Model Driven Solutions

Where Business Meets Technology

Formerly Data Access Technologies

The Architecture of Services

Workshop on eGovernment and the Web

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Full Paper

http://modeldriven.com/whitepapers.shtml

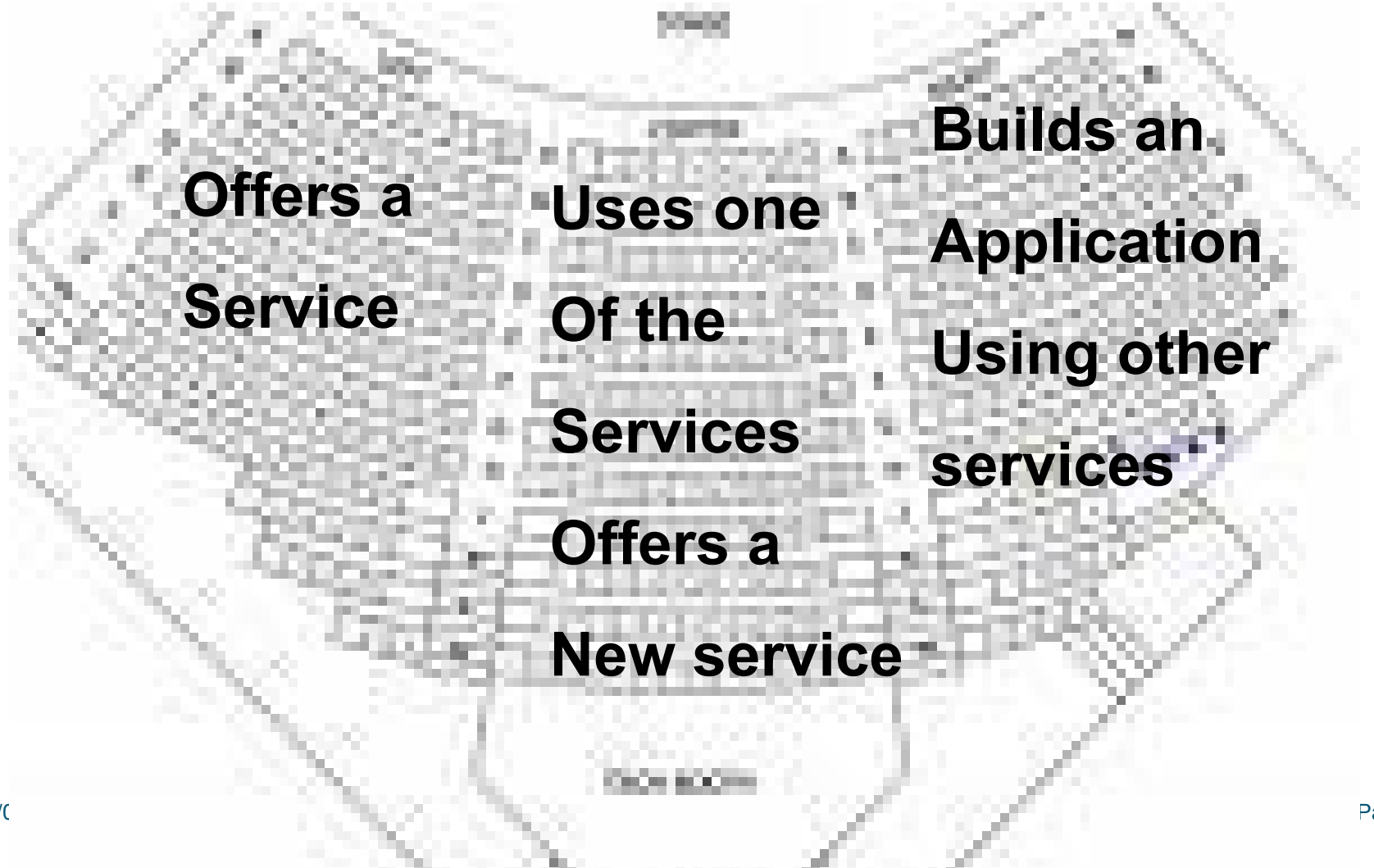
Our perspective on Service Oriented Architecture (SOA)

- SOA is:
  - **An enterprise and business architecture approach** – a way to understand and integrate the enterprise in the context of its community and as a network of business services. "A SOA" at the business level is part of the enterprise architecture showing how this network of services delivers business value
  - **A system of systems solution architecture** – a way to understand and integrate enterprise systems internally and externally as a network of technology services. "A SOA" at the systems of systems level is the solutions architecture showing how this network of systems works together to delivers business value.
  - **A system integration approach** – a way to expose existing capabilities to integrate applications and create new composite solutions.

