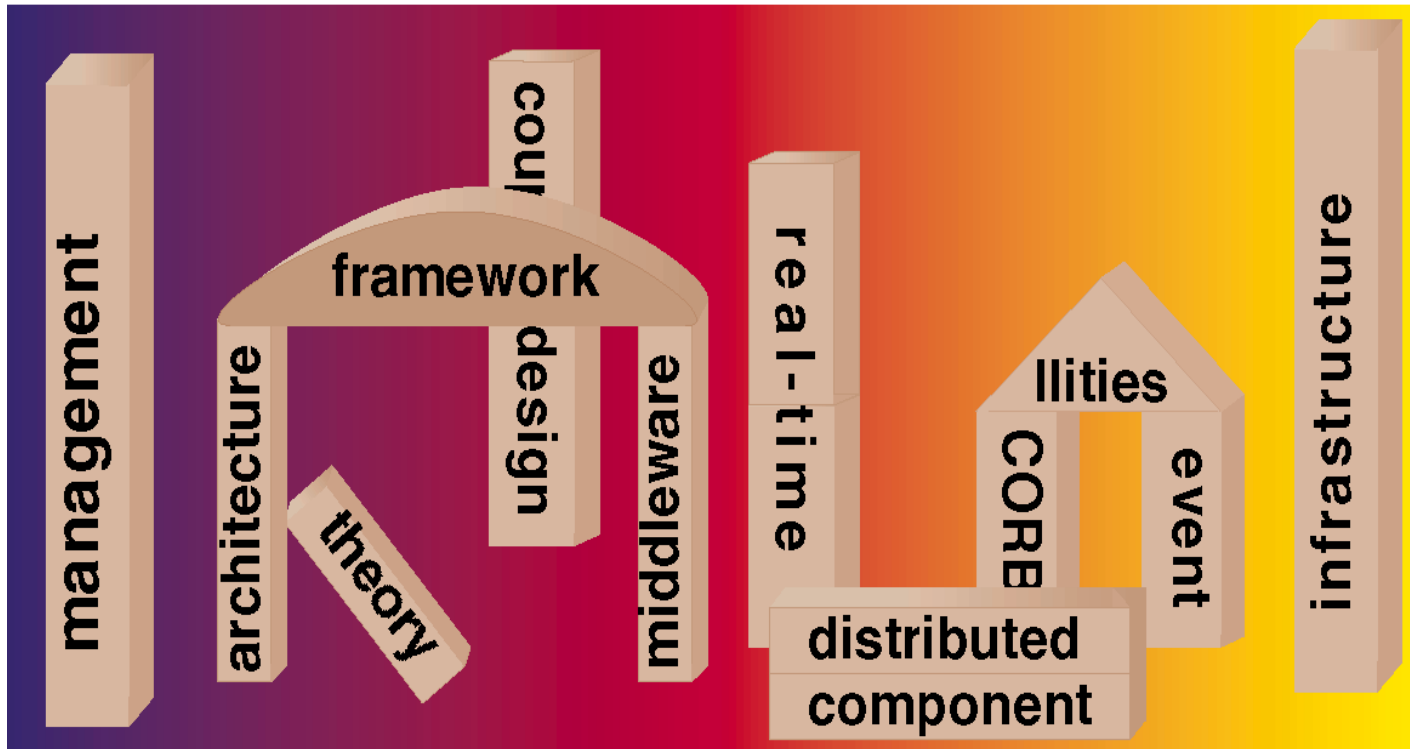
Workshop Summary

Craig Thompson
Object Services and Consulting, Inc.



OMG-DARPA Workshop on Compositional Software Architectures

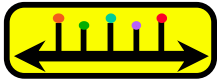
Object Services and Consulting, Inc.



Monterey, California
January 6-8, 1998

112 position papers, 100+ participants

Workshop Report: <http://www.objs.com/workshops/ws9801/report.html>



Workshop Structure

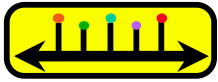
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Presentations

- **Higher Order Connectors, David Garlan, CMU**
- **Component Model, Umesh Bellur, Oracle**
- **Distributed Objects with Quality of Service, Richard Schantz, BBN**
- **Large-Scale Agent Architectures, Stephen Milligan, GTE/BBN**
- **OLE DB, Michael Pizzo, Microsoft**
- **W3C HTTP-NG, Bill Janssen, Xerox PARC**
- **Composing Active Proxies to Extend the Web, Rohit Khare, UC Irvine**
- **Resource Description Framework, Ora Lassila, Nokia Research Center and W3C**
- **Eco System: An Internet Commerce Architecture, Jay Tenenbaum, CommerceNet**
- **A Comparison of Component Models, Dave Curtis, OMG**
- **Aspect-Oriented Programming, Gregor Kiczales, Xerox PARC**

