Cambridge Centre for Risk Studies

The Future of Cyber Risk Conference 2019

The Evolution of CyberSecurity Risk Ratings

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Centre for Risk Studies

UNIVERSITY OF CAMBRIDGE
Judge Business School

SecurityScorecard Company – Overview

- Founded in 2014, NYC HQ, offices worldwide
- Venture funded by **Sequoia Capital, Google**, Nokia, & others
- **#1 rated solution By Gartner Peer Insights, Forrester Wave leader**
- Use Cases: **VRM, Self Monitoring, Cyber Insurance, and others**
- **1,000,000+ rated companies** (10X any solution)
- Trusted by 650+ enterprise customers **engaging 150,000+ other companies**
- **Proprietary risk model** proving SSC grades linked to likelihood of breach

Basics of Cyber Security Risk Ratings

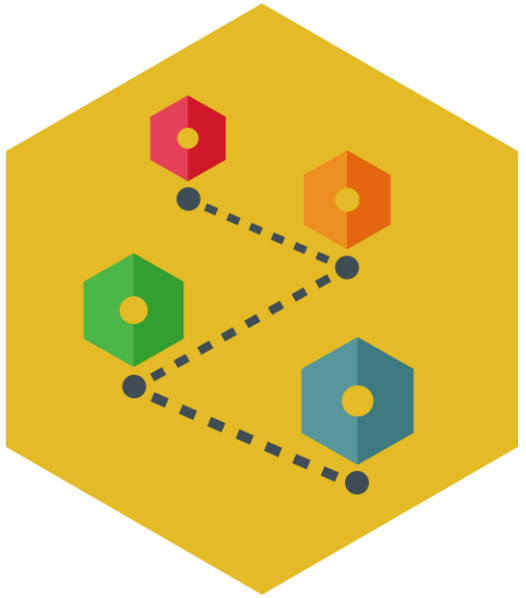
- **Data collection** – active & passive collection and asset discovery
- **Attribution** – relate digital assets to business entities globally
- **Measurement** – produce security judgements over observed hygiene, behavior & incidents
- **Scoring** – model building & entity rating

Collection – what is out there?

- **Rich data sources –** scanning, routing, registries & observations
- **Global presence –** regional collection necessary for comprehensive visibility
- **Contextualization –** deep analysis only possible with collection context
- **Adversarial tracking –** general and targeted threat intelligence

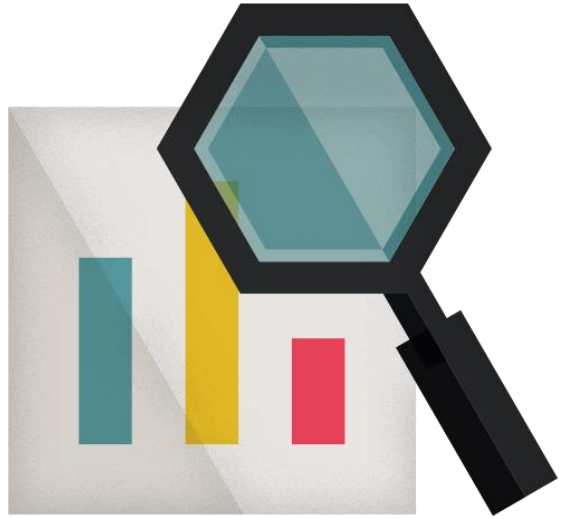
Attribution – who controls what?

- **Rich data sources –** scanning, routing, registries & observations
- **Probabilistic techniques –** signals provide estimates & error
- **Relationship analysis –** interaction between services is itself a signal
- **Signal compositing –** increase confidence to yield a conclusion



