Delivering Simulation-based Training to the Soldier’s Desktop

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### Army Size

- **Regular Army:** 507,082
- **Army National Guard:** 333,177
- **Army Reserve:** 189,005
- **Total:** 1,029,264

### How do you serve one million customers on their schedules?

- McDonalds does it (47 million/day)
- Google Search does it (130 million/day)
- World of Warcraft does it (675,000 /day)

### How can the Army do it with training?

*Numbers as of: Regular Army, 2007; ARNG & USAR, 2005*
- World of Warcraft
- Army Knowledge Online
- Yahoo Mail
- Google Search
- Facebook
- Cellular Telephones
- Skype
- Satellite Television
- AOL Instant Messenger
Training One Million Soldiers

1,000,000 soldiers =

100 soldiers per event $\times$ 10,000 events each year

1,000 soldiers per event $\times$ 1,000 events each year

10,000 soldiers per event $\times$ 100 events each year
Enlisted MOS

Infantry Branch

11B Infantryman
11C Indirect Fire Infantryman
11X Infantryman (ambiguous, turns into 11B, 11C, or 11M)
11M 11M 11M
11Z Infantry Senior Sergeant
11H Infantry Anti-Air Specialist
11M Mechanized Infantryman

Field Artillery Branch

13B Cannon Crewmember
13C TAC Fire Operations Specialist
13D Field Artillery Tactical Data Systems Specialist
13E Cannon Fire Direction Specialist
13F Fire Support Specialist
13G Multiple Launch Rocket System Crewmember
13H Field Artillery Meteorological Crewmember
13I Field Artillery Enlistment Option
13J Field Artillery Senior Sergeant

Air Defense Artillery Branches

14E Patriot Fire Control Enhanced Operator/Maintainer
14J Early Warning System Operator
14M Man Portable Air Defense System Crewmember
14R Bradley Linebacker Crewmember
14S Avenger Crewmember
14T PATRIOT Launching Station Enhanced Operator/Maintainer
14U Air Defense Artillery (ADA) Senior Sergeant

Aviation Branch

15B Aircraft Powerplant Repairer
15D Aircraft Powertrain Repairer
15F Aircraft Electrician
15G Aircraft Structural Repairer
15H 15M Shoulder/Aviation Systems Repairer
15K Aircraft Components Repair Supervisor
15M UH-1 Helicopter Repairer
15N Avionics Mechanic
15P Aviation Operations Specialist
15Q Air Traffic Control Operator
15R AH-64 Attack Helicopter Repairer
15S OH-58D Helicopter Repairer
15T UH-60 Helicopter Repairer
15U Medium Helicopter Repairer
15V Observation/Scout Helicopter Repairer
15X AH-64 Armament/Electrical Systems Repairer
15Y AH-64D Armament/Electrical Systems Repairer
15Z Aircraft Maintenance Senior Sergeant

Special Forces Branch

18B Special Forces Weapons Sergeant
18C Special Forces Engineer Sergeant
18D Special Forces Medical Sergeant
18E Special Forces Communications Sergeant
18F Special Forces Assistant Operations & Intelligence Sergeant

Branch MOS

Ordnance Branch

92G Food Service Specialist
92H Medical Department Branches

63X Track Vehicle Repairer
63W All Wheel Vehicle Repairer
63Z Mechanical Maintenance Supervisor
68P Radiology Specialist
68Q Pharmacy Specialist
68R Veterinary Food Inspection Specialist
68S Preventive Medicine Specialist
68T Animal Care Specialist
68V Respiratory Specialist
68W Health Care Specialist (aka Combat Medic)
74D Chemical Operations Specialist (formerly 54B)

Chemical Branch

68X Mental Health Specialist
68Z Chief Medical NCO

CMF 79 - Recruiting and Retention
79R Recruiter Nonsenior MOS
79T Career Counselor
79U Recruiting and Retention NCO
79W Retention and Transition Nonsenior MOS

