

# Echo Request/Reply for DetNet Capability Discovery

draft-tan-detnet-cap-discovery-00

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# Agenda

- Requirements
- Alternative solutions
- Ping/Traceroute solution
- DetNet Echo Request/Reply extension
- DetNet Capability Discovery Objects
- Encapsulation of Data Plane
- Next steps

# Requirements

- As per [RFC8665], DetNet provides a capability to deliver data flows with extremely low packet loss rates and assured maximum end-to-end delivery latency. DetNet functionality is divided into forwarding and service sub-layers.
- As per [I-D.ietf-detnet-oam-framework]:
  - DetNet OAM MUST support the discovery of DetNet relay nodes in a DetNet network.
  - DetNet OAM MUST support the discovery of Packet Replication, Elimination, and Order preservation sub-functions locations in the domain.
  - DetNet OAM MUST support the collection of the DetNet service sub-layer specific (e.g., configuration/operation/status) information from DetNet relay nodes.

# Alternative solutions

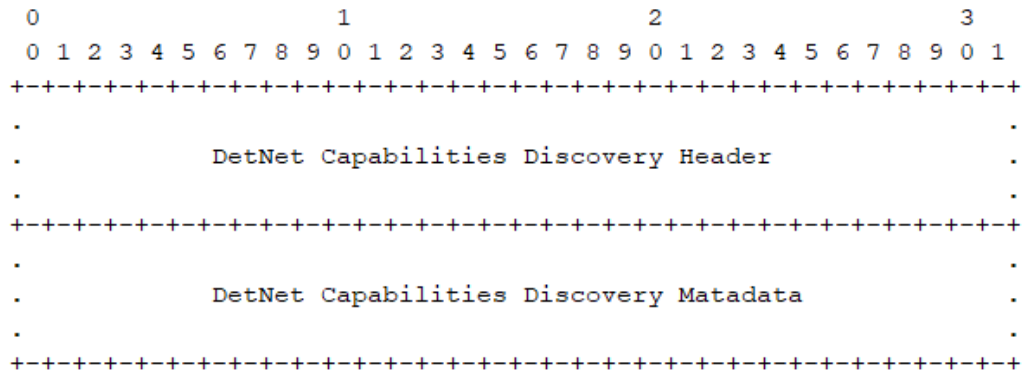
- Netconf/Yang
- IGP/BGP
- Ping/Traceroute
- .....

# Ping/Traceroute Solution

- As per [I.D.varga-detnet-service-sub-layer-oam], it introduces “DetNet PING” mechanism, and mentions that DetNet Echo Request/Reply packets could be used to discover DetNet capabilities of DetNet relay nodes, such as:
  - Identity of a DetNet service sub-layer node.
  - Discover Ingress/Egress flow-specific configuration of a DetNet service sub-layer node.
  - Detect the status of the flow-specific service sub-layer function.

# DetNet Echo Request/Reply Extension

- In our new draft, we introduce DetNet Capabilities Discovery Objects to deliver DetNet capabilities.
- In each DetNet Echo Request/Reply message used for DetNet capability discovery, **DetNet Capability Matadatas** are delivered by several kinds of DetNet Capabilities Discovery Objects defined in this new draft.
- These objects comprise of DetNet Capability Matadatas and an abstract object header which has the corresponding format depending on the specific type of DetNet data plane (e.g., MPLS/IP).
- The format of DetNet Capability Discovery Objects is shown as below.

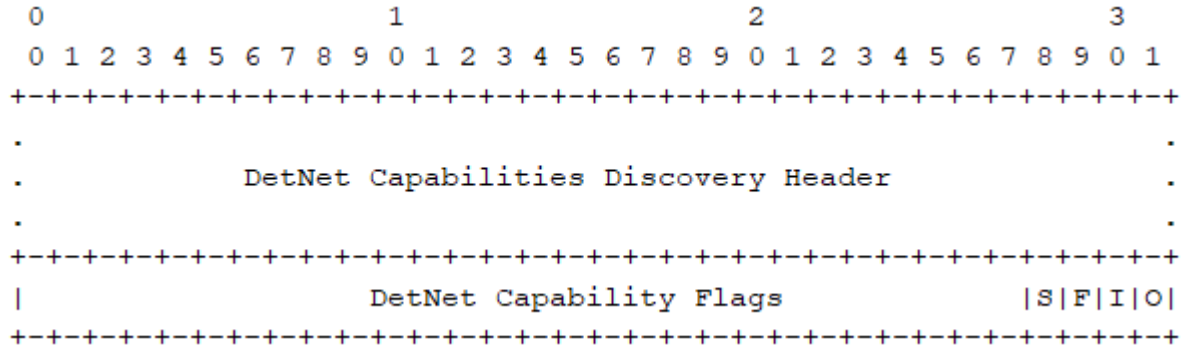


- DetNet Capability Object
- DetNet Relay Node Identifier Object
- DetNet Service Protection Function objects
- DetNet Service Flow Information Objects