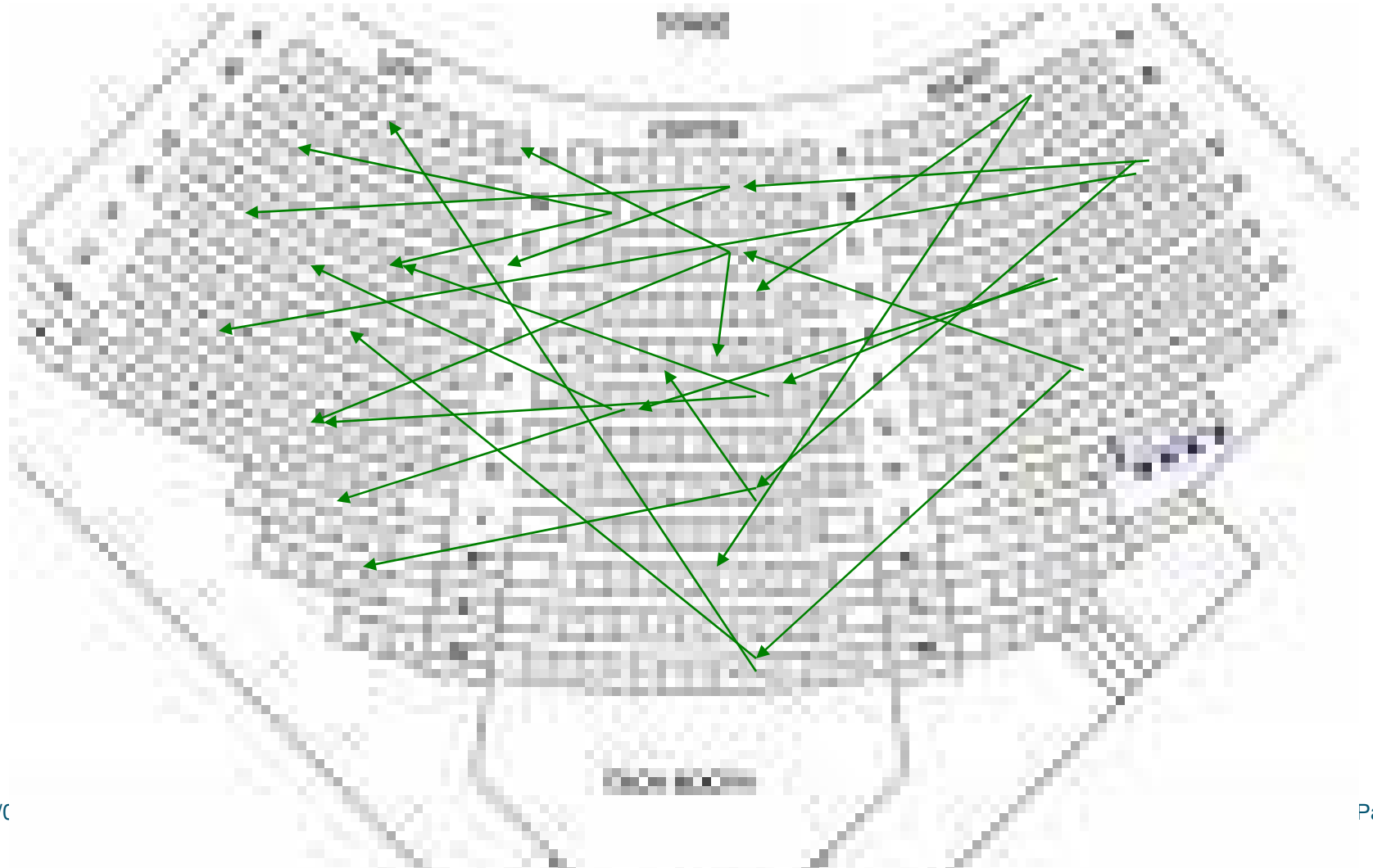
SOA Hype and Reality

- This is easy – no planning required
  - Hype: “Just start exposing capabilities as services – use these to make new services and “mash up” applications”
  - Reality: Service anarchy is a road to disaster – architect for longevity and loose coupling
- Network of Services
  - Hype: Services are simple and stand-alone
  - Reality: Services can be complex and interdependent
- Suitability, process and trust
  - Hype: Dynamically find and use services from across the internet
  - Reality: Mission critical use of services requires trusted and reliable services from known parties

