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# Intelligent transport systems — Using web services (machine-machine delivery) for ITS service delivery —

## Part 1: Realization of interoperable web services

*Utilisation des services du Web (livraison de machine à machine) pour la livraison de services ITS —*

*Partie 1: Réalisation des services du Web interopérables*



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## Foreword

ISO (the International Organization for Standardization) is a worldwide federation of national standards bodies (ISO member bodies). The work of preparing International Standards is normally carried out through ISO technical committees. Each member body interested in a subject for which a technical committee has been established has the right to be represented on that committee. International organizations, governmental and non-governmental, in liaison with ISO, also take part in the work. ISO collaborates closely with the International Electrotechnical Commission (IEC) on all matters of electrotechnical standardization.

The procedures used to develop this document and those intended for its further maintenance are described in the ISO/IEC Directives, Part 1. In particular the different approval criteria needed for the different types of ISO documents should be noted. This document was drafted in accordance with the editorial rules of the ISO/IEC Directives, Part 2 (see [www.iso.org/directives](http://www.iso.org/directives)).

Attention is drawn to the possibility that some of the elements of this document may be the subject of patent rights. ISO shall not be held responsible for identifying any or all such patent rights. Details of any patent rights identified during the development of the document will be in the Introduction and/or on the ISO list of patent declarations received (see [www.iso.org/patents](http://www.iso.org/patents)).

Any trade name used in this document is information given for the convenience of users and does not constitute an endorsement.

For an explanation on the voluntary nature of standards, the meaning of ISO specific terms and expressions related to conformity assessment, as well as information about ISO's adherence to the World Trade Organization (WTO) principles in the Technical Barriers to Trade (TBT) see the following URL: [www.iso.org/iso/foreword.html](http://www.iso.org/iso/foreword.html).

This document was prepared by ISO/TC 204, *Intelligent transport systems*.

This second edition cancels and replaces the first edition (ISO 24097-1:2009), which has been technically revised.

A list of all the parts in the ISO 24097- series, can be found on the ISO website.

## Introduction

ITS services have been evolving from single functional and limited area specific services, to a broad range of services in which many systems co-operate to provide effective and efficient service provision across a wide area. Today, ITS services are required to communicate not just with other parts of the same ITS service, but between different ITS services, and even with non-ITS services or a user's system directly, e.g. traffic management systems, route guidance systems, homeland security systems, environment protection systems, private freight management systems, etc.

These systems (even those limited to ITS services) are usually deployed in a heterogeneous environment that may use different hardware, operating systems (OS), middleware, and/or development languages. This creates a challenge to realize system coordination across the organizations in a way that is flexible and quick, at a reasonable cost. Web services (WS) are a recent methodology that overcomes these difficulties. Using web service technology for ITS services can significantly simplify and reduce the cost of internet based service provision, which may well affect the speed at which ITS services are deployed.

The World Wide Web Consortium (W3C) defines web services as follows:

“A web service is a software system designed to support interoperable machine-to-machine interaction over a network. It has an interface described in a machine-processable format (specifically WSDL (Web Services Description Language)). Other systems interact with the web service in a manner prescribed by its description using SOAP-messages, typically conveyed using HTTP with an XML serialization in conjunction with other web-related standards.”

Web services require significant functionality, and as a result, an architecture is indispensable. Web service standardization organizations construct standards by SOA. SOA is the evolutionary form of distributed computing and object orientation.

By applying SOA-based standards to the ITS services, the following benefits are expected.

From a business viewpoint:

- Increased service value;
- Internationalization; and
- Expansion towards business automation.

From a system development viewpoint:

- Easy and quick development of ITS service coordination and service area expansion;
- More efficient service development (web services enable system developers to focus on the “what” rather than the “how.” “How” is covered by a set of standard base tools. This enables quick and easy system software development;
- More reusable software because web service standards have a composable structure, and
- Easier connections to legacy systems.

In the ITS sector, a significant number of messages have been or are being developed (and in some cases standardized). Message standardization is intended to improve system coordination, interoperability and re-use, so the conditions for web services are already considered mature. In addition, the use of web services will increase the flexibility of ITS services to interoperate and communicate beyond the ITS sector and in areas where the delineation between ITS services and general commercial services converge.

From the perspective of web services standards evolution, 2007 was an epoch-making year. WSDL 2.0 became the W3C recommendation. Correspondingly, relevant web service specifications were standardized by open standards bodies (W3C and OASIS). These standards cover all functional layers. By using these standards, the ITS sector has a rigid base for interoperable web services.

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ITS service collaboration with other sectors is expected to increase mutual effectiveness. Economic globalization also requires communication across the country, often across the world. All of these collaborations rely on interoperability of services. Interoperability is only achieved based on open international standards.

Web services were developed to use distributed network resources in an interoperable way. However, to realize interoperable web services various capabilities are required.

Using web services (machine-machine delivery) for ITS service delivery has been developed considering these circumstances. ISO 24097 consists of two parts: ISO 24097-1 and ISO/TR 24097-2.

This document focuses on a way to realize interoperable ITS web services. ISO/TR 24097-2 will be an example-based document which will show how to realize interoperable web services.