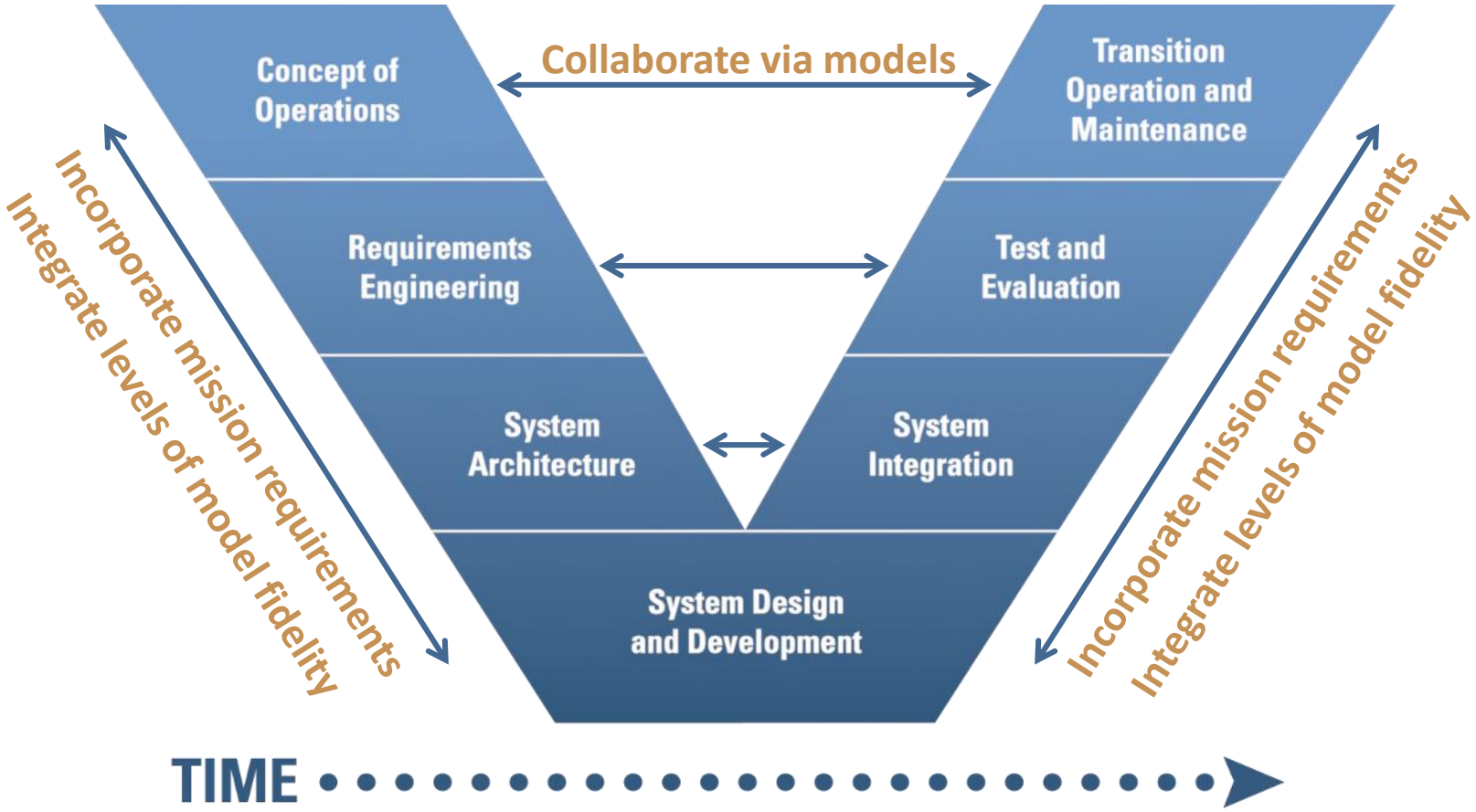
Aerospace Mission Design and Analysis Across the Engineering "V"

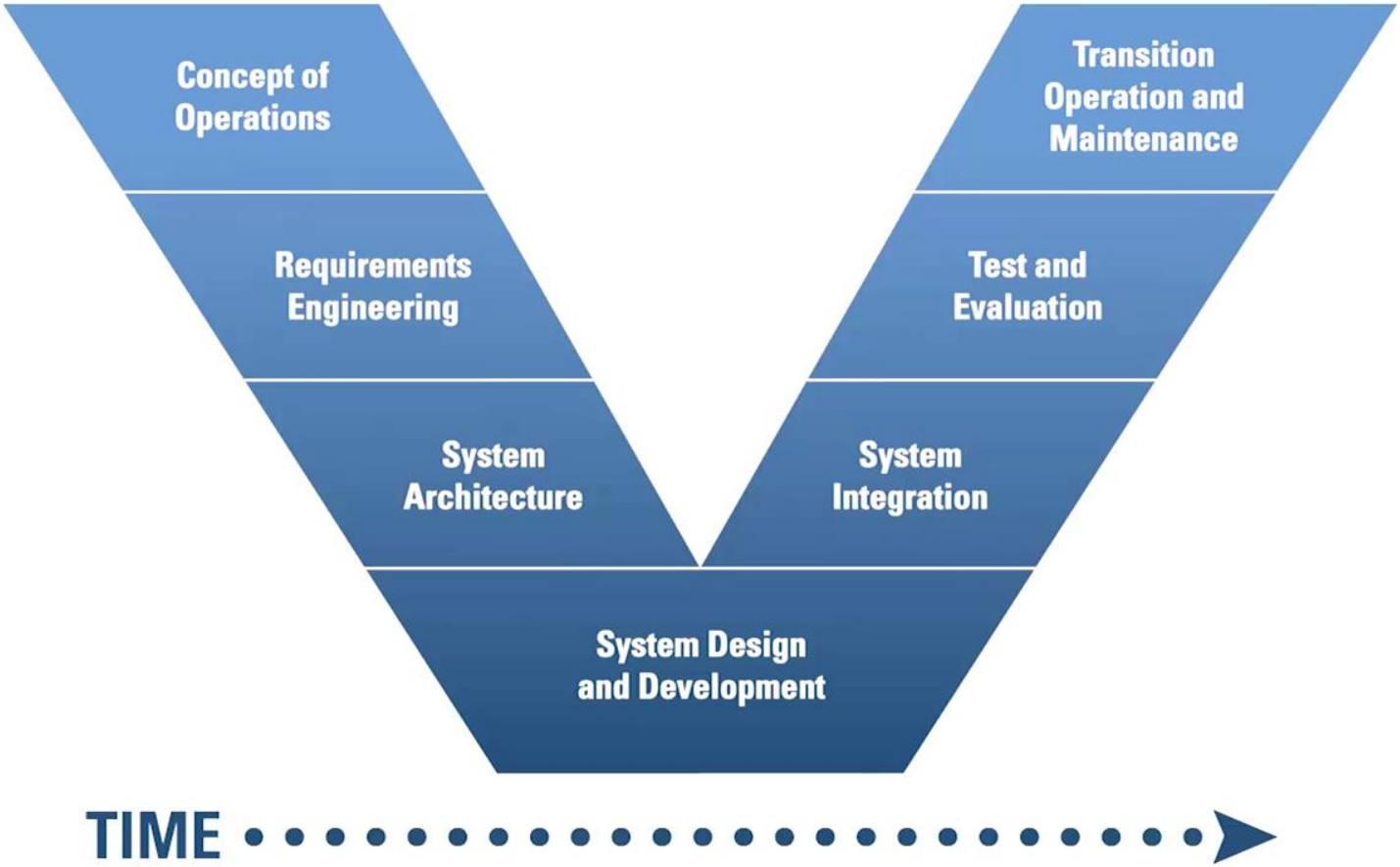
Kevin Flood

Analytical Graphics, Inc.

