SCION
Update and Q&A

Corine de Kater (cdekater@scion.org)
Nicola Rustignoli (nic@scion.org)

IETF 115 - RTGWG
09.11.2022

IETF 113 - Starting Point

Two events

- Tuesday 22 March - Side Meeting about SCION
  - Introduction to SCION; request for input on SCION IETF strategy
- Wednesday 23 March - SCION Presentation at RTG Area Open Meeting
  - High-level overview of SCION

→ Feedback

- Interest is there, but

   "SCION is a large system, and the IETF is not good at large systems"
- Therefore: Try to break SCION down in smaller chunks

Work done so far

Written and published three Internet-Drafts:

1. SCION Overview
   draft-dekater-panrg-scion-overview

2. SCION Component Analysis
   draft-rustignoli-panrg-scion-components

3. SCION Control-Plane PKI
   draft-dekater-scion-pki

Participated in several PANRG (interim) meetings as a base for discussion

- Since we have no "home", the *path-aware* networking RG seemed most close
- But we also want to share our work with the Routing Area community

SCION Overview Internet-Draft

- Discusses the motivations behind the SCION architecture

- Gives a high-level overview of SCION fundamental components

- Concludes with an overview of current SCION deployments

[draft-dekater-panrg-scion-overview](https://datatracker.ietf.org/doc/draft-dekater-panrg-scion-overview/)

SCION Overview I-D

SCION in a Nutshell

- Path-based inter-domain network architecture

- Control-plane PKI - Authentication
  - Builds the basis for the unique SCION trust model

- Control plane – routing
  - Constructs and disseminates path segments
  - Authenticates path information

- Data plane – packet forwarding
  - Combines path segments into paths
  - Puts path information in the packets (header)
  - Forwards packets based on the path information
  - Simple routers, stateless operation

Control Plane PKI (CP-PKI)
Authentication

Control Plane
Routing

Data Plane
Packet forwarding

SCION Overview I-D

SCION Deployments

- **SPs**: Switzerland, Europe and Asia (and growing)

- **IXPs**: SwissIX offers SCION peering

- **Customers**: Swiss financial institutions (SSFN), education, government, healthcare

- **NRENs**: SCI-ED: Research network connecting Swiss institutions of the ETH

- **R&D:** SCIONLab, a global SCION research testbed: https://www.scionlab.org
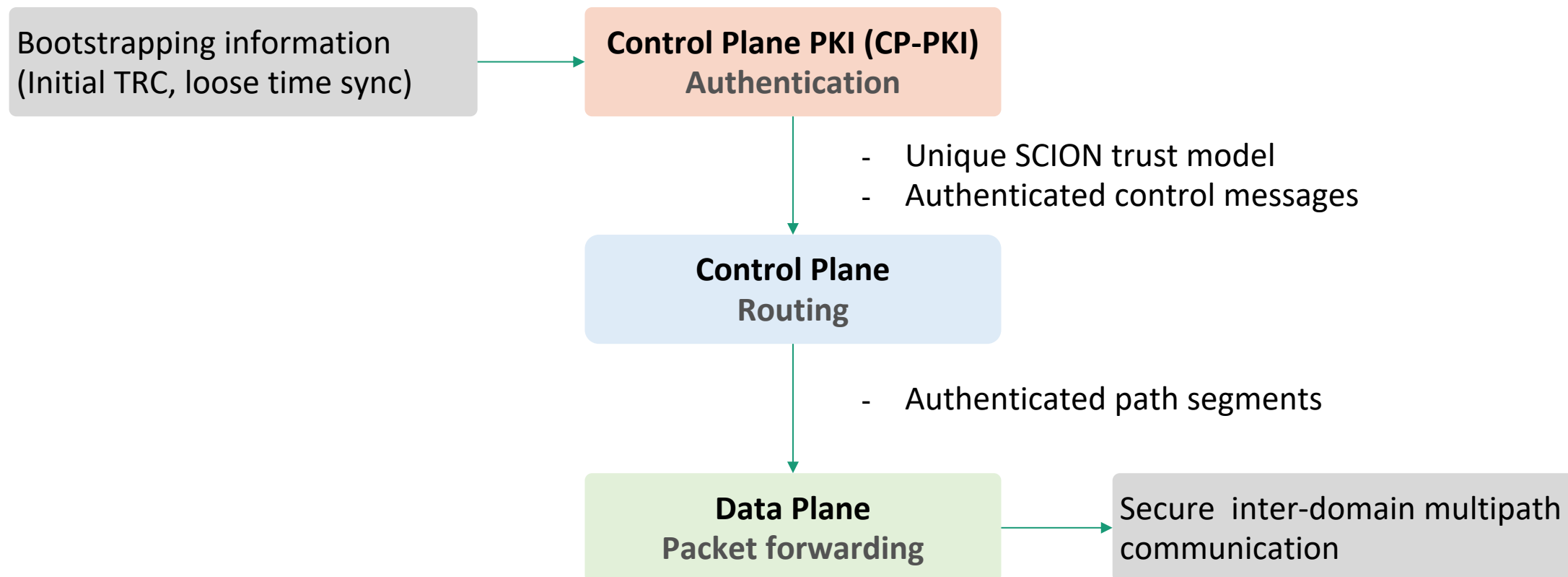
SCION Component Analysis Internet-Draft

