

SuperMap iServer Cluster

SuperMap Software Co., Ltd.



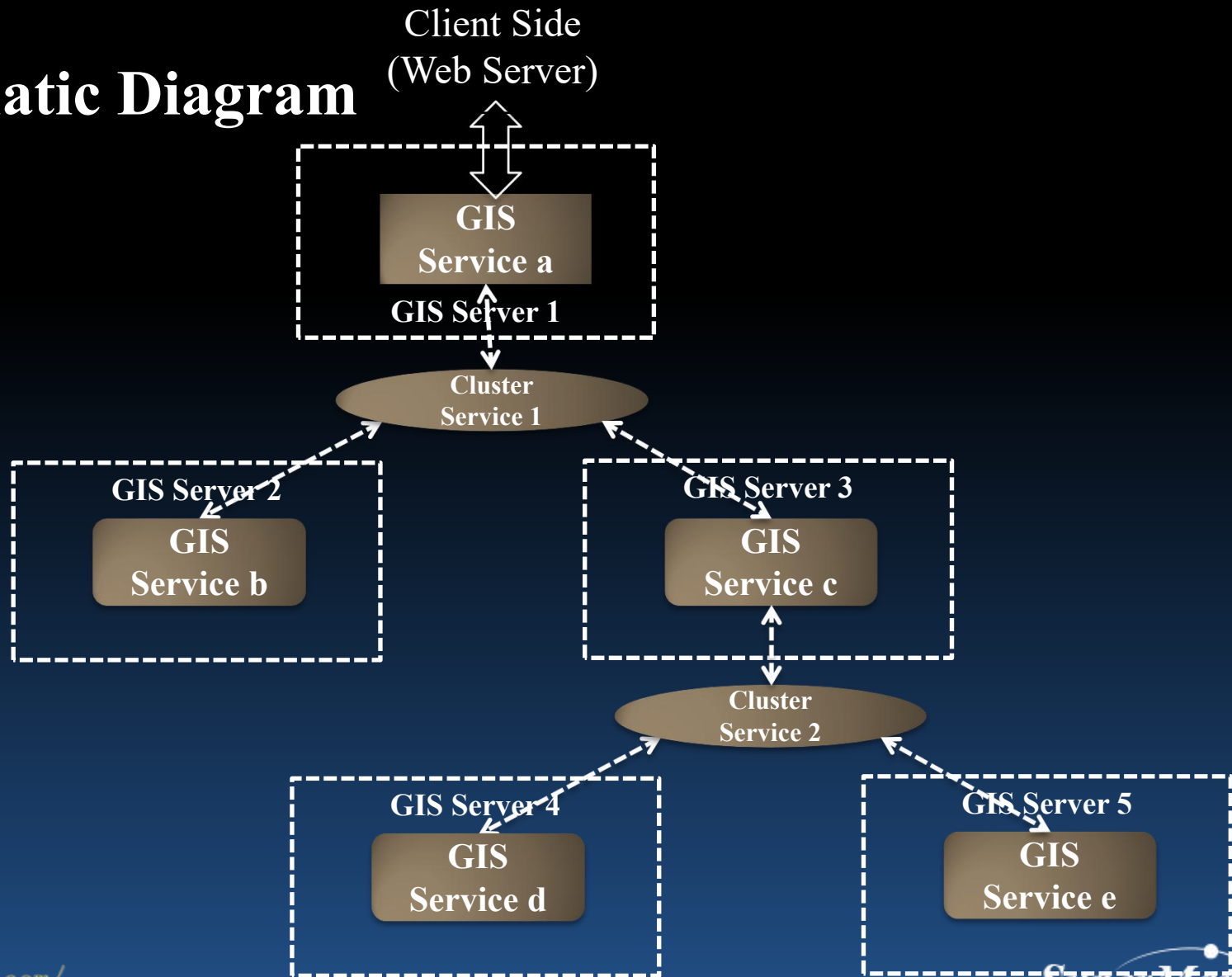
Main Contents

- **Brief Introduction of Cluster**
 - **Functions of cluster**
 - **Classification of cluster**
 - **Structure of cluster**
 - **Roles in cluster and their responsibility**
- **Cluster Configuration**

Notice: The iServer mentioned in the class are all for SuperMap iServer product if there is no special description.

Brief Introduction of Cluster

- Schematic Diagram

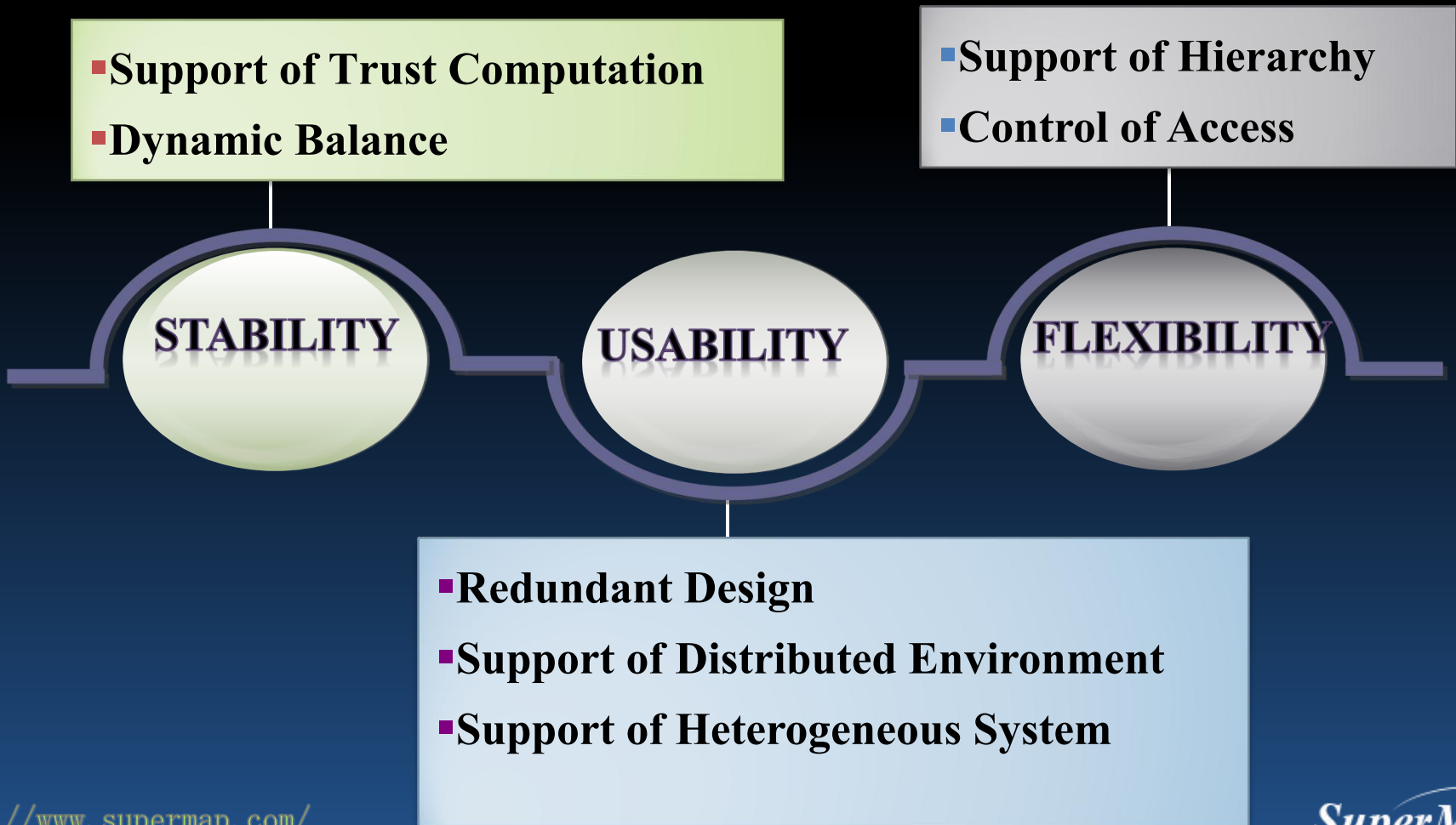


Brief Introduction of Cluster

- **SuperMap iServer Cluster System**
 - **Cluster system is a transparent scalable GIS service system.**
 - **System provides GIS services to the client side externally, manage and assign the GIS services internally.**

