

# MAGNETAR MULTIVERSE WORLDS IN WORLDS

“The *higher* we soar the smaller we appear to those who cannot *fly*..”

Friedrich *Nietzsche*



## Magnetar Games Corporation

# Magnetar Multiverse Highlights

- **Standards** – based virtual alternate reality authoring and runtime web environment.
- **Astrophysics** – themed games and simulations using a scientific data grid.
- **Collaborative** – sandbox with planetary scale procedurally generated alien worlds.
- **Interoperability** – across Open Simulator, High Fidelity and Multiverse virtual worlds.

# Magnetar Multiverse Titles

- **Proof of Concept** - three titles promoting Magnetar Multiverse are being designed.
- **Magnetar Dawn** - first episode of virtual alternate reality game series on Ceres.
- **Magnetar Universe** – viewer and simulation authoring for our Universe.
- **Magnetar Worlds** - user created fantasy reality featuring Worlds in Worlds.

# Magnetar Multiverse

## Voyager

- ⦿ **About** - Integrated Web3D development and runtime interfaces for Magnetar Multiverse .
- ⦿ **Multiverse** – Voyager generic viewer mode
  - **Reality** player for games and simulations.
  - **Sandbox** collaborative user content creator.
- ⦿ **Matrix** - Voyager repository facility mode.
  - **Asset** library for blueprints and prototypes
  - **Guild** directory of content creation teams.

# Magnetar Multiverse Plan

- **Alpha** – Continuous integration with near term focus on Voyager design .
- **Title** – develop in parallel “Magnetar Dawn” as proof of concept for Voyager .
- **Integration** – of Virtual World, Virtual Globe and RTS Engine to support Dawn project
- **SURF** – Synthetic Universe Representation Framework introduced as part of Dawn project .
- **Links (Chrome)**
  - <http://magnetarnet.azurewebsites.net/>
  - <http://www.magnetar.net/> .

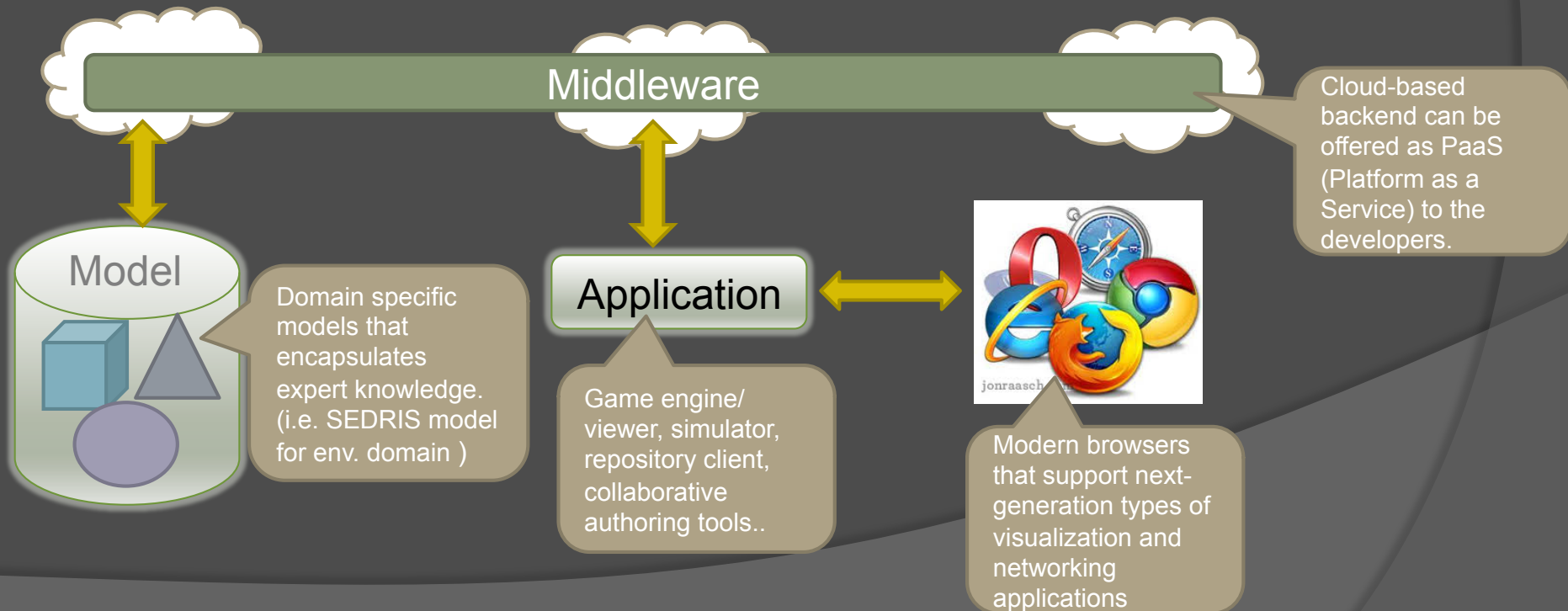
# ADOPTING SEDRIS IN MAGNETAR MULTIVERSE

