SCiON
Update and Q&A

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IETF 115 - RTGWG
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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
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
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](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)
- Unique SCION trust model
- Authenticated control messages

Control Plane Routing
- Authenticated path segments

Data Plane Packet forwarding → Secure inter-domain multipath communication

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draft-rustignoli-panrg-scion-components
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
Next Steps

• Address received feedback (reviews and comments welcome!)
• Improve existing Internet-Drafts, based on the feedback
• Continue documenting current specifications with new drafts:
  o SCION Control Plane
  o SCION Data Plane
• In the meantime:
  o Share progress and thoughts with the IETF/IRTF/ISE
  o Build up SCION support and community
Thank you for your attention!

We are open for
Any Questions & Feedback

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