Breakout Sessions

- **I-1 Problem Definition by Application Architects**
- **I-2 Extending Current Middleware Architectures**
- **I-3 Challenging Problems in Middleware Development**
- **I-4 Software Architecture and Composition**
- **II-1 Economy of Component Software**
- **II-2 Component Model Representation and Composition**
- **II-3 System-wide Properties or Ilities**
- **II-4 How do these fit in?**
- **III-1 Scaling component software architectures**
- **III-2 Adaptivity of component software architectures**
- **III-3 Quality of Service**
- **III-4 ORB and Web Integration Architectures**
- **IV-1 Working Toward Common Solutions**
- **IV-2 Towards Web Object Models**
- **IV-3 Standardized Domain Object Models**
- **IV-4 Reifying Communication Paths**



Background

Sponsors/Organizers

- **OMG - Richard Soley and Dave Curtis**
- **DARPA - Randy Garrett and Todd Carrico**
- **MCC Object Infrastructure Project - Ted Linden**
- **OBJS - Craig Thompson**

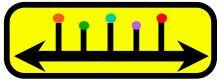
Themes

- **component-based architectures**
- **inserting -ilities into component-based software**
- **web-object integration architectures**



Conclusions

- **nature of the problem and approach**
 - well-understood problem: legacy systems, stovepipes, preserve investment
 - component approach
 - many technical and economic roadblocks, e.g., competing middleware stacks (DCOM, Java, OMG, and W3C)
- **software architecture**
 - common terminology possible - e.g., higher order connectors, aspects, ility tradeoffs, separation of concerns, architecture views, metadata, ...
 - tie to OMG OSAs as technology transfer vehicle
- **component models**
 - clear need else no floor interfaces and no plug-and-play
 - Oracle led discussion -- OMG Component RFPs at http://www.omg.org/library/schedule/CORBA_Component_Model_RFP.htm
 - OMG likely to *follow* JavaBeans approach
 - no general workshop consensus on component definition, granularity, encapsulation, metadata
 - critical to OMG OMA and DARPA AITS component-based architecture



Conclusions (cont)

- -ilities

- includes QoS, security, scalability, evolvability, reliability, survivability, adaptability, ...
- pre-workshop status: many mechanisms, ility-specific progress
- post-workshop status: general framework possible for ility insertion
- general approach is reify communication paths and insert ilities there
- unknowns: ility-specific frameworks, ility composability, tradeoffs
- critical to longevity of OMG OMA and DARPA AITS architectures

- web-object integration

- Web-ORB integration - cgi, applets, servlets, intermediaries, HTTP-NG
- Web object model - expanding universe - HTML, XML, IDL, RDF, DOM, etc. - how do these relate? how to add behavior to XML? critical to AITS - right core representations

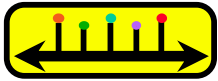
- agents

- mixed views at workshop: magic, mechanism, next step beyond objects
 - not an agent-friendly or agent-informed crowd
- OMG/DARPA position on agents vs. objects: unify or co-existence/interoperation?



Conclusions (cont)

- Architecture-driven Technology Transition
 - **OMG**
 - **Next Generation OMA needed: add semantics, -ilities, agents, constraints, microlicensing, ...**
 - **complexity barrier and implementation gap**
 - **OMG - Java**
 - **OMG now leading *and following* Java, danger of split or too dominant partner**
 - **ideas to make OMG more Java-friendly**
 - **OMG - W3C**
 - **danger: Web and OMG divergence - missed opportunity?**
 - **Web moving toward loose-coupled object model**
 - **good ideas: intermediary architecture, web-object model, HTTP-NG**
 - **possibility that domain-specific XML DTDs may win over IDL-based domain-specific models**



Conclusions (cont)

- Architecture-driven Technology Transition (cont)
 - **OMG - DARPA**
 - **OMG needs DARPA research, DARPA needs OMG connection to industry. DARPA should invest in {OMG, W3C, OGC, etc.} as technology transition partners.**
 - **some opportunities for DARPA to improve OMG**
 - **Security and Information Assurance Reference Architecture**
 - **Triggers to improve OMG Events**
 - **WebServer**
 - **DataServer**
 - **ALP clusters, HLA confederates**
 - **C4I Object Model**
 - **Quorum**
 - **Logistic**
 - **others likely**



Next Steps

- we might be interesting in organizing a follow-on workshop in about a year:

OMG-DARPA-W3C Workshop on Adaptive Compositional Software Architectures