

Introduction to Grid Pilot Project

Development of Grid Based Online Game Service

2006.12.01
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Agenda

I. Project Overview

1. Grid Pilot Project Background

II. Development of Grid Based Online Game Service

1. Servers for Grid Application
2. Scheduling Policy for Game Service
3. Grid Monitoring
4. Benefits of Grid Application and Decision for Stable Service

III. Grid Based Online Game Service Operation

1. Grid Based Online Game Service Operation

IV. Results

1. Benefit of Grid Based Online Game Service

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1. Prospects of Grid Based Online Game Service

I. Project Overview

1. Grid Pilot Project Background

Need for Grid Based Online Game Service

Overcoming Resource Utilization Inefficiency Due to Environmental Factors

Unlike electrical power, Internet network service cannot be delivered at the uniform quality unbounded by time or location. That increases the hardware burden on the service providers to ensure stable delivery of the service. (Lack of continued real-time response)

Solving the Overload Problem Due to User's Habits

Since the user connection to the server is not distributed uniformly, the load to the system drastically increases during the time of concentrated connection. (Degraded service quality due to traffic hike)



Increased Efficiency/Stability from Application of Grid Technology

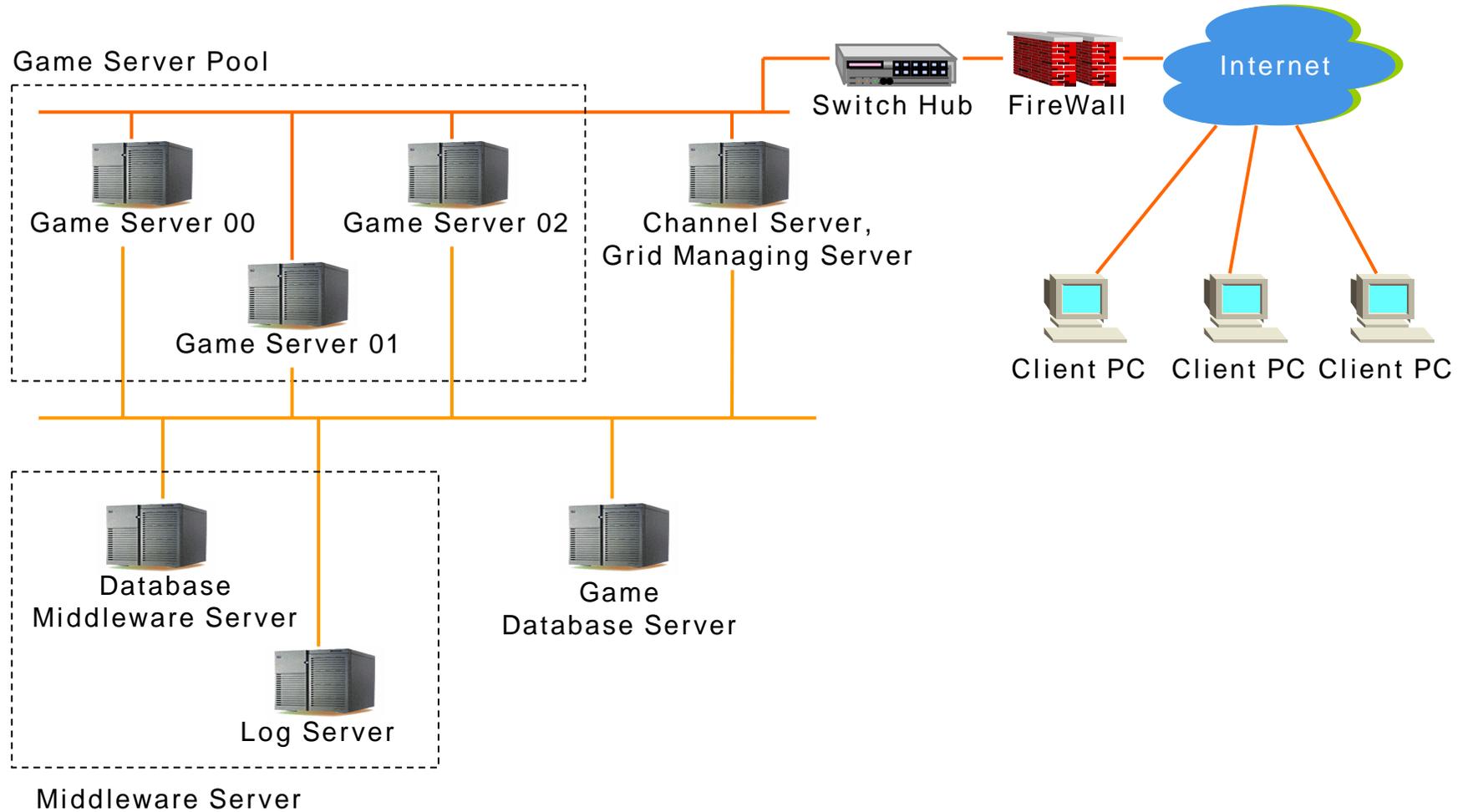


[Service System Operation Enhancement /
Customer Service Quality Improvement]

