DetNet
Data Plane Drafts

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DetNet WG
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Data plane documents

Status

• Building block approach
• Solution documents were split in data plane documents

DetNet Data plane drafts
- draft-ietf-detnet-data-plane-framework-01
- draft-ietf-detnet-ip-01
- draft-ietf-detnet-mpls-01
- draft-ietf-detnet-ip-over-mpls-01
- draft-ietf-detnet-mpls-over-udp-ip-01
- draft-ietf-detnet-ip-over-tsn-00
- draft-ietf-detnet-mpls-over-tsn-00
- draft-ietf-detnet-tsn-vpn-over-mpls-00

Note: 01 revisions focused on pre-last call cleanup, notably clarifying formal procedures and addition of "Management and Control Information Summary" sections.
DetNet Data Plane Framework

draft-ietf-detnet-data-plane-framework-01

• Content
  • provides an overall framework for the Deterministic Networking data plane.
  • covers concepts and considerations that are generally common to any Deterministic Networking data plane specification.

• DetNet Data Plane
  • Encapsulation
  • DetNet Specific Metadata
  • DetNet IP Data Plane
  • DetNet MPLS Data Plane
  • Service Protection, Aggregation, End-Systems, Sub-Network

• Controller Plane (Management and Control) Considerations
DetNet Data Plane: IP
draft-ietf-detnet-ip-01

• 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

• 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.
- IPv4 Type of Service and IPv6 Traffic Class Fields.
- IPv4 Type of Service and IPv6 Traffic Class Field Bitmask.
- 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.
DetNet Data Plane: MPLS
draft-ietf-detnet-mpls-01

- **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**

Note: zero or more F-labels
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.
DetNet Data Plane: IP over MPLS
draft-ietf-detnet-ip-over-mpls-01

• 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
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.
DetNet Data Plane: MPLS over UDP/IP

draft-ietf-detnet-mpls-over-udp-ip-01

• 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.
DetNet Data Plane: TSN related cases

• DetNet Data Plane: IP over IEEE 802.1 Time Sensitive Networking (TSN)
  draft-ietf-detnet-ip-over-tsn-00

• DetNet Data Plane: MPLS over IEEE 802.1 Time Sensitive Networking (TSN)
  draft-ietf-detnet-mpls-over-tsn-00

• DetNet Data Plane: IEEE 802.1 Time Sensitive Networking over MPLS
  draft-ietf-detnet-tns-vpn-over-mpls-00

• We have just created these drafts during split
• Further work needed, contributions are welcome
Summary – Next Steps

• WG last call on:

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<th>Ready for WG last call</th>
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• Further work needed on TSN related drafts
Thanks ...