



Commercial Joint Mapping Toolkit (CJMTK)

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NORTHROP GRUMMAN

Purpose

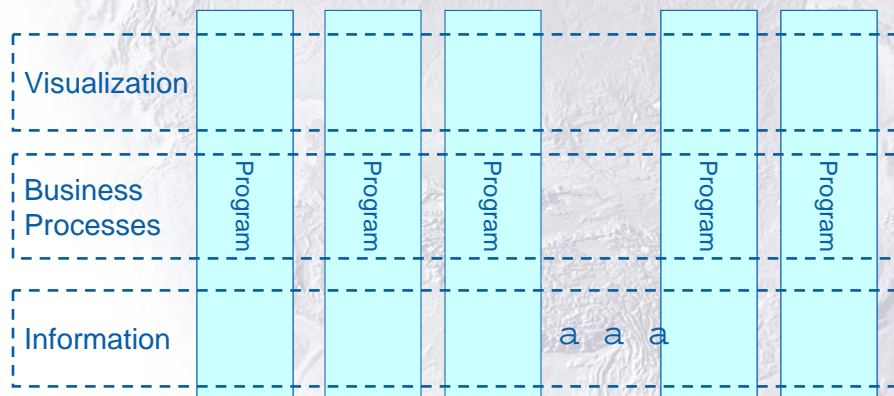
- Providing the essential software toolkit for data management, analysis, and visualization of geospatial intelligence (GEOINT) through the Commercial Joint Mapping Toolkit (CJMTK).
- Provided by the National Geospatial-Intelligence Agency (NGA)
- Supported By:
 - Northrop Grumman (Prime Contractor)
 - ESRI
 - Analytical Graphics, Inc. (AGI)
 - Leica Geosystems

Commercial Joint Mapping Toolkit

- CJMTK is replaced the Government-developed JMTK (retired September 2006)
- CJMTK provides the Mapping, Charting, Geodesy, and Imagery (MCG&I) functionality for NCES – effectively all the DoD C2I systems at national, joint and service level
- CJMTK is the NGA recommended standard Geospatial Visualization, Analysis, and Data Management tool for the C2I community
- CJMTK is a single scalable enterprise developer suite based on ESRI ArcGIS 9.x ***It is not an application but a developer toolkit.***

Horizontal Integration Solution

Modern government approved technology exists that can work with existing teams and programs, in addition to new programs, to share information, visualizations, impacts, and decisions, and can access joint data sets across the enterprise leveraging IP based backbones (such as the GIG-BE)



Licensing Options

- **Toolkit Option**
 - Windows (2000, XP)
 - Solaris, Linux (Red Hat, SUSE)
 - Fully funded by NGA for **approved** programs (including maintenance through March 2014)
- **Extended User Community (EUC) Option**
 - No formal requirements submitted
 - Not funded within NGA
 - To be exercised only if sponsor steps forward
 - Includes purchase of either Toolkit or selected full COTS Applications from ESRI, AGI, Leica Geosystems
- **Foreign Military Sales (FMS) Option**
 - Same as EUC option

CJMTK Community Status (As of 1 October 2007)

	Pending	Retired	Approved	Actively Migrating	Fielding	Total
Air Force	1	7	2	12	6	20
Army	2	4	8	50	13	71
Coast Guard	0	1	6	1	1	8
Joint	3	10	11	40	7	58
Marine Corps	0	2	11	13	4	28
Navy	1	22	11	23	1	35
Totals	7	46	49	139	32	220
August Totals	8	47	49	137	32	218

	Runtime	Development
Approved	22713	265
Actively Migrating	96201	1709
Fielding	43914	469
Totals	162828	2443
August Totals	160810	2416

*Fields Retired, Approved, Actively Migrating, and Fielding describe the state of CJMTK Approved mission applications.