II. Development of Grid Based Online Game Service

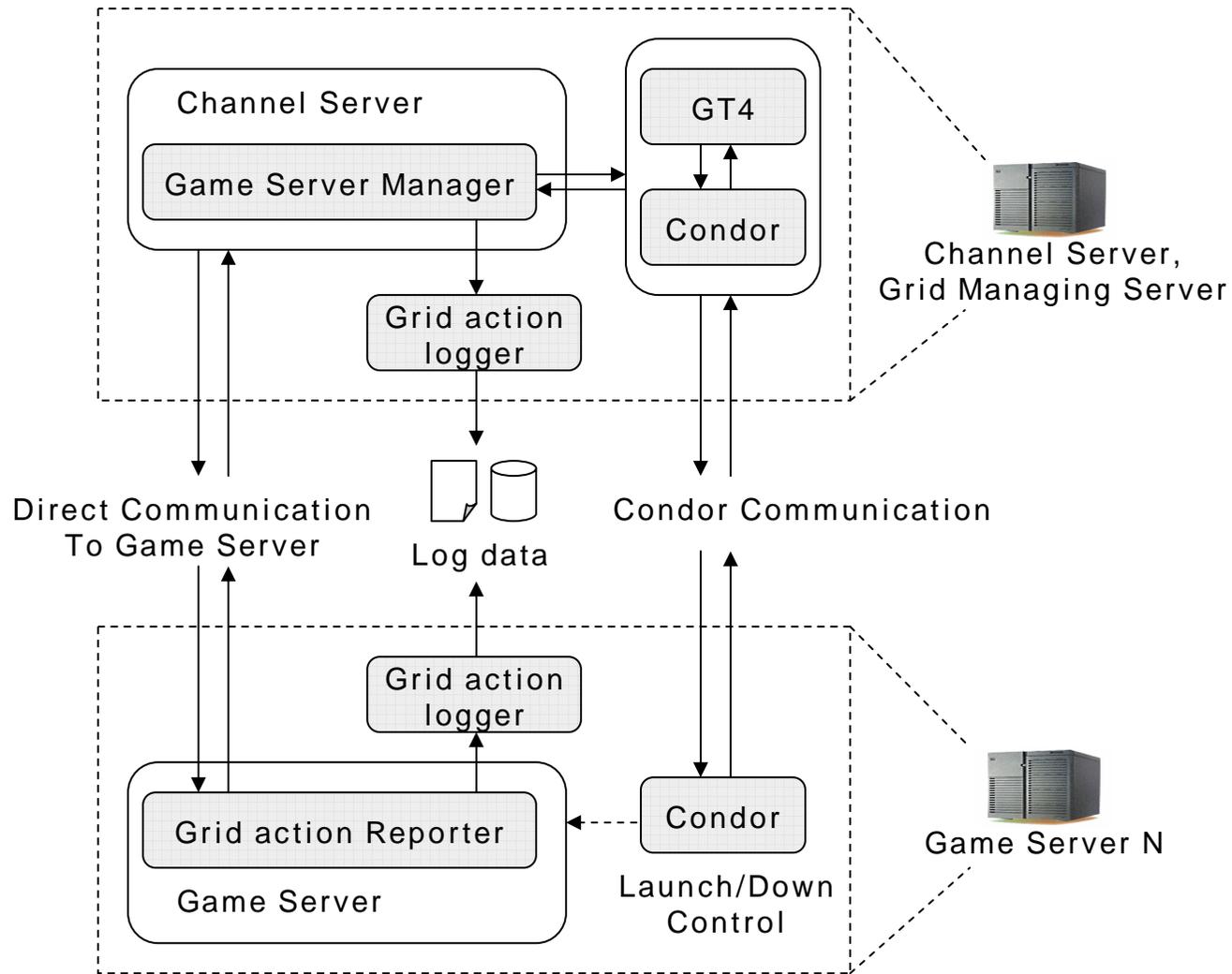
1. Servers for Grid Application

1.1. 'Korean Card Game' Server Hardware for Grid Application



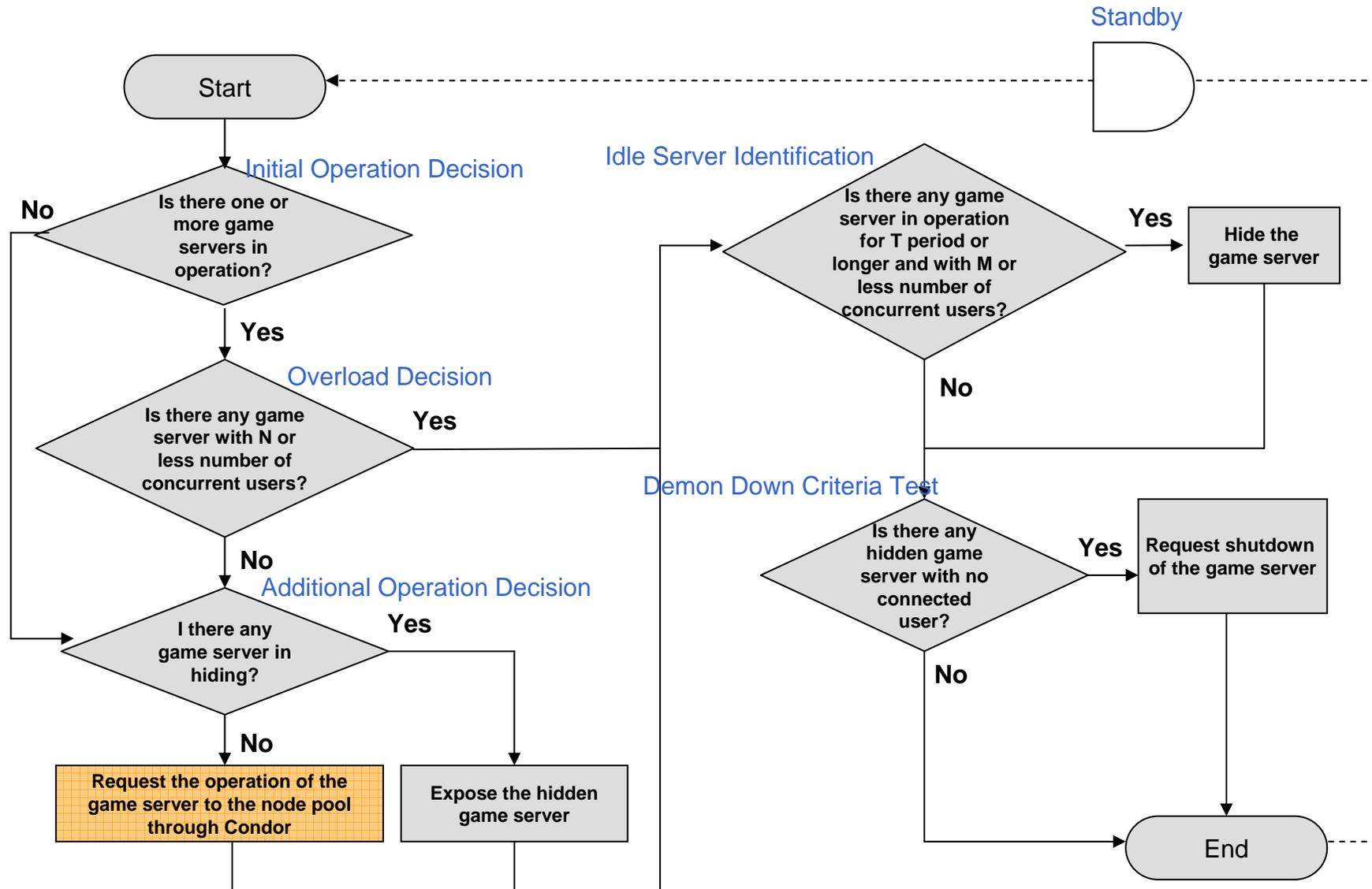
