Joint US and German Simulation and C2 Information Systems Connectivity Experimentation Program (SINCE)

Technical and Operational Design, Implementation and Execution Results for SINCE Experiment 1

10th ICCR&TS Presentation

14 June 2005

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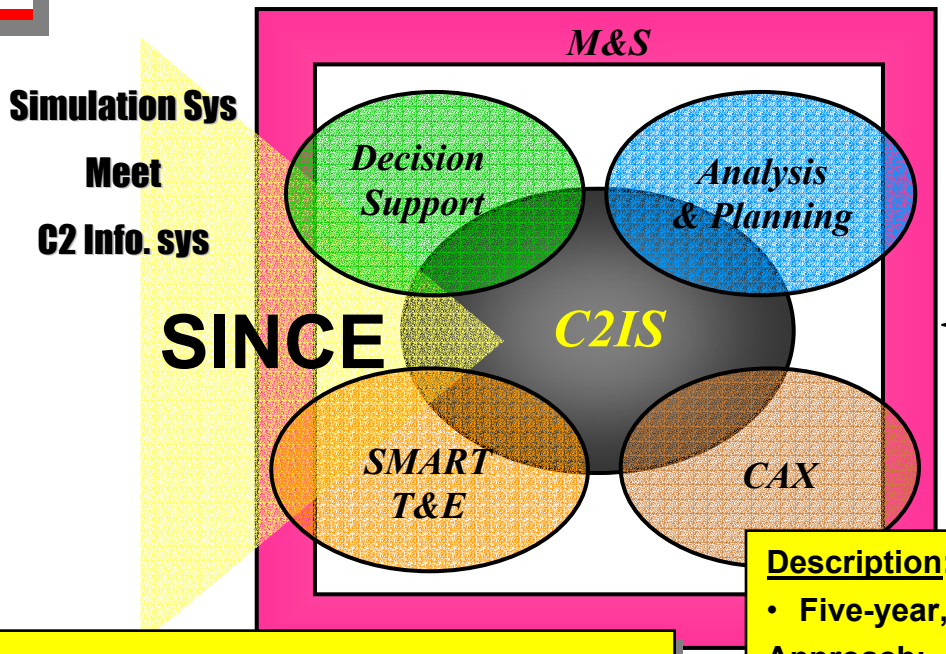
SINCE Objectives & Description



Bridging Technical & Operational Capabilities

Objectives:

- Demonstrate Improvements in BDE & Below Future Coalition Force Effectiveness in
  - Collaborative Mission Planning
  - Execution Management
  - Battlefield Visualization for BDE & Below
  - Conduct of High Mobility, Collaborative Future Force Coalition Operations
- Implement real-time information exchange mechanisms that enable federated interoperability between US and GE C2 systems and Combat Simulation Systems.

Description:

- Five-year, Three Experiment Effort initiated Nov 02

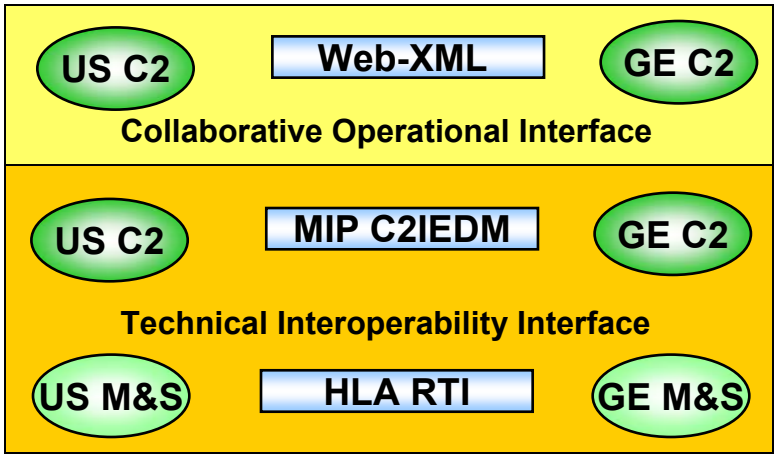
Approach:

- Integrate US & GE C2 Info Sys. (C2IS) & Simulation (M&S) Sys. into a Coalition C2 Experimentation Test Bed environment to support:
  - R&D Experimentation activities
  - Mission Rehearsal & Training activities

Participants:

- Combined Military User and R&D community participation
  - US-CERDEC, TRADOC- MMBL, BCBL,CALL & 35th ID
  - GE- BWB, HEERESAMT, GefSimZ
  - Other Nations in the Future

SINCE Implementation Approach



Web-based C2 Collaboration Portal (WCP)

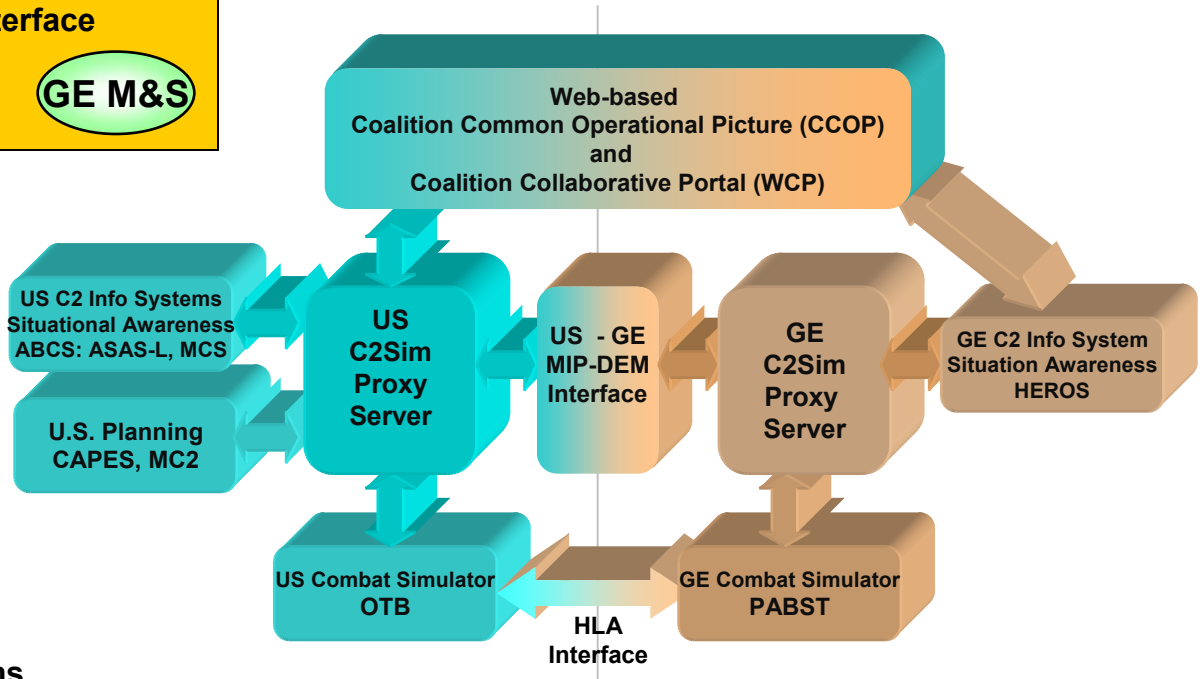
- Supports Display of Coalition Common Operating Picture (CCOP)
- Supports Graphical Collaboration on Coalition OPLAN/FRAGO development & mission management