Approved	• Currently approved and has not begun migration.
Active Migration	• Currently active ACTDs, prototypes, and approved systems developing with CJMTK software components
Fielding	• Development complete OR • Approved for testing, production or deployment
Retired	• Approved program that is currently not using CJMTK

CJMTK Approved Community (as of 1 October 2007)

Air Force	Army	Coast Guard		DISA	Marine Corps	Navy
PFPS	ASAS-ACE E	CGISS	AF	AMR	CESAS	AEA_UPC
FAS	C4ISR L1F	CGWebCOP(U)	AF	CCIC2S	COBRA	AREPS
	DCGS A- V4	COMDAC-INS	AF	IIMS	GCSS-MC	CNI
	ISYSCON	SCCS	AF	MWR	INTELBN MODS	JCDX
	MEADS	VMS	AF	SS	IOS	NAVSSI
	SIFT	VTS	A	ASAS-SS	ISR	NFCS
	TES		A	ASOMS	RADBN MODS	NSS
	WEBGIS		D	CJSMPT	RTC	NSWPC- SPF
			D	DCGS-SOF	SCSM	SRMT
			D	JFCC-ISR	THS(X)	TACC
			M	GUNSLINGER	WOLFPACK	TIS

CJMTK Active Migration (as of 1 October 2007)

Air Force	Army			Coast Guard	DISA			Marine Corps	Navy	
AME	AFATDS	FAAD C21	SoScoe	IIS	AF	FBV	A	WEBCOP	AFCS	AESOP
CAOC-21	ARCHER	FBCB2	SU		AF	ISPAN	D	C2BMCJDP-BMD	CIHEP	ARIEL
COMET	ARES-FIST	FOS	TC-AIMS II		AF	JAAWIN	D	DRRS	IAS	Builder
DASEA	ASAS-ACE	GCCS-A	THAAD C2BMC		AF	JIAPC	D	D-SIDE	IFCS	CADRT
E-10A BMC2	BC-PPS	GTIC	TPIO-BC PROTOTYPE		AF	JASMAD	D	GALE	MAGTFC2	COE-M
GCCS-AF	BCCS	ICS	TSP		AF	JMPS	D	GCSS	MEWS	CV/TSC
ISC2	BECOF	IMETS	UAV		AF	NGCC	D	GCSS-J	SPEED	DCC2
JET	BTRA	IMS	UGCV-UPI		AF	NIDS II	D	GIG COP	TCO	DCGS-N
PS3	C2CUT	IPB-DA	URBAN		AF	NPES	D	HARVESTNET	TEG	EVIS
QF	CZORE	JAWS	WIN-T		AF	SMS	D	JFP ACTD	TERPES	FHPGIS
TASS	C4ISR	MCS-L	WMIS		AF	UCAV-OVI	D	PACC	TMIP-M	GCCS-M
WIDE	CAPES/MC2	MSS			A	DDVM	D	SensUtilityExp	TPCS/MPC	GT2MP
	CAPES/MC2 Interop	NGIC-WF			A	DiamondBack	D	DARTS	TRSS	IODN
	CGS	PCI			A	FSEP	MC	MSDS		JEM
	CHAMS	RFCAT			A	JADOCs	N	Cfn		MEDAL
	CPOF	SZS CIP			A	JC2S	N	DIO-S		NURTAC GIS
	DCGS-A Fixed	SHIELD			A	JGES-APP	N	GCTE/COPE		PCIMAT
	DCGS-A V2	SOMPE			A	JWNM	N	MSCAD		RAID
	DCGS-A V3				A	TAIS	N	MUOS		RP-1
	ENFIRE						N	MRHA		SLBM/SSBN/SSGN
	EG-36						N	JOEF		SURETRAK
										TTWCS
										USW DSS

CJMTK Fielded Community (as of 1 October 2007)

Air Force	Army	Coast Guard		DISA	Marine Corps	Navy
DCGS	AMDS-EE	SAROPS	AF	JSS	C2PC	TUSW
GSSS2	AMDWS		AF	SISP	RREP	
GEOREACH	ASAS-L		A	INFORMATION-IPE	TCAC	
IMOM	AWARE		D	IWMDI	TPC	
RADARWEB	DAGR		D	STRAT-GATEWAY (SKIWEB)		
TBMC:UL	DCARS		MC	JSTARS		
	DTSS		N	COLLECTOR-EIPB		
	FUSIONNET					
	MAPSERVER					
	MCS					
	MCS-ENG					
	NSOF					
	RATL					

