

Protocol Number Option in UDP Options

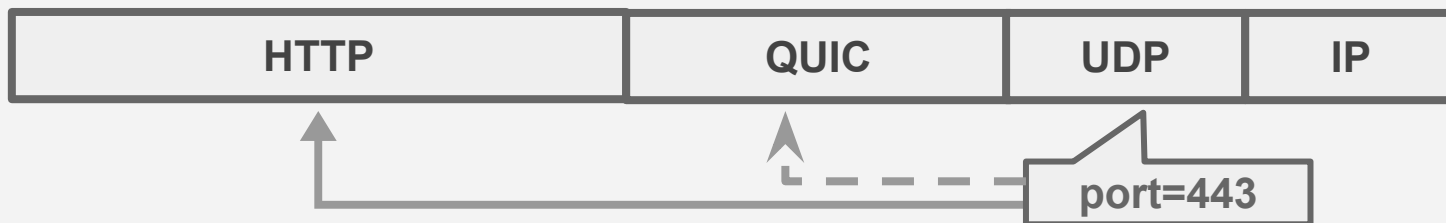
draft-daiya-tsvwg-udp-options-protocol-number

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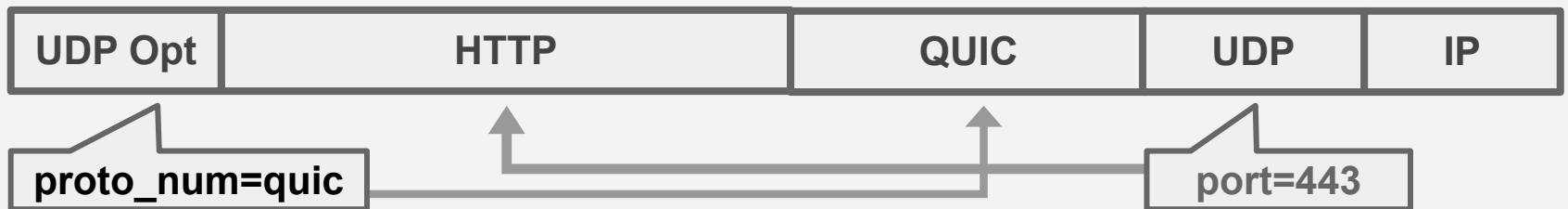
Background

- New transport protocols are implemented based on UDP.
 - e.g. QUIC
- New transport protocols are used as transport protocol for existing applications.
 - e.g. HTTP over QUIC, DNS over DTLS, DNS over QUIC
- **The UDP layer does not have field to specify UDP-based transport protocols separately from the port number**
 - ip_proto=17(UDP) & port=443 => HTTP over QUIC ?
 - ip_proto=17(UDP) & port=853 => DNS over DTLS ?
 - ip_proto=17(UDP) & port=853 => DNS over QUIC ?