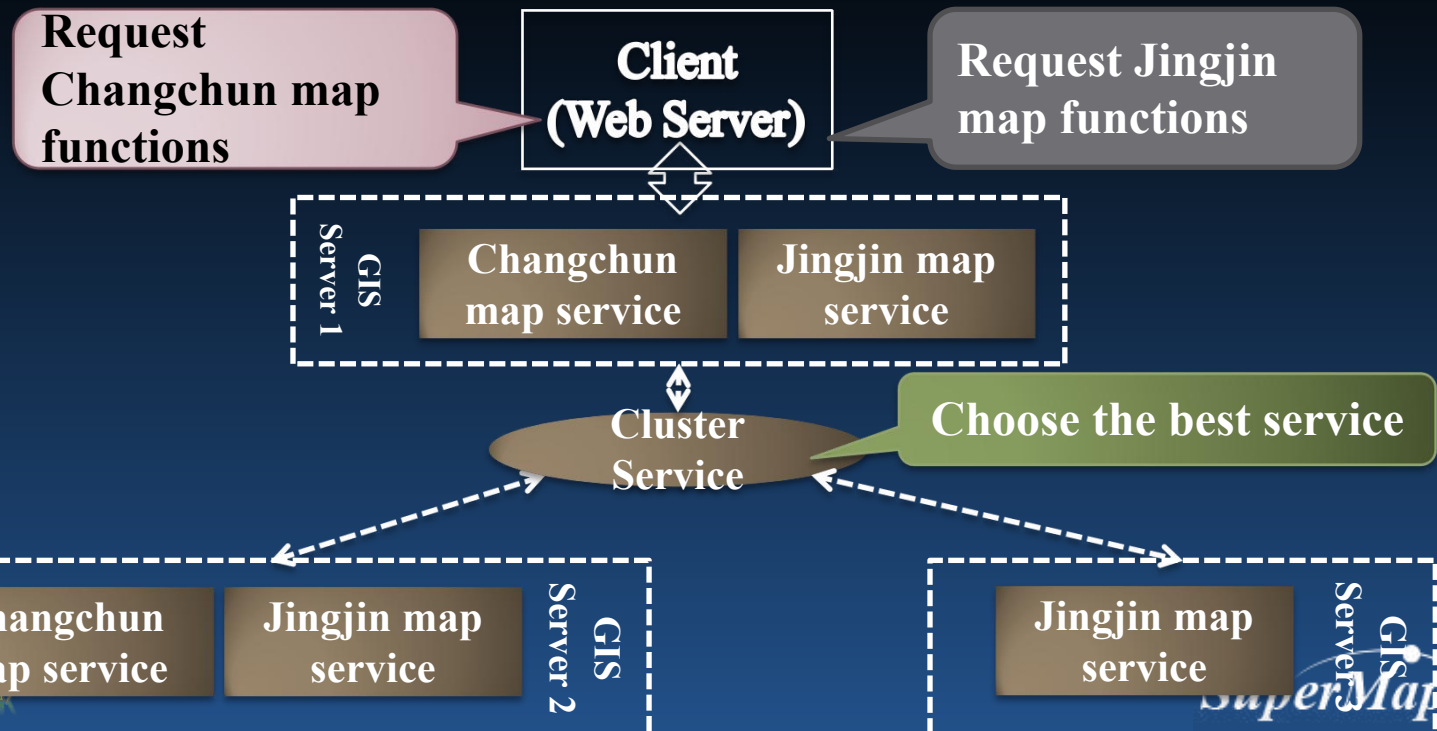
Brief Introduction of Cluster

- **Function of Cluster**



Brief Introduction of Cluster

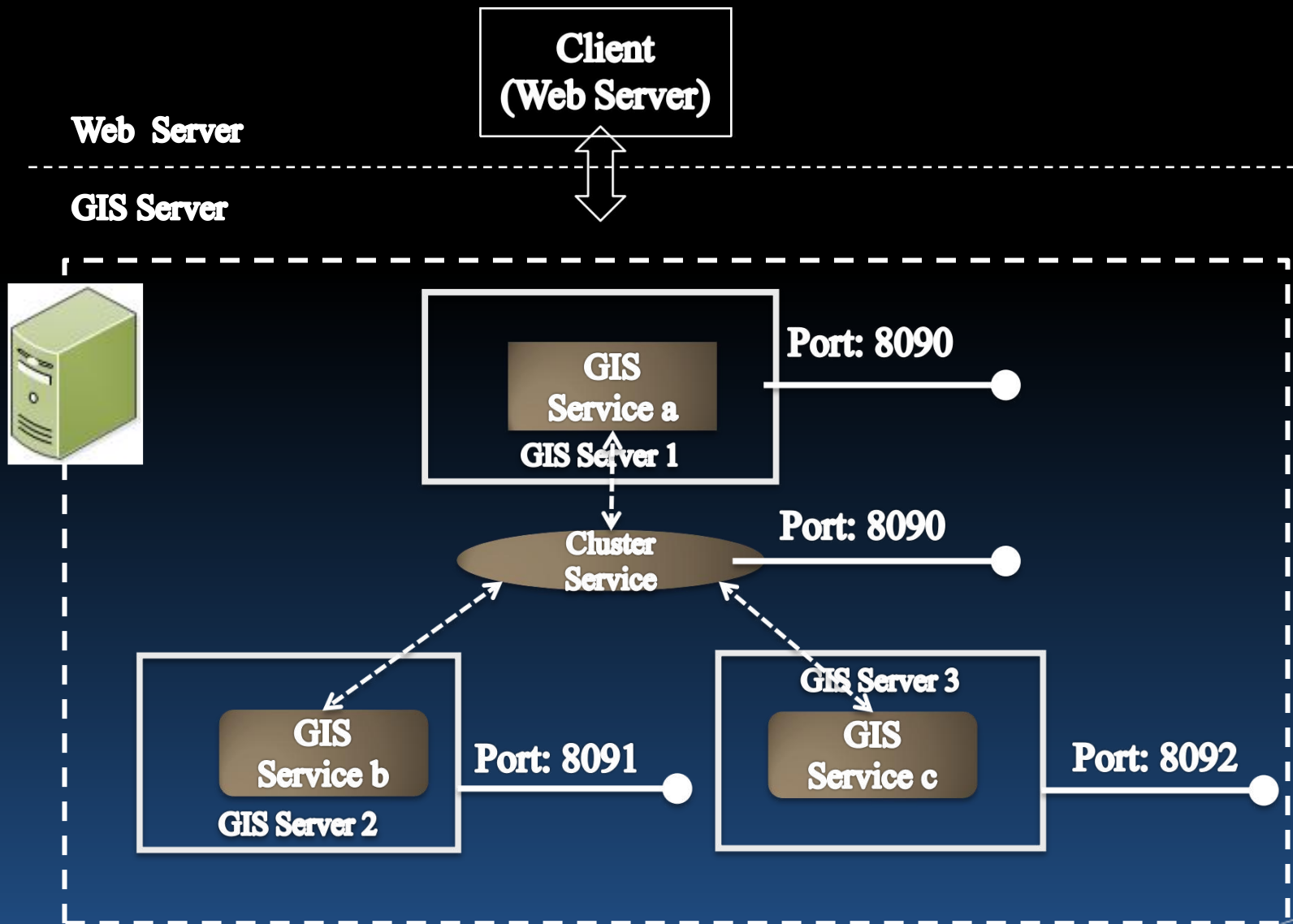
- The control range of cluster service
 - Take the GIS server as unit to join/use the cluster, which means all the services in one server will join/use the cluster
 - Cluster service will find the best GIS service according to the requested map name