Digitized OPORD/OPLAN

- Data Model & Representation
  - XML & Battle Management Language (BML) Structure
  - Used to map info between C2 and Simulation worlds
- Support Authoring software

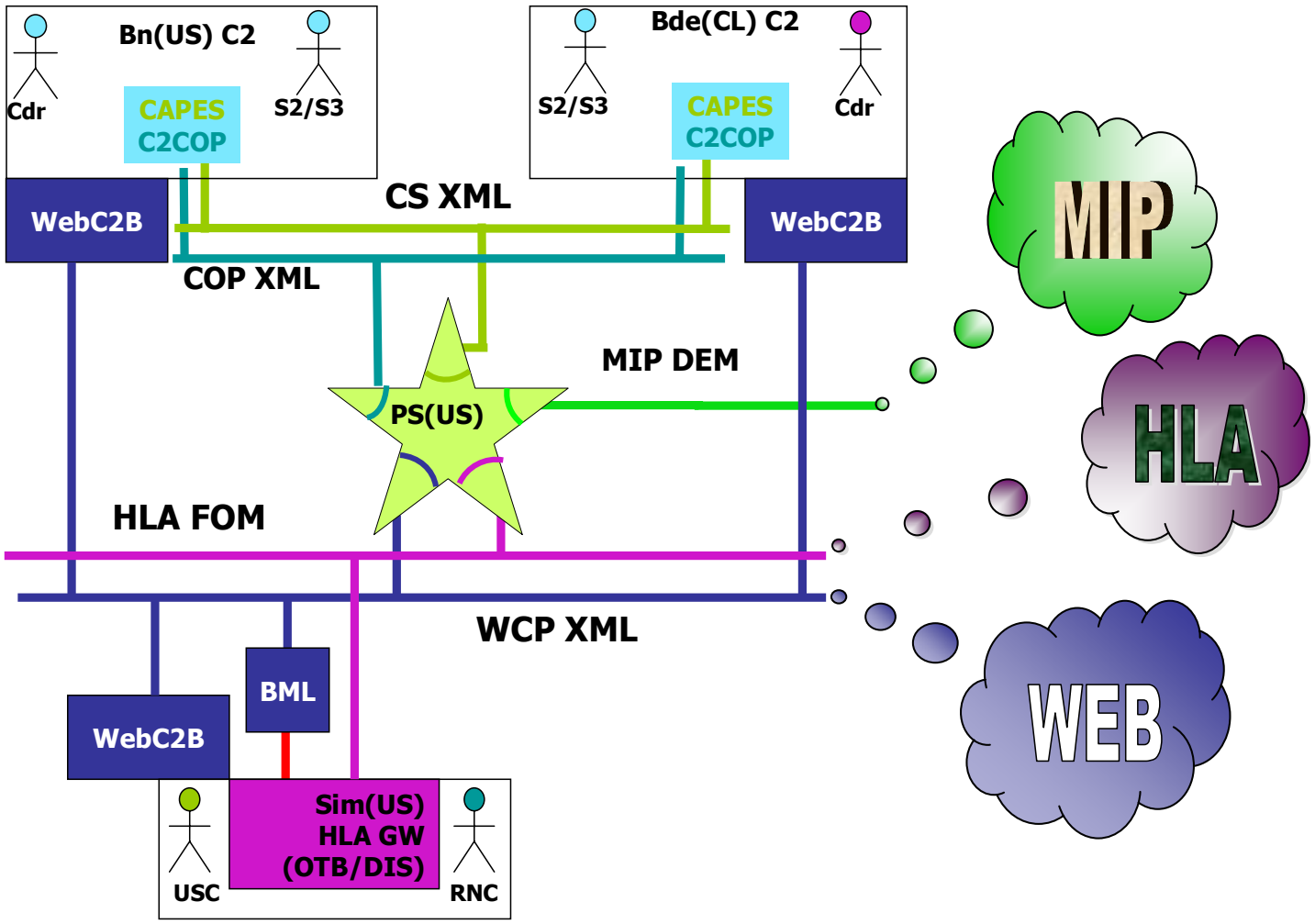
C2Sim Proxy Server

- Web-based Enterprise Services supporting Net-Centric Operations
- Enables Info Exchange between C2 and M & S systems

