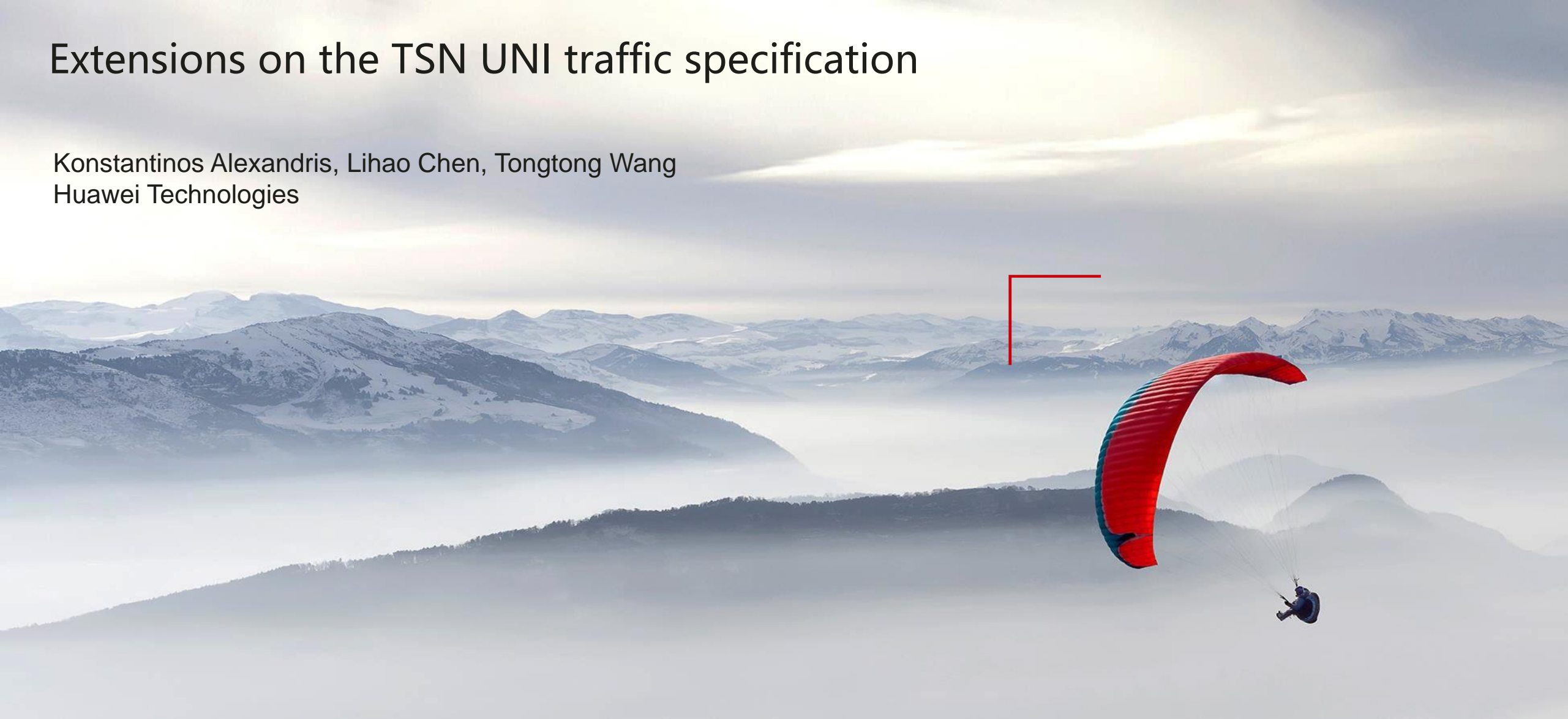


Extensions on the TSN UNI traffic specification

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Introduction - Background in IEEE Std 802.1Q-2022

IEEE Std 802.1Q-2022

46.2.3.5 TrafficSpecification

The TrafficSpecification group specifies how the Talker transmits frames for the Stream. This is effectively the Talker's promise to the network. The network uses this traffic specification to allocate resources and adjust queue parameters in Bridges.