1. Servers for Grid Application

1.2. 'Korean Card Game' Logical Server Structure for Grid Application



2. Scheduling Policy for Game Service

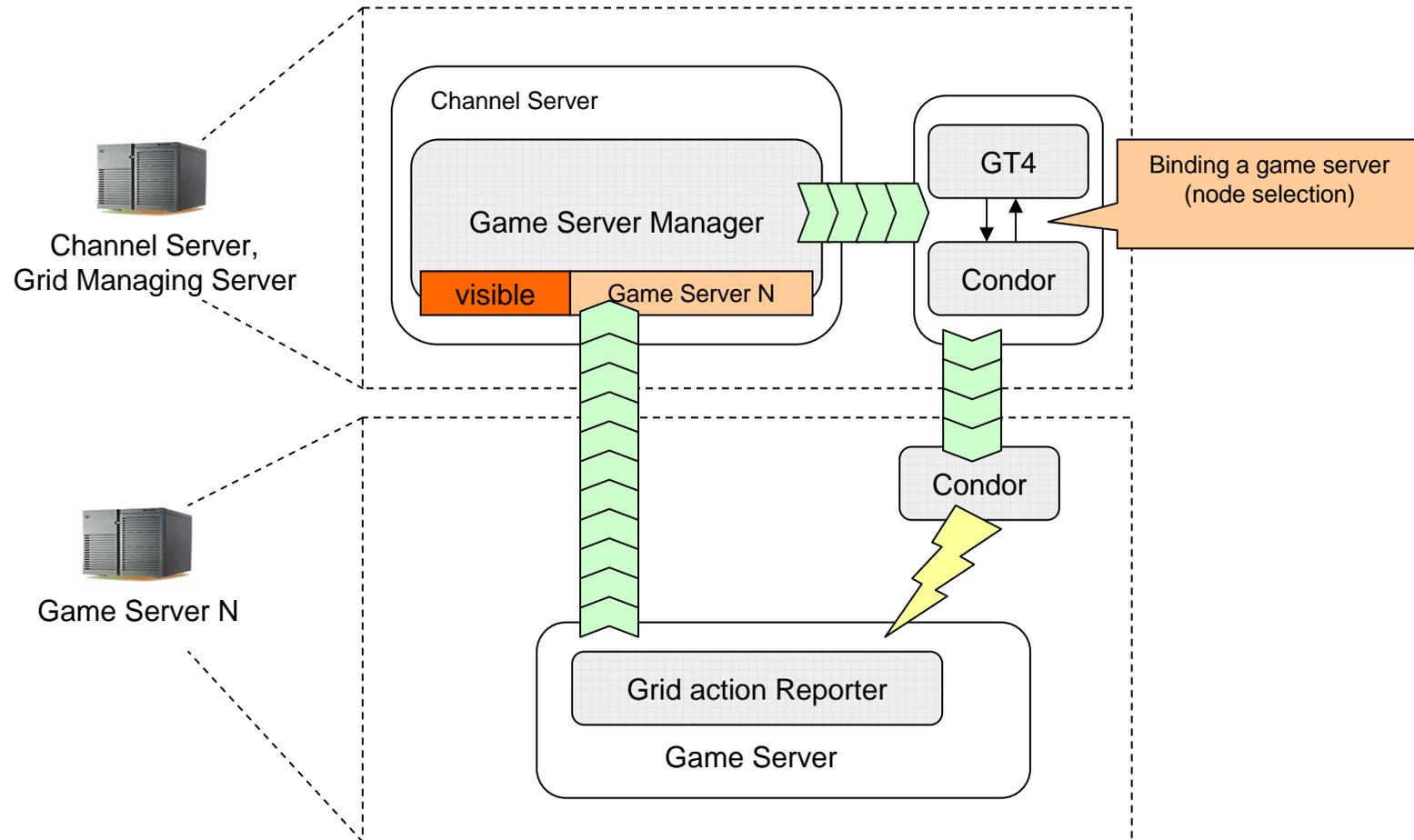
2.1. Scheduling Logic for Channel Server with Grid Application



