A Key Challenge for Device Management

• It is essential to define an infrastructure for interoperability of native and OSGi management services
  • One possible approach is via “universal” services as defined by a light-weight distributed object protocol
Lightweight Distributed Object Protocol (LDOP)

• LDOP is a very compact, uniformly extensible, distributed services/distributed object protocol

• LDOP can be thought of as wrapping objects and services similar to DCOM or CORBA, just very light weight

• LDOP is very friendly to multicore/multiprocessor architectures

• LDOP is portable to all host OS and RTOS combinations across multiple programming languages

• LDOP defines:
  • A message-oriented, high-reliability, distributed object protocol that can support one-to-one, one-to-many, many-to-one, many-to-many and many-to-any communication topologies
  • A distributed services architecture for “universal” services
  • A connection protocol for establishing messaging connections to objects
  • A message encapsulation protocol for use with multiple transports
  • A mechanism for object/service discovery
LDOP Distributed Services Architecture

Processor 1

Process-1

Server Task 1

Client Task 1

Service API

Service Object

LDOP

Remote Transport Provider

Local Transport Provider

Transport Link Driver

Processor 2

Process-2

Process-3

Client Task 2

Client Task 3

Service API

LDOP

Remote Transport Provider

Local Transport Provider

Transport Link Driver

Physical Link
LDOP Implementation Layers

Service Object Interface

Service1  Service2  ...

LDOP

LDOP Transport Provider Interface

LDOP Transport Provider

Extended TPI

Other API Support (Optional)

Supporting communication layers, device drivers and physical interfaces
LDOP Messaging Model

Transport Providers

Supporting communication layers and interfaces

LDOP Link

Service Object Interface

LDOP

Session Objects

Transport Objects

Message Dispatch Object

Connection Objects

Unconnected Messages

Connected Messages

Message Encapsulation

Service Objects

Services

Transport Provider Interface
Open Service Architecture Development Framework

- Eclipse IDE
- Java (OSGi)/C/C++ Integration Framework
- Component Software Framework
  - Client 1
  - Client 2
  - ... Client m
  - Distributed Services
    - API
      - Service Object 1
      - Service Object 2
      - Service Object 3
      - ... Service Object n

- Lightweight Distributed Object Protocol (LDOP)
- (Low) Middleware
- OS Abstraction (POSIX)
- Operating System + BSP + Drivers
- Hardware