



System Security Engineering Working Group

Brief Overview

San Diego Chapter, December 23, 2020

Rick Dove

Chair, System Security Engineering Working Group

**Download this file:
[www/parshift.com/t/1.pptx](http://www.parshift.com/t/1.pptx)**

Abstract

The Systems Security Engineering working group was founded in 2007 and has won two INCOSE awards.

This talk will present an overview of the working group charter and its project history, and then briefly review one project in process: Security in the Future of Systems Engineering (FuSE).

The working group has identified a roadmap of eleven foundational concepts for building the security aspects of the INCOSE vision. A brief overview of the eleven concepts will be presented.

General Info

Chair: Rick Dove, Paradigm Shift International, dove@parshift.com

Co-Chair: Beth Wilson, Retired Raytheon, wilsondrbeth@aol.com

Co-Chair: Ken Kepchar, Eagle View, eagleview2@cox.net

Co-Chair: Keith Willett, US DoD, Keith.Willett@incose.org

Members on Mailing List: 136 (8-Aug-2020)

IW20 Participants: 21 (19 in person, 2 remote)

INCOSE Connect: <https://connect.incose.org/WorkingGroups/SystemsSecurityEngineering/Pages/Home.aspx>

Public Page: www.incose.org/ChaptersGroups/WorkingGroups/knowledge/agile-systems-se

Charter (briefly, full charter in docs at INCOSE Connect site)

Purpose: Identify effective system security principles consistent with new reality; and integrate responsibility into the SE community.

Goals:

- SE responsibility for system security.
- SE influence on security and standards.
- SE concepts for next gen security.
- International engagement.

Scope: System Engineering enablement of next generation system security strategies: adaptive, resilient, evolutionary.

WG Operating Principles

Objectives:

- Leverageable fundamentals rather than niche practices & recommendations.
- Applied rather than theoretical research.
- In-demand knowledge products for the practitioner.
- Embraceable knowledge products (a joy to use).
- Testing and refinement to verify efficacy.
- Socialization and facilitated-assimilation of results.

Project execution:

Clear project objectives, customers, and plans.

Core members with passionate interest driven by personal value.

Effective project leadership.

Firm deliverable dates.

Frequency & Momentum – project-progress meetings weekly.

Knowledge-development and remote collaboration tools.

Incrementally releasable deliverables – papers towards INCOSE products.

Reflective process learning.

Oversight progress facilitation.

Reality: People work on what they want to work on the way they wish, but we attempt to guide.

