

Accepted Manuscript

Cloud computing based bushfire prediction for cyber-physical emergency applications

Saurabh Garg, Jagannath Aryal, Hao Wang, Tejal Shah, Gabor Kecskemeti, Rajiv Ranjan

PII: S0167-739X(17)30204-2
DOI: <http://dx.doi.org/10.1016/j.future.2017.02.009>
Reference: FUTURE 3327

To appear in: *Future Generation Computer Systems*

Received date: 15 July 2016
Revised date: 23 December 2016
Accepted date: 6 February 2017

Please cite this article as: S. Garg, J. Aryal, H. Wang, T. Shah, G. Kecskemeti, R. Ranjan, Cloud computing based bushfire prediction for cyber-physical emergency applications, *Future Generation Computer Systems* (2017), <http://dx.doi.org/10.1016/j.future.2017.02.009>

This is a PDF file of an unedited manuscript that has been accepted for publication. As a service to our customers we are providing this early version of the manuscript. The manuscript will undergo copyediting, typesetting, and review of the resulting proof before it is published in its final form. Please note that during the production process errors may be discovered which could affect the content, and all legal disclaimers that apply to the journal pertain.



Cloud Computing Based Bushfire Prediction for Cyber-Physical Emergency Applications

Saurabh Garg¹, Jagannath Aryal², Hao Wang¹, Tejal Shah^{3,6}, Gabor
Keckskemeti⁴ and Rajiv Ranjan^{5,6}

¹ School of Engineering and ICT, University of Tasmania, Hobart, Australia

² Discipline of Geography and Spatial Sciences, School of Land and Food, University of
Tasmania, Hobart, Australia

³ School of Computer Science and Engineering, University of New South Wales, Australia

⁴ Department of Computer Science, Liverpool John Moores University, United Kingdom

⁵ Chinese University of Geosciences, China

⁶ Newcastle University, United Kingdom

Abstract

In the past few years, several studies proposed to reduce the impact of bushfires by mapping their occurrences and spread. Most of these prediction/mapping tools and models were designed to run either on a single local machine or a High performance cluster, neither of which can scale with users' needs. The process of installing these tools and models their configuration can itself be a tedious and time consuming process. Thus making them, not suitable for time constraint cyber-physical emergency systems. In this research, to improve the efficiency of the fire prediction process and make this service available to several users in a scalable and cost-effective manner, we propose a scalable Cloud based bushfire prediction framework, which allows forecasting of the probability of fire occurrences in different regions of interest. The framework automates the process of selecting particular bushfire models for specific regions and scheduling users' requests within their specified deadlines. The evaluation results show that our Cloud based bushfire prediction system can scale resources and meet user requirements.

* Fully documented templates are available in the elsarticle package on CTAN.

Email address: rranjans@gmail.com (Saurabh Garg¹, Jagannath Aryal², Hao Wang¹,
Tejal Shah^{3,6}, Gabor Keckskemeti⁴ and Rajiv Ranjan^{5,6})

Download English Version:

<https://daneshyari.com/en/article/6873441>

Download Persian Version:

<https://daneshyari.com/article/6873441>

[Daneshyari.com](https://daneshyari.com)