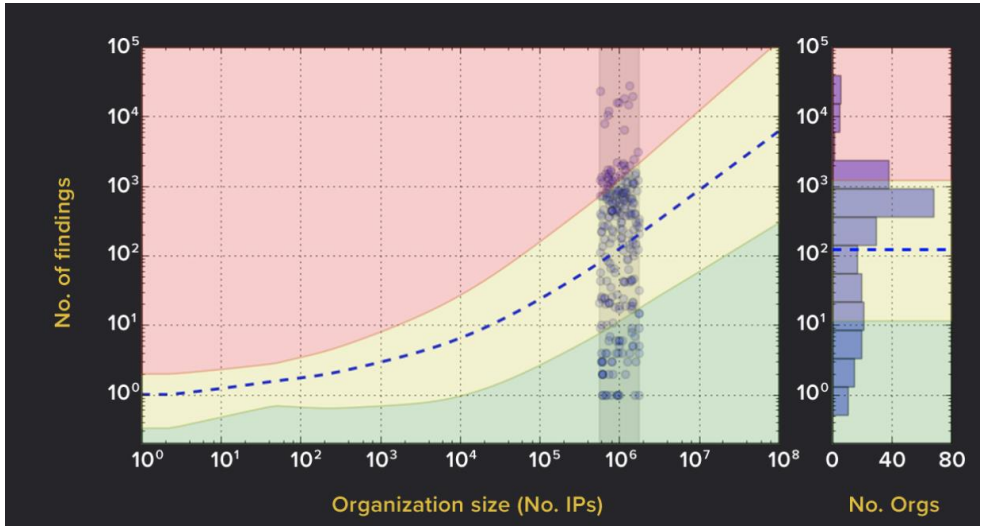
Measurements – what can we say?

- **Judgement – observations, assumptions, logic & conclusion**
- **Hygiene – claim against an asset: best common practices, weakness, vulnerability**
- **Behavior – model of interaction driving change over a collection of assets**
- **Incidents – highly suspicious signals emanating from an asset**



Scoring – what should we do?

- **Model – underlying mathematics that drive the scoring process**
- **Calibration – process for updating the scoring model**
- **Cadence – frequency of entity scoring**
- **Efficacy – claims of risk reduction, breach likelihood of entities and portfolios**



Principles for Fair and Accurate Security Ratings
U.S. Chamber of Commerce

- **Transparency**
  - Free scorecard for rated companies
  - Score planner tool to plan improvement
- **Dispute, Correction and Appeal Workflows**
  - Error reporting and dispute support
  - 24-hour turnaround on feedback
- **Accuracy and Validation**
  - Our models used by proxy advisories, baked into insurance underwriting models
  - Backed by 3rd party risk & loss firms
- **Model Governance**
  - Independence - grades are not impacted by customer relationships
  - Confidentiality - companies control distribution of their confidential information

So Now What?

Key Observations

- **Vulnerability Management Confusion**
- **Most exist in some state of compromise**
- **Effective security is a team sport**
- **Existing frameworks could be used to model a team's performance**

Traditional Vulnerability Scanners

- **Provide a laundry list of security issues of varying severity**
- **Intrusive, one-time : can only do it on your own company**
- **The companies are inundated with data and don't know what to focus on first**

You have an expired SSL certificate on 1.2.3.4

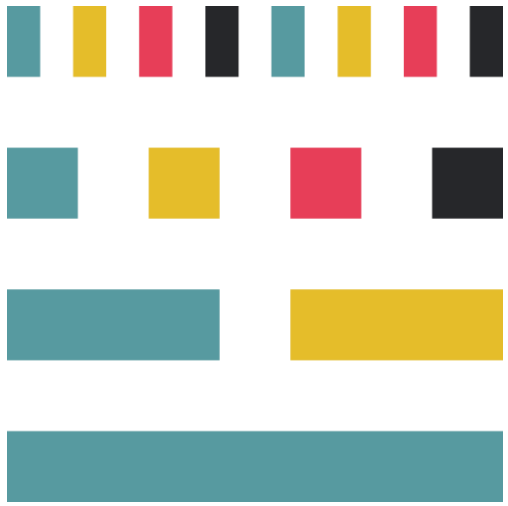
RDP port 3389 is exposed on 1.2.3.4 at 4/21/2019

This endpoint is vulnerable to CVE - CVE-2014-0160 Heartbleed vulnerability

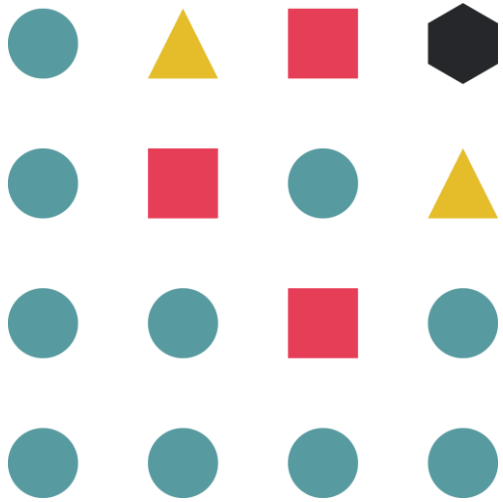
There is a Zeus botnet signature observed on 192.168.1.201 on 4/21/2019

Next Frontier : Focusing on Organizational Behavior Measurements

- **Measuring behavior is more meaningful than measuring absolute the number of issues**
- **Quick rate of response and high uniformity indicative of mature practices**



Rate of Response



Uniformity of Response

Modeling a Team – pick a framework!

