

Recommendation

ITU-T Y.4224 (11/2023)

SERIES Y: Global information infrastructure, Internet protocol aspects, next-generation networks, Internet of Things and smart cities

Internet of things and smart cities and communities –
Requirements and use cases

Requirements for digital twin federation in smart cities and communities

ITU-T Y-SERIES RECOMMENDATIONS

Global information infrastructure, Internet protocol aspects, next-generation networks, Internet of Things and smart cities

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Recommendation ITU-T Y.4224

Requirements for digital twin federation in smart cities and communities

Summary

A digital twin is the digital representation of an object of interest with data connections that enable convergence between the physical and digital states at an appropriate rate of synchronization. Also, a digital twin has the capabilities of connection, integration, analysis, simulation, visualization, optimization and provides an integrated view throughout the life-cycle of the objects of interest. The digital twin can provide real-time monitoring and proactive control, predictive maintenance by data analytics, cost and downtime reduction, and so on. Due to these benefits, various industries have adopted the digital twin technology.

The smart cities and communities may have many kinds of cross domain problems, such as manufacturing, transportation, energy and safety, and it is difficult to resolve these problems by individual digital twins. To solve them, the digital twins in various domains can be federated.

The federated digital twins collect and analyse the information from various domains, provide the solution for the problems, and simulate the effects. For this, some components and functions are needed to support for digital twin federation. First, registration of information for each digital twin is performed. And the discovery, connection, and utilization for the adequate digital twins are carried out for digital twin federation.

Recommendation ITU-T Y.4224 defines the requirements for digital twin federation.

History *

Edition	Recommendation	Approval	Study Group	Unique ID
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Keywords

Digital transformation, digital twin, federation, object of interest, observable object, smart sustainable cities and communities.

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