CJMTK Toolkit Option Components

- Embedded Clients & Desktop
 - All platforms - ArcGIS Engine with Geodatabase Update, Spatial, 3D, Military Analyst, MOLE, and Tracking (Engine only) Extensions
 - Windows only – ESRI Application Frameworks (i.e. ArcGIS Desktop) - ArcMap, ArcCatalog, ArcGlobe, etc.
- Web Clients
 - MapObjects Java Edition (and other java/html applications – IE/Netscape)
- Servers
 - Application Servers
 - ArcIMS and ArcGIS Server
 - Data Server
 - ArcSDE
- Platforms – Windows XP/2K, Solaris 8/10, and Linux-Intel Red Hat Enterprise Server 3 and SUSE Enterprise Server 9

CJMTK Releases

- CJMTK releases are tied to ESRI releases
 - Approximately once a year
 - Quarterly Service Packs
 - Address discrepancy reports
- CJMTK Requirements
 - Requirements collection from community
 - NGA funds new requirements annually
 - ESRI releases are influenced

Migration Support Activities

Program	Status (September)
CWID 08	<ul style="list-style-type: none"> • Trial Submission continues • System will be a core NGA service • Trail collaboration is between UK and BCE with others possible
FCS	<ul style="list-style-type: none"> • Continued to provide teleconference support to FCS CJMTK architecture working group • Continued to provide support to FCS CJMTK Working Group on 9.2 migration and architecture issues
GALE	<ul style="list-style-type: none"> • Documented use case for layer rename defect. • Supported engineering questions on use of map user interface library. • Attended GALE code review meeting. • Began drafting prototype evaluation report.
C2I Enterprise Prototype	<ul style="list-style-type: none"> • Met with Tomahawk Program to discuss scope of effort – actual start of prototype development mid October • Met with GCCS-M program to discuss Water Space Management effort – actual start of prototype beginning of November • Started discussions with Army on Common Viewer effort • DataServices effort will start in October.

The C2I Community Requires Application Ready Data

- **Current Situation**
 - NGA data is in transmittal formats rather than optimized for network centric systems.
 - Users often lack network connectivity/bandwidth to receive updates
 - End users have issues making data immediately usable by mission applications
 - CJMTK provides standard software architecture, but problem has been lack of standard application ready data architecture
 - Individual Programs need to request NGA data and then load into their individual systems
 - Redundant/duplicative effort
 - System Integrators are not geospatial experts
 - Data stored on systems is not necessarily implemented in an optimized manner to take advantage of CJMTK tools

CJMTK Geospatial Appliance (CGA) Features

- **Application Ready Data**
 - Standard NGA Products
 - General Worldwide Coverage Data (ArcGIS Data and Maps)
 - NGA Geonames
- **Preconfigured Content and Applications**
 - Map Documents
 - Layer Files
 - Map Services
- **Data Administration Tools**
 - Update Map Database
 - Replication Tools
 - Administration Tools
- **User Partition (1TB on Deployable, 7 TB on Rack)**

CJMTK Geospatial Appliance Content

Mission/ Scale	Maps	Imagery	Terrain	Vector
Global Base 1:160,000,000- 1:10,000,000	ArcGIS Data and Maps raster	Imagery and Shaded Relief (ArcGIS Data and Maps)	ArcGIS Data and Maps	ArcGIS Data and Maps
Strategic Base 1:10,000,000- 1:1,000,000	CADRg- GNC/JNC, ONC	Imagery and Shaded Relief (ArcGIS Data and Maps)	ArcGIS Data and Maps Elevation Data	VMap 0
Operational Base 1:1,000,000-1:250,000	CADRg- TPC,JOG	Natural View	ArcGIS Data and Maps Elevation Data	VMap 1 DNC
Tactical Base 1:100,000-1:50,000	CADRg- TLM	Natural View	DTED 2	VMap 2 DNC
Urban Base 1:5,000- 1:12,500	City Graphics	CIB 5, 1	None	UVMaP