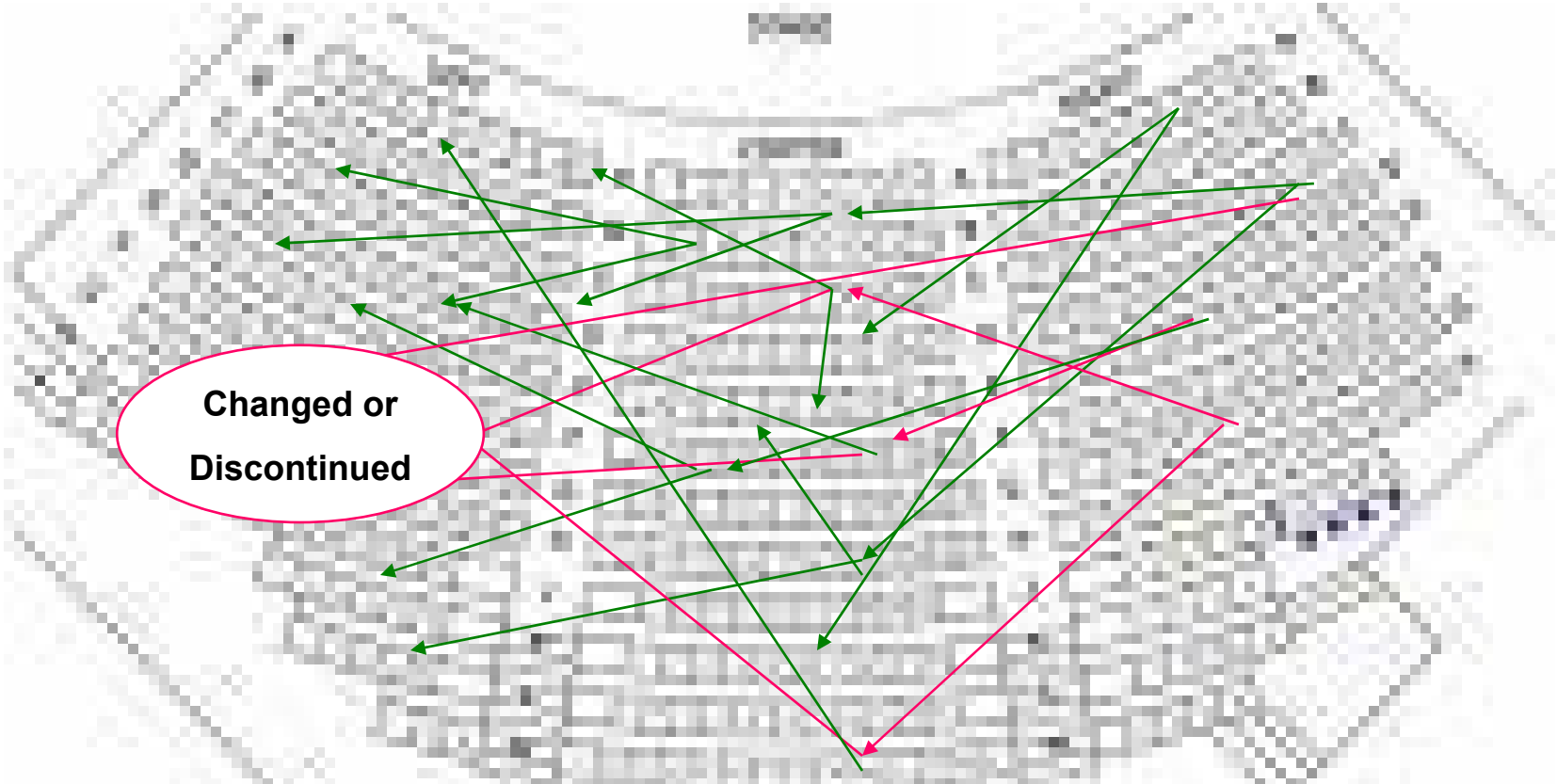
Spaghetti Enterprise Example



Services Use Services



Anti-Agile Service Dependencies

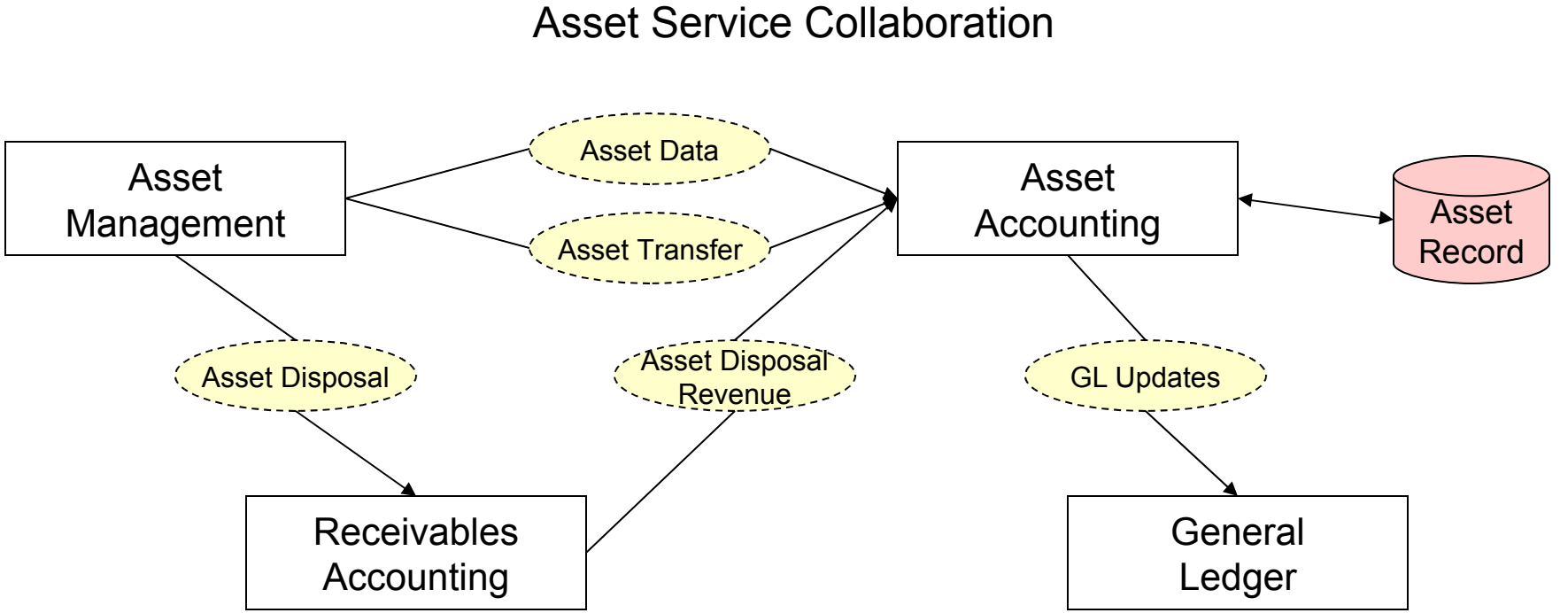


Core problem – services "bottom up" – not architected or standard

SOA Simplification

- Services are limited to a single interaction between provider and consumer
- There is just a “request message” and a result

Reality – Multiple services work together



The Asset service collaboration shows the service interactions supporting the management of asset records and the posting of general ledger as a result of asset transactions.