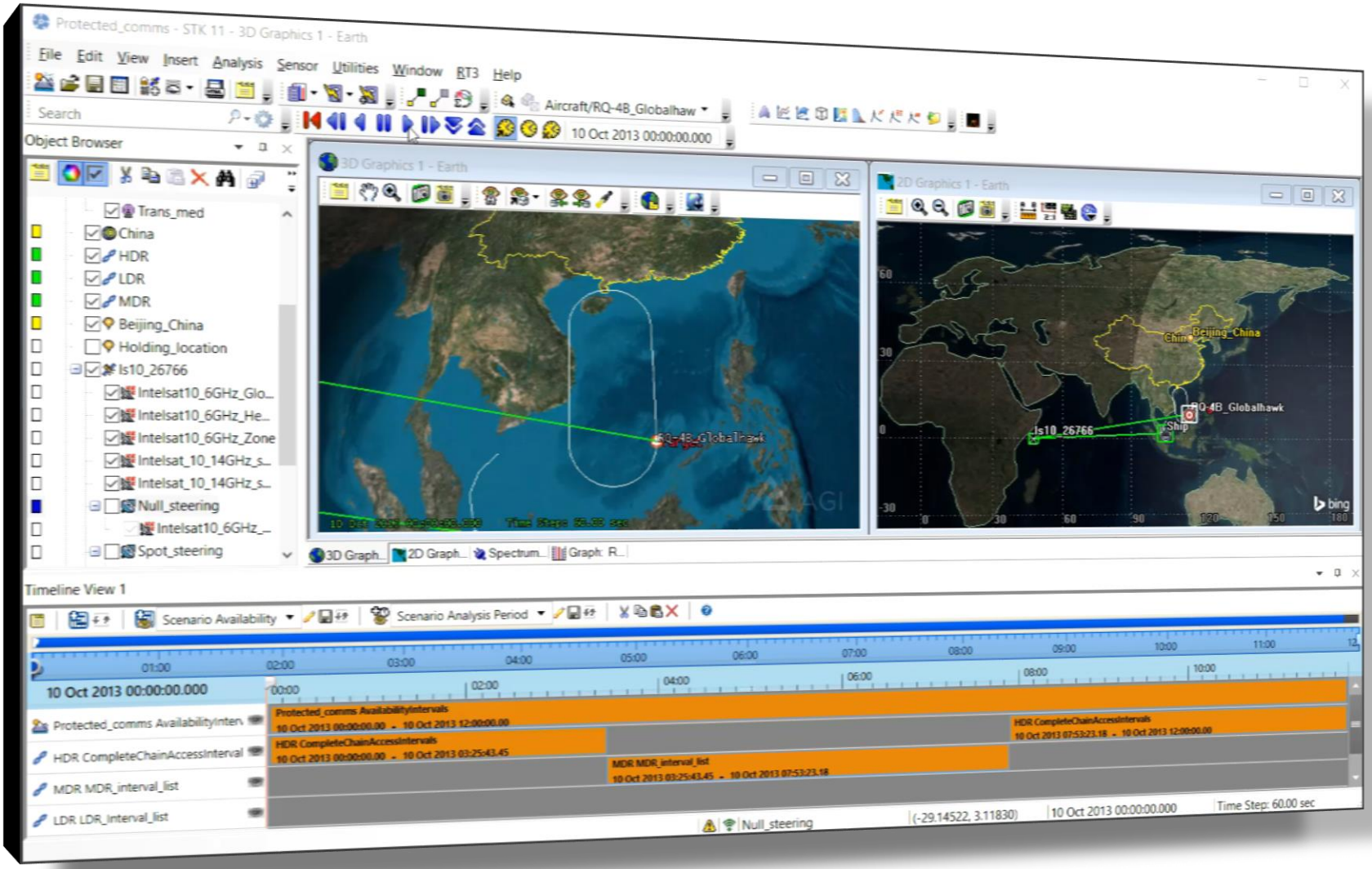
Common aerospace challenges

- More sophisticated missions
- More complex, faster acquisition cycles
- More demanding engineering processes