The TrafficSpecification group consists of the following:

- a) Its required elements, listed in Table 46-8.

Table 46-8—TrafficSpecification elements

Name	Data type	Reference
Interval	rational	46.2.3.5.1
MaxFramesPerInterval	uint16	46.2.3.5.2
MaxFrameSize	uint16	46.2.3.5.3
TransmissionSelection	uint8	46.2.3.5.4

- b) An optional TSpecTimeAware group, whose elements are listed in Table 46-9.

Table 46-9—TSpecTimeAware elements

Name	Data type	Reference
EarliestTransmitOffset	uint32	46.2.3.5.5
LatestTransmitOffset	uint32	46.2.3.5.6
Jitter	uint32	46.2.3.5.7

IEEE Std 802.1Q-2022
IEEE Standard for Local and metropolitan area networks—Bridges and Bridged Networks

46.2 User/network configuration information

This subclause specifies the user/network configuration information that is used for the three TSN configuration models (46.1.3). The semantics for the TSN user/network configuration information is specified independent of schema, encoding, or protocol.

- We focus on the generic TSN UNI Tspec as defined in **Section 46.2.3.5 (IEEE Std 802.1Q-2022)**.
- **What about burst traffic ?** The supported parameters do not suffice in configuring relevant TSN shaping features.
- **Key elements:** Committed Information Rate (CIR), Committed Burst Size (CBS) & Max/Min Frame Length (see Token Bucket model in **Qcr [1]/Qdd [2]**).
- Upper bounds on burst traffic characteristics (i.e., arrival curves) and latency usually described in terms of those elements.
- **Gap:** No matter the **use case** and no matter the **configuration** model; the **burst traffic** model is not part of the current TSN UNI Tspec.

[1] <https://www.ieee802.org/1/files/public/docs2021/new-specht-onats-0921-v01.pdf>.

[2] <https://1.ieee802.org/tsn/802-1qdd/>.

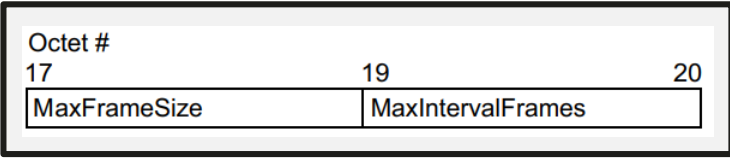
Traffic model - History & Dependencies

A TSpec does not have to be supported by any reservation protocol.

No dependencies

Reservation protocol specific

Added from Qat, revised and expanded by Qcc.



IEEE Std 802.1Qat: SRP/MSRP

Proposal 1: Added from Qdd.

	Octet	Length
MaxTransmittedFrameLength	1	2
MinTransmittedFrameLength	3	2
CommittedInformationRate	5	8
CommittedBurstSize	13	4

Figure 99-14—Value of Token Bucket TSpec sub-TLV

IEEE Std P802.1Qdd: RAP

Proposal 2: More traffic models to be studied and added to generic TSpec.

IEEE Std 802.1Q-2022: Generic TSpec (Traffic model)

46.2.3.5 TrafficSpecification

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Shaper parameters

A generic traffic model can be mapped to various shaper parameter configurations.

TimeAwareOffset placed for TAS configuration.

IEEE Std 802.1Qbv: TAS

CIR/CBS & Max/Min Frame Length fit well with ATS.

IEEE Std 802.1Qcr: ATS



Summary – Open discussion

- The parameters needed to characterize burst traffic requirements are missing in the generic TSN UNI Tspec (**Section 46.2.3.5, IEEE Std 802.1Q-2022**), i.e., irrespectively of the applied configuration model.
- **Main ingredients:** Committed Information Rate (CIR), Committed Burst Size (CBS) & Max/Min Frame Length (see Token Bucket model in **Qcr/Qdd**).
- **Proposal:** Specify a **new Tspec** (generic traffic models) on top of the **existing TSN UNI TSpec**.
- New project proposal in IEEE TSN TG ? How to proceed further after drawing conclusions?

Thank you.