- **Identify –** asset attribution and discovery
- **Protect –** asset hygiene
- **Detect –** collective asset behavior
- **Respond –** collective asset behavior
- **Recover –** not sure?

Reducing time to detect and time to respond will make companies more resilient to threats

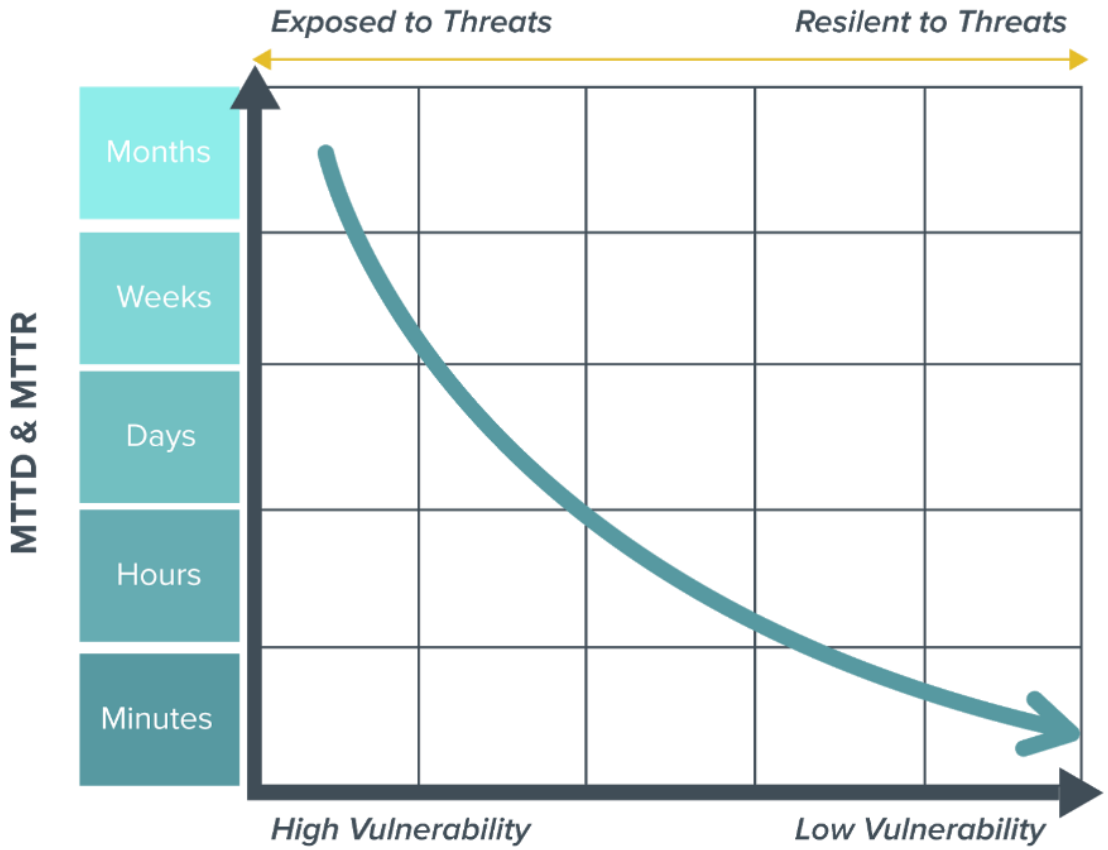


Image and statistics from LogRhythm: https://www.slideshare.net/LgRhythm/5-obstacles-to-faster-cyber-threat-detection-and-response-slideshare

