

ECSS Security Standards & Handbooks

Next Steps & Proposed Roadmap

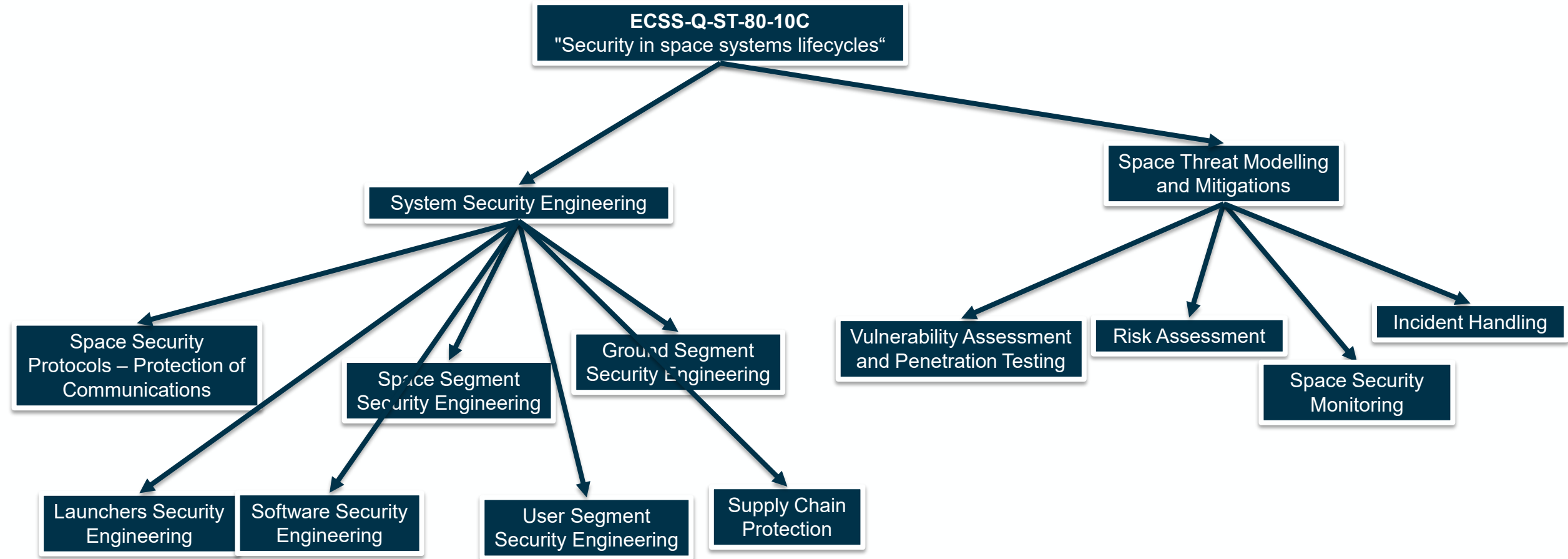
ECSS Security Working Group

12/09/2023

- ECSS-Q-ST-80-10C DIR1 "*Space product assurance - Security in space systems lifecycles*"
 - Due date of the Public Review is: 8th September 2023 → extended until 6th October
 - DRRs are now under disposition
- During the compilation of the first standard, it was identified that we need to go deeper to several areas (e.g. supply chain, vulnerability assessment, etc.)
- **Action** to present to the next ECSS TA meeting in September (21/22 September) a roadmap presentation regarding the next standards & handbooks to be addressed.

- Several standards / handbooks have been identified (list is provided later)
- Prioritisation is needed, based on various criteria:
 - Urgency (importance versus gaps),
 - Current maturity,
 - Inputs potentially expected by other ongoing activities, etc.
 - Requests received by TA
- In many (if not all) cases coordination with other disciplines / domains are needed (eg Avionics, software, etc.)
- It is suggested NOT to split forces in order to expedite compilation of standards / handbooks → experts and their availability is minimum

(Long-Term) Vision for an ECSS Security Branch



NOTE: Tree structure is not complete and exhaustive. It is provided as an indication of security topics that need to be addressed, their grouping and hierarchy.