NOTE: All data is unclassified and NGA data is LIMDIS

CGA Ruggedized Server

Standard System Configuration

- 2x Intel 2.33GHz Quad-Core Xeon, 8MB L2 Cache (1333 FSB)
- 8GB DDR2 FB System Memory, 3.5" 1.44MB Floppy drive
- Internal Slim DVD±RW Drive
- QuadroFX 1500 PCI-e Graphics w/ 256MB and Dual DVI
- Adaptec 29320 U320 SCSI Adapter
- (6) Removable 750GB SATAII Enterprise Raid Ready HDs
- 3.5TB storage in Raid level 5 Array
- IEEE 1394b FireWire 800 Adapter w/ (2) 800 & (1) 400 Ports
- 2X 10/100/1000 Ethernet ports
- (6) High-Speed USB 2.0 Ports
- Microsoft Windows Server 2003 64-bit Standard Edition
- Integrated 20.1" 1600 x 1200 High-Res Color Flat Panel Display
- Quick Release, Ruggedized Backlit Tactical KeyBoard/Touch-Pad
- Corner Shock Protectors, Built-in Dust Filter
- Individual Machined Aluminum Peripheral and I/O doors with gaskets



CGA Rackmount Server

Standard System Configuration

- 2X Intel 2.33GHz Quad-Core Xeon, 8MB L2 Cache (1333 FSB)
- 16GB DDR2 FB System Memory
- Internal Slim DVD-Rom Drive
- Slim 1.44MB floppy Drive
- QuadroFX 1500 PCI-e Graphics w/ 256MB and Dual DVI
- Adaptec 29320 U320 SCSI Adapter
- High Performance SAS/SATAII 16 Ports PCI-e Array Controller
- (16) Removable 750GB SATAII Enterprise Raid Ready HDs
- 10.0 TB storage in Raid level 5 array
- 2X 10/100/1000 Ethernet ports
- IEEE 1394b FireWire 800 Adapter w/ (2) 800 & (1) 400 Ports
- High-Speed USB 2.0 Ports
- Microsoft Windows Server 2003 64-bit Standard Edition

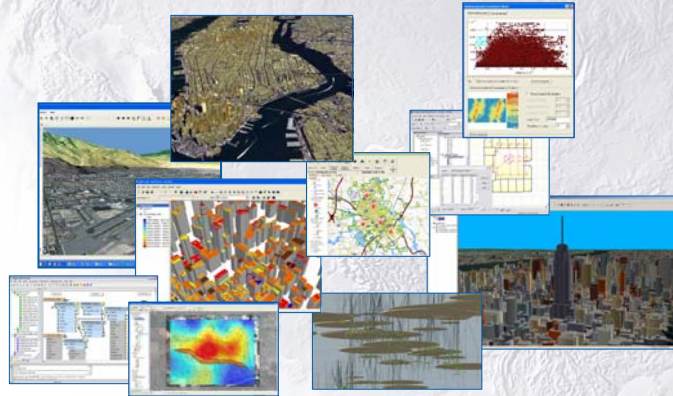


Influencing Future Releases

- The CJMTK Program works with the MCG&I ESG to manage the CJMTK requirements
- Periodic CJMTK requirements calls are initiated by NGA
- The MCG&I representatives gather requirements from their respective services/agencies using the CJMTK web site
- Requirements are reviewed and prioritized by the MCG&I representatives
- Requirements are provided to ESRI for consideration in future releases
- NGA applies available funds to CJMTK for the implementation of new requirements

CJMTK

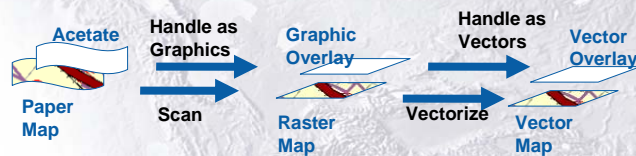
- Five years helping C2I programming teams
- Experience across the services
- Witness to modernization of GIS requirements



