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**Dissertation Proposal Form**

**Date of Submission: \_13 May 2023\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_**

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| **Name** | **Venkata Rami Reddy Chaganti** |
| **Student Id** | **220015512** |
| **Module Code** | **COM7042M-2022-23-T123-LDN01** |
| **Project Title** | **Analyzing The Benefits And Drawbacks Of Using AWS Shield In A**  **Multi-Cloud Environment** |
| **Supervisor Name** | **Dr**.**Kamran** |
| **Supervisor Approval** | **Yes/No** |
| **Supervisor Signature** |  |

**Section 1: Academic**

*This section helps Academic staff assess the viability of your project. It also helps identify the most appropriate supervisor for your proposed research. This proposal will be referred to as a point of discussion by your supervisor in seminar sessions.*

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| **NAME**: **Venkata** **Rami** **Reddy** **Chaganti** | **STUDENT** **NUMBER**: **220015512** | | | | |
| **PROPOSED TITLE OF PROJECT**: Analysing the benefits and drawbacks of using AWS Shield in a multi-cloud environment | | | | | |
| **BRIEFLY DESCRIBE YOUR FIELD OF STUDY:**  The field of study chosen is cloud computing, which is a type of technology that allows individuals and organizations to rent out various services, including computing, storage, networking, software, analytics and intelligence over the internet. The prime reason for selecting out this technology is its advantages in terms of security, performance, flexibility, scalability and reliability to foster innovation. Using this field of study, a detailed analysis on the benefits and drawbacks of AWS shield service provided by AWS cloud provider will be performed in order to analyse its impact over a multi-cloud environment. In addition to this, the focus will be laid on distributed denial of service and other availability attacks that could be resisted by the cloud computing technology. | | | | | |
| **WHAT QUESTION DOES YOUR PROJECT SEEK TO ANSWER?**  The undertaken research project seeks to answer the following questions:   * **RQ1:** How does AWS Shield compare to other DDoS protection solutions in a multi-cloud environment? * **RQ2:** How effective is AWS Shield in protecting against DDoS attacks in a multi-cloud environment? | | | | | |
| **WHAT HYPOTHESIS ARE YOU SEEKING TO TEST?**  The following are hypothesis statements that are intended to be tested through this research work.   * **H0:** AWS Shield provides better DDoS protection in a multi-cloud environment than other DDoS protection solutions. * **H1:** AWS Shield does not provides better DDoS protection in a multi-cloud environment than other DDoS protection solutions. | | | | | |
| **WHAT ARE THE PROBABLE PROJECT OUTCOMES?**  The probable outcome from the undertaken research project includes a detailed analysis on cloud native security service to detect and respond to distributed denial of service and other availability attacks. This cyber-attack has a potential to disrupt on-going business operations and requires efficient solutions to tackle it. Using cloud computing technology, an analysis will be performed to check to which extent cloud environment is able to resist such availability attacks. | | | | | |
| **PLEASE PROVIDE A BRIEF BIBLIOGRPAHY OF 2-4 KEY TEXTS FOR YOUR STUDY (USE HARVARD REFERENCE STYLE)**  Alam, M.S. *et al.* (2022) “An efficient SVM based DEHO classifier to detect DDoS attack in cloud computing environment,” *Computer Networks*, 215, p. 109138. Available at: https://doi.org/10.1016/j.comnet.2022.109138.  Hezavehi, S.M. and Rahmani, R. (2023) “Interactive Anomaly-Based DDoS Attack Detection Method in Cloud Computing Environments Using a Third Party Auditor,” *Journal of Parallel and Distributed Computing*, 178, pp. 82–99. Available at: https://doi.org/10.1016/j.jpdc.2023.04.003.  Myneni, S. *et al.* (2022) “SmartDefense: A distributed deep defense against DDoS attacks with edge computing,” *Computer Networks*, 209, p. 108874. Available at: https://doi.org/10.1016/j.comnet.2022.108874. | | | | | |
| **PLEASE NAME ANY MEMBER OF THE ACADEMIC TEAM YOU HAVE DISCUSSED THIS POTENTIAL PROJECT:**  Dr.Kamran Ali | | | | | |
| ***(staff use only) Project Approved by Academic Team?*** | | YES |  | NO |  |
| *Any other Academic Staff comments* | | | | | |

**Section 2: Technical**

*This section is designed to help the technical team ensure the appropriate equipment to support each project has been ordered. It also exists to help you fully ascertain the technical requirements of your proposed project. In filling out this section please note that we do not ‘buy’ major items of equipment for student projects. However, if a piece of equipment has a use to the department beyond the scope of a single project, we will consider purchasing it. Though purchasing equipment through the university is often is a slow process.*

