HLA draft (to be included in ccsc paper)

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High-Level Architecture(HLA) is an architecture that allows many distributed simulation systems to work together seamlessly.

There are five parts to a HLA system:

- Runtime Infrastructure(RTI) - Software that provides HLA services.

- Federate - A simulation system that connects to the RTI.

- Federation Object Model(FOM) - A description of data exchanges in a federation.

- Federation - All of the federates along with the RTI and the FOM they use.

- Federation Execution - An instance of the federation.

HLA uses a publish/subscribe methodology for information services. This means that a federate "publishes" certain data and "subscribes" to other data. To publish data a federate sends it to the RTI. To receive subscribed data a federate will receive a callback from the RTI anytime the subscribed data is updated.

Figure 1: MWSU Satellite publish/subscribe listing.

Pub	Sub	Object Class
		HLAobjectRoot.PhysicalEntity
P		HLAprivilegeToDeleteObject
P	S	entity_name
P		entity_type
P	S	parent_reference_frame
P	S	position
P		status
P		time
P		velocity
		HLAobjectRoot.Radio
	S	RX_required_signal_strength
	S	TX_power
	S	elevation
	S	radio_name
		HLAobjectRoot.ReferenceFrame
	S	name
	S	parent_name
	S	rotational_state
	S	time
	S	translational_state

Pub	Sub	Interaction Class
P		HLAinteractionRoot.Radio_message.RX_message
	S	HLAinteractionRoot.Radio_message.TX_message

The FOM contains descriptions of the Objects, Interactions, and Data Types that federates will use in a federation. Because of this all federates must agree on which FOMs to use.

Figure 2: FOMs used in SEE 2016.
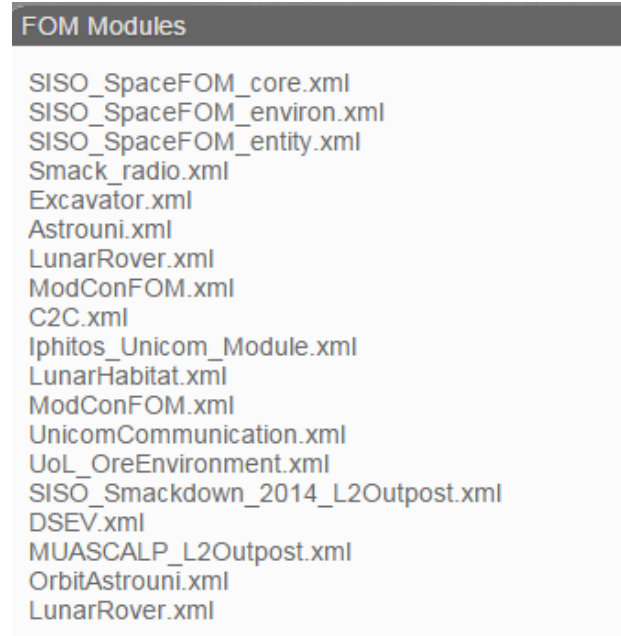
The recommended representation for a federation is call a "lollipop" diagram.

Figure 3: SEE 2016 participants lollipop diagram.