

CubeMOM

Overview

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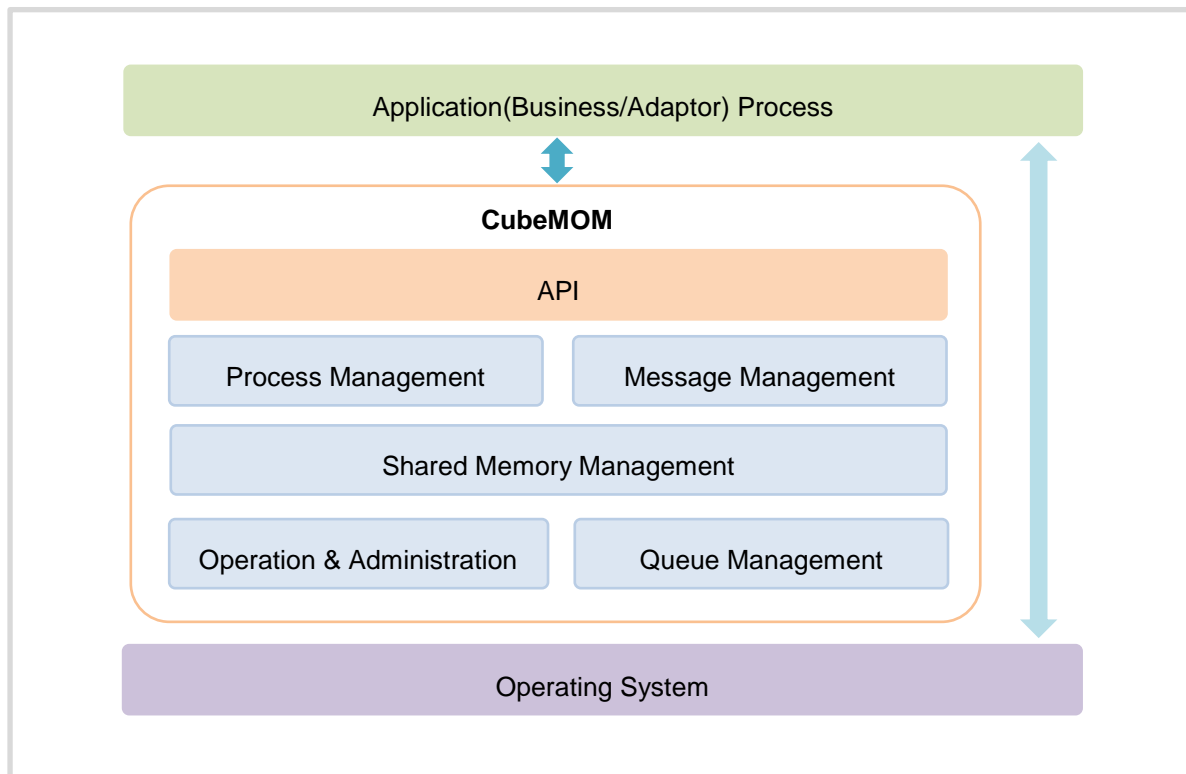
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CubeMOM Overview

This document is an introductory overview of the typical features of CubeMOM. You can learn basic knowledge about each function of CubeMOM.