Critical Metrics in Org Health

Level of preparedness

Time to Detect

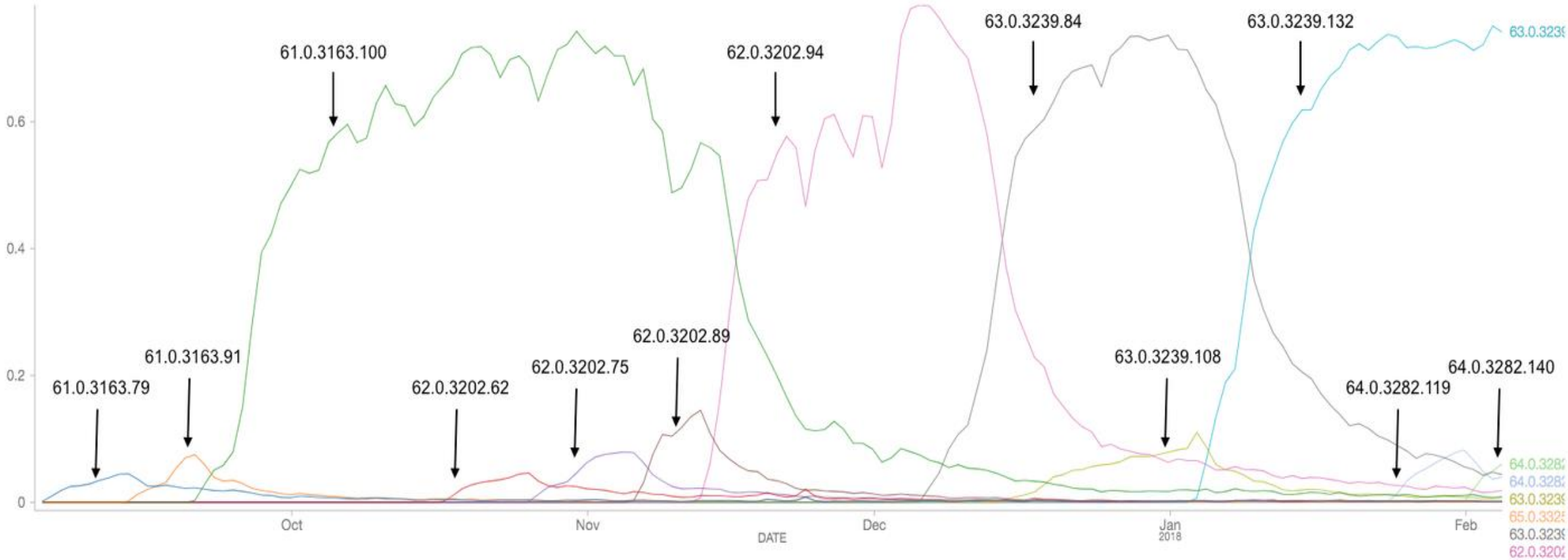
Time to respond

HACKER'S WINDOW OF OPPORTUNITY