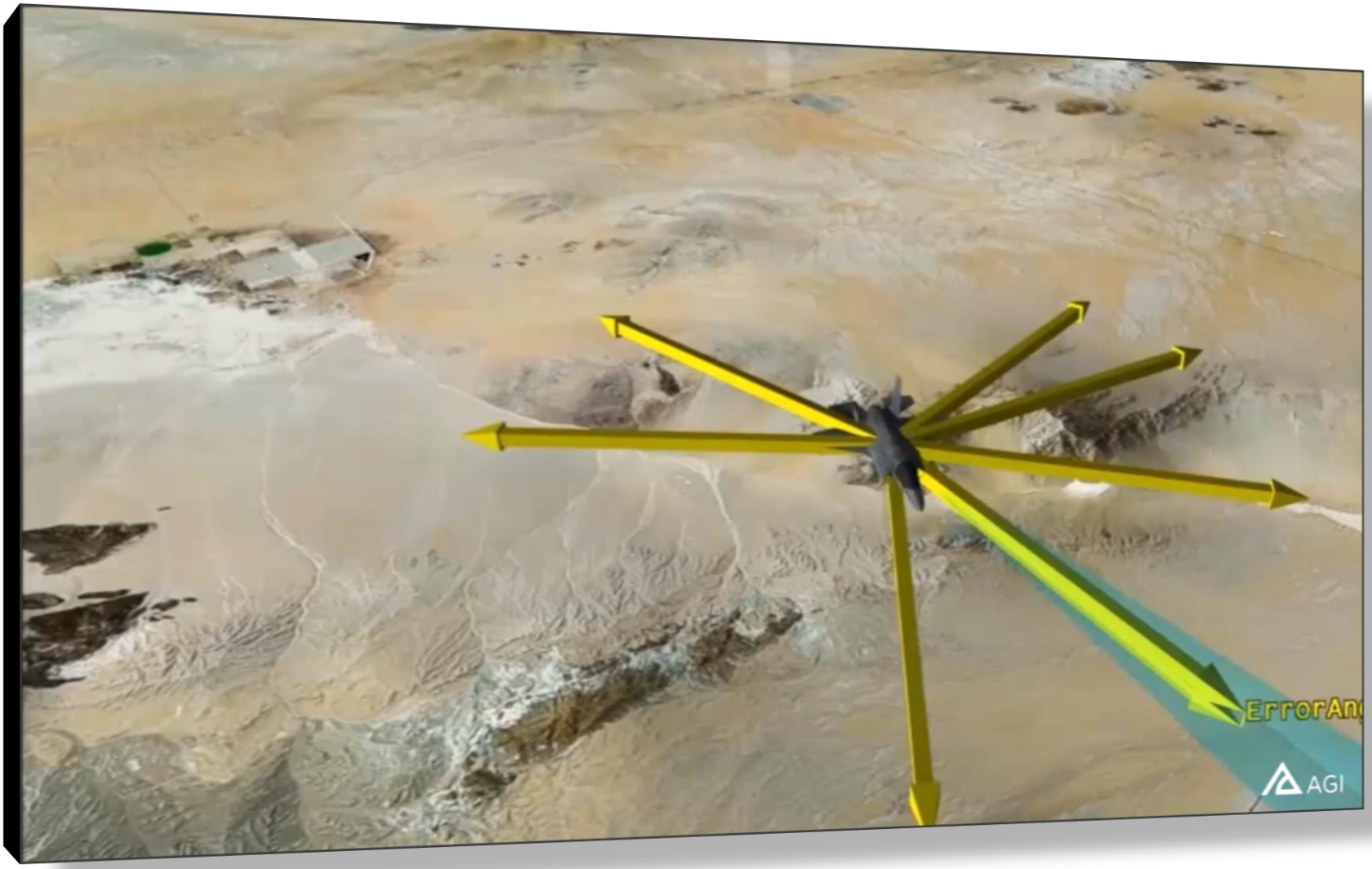




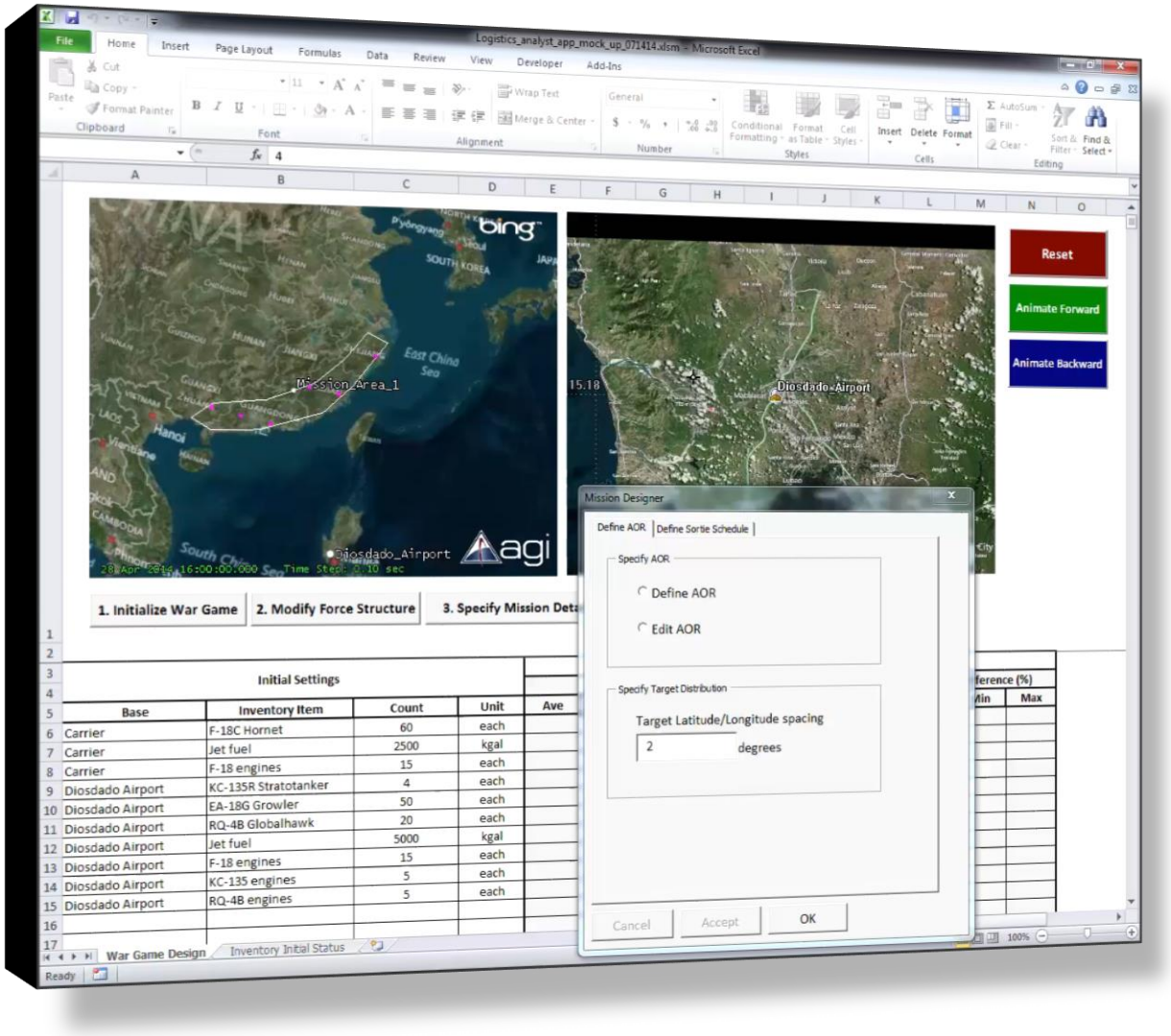
Concept development example: A2AD



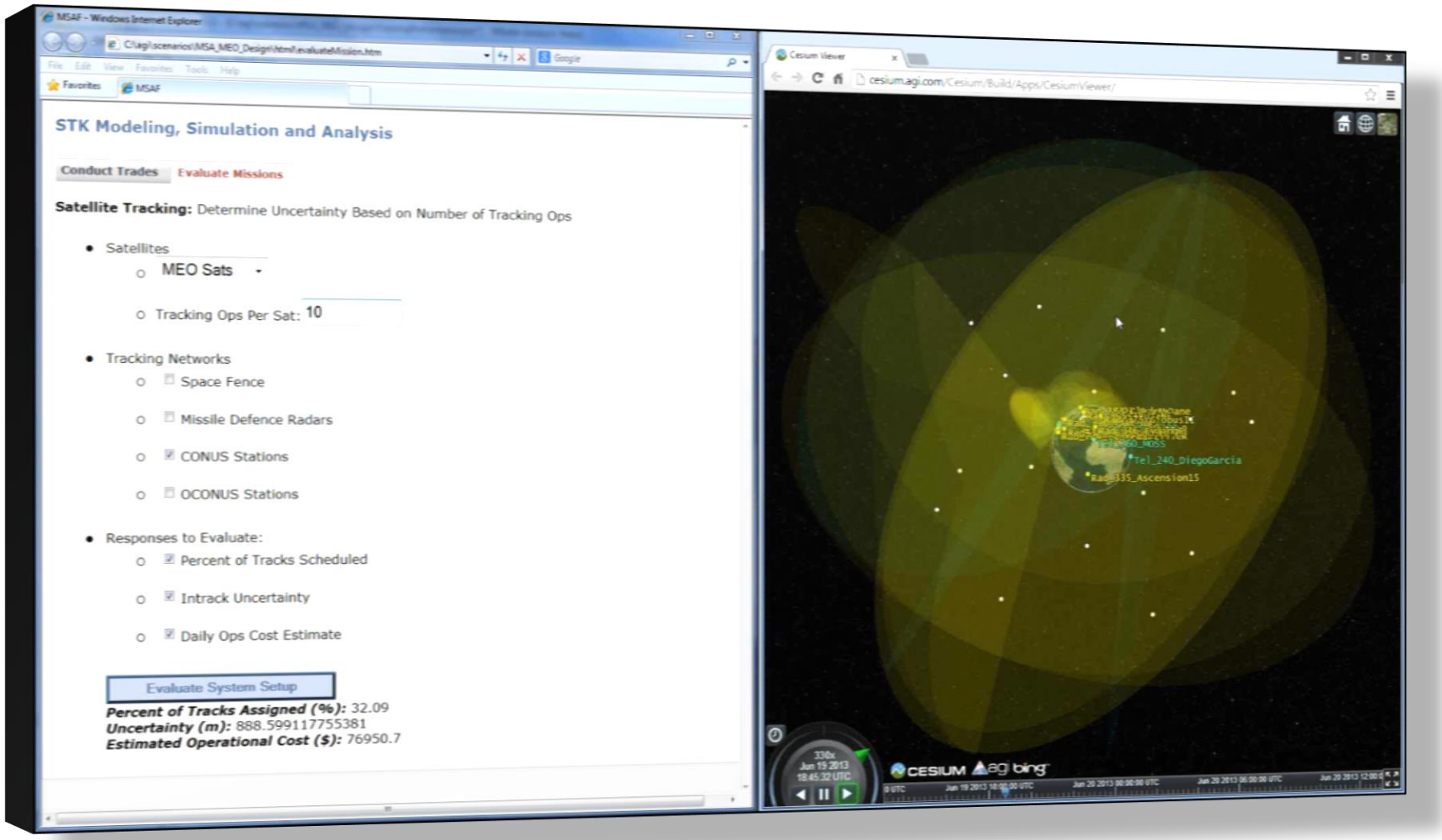
Test example: air system DT&E



Training example: logistics war game

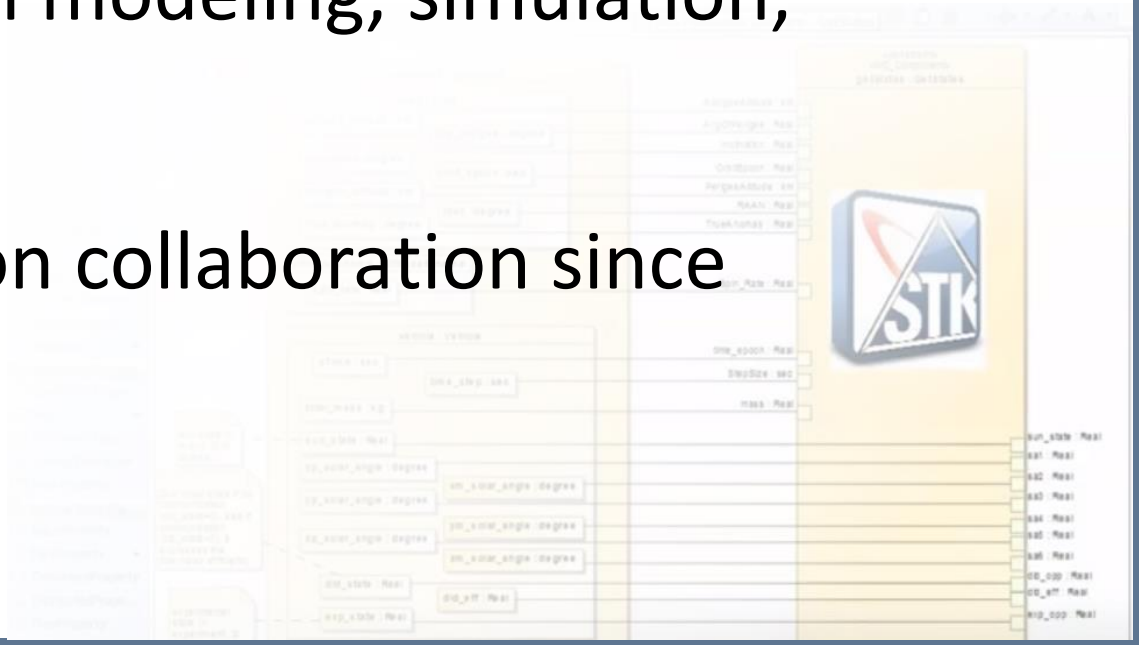


Operations example: task planning



AGI background

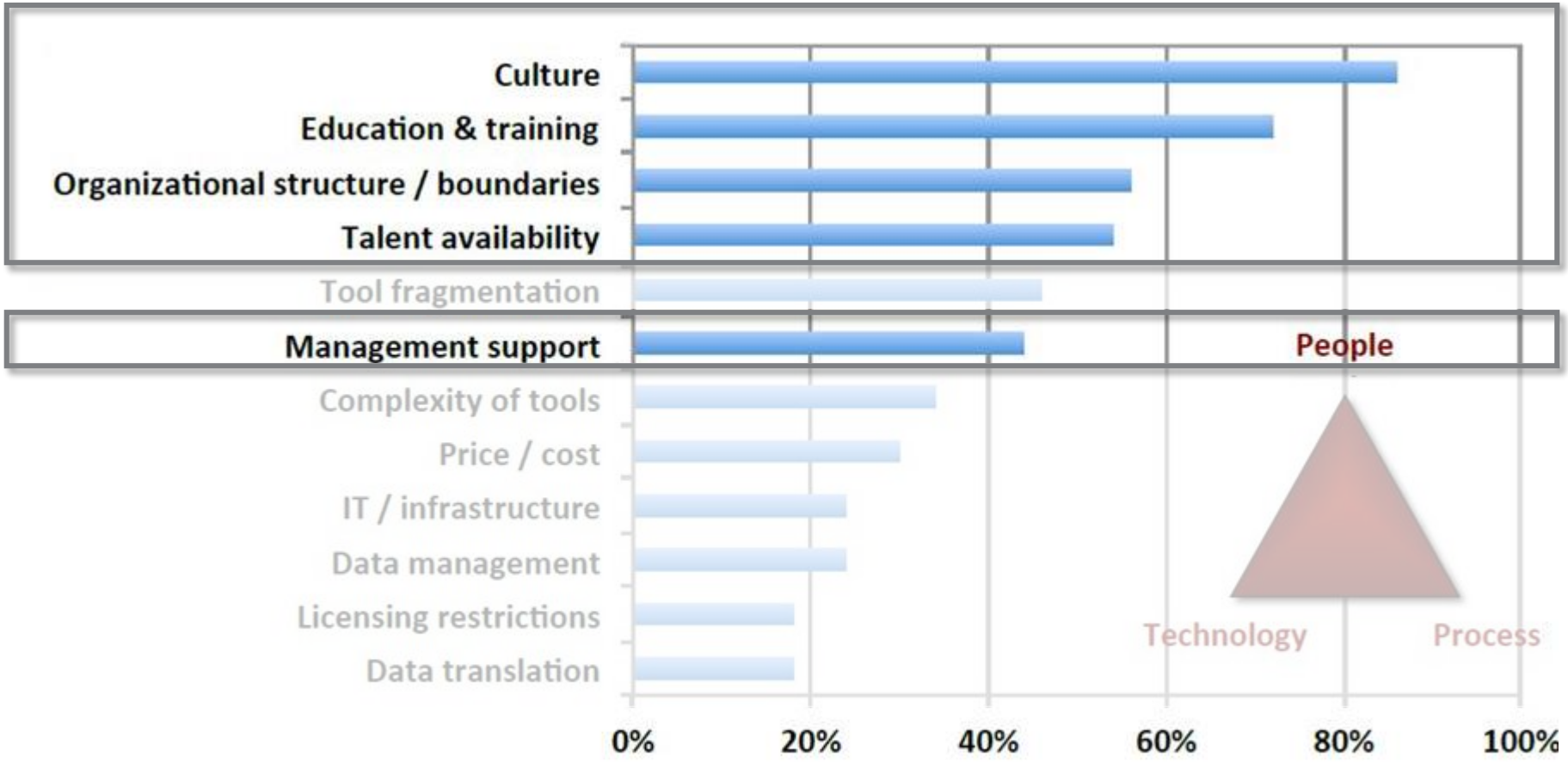