Protocol Number Option

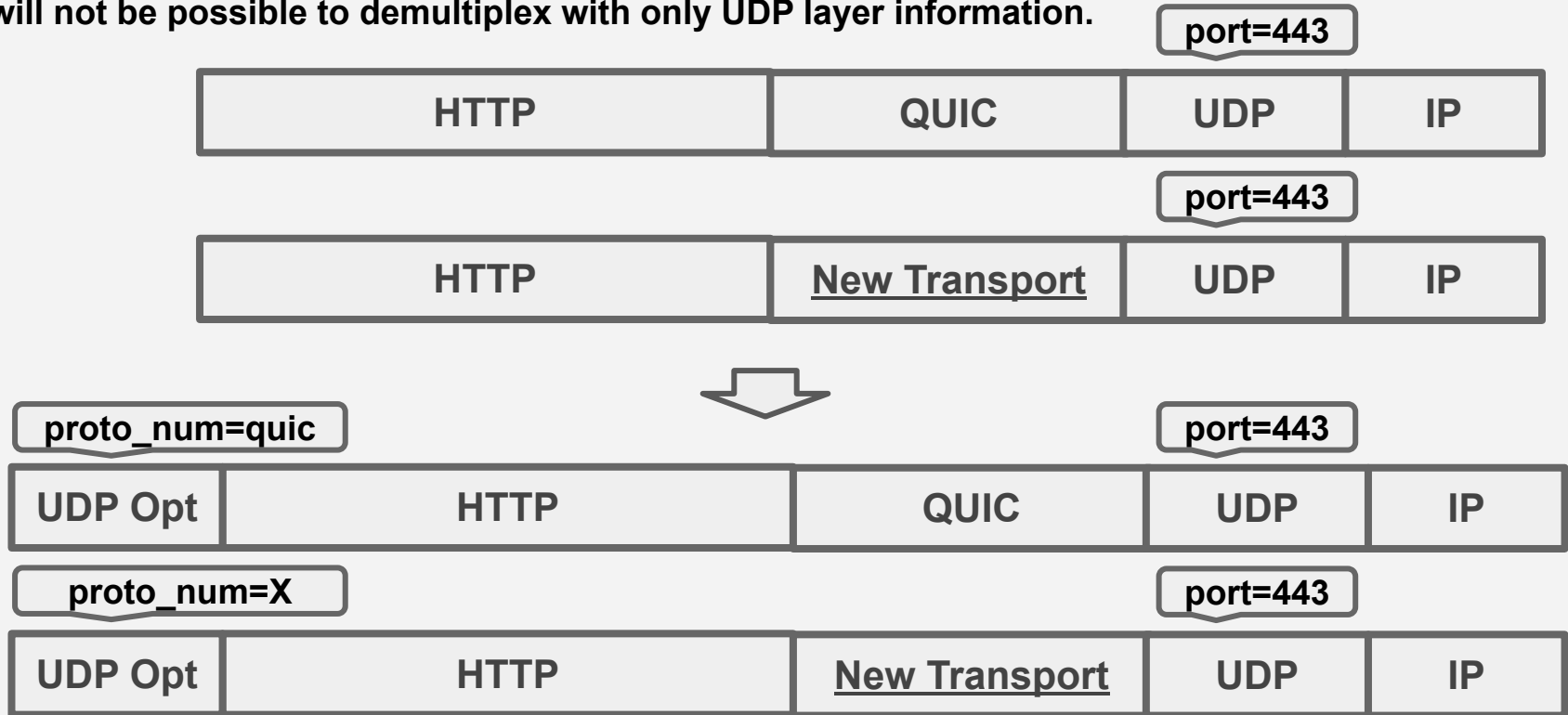
- Provide the UDP layer with information on the protocol type of the packet encapsulated
- Allow the transport endpoint to identify the protocol of the packet that UDP encapsulates
- **When using the UDP-based transport protocol, allow end hosts to identify the protocol**
 - ip_proto=17(UDP) & port=443 & **proto_num=quic** => HTTP over QUIC
 - ip_proto=17(UDP) & port=853 & **proto_num=dtls** => DNS over DTLS
 - ip_proto=17(UDP) & port=853 & **proto_num=quic** => DNS over QUIC



Use case

Use for demultiplexing transport protocols based on UDP

If a new transport protocol based on UDP is used as a transport for HTTP, it will not be possible to demultiplex with only UDP layer information.



Protocol numbers in the options area allow identification of transport layer protocols

Next Step - Discussion of details

Format of Protocol Number

- Integer format
 - Need numbers that can represent transport protocols based on UDP such as QUIC
 - There are several choices.
 - Create a new registry for protocol numbers
 - Allocate ip protocol type to transport protocol based on UDP.
- String format
 - May not fit the binary format UDP options.
 - The matter of what string to use exists just as when using integer format.

Thank you

Additional slides

Current DTLS and QUIC demultiplexing methods

Multiplexing Scheme Updates for QUIC [RFC 9443]