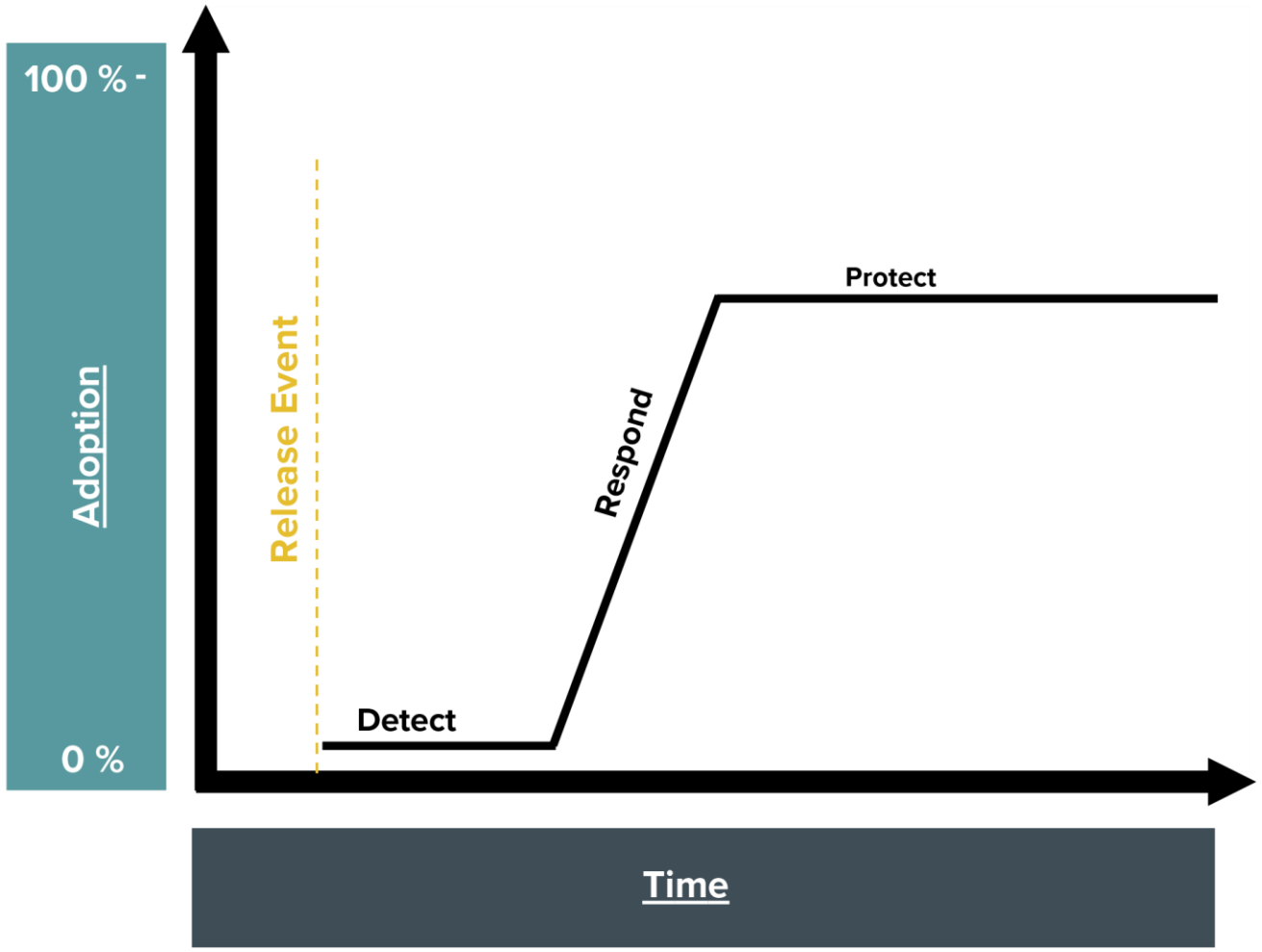
Image and statistics from LogRhythm: https://www.slideshare.net/LgRhythm/5-obstacles-to-faster-cyber-threat-detection-and-response-slideshare

Show me!

