“Red Teaming” Agility

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TRADOC G2 Forward


1. REPORT DATE
JUN 2014

2. REPORT TYPE

3. DATES COVERED
00-00-2014 to 00-00-2014

4. TITLE AND SUBTITLE
'Red Teaming' Agility

5a. CONTRACT NUMBER

5b. GRANT NUMBER

5c. PROGRAM ELEMENT NUMBER

5d. PROJECT NUMBER

5e. TASK NUMBER

5f. WORK UNIT NUMBER

6. AUTHOR(S)

7. PERFORMING ORGANIZATION NAME(S) AND ADDRESS(ES)
Army Training and Doctrine Command, 950 Jefferson Avenue, Fort Eustis, VA, 23604-5700

8. PERFORMING ORGANIZATION REPORT NUMBER

9. SPONSORING/MONITORING AGENCY NAME(S) AND ADDRESS(ES)

10. SPONSOR/MONITOR’S ACRONYM(S)

11. SPONSOR/MONITOR’S REPORT NUMBER(S)

12. DISTRIBUTION/AVAILABILITY STATEMENT
Approved for public release; distribution unlimited

13. SUPPLEMENTARY NOTES
Presented at the 18th International Command & Control Research & Technology Symposium (ICCRTS) held 16-19 June, 2014 in Alexandria, VA.

14. ABSTRACT

15. SUBJECT TERMS

16. SECURITY CLASSIFICATION OF:

a. REPORT
unclassified

b. ABSTRACT
unclassified

c. THIS PAGE
unclassified

17. LIMITATION OF ABSTRACT
Same as Report (SAR)

18. NUMBER OF PAGES
15

19a. NAME OF RESPONSIBLE PERSON

Standard Form 298 (Rev. 8-98)
Prescribed by ANSI Std Z39-18
The nexus of red teaming and experimentation in the context of the future operational environment enables the Army to measure the agility of systems, and inform investment in future research, science and technology.
What is C2 Agility?

- C2 Agility is defined as the **ability to maintain mission effectiveness proactively in the face of changing circumstances and stresses, including the ability to conceptualize, design, create and deploy a successful endeavor** (Source: NATO Studies, Analyses, and Simulation (SAS) Research Study Group 065, 2006-2009)
- Function of and enabled by *People, Organizations, Processes, and Systems*
- Emphasis on capability to successfully cope with changes in circumstances
- Attributes include patterns of interaction, distribution of information, and allocation of decision rights
  - Each attribute can be defined, observed, and measured; and comprise the “C2 Approach Space”

Why C2 Agility?

- Chairman of the Joint Chiefs of Staff Mission Command and Joint Education White Papers:
  - Response to increasingly complex environment and need for change
  - Calls for changes in Mission Command (C2) and Joint Education
  - Stresses that Joint Education must ensure leaders can:
    - Understand security environment and elements of national power;
    - Deal with surprise and uncertainty;
    - Anticipate and recognize change and lead transitions;
    - Operate on intent through trust, empowerment, and understanding

*Operational Adaptability is a form of Agility*
**Converging Thoughts**

### C2 Agility

**Leaders must...**
- Understand security environment and elements of national power;
- Deal with surprise and uncertainty;
- Anticipate and recognize change and lead transitions;
- Operate on intent through trust, empowerment, and understanding

- Affects organizational effectiveness, efficiency, and force agility
- Ability to move in C2 approach space in response to changing circumstances
- Ability to change C2 approach is essential
- Need for more agility in spite of declining resources

### Mission Command

**Principles of Mission Command**
- Create shared understanding
- Provide clear commander’s intent
- Exercise disciplined initiative
- Use mission orders
- Accept prudent risk
- Build cohesive teams through mutual trust

**Similar Characteristics**

- Requires judgment (delegating authority, making decisions, degree of control, and allocating resources)
- Human skill sharpened by experience, study, and observation
- Systems and procedures used to improve the commander’s understanding
- Supports Art of Command based on objectivity, facts, empirical methods, and analysis
- Used to overcome the physical and procedural constraints under which units operate
Entry of US forces into a complex environment requires a **calculated and controlled mix of engagement, shaping and force. Change unfavorable “order” – “mitigate disorder”**
The future is dominated not by trends, but by outliers, extreme events that lie outside the realm of regular expectations. Extreme events are unknown and improbably based upon current understanding, and they carry with them a disproportionately higher mission impact.

