

COLE CYBERSPACE OPERATIONS LETHALITY AND EFFECTIVENESS



- Provides means to develop and characterize the dynamics of the target and its environment, including uncertainties
- Enables access to standardized offensive cyber capability performance data; ability to simulate individual and chained attacks
- Includes analytical tools to optimize the attack and infer the aggregate effect or probability of success
- Nightly updates from National Vulnerability Database enable automated early discovery
- Functional analysis provides insight into tangible mission impact of cyber effects
- Fielded across multiple security domains in FY21; stand-alone version available in FY23



COLE ENABLES COMMANDER OPERATIONS DECISIONS THROUGH ADVANCED ANALYTICS USED TO VISUALIZE, PLAN, EVALUATE, AND ASSESS OFFENSIVE AND DEFENSIVE CYBERSPACE ACTIVITIES

DATA STANDARDS (intelligence, capabilities, target) to facilitate data transformation into and out of the suite

CAPABILITY MANAGEMENT for cataloging of performance, provenance, and effectiveness of cyber effects and enabling capabilities against characterized targets

NETWORK CHARACTERIZATION for the development and data-enriched modeling of cyber terrain; components (nodes), configuration and properties (e.g., hardware, software, network addressing, ports, services, etc.) of an operational environment model (OEM)

MISSION PLANNING for scheme of maneuver simulation to calculate probability of an effect for a sequence of attacks based on target properties and selection of available weapons. Requires knowledge of weapon characteristics and vulnerabilities of the target

- Target Vulnerability Assessment
- Attack Sequence Modeling
- Effects-Based Modeling



COLE: CYBERSPACE OPERATIONS LETHALITY AND EFFECTIVENESS

Providing critical information to decision makers to reliably estimate cyberspace operations effects for targeting, weaponeering, and planning.

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The image displays three overlapping screenshots of the COLE Gateway software interface, illustrating the workflow from network characterization to attack analysis. The top screenshot shows a network graph with a callout box labeled '1 CHARACTERIZE NETWORK'. The middle screenshot shows the same network graph with a callout box labeled '2 ASSESS VULNERABILITIES' and a browser window displaying a vulnerability database. The bottom screenshot shows the network graph with a callout box labeled '3 PLAN & ANALYZE ATTACKS' and a detailed analysis panel on the right. The analysis panel includes a table of results and a 'Notional Data' label.

Scenario	Probability of Effect	Confidence Interval
54d 5h 24m	0.283	0.277 - 0.290
65d 7h 25m	0.283	0.277 - 0.290
17 207h	0.283	0.277 - 0.290
66d 6h 35m	0.283	0.277 - 0.290

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