Traditional Map Display

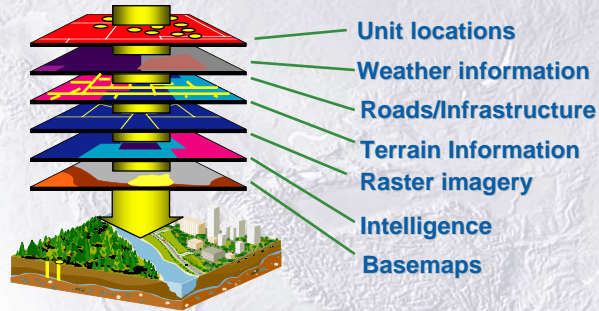
Many older systems divide the display into *map* and *overlays*.

- The map is a base dataset, generally raster, that serves as a canvas on which to display the overlays.
- The overlays are graphical objects that represent tactical objects. They are drawn on top of the map.



Map Display in CJMTK

The CJMTK fuses all available geospatial data, regardless of data type, into a single coherent database that remains independent of the various visualization mechanisms.



www.cjmtk.com

Commercial Joint Mapping Toolkit | Home | Microsoft Internet Explorer provided by Nortrop Corporation

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Others: Submit email to: cmjmtk@jmtk.com

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Latest News

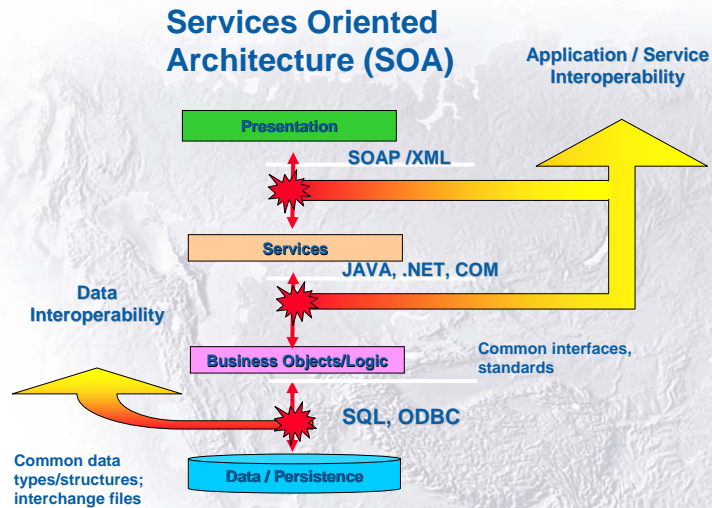
- CPI for Suburbs
Posted: 02/22/2017
- MOX 2.0.2 for Windows
Now available
Posted: 02/22/2017
- New release of CMISG
Available. Patch available
Posted: 02/22/2017
- CMIS Filled Programs
Posted: 02/22/2017
- GeoIT Support for
AVI2T Now available
Posted: 02/22/2017
- Route Management:
Simulations & Geospatial
Services Conference Oct.
18-17
Posted: 01/16/2017
- Geodetic Geometry Tools
ESDA
Posted: 02/22/2017
- Service Pack 3 for 9.2
available
Posted: 02/22/2017

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The Commercial Joint Mapping Toolkit (CJMTK) is under contract to FASIG, a part of Northrop's Geospatial Information Technology, as the prime contractor. Contract Number MNA201-02-C-0014 is managed and funded by the National Geospatial-Intelligence Agency (NGA) for development and full cycle support for over 11 years.