# Magnetar Multiverse

- ◎ Publishing, development and execution platforms for web based MMOs (Massively Multiplayer Online)
  - NVE (Networked Virtual Environment)
    - OpenSim, High Fidelity, Cloud Party...
    - Astrophysics application.
      - IVOA compatible systems
  - MMORTS, MMORPG
    - Multiverse, Dark Reign.

# Magnetar Multiverse II

- ◉ Distributed Application Framework
- ◉ Enterprise Information Bus
- ◉ Middleware built in MDA ( Model Driven Arch.)





# Multiverse environment data

- ◎ Virtual world data
  - DEM, mesh, prim...
  - 2D/3D tile sets, procedural content/terrain...
- ◎ Data format
  - XML, JSON, BASE64, PNG...
- ◎ Data coding specification
  - EDICS style dictionary.

# Metadata modeling with SURF

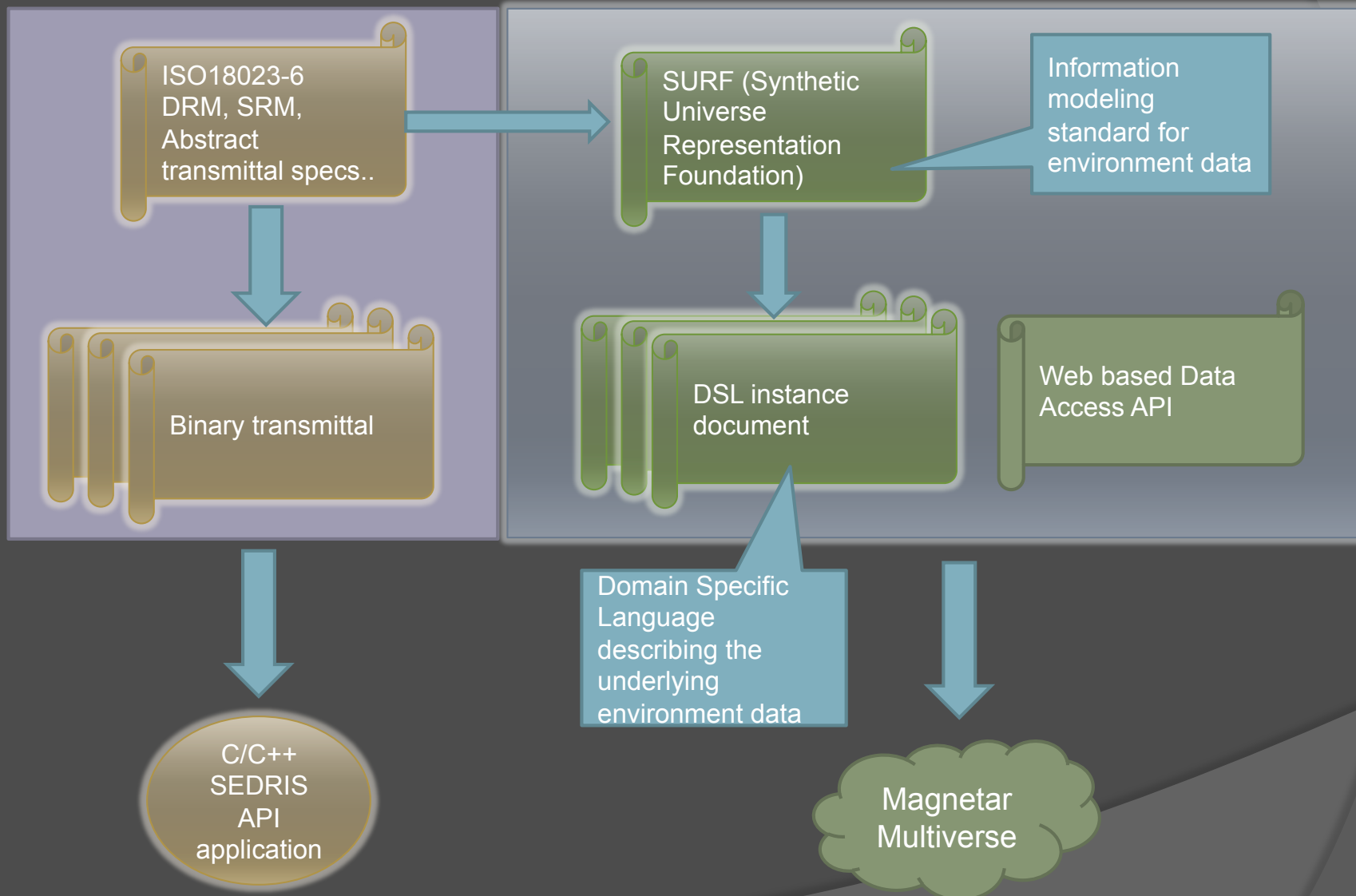
(Synthetic Universe Representation Foundation )

- Metadata modeling formalism for Magnetar Multiverse environment data.
- Capturing SEDRIS meta modeling semantics in ISO standard.
- Plain text for easy meta data exchange.
- Adopting MORPH/OMT for HLA sim

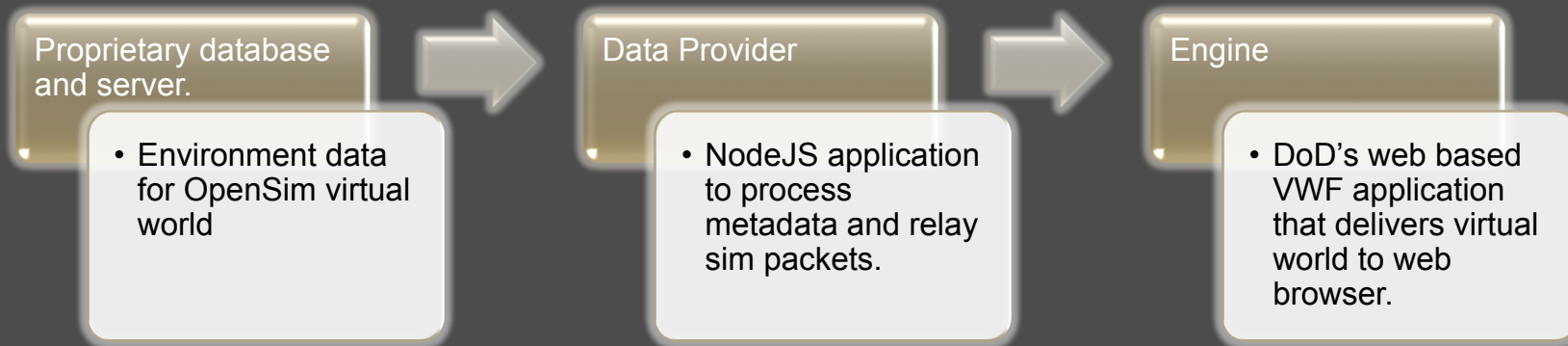
# SURF as Domain Specific Language for environment data.

