



Load Balancing in Distributed Systems

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resumen:

Load balancing attempts to improve the performance of a distributed system by using the processing power of the entire system to smooth out periods of high congestion at individual nodes, this is done by transferring some of the workload of heavily loaded nodes to other nodes for processing. Decisions on how to balance loads among the nodes are either static or dynamic. A static decision is independent of the current system state. Static load balancing can also be viewed as a deterministic allocation of jobs in a system, where an overloaded node N_i will transfer some of its jobs to node N_j with probability P_{ij} , which is independent of the current system state. Although static load balancing is simple and easy to analyze with queuing models, but its potential benefit is limited, since it does not adapt itself to time-varying system state. On the other hand, a dynamic decision is depending on the system state at the time of the decision. When a dynamic load balancing is used, an over loaded node can transfer its jobs to other nodes using the information on the current system state. The dynamic policy is inherently more complex than any static policy because it requires that each node must to know the states of the other nodes. The load balancing algorithms are further divided into several clusters according to the amount of information required for them. Typically a load balancing algorithm has three types of processes: 1. A load information process: this determines system states information (processor load, length of queues, history of system workload). 2. A transfer process: this determines whether a job should be executed locally or remotely based on the local load conditions. 3. A location process: this determines the method to find a suitable node for remote execution.

sobre Ali Al-Dahoud:

Ali Al-Dahoud, Ingeniero de Sistemas por la Universidad de Belgrado (Yugoslavia) y Doctor por las Universidades de Kiev (Ucrania) y La Sapienza (Italia), es Catedrático del Departamento de Informática de la Universidad Al-Zaytoonah (Amán, Jordania) y Director del Grupo de Investigación Sistemas Distribuidos de la Escuela de Ingeniería en la citada Universidad. Editor de diversas revistas internacionales de prestigio como Computer Science (USA), es autor de más de 25 artículos en revistas y congresos internacionales y ha sido / es el máximo responsable de los más importantes congresos en Oriente Medio tales como ICITNS 2003, ICIT 2005, ICIT 2007, ICIT 2009 y, recientemente, ICIT 2011. Cuenta asimismo con una gran experiencia en Proyectos de Investigación siendo su principal línea de investigación el tema de la optimización del balanceo de carga en los sistemas distribuidos.