Brief Introduction of Cluster

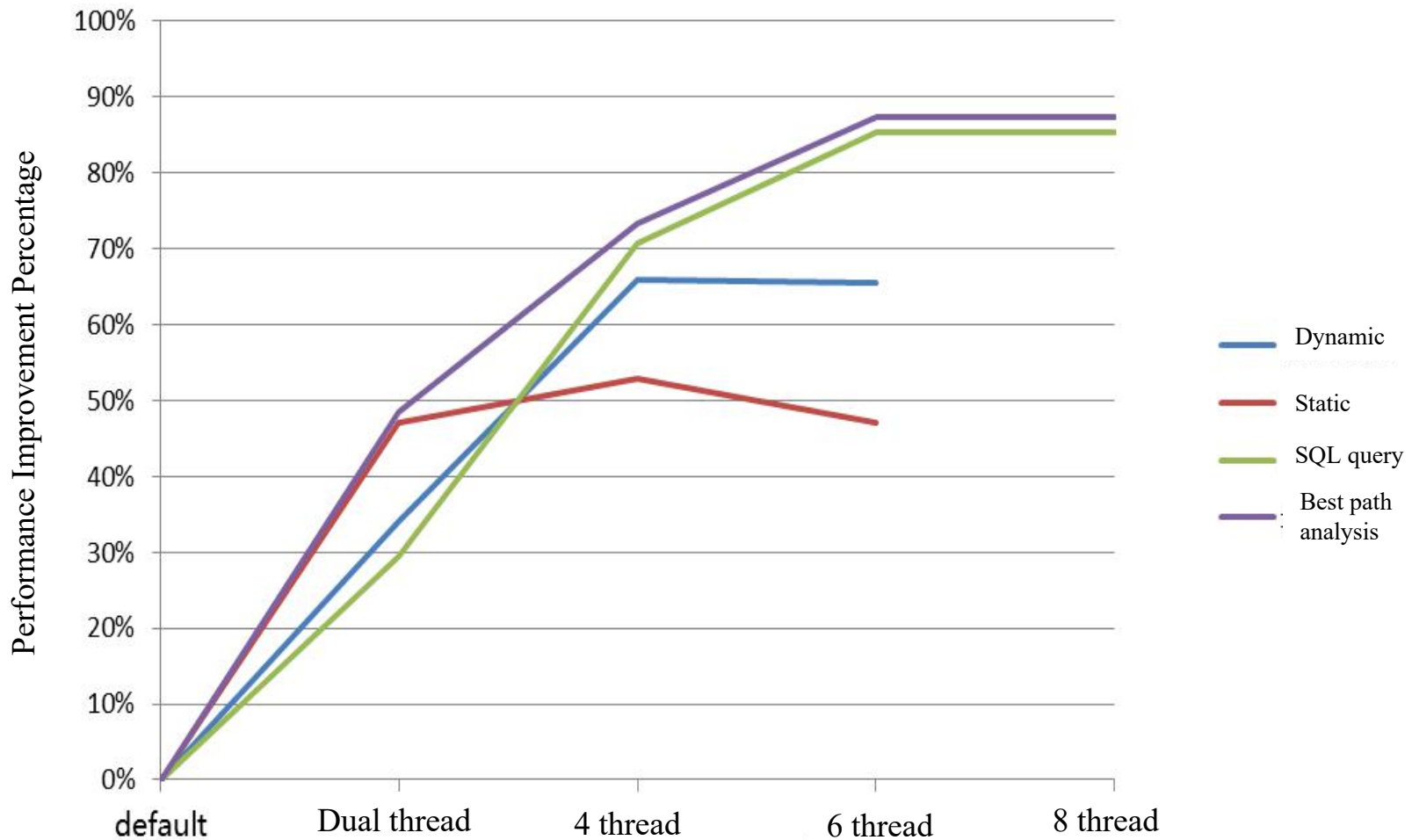
- **Classification of Cluster**
 - **Multiple process cluster on single computer**
 - **Multiple level cluster**
 - **Multiple computer/Multiple application cluster**