Technology that supports our Warfighters which goes beyond resilient and becomes more capable in environments of incomplete understanding. Such systems that improve under conditions of chaos are termed “antifragile”.

Agility is a measure of antifragile systems
Red Teaming Defined

Red Teaming is a function to provide commanders with an independent capability to fully explore alternatives in plans, operations, concepts, organizations and capabilities in the context of the operational environment and from the perspective of our partners, adversaries and others.

Red Teamers:
- Identify problems; define the end state
- Challenge planning assumptions
- Offer alternative perspectives (alternative hypotheses)
- Ensure staffs are assessing the right things
- Help the staff to determine the next right thing to do

Ensuring staff does not get on a “bus to Abilene”

Deployable Force Protection (DFP)
Adaptive Red Team (ART) Components

Government & Industry Participants
Operationally Relevant Environments
Vulnerability Probes

More Fully Explore Alternatives in Plans, Concepts, Operations, and Organizations

Live Experiment Venues (TSOA)
Virtual / Table -Top Experiment Venues

Research Underpinnings

Warfighter Technology Tradespace Methodologies (WTTM), Quantitative Analysis, Risk Modeling, and Systems Thinking

Uncover Vulnerabilities and Improve System Performance through Scenario-Driven Exercises & Soldier Involvement
ART / TSOA Characteristics

- Live experiment, conducted quarterly, at various venues including Camp Roberts, CA; Fort AP Hill, MD; Camp Blanding, FL; Stennis, MS; Quantico, VA, and Playas, NM
- Accelerates government / industry development across the Services
- **Warfighter Driven**
- Collaborative - Takes advantage of the austere location, attending personnel, and participant investment to further capability development
- Try New Things / Learn New Things - *Challenge the Limits of Your Technology*
  - Integration with other systems / Common Operating Pictures / Common Message Protocol
  - Vulnerability Analysis: Joint Vulnerability Assessment Branch (JVAB)
- **No penalty if “it” doesn’t work - Benefit from learning environment**
- Experiment and assess - Feedback and assessments provided to developers for their information and application as they see fit
- Participants include government and industry; they pay their way but leverage warfighters, vulnerability probe teams (e.g. JVAB), infrastructure, and other participants
- From ART data collection, industry invests their R&D to correct the vulnerabilities exposed and/or implement lessons learned

*Not a formal test event or substitute for developmental or operational test and evaluation*
Agility Model within Adaptive Red Teaming Experiments

**Purpose:** Provide a conceptual framework, methodology, and a set of metrics needed to observe and measure the agility of Deployable Force Protection and the processes, systems, and tools that contribute.

**Objective** Inform science and technology long term investment decisions by empirical evidence obtained by experimentation.

Agility is required to ensure Force Protection in scenarios in which the adversary seeks to counter our technical capabilities with low-cost technologies. TSOA must measure agility in order to inform future science and technology investment opportunities.
Notional Force Protection Technology

Benign Environment

Hostile Environment

Uncluttered

Cluttered

Urban
Forest
Urban
Forest
Urban
Forest
“We are also increasing our investments in vulnerability assessments of both technology and systems as well as expanding our Red Teaming efforts to identify potential vulnerabilities in emerging technologies, systems and systems-of-systems, including performance degradation in contested environments, interoperability, adaptability, and training/ease of use.”
Deep Red Futures Program: a framework to systematically project multiple variants of the far future operational environment in which future capabilities, doctrines and force structures are formulated, gamed and tested.
Agility is a fundamental aspect of innovation for the Army: agile processes and agile technology-enabled capabilities.
Special Recognition

Dr. David Alberts, IDA
Professor Chris Arney, USMA Mathematics Department
Professor Patrick Driscoll, USMA Engineering Department
Mr. Phillip Burum, NAVAIR China Lake
Mr. Garret Scott, DoE, NNSA, Oak Ridge
John Klopfenstein, George Gilkes, and Mary O’Dea, ARL
Dr. Niki Goerger, ERDC Vicksburg, ART Program Manager
Mr. Thomas Greco, TRADOC G2 Director
Dr. Susan Canedy, TRADOC G2 Chief of Staff
Mr. Thomas Pappas, TRADOC G2 Futures

Thank You