Session 1: Reconsidering Internet Architecture

“Internet Architecture”: the definition?
The well-known hourglass protocol stack

The narrow waist: the centerpiece in the architecture
Company A using a wireless M2M service for a mission-critical application

- experiencing a two-minute outage in one or two of their M2M systems every day
- the app is built by third-party B, hosted by a specialized cloud service provider C in yet another party D’s data center
- communicating with machines in the field using a cellular network E as the primary communication channel
- Every party meeting its service-level agreement (SLA)
Consequence of virtualization?

- How easy to debug such a system?
- Resiliency?
Internet Engineering Task Force (IETF)
Request for Comments: 9298
Category: Standards Track
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Proxying UDP in HTTP

Abstract

This document describes how to proxy UDP in HTTP, similar to how the HTTP CONNECT method allows proxying TCP in HTTP. More specifically, this document defines a protocol that allows an HTTP client to create a tunnel for UDP communications through an HTTP server that acts as a proxy.

“UDP tunnels are commonly used to create an end-to-end virtual connection, which can then be secured using QUIC [QUIC] or another protocol running over UDP.”
Proxying IP in HTTP

Abstract

This document describes how to proxy IP packets in HTTP. This protocol is similar to UDP proxying in HTTP but allows transmitting arbitrary IP packets. More specifically, this document defines a protocol that allows an HTTP client to create an IP tunnel through an HTTP server that acts as an IP proxy. This document updates RFC 9298.

This document describes a protocol for tunnelling IP through an HTTP server acting as an IP-specific proxy over HTTP. This can be used for various use cases, such as remote access VPN, site-to-site VPN, secure point-to-point communication, or general-purpose packet tunnelling.
Proxying Ethernet in HTTP

Abstract

This document describes how to proxy Ethernet frames in HTTP. This protocol is similar to IP proxying in HTTP, but for Layer 2 instead of Layer 3. More specifically, this document defines a protocol that allows an HTTP client to create Layer 2 Ethernet tunnel through an HTTP server to an attached physical or virtual Ethernet segment.
A recent drawing of the hourglass

Lookahead: establish a new stack and narrow waist?

- Define interoperability for an “infrastructure services stack”
  - What services? e.g. caching, DoS/IDF, zero-trust, etc.
  - What interfaces and abstractions?

From the networking channel panel 11/8/2023 on “Lessons learned from 40+ years of the Internet: an Industry Perspective”, [https://youtu.be/ec4J7PwYPSA](https://youtu.be/ec4J7PwYPSA)
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