- Commercial software product company
- Founded 1989
- Aerospace mission modeling, simulation, and analysis
- Phoenix Integration collaboration since 2003



Lifecycle Enterprise Engineering Mandates

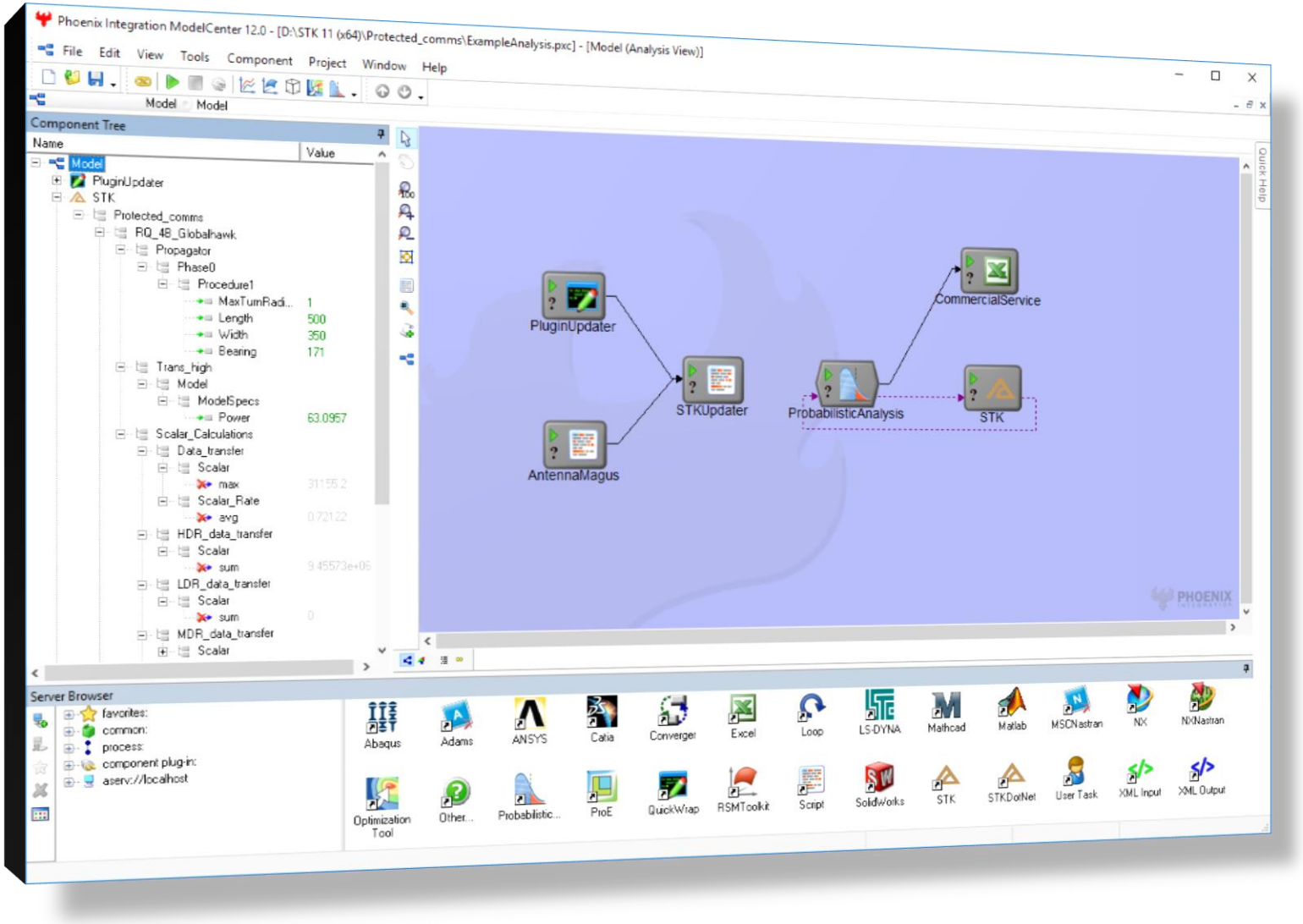
- **Lifecycle** – Integrate mission with engineering and connect models across entire lifecycle
- **Process Evolution** – Solve problems today; adapt to tomorrow's processes
- **Stakeholders** – Support all engineering disciplines, mission areas, and user personas
- **Fidelity Spectrum** – Account for graphical models through high-fidelity, physics-based models
- **Integration** – Avoid need for tool-to-tool, project-by-project integrations
- **Orchestration** – Execute simulations composed from models of models

