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Enterprise-control system integration – Part 6: Messaging Service Model

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FOREWORD

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IEC PAS 62264-6 has been processed by subcommittee 65E: Devices and integration in enterprise systems, of IEC technical committee 65: Industrial-process measurement, control and automation.

The text of this PAS is based on the following document:	This PAS was approved for publication by the P-members of the committee concerned as indicated in the following document
Draft PAS	**Report on voting**
65E/476/PAS	65E/502/RVD

Following publication of this PAS, which is a pre-standard publication, the technical committee or subcommittee concerned may transform it into an International Standard.

This PAS shall remain valid for an initial maximum period of 3 years starting from the publication date. The validity may be extended for a single period up to a maximum of 3 years, at the end of which it shall be published as another type of normative document, or shall be withdrawn.

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INTRODUCTION

This PAS is based on the use of ISA-95 object models defined in ISA-95 Parts 2, 4 and 5 (Parts 1 and 3 do not contain object models) to define a set of services that may be used to exchange information messages. It is recognized that other, non-Part 6 sets of services are possible and are not deemed invalid as a result of this PAS. This PAS defines a Messaging Service Model (MSM) for exchanging data exchange messages in a publish/subscribe mode and a request/response mode. It defines a minimal interface subset to message exchange systems.

The Messaging Service Model provides a method for applications to send and receive messages from MSM service providers without regard to the underlying communication mechanism, as part of a complete application-to-application communication protocol.

This PAS defines a set of services definitions that are designed to provide the functionality needed for a vendor-independent method for sending and receiving data exchange messages on a message exchange system, such as an Enterprise Service Bus (ESB).

The knowledge requirements to interface to just one message exchange system can be immense, and are usually not transferable to a different system. MSM defines a single interface, independent of the underlying services, for Level 3-3 and Level 4-3 communications. This removes the need for vendors to build custom interface after custom interface, and for end users to get locked into a single vendor because their investment prevents them from reusing any of the integration efforts.

Enterprise-control system integration involves multiple different steps to exchange data between different computer system applications, as shown in Figure 1.

a) The applications usually have different internal representations of exchanged objects in their own local data stores. This representation is usually converted from the local format to a commonly accepted global format. The ISA-95 Part 2 standard defines representations of a global format for Level 4-3 data exchanges. The Part 4 standard defines representations of a global format for Level 3-3 data exchanges. This conversion, from local to global and global to local, is usually performed twice for any two-way communications.

   EXAMPLE 1 Assume two applications, ALPHA and BETA: the ALPHA application initiates a data exchange with the BETA application, and BETA responds back to ALPHA. The format conversions are: ALPHA's local format to global format for the request data, global format to BETA's local format for the request data, BETA's local format to global format for the response data, and global format to ALPHA's format for the response data.

b) Conversion is performed to align the namespaces among the exchanging applications, and is usually performed four times for any two-way communications.

   EXAMPLE 2 Names for elements of data may be codes, tag names, or equipment identifiers.

   EXAMPLE 3 Data which are represented in one element namespace, such as codes 1,2,3,4, may have a different namespace in another application, such as codes Ok, Done, Error, Delay.

c) Once information is in the global format with appropriate global names, the exchanged information is sent from one application to another application.

d) Messages are transported from one application to another, either within the same computer environment or across computers. Transport mechanisms are defined in other standards, such as TCP/IP and Ethernet standards.

e) When data exchange information is received, there are specific rules that define what resultant data are to be returned. The transaction rules are defined in the ISA-95 Part 5 standard.

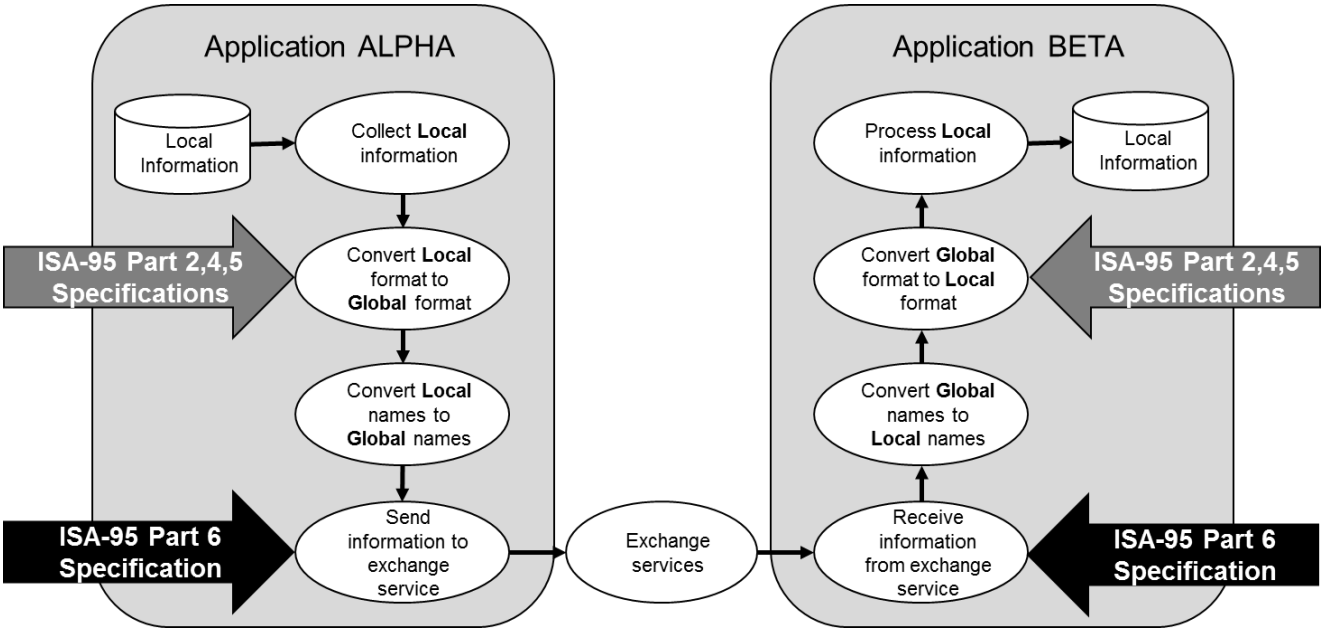

Figure 1 – Steps in application-to-application communication

ENTERPRISE-CONTROL SYSTEM INTEGRATION –

Part 6: Messaging Service Model

1 Scope

This part of IEC 62264, which is a PAS, defines a model of a set of messaging services for information exchanges across Levels 3 and 4, and within Level 3, between applications performing business and manufacturing activities. It defines a standard interface for information exchange between systems.

2 Normative references

The following documents are referred to in the text in such a way that some or all of their content constitutes requirements of this document. For dated references, only the edition cited applies. For undated references, the latest edition of the referenced document (including any amendments) applies.

ANSI/ISA-95.00.01-2010 (IEC 62264-1 Mod), *Enterprise-Control System Integration – Part 1: Models and Terminology*

ANSI/ISA-95.00.02-2010 (IEC 62264-2 Mod), *Enterprise-Control System Integration – Part 2: Object Model Attributes*

ANSI/ISA-95.00.04-2012, *Enterprise-Control System Integration – Part 4: Objects and Attributes for Manufacturing Operations Management Integration*

ANSI/ISA-95.00.05-2013, *Enterprise-Control System Integration – Part 5: Business-to-Manufacturing Transactions*