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DoD Modeling and Simulation (M&S) Glossary

January 1998

Under Secretary of Defense for

Acquisition Technology

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FOREWORD

This Manual is issued under the authority of DoD Directive 5000.59, "DoD Modeling and Simulation (M&S) Management," January 4, 1994. Its purpose is to prescribe a uniform glossary of modeling and simulation (M&S) terminology for use throughout the Department of Defense. In addition to the main glossary of terms, this Manual includes a list of M&S-related abbreviations, acronyms, and initials commonly used within the Department of Defense.

This Manual is effective immediately and is mandatory for use by all of the DoD Components. However, it is not a substitute for the Department of Defense Dictionary of Military and Associated Terms (JOINT PUB 1-02), which the Secretary of Defense has directed to be used throughout the Department of Defense.

The provisions of this Manual apply to the Office of the Secretary of Defense (OSD), the Military Departments, the Chairman of the Joint Chief of Staff, the Combatant Commands, the Defense Agencies, and activities administratively supported by OSD (hereafter called "DoD Components").

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PART I

ACRONYMS/ABBREVIATIONS

A

A/D	analog-to-digital
A2ATD	Anti-Armor Advanced Technology Demonstration
Aa	Achieved Availability
AAAS	American Association for the Advancement of Science
AAAV	Advanced Amphibious Assault Vehicle
AAIS	Advanced Airborne Interceptor Simulator
AAL	ATM Adaptation Layer
AAODL	Atmospheric Aerosols and Optics Data Library
AAR	1 - After Action Review 2 - After Action Report
AARS	After Action Review System
AAS	Advanced Automation System
AASP	Army Automation Security Program
AASPEM	Air-to-Air System Performance Evaluation Model
AATD	Army Advanced Technology Demonstration(s)
ABCSIM	Atmospheric, Biological, and Chemical Simulation
ABE	ALSP Broadcast Emulator
ABM	Armor Breakpoint Model
ABS	Advanced Battle Simulation
ABU	Analog Backup
ACAAM	Air Courses of Action Assessment Model
ACAD	Advanced Computer Aided Design
ACALS	Army Computer-aided Acquisition & Logistics Support
ACC	Aegis Computer Center
ACDI	Asynchronous Communications Device Interface
ACEC	Army Communications-Electronics Command (now CECOM)
ACEM	1 - Advanced Campaign Effectiveness Model 2 - Air Combat Evaluation Model
ACETEF	Air Combat Environment Test and Evaluation Facility
ACI	AWSIM CTAPS Interface
ACISD	Advanced Computational and Information Sciences Directorate
ACM	ALSP Common Module
ACMI	Air Combat Maneuvering Instrumentation
ACMS	Air Combat Maneuvering Simulator

ACMT	Automated Configuration Management Tool
ACOE	Army Common Operating Environment
ACPT	Automated Corporate Planning Tool
ACQSIM	Acquisition Simulation
ACR	Advanced Concepts and Requirements
ACS	Access Control System
ACSIT	Aegis Combat System Interactive Trainer
ACT	1 - Advanced Concepts and Technology 2 - ALSP Control Terminal 3 - Architecture Characterization Template
ACTD	Advanced Concept Technology Demonstration
Ada	High Level Computer Programming Language
ADDS	1 - Advanced Data Distribution System 2 - Automated Data Distribution System
ADEPT	Administrative Data Entry for Processing Transmission
ADL	Ada Design Language
ADLP	Advanced Data Link Program
ADM	1 - Acquisition Decision Memorandum 2 - Advanced Development Model 3 - Application Distribution Module
ADMP	Army Data Management Program
ADO	Army Digitization Office
ADP	Automatic Data Processing
ADPA	American Defense Preparedness Association
ADPE	Automatic Data Processing Equipment
ADPSO	Automatic Data Processing Security Officer
ADPSSEP	Automatic Data Processing System Security Enhancement Program
ADPSSO	Automatic Data Processing System Security Officer
ADRG	Arc Digitized Raster Graphics
ADS	1 - Advanced Distributed Simulation 2 - Authoritative Data Source 3 - Automated Data System
ADSI	Advanced Distributed System Interface
ADSIM	Air Defense Simulation
ADSS	1 - Air Defense Simulation System 2 - Army Data Standardization System
ADST	Advanced Distributed Simulation Technology
ADTAM	Air Defense Tanker Analysis Model
ADUA	Administrative Directory User Agent
AESAT	Avionics & Electrical Systems Advanced Trainer
AESOP	Army EMP Simulator Operations
AETS	Airborne Electronic Threat Simulator
AFAM	Advanced Field Artillery Model

AFATDS	Advanced Field Artillery Tactical Data System
AFCENT	Allied Forces Central Europe
AFEWES	Air Force Electronic Warfare Evaluation Simulator
AFIN	Air Force Information Network
AFIT	Air Force Institute of Technology
AFNET	Air Force Network
AFO	Awaiting Further Occurrence
AFOR	Automated Forces
AFS	Advanced Flight Simulator
AFSCN	Air Force Satellite Control Network
AFWG	1 - Acquisition Functional Working Group 2 - Analysis Functional Working Group
AG	Application Gateway
AGCCS	Army Global Command and Control System
AGES	Air to Ground Engagement Simulation
AGIS	Analysis and Gaming Information System
AGRAM	Air-to-Ground Assessment Model
AGRMET	Agricultural Meteorological Model
AHP	Analytic Hierarchical Process
AHPCRC	Army High Performance Computer Research Center
AI	Artificial Intelligence
AI-ESTATE	Artificial Intelligence and Expert System Tie to Automatic Test Equipment
AI2	Advanced Image Intensification
AID	AUTODIN Interface Device
AIN	Advanced Intelligent Network
AIRES	Automated Information Retrieval And Expert System
AirSAF	Air Semi-Automated Forces
AIS	1 - ALSP Infrastructure Software 2 - Automated Information System
AISSAP	Automatic Information System Security Assessment Program
AISSO	Automated Information System Security Officer
AITS	Advance Information Technology Systems
AIU	Advanced Interface Unit
ALARM	Advance Low-Altitude Radar Model
ALBAM	Air Land Battle Assessment Model
ALBE	Air Land Battlefield Environment
ALBM	Air Land Battle Management
ALES	Air Land Engagement Simulation
ALISS	Advanced Lightweight Influence Sweep System
ALM	Airlift Loading Model
ALS	ADA language system
ALSP	Aggregate Level Simulation Protocol
ALWSIM	Army Laser Weapon Simulation

AMASS	ATO Mission Analysis and Simulation System
AMES	Advanced Multiple Environment Simulator
AMG	Architecture Management Group
AMHS	Automated Message Handling System
AMIP	Army Model Improvement Program
AMM	1 - Advanced Missile Model 2 - Army Mobility Model
AMME	Automated Multi-Media Exchange
AMP	Analysis of Mobility Platform
AMPE	Automated Message Processing Exchange
AMPES	Automatic Message Processing Exchange System
AMPS	1 - Association of Modeling, Planning and Simulation 2 - Automated Mission Planning System 3 - Aviation Mission Planning System
AMSAA	Army Materiel Systems Analysis Activity
AMSDL	Acquisition Management Systems and Data Requirements Control List
AMSEC	Army Model and Simulation Executive Council
AMSGOSC	Army Model and Simulation General Officer Steering Council
AMSMC	Army Model and Simulation Master Catalog
AMSMP	Army Modeling and Simulation Management Program
AMSO	Army Model and Simulation Office
AMSS	Ammunition Management Standard System
ANDF	1 - Application Neutral Data Format 2 - Architecture Neutral Distribution Format
ANM	Automated Network Manager
ANN	Artificial Neural Networks
ANS	Artificial Neural Systems
ANSI	American National Standards Institute
A_o	Operational Availability
AoA	Analysis of Alternatives
APHIDS	Advanced Panoramic Helmet Interface Demonstrator System
API	1 - Application Programmer's Initiative 2 - Application Program Interface
APIU	Adaptable Programmable Interface Unit
APM	Advanced Penetration Model
APMM	Activity Planning and Management Model
APMIS	Automated Program Management Information System
APP	Application Portability Profile
APS	Asynchronous Protocol Specification
APSE	ADA Programming Support Environment
ARES	1 - Advanced Regional Exploratory System

	2 - Advanced Research Electromagnetic Simulator
ARGUS	Advanced Realtime Gaming Universal Simulation
ARI	Army Research Institute (for the Behavioral and Social Sciences)
ARIEM	Army Research Institute of Environmental Medicine
ARIES	Automated Real-Time Instrumented Experimentation System
ARTBASS	Army Tactical Battlefield Simulation System
ARTDT	Advanced Real-Time Data Tool
ARTE	Ada Run Time Environment
ASBAT	Air/Sea Battle Model
ASC	1 - Advanced Simulation Center 2 - Aeronautical Systems Center (Air Force) 3 - American Standards Committee
ASCIET	All-Service Combat Identification Evaluation Team
ASCII	American Standard Code for Information Interchange
ASCM	Advanced Space Computing Module
ASD	Assistant Secretary of Defense
ASD(C3I)	Assistant Secretary of Defense for Command, Control, Communications and Intelligence
ASEM	Anti-Satellite (ASAT) Engagement Model
ASIC	Application-Specific Integrated Circuit
ASIS	Ada Semantic Interface Specification
ASME	American Society of Mechanical Engineers
ASN	1 - Abstract Syntax Notation 2 - Assistant Secretary of the Navy
ASPT	Advanced Simulator for Pilot Training
ASSIST	Acquisition Streamlining and Standardization Information System
ASTC	Advanced Simulation Technology Center
ASTO	Advanced Systems Technology Office
ASTT	Advanced Simulation Technology Thrust
ATASS	Adaptive Training, Analysis, and Simulation System
ATB	Analytical Tool Box
ATCAL	Attrition Model Using Calibrated Parameters
ATD	Advanced Technology Demonstration
ATDL	1 - Army Tactical Data Link 2 - Automated Tactical Data Link
ATDL-1	Army Tactical Data Link-One
ATE	Automatic Test Equipment
ATEMS	Advanced Threat Emitter Simulator
ATEWES	Advanced Tactical Electronic Warfare Environment Simulator
ATF	Advanced Tactical Fighter
ATFM&S	Acquisition Task Force on Modeling and Simulation

ATM	Asynchronous Transfer Mode
ATO	Air Tasking Order
ATR	Automatic Target Recognition
ATRJ	1 - Advanced Tactical Radar Jammer 2 - Advanced Threat Radar Jammer
ATS	1 - Advanced Threat Simulator 2 - Automatic Telecommunication System 3 - Automated Tracking System
ATTD	Advanced Technology Transition Demonstration
ATV	ALSP (Aggregate Level Simulation Protocol) Translator Validator
ATVSS	Automatic Tracking and (with) Video Scene Simulation System
AU	Access Unit
AURA	Army Unit Resiliency Analysis Model
AUT	Application Under Test
AUTODIN	Automatic Digital Network
AVCATT	Aviation Combined Arms Tactical Trainer (virtual simulator)
AVO	ADA Validation Office, part of AJPO
AWACS	Airborne Warning and Control System
AWD	1 - Advanced Warfighting Demonstration 2 - Alternate World Database
AWE	1 - Advanced Warfighting Experiment 2 - Area Weapons Effects
AWESS	Automatic Weapon Effect Signature Simulator
AWIPS	Advanced Weather Interactive Processing System
AWIS	Army World-Wide Information Systems
AWSIM	Air Warfare Simulation
AWSIM-R	Air Warfare Simulation-Reengineered

B

BADD	Battlefield Awareness and Data Dissemination
BASEWAM	Battlefield Surveillance Electronic Warfare Analysis Model
BASOPS	Base Operating Information System
BATTS	Basic Air Tactics Trainer
BAUD	Characters Xmitted/sec Serially From a Computer
BBN	Broad Band Noise
BBS	1 - Brigade/Battalion Simulation 2 - Bulletin Board System
BCBL	Battle Command Battle Lab
BCC	Base Communications-Computer Center
BCCS	Battlefield Command and Control System
BCOM	Battalion Combat Outcome Model
BCS	Battery Computer System
BDS	Battlefield Distributed Simulation
BDS-D	Battlefield Distributed Simulation - Developmental
BEES	Battlefield Environmental Effects Software
BER	1 - Basic Encoding Rules 2 - Basic Error Rate 3 - Bit Error Rate
BERT	Bit-Error-Rate Test
BES	Background Environment Simulator
BEWSS	Battlefield Environment Weapon System Simulation
BFA	Battlefield Functional Area
BFIT	Battle Force In-port Trainer
BFM	Battlefield Forecast Model
BFTT	Battle Force Tactical Trainer (naval virtual simulator)
BG	Battle Group
BGEM	Battle Group Effectiveness Model
BIA	Battlefield Information Architecture
BICES	Battlefield Information Collection & Exploitation System
BICM	Battlefield Intelligence Collection Model
BIS	1 - Battlespace Information System 2 - Built-in Simulation
BISDN	Binary Integrated Services Digital Network
BIT	Built-In Test
BITE	Built-in-Test Equipment
BLC	Base Level Computing

BLCI	Base Level Communication Infrastructure
BLDM	Battalion Level Differential Model
BLERT	Block-Error-Rate Test
BLII	Base Level Information Infrastructure
BLOB	Binary Large Object
BLRSI	Battle Lab Reconfigurable Simulator Initiative
BLRSIM	Battle Lab Reconfigurable Simulator
BLSM II	Base Level System Modernization Phase II (See GCCS-AF)
BM	Battlespace Management
BMC3	Battle Management, Command, Control, and Communications
BMDES	Ballistic Missile Defense Engagement Simulation
BMDO	Ballistic Missile Defense Organization
BMTA	Backbone Message Transfer Agent
BODAS	Brigade Operations Display and AAR System
BODESIM	Barrier/Obstacle Deployment and Effectiveness Simulation
BOS	1 - Battlefield Operating System 2 - Basic Operating System
BOSM	Balance of Sustainment Model
BOSS	Binary Object Storage System
bps	Bits Per Second
BPS	Battlefield Planning System
BRACE	Base Resource and Capability Estimator
BRIDGESIM	Bridge Simulator
BSC	Battle Simulation Center
BST	Basic Skills Trainer
BT	Behavioral Taxonomy
BTA	Best Technical Approach
BUCS	Back-up computer system
BULLET	Battalion/Unit Level Logistics Evaluation Tool
BV	Battlefield Visualization
BW	Bandwidth

C

C-CS	Communications-Computer Systems
C2	Command and Control
C2I	Command, Control, and Intelligence
C2IPS	Command and Control Information Processing System
C2IS	C2 Information Systems
C2W	Command and Control Warfare
C3	Command, Control, and Communications
C3CM	Command, Control and Communications Countermeasures
C3I	Command, Control, Communications, and Intelligence
C3I/IS	C3I/Information Systems
C3S	C3 Systems
C3ISR	Command, Control, Communications, Intelligence, Surveillance, and Reconnaissance
C4	Command, Control, Communications, and Computers
C4I	Command, Control, Communications, Computers and Intelligence
C4I2	Command, Control, Communications, Computers, and Intelligence Integration
C4IFTW	C4I for the Warrior
C4ISR	Command, Control, Communications and Computer Intelligence, Surveillance and Reconnaissance
C4SMP	C4 System Master Plan
CAA	U.S. Army Concepts Analysis Agency
CAAM	Composite Area Analysis Model
CAAN	Combined Arms Assessment Network
CACE	Computer-Aided Cost Estimating
CACEAS	Computer-Assisted Circuit Engineering and Allocating System
CACTIS	Community Automated Counter-Terrorism Intelligence System
CAD	Computer-Aided Design
CAD/CAM	Computer Aided Design/Computer Aided Manufacturing
CADD	Computer Aided Design and Drafting
CADDS	Computer Aided Design and Drafting System
CADE	Computer-Aided Design Equipment
CADEX	Computer Adjunct Data Evaluator - X
CADIS	Communication Architecture for Distributed Interactive Simulation
CADMAT	Computer-Aided Design, Manufacture and Test

CADS	Computer-Assisted Display System
CAE	1 - Common Application Environment 2 - Component Acquisition Executive 3 - Computer Aided Engineering 4 - Computer Aided Exercise
CAESAR	Computer-Aided Exploration of Synthetic Aperture Radar
CAETI	Computer-Aided Education and Training Initiative
CAFMS	Computer Assisted Force Management System
CAI	Computer Aided Instruction
CAINES	Computer Assisted Instructional Evaluation System (AF Academy model)
CAIV	Cost As An Independent Variable
CAL	Computer Aided Learning
CALOW	Contingency/Limited Objective Warfare
CALS	1 - Computer Aided Acquisition and Logistics Support 2 - Continuous Acquisition and Life-cycle Support
CAM	1 - Civil Affairs Model 2 - Computer Aided Manufacturing
CAMAC	Computer-Aided Measurement and Control
CAMD	Computer Assisted Molecular Design
CAMDSS	Common Architecture for Model Development and Simulation Support
CAMEO	Computer Aided Management of Emergency Operations
CAMERA	Computational Algorithm for Missile Exhaust Radiation
CAMEX	Computer-Assisted Map Exercise
CAMMS	Condensed Army Mobility Model System
CAMPS	Computer Aided Mission Planning System
CAPE	Computer Aided Project Engineering
CAPP	Computer-Aided Process Plan
CAPS	1 - Computer-Aided Paperless System 2 - Contingency Analysis Planning System
CARD	Computer-Aided Remote Driving
CARDS	1 - Catalog of Approved Requirements Documents (Army) 2 - Central Archive for Reusable Defense Software 3 - Comprehensive Approach to Reusable Defense Software
CARE	Computer Assistance Resource Exchange
CARES	Cratering and Related Effects Simulation
CASDM	Common Approach to Software Development and Maintenance
CASE	1 - Computer Aided Software Engineering

	2 - Computer Assisted Software Engineering
	3 - Computer-Assisted Systems Engineering
CASES	1 - Capabilities Assessment Expert System
	2 - Contingency Assessment Simulation and Evaluation System
CASMO	Combat Analysis Sustainability Model
CASP	Computer Assisted Search Planning
CASS	Consolidated Automated Support System
CAST	Computer-Aided Software Testing
CASTFOREM	Combined Arms and Support Task Force Evaluation Model
CASTFOREM-DIS	Combined Arms and Support Task Force Evaluation Model with DIS
CATIA	Computer-Aided Three Dimensional Interactive Application
CATIS	1 - Computer-Aided Tactical Information System
	2 - Computer-Assisted Tactical Information System
CATT	Combined Arms Tactical Trainer
CAU	Cell Adapter Unit
CAX	1 - Combined Arms Exercise
	2 - Computer Aided Exercise
	3 - Computer Assisted Exercise (NATO)
CBAM	Combat Base Assessment Model
CBI	Computer Based Instruction
CBITS	Computer Based Instructional Training System
CBL	Computer Based Learning
CBR	Constant Bit Rate
CBS	Corps Battle Simulation
CBS-ATCCS	Corps Battle Simulation - Army Tactical Command and Control System Interface
CBT	Computer Based Training
Cbt STTAR	Combat Synthetic Test and Training Assessment Range
CCB	Configuration Control Board
CCBD	Configuration Control Board Directives
CCEB	Combined Communications-Electronics Board
CCF	Central Computer Facility
CCH	Computer-Controlled Hostiles
CCIB	Command and Control Interoperability Board
CCIS	1 - Command and Control Information System
	2 - Command, Control and Intelligence System (NATO)
CCOMEN	Conventional Collateral Mission Effectiveness Model
CCSIL	Command and Control Simulation Interface Language
CCSP	Consolidated Computer Security Program
CCTB	Close Combat Test Bed
CCTT	Close Combat Tactical Trainer

CCU	Computer Control Unit
CD-R	Compact Disk - Recordable
CD-ROM	Compact Disk - Read Only Memory
CD-V	Compact Disk - Video
CD-WO	Compact Disk - Write Once
CDA	1 - Central Design Activity
	2 - Cognitive Decision Aids
CDAd	Component Data Administrator
CDB	Common Data Base
CDD	Common Data Dictionary
CDDI	Copper Distributed Data Interface
CDE	Common Desktop Environment
CDI	Compact Disk Interactive
CDIN	CONUS Defense Integrated Network
CDP	Classified Data Processing
CDRL	Contract Data Requirements List
CDS	Congressional Data Sheets
CDU	Control Display Unit
CE	Command Entity
CECOM	U.S. Army Communications-Electronics Command
CEESIM	Combat Electromagnetic Environment Simulator
CEM	Concepts Evaluation Model
CERS	Combat Environment Realism System
CERT	Computer Emergency Response Team
CES	Cognitive Environment Simulator
CET	Computers and Electronic Technology
CEWI	Communications Electronic Warfare Intelligence
CFAW	Contingency Force Analysis War Game
CFDB	Conventional Forces Database
CFE	1 - Center for Engineering
	2 - Contractor Furnished Equipment
	3 - Conventional Forces in Europe
CFII	Center for Integration and Interoperability
CFOR	Command Forces
CGF	Computer Generated Forces
CGI	1 - Computer Generated Imagery
	2 - Computer Graphics Interface
CGM	Computer Graphics Metafile
CHANCES	Climatological and Historical Analysis of Cloud for Environmental Simulations
CHAS	Chemical Hazard Assessment System
CHS	Common Hardware/Software
CI	Configuration Item
CIC	Combat in Cities
CICS	Customer Information Control System

CIDS	Computerized Information Delivery Service
CIE	Computer Integrated Engineering
CIE-PAT	Computer Integrated Engineering-Process Action Team
CIG	1 - Computer Image Generation 2 - Computer Image Generator
CIITA	Computer Improved Instructor's Training Aid
CIM	1 - Computer Integrated Manufacturing 2 - Corporate Information Management
CIM/EI	Corporate Information Management/Enterprise Integration
CIMNET	Center for Information Management Network
CIMP	1 - Cartographic Imaging Modeling Program 2 - Corporate Information Management Plan
CIP	1 - Capital Investment Plan 2 - Combat Information Processor 3 - Combined Interoperability Program
CIRIS	Completely Integrated reference Instrumentation System
CIRRUS	Clouds, IR, Real, for Use in Simulations
CIS	1 - CASE Integration Services 2 - Combat Instruction Set 3 - Command Information System
CISC	Complex Instruction Set Computer
CISS	Center for Information Systems Security
CITS	Combat Information Transport System
CIU	Cell Interface Unit
CIWG	Communications Interoperability Working Group
CL	Closed Loop
CLA	Conventional Land Attack
CLAP	C++ Library Actor Programming
CLCGF	Corps Level Computer Generated Forces
CLCGF-HS	Corps Level Computer Generated Forces-Hybrid State
CLD	Center Line Data
CLDGEN	Cloud Scene Generator
CLDSIM	Cloud Simulation
CLEAR	Campaign Logistics Expenditure And Replenishment Model
CLNP	Connectionless Network Protocol
CLNS	Connectionless Network Service
CM	Configuration Management
CMAS	Crisis Management ADP System
CMASS	Counterdrug Modeling and Simulation System
CMI	Computer Managed Instruction
CMIP	Common Management Information Protocol
CMIS/P	Common Management Information Services & Protocols

CMMS	Conceptual Model of the Mission Space
CMP	Configuration Management Plan
CMR	Common Model Repository
CMS	Combat Mission Simulator
CMT	Confederation Management Tool
CMTC	Combat Maneuver Training Center
CMTC-IS	Combat Maneuver Training Center-Instrumented Systems
CMUES	Campaign Model Utilizing Environmental Simulator
CMWG	Configuration Management Working Group
CN	Communications Network
CAN	Computer Network Attack
CNAD	Conference of National Armament Directors (NATO)
CNC	Communications Network Control
CNMS	Consolidated Network Management System
COADS	Comprehensive Ocean Atmosphere Data Set
COAST	Course of Action Selection Tool
COBOL	Common Business Oriented Language
COBRA	Combat Outcome Based on Rules of Attrition
COE	Common Operating Environment
COEA	Cost and Operational Effectiveness Analysis (replaced by the term AOA)
COLD	Computer Output to Laser Disk
COM	Computer Output Microform
COMBIC	Combined Obscurant Model for Battlefield-Induced Contaminants
COMBIC/STATIC	Combined Obscuration Model for Battlefield Induced Contaminants/Statistical Texturing Applied to Battlefield Induced Contaminants
COMINT	Communications Intelligence
COMNET	Communications Network
COMPASS	Common Operational Modeling, Planning, and Simulation Strategy
COMPUSEC	Computer Security
COMSAT	Communications Satellite
COMSEC	Communications Security
CONMOD	Conflict Model
CORBA	Common Object Request Broker Architecture
CORBAN	Corps Battle Analyzer
CORDIVEM	Corps/Division Evaluation Model
Corn	Computer Resource Nucleus
COSAGE	Combat Sample Generator
COSE	Common Open Software Environment
COTS	Commercial Off The Shelf
COVART	Computation of Vulnerable Area and Repair Time

CPCI	Computer Program Configuration Item
CPIPT	Cost/Performance Integrated Process Team
CPM	Critical Path Method
CPU	Central Processing Unit
CRB	Configuration Review Board
CRLCMP	Computer Resource Life Cycle Management Plan
CRMP	Computer Resources Management Plan
CROSSBOW-S	Construction of a Radar to Operationally Simulate Signals Believed to Originate Within the Soviet Union
CRT	Cathode Ray Tube
CRWG	Computer Resource Working Group
CS	Constraint Set
CSC	Computer Software Component
CSCI	Computer Software Configuration Item
CSE	Common Support Equipment
CSERIAC	Crew System Ergonomics Information Analysis Center
CSIDS	CENTCOM/SOCOM Integrated Data System
CSII	Center for Systems Interoperability and Integration
CSL	Computer Systems Laboratory (part of NIST)
CSM	Computer Software Module
CSP	Communications Service Processor
CSPEI	Computer Software Product End Item
CSPM	Communication System Performance Model
CSRDF	Army Crew Station Research and Development Facility
CSS	Communications Support System
CSSBL	Combat Service Support Battle Lab
CSSCS	Combat Service Support Computer System
CSSFAM	Combat Service Support Functional Area Model
CSSM	Cloud Scene Simulation Model
CSSTSS	1 - Combat Service Support Tactical Simulation System 2 - Combat Service Support Training Simulation System
CSU	Computer Software Unit
CT	Computer Tomography
CTAPS	1 - Contingency Tactical Air Planning System 2 - Contingency Theater Automated Planning System
CTC	Critical Technical Characteristics
CTE	Center for Test and Evaluation
CTEIP	Central Test And Evaluation Investment Program
CTF	Common Technical Framework
CTIS	1 - Combat Terrain Information System 2 - Command Tactical Information System
CTLS	Concurrent Theater Level Simulation

CTOS	Convergent Technologies Operating Systems
CUTM	Computer Understandable Terrain Model
CVAT	Combat Vehical Appended Trainer
CVF	Compressed Volume File
CVGA	Color Video Graphics Array
CVIT	Combat Vehicle Institutional Trainer
CVSA	Combat Vehicle Simulation Architecture
CVTS	Combat Vehicle Training System
CWASAR	Cruise Weapon Analysis Simulation and Research
CWIC	CTAPS Wargame Interface Control
CWM	Composite Warfare Model

D

D/A	digital-to-analog
DAB	Defense Acquisition Board
DACS	1 - Data and Analysis Center for Software 2 - Digital Access and Cross-Connect System
DAd	Data Administrator
DAdm	Data Administration
DADS	Dynamic Analysis and Design System
DAE	Defense Acquisition Executive
DAES	Defense Acquisition Executive Summary
DAG	1 - Data Analysis Group 2 - Data Authentication Group
DAI	Distributed Artificial Intelligence
DAISY	Defense Automated Information System
DAMIS	Defense Analysis and Management Information System
DAP	1 - Data Access Protocol 2 - Data Administration Program 3 - Directory Access Protocol
DAPG	Data Analysis Programming Group
DAPM	1 - Data Administration Program Manager 2 - Domain Analysis Process Model
DAPMO	Data Administration Program Management Office
DAPS	Data Acquisition and Processing System
DARIC	Defense Automation Resources Information Center
DARMP	Defense Automation Resources Management Program
DARPA	Defense Advanced Research Projects Agency
DASD	1 - Direct Access Storage Device 2 - Deputy Assistant Secretary of Defense
DASD(IM)	Deputy Assistant Secretary of Defense for Information Management
DASP	Data Administration Strategic Plan
DASS	Digital Acoustic Sensor Simulator
DATS	Data Automated Tower Simulator
DAU	Data Acquisition Unit
DAWN	Defense Attache Worldwide Network
db	Decibel
DB	Database
DBA	1 - Design-based Analysis 2 - Dominant Battlespace Awareness
DBAd	Data Base Administrator
DBAdm	Data Base Administration

DBD	Data Base Document
DBK	Dominant Battlespace Knowledge
DBMS	Data Base Management System
DBOF	Defense Business Operations Fund
DCA	1 - Data Collection and Analysis
	2 - Defense Communications Agency (now DISA)
DCAC	Digital Concepts Analysis Center
DCE	Distributed Computing Environment
DCI	1 - Data Communication Interface
	2 - Director for Central Intelligence
DCID	Director for Central Intelligence Directive
DCN	Defense Communications Network
DCP	1 - Decision Coordinating Paper
	2 - Distributed Collaborative Planning
DCPDS	Defense Civilian Personnel Data System
DCPS	Data Communications Protocol Standards
DCT	1 - Desktop Computer Terminal
	2 - Digital Communication Terminal
DCTN	Defense Commercial Telephone Network
DCW	Digital Chart of the World
DD/DS	Data Dictionary/Directory System
DDA	Domain Defined Attribute
DDARS	Distributed Data Archive and Retrieval System
DDBMS	Distributed Database Management System
DDDS	Defense Data Directory System
DDI	Director of Defense Information
DDL	Data Definition Language
DDM	Distributed Data Management
DDN	Defense Data Network
DDR	DoD Data Repository
DDR&E	Director of Defense Research and Engineering
DDS	1 - Digital Data Service
	2 - Direct Digital Synthesizer
	3 - Distributed Data System
	4 - Distributed Defense Simulation
DDSS	Distributed Defense Simulation System
DE	Data Engineering
DEA	Data Exchange Agreement
DECA	Digital Electronic Control Assembly
DED	Data Extraction Device
DEEM	Dynamic Environmental Effects Model
DEF	Data Exchange Format
DELTA	Data Element Tool-Based Analysis
DEM	Digital Elevation Model
DES	1 - Data Encryption Standard