Process Evolution



CIMdata

Concept development example: A2AD



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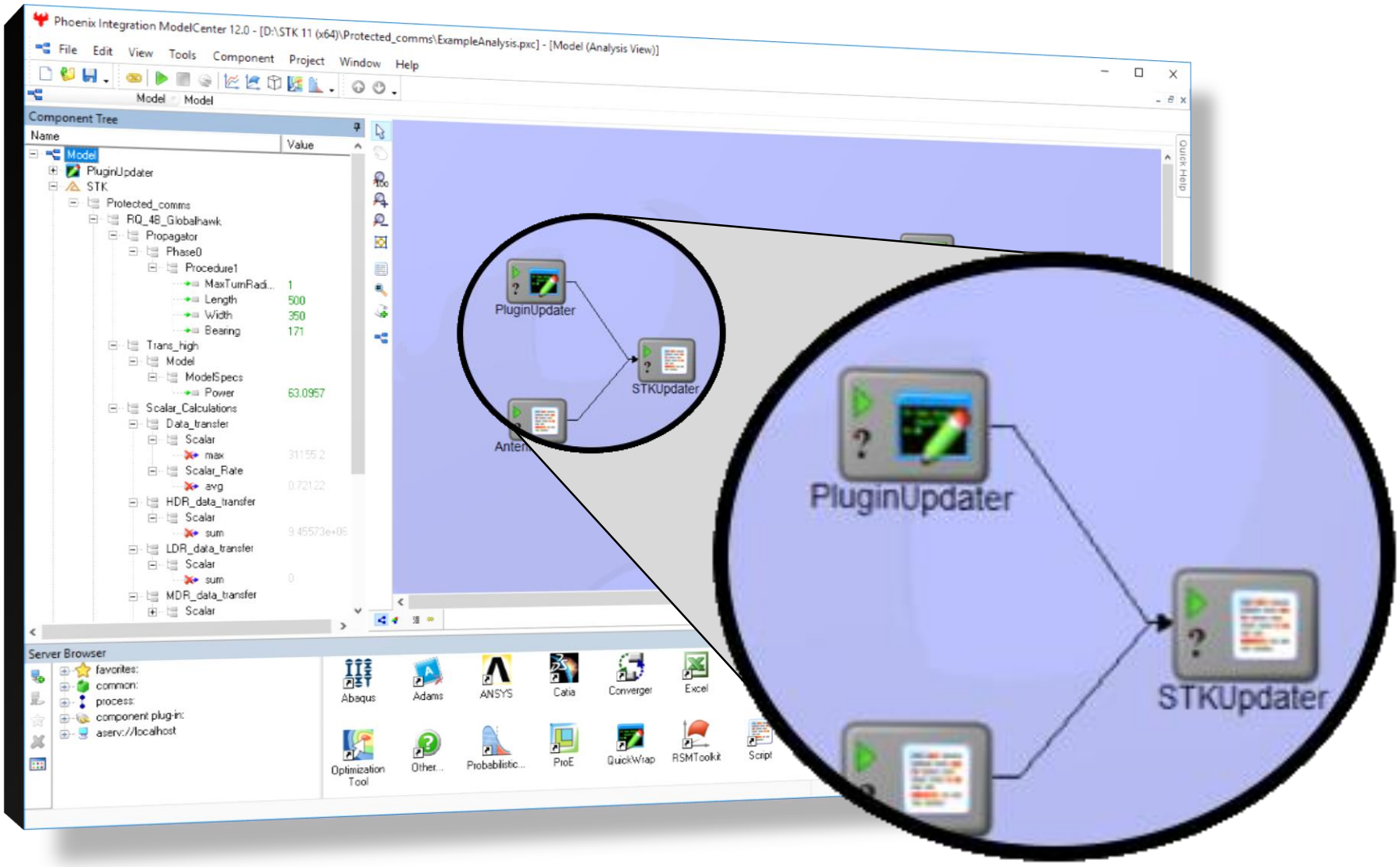

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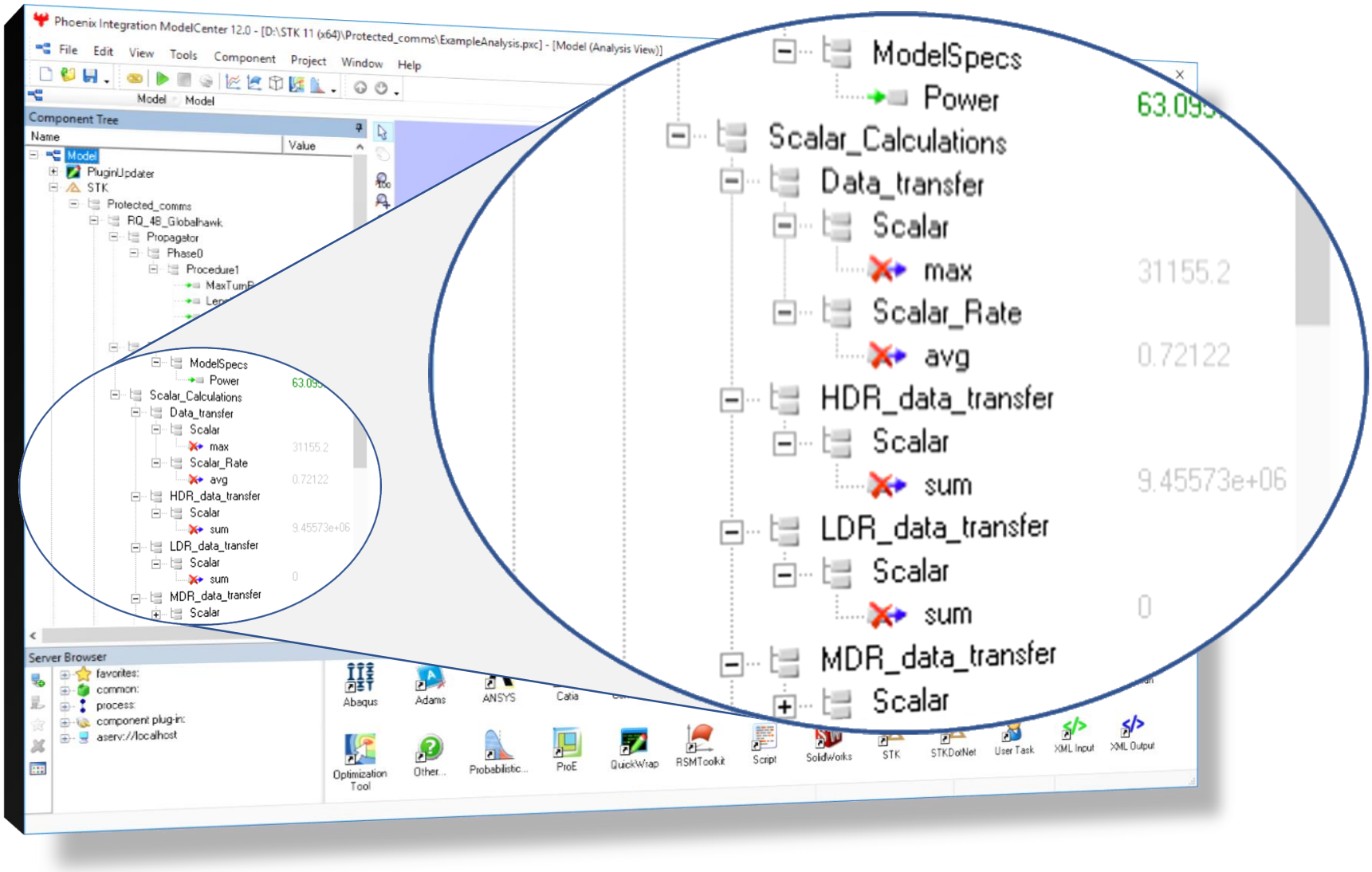

