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Ships and marine technology — Guidelines for implementation of a fleet management system network

AMENDMENT 1: Annex A

Navires et technologie maritime — Lignes directrices pour la mise en œuvre d'un système de management d'une flotte par réseau

AMENDEMENT 1: Annexe A

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Foreword

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Introduction

Annex A indicates an example of the specifications for the design of the software of the Application Program Interface (API) when it is applied to the SITP and the LITP, as required by the main text of ISO 15849 (Guidelines for the Fleet Management System Network, FMSN) to secure the effective execution of the mutual connectivity with transparency.

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AMENDMENT 1: Annex A

Annex A
(informative)

Example of specifications for the design of the software of the Application Program Interface (API) when it is applied to the SITP and LITP

A.1 Scope

The scope of this Annex is the software design guide for the purpose of applying the API for the functions of the SITP and the LITP that are specified in the main text of ISO 15849.

In this Annex, the concept is based on the use of CORBA (A.2.3) as the specification of a distributed object for a model.

A.2 Terms and definitions

For the purposes of this Annex, the following terms and definitions apply.

A.2.1
acquire data list
operation of acquiring the data list from the database, on the specified server

A.2.2
acquire ship information
polling operation from the specified server

A.2.3
CORBA
Common Object Request Broker Architecture
standard of distributed object model as defined by the Object Management Group

A.2.4
database server
station which became independent of the LITP-installed system and the SITP-installed system, when a database is arranged on this station

A.2.5
IDL
Interface Definition Language

language to define interface in each operation

NOTE CORBA's primary tool to insulate language.

A.2.6
IDL skeleton
when CORBA is used and the client and server communicate, a program (as a part of API) on the server side to provide an application program to start the operation directly

A.2.7
IDL stub
when CORBA is used and the client and server communicate, the client program that accesses the operation on the server side provided with the corresponding pseudo-object (as a part of API) on the client side

A.2.8
naming service
common reference service provided by CORBA

NOTE The naming service responds to the inquiry from the object, relating the name of the object to its location in the network.

A.2.9
naming service interface
program, which executes the API request from the user application, in the series of processes when a naming service is used

A.2.10
OMG
Object Management Group
international standardization group which prescribes technology for the infrastructure which is necessary for the development of the application in the environment of the dispersion of object oriented architecture and independent of the hardware

A.2.11
ORB
Object Request Broker
software which provides the tasks of communication between stub and skeleton

A.2.12
read data
operation of reading one particular datum from the database, on the specified server

A.2.13
user application
program, which is established by the user of the FMSN in accordance with the requirement by the LITP-installed system to realize the functionality on the FMSN

NOTE The functionality on the FMSN serves to acquire the operational management information and/or the ship management information.

A.2.14
user-application interface
interface in the API opened between the API and user application

NOTE This also defines four kinds of operation (Read data, Write data, Acquire data list and Acquire ship information) as described in the A.4.1.2 to A.4.3.2.

A.2.15
write data
operation of writing one particular datum to the database, on the specified server

A.3 Objectives

See 7.2 “Overview of APIs” in the main text.

For design of the software of the API, the following objectives should be considered:

a) make the system platform transparent to the programming language and development environment of the application;

b) provide links to external operating system;

c) provide links to external networks;

d) provide transparency to distributed objects;

e) provide an easy interface between the user application and the API;

f) provide a data structure of the information that is used for the communication between an application and the API, using a common method of data exchange.

A.4 Software configuration

A.4.1 LITP

A.4.1.1 Illustration

The LITP software configuration is schematically shown in Figure A.1, surrounded by a dotted line.

