



Cloud-Aware Data Intensive Workflow Scheduling on Volunteer Computing Systems

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INTRODUCTION

Volunteer computing is a form of distributed computing where individuals or organizations volunteer their unused computing power to contribute to scientific research. This has become a popular way for researchers to harness the processing power of many devices, without having to invest in expensive computing hardware. However, while volunteer computing has many benefits, there are also several drawbacks that need to be considered. One of the biggest drawbacks of volunteer computing is the lack of control over the computing environment. In traditional computing environments, researchers have complete control over the hardware and software used for their experiments. With volunteer computing, however, the environment is largely out of their hands. Participants may have different operating systems, different levels of security, and varying amounts of computing power, which can all impact the results of the experiment. Additionally, because participants are not obligated to keep their devices running for a specific amount of time, there may be periods where computing power is unavailable, which can delay experiments. Another issue with volunteer computing is the potential for security breaches. Because participants are allowing researchers to access their computing power, there is a risk that malicious actors could gain access to sensitive data or inject malware into the system. This risk is heightened because participants are not always screened for security vulnerabilities, and may not have the same level of security protocols in place as traditional computing environments.

DESCRIPTION

Furthermore, volunteer computing is not always cost-effective. While it may seem like a cost-effective solution to research

computing, there are many hidden costs associated with volunteer computing. For example, researchers must invest time and resources in developing and testing software that can run on a wide range of devices, which can be a complex and time-consuming process. Additionally, because there is no guarantee that participants will keep their devices running for the duration of the experiment, researchers may have to run multiple trials, which can increase the overall cost of the experiment. Another issue with volunteer computing is the potential for biased results. Because participants are self-selected and may have different motivations for participating, the sample may not be representative of the general population. This can lead to biased results, which can be problematic for research projects that require a representative sample. Finally, volunteer computing may not always be reliable. Because participants are not obligated to keep their devices running, there may be periods of time where computing power is unavailable. This can lead to delays in experiments, which can impact the overall results. Additionally, because participants may have different levels of computing power and may not always have the latest hardware, there may be inconsistencies in the results, which can make it difficult to draw conclusions from the data.

CONCLUSION

However, researchers must be aware of the limitations of volunteer computing and take steps to mitigate these drawbacks. This may include developing software that can run on a wide range of devices, implementing security protocols to protect against malicious actors, and running multiple trials to ensure the reliability of the results. In conclusion, while volunteer computing has many benefits, there are also several drawbacks that need to be considered. These include the lack of control over the computing environment, the potential for security

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breaches, the cost-effectiveness of the approach, the potential for biased results, and the reliability of the results. Researchers must be aware of these limitations and take steps to mitigate them, in order to ensure that the data collected through volunteer computing is reliable and useful for scientific research.

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CONFLICT OF INTEREST

The author declares there is no conflict of interest.