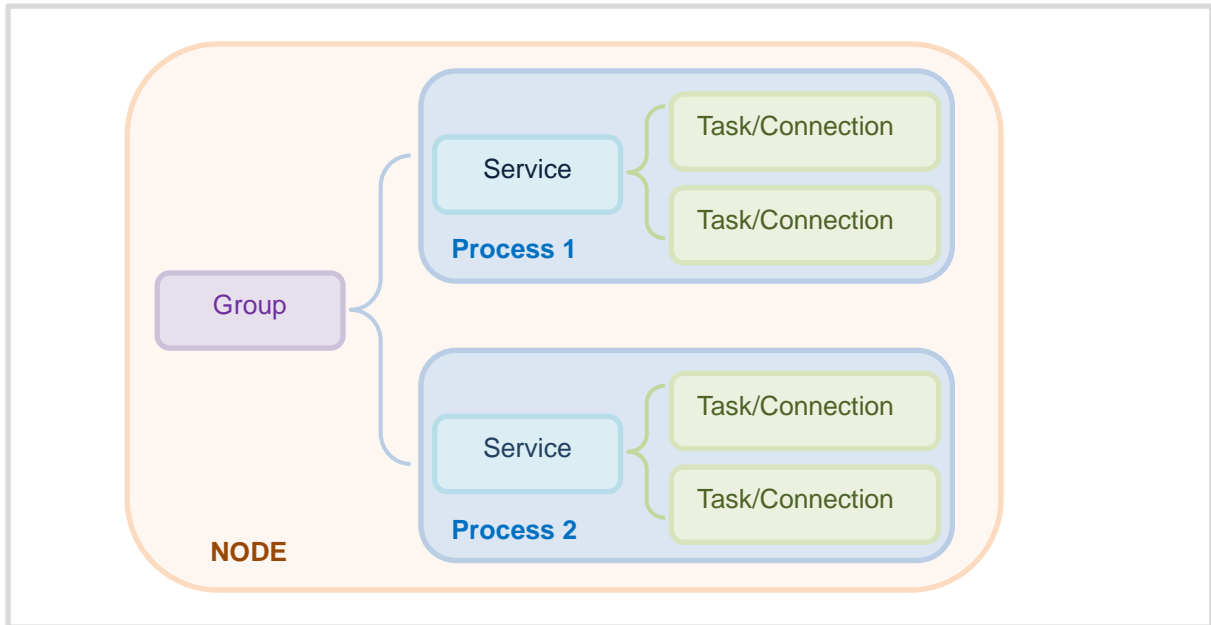
Outline



CubeMOM is message-oriented middleware for interconnection between internal and external systems. As a multi-threaded asynchronous method, it ensures high-performance and reliable message delivery. It also provides the environment for large-scale distributed application development and effective operation.

CubeMOM is designed for online transaction processing. It also provides excellent reliability so that customers can provide uninterrupted service 24/7/365. CubeMOM has failover capability to deliver messages without distortion or loss.

Component



CubeMOM maintains components as logically abstracted objects. One object contains one or more lower-level objects.