- ⦿ Standard/template for creating DSL about environment data.
- ⦿ External DSL expressed in XML
- ⦿ SURF is also Inspired by
  - ⦿ XTCRS (Xml Transmittal Content Requirement Specification )
  - ⦿ SONY Collada ATF ( XSD DOM codegen)

# SURF and Magnetar Multiverse



# Example Magnetar Multiverse Application

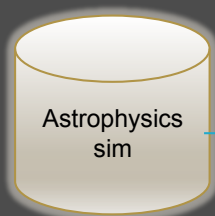




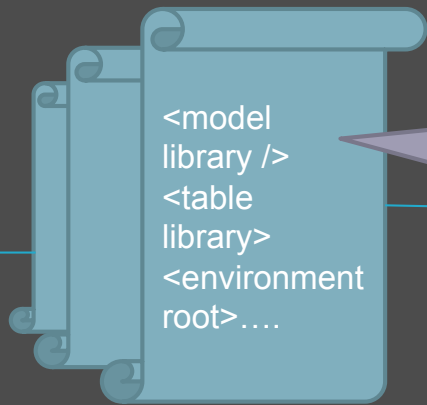
OpenSim



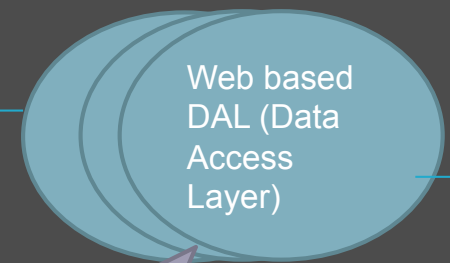
Dark Reign,  
Multiverse  
mo.com



Astrophysics  
sim



SURF documents.  
XTCRS like Markups  
to express SEDRIS  
metadata in plain text.



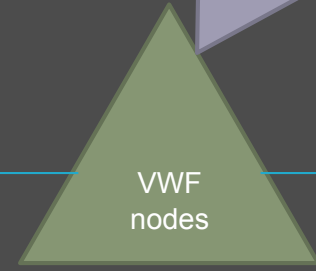
Web based  
DAL (Data  
Access  
Layer)

Web based interface  
provides data access via  
REST, Websockets,  
WebRTC...



Node  
mapper

Mapping component  
utilizes metadata and  
'access API' to  
produce optimized  
runtime data.



