Securing the Ecosystem

The Need for Multidimensional Protection in the 21st Century

Ron Ross

Complexity

Millions, Billions, and Trillions of Everything

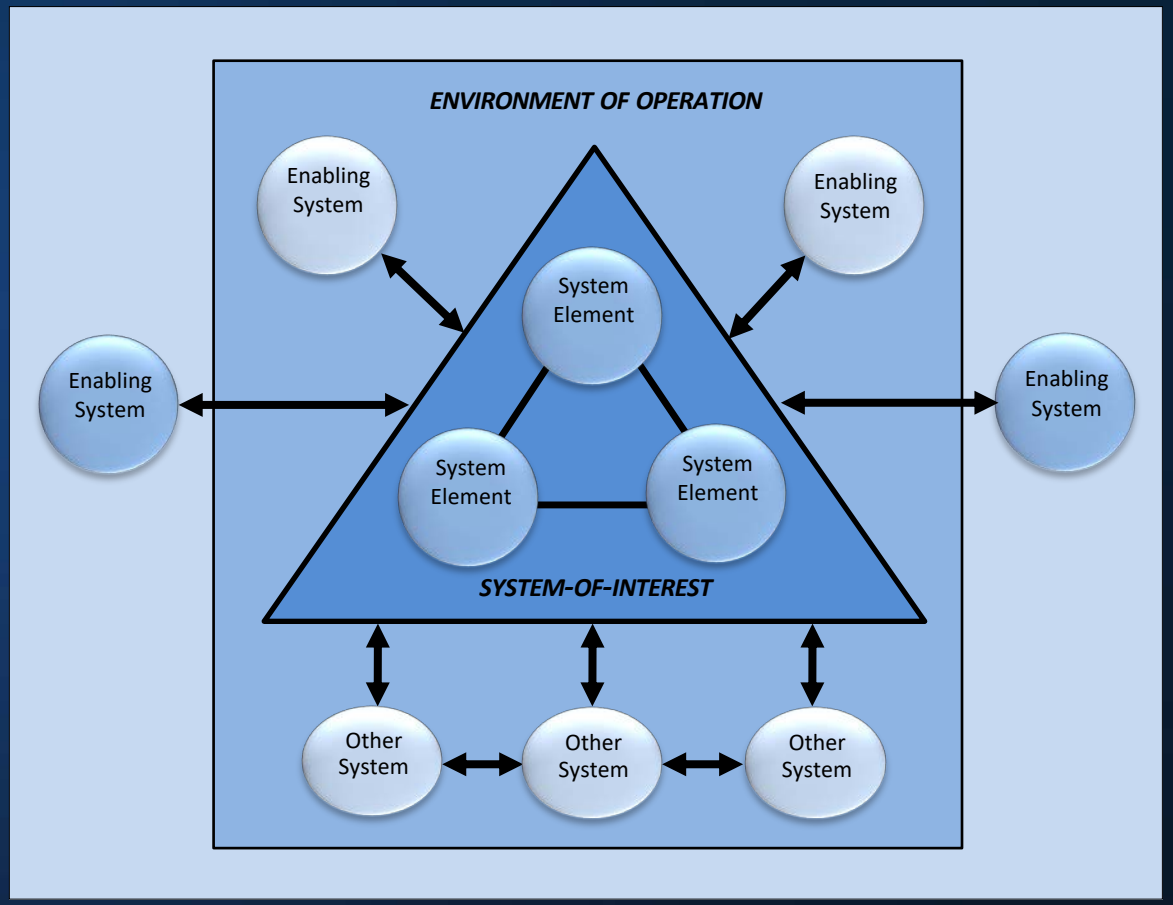
The Ecosystem

Ubiquitous Connectivity Produces Shared Risk

The Ecosystem

Systems Engineering View

Critical interdependencies and relationships among internal system elements, systems within enterprise environments, and systems in external environments that affect security solutions.