Transportation Branch

88H Cargo Specialist
88K Watercraft Operator
88L Watercraft Engineer
88M Motor Transport Operator
88N Traffic Management Corporal
88P Railway Equipment Repairer
88T Railway Section Repairer
88U Railway Operations Crewmember
88Z Transportation Senior Sergeant

CMF 63 - Mechanical Maintenance
44A Fuel Worker
44E Machinist
45B Small Arms/Anti-Aircraft Repairer
45E Fire Control Repairer
45K Armament Repairer
52C Utilities Equipment Repairer
52D Power Generation Equipment Repairer
62B Construction Equipment Repairer
63A MA Abrams Tank Turret Mechanic/MA Abrams Tank System Mechanic
63B Light-Wheel Vehicle Mechanic/Heavy Wheel Vehicle Mechanic/Vehicle Repairer
63D Artillery Mechanic
63F Fuel and Electrical Repairer/Track Vehicle Mechanic
63J Quartermaster and Chemical Equipment Repairer
63M M-23 Bradley Fighting Vehicle System Mechanic/Bradley Fighting Vehicle Systems Turret Mechanic
63X Track Vehicle Repairer
63W All Wheel Vehicle Repairer
63Z Mechanical Maintenance Supervisor

Medical Department

68A Medical Equipment Repairer
68D Operating Room Specialist
68E Dental Specialist
68G Patient Administration Specialist
68H Optical Laboratory Specialist
68I Medical Laboratory Specialist
68K Medical Laboratory Specialist
68M Hospital Food Specialist
68N Hospital Pharmacy Specialist
68P Pharmacy Specialist
68R Veterinary Food Inspection Specialist
68T Veterinary Laboratory Specialist
68V Veterinary Specialist
68W Veterinary Care Specialist (aka Combat Medic)
68X Mental Health Specialist
68Z Chief Medical NCO

Chemical Branch

74D Chemical Operations Specialist (formerly 54B)

CMF 94 - Electronic Maintenance
94A Land Combat Electronic Missile System Repairer
94D Air Traffic Control Equipment Repairer
94E Radio and Communications Security Repairer
94F Special Electronics Devices Repairer
94G Test, Measurement & Diagnostic Equipment Supp Specialist
94K Automatic Test Equipment Operator/Maintainer
94L Avionics Communications Equipment Repairer
94M Radar Repairer
94P Multiple Launch Rocket System Repairer
94R Avionics Systems Repairer
94S Patriot System Repairer
94T Avenger System Repairer
94V Electronic Maintenance Specialist
94Y Integrated Family of Test Equipment
94Z Senior Electronic Maintenance Chief

Branch Immaterial (not oriented to a branch)

00Z Command Sergeant Major

Commissioned Officer & Warrant Officer MOS

09R Cadet
09S Officer Candidate
09W Warrant Officer Candidate

14 Air Defense Artillery Officer
140A Command and Control Systems Technician

Air Defense Artillery Branch

140E Air and Missile Defense (AMD) Tactician/Technician

140X Air Defense Artillery (ADA) Immaterial

Ordinance Branch

96M Ammunition Specialist
96P Explosive Ordnance Disposal Specialist

Quartermaster Corps Branch

92C Automated Logistics Specialist
92K Petroleum Supply Specialist
92Q Food Service Specialist
92T Petroleum Laboratory Specialist
92M Mortuary Affairs Specialist
92R Parachute Rigger
92S Shower/ Laundry and Clothing Repair Specialist
92W Water Treatment Specialist
92Y Unit Supply Specialist
92Z Senior Nonsenior Logistician

CMF 94 - Electronic Maintenance
94A Land Combat Electronic Missile System Repairer
94D Air Traffic Control Equipment Repairer
94E Radio and Communications Security Repairer
94F Special Electronics Devices Repairer
94G Test, Measurement & Diagnostic Equipment Supp Specialist
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Air Defense Artillery Branch

140E Air and Missile Defense (AMD) Tactician/Technician

140X Air Defense Artillery (ADA) Immaterial
Military Intelligence Branch

- 35D Military Intelligence Officer
- 350F All Source Intelligence Technician
- 350G Imagery Intelligence Technician
- 350Z Analyst Technician