Multiple Process Cluster on Single Computer

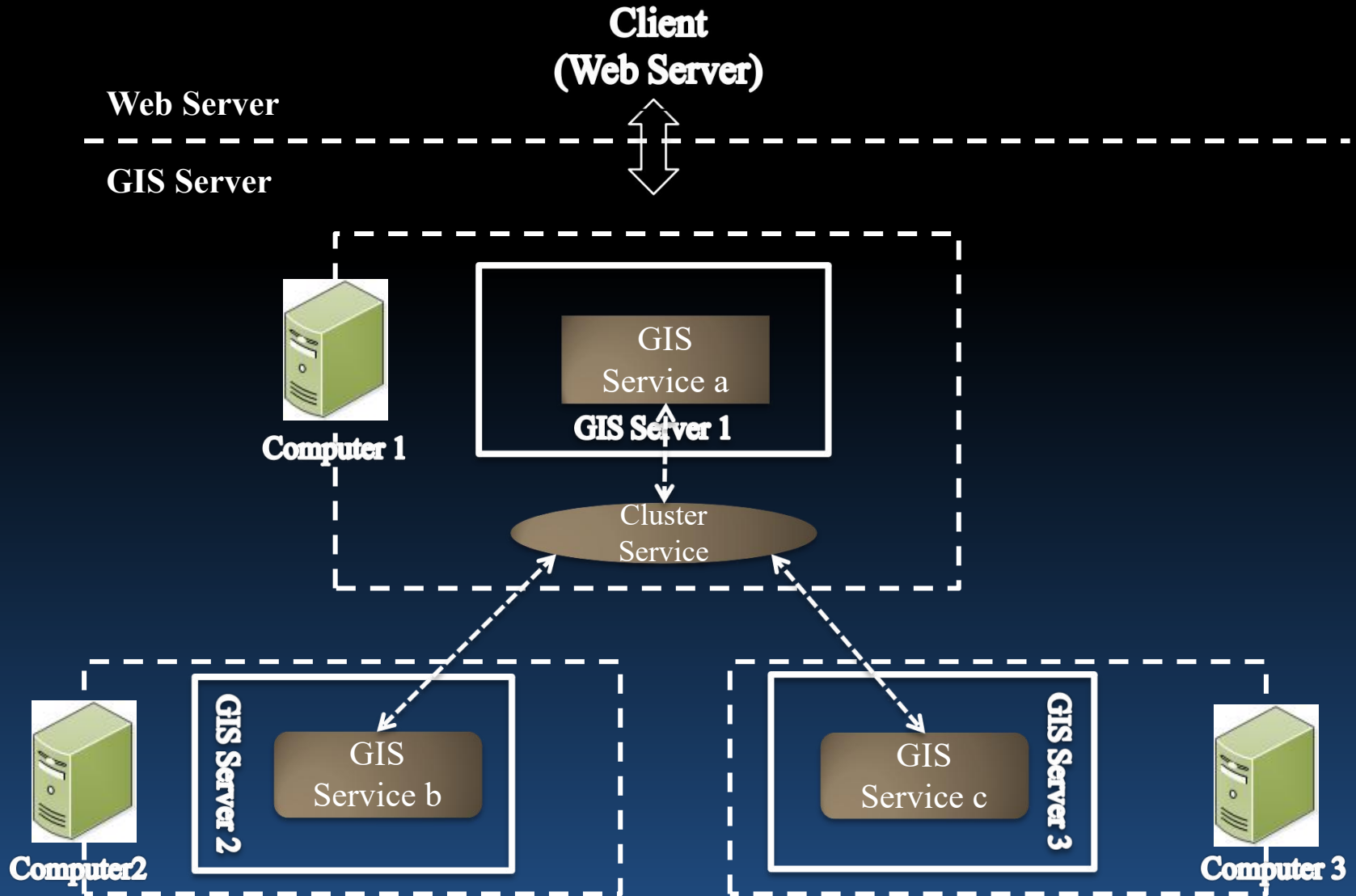


Multi-thread on single machine – performance comparisons

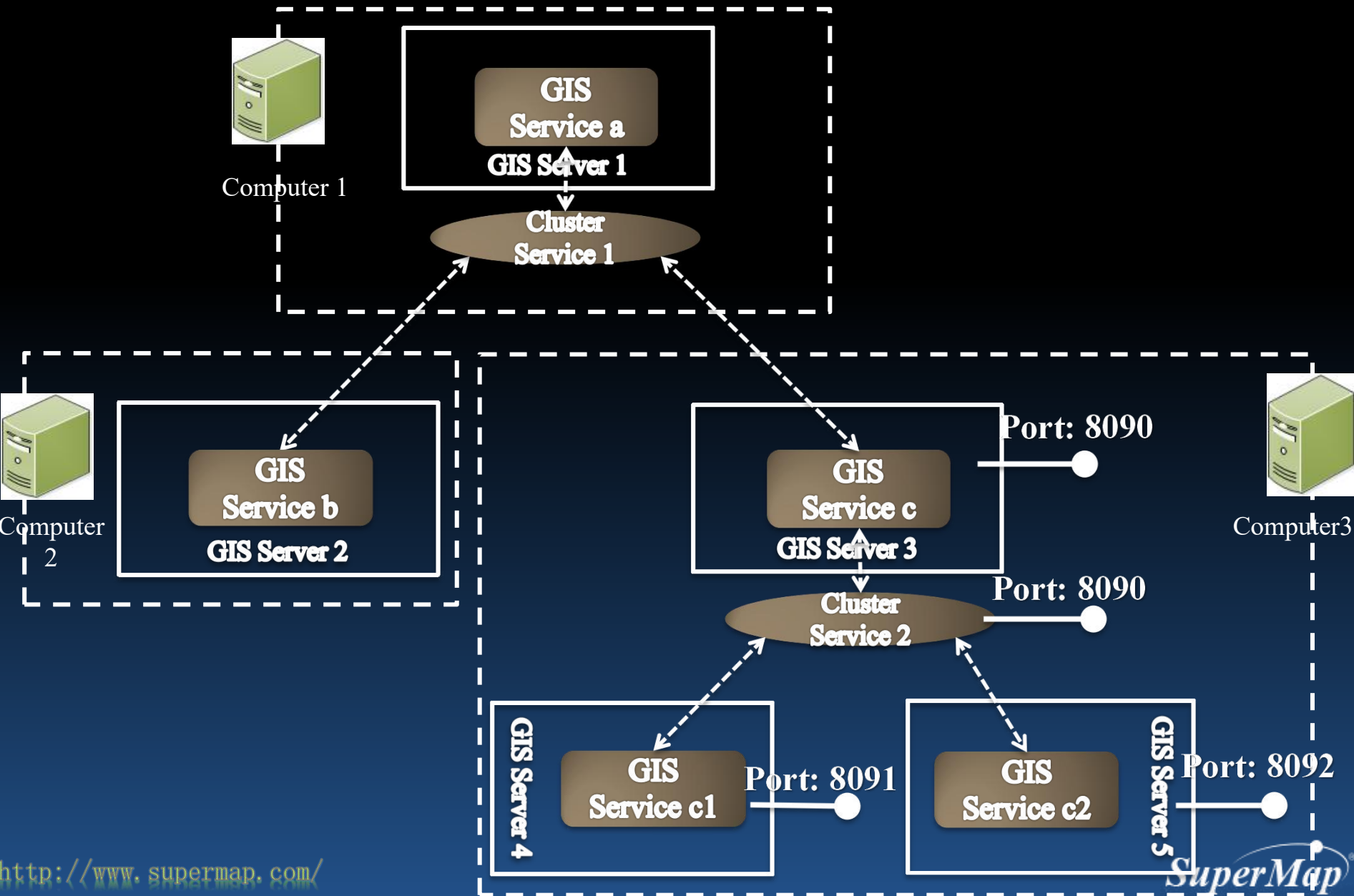
Cluster performance improvement on single machine (100 user in concurrency)



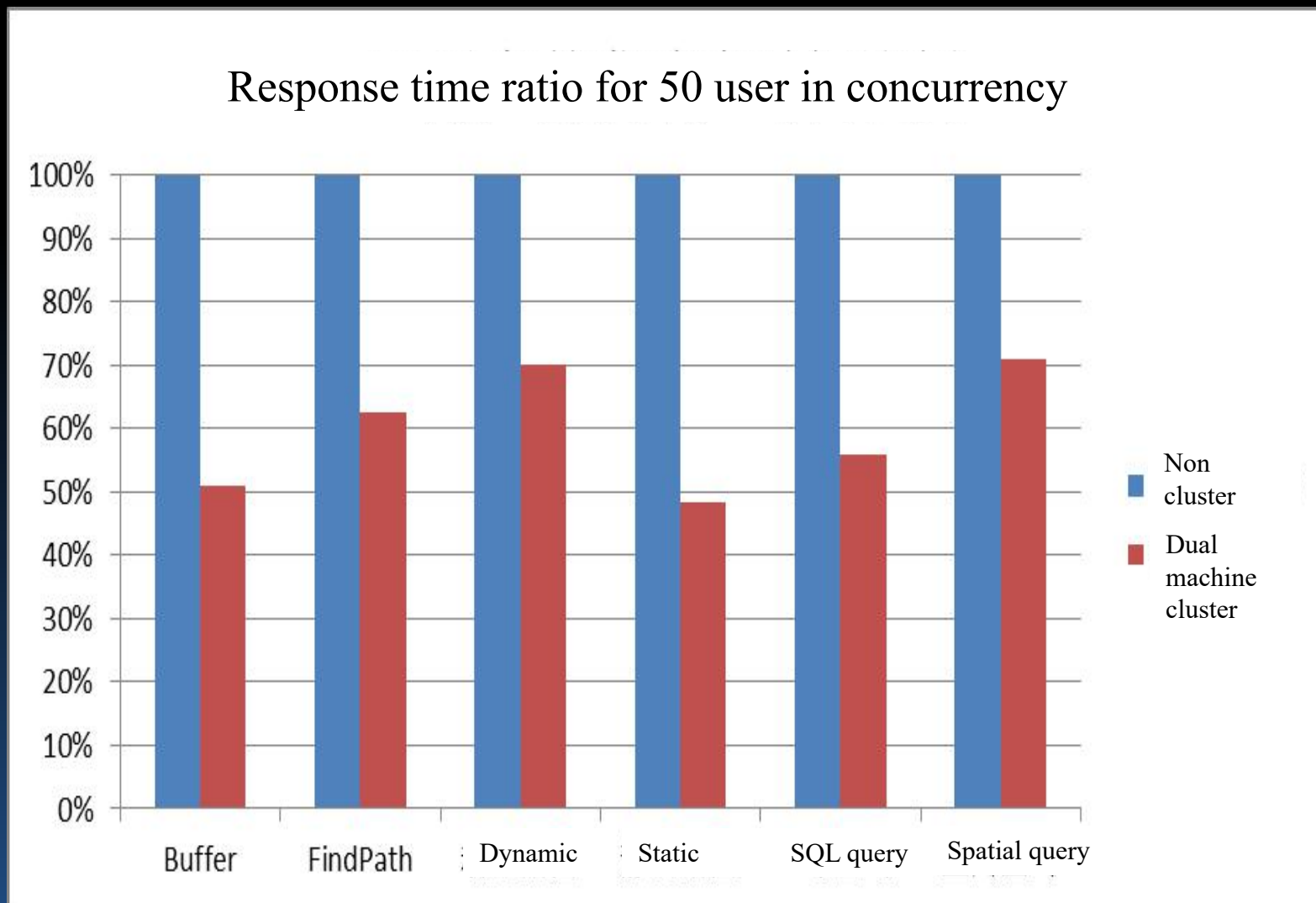
Multiple Level Cluster



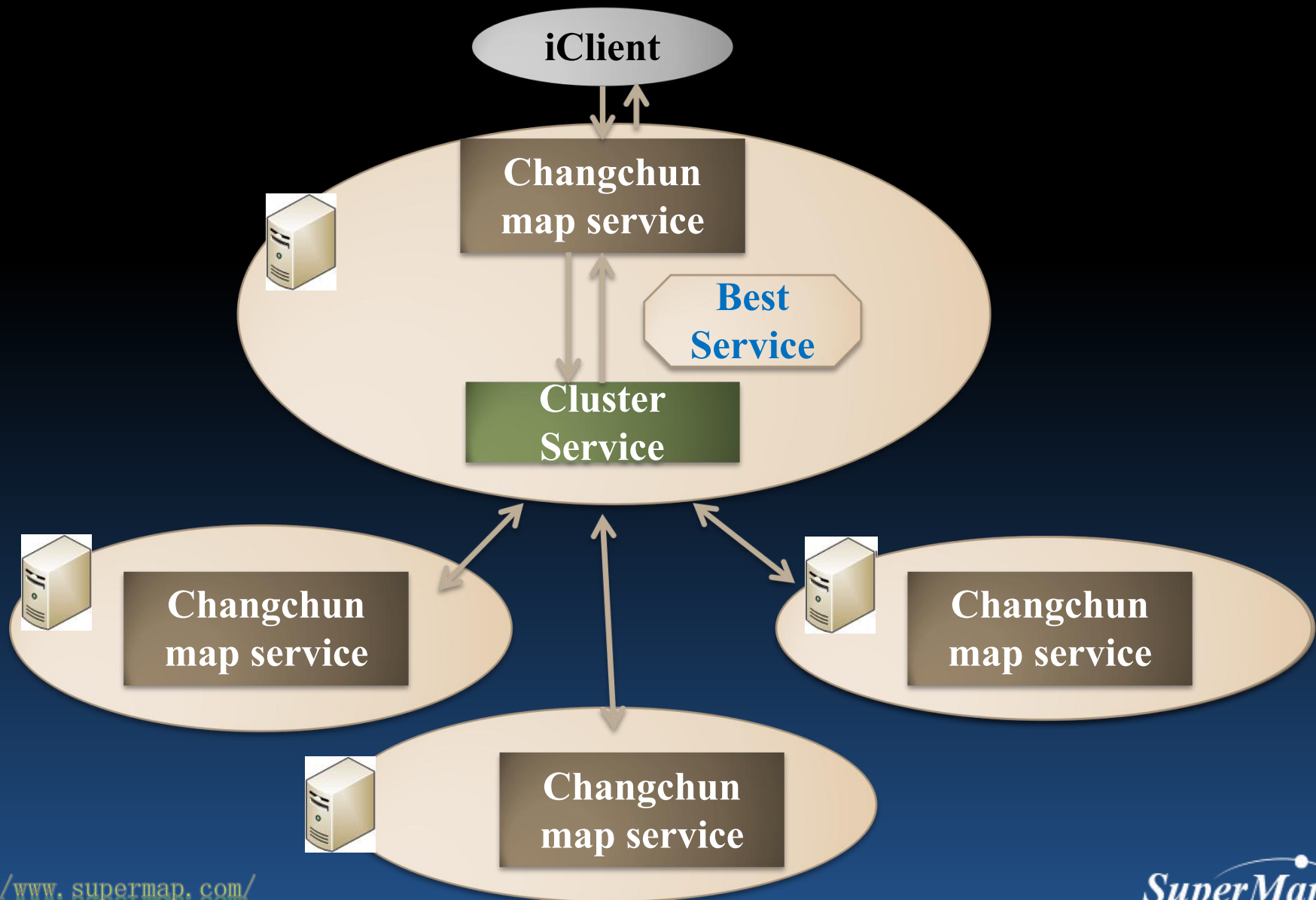
Multiple Level Cluster on Multiple Machines