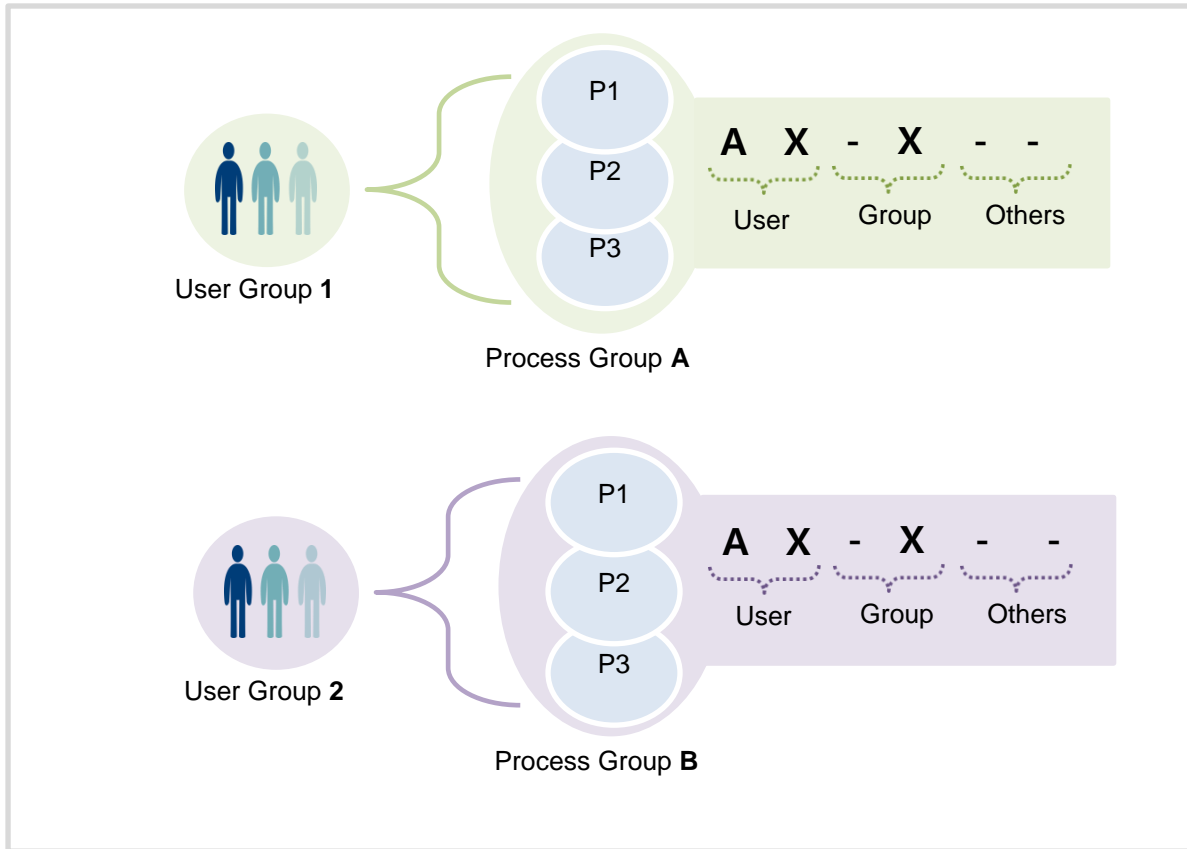
| Level | Object | Description |
|-------|------------|---|
| 1 | Host | Physical computer system |
| 2 | Node | Logical computer system |
| 3 | Group | Business/Adaptor Process Group |
| 4 | Process | Business/Adaptor Process |
| 5 | Service | Specific function of business/adaptor process |
| 6 | Task | Business process, minimum unit of work |
| 6 | Connection | Adaptor process, access management |

Main Functions

Summary

| Function | Description |
|-------------------------------------|---|
| User | <ul style="list-style-type: none"> • User and User group |
| Process | <ul style="list-style-type: none"> • Process grouping/naming • Process group permission • Process state management • Automatically increase/decrease the number of processes based on transaction volume • Set thread count |
| Queue | <ul style="list-style-type: none"> • Static and dynamic queue size • Dynamically changing the queue size • Queue Wait Timeout • QAT(Queue Alert Watermark), QMT(Queue Maximum Watermark) |
| Routing | <ul style="list-style-type: none"> • Static and dynamic routing of message • Message broadcasting • Message delivery method - First-Available/Round-Robin |
| Communication (Built-in adaptor) | <ul style="list-style-type: none"> • Real-time (TPS/TPM, Average response time) monitoring • Protocol abstraction (support for multiple protocols) - TCP, HTTP, ... • Encrypted communication - TLS(Transport Layer Security) • Minimum/Maximum concurrent connections • Message boundary delimitation • Message send/receive timeout |
| Log | <ul style="list-style-type: none"> • Dedicated log process - improve message processing performance • Dynamically adjust log level • Error log - For easy error monitoring • Message tracking log - message flow, elapsed time • Response Delay Log - tracking response delay message • Audit log |
| Error handling | <ul style="list-style-type: none"> • Process and communication lines, node multiplexing • Process failure - abnormal stop, processing timeout • Message queue failure - full, waiting timeout • Communication failure - send/receive error, send/receive timeout |

