Project Bid - Improving Cybersecurity Measurement Science

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University: University of Nebraska-Omaha

Faculty Advisor: Dr. Matt Hale

Project: Improving Cybersecurity Measurement Science

Project Agency (optional): MITRE

Technical Director / External Customer: Harry Perper

Reason for wanting this project:

Since we are a team composed of people who are either in or looking to enter the Cybersecurity field, the improvement of this science not only interests us but is something that we would love to take on. The study and improvement in this field of science will not only affect us this semester but for the rest of our careers.

Furthermore, governments and private sectors are spending billions of dollars every year on maintaining a secure cyber environment by buying tools and services from vendors. As a team we are interested in investigating effectiveness and reliability of these tools and comparing the ones that serve a similar purpose. Additionally, we will provide our suggestions for improvement, if any, after measuring the effectiveness of each tool.

The triad of cybersecurity (confidentiality, integrity and availability) are no longer enough to measure against for effectiveness. People, processes and technology are just as important. This project will attempt to look at all facets of the landscape to determine how to effectively protect the environment.

Project Scope:

The team will research existing methodologies for measuring cybersecurity effectives of the perimeter, the data centers, the internal networks, the endpoint (both internal and external) and the users. After conducting rigorous research on existing methodologies we will suggest necessary improvements, if any, and the additional value provided by them. Our suggested methodologies could already be available in the industry therefore we will provide all necessary documentation and references in our final deliverable.

If necessary, we will suggest new methodologies for measuring effectiveness of any components that the current body of research does not address. This may include methodologies for new technologies that the current research has not evaluated yet or entirely new methodologies that we think will be more effective than the current ones based on our research.

Once we have thoroughly evaluated the methodologies and provided recommendations on changes to those methodologies, we will apply the recommendations to a test organization to test their effectiveness. Our test organization is a local medical center that has the security controls mentioned above applied in their network. Any lessons learned from this assessment will be applied to our final recommendations.

Qualifications:

- Lisa Bazis is a graduate student in Cybersecurity at the University of Nebraska Omaha. She currently works in the Information Security Office at the University of Nebraska Medical Center/Nebraska Medicine. Her background is in network security and risk assessments. She has a strong understanding of cloud architecture which will help with this INSuRE project.
- Collin Daily is a senior in his last semester studying Cybersecurity at the University of Nebraska at Omaha. His passion is in network security and forensics. After he completes his bachelor's degree, he will look to start working full time while pursuing his master's degree.
- Lyle Reinholz is an undergraduate student majoring in Cybersecurity and minoring in Computer science. His passion is to be a penetration tester and to be able to make networks more secure in doing so.
- Sanjar Hamidi is a student of UNO's integrated Undergraduate/Graduate program. MS in Cybersecurity with concentration in Cyber operations; and BS in Cybersecurity with minors in Computer Science and Management Information Systems. Sanjar is an intern with a security company focusing on cybersecurity integration in systems currently used by the U.S. government. Sanjar has developed a strong understanding of Cybersecurity in the industry and the challenges the industry faces due to the lack of Cybersecurity; which will help him in this INSuRE project.
- Sarah Noles is a graduate student studying Cybersecurity at the University of Nebraska at Omaha. She currently works as a security analyst at a software development company focusing on penetration testing and automation. She has strong programming and analysis skills that will assist in this graduate capstone.