Services can be complex and long lived interactions

Bde - FSE

Bde- Artillery

Bn-FSE

FA Bn - FSE

Co-FIST

Call For Fire

Fire Ready

Rounds Complete

Fire Shot

Fire Splash

Mission Fire Rpt

End Of Mission

MLRS Battery

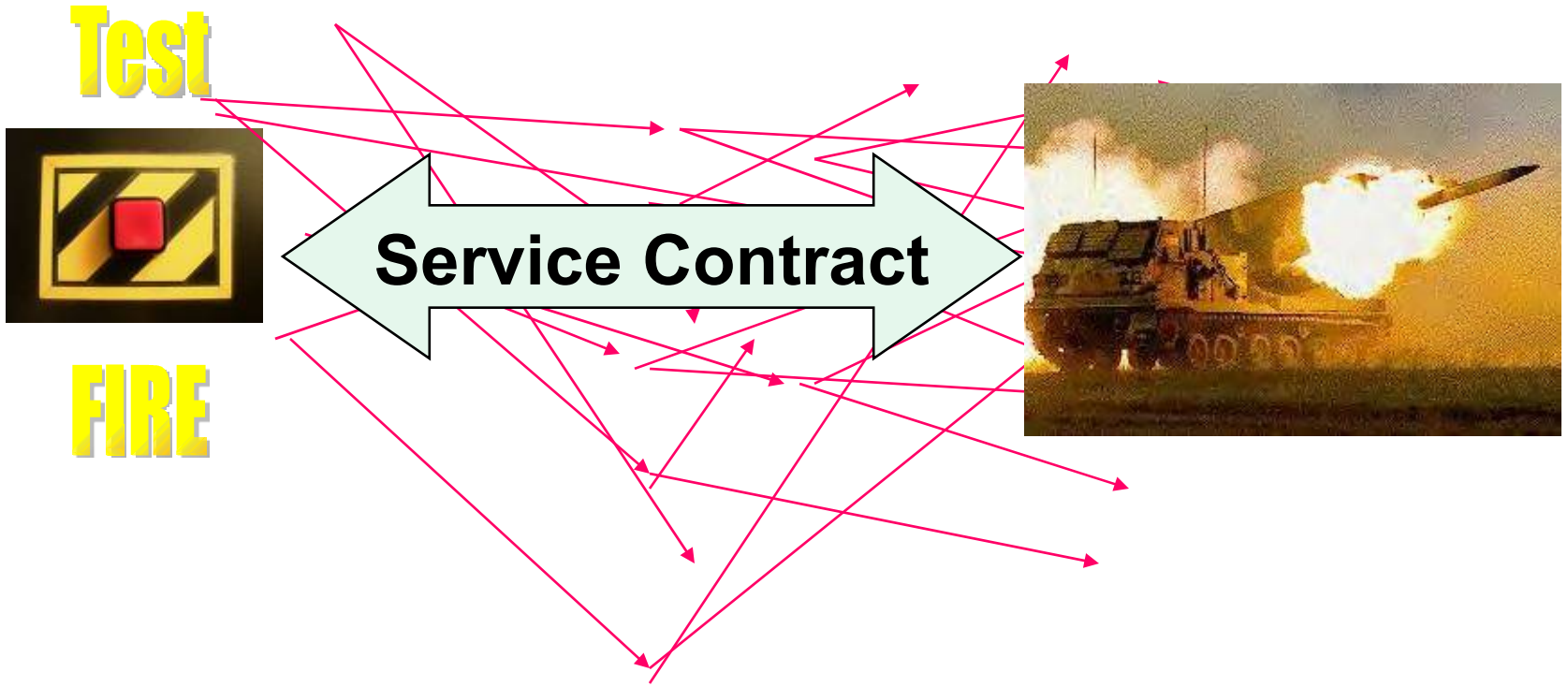
Forward Observer

MLRS

Call for fire is a “protocol” of action and information exchange between parties

Trust and Validation

Clear, Trusted and Validated Service Effects

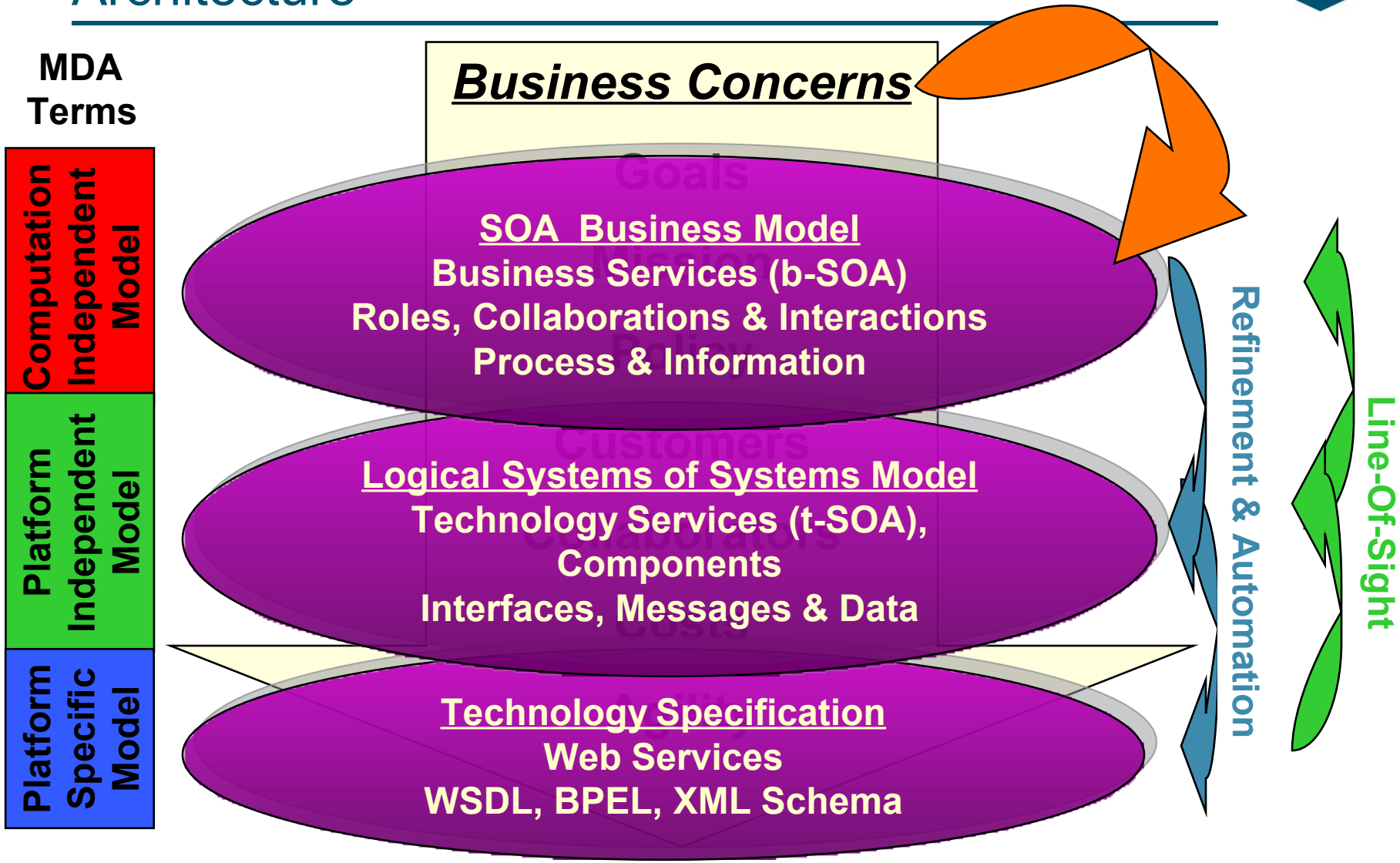


Under All Conditions

Message – Don't forget the "A" in SOA!

- A Service Oriented Architecture Should:
  - Treat the enterprise as "service oriented" at the business level - people and organizations provide and use services
