

Requirements for Scaling Deterministic Network

draft-ietf-detnet-scaling-requirements-05

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Motivations and Status

Motivations

Aiming at scaling deterministic network with large variation in latency among hops, great number of flows and/or multiple domains without the same time source, this document describes the technical requirements including the data plane enhancement requirements when the different deterministic levels of applications co-exist and are transported.

Status

This document was updated from v04 to v05 according to the discussion around IETF118.

Add some text to enhance the explanation of requirements.

It's stable and close to the Last Call according to the milestone.

Main Updates(v04-v05)

- Section 3.7. Add the text related to consider end-to-end jitter bounds, achievable end-to-end latency bounds and complexity in evaluation and selection of scalable DetNet queuing mechanisms. (was provided by David and presented in IETF118)
- Section 3.8. Add some text about 'providing queuing solutions with multiple levels of deterministic capabilities' as queuing mechanisms development.
- Section 10. Change the references from 'Normative' to 'Informative'
- Correct minor spelling errors.

requirements for the diverse queuing mechanisms. For strict deterministic services, strict queuing technologies need to be used, and all network devices may need to be upgraded. For non-strict deterministic services, it may only be necessary to upgrade some network devices(maybe edge nodes) or share corresponding network resources.

Those different queuing technologies may be used in:

requirements for the diverse queuing mechanisms. For strict deterministic services, strict queuing technologies need to be used, and all network devices may need to be upgraded. For non-strict deterministic services, it may only be necessary to upgrade some network devices(maybe edge nodes) or share corresponding network resources. Moreover, as queuing mechanisms development, it is also desirable to provide the queuing solutions with multiple levels of deterministic capabilities and schedule the reasonable resources to achieve the optimization of network resource utilization. Those different queuing technologies may be used in:

<https://author-tools.ietf.org/iddiff?url1=draft-ietf-detnet-scaling-requirements-04&url2=draft-ietf-detnet-scaling-requirements-05&difftype=-html>

Overview of Technical Requirements

- Req 1. Tolerate Time Asynchrony
 - Support Asynchronous Clocks Across Domains
 - Tolerate Clock Jitter & Wander within a Clock Synchronous Domain
 - Provide Mechanisms not Requiring Strict Time Synchronization
 - Provide Mechanisms not Requiring Synchronization
- Req 2. Support Large Single-hop Propagation Latency
- Req 3. Accommodate the Higher Link Speed
- Req 4. Be Scalable to The Large Number of Flows and Tolerate High Utilization of Bandwidth
- Req 5. Tolerate Failures of Links or Nodes and TopologyChanges
- Req 6. Prevent Flow Fluctuation
- Req 7. Be Scalable to a Large Number of Hops with Complex Topology
- Req 8. Support Multi-Mechanisms in Single Domain and Multi-Domains
 - Support Provisioning of Multiple Mechanisms
 - Support Mechanisms Switchover Crossing Multi-domains

Next step

- Coordinate with the draft 'Dataplane Enhancement Taxonomy'.
- Hope more review before the LC.