- Analyzes SCION's core components from a functionality perspective

- Describes their dependencies, outputs, and properties provided

- Aims to answer the following questions:
  - What are the main components of SCION and their dependencies?
    Can they be used independently?
  - What existing protocols are reused or extended? Why (or why not)?

- Briefly touches on the maturity level of components and some extensions

draft-rustignoli-panrg-scion-components

SCION Component Analysis I-D

Dependencies

Bootstrapping information
(Initial TRC, loose time sync)

Control Plane PKI (CP-PKI)
Authentication

- Unique SCION trust model
- Authenticated control messages

Control Plane
Routing

- Authenticated path segments

Data Plane
Packet forwarding

Secure inter-domain multipath communication

SCION Control-Plane PKI Internet-Draft

- Presents the trust concept and design of the SCION Control-Plane Public Key Infrastructure

- Provides a short overview of the certificates, keys, and roles involved

- Gives detailed specifications of the building blocks

- Concludes with several considerations about deploying the Control-Plane PKI

draft-dekater-scion-pki

SCION Control-Plane PKI I-D

Trust Model

SCION's trust model is based on Isolation Domains (ISD):

- Logical grouping of ASes that share a uniform trust environment (for example, a common jurisdiction)

- Each ISD is administered by several core ASes, the ISD core

- The ISD core negotiates its own trust policy/contract called Trust Root Configuration (TRC)

- The CAs in an ISD can only create certificates for ASes in this respective ISD

draft-dekater-scion-pki
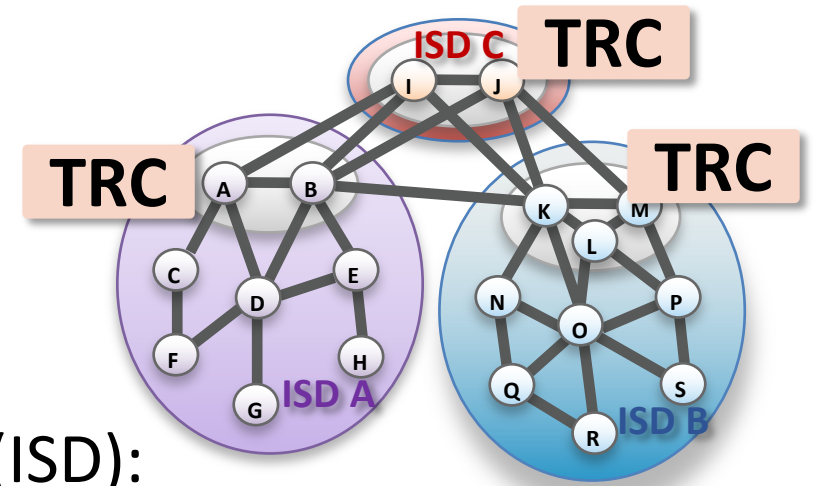
Next Steps

- Address received feedback (reviews and comments welcome!)

- Improve existing Internet-Drafts, based on the feedback

- Continue documenting current specifications with new drafts:
  - SCION Control Plane
  - SCION Data Plane

- In the meantime:
  - Share progress and thoughts with the IETF/IRTF/ISE
  - Build up SCION support and community

Thank you for your attention!

We are open for
Any Questions & Feedback

Corine de Kater (cdekater@scion.org)
Nicola Rustignoli (nic@scion.org)