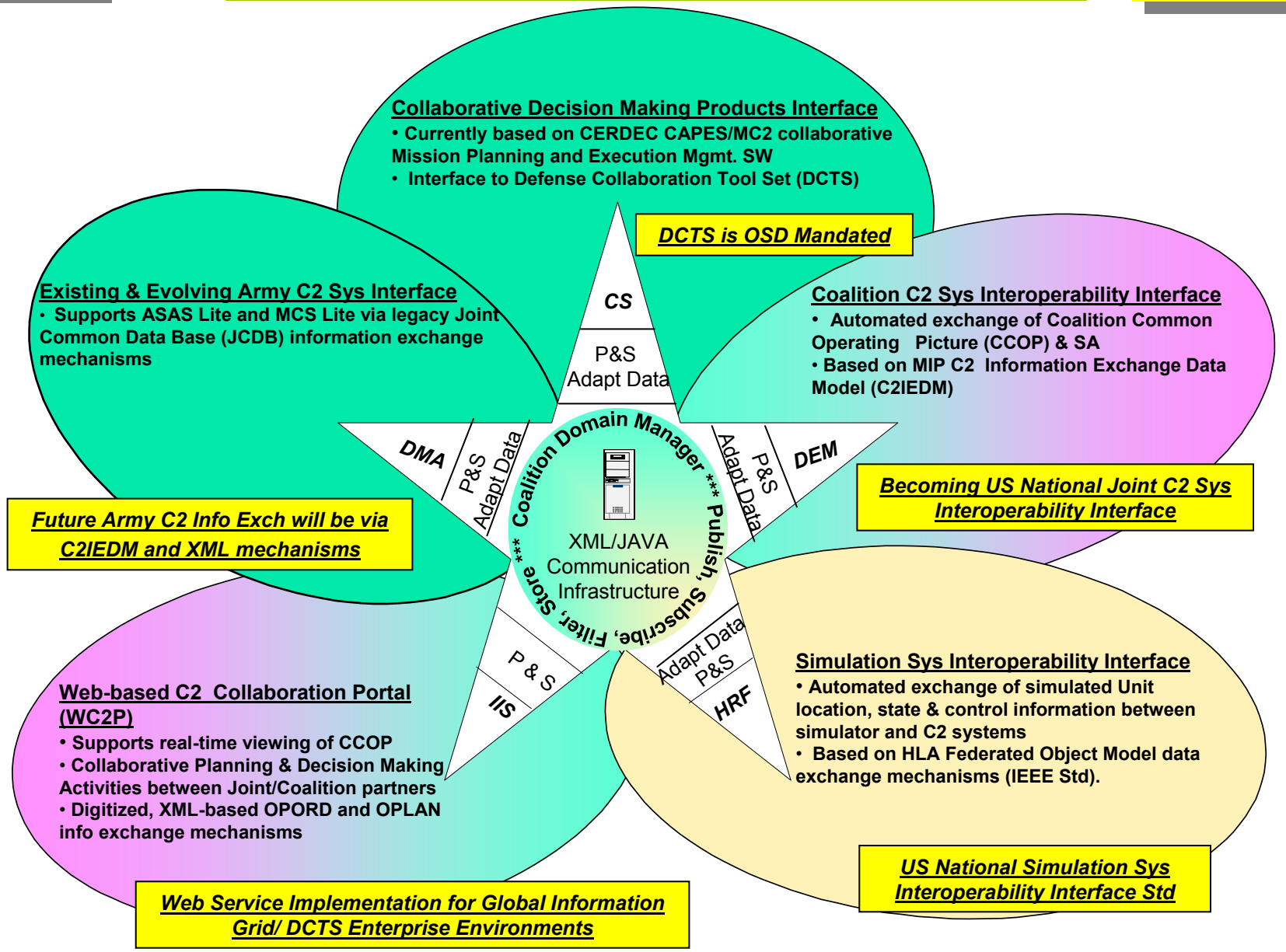


Experimentation Test Bed Implementation

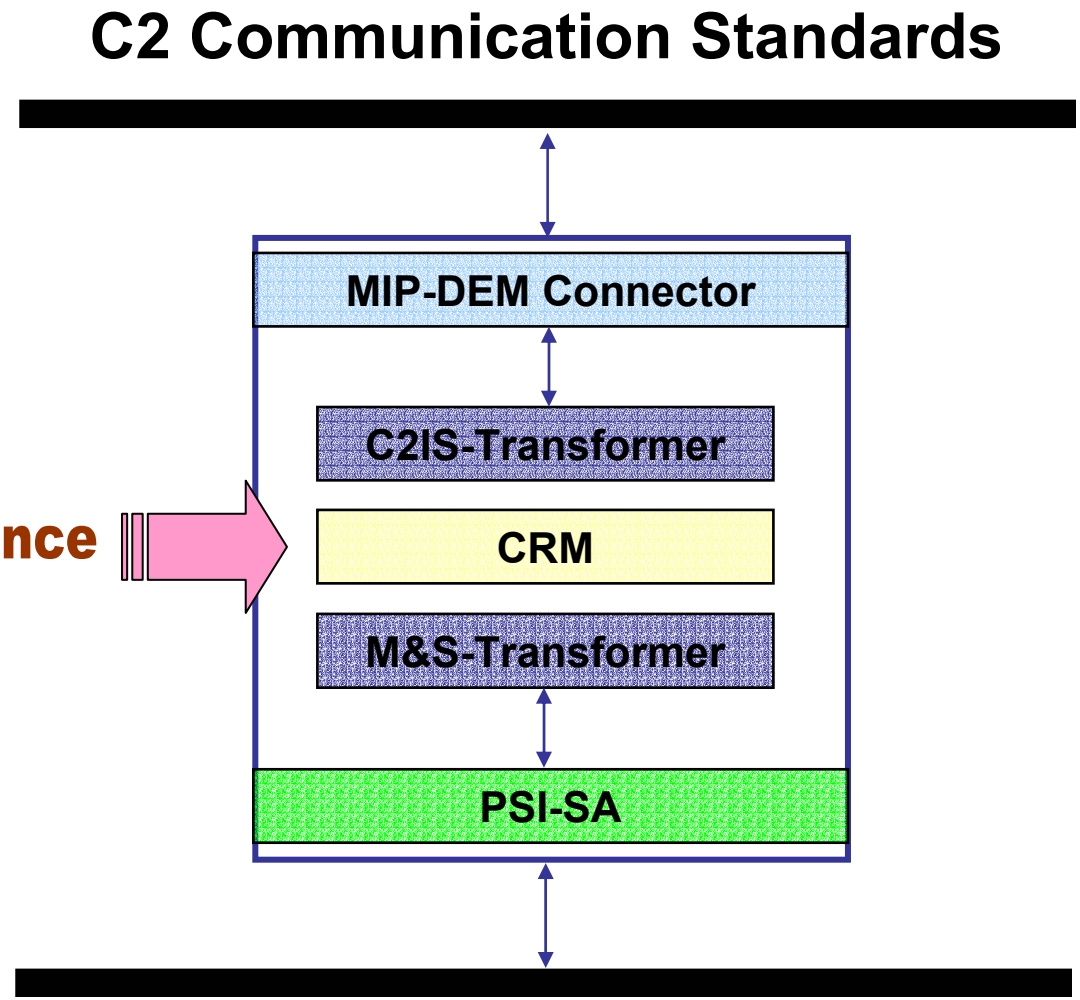
Figure 2. SINCEx1 Open System View (US perspective)



US SINCE C2Sim Proxy Server
(*Key Interoperability Agent*)