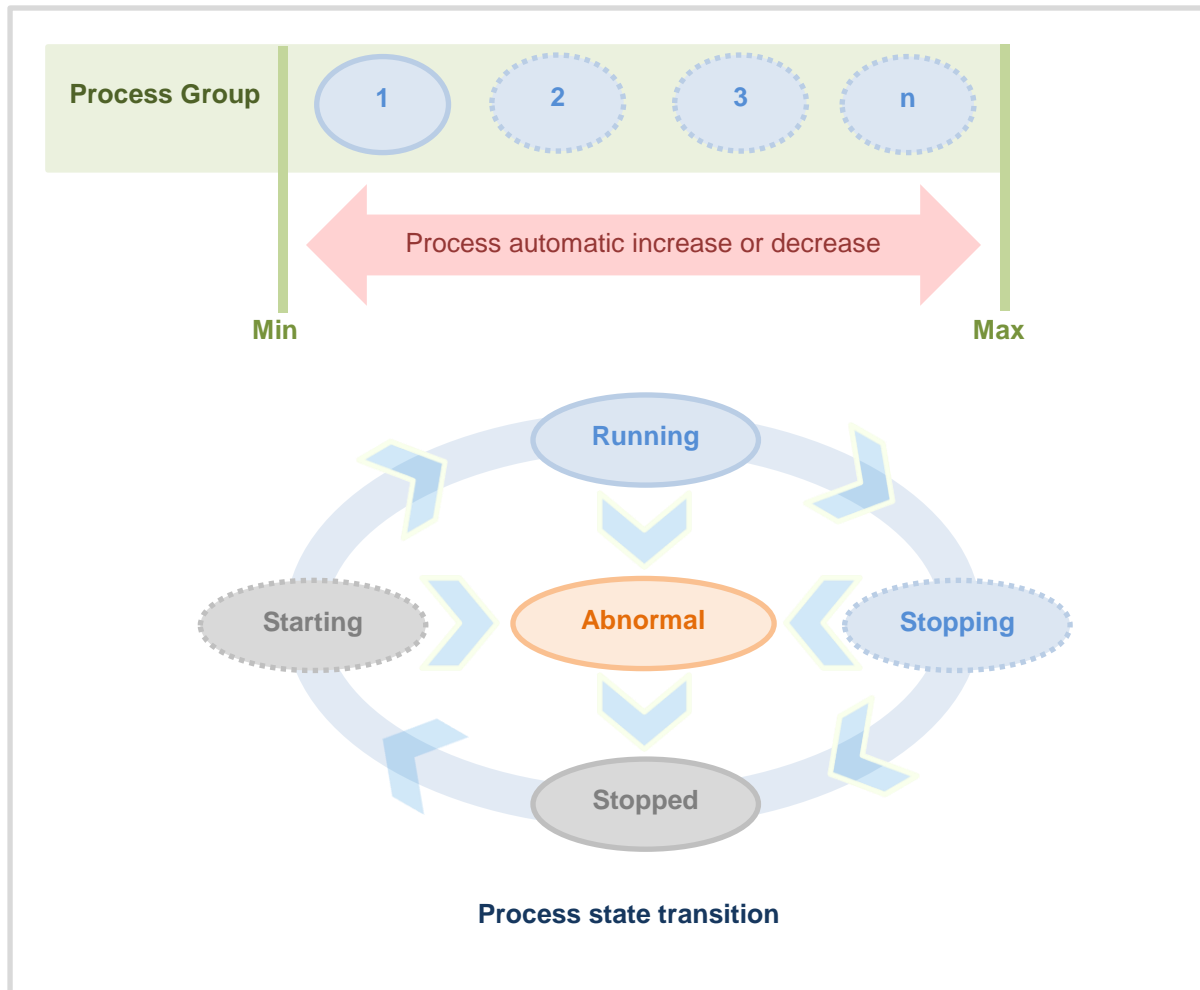
User



CubeMOM users are accounts that control and monitor middleware resources. Administrators (special accounts) can delegate process group management to other users.

Process group permissions (**A**lter, **E**xecute) can be granted to the owner, the owner's group, and other users.