Local Internet

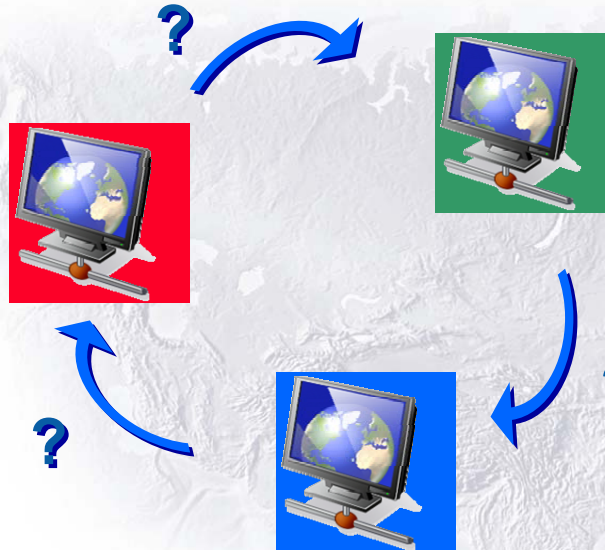
Integration and Interoperability



Netcentricity An Unending Cycle



Netcentricity Without Common Standards - Unrealizable

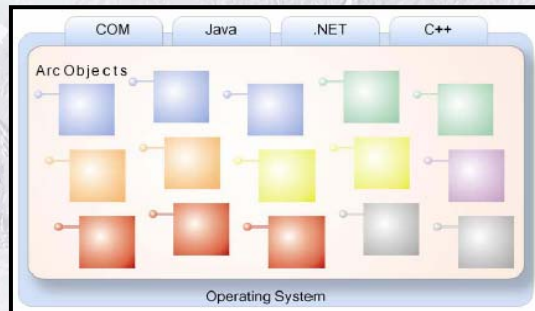


Adherence to Standards

- **Data Standards**
 - VPF
 - RPF
- **Symbology Standards**
 - 2525B
 - Geosym
- **Application Standards**
 - Design Patterns
 - Interface standards
- **Next Generation**
 - XML
 - BML/geoBML

Thousands of ArcObjects

- ArcObjects can be accessed through different APIs
- One set of binaries, multiple APIs
- Access binaries in different ways
 - COM - type libraries
 - .NET - assemblies
 - Java - .jar files
 - C++ - .h files



Standards

Adherence to proven standards provides a low-risk solution to common problems...

And frees you to focus on areas in need of real innovation.

Essentially a retelling of the purpose of the Commercial Joint Mapping Toolkit itself.