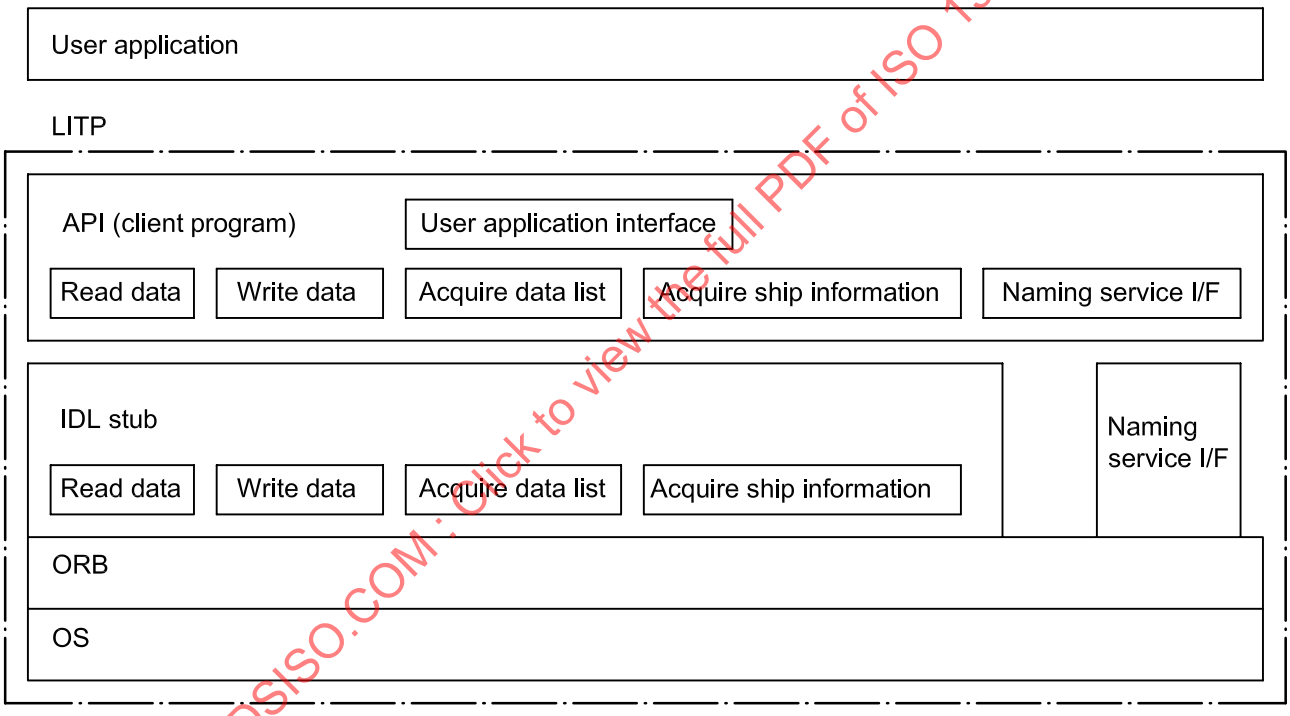

Figure A.1 — Example of construction of software of the LITP-installed system

A.4.1.2 API software block

— User application interface

A requirement from the user application invokes the operation.

— Read data

Invokes a program for accesses for the read data operation in the IDL stub block.

— Write data

Invokes a program for accesses for the write data operation in the IDL stub block.

— Acquire data list

Invokes a program for accesses for the acquire data list operation in the IDL stub block.

— Acquire ship information

Invokes a program for accesses for the acquire ship information operation in the IDL stub block.

— Naming service interface

Naming service provided by ORB is invoked and Object reference of the server is assigned.

A.4.1.3 IDL stub block

— Read data

It requests the invocation of an operation program for the read data on the server (SITP-installed system) to the ORB.

— Write data

It requests the invocation of an operation program for the write data on the server (SITP-installed system) to the ORB.

— Acquire data list

It requests the invocation of an operation program for the acquire data list on the server (SITP-installed system) to the ORB.

— Acquire ship information

It requests the invocation of an operation program for the acquire ship information on the server (SITP-installed system) to the ORB.

A.4.1.4 Naming service

It acquires the Object reference for the server (SITP-installed system or on the network of one's station).

A.4.2 SITP

A.4.2.1 Illustration

The SITP software configuration is schematically shown in Figure A.2.