2. Scheduling Policy for Game Service

2.2. Operation/Hiding/Shutdown of a Game Server

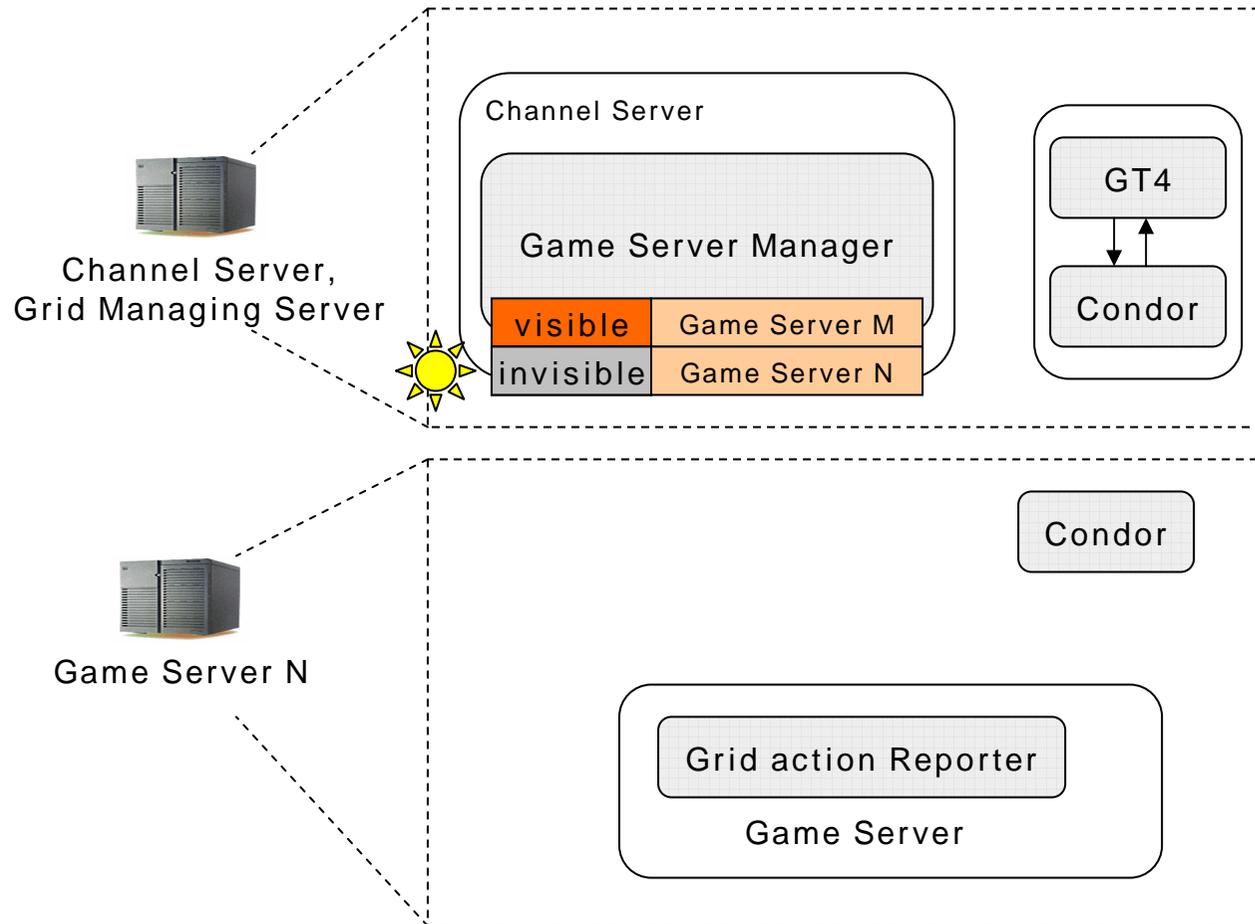
Operating a Game Server



2. Scheduling Policy for Game Service

2.3. Operation/Hiding/Shutdown of a Game Server

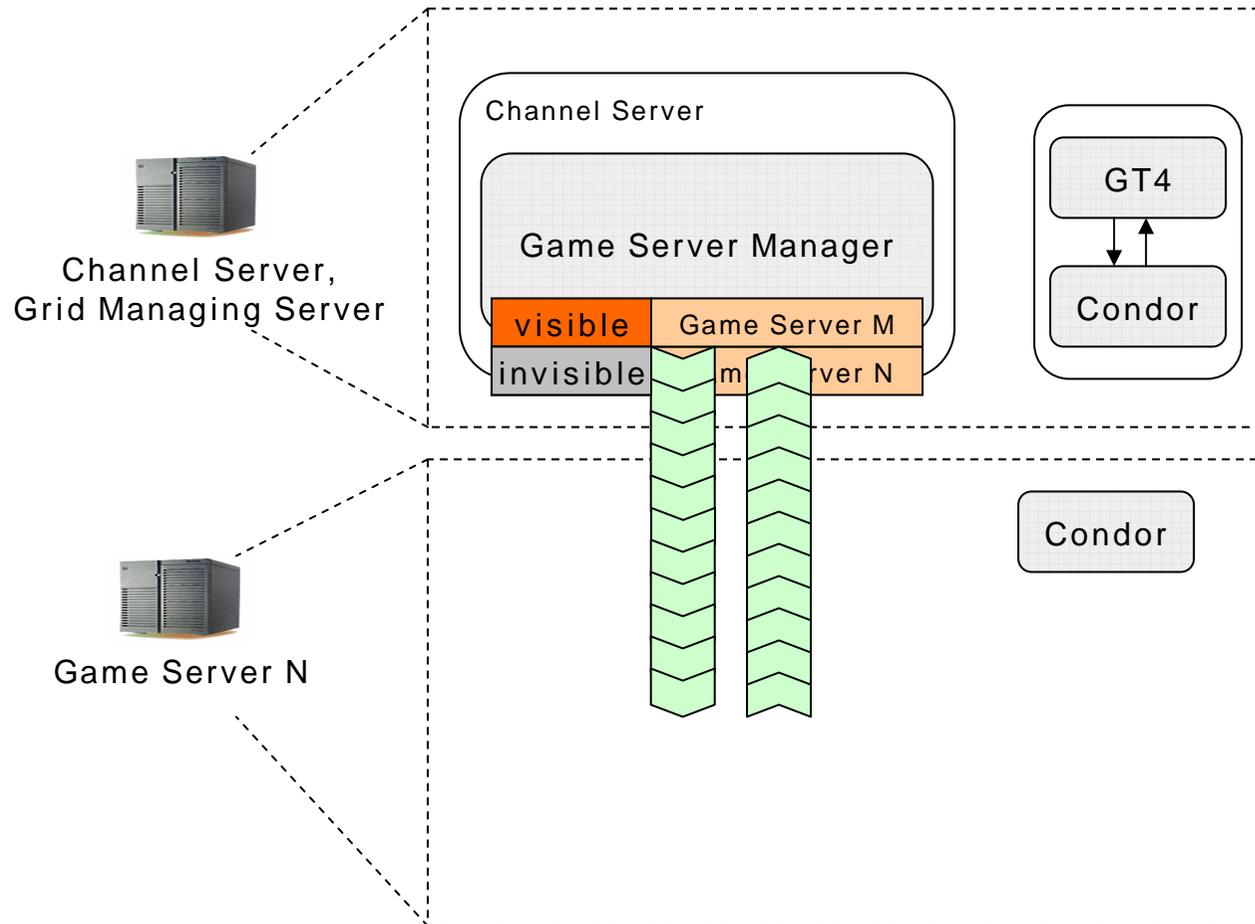
Hiding a Game Server



2. Scheduling Policy for Game Service

2.4. Operation/Hiding/Shutdown of a Game Server

Shutting Down a Game Server

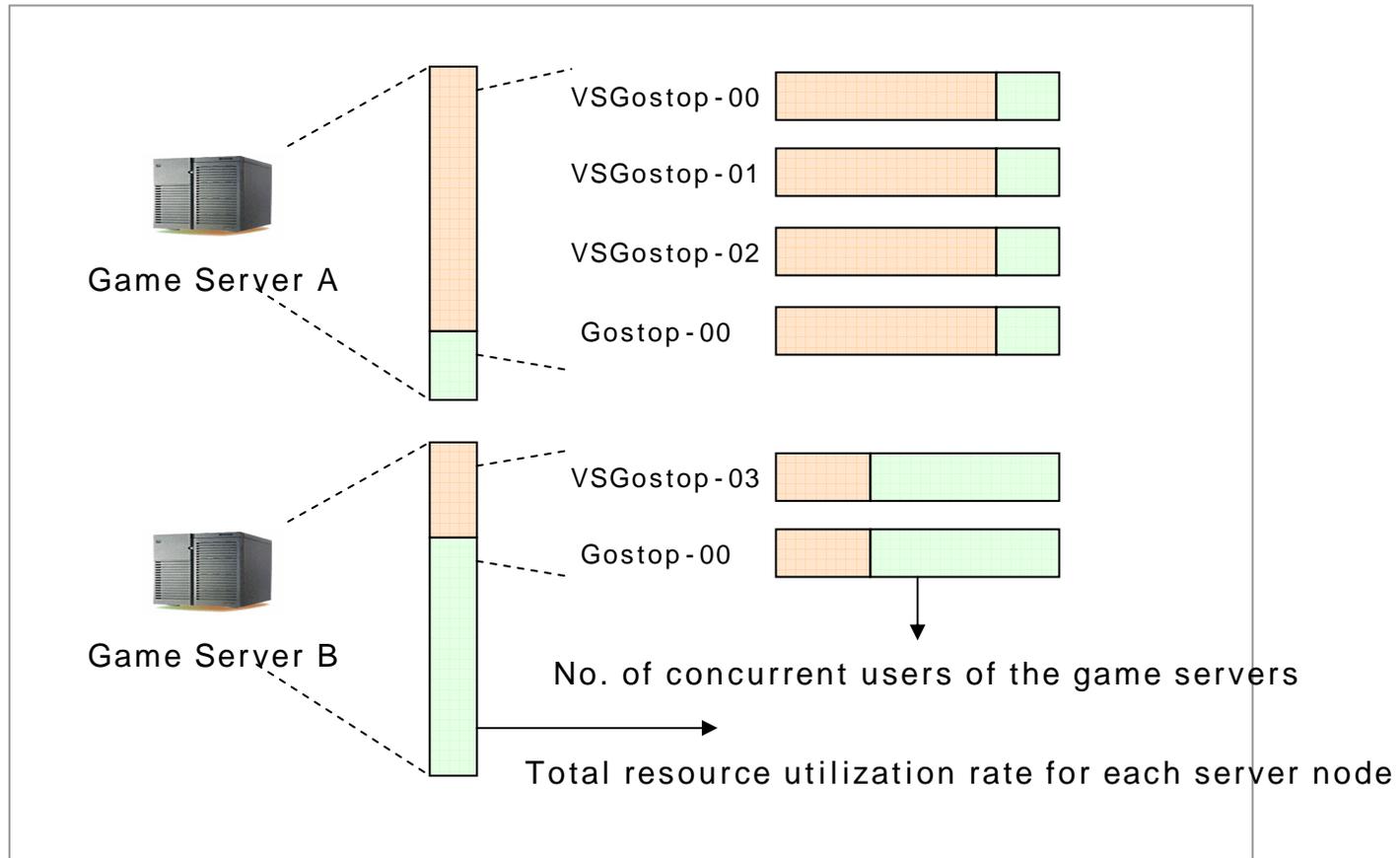


3. Grid Monitoring

3.1. Monitored Data

Total resource utilization and hourly change for each server node

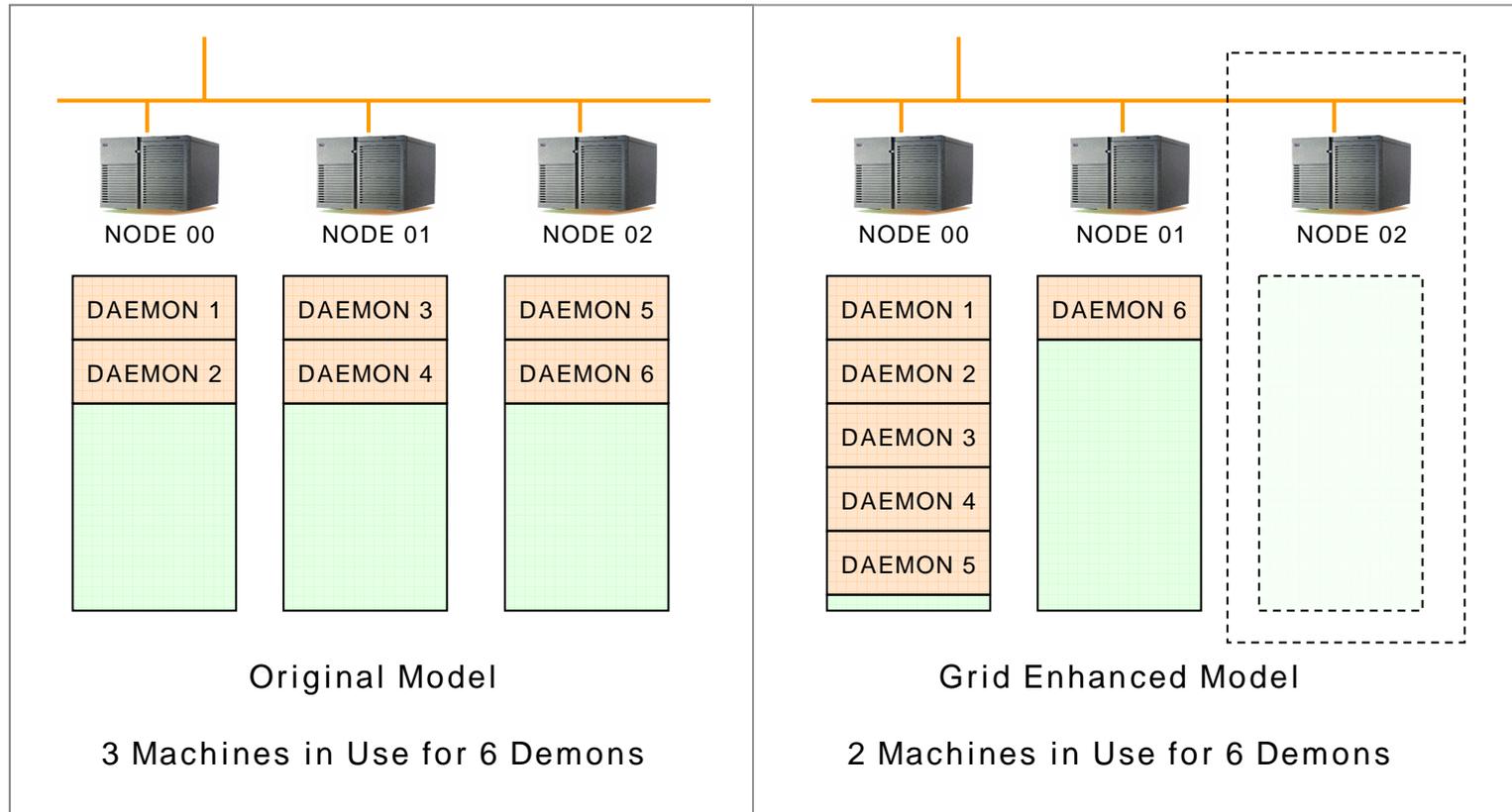
No. of concurrent users and hourly change of the serviced game server for each server node



4. Benefits of Grid Application

4.1. Benefits of Grid System

Reduced Hardware Expense For the Same Level of Service Quality



Flexible arrangement of the game servers to encourage the user concentration with the benefit of community concentration.