Chemical Branch

- 880A Marine Deck Officer
- 881A Marine Engineering Officer
- 882A Mobility Officer

Military Occupational Specialties

<table>
<thead>
<tr>
<th>Military Intelligence Branch</th>
</tr>
</thead>
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<td>35D Military Intelligence Officer</td>
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Chemical Branch

- 880A Marine Deck Officer
- 881A Marine Engineering Officer
- 882A Mobility Officer

Pilot Branch

- 150A Air Traffic and Air Space Management Technician
- 150I Tactical Unmanned Aerial Vehicle Operations Technician (still classified at 350K until official transfer to Aviation Branch)

Aviation Branch

- 15A Aviation Officer
- 150A Air Traffic and Air Space Management Technician
- 150I Tactical Unmanned Aerial Vehicle Operations Technician (still classified at 350K until official transfer to Aviation Branch)

Air Force

- 15A Aviation Officer
- 150A Air Traffic and Air Space Management Technician
- 150I Tactical Unmanned Aerial Vehicle Operations Technician (still classified at 350K until official transfer to Aviation Branch)

Navy

- 15A Aviation Officer
- 150A Air Traffic and Air Space Management Technician
- 150I Tactical Unmanned Aerial Vehicle Operations Technician (still classified at 350K until official transfer to Aviation Branch)

Marine Corps

- 15A Aviation Officer
- 150A Air Traffic and Air Space Management Technician
- 150I Tactical Unmanned Aerial Vehicle Operations Technician (still classified at 350K until official transfer to Aviation Branch)

Coast Guard

- 15A Aviation Officer
- 150A Air Traffic and Air Space Management Technician
- 150I Tactical Unmanned Aerial Vehicle Operations Technician (still classified at 350K until official transfer to Aviation Branch)

Space Force

- 15A Aviation Officer
- 150A Air Traffic and Air Space Management Technician
- 150I Tactical Unmanned Aerial Vehicle Operations Technician (still classified at 350K until official transfer to Aviation Branch)
IT Service Characteristics

- Professionally Managed
- Customer Oriented
- 24/7 Access
- Globally Accessible
- Facility, Geography, and Time Independent
- Light Clients, Remote Updates
- Controlled Access
Sim Products Characteristics

- Heavyweight computer hardware
- Dedicated computer networks
- Tightly integrated Client/Server software
- Large local support staff
- One-to-one relationships between hardware, software, staffing, and the simulation event.
Client Operations

Visual Presentation
- Maps, 3D, HTML, Tables
- Overlays

Behavior Representation
- Client-side Actions
- Models

Client Application
- Navigation, Identification
- Loading Data

Network Communication
- Multi-player Collaboration
- Server-based Scoring
Customer-focused Training

SOA Enterprise Service Bus

- Registry
  - App List
  - Metadata
- Repository
  - Downloads
  - Executables
  - Data
- Lobby
  - Player Matching
  - Coordination
- Runtime
  - Execution
  - Training
  - Learning
- Record
  - Data Collect
    - AAR
    - Packaging
- Review
  - Replay
  - Relearn
Use Cases

1. Lone Player
2. Player w/ Server
3. Multi-player / Multi-server
4. Multi-Event
SOA-based Simulation Services

- Scalable Simulation Services provided on the customers’ schedule
- Break the 1-to-1 relationship between equipment and events
- Light simulation client as an application on IT Desktop or C4I system
- Evolving Services
- Service Global Customers
  - Units in Country, Homestation, National Guard

[Commercial SOA Diagram]
Challenges

- **Military IT Infrastructure**
  - Security configurations vary by organization and by day
  - Apps cannot be guaranteed to work from any node in the IT network

- **Ownership of Training Applications**
  - Military apps have typically fallen into at least 3 major camps: Business, Mission, Training
  - Each have their own separate networks
  - Running a Training app across the Business infrastructure raises a number of supportability and contracting questions