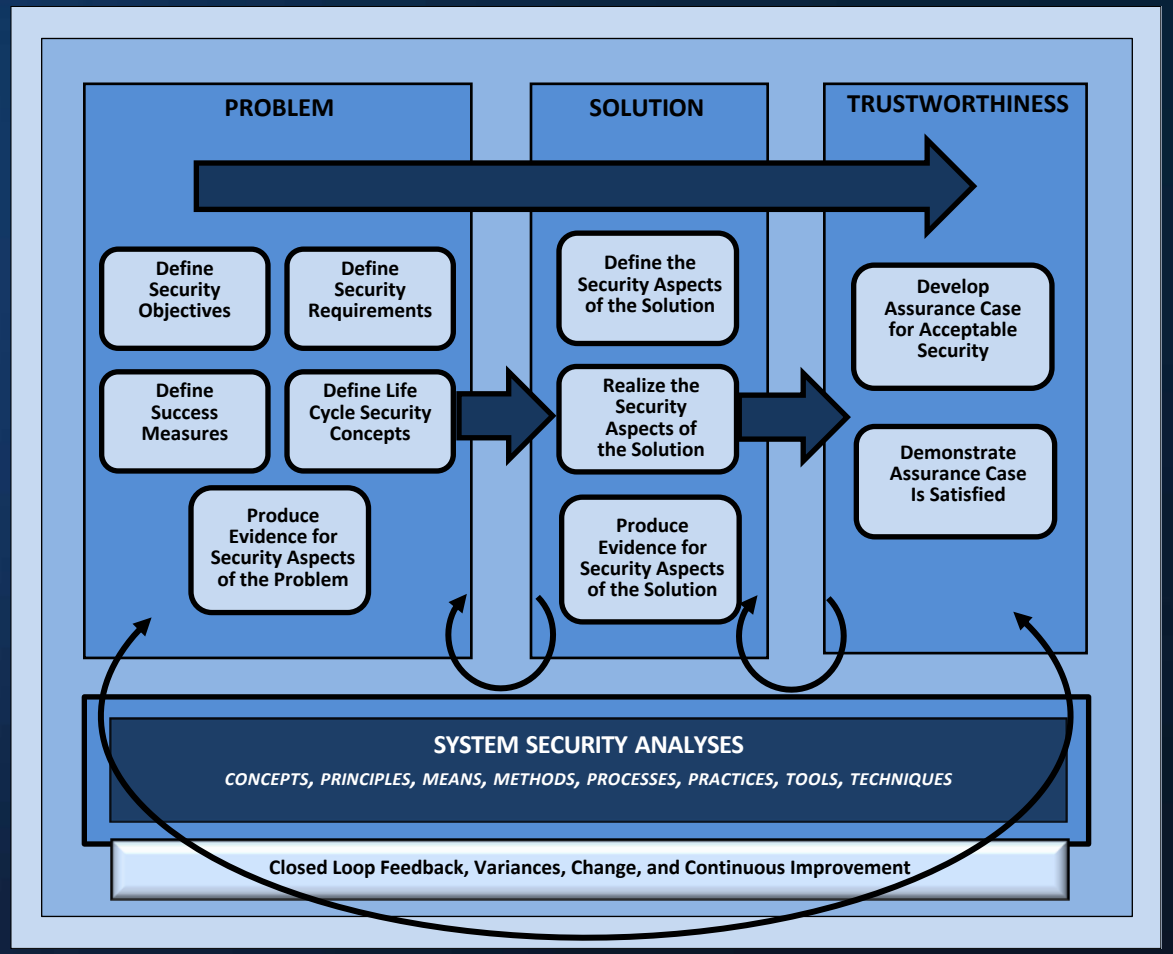


Courtesy: NIST Special Publication 800-160, Volume 1

Systems Security Engineering

Characteristics

- Disciplined and structured development process
- Integrates security into the system life cycle
- Applied to all elements in the system stack
- Can be tailored and implemented in agile development processes
- Provides needed traceability of requirements and transparency into development processes leading to greater trust in systems and system elements



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Systems Security Engineering

Key Concerns

- Architecture
- Assurance
- Behavior
- Cost
- Criticality
- Design
- Effectiveness
- Emergence
- Ergonomics
- Exposure
- Fit-for-purpose
- Human performance
- Life cycle concepts
- Penetration resistance
- Performance
- Privacy
- Protection needs
- Requirements
- Risk
- Security objectives
- Strength of function
- Security performance
- Threat
- Trades
- Training
- Uncertainty
- Vulnerability
- Verification
- Validation

