

# **Global Time-Sensitive Networking (TSN) Market Size Study, by Component (Communication Interfaces, Connectors, Controllers and Processors, Hubs, Routers, and Gateways, Isolators and Converters, Memory, Power Supply Devices, Switches), by Function (Enhancements & Performance Improvements, Enhancements For Scheduled Traffic, Frame Pre-Emption, Frame Replication & Elimination For Reliability, Path Control & Reservation, Per-Stream Filtering & Policing), by Application (Aerospace, Automotive & Transportation, Industrial Automation, Oil & Gas, Power & Energy) and Regional Forecasts 2022-2032**

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## **Abstracts**

Global Time-Sensitive Networking (TSN) Market is valued at approximately USD 1.02 billion in 2023 and is anticipated to grow with a healthy growth rate of more than 48.82% over the forecast period 2024-2032. Time-Sensitive Networking (TSN) is an IEEE 802 Ethernet sub-standard designed to enhance the reliability, timing, and synchronization of data transmission over Ethernet networks. By incorporating time synchronization, traffic scheduling, and resource reservation mechanisms, TSN ensures deterministic communication crucial for applications such as industrial automation, automotive networking, and audio/video streaming. The rapid increase in data traffic and the necessity for deterministic communication in industrial automation drive the demand for TSN. As the Industrial Internet of Things (IIoT) becomes more prevalent, TSN's

capability to ensure timely data delivery becomes vital. Nevertheless, issues related to security breaches and the complexity of deployment pose challenges to the widespread adoption of TSN. Companies are developing scalable TSN solutions that integrate easily with existing network infrastructures and are interoperable across diverse applications and industries. Emerging technologies and increased digitalization provide significant potential for TSN market expansion, with smart manufacturing, autonomous systems, and smart city initiatives presenting new opportunities for manufacturers and operators. Additionally, the push towards Industry 4.0 and regulatory support and standardization significantly boost the market prospects.

In the rapidly evolving TSN landscape, various components ensure the precise timing and synchronization needed for real-time communication across diverse applications. Communication interfaces like Ethernet ports facilitate the flow of time-sensitive data, while connectors ensure robust physical links. Controllers and processors efficiently manage and direct data traffic, and hubs, routers, and gateways extend the network's reach and versatility. Isolators and converters enhance signal integrity and compatibility between disparate systems, and memory components are crucial for buffering and handling data payloads effectively. Power supply devices ensure a stable and reliable energy source for network equipment, and TSN-specific switches enable precise control and prioritization of data packets, ensuring that time-sensitive information is transmitted with minimal latency.

TSN plays a pivotal role in enhancing the communication infrastructure of aerospace systems, enabling real-time control and synchronization of avionics systems and improving navigation, safety, and in-flight entertainment experiences. In the automotive sector, TSN advances vehicle-to-everything (V2X) communications, supporting autonomous driving technologies by ensuring timely and reliable information exchange among vehicles, infrastructure, and pedestrians, thereby enhancing road safety and traffic efficiency. TSN's precise timing and low-latency communication are essential for industrial automation, enabling seamless integration of machines and devices across complex manufacturing processes, facilitating operational efficiency, real-time monitoring, and predictive maintenance, driving productivity, and reducing downtime. In the oil and gas industry, TSN enables robust and secure data communication networks, ensuring precise monitoring and control of exploration, drilling, and production operations, enhancing safety, reducing operational costs, and improving environmental compliance. TSN enhances smart grid applications' reliability and efficiency by enabling synchronized communication across diverse devices and systems, supporting advanced metering infrastructure, distribution automation, and integration of renewable energy sources, contributing to sustainable and resilient power systems.

The key regions considered for the global Time-Sensitive Networking (TSN) Market study include Asia Pacific, North America, Europe, Latin America, and Rest of the World. North America is a dominating region in the Time-Sensitive Networking (TSN) Market in terms of revenue. The market growth in the region is being attributed to factors including an increase in demand for integrating TSN technology within the transportation, automotive, and industrial automation sectors. Improving operational effectiveness and meeting the need for real-time networking are contributing to the market demand across the region. Whereas, the market in Asia Pacific is anticipated to grow at the fastest rate over the forecast period fueled by government initiatives and investments in smart technologies.

Major market players included in this report are:

ABB Limited

Advanced Micro Devices, Inc.

Advantech Co., Ltd.

Analog Devices, Inc.

Belden Inc.

Bosch Rexroth AG Robert Bosch GmbH

Broadcom Inc.

Calnex Solutions PLC

Cisco Systems, Inc.

General Electric Company

HMS Networks

Intel Corporation

Keysight Technologies

Marvell Technology, Inc.

Microchip Technology Inc.

The detailed segments and sub-segments of the market are explained below:

By Component:

Communication Interfaces

Connectors

Controllers and Processors

Hubs, Routers, and Gateways

Isolators and Converters

Memory

Power Supply Devices

Switches

By Function:

Enhancements & Performance Improvements

Enhancements For Scheduled Traffic

Frame Pre-Emption

Frame Replication & Elimination For Reliability

Path Control & Reservation

Per-Stream Filtering & Policing

## By Application:

Aerospace

Automotive & Transportation

Industrial Automation

Oil & Gas

Power & Energy

## By Region:

North America

U.S.

Canada

Europe

UK

Germany

France

Spain

Italy

ROE

## Asia Pacific

China

India

Japan

Australia

South Korea

RoAPAC

## Latin America

Brazil

Mexico

RoLA

## Middle East & Africa

Saudi Arabia

South Africa

RoMEA

Years considered for the study are as follows:

Historical year – 2022

Base year – 2023

Forecast period – 2024 to 2032

**Key Takeaways:**

Market Estimates & Forecast for 10 years from 2022 to 2032.

Annualized revenues and regional level analysis for each market segment.

Detailed analysis of geographical landscape with Country level analysis of major regions.

Competitive landscape with information on major players in the market.

Analysis of key business strategies and recommendations on future market approach.

Analysis of competitive structure of the market.

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