The Web Services Composite Application Framework

Mark Little
(mark.little@arjuna.com)

What is WS-CAF?

- Collection of 3 specifications
  - Designed to be used independently or together
- 18+ months of effort
- OASIS Technical Committee
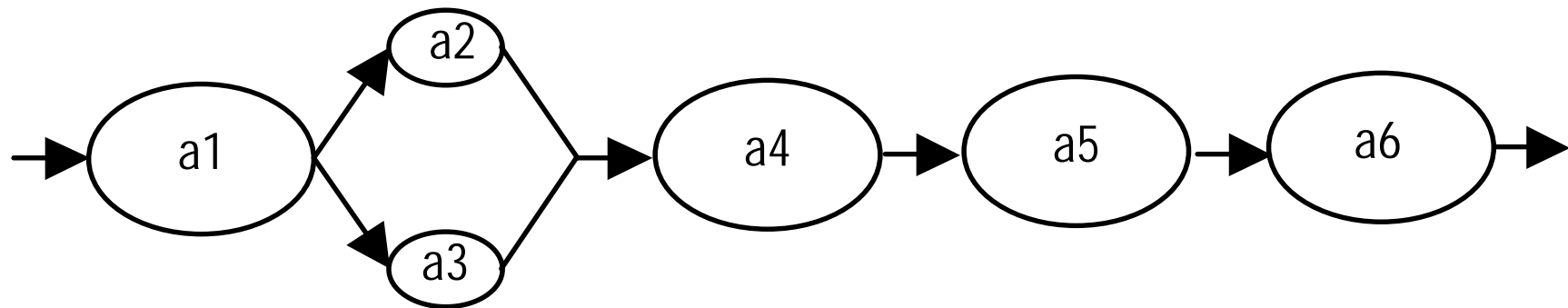 - Royalty free

What are the specifications?

- **WS-Context**
  - Context service

- **WS-Coordination Framework**
  - Framework for pluggable coordination protocols

- **WS-Transaction Management**
  - Three transaction models for Web services
    - Interoperability with existing implementations is important

WS-Context

- Context and "life-cycle" service
  - Fundamental aspect of WS architecture
- Defines notion of an activity
  - Unit of work
    - Precise definition left up to higher level services/users
  - Basic context associated with activity
- Maintains context for each activity

Activity example

WS-Context goals

- To provide a basic context service for Web services

  - Lots of different services need one

- Provide ability to do correlation of work at a minimum

  - Activities define correlation domains via context

Context

- Context is a first-class element
  - URI which may represent a web resource

- Basic context contains
  - Unique activity id for each activity
  - Timeout period (lifetime of activity)

- May be augmented:
  - Dynamically as remote invocations progress
  - Before application invocation occurs
    - By calling Activity Lifecycle Services (ALS)

ALS

- Services may register to participate in lifecycle of activity
- Are given a chance to augment context before application invocation
  - Not called prior to each invocation, only on lifecycle "events"
- Example
  - Coordination
  - Security

WS-CF

- Coordination is more fundamental than transactions
  - Security
  - Replication
  - Transactions
  - Caching
  - Process-flow

WS-CF Goals

- Provide a general framework for coordination protocols
  - Existing implementations to be plugged in
  - New implementations can be supported
    - Defines coordinator and participant relationships
- Work with WS-Context
  - Define an appropriate ALS
  - Augment context
- Scope of activity becomes scope of coordination boundary

What does it define?

- The structure of the augmented context
- Coordinator and participants
  - Interaction protocol
  - Not mandated
    - Can plug in other implementations

WS-TXM

- Transactions for Web services
- Builds on WS-CF and WS-Context
- Scope of activity becomes scope of transaction

WS-TXM Goals

- Support range of use cases
- "One-size does not fit all"
  - Therefore a single protocol cannot cope with all requirements
- Interoperability with existing transaction infrastructures

Defines

- Three transaction models
  - Atomic transaction (ACID)
    - For interoperability and high-cost services where ACID transactions are a requirement
  - Long Running Action
    - Loosely coupled, long duration work that uses compensation
  - Business Process
    - For treating all steps in an automated business process as part of a single logical transaction