	2 - Digital Encryption Standard
DESCEM	Dynamic Electromagnetic Systems Combat Effectiveness Model
DESP	Data Element Standardization Program
DET	Dynamic Environment and Terrain
DEWCOM	Divisional Electronic Warfare Combat Model
DEXES	Deployable Exercise System
DFAD	Digital Features Analysis Data
DFARS	Defense Federal Acquisition Regulation Supplement
DFMS	Data File Management System
DFOM	Derived Federation Object Model
DFSAM	Direct Fire Stand-Alone Model
DGCC	Defense Information Systems Agency Global Control Center
DGDEM	Dynamic Generalized Digital Environmental Model
DGIS	Direct Graphics Interface Standard
DGIWG	Digital Geographic Information Working Group
DGSA	Defense Goal Security Architecture
DGTS	Dynamic Ground Target Simulator
DHIS	Distributed Heterogeneous Information Systems
DI	1 - Date Integrity
	2 - Dismounted Infantry
DIAL	Distributed Intelligent Architecture for Logistics
DIB	1 - Defense Information Base
	2 - Directory Information Base
DICE	1 - DARPA Initiative for Concurrent Engineering
	2 - Distributed Interactive C3I Effectiveness Simulation Project
DID	1 - Data Item Description
DID	2 - Digital Interface Device
DIDHS	Deployed Intelligence Data Handling System
DIDOP	Digital Image Data Output Product
DIF	Data Interchange Format
DIGEST	Digital Geographic Information Exchange Standard
DII	Defense Information Infrastructure
DIICC	Defense Information Infrastructure Control Concept
DIM	Director of Information Management
DIME	Digital Integrated Modeling Environment
DIRSP	Dynamic Infrared Scene Projector
DIS	1 - Defense Information System
	2 - Distributed Interactive Simulations
DISA	Defense Information Systems Agency
DISA/CI	Defense Information Systems Agency/Center for Information
DISA-IS	DISA Information System

DISANet	DISA Information Network
DISC	Defense Information System Council
DISC4	Director of Information Systems Command, Control, Communications, and Computers
DISN	Defense Information Systems Network
DISP	Directory Information Shadowing Protocol
DISS	Distributed Interactive Simulation and Stimulation
DISSIT	Distributed Interactive Simulation Synthesis with Interactive Television
DISSP	Defense Information System Security Program
DIST	Defense Integration Support Tool
DISTAR	Distributed Interactive Simulation Technologies in After Action Review
DIST-EAGLE	Distributed Interactive System for Eagle
DITPRO	Defense Information Technical Procurement Office
DIVE	Dismounted Infantry in a Virtual Environment
DKP	Distributed Knowledge Processing
DL	1 - Data Link 2 - Distance Learning
DLI	Data Link Interface
DLMS	Digital Land Mass System
DLPS	Data Links Processor System
DMAP	Data Management and Analysis Plan
DMD	Digital Message Device
DME	1 - Distributed Management Environment 2 - Distance Measuring Equipment
DMF	Data Management Facility
DMG	Digital Map Generator
DMGMP	Data Base Generation/Modification Program
DMS	1 - Defense Message System 2 - Digital Modeling and Simulation 3 - Distributed Models and Simulations
DMSCC	Defense Modeling and Simulation Coordination Center
DMSI	Defense Modeling and Simulation Initiative
DMSIS	Defense Modeling and Simulation Information System
DMSO	Defense Modeling and Simulation Office
DMSP	Defense Message System Program
DMSTTIAC	Defense Modeling, Simulation, and Tactical Technology Information Analysis Center
DNSIX	DoDIIS Network Security for Information Exchange
DNVT	Digital Non-Secure Voice Telephone
DoDCSEC	DoD Computer Security Evaluation Center
DoDIIS	DoD Intelligence Information System
DoDISS	DoD Index of Specifications and Standards
DoDMSEA	DoD M&S Executive Agent

DOE	Distributed Object Environment
DOF	Degrees of Freedom
DOIM	Directors of Information Management
DOMF	Distributed Object Management Facility
DONMSMO	Department of the Navy, Modeling and Simulation Managagement Office
DONMSTSG	Department of the Navy Modeling and Simulation Technical Support Group
DOORS	Demonstration of Dynamic Object Oriented Requirements System
DOS	Disk Operating System
DOT	Distributed Object Technologies
DOTBF	Digitization of the Battlefield
DOW	Day of the Week
DP	Data Processing
DPA	1 - Defense Production Act 2 - Demand Protocol Architecture
DPDB	Digital Product Data Base
DPI	Data Processing Installation
DPPDB	Digital Point Positioning Database
DPS	Digital Production System
DR	1 - Data Repositories 2 - Dead Reckoning
DRAM	Dynamic Random Access Memory
DRDA	Distributed Relational Data Base Architecture
DREN	Defense Research and Engineering Network
DRFM	Digital RF Memory
DRLMS	Digital Radar Landmass Simulator
DRN	Data Representation Notation
DRRB	Data Requirements Review Board
DRTWG	Data and Repositories Technology Working Group
DRU	Data Retrieval Unit
DQ	Data Quality
DS	1 - Data Security 2 - Digital Signal 3 - Direct Support
DSA	1 - Directory System Agent 2 - Distribution Systems Analyzer
DSAMS	Defense Security Assistance Management System
DSB	Defense Science Board
DSCS	Defense Satellite Communications System
DSE	1 - Data Storage Equipment 2 - Dynamic Synthetic Environments
DSF	Display Simulation Facility
DSI	Defense Simulation Internet

DSMAC	Digital Scene Matching Area Correlator
DSMC	Defense Systems Management College
DSN	Defense Switching Network [formerly Autovon]
DSP	Digital Signal Processing
DSREDS	Digital Storage and Retrieval Engineering Data System
DSRS	Defense Software Repository System
DSS	1 - Decision Support System 2 - Distribution Standard System 3 - Digital Signature Standard
DSSA	Domain-Specific Software Architecture
DSSCS	Defense Special Security Communications System
DSSE	Developmental Software Support Environment
DSSEP	Developmental Software Support Environment Plan
DSU	1 - Data Service Units 2 - Digital Signal Unit
DSVT	Digital Secure Voice Terminal
DTAD	Digital Terrain Analysis Data
DTAMS	Digital Terrain Analysis Mapping System
DTAP	Defense Technology Area Plan
DTD	Data Transfer Device
DTE/DCE	Data Terminal Equipment/Data Circuit-Terminating Equipment
DTED	Digital Terrain Elevation Data
DTIC	Defense Technical Information Center
DTLOMS	Doctrine, Training, Leader Development, Organization, Materiel and Soldier
DTLS	Distributed Theater Level Simulation
DTM	1 - Data Transfer Module 2 - Digital Terrain Matrix
DTMP	Data Communications Protocol Standards Technical Management Plan
DTOP	Digital Topographic Data
DTS	1 - Data Terminal Set 2 - Digital Terrain System
DTSE&E	Director, Test, Systems Engineering and Evaluation
DVW	Dynamic Virtual Worlds
DWS	Distributed Wargaming System

E

E-MAIL	Electronic Mail
E-R	Entity-Relationship Model
E2DIS	Environmental Effects for Distributed Interactive Simulation
E3	1 - Electromagnetic Environmental Effects 2 - End-To-End Encryption
E3SM	Electromagnetic Environmental Effects and Spectrum Management
EA	1 - Environmental Assessment 2 - Evaluation Authority 3 - Evolutionary Acquisition 4 - Executive Agent
EAC	Echelon Above Corps
EAD	Executive Agent Developer
EADSIM	Extended Air Defense Simulation
EADTB	Extended Air Defense Test Bed
EAGLE	U. S. Army Corps-Division Combat Model
EAROM	Electrically Alterable Read Only Memory
EBB	Electronic Bulletin Board
EBBS	Electronic Bulletin Board System
EBCDIC	Extended Binary Coded Decimal Interchange Code
EBM	Entity Based Model
EC/EDI	Electronic Commerce/Electronic Data Interchange
EC	Electronic Combat
ECCM	Electronic Counter Countermeasures
ECDES	Electronic Combat Digital Evaluation Simulation
ECDIS	Electronic Chart Display and Information System
ECESL	Electronic Combat Evaluation and Simulation Laboratory
ECM/EOCM	Electronic Countermeasures/Electro-Optical Countermeasures
ECM	Electronic Countermeasures
ECSRL	Electronic Combat Simulation Research Laboratory
EDECSIM	Extended Directed Energy Combat Simulation
EDI	1 - Electronic Data Interchange 2 - Electronic Document Interchange
EDIF	Electronic Document Interchange Format
EDIFACT	Electronic Data Interchange for Administration, Commerce, and Transportation
EDIM	Enhanced Diagnostic Inference Model

EDM	1 - Electronic Document Management Program
	2 - Engineering Development Model
EDP	1 - Electronic Data Processing
	2 - ELINT Data Processor
EEAT	Environmental Effects Architecture Toolkit
EEI	External Environment Interface
EEM	Environmental Event Modeler
EEPROM	Electrically Erasable/Programmable Read Only Memory
EGA	Enhanced Graphics Adapter
EGM	Earth Gravity Model
EHP	Entity Handover Protocol
EKMS	Electronic Key Management System
ELINT	Electronic Intelligence
ELIST	Enhanced Logistics Intratheater Support Tool
ELMC	Electronics Maintenance Company Model
EM	Electro-magnetic
EMA	Electronic Messaging Association
EMB	Extended Memory Block
EMD	Engineering and Manufacturing Development
EMIS	Environmental Management Information System
EMP	Electromagnetic Pulse
EMPRESS	EMP Radiation Environment Simulator for Ships
EMPRS	Electronic Military Personnel Records System
EMS	Engineering Modeling Software
ENIAC	Electronic Numerical Integrator and Computer
ENSOP	Environmental/Nuclear Simulation Oversight Panel
ENWGS	Enhanced Naval Warfare Gaming System
EO	Electro-Optical
EOB	Electronic Order of Battle
EOC	End of Conversion
EOD	Erasable Optical Disk
EOF	End of File
EOI	End of Identity
EOJ	End of Job
EOSAEL	Electro-Optical Systems Atmospheric Effects Library
EOSDIS	Earth Observing System Data and Information System
EOSS	Electro-Optical Simulation System
EOTDA	Electro-Optical Tactical Decision Aids
EPL	ELINT Parameter List
EPROM	Electronic Programmable Read Only Memory
ERD	Entity Relationship Diagram
ERDAS	Earth Resources Data Analysis System
ERIM	Environmental Research Institute of Michigan
EROM	Erasable Read-Only Memory
ERTWG	Environmental Representation Technical Working

	Group
ESAMS	Enhanced Surface-to-Air Missile Simulation
ESC	Air Force Electronic Systems Center
ESD	Exploitation Support Data
ESDD	Earth Science Data Directory
ESDI	Enhanced Small Data Interface
ESP	External Simulation Protocol
ESPDU	Entity State Protocol Data Unit
ESTEL	E-2C Simulation Test and Evaluation Laboratory
ETDA	Environmental Tactical Decision Aids
EW	Electronic Warfare
EWIRD	Electronic Warfare Integrated Reprogrammable Database
EWTES	Electronic Warfare Threat Environment Simulator
EXCIMS	Executive Council for Modeling and Simulation
EXERTAS	Exercise Temporal Analysis System

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F

FADAC	Field Artillery Digital Automatic Computer
FAMSIM	Family of Simulations (Army term for their approved suite of models)
FAQ	Frequently Asked Questions
FAR	Federal Acquisition Regulation
FAST	1 - Federal Automated System for Travel 2 - Field Assistance in Science and Technology 3 - Framework for Advanced Simulation Technology
FASTALS	Force Analysis and Simulation of Theater Administrative and Logistic Support
FASTC	Foreign Aerospace Science and Technology Center
FDAd	Functional Data Administrator
FDB	Functional Description of the Battlespace
FDC	Functional Data Coordinator
FDDI	Fiber Digital Data Interface
FDE	Force Deployment Estimator
FDM	Force Design Model
FEBA	Forward Edge of the Battle Area
FECFR	Fidelity, Exercise Control, and Feedback Requirements
FED	Federation Execution Date
FEDEP	Federation Execution and Development Process
FFRDC	Federally Funded Research and Development Center
FI	Field Instrumentation
FIFO	First In, First Out
FILO	First In, Last Out
FIM	Functional Information Manager
FIP	Federal Information Process
FIPC	Federal Information Processing Center
FIPS	Federal Information Processing Standards
FIRESTORM	Federation of Intelligence, Reconnaissance, Surveillance and Targeting Operations, and Research Models
FIRMA	Federal Information Resources Management Act
FIRMR	Federal Information Resources Management Regulation
FIS	Federal Information System
FLAMES	Force Level Analysis and Mission Effectiveness System
FLOT	Forward Line of Own Troops

FLS	Force Level Simulation
FODA	Feature-Oriented Domain Analysis
FODDS	Fact-Oriented Data Distribution System
FOF	Force-on-Force
FOHMD	1 - Fiber-Optic Helmet-Mounted Device 2 - Fiber-Optic Helmet-Mounted Display
FOM	Federation Object Model
FON	Fiber Optic Network
Force XXI	Army program to design and field the 21st Century Army
FORCEGEN	Force Generation for Modeling and Simulation
FORCEM	1 - Force Concepts Evaluation Model 2 - Force Evaluation Model
FORCES	Force and Organization Cost Estimating System
FORGE	Force Evaluation Model Gaming Evaluator
ForMAT	Force Management and Analysis Tool
FOV	Field Of View
FPDC	Federal Procurement Data Center
FPM	Force Protection Model
FQT	Formal Qualification Testing
FRAM	Fleet Requirements Analysis Model
FRED	Federation Required Execution Details
FRT	Faster than Real Time
FS	Flight Simulators
FSCATT	Fire Support Combined Arms Tactical Trainer
FSK	Frequency Shift-Keying
FSM	Finite State Machine
FTAM	File Transfer, Access and Management
FTM	Fault Tree Mode
FTP	File Transfer Protocol
FTS	Full Threat Simulator
FTT	Field Tactical Trainer
FV	Functional Validation
FWG	Functional Working Group
FWS	Flight and Weapons Simulator
FY	Fiscal Year
FYDP	Future-Years Defense Plan

G

G/IDEP	Government/Industry Data Exchange Program
G-WARS	Ground Wars (Computer simulation model)
GAIS	Government Automated Information System
GAMS	Generalized Algebraic Modeling System
GASS	Generic Acoustic Simulation System
GATERS	Ground Air Teleoperated Robotic System
GAWS	Graphical Analysis Workstation
GBS	1 - Global Broadcast System 2 - Global Broadcasting System
GCCS	Global Command and Control System
GCSS	Global Combat Support System
GCSS-AF	Global Combat Support System - Air Force (formerly BLSM II)
GCDIS	Global Change Data and Information System
GCSS	Global Command Support System
GDAS	Global Deployment Analysis System
GDD/D	Global Data Dictionary and Directory
GDDM	Graphics Data Display Manager
GDEM	Generalized Digital Environmental Model
GDI	Graphics Device Interface
GDIP	General Defense Intelligence Program
GDMS	Global Data Management System
GDSS	Global Decision Support System
GENESSIS	Generic Scene Simulation Software
GEOLOC	Geographic Location
GEOREF	Geographic reference
GFE	Government Furnished Equipment
GFI	Government Furnished Information
GFM	Government Furnished Material
GFP	Government Furnished Property
GFS	Government Furnished Software
GI	Geospatial Information
GIAC	Graphical Input Aggregate Control
GICOD	Good Idea Cutoff Data
GIF	1 - Graphic Imagery Files 2 - Graphics Interchange Format
GII	Global Information Infrastructure
GIN	Graphics Input
GIS	Geographic Information System
GKS	Graphical Kernel System

GLM	General Linear Model
GMT	Greenwich Mean Time
GNMP	Government Network Management Profile
GOB	Ground Order of Battle
GOCO	Government-Owned, Contractor Operated
GOE	Government Owned Equipment
GOGO	Government Owned, Government Operated
GOSC	General Officer Steering Committee
GOSG	General Officer Steering Group
GOSIP	Government Open System Interconnection Protocol
GOTS	Government-Off-the-Shelf
GPS	Global Positioning System
GPSS	General Purpose Simulation System
GREWMS	Global Requirements Estimator for Wartime Medical Support
GRWSIM	Ground Warfare Simulation
GSCC	Global Simulation Coordination Center
GSM	Global Shared Memory
GSS	1 - Generalized Stimulation Simulation 2 - Ground Station Simulator
GST	Greenwich Sidereal Time
GTCT	Global Tropical Cyclone Tracks Data Base
GTDB	Generic Transformed Data Base
GTE	Ground Threat Emitter
GTM	Ground Truth Model
GTMV	Ground Target Modeling and Validation
GTN	Global Transportation Network
GTRI	Georgia Tech Research Institute
GTWAPS	Global Theater Weather Analysis and Prediction System
GUARDFIST	Guard Unit Armory Device Full Crew Interactive Simulation Trainer
GUI	Graphical User Interface
GWEF	Guided Weapons Evaluation Facility

H

H/W	hardware
HAMPS	Host AUTODIN Message Processing System
HAP	Host Access Protocol
HBR	1 - Human Behavior Representation
	2 - House Budget Resolution
HBTWG	Human Behavior Technology Working Group
HBV	Human Behavior Variables
HCI	1 - Human Computer Interaction
	2 - Human Computer Interface
HD	1 - Hard Disk
	2 - High Density
HDF	Hierarchical Data Format
HDL	Harry Diamond Laboratories
HDLC	High-level Data Link Control Protocol
HDR	High-Data-Rate
HDS	High Definition Systems
HDTV	High Definition Television
HDU	Helmet Display Unit
HEFS	Hierarchical Environmental Feature Structure
HELIPAC	Helicopter Piloted Air Combat Model
HERO	Heuristic Route Organization
HES	Hostile Environment Simulator
HET	HARPOON Embedded Trainer
HF-ATSS	High Fidelity Acoustic Time Series Simulator
HFE	Human Factors Engineering
HFEA	1 - Human Factors Engineering Analysis
	2 - Human Factors Engineering Assessment
HITL	Human-in-the-Loop
HLA	High-Level Architecture
HMD	Helmet Mounted Display
HMI	Human-Machine Interface
HMMRSS	Helmet-Mounted Mission Rehearsal Simulation System
HMS	Helmet Mounted Sight
HMS/DS	Helmet Mounted Sight/Display System
HMU	Helmet Mounted Unit
HOL	High Order Language
HOM	Higher Order Model
HOTMAC	High Order Turbulence Model for Atmospheric Circulations
HPC	High Performance Computer

HPCC	High Performance Computing and Communications
HPCCIT	High Performance Computing, Communications, and Information Technology
HPCMP	High Performance Computing Modernization Program
HPMWAM	High Power Microwave Weapon Assessment Model
HPPI	High Performance Parallel Interface
HRCP	High Resolution Cloud Prognosis Model
HRIS	Human Resource Information System
HS	High Speed
HSC	Air Force Human Systems Center
HSDC	High Speed Digital Chart
HSI	1 - Human Systems Integration 2 - High Speed Serial Interface
HTML	Hyper Text Mark-Up Language
HTTP	Hyper Text Transfer Protocol
HTU	Handheld Thermal Unit
HUMINT	Human Intelligence
HW/SWIL	Hardware/Software-In-The-Loop
HWIL	Hardware-in-the-Loop
HYTIME	Hypermedia/Time-Based Structuring Language

I

I/DBTWG	Information/Database Technology Working Group
I/ITSEC	Interservice Industry Training Systems and Education Conference
IO	1 - Information Operations 2 - Input/Output
I&M	Improvement and Modernization
I-TES	I-Band Threat Environment Simulator
I3	Intelligent Integration of Information
IAC	Information Analysis Center
IADS	Integrated Air Defense System
IAS	Intelligence Analysis System
IC	1 - Individual Combatant 2 - Image Computer 3 - Integrated Circuit
ICA	Integrated Communications Architecture
ICASE	Integrated Computer Aided Software Engineering
ICATT	Intelligent Computer Assisted Training Testbed
ICC	Integrated Control Center
ICCOG	Intelligence Community Coordination Group
ICD	Interface Control Document
ICDB	Integrated Communications Database
I-CLCGF-CBS	Integrated CLCGF Combat Battle Simulation
ICM	Intelligence Correlation Model
ICMP	Internet Control Message Protocol
ICOC	Integrated Combat Operations Center
ICODES	Integrated Computerized Deployment System
ICOM	Input, Control, Output, and Mechanism
ICW	Interactive Courseware
IDB	Integrated Database
IDBEF	Integrated Database Extract Format
IDBTF	Integrated Database Transaction Format
IDEA	Integrated Design/Engineering Aide
IDEEAS	Interactive Distributed Early Entry Analysis Simulation
IDEF	Integration Definition
IDEF1X	Integration Definition Language for Information Modeling
IDEF0	Integration Definition for Function Modeling
IDHS	Intelligence Data Handling System
IDIQ	Indefinite Delivery, Indefinite Quantity

IDL	1 - Interface Definition Language 2 - Interface Design Language
IDM	Improved Data Modem
IDP	Initial Domain Part
IDPS	Integrated database Preparation System
IDRL	Integrated Data Requirements List
IEEE	Institute of Electrical and Electronic Engineers
IEWTPT	Intelligence and Electronic Warfare Tactical Proficiency Trainer
IFIP	International Federation of Information Processing
IFM	Ionospheric Forecast Model
IFOR	Intelligent Forces
IG	Image Generator
IGES	Initial Graphics Exchange Standard
IGOSS	Industry/Government Open System Specification
IHADSS	Integrated Helmet and Display Sight System
IIS	Intelligence Information System
IM	Information Management
IMA	Information Mission Area
IMAG	Information Management and Analysis Group
IMB	Interoperability Management Board
IMD	Information Management Directorate
IMDS	Integrated Maintenance Data System
IMINT	Imagery Intelligence
IMIT	Interoperability Management Information Tool
IMP	Information Management Plan
IMR	Information Management Representative
IMS	Information Management System
INCA	Intelligence Communications Architecture
INCOMMS	Individual Combatant Modeling and Simulation
INFORMS	Institute for Operations Research and Management Science
INFOSEC	Information Security
INMS	Integrated Network Management System
INST	Information Standards and Technology Standardization
INX	Information Exchange
IO	Information Operations
IOC	1 - Initial Operational Capability 2 - Industrial Operations Command (Army)
IODA	Information Oriented Decision Architecture
IOT&E	Initial Operational Test and Evaluation
IP	1 - Image Processor 2 - Information Processor 3 - Internet Protocol

IPA	Imagery Product Archive
IPB	Intelligence Preparation of the Battlefield
IPC	Information Policy Council
IPM	Interpersonal Messaging
IPMS	Interpersonal Messaging System
IPPD	Integrated Product and Process Development
IPPM	Integrated Product Process Model
IPR	In-process Review
IPS	Illustrative Planning Scenarios
IPT	Integrated Product Team (See also OIPT)
IPTL	Integrated Priority Target List
IR&D	Independent Research and Development
IRDS	Information Resource Dictionary System
IREM	Integrated Research, Evaluation, and System Analysis Model
IRIAC	Infrared Information Analysis Center
IRIAM	Integrated Radar and Infrared Analysis and Modeling
IRIG	Inter-Range Instrumentation Group
IRIS	Internetted Range Interactive Simulations
IRM	Information Resource Management
IS	1 - Information System 2 - International Standardization 3 - Interface Specification 4 -International Staff (NATO)
ISA	1 - Integrated Support Activity 2 - Information System Architecture 3 - Industry Standard Architecture
ISATS	Information System ADP Tracking System
ISC	U.S. Army Information Systems Command
ISDN	Integrated Services Digital Network
ISEE	Integrated Software Engineering Environment
ISEM	Integrated Space Environmental Model
ISG	Industry Steering Group
ISGMS	Industry Steering Group on Modeling and Simulation
ISLE	Integrated Simulation Language Environment
ISM	Industrial, Scientific, and Medical
ISMC	Imagery Standards Management Committee
ISMT	Indoor Simulated Marksmanship Trainer
ISO	International Standardization Organization
ISR	Intelligence, Surveillance, and Reconnaissance
ISS	Interactive Survivabiliy Simulation (Army aviation manned simulator/tester)
ISSAA	Information Systems Selection and Acquisition Agency
ISSC	Information Systems Software Center

ISSM	Information Systems Security Manager
ISSO	Information System Security Officer
ISSPM	Information Systems Security Program
IST	1 - Infantry Squad Trainer (marksmanship trainer) 2 - Institute for Simulation and Training
IT	Information Technology
ITAM	Interdiction Tanker Analysis Model
ITD	1 - Interim Terrain Data 2 - Interim Terrain Database
ITDN	Integrated Tactical Data Network
ITEC	International Training Equipment Conference
ITEM	Integrated Theater Engagement Model
ITEMM	Integrated Terrain-Environment-Multipath Model
ITEMS	Interactive Tactical Environment Management System
ITMRA	Information Technology Management Reform Act
ITN	Identification Tasking and Networking
ITPB	Information Technology Policy Board
ITRI	Information Technology Reuse Initiative
ITRUS	Information Technology Reuse
ITS	1 - Individual Training Standards 2 - Intelligent Tutoring System
ITSDN	Integrated Tactical/Strategic Data Network
ITSPO	Information Technology Standards Program Office
ITTS	Instrumentation Targets and Threat Simulators
ITU	Information Transport Utility
ITV	Interactive Television
ITVGS	Interactive Television Generic Server
IUSS	Integrated Unit Simulation System
IV&V	Independent Verification and Validation
IVEPSS	Immersive Virtual Environment Prototyping Simulation System
IVIS	Inter-Vehicular Information System
IW	Information Warfare
IWG	Interface Working Group
IWSDB	Integrated Weapon Systems Data Base
IWSS	Interactive Weapon System Simulation

J

J-SPACES	Joint Space Combat Environment Simulation
JAC	Joint Analysis Center
JACG	Joint Aeronautical Commanders Group
JACTS	Joint Aircrew Combat Training System
JADS	Joint Advanced Distributed Simulation
JADS-I	Joint Advanced Distributed Simulation-Improved
JADS/JFS	Joint Advanced Distributed Simulation Joint Feasibility Study
JAFLME	Joint Automated Field Logistics Model for Employment
JAMC	Joint Amphibious Mine Countermeasure
JAMIP	Joint Analytic Model Improvement Program
JAMP	Joint Analytic Model Program
JANNAF	Joint Army, Navy, NASA, Air Force
JANUS	A series of land combat models with some limited air and naval operations. Primarily sponsored by Lawrence Livermore National Laboratory and TRADOC
JANUS App	JANUS Applique
JAWS	Joint Analytic Warfare Systems
JBC	Joint C4ISR Battle Center
JCALS	Joint Computer-Aided Acquisition and Logistics Support
JCAS	Joint Command and Control Attack Simulation
JCATS	Joint Conflict and Tactical Simulation
JCCC	Joint Communications Control Center
JCCD	Joint Camouflage, Concealment and Deception
JC2WC	Joint Command and Control Warfare Center (formerly JEWC)
JCG	Joint Commanders Group
JCG(T&E)	Joint Commanders Group (Test and Evaluation)
JCM	Joint Conflict Model
JCMO	Joint CALS Management Organization
JCOS	Joint Countermine Operational Simulation
JCS	Joint Chiefs of Staff
JCSE	1 - Joint Command Support Element 2 - Joint Communications Support Element
JDA	1 - Japan Defense Agency 2 - Joint Duty Assignment
JDAL	Joint Duty Assignment List
JDBE	Joint Data Base Elements

JDC	Joint Doctrine Center (integrated in the JWFC)
JDISS	Joint Deployable Intelligence Support System
JDL	Joint Director of Laboratories
JDS	Joint Data Support
JDSS	Joint Decision Support System
JEAP	Joint Electronic Analysis Program
JECEWSI	Joint Electronic Combat Electronic Warfare Simulation
JEDMICS	Joint Engineering Data Management Information and Control System (formerly EDMIS)
JECG	Joint Exercise Control Group
JEL	Joint Electronic Library
JEPES	Joint Engineering Planning and Execution System
JESS	Joint Exercise Support System
JETTA	Joint Environment for Testing, Training, and Analysis
JEWC	Joint Electronic Warfare Center (outdated - see JC2WC)
JFACC	Joint Force Air Component Commander
JFAST	Joint Flow and Analysis System for Transportation
JHU	Johns Hopkins University
JHU/APL	Johns Hopkins University/Applied Physics Lab
JIC	Joint Intelligence Center
JICM	1 - Joint Integrated Contingency Model 2 - Joint Intelligence Collection Module
JIEO	Joint Interoperability and Engineering Organization
JIMASS	Joint Intelligence Modeling and Simulation System
JINTACCS	Joint Interoperability of Tactical Command and Control System
JIPTL	Joint Integrated Prioritized Target List
JITC	Joint Integration Test Command
JITF	Joint Integration Test Facility
JLASS	Joint Land, Aerospace, and Sea Simulation
JLC	Joint Logistics Commanders
JLOG	JTF Logistics Management Information System
JLOTS	Joint Logistics Over the Shore
JM&S	Joint Modeling and Simulation
JMASS	Joint Modeling and Simulation System
JMCIS	Joint Maritime Command Information System
JMEM	Joint Munitions Effectiveness Manual
JMETL	Joint Mission Essential Task Lists
JMSEP	Joint Modeling and Simulation Executive Panel
JMSIP	Joint Modeling and Simulation Integration Program
JMSRG	Joint Modeling and Simulation Requirements Group
JMSWG	Joint Multi-TADIL Standards Working Group

