



SIM-TBASSCO – Semantic Interoperability Measures: Template-based Assurance of Semantic Interoperability in Software Composition

Testbed: GeoWorlds Geospatial Information Analysis (GeoTopics “Hot News” Portal)

Create/adapt special-purpose information analysis applications

- GeoWorlds supplies component library
- Supports end users and application developers
- “Wire together” apps using semantic scripting tool

News Sources



Extracted Articles



Document Analyses

- Document filtering
- Topic and place name extractions
- Topic and place-based Document classifications
- Topic ranking and sorting
- Cross-product between topics and places
- Geographical mapping of the articles

News Compilation Results



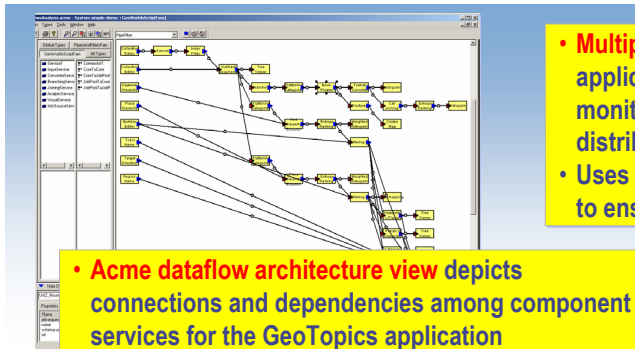
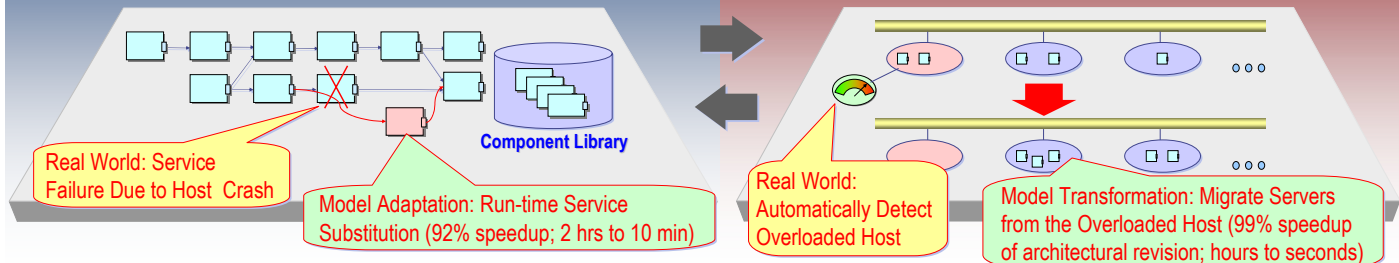
Faults Overcome via Semantic Adaptation and Semantically-Invariant Transformation

Dataflow Architecture View

- Load dataflow architecture; extend it at run-time
- Update dataflow architecture to replace malfunctioning service at run-time

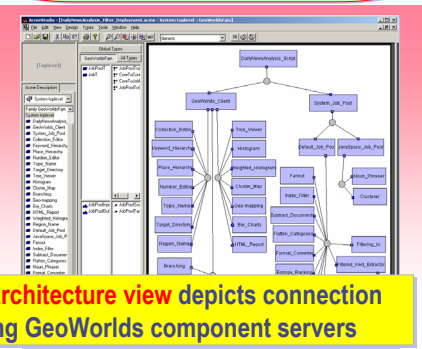
System Architectural View

- Detect overloaded server; re-host the service
- Update system architecture automatically to reflect re-hosted service

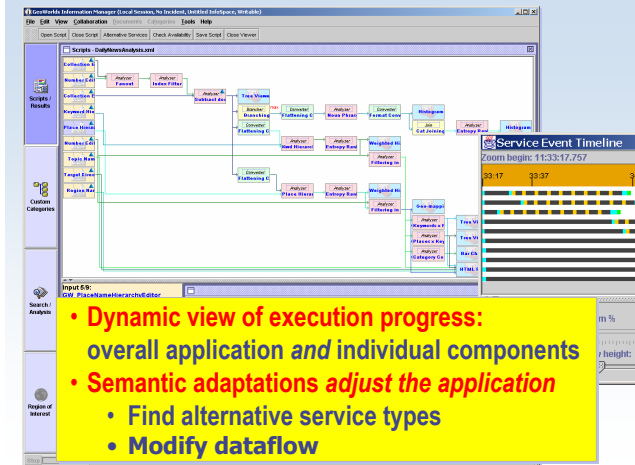


- Multiple architectural views of application to enable monitoring and analysis of distributed systems
- Uses Acme-based description to ensure tool interoperability

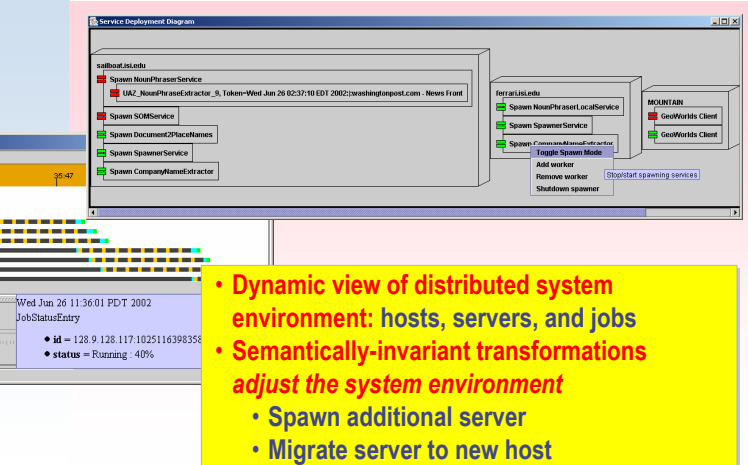
• Acme dataflow architecture view depicts connections and dependencies among component services for the GeoTopics application



• Acme system architecture view depicts connection hierarchy among GeoWorlds component servers



- Dynamic view of execution progress: overall application and individual components
- Semantic adaptations adjust the application
 - Find alternative service types
 - Modify dataflow



- Dynamic view of distributed system environment: hosts, servers, and jobs
- Semantically-invariant transformations adjust the system environment
 - Spawn additional server
 - Migrate server to new host