III. Grid Based Online Game Service Operation

1. Grid Based Online Game Service Operation

1.1. Service Operation

A. Providing a game site for the users to experience the grid system

Step 1: Operation of the test game to verify the stability of the grid system

Step 2: Operation of the commercial games to verify the efficiency of the grid system

[Ho-dong Kang 2-Player Korean Poker Site]



B. Link between the contents to attract more users

- Banner and site link installed on other game client

C. Customer support window to ensure user convenience and management

- Customer Center (FAQ,Q&A,E-mail) / Call Center / Visit Service

D. Study of the games with grid system

- Understanding of the user requirements and presentation of the system improvement direction

E. System monitoring / fault processing and backup / security monitoring / operation DB

1. Grid Based Online Game Service Operation

1.1. Service Operation

F. Promotion

Attracting New Subscribers	The users' visit to the game sites are recorded, and the various incentives of visiting the game sites are offered to attract more uses.
Incentives of Playing Games	<ol style="list-style-type: none">1. Awards according to the game score, mission accomplished and playing time.2. Awards according to the game result as an incentive for the users to plan the game longer.
Encouragement of User Participation	Outstanding Reporter Award: The users posting good reports are awarded with gifts to encourage them to present more opinions to improve the service.
Public Promotion	Events linked with the various services (search, blog, etc.) of Empas

IV. Results

1. Benefits of Grid Based Online Game Service

1.1. Efficiency of using resource is improved

A. Efficiency of Software resource is improved

Efficiency of Software resource is 65% up

Daemons for Game are operated (bind / down) by scheduling system that is under the control of Grid System.

