Overview of MAGONIA API Specifications (For Distributed Processing Base)
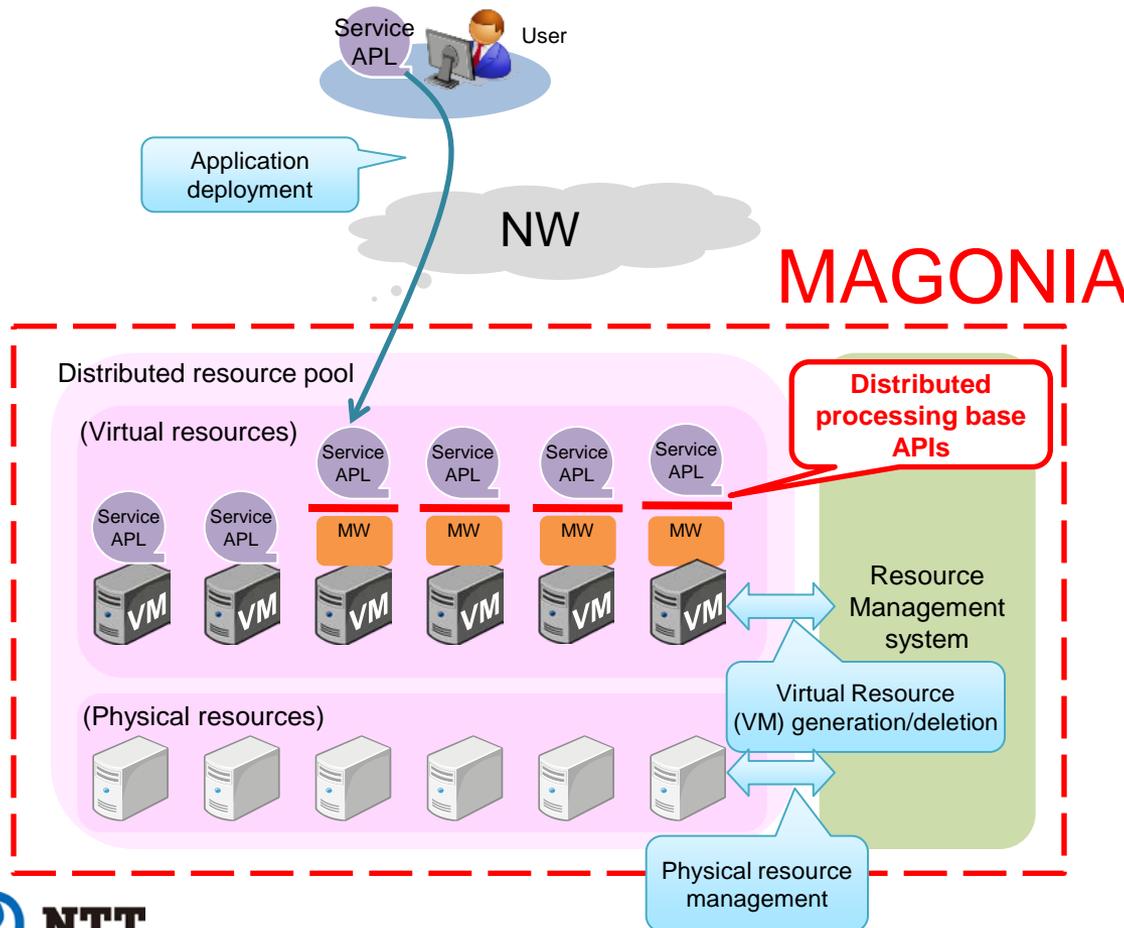
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MAGONIA Overview

- MAGONIA - a service platform resilient to disasters and changes in traffic
- For service application, we are publishing API and functions for the Distributed Processing Base, part of the MAGONIA middleware

Distributed resource pool

Resource pool distributed among multiple data centers

Resource management system

Physical resource management Virtual resource generation/deletion/ provision to users

Middleware (MW)