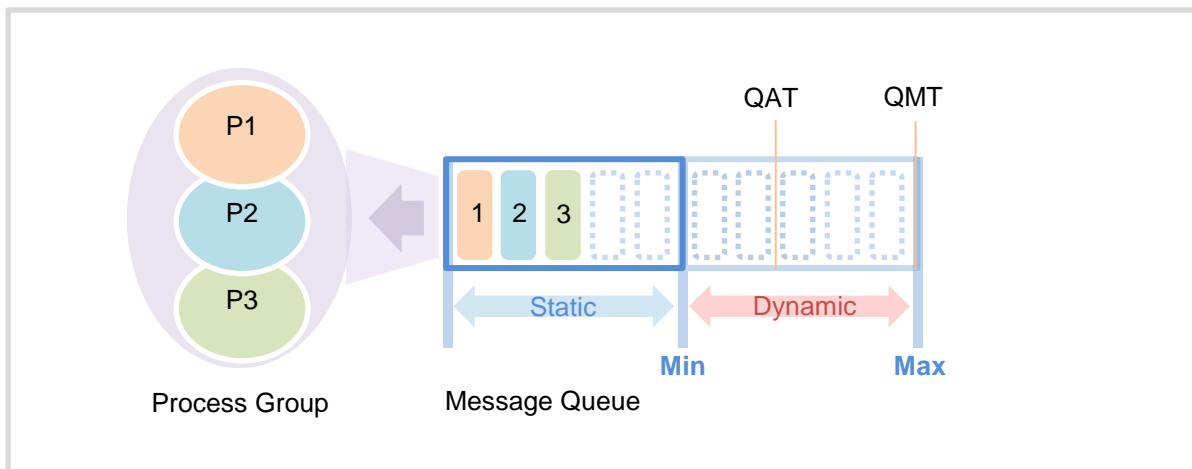
Process



CubeMOM associates executable program with queue and gives them names. These are called process groups and manage process-related attributes (min/max counts, ...), queue-related attributes (number of queues, wait timeouts, ...), message delivery-related attributes (first-available, round-robin), and other attributes.

The process group automatically increases or decreases the number of processes according to the transaction volume and manages process monitoring and status.