JNETS	Joint Network Simulation
JOISIM	Joint Operations Information Simulation
JOPES	Joint Operation Planning and Execution System
JOTS-VIDS	Joint Operations and Tactical System - Visually Integrated Data System
JOVE	Joint Operations Visualization Environment
JPATS	Joint Primary Aircraft Training System
JPL	Jet Propulsion Laboratory
JPO	Joint Program Office
JPSD	Joint Precision Strike Demonstration
JRISS	Joint Recruiting Information Support System
JRMB	Joint Requirements and Management Board
JROC	Joint Requirements Oversight Council
JRTC	Joint Readiness Training Center
JSAN	Joint Staff Automation of the Nineties
JSEAD	Joint Suppression of Enemy Air Defense
JSEM	Joint Service Endgame Model
JSF	Joint Strike Fighter
JSIMS	Joint Simulation System
JSIP	Joint Services Imagery Processing System
JSMMPG	Joint Services Medical Modeling and Planning Group
JSOR	Joint Service Operational Requirement
JSOW	Joint Stand-Off Weapon
JSP	Joint Service Program
JSPS	Joint Strategic Planning System
JSRB	Joint Software Review Board
JSS	Joint STARS Simulator
JSSA	Joint Stealth Strike Aircraft
JSTARS	Joint Surveillance & Target Attack Radar System
JSTASL	Joint Scenario Tool Architecture and Script Language
JSTE	Joint Services Training Exercise
JT&E	Joint Test and Evaluation
JTAGS	Joint Tactical Ground Station
JTAMS	Joint Tactical Missile Signatures
JTASC	Joint Training, Analysis and Simulation Center
JTAV	Joint Total Asset Visibility System
JTC	1 - Joint Technical Committee 2 - Joint Training Confederation
JTC3A	Joint Tactical Command, Control and Communications Agency
JTCTS	Joint Tactical Combat Training System
JTF	Joint Task Force
JTFS	Joint Task Force Simulation
JTIDS	Joint Tactical Information Distribution System

JTLS	Joint Theater Level Simulation
JTMP	Joint Training Master Plan
JTP	Joint Training Program
JTS	1 - Joint Tactical Simulation
	2 - Joint Training System
JTSP	Joint Training Simulation Plan
JTSSG	Joint Telecommunications Standards Steering Group
JTWSG	Joint Theater of War Scenario Generator
JUDI	Joint Universal Data Interpreter
JULLS	Joint Universal Lessons Learned System
JUSTIS	Joint Uniform Services Technical Information System
JVIDS	Joint Visually Integrated Display System
JVL	Joint Virtual Laboratory
JWAC	Joint Warfare Analysis Center
JWARS	Joint Warfare System
JWCA	Joint Warfighting Capability Assessment
JWFC	Joint Warfighting Center
JWICS	Joint Worldwide Intelligence Communications System
JWID	Joint Warrior Interoperability Demonstration
JWSOL	Joint Warfare Simulation Object Library
JWSTP	Joint Warfighting Science and Technology Plan

K

KA	Knowledge Acquisition
KASC	Korean Air Simulaiton Center
KBE	Knowledge Based Extraction
KBI	Knowledge-Based Information
KBLPS	Knowledge Based Logistics Planning Shell
kbps	Kilobits per second
KBS	Knowledge Based System
KBSC	Korean Battle Simulation Center
KDEC	Kinetic Energy Weapons Digital Emulation Center
KDR	Kill/Detection Ratio
KE	Knowledge Engineering
KHILS	Kinetic Kill Vehicle HITL Simulator
kHz	Kilohertz
KI	Knowledge Integration
KIPPL	Key Intelligence Programs Priority List
KNACK	Knowledge Acquisition Kernel
KOPS	Thousands of Operations Per Second
KPP	Key Performance Parameters
KRS	Knowledge Retrieval System
KSS	Knowledge Support System
KWIC	Key Word in Context
KWOC	Key Word out of Context

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L

LAD	Logistics Anchor Desk
LAM	Louisiana Maneuvers
LAN	Local Area Network
LANACS	Local Area Network Asynchronous Connection Server
LAPM	Link Access Procedure for Modems
LASER	Light Amplification by Stimulated Emission of Radiation
LAT	Local Access Terminal
LATS	Low Altitude Threat Simulator
LAU	LAN Access Unit
LAWN	Local Area Wireless Network
LB/TS	Large Blast/Thermal Simulator
LBJS	Littoral Battlespace Joint Service
LBTS	Lower Bound on the Time Stamp
LCC	Life Cycle Cost
LCCE	Life Cycle Cost Estimate
LCD	Liquid Crystal Display
LCM	1 - Life Cycle Management 2 - Life Cycle Model
LCSEC	Life Cycle Software Engineering Center
LCSS	Life Cycle Software Support
LCSSA	Life Cycle Software Support Activity
LCSSE	Life Cycle Software Support Environment
LCU	1 - Laptop Computer Unit 2 - Last Cluster Used 3 - Lightweight Computer Unit
LDM	1 - Logical Data Model 2 - Long Distance Modem
LDR	Low-Data-Rate
LEC	Local Exchange Carrier
LED	Light-Emitting Diode
LEE	Leading Edge Environment
LEEGCCS	Leading Edge Environment for the Global Command and Control System
LEM	Language Extension Module
LFF	Logistics Factors File
LFU	Least Frequently Used
LHN	Long-Haul Network
LIFO	Last In, First Out
LIVID	Language Identification and Voice Identification

LLNL	Lawrence-Livermore National Laboratory
LNE	Local Network Element
LOC	1 - Lines of Code
	2 - Lines of Communication
LOCAASS	Low-Cost Anti-Armor Submunition Simulation
LOCIS	Library of Congress Information System
LOD	Level of Detail
LOE	Level of Effort
LoF	Loss Of Function
LoF (P)	Loss of Function for Personnel
LOGAIS	Logistics Automated Information System
LOGGEN	Logistics Plan Generator
LOGSAFE	Logistics Sustainability Analysis and Feasibility Estimator
LOGSIM	Logistics Simulation
LOTS	Logistics Over The Shore
LOTSSIM	Logistics Over The Shore Simulation
LP	Linear Programming
LPM	Lines Per Minute
LRC	Learning Resource Center
LRI	Line Replacement Item
LRIP	Low-Rate Initial Production
LRM	Language reference Manual
LRN	Local Range Network
LRU	Line Replaceable Unit
LSA	Logistics System Analysis
LSB	Least Significant Bit
LSC	Least Significant Character
LSE	Local Subscriber Environment
LSTF	Life Sciences Test Facility
LWTB	Land Warrior Testbed
LWTC	Littoral Warfare Training Complex

M

M&S	Modeling and Simulation
m.r.a.	model range of accuracy
M2DBMS	Multi-Model, Multi-Lingual Data Base Management System
MACATAK	Maintenance Capbilities Attack Model
MACH	Model of Atmospheric Chemical Hazards
MACIPS	Military Airlift Command Information Processing System
MACS	Mutually Agreeable Commercial Software
MAD	Message Address Directory
MADCAP	Mobilization and Deployment Capability Assurance Project
MAHCA	Multiple Agent Hybrid Control Architecture
MAIS	1 - Major Automated Information System 2 - Mobile Automated Instrumentation Suite
MAISRC	Major Automated Information System Review Council
MAMO	Maintenance Model
MAPP	Modern Aids to Planning Program
MARISIM	Maritime Simulation
MASC	Modeling Analysis and Simulation Center (U.S. Air Force)
MASDA	Model and Simulation Decision Aid
MASE	Message Administration Service Element
MASINT	Measurement and Signature Intelligence
MASS	Mobility Analysis Support System
MATT	Mapping and Analysis Tool for Transportation
MBE	Multi-Band Emitter
MBO	Management By Objectives
Mbps	Megabits per second
MC4	Medical Communications for Combat Casualty Care
MC&G	Mapping, Charting and Geodesy
MCAD	Mechanical Computer Aided Design
MCB	Memory Control Block
MCCR	Mission Critical Computer Resources
MCEB	Military Communications-Electronic Board
MCGA	Multicast Group Agent
MCMSMO	Marine Corps Modeling and Simulation Management Office
MCMSWG	Marine Corps Modeling and Simulation Working Group
MCS	Message Conversion System

MCTL	Militarily Critical Technology List
MCTSSA	Marine Corps Tactical Systems Support Activity
MDA	Milestone Decision Authority
MDAd	MAJCOM Data Administrator
MDAP	Major Defense Acquisition Program
MDDC	Missile Defense Data Center
MDR	Medium-Data-Rate
MDS	Meteorological Data System
MDSE	Message Delivery Service Element
MDT	Message Distribution Terminal
MDT2	Multi-Service Distributed Training Testbed
MEL	1 - Master Environmental Library 2 - Master Events List
MERIT	Model Evaluation Requirements Integration Tool
METL	Mission Essential Task List
METS	Mobile Electronic Threat Simulator
METT-T	Mission, Enemy, Troops, Terrain, and Time
MFG	Multi-Function Gateway
MFIP	Multi-Function Interoperability Processor
MFS	Manned Flight Simulator
MGED	Multidevice Graphics Editor
MGRS	Military Grid reference System
MHS	Message Handling System
MHz	MegaHertz
MIB	Management Information Base
MICRO-SAINT	Task network simulation language
MICSS	Marine Corps Individual Combatant Simulator System
MIDAS	Model for Intertheater Deployment by Air and Sea
MIDS	Multifunction Information Distribution System
MIDS-LVT	Multi-Functional Information Distribution System - Low Voltage Terminal
MIIDS/IDB	Military Integrated Intelligence Data System/Integrated Database
MIL	Man-in-the-loop
MILES	Multiple Integrated Laser Engagement System
MILNET	Military network
MIMD	1 - Multiple-Input, Multiple Data 2 - Multiple-Instruction, Multiple-Data
MIME	Multipurpose Internet Mail Extension
MIMI	MADCAP Integration Management Initiative
MINX	Multimedia Information Exchange Network
MIPR	1 - Military Interagency Procurement Requisition 2 - Military Interdepartmental Purchase Request
MIPS	Millions of Instructions Per Second
MIS	Management Information System

MISD	Management Information Systems Directorate
MISMA	US Army Model Improvement and Study Management Agency
MISSI	Multi-level Information System Security Initiative
MIST	Multiple Input Sensor Terminal
MIT	1 - Management Information Tree 2 - Massachusetts Institute of Technology
MITL	Man-In-The-Loop
ML	Machine Language
MLS	Multi-Level Security
MM	Multi-Media
MMHS	Military Message Handling System
MMI	Man-Machine Interface
MMS	Multilevel Mail Server
MMU	1 - Mass Memory Unit 2 - Memory Management Unit
MMW	Millimeter Wave
MMWPROP	Millimeter Wave Propagation Prediction Model
MNC	1 - Major NATO Command (NATO) 2 - Major NATO Commander (NATO)
MNOI	Messages Not Of Interest
MNS	Mission Needs Statement
MOBA	Military Operations in Built-Up Areas
MOBACS	Military Operations in Built-Up Areas Combat Simulation
MOBCEM	Mobilization Capabilities Evaluation Model
MOBSAM	Mobilization Station Assessment Model
MODAS	Modular Ocean Data Assimilation System
ModSAF	Modular Semi-Automated Forces
MOE	Measure of Effectiveness
MOHLL	Machine Oriented High Level Language
MOM	Measure of Merit (MOMs encompass MOEs, MOOs, and MOPs)
MOO	Measure of Outcome
MOOTW	Military Operations Other Than War
MOP	Measure of Performance
MORIMOC	More Operational Realism in Modeling of Combat
MORS	Military Operations Research Society
MOSAIC	MOdels and Simulations: Army Integrated Catalog
MOSART	Moderate Spectral Atmospheric Radiance and Transmittance Code
MOUT	Military Operations in Urban Terrain
MPC	Micro Portable Computer
MPD	Message Preparation Directory
MPDU	Message Protocol Data Unit

MPF	Maritime Prepositioned Force
MPN	MSE Packet Network
MRCI	Modular Reconfigurable C4I Interface
MRM	Medical Regulating Model
MRSE	Message Retrieval Service Element
MS	1 - Message Store 2 - Milestone
MS&A	Modeling, Simulation and Analysis
MSAS	Military Simulation Assessment System
MSC	1 - Major Subordinate Command (NATO) 2 - Major Subordinate Commander (NATO)
MSCC	Modeling and Simulation Coordination Center (now MSOSA)
MSCCTF	Modeling and Simulation Coordination Center Task Force
MSD	Mass Storage Device
MSDDB	Master Seafloor Digital Data Base
MSDOS	Microsoft Disk Operating System
MSDS	1 - Master Simulation Data System 2 - Mission Scenario Data System
MSE	1 - Mobile Subscriber Equipment 2 - Multiple Simulation Exercise
MSEA	Modeling and Simulation Executive Agent
MSEL	Master Scenario Events List
MSI	Multi-Spectral Imagery
MSIC-CLUTTER	Missile-Space and Intelligence Center-CLUTTER Model
MSIP	Modeling and Simulation Investment Plan
MSIS	M&S Information System
MSL	Mean Sea Level
MSMP	Modeling and Simulation Master Plan
MSOSA	M&S Operational Support Activity (formerly MSCC)
MSP	Message Security Protocol
MSR	Missile Simulation Round
MSRR	Modeling and Simulation Resource Repository
MSS	Millimeter Simulation System
MSSE	Message Submission Service Element
MSWG	Modeling and Simulation Working Group
MT	Message Transfer
MTA	Message Transfer Agent
MTADME	Military Thinking and Decision Making Exercises
MTDS	Marine Corps Tactical Data System
MTF	1 - Message Text Format 2 - Message Transfer Format 3 - Modulation Transfer Function

MTM	Model-Test-Model
MTOPS	Millions of Theoretical Operations Per Second
MTS	1 - Message Transfer System
	2 - Moving Target Simulator
MTW	Major Theater War
MTWS	MAGTF Tactical Warfare Simulation
MUSE	Multiple UAV Simulation Environment
MUTES	Multiple Threat Emitter Systems
MWARS	Maneuver-Warfare Analytical Research System
MWTB	Mounted Warfare Testbed

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N

NABEM II	Naval Air Battle Evaluation Model II
NADM-V	NORAD Air Defense Model - Visual
NAIC	National Air Intelligence Center
NALCOMIS	Naval Aviation Logistics Command Information System
NAM	Network Assessment Model
NARDAC	Navy Regional Data Automation Center
NAS	National Academy of Sciences
NASI	NetWare Asynchronous Services Interface
NASM	National Air and Space (Warfare) Model
NASNET	Naval Aviation Simulator Network Training
NATSIM	National Simulation System
NAU	Network Addressable Unit
NBS	National Bureau of Standards (now NIST)
NCA	National Command Authorities
NCARAI	Navy Center for Applied Research in Artificial Intelligence
NCC	Network Control Center
NCDC	National Climatic Data Center
NCS	1 - National Communications System 2 - Network Computing System 3 - Network Control Station
NCSA	National Center for Super-computing Applications
NCSC	National Computer Security Center
NCSL	National Computer System Laboratory
NDL	Network Data Language
NERF	Naval Emitter reference File
NES	Network Encryption System
NESDIS	National Environmental Satellite Data and Information Service
NESSE	1 - Near Earth Simulated Space Environment 2 - Near Earth Space Synthetic Environment
NET	1 - Network Entity Title 2 - New Equipment Training 3 - Not Earlier Than
NETT	New Equipment Training Team
NETWARS	Network Warfare Simulation
NFS	Network File Server
NGCR	Next Generation Computer Resources
NIC	Network Information Center
NIDR	Network Information Discover and Retrieval

NII	National Information Infrastructure
NIMA	National Imagery and Mapping Agency (formerly DMA)
NIPRNET	Non-secure Internet Protocol (IP) Router Network
NIR	Network Information Retrieval
NISO	National Information Standards Organization
NISP	National Individual Security Program
NIST	National Institute of Standards and Technology
NITC	National Information Technology Center
NITES	1 - Naval Integrated Tactical Environmental System 2 - Navy Integrated Tactical Environment Subsystem
NITF	1 - National Imagery Test Facility 2 - National Imagery Transmission Format
NLSP	Network Layer Security Protocol
NLT	Not Later Than
NMS	Network Management System
NODC	National Oceanographic Data Center
NODDS	Navy Oceanographic Data Distribution System
NOGAPS	Navy Operational Global Atmospheric Prediction System
NORAPS	Naval Operational Regional Atmospheric Predictions System
NOS	Network Operating System
NOVAM	Navy Oceanic Vertical Aerosol Model
NREN	National Research and Education Network
NRL	Naval Research Laboratory
NRMS	Near Term Mine Reconnaissance System
NRT	Near Real Time
NSC	National Simulation Center
NSDE	Non-Standard Data Element
NSDI	National Spatial Data Infrastructure
NSF	National Science Foundation
NSIDC	National Snow and Ice Data Center
NSO	Network Security Officer
NSRD	National Software Reuse Directory
NSS	Naval Simulation System
NSTC	National Science and Technology Council
NSTL	National Software Testing Labs
NTACMS	Navy Tactical Missile System
NTC	National Training Center
NTC-IS	National Training Center Instrumentation System
NTCS-A	Navy Tactical Command Systems Afloat
NTCSS	1 - Naval Tactical Command Support System 2 - Navy Tactical Command Support System
NTDS	Navy Tactical Data System
NTF	National Test Facility

NTIC	1 - National Technical Information Service
	2 - Naval Technical Intelligence Center
NTU	New Threat Upgrade
NUI	Network User Interface
NUSSE	Non-Uniform Simple Surface Evaporation (model)
NV&EOL	Night Vision and Electro-Optics Laboratory
NVD	Night Vision Device
NVE	Night Vision Equipment
NVESD	Night Vision and Electronic Sensors Directorate
NVG	Night Vision Goggles
NVRAM	Non-Volatile Random Access Memory
NVS	Night Vision System
NWARS	National Wargaming System
NWP	Numerical Weather Prediction Model
NWTDB	Naval Warfare Tactical Data Base

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O

OA	Operational Architecture
OAI	Open Applications Interface
OAML	Oceanographic and Atmospheric Master Library
OASIS	Operations Analysis and Simulation Interface System
OATS	Office Automation and Technology Services
ODES	Operational and Deployment Experiments Simulator
ODI	Open Datalink Interface
ODM	Organizational Domain Modeling
ODP	Open Distributed Processing
OEA	Ocean Executive Agent
OII	Operations-Intelligence Interface
OIRA	OMB Office of Information and Regulatory Affairs
OIS	Office Information System
OLE	Object Linking and Embedding
OMA	Object Management Architecture
OMEGA	Operational Multiscale Environment Model with Grid Adaptivity
OMFTS	Operational Maneuver From the Sea
OMG	Object Management Group
OMO	Other Military Operations
OMT	Object Model Template
ONC	Open Network Computing
OO	Object-Oriented
OOA	Object-Oriented Analysis
OOD	Object-Oriented Design
OODA	Object-Oriented Design with Assemblies
OODB	Object-Oriented Data Base
OODBMS	Object-Oriented Database Management System
OOM	Object-Oriented Modeling
OOP	Object-Oriented Programming
OOT	Object-Oriented Technologies
OOTW	Operations Other Than War
OPFOR	Opposing Forces
OPSEC	Operations Security
OPT	Operations Planning Tool
OPTADS	Operations Tactical Data Systems
OR	Operations Research
ORACLE	Operational Research and Critical Link Evaluation
ORB	Object Request Broker
ORD	Operational Requirements Document

ORSA	Operations Research Systems Analysis
ORSMC	Off-Route Smart Mine Clearance
ORT	OSD Review Team
OS	Operating System
OSE	Open System Environment
OSEA	Organization for Synthetic Environment Architecture
OSF	Open Software Forum
OSINT	Open Source Intelligence
OSIRIS	Optimized Synthetic Infra-Red Interactive Simulation
OSP	Other Service Program
OSRM	Open System reference Model
OSS	Operations Support System
OTAU	Over The Air Updating
OTDR	Optical Time Domain Reflector
OTI	Office of Technical Integration
OUSD(A&T)	Office of the Under Secretary of Defense for Acquisition and Technology

P

PADIL	PATRIOT Air Defense Information Language
PADS	Position Azimuth Determining System
PAL	Public Ada Library
PALOS	Planning Assistant for Logistics Systems
PAMS	Predictive Aircraft Maintenance System
PASS-K	PACOM ADP Site Server - Korea
PATGEN	Patient Generator
PC	Personal computer
PCB	Printed circuit board
PCE	Process-Centered Environment
PCIS	Portable Common Interface Set
PCM	1 - Production Cost Model 2 - Pulse Coded Modulation
PCMCIA	Personal Computer Memory Card International Association
PCMT	Personal Computer Message Terminal
PCTE	Portable Common Tools Environment
PDES	Product Data Exchange using STEP
PDL	Programmable Design Language
PDR	Preliminary Design Review
PDSS	Post Deployment Software Support
PDU	Protocol Data Unit
PEGASUS	Perspective View Generator and Analysis Systems for Unmanned Sensors
PERT	Program Evaluation Review Technique
PHIGS	Programmer's Hierarchical Interactive Graphics Standard
PID	Protocol Identifier Data
PIF	Picture Interchange Format
PIN	1 - Personal Identification Number 2 - Process Identification Number
PIO	Processor Input/Output
PIPS	Polar Ice Prediction System
PLA	Plain Language Address
PLAD	Plain Language Address Designator
PLEXUS	Phillips Laboratory Expert User System
PM ITTS	Project Manager for Instrumentation, Targets, and Threat Simulations
PM	Program Manager
PMSP	Preliminary Message Security Protocol

PNP	Plug and Play
POP	Point of Presence
POP-Ds	Proof-of-Principle Demonstrations
POPS	Pyrotechnic Optical Plume Simulator
PORTSIM	Port Simulation Model
POSIX	Portable Operating System Interface
PPDB	Point Positioning Data Base
PPF	Platform Proto-Federations
PPP	Point-to-Point Protocol
Pre-BADD	Pre-Battlefield Awareness Data Dissemination
PRETT	PATRIOT Radar Emulator Test Tool
PRF	Pulse Repetition Frequency
PRIMES	Pre-flight Integration of Munitions and Electronic Systems
PRISM	1 - Parameterized Real-Time Ionospheric Specification Model 2 - Portable, Reusable, Integrated Software Modules
PROM	Programmable Read-Only Memory
PSDB	Perceived Situation Database
PSM	Portable Space Model
PSYOP	Psychological Operations
PTADB	Planning Terrain Analysis Data Base
PTCCN	Prototype Tactical Cryptological Communications Network
PTOS	Patriot Tactical Operations Simulation
PUA	Profiling User Agent
PVC	Permanent Virtual Circuit
PVD	Plain View Display

Q

Q/I	Question/Issue
QA	Quality Assurance
QAE	Quality Assurance Evaluator
QBE	Query By Example
QBF	Query By Form
QC	Quality Control
QDE	Quality Data Evaluation
QDOS	Quick and Dirty Operating System
QDR	1 - Quadrennial Defense Review 2 - Quality Deficiency Report
QFA	Quick File Access
QJM	Quantified Judgement Model
QMR	Quarterly Management Review
QoS	Quality of Service

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R

R&A	Review and Analysis
R&D	Research and Development
R-T	Real-Time
RAC	Reliability Analysis Center
RADGUNS	Radar Directed Gun Simulation System
RADIUS	Research and Development for Image Understanding Systems
RAM	1 - Random Access Memory 2 - Reliability, Availability, and Maintainability
RAPIDSIM	Rapid Intertheater Deployment Simulator
RASS	Random Access Storage System
RASSP	Rapid Prototyping of Application Specific Signal Processors
RAV	Robotic Air Vehicle
RBBS	Remote Bulletin Board System
RC	Routing Control
RCAS	Reserve Component Automation System
RD&A	Research, Development & Acquisition
RDA	1 - Remote Database Access 2 - Research, Development, and Acquisition
RDADS	Real Time Data Acquisition And Display System
RDAISA	Research, Development and Acquisition Information Systems Agency
RDB	Relational Database
RDBMS	Relational Database Management System
RDMS	1 - Range Data Management System 2 - Relational Data Management System
RDT	Remote Debriefing Tool
REA	Remote Entity Approximation
REDCAP	Real-Time Electronic Digitally Controlled Analyzer Processor
RESA	Research, Evaluation, and System Analysis Model
RESS	Radar Environment Simulator System
RFS	Remote File Sharing
RFSS	Radio Frequency Simulation System
RG	Remote Gateway
RID	RTI Initialization Data
RIMS	1 - Radar Image Modeling System

	2 - Research and Development Information Management System
RIP	Routing Information Protocol
RIS	Range Instrumentation Systems
RISC	Reduced Instruction Set Computer
RISM	Reduced Instruction Set Model
RITN	Real-Time Information Transfer and Networking
RLF	Reuse Library Framework
RLMS	Radar Land Mass Simulator
RMSD	Requirements, Models, Software, and Data
ROAMS	Reusable Object Access and Management System
ROI	Return on Investment
ROM	1 - Read Only Memory
	2 - Rough Order of Magnitude
ROMC	Required Operational Messaging Characteristics
ROSE	Remote Operation Service Element
ROV	1 - Range of View
	2 - Remotely Operated Vehicle
ROW	Rest of the World
RPC	Remote Procedure Call
RRDB	Rapidly Reconfigurable Data Base
RRDS	Reduced Resolution Data Set
RS	Relay System
RSFCT	Road Simulator for Fire Control Testing
RSIS	Rotorcraft Systems Integrated Simulator
RSOI	Reception, Staging, Onward Movement and Integration
RSS	Remote Satellite Simulation
RTAD	Relocatable Targets Analysis Data
RTCA	Real-Time Casualty Assessment
RTCNS	Real-Time Communications Network Simulator
RTCS	Real Time Clock System
RTF	Rich Text Format
RTI	Runtime Infrastructure
RTIC	Real-Time information in the cockpit
RTOS	1 - Real Time Operating System
	2 - Reconfigurable Tactical Operations Simulator
RTV	Real Time Video
RWM	1 - Read-Write Memory
	2 - Relocatable Window Model

S

S/W	Software
S&M	Simulation and Modeling
S&T	Science and Technology
S&TP	Science and Technology Program
SA	1 - Situational Awareness 2 - Studies and Analysis 3 - Systems Architecture
SAAE	Software Architecture Attribute Engineering
SADS	Simulated Air Defense System
SAE	Service Acquisition Executive
SAF	Semi-Automated Forces
SAFOR	Semi-Automated Forces
SALT	Society for Applied Learning Technology
SAMSON	Simulation and Modeling Supporting Operational Needs
SAS	Statistical Analysis Software
SASER	Synthetic Atmosphere and Space Environment Representations
SATCOM	Satellite Communications
SATT	Stand Alone TENCAP Simulator
SAWE-RF	Simulating Aerial Weapon Effect - Radio Frequency
SBA	Simulation Based Acquisition
SB ITS	Simulation Based Intelligent Tutoring System
SBB	Synthetic Battle Bridge
SBD	Simulation Based Design
SBDS	Simulation Based Design System
SBIS	Sustaining Base Information System
SBLC	Sustaining Base Level Computer
SBS	Seamless Battlefield Simulator
SCCB	Software Configuration Control Board
SCDL	Surveillance and Control Data Link
SCI	Sensitive Compartmented Information
SCIF	Sensitive Compartmented Information Facility
SCIPMIS	Standard Civilian Personnel Management Information System
SCM	Software Configuration Management
SCORES	Scenario Oriented Recurring Evaluation System
SCRAM	System Configuration Reconfiguration Automation Module
SDA	Software Design Activity

SDD	System Design Document
SDF	Software Development File
SDL	1 - Sensor Data Link
	2 - Software Development Library
SDLC	Synchronous Data Link Control (IBM)
SDM	Sub-Rate Data Multiplexer
SDNS	Secure Data Network System
SDP	Software Development Plan
SDRB	Specifications and Data Review Board
SDSA	Software Development and Support Activity
SDSF	Software Development and Support Facility
SE	Synthetic Environment
SEAROADS	Simulation, Evaluation, Analysis and Research on Air Defense Systems
SECOMO	Software Engineering Cost Model
SED	Software Engineering Directorate
SEDRIS	Synthetic Environment Data Representation and Interchange Specification
SEE	1 - Software Engineering Environments
	2 - Synthetic Environment Exercise
SEES	Security Exercise Evaluation System
SEI	Software Engineering Institute
SEM	1 - Simulation, Engineering and Modeling
	2 - Spherical Earth Model
	3 - System Engineering and Modeling
SESG	Software Engineering Support Group
SEWSIM	Space and Electronic Warfare Simulator
SF	Synthetic Forces
SFCTMP	Surface Temperature Model
SFTS	Synthetic Flight Training Systems
SGD	Symbolized Graphics Data
SGEN	Signal Generator
SGML	Standard Generalized Markup Language
SIAM	1 - Situational Influence Assessment Model
	2 - Space Impact Assessment Methodology
SIDS	Standard Interoperable Datalink System
SIF	1 - Standard Interchange Format
	2 - System Integration Facilities
SIFT	Simulation Interface Toolset
SIG	Special Interest Group
SIGINT	Signals Intelligence
SIGS	Synthetic Imagery Generation System
SIL	System Integration Laboratories
Sim/Stim	Simulation/Stimulation
SIM	Sensor Interaction Model