VWF  
nodes

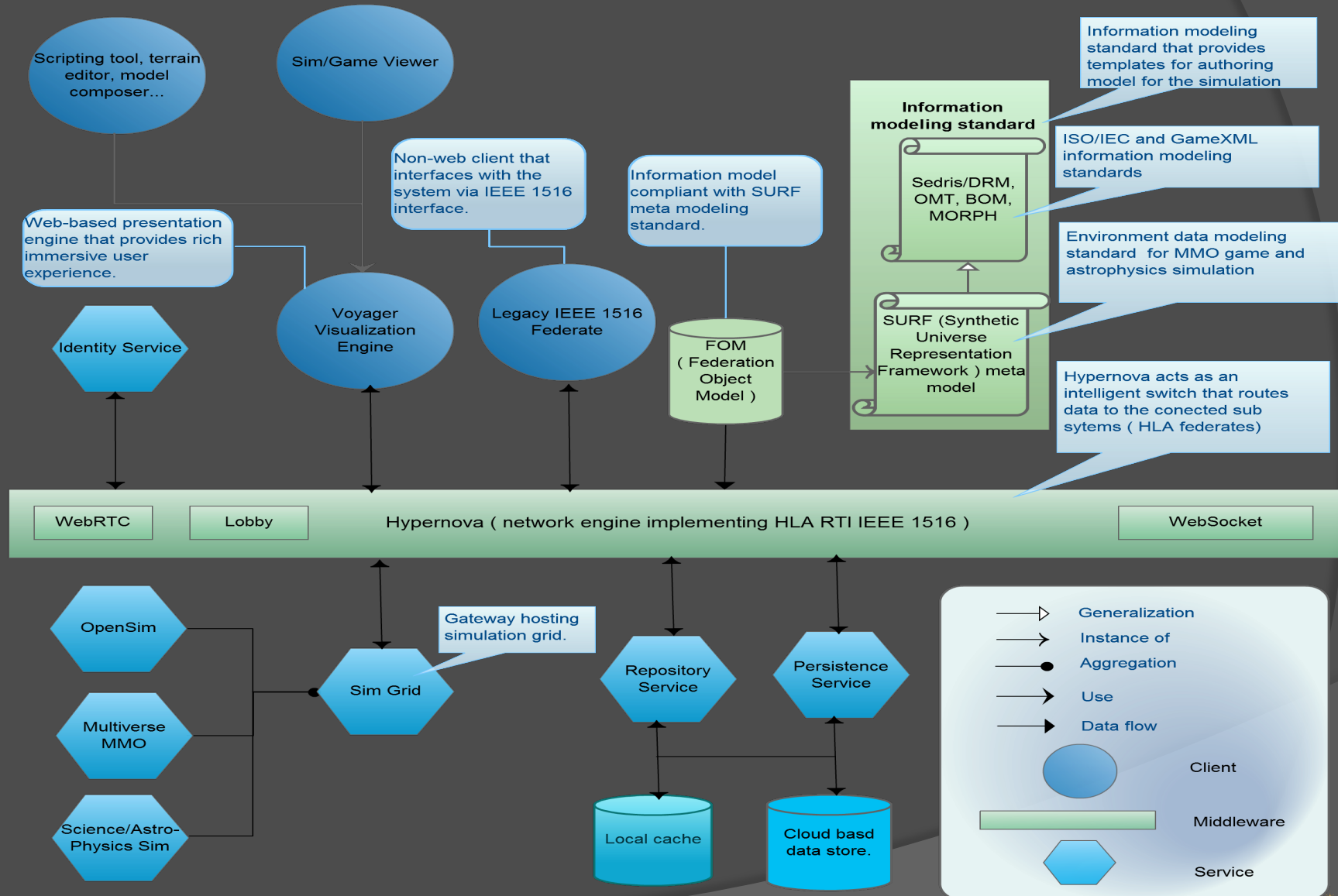
Virtual World Framework  
is supported by DoD and  
ADL.net. VWF  
implements an MVC style  
scene graph for WebGL  
application.



# Compare data access approaches

Data source	Dev tool	Application	Remarks
M&S, GIS applications..	C/C++ SDK, TCRS	Applications created to work with ISO transmitter.	FOCUS, SBS, TCRS rule checker, validator..
OpenSim, Dark Reign, MMO, Astrophysics sim. HLA/Chronos sim.	Declarative markups and REST API that implements SEDRIS	Cloud-based application, REST web client.	Magnetar Multiverse application suite ( game engine, auth. tools ..)

# Magnetar Multiverse System Topology





# References

- ◉ OpenSim <http://opensimulator.org>
- ◉ High fidelity <https://highfidelity.io/>
- ◉ MultiverseMMO <http://multiversemmo.com>
- ◉ IVOA <http://www.ivoa.net>
- ◉ Cloud Party <https://www.youtube.com/user/CloudPartyInc>
- ◉ Martin Fowler on DSL  
<http://www.martinfowler.com/bliki/DomainSpecificLanguage.html>
- ◉ MORPH <http://www.gamexml.org/MORPH/>
- ◉ XTCRS <http://www.sedris.org/presentation/12S-SIW-040.pdf>
- ◉ SONY ATF <https://github.com/SonyWWS/ATF/wiki>
- ◉ VWF <https://virtual.wf/>
- ◉ ADL Sandbox <https://vwf.adlnet.gov>