DetNet Capabilities Discovery Header: abstract header, with varied length and format depending on the DetNet data plane type.

DetNet Capabilities Discovery Metadata: detailed information of DetNet capabilities, with varied length and format depending on the DetNet capability type.

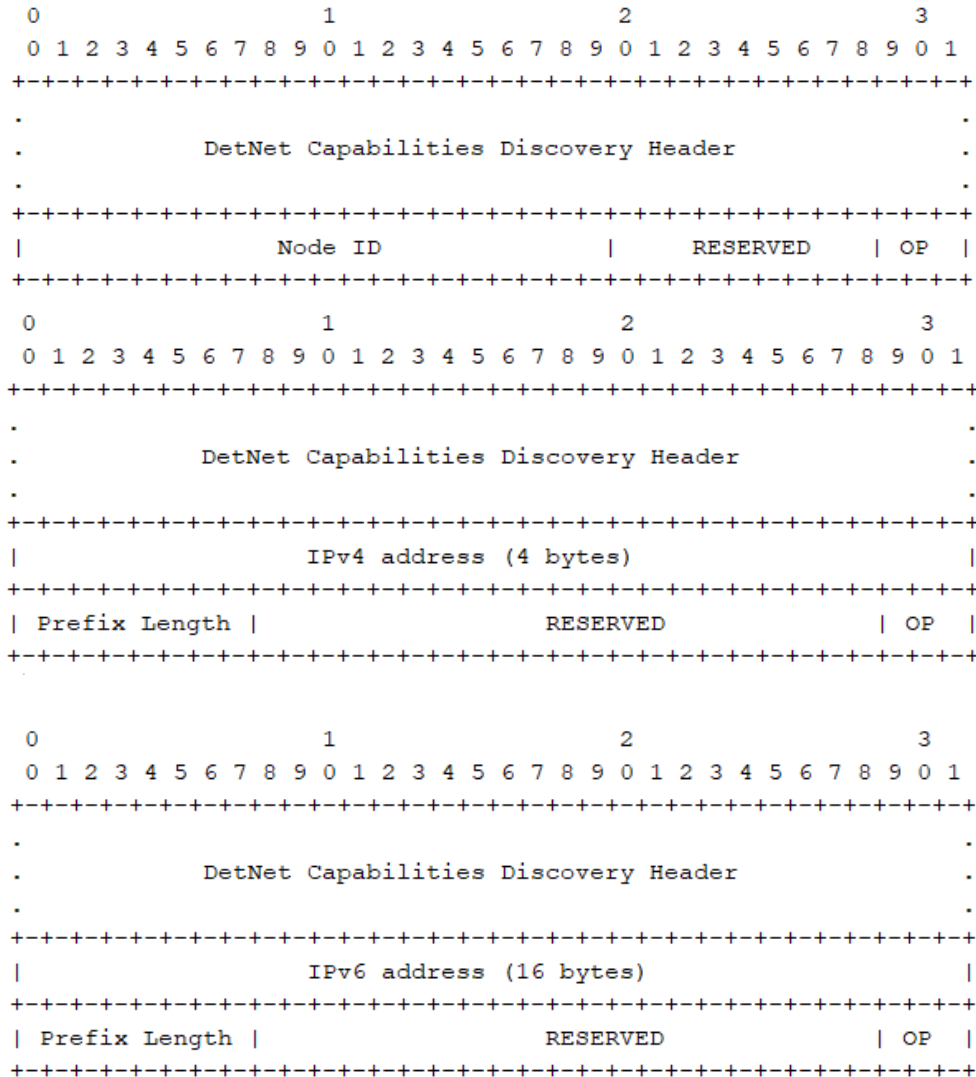
# DetNet Capability Object



Flags (4 bytes): DetNet Capability Flags

- S: Service sub-layer capability
- F: Forwarding sub-layer capability
- I: Incoming flow configuration
- O: Outgoing flow configuration

