INFORME EXPERT
EXTERN *INFORME EXPERTO EXTERNO EXTERNAL REFEREE REPORT*

Nom de l'expert/ Nombre del experto/ Name of the referee: Miquel Pericàs
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Títol de la tesi/ Título de la tesis/ Title of the thesis Energy Optimising Methodologies On Heterogeneous Data Centres
Nom del doctorand que presenta la tesi/ Nombre del doctorando que presenta la tesis/ Name of the student presenting the thesis: Rajiv Nishtala

Especifiqueu les raons que avalen la qualitat de la tesi per a la seva defensa pública :
Especificar los motivos que avalan la calidad de la tesis mencionada para su defensa pública:
Specify reasons endorsing the quality of the above-mentioned thesis for its public reading:

Quins objectius s'han assolit amb la tesi ?
¿Qué objetivos se han logrado con la tesis presentada?
What objectives have been achieved with the thesis?

This thesis has developed an online technique for power efficient management of co-located batch and interactive workloads in heterogeneous data centers. The system is agnostic to applications and systems and can be deployed effectively in a variety of environments by modeling contention due to shared resources, the latter of which is achieved via a performance and power methodology that is aware of DVFS states, core consolidations and core idle states. Overall, this improves data centers by improving QoS and reducing resource overprovisioning.

Originalitat del treball :
Originalidad del trabajo:
Originality of the work:

This thesis deals with a very hot topic: data centre management for energy efficiency and performance (throughput and QoS). The thesis advances the state of the art by 1) extending power+performance modeling to systems with idle states and core consolidation, and 2) proving that schemes from machine learning (such as reinforcement learning) are effective in learning the requirements of batch & interactive applications and selecting their most power-efficient configurations.

Metodologia emprada / hipòtesis contrastades :
Metodología usada / hipótesis contrastadas:
Methodology used / hypotheses tested:

The thesis proves its results by using actual implementations of the proposed algorithms within a Linux environment, and testing the results on a set of platforms from a variety of vendors, such as Intel, AMD, ARM and AppliedMicro. This methodology allows the author to establish previously unexplored relations, such as the trade-offs between energy-efficiency and performance-efficiency and the ineffectiveness of prior approaches to model interactive workloads.

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Valoració absoluta i/o ponderada de la tesi en relació amb altres treballs d'investigació:
Valoración absoluta y/o ponderada de la tesis presentada en comparación con otros trabajos de investigación:
Absolute and/or relative assessment of the thesis in comparison with other works of research:

There is a clear contribution in the directions of 1) dealing with interactive and consolidated workloads and 2) applying novel schemes (based on ML) to manage heterogeneity and DVFS in modern data centres with minimal support required from the hardware.

Considera que la tesi esmentada és apta per al tràmit de lectura i la defensa pública?
Considera que la tesis anteriormente mencionada es apta para su lectura y defensa pública?
In consideration of all the above, is the thesis judged to be suitable for public reading?

☒ Si / Yes ☐ No

Observacions:
Observaciones:
Observations:

None

Signatura i data
Firma y fecha
Signature and date

May 15th, 2017

(*) Si és necessari adjunteu les respostes en els fulls annexos/ Si es necesario adjunten las respuestas en las hojas anexas/ If necessary, enclose the answers in the annexed sheets

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