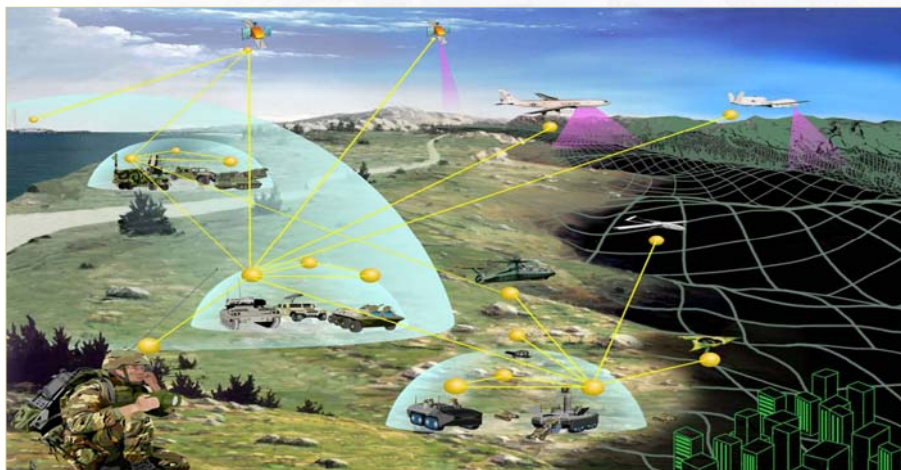


Reenergized community

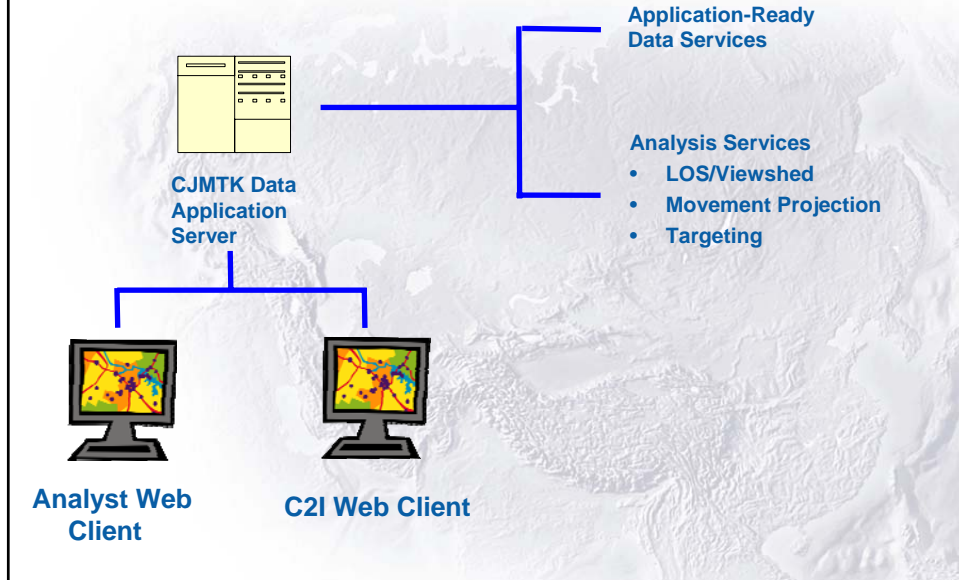
- Maturation of OGC and other standards organizations
- Web service tools and techniques
- New analytical capabilities like those from ERDC



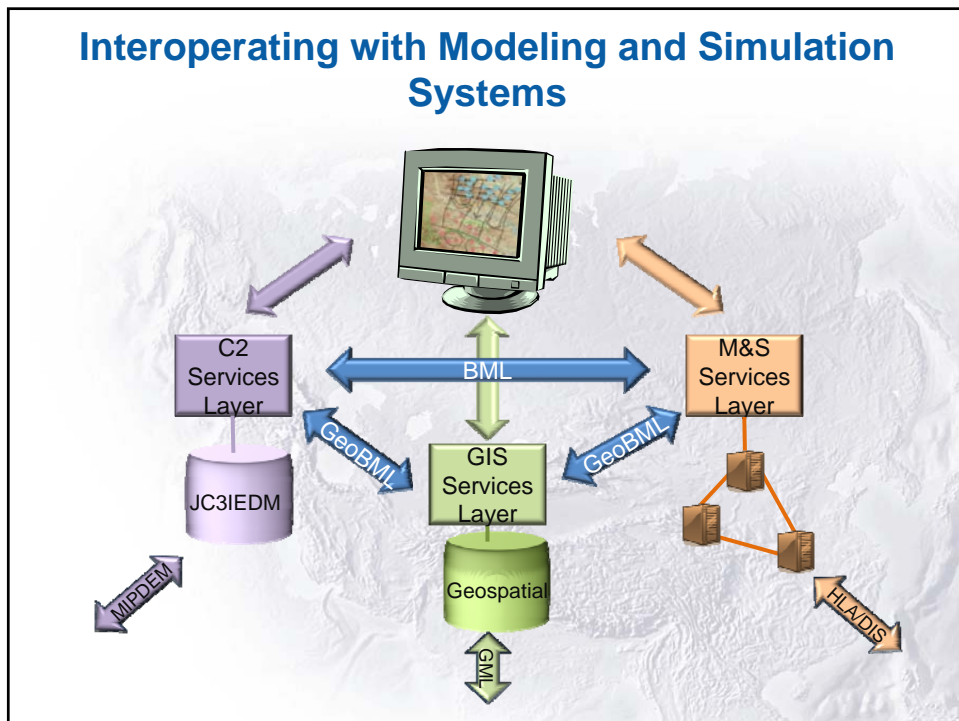
Battlespace Terrain Reasoning and Awareness (BTRA)



