

Methods for Testing and Qualifying Analytics

Timothy Shimeall, Ph.D.

CERT Situational Awareness Group

Software Engineering Institute
Carnegie Mellon University
Pittsburgh, PA 15213

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Overview

Motivation and Definitions

Example Analytic

Test Framework

Qualifying Analytics

Motivation

It's only an analytic

- Just run it and see if it works
- It's only needed for this one incident
- It's too simple to worry about

I'm an analyst

- Not a developer
- Not a test/QA person
- Too busy for test

Takes too long to build (or fix)

Code starts generating poor results

- False positives / false negatives
- Too many resources needed
- Bugs / crashes / odd messages

Next person has to deal with it

- Poor idea what it does
- No clear flow of logic
- Mix of scripts/structures/languages

Definitions

Analytic: A particular process that examines data to find trends and answer questions

- Descriptive analytics: pull data and present; find range and central tendency statistics on traffic
- Diagnostic analytics: track indicator that flags data exfiltration
- Predictive analytics: track indicator that suggests scanning prior to compromise
- Prescriptive analytics: flag traffic that is banned by policy

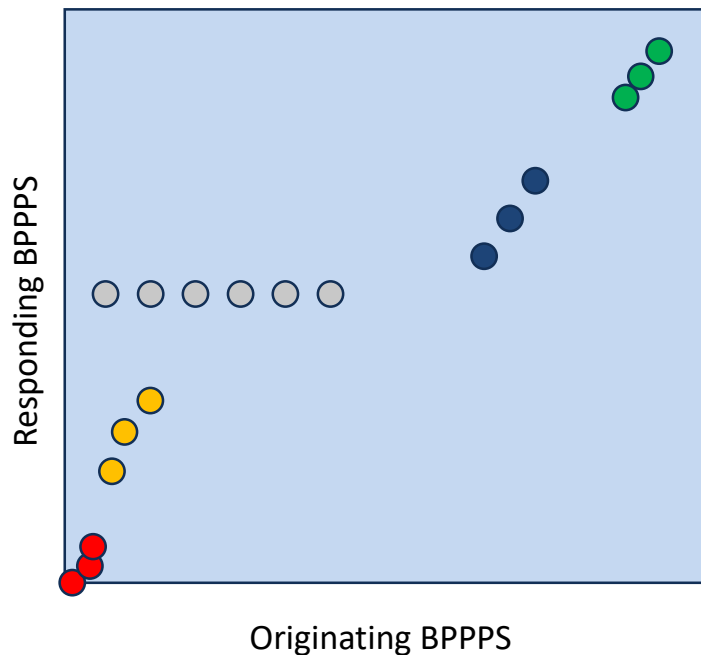
<https://www.mastersindatascience.org/resources/what-is-data-analytics/>

Test: A procedure intended to establish the quality, performance, or reliability of something, especially before it is taken into widespread use.

Qualify: Be entitled to a particular benefit or privilege by fulfilling a necessary condition.

<https://www.lexico.com/en/definition/test>

BPPPS Analytic



Flow bytes per packet per second analytic

Mixing volumes and timing to separate:

- Signaling overhead (redundant close)
- Common attacks (brute force, port knocking)
- File transfer
- Interactive traffic

