

Development of Distributed Real-Time Platform for the Information Processing System for the  
Korean Next Generation Reactor

150

103-16

가 가

CORBA(Common Object Request Broker Architecture)

Abstract

Because of the ever-increasing requirements of the information processing system to improve safety, plant availability and economy of the nuclear power plant operations, the conventional process computer is becoming inadequate and outdated. The distributed real time platform for KNGR information processing system is designed such that it provides the real time scheduling to manage distributed tasks and distributed shared memory structure to provide transparency and consistency. The CORBA(Common Object Request Broker Architecture) is used as the object oriented middle-ware of the developed platform. The developed platform will be used as a basic

architecture of the information processing system for KNGR.

1.

(Korean Next Generation Reactor, KNGR) (Information Processing System, IPS)

[1]. , (fault tolerant)

(distributed real-time platform)

CORBA(Common Object Request Broker Architecture) [2] (distributed real-time scheduling) (distributed shared memory)

2 , 3

4 .

2.

System Server, Application Server 1, Application Server 2 Communication Channel  
 , 가 가 .

(Data Communication Network) System Server  
 , Application Server . Application Server  
 , Display Station . Display Station

Display Station

Switched Ethernet . ,  
 Primary/Backup Protocol . Master Server 가  
 Slave Server Master Server  
 , . Master Server 가  
 Slave Server 가 . Master/Slave  
 Server

Communication Channel Primary  
 Channel Alternative Channel . 가 tolerant  
 , . Backup/Maintenance  
 Server Master Slave Server  
 . 가 ,

Display Station UNIX Workstation .  
 Protocol Switched Ethernet TCP/IP UDP/IP 가 . Middleware  
 CORBA(Orbix)가 . 가 (FORTRAN, C/C++ )  
 가 (CFM/SPM, COLSS, .),  
 . Graphical User Interface(GUI) SL-GMS 가 .

.( 2)

NSSS (Nuclear Steam Supply System)

MMI

3.

3.1 (Distributed Real-time Scheduling)

(global time) (global priority) (time constraint),  
가

가 ORB (Object Request Broker)

ORB

.( 3)

(real-time scheduler)

(real-time library)가

(demon) ,

priority-based, preemptive

first-in-first-out

Message Queue, Periodic Run Queue, Aperiodic Run Queue,

Time

Controller Real-time Dispatching 가

Message Queue

(Periodic Run Queue)

(Aperiodic Run Queue) . Periodic Run Queue Time  
 Controller Real-time Dispatching , Aperiodic Run  
 Queue . ( 4)

Time Controller . Active Table  
 , interrupt가  
 0 가 dispatching . Real-time dispatching  
 POSIX 1003.1b real-time extension [6] .

CORBA  
 . CORBA 가  
 가 . CORBA  
 , , IDL (Interface Design  
 Language) .

```
struct t_RtInfo {
    t_Time timeConstraint;
    long periodic;
    short importance;
    long priority;
};
```

```
setRtInfo(in t_TrInfo rtInfo);
scheduling();
```

가 .

```
struct RtProcessInfo {
    ClientId clientId;
    TimeStamp tStamp;
    Timeval timeConstraint;
```

```

        Importance important;
        Short priority;
        Short policy;
        Timeval periodic;
    };

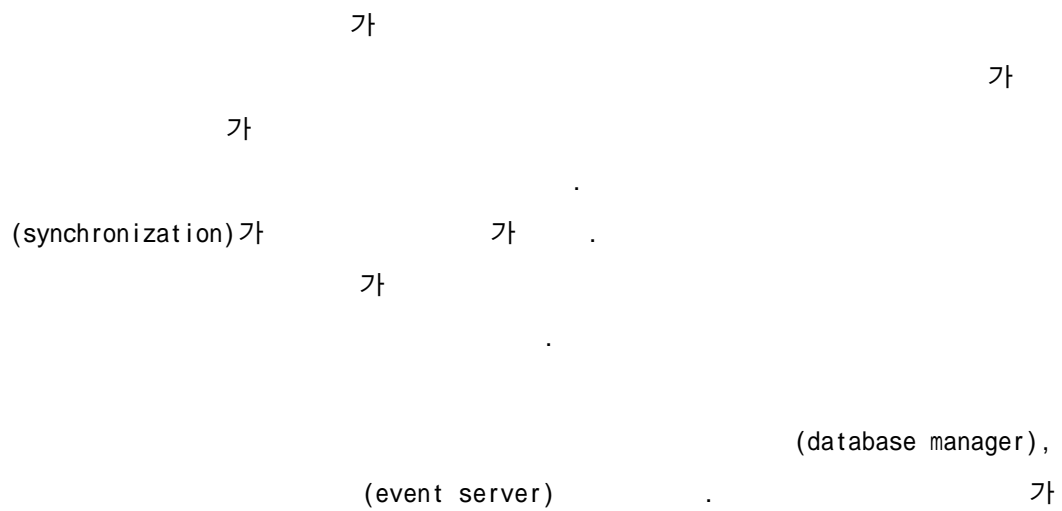
```

```

setClientId(pocess id);
setProcessName(process name);*
setconstraint(constraint)
setImportance(importance);
setPriority(priority);
setPeriodic(periodic);
RegisterToRtScheduler();
EndRtScheduling()

```

### 3.2 (Distributed Shared Memory)



- shared memory update event -
- point update event -

- point delete event -
- point add event - 가

4.

