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Supply chain interoperability and integration —

Part 1: Overview and principles of the industrial internet

Interopérabilité et intégration dans la chaîne d'approvisionnement —

Partie 1: Vue d'ensemble et principes de l'Internet industriel

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This document was prepared by Technical Committee ISO/TC 184, *Automation systems and integration*, Subcommittee SC 5, *Interoperability, integration, and architectures for enterprise systems and automation applications*.

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Introduction

Supply chain data is the data that must be shared between potential or existing trading entities to support the acquisition, transfer, storage, maintenance and eventual disposal of goods or services.

Fundamental to this document is the understanding that data is the tangible form of information. For data to reliably transfer information between systems the data must be portable and unambiguous; this is the goal of the ISO 8000 series, consisting of international standards for data quality.

The ISO 8000 series achieves data portability and unambiguity through including provenance as well as concept encoding, a process where metadata and reference data are represented by a language independent concept identifier from a concept dictionary that contains the terminology (terms, definitions, symbols or images) used to provide the unambiguous meaning of the concept.

Also fundamental is the understanding that no two objects can occupy the same place at the same time and it follows that all objects can be uniquely identified and differentiated from all other objects by their time and place of origin. Finally, identifiers are a critical component of supply chain communication. An identifier is a string of characters created by an organization to reference a dataset, the characteristic data that describes the object identified.

Critical to supply chain interoperability and integration is trust. Trust requires the positive and verifiable identification of the trading entities and an understanding of their authority. Anonymity is not acceptable in supply chain data exchanges. In addition to the identification of the trading entities (who), the identification and description of the products and services subject to contract (what), as well as the locations (where) and the time (when) of associated events are necessary to create the industrial internet, a secure and efficient environment for the verification of supply chain data.

The industrial internet is above all else a trusted business-to-business (B2B) platform for commercial users. It is designed to allow interoperability of supply chain data and integration of supply chain systems between known and trusted parties as legal entities. To do this, the industrial internet overcomes both anonymity and impersonation. The industrial internet relies on verifiable legal identity to overcome anonymity and protection from impersonation through callback security.

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The industrial internet uses a prefix name server (PNS), which is an ISO 8000-115 compliant register of prefixes with globally unique prefix records that contain the legal owner of any identifier with that prefix and contains an electronic address to resolve the identifier to the dataset it represents as well as any use restrictions. The PNS used in the industrial internet is an enhanced version of the domain name server (DNS), that supports callback security, one of the earliest forms of secure communication and the backbone of two-factor authentication. For example, if an account holder receives a call stating that a bank or credit account is compromised, and the caller requests verification of account information, the appropriate response is to end the call. The account holder should then promptly call the financial service provider using a verified number (not one provided by the caller). This method is known as callback security. Callback security is simple, low cost and very effective.

This document describes the principles of supply chain interoperability and integration and introduces the supply chain data formatting contract clause which supports the creation and verification of quality portable data that underpins the industrial internet. This document includes an overview of the structure of the ISO 25500 series. Each document in this series defines the data required to perform specific supply chain functions and how this data can be verified.

Annex A contains an identifier that conforms to ISO/IEC 8824-1. The identifier unambiguously identifies this document in an open information system.

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