



Multicast HTTP using BIER

<https://tools.ietf.org/html/draft-purkayastha-multicast-http-using-bier-00>

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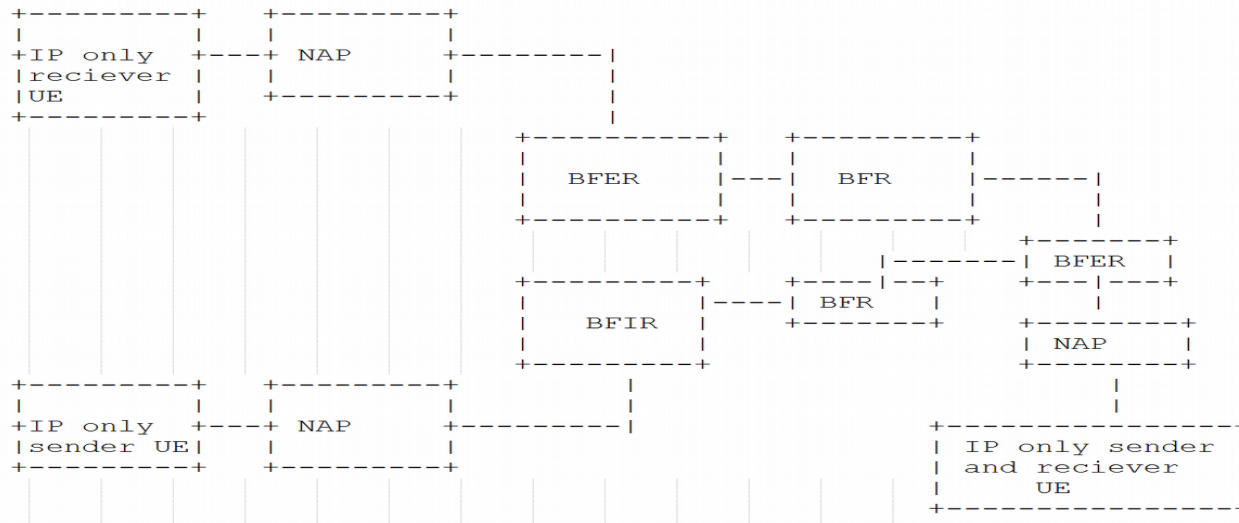
Background (HTTP Level Multicast)

- HTTP-level clients benefit from the dynamic multicast group formation enabled by BIER
- Server NAP (network attachment point), creates a list of outstanding client NAP requests to the same HTTP request URI
- When response is available, BIER forwarding information is retrieved and used to send the HTTP response
- We introduce the requirements for a BIER multicast overlay realizing this use case

Requirements

- Must Support multiple FQDN-based service endpoints to exist in the overlay
- MUST send FQDN-based service requests at the network level to a suitable FQDN-based service endpoint via policy-based selection of appropriate path information
- MUST allow for multicast delivery of HTTP response to same HTTP request URI
- MUST provide direct path mobility, where the path between the egress and ingress NAPs can be determined as being optimal

HTTP Multicast Overlay Operations



- Includes a function called PCE (Path Computation Element function), responsible for selecting the correct multicast endpoint
- The result of the selection is a BIER path identifier, which is delivered to the NAP upon initial path computation request
- The path identifier is utilized for any future request for a given URL-based request

HTTP Multicast Overlay Operations

- If no local BIER forwarding information exists to the server (NAP), a path computation entity (PCE) is consulted, which calculates a unicast path from the BFIR to which the client NAP is connect to the BFER to which the server NAP is connected.
- Upon arrival of an HTTP request at the server NAP, the server NAP proxy forwards the HTTP request as a well-formed HTTP request locally to the server. If no BIER forwarding information exists for the reverse direction towards the requesting client NAP, this information is requested from the PCE

HTTP Multicast Overlay Operations

- Upon arrival of any further client NAP request at the server NAP to an HTTP request whose response is still outstanding
 - the client NAP is added to an internal request table
 - Optionally, the request is suppressed from being sent to the server.
- Upon arrival of an HTTP response at the server NAP, the server NAP consults its internal request table for any outstanding HTTP requests to the same request
- The server NAP retrieves the stored BIER forwarding information for the reverse direction for all outstanding HTTP requests and determines the path information to all client NAPs through a binary OR over all BIER forwarding identifiers with the same SI field

Protocol Considerations

- Following protocol changes are required:
 - NAP-to-NAP protocol for HTTP: Map HTTP to BIER message exchange between client and server NAPs
 - NAP-PCE protocol: Used for path computation and delivery of BIER routing information as well as path updates
 - Overlay transport protocol: Used for transport-level exchange over BIER layer
 - Registration protocol: Used to register FQDN service endpoints
 - Content certificate distribution protocol: Used for HTTPS support

Next steps

- Collect feedback from the WG
 - Does the use case and protocol changes proposal look reasonable?
- We will work on this use case and a solution in the H2020 FLAME project with experiments planned for early 2018 and beyond