IV&V Program

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Architecture of the AMF

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Origins

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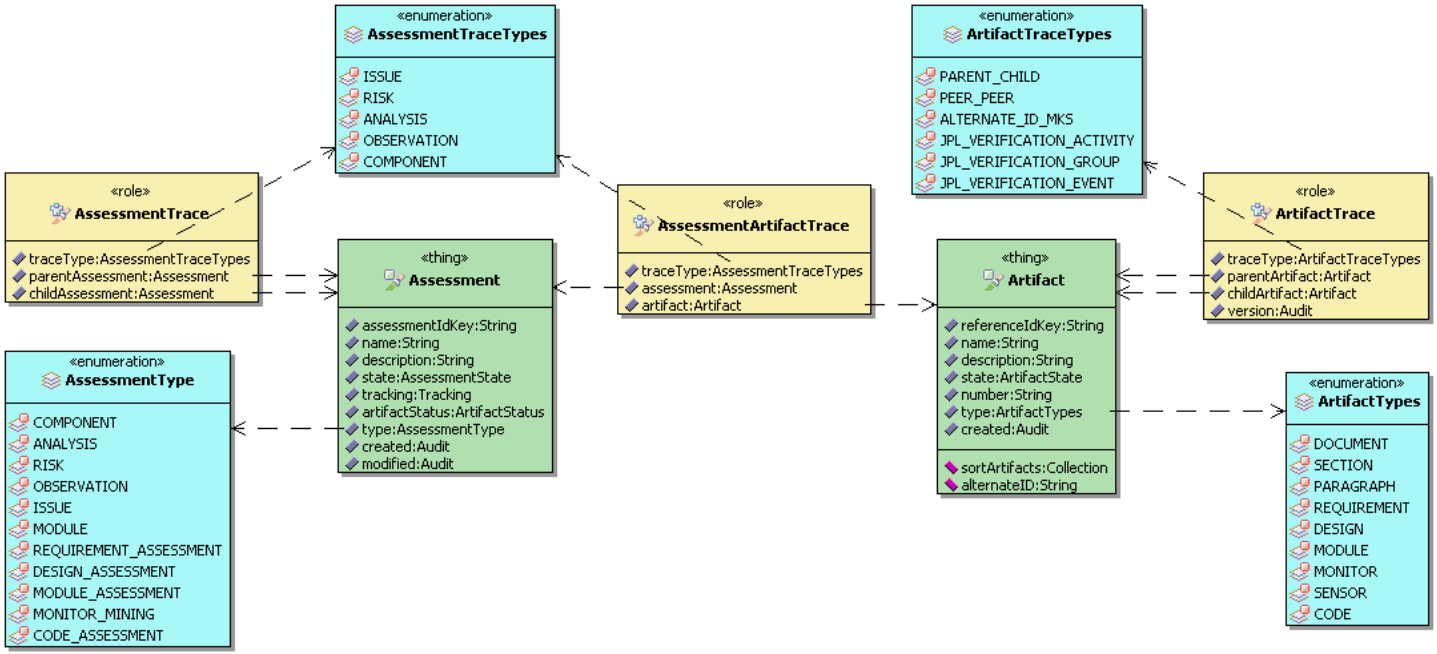
- Analyst Workbench for SMAP
- MSL Assessment Tool
- Artifact Mapping Tool
- Encourages creation and reuse of analysis support utilities across technologies
- Leverages current IV&V technology investments



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The Purpose of Architecture

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- "Software architecture serves as the blueprint for both the system and the project developing it, defining the work assignments that must be carried out by design and implementation teams. The architecture is the primary carrier of system qualities such as performance, modifiability, and security, none of which can be achieved without a unifying architectural vision. Architecture is an artifact for early analysis to make sure that a design approach will yield an acceptable system."
- *Software Engineering Institute (2013)*
- *Carnegie Mellon University*
- *http://www.sei.cmu.edu/architecture/*

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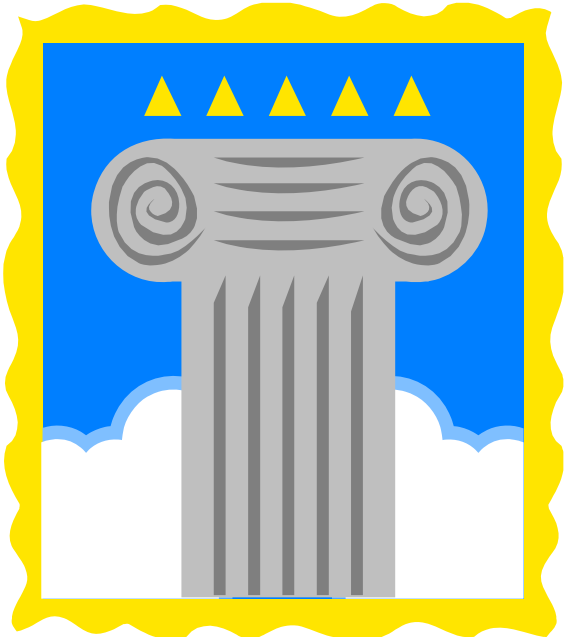
Principles