  - Define technology services to augment and enable business services
  - Define "service contracts" so all parties know what to expect
  - Abstract "enterprise services" from solution specific capabilities
  - Provide for reuse and longevity
  - Define how services collaborate to provide business value
  - Separate service contracts from implementing technologies
  - Provide an integrated view of processes, collaborations, information and services – without coupling these together

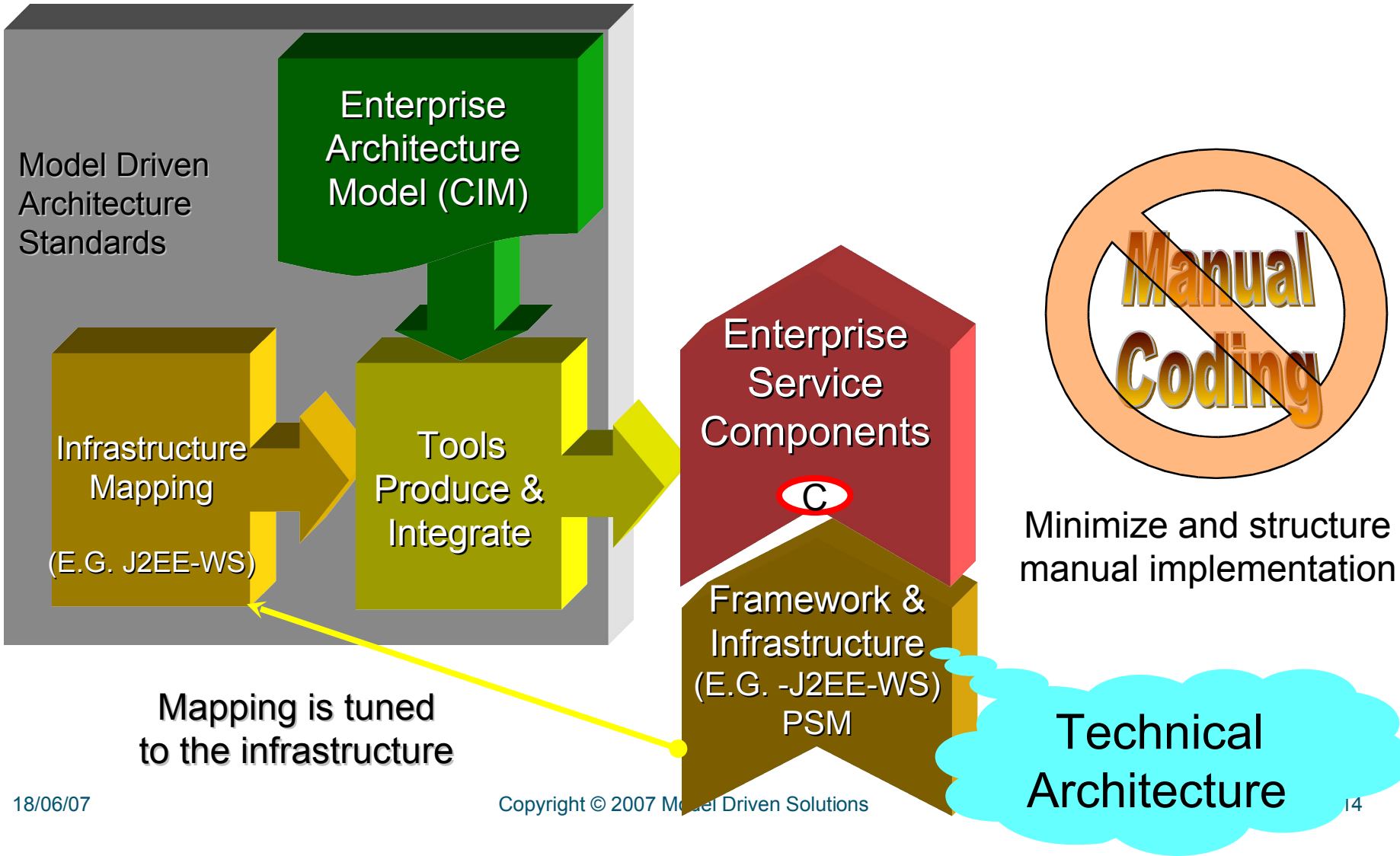
Business Focus Using Model Driven Services Architecture