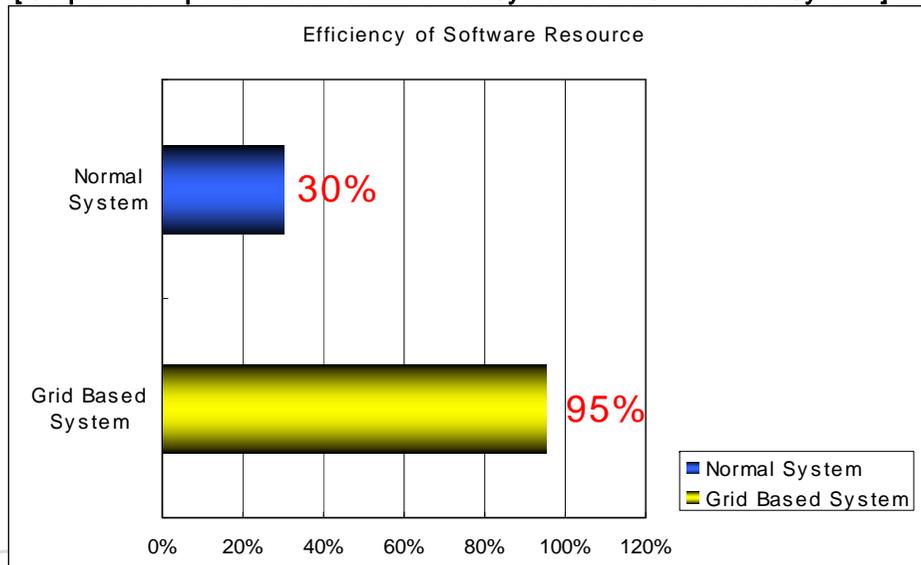
Condition

- 2,100 of users are using online game service

[Table1. comparison between Normal System and Grid Based System]

	Number of Daemon (bound / reserved)	max receptive users	Efficiency of Software Resource
Grid Based System	11/35	2200	95%
Normal System	35/35	7000	30%

[Graph1. comparison between Normal System and Grid Based System]



$$\text{Efficiency of Software Resource (\%)} = A / B * 100$$

A : Number of users who are connected in service
B : max receptive users

1. Benefits of Grid Based Online Game Service

1.1. Efficiency of using resource is improved

B. Cost for Hardware resource is saved

Cost for Hardware resource is 75% down

Machines for service are operated (used / down) by scheduling system that is under the control of Grid System.

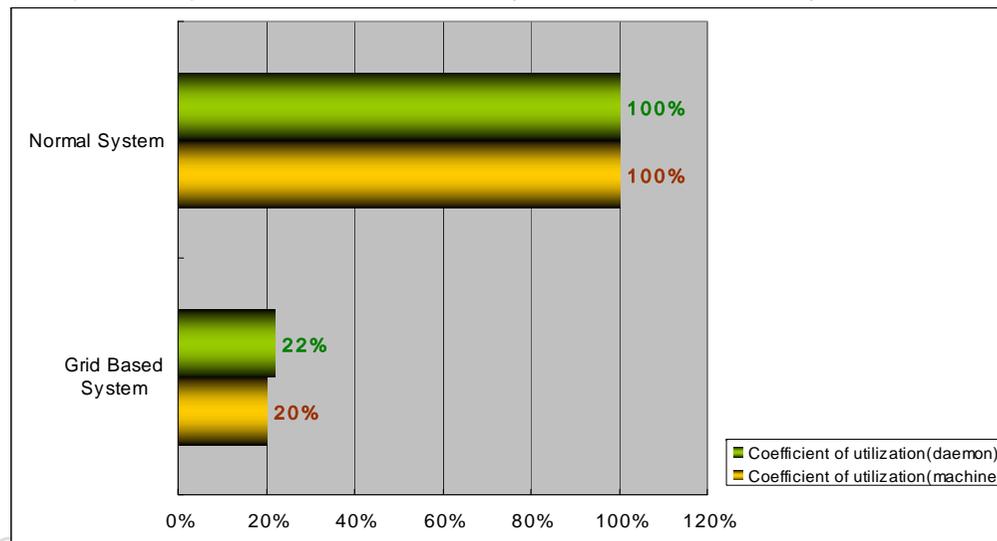
Condition

- 2,100 of users are using online game service

[Table2. comparison between Normal System and Grid Based System]

	Number of Machine (used / reserved)	max receptible daemon	Bound daemon in a day	Coefficient of utilization (machine)	Coefficient of utilization (daemon)
Grid Based System	1 / 5	50	11	20%	22%
Normal System	5 / 5	50	50	100%	100%

[Graph2. comparison between Normal System and Grid Based System]



Coefficient of Utilization [machine] (%)
= used machine / reserved machine * 100

Coefficient of Utilization [daemon] (%)
= bound daemon in a day / max receptible daemon * 100