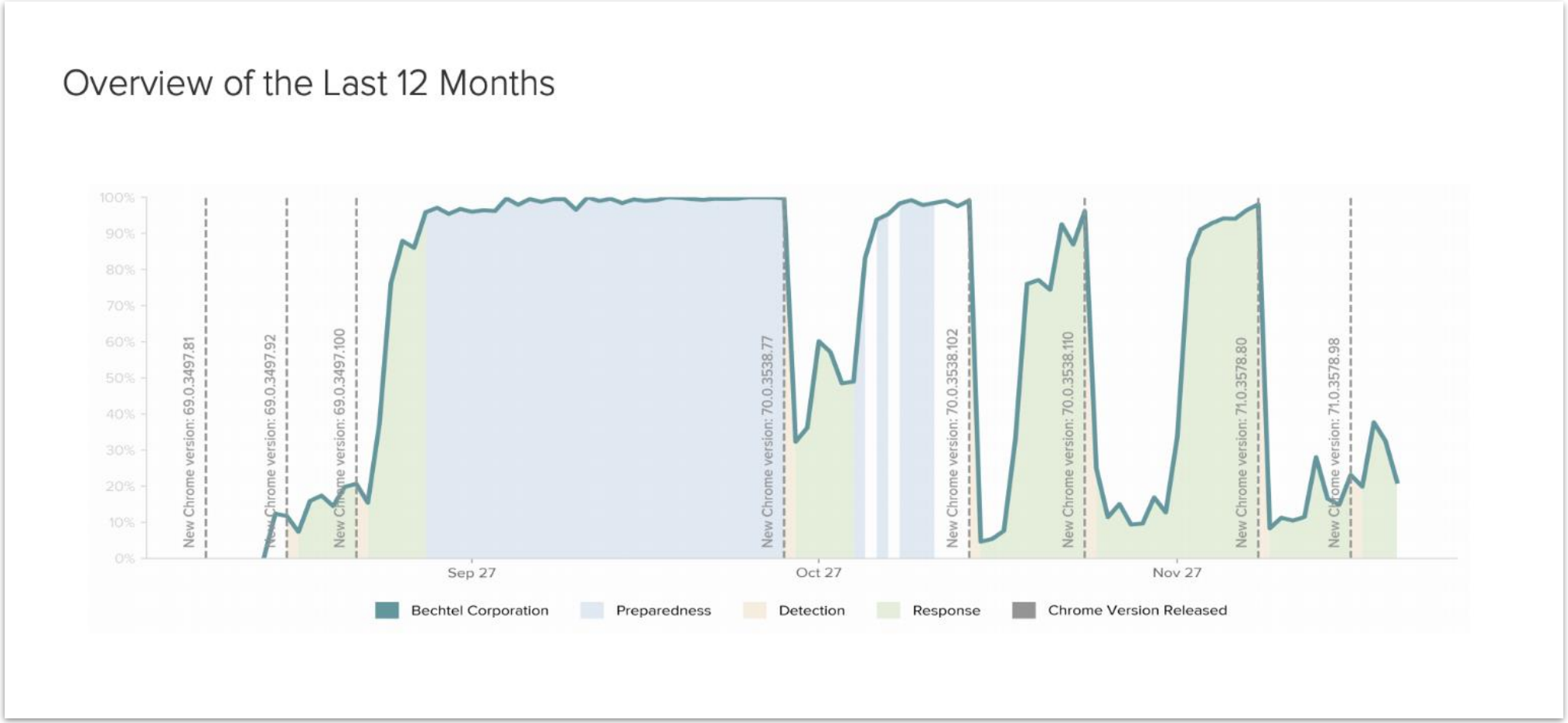
Browsers – Lets start with endpoints



Applying the NIST Framework to Evaluations of Third Parties

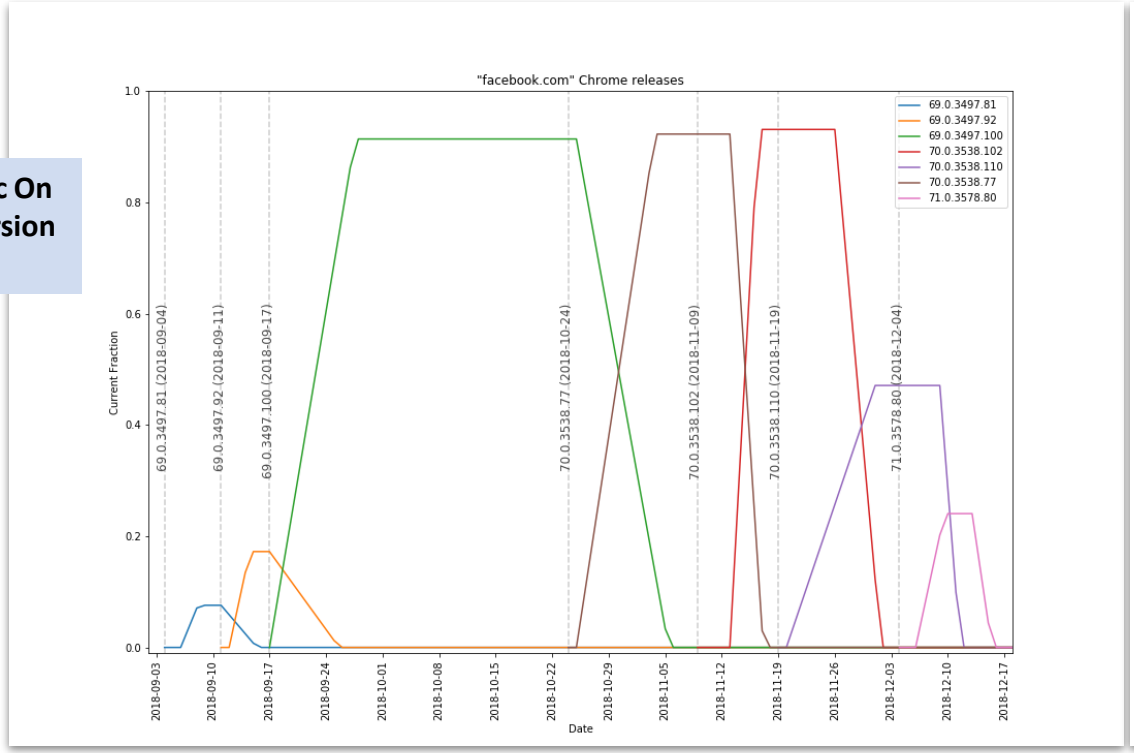


Historical Trend for that Supermarket Chain

