Data Center Server Provision : Distributed Asynchronous Control for Coupled Renewal Systems

ABSTRACT

- Cost minimization problem for data centres with *N servers and randomly arriving service* requests
- A central router decides which server to use for each new request
- Each server has three types of states (active, idle, and setup) with different costs and time durations
- Online distributed control algorithm so that each server makes its own decisions
- algorithm does not need probability information for the arrival rate or job sizes
- Finally, an improved algorithm that uses a single queue is developed via a "virtualization" technique, which is shown to provide the same (near optimal) costs

EXISTING SYSTEM

- data center that consists of a central controller and *N servers that serve randomly arriving* requests
- cost often represents the power consumption of each individual server

DISADVANTAGE

- Two main problems
- First, since each setup state generates cost but serves no request, it is not clear whether or not transitioning to idle from the active state indeed saves power
- Second, if one server is currently in a setup state, it cannot make another decision until it reaches the active state

PROPOSED SYSTEM

- Efficient distributed asynchronous control algorithm reducing the cost in a data center
- the front-end load balancer makes slot-wise routing requests to the shortest queue and each server makes a frame-based
- service decision by only looking at its own request queue
- algorithm is shown to achieve the near optimal cost while stabilizing the request queues

ADVANTAGE

- Reduces the cost
- achieve the near optimal cost
- Reducing the power consumption

System Requirements

HARDWARE REQUIREMENTS

- System : Pentium IV 2.4 GHz.
- Hard Disk : 40 GB.
- Floppy Drive : 1.44 Mb.
- Monitor : 15 VGA Colour.
- Mouse : Logitech.
- Ram : 512 Mb.

- **SOFTWARE REQUIREMENTS**

- Operating system : Windows XP/7.
- Coding Language : ASP.net, C#.net
- Tool : Visual Studio 2010
- Database : SQL SERVER 2008

Conclusion

- This paper proposes an efficient distributed asynchronous control algorithm reducing the cost in a data center, where the front-end load balancer makes slot-wise routing requests to the shortest queue and each server makes a frame-based service decision by only looking at its own request queue. Theoretically, this algorithm is shown to achieve the near optimal cost while stabilizing the request queues. Simulation experiments on a real data center traffic trace demonstrate that our algorithm outperforms several other algorithms in reducingthe power consumption as well as achieving lower delays.