Response time ratio for 50 user in concurrency

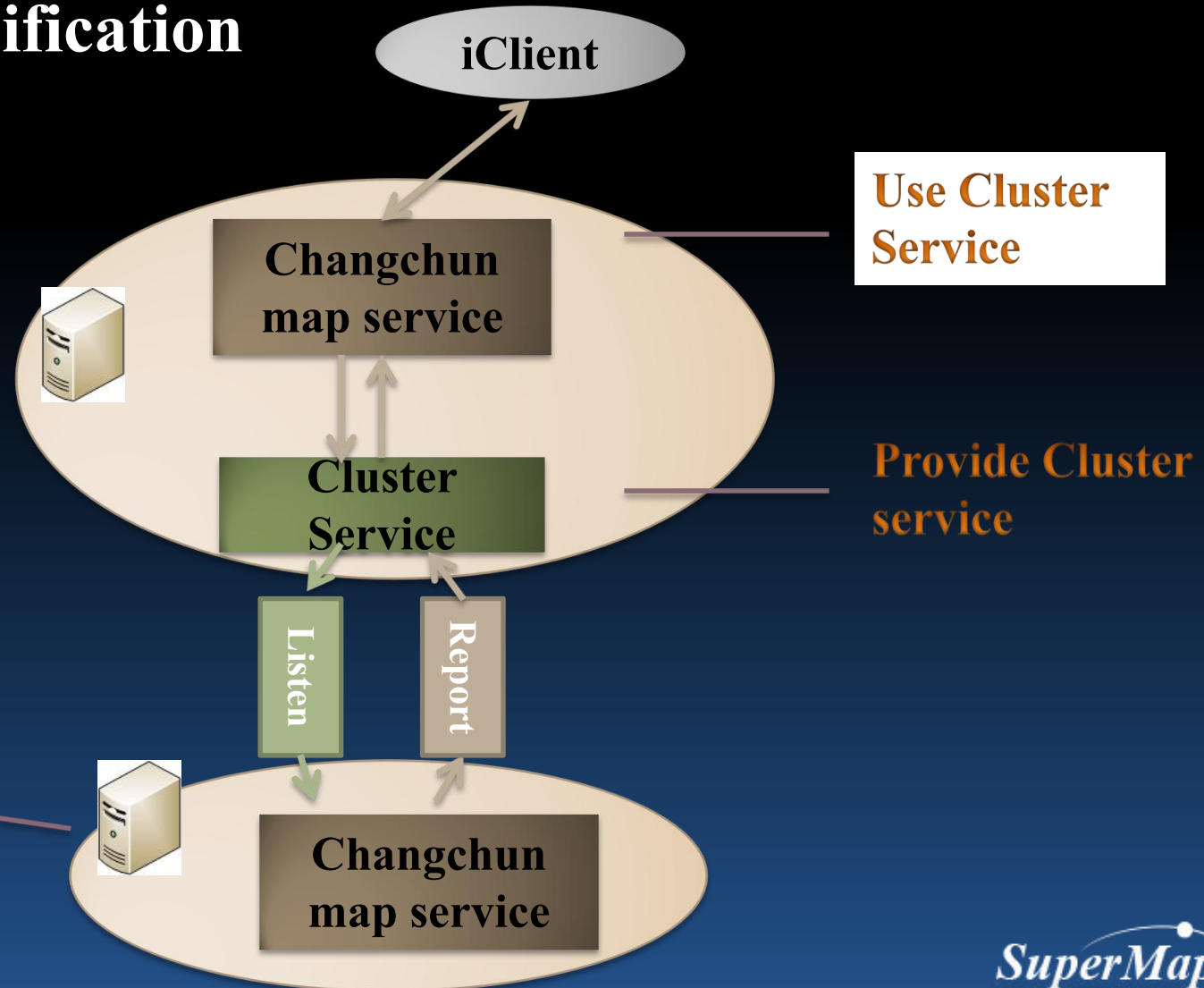


The Operation Process of Cluster



Brief Introduction of Cluster

- **Role Classification**



Brief Introduction of Cluster

- **Responsibility of Roles**

Use Cluster Service

- **Whether to get the cluster service**
- **Cluster service address**

Provide Cluster Service

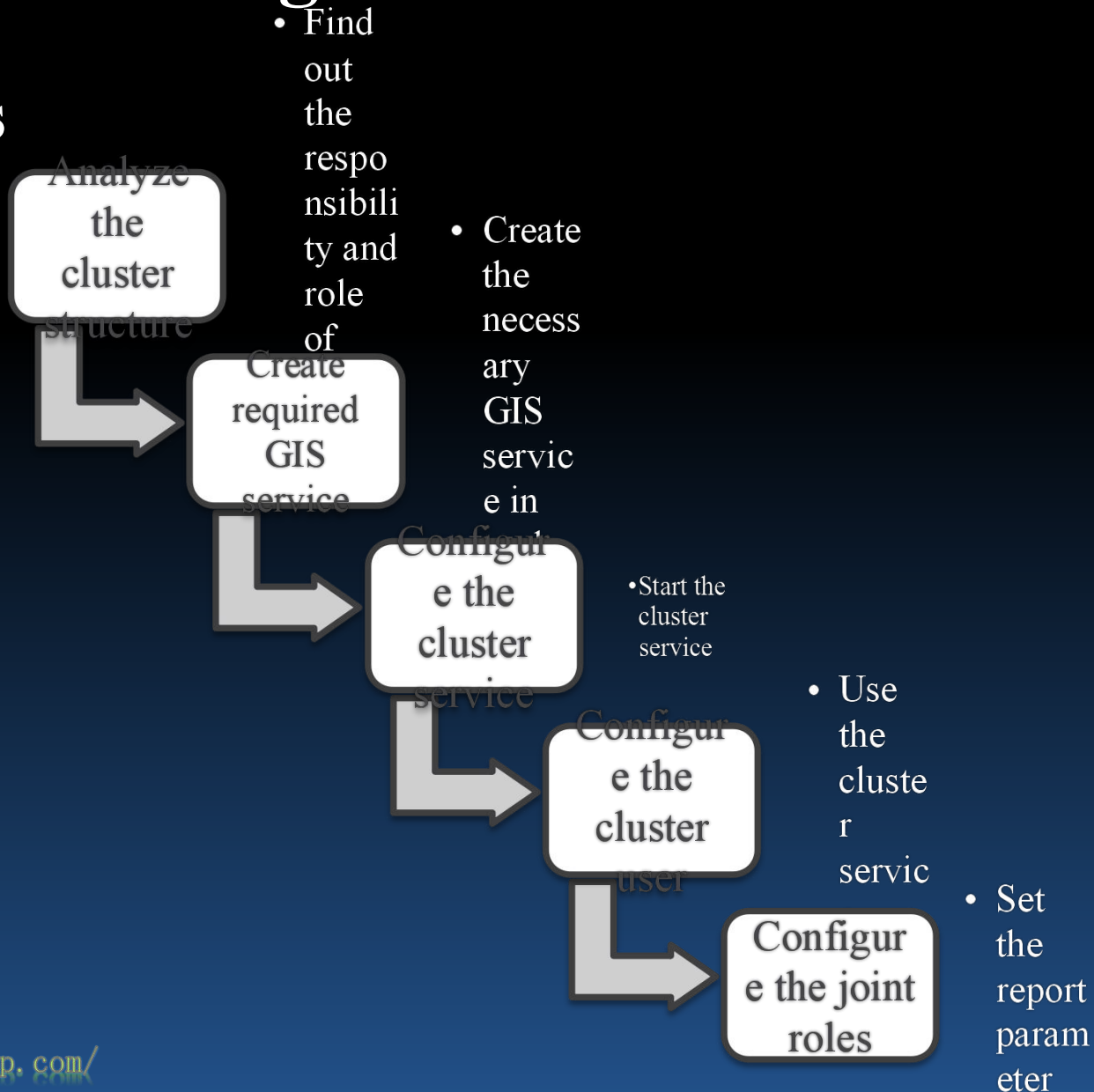
- **Whether to start service**
- **Listener information**
- **Cluster address**
- **Load balancing algorithm**