SiMan	Simulation Management
SIMD	Single Instruction Multiple Data
SIMITAR	Simulation in Training for Advanced Readiness
SIMNET	Simulation Network
SIMTECH	Simulation Technology Program
SIMULOGS	Simulation of Logistics Systems
SIMWG	Simulation Working Group
SIPRNET	SECRET Internet Protocol Router Network
SIRAS	Simulation, Instrumentation, Reduction, and Analysis System
SISL	Secure Integration Simulation Laboratory
SISO	Simulation, Interoperability, and Standards Organization
SLAVE	Simple Lethality and Vulnerability Simulator
SLF	Scalability Logger Format
SLIP	Serial Line Internet Protocol
SLOD	Simulator Level of Detail
SMART	1 - Simulation and Modeling Anchored in Real-World Testing 2 - Susceptibility Model Assessment with Range Test
SMC	Air Force Space and Missile Center
SMDS	Switched Multi-megabit Data Service
SME	Subject Matter Expert
SMI	Soldier-Machine Interface
SMSE	Super Multiple Simulation Exercise
SMSP	Soil Moisture Strength Prediction Model
SMTA	Subordinate Message Transfer Agent
SMTP	1 - Simple Mail Transfer Protocol 2 - Simple Message Transfer Protocol
SNA	System Network Architecture
SNAP	Simulator Network Analysis Project
SND	Standardized Nomenclature Database
SNMP	Simple Network Management Protocol
SNNAP	Statistical Neural Network Analysis Package
SNODEP	Snow Depth Model
SNP	Sub-Network Protocol
SNR	Signal to Noise Ratio
SNS	Secure Network Server
SOACMS	Special Operations Aviation Combat Mission Simulators
Soar	State Operator And Result
SOE	1 - Standard Operating Environment 2 - Synthetic Operating Environment
SOFATS	Special Operations Forces Aircrew Training System
SOFNET-JCM	Special Operations Forces Inter-Simulation Network

	- Joint Conflict Model
SOFPARS	Special Operations Forces Planning and Rehearsal System
SOL	Simulation Oriented Language
SOM	Simulation Object Model
SONET	Synchronous Optical Network
SOO	Statement of Objectives
SPCR	Software Problem Change Requests
SPD	Standards Planning Database
SPPD	Signal Processor Package Design
SPRAE	Stochastic Predictor of Artillery Effectiveness
SPS	Software Product Specification
SQA	Software Quality Assurance
SQEP	Software Quality Evaluation Plan
SQL	Structured Query Language
SQL/DS	Structured Query Language/Data System
SQP	Software Quality Program
SQPP	Software Quality Program Plan
SQuASH	Stochastic Quantitative Analysis of System Hierarchies (Computer model for predicting terminal ballistic effects)
SRF	Summary Reference File
SRP	Software Reuse Program
SRR	System or Software Readiness Review
SRS	1 - Software Requirements Specification
	2 - System Requirements Specification
SRT	Slower Than Real Time
SS&T	Space, Science and Technology
SSA	Software Support Activity
SSC	Small Scale Contingency
SSCDB	Subsurface Currents Data Base
SSDB	Standard Simulator Data Base
SSE	1 - Simulation Support Environment
	2 - Single Simulation Exercise
SSF	1 - Software Support Facility
	2 - Software Support Function
SSG	Synthetic Signature Generator
SSGM	Synthetic Scene Generation Model
SSID	Standard Simulation Interface Design
SSM	Soldier System Modeling
SSMC	Symbology Standards Management Committee
SSP	Simulation Support Plan
SSPO	Simulation Strategic Planning Office
SSR	Software Specification Review
SSSE	Small Single Simulation Exercise

SSTORM	Structured Scenario Torpedo Operational Requirements Model
STAARS	Sustainment Training for Army Aviation Readiness Through Simulation
STADLS	Surrogate Threat Air Defense Laser System
STAF	Simulation/Test Acceptance Facility
STAFLO	Strategic Transportation Analysis Unit Force Flow
STAGE	Scenario Toolkit and Generation Environment
STAMIS	Standard Army Management Information System
STARS	1 - SHAPE Technical Center Adaptable Radar Simulator 2 - Software Technology for Adaptable, Reliable Systems 3 - Software Technology for Adaptable Reliable Software 4 - Standard Accounting and Reporting System
STDL	Submarine Tactical Data Link Program
STDN	Secure Tactical Data Network
STE	1 - Software Test Environment 2 - Special Test Equipment 3 - Surface Threat Emitter
STEMS	Software Test and Evaluation Message System
STEP	Standard for the Exchange of Product Model Data
STM	Synchronous Transfer Mode
STOW	Synthetic Theater of War
STOW-E	Synthetic Theater of War - Europe
STP	Software Test Plan
STR	Software Trouble Reports
STRICOM	U.S. Army Simulation, Training and Instrumentation Command
STSC	Software Technology Support Center
STVLS	Surrogate Threat Visible Laser System
SUAWACS	Soviet Airborne Warning and Control System
SUE	System Unique Equipment
SUMM	Semantic Unification Meta-Model
SUMMITS	Scenario Unrestricted Mobility Model for Intratheater Simulation
SURVIAC	Survivability/Vulnerability Information Analysis Center
SUT	System Under Test
SWCI	Software Configuration Item
SWEG	Simulated Warfare Environment Generator (naval aviation simulator support)
SWIL	Software-in-the-Loop
SWIP	Software Improvement Program

SWOE	Smart Weapon Operability Enhancement
SWPS	Strategic War Planning System
SYNB	Synthetic Battlefield
SYNC	Synchronous
SYSGEN	System Generator
SYSLOG	System Log

T

T&S	Training and Simulation
TA	Technical Architecture
TAA	Technology Area Assessment
TAARUS	TACSIM After Action Review User System
TACCIMS	Theater Automated Command Control Information Management System
TACCSF	Theater Air Command and Control Simulation Facility
TACDEW	Tactical Advanced Combat Direction and Electronic Warfare (Navy model)
TACDEWEGCS	Tactical Advanced Combat Direction and Electronic Warfare, Environmental Generation and Control System
TACSIM	Tactical Simulation (intelligence model, air and ground sensors)
TACTICS	Tri-Service Advanced Countermeasures and Threats Integrated Combat Simulation
TACTS	Tactical Aircrew Combat Training System
TACWAR	Tactical Warfare Model
TADIL	Tactical Digital Information Link
TADSS	Training Aids, Devices, Simulators, and Simulations
TAFIM	Technical Architecture Framework for Information Management
TAFSM	Target Acquisition Fire Support Model
TAGS	Tactical Gamma Ray Simulator
TAIS	Telecommunications and Automated Information Systems
TALON	TACSIM Analysis and Operations Node
TAM	Theater Analysis Model
TAMD	Theater Air and Missile Defense
TAMMIS	Theater Army Medical Management Information System
TAMPS	Tactical Aircraft Mission Planning System
TAMS	Transportation Analysis, Modeling, and Simulation
TAP	Technology Area Plan
TAR	Technology Area Review
TARGET	Theater Analysis and Replanning Graphical Execution Toolkit
TASWIT	Tactical Advanced Simulated Warfare Integrated Trainer
TAT	TACSIM ALSP Translator

TATR	Technical Advisory Team for Reuse
TBIS	Technology Base Investment Strategy
TBMCS	Theater Battle Management Core Systems
TCC	Telecommunications Center
TCG	Time Code Generator
TCIM	Tactical Communications Interface Module
TCIS	Tactical Communications Interface Software
TCP/IP	Transmission Control Protocol/Internet Protocol
TCSEC	Trusted Computer System Evaluation Criteria
TCT	Time-Critical Targets
TCU	Transportable Computer Unit
TD/CM	Technical Data/Configuration Management
TD/CMS	Technical Data/Configuration Management System
TDC	Theater Deployable Communications
TDDS	Tactical Data Distribution System
TDG	Tactical Decision Games
TDI	Trusted Database Interpretation
TDL	Tactical Data Link
TDM	Time-Division Multiplexer
TDMA	Time Division Multiple Access
TDP	1 - Technical Data Package 2 - Test Design Plan 3 - TSPI Data Processor
TDPS	Terrain Data Preparation System
TDS	Tactical Data System
TDSS	Training Devices, Simulations, and Simulators
TDT	Tactical Data Terminal
TEAM	Threat Engagement Analysis Model
TEED	Tactical End-to-End Encryption Device
TEGEN	Tactical Environment Generator
TEM	1 - Terrain Effects Model 2 - Terrain Evaluation Model
TEMITS	Test and Evaluation Management Information and Tracking System
TEMO	Training, Exercises, and Military Operations
TEMPEST	Security class involving compromise of classified data through interception of electronic impulses.
TEMS	Test and Evaluation Mission Simulator
TENA	Test and Evaluation Network Architecture
TERIS	Test and Evaluation Range Internet System
TERSIM	Terrain Simulation
TES	Tactical Engagement Simulation
TESS	1 - Tactical Engagement Simulation System 2 - Tactical Environmental Support System
TEXIS	Theater Exercise and Intelligence Simulation

TFA	Transparent File Access
TFDD	Text File Device Driver
TFG	Terrain and Feature Generation
TFT	Time Flexible Training
TFTP	Trivial File Transfer Protocol
TGT	Tank Gunnery Trainer
TIBS	Tactical Information Broadcast Service
TID	Touch Interactive Display
TIDES	Threat Intelligence Data Extraction System
TIDS	Tactical Information Distribution System
TIE	TACWAR Integrate Environment
TIES	Terrain Imagery Exploitation System
TIIP	Topographic Imagery Integration Prototype
TIM	Technical Integration Manager
TIP	TACSIM Interface Program
TIREM	Terrain-Integrated Rough-Earth Model
TLCSC	Top-Level Computer Software Component
TLD	Top Level Demonstrations
TLSP	Transport Layer Security Protocol
TMDA	Target Management and Development Application
TMDSE	Theater Missile Defense System Exerciser
TMIP	Theater Medical Information Program
TMPO	Terrain Modeling Project Office
TMS	1 - Target Management System
	2 - Telecommunications Management System
TNI	Trusted Network Interpretation
TOPIT	Touched Objects Positioned in Time
TOPS	Thermodynamic Ocean Prediction System
TOSL	Tactical Ocean Simulation Laboratory
TPFDD	Time-Phased Force and Deployment Data
TPFDL	Time-Phased Force and Deployment Listing
TPN	Tactical Packet Network
TRANSCAP	Transportation Systems Capability Model
TREEGEN	Tree Generation Model
TRI-TAC	Tri-Service Tactical Communications
TRM	Technical reference Model
TRS	1 - Thermal Radiation Simulator
	2 - Training, Readiness & Simulation
TSCAM	Team Signal Communications Analysis Model
TSIG	Trusted Systems Interoperability Group
TSMO	Threat Simulator Management Office
TSO	Time Stamp Ordered
TSPI	Time, Space, and Position Information
TTD	Tactical Terrain Data
TTES	Team Tactical Engagement Simulator

TTGT	Tank Team Gunnery Trainer
TTP	Tactics, Techniques and Procedures
TTS	Tactical Training Strategy
TWG	1 - Technical Working Group 2 - Technology Working Group
TWSEAS	Tactical Warfare Simulation, Evaluation and Analysis System

U

UA	User Agent
UAGC	Upper Air Gridded Climatology Data Base
UCCATS	Urban Combat Computer Assisted Training System
UCI	User-Computer Interface
UCOFT	Unit Conduct of Fire Trainer
UD	User Domain
UDP	User Datagram Protocol
UFL	Ulchi Focus Lens
UFSP	Underground Facilities Signature Program
UGDF	Uniform Gridded Data Field
UIDL	User Interface Definition Language
UIMS	User Interface Management System
UISRM	User Interface System reference Model
UJTL	Unified Joint Task List
ULANA	Unified Local Area Network Architecture
ULCS	Unit Level Command Simulation
ULMS	Unit-Level Message Switch
UMEDS	User-Oriented Minimum Essential Data Sets
UNA	Use No Abbreviations
UNC	United Nations Command
UNIX	An open-architecture operating system
UNMA	Unified Network Management Architecture
URL	Universal Resource Location
USAF/XOC	U.S. Air Force Directorate of Modeling, Simulation and Analysis
USAISC	U.S. Army Information System Command
USD(A&T)	Under Secretary of Defense for Acquisition & Technology
USMTF	U.S. Message Transfer Format
USMTF	U.S. Message Text Format
USNI	Universal Simulator Network Interface
USO	Unix Software Organization
USR	Universal Sapce Rectangular
UTC	Universal Time Coordinated
UTE	Unmanned Threat Emitter
UTM	Universal Transverse Mercator
UTSS	Universal Threat System for Simulators
UUCP	Unix-to-Unix Copy
UW	Unconventional Warfare
UWEF	Underwater Evaluation Facility

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V

V&V	Verification and Validation
VAIDC	Video Artificial Intelligence Data Collection
VALAD	Voice Activated Logistics Anchor Desk
VBR	Variable Bit Rate
VCOMM-CLCGF	Virtual Communications in a Corps Level Computer Generated Forces
VE	1 - Value Engineering 2 - Virtual Environment
VEMPS	Vertically Polarized Electromagnetic Pulse Simulator
VFM	Variable Format Message
VGDEM	Variable Generalized Digital Environmental Model
VHSIC	Very High Speed Integrated Circuit
VIC	Vector In Commander
VICTORS	Variable Intensity Computerized Training System
VIGS	Video Disk Gunnery Simulator
VISTA	Variable Stability In-Flight Simulator Test Aircraft
VIT	Virtual Interactive Target
VLSHSIC	Very Large Scale High Speed Integrated Circuitry
VM	Virtual Memory
VME	Virtual Memory Extension
VMF	Variable Message Format
VMS	1 - Virtual Memory System 2 - Vertical Motion Simulator
VMU	Voice Message Unit
VPD	Virtual Prototype Demonstration
VPG	Virtual Proving Ground
VPL	Virtual Programming Language
VR	Virtual Reality
VRML	Virtual Reality Modeling Language
VRPE	Virtual Reality Presentation Engine
VRT	Variable Resolution Terrain Model
VSR	Visual Stimulation Research
VSTI	Vehicle Signature Test Instrumentation
VSU	Virtual Simulation Units
VT	Virtual Terminal
VTC	video teleconference
VTT	video teletraining
VTTR	Virtual Test and Training Range
VUAV	Virtual Unmanned Aerial Vehicle

VV&A	Verification, Validation and Accreditation
VV&C	Verification, Validation and Certification

W

WAIS	Wide Area Information Server
WAM	1 - Wave Amplitude Model 2 - Wide Area Mine
WAN	Wide Area Network
WARSIM 2000	Warfighters' Simulation 2000
WASPS	War-at-Sea Planning System
WAVES	Weather and Atmospheric Visualization Effects for Simulation
WB	Warbreaker
WBMOD	Wide Band Scintillation Model
WBPDU	White Board Protocol Data Unit
WBSS	Wideband Digital Switching System
WBSV	Wideband Secure Voice
WEAM	Weapons Effectiveness Analysis Model
WEEMS	Weapons Effects and Environments Modeling and Simulation
WEST	1 - Weapons Effectiveness Simulated Threat 2 - Weather Environment Simulation Technology
WFS	Weapon Fire Simulator
WGS 84	World Geodetic System 1984
WISDIM	Warfighting and Intelligence Systems Dictionary for Information Management
WISSARD	What If Simulation System for Advanced Research and Development
WMASC	Weapons Modification and Simulation Capability
WORM	Write Once - Read Many
WPC	Warrior Preparation Center
WPE	Word Processing Equipment
WPS	1 - Wideband Packet Switch 2 - Worldwide Port System
WRAP	1 - Wide Area Rapid Acoustic Prediction 2 - Warfighter Rapid Acquisition Program
WWOLS	World Wide On-Line System
WWW	World Wide Web

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X, Y, and Z

X-Windows	A network based graphics windowing system
X.400	A protocol Standard for electronic mail
XTERM	X-terminal
ZULU	time zone indicator for Universal Time

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PART II

DEFINITIONS

Glossary - A

1. 3-D. Three-dimensional, refers to the visual display that exhibits breadth, height and thickness or depth. Standard 2-D computer images and television displays create a flat image with only height and breadth. (DSMC 1992-93 Military Research Fellows Report (reference (a))

2. 6 DOF. Refers to the number of simultaneous directions or inputs a sensor can measure. Typically used to describe the combination of spatial positions (X, Y, Z) and orientation (roll, pitch, yaw). (DSMC 1992-93 Military Research Fellows Report (reference (a))

3. Absorbing Markov Chain Model. A Markov chain model that has at least one absorbing state and in which from every state it is possible to get to at least one absorbing state. (DIS Glossary of M&S Terms, and IEEE STD 610.3, (references (b) and (c))

4. Absorbing State. In a Markov chain model, a state that cannot be left once it is entered. (DIS Glossary of M&S Terms, (reference (b))

5. Abstraction. Abstraction denotes the essential characteristics of an object that distinguish it from all other kinds of objects and thus provide crisply defined conceptual boundaries, relative to the perspective of the user. (DMSO Survey of Semi-Automated Forces, (reference (d))

6. Accessibility. The ease of approaching, entering, or obtaining. (DoD Publication 8320.1-M-3, (reference (e))

7. Accreditation. The official certification that a model or simulation is acceptable for use for a specific purpose. (DoD Directive 5000.59, DoD Publication 5000.59-P and DoD Instruction 5000.61, (references (f), (g) and (h))

8. Accreditation Agent. The organization designated by the accreditation sponsor to conduct an accreditation assessment for a M&S application. (DoD Instruction 5000.61, (reference (h))

9. Accreditation Authority. An individual occupying a position with the appropriate rank, grade, responsibility and/or authority to accredit a model, simulation, or federation of models and/or simulations for a particular purpose or purposes. (DoD Instruction 5000.61, (reference (h))

10. Accreditation Process. The procedure followed by the M&S application sponsor that culminates in the accreditation determination. (DA PAM 5-11, (reference (i))

11. Accreditation Sponsor. The DoD Component or other organization with the responsibility for accrediting a model, simulation, or federation of models and/or simulations for a specific use or series of uses (e.g., for joint training or a Defense Acquisition Board milestone review). (DoD Instruction 5000.61, (reference (h))

12. Accuracy. The degree of exactness of a model or simulation, high accuracy implying low error. Accuracy equates to the quality of a result, and is distinguished from precision, which relates to the quality of the operation by which the result is obtained and can be repeated. (DIS Glossary of M&S Terms, (reference (b))

13. Activity. In modeling and simulation, a task that consumes time and resources and whose performance is necessary for a system to move from one event to the next. (IEEE STD 610.3 (reference (c))

14. Activity-Based Simulation. A discrete simulation that represents the components of a system as they proceed from activity to activity; for example, a simulation in which a manufactured product moves from station to station in an assembly line. (DIS Glossary of M&S Terms, (reference (b))

15. Activity Models. Models of the processes that make up the functional activity showing inputs, outputs, controls, and mechanisms through which the processes of the functional activity are (or will be) conducted. (DoD Publication 8320.1-M, (reference (j))

16. Ada. A high order computer language designed and developed to DoD requirements for modular standard language. While the original focus was for real-time embedded software, Ada has also been used for a variety of other software systems including some simulation systems. (DSMC 1993-94 Military Research Fellows Report, (reference (k))

17. Advanced Concept Technology Demonstration (ACTD). Technology demonstrations that are tightly focused on specific military concepts and that provide the incorporation of technology that is still at an informal stage into a war fighting system. The ACTDs have three objectives: a. to have the user gain an understanding of and to evaluate the military utility of concepts before committing to acquisition; b. to develop corresponding concepts of operation and doctrine that make best use of the new capability; and c. to provide the residual operational capability to the forces. ACTDs are of militarily significant scope and of a size sufficient to establish utility. (DDR&E, Defense S&T Strategy, (reference (l))

18. Advanced Distributed Simulation (ADS). A set of disparate models or simulations operating in a common synthetic environment in accordance with the DIS standards. The ADS may be composed of three modes of simulation: live, virtual and constructive, which can be seamlessly integrated within a single exercise. (DIS Glossary of M&S Terms, (reference (b))

19. Affected Attributes. The specific attributes of an object class instance whose value in a federation execution may be affected by that instance's participation in a dynamic interaction with another instance of the same class, or an instance of another object class. (High Level Architecture Glossary, (reference (m))

20. Aggregate Level Simulation Protocol (ALSP). A family of simulation interface protocols and supporting infrastructure software that permit the integration of distinct simulations and war games. Combined, the interface protocols and software enable large-scale, distributed simulations and war games of different domains to interact at the combat object and event level. The most widely known example of an ALSP confederation is the Joint/Service Training Confederation that has provided the backbone to many large, distributed, simulation-supported exercises. Other examples of ALSP confederations include confederations of analytical models that have been formed to support U.S. Air Force, U.S. Army, and USTRANSCOM studies. (DoD Publication 5000.59-P, (reference (g))

21. Aggregation. The ability to group entities while preserving the effects of entity behavior and interaction while grouped. See also: disaggregation. (DoD Publication 5000.59-P, (reference (g))

22. Algorithm. A prescribed set of well defined unambiguous rules or processes for the solution of a problem in a finite number of steps. (DSMC 1993-94 Military Research Fellows Report, (reference (k))

23. Algorithm Checks. A rigorous verification of the mathematics of an algorithm to ensure freedom from any errors in the expression (e.g., incorrect signs, incorrect variables applied in the equations, derivation errors) and to ensure that the algorithms are consistent with their stated intents. (DIS Glossary of M&S Terms, (reference (b))

24. Alternate Key. Property or characteristic that can be used as a secondary identifier for an entity or entity class. (Federal Information Processing Standard Publication 184, (reference (n))

25. Analytical Model. A model consisting of a set of solvable equations; for example, a system of solvable equations that represents the laws of supply and demand in the world market. (DIS Glossary of M&S Terms, and IEEE STD 610.3, (references (b) and (c))

26. Architecture. The structure of components in a program/system, their interrelationships, and the principles and guidelines governing their design and evolution over time. (DoD Publication 5000.59-P, (reference (g))

27. Artificial Intelligence (AI). The effort to automate those human skills that illustrate our intelligence e.g., understanding visual images, understanding speech and written text, problem solving and medical diagnosis. (DSMC 1993-94 Military Research Fellows Report, (reference (k))

28. Association. A type of static relationship between two or more object classes, apart from class-subclass or part-whole relationships. (High Level Architecture Glossary, (reference (m))

29. Associative Entity. An entity that inherits its primary key from two or more other entities (those that are associated). An associative entity is used to represent many-to-many relationships. (Military Handbook for Joint Data Base Elements for M&S, (reference (o))

30. Asynchronous Transmission. Transmission in which each information character is individually synchronized (usually by the use of start elements and stop elements). (M&S Educational Training Tool, NAWC-TSD Glossary, (reference (p))

31. Asynchronous Transfer Mode (ATM). A multiplexing protocol based on a small 53-byte fixed-length cell designed to efficiently transfer information derived from several sources of data over a single carrier at high speeds.

32. Atmosphere. A kind of mission space entity. The mass of air surrounding the earth and the features embedded within it, including clouds, smoke, and fog.

33. Attribute. A property or characteristic of one or more entities; for example, COLOR, WEIGHT, SEX. Also, a property inherent in an entity or associated with that entity for database purposes. (DoD Publication 8320.1-M, DoD Publication 8320.1-M-1, and FIPS Pub 11-3, (references (j), (q), and (r))

34. Attribute Overloading. The ability of an attribute to carry one of two or more separate facts. (DoD Publication 5000.2-R, (reference (s))

35. Attribute Ownership. The property of a federate that gives it the responsibility to publish values for a particular object attribute. (High Level Architecture Glossary, (reference (m))

36. Attributive Entity. An entity that has the same primary key as the parent and additional attributes that eliminate the occurrence of repeating groups in the parent.

37. Authoritative Data Source. A data source whose products have undergone producer data verification, validation and certification activities.

38. Automated Forces (AFOR). The most automated of the computer-generated forces which requires little or no human interaction. (DoD Publication 5000.59-P, (reference (g))

39. Automated Information System (AIS). A combination of computer hardware and computer software, data, and/or telecommunications that performs functions such as collecting, processing, storing, transmitting, and displaying information. Excluded are computer resources, both hardware and software, that are: physically part of, dedicated to, or essential in real time to the mission performance of weapon systems; used for weapon system specialized training, simulation, diagnostic test and maintenance, or calibration; or used for research and development of weapon systems. (DoD Publication 8320.1-M and DoD Publication 5000.2-R, (references (j) and (s))

40. Autonomous. A battlefield entity that does not require the presence of another battlefield entity in order to conduct its own simulation in the battlefield environment is said to be

autonomous. All Distributed Interactive Simulation compliant battlespace entities are autonomous in that they are responsible for creating their own view of the environment. (M&S Educational Training Tool, NAWC-TSD Glossary, (reference (p))

Glossary - B

41. Baselining. A configuration management term that implies that the item is placed under formal control so that it cannot be changed without going through a formal review process.

42. Battlefield View. A battlefield entity incorporates a direct soldier/machine interface that replicates the soldier/machine interface of the actual battlefield entity. (M&S Educational Training Tool, NAWC-TSD Glossary, (reference (p))

43. Battlespace. Refers both to the physical environment in which the simulated warfare will take place and the forces that will conduct the simulated warfare. All elements that support the front line forces (e.g., logistics, intelligence) are included in this definition of battlespace. (DoD Publication 5000.59-P, (reference (g))

44. Battlespace Data Base. Data base that defines the specific domain of an engagement. It includes the parametric data needed to generate an operating version of the SIMWORLD. When combined with the SESSION data base (which provides the scenario and other simulation specific data), the BATTLESPACE can generate an exercise. The BATTLESPACE in all capitals is used as a shortened notation for "Battlespace Data Base." (M&S Educational Training Tool, NAWC-TSD Glossary, (reference (p))

45. Battlespace Entity. A simulation entity that corresponds to actual equipment, supplies, and personnel that can be seen or sensed on a real battlefield. (M&S Educational Training Tool, NAWC-TSD Glossary, (reference (p))

46. Behavior. For a given object, how attribute value changes affect (or are affected by) the object attribute value changes of the same or other objects.

47. Benchmark. The activity of comparing the results of a model or simulation with an accepted representation of the process being modeled. (DIS Glossary of M&S Terms, (reference (b))

48. Benchmarking. The comparison between a model's output and the outputs of other models or simulations, all of which represent the same input and environmental conditions. (MORS Report, October 27, 1989, (reference (t))

49. Bit. The smallest unit of information in the binary system of notation. (DIS Glossary of M&S Terms, and IEEE STD 610.3, (references (b) and (c))

50. Black Box Model. A model whose inputs, outputs, and functional performance are known, but whose internal implementation is unknown or irrelevant; for example, a model of a computerized change-return mechanism in a vending machine, in the form of a table that indicates the amount of change to be returned for each amount deposited. Syn: input/output model. Contrast with: glass box model. (DIS Glossary of M&S Terms, and IEEE STD 610.3, (references (b) and (c))

51. Boundary Condition. The values assumed by the variables in a system, model, or simulation when one or more of them is at a limiting value at the edge of the domain of interest. Contrast with: final condition; initial condition. (DIS Glossary of M&S Terms, and IEEE STD 610.3, (references (b) and (c))

52. Broadcast. A transmission model in which a single message is sent to all network destinations; i.e., one-to-all. Broadcast is a special case of multicast. Contrast with: multicast; unicast. (DIS Glossary of M&S Terms, and IEEE STD 610.3, (references (b) and (c))

53. Browsing. Opportunity for users to freely examine and peruse through the contents of a database.

54. Built-in-Simulation. A special-purpose simulation provided as a component of a simulation language; for example, a simulation of a bank that can be made specific by stating the number of tellers, number of customers, and other parameters. (DIS Glossary of M&S Terms, and IEEE STD 610.3, (references (b) and (c))

55. Built-in-Simulator. A simulator that is built-in to the system being modeled; for example, an operator training simulator built into the control panel of a power plant such that the system can operate in simulator mode or in normal operating mode. (DIS Glossary of M&S Terms, and IEEE STD 610.3, (references (b) and (c))

Glossary - C

56. C++ (C-Plus-Plus). A high order computer language used extensively in commercial software. C++ is an object-oriented extension to the C language. (DSMC 1993-94 Military Research Fellows Report, (reference (k))

57. Cancellation. A mechanism used in optimistic synchronization mechanisms such as Time Warp to delete a previously scheduled event. Cancellation is a mechanism used within the Time Warp executive, and is normally not visible to the federate. It is implemented (in part) using the Runtime Infrastructure event retraction mechanism. (High Level Architecture Glossary, (reference (m))

58. Candidate Key. An attribute or group of attributes that might be chosen as a primary key. (Military Handbook for Joint Data Base Elements for M&S, (reference (o))

59. Catalogue. An enumeration of M&S data, or other items arranged systematically with descriptive details such as setup time, running time, developer, point of contact, etc. (MORS Report, October 27, 1989, (reference (t))

60. Causal Order. A partial ordering of messages based on the "causally happens before" (-->) relationship. A message delivery service is said to be causally ordered if for any two messages M_1 and M_2 (containing notifications of events E_1 and E_2 respectively) that are delivered to a single federate where E_1 -> E_2, then M_1 is delivered to the federate before M_2. (High Level Architecture Glossary, (reference (m))

61. Central Station. A computer connected to a local area network that transmits/receives simulation management protocol data units at the direction of the simulation manager. (M&S Educational Training Tool, NAWC-TSD Glossary, (reference (p).)

