Traffic Engineering Architecture and Signaling (TEAS) WG

https://datatracker.ietf.org/wg/teas

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TEAS WG [teas@ietf.org]

- Started in 2014
- WG responsible for:
  - Traffic-engineering architectures for **generic applicability** across **packet** and **non-packet** networks.
    - Includes networks that perform centralized computation and control, distributed computation and control, or even a hybrid approach.
  - Definition of **protocol-independent** metrics and parameters for describing **links** and **tunnels/paths** required for traffic engineering.
  - Functional specification of **extensions** for **routing** (OSPF-TE, ISIS-TE, BGP-LS) and for **path computation** (PCEP), including those that provide general enablers of traffic-engineering systems that may also use RSVP-TE.
  - Functional specification of **generic extensions** for **RSVP-TE**, and the associated protocol formats and procedures that embody these extensions.
  - Definition of **control plane mechanisms** and **extensions** to allow the setup and maintenance of TE paths and TE tunnels that span **multiple domains and/ or switching technologies**
    - A domain may be an IGP area, an Autonomous System, or any other region of topological visibility.
  - Definition and extension of **management** and **security techniques** for TE path and tunnel control.
    - Includes configuring and monitoring RSVP-TE as well as mechanisms used to configure, control, and report OAM within TE networks. YANG and MIB modules may be considered.

Traffic Engineering in IETF

Traffic Engineering (TE) [RFC2702] deals with the issues of performance evaluation and performance optimization of operational networks.

- Encompasses the application of technology and scientific principles to the measurement, characterization, modeling, and control of traffic.

Key elements in any TE solution [RFC3272bis]:

Policy

- Allows for the selection of paths based on information beyond basic reachability
- Policy decisions made within the control plane or by controllers

Path Steering

- Ability to forward packets using more information than just knowledge of the next hop
- Can be supported via control plane protocols, by encoding in the data plane headers, or by a combination of the two

Resource Management

- Provides resource-aware control and forwarding
- Resource reservation
- Resource allocation

Tools in the TE toolkit enable topology discovery, path computation, path setup/provisioning, path maintenance and service mapping.

TEAS WG – 27 RFCs

RFC7751[PS] : RSVP-TE Extensions for Associated Bidirectional Label Switched Paths

RFC7570[PS]: Label Switched Path Attribute in the Explicit Route Object

RFC7571[PS]: GMPLS RSVP-TE Extensions for Lock Instruct and Loopback

RFC7709[Inf]: Requirements for Very Fast Setup of GMPLS Label Switched Paths

RFC7823[Inf]: Performance-Based Path Selection for Explicitly Routed Label Switched Paths (LSPs) Using TE Metric Extensions

RFC7898[Exp]: Domain Subobjects for Resource Reservation Protocol – Traffic Engineering

RFC7926[BCP]: Problem Statement and Architecture for Information Exchange between Interconnected Traffic-Engineered Networks

RFC8001[PS]: RSVP-TE Extensions for Collecting Shared Risk Link Group Information

RFC8131[Inf]: RSVP-TE Signaling Procedure for End-to-End GMPLS Restoration and Resource Sharing

RFC8149[PS]: RSVP Extensions for Reoptimization of Loosely Routed Point-to-Multipoint Traffic Engineering Label Switched Paths

RFC8258[PS]: Generalized SCSI: A Generic Structure for Interface Switching Capability Descriptor Switching Capability Specific Information

RFC8271[PS]: Updates to the Resource Reservation Protocol for Fast Reroute of Traffic Engineering GMPLS Label Switched Paths

RFC8283[Inf]: An Architecture for Use of PCE and the PCE Communication Protocol in a Network with Central Control

RFC8359[PS]: Network-Assigned Upstream Label

RFC8370[PS]: Techniques to Improve the Scalability of RSVP-TE Deployments

RFC8390[PS]: RSVP-TE Path Diversity Using Exclude Route

RFC8400[PS]: Extensions to RSVP-TE for Label Switched Path Egress Protection

RFC8413[Inf]: Framework for Scheduled Use of Resources

RFC8424[Exp]: Extensions to RSVP-TE for Label Switched Path Ingress Fast Reroute Protection

RFC8426[Inf]: Recommendations for RSVP-TE and Segment Routing Label Switched Path (LSP) Coexistence

RFC8453[Inf]: Framework for Abstraction and Control of TE Networks

RFC8454[Inf]: Information Model for Abstraction and Control of TE Networks

RFC8537[PS]: Updates to the Fast Reroute Procedures for Co-routed Associated Bidirectional Label Switched Paths

RFC8735[Inf]: Scenarios and Simulation Results of PCE in a Native IP Network

RFC8776[PS]: Common YANG Data Types for Traffic Engineering

RFC8795[PS]: YANG Data Model for Traffic Engineering Topologies

RFC8821[Inf]: PCE-Based Traffic Engineering in Native IP Networks

* *Proposed Standard 14, Informational 10, Experimental 2, BCP 1*

TEAS WG – Ongoing Work

- TE specific Data Models
  - TE Tunnels, TE LSPs, TE Interfaces, RSVP/RSVP-TE, Path Computation, TE Service Mapping, L3 TE Topologies, SR/SR-TE Topologies, SF-Aware TE Topologies
- 3272bis – Overview and Principles of Internet Traffic Engineering
- Abstraction and Control of TE Networks [ACTN]
  - Applicability to Packet Optical Integration; Applicability to Network Slicing
- Enhanced VPN
  - Framework; Applicability to Network Slicing
- Network Slicing
  - Framework; Solutions; Data Models
- GMPLS specific items
  - Extensions for Shared Mesh Protection; Interworking of GMPLS Control and Centralized Controller System