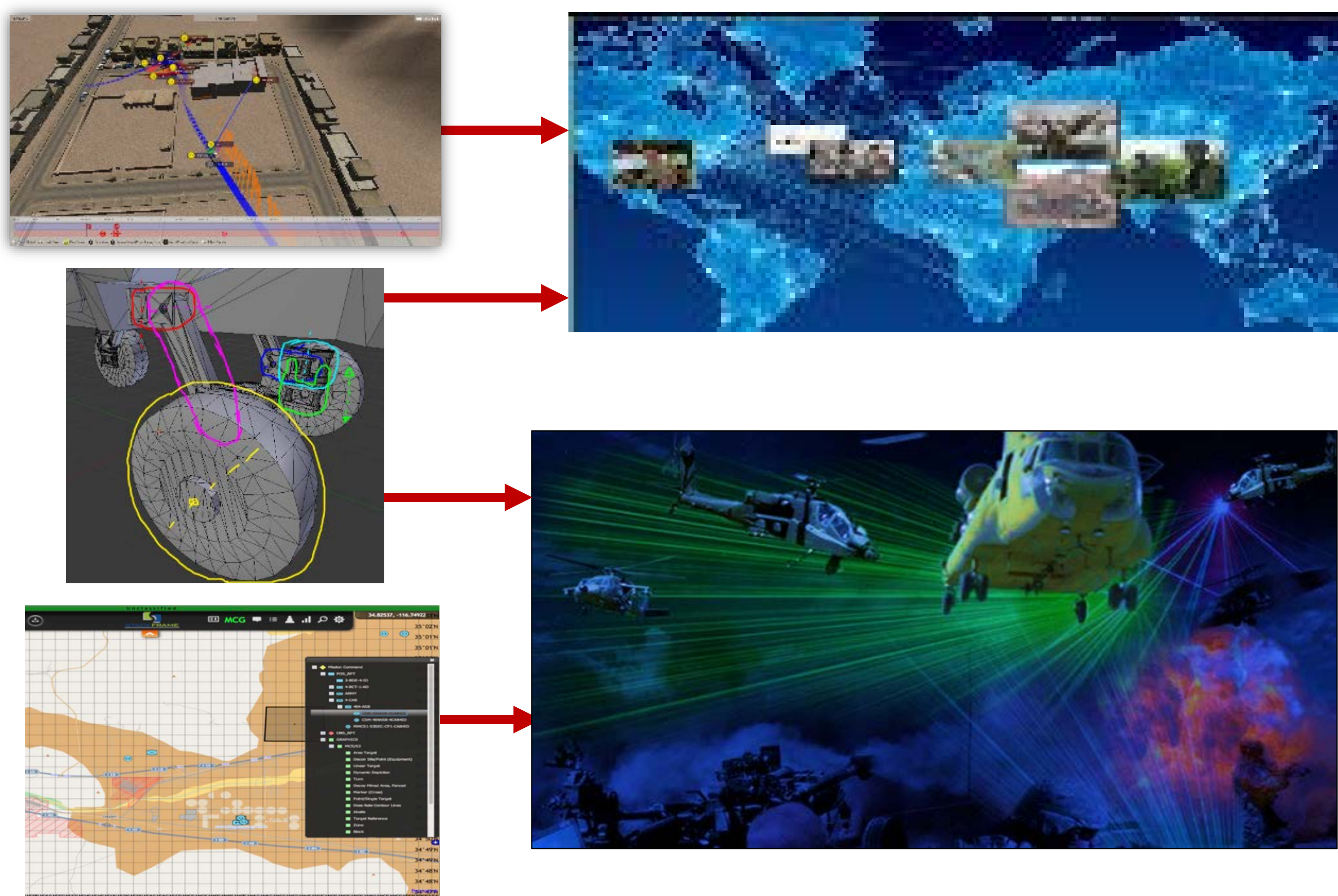


S&T Campaign: Computational Sciences Advanced Computing Architectures

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Research Objective

- Refine and demonstrate advances in computer science that support the development of M&S architectures required to support the M&S Communities (Acquisition, Test & Evaluation, Intelligence, Experimentation, Analysis and Training) in the future.
- Identify demonstrable concepts for investigation that will be used to accomplish Army M&S 3-5 years in the future.



Simulation Results Delivered To The Point Of Need

Challenges

- Existing simulation systems are black boxes that interface externally allowing internal computations to be non-standard between model representations, introducing fair fight issues and additional inconsistencies
- Service-oriented and distributed computing concepts may introduce scalability disruptions as the scale and complexity of what is to be simulated is increased
- Current authoring approaches make simulation a specialized discipline vice being able to better incorporate model developers and domain experts input through easy to use interfaces in the creation of a simulation environment and execution
- Delivery to the Point of Need not just dependent on network and computing resources, but also interface technologies of how the “simulations” will be interacted with

ARL Facilities and Capabilities Available to Support Collaborative Research

- Robust ARL High Performance Computing infrastructure
- Numerous legacy Army and Department of Defense simulations for use in demonstrating new computing concepts
- Access to models and unclassified empirical data for incorporation into new simulation architectures
- Geographically distributed networking infrastructure to demonstrate new computing concepts over long haul networks
- Subject Matter Expertise covering all six M&S Communities



The Future Army Training Concept Desires a Paradigm Shift From Simulations Interoperating to a Single Synthetic Environment

Complementary Expertise / Facilities / Capabilities Sought in Collaboration

- Computing architecture concepts and application to the M&S domain
- Computational expertise for exploring distributed computing concepts
- Methods to provide multi-resolution M&S to diverse user interfaces without introducing fair fight issues and other simulation inconsistencies
- Computing techniques relevant to real-time and non-real-time complex M&S
- Relevant non-military M&S expertise and simulation architecture concepts