62. Class. A description of a group of objects with similar properties, common behavior, common relationships, and common semantics. (High Level Architecture Glossary, (reference (m))

63. Class Hierarchy. A specification of a class-subclass, or "is-a" relationship between object classes in a given domain. (High Level Architecture Glossary, (reference (m))

64. Class Word. A word in the name of a data element describing the category to which the data element belongs; e.g., "date," "name," "code." The word establishes the general structure and domain of a standard data element. (DoD Publication 8320.1-M-1 and NBS Pub 500-149, (references (q) and (u))

65. Closed-Form Solution. A closed-form solution for representing time in dynamic models is a method in which the states or status of resources are described as explicit and computationally tractable functions of time. Thus, the status of a resource at time "t" can be found by evaluating the appropriate function at "t", without having to simulate combat from the start of that combat through time "t". (MORS Report, October 27, 1989, (reference (t))

66. Code Verification. A rigorous audit of all compilable code to ensure that the representations of verified logic have been properly implemented in the computer code. (DA PAM 5-11, (reference (i))

67. Coenetic Variable. In modeling, a variable that affects both the system under consideration and that system's environment. (IEEE STD 610.3 (reference (c))

68. Cohesion. Cohesion refers to the degree to which the contents of a module are logically related. (DMSO Survey of Semi-Automated Forces, (reference (d))

69. Command and Control Warfare (C2W). The integrated use of operations security (OPSEC), military deception, psychological operations (PSYOP), electronic warfare (EW), and physical destruction, mutually supported by intelligence, to deny information to, influence, degrade, or destroy adversary C2 capabilities, while protecting friendly C2 capabilities against such actions. (Joint Pub 3-13.1, (reference (v))

70. Common Federation Functionality. Agreements on common simulation functionality (services and resources) which are finalized among all participants in the federation during the federation development process. Federation members identified during Federation Design will propose opportunities for common services in areas of assigned responsibilities (also established during Federation Design) during federation development for discussion and negotiation among all federation participants. For instance, agreements on common representations of terrain (data, source, resolution, dynamic vs. static), and environment (required types, data sources, resolution, servers), would be negotiated and agreed to, as would any relevant federation-

specific algorithms (e.g., extrapolation). (High Level Architecture Glossary, (reference (m))

71. Common-Use M&S. M&S applications, services, or materials provided by a DoD Component to two or more DoD Components. (DoD Directive 5000.59 and DoD Publication 5000.59-P, (references (f) and (g))

72. Complex Data. Data that cannot be characterized as a single concept, atomic data element as defined in DoD 8320.1-M-1, (reference (q)). Complex data includes most scientific and technical data. It has been categorized into: a. highly derived data (e.g., probability hit/kill); b. objects utilizing the concepts of multiple inheritance (e.g., student-assistant is subclass of student class and employee class), multiple root hierarchies (e.g., a tank is a vehicle and a tank is a weapon where "vehicle" and "weapon" are each roots), and polymorphic attributes (e.g., "capacity" for different types of aircraft may mean number of people, pounds of cargo, or gallons of fuel); c. compositions such as command hierarchies, road networks, images (binary large objects), compound documents; and d. artifacts of legacy systems and physical constraints (e.g., aircraft category and mission in one data element, intelligence facility code where the first few bytes define how the rest of the field is used. (DoD Publication 5000.59-P, (reference (g))

73. Component Class. An object class which is a component, or part of, a "composite" object which represents a unified assembly of many different object classes. The identification of a Component Class in the object model template (OMT) should include cardinality information. (High Level Architecture Glossary, (reference (m))

74. Composite Attribute. A single attribute that is composed of a specific set of identifiable pieces of information; e.g., an address made up of a street number, city, state, and zip code. (Military Handbook for Joint Data Base Elements for M&S, (reference (o))

75. Compression. Any of several techniques that reduce the number of bits required to represent information in data transmission or storage, therefore conserving bandwidth and/or memory, wherein the original form of the information can be reconstructed; also called compaction. (M&S Educational Training Tool, NAWC-TSD Glossary, (reference (p))

76. Computational Model. A model consisting of well-defined procedures that can be executed on a computer; for example, a

model of the stock market, in the form of a set of equations and logic rules. (IEEE STD 610.3, (reference (c))

77. Computer Generated Forces (CGF). A generic term used to refer to computer representations of forces in simulations that attempts to model human behavior sufficiently so that the forces will take some actions automatically (without requiring man-in-the-loop interaction). Also referred to as Semi-automated Forces. DoD programs addressing various levels of computer automation of forces include Command Forces, Intelligent Forces, Modular Semi-Automated Forces, Integrated Tactical Environment Management System, and Close Combat Tactical Trainer Semi-Automated Forces. (DoD Publication 5000.59-P, (reference (g))

78. Computer Hardware. Devices capable of accepting and storing computer data, executing a systematic sequence of operations on computer data, or producing control outputs. Such devices can perform substantial interpretation, computation, communication, control, or other logical functions. (DoD STD-498, (reference (w))

79. Computer Resources. The totality of computer hardware, firmware, software, personnel, documentation, supplies, services, and support services applied to a given effort.

80. Computer Simulation. A dynamic representation of a model, often involving some combination of executing code, control/display interface hardware, and interfaces to real-world equipment.

81. Computer Software (or Software). A set of computer programs, procedures, and associated documentation concerned with the operation of a data processing system, e.g., compilers, library routines, manuals, and circuit diagrams.

82. Computer Software Documentation. Technical data or information, including computer listings and printouts, which documents the requirements, design, or details of computer software, explains the capabilities and limitations of the software, or provides operation instructions for using or supporting computer software during the software's operational life. (Joint Pub 1-02, (reference (x))

83. Computer War Game. A technique by which different concepts, different pieces of hardware, or different military plans can be investigated in a multi-sided confrontation using a computer to generate displays of the battlefield and perform computations of outcomes. (DSMC 1992-93 Military Research Fellows Report (reference (a))

84. Conceptual Analysis. The step in the federation development and execution process which establishes the conceptual framework for the federation. It feeds the design of the overall federation structure. The conceptual view of the objects and interactions that must be represented in the federation is key to identifying reuse opportunities in established Federation Object Models (FOMs), and high-level representation of the federation scenario refined during Conceptual Analysis also provides the basis for generation of a more detailed scenario instance during Federation Design/Development. (High Level Architecture Glossary, (reference (m))

85. Conceptual Model. A statement of the content and internal representations which are the user's and developer's combined concept of the model. It includes logic and algorithms and explicitly recognizes assumptions and limitations. (DIS Glossary of M&S Terms, (reference (b))

86. Conceptual Model of the Mission Space (CMMS). First abstractions of the real world that serve as a frame of reference for simulation development by capturing the basic information about important entities involved in any mission and their key actions and interactions. They are simulation-neutral views of those entities, actions, and interactions occurring in the real world.

87. Conceptual Schema. Descriptive representation of data and data requirements that supports the "logical" view or data administrator's view of the data requirement. This view is represented as a semantic model of the information that is stored about objects of interest to the functional area. This view is an integrated definition of the data that is unbiased toward any single application of data and is independent of how the data is physically stored or accessed. (DoD Publication 8320.1-M, (reference (j))

88. Concrete Model. A model in which at least one component represented is a tangible object; for example, a physical replica of a building. (DIS Glossary of M&S Terms, and IEEE STD 610.3, (references (b) and (c))

89. Concurrent Engineering. Concurrent engineering is a systematic approach to the integrated, concurrent design of products and their related processes, including manufacture and support. This approach is intended to cause the developers, from the outset, to consider all elements of the product life cycle from conception through disposal, including quality, cost,

schedule, and user requirements. See also: Integrated Product and Process Development. (DSMC 1993-94 Military Research Fellows Report, (reference (k))

90. Condition. The values assumed at a given instant by the variables in a system, model, or simulation. See also: boundary condition; final condition; initial condition; state. (DIS Glossary of M&S Terms, and IEEE STD 610.3, (references (b) and (c))

91. Conditional Event. A sequentially dependent event that will occur only if some other event has already taken place. See also: time-dependent event. (DIS Glossary of M&S Terms, and IEEE STD 610.3, (references (b) and (c))

92. Configuration. A collection of an item's descriptive and governing characteristics, which can be expressed: a. in functional terms i.e., what performance the item is expected to achieve; and b. in physical terms i.e., what the item should look like and consist of when it is built.

93. Configuration Management (CM). The application of technical and administrative direction and surveillance to identify and document the functional and physical characteristics of a model or simulation, control changes, and record and report change processing and implementation status. (DA PAM 5-11, Army M&S Master Plan, and Marine Corps M&S Master Plan, (references (i), (y), and (z))

94. Conservative Synchronization. A mechanism that prevents a federate from processing messages out of time stamp order. This is in contrast to optimistic synchronization. The Chandry/Misra/ Bryant null message protocol is an example of a conservative synchronization mechanism. (High Level Architecture Glossary, (reference (m))

95. Consistency. Data that is maintained so that it is free from variation or contradiction. (DoD Publication 8320.1-M-3 and DoD Publication 8320.1-M, (references (e) and (j))

96. Constant. A quantity or data item whose value cannot change. (IEEE STD 610.3, (reference (c))

97. Constrained Simulation. A simulation where time advances are paced to have a specific relationship to wallclock time. These are commonly referred to as real-time or scaled-real-time simulations. Here, the terms *constrained simulation* and *(scaled) real-time simulation* are used synonymously. Human-in-the-loop (e.g., training exercises) and hardware-in-the-loop (e.g., test

and evaluation simulations) are examples of constrained simulations. (High Level Architecture Glossary, (reference (m))

98. Constructive Model or Simulation. See: Live, Virtual and Constructive Simulation. (DoD Publication 5000.59-P, (reference (g))

99. Continuous Model. A mathematical or computational model whose output variables change in a continuous manner. Contrast with: Discrete Model. (DIS Glossary of M&S Terms, and IEEE STD 610.3, (references (b) and (c))

100. Continuous Simulation. A simulation that uses a continuous model. (DIS Glossary of M&S Terms, and IEEE STD 610.3, (references (b) and (c))

101. Continuous System. A system for which the state variables change continuously with respect to time.(DSMC 1993-94 Military Research Fellows Report, (reference (k))

102. Control Station. Facility that provides the individual responsible for controlling the simulation and also provides the capability to implement simulation control as Protocol Data Units on the Distributed Interactive Simulation network. (DIS Glossary of M&S Terms, (reference (b))

103. Controllability. In respect to user interface of SAFORs, this is the ability of a user to dynamically change the tactics or behavior of a force during the course of an exercise easily and efficiently. For all exercises this is the ability to stop and restart an exercise from some interim point in time.

104. Cooperative Development. A project in which two or more DoD Components share in domain research, technical studies, or technology development that may result in dissimilar M&S applications. (DoD Directive 5000.59, DoD Instruction 5000.61, DSMC 1993-94 Military Research Fellows Report, and MSETT NAWC-TSD Glossary, (references (f), (h), (k), and (p))

105. Coordinate. Linear or angular quantities which designate the position that a point occupies in a given reference frame or system. Also used as a general term to designate the particular kind of reference frame or system, such as Cartesian coordinates or spherical coordinates. (M&S Educational Training Tool, NAWC-TSD Glossary, (reference (p))

106. Coordinated Time Advancement. A time advancement mechanism where logical clock advances within each federate only occur after some coordination is performed among the federates participating in the execution e.g., to ensure that the federate

never receives an event notice in its past. Aggregate Level Simulation Protocol, for example, used coordinated time advancement. (High Level Architecture Glossary, (reference (m))

107. Critical Event Simulation. A simulation that is terminated by the occurrence of a certain event; for example, a model depicting the year-by-year forces leading up to a volcanic eruption, that is terminated when the volcano in the model erupts. See also: time-slice simulation. (DIS Glossary of M&S Terms, and IEEE STD 610.3, (references (b) and (c))

108. Cross-Functional Integration. The melding of acquisition functions (such as design analysis with logistics analysis) involving shared modeling and simulation data and information. (DSMC 1993-94 Military Research Fellows Report, (reference (k))

109. Cultural Features. Features of the environment that have been constructed by man. Included are such items as roads, buildings, canals, marker buoys; boundary lines, and, in a broad sense, all names and legends on a map.

110. Current Time (of a federate). Same as federate time. (High Level Architecture Glossary, (reference (m))

111. Cybernetics. The study of human control functions and the mechanical and electronic systems designed to replace or emulate them, including computers. "Cyber," as a prefix, denotes anything related to computer environments, especially things that involve extensive interaction by the user. (DSMC 1992-93 Military Research Fellows Report (reference (a))

Glossary - D

112. Data. A representation of facts, concepts, or instructions in a formalized manner suitable for communication, interpretation, or processing by humans or by automatic means. (DoD Publication 8320.1-M, DoD Publication 8320.1-M-1, and FIPS Pub 11-3, (references (j), (q), and (r))

113. Data Administration (DAdm). The responsibility for definition, organization, supervision, and protection of data within an enterprise or organization. (DoD Publication 8320.1-M, and DoD Directive 8320.1, (references (j) and (aa))

114. Data Administrator (DAd). A person or group that ensures the utility of data used within an organization by defining data policies and standards, planning for the efficient use of data, coordinating data structures among organizational components, performing logical database design, and defining data security procedures. See also: Data Steward. (DoD Publication 8320.1-M, DoD Publication 8320.1-M-1, and NBS Special Pub 500-152, (references (j), (q), and (bb))

115. Data Architecture. The framework for organizing and defining the interrelationships of data in support of an organization's missions, functions, goals, objectives, and strategies. Data architectures provide the basis for the incremental, ordered design and development of databases based on successively more detailed levels of data modeling. (DoD Publication 8320.1-M, (reference (j))

116. Data Attribute. A characteristic of a unit of data such as length, value, or method of representation. (DoD Publication 8320.1-M-1 and NBS Special Pub 500-152, (references (q) and (bb))

117. Data Center. An organization which serves as a conduit between data sources and data customers. The data center may transform these data as necessary to meet the operational requirements, format, security, and data verification, validation, and certification provisions of its sources and supported users.

118. Data Certification. The determination that data have been verified and validated. Data user certification is the determination by the application sponsor or designated agent that data have been verified and validated as appropriate for the

specific M&S usage. Data producer certification is the determination by the data producer that data have been verified and validated against documented standards or criteria. (DoD Publication 5000.59-P, (reference (g))

119. Data Collection. The process of obtaining information that supports a functional activity, or information requirement. (DoD Publication 8320.1-M, (reference (j))

120. Data Dictionary. A specialized type of database containing metadata that is managed by a data dictionary system; a repository of information describing the characteristics of data used to design, monitor, document, protect, and control data in information systems and databases; an application of a data dictionary system. (DoD Publication 8320.1-M-1 and DoD Directive 8320.1, (references (q) and (aa))

121. Data Dictionary System. An automated system such as an IRDS that can support one or more data dictionaries. A system specifically designed for managing a data dictionary. (National Bureau of Standards Pub 500-152, (reference (bb))

122. Data Element. A basic unit of information having a meaning and subcategories (data items) of distinct units and values (e.g., address). (DoD Directive 8320.1, (reference (aa))

123. Data Element Standardization. The process of documenting, reviewing and approving unique names, definitions, characteristics and representations of data elements according to established procedures and conventions. (DoD Publication 8320.1-M-1, (reference (q))

124. Data Entity. An object of interest to the enterprise, usually tracked by an automated system. (DoD Publication 8320.1-M, DoD Publication 8320.1-M-1, and NBS Pub 500-149, (references (j), (q) and (u))

125. Data Exchange Standard. Formally defined protocols for the format and content of data messages used for interchanging data between networked simulation and/or simulator nodes used to create and operate a distributed, time and space coherent synthetic environment. (Army Model and Simulation Master Plan, (reference (y))

126. Data Integrity. In information processing, the condition in which data is accurate, current, consistent, and complete (DoD Publication 8320.1-M, (reference (j))

127. Data Logger. A device that accepts Protocol Data Units (PDUs) from the network and stores them for later replay on the

network in the same time sequence as the PDUs were originally received. See also: Protocol Data Unit. (DIS Glossary of M&S Terms, and IEEE STD 610.3, (references (b) and (c))

128. Data Model. In a database, the user's logical view of the data in contrast to the physically stored data, or storage structures. A description of the organization of data in a manner that reflects the information structure of an enterprise. (DoD Publication 8320.1-M, DoD Publication 8320.1-M-1, and FIPS Pub 11-3, (references (j), (q), and (r))

129. Data Quality. The correctness, timeliness, accuracy, completeness, relevance, and accessibility that make data appropriate for use. Quality statements are required for source, accuracy (positional and attribute), up-to-dateness/currency, logical consistency, completeness (feature and attribute), clipping indicator, security classification, and releasability. (DoD Publication 5000.59-P, and DoD Publication 8320.1-M, (references (g) and (j)

130. Data Repository. A specialized database containing information about data, such as meaning, relationships to other data, origin, usage, and format, including the information resources needed by an organization. (DoD Publication 8320.1-M, (reference (j))

131. Data Security. The protection of data from accidental or intentional modification or destruction and from accidental or intentional disclosure to unauthorized personnel. (DoD Publication 8320.1-M, (reference (j))

132. Data Source. An organization or subject matter expert who, because of either mission or expertise, serves as a data producer.

133. Data Standardization. The process of documenting, reviewing, and approving unique names, definitions, characteristics and representations of data according to established procedures and conventions. (DoD Publication 8320.1-M, and DoD Publication 8320.1-M-1, (references (j) and (q))

134. Data Steward. The person or group that manages the development, approval, and use of data within a specified functional area, ensuring that it can be used to satisfy data requirements throughout the organization. (DoD Publication 8320.1-M, and DoD Publication 8320.1-M-1, (references (j) and (q))

135. Data Structure. The logical relationships that exist among units of data and the descriptive features defined for those relationships and data units; an instance or occurrence of a data model. (DoD Publication 8320.1-M-1, and NBS Special Pub 500-152, (references (q) and (bb))

136. Data Synchronization. The timing requirements of a data element, or between and/or among data elements. (DoD Publication 8320.1-M, (reference (j))

137. Data Validation. The documented assessment of data by subject area experts and its comparison to known values. Data user validation is an assessment as appropriate for use in an intended model. Data producer validation is an assessment within stated criteria and assumptions. (DoD Publication 5000.59-P, (reference (g))

138. Data Value. A value associated with a data element. One of the allowable values of a data element. (DoD Publication 8320.1-M, and DoD Directive 8320.1, (references (j) and (aa))

139. Data Verification. Data producer verification is the use of techniques and procedures to ensure that data meets constraints defined by data standards and business rules derived from process and data modeling. Data user verification is the use of techniques and procedures to ensure that data meets user specified constraints defined by data standards and business rules derived from process and data modeling, and that data are transformed and formatted properly. (DoD Publication 5000.59-P, (reference (g))

140. Data Verification, Validation & Certification (VV&C). The process of verifying the internal consistency and correctness of data, validating that it represents real world entities appropriate for its intended purpose or an expected range of purposes, and certifying it as having a specified level of quality or as being appropriate for a specified use, type of use, or range of uses. The process has two perspectives: producer and user process. (DoD Publication 5000.59-P, (reference (g))

141. Database. A collection of interrelated data, often with controlled redundancy, organized according to a schema to serve one or more applications; the data are stored so that they can be used by different programs without concern for the data structure or organization. A common approach is used to add new data and to modify and retrieve existing data. (DoD Publication 8320.1-M, DoD Publication 8320.1-M-1, and FIPS Pub 11-3, (references (j), (q), and (r))

142. Database Administration (DBAdm). The activity responsible for the enforcement of the policies and standards established by the data administrator, to include providing technical support for physical database definition, design, implementation, maintenance, integrity, and security; and coordinating with computer operations technicians, system developers, vendors, and users. Database administration is oriented toward technical support for databases and the effective and efficient use of information technology resources. (DoD Publication 8320.1-M, (reference (j))

143. Database Administrator (DBAd). A person or group that enforces policy of "how," "where," and "in what manner," data is stored and maintained in each database. Provides information to the Data Administrator (DA) on organizational use of data within the subject database. (DoD Directive 8320.1, (reference (aa))

144. Database Directory. A database of entries each of which represents information about a database or a directory of databases. Information includes the name of a database or directory, ownership, point of contact, access path to the database or directory, description of purpose of database.

145. Database Management System (DBMS). A system that provides the functionality to support the creation, access, maintenance, and control of databases, and that facilitates the execution of application programs using data from these databases.

146. Dead Reckoning. The process of extrapolating emulation entity position/orientation based on the last known position/orientation, velocity, and (sometimes) higher-order derivatives of position vs. time and/or other vehicle dynamic characteristics. Syn: remote entity approximation. (DIS Glossary of M&S Terms, and MSETT NAWC-TSD Glossary, (references (b) and (p))

147. Deaggregate. See: disaggregate.

148. Defense Simulation Internet (DSI). A wide-band telecommunications network operated over commercial lines with connectivity to both military and civilian satellites, allowing users to be linked on a worldwide wide-area network. Note: Superceded with Enhanced Internet Protocol Services in the Defense Information System Network (DISN). (DoD Publication 5000.59-P, (reference (g))

149. Dependent Variable. A variable whose value is dependent on the values of one or more independent variables. Contrast with:

independent variable. (DIS Glossary of M&S Terms, and IEEE STD 610.3, (references (b) and (c))

150. Descriptive Model. A model used to depict the behavior or properties of an existing system or type of system; for example, a scale model or written specification used to convey to potential buyers the physical and performance characteristics of a computer. Contrast with: prescriptive model. (DIS Glossary of M&S Terms, and IEEE STD 610.3, (references (b) and (c))

151. Deterministic. Pertaining to a process, model, simulation or variable whose outcome, result, or value does not depend upon chance. Contrast with: stochastic. (DIS Glossary of M&S Terms, and MSETT NAWC-TSD Glossary, (references (b) and (p))

152. Deterministic Algorithm. A process that yields a unique and predictable outcome for a given set of inputs. (DSMC 1993-94 Military Research Fellows Report, (reference (k))

153. Deterministic Model. A model in which the results are determined through known relationships among the states and events, and in which a given input will always produce the same output; for example, a model depicting a known chemical reaction. Contrast with: stochastic model. (DIS Glossary of M&S Terms, and IEEE STD 610.3, (references (b) and (c))

154. Digital Simulation. (1) A simulation that is designed to be executed on a digital system. (2) A simulation that is designed to be executed on an analog system but that represents a digital system. (3) A simulation of a digital circuit. Contrast with: analog simulation. See also: hybrid simulation. (DIS Glossary of M&S Terms, and IEEE STD 610.3, (references (b) and (c))

155. Disaggregate. Activity that decomposes an aggregated entity into multiple entities representing its components. (DIS Glossary of M&S Terms, (reference (b))

156. Disaggregation. The ability to represent the behavior of an aggregated unit in terms of its component entities. If the aggregate representation did not maintain state representations of the individual entities, then the decomposition into the entities can only be notional. (DoD Publication 5000.59-P, (reference (g))

157. Discrete Model. A mathematical or computational model whose output variables take on only discrete values; that is, in changing from one value to another, they do not take on the intermediate values; for example, a model that predicts an organization's inventory levels based on varying shipments and

receipts. Contrast with: continuous model. (DIS Glossary of M&S Terms, and IEEE STD 610.3, (references (b) and (c))

158. Discrete Simulation. A simulation that uses a discrete model. (DIS Glossary of M&S Terms, and IEEE STD 610.3, (references (b) and (c))

159. Discrete System. A system for which the state variables change instantaneously at separated points in time. (DSMC 1993-94 Military Research Fellows Report, and Joint Pub 1-02, (references (k) and (x))

160. Distributed Interactive Simulation (DIS) Compatible. Two or more simulations and/or simulators are DIS compatible if they are DIS compliant and their models and data that send and interpret Protocol Data Units support the realization of a common operational environment among the systems (coherent in time and space). (DIS Glossary of M&S Terms, (reference (b))

161. Distributed Interactive Simulation (DIS) Network Manager. A specified agency with the responsibility to manage the physical network used for distributed simulation. Responsibilities include: ensuring security of network; scheduling of utilization; establishing network priorities; monitoring execution of scheduled usage; coordinating functional, technical, and user communities' network requirements. (DIS Glossary of M&S Terms, (reference (b))

162. Distributed Interactive Simulation (DIS) Protocol Data Unit (PDU). A standard that specifies the format and structure in which data will be organized. The general purpose is to facilitate the electronic transfer of data between agencies with software; specifically, DIS PDUs are designed to enable communications between different types of simulators, simulations, and models. (DIS Glossary of M&S Terms, (reference (b))

163. DoD M&S Executive Agent. A DoD Component to whom the USD(A&T) has assigned responsibility and delegated authority for the development and maintenance of a specific area of M&S application, including relevant standards and databases, used by or common to many models and simulations. (DoD Directive 5000.59, DoD Publication 5000.59-P, and DSMC 1993-94 Military Research Fellows Report, (references (f), (g), and (k))

164. DoD Publications. DoD issuances that implement or supplement DoD Directives and Instructions by providing uniform procedures for management or operational systems and disseminating administrative information. DoD Publications

include: Catalogs, Directories, Guides, Handbooks, Indexes, Inventories, Lists, Manuals, Modules, Pamphlets, Plans, Regulations, and Standards that implement or supplement DoD Directives or Instructions. (DoD Instruction 5000.61, (reference (h))

165. Domain. The physical or abstract space in which the entities and processes operate. The domain can be land, sea, air, space, undersea, a combination of any of the above, or an abstract domain, such as an n-dimensional mathematics space, or economic or psychological domains. (MORS Report, October 27, 1989, (reference (t))

166. Dual Use Technologies. Technologies with both a military and a civilian application.

167. Dynamic Model. A model of a system in which there is change, such as the occurrence of events over time or the movement of objects through space; for example, a model of a bridge that is subjected to a moving load to determine characteristics of the bridge under changing stress. (DIS Glossary of M&S Terms, and IEEE STD 610.3, (references (b) and (c))

168. Dynamic Natural Environment. The natural environment is constantly changing as a result of man-made efforts (battlefield smoke) and natural phenomenon (weather). Incorporating dynamic natural environment into real time simulations provides a more realistic test bed for weapons, equipment, and personnel. (Army Model and Simulation Master Plan, (reference (y))

Glossary - E

169. Emitter. A device that is able to discharge detectable electromagnetic or acoustic energy. (DIS Glossary of M&S Terms, and MSETT NAWC-TSD Glossary, (references (b) and (p))

170. Empirical. Pertaining to information that is derived from observation, experiment, or experience. (DIS Glossary of M&S Terms, and IEEE STD 610.3, (references (b) and (c))

171. Emulate. To represent a system by a model that accepts the same inputs and produces the same outputs as the system represented. For example, to emulate an 8-bit computer with a 32-bit computer. (DIS Glossary of M&S Terms, and IEEE STD 610.3, (references (b) and (c))

172. Emulation. A model that accepts the same inputs and produces the same outputs as a given system. See also: simulation. (DIS Glossary of M&S Terms, and IEEE STD 610.3, (references (b) and (c))

173. Emulator. A device, computer program, or system that performs emulation. (DIS Glossary of M&S Terms, and IEEE STD 610.3, (references (b) and (c))

174. Encapsulation. The process of hiding the details of an object that do not contribute to its essential characteristics. (DMSO Survey of Semi-Automated Forces, (reference (d))

175. Endogenous variable. A variable whose value is determined by conditions and events within a given model. Syn: internal variable. Contrast with: exogenous variable. (DIS Glossary of M&S Terms, and IEEE STD 610.3, (references (b) and (c))

176. Enterprise. An arbitrarily defined functional and administrative entity that exists to perform a specific, integrated set of missions and achieve associated goals and objectives, encompassing all of the primary functions necessary to perform those missions.

177. Enterprise Model. An information model(s) that presents an integrated top-level representation of processes, information flows, and data. (DoD Publication 8320.1-M and DoD Directive 8000.1, (references (j) and (cc))

178. Entity. A distinguishable person, place, unit, thing, event, or concept about which information is kept. (Military Handbook for Joint Data Base Elements for M&S, (reference (o))

179. Entity Coordinates. Location with respect to a simulation entity. (DIS Glossary of M&S Terms, (reference (b))

180. Entity Perspective. The perception of the synthetic environment held by a simulation entity based on its knowledge of itself and its interactions with the other simulation entities. This includes not only its own view of the simulated physical environment (terrain, air, and sea), but also its own view of itself, the other entities in the synthetic environment, and of the effects of the other entities on itself and the synthetic environment. Syn: worldview. (DIS Glossary of M&S Terms, (reference (b))

181. Entity Relationship Diagram (ERD). A graphic representation of a data model.

182. Environment. The texture or detail of the natural domain, that is terrain relief, weather, day, night, terrain cultural features (such as cities or farmland), sea states, etc.; and the external objects, conditions, and processes that influence the behavior of a system (such as terrain relief, weather, day/night, terrain cultural features, etc.). (DIS Glossary of M&S Terms, (reference (b))

183. Environmental Effect. The impact that the natural environment or environmental feature has on some component or process in the simulation exercise such as the propagation of energy and image formation, the performance of a weapon system, platform or sensor, or other non-visualized combat process.

184. Environmental Effect Model. A numerical model, parametric model, or database for simulating a natural environmental effect on an entity of a simulation exercise, such as a sensor or platform.

185. Environmental Entity. A simulation entity that corresponds to dynamic elements of the natural state of the geographic, atmospheric, and bathyspheric environment, of the synthetic environment, that can be seen or sensed on a real battlefield, for example, craters, smoke, building collapse, weather conditions, and sea state. (DIS Glossary of M&S Terms, (reference (b))

186. Environmental Features. An individual element of the natural environment (e.g., a rain system, fog, cloud).

187. Environmental Model. A numerical model, parametric model, or database designed to produce an accurate and consistent data set for one or more parameters that characterize the state of the natural environment.