Status of Past and Current Projects – SSE WG

INSIGHT Publications – Articles (5): 2008-Q2 (2), 2015-Q2 (1), 2016-Q4 (2) – Theme Issues (5): 2009-Q2, 2011-Q2, 2013-Q2, 2016-Q2. 2020-Q3	Done Done
Projects – Next Handbook Revision, POC: Perri Nejb, Dawn Beyer – SEBoK Systems Security Engineering, POC: Keith Willett – SE Requirements Framework for Security, POC: Perri Nejb, Dawn Beyer – FUSE Security Topic, POC: Rick Dove – Maynard’s Industrial Engineering Handbook, 6 th Edition, POC: Rick Dove	WIP WIP WIP WIP WIP
Tracks at Non-INCOSE Conferences – 2011, April 11-13, Security Track at ITNG conference: 6 Papers (Proceedings: IEEE Comp Society) – 2015, June 16-19, CCRP/ICCRTS Symposium, Agile C2 Security Track (3 papers) – 2015, June 30, NSA IAS conference, panel session on security architecture – 2016, July 28, ISSS conference, plenary presentation on sustainable systems	Done Done Done Done
Product – SE Handbook V4.0: Section 10.11 (SSE) and Section 3.6.4 (Case study) – Published in July 2015 – ISO Standards TPP (Technical Project Proposal) Approved December 2014 (Ken Kepchar) – 140628-INCOSE-TA-2014-001-01_NIST_SP_800-160 Standard (1 st public draft) – 160629-INCOSE-TA-2014-001-02_NIST_SP_800-160 Standard (2 nd public draft) – 161021-INCOSE-TA-2014-001-03_NIST_SP_800-160 Standard (pre-release draft)	Done WIP Done Done Done
Papers/Panels/Tutorials/Workshops – Papers: IS11 (2), IS13 (1), IS14 (1), IS15 (2), IS16 (1), IS17 (2), IS20 (3) – Panels: IS10 (1), IS11 (1), IS15 (2) – Tutorials: IS13 (Popick/Miller), IS17/IS18 Winstead/Hild/McEvilly – Workshops: WG 2/year at IW and IS since 2007 – 2016-Oct, Socorro Systems Summit – Agile Security (Jack Ring)	Done Done Done Done Done
Collaborations – CAB Security Priority, POC: Keith Willett – NDIA Systems Engineering Division, SSE, POC: Beth Wilson – NDIA Cyber Division, POC: Perri Nejb & Dawn Beyer – Resilient Systems WG, POC: Keith Willett – Critical Infrastructure Protection & Recovery WG, POC: Ken Kepchar – Academic Council, ABET, POC: Keith Willett	WIP WIP WIP WIP WIP WIP
Webinars – Apr 2014: Security R Us – SE is the High Ground – A Medical Device Perspective (Rick Dove) – Jun 2014: Secure Engineering Assurance Model (Dawn Beyer, Perri Nejb) – Jun 2014: Introduction to the Security Working Group (Rick Dove) – Apr 2015: Natural-System Patterns for Systems Engineering of Agile Self Organizing Security (Rick Dove) – Mar 2018: What is System Security (Mark Winstead)	Done Done Done Done Done
Awards – INCOSE: 2013 Sustained Performance; 2016 Collaboration	Awarded

Status of Past and Current Projects – SSE WG

INSIGHT Publications – Articles (5): 2008-Q2 (2), 2015-Q2 (1), 2016-Q4 (2) – Theme Issues (5): 2009-Q2, 2011-Q2, 2013-Q2, 2016-Q2. 2020-Q3	Done Done
Projects – Next Handbook Revision, POC: Perri Nejb, Dawn Beyer – SEBoK Systems Security Engineering, POC: Keith Willett – SE Requirements Framework for Security, POC: Perri Nejb, Dawn Beyer – FUSE Security Topic, POC: Rick Dove – Maynard’s Industrial Engineering Handbook, 6 th Edition, POC: Rick Dove	WIP WIP WIP WIP WIP
Tracks at Non-INCOSE Conferences – 2011, April 11-13, Security Track at ITNG conference: 6 Papers (Proceedings: IEEE Comp Society) – 2015, June 16-19, CCRP/ICCRTS Symposium, Agile C2 Security Track (3 papers) – 2015, June 30, NSA IAS conference, panel session on security architecture – 2016, July 28, ISSS conference, plenary presentation on sustainable systems	Done Done Done Done
Product – SE Handbook V4.0: Section 10.11 (SSE) and Section 3.6.4 (Case study) – Published in July 2015 – ISO Standards TPP (Technical Project Proposal) Approved December 2014 (Ken Kepchar) – 140628-INCOSE-TA-2014-001-01_NIST_SP_800-160 Standard (1 st public draft) – 160629-INCOSE-TA-2014-001-02_NIST_SP_800-160 Standard (2 nd public draft) – 161021-INCOSE-TA-2014-001-03_NIST_SP_800-160 Standard (pre-release draft)	Done WIP Done Done Done
Papers/Panels/Tutorials/Workshops – Papers: IS11 (2), IS13 (1), IS14 (1), IS15 (2), IS16 (1), IS17 (2), IS20 (3) – Panels: IS10 (1), IS11 (1), IS15 (2) – Tutorials: IS13 (Popick/Miller), IS17/IS18 Winstead/Hild/McEvilly – Workshops: WG 2/year at IW and IS since 2007 – 2016-Oct, Socorro Systems Summit – Agile Security (Jack Ring)	Done Done Done Done Done
Collaborations – CAB Security Priority, POC: Keith Willett – NDIA Systems Engineering Division, SSE, POC: Beth Wilson – NDIA Cyber Division, POC: Perri Nejb & Dawn Beyer – Resilient Systems WG, POC: Keith Willett – Critical Infrastructure Protection & Recovery WG, POC: Ken Kepchar – Academic Council, ABET, POC: Keith Willett	WIP WIP WIP WIP WIP WIP
Webinars – Apr 2014: Security R Us – SE is the High Ground – A Medical Device Perspective (Rick Dove) – Jun 2014: Secure Engineering Assurance Model (Dawn Beyer, Perri Nejb) – Jun 2014: Introduction to the Security Working Group (Rick Dove) – Apr 2015: Natural-System Patterns for Systems Engineering of Agile Self Organizing Security (Rick Dove) – Mar 2018: What is System Security (Mark Winstead)	Done Done Done Done Done
Awards – INCOSE: 2013 Sustained Performance; 2016 Collaboration	Awarded