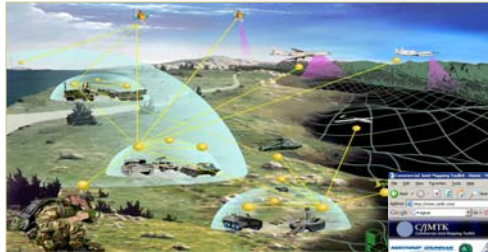
CJMTK at CWID 2007



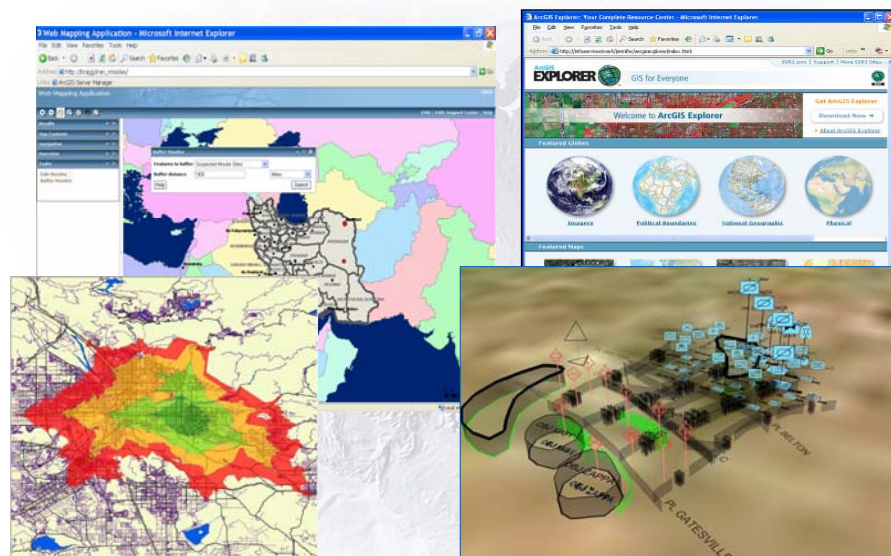
Interoperating with Modeling and Simulation Systems



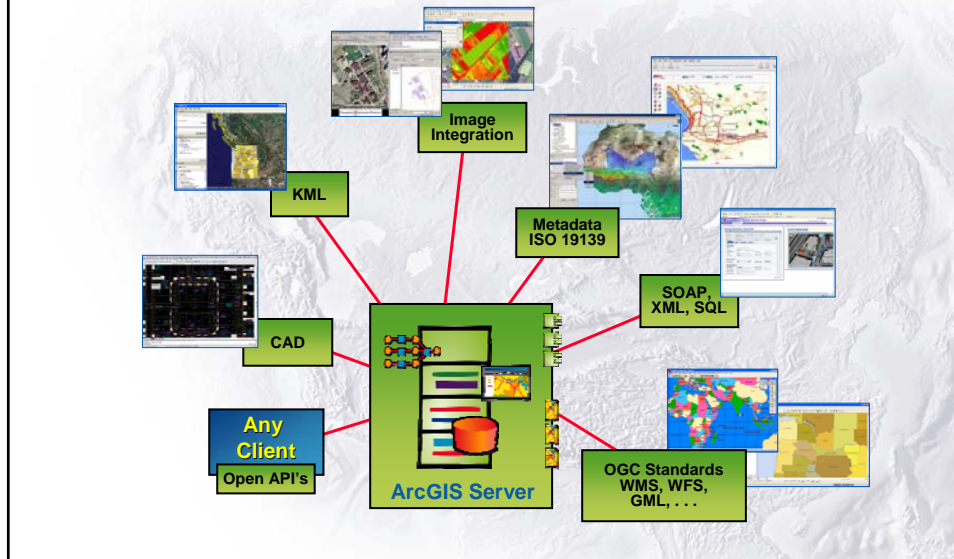
BTRA and CJMTK



CJMTK Case Study



ArcGIS 9.3 and ArcGIS Server



Conclusion

CJMTK and its ethos of adherence to standards has been setting the stage for the next generation of standards – like BML.



We welcome the BML community to our efforts to put the latest GIS capabilities to work in the service of warfighters.