QuickSpecs

Compaq NonStop Distributed Object Manager/MP

Models
Reliable, scalable object computing on Compaq NonStop Himalaya servers

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Introduction
The fusion of distributed computing and object-oriented technologies has created a new, powerful heterogeneous system architecture called distributed object computing. Compaq NonStop Distributed Object Manager/MP (Compaq NonStop DOM/MP) middleware provides core support for this new architecture. With Compaq NonStop DOM/MP, Compaq NonStop Himalaya servers can seamlessly inter-operate in a multi-vendor distributed object computing environment, using Internet Inter-ORB Protocol (IIOP) interfaces that are compliant with Common Object Request Broker Architecture 2.0 (CORBA 2.0).

Compaq NonStop DOM/MP combines the productivity advantages of object technology with the traditional execution-time strengths of Compaq NonStop servers—massive parallelism, full data integrity, dynamic load balancing, and superior reliability. This makes Compaq NonStop DOM/MP an ideal vehicle for delivering robust, scalable distributed object solutions that can meet the demands of business-critical enterprise applications.

Inter-operable with multiple platforms
Compaq NonStop DOM/MP delivers the features that have made CORBA the most popular server-side object request broker. The CORBA-compliant features include mechanisms that allow objects to send requests and responses transparently between applications on different machines in a heterogeneous, distributed environment.

CORBA is a specification developed by the Object Management Group (OMG), a non-profit consortium of over 700 companies. OMG is dedicated to promoting the use of object technology for the development of distributed computing systems, and to providing a common architectural framework for object-oriented applications, based on widely available interface specifications. OMG also has the goal of reducing the complexity, costs, and development time associated with the introduction of applications based on object technology.

In addition to allowing participation in a distributed object computing environment, Compaq NonStop DOM/MP allows the development of object access to legacy applications, using object "wrappers" for existing non-object interfaces.

## Comprehensive transaction protection
Compaq NonStop DOM/MP ensures the integrity of Tandem databases by constantly monitoring transactions to see that they are completed in an all-or-nothing manner. Compaq NonStop DOM/MP works with Compaq NonStop TM/MP to coordinate updates to either Enscribe or Compaq NonStop SQL databases on Tandem systems. In conjunction with Compaq NonStop TM/MP high-performance recovery services, Compaq NonStop DOM/MP maintains database consistency in the event of a hardware or software malfunction or power outage. Compaq NonStop TM/MP provides transaction protection and recovery services to a variety of processing environments, including Pathway/TS, Compaq NonStop TUXEDO, and Compaq NonStop ODBC Servers. These environments can coexist with Compaq NonStop DOM/MP and simultaneously access a shared database, while still receiving full transaction protection from Compaq NonStop TM/MP.

## Compaq NonStop Himalaya servers
Compaq NonStop DOM/MP runs on the Compaq NonStop Himalaya range of high-performance, fault-tolerant servers. Himalaya servers combine unique parallel processing architecture with RISC technology to deliver outstanding price/performance and reliability in open computing environments. The loosely coupled architecture of Compaq NonStop Himalaya servers consists of multiple processors, dual interprocessor buses, dual-ported controllers, and fault-tolerant power subsystems. This architecture prevents all single and most multiple hardware or software malfunctions from disrupting an application, and provides full data integrity for critical applications. The Compaq NonStop Kernel operating system provides the ideal foundation for critical business applications to take advantage of the powerful processing, massive scalability, continuous availability, application program interfaces, and system services offered on the Himalaya server platform.

## Distributed middleware based on CORBA 2.0 specifications
Compaq NonStop DOM/MP has implemented the core object request broker (ORB) and some of the common object services to the specifications of the Object Management Group.

## Inter-operability via Internet Inter-ORB Protocol
Compaq NonStop DOM/MP provides Inter-operability with other vendors' object request brokers that are CORBA 2.0D compliant and have implemented the mandatory IIOP. This protocol specifies how messages are exchanged over a TCP/IP network. By using IIOP, Compaq NonStop DOM/MP makes it possible to use the Internet itself as a backbone through which other ORBs can bridge.

## Scalability
Scalability allows a system to grow as usage increases, and Compaq NonStop DOM/MP contributes to scalability in the following dimensions:
Network connections

On some ORB platforms, a client must use a separate port number for each server to which it connects, which can dramatically restrict the number of clients that connect to the ORB. Compaq NonStop DOM/MP does not have this limitation: a client can use a single port number to connect to any number of servers on the same system. The ORB process that provides this feature, the Comm Server, manages linkages between remote clients and local servers or between local clients and remote servers.