1. Benefits of Grid Based Online Game Service

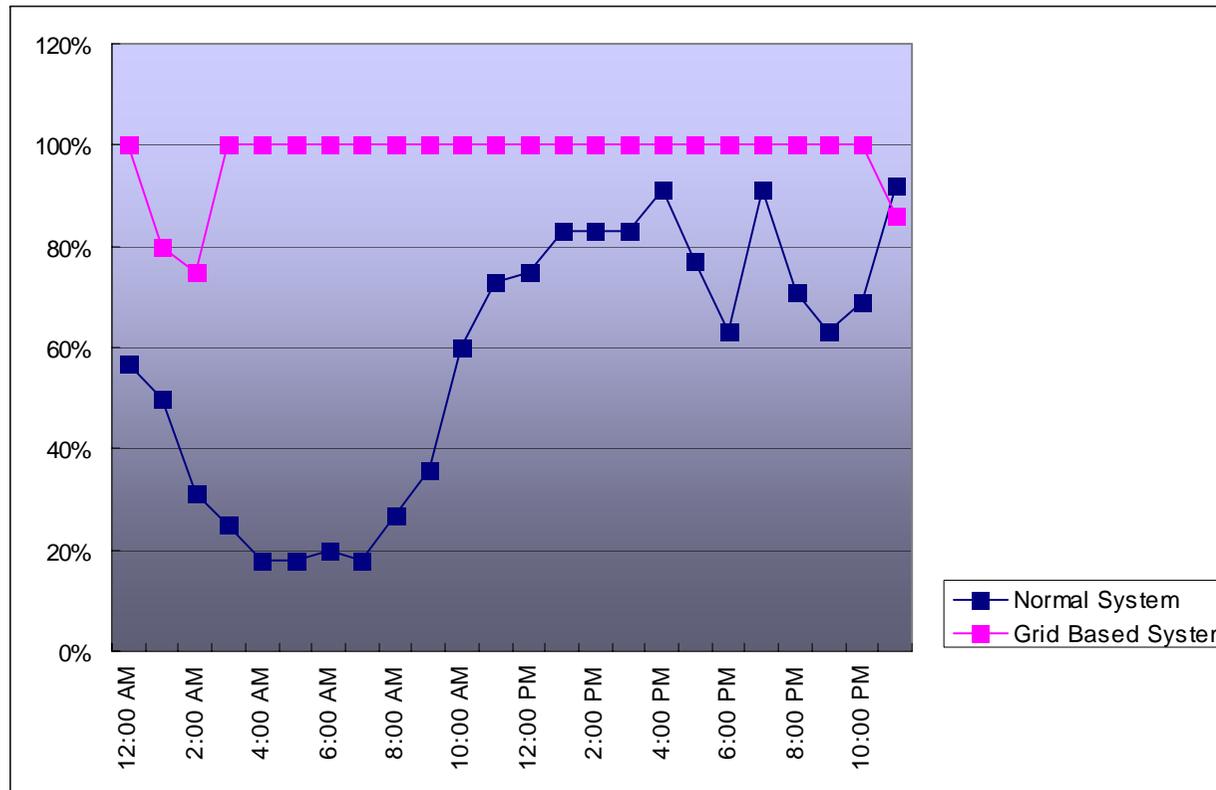
1.2. Boom up the user community

A. Coefficient of gathering who connect the service is improved

Coefficient of gathering is 82%(max) up

Game channels that users can connect is controlled (visable / invisible) by scheduling system that is under the control of Grid System.

[Graph3. comparison between Normal System and Grid Based System]

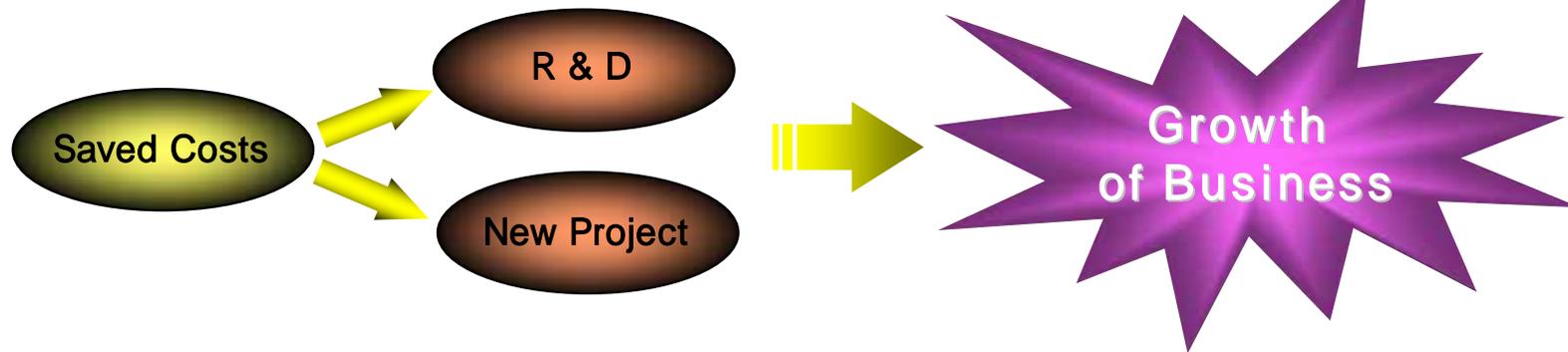


V. Prospects

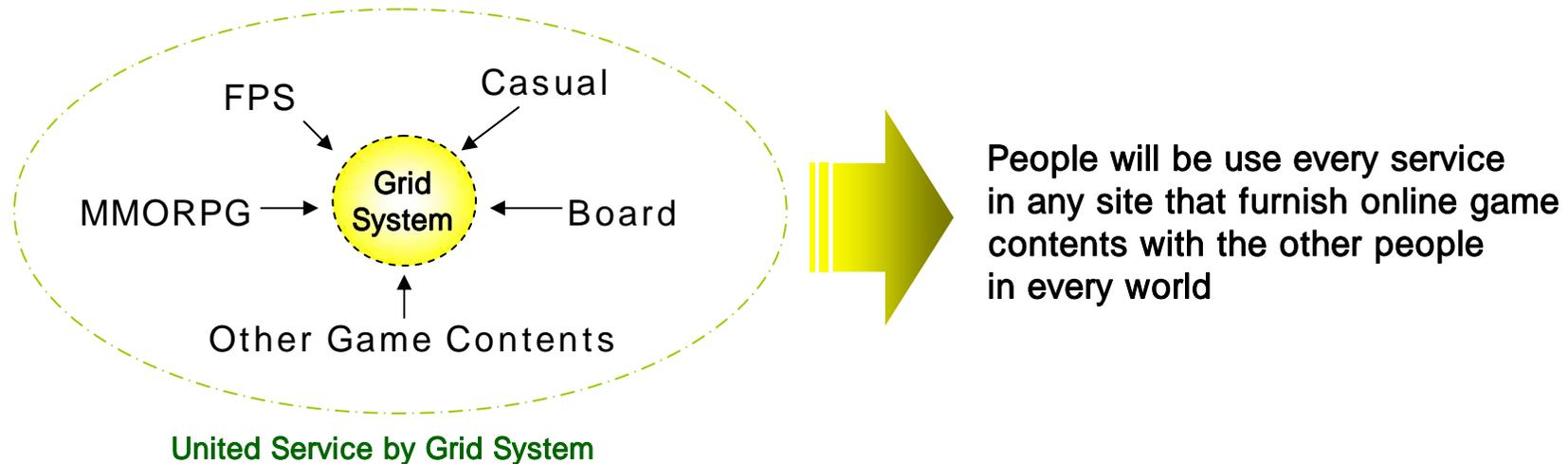
1. Prospects of Grid Based Online Game Service

1.1. The Future of Grid Based online Game Service

* A business – R&D about game service for better quality / New Project - will be activated.



* Online Game Service will be united.



End