Improved Prediction of Vulnerability Exploitation using   
CVSS Base-Score with Optimized Equation Parameters

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**Abstract**

# Introduction

Software vulnerability addressment is an important problem for organizations since exploitation of such vulnerabilities causes preventable costs. This problem tends to grow with time because vulnerabilities are often reported more frequently than they can be fixed. [Find example from VRP?] To minimize losses in spite of the increasing number of vulnerabilities becoming known, and with limited available resources, organizations must prioritize their vulnerability addressment strategy. Organizations minimize real losses by prioritizing vulnerabilities based on the cost each one is expected to impart if left unaddressed. Probabilistically, this expected cost, commonly called risk, is equal to the real cost in the event of exploitation, times the probability of that exploitation occurring.

The Common Vulnerability Scoring System (CVSS) was created to provide a single, objective measure of the risk presented by any software vulnerability [Scarfone2007]. This measure of risk is quantified by the CVSS’ base score, a single number in the range 0-10. The base score is computed from two metric groups, representing both the likelihood (probability) and impact (cost) of exploitation, in accordance with the organizational need to prioritize vulnerabilities based on risk. CVSS’ base score corresponds best to the goal of an objective measure of risk, since it is designed to convey intrinsic risk, or in other words, risk based on characteristics of the vulnerability independent of time or context. Because of its intrinsic, unchanging nature, the base score is commonly available from databases and widely used in literature.

# Methods

# References

[Scarfone2007] - Mell P, Scarfone K, and Romanosky S. “A complete guide to the common vulnerability scoring system version 2.0” Published by FIRST-Forum of Incident Response and Security Teams. 2007.

[NVD] - https://nvd.nist.gov/