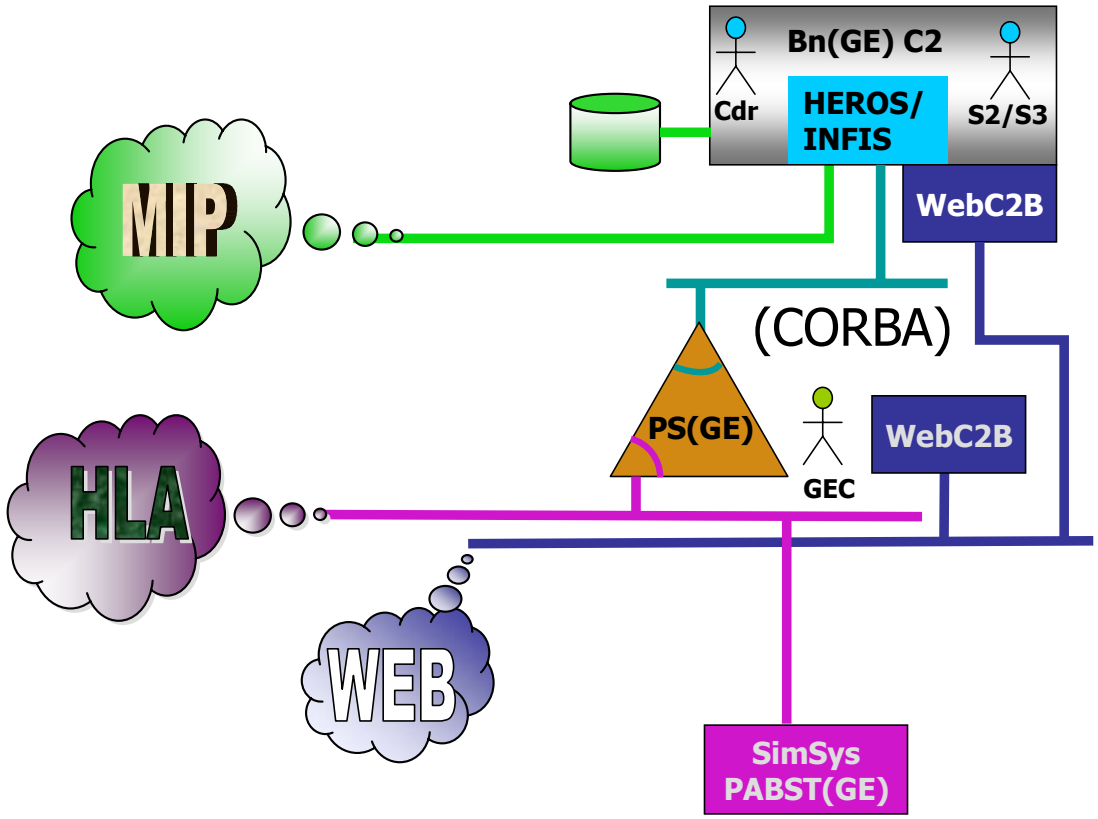


GERMAN
C2Sim Proxy



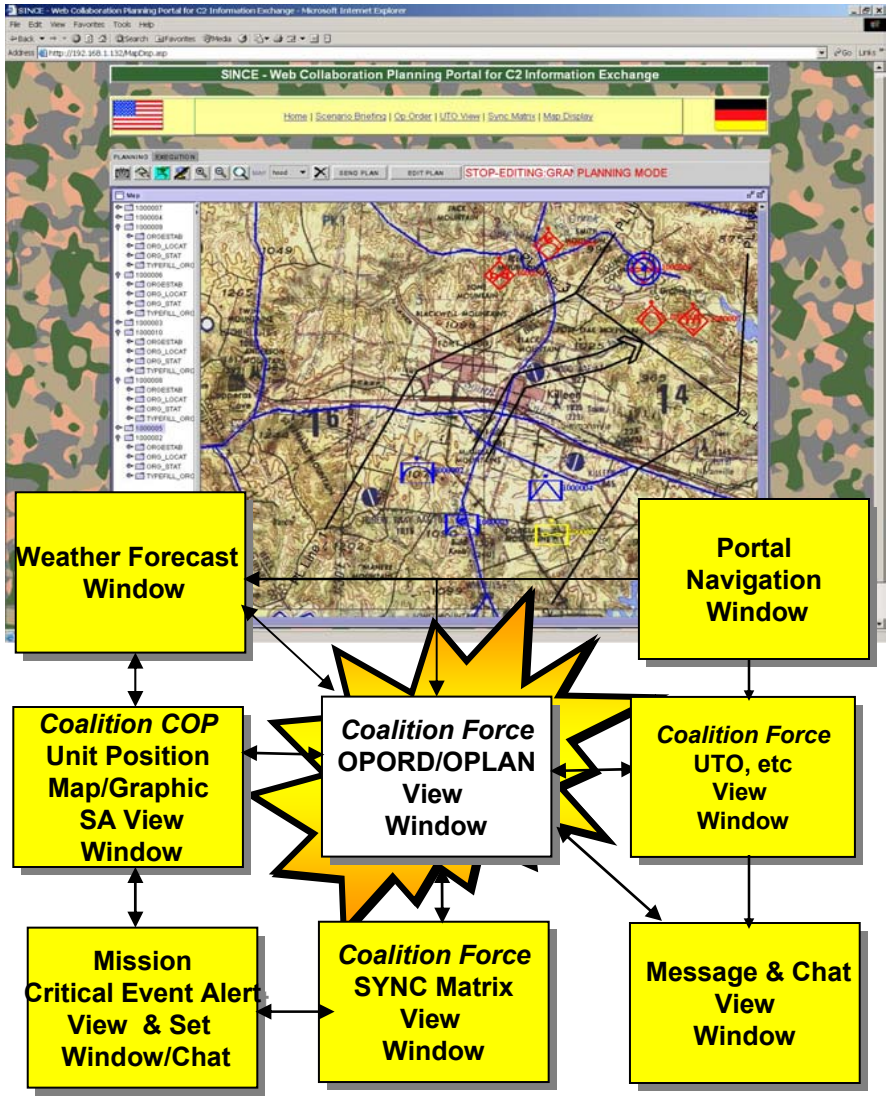
Conceptual Reference Model

Figure 3. SINCEx1 Open System View (GE perspective)



The Web-based C2 Portal & XML Information Model

Typical Portal Display



- ➔ Gateway between National & Coalition C2 Planning Systems
- ➔ Displays, Sees and Operates on only Coalition C2IEDM based Information
- ➔ Standard user interfaces & Common Info Battle Mgmt. Language (BML), Graphics, Xml-based representations for exchange of planning Info
- ➔ Interactive OPORD building and Info Exchange

Typical OPORD/OPLAN Text Parsed by W6H Rules

On order IBCT deploys to MACRAN REPUBLIC and moves immediately to Kazar to secure the KACANIC CORRIDOR, PRISTINA Airfield, and PRISTINA, and to establish a US presence throughout the zone. IBCT cooperates with KAF to defeat GSPF elements in zone and deters a Gordian attack on Kazar. If deterrence fails, IBCT defends in order to defeat GAF attack and to restore Kazarian territorial integrity.