Join Cluster

- **Report information to cluster**

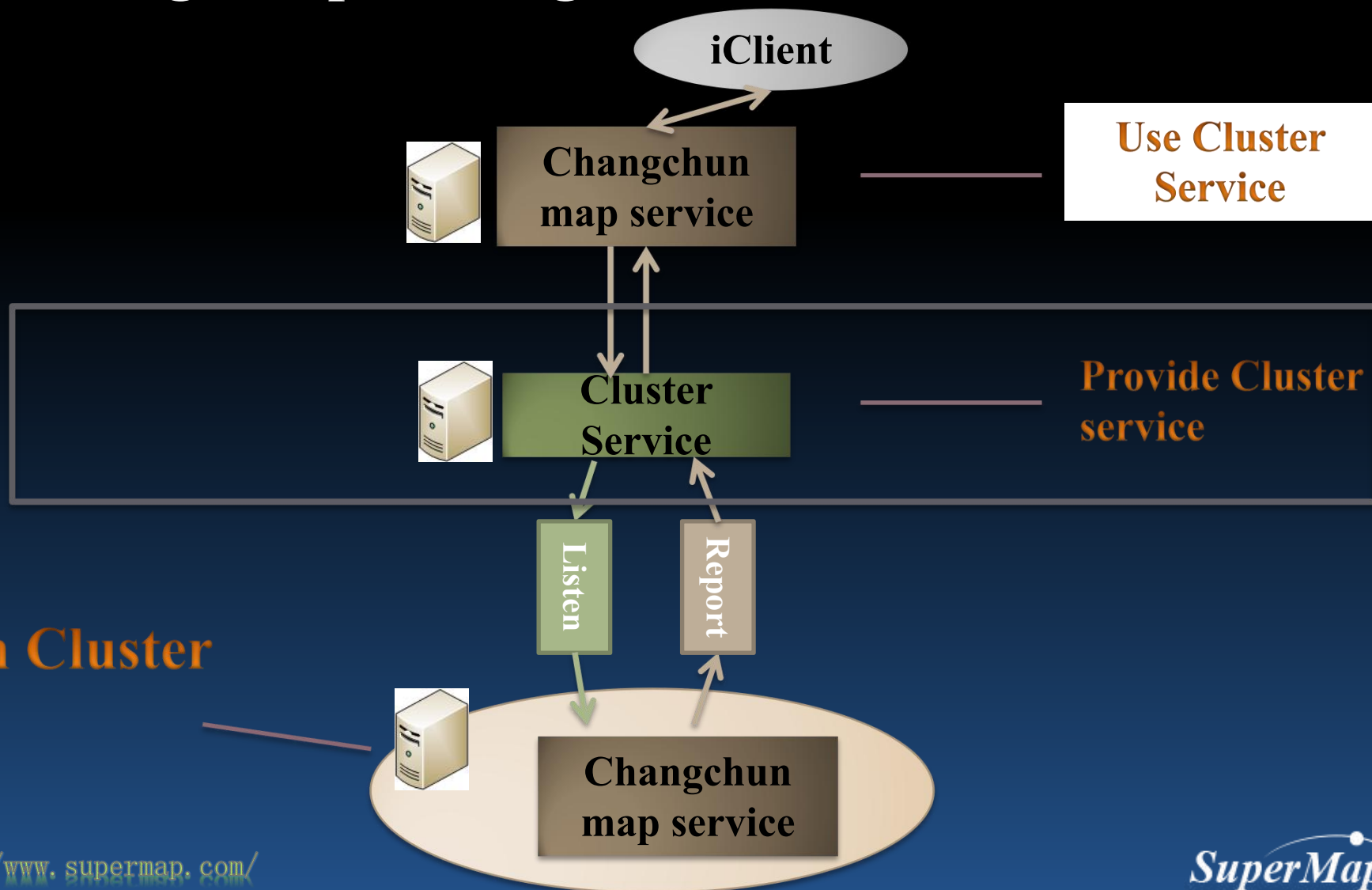
Cluster Configuration

- **Steps**



Cluster Configuration

- Settings for providing cluster service



Cluster Configuration

- **Settings for providing cluster service(selectable)**
 - There is a cluster service on each GIS server, the default status is running.
- **Open the iServer configuration file of cluster server**
 - **Location: 【SuperMapiServerJava】**
\webapps\iserver\WEB-INF\iserver-system.xml
 - **Configuration information:**

```
<clustering>  
    <clusterService>  
        <enabled>true</enabled>  
        <monitorPeriod>5000</monitorPeriod>  
        <balancer>com.supermap.services.cluster.WeightedRoundBalancer<  
/balancer>  
    </clusterService>  
</clustering>
```

Cluster Configuration

- **Configuration parameter:**

Node name	Description
<clusterService>	The configuration root node of cluster service.
<enabled> (child node of <clusterService>)	Indicator if the cluster service available, if it is false, then cluster service is not available, if it is true, cluster service can be activated.
<balancer>	The node is used to set which loading balance algorithm to calculate GIS server loading in cluster service.
<monitorPeriod>	Time interval of monitoring sub-node in cluster service, unit is millisecond.