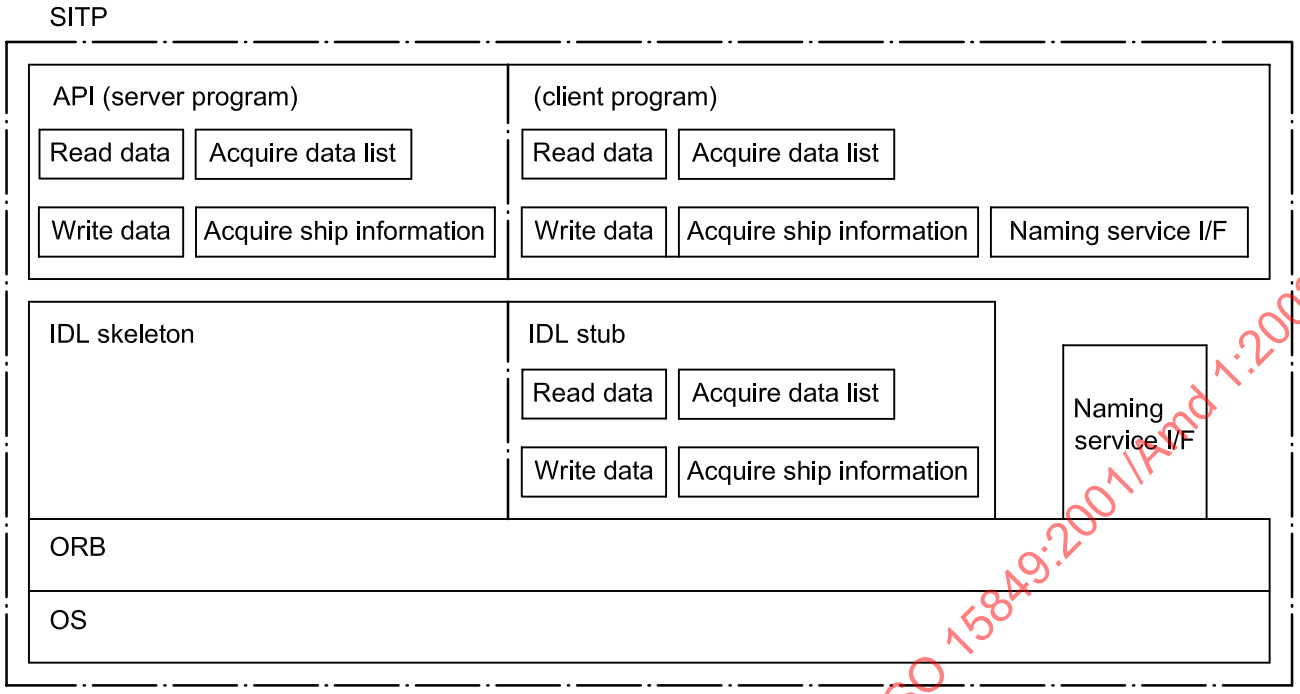

Figure A.2 — Example of construction of software of the SITP-installed system

A.4.2.2 API server program block

— Read data

The read data operation requests, which are received from the client of the LITP-installed system, are then transmitted to a client program.

— Write data

The write data operation requests, which are received from the client of the LITP-installed system, are then transmitted to a client program.

— Acquire data list

The acquire data list operation requests, which are received from the client of the LITP-installed system, are then transmitted to a client program.

— Acquire ship information

The acquire ship information operation requests, which are received from the client of the LITP-installed system, are then transmitted to a client program.

A.4.2.3 API client program block

— User application interface

A requirement from the user application is transmitted to the server, and invokes the operation.

— Read data

Invokes a program for accesses for the read data operation in the IDL stub block.

— Write data

Invokes a program for accesses for the write data operation in the IDL stub block.

— Acquire data list

Invokes a program for accesses for the acquire data list operation in the IDL stub block.

— Acquire ship information

Invokes a program for accesses for the acquire ship information operation in the IDL stub block.

— Naming service interface

Invokes a Naming service operation, provided by ORB, and acquires the Object reference for the server.

— IDL skeleton

Requirements of each operation, which are issued from the client program of the LITP-installed system, are transmitted to the API server program.

A.4.2.4 IDL stub block

— Read data

It requests the invocation of an operation program for the read data on the database server to the ORB.

— Write data

It requests the invocation of an operation program for the write data on the database server to the ORB.

— Acquire data list

It requests the invocation of an operation program for the acquire data list on the database server to the ORB.

— Acquire ship information

It requests the invocation of an operation program for the acquire ship information on the database server to the ORB.

A.4.2.5 Naming service

It acquires the Object reference for the database server.

A.4.3 Database server

A.4.3.1 Illustration

The database server software configuration is schematically shown in Figure A.3, surrounded by a dotted line.