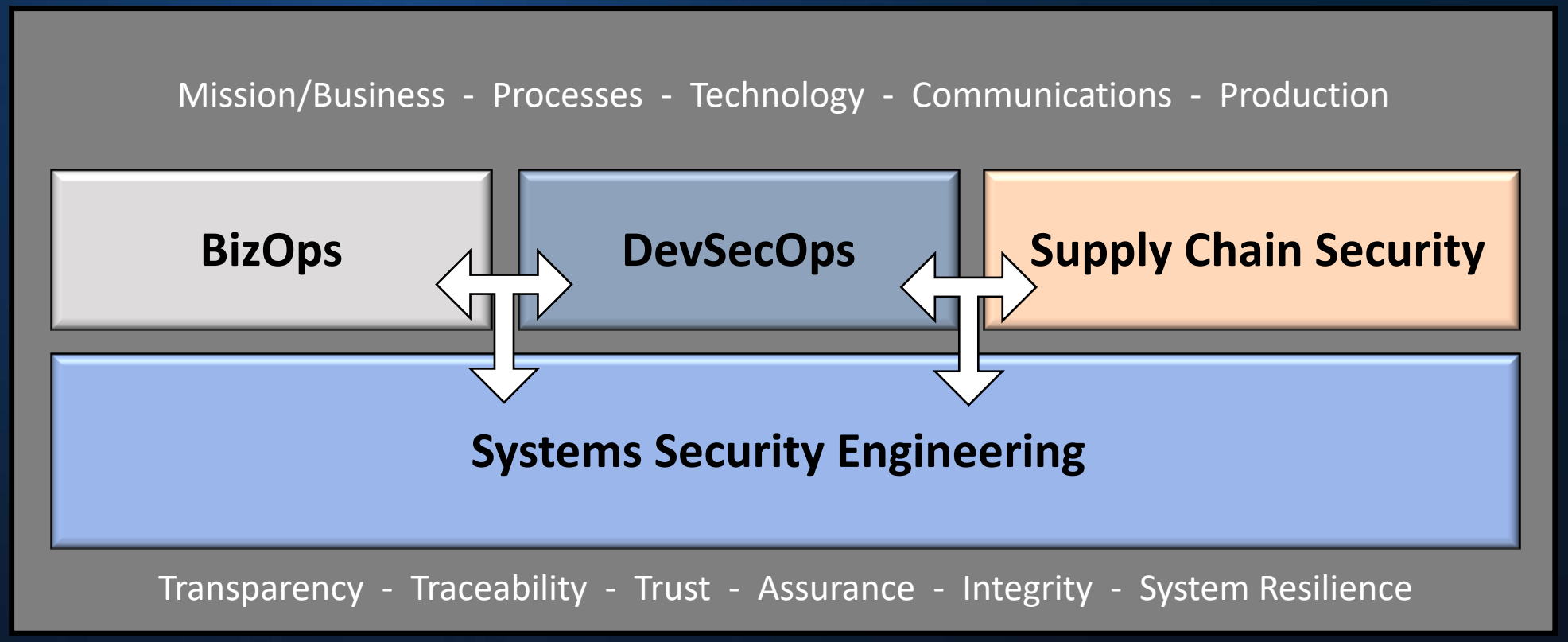
Multidimensional Protection Strategy

- Penetration-resistant architecture
- Damage-limiting operations
- Designs to achieve cyber resiliency and survivability

Stop the incursion…
Limit the damage after the incursion has occurred…
Continue to operate even in a degraded or debilitated state.

The Vision

Framework for Securing the Ecosystem



Framework for Securing the Ecosystem

Part 1 of 2

Objectives

- Apply system security engineering concepts to agile, DevOps, and DevSecOps processes to create a “lean SSE” process
- Expand DevSecOps approaches from software components to ”systems”
- Incorporate “security” into product and system development, implementation, operation, sustainment, and compliance

Framework for Securing the Ecosystem

Part 2 of 2

Objectives

- Develop a “holistic” risk management approach for systems and organizations
- Use BizOps to drive technology and security solutions
- Implement a multidimensional protection strategy to create cyber resilient systems
- Increase system and component assurance by maximizing life cycle testing and evaluation
- Focus on supply chain security

What are you building?

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