Core of services architecture

- **Services contract**
  - What is the service provided?
  - Under what terms and guarantees?
  - What are the interactions – information and assets exchanged?
  - What is the data?
  - How is the services choreographed?
- **Service Collaboration**
  - Why do parties work together – what is the business goal?
  - What roles do they play in this collaboration?
  - What services does each party provide and use?
- **Process**
  - Externally, what process or processes does the collaboration serve?
  - Internally, what activities take place to enact a service?
  - What resources are consumed or produced?
- **Information**
  - What is the core information (ontology) of the domain
  - What information is exchanged to enact services
  - What information is retained and shared

Automate from Architecture model to technology



Model Driven Solutions

- Business Enablement
  - Business Transformation
  - Enterprise Agility
  - Enterprise Integration
  - Service Implementation
- Architecture
  - Enterprise Architecture
  - Business Architecture
  - Service Oriented Architecture
  - Model Driven Architecture
  - Business Process Architecture
- Open Source
  - www,ModelDriven.org – Open community for MDA, SOA and the Semantic web
- Opportunity to solution – architected, fast, strategic

www.ModelDriven.com

Backup Example

Example Call for Fire - MLRS

Bde - FSE

Bde- Artillery

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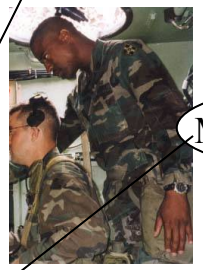
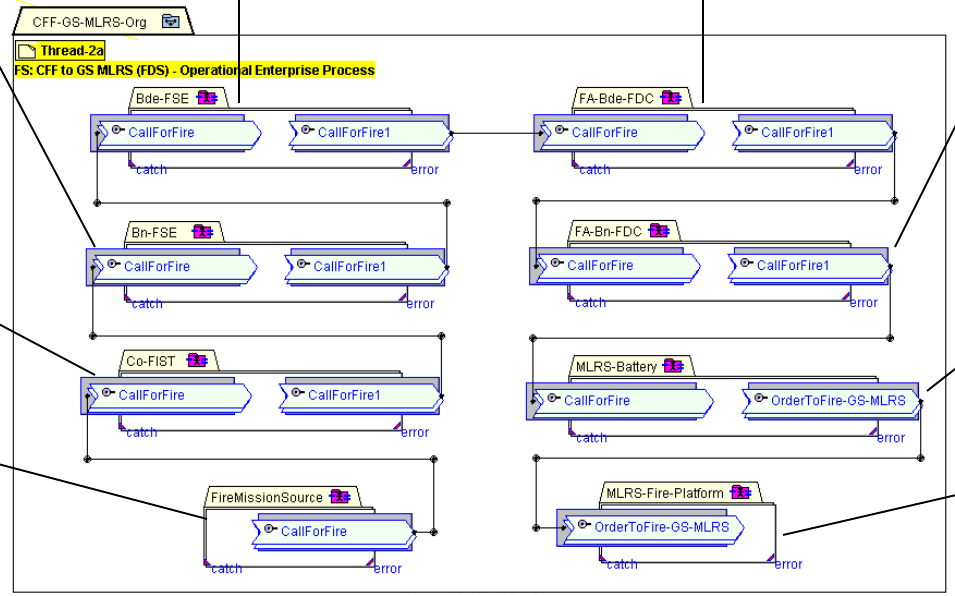