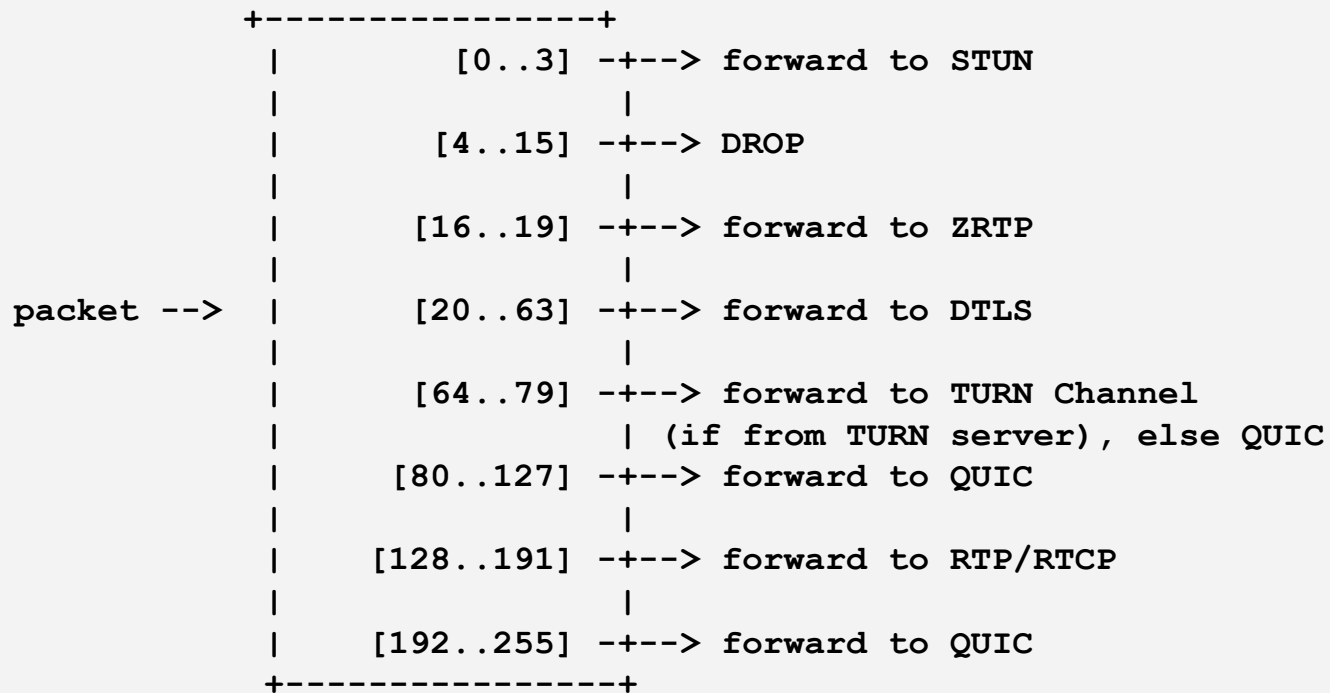
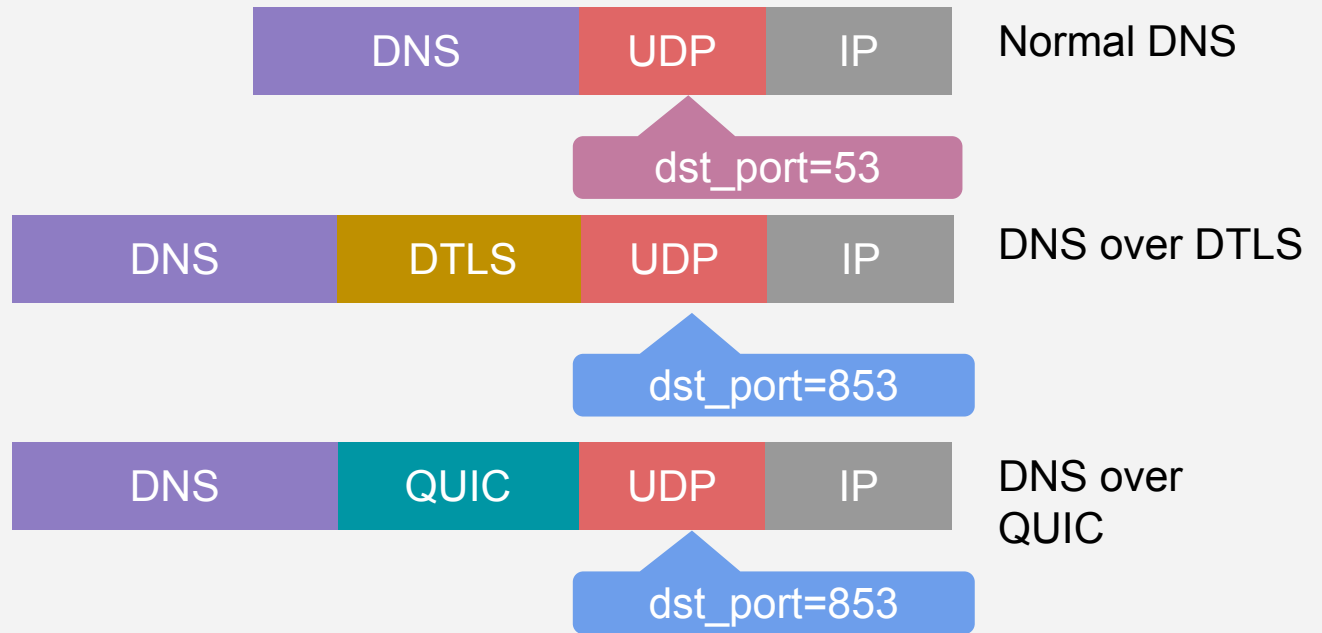


Figure 3: The receiver's packet demultiplexing algorithm.

