

# Time Sensitive Network (TSN)

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**Time Sensitive Network (TSN)** is the [Institute of Electrical and Electronics Engineers \(IEEE\)](#) 802.1Q defined standard technology to provide deterministic messaging on standard Ethernet. **TSN** technology is centrally managed and delivers guarantees of delivery and minimized [Jitter](#) using time scheduling for those [Real-Time Application \(RTA\)](#) that require determinism.

**TSN** is a [Open Systems Interconnection \(OSI\) Model Physical Layer](#) (i.e., **Layer 2**) technology. The IEEE 802.1Q standards work at OSI Layer 2. **TSN** is an [Ethernet](#) standard, not an [Internet Protocol \(IP\)](#) standard. The forwarding decisions made by the **TSN** bridges use the Ethernet header contents, not the [Internet Protocol Address \(IP Address\)](#). The payloads of the Ethernet frames can be anything and are not limited to Internet Protocol. This means that **TSN** can be used in any environment and can carry the payload of any [Industrial Application](#).

**TSN** was developed to enable deterministic communication on standard Ethernet. The market for deterministic communication is using nonstandard technologies or nonstandard Ethernet. Prior to the [IEEE 802.1 Working Group TSN](#), standard Ethernet didn't have pure [Layer 2](#) deterministic capability.

Deterministic communication is important to multiple industries (for example, aerospace, automotive, manufacturing, transportation, and utilities). Providing a means for determinism over standard Ethernet enables new levels of connectivity and optimization, leading to cost savings for many industries.

As the name suggests, "time" is the primary aspect of **TSN**. **TSN** is a technology focused on time. **TSN** was developed to provide a way to make sure information can travel from point **A** to point **B** in a fixed and predictable amount of time. Being predictable enables increased efficiency.

There's an implied requirement for those networking devices implementing **TSN** ([Endpoint](#) devices and [Bridges](#)) to share a common sense of time. [Precision Time Protocol \(PTP\)](#) is used to maintain a common sense of time. The PTP profiles chosen to work with **TSN** are [IEEE 802.1AS-2020 - Standard for Local and Metropolitan Area Networks--Timing and Synchronization for Time-Sensitive Applications](#).

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Last update: **2022/01/15 10:40**