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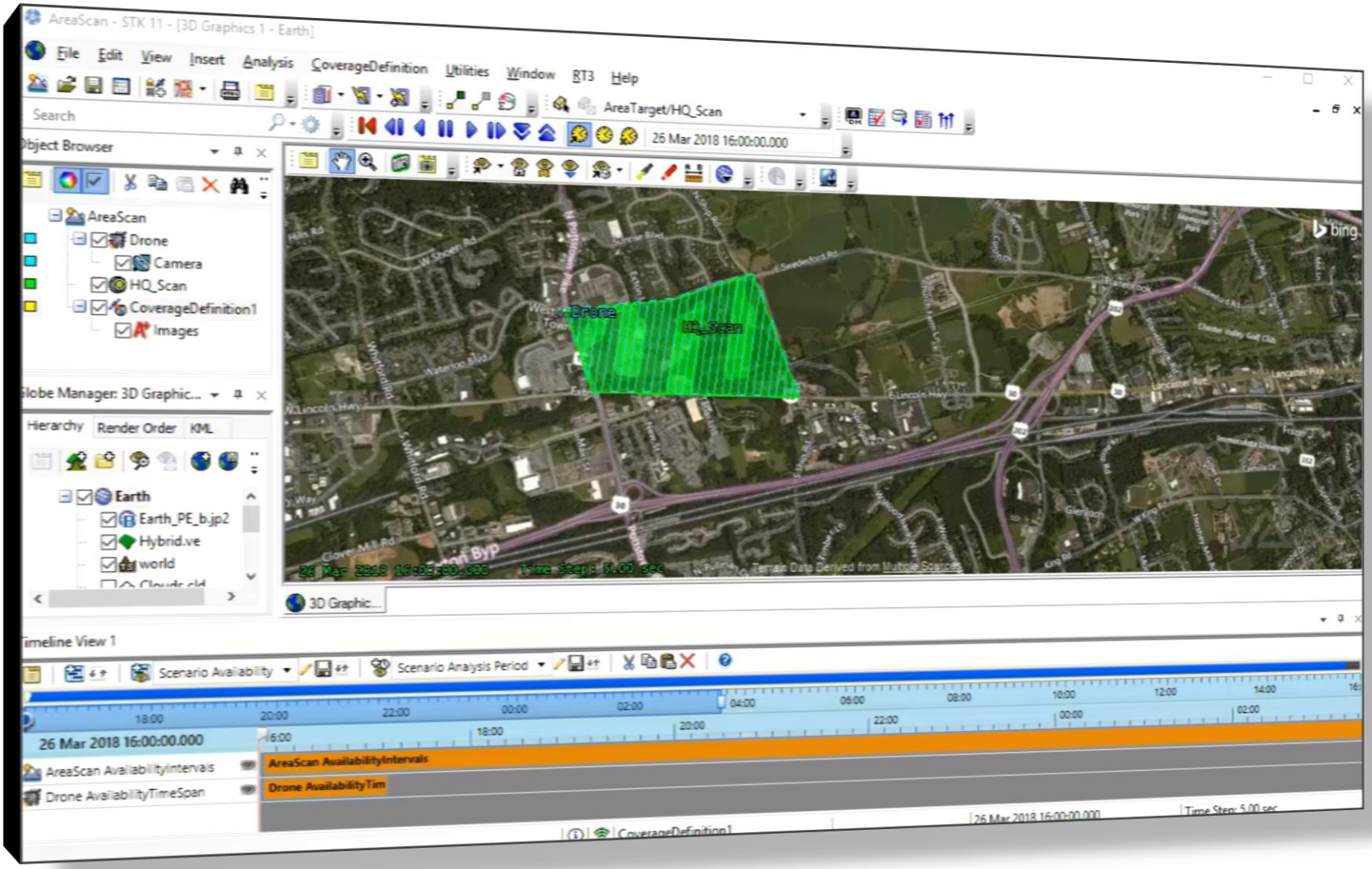