Can be demultiplexed by the first byte of the payload

Use case



Next step?

- WG GitHub issue before WG adoption?
 - or on my GitHub repos?



dst_port=443



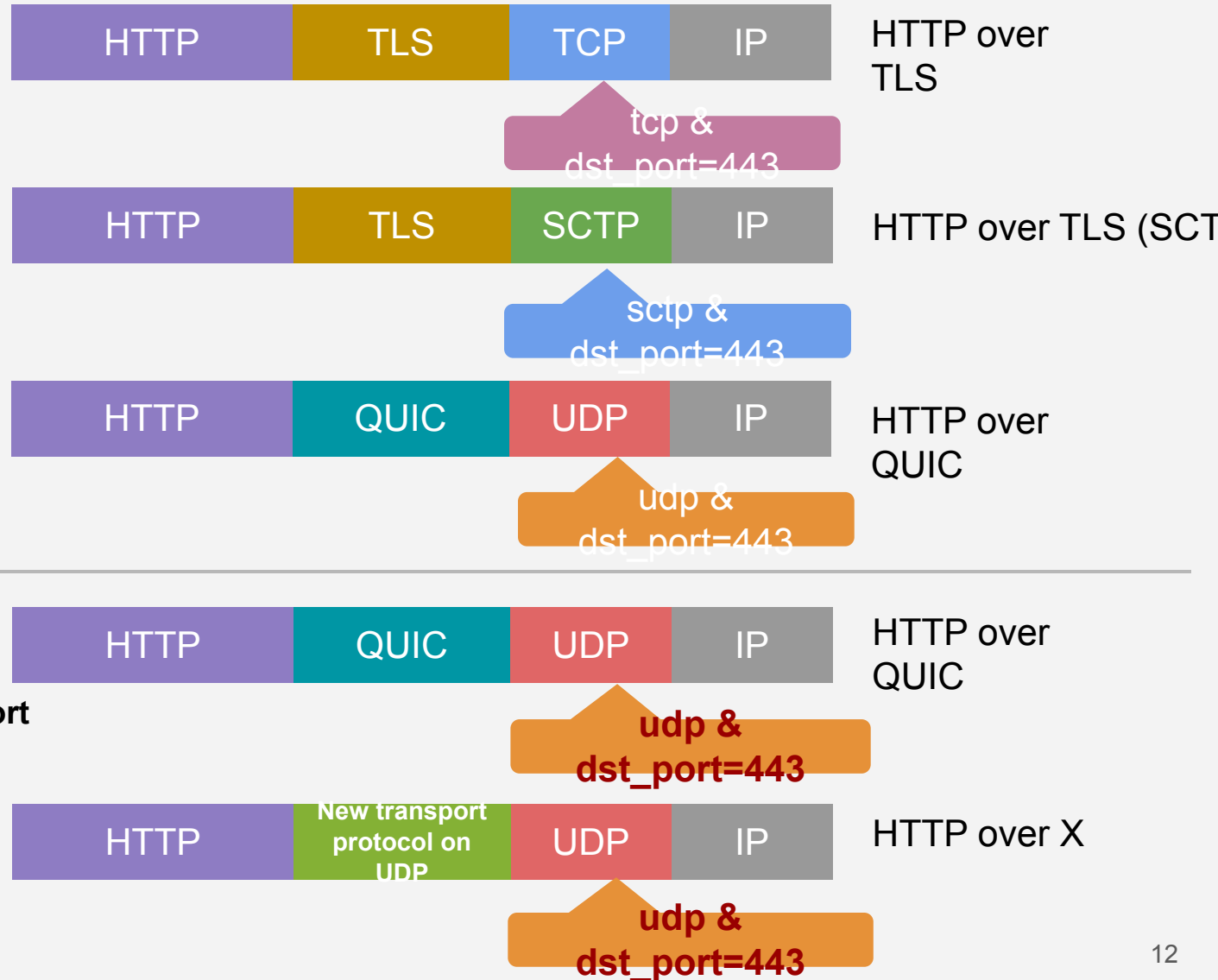
dst_port=443



port=443

proto=UDP

Problem when new UDP-based transport protocols are used



The next transport protocol can be indicated by proto_num

Unknown which transport protocol is being transmitted.