188. Environmental Representation. An authoritative representation of all or a part of the natural or man-made environment, including permanent or semi-permanent man-made features.(DoD Publication 5000.59-P, (reference (g))

189. Environmental Simulation. A simulation that depicts all or part of the natural or manmade environment of a system; for example, a simulation of the radar equipment and other tracking devices that provide input to an aircraft tracking system. (IEEE STD 610.3 (reference (c))

190. Equilibrium. See: steady state. (DIS Glossary of M&S Terms, (reference (b))

191. Error Model. a. A model used to estimate or predict the extent of deviation of the behavior of an actual system from the desired behavior of the system; for example, a model of a communications channel, used to estimate the number of transmission errors that can be expected in the channel; b. in software evaluation, a model used to estimate or predict the number of remaining faults, required test time, and similar characteristics of a system. (DIS Glossary of M&S Terms, and IEEE STD 610.3, (references (b) and (c))

192. Euler Angles. A set of three angles used to describe the orientation of an entity as a set of three successive rotations about three different orthogonal axes (x, y, and z). The order of rotation is first about z by angle (psi), then about the new y by angle (theta), then about the newest x by angle (phi). Angles psi and phi range between +/- pi, while angle theta ranges only between +/- pi/2 radians. These angles specify the successive rotations needed to transform from the world coordinate system to the entity coordinate system. The positive direction of rotation about an axis is defined by the right-hand rule. (DIS Glossary of M&S Terms, (reference (b))

193. Event. A change of object attribute value, an interaction between objects, an instantiation of a new object, or a deletion of an existing object that is associated with a particular point on the federation time axis. Each event contains a time stamp indicating when it is said to occur. (High Level Architecture Glossary, (reference (m))

194. Event Notice. A message containing event information. (High Level Architecture Glossary, (reference (m))

195. Event-Oriented Simulation. A simulation in which attention is focused on the occurrence of events and the times at which those events occur; for example, a simulation of a digital circuit that focuses on the time of state transition. (DIS Glossary of M&S Terms, and IEEE STD 610.3, (references (b) and (c))

196. Executive Council for Modeling and Simulation (EXCIMS). An organization established by the USD(A&T) and responsible for providing advice and assistance on DoD M&S issues. Membership is determined by the USD(A&T) and is at the Senior Executive Service, flag, and general officer level. DoD Directive 5000.59, (reference (f))

197. Exercise Manager. Test director or training officer who manages the setup, control, and feedback of a simulation exercise after the computer network is activated. This individual is part of the user organization. Syn: Simulation Manager. (DIS Glossary of M&S Terms, (reference (b))

198. Exogenous Variable. A variable whose value is determined by conditions and events external to a given model. Syn: external variable. Contrast with: endogenous variable. (DIS Glossary of M&S Terms, and IEEE STD 610.3, (references (b) and (c))

199. Expert System. An expert system is a knowledge collection combined with an inference engine capable of interpreting queries and chaining together separate items of knowledge to develop new inferences. The knowledge is typically causally represented as a system of rules. In some cases, expert systems can retrace their paths of inference on demand, thus explaining their conclusions and reasoning. (DSB Report May 1988, (reference (dd))

200. Extensibility. The ability of a data structure to accommodate additional values or iterations of data over time without impacting its initial design. (DoD Publication 8320.1-M-3 and DoD Publication 8320.1-M, (references (e) and (j))

201. External Schema. A logical description of an enterprise that may differ from the conceptual schema upon which it is based in that some entities, attributes, or relationships may be omitted, renamed, or otherwise transformed. (DoD Publication 8320.1-M, (reference (j))

Glossary - F

202. Face Validation. The process of determining whether a model or simulation seems reasonable to people who are knowledgeable about the system under study, based on the model's performance. This process does not review the software code or logic, but rather reviews the inputs and outputs to ensure they appear realistic or representative. (DIS Glossary of M&S Terms, and MSETT NAWC-TSD Glossary, (references (b) and (p))

203. Fair Fight. Two or more simulations may be considered to be in a fair fight when differences in the simulations' performance characteristics have significantly less effect on the outcome of the conflict than actions taken by the simulation participants. (DIS Glossary of M&S Terms, (reference (b))

204. Fast Time. a. Simulated time with the property that a given period of actual time represents more than that period of time in the system being modeled; for example, in a simulation of plant growth, running the simulation for one second may result in the model advancing time by one full day; that is, simulated time advances faster than actual time; b. the duration of activities within a simulation in which simulated time advances faster than actual time. Contrast with: real time; slow time.(DIS Glossary of M&S Terms, and IEEE STD 610.3, (references (b) and (c))

205. Feature. A static element of the synthetic environment that exists but does not actively participate in synthetic environment interactions. Features are represented in the implementation environment by cartographic databases that are used by simulation assets. Entities can interact with features (building them, destroying them, colliding with them, etc.), but features are passive in that they do not initiate action. When features are dynamic (e.g., dynamic terrain) they are called environment entities. See: environmental entity; synthetic environment. (DIS Glossary of M&S Terms, (reference (b))

206. Federate. A member of a High Level Architecture Federation. All applications participating in a Federation are called Federates. This may include federation managers, data collectors, real world ("live") systems (e.g., C4I systems, instrumented ranges, sensors), simulations, passive viewers and

other utilities. (High Level Architecture Glossary, (reference (m))

207. Federate Time. Scaled wallclock time or logical time of a federate, whichever is smaller. Federate time is synonymous with the "current time" of the federate. At any instant of an execution different federates will, in general, have different federate times. (High Level Architecture Glossary, (reference (m))

208. Federation. A named set of interacting federates, a common federation object model, and supporting Runtime Infrastructure, that are used as a whole to achieve some specific objective. (High Level Architecture Glossary, (reference (m))

209. Federation Element. Term applied to an individual model and/or simulation that is part of a federation of models and simulations. (DoD Instruction 5000.61, (reference (h))

210. Federation Execution. The actual operation, over time, of a subset of the federates and the Runtime Infrastructure initialization data taken from a particular federation. It is the step where the executable code is run to conduct the exercise and produce the data for the measures of effectiveness for the federation execution. (High Level Architecture Glossary, (reference (m))

211. Federation Execution Data (FED). Information derived from the Federation Object Model (class, attribute, parameter names, etc.). Each federation execution needs one. In the abstract, creation of a federation execution is simply the binding of a federation execution name to a Federation Execution Data. The organization of Federation Execution Data will become the subject of standard so Federate Object Model tools can automatically generate them for any vendor's Runtime Infrastructure. (High Level Architecture Glossary, (reference (m))

212. Federation Execution Sponsor. Federation development begins with a user and a requirement. The federation execution sponsor is the organization that uses the results and/or products from a specific application of modeling and simulation. It is the group responsible for establishing the need for the development and execution of a federation. They also establish the framework for the Measures of Effectiveness by which the results of the execution are employed. (High Level Architecture Glossary, (reference (m))

213. Federation Object Model (FOM). An identification of the essential classes of objects, object attributes, and object

interactions that are supported by a High Level Architecture federation. In addition, optional classes of additional information may also be specified to achieve a more complete description of the federation structure and/or behavior. (High Level Architecture Glossary, (reference (m))

214. Federation Objective. The statement of the problem that is to be addressed by the establishment and execution of a federation. The description of the problem domain implicit in the objectives statement is critical for focusing the domain analysis activities in the conceptual analysis phase. It specifies the top-level goals of the federation, and may specify the operational need or shortfall from which federation developers will derive a scenario for the federation execution. The federation objectives drive this specification, as the scenario development phase must utilize the statement of the objectives to generate a viable context for system evaluations intrinsic to the federation objectives. High-level testing requirements implied in the federation objectives may also drive the identification of well defined "test points" during development of the federation scenario. (High Level Architecture Glossary, (reference (m))

215. Federation Required Execution Details (FRED). A global specification of several classes of information needed by the Runtime Infrastructure to instantiate an execution of the federation. Additional execution-specific information needed to fully establish the "contract" between federation members (e.g., publish responsibilities, subscription requirements, etc.) is also documented in the FRED. The set of management requirements provides one source of input to the Federation Required Execution Details specification, which will be recorded in a standardized format. (High Level Architecture Glossary, (reference (m))

216. Federation Time. The time used to coordinate the activities between federation members. Runtime Infrastructure services are specified in terms of Federation Time and are independent of the discipline used by Federation members to advance to their individual temporal states. (High Level Architecture Glossary, (reference (m))

217. Federation Time Axis. A totally ordered sequence of values where each value represents an instant of time in the physical system being modeled, and for any two points T_1 and T_2 on the federation time axis, if $T_1 < T_2$, then T_1 represents an instant of physical time that occurs before the instant represented by T_2. Logical time, scaled wallclock time, and federate time specify

points on the federation time axis. The progression of a federate along the federation time axis during the execution may or may not have a direct relationship to the progression of wallclock time. (High Level Architecture Glossary, (reference (m))

218. Fidelity. The accuracy of the representation when compared to the real world. (DoD Publication 5000.59-P, (reference (g))

219. Field. A series of contiguous bits treated as an instance of a particular data type that may be part of a higher-level data structure. (DIS Glossary of M&S Terms, and MSETT NAWC-TSD Glossary, (references (b) and (p))

220. Field Instrumentation. An internal or external recording, monitoring, and relaying device employed by live instrumented entities, usually platform, facility, or exercise-unique, and not typically part of the operational system or equipment. These devices provide an independent source of data to assess the performance of operational systems involved in the exercise. (DIS Glossary of M&S Terms, (reference (b))

221. Final Condition. The values assumed by the variables in a system, model, or simulation at the completion of some specified duration of time. Syn: equilibrium condition. Contrast with: boundary condition; initial condition. (DIS Glossary of M&S Terms, and IEEE STD 610.3, (references (b) and (c))

222. Final State. The values assumed by the state variables of a system, component, or simulation at the completion of some specified duration of time. (DIS Glossary of M&S Terms, and IEEE STD 610.3, (references (b) and (c))

223. Functional Area. A functional area encompasses the scope (the boundaries) of a set of related functions and data for which an OSD Principal Staff Assistant or the Chairman of the Joint Chiefs of Staff has DoD-wide responsibility, authority, and accountability. A functional area (e.g., personnel) is composed of one or more functional activities (e.g., recruiting), each of which consists of one or more functional processes (e.g., interviews). Also known as a business area. (DoD Publication 5000.59-P, (reference (g))

224. Functional Data Administrator (FDAd). A person or group that ensure the utility of data used within the Functional Area by defining data policies and standards, planning for the efficient use of data, coordinating data structures among organizational components, performing logical database design,

and defining data security procedures. (DoD Publication 5000.59-P, (reference (g))

225. Functional Process. A well-defined (or definable) set of logically related tasks and decisions within a functional activity that use resources to produce products or services. (DoD Publication 8320.1-M, (reference (j))

226. Functional Process Improvement. Application of a structured methodology to define a function's "as is" and "to be" environments; current and future mission needs and end user requirements; objectives and a strategy for achieving those objectives; and a program of incremental and evolutionary improvements to processes, data, and supporting Automated Information Systems that are implemented through functional, technical, and economic analysis and decision-making. (DoD Publication 8320.1-M, (reference (j))

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Glossary - G

227. Game. A physical or mental competition in which the participants, called players, seek to achieve some objective within a given set of rules. See also: game theory. (DIS Glossary of M&S Terms, and IEEE STD 610.3, (references (b) and (c))

228. Game Theory. a. The study of situations involving competing interests, modeled in terms of the strategies, probabilities, actions, gains, and losses of opposing players in a game. See also: management game; war game; b. The study of games to determine the probability of winning given various strategies. (DIS Glossary of M&S Terms, and IEEE STD 610.3, (references (b) and (c))

229. Gateway. A device that connects two systems, especially if the systems use different protocols. For example, a gateway is needed to connect two independent local networks, or to connect a local network to a long-haul network. (MSETT NAWC-TSD Glossary, (reference (p))

230. Generic Domain. A domain type where the attribute is constrained only by the data type assigned by the data base management system (DBMS), or implied by the record type in a flat file, whichever is applicable. (Military Handbook for Joint Data Base Elements for M&S, (reference (o))

231. Generic Element. A generic element is the part of a data element that establishes a structure and limits the allowable set of values of a data element. A generic element has no functional or application context other than to define a general class of data and ensure consistency in structure and domain. (DoD Publication 8320.1-M-1, (reference (q))

232. General-Use M&S Applications. Specific representations of the physical environment or environmental effects used by, or common to, many models and simulations; e.g., terrain, atmospheric, or hydrographic effects. (DoD Directive 5000.59, DoD Publication 5000.59-P, and DoD Instruction 5000.61, (references (f), (g) and (h))

233. Glass Box Model. A model whose internal implementation is known and fully visible; for example, a model of a computerized change-return mechanism in a vending machine, in the form of a

diagram of the circuits and gears that make the change. Contrast with: black box model. Syn: white box model. (DIS Glossary of M&S Terms, and IEEE STD 610.3, (references (b) and (c))

234. Global Combat Support System (GCSS). Demand driven, joint initiative designed to accelerate delivery of combat support applications and databases (e.g., logistics, engineering, finance, medical, etc.) to the warfighter. Focus is on providing user access to these applications from a single workstation.

235. Graphical Model. A symbolic model whose properties are expressed in diagrams; for example, a decision tree used to express a complex procedure. Contrast with: mathematical model; narrative model; software model; tabular model. (DIS Glossary of M&S Terms, and IEEE STD 610.3, (references (b) and (c))

236. Guise. A function that provides the capability for an entity to be viewed with one appearance by one group of participants, and with another appearance by another group. (DIS Glossary of M&S Terms, and MSETT NAWC-TSD Glossary, (references (b) and (p))

237. Greenwich Mean Time (GMT). A measure of time that conforms, within a close approximation, to the mean diurnal rotation of the Earth and serves as the basis of civil time-keeping. Universal time (UT1) is determined from observations of the stars, radio sources, and also from ranging observations of the Moon and artificial Earth satellites. The scale determined directly from such observations is designated Universal Time Observed (UTO); it is slightly dependent on the place of observation. When UTO is corrected for the shift in longitude of the observing station caused by polar motion, the time scale UT1 is obtained. When an accuracy better than one second is not required, Universal Time can be used to mean Coordinated Universal Time (UTC). Also called "Universal Time [Coordinated]" or "Zulu Time." (Joint Pub 1-02, (reference (x))

238. Ground Truth. The actual facts of a situation, without errors introduced by sensors or human perception and judgment. (DIS Glossary of M&S Terms, (reference (b))

Glossary - H

239. Happens Before, Causal (-->). A relationship between two actions A_1 and A_2 (where an action can be an event, an RTI message send, or an Runtime Infrastructure message receive) defined as follows: a. if A_1 and A_2 occur in the same federate/Runtime Infrastructure, and A_1 precedes A_2 in that federate/Runtime Infrastructure, then $A_1 \rightarrow A_2$; b. if A_1 is a message send action and A_2 is a receive action for the same message, then $A_1 \rightarrow A_2$; and c. if $A_1 \rightarrow A_2$ and $A_2 \rightarrow A_3$, then $A_1 \rightarrow A_3$ (transitivity). (High Level Architecture Glossary, (reference (m))

240. Happens Before, Temporal ($\rightarrow_t$). A relationship between two events E_1 and E_2 defined as follows: if E_1 has a smaller time stamp than E_2, the $E_1 \rightarrow_t E_2$. The Runtime Infrastructure provides an internal tie-breaking mechanism to ensure (in effect) that no two events observed by a single federate contain the same time stamp. (High Level Architecture Glossary, (reference (m))

241. Haptic. Refers to all the physical sensors that provide a sense of touch at the skin level and force feedback information from muscles and joints. (DSMC 1992-93 Military Research Fellows Report (reference (a))

242. Haptics. The design of clothing or exoskeletons that not only sense motions of body parts (e.g., fingers) but also provide tactile and force feedback for haptic perception of a virtual world.

243. Heterogeneous. Consisting of or involving dissimilar elements or parts.

244. Heterogeneous Network. A collection of simulations with partially consistent behaviors and/or partially correlated data bases. Examples include simulators of different fidelity, mixed virtual and live simulations, and mixes of virtual and constructive simulations. (DIS Glossary of M&S Terms, (reference (b))

245. Heuristic. Relating to or using a problem-solving technique in which the most appropriate solution of several found by alternative methods is selected at successive stages of a program for use in the next step of the program.

246. Hierarchical Model. A model of information in which data are represented as trees of records connected by pointers. (Military Handbook for Joint Data Base Elements for M&S, (reference (o))

247. Hierarchy. Hierarchy is a ranking or ordering of abstractions. (DMSO Survey of Semi-Automated Forces, (reference (d))

248. High Level Architecture (HLA). Major functional elements, interfaces, and design rules, pertaining as feasible to all DoD simulation applications, and providing a common framework within which specific system architectures can be defined. (MSETT NAWC-TSD Glossary, (reference (p))

249. Higher Order Model (HOM). A computer model representing combat elements, their functions and/or the terrain they operate on in an aggregated manner. A HOM may represent a battalion as a specific entity that is a conglomeration or averaging of the characteristics of its real-world components. "Higher Order" generally refers to echelons battalion and above with greater than 100m resolution, e.g. 3km, and with faster than real-time performance (e.g., days compressed into minutes, hours into seconds). See also: war game. (DIS Glossary of M&S Terms, and MSETT NAWC-TSD Glossary, (references (b) and (p))

250. Homogeneous Network. A network of DIS objects with fully consistent behaviors and fully correlated data bases. (Glossary of M&S Terms for DIS, and MSETT NAWC-TSD Glossary, (references (b) and (p))

251. Host or Host Computer. A computer that supports one or more simulation applications. All host computers participating in a simulation exercise are connected by network(s) including wide area networks, local area networks, and RF links. (DIS Glossary of M&S Terms, and IEEE STD 610.3, (references (b) and (c))

252. Human Factors. The discipline or science of studying man-machine relationships and interactions. The term covers all biomedical and psychological considerations; it includes, but is not limited to, principles and applications in the areas of human engineering, personnel selection, training, life support, job performance aids, and human performance evaluation.

253. Human-in-the-Loop (HITL). A model that requires human interaction. See: interactive model. (DIS Glossary of M&S Terms, (reference (b))

254. Human-Machine Simulation. A simulation carried out by both human participants and computers, typically with the human participants asked to make decisions and a computer performing processing based on those decisions. (DIS Glossary of M&S Terms, (reference (b))

255. Hybrid Simulation. A simulation that combines constructive, live, and/or virtual simulations, typically in a distributed environment. Such simulations typically combine simulators with actual operational equipment, prototypes of future systems, and realistic representations of operational environments. (MSETT NAWC-TSD Glossary, (reference (p))

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Glossary - I

256. Iconic Model. A physical model or graphical display that looks like the system being modeled; for example, a non-functional replica of a computer tape drive used for display purposes. See also: scale model.(DIS Glossary of M&S Terms, and IEEE STD 610.3, (references (b) and (c))

257. Identity Simulation. A simulation in which the roles of the participants are investigated or defined; for example, a simulation that identifies aircraft based on their physical profiles, speed, altitude, and acoustic characteristics. (DIS Glossary of M&S Terms, (reference (b))

258. Implementation. The means by which a synthetic environment, or portions of a synthetic environment, is realized. (DIS Glossary of M&S Terms, (reference (b))

259. In-Basket Simulation. A simulation in which a set of issues is presented to a participant in the form of documents on which action must be taken; for example, a simulation of an unfolding international crisis as a sequence of memos describing relevant events and outcomes of the participant's actions on previous memos.(DIS Glossary of M&S Terms, and IEEE STD 610.3, (references (b) and (c))

260. Independent Time Advancement. A means of advancing federate time where advances occur without explicit coordination among federates. Distributed Interactive Simulation is an example of a federation using independent time advancement. (High Level Architecture Glossary, (reference (m))

261. Independent Verification and Validation (IV&V). The conduct of verification and validation of a model or simulation by individuals or agencies that did not develop the model or simulation. (DIS Glossary of M&S Terms, (reference (b))

262. Information. Any communication or reception of knowledge such as facts, data, or opinions, including numerical, graphic, or narrative forms, whether oral or maintained in any medium, including computerized databases, paper, microform, or magnetic tape. (DoD Publication 8320.1-M, D0D Publication 8320.1-M-1, and DoD Directive 8000.1, (references (j), (q), and (cc))

263. Information Management (IM). The creation, use, sharing, and disposition of data or information as corporate resources

critical to the effective and efficient operation of functional activities consistent with Information Management guidance issued by the Office of the Secretary of Defense. Information Management includes the structuring of functional management improvement processes by the Office of the Secretary of Defense Principal Staff Assistants to produce and control the use of data and information in functional activities; information resources management; and supporting information technology and information services. (CJCSI 8510.01, (reference (ee))

264. Information Model. A model that represents the processes, entities, information flows, and elements of an organization and all relationships between these factors. (DoD Publication 8320.1-M-1, (reference (q))

265. Information Resource Dictionary System (IRDS). A set of standard specifications for a data dictionary system resulting from U.S. Federal and national standards efforts; a computer system conforming to those standards that provides facilities for recording, storing, and processing descriptions of an organization's significant information and information processing resources. (DoD Directive 8320.1 and NBS Special Pub 500-152, (references (aa) and (bb))

266. Information System (IS). The organized collection, processing, maintenance, transmission, and dissemination of information in accordance with defined procedures, whether automated or manual(DoD Publication 8320.1-M, and DoD Publication 8320.1-M-1, (references (j) and (q))

267. Information Technology (IT). The hardware and software used in connection with government information, regardless of technology involved, whether computers, communications, micrographics, or others. (DoD Publication 8320.1-M and DoD Directive 8000.1, (references (j) and (cc))

268. Information Warfare (IW). Actions taken to achieve information superiority by affecting adversary information, information-based processes, information systems, and computer-based networks, while defending one's own information, information-based processes, information systems, and computer-based networks. (National Bureau of Standards Pub 500-149, (reference (u))

269. Infrastructure. An underlying base or foundation; the basic facilities, equipment, and installations needed for the functioning of a system. See: M&S infrastructure.

270. Initial Condition. The values assumed by the variables in a system, model, or simulation at the beginning of some specified duration of time. Contrast with: boundary condition; final condition. (DIS Glossary of M&S Terms, (reference (b))

271. Initial State. The values assumed by the state variables of a system, component, or simulation at the beginning of some specified duration of time. Contrast with: final state. (DIS Glossary of M&S Terms, (reference (b))

272. Instantiation. To represent an abstraction by a concrete instance.

273. Instructional Simulation. A simulation intended to provide a simulation equivalent of a real or hypothesized stimulus that could occur in the synthetic environment for the purpose of training. (DIS Glossary of M&S Terms, (reference (b))

274. Integrated Product and Process Development (IPPD. An approach to systems acquisition that brings together all of the functional disciplines required to develop, design, test, produce and field a system. This is essentially the same as Concurrent Engineering. (DSMC 1993-94 Military Research Fellows Report, (reference (k))

275. Integrated Product Team (IPT). Integrated Product Teams are a means to achieve concurrent engineering or Integrated Product and Process Development. They are multi-disciplinary teams consisting of representatives from all disciplines involved in the system acquisition process, from requirements development through disposal. Having the participation of all the appropriate disciplines, Integrated Product Teams are often empowered to make decisions to achieve successful development of their particular product. (DSMC 1993-94 Military Research Fellows Report, (reference (k))

276. Intelligence Community Coordinating Group (ICCOG). Serves as the intelligence community's forum for M&S exchange, fostering improved communication among community and other government agencies and industry. The Intelligence Community Coordinating Group promotes sharing programs, methodologies, tools, techniques, data and other information. (DoD Publication 5000.59-P, (reference (g))

277. Intelligent Agent. A software entity that carries out a set of operations on behalf of a user with some degree of independence or autonomy, and in so doing, employs knowledge or representation of the user's goals or desires.

278. Intelligent Forces (IFOR). A specific program funded by Defense Research Projects Agency to build a maximum of intelligence into the computer representations of forces. (DoD Publication 5000.59-P, (reference (g))

279. Interaction. An explicit action taken by an object, that can optionally (within the bounds of the Federation Object Model) be directed toward other objects, including geographical areas etc. (High Level Architecture Glossary, (reference (m))

280. Interaction Parameters. The information associated with an interaction which objects potentially affected by the interaction must receive in order to calculate the effects of that interaction on its current state. (High Level Architecture Glossary, (reference (m))

281. Interactive Model. A model that requires human participation. Syn: human-in-the-loop. (DIS Glossary of M&S Terms, (reference (b))

282. Internal Schema. An internal schema describes data as it is physically stored and includes all aspects of the environment in which a database is to reside. (DoD Publication 8320.1-M and FIPS Pub 11-3, (references (j) and (r))

283. Interoperability. See: M&S Interoperability. (DoD Publication 5000.59-P, (reference (g))

284. Interval-Oriented Simulation. A continuous simulation in which simulated time is advanced in increments of a size suitable to make implementation possible on a digital system. (DIS Glossary of M&S Terms and IEEE STD 610.3, (references (b) and (c))

Glossary - J

285. Joint M&S. Representations of joint and Service forces, capabilities, equipment, materiel, and services used by the Joint community or by two, or more, Military Services. (DoD Directive 5000.59, (reference (f)

286. JM&S Proponent. The joint Component responsible for life cycle management of a JM&S application or data base. (CJCSI 8510.01, (reference (ee))

287. Joint Modeling and Simulation Executive Panel (JMSEP). An organization responsible for providing advice and assistance on joint M&S issues. The joint Components provide representatives. Membership is at the 0-6 level or higher. The Deputy Director for Wargaming, Simulation, and Operations, J-8, serves as the chair. (CJCSI 8510.01, (reference (ee))

288. Joint Modeling and Simulation Investment Plan (JMSIP). A joint Components plan, published under the authority of the Chairman of the Joint Chiefs of Staff and with the coordination of the joint Components, that establishes short-term (present to 6 years) and long-term (beyond 6 years) programs and funding for joint and common use JM&S to achieve the specified goals and objectives outlined in the JM&S Master Plan. (CJCSI 8510.01, (reference (ee))

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Glossary - K

289. Knowledge. The rules, environment, etc. that form the structure humans use to process and relate to information, or the information a computer system must have to behave in an apparently intelligent manner.

290. Knowledge-Based System. A system in which the domain knowledge is explicit and separate from the system's operational instructions/information.

291. Known Object. An object is known to a federate if the federate is reflecting or updating any attributes of that object. (High Level Architecture Glossary, (reference (m))

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Glossary - L

292. Lag Variable. a. In a discrete simulation, a variable that is an output of one period and an input for some future period; b. in an analog simulation, a variable that is a function of an output variable and that is used as input to the simulation to provide a time delay response or feedback. (DIS Glossary of M&S Terms, (reference (b))

293. Latency. The time required for a device to begin physical output of a desired piece of data once processing is complete.

294. Lead Variable. a. In a discrete simulation, a variable that is an output of one period and that predicts what the output of some future period will be; b. in an analog simulation, a variable that is a function of an output variable and that is used as input to the simulation to provide advanced time response or feedback. (DIS Glossary of M&S Terms, (reference (b))

295. Live Entity. A perceptible object that can appear in the virtual battlespace but is unaware and non-responsive (either by intent, lack of capability or circumstance) to the actions of virtual entities. See also: field instrumentation. (DIS Glossary of M&S Terms, (reference (b))

296. Live Simulation. One of several categories of simulation. See Live, Virtual, and Constructive Simulation. (DoD Publication 5000.59-P, (reference (g))

297. Live, Virtual, and Constructive Simulation. A broadly used taxonomy for classifying simulation types. The categorization of simulation into live, virtual, and constructive is problematic, because there is no clear division between these categories. The degree of human participation in the simulation is infinitely variable, as is the degree of equipment realism. This categorization of simulations also suffers by excluding a category for simulated people working real equipment (e.g., smart vehicles). (DoD Publication 5000.59-P, (reference (g))

298. Live Simulation. A simulation involving real people operating real systems.

299. Virtual Simulation. A simulation involving real people operating simulated systems. Virtual simulations inject human-in-the-loop in a central role by exercising motor control skills

(e.g., flying an airplane), decision skills (e.g., committing fire control resources to action), or communication skills (e.g., as members of a C4I team).

300. Constructive Model or Simulation. Models and simulations that involve simulated people operating simulated systems. Real people stimulate (make inputs) to such simulations, but are not involved in determining the outcomes.

301. Local Area Network. A class of data network that provides high data rate interconnection between network nodes in close physical proximity. (Marine Corps Modeling and Simulation Master Plan, (reference (z))

302. Local Time. The mean solar time for the meridian of the observer. (High Level Architecture Glossary, (reference (m))

303. Logical Data Model. A model of the data stores and flows of the organization derived from the conceptual business model. (DoD Publication 8320.1-M-1, (reference (q))

304. Logical Time. A federate's current point on the logical time axis. If the federate's logical time is T, all time stamp ordered messages with time stamp less than T have been delivered to the federate, and no time stamp ordered messages with time stamp greater than T have been delivered; some, though not necessarily all, time stamp ordered messages with time stamp equal to T may also have been delivered. Logical time does not, in general, bear a direct relationship to wallclock time, and advances in logical time are controlled entirely by the federates and the Runtime Infrastructure. Specifically, the federate requests advances in logical time via the Time Advance Request and Next Event Request Runtime Infrastructure services, and the Runtime Infrastructure notifies the federate when it has advanced logical time explicitly through the Time Advance Grant service, or implicitly by the time stamp of time stamp ordered messages that are delivered to the federate. Logical time (along with scaled wallclock time) is used to determine the current time of the federate (see definition of federate time). Logical time is only relevant to federates using time stamp ordered message delivery and coordinated time advances, and may be ignored (by requesting a time advance to "infinity" at the beginning of the execution) by other federates. (High Level Architecture Glossary, (reference (m))

305. Logical Time Axis. A set of points (instants) on the federation time axis used to specify before and after

relationships among events. (High Level Architecture Glossary, (reference (m))

306. Logical Verification. The identification of a set of assumptions and interactions for which the M&S correctly produces intended results. It determines the appropriateness of the M&S for a particular application and ensures that all assumptions and algorithms are consistent with the conceptual M&S. (DA PAM 5-11, (reference (i))

307. Long-Haul Network (LHN). A communications network of devices which are separated by substantial geographical distance. A LHN could be any of numerous networks available commercially or through the government that can accommodate the requirements of the DIS virtual battlefield for long distance network services. Also called Wide Area Network. (DIS Glossary of M&S Terms, and MSETT NAWC-TSD Glossary, (references (b) and (p))

308. Lookahead. A value used to determine the smallest time stamped message using the time stamp ordered service that a federate may generate in the future. If a federate's current time (i.e., federate time) is T, and its lookahead is L, any message generated by the federate must have a time stamp of at least T+L. In general, lookahead may be associated with an entire federate (as in the example just described), or at a finer level of detail e.g., from one federate to another, or for a specific attribute. Any federate using the time stamp ordered message delivery service must specify a lookahead value. (High Level Architecture Glossary, (reference (m))

309. Lower Bound on the Time Stamp (LBTS). Lower Bound on the Time Stamp of the next time stamp ordered message to be received by a Runtime Infrastructure from another federate. Messages with time stamp less than LBTS are eligible for delivery by the runtime infrastructure to the federate without compromising time stamp order delivery guarantees. Time stamped ordered messages with time stamp greater than LBTS are not yet eligible for delivery. LBTS is maintained within the runtime infrastructure using a conservative synchronization protocol. (High Level Architecture Glossary, (reference (m))

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Glossary - M

310. Machine Simulation. A simulation that is executed on a machine. See also: computer simulation. (DIS Glossary of M&S Terms, and IEEE STD 610.3, (references (b) and (c))

311. Management Game. A simulation game in which participants seek to achieve a specified management objective given pre-established resources and constraints; for example, a simulation in which participants make decisions designed to maximize profit in a given business situation and a computer determines the results of those decisions. See also: war game. (DIS Glossary of M&S Terms, and IEEE STD 610.3, (references (b) and (c))

312. Markov Chain. A discrete Markov process. (IEEE STD 610.3 (reference (c))

313. Markov Chain Model. A discrete, stochastic model in which the probability that the model is in a given state at a certain time depends only on the value of the immediately preceding state. Syn: Markov model. See also: semi-Markov model. (DIS Glossary of M&S Terms, and IEEE STD 610.3, (references (b) and (c))

314. Markov Process. A stochastic process that assumes that in a series of random events, the probability for occurrence of each event depends only on the immediately preceding outcome. See also: semi-Markov process. (DIS Glossary of M&S Terms, and IEEE STD 610.3, (references (b) and (c))

315. Mass Storage. Refers to any device that can store large amounts of data and retrieve it at some later time, even after system power-down. Mass storage devices are usually categorized in terms of being either on-line storage or off-line storage.