FuSE Collaborative Community

FuSE Road Map (~January 2020)

Collaborating Organizations




The purpose of FuSE is to accelerate the realization of INCOSE’s vision

FuSE System Security Charter (2020)

Systems Security in the Future of Systems Engineering

(a FuSE initiative topic project)

What will good look like when we use FuSE to deliver systems?

1. All stakeholders share common security vision and respect.
2. Security is embedded in systems.
3. Security agility is in practice.
4. Systems are built for trust.
5. System and component behavior is monitored for anomalous operation.
6. System components are self protective.

Objectives

What will good look like in 2023-2025?

1. Security responsibility and expertise is integrated in the SE-team.
2. Security is viewed as a functional requirement.
3. Security agility will have some effective working patterns in practice as an early base line.
4. Strategies for shared security vision and respect in early practice.

What will good look like by end of 2020?

1. Multi-organization collaboration is active.
2. Initial foundation concepts for FuSE Security identified.
3. Projects to develop and publish some of the foundation concepts are active.

Team:

- INCOSE – Rick Dove (Lead), Keith Willett
- ISSS – Delia Pembrey MacNamara
- NDIA – Holly Dunlap, Corey Ocker
- SERC – Tom McDermott

What is stopping us from doing this now?

1. SE relates to SSE as an independent specialty practice.
2. Security is viewed as a non-functional cost and ROI value is difficult to verify.
3. Security standards compliance is considered sufficient.
4. Actionable research is in early stages.
5. Contracts and projects detail features and requirements up front rather than desired capabilities that allow innovative solutions.