- Open
  - Easy to understand
  - Technology neutral
- Industry Standards
  - Design patterns
  - N-Tier
  - Object-Oriented
- Stable
- Extensible



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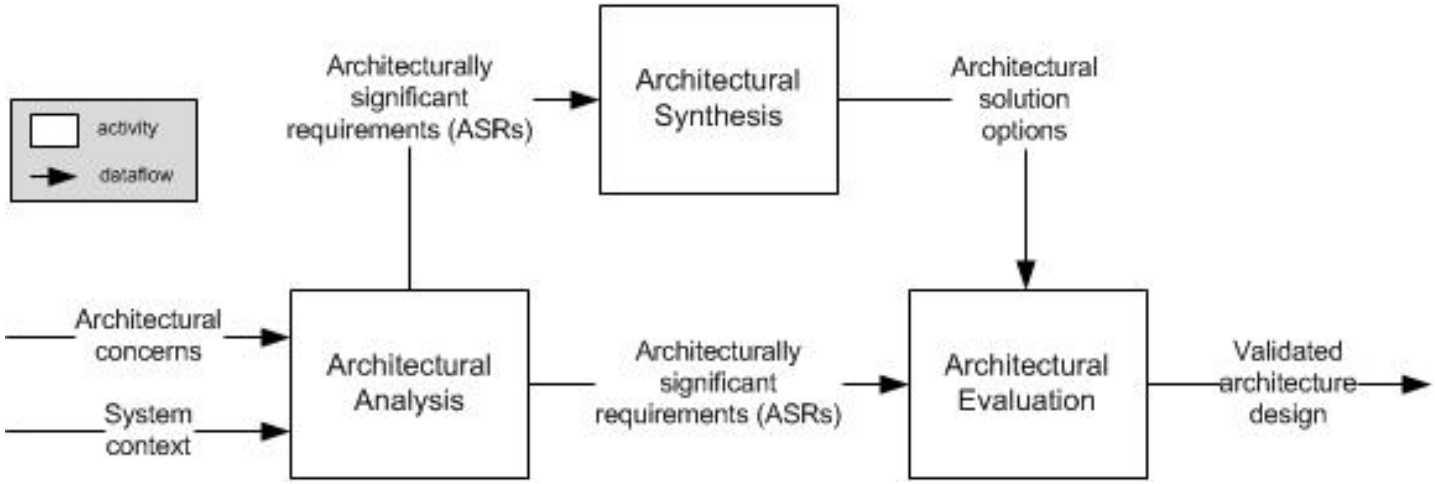
Architecture Activities



From: Wikimedia Commons
http://en.wikipedia.org/wiki/File:SoftwareArchitectureActivities.jpg

For AMF the System Contexts are:

- IVV 09-1
- Catalog of Methods
- IV&V Practices
  - The AMF architecture team are practicing IV&V analysts

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Methodology

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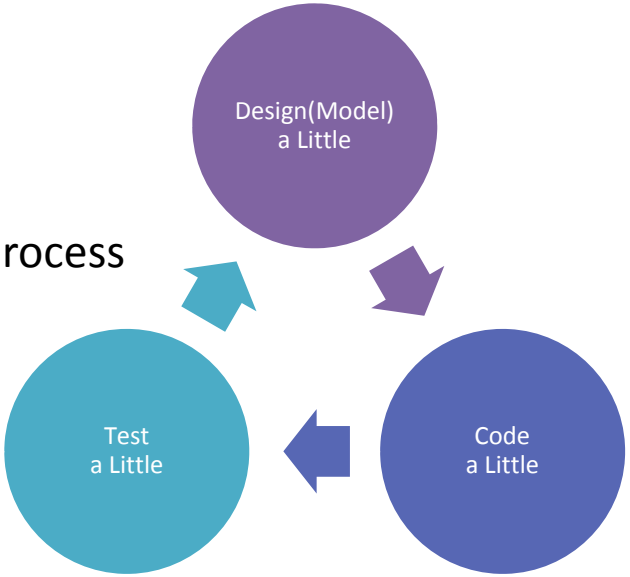
Analysis: Distill the domain to its essential concept –
"At IV&V we take **Actions** to make **Assessments** about **Artifacts**"

Collections of assessments about artifacts, linked together, make up the evidence we use to justify conclusions.