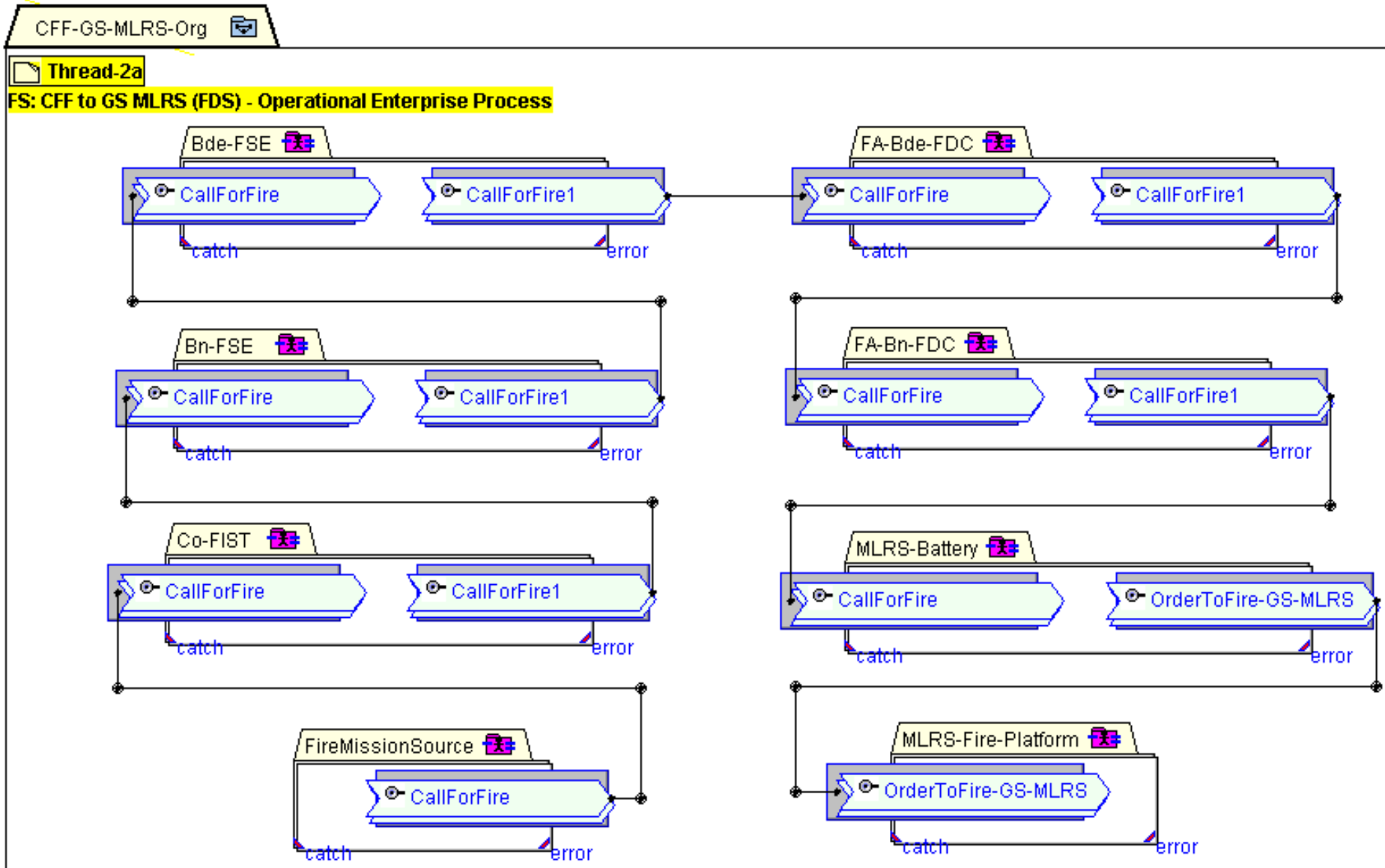
MLRS Battery



Forward Observer

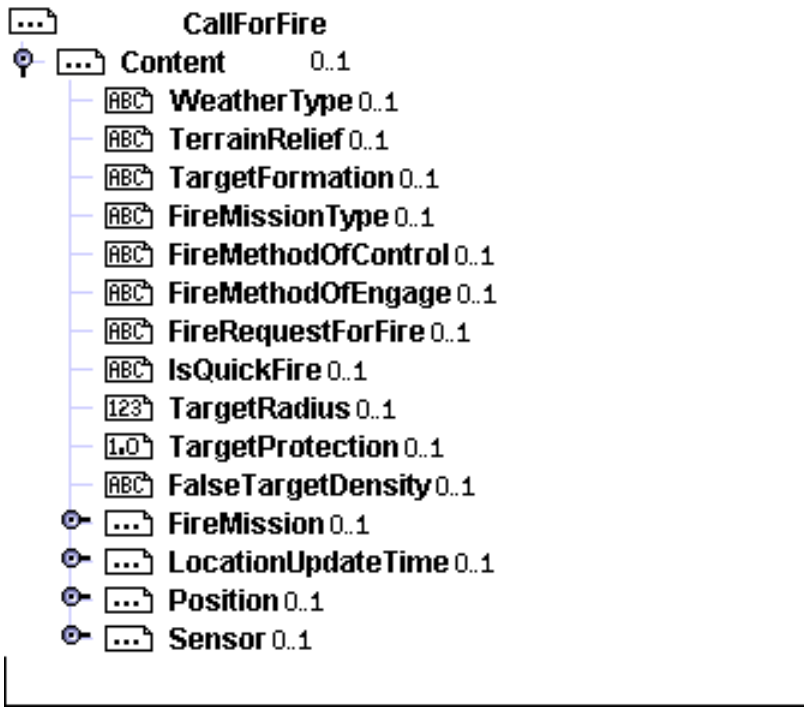
MLRS

Model Of CFF Thread



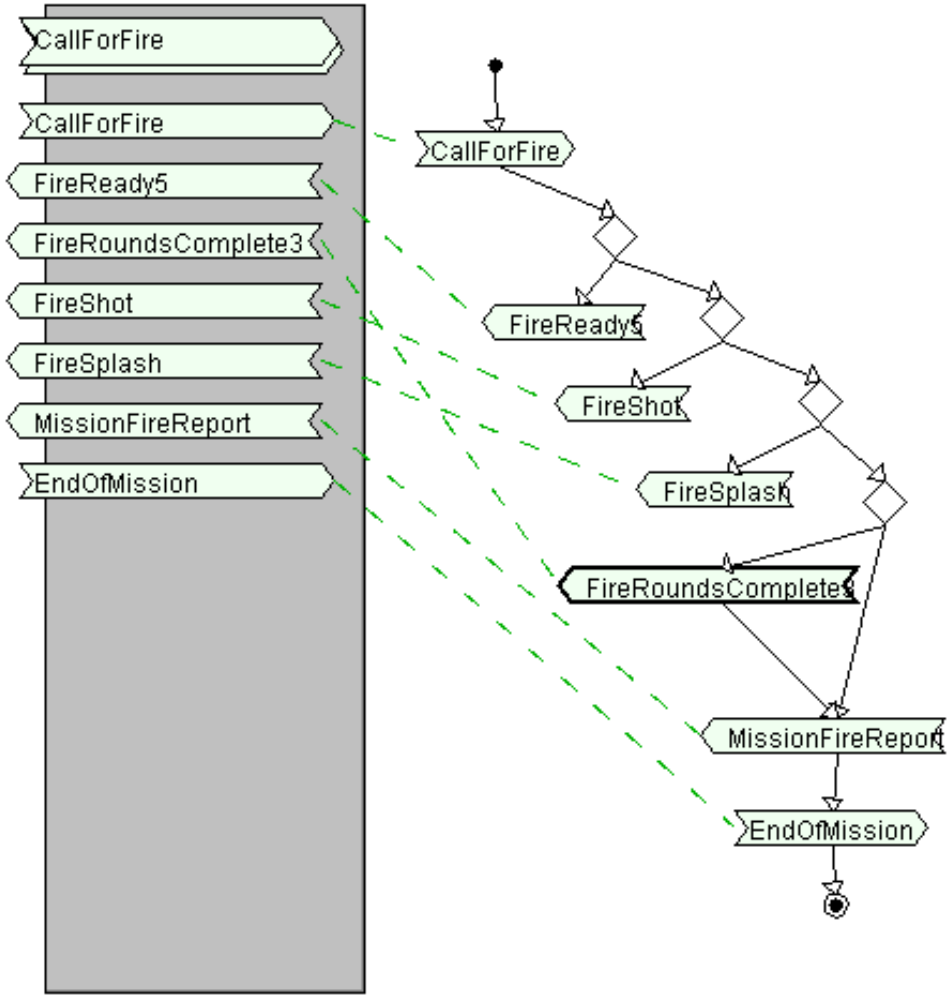
Base:CFF-GS-MLRS-Org

Model Information Flows



* Not technology details!

Choreography – Understanding When



Generated Web Services Definition

```
<wsdl:portType name="CustomerOrderEstablishment.CustomerOrderEstablishment">
   <wsdl:operation name="CustomerOrderEstablishment">
     <wsdl:input message="tns:CustomerOrderEstablishmentPanopticInheritanceCluster"
                 name="CustomerOrderEstablishment">
     </wsdl:input>
   </wsdl:operation>
 </wsdl:portType>
```

The primary port type has operations corresponding to the request flows in the protocol.

```
<wsdl:portType name="CustomerOrderEstablishment.CustomerOrderEstablishmentCallback">
  <wsdl:operation name="CustomerOrderEstablished">
    <wsdl:input message="tns:CustomerOrderEstablishedPanopticInheritanceCluster"
                name="CustomerOrderEstablished">
    </wsdl:input>
  </wsdl:operation>
  <wsdl:operation name="CustomerOrderEstablishmentRejected">
    <wsdl:input message="tns:CustomerOrderEstablishmentRejectedInheritance"
                name="CustomerOrderEstablishmentRejected">
    </wsdl:input>
  </wsdl:operation>
 </wsdl:portType>
```

The callback port type has operations corresponding to the response flows in the protocol.

Example Transaction Message XML Document

```
<CustomerOrderEstablishment>
     <customerOrderEstablishment>
          <newOrder>
               <customerOrder>
                    <customerOrderID> … </customerOrderID>
                    <customerOrderAmount> … </customerOrderAmount>
                    <orderingCustomer>
                         <customer>
                              <customerID> … </customerID>
                         </customer>
                         <party>
                              <name> … </name>
                         </party>
                    </orderingCustomer>
                    <controllingSalesInstrument>
                         <salesInstrumentID> … </salesInstrumentID>
                    </controllingSalesInstrument>
                    …
                    <lineItems>
                         …
                    </lineItems>
               </customerOrder>
          </newOrder>
     </customerOrderEstablishment>
     <businessDomainTransaction>
          <transactionID> … </transactionID>
     </businessDomainTransaction>
</CustomerOrderEstablishment>
```