Cluster Configuration

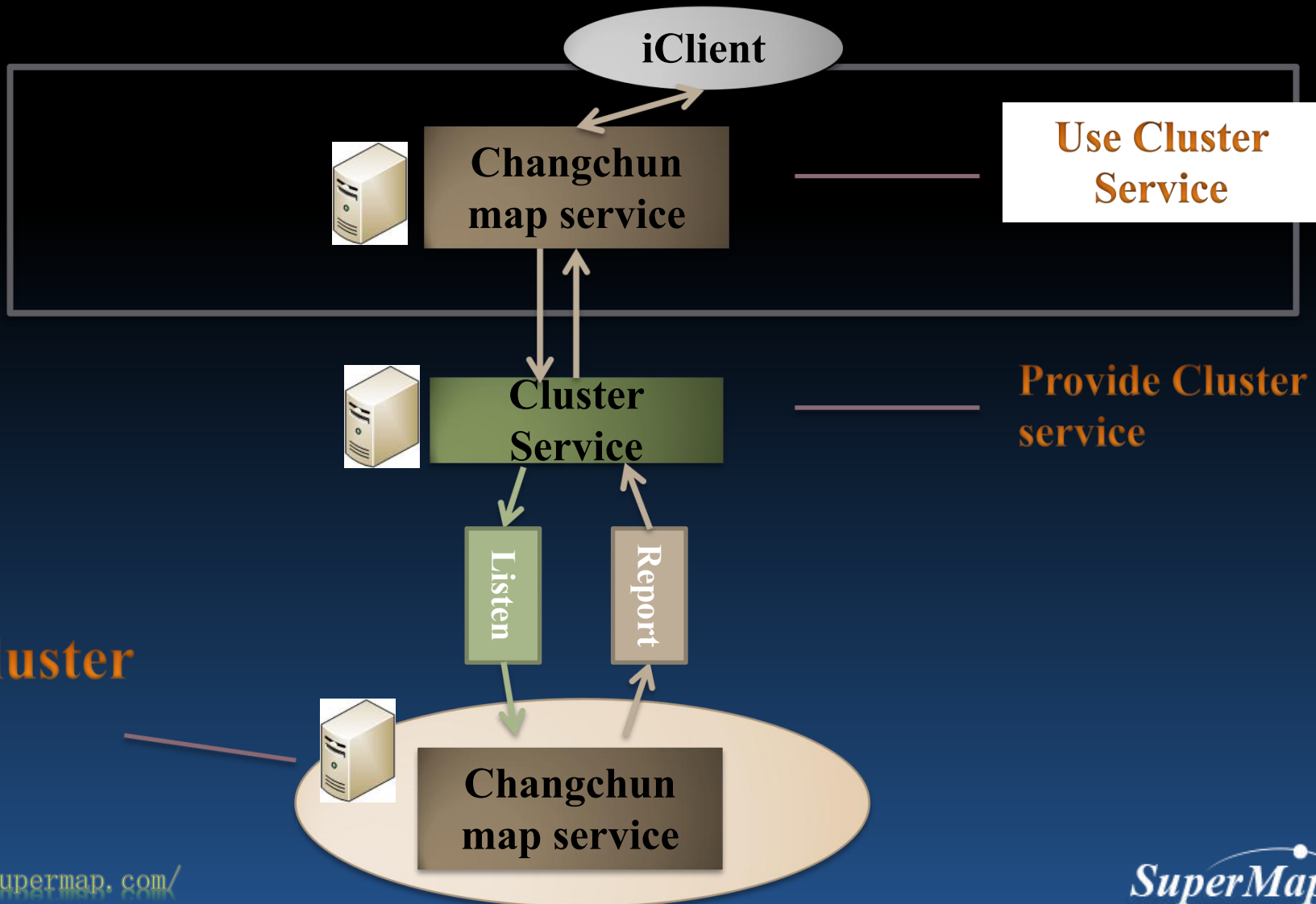
- **Cluster service address**

http://[IP of cluster server or server name]:[iServer service port of cluster server]/iserver/services/cluster

http://192.168.1.1:8090/iserver/services/cluster

Cluster Configuration

- Configuration for using cluster service



Cluster Configuration

- Configuration for using cluster service

Home Services **Clusters** Logs Security Monitoring Backup Task License Settings supermap ▾ He

Cluster Overview Use Cluster **Configure Cluster** Join Cluster Distributed Tiles Distributed Tiles Repository

You can improve the GIS service performance and capacity of this computer by using cluster. The cluster system will provide the high performance service for the client. Please refer to [Cluster](#).

Notes: Before using a cluster, you should build a cluster.

Use Cluster

Enable the cluster

Use local cluster service (default)

Use other cluster service

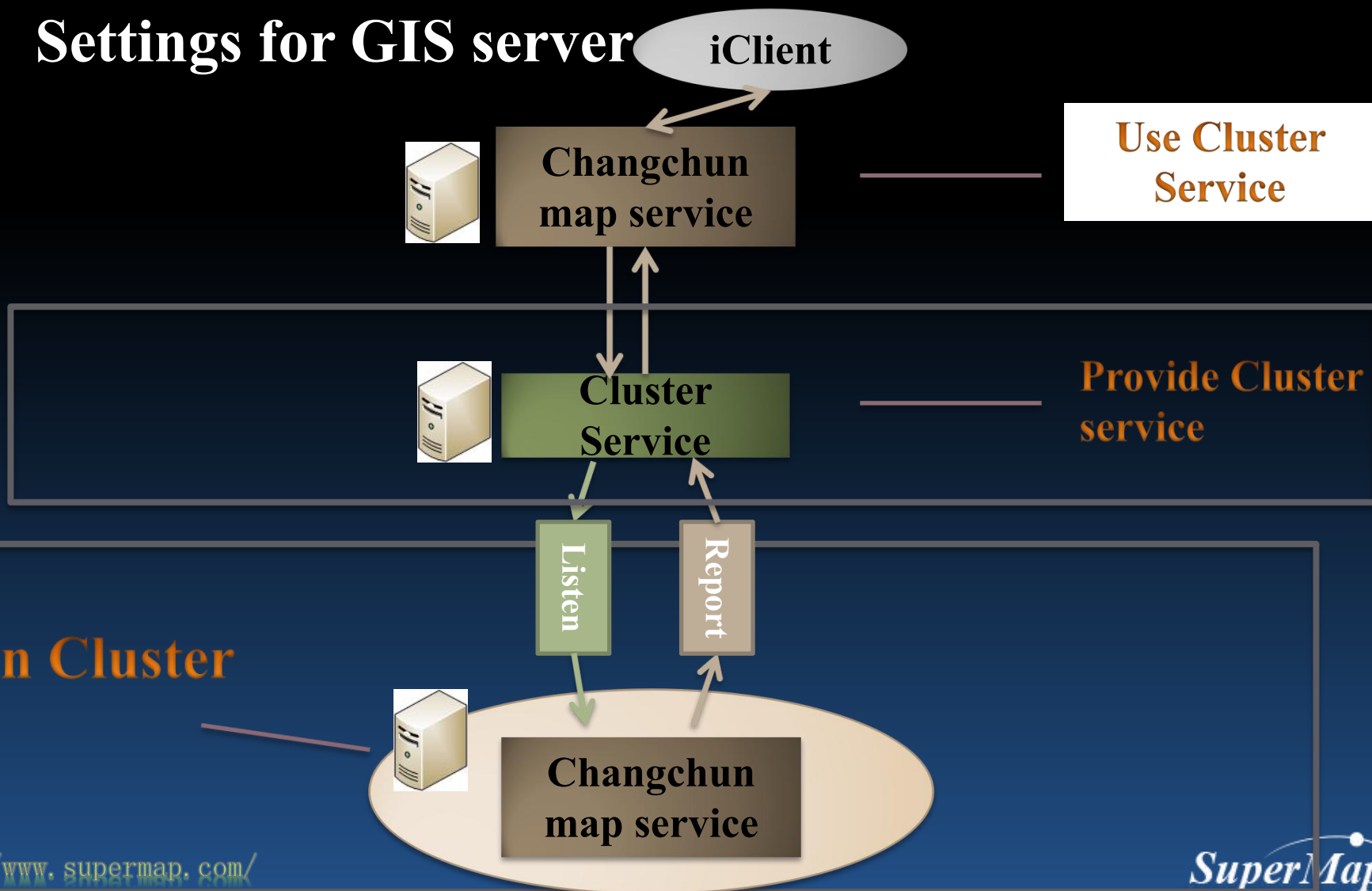
Cluster service URL: * Token:

Show (Token needs to be input here if a security Token has been set for the cluster service.)

Advanced

Cluster Configuration

- Settings for GIS server



Cluster Configuration

- Configuration for GIS server node
 - Add reporter, input the cluster service address

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Cluster Overview Use Cluster Configure Cluster Join Cluster Distributed Tiles Distributed Tiles Repository

Any iServer can be used as a cluster server to accept child nodes. When a child node joins in the cluster, it needs to report to the cluster server address.

Cluster Server Address: **http://<ip>:<port>/iserver/services/cluster**

Report to the cluster service by adding a reporter. You can add the local computer to the clusters.

Notes:

1. If the cluster server opens security control, the child node is valid only when the cluster server "Allow".
2. When the cluster server has already set the security token, it needs to add Token information to the report.