Synthesis: Use an iterative process



Evolution: Gather the Building Blocks -

- Artifacts
- Assessments
- Actions
- Traces

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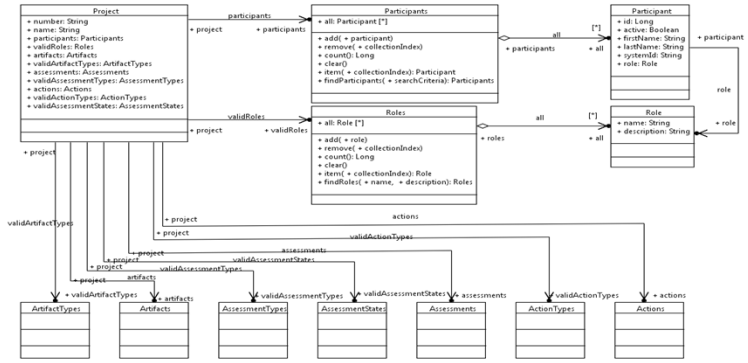
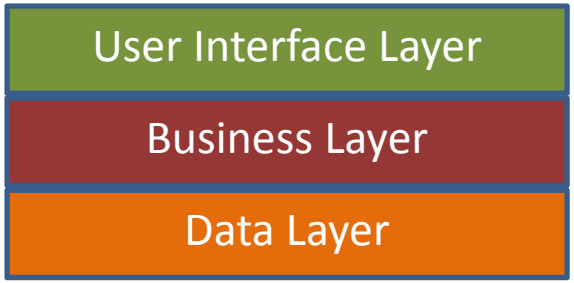
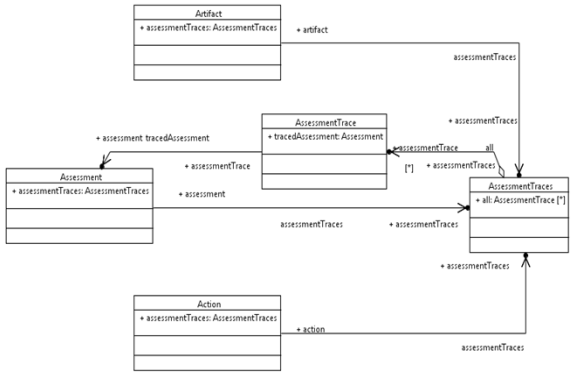
Loosely Coupled







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All of the concepts of the Framework are geared to promote modularity –

- The tiers are designed to separate the presentation, control, and storage of the data
- Patterns are used to maintain consistency throughout the system
- Objects are designed to stand alone so they can be used independently (Though their real power comes when they are combined)

This modular approach means you only have to use as much of the Framework as you need to get your job done.

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Cross Platform

- Implement in any object oriented language
- XML makes inter-program transfers simple

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<xsd:schema xmlns:xsd="http://www.w3.org/2001/XMLSchema">

        <xsd:annotation>
                <xsd:documentation xml:lang="en">
                        amf.xsd
                        Schema for the IVV Analysis Management Framework
                        Generated: 07/03/2013
                </xsd:documentation>
        </xsd:annotation>