가

CORBA

가

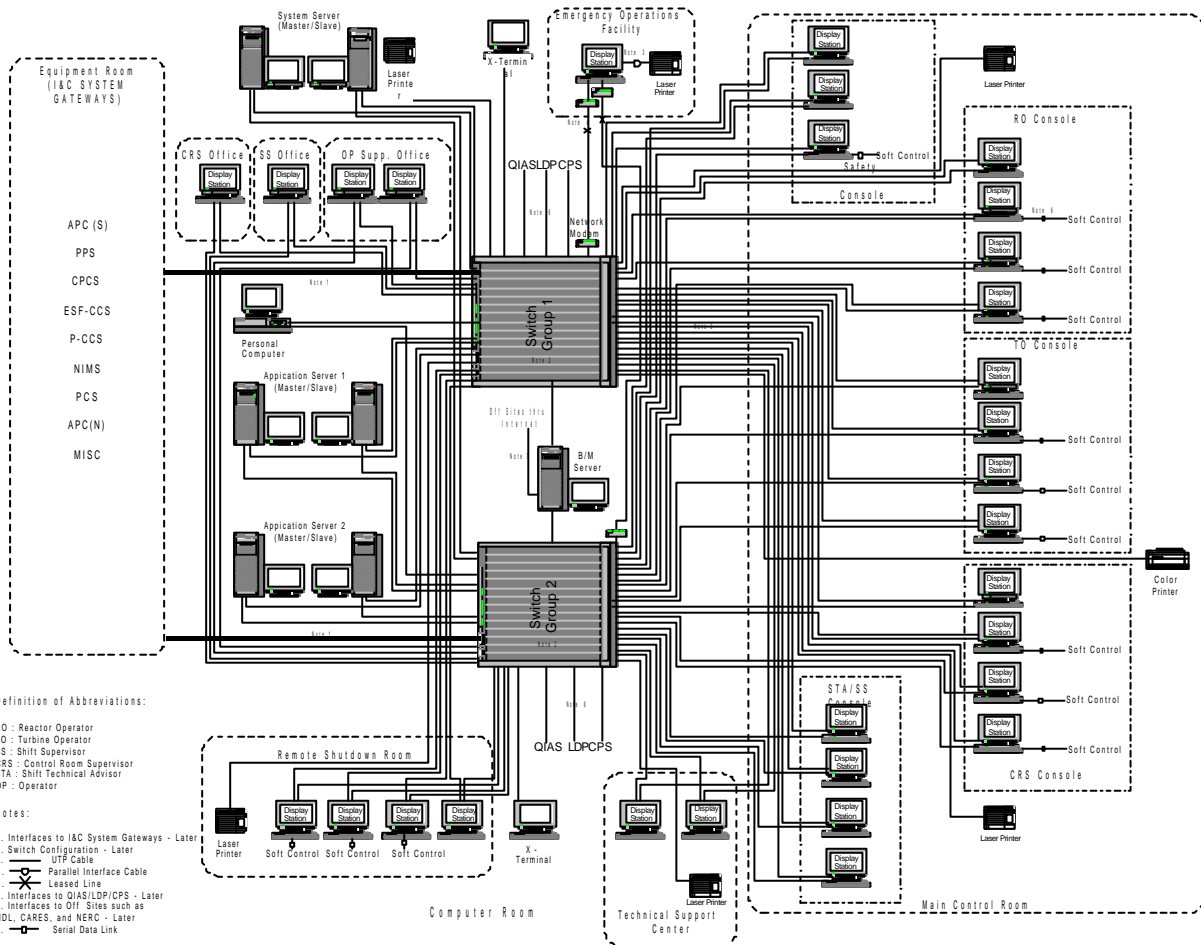
, naming service CORBA

가

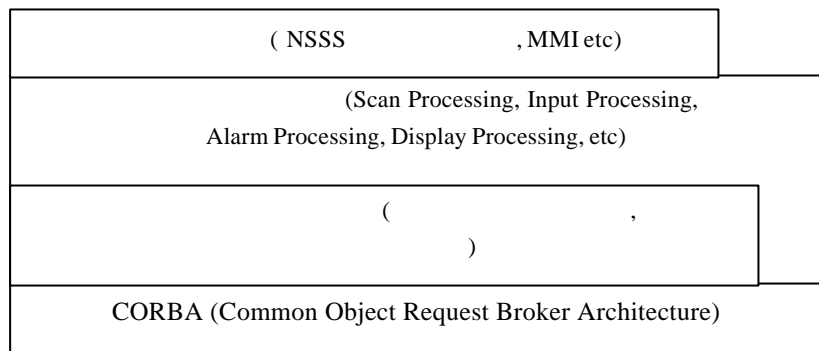
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5.

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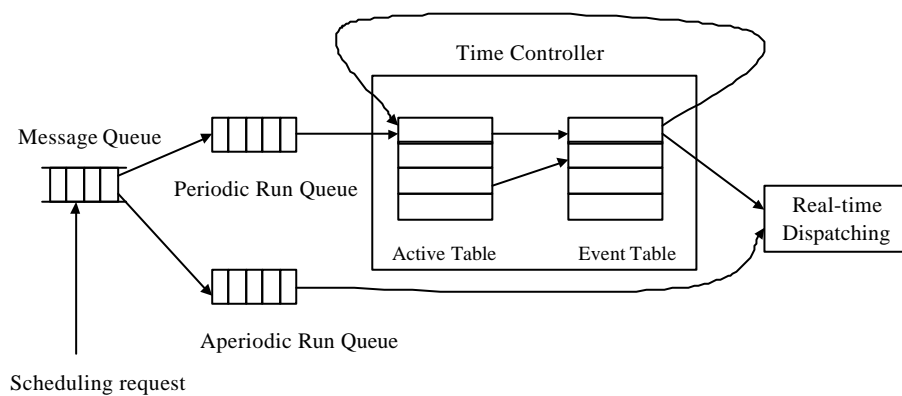






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