2020 Action Plan

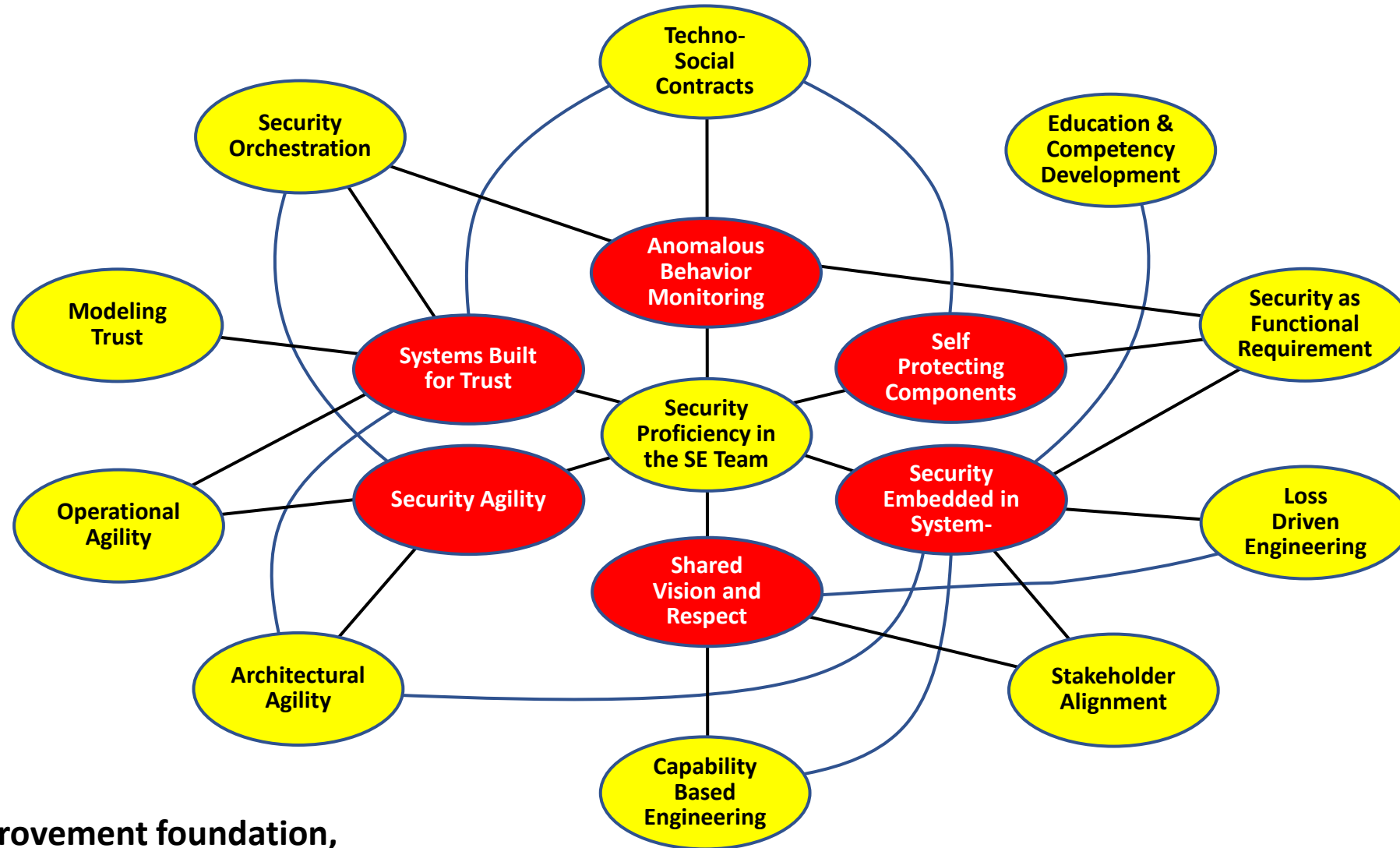
1. IS20 initial foundation papers:

- **Techno-Social Contracts for Security Orchestration.**
www.parshift.com/s/200718IS20-FuSETechnoSocialContracts.pdf
- **Contextually Aware Agile Security.**
www.parshift.com/s/200718IS20-FuSEAgileSecurity.pdf
- **Toward Architecting the Future of System Security.**
<https://onlinelibrary.wiley.com/doi/abs/10.1002/j.2334-5837.2020.00717.x>

2. Mid 2020: Periodic web workshops in process identifying additional foundation areas.
3. Ongoing: Recruit foundation developers.
4. Late 2020: Additional foundation papers in process.

Key Concept-Objective Synergy Links

Depicted as a Strategic Activity Web



A near-term improvement foundation,
not a comprehensive strategy web.

FuSE System Security Project – 2021

What will good look like by end of 2021?

1. Multi-organization collaboration is active.
2. Foundation concept development is active.
3. All foundation concepts have publishable development

Action Plan

1. Instigate & inspire foundation concept development.
2. Create video overview of foundation concepts.
3. Find early practice examples.
4. Conduct and support virtual workshops on plan achievement.
5. Obtain draft content for June 2022 INSIGHT on FuSE Security.
6. Plan transition to practice.

**If you are interested in active participation,
contact dove@parshift.com**

Download this file: [www/parshift.com/t/1.pptx](http://www.parshift.com/t/1.pptx)