DetNet
Data Plane Drafts
IP, MPLS and Sub-Nets (IP, MPLS)

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DetNet WG
Singapore, 21st November, 2019
Data plane documents

Status

- Building block approach

DetNet Data plane drafts

- draft-ietf-detnet-data-plane-framework-03
- draft-ietf-detnet-ip-03
- draft-ietf-detnet-mpls-03
- draft-ietf-detnet-ip-over-mpls-03
- draft-ietf-detnet-mpls-over-udp-ip-03
- draft-ietf-detnet-ip-over-tns-01
- draft-ietf-detnet-mpls-over-tns-01
- draft-ietf-detnet-tns-vpn-over-mpls-01

Data plane framework

DetNet IP/MPLS

DetNet over sub-net

TSN VPN over DetNet
DetNet Data Plane: IP
draft-ietf-detnet-ip-03

• Content
  • specifies the Deterministic Networking data plane when operating in an IP packet switched network.

• DetNet IP Data Plane
  • DetNet forwarding sub-layer only

• DetNet IP Data Plane Procedures
  • Flow identification: 6-tuple (5-tuple + DSCP)

• Management and Control Information Summary

Note: the DetNet IP data plane does not perform additional encapsulations but operates on the IP header fields already in place.
DetNet Data Plane: IP
Management and Control Information Summary

Set of information that is needed to identify individual and aggregated DetNet flows:

- IPv4 and IPv6 source address field.
- IPv4 and IPv6 source prefix length.
- IPv4 and IPv6 destination address field.
- IPv4 and IPv6 destination prefix length.
- IPv4 protocol field.
- IPv6 next header field.

- DSCP field in IPv4 Type of Service and IPv6 Traffic Class.
- DSCP list in IPv4 Type of Service and IPv6 Traffic Class.
- IPv6 flow label field.
- TCP and UDP Source Port. Exact and wildcard matching. Port ranges optional.
- TCP and UDP Destination Port. Exact and wildcard matching. Port ranges optional.
- IPsec Header SPI field. Exact matching is required.

ECN omitted

In order to maximize reuse of 5-tuple based mechanisms, DetNet aware applications and end systems SHOULD NOT mix DetNet and non-DetNet traffic within a single 5-tuple.
DetNet Data Plane: MPLS
draft-ietf-detnet-mpls-03

• Content
  • specifies the Deterministic Networking data plane when operating over an MPLS Packet Switched Networks.

• DetNet MPLS Data Plane
  • DetNet service sub-layer
  • DetNet forwarding sub-layer

• DetNet MPLS Data Plane Procedures
  • Flow identification: Labels
  • Sequence number: d-CW

• Management and Control Information Summary
DetNet Data Plane: MPLS
Management and Control Information Summary

Service Sub-Layer Information
- App-Flow identification information
- Sequence number length
- S-Label for the service
- PRF used or not
- Associated forwarding sub-layer information

Service sub-layer (for received traffic)
- Associated forwarding sub-layer information
- S-Label for the received service
- PEF or POF is to be provided
- Sequence number length

Service Aggregation
- S-Labels or F-Labels that are to be carried over each aggregated service
- A-Label associated with each aggregated service
- Other S-Label information summarized above

Forwarding Sub-Layer Information
- Outgoing F-Label stack
- Traffic parameters associated with a specific label in the stack
- Outgoing interface and next hop (for unicast traffic)
- Sub-network specific parameters

Forwarding sub-layer (for received)
- Incoming interface
- Incoming F-Label stack to be popped
- Incoming forwarding sub-layer flow

Note: Required information depends on the DetNet node type and the DetNet functions being provided.

ONLY some editorial changes.
DetNet Data Plane: IP over MPLS
draft-ietf-detnet-ip-over-mpls-03

• **Content**
  • specifies the Deterministic Networking data plane when operating in an IP over MPLS packet network.

• **IP over DetNet MPLS**
  • Data plane scenarios
  • Encapsulation

• **IP over DetNet MPLS Procedures**
  • Flow identification
  • Traffic treatment

• **Management and Control**

Information Summary

21/11/2019
DetNet Data Plane: IP over MPLS
Management and Control Information Summary

At the MPLS ingress node:

- Each MPLS App-Flow is identified using the IP flow identification information as defined in [I-D.ietf-detnet-ip]. Includes all wildcards, port ranges and ability to ignore specific IP fields.
- The DetNet MPLS service that is to be used to send the matching IP traffic. Includes both service and traffic delivery information.

At the MPLS egress node:

- S-Label values that are carrying MPLS over IP encapsulated traffic.
- For each S-Label, how the received traffic is to be handled.

ONLY some editorial changes.
DetNet Data Plane: MPLS over UDP/IP

draft-ietf-detnet-mpls-over-udp-ip-03

- Content
  - specifies the MPLS Deterministic Networking data plane operation and encapsulation over an IP network.

- DetNet MPLS over DetNet IP
- IP over DetNet MPLS Procedures
- Management and Control Information Summary

Figure 1: UDP/IP Encapsulation of DetNet MPLS
DetNet Data Plane: MPLS over UDP/IP
Management and Control Information Summary

Set of information that is needed to configure DetNet MPLS over UDP/IP

• Label information (S-label or F-label) to be mapped to UDP/IP flow.
• IPv4 and IPv6 source address field.
• IPv4 and IPv6 destination address field.
• IPv4 Type of Service and IPv6 Traffic Class Fields.
• UDP Source Port.
• UDP Destination Port.
Summary – Next Steps

• Shepherd review: DONE

• WG last call: FINISHED
  • Started: 28th October
  • Ended: 11th November

• Ready for submission to the IESG ...

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