316. Mathematical Model. A symbolic model whose properties are expressed in mathematical symbols and relationships; for example, a model of a nation's economy expressed as a set of equations. Contrast with: graphical model; narrative model; software model; tabular model. (DIS Glossary of M&S Terms, (reference (b))

317. Mean Solar Time. A time measurement where time is measured by the diurnal motion of a fictitious body (called "mean Sun") which is supposed to move uniformly in the celestial Equator, completing the circuit in one tropical year. Often termed simply "mean time." The mean Sun may be considered as moving in the

celestial Equator and having a right ascension equal to the mean celestial longitude of the true Sun. At any given instant, mean solar time is the hour angle of the mean Sun. In civil life, mean solar time is counted from the two branches of the meridian through 12 hours; the hours from the lower branch are marked a.m. (ante meridian), and those from the upper branch, p.m. (post meridian). In astronomical work, mean solar time is counted from the lower branch of the meridian through 24 hours. Naming the meridian of reference is essential to the complete identification of time. The Greenwich meridian is the reference for a worldwide standard of mean solar time called "Greenwich Mean Time" (GMT) or "Universal Time [Coordinated]" (UTC). (High Level Architecture Glossary, (reference (m))

318. Measure of Effectiveness (MOE). A qualitative or quantitative measure of the performance of a model or simulation or a characteristic that indicates the degree to which it performs the task or meets an operational objective or requirement under specified conditions.

319. Measure of Outcome (MOO). Metric that defines how operational requirements contribute to end results at higher levels, such as campaign or national strategic outcomes. (DSMC 1993-94 Military Research Fellows Report, (reference (k))

320. Measure of Performance (MOP). Measure of how the system/individual performs its functions in a given environment (e.g., number of targets detected, reaction time, number of targets nominated, susceptibility of deception, task completion time). It is closely related to inherent parameters (physical and structural) but measures attributes of system behavior. See also: measure of effectiveness. (DIS Glossary of M&S Terms, and IEEE STD 610.3, (references (b) and (c))

321. Message. A data unit transmitted between federates containing at most one event. Here, a message typically contains information concerning an event, and is used to notify another federate that the event has occurred. When containing such event information, the message's time stamp is defined as the time stamp of the event to which it corresponds. Here, a "message" corresponds to a single event, however the physical transport media may include several such messages in a single "physical message" that is transmitted through the network. (High Level Architecture Glossary, (reference (m))

322. Message (event) Delivery. Invocation of the corresponding service (Reflect Attribute Values, Receive Interaction,

Instantiate Discovered Object, or Remove Object) by the Runtime Infrastructure to notify a federate of the occurrence of an event. (High Level Architecture Glossary, (reference (m))

323. Metadata. Information describing the characteristics of data; data or information about data; descriptive information about an organization's data, data activities, systems, and holdings. (DoD Publication 8320.1-M, DoD Publication 8320.1-M-1, DoD Directive 8320.1, and NBS Special Pub 500-152, (references (j), (q), (aa), and (bb))

324. Meta-Knowledge. Knowledge about knowledge. Knowledge about the use and control of domain knowledge in an expert or knowledge-based system. Knowledge about how the system operates or reasons. Syn: wisdom. (MSETT NAWC-TSD Glossary, (reference (p))

325. Metamodel. A model of a model. Metamodels are abstractions of the M&S being developed which use functional decomposition to show relationships, paths of data and algorithms, ordering, and interactions between model components and subcomponents. Metamodels allow the software engineers who are developing the model to abstract details to a level that subject matter experts can validate. (MSETT NAWC-TSD Glossary, (reference (p))

326. Methodology. The system of principles, practices, and procedures, applied to a specific branch of knowledge.

327. Metric A measure of the extent or degree to which a product possesses and exhibits a certain quality, property, or attribute. (IEEE STD 610.3 (reference (c))

328. Metric(s). A process or algorithm that may involve statistical sampling, mathematical computations, and rule-based inferencing. Metrics provide the capability to detect and report defects within a sample. (DoD Publication 8320.1-M-3, (reference (e))

329. Mission Space. The environment of entities, actions, and interactions comprising the set of interrelated processes used by individuals and/organizations to accomplish assigned tasks. (DoD Publication 5000.59-P, (reference (g))

330. Mock-Up. A full-sized structural, but not necessarily functional, model built accurately to scale, used chiefly for study, testing, or display. See also: physical model. (DIS Glossary of M&S Terms, and IEEE STD 610.3, (references (b) and (c))

331. Model. A physical, mathematical, or otherwise logical representation of a system, entity, phenomenon, or process. (DIS Glossary of M&S Terms, DoD Directive 5000.59, DoD Publication 5000.59-P and MSETT NAWC-TSD Glossary, (references (b), (f), (g), and (p))

332. Modeling. Application of a standard, rigorous, structured methodology to create and validate a physical, mathematical, or otherwise logical representation of a system, entity, phenomenon, or process. (DoD Publication 8320.1-M, (reference (j))

333. Modeling and Simulation (M&S). The use of models, including emulators, prototypes, simulators, and stimulators, either statically or over time, to develop data as a basis for making managerial or technical decisions. The terms "modeling" and "simulation" are often used interchangeably. (MSETT NAWC-TSD Glossary, (reference (p))

334. Modeling and Simulation (M&S) Accreditation. The official certification that a model or simulation is acceptable for use for a specific purpose. (DIS Glossary of M&S Terms, and DoD Directive 5000.59, (references (b) and (f))

335. Modeling and Simulation (M&S) Application Sponsor. The organization that utilizes the results/product(s) from a specific application of an M&S. (DoD Instruction 5000.61, (reference (h))

336. Modeling and Simulation (M&S) Developer. The agency that actually develops an M&S or the agency that is overseeing the M&S development by a contractor or FFRDC. (Army Model and Simulation Master Plan, (reference (y))

337. Modeling and Simulation (M&S) Executive Agent. See: DoD M&S Executive Agent. (DoD Directive 5000.59, DoD Publication 5000.59-P, and DSMC 1993-94 Military Research Fellows Report, (references (f), (g), and (k))

338. M&S Infrastructure. A M&S infrastructure consists of M&S systems and applications, communications, networks, architectures, standards and protocols, and information resource repositories. (DoD Directive 5000.59, DoD Publication 5000.59-P, and DSMC 1993-94 Military Research Fellows Report, (references (f), (g) and (k))

339. M&S Interoperability. The ability of a model or simulation to provide services to and accept services from other models and simulations, and to use the services so exchanged to enable them to operate effectively together. (DoD Directive 5000.59 and DoD Publication 5000.59-P, (references (f) and (g))

340. Modeling and Simulation Master Plan (MSMP). A DoD plan, published under the authority of the USD(A&T) and with the coordination of the DoD Components, that establishes short-term (present to 6 years) and long-term (beyond 6 years) DoD goals and objectives for the application of M&S for joint and common use within the Department of Defense. It shall also include an assessment of current M&S capabilities, and a road map that delineates the management, investment, and technical strategies required to achieve DoD M&S objectives. (DoD Directive 5000.59, (reference (f))

341. M&S Working Group (MSWG). The MSWG supports the activities of the Executive Council for Modeling and Simulation and responds to guidance and direction from the USD(A&T). The Director, Defense Modeling and Simulation Office, chairs the MSWG. The membership of the MSWG will normally be 0-6 military officers or GM-15 grade civilians. The MSWG promotes coordination and cooperation of DoD M&S at the working level. Members will represent their organization, serve as the Defense Modeling and Simulation Office point of contact for M&S issues, and prepare their principals for Executive Council for Modeling and Simulation meetings. MSWG membership will mirror the organizational makeup of the Executive Council for Modeling and Simulation; however, other organizations may be added by majority vote of the group, as required. (DoD Publication 5000.59-P, (reference (g))

342. Model-Test-Model. An integrated approach to using models and simulations in support of pre-test analysis and planning; conducting the actual test and collecting data; and post-test analysis of test results along with further validation of the models using the test data. (DSMC 1993-94 Military Research Fellows Report, (reference (k))

343. Modifier. A word that helps define and render a name unique within the database, which is not the prime or class word. (DoD Publication 8320.1-M-1 and NBS Pub 500-149, (references (q) and (u))

344. Modular Semi-Automated Forces (ModSAF). A class of Computer Generated Forces utilizing a modular software structure in which model components have well-defined and documented interfaces allowing run-time reconfiguration of model behavior to develop generalized, and more sophisticated, representations of reactive behaviors and missions. (DoD Publication 5000.59-P, (reference (g))

345. Monte Carlo Algorithm. A statistical procedure that determines the occurrence of probabilistic events or values of probabilistic variables for deterministic models; e.g., making a random draw. (DSMC 1993-94 Military Research Fellows Report, (reference (k))

346. Monte Carlo Method. In modeling and simulation, any method that employs Monte Carlo simulation to determine estimates for unknown values in a deterministic problem. (DIS Glossary of M&S Terms, and IEEE STD 610.3, (references (b) and (c))

347. Monte Carlo Simulation. A simulation in which random statistical sampling techniques are employed such that the result determines estimates for unknown values. (DIS Glossary of M&S Terms, (reference (b))

348. Multicast. A transmission mode in which a single message is sent to selected multiple (but not necessarily all) network destinations; i.e., one-to-many. Contrast with: broadcast, unicast. (DIS Glossary of M&S Terms, and IEEE STD 610.3, (references (b) and (c))

349. Multisensory I/O. The use of more than one sensory mechanism (visual, aural, tactile, etc.) to interact with a computer-generated environment. (DSMC 1992-93 Military Research Fellows Report (reference (a))

350. Multi-State Objects. Mission space entities that express a changing state (in attribution and visual display) as the simulation progresses (e.g., damage to structures, changes in vegetation, damage system representations such as vehicles, tanks, etc). (DoD Publication 5000.59-P, (reference (g))

Glossary - N

351. Narrative Model. A symbolic model the properties of which are expressed in words; for example, a written specification for a computer system. Syn: verbal descriptive model. Contrast with: graphical model; mathematical model; software model and tabular model. (DIS Glossary of M&S Terms, and IEEE STD 610.3, (references (b) and (c))

352. Natural Model. A model that represents a system by another system that already exists in the real world; for example, a model that uses one body of water to represent another. (DIS Glossary of M&S Terms, and IEEE STD 610.3, (references (b) and (c))

353. Network Byte Order. The Internet-standard ordering of the bytes corresponding to numeric values. (MSETT NAWC-TSD Glossary, (reference (p))

354. Network Communication Services. The capability provided to electronically transmit modeling and simulation data between networked computational nodes in a manner that meets requirements for transmission latency, multi-cast addressing and security needed to support the creation and operation of distributed time and space coherent synthetic environments. (Army Model and Simulation Master Plan, (reference (y))

355. Network Filter. A system to selectively accept or reject data received from the network. (DIS Glossary of M&S Terms, (reference (b))

356. Network Management. The collection of administrative structures, policies, and procedures that collectively provide for the management of the organization and operation of the network as a whole. See: network manager. (DIS Glossary of M&S Terms, and IEEE STD 610.3, (references (b) and (c))

357. Network Manager. The person or organization responsible for maintaining, monitoring and scheduling the operation of the portion of a network used for a distributed simulation and whose responsibilities for the network terminates at the gateways and who is not responsible for the simulation hosts or a local area network. Normally, also in charge of the gateway and not part of the user organization. (DIS Glossary of M&S Terms, (reference (b))

358. Network Node. A specific network address. See: node. Contrast with: processing node. (DIS Glossary of M&S Terms, (reference (b))

359. Network Theory. The study of networks used to model processes such as communications, computer performance, routing problems, and project management. (DIS Glossary of M&S Terms, and IEEE STD 610.3, (references (b) and (c))

360. Node. A general term denoting either a switching element in a network or a host computer attached to a network. See: processing node; network node. (DIS Glossary of M&S Terms, and IEEE STD 610.3, (references (b) and (c))

361. Non-Absorbing State. In a Markov chain model, a state that can be left once it is entered. (DIS Glossary of M&S Terms, and IEEE STD 610.3, (references (b) and (c))

362. Non-Standard Cell. A cell that is not compliant with the Distributed Interactive Simulation message and data base standards. Non-standard cells require a Cell Adapter Unit in order to join a Distributed Interactive Simulation exercise. (DIS Glossary of M&S Terms, and MSETT NAWC-TSD Glossary, (references (b) and (p))

363. Non-Standard Data Element. Any data element that exists in a system or application program and does not conform to the conventions, procedures, or guidelines established by the organization. (DoD Publication 8320.1-M-1, (reference (q))

364. Normative Model. A model that makes use of a familiar situation to represent a less familiar one; for example, a model that depicts the human cardiovascular system by using a mechanical pump, rubber hoses, and water. (DIS Glossary of M&S Terms, and IEEE STD 610.3, (references (b) and (c))

365. Notional Data. Speculative or theoretical data rather than actual data.

366. Numerical Model. a. A mathematical model in which a set of mathematical operations is reduced to a form suitable for solution by simpler methods such as numerical analysis or automation; for example, a model in which a single equation representing a nation's economy is replaced by a large set of simple averages based on empirical observations of inflation rate, unemployment rate, gross national product, and other indicators; b. A model whose properties are expressed by numbers. (DIS Glossary of M&S Terms, and IEEE STD 610.3, (references (b) and (c))

Glossary - O

367. Object. A fundamental element of a conceptual representation for a federate that reflects the "real world" at levels of abstraction and resolution appropriate for federate interoperability. For any given value of time, the state of an object is defined as the enumeration of all its attribute values. (High Level Architecture Glossary, (reference (m))

368. Object-Based. A software design methodology adhering to only some of the properties of object-oriented software; for example, Ada does not support inheritance, a key property of object oriented systems, therefore Ada is often referred to as an object based language. See: object-oriented.

369. Object Model. A specification of the objects intrinsic to a given system, including a description of the object characteristics (attributes) and a description of the static and dynamic relationships that exist between objects. (High Level Architecture Glossary, (reference (m))

370. Object Model Framework. The rules and terminology used to describe High Level Architecture object models. (High Level Architecture Glossary, (reference (m))

371. Object Ownership. Ownership of the ID attribute of an object, initially established by use of the Instantiate Object interface service. Encompasses the privilege of deleting the object using the Delete Object service. Can be transferred to another federate using the attribute ownership management services. (High Level Architecture Glossary, (reference (m))

372. Object-Oriented Language. A language that best suits an object-oriented decomposition of software and that provides the capability to implement classes and objects. Directly supports data abstraction and classes, and provides additional support for inheritance as a means of expressing hierarchies of classes. (DSMC 1993-94 Military Research Fellows Report and Air Force Modeling and Simulation Master Plan, (DSMC 1993-94 Military Research Fellows Report and Air Force Modeling and Simulation Master Plan, (references (k) and (ff))

373. Object-Oriented Programming. Use of a programming system that results in programs organized as cooperative collections of objects, each of which represents an instance of some class, and whose classes are members of class hierarchies as defined by the

inheritance mechanism. (DMSO Survey of Semi-Automated Forces, (reference (d))

374. Occlusion. The vision effect of closer objects overlapping or occluding more distant ones, providing visual clues to judge how close objects are from the viewer. Slight head motions provide more information about occlusions. (DSMC 1992-93 Military Research Fellows Report (reference (a)) .

375. Octet. A sequence of eight bits, usually operated upon as a unit. (MSETT NAWC-TSD Glossary, (reference (p))

376. Office of the Secretary of Defense (OSD). Includes the immediate Offices of the Secretary and Deputy Secretary of Defense, the Under Secretaries of Defense, the Director of Defense Research and Engineering, the Assistant Secretaries of Defense (ASDs), the General Counsel of the Department of Defense (GC, DoD), the Assistants to the Secretary of Defense (ATSDs), the OSD Directors, or equivalents, who report directly to the Secretary or the Deputy Secretary of Defense, and such other staff offices as the Secretary of Defense establishes to assist in carrying out assigned responsibilities. (DoD Directive 5000.59 and DoD Instruction 5000.61, (references (f) and (h))

377. Off-Line Storage Devices. Off-line storage devices generally are used for data backup and archival applications, using media-like magnetic tapes or removable hard or floppy disks.

378. On-Line Storage Devices. On-line storage devices provide more immediate retrieval of data than off-line storage devices, and usually refer to non-removable magnetic or optical hard disk drives.

379. Open System. A system in which the components and their composition are specified in a non-proprietary environment, enabling competing organizations to use these standard components to build competitive systems. There are three perspectives on open systems: portability - the degree to which a system component can be used in various environments, interoperability - the ability of individual components to exchange information, and integration - the consistency of the various human-machine interfaces between an individual and all hardware and software in the system. (DSMC 1993-94 Military Research Fellows Report and Air Force Modeling and Simulation Master Plan, (DSMC 1993-94 Military Research Fellows Report and Air Force Modeling and Simulation Master Plan, (references (k) and (ff))

380. Operational Environment. A composite of the conditions, circumstances, and influences that affect the employment of military forces and the decisions of the unit commander. Frequently characterized as permissive, semi-permissive, or non-permissive. (DIS Glossary of M&S Terms, (reference (b))

381. Optimisitic Synchronization. A mechanism that uses a recovery mechanism to erase the effects of out-of-order event processing. This is in contrast to conservative synchronization. The Time Warp protocol is an example of an optimistic synchronization mechanism. Messages sent by an optimistic federate that could later be canceled. (DIS Glossary of M&S Terms, (reference (b))

382. Orthogonal. Pertaining to or composed of right angles. Variables which are orthogonal are mutually independent mathematically. This includes the notion of 'independence' or 'ease of transformation' as used in regard to matrices in multivariate analysis.

383. Outcome-Oriented Simulation. A simulation in which the end result is considered more important than the process by which it is obtained; for example, a simulation of a radar system that uses methods far different from those used by the actual radar, but whose output is the same. Contrast with: process-oriented simulation. (DIS Glossary of M&S Terms, and IEEE STD 610.3, (references (b) and (c))

384. Output Validation. The process of determining the extent to which the output (outcome distributions for the M&S and/or sub-models) represent the significant and salient features of distributions or real world systems, events, and scenarios. (DA PAM 5-11, (reference (i))

385. Owned Attribute. An object attribute that is explicitly modeled by the owning federate. A federate that owns an attribute has the unique responsibility to provide values for that attribute to the federation, through the Runtime Infrastructure, as they are produced. (High Level Architecture Glossary, (reference (m))

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Glossary - P

386. Parallax. The vision effect of having two eyes viewing the same scene from slightly different positions that creates a sense of depth. Computer-generated environments, one for each eye, artificially create the parallax effect. (DSMC 1992-93 Military Research Fellows Report (reference (a))

387. Parallel Processing. Multiple processes running on multiple processors simultaneously. (DSMC 1993-94 Military Research Fellows Report, (reference (k))

388. Parametric Model. A model using parametric equations that may be based on numerical model outputs or fits to semi-empirical data to succinctly describe a particular process, feature, or effect. (MSETT NAWC-TSD Glossary, (reference (p))

389. Period. The time interval between successive events in a discrete simulation. (DIS Glossary of M&S Terms, and IEEE STD 610.3, (references (b) and (c))

390. Petri Net. An abstract, formal model of information flow, showing static and dynamic properties of a system; i.e., the petri net is defined by its places, transitions, input function, and output function.(DIS Glossary of M&S Terms, and IEEE STD 610.3, (references (b) and (c))

391. Physical Data Model. A representation of the technologically independent information requirements in a physical environment of hardware, software, and network configurations representing them in the constraints of an existing physical environment. (DoD Publication 8320.1-M, and FIPS Pub 11-3, (references (j) and (r))

392. Physical Model. A model whose physical characteristics resemble the physical characteristics of the system being modeled; for example, a plastic or wooden replica of an airplane. A mock-up. See also: iconic model; scale model. Contrast with: symbolic model. (DIS Glossary of M&S Terms, and IEEE STD 610.3, (references (b) and (c))

393. Pixel. A "picture element," refers to the smallest visual unit in an image on a computer display. (DSMC 1992-93 Military Research Fellows Report (reference (a))

394. Platform. A generic term used to describe a level of representation equating to vehicles, aircraft, missiles, ships, fixed sites, etc., in the hierarchy of representation possibilities. Other representation levels include units (made up of platforms) and components or modules (which make up platforms). (DIS Glossary of M&S Terms, and MSETT NAWC-TSD Glossary, (references (b) and (p))

395. Polygon. A flat plane figure with multiple sides, the basic building block of virtual worlds. The more polygons a computer can display and manipulate per second, the more realistic the virtual world will appear. Humans perceive the equivalent of 80 million polygons at more than 30 frames per second in normal vision. (DSMC 1992-93 Military Research Fellows Report (reference (a))

396. Predictive Model. A model in which the values of future states can be predicted or are hypothesized; for example, a model that predicts weather patterns based on the current value of temperature, humidity, wind speed, and so on at various locations. (DIS Glossary of M&S Terms, and IEEE STD 610.3, (references (b) and (c))

397. Prescriptive Model. A model used to convey the required behavior or properties of a proposed system; for example, a scale model or written specification used to convey to a computer supplier the physical and performance characteristics of a required computer. Contrast with: descriptive model. (DIS Glossary of M&S Terms, and IEEE STD 610.3, (references (b) and (c))

398. Prime Word. A word included in the name of a data entity that represents the logical data grouping (in the logical data model) to which it belongs. (DoD Publication 8320.1-M-1 and NBS Pub 500-149, (references (q) and (u))

399. Principal Staff Assistants. The Under Secretaries of Defense; the Assistant Secretaries of Defense (ASDs); the General Counsel of the Department of Defense (GC, DoD); the Assistants to the Secretary of Defense (ATSDs); and the OSD Directors, or equivalents, who report directly to the Secretary or Deputy Secretary of Defense. (DoD Instruction 5000.61, (reference (h))

400. Probabilistic Model. See: stochastic model. (DIS Glossary of M&S Terms, (reference (b))

401. Processes. Processes affect entities. Attrition, communications, and movement are examples of processes.

Processes have a level of detail by which they are described. (MORS Report, October 27, 1989, (reference (t))

402. Process Improvement Modeling. Defines and documents the current ("as is") and desired future ("to be") processes and information requirements of a functional activity. Two types of process improvement models are:

403. Activity Models. Models of the processes that make up the functional activity showing inputs, outputs, controls, and mechanisms through which the processes of the functional activity are (or will be) conducted. (DoD Publication 8320.1-M, (reference (j))

404. Data Model. In a database, the user's logical view of the data in contrast to the physically stored data, or storage structure. A description of the organization of data in a manner that reflects the information structure of an enterprise. (DoD Publication 8320.1-M-1 and NBS Pub 500-149, (references (q) and (u))

405. Process Model. A model of the processes performed by a system; for example, a model that represents the software development process as a sequence of phases. Contrast with: structural model. (DIS Glossary of M&S Terms, (reference (b))

406. Process-Oriented Simulation. A simulation in which the process is considered more important than the outcome; for example, a model of a radar system in which the objective is to replicate exactly the radar's operation, and duplication of its results is a lesser concern. Contrast with: outcome-oriented simulation. (DIS Glossary of M&S Terms, and IEEE STD 610.3, (references (b) and (c))

407. Processing Node. The hardware and software processing resources devoted to one or more simulation entities. See: node. Contrast with: network node. (DIS Glossary of M&S Terms, (reference (b))

408. Protocol. A set of rules and formats (semantic and syntactic) that define the communication behavior of simulation applications. (DIS Glossary of M&S Terms, IEEE STD 610.3, and DoD Directive 5000.59, (references (b), (c), and (f))

409. Protocol Data Unit (PDU). Distributed Interactive Simulation terminology for a unit of data that is passed on a network between simulation applications. (DoD Publication 5000.59-P, (reference (g))

410. Protocol Data Unit (PDU) Standards. Formally defined data exchange standards established for each of the several primary classes of functionality that is represented in the DIS synthetic environment; e.g., movement, weapons, firing effects, collisions, etc. (Army Model and Simulation Master Plan, (reference (y))

411. Protocol Entity. An object that exchanges information with other protocol entities in a network via Protocol Data Units in accordance with an established protocol. A key attribute of a protocol entity is its state. State transitions occur in a given protocol entity in accordance with the established protocol as the result of: a. Protocol Data Units received from other protocol entities, and b. occurrence of an external event (e.g., expiration of a time-out counter.) See also: Protocol Data Unit. (DIS Glossary of M&S Terms, (reference (b))

412. Protocol Suite. A defined set of complementary protocols within the communication architecture profile. (MSETT NAWC-TSD Glossary, (reference (p))

413. Prototype. A preliminary type, form, or instance of a system that serves as a model for later stages or for the final, complete version of the system. (DIS Glossary of M&S Terms, and IEEE STD 610.3, (references (b) and (c))

414. Pseudocode. A description of control and/or data structures in a natural language with no rigid rules of syntax. (DA PAM 5-11, (reference (i))

Glossary - Q

415. Qualitative Data. A data value that is a non-numeric description of a person, place, thing, event, activity, or concept. (DoD Publication 8320.1-M-1, (references (q))

416. Quality Assurance (QA). The policies, procedures and systematic actions established in an enterprise for the purpose of providing and maintaining some degree of confidence in data integrity and accuracy throughout the life cycle of the data. The planned systematic activities necessary to ensure that a component, module, or system conforms to established technical requirements. (FIPS Pub 11-3, (reference (r))

417. Quantitative Data. Numerical expressions that use Arabic numbers, upon which mathematical operations can be performed. (DoD Publication 8320.1-M-1, (references (q))

418. Queue. In queuing theory, a set of zero or more entities waiting to be serviced by a service facility. (DIS Glossary of M&S Terms, and IEEE STD 610.3, (references (b) and (c))

419. Queuing Model. A model consisting of service facilities and entities waiting in queues to be served; for example, a model depicting teller windows and customers at a bank. (DIS Glossary of M&S Terms, and IEEE STD 610.3, (references (b) and (c))

420. Queuing Network Model. A model in which a process is described as a network in which each node represents a service facility rendering a given type of service and a queue for holding entities waiting to be served; for example, a model depicting a network of shipping routes and docking facilities at which ships must form queues in order to unload their cargo. (DIS Glossary of M&S Terms, and IEEE STD 610.3, (references (b) and (c))

421. Queuing Theory. The study of queues and the performance of systems that service entities that are organized into queues. See also: queuing model; queuing network model. (DIS Glossary of M&S Terms, and IEEE STD 610.3, (references (b) and (c))

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Glossary - R

422. Random. Pertaining to a process or variable whose outcome or value depends on chance or on a process that simulates chance, often with the implication that all possible outcomes or values have an equal probability of occurrence; for example, the outcome of flipping a coin or executing a computer-programmed random number generator. (DIS Glossary of M&S Terms, and IEEE STD 610.3, (references (b) and (c))

423. Real Battlefield. See: real world. (DIS Glossary of M&S Terms, (reference (b))

424. Real-Time. In modeling and simulation, simulated time advances at the same rate as actual time; for example, running the simulation for one second results in the model advancing time by one second. Contrast with: fast time; slow time. (DIS Glossary of M&S Terms, (reference (b))

425. Real-Time Service. A service that satisfies timing constraints imposed by the service user. The timing constraints are user specific and should be such that the user will not be adversely affected by delays within the constraints. (MSETT NAWC-TSD Glossary, (reference (p))

426. Real-Time Simulation. Same as constrained simulation. (High Level Architecture Glossary, (reference (m))

427. Real-Time System. A system that computes its results as quickly as they are needed by a real-world system. Such a system responds quickly enough that there is no perceptible delay to the human observer. In general use, the term is often perverted to mean within the patience and tolerance of a human user.

428. Real-World. The set of real or hypothetical causes and effects that simulation technology attempts to replicate. When used in a military context, the term is synonymous with real battlefield to include air, land, and sea combat. Syn: real battlefield. (DIS Glossary of M&S Terms, (reference (b))

429. Real-World Time. The actual time in Greenwich, England. Syn: sidereal time. (DIS Glossary of M&S Terms, and IEEE STD 610.3, (references (b) and (c))

430. Reality Engine. Any computer system specifically designed to generate virtual images on a display device. (DSMC 1992-93 Military Research Fellows Report (reference (a))

431. reference Version. The most recent version of a model or simulation that has been released by, and under configuration management of an approving authority. (DIS Glossary of M&S Terms, (reference (b))

432. Reflected Attribute. An object attribute that is represented but not explicitly modeled in a federate. The reflecting federate accepts new values of the reflected attribute as they are produced by some other federation member and provided to it by the Runtime Infrastructure. (High Level Architecture Glossary, (reference (m))

433. Reflected Object. An object that is represented but not explicitly modeled in a simulation. The reflecting simulation accepts changes in state of the reflected object as they are produced by some other federation member and provided to it by the Runtime Infrastructure.