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| **PLEASE DESCRIBE YOUR PROJECT IN TECHNICAL TERMS:**  From the technical point of view, the undertaken research project will be based on configuring AWS shield service on AWS cloud platform to counter distributed denial of service attacks. Once the server has been set up, the next step will be performing simulated DDoS attacks on the cloud based virtual servers in order to check the effectiveness of cloud technology on the availability attacks. In addition to this, a detailed analysis will also be supported by providing some factors on which cloud computing is secure against DDoS attacks and other traditional methods. | | | | |
| **WHAT EXISTING LAB EQUIPMENT DO YOU NEED ACCESS TO UNDERTAKE YOUR PROPOSED PROJECT:**  In order to undertake this research project, there is a need for a root user Amazon Web Services (AWS) account. Using AWS account, all services such as AWS compute, AWS shield, Security Groups and Firewall will be used. | | | | |
| **PLEASE LIST ANY MINOR EQUIPMENT YOU MUST PURCHASE TO COMPLETE YOUR RESEARCH PROJECT: (eg, switches, resistors, raspberry pi, arduino etc)**  As the use of cloud service provider will be done, there will be no need for any hardware but a computer system is required to access cloud platform. Even for testing part, there will be a need for a computer that must have minimum of 4 GB RAM, 500 hard disk and i5 processor to virtualize Kali machine for testing DDoS against cloud provider. | | | | |
| **PLEASE LIST ANY MAJOR EQUIPMENT YOU REQUIRE TO COMPLETE YOUR RESEARCH PROJECT ALONG WITH LINKS TO WHERE IT MAY BE PURCHASED (eg a Drone, mobile phone etc).**  There is no need for any major equipment as entire work has to be carried out using AWS cloud platform. | | | | |
| **HAVE YOU DISCUSSED THE FEESIBILITY OF YOUR PROJECT WITH A MEMBER OF THE TECHNICAL TEAM? IF SO WHO?**  No | | | | |
| ***(staff use only) Project Approved by Technical Team?*** | YES |  | NO |  |
| Please comment on the Feasibility of the project: | | | | |

**Section 3: Ethics Approval**

*This section of the form will help ascertain if you need to complete and undergo the universities research ethics approval process. Please answer all questions honestly.*

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| **Question** | **Yes** | **No** |
| **Does your Research involve any of the following?**  **Human participants / subjects, Human tissue, Documents** |  | No |
| **Will the research require the collection of primary source material that might be considered offensive or illegal to access or hold on a computer? (e.g. studies related to state security, pornography, abuse, illegal behaviour or terrorism).** |  | No |
| **Does your research concern group which may be construed as terrorist or extremist?** |  | No |
| **Will the research involve visual/vocal methods where participants may be identified?** |  | No |
| **Will the research involve the use of genetic data (inherited/acquired genetic characteristics resulting from the analysis of a biological sample)?** |  | No |
| **Will the study require the co-operation of a gatekeeper to give access to, or to help recruit, participants? (eg, headteacher or group leaders publicising your work)** |  | No |
| **Will it be necessary for participants to take part in the study without their knowledge or consent at the time?** |  | No |
| **Will the study involve recruitment of patients through the NHS?** |  | No |
| **Will inducements be offered to participants? (eg the offer of being entered into a prize draw)** |  | No |
| **Does the study involve participants who are particularly vulnerable or unable to give informed consent? (e.g. participants under 18. Adults with learning disabilities, the frail elderly, or anyone who may be easily coerced due to lack of capacity)** |  | No |
| **Is there a possibility that the safety of the researcher may be in question?** |  | No |
| **Will the study require participants to commit extensive time to the study?** |  | No |
| **Are drugs, placebos or any other substances to be administered to participants, or will the study involve invasive, intrusive or potentially harmful procedures of any kind?** |  | No |
| **If there are experimental and control groups, will being in one group disadvantage participants?** |  | No |
| **Is an extensive degree of exercise or physical exertion involved?** |  | No |
| **Will blood or tissue samples be obtained from participants?** |  | No |
| **Could the study induce psychological stress or anxiety or cause harm or negative consequences beyond the risks encountered in normal life?** |  | No |

*This part of Section 3 requires you to thoroughly* ***identify*** *and* ***mitigate*** *the ethical challenges of your research project. This is required to enable the computer Science ethics panel to properly consider if your proposed project requires you to submit a formal proposal to the university ethics panel.*

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| **With your answers to the previous questions in mind, please describe the main ethical challenges of your research project and how you propose to mitigate them. Your discussion may include material not covered in the above questions. Please be as through as possible:**  For the purpose of conducting this research, various ethical challenges would be faced which are explained below. In addition to this, suitable measures to mitigate these challenges are also explained.   * For the purpose of conducting this research, data collection will be performed from reputed data sources like IEEE Xplore, Science Direct or Google Scholar. Also, the experimentation part will be done individually rather than copying it from other sources. * The thesis paper will be finalized using own content rather than copying it from another location. The plagiarism free content will be provided to avoid legal penalties and academic misconduct. * For the practical work, when testing is to be performed, the cyber-attacks will be performed on client side configured virtual machines rather than real-cloud servers as it is unethical to execute cyber-attacks. |