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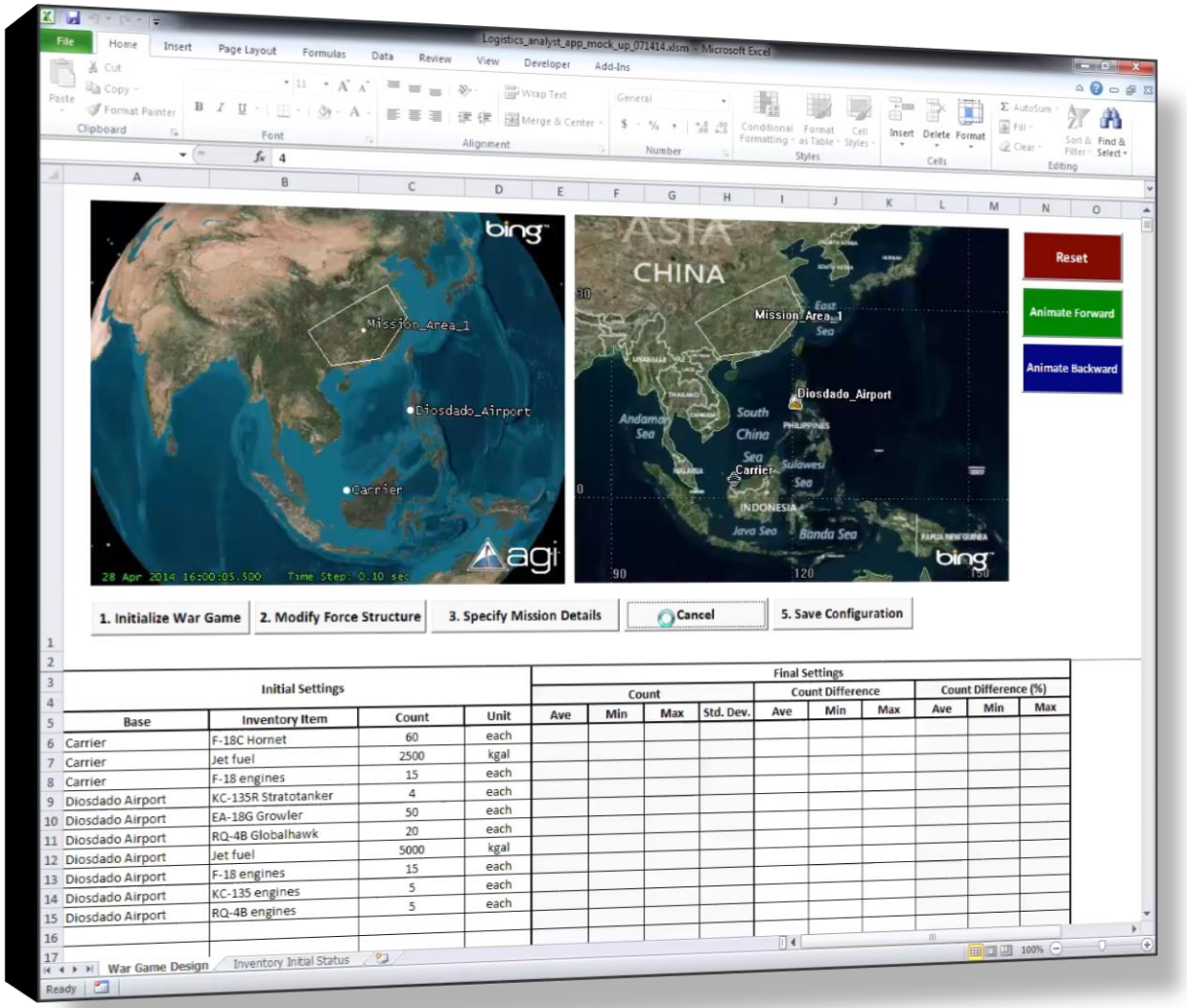
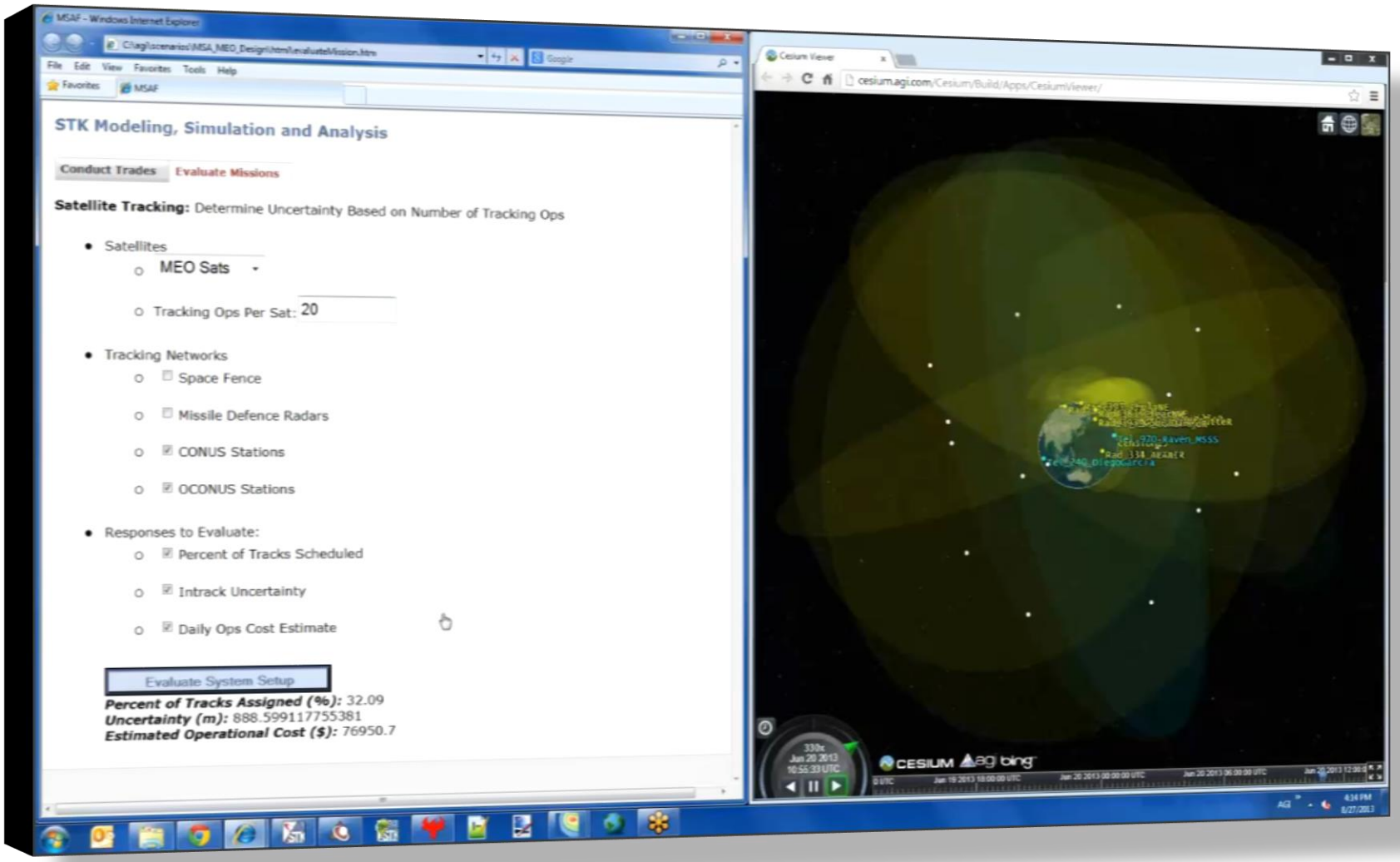


Initial Settings				Final Settings								
				Count				Count Difference			Count Difference (%)	
Base	Inventory Item	Count	Unit	Ave	Min	Max	Std. Dev.	Ave	Min	Max	Ave	Min	Max
Carrier	F-18C Hornet	60	each										
Carrier	Jet fuel	2500	kgal										
Carrier	F-18 engines	15	each										
Diosdado Airport	KC-135R Stratotanker	4	each										
Diosdado Airport	EA-18G Growler	50	each										
Diosdado Airport	RQ-4B Globalhawk	20	each										
Diosdado Airport	Jet fuel	5000	kgal										
Diosdado Airport	F-18 engines	15	each										
Diosdado Airport	KC-135 engines	5	each										
Diosdado Airport	RQ-4B engines	5	each										

Operations example: task planning



Summary

- **Integrate mission and engineering across lifecycle**
- **Important tool attributes include:**
  - Open APIs, open data, and interoperability
  - Multiple levels of fidelity
  - Orchestration of models of models
- **Learn by doing**
  - Solve today's problems
  - Evolve tomorrow's solutions
- **ModelCenter is a key component**