# DetNet Relay Node Identifier Object



- Node ID: DetNet node id (MPLS)
- IPv4 addr: DetNet node id (IPv4)
- IPv6 addr: DetNet node id (IPv6)
- OP: Service operation on node
  - 0x00: No operation of service
  - 0x01: Initiation of service
  - 0x02: Termination of service
  - 0x03: Relay (Swap) of service

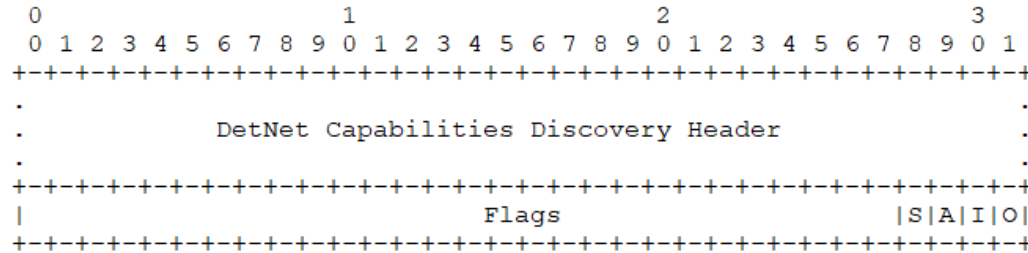






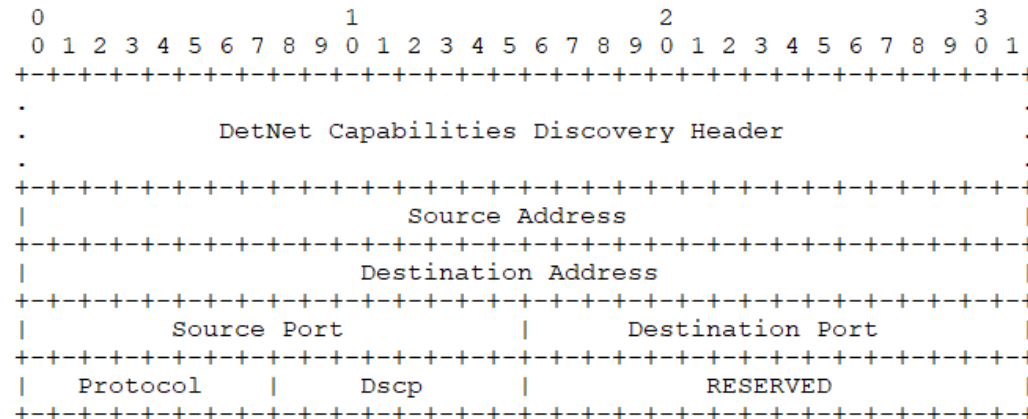
# DetNet Service Flow Information Objects (IPv4)

- DetNet Service Flow Information Object (IPv4)

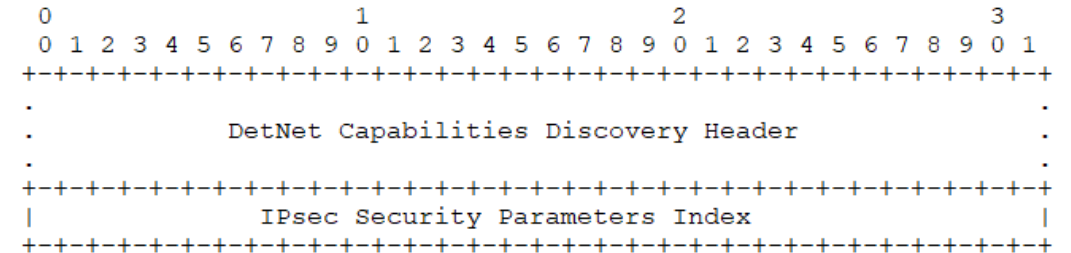


- Flags (4 bytes):
  - I: Incoming flow
  - O: Outgoing flow
  - A: IPv4 header identifier (6-tuple)
  - S: IPsec Security Parameters Index (IPSec-SPI)

- IPv4 Header Identifier Sub-Object



- IPSec-SPI Sub-Object







# Next Steps

- Aggregation configuration
- Forwarding sub-layer configuration
- Data plane specification: MPLS/IP
- Commits and suggestions are always welcome.

Thank you