# CWE Detail – CWE-333

## Description

True random number generators (TRNG) generally have a limited source of entropy and therefore can fail or block.

## Extended Description

The rate at which true random numbers can be generated is limited. It is important that one uses them only when they are needed for security.

## Threat-Mapped Scoring

Score: 1.8

Priority: P4 - Informational (Low)

## Modes of Introduction

**•** Architecture and Design: N/A

**•** Implementation: REALIZATION: This weakness is caused during implementation of an architectural security tactic.

## Common Consequences

**•** Impact: DoS: Crash, Exit, or Restart — Notes: A program may crash or block if it runs out of random numbers.

## Potential Mitigations

**•** Implementation: Rather than failing on a lack of random numbers, it is often preferable to wait for more numbers to be created. (Effectiveness: N/A)

## Applicable Platforms

**•** None (Class: Not Language-Specific, Prevalence: Undetermined)

## Demonstrative Examples

**•** This code does not attempt to limit the number of new connections or make sure the TRNG can successfully generate a new random number. An attacker may be able to create many new connections and exhaust the entropy of the TRNG. The TRNG may then block and cause the program to crash or hang.

## Notes

**•** Maintenance: As of CWE 4.5, terminology related to randomness, entropy, and  
 predictability can vary widely. Within the developer and other  
 communities, "randomness" is used heavily. However, within  
 cryptography, "entropy" is distinct, typically implied as a  
 measurement. There are no commonly-used definitions, even within  
 standards documents and cryptography papers. Future versions of  
 CWE will attempt to define these terms and, if necessary,  
 distinguish between them in ways that are appropriate for  
 different communities but do not reduce the usability of CWE for  
 mapping, understanding, or other scenarios.