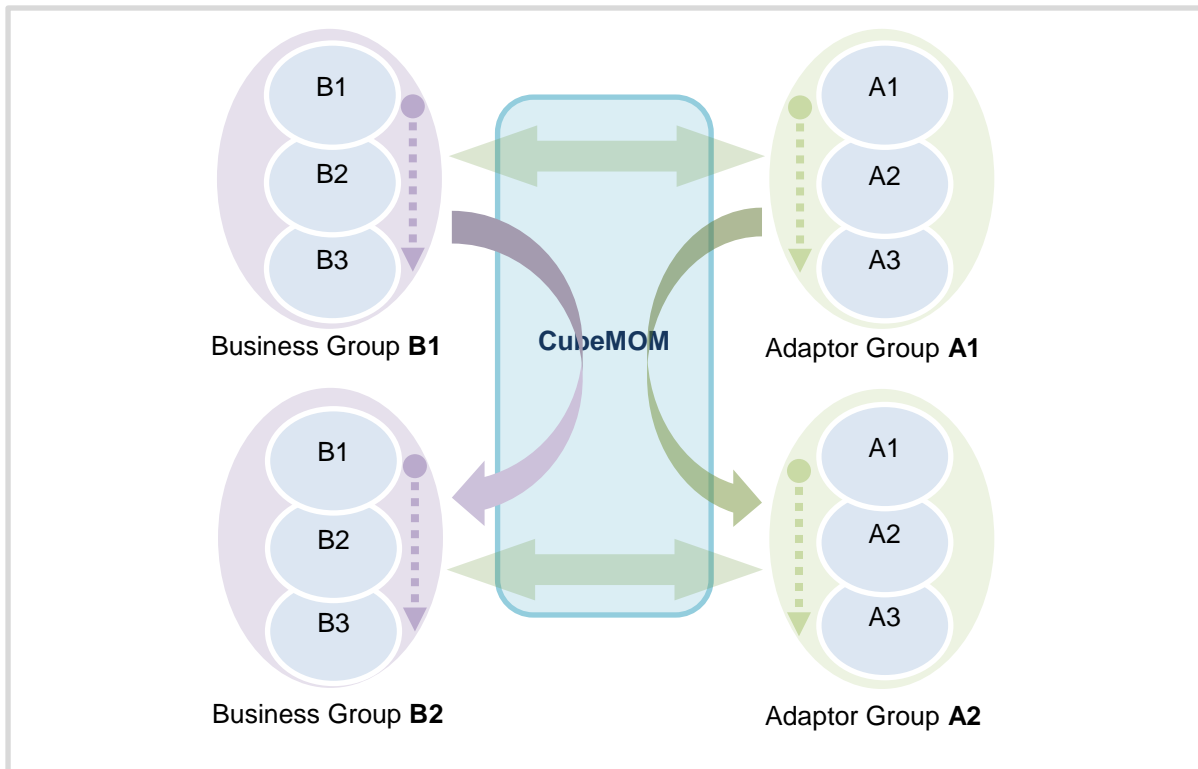
Queue



CubeMOM manages queues for message delivery. Queue items are separated into statically reserved area and dynamically reserved area. The statically reserved area guarantees message queuing as much as the corresponding number, and the dynamically reserved area determines whether queuing is possible or not depending on the queue storage usage.

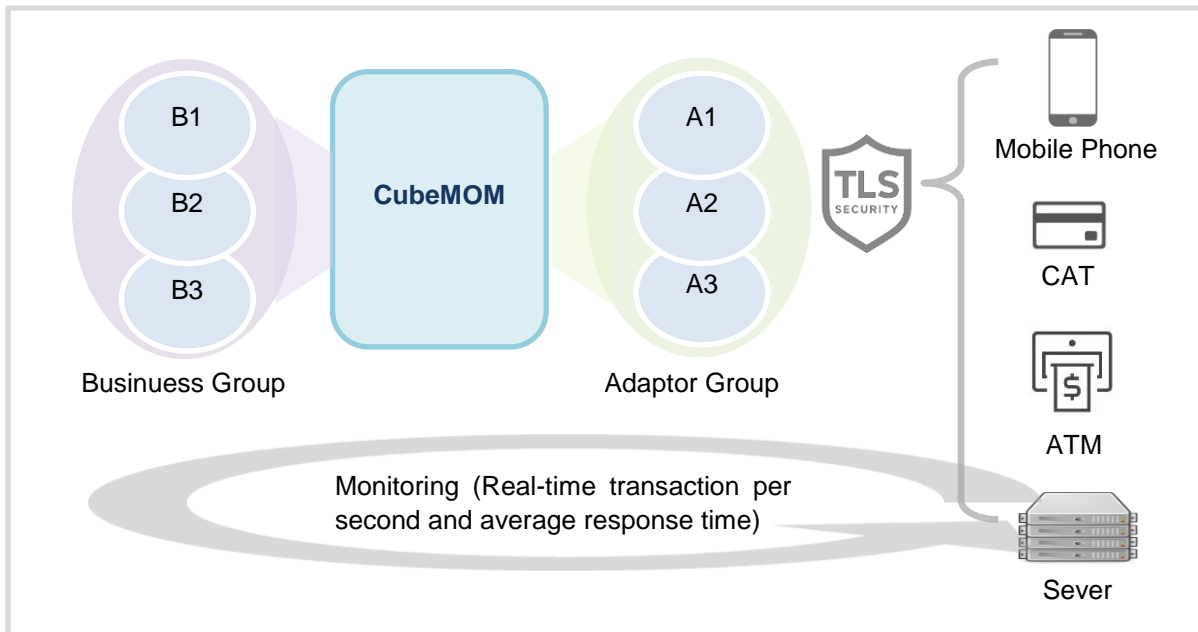
Queueing messages are delivered to a process, removed after receiving a processing completion notification, and fail if they do not receive a processing completion notification or if the delivery wait time is exceeded. An alarm value (Queue Alter Watermak) can be set to monitor queue stacking.

