Guide

Distributed Transaction Processing:
Reference Model, Version 3

TECHNICAL GUIDES

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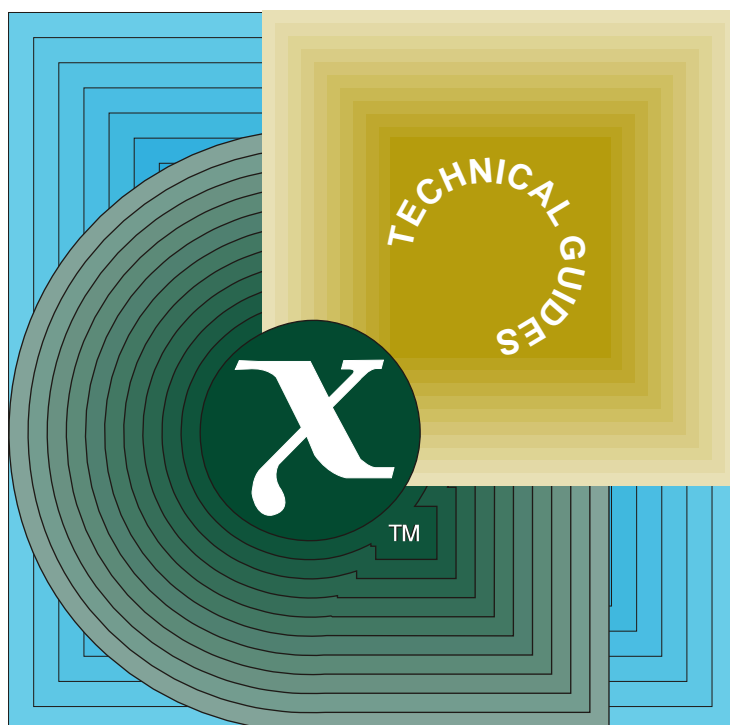
X/Open Guide

Distributed Transaction Processing:

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X/Open Company Ltd.

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Introduction

1.1 Overview

The X/Open Distributed Transaction Processing (DTP) model is a software architecture that allows multiple application programs to share resources provided by multiple resource managers, and allows their work to be coordinated into global transactions.

The X/Open DTP Model comprises five basic functional components:

- an Application Program (AP), which defines transaction boundaries and specifies actions that constitute a transaction

- Resource Managers (RMs) such as databases or file access systems, which provide access to resources

- a Transaction Manager (TM), which assigns identifiers to transactions, monitors their progress, and takes responsibility for transaction completion and for coordinating failure recovery.

- Communication Resource Managers (CRMs), which control communication between distributed applications within or across TM domains.

- a communication protocol, which provides the underlying communication services used by distributed applications and supported by CRMs.

These terms are defined more precisely in Section 3.2 on page 8.

X/Open DTP publications based on this model specify a portable high-level TP language (HTL), portable APIs and system-level interfaces that facilitate:

- portability of application program source code to any X/Open environment that offers that HTL and/or those APIs

- interchangeability of TMs, RMs and CRMs from various sources

- interoperability of diverse TMs, RMs and CRMs in the same global transaction.

1.2 Benefits of X/Open DTP

Distributed transaction processing provides the necessary mechanism to combine multiple software components into a cooperating unit that can maintain shared data, potentially spanning multiple physical processors or locations, or both. This enables construction of applications that manipulate data consistently using multiple products, that can easily incorporate additional components, and that can be scaled by adding additional hardware and software components.

Portability, interchangeability and interoperability let application writers benefit from a wider selection of transaction managers, resource managers and communication resource managers. Application writers also gain the freedom to select from alternative products, hardware and software platforms.

Published language and interface specifications simplify software design. For example, some software products that might once have been implemented using customised interfaces may

now be viewed as interchangeable DTP components. This approach shortens development time and extends the above benefits to a greater number of products.

All parties benefit from the X/Open method of achieving consensus and communication among open systems providers, with a significant voice for system vendors, independent software vendors (ISVs) and users.

1.3   Areas Not Addressed

The X/Open DTP Model does not address all issues of importance in transaction processing, for example:

- configuration, administration and monitoring of transaction processing systems
- forms management and other user interfaces
- specification of benchmarks
- security
- naming
- communication techniques that may be used within RM implementations.

1.4   Relationship to International Standards

The X/Open DTP Model shows that DTP software components use the communication protocol specified in the referenced OSI TP standards to facilitate interoperability of components in heterogeneous environments. The use of OSI TP is not mandatory where implementors require to use a product-internal communication provider.

Data structures from the referenced OSI CCR standards are a recommended component of the transaction identifier that X/Open specifies.

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