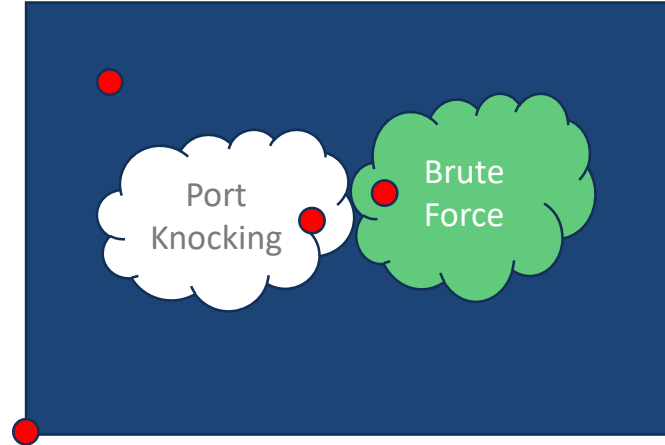
Port agnostic, not signature-based

Test Design -1

Data driven testing

- Normal input
- Null input
- Input for each output

Output Space

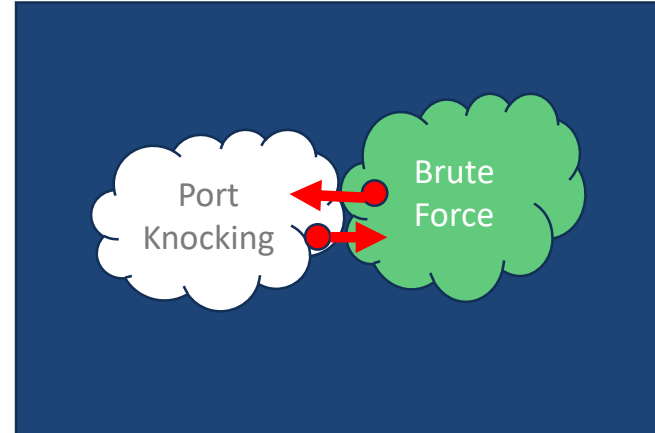


Test Design - 2

Case driven testing

- Where small addition changes output
- Where small deletion changes output
- Where reordering changes output

Output Space

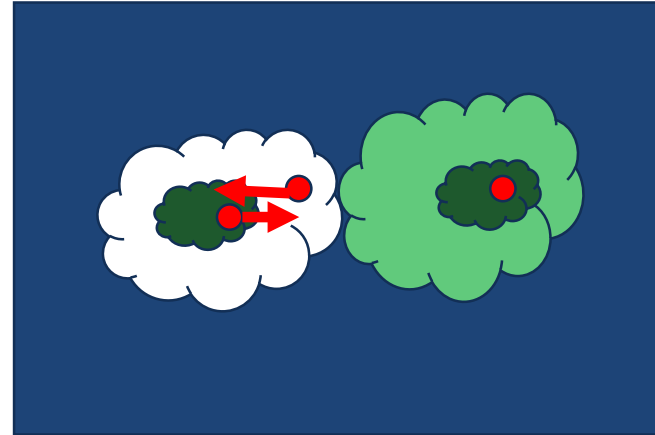


Test Design – 3

Threat Driven:

- Sample outputs associated with threats
- Where small addition can move non-threat to threat
- Where small deletion can move threat to non-threat

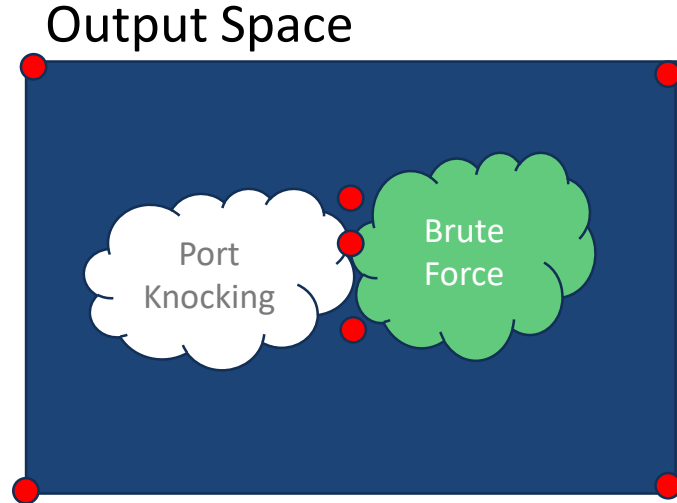
Output Space



Test Design - 4

Bug-driven

- Where most likely omissions
- Where most likely confusions
- Where potential incompatibilities



Qualifying Analytics

Reliability

Trust

Robustness

Maintainability

Compatibility

Security