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Abstract:

Online services that rely on large scale server systems have become major energy users. These systems are generally dimensioned for

peak loads and therefore have very low average utilisation, often around 20-30%. This paper presents a mathematical performance analysis of a simple routing mechanism that uses staged overflow routing to assign requests to servers. The technique relies on a router, in conjunction

with a server daemon. Idle servers are suspended; and suspended systems are returned to an active state by the Wake-on-LAN function. The number of active servers is proportional to the overall system

utilisation and leads to a load proportional carbon footprint.

Performance models are developed and used to analyse the proposed mechanism. A potential system design is briefly discussed. It is concluded that substantial power savings are possible using overflow routing; however, there is also significant effects on user performance

as a result of the higher server utilisation.

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Keywords:

carbon footprint; energy efficient computing; load proportional power

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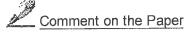
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International Journal of Communication Networks and Distributed Systems (IJCNDS)

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Special Issue on Energy-Efficient Communications for High-Performance Distributed Systems

Guest Editors: Dr. Samee Ullah Khan and Professor Pascal Bouvry

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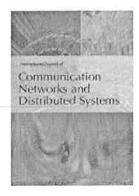
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