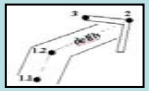
Why | Who | Where | When | How | What | Which

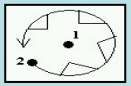
OPORD Text represented in XML

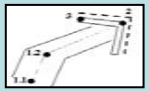
```
<?xml version="1.0" encoding="UTF-8"?>
<grp type="Situation/Friendly Forces" fnc="Mission">
<on type="order"><unit id="1st" role="IBCT" size="Bde" aff="Coalition"/><do type="mission">deploy</do>
<at type="state" name="Macran Republic"/><do type="mission">move</do><by type="rate">immediately</by>
<at type="region" name="Kazar"/><to>secure</to><at type="Corridor" name="Kacanic"/><to>secure</to>
<at type="airfield" name="Pristina"/><to>secure</to><at type="region" name="Pristina"/><to>establish</to>
<units aff="US"/><at type="zone" aff="Kazar"/><To>cooperate</To><Link><unit id=" KAF"/><To>defeat</To>
<unit id="GSPF" size="elements"/><at type="zone" name="Pristina"/><To>deter</To><Link><unit aff="Gordo"/>
<do> attack</do><unit aff="Kazar"/></Link><if><Link><unit aff="Gordo"/><do> attack</do><unit aff="Kazar"/>
</Link><then><do>defend</do><To>defeat</To><unit id="GAF"/><To>restore</To><unit aff="Kazarian">
<Status>territorial integrity </Status></unit></then></if></Link></on>
</grp>
```

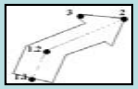
Typical Web C2 Portal
Graphical Plan Build

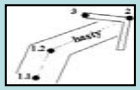
Graphical Action Tasks


Deliberate Attack

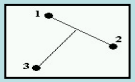

Isolate

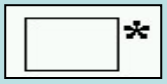

Feint Attack

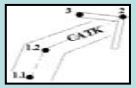

Move


Hasty Attack

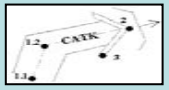

Occupy

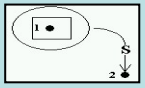

Block


Reinforce

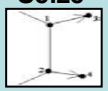

CATK

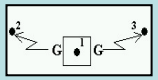

Secure

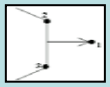

CATK-by-Fire

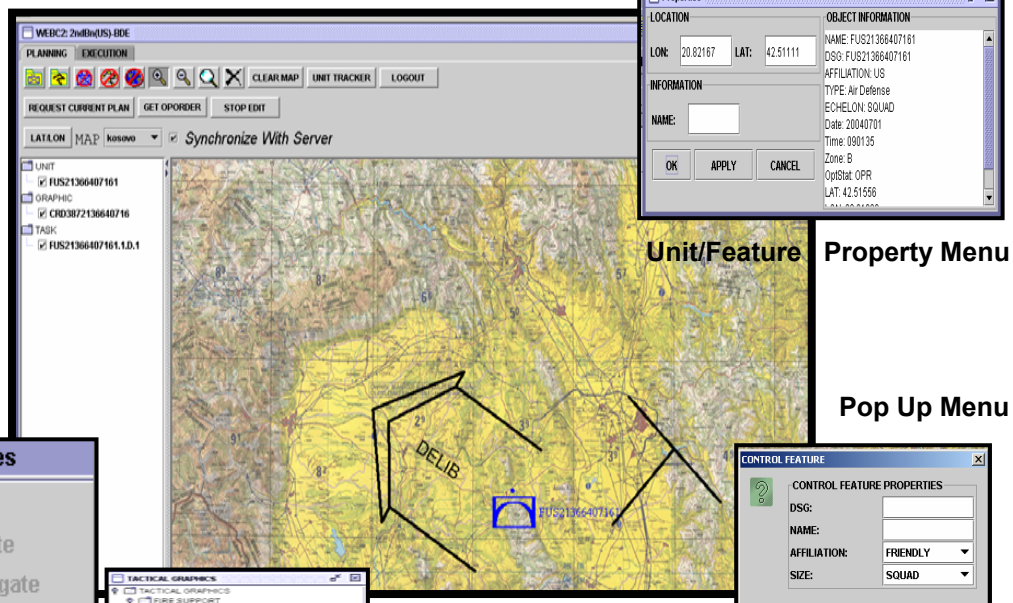

Seize


Fix


Support

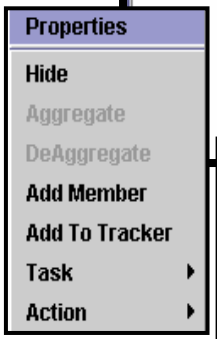

Guard


Suppress

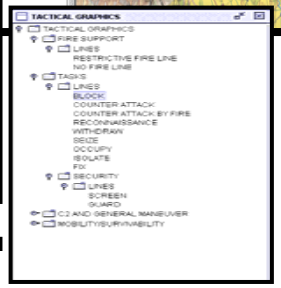


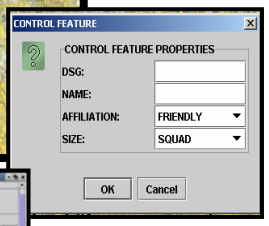
Unit/Feature Property Menu

Pop Up Menu



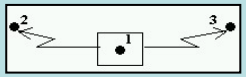
Task/Action Menu

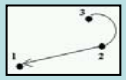




BML Action Task View

Graphical Action Tasks


Recon


Withdraw

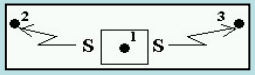

Screen

Table 1. Sample Tasks available to create Operational Overlay for OPORD (BDE/BN)

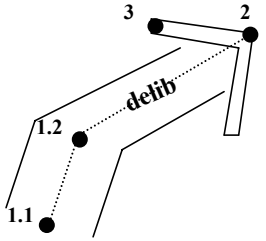
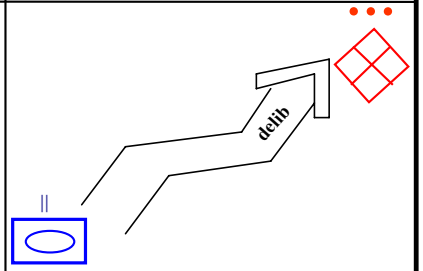
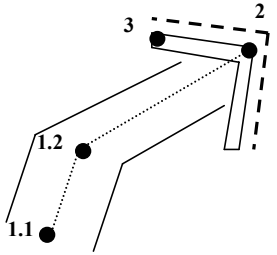
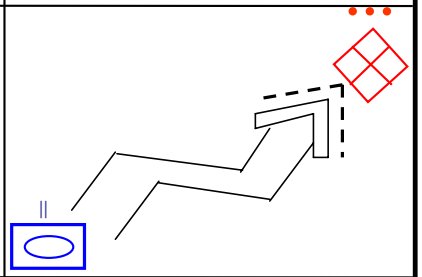
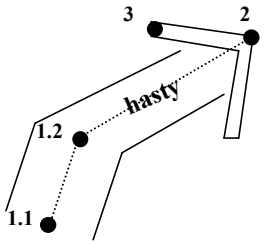
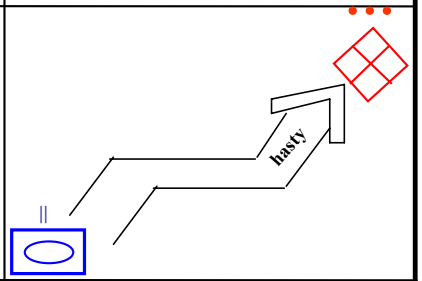
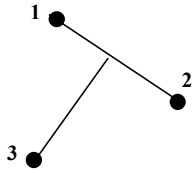
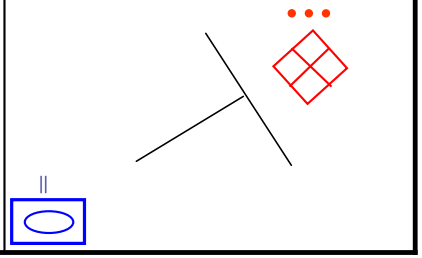
Action: Comments	Graphical Representation	Example
Attack, deliberate: Use Axis of Advance (Main Attack) to represent the path for the unit to attack. The word 'delib' is added to denote such action.		
Attack, feint: Use Axis of Advance for feint to represent the path for the unit to attack.		
Attack, hasty: Use Axis of Advance (Main Attack) to represent the path for the unit to attack. The word 'hasty' is added to denote such action.		
Block: Defined in MIL-2525B.		