Routing



The CubeMOM acts as a message carrier for intercommunication between objects (group/process/service/connection). The sending side can specify the receiving side objects as either static (setting) or dynamic (program). Receiving-side objects are specified as strings and multiple objects can be targeted according to string matching. If the sending side does not specify the lowest object (task or connection) of the receiving side, it will route (First-Available/Round-Robin) according to the settings of the receiving side.

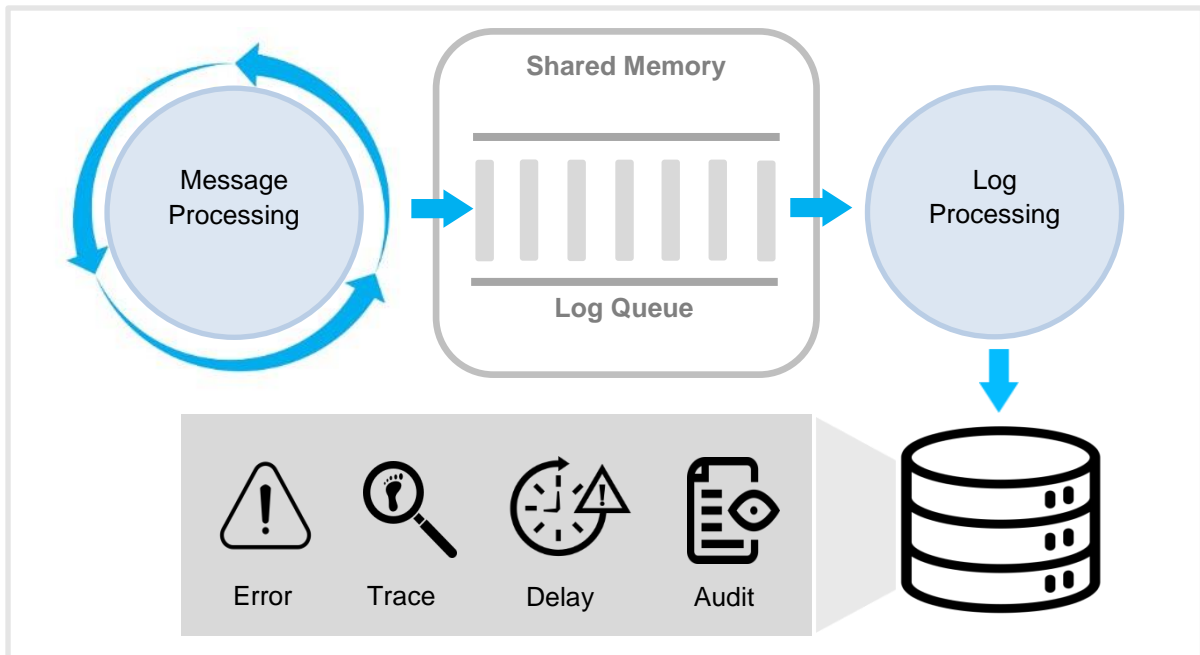
Communication



CubeMOM provides adapters for communication between internal and external systems. Adapters support various protocols (TCP, HTTP, ...) through protocol abstraction. Many functions for communication (Transport Layer Security, minimum/maximum connection, persistent/non-persistent, ...) are built-in for communication from small terminals to large servers.

You can monitor online transactions in real time (transaction volume, transaction per second, average response time) and track delays in response or failed transactions.