A client program need not be aware of whether a server is local or remote. When a client refers to an object, Compaq NonStop DOM/MP transparently establishes a link with a process called the Location Service Agent, which assigns a Comm Server to handle subsequent requests. The Comm Server provides three call-streams, or predefined transport components, each supporting a different protocol:

- A Pathway callstream for communicating with Compaq NonStop TS/MP server pools using the Pathsend mechanism of Compaq NonStop TS/MP
- A file system callstream for communicating with an individual process using file system interprocess communications (IPC)
- An IIOP callstream for communicating with remote systems using a TCP/IP connection

ORB processes

With Compaq NonStop DOM/MP, the capacity of the ORB can be increased without disturbing running applications. The number of Comm Servers can be increased to support a growth in request traffic, and the number of TCP/IP processes can be increased to provide more port numbers.

A new client can connect to the ORB on any of its existing ports. No configuration change is required on either the client workstation or the Tandem system.

Application processes

The throughput of application servers can be increased by running them as Compaq NonStop TS/MP server pools, in which each process runs the same application logic. The number of servers in the pool can be specified as a configuration option, or Compaq NonStop TS/MP can automatically vary the number of servers and distribute work among them as required for load balancing.

Context-free and context-sensitive object invocations

Compaq NonStop DOM/MP has the ability to run server processes as Compaq NonStop TS/MP server pools. This allows a number of processes to act as one logical server, where the least busy server gets a new unit of work, thus providing automatic load balancing. Compaq NonStop TS/MP server pools support both context-free and context-sensitive requests.

A context-free request can go to a different server instance on each invocation; a context-sensitive request initially goes to a free server instance, but causes subsequent invocations to go to the same server. Compaq NonStop DOM/MP provides the application programmer with both choices, providing flexibility in designing server-side objects.

Interface Definition Language compiler
Compaq NonStop DOM/MP provides the capability to implement distributed object capabilities on the Compaq NonStop Kernel platform. The CORBA-compliant Interface Definition Language (IDL) is the means by which objects tell their potential clients what operations (methods) are available and how they should be invoked. IDL defines the types of objects, their attributes, the methods they export, and the method parameters.

The IDL compiler processes the IDL files and produces language skeletons for the implementation server classes. A programmer then supplies the code that implements the methods in the skeletons to create the desired server classes. The IDL compiler also generates all the necessary code to enable transparent client interactions with potentially remote objects.

### C++ language bindings

Compaq NonStop DOM/MP provides language bindings for the C++ language. While the IDL defines the interface to an object, client programs that use the object and the object implementations themselves are not written in IDL. Instead, they are written in languages where language bindings have been defined.

### Dynamic invocation interface

In addition to a static invocation interface, Compaq NonStop DOM/MP also supports a dynamic invocation interface. Compaq NonStop DOM/MP's dynamic invocation interface allows a client program to dynamically build and invoke requests on objects at run time. In contrast, the static invocation interface requires the client application programmer to know the object interface at compile time. Supporting both static and dynamic invocations allows flexibility in designing application systems.

### Naming and Event Services

In addition to the base object request broker, Compaq NonStop DOM/MP provides additional services defined by OMG. The Naming Service is used to "advertise" services. This allows client programs to look up object references by name, rather than through embedded object references within the client.

The Event Service allows objects to register or unregister their interest in specific events. This service defines a well-known object, called an event channel, which collects and distributes events among components that know nothing of each other.

### Ordering Information

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<th>Product ID</th>
<th>Description</th>
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<tbody>
<tr>
<td>SE60V2</td>
<td>Compaq NonStop DOM/MP (full product) - includes all components necessary to develop an application, install and configure Compaq NonStop DOM/MP, and execute programs also includes runtime version.</td>
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<tr>
<td>SE61V1</td>
<td>Compaq NonStop DOM/MP Runtime - version. Includes only those components necessary to install and execute Compaq NonStop DOM/MP application programs</td>
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<table>
<thead>
<tr>
<th>Manuals</th>
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<tr>
<td>127123</td>
<td>Tandem Distributed Object Computing Orientation Guide</td>
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<td>140418</td>
<td>Getting Started</td>
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<td>138122</td>
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### Specifications

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<tr>
<td></td>
<td>Any Compaq NonStop Himalaya server</td>
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Compaq NonStop Distributed Object Manager/MP - World Wide QuickSpecs

Compaq NonStop Kernel Open Systems Services (OSS)
Compaq NonStop TS/MP (SA-58)
Compaq NonStop TM/MP
Tandem C++ compiler

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