Figure 4. An operational Overlay corresponding to a sample OPORD (BN)

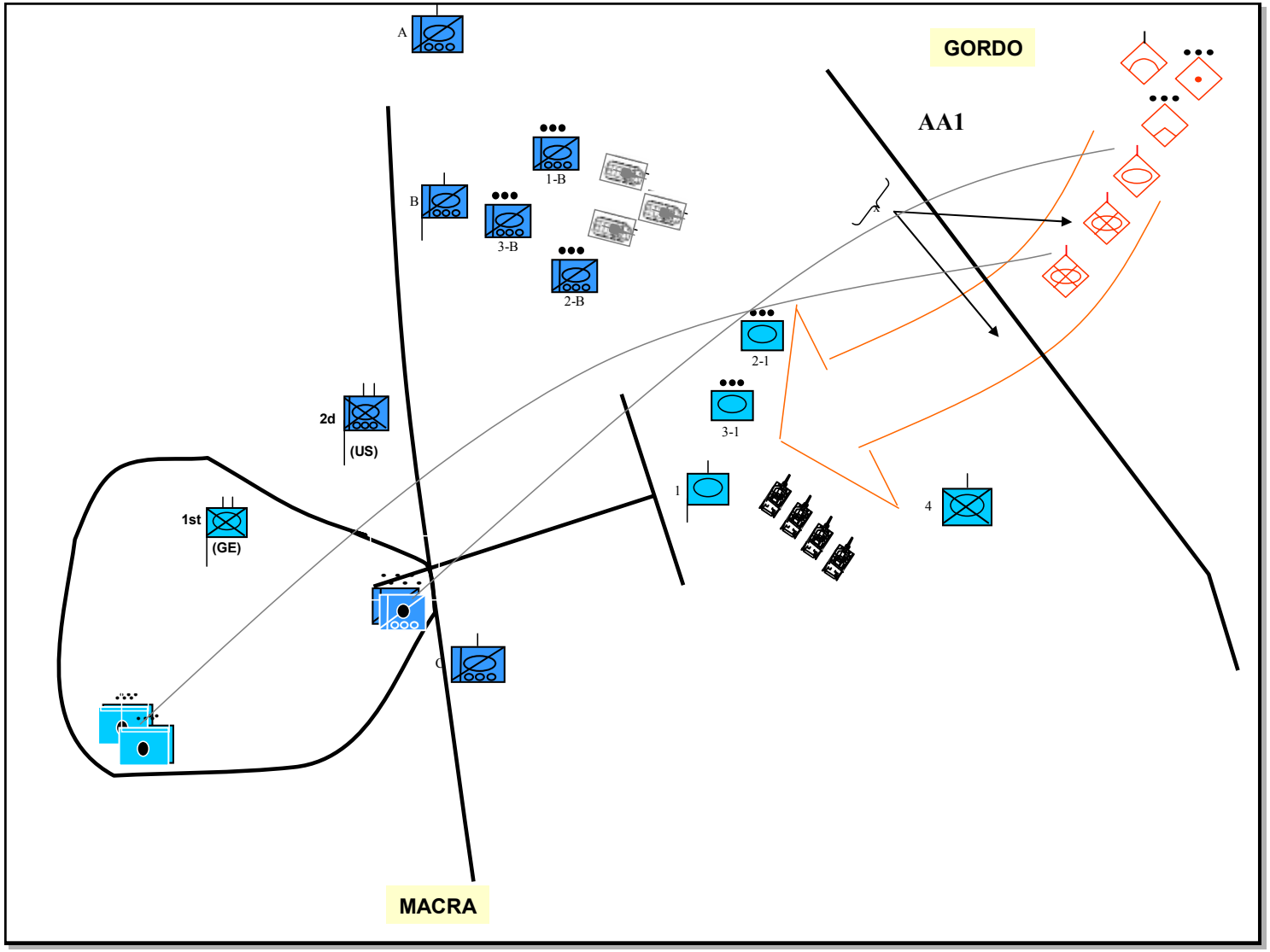
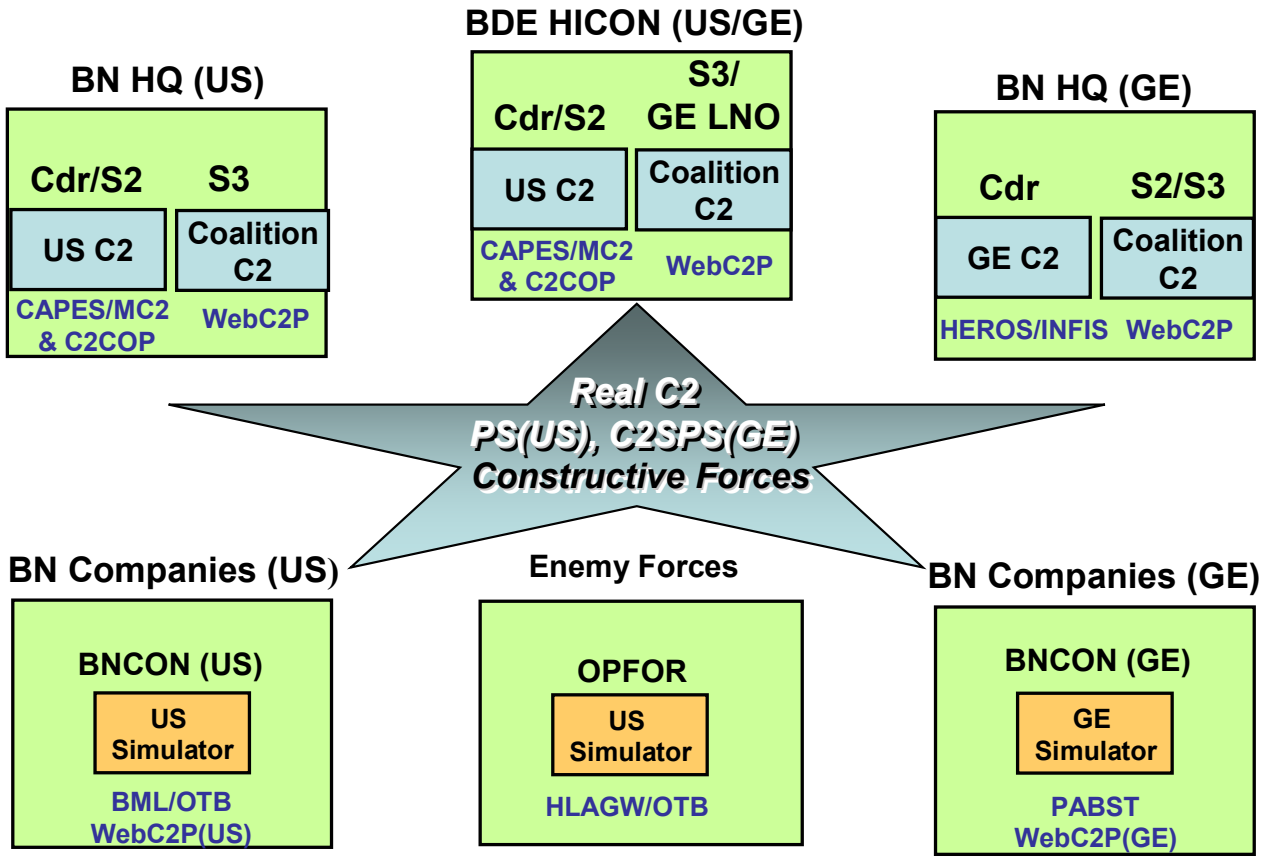