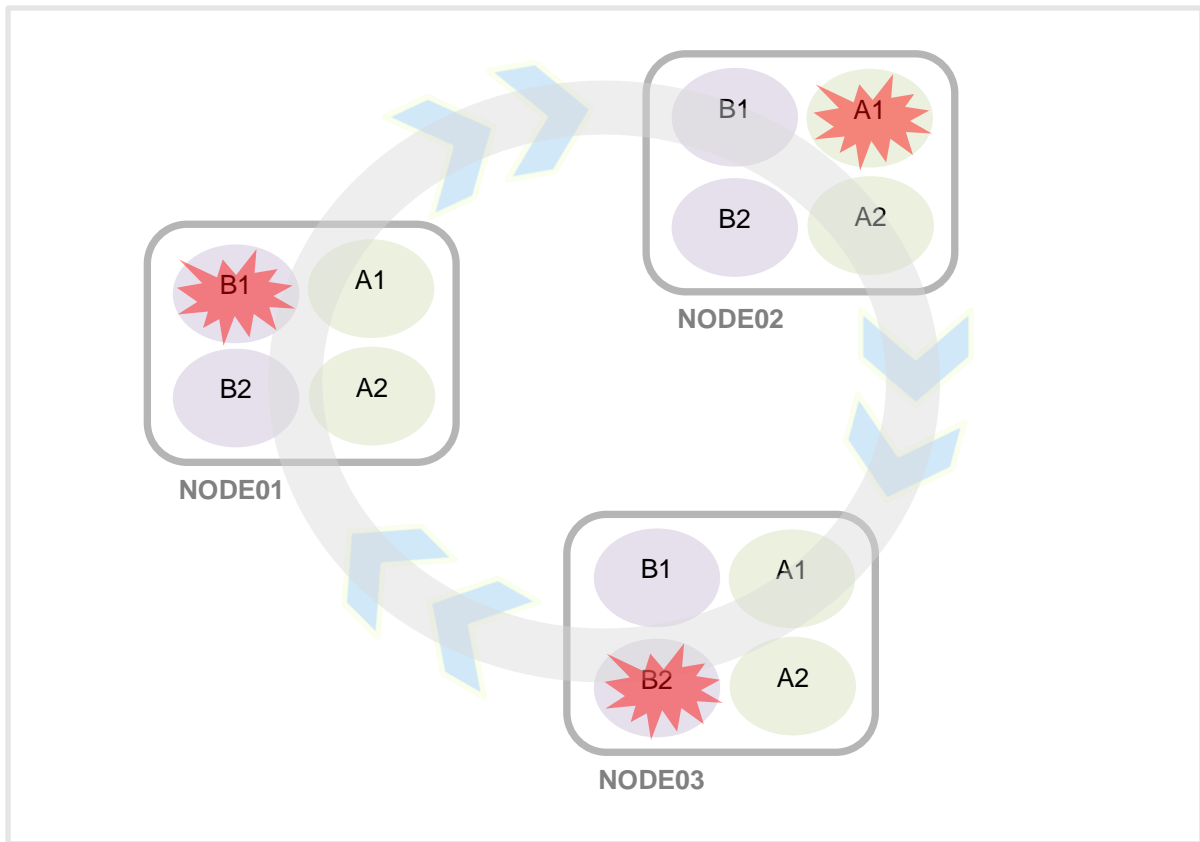
Log



In CubeMOM, message processing and log processes are separated. The message processing process stores the logs in the queue of shared memory, and the log processing process writes the logs from the queue to disk. The message processing process has no disk input or output, which improves performance and isolates it from disk failures.

The Log levels can be changed dynamically and important logs (error, trace, response delay, audit) are written to separate files.

Error Handling



CubeMOM can configure multiple process groups on multiple nodes to increase the availability of critical tasks. By configuring multiplexing, in case of any node failure (process, queue, communication, ...), messages can be processed on the backup node without loss.

In the event of a particular host failure, a node can fail-over or fail-back to another host.