Join Cluster

+ Add reporter (Reporting to cluster service means to join the cluster)

Cluster address	Security token	Enable tile node	Enable reporter		
http://localhost:8090/iserver/services/cluster	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	Edit	Delete

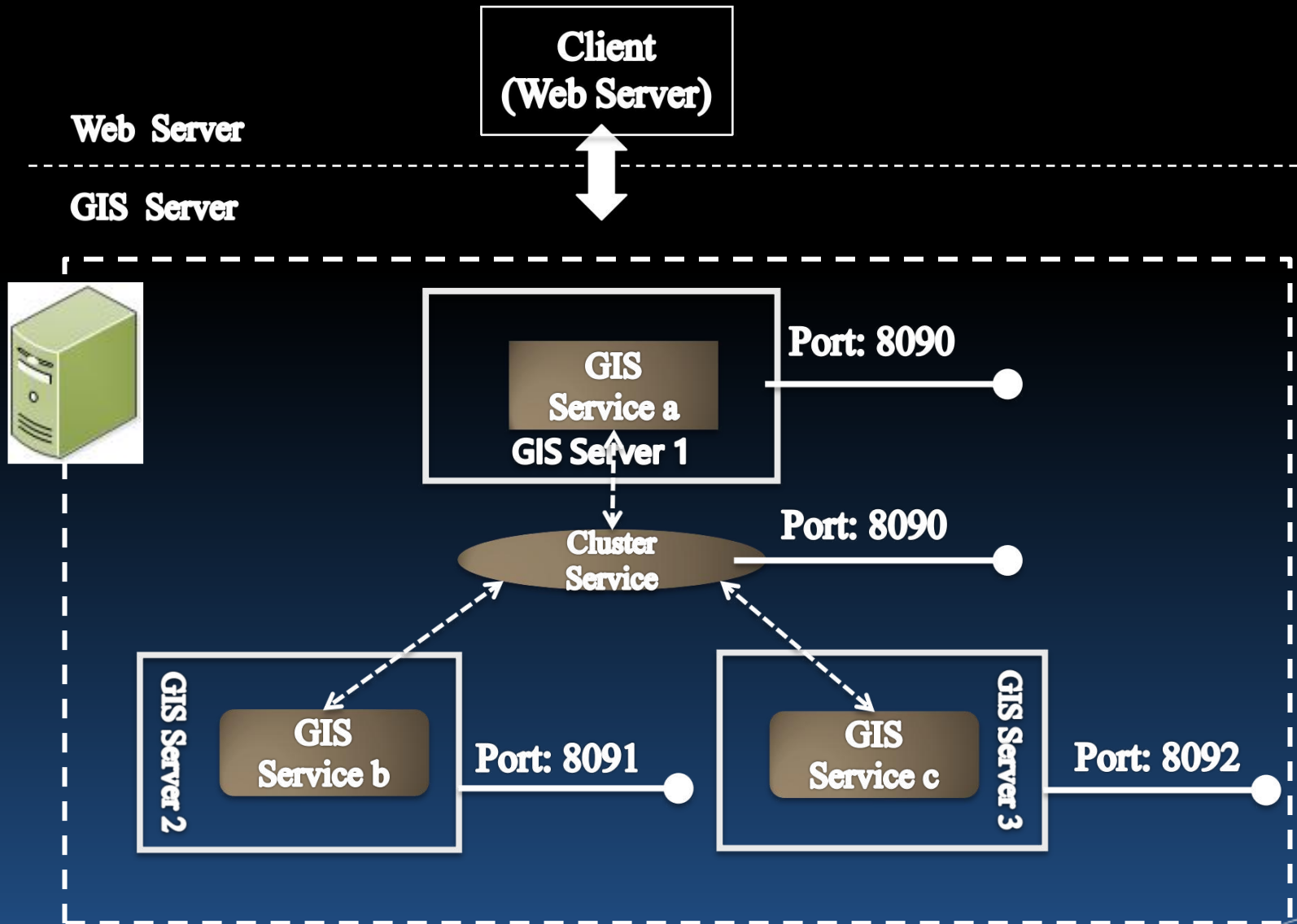
Save Cancel

Cluster Configuration

- **Browse the cluster member list**

The screenshot displays the 'Configure Cluster' tab in a web interface. At the top, there is a navigation bar with six tabs: 'Cluster Overview', 'Use Cluster', 'Configure Cluster' (which is active), 'Join Cluster', 'Distributed Tiles', and 'Tiles Repository'. Below the navigation bar, the 'Security Control' section is visible, featuring a 'Join:' label, an 'Enable' button, and a note: '(When enable the security, it needs to click the Enable button.)'. A link 'Check service list of cluster main node' is also present. The 'Agent list' section is currently empty. Below it, the 'Ordinary members' section contains one entry: 'http://192.168.52.40:8091/iserver/services' with a 'View Details' link. The 'Controlled members' section is also empty.

Practice: Multiple Process Cluster on Single Computer



Practice

- **Multiple Process Cluster on Single Computer**
 - **Modify the ports to avoid port conflicts among several servers**
 - **Method 1: Copy iServer directory and modify iServer port**
 - **Port modified location: 【iServer directory】**
\conf\server.xml
 - `<Server port="8015" shutdown="SHUTDOWN">`
 - `<Connector port="8090"`
 - `protocol="org.apache.coyote.http11.Http11NioProtocol"`
 - `connectionTimeout="20000"`
 - `redirectPort="8453"`
 - `executor="tomcatThreadPool"`
 - `enableLookups="false"`
 - `URIEncoding="utf-8"`
 - `/>`
 - **Method 2: war package + iServer installation package (or iServer zip package)**

Security Control of Cluster Service

- **The cluster service controls the GIS service nodes which will join the cluster system**
- **Security control methods**
 - **Cluster service——Turn on the control switch and set the security Token**
 - Control the members in the member list
 - **GIS server added to the cluster——Input the secure Token when adding reporter**

Security Control of Cluster Service

- **Security control operation:**
 - **Cluster service operation**

The screenshot displays the 'Configure Cluster' tab in the SuperMap interface. Under the 'Security Control' section, there are several controls:

- Join:** A dropdown menu currently set to 'Disable'. A note indicates: "(When enable the security, it needs to click the Enable button.)"
- Security Token:** An input field containing a red circle. To its right are 'Change' and 'Show' buttons. A note states: "(When setting Token, Token information should be added to the report.)"
- A link below the token field reads: "Check service list of cluster main node".

Below the 'Security Control' section are three sections: 'Agent list', 'Ordinary members', and 'Controlled members'. A callout box labeled 'Set Token' points to the 'Security Token' input field. Another callout box labeled 'Control the GIS server node of joining cluster' points to the 'Agent list' section.

Security Control of Cluster Service

- **Security control operation:**
 - **Operation of join GIS server node**

Cluster Overview Use Cluster **Configure Cluster** **Join Cluster** Distributed Tiles Tiles Repository

Any iServer can be used as a cluster server. The cluster server address is the address of the iServer that you want to join to the cluster.

Cluster Server Address: <http://localhost:8090/iserver/services/cluster>

Report to the cluster service by address: <http://localhost:8090/iserver/services/cluster>

Notes:

1. If the cluster server opens security control, you must input the security token.
2. When the cluster server has already joined to the cluster, you cannot join it again.

Join Cluster

+ Add reporter (Reporting to cluster service means to join the cluster)

Cluster service address	Security token	Enable tile node	Enable reporter	
http://anotherclusterservice:8090/iserver/services/cluster		<input type="checkbox"/>	<input type="checkbox"/>	Edit Remove

Save Cancel

OK Cancel

Input the cluster service Token

Controlled Cluster

- **The child node could be controlled to join the cluster**
- **Service instance and data from parent node will be synchronous to the child node**
- **Child node will be controlled by parent node completely, its original service instances and service manager will be forbidden**
- **Principle**
 - **Cluster will copy all the data from parent node to \data folder of all child node**
 - **Child node will create a new configuration file: iserver-services-interfaces-controller.xml**
 - **The old configuration file iserver-services-interfaces.xml will be forbidden**

Controlled Cluster

- **Steps:**
 - **Step 1:** shut down iServer server of sub node
 - **Step 2:** Open the installation directory `\webapps\iserver\WEB-INF\iserver-system.xml`, modify the code as following:

```
<clustering>
  <reporters>
    <reporter>
  </reporters>
  <cluster>
    <clusterService>
      <!-- 以受控方式加入集群的配置方法 -->
      <controllable>
        <address>http://localhost:8090/iserver/services/cluster</address>
        <enabled>true</enabled>
        <token/>
      </controllable>
    </clusterService>
  </cluster>
</clustering>
```


Controlled Cluster

- Steps:
 - Step 3: Restart the child node server
 - Step 4: Verify whether there are controlled members on the cluster server

集群概览 使用集群 配置集群 加入集群 分布式切图 切片存储库

安全控制

受控加入： (当开启安全控制时，需要点击“允许”使子节点生效。)

[查看集群主节点服务实例列表](#)

Agent列表

普通成员列表

- <http://192.168.169.17:8090/issuer/services> [查看服务详情](#)

受控成员列表

- <http://127.0.0.1:8091/issuer/services> 受控节点服务实例部署成功：36，失败：0，总共：36 2013-09-05 15:41:16

Thank You!

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