434. Regime. The interaction domain of entities. Platform level

435. Reliability Model. A model used to estimate, measure, or predict the reliability of a system; for example, a model of a computer system, used to estimate the total down time that will be experienced. (DIS Glossary of M&S Terms, and IEEE STD 610.3, (references (b) and (c))

436. Reliable Service. A communication service in which the received data is guaranteed to be exactly as transmitted. (DIS Glossary of M&S Terms, IEEE STD 610.3 and MSETT NAWC-TSD Glossary, (references (b), (c), and (p))

437. Remote Entity Approximation (REA). The process of extrapolating and interpolating any state of an entity based on its last known state. This includes dead reckoning and smoothing. Syn: dead reckoning. (DIS Glossary of M&S Terms, (reference (b))

438. Research, Development, and Acquisition (RDA). One of the three domains for Army M&S applications. RDA includes all M&S used for design, development, and acquisition of weapons systems and equipment. M&S in the RDA domain are used for scientific inquiry to discover or revise facts and theories of phenomena, followed by transformation of these discoveries into physical representations. RDA also includes test and evaluation (T&E) where M&S are used to augment and possibly reduce the scope of

real-world T&E. (Army Model and Simulation Master Plan, (reference (y))

439. Resolution. The degree of detail and precision used in the representation of real world aspects in a model or simulation. See also: granularity. (DoD Publication 5000.59-P, DA PAM 5-11, and DSMC 1993-94 Military Research Fellows Report, (references (g), (i), and (k))

440. Retraction. An action performed by a federate to unschedule a previously scheduled event. Event retraction is visible to the federate. Unlike "cancellation" that is only relevant to optimistic federates such as Time Warp, "retraction" is a facility provided to the federate. Retraction is widely used in classical event oriented discrete event simulations to model behaviors such as preemption and interrupts. (High Level Architecture Glossary, (reference (m))

441. Right-Hand Rule. Positive rotation is clockwise when viewed toward the positive direction along the axis of rotation. (DIS Glossary of M&S Terms, (reference (b))

442. Runtime Infrastructure (RTI). The general purpose distributed operating system software that provides the common interface services during the runtime of a High Level Architecture federation.

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Glossary - S

443. Scalability. The ability of a distributed simulation to maintain time and spatial consistency as the number of entities and accompanying interactions increase. (DoD Publication 5000.59-P, (reference (g))

444. Scale Model. A physical model that resembles a given system, with only a change in scale; for example, a replica of an airplane one tenth the size of the actual airplane. (DIS Glossary of M&S Terms, and IEEE STD 610.3, (references (b) and (c))

445. Scaled Wallclock Time. A quantity derived from a wallclock time defined as offset +[rate*(wallclock time - time of last exercise start or restart)]. All scaled wallclock time values represent points on the federation time axis. If the "rate" factor is k, scaled wallclock time advances at a rate that is k time faster than wallclock time. (High Level Architecture Glossary, (reference (m))

446. Scenario. a. Description of an exercise. It is part of the session database that configures the units and platforms and places them in specific locations with specific missions; b. an initial set of conditions and time line of significant events imposed on trainees or systems to achieve exercise objectives. (DIS Glossary of M&S Terms, and IEEE STD 610.3, (references (b) and (c))

447. Scenario Development. A phase of the development of a federation. In this phase, the federation developer(s) formulate a scenario whose execution and subsequent evaluation will lead toward achieving the study objectives set forth by the federation sponsor. The scenario provides an identification of the major entities that must be represented by the federation, a conceptual description of the capabilities, behavior, and relationships (interactions) between these major entities over time, and a specification of relevant environmental conditions (e.g., terrain, atmospherics). Initial and termination conditions are also provided. The style of format of the scenario documentation (e.g., graphics, tables, text) is entirely at the discretion of the federation developer. However, communities of use may wish to establish scenario documentation standards among themselves to

facilitate reuse of scenario components. The output of this phase is a functional-level scenario description, which is provided as input to the Conceptual Analysis phase. Certain key activities during Conceptual Analysis may also drive reiterations of the Scenario Development phase. (High Level Architecture Glossary, (reference (m))

448. Scheduling an Event. Invocation of a primitive (Update Attribute Values, Send Interaction, Instantiate Object, or Delete Object) by a federate to notify the Runtime Infrastructure of the occurrence of an event. Scheduling an event normally results in the Runtime Infrastructure sending messages to other federates to notify them of the occurrence of the event. (High Level Architecture Glossary, (reference (m))

449. Schema. Descriptive representation of data and/or data requirements that describe conceptual, internal, or external views of information/data needs.

450. Scope. Used in reference to SAFOR, scope refers to the aspects of combat portrayed by the system. For example, ground combat, combat support, combat service support, air-to-air combat, air-to-ground combat, air-to-ship combat, naval surface combat, naval undersea warfare, deployment. (DMSO Survey of Semi-Automated Forces, (reference (d))

451. Seamless. Perfectly consistent. Transparent.

452. Segment. A portion of a session that is contiguous in simulation time and in wallclock time (sidereal time). (DIS Glossary of M&S Terms, and IEEE STD 610.3, (references (b) and (c))

453. Selector. A portion of an address identifying a particular entity at an address (e.g., a session selector identifies a user of the session service residing at a particular session address). (MSETT NAWC-TSD Glossary, (reference (p))

454. Semi-Automated Forces (SAFOR). Simulation of friendly, enemy and neutral platforms on the virtual battlefield in which the individual platform simulation are operated by computer simulation of the platform crew and command hierarchy. The term "semi-automated" implies that the automation is controlled and monitored by a human who injects command-level decision making into the automated command process. See also: Computer-Generated Forces. (DSMC 1993-94 Military Research Fellows Report and Air Force Modeling and Simulation Master Plan, (references (k) and (ff))

455. Semi-Markov Model. A Markov chain model in which the length of time spent in each state is randomly distributed. (DIS Glossary of M&S Terms, and IEEE STD 610.3, (references (b) and (c))

456. Semi-Markov Process. A Markov process in which the duration of each event is randomly distributed. (DIS Glossary of M&S Terms, and IEEE STD 610.3, (references (b) and (c))

457. Session. A portion of an exercise that is contiguous in wall-clock (sidereal) time and that is initialized per an exercise database. (DIS Glossary of M&S Terms, and IEEE STD 610.3, (references (b) and (c))

458. Shutter Glasses. Stereoscopic viewing eyeglasses that alternately reveal an image to the left and right eye to create the parallax effect giving a sense of depth (each eye receives a slightly different image). The shutters are typically composed of electrically switched liquid crystal display or Polaroid material and have no moving parts. (DSMC 1992-93 Military Research Fellows Report (reference (a))

459. Sidereal Time. Time based upon the rotation of the Earth relative to the vernal equinox. Time that is independent of simulation clocks, time zones, or measurement errors. The "Ground Truth" of time measurement. See also: Real World Time. (MIL-HDBK-850, (reference (gg))

460. Simuland. The system being simulated by a simulation. (DIS Glossary of M&S Terms, (reference (b))

461. Simulated Time. Time as represented within a simulation. Syn: virtual time. See also: fast time; real time; slow time. (IEEE STD 610.3, (reference (c))

462. Simulation. A method for implementing a model over time. (DoD Directive 5000.59 and DoD Publication 5000.59-P, (references (f) and (g))

463. Simulation Application. a. The executing software on a host computer that models all or part of the representation of one or more simulation entities. The simulation application represents or "simulates" real-world phenomena for the purpose of training, analysis, or experimentation. Examples include manned vehicle (virtual) simulators, computer-generated forces (constructive), environment simulators, and computer interfaces between a Distributed Interactive Simulation network and real (live) equipment. The simulation application receives and processes information concerning entities created by peer simulation

applications through the exchange of Distributed Interactive Simulation Protocol Data Units. More than one simulation application may simultaneously execute on a host computer; b. the application layer protocol entity that implements standard Distributed Interactive Simulation protocol. (DIS Glossary of M&S Terms, and IEEE STD 610.3, (references (b) and (c))

464. Simulation Clock. A counter used to accumulate simulated time. (DIS Glossary of M&S Terms, and IEEE STD 610.3, (references (b) and (c))

465. Simulation Entity. An element of the synthetic environment that is created and controlled by a simulation application through the exchange of Distributed Interactive Simulation Protocol Data Units (e.g., tanks, submarines, carriers, fighter aircraft, missiles, bridges). It is possible that a simulation application may be controlling more than one simulation entity. (DIS Glossary of M&S Terms, and IEEE STD 610.3, (references (b) and (c))

466. Simulation Environment. a. Consists of the operational environment surrounding the simulation entities including terrain, atmospheric, bathyspheric and cultural information; b. all the conditions, circumstances, and influences surrounding and affecting simulation entities including those stated in a. (DIS Glossary of M&S Terms, (reference (b))

467. Simulation Game. A simulation in which the participants seek to achieve some agreed upon objective within an established set of rules. For example, a management game, a war game. Note: The objective may not be to compete, but to evaluate the participants, increase their knowledge concerning the simulated scenario, or achieve other goals. Syn: gaming simulation. (DIS Glossary of M&S Terms, and IEEE STD 610.3, (references (b) and (c))

468. Simulation Management. A mechanism that provides centralized control of the simulation exercise. Functions of simulation management include: start, restart, maintenance, shutdown of the exercise, and collection and distribution of certain types of data. (DIS Glossary of M&S Terms, and IEEE STD 610.3, (references (b) and (c))

469. Simulation Manager. See: exercise manager. (DIS Glossary of M&S Terms, (reference (b))

470. Simulation Object Model (SOM). A specification of the intrinsic capabilities that an individual simulation offers to federations. The standard format in which SOMs are expressed

provides a means for federation developers to quickly determine the suitability of simulation systems to assume specific roles within a federation. (High Level Architecture Glossary, (reference (m))

471. Simulation Process. The imitative representation of the actions of platform(s), munitions(s), and life form(s) by computer program(s) in accordance with a mathematical model and the generation of associated battlefield entities. May be fully automated or partially automated. In the latter case, the human-in-the-loop injects command-level decisions into the process and is not intended to be a "trainee." (DIS Glossary of M&S Terms, (reference (b))

472. Simulation Support Entity. Processing modules used to support, control, or monitor the simulation environment, but which do not actually exist on the battlefield. This includes battlefield viewing devices for controllers or exercise observers such as the stealth vehicle, the plan view display, after action review systems, and simulation control systems. (DIS Glossary of M&S Terms, and MSETT NAWC-TSD Glossary, (references (b) and (p))

473. Simulation Time. a. A simulation's internal representation of time. Simulation time may accumulate faster, slower, or at the same pace as sidereal time; b. The reference time (e.g., Universal Coordinated Time) within a simulation exercise, this time is established by the simulation management function before the start of the simulation and is common to all participants in a particular exercise. (DIS Glossary of M&S Terms, and IEEE STD 610.3, (references (b) and (c))

474. Simulator. a. A device, computer program, or system that performs simulation; b. For training, a device which duplicates the essential features of a task situation and provides for direct human operation. (DIS Glossary of M&S Terms, (reference (b))

475. Single Point-of-Entry. The organization (s) responsible for entering data values for a data element. (DoD Publication 8320.1-M, (reference (j))

476. Slow Time. The duration of activities within a simulation in which simulated time advances slower than actual time. (DIS Glossary of M&S Terms, (reference (b))

477. Smoothing. Interpolation of the previous state of an entity (location, velocity, etc.) to the current state, creating a smoothed transition between two successive entity state updates. (DIS Glossary of M&S Terms, (reference (b))

478. Span. The scale of the domain that is global, theater, regional, local, individual. Description of the span is often subjective.

479. Stability. Constancy of purpose; steadfastness; reliability; dependability. (DoD Publication 8320.1-M-3, (reference (e))

480. Stabilized-Variable Model. A model in which some of the variables are held constant and the others are allowed to vary; for example, a model of a controlled climate in which humidity is held constant and temperature is allowed to vary. (DIS Glossary of M&S Terms, and IEEE STD 610.3, (references (b) and (c))

481. Standard. A rule, principle, or measurement established by authority, custom, or general consent as a representation or example. (DoD Publication 5000.59-P, (reference (g))

482. State. a. The internal status of a simulation entity; e.g. fuel level, number of rounds remaining, location of craters, etc. b. A condition or mode of existence that a system, component, or simulation may be in; for example, the pre-flight state of an aircraft navigation program or the input state of given channel; c. the values assumed at a given instant by the variables that define the characteristics of a system, component, or simulation. Syn: system state. See also: final state; initial state; steady state. (DIS Glossary of M&S Terms, (reference (b))

483. State Transition. A change from one state to another in a system, component, or simulation. (DIS Glossary of M&S Terms, (reference (b))

484. State Variable. A variable that defines one of the characteristics of a system, component, or simulation. The values of all such variables define the state of the system, component, or simulation. (DIS Glossary of M&S Terms, (reference (b))

485. Static Model. A model of a system in which there is no change; for example, a scale model of a bridge, studied for its appearance rather than for its performance under varying loads. (DIS Glossary of M&S Terms, and IEEE STD 610.3, (references (b) and (c))

486. Steady State. A situation in which a model, process, or device exhibits stable behavior independent of time. (DIS Glossary of M&S Terms, and IEEE STD 610.3, (references (b) and (c))

487. Stealth Viewer. A component that provides the capabilities for visually observing a Distributed Interactive Simulation exercise without participating in the Distributed Interactive Simulation exercise interaction. (DIS Glossary of M&S Terms, (reference (b))

488. Stimulate. To provide input to a system in order to observe or evaluate the system's response. (DIS Glossary of M&S Terms, and IEEE STD 610.3, (references (b) and (c))

489. Stimulation. Stimulation is the use of simulations to provide an external stimulus to a system or subsystem. An example is the use of a simulation representing the radar return from a target to drive (stimulate) the radar of a missile system within a hardware/software-in-the-loop simulation. (DSMC 1993-94 Military Research Fellows Report, (reference (k))

490. Stimulator. a. A hardware device that injects or radiates signals into the sensor system(s) of operational equipment to imitate the effects of platforms, munitions, and environment that are not physically present; b. a battlefield entity consisting of hardware and/or software modules that injects signals directly into the sensor systems of an actual battlefield entity to simulate other battlefield entities in the virtual battlefield. (DIS Glossary of M&S Terms, (reference (b))

491. Stochastic. Pertaining to a process, model, or variable whose outcome, result, or value depends on chance. Contrast with: deterministic. (DIS Glossary of M&S Terms, and IEEE STD 610.3, (references (b) and (c))

492. Stochastic Model. A model in which the results are determined by using one or more random variables to represent uncertainty about a process or in which a given input will produce an output according to some statistical distribution; for example, a model that estimates the total dollars spent at each of the checkout stations in a supermarket, based on probable number of customers and probable purchase amount of each customer. Syn: probabilistic model. See also: Markov-chain model. Contrast with: deterministic model. (DIS Glossary of M&S Terms, (reference (b))

493. Stochastic Process. Any process dealing with events that develop in time or cannot be described precisely, except in terms of probability theory. (DSMC 1993-94 Military Research Fellows Report, (reference (k))

494. Structural Model. A representation of the physical or logical structure of a system; for example, a representation of a

computer network as a set of boxes connected by communication lines. Contrast with: process model. (DIS Glossary of M&S Terms, and IEEE STD 610.3, (references (b) and (c))

495. Structural Validation. The process of determining that the M&S assumptions, algorithms, and architecture provide an accurate representation of the composition of the real world as relevant to the intended use of the M&S. (DA PAM 5-11, (reference (i))

496. Subject Area. A major, high-level classification of data. A group of entity types that pertain directly to a function or major topic of interest to the enterprise. (DoD Publication 8320.1-M, (reference (j))

497. Symbolic Model. A model whose properties are expressed in symbols. Examples include graphical models, mathematical models, narrative models, software models, and tabular models. Contrast with: physical model. (DIS Glossary of M&S Terms, and IEEE STD 610.3, (references (b) and (c))

498. Symbology. A graphic representation of concepts or physical objects. (DoD Directive 8320.1, (reference (aa))

499. Synthetic Battlefield. One type of synthetic environment. (DoD Publication 5000.59-P, (reference (g))

500. Synthetic Environments (SE). Internetted simulations that represent activities at a high level of realism from simulations of theaters of war to factories and manufacturing processes. These environments may be created within a single computer or a vast distributed network connected by local and wide area networks and augmented by super-realistic special effects and accurate behavioral models. They allow visualization of and immersion into the environment being simulated. (DoD Publication 5000.59-P, Army Model and Simulation Master Plan, and CJCSI 8510.01, (references (g), (y), and (ee))

501. System. A collection of components organized to accomplish a specific function or set of functions. (IEEE STD 610.3 (reference (c))

Glossary - T

502. T-1. Data communications service that supports 1.544 megabits per second operation. (Marine Corps Modeling and Simulation Master Plan, (reference (z))

503. T-2. Data communications service that supports 45 megabits per second operation. (Marine Corps Modeling and Simulation Master Plan, (reference (z))

504. Tabular Model. A symbolic model whose properties are expressed in tabular form; for example, a truth table that represents a Boolean logic "OR" function. Contrast with: graphical model; mathematical model; narrative model; software model. (DIS Glossary of M&S Terms, and IEEE STD 610.3, (references (b) and (c))

505. Taxonomy. A classification system. Provides the basis for classifying objects for identification, retrieval and research purposes. (MORS Report, October 27, 1989, (reference (t))

506. Technical Data. Scientific or technical information recorded in any form or medium (such as manuals and drawings). Computer programs and related software are not technical data; documentation of computer programs and related software are. Also excluded are financial data or other information related to contract administration.

507. Technical Infrastructure. The internal framework that must be built to implement an operational service. (DoD Publication 8320.1-M, (reference (j))

508. Tightly Coupled. A condition that exists when simulation entities are involved in very close interaction such that every action of an entity must be immediately accounted for by the other entities. Several tanks in close formation involved rapid, complicated maneuvers over the terrain is an example of a tightly coupled situation. (MSETT NAWC-TSD Glossary, (reference (p))

509. Time. The measurable aspect of duration. Time makes use of scales based upon the occurrence of periodic events. These are: the day, depending on the rotation of the Earth; the month, depending on the revolution of the Moon around the Earth; and the year, depending upon the revolution of the Earth around the Sun. Time is expressed as a length on a duration scale measured from an index on that scale. For example: 4 p.m. local mean solar

time means that 4 mean solar hours have elapsed since the mean Sun was on the meridian of the observer. (High Level Architecture Glossary, (reference (m))

510. Time-Dependent Event. An event that occurs at a predetermined point in time or after a predetermined period of time has elapsed. See also: conditional event. (DIS Glossary of M&S Terms, and IEEE STD 610.3, (references (b) and (c))

511. Time Flow Mechanism. The approach used locally by an individual federate to perform time advancement. Commonly used time flow mechanisms include event driven (or event stepped), time driven, and independent time advance (real-time synchronization) mechanisms. (High Level Architecture Glossary, (reference (m))

512. Time Management. A collection of mechanisms and services to control the advancement of time within each federate during an execution in a way that is consistent with federation requirements for message ordering and delivery. (High Level Architecture Glossary, (reference (m))

513. Time-Slice Simulation. a. A discrete simulation that is terminated after a specific amount of time has elapsed; for example, a model depicting the year-by-year forces affecting a volcanic eruption over a period of 100,000 years. Syn: time-interval simulation. See also: critical event simulation; b. a discrete simulation of continuous events in which time advances by intervals chosen independent of the simulated events; for example, a model of a time multiplexed communication system with multiple channels transmitting signals over a single transmission line in very rapid succession. (DIS Glossary of M&S Terms, (reference (b))

514. Time Stamp (of an event). A value representing a point on the federation time axis that is assigned to an event to indicate when that event is said to occur. Certain message ordering services are based on this time stamp value. In constrained simulations, the time stamp may be viewed as a deadline indicating the latest time at which the message notifying the federate of the event may be processed. (High Level Architecture Glossary, (reference (m))

515. Time Stamp Order (TSO). A total ordering of messages based on the "temporally happens before" ($\xrightarrow{t}$) relationship. A message delivery service is said to be time stamp ordered if for any two messages M_1 and M_2 (containing notifications of events E_1

and E_2, respectively) that are delivered to a single federate where E_1 --> $_t$ E_2, then M_1 is delivered to the federate before M_2. The Runtime Infrastructure ensures that any two-time stamp ordered messages will be delivered to all federates receiving both messages in the same relative order. To ensure this, the Runtime Infrastructure uses a consistent tie-breaking mechanism to ensure that all federates perceive the same ordering of events containing the same time stamp. Further, the tie-breaking mechanism is deterministic, meaning repeated executions of the federation will yield the same relative ordering of these events if the same initial conditions and inputs are used, and all messages are transmitted using time stamp ordering. (High Level Architecture Glossary, (reference (m))

516. Time Step Models. Dynamic models in which time is advanced by a fixed or independently determined amount to a new point in time, and the states or status of some or all resources are updated as of that new point in time. Typically these time steps are of constant size, but they need not be. (MORS Report, October 27, 1989, (reference (t))

517. Time Variable. A variable whose value represents simulated time or the state of the simulation clock. (DIS Glossary of M&S Terms, and IEEE STD 610.3, (references (b) and (c))

518. Tracked Munitions. A munition for which tracking data is required. By necessity, a tracked munition becomes a simulation entity during its flight; its flight path is represented, therefore, by Entity State Protocol Data Units. (DIS Glossary of M&S Terms, and IEEE STD 610.3, (references (b) and (c))

519. Translator. The translator is the portion of an actor that interacts with ALSP. Normally, this is new software that adds the ability to transmit information about objects modeled by the actor and to receive information about objects modeled by other actors and to ghost these objects. (ALSP 1993 Annual Report, (reference (hh))

520. Transmit Management. The control of the transmission rate to match the transmission media. The transmission rate is selected to reduce total network traffic. (DIS Glossary of M&S Terms, (reference (b))

521. Transportation Service. A Runtime Infrastructure provided service for transmitting messages between federates. Different categories of service are defined with different characteristics regarding reliability of delivery and message ordering. (High Level Architecture Glossary, (reference (m))

522. True Global Time. A federation-standard representation of time synchronized to Greenwich Mean Time or Universal Time [Coordinated] (as defined in this glossary) with or without some offset (positive or negative) applied. (High Level Architecture Glossary, (reference (m))

523. Typing. Typing is the enforcement of the class of an object, such that objects of different types may not be interchanged, or may be interchanged only in restricted ways. (DMSO Survey of Semi-Automated Forces, (reference (d))

Glossary - U

524. Unbundling. The process of unpacking a bundled Protocol Data Unit into multiple separate Protocol Data Units. Contrast with: bundling. (DIS Glossary of M&S Terms, (reference (b))

525. Unconstrained Simulation. A simulation where there is no explicit relationship between wall clock time and the rate of time advancements. These are sometimes call "as-fast-as-possible" simulations, and these two terms are used synonymously here. Analytic simulation models and many constructive "war game" simulations are often unconstrained simulations. (High Level Architecture Glossary, (reference (m))

526. Unicast. A transmission mode in which a single message is sent to a single network destination; i.e., one-to-one. (Glossary of M&S Terms for DIS, and MSETT NAWC-TSD Glossary, (references (b) and (p))

527. Unit. a. An aggregation of entities; b. A basis of measurement. (DIS Glossary of M&S Terms, and IEEE STD 610.3, (references (b) and (c))

528. Unit Conversion. A system of converting measurement from one basis to another; for example, English/metric, knots/feet per second, etc. (DIS Glossary of M&S Terms, (reference (b))

529. Universal Time [Coordinated] (UTC). The same as Greenwich Mean Time. A non-uniform time based on the rotation of the Earth, which is not constant. Usually spoken as, "Coordinated Universal Time." (High Level Architecture Glossary, (reference (m))

530. Universal Space Rectangular (USR) Coordinate System. A right-handed orthogonal coordinate system with its origin at the center of the Earth, positive x-axis in the equatorial plane and passing through the zero degree meridian, positive y-axis in the equatorial plane and passing through the ninety degree east meridian, and positive z-axis passing through the North Pole. (MIL-HDBK-850, (reference (gg))

531. User. Military, industrial, or academic organizations requiring access to the DIS network. Prior to use, they will appoint one point of responsibility for their use of the network. This person is the Exercise Manager. See also: Simulation Manager. (DIS Glossary of M&S Terms, (reference (b))

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Glossary - V

532. Validation. The process of determining the degree to which a model or simulation is an accurate representation of the real-world from the perspective of the intended uses of the model or simulation. (DoD Directive 5000.59, and DoD Instruction 5000.61, (references (f) and (h))

533. Validation Agent. The organization designated by the M&S sponsor to perform validation for a model, simulation, or federation of models and/or simulations. See also: verification and validation proponent. (DoD Instruction 5000.61, (reference (h))

534. Validity. The quality of maintained data that is found on an adequate system of classification (e.g., data model) that is rigorous enough to compel acceptance. (DoD Publication 8320.1-M-3 and DoD Publication 8320.1-M, (references (e) and (j))

535. Variable. A quantity or data item whose value can change. See also: dependent variable; independent variable; state variable. Contrast with: constant. (DIS Glossary of M&S Terms, and IEEE STD 610.3, (references (b) and (c))

536. Verification. The process of determining that a model or simulation implementation accurately represents the developer's conceptual description and specification. Verification also evaluates the extent to which the model or simulation has been developed using sound and established software engineering techniques. (DoD Directive 5000.59 and DoD Publication 5000.59-P, (references (f) and (g))

537. Verification Agent. The organization designated by the M&S sponsor to perform verification for a model, simulation, or federation of models and/or simulations. See also: verification and validation proponent. (DoD Instruction 5000.61, (reference (h))

538. Verification and Validation (V&V) Proponent. The agency responsible for ensuring verification and validation is performed on a specific model or simulation. (DIS Glossary of M&S Terms, (reference (b))

539. Vignette. A self-contained portion of a scenario. (DIS Glossary of M&S Terms, (reference (b))

540. Virtual. Refers to the essence or effect of something, not the fact. (DSMC 1992-93 Military Research Fellows Report (reference (a))

541. Virtual Battlespace. The illusion resulting from simulating the actual battlespace. (DIS Glossary of M&S Terms, (reference (b))

542. Virtual Images. Visual, auditory and tactile stimuli that are transmitted to the sensory end organs so they appear to originate from within the three-dimensional space surrounding the user. (DSMC 1992-93 Military Research Fellows Report (reference (a))

543. Virtual Network. The interconnection of Distributed Interactive Simulation cells by any communications means that provide the necessary network services to conduct an exercise. (DIS Glossary of M&S Terms, and MSETT NAWC-TSD Glossary, (references (b) and (p))

544. Virtual Prototype. A model or simulation of a system placed in a synthetic environment, and used to investigate and evaluate requirements, concepts, system design, testing, production, and sustainment of the system throughout its life cycle. (DoD Publication 5000.59-P, (reference (g))

545. Virtual Reality. The effect created by generating an environment that does not exist in the real world. Usually, a stereoscopic display and computer-generated three-dimensional environment giving the immersion effect. The environment is interactive, allowing the participant to look and navigate about the environment, enhancing the immersion effect. Virtual environment and virtual world are synonyms for virtual reality. (DSMC 1992-93 Military Research Fellows Report (reference (a))

546. Virtual Simulation. See: Live, Virtual, and Constructive Simulation. (DoD Publication 5000.59-P, (reference (g))

547. Virtual Time. See: simulated time. (DIS Glossary of M&S Terms, (reference (b))

548. Virtual World. See: synthetic environment. (DIS Glossary of M&S Terms, (reference (b))

549. Visualization. The formation of an artificial image that cannot be seen otherwise. Typically, abstract data that would normally appear as text and numbers is graphically displayed as an image. The image can be animated to display time varying data. (DSMC 1992-93 Military Research Fellows Report (reference (a))

550. Visual Stealth. A component that provides the capabilities for visually observing a Distributed Interactive Simulation exercise without participating in the Distributed Interactive Simulation exercise interaction. (DIS Glossary of M&S Terms, (reference (b))

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Glossary - W

551. Wallclock Time. A federate's measurement of true global time, where the measurement is typically output from a hardware clock. The error in this measurement can be expressed as an algebraic residual between wallclock time and true global time or as an amount of estimation uncertainty associated with the wallclock time measurement software and the hardware clock errors. (High Level Architecture Glossary, (reference (m))

552. Warfare Simulation. A model of warfare or any part of warfare for any purpose (such as analysis or training). (DIS Glossary of M&S Terms, and MORS Report, (references (b) and (t))

553. War Game. A simulation game in which participants seek to achieve a specified military objective given pre-established resources and constraints; for example, a simulation in which participants make battlefield decisions and a computer determines the results of those decisions. See also: management game. Syn: constructive simulation; higher order model.(DIS Glossary of M&S Terms, and IEEE STD 610.3, (references (b) and (c))

554. White Box Model. See: glass box model. (DIS Glossary of M&S Terms, (reference (b))

555. Wide Area Network (WAN). A communications network designed for large geographic areas. (DIS Glossary of M&S Terms, and IEEE STD 610.3, (references (b) and (c))

556. World Coordinate System. The right-handed geocentric Cartesian system. The shape of the world is described by the World Geodetic System 1984 standard. The origin of the world coordinate system is the centroid of the earth. The axes of this system are labeled X, Y, and Z, with: the positive X-axis passing through the Prime Meridian at the Equator; the positive Y-axis passing through 90 degrees East longitude at the Equator; and the positive Z-axis passing through the North Pole. (DIS Glossary of M&S Terms, and IEEE STD 610.3, (references (b) and (c))

557. World Geodetic System 1984 (WGS 84). A geocentric coordinate system which describes a basic frame of reference and geometric figure for the Earth, and which models the Earth from a geometric, geodetic, and gravitational standpoint. The WGS 84 coordinate system origin and axes also serve as the x, y, and z axes of the WGS 84 ellipsoid, the z axis being the rotational axis. (DMA Technical Report 8350.2, (reference (ii))

558. World View. The view each simulation entity maintains of the simulated world from its own vantage point, based on the results of its own simulation and its processing of event messages received from all external entities. For Computer Generated Forces and for manned simulators or real vehicles, the world view is the perceptions of the participating humans. (DIS Glossary of M&S Terms, and MSETT NAWC-TSD Glossary, (references (b) and (p))

Glossary - X, Y, and Z

559. Yoked Variable. One of two or more variables that are dependent on each other in such a manner that a change in one automatically causes a change in the others. (DIS Glossary of M&S Terms, and IEEE STD 610.3, (references (b) and (c))

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