        <xsd:element name="project" type="amfProject"/>
        <xsd:element name="participants" type="amfParticipants"/>
        <xsd:element name="artifacts" type="amfArtifacts"/>
        <xsd:element name="assessments" type="amfAssessments"/>
        <xsd:element name="actions" type="amfActions"/>
```

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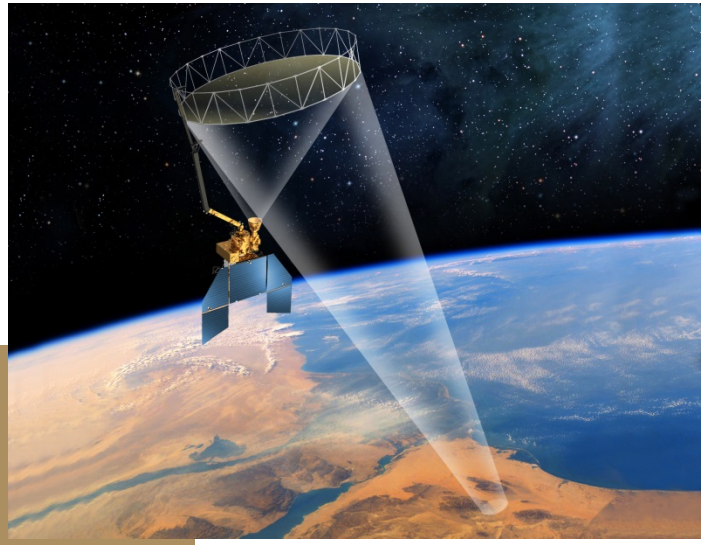
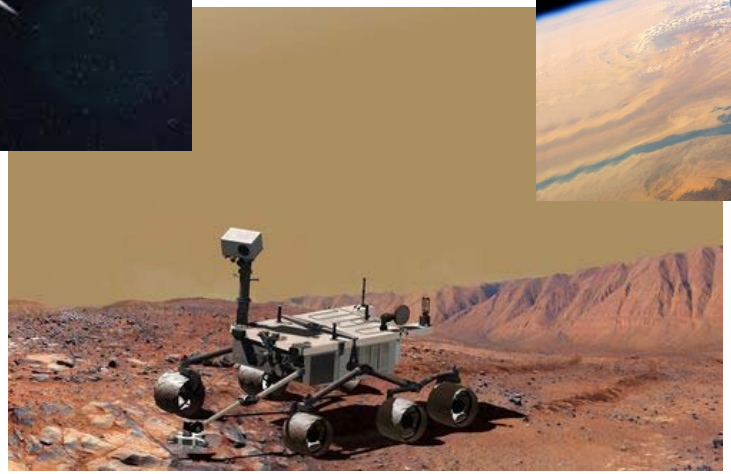
Stable

By focusing on what is essential to the IV&V endeavor the framework can be used across projects and can even help organize legacy data





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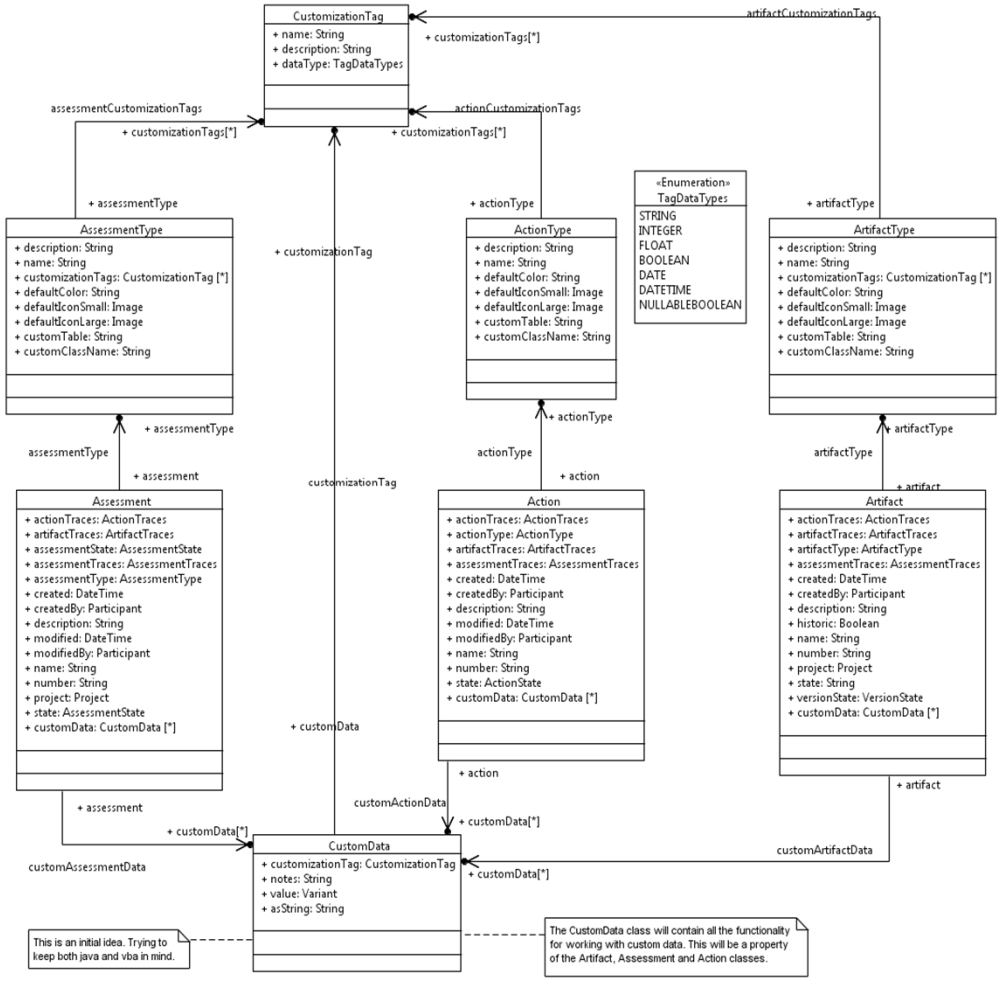
Extensible

The AMF extension strategy makes it possible to capture and incorporate specialized records for any assessment activity



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Questions?

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