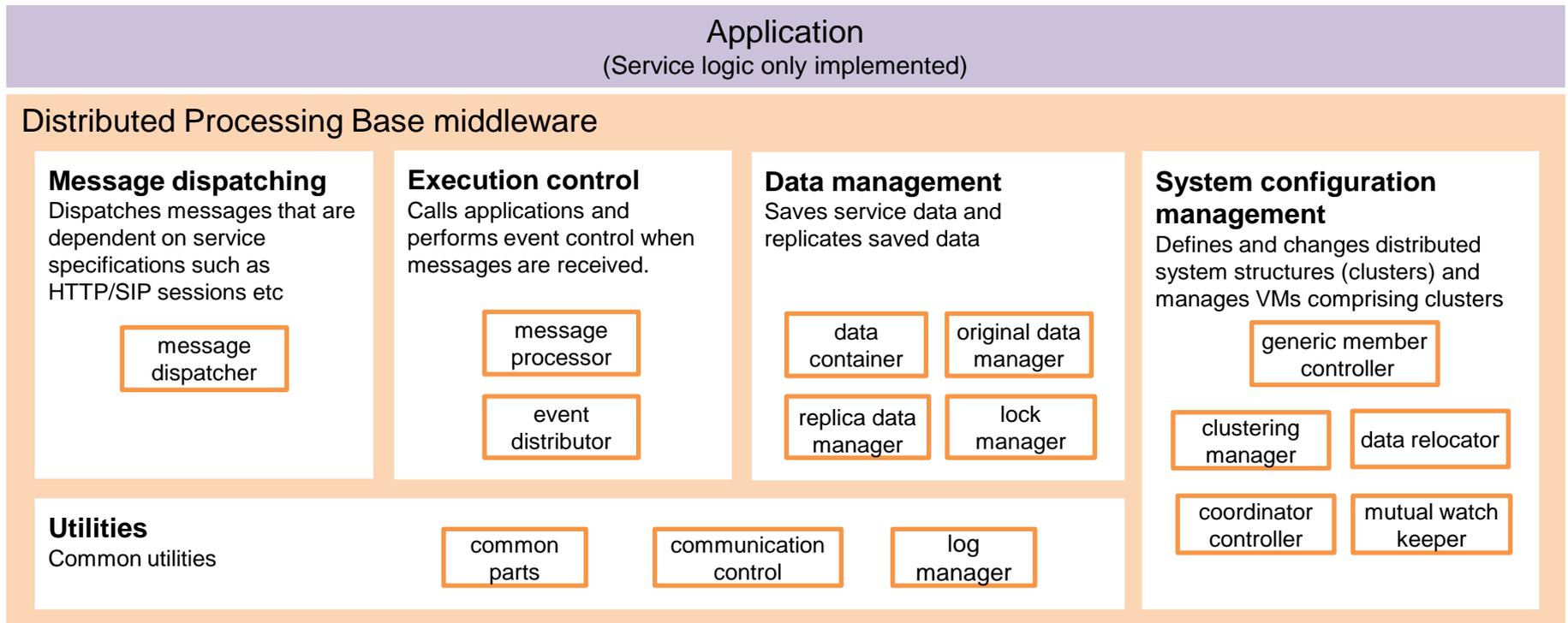Middleware provides high reliability and automatic scaling function to applications

Distributed Processing Base etc

What is a Distributed Processing Base?

A Distributed Processing Base is…

A highly reliable, highly available and automatically scalable framework to distribute processing load etc.

provided by middleware

End users

Traffic distribution

Distributed processing (load balancing) handles large-scale traffic processing

Data replication

Data

Data

Malfunctioning VM deleted

New VM added

Better reliability with data replication

End users

Traffic increase
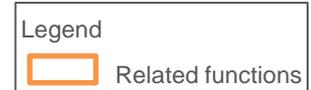
New VM added

Dynamic system scaling

Distributed Processing Base functions

- The Distributed Processing Base is a highly reliable scale-out system that features message dispatching, data management, executable commands and system configuration management functions etc.
- Enables application development focused on service logic, and enables efficient development

Application
(Service logic only implemented)

Distributed Processing Base middleware

Message dispatching
Dispatches messages that are dependent on service specifications such as HTTP/SIP sessions etc

> message dispatcher

Execution control
Calls applications and performs event control when messages are received.

> message processor

> event distributor

Data management
Saves service data and replicates saved data

> data container

> original data manager

> replica data manager

> lock manager

System configuration management
Defines and changes distributed system structures (clusters) and manages VMs comprising clusters

> generic member controller

> clustering manager

> data relocator

> coordinator controller

> mutual watch keeper

Utilities
Common utilities

> common parts

> communication control

> log manager

Distributed Processing Base functions and internal function blocks

Legend

☐ Related functions

Overview of Distributed Processing Base function blocks

- Function blocks contain the following functions:

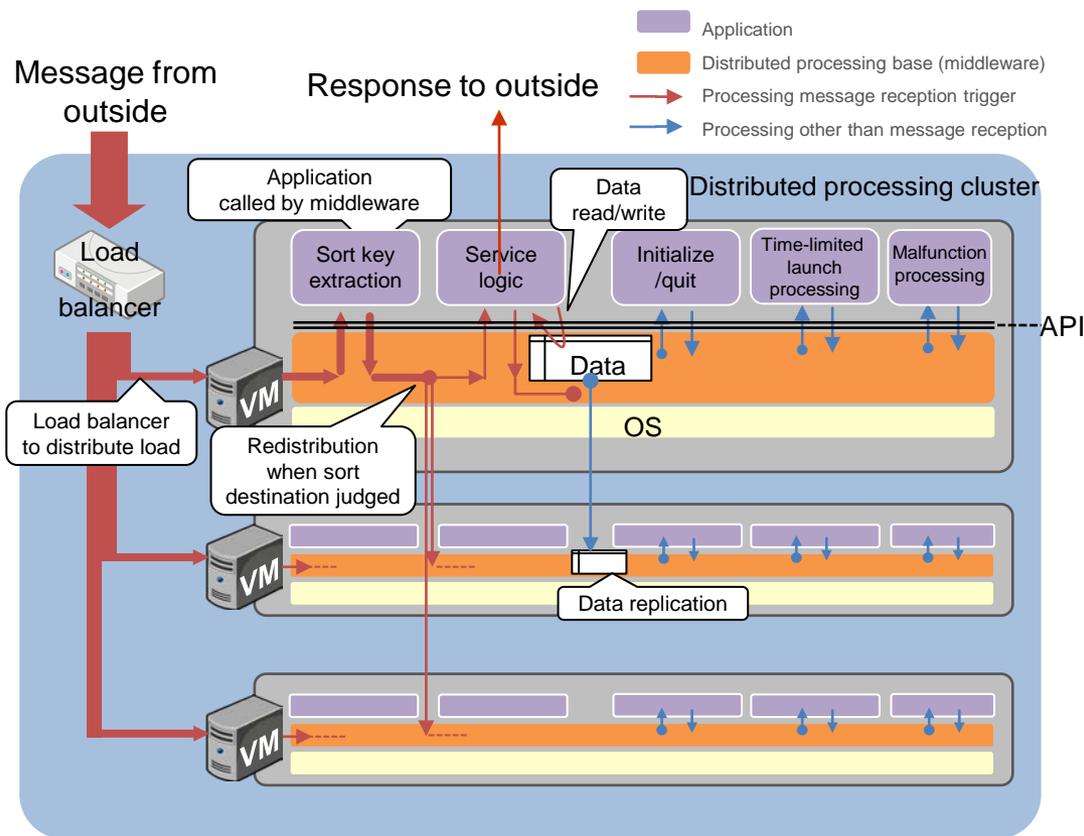### Overview of Distributed Processing Base functions

Function block name	Function block abbreviation	Description of main function
common parts	CMNP	Common utility for thread management, buffer management etc
communication controller	COMC	Common processing of TCP/UDP layer communication control
log manager	LOGM	Common processing of log output
data container	DTCT	Creates, updates, get and deletes data
original data manager	ODTM	Manages original data
replica data manager	RDTM	Manages replica data
lock manager	LCKM	Manages data lock
generic member controller	GMBC	Processing in each VM for initialize/shutdown processing, and changes in cluster structure
clustering manager	CLSM	Manages cluster structure data, and distributes to each VM
coordinator controller	CRDC	Decides the coordinator (that which decides the cluster structure), decides the cluster structure, and controls when cluster structure is changed (notifies each VM etc)
data relocator	DTRL	Controls and executes data transfer and redundancy when VMs are added or deleted due to malfunction or changes in traffic
mutual watch keeper	MWTC	Monitors other VMs for malfunction, and notifies detected malfunctions
message dispatcher	MSDP	Calls application sorting logic, and judges destination for sorting
message processor	MSPR	Calls applications, locks data, and executes time-limited processing
event distributor	EVDT	Sends and receives messages, triggers events when sending and receiving message

Distributed Processing Base processing image

- Distributed processing base provides implementation frameworks for application
- Applications such as message dispatch key extraction and service logic etc are implemented in the specified methods, while distributed processing base calls those methods.

Main APL implementation point

Distributed processing base API	APL mount processing
Dispatch key extraction	Implements dispatch key extraction processing called by distributed processing base when messages are received
Service logic	Implements service logic (data update, message processing) called by distributed processing base after dispatch destination is determined.
Initialize/quit	Implements initialize/quit processing called by distributed processing base when processes launch or finish.
Time-limited launch processing	Implements periodic or time-limited launch processing called by distributed processing base with the timing specified by APL
Malfunction processing	Implements application processing called by distributed processing base when process health check is NG

Legend:
- Application
- Distributed processing base (middleware)
- Processing message reception trigger
- Processing other than message reception

Diagram labels: Message from outside, Response to outside, Load balancer, Load balancer to distribute load, Application called by middleware, Data read/write, Distributed processing cluster, Sort key extraction, Service logic, Initialize/quit, Time-limited launch processing, Malfunction processing, API, Data, OS, VM, Redistribution when sort destination judged, Data replication