Limited Domains and Internet Protocols

draft-carpenter-limited-domains-04

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IETF 103
November 2018
Topics

- Document reminder
- Changes since IETF 102
- Taxonomy
- Protocol scope in limited domains
- Functional requirements of limited domains
- Next steps
Reminder

Types of limited domain
• SOHO networks
• In-vehicle networks
• SCADA networks
• Sensor networks
• Enterprise & campus
• Data & hosting centres
• CDNs
• Network slices
• etc

Technologies
• Differentiated Services
• NFV/SFC
• Data Centre Overlays
• Segment Routing
• Autonomic Networks
• Homenet (HNCP...)
• Creative use of IPv6
• Deterministic Networking
• etc
Updates since IETF102

• Improved/reorganized descriptive text
• Added taxonomy
• Added section on scope of protocols in limited domains
• Added section on functional requirements of limited domains
Taxonomy (outline)

- The Domain as a Whole
- Individual Nodes
- The Domain Boundary
- Topology
- Technology
- Connection to the Internet
- Security, Trust and Privacy Model
- Operations

The main value of this taxonomy is to help identify common features and requirements.
The scope of protocols in limited domains (1)

- Some protocols will be designed to only work correctly between end systems inside domains.
- Some IETF efforts (diffserv, SFC, Segment Routing, DETNET...) actively encourage this.
- IoT edge networks are definitely limited domains.
- We need to discuss whether protocols (or extensions) should sometimes be standardised to interoperate only within a Limited Domain boundary. Such protocols would not be required to interoperate across the Internet as a whole.
  - except perhaps via encapsulation
The scope of protocols in limited domains (2)

• If you think that was provocative, read draft-voyer-6man-extension-header-insertion

• We conclude that it is reasonable to explicitly define limited-domain protocols, if they
  - completely describe the scenario
  - explain how the domain is defined.

• As long as all relevant standards are respected outside the domain boundary, a limited-domain protocol is not harmful to the Internet.

• However, mechanisms are needed to support domain membership operations.
Functional Requirements of Limited Domains (1)

• Domain Identity. A domain must have a unique and verifiable identifier - a public key for the domain. The holder of the private key becomes the trust anchor for the domain.

• Node Eligibility. A node must be able to determine which domain(s) it can join.

• Secure Enrolment. A node must be able to enrol securely in a given domain and acquire relevant credentials for operations within the domain.

• Withdrawal. A node must be able to cancel enrolment in a given domain.
Functional Requirements of Limited Domains (2)

- Dynamic Membership. A node should be able to temporarily leave and rejoin a domain.
- Role. A node must have a verifiable role (capabilities and authorizations).
- Verify Peer. A node must be able to verify whether another node is a member of the domain.
- Verify Role. A node must be able to learn the role of another node.
- Domain Data. It must be possible for a node to acquire domain policy and/or domain configuration data.
Discussion + next steps

• Comments? Questions?
• Next steps: further develop the functional requirements