First batch

1. Handbook: How to implement the new ECSS Security Standard → T0 + 12 months
2. Handbook: security threats & mitigations for space (MITRE ATT&CK® like) * → T0 + 9 months

Second batch

1. Standard: System Security engineering ** → T1 + 2 years
2. Standard: Supply chain protection standard ** → T1 + 2 years
3. Handbook: vulnerability assessment ** → T1 + 1 year
4. Standard (or handbook): Software security engineering (if needed) → T1 + 1 ½ year → pending review of revised ECSS-E-ST-40C Rev.1

Third batch

To be decided at a later phase (also considering potentially other needs identified during compilation of previous standards). Preliminary list is included [here](#).

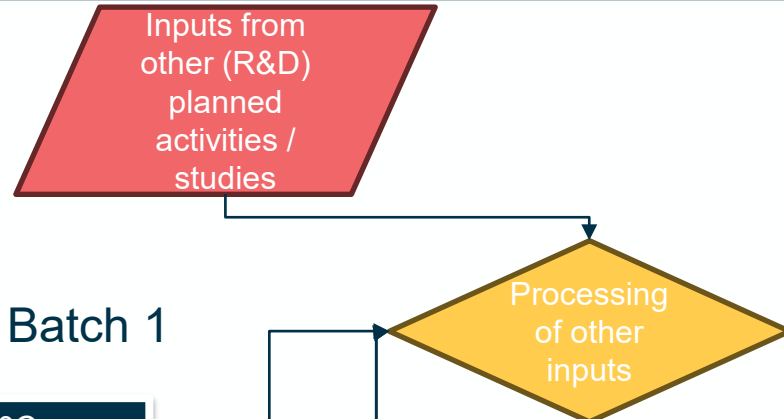
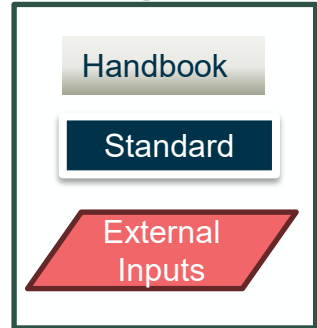
NOTES:

* There is a starting point from which we can benefit (previous work, ongoing studies, etc.); It will also feed the rest.

** We can benefit on the topic by activities are about to start (and hence better planned for 2nd batch)

Proposed Roadmap + Logic

Legend



Batch 1

Batch 2

Batch 3

ECSS-Q-ST-80-10C
"Space product assurance
- Security in space
systems lifecycles"

How to implement / use
ECSS-Q-ST-80-10C

Security Threats &
Mitigations for Space

- Vulnerability Assessment & penetration testing
- System Security Engineering
- Supply Chain Protection
- Software Security Engineering (if needed)



List of needed standards / handbooks

- System Security Engineering → Batch 2
 - Space segment (incl. various use cases, e.g. hosted payloads)
 - Ground segment (incorporating new principles, like zero-trust)
- Secure protocols for space (incl. applied crypto part, aligned to the best possible extent with CCSDS, and complement where needed, e.g. PQC). → Batch 3 (or Batch 2)
- End-to-end supply chain protection. → Batch 2
- Security assessment and testing of space components, subsystems and systems (covering all aspects, from risk assessment to penetration testing). → Batch 3
- Vulnerability assessment & management → Batch 2.
- Space threat modelling/intelligence and mitigations → Batch 2
- Security monitoring for space systems. → Batch 3
- Software Security → Batch 2
- Incident handling for space systems. → Batch 3
- Handbook / Guidance Mapping to [NIS2 Directive](#) → Batch 3 (maybe a white paper?)
- Space Cyber Security Maturity models and assessments for Space → Batch 3
- AI/ML Security → Batch 3
- Handbooks: How to use security standards → Batch 1
- ...other → Batch 3

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Security for Space Systems (3S) 2024 is the 1st edition of a conference organised and hosted by ESA on the topic of security for space systems.

3S Conference aims at bringing together academia and industry to present their latest research on security topics for space.

Alongside the conference, an industrial exhibition will be organised. European companies active in the security for space systems area will be invited to exhibit their products either by means of equipment demonstrations or by appropriate posters.

The conference will offer the opportunity of joining industry professionals and academic researchers in a single place allowing to interact with a wide sample of the security community for space systems.

More info at: www.security4space.com

Security for Space Systems
27-28 May 2024
ESTEC, the Netherlands