Figure 1. SINCEx1 Multi-National, Multi-Echelon (Operational View)



C2 & Simulation Systems
connected to US SINCE Test Bed & Playing in
SINCE Experiment 1b (Operational)


Maneuver Control System (MCS)-Lite


Force Battle Command Brigade & Below (FBCB2)


Marine Corp C2 Personal Computer (C2PC)


ABCS Info System Server (AIS)


Integrated Data Viewer (IDV)


US C2Sim Proxy Server


Combined Arms Planning Execution-Monitoring System (CAPES/MC2)


Web-based C2 Collaboration Portal (WC2P)


All Source Analysis System (ASAS)-Lite


ONESAF Test Bed (OTB) Combat Simulators


GE HEROS C2 System (Server)


GE HEROS C2 System (Client)

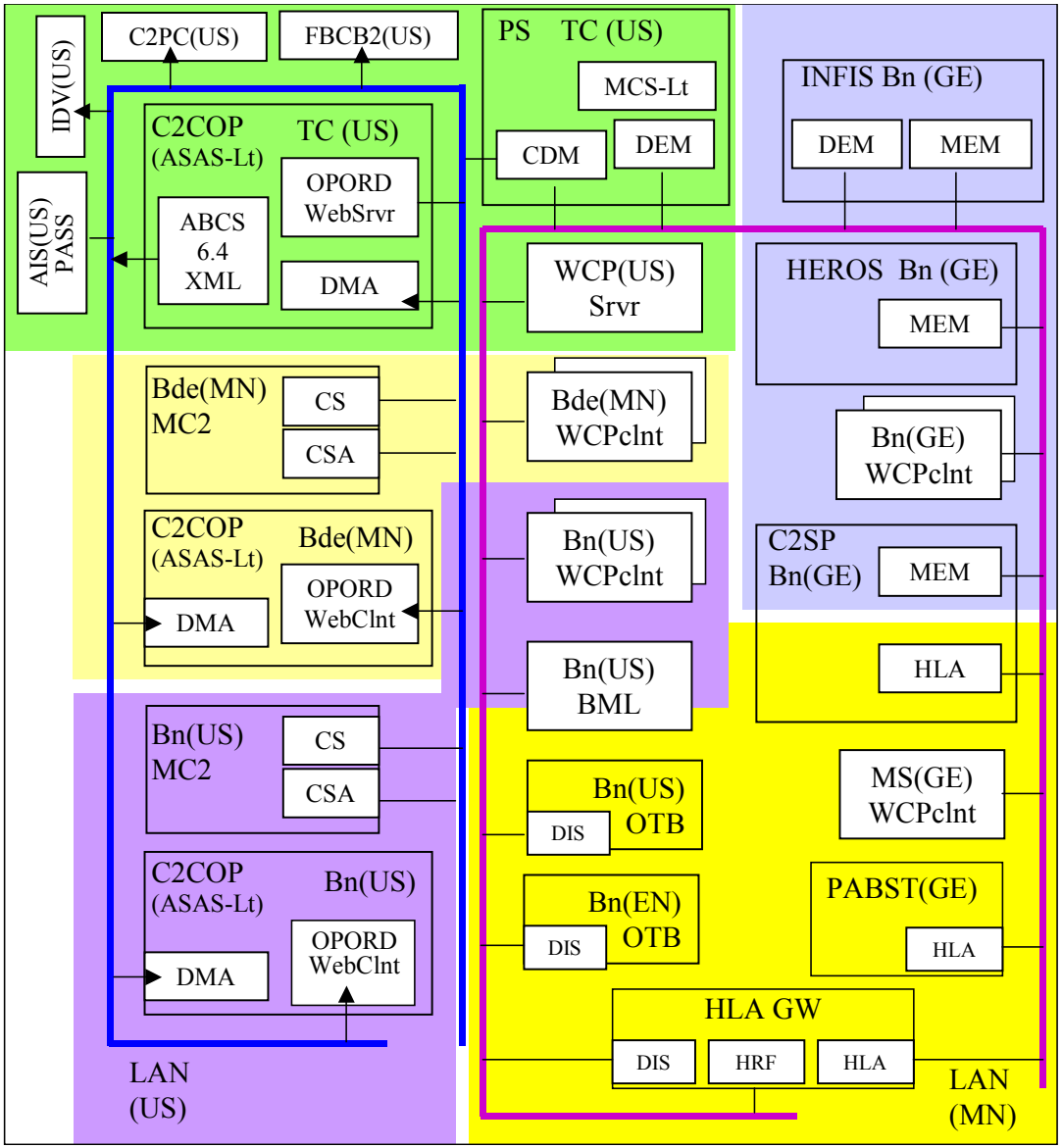

GE INFIS System


GE C2-Sim Proxy Server

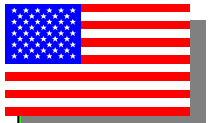

GE PABST Simulator


US HLA Gateway (HLA GW)

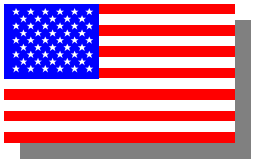
Figure 5. SINCEx1b Coalition Network Connectivity Architecture



SINCE Experiment 1b Schedule



		1st Week 12 -16 July, 2004.						2nd Week 19 - 23 July, 2004.				
Morning Session 08:30 – 11:30 / Afternoon Session 13:00 – 16:00		SINCE Testing						SINCE Experiment				
		Technical Validation			User V&A/Training			Operational Experimentation				
		Day 1 Mon.	Day 2 Tue.	Day 3 Wed.	Day 4 Thu.	Day 5 Fri.	Day 6-7 Weekend.	Day 8 Mon.	Day 9 Tue.	Day 10 Wed.	Day 11 Thu.	Day 12 Fri.
Experim't Control (M&S)	SINCE Proxy OTB	Arrival	Connectivity Testing	Federation Testing	M&S Update all data Bases Database tests w/ technicians	M&S Crawl-through screenplay Walk-through screenplay	OPEN	screenplay Mission Run Iteration 1	Update System Configurations	screenplay Ad hoc Iteration 4	VIP Demo	Tear Down
					M&S Operator Training	M&S Run-through Script Ad hoc run		screenplay Mission Run Iteration 2	screenplay Mission Run Iteration 3	Plan for Ad hoc Iteration(s)		
Experiment Planning	CAPES WebC2B				Bn Update all data bases Database tests w/ technicians	Crawl-through screenplay Walk-through screenplay		screenplay Mission Run Iteration 1	Update System Configurations	screenplay Ad hoc Iteration 4		
		Setup	Bn Operator & technician Training	Bn Operator & technician Training	Bn Operator & technician Training	Run-through screenplay Ad hoc run		screenplay Mission Run Iteration 2	screenplay Mission Run Iteration 3	Plan for Ad hoc Iteration	AAR PMG	Departure
Experiment Execution	C2COP WebC2B		Bde Operator & technician Training	Bde Operator & technician Training	Bde Update all data Bases Database tests w/ technicians	Crawl-through screenplay Walk-through screenplay		screenplay Mission Run Iteration 1	Update System Configurations	screenplay Ad hoc Iteration 4	AAR OWG	
			M&S Operator Training	M&S Operator Training	Bde Operator & technician Training	Run-through screenplay Ad hoc run		screenplay Mission Run Iteration 2	screenplay Mission Run Iteration 3	Plan for Ad hoc Iteration	AAR TWG	
		Setup, Testing and Training						Screenplay / Ad hoc Missions/Tasks				
		Brigade(C2)	Battalion(C2)		Company(M&S)							



Experiment 1b – Results Synopsis

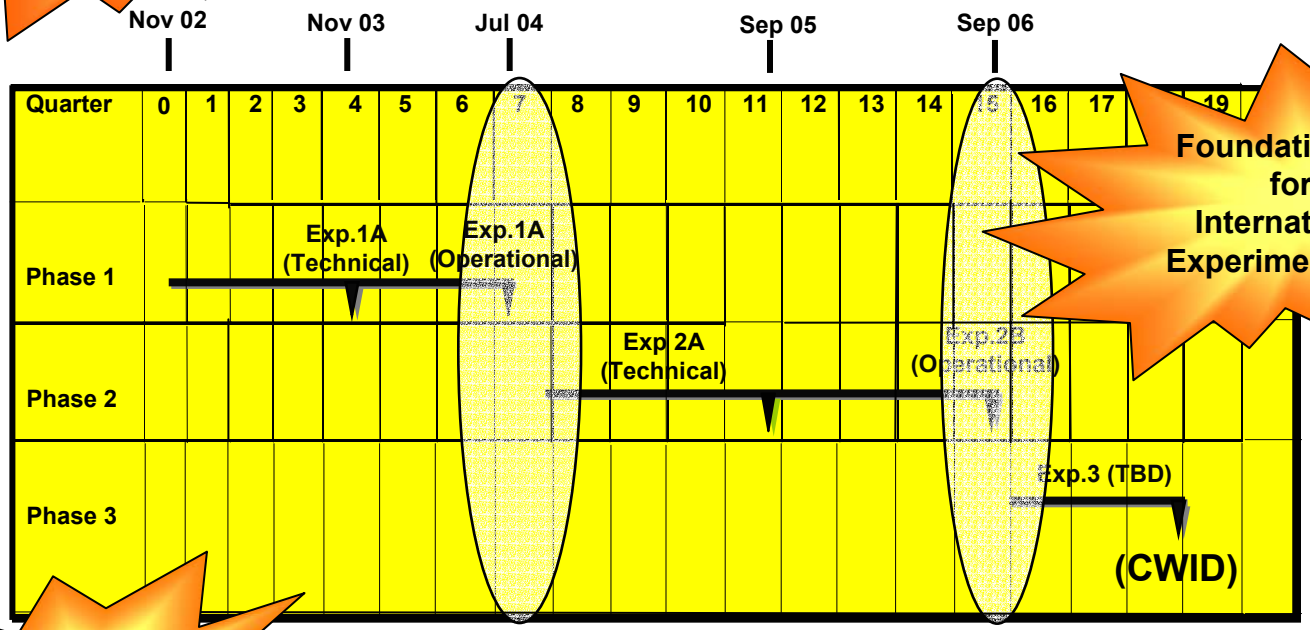
- The SINCE Experiment 1B (Operational) was a success
- Successfully demonstrated that the US-GE SINCE Experimentation environment could scale to support realistic coalition force operational experimentation, rehearsal and training activities.
  - Seamless information flow, interoperability and integration of C2 systems and M&S Combat simulation systems demonstrated
  - Initial functionality in Web-based C2 Collaboration Portal (WCP) and Digitized OPLAN/OPORD and FRAGO demonstrated to support real-time collaborative mission planning information exchange between US-GE BDE and BN level command cells
- Participating Military Users had high praise for WCP and its graphical point & click plan generation capabilities
- Forty-three VIP's attended the SINCE VIP Day Demo and expressed positive praise for what they saw at the demo
- A detailed SINCE Experiment 1 Report has been produced and published in Apr 05 (expect public release clearance in near future)
- A joint US-GE paper entitled "Train as You Fight: SINCE - the Key Enabler" presented at the 2004 NATO MSG Symposium in Koblenz GE.

Conclusions, Summary and Schedule

Experiment 1b was a Success!

Training using Warfighter C2I Systems with M&S Systems is Achievable

Other Nations Participation



Foundation set for International Experimentation

SINCE enables C2I & M&S Sys. Interoperability

2003/04

2005/06

2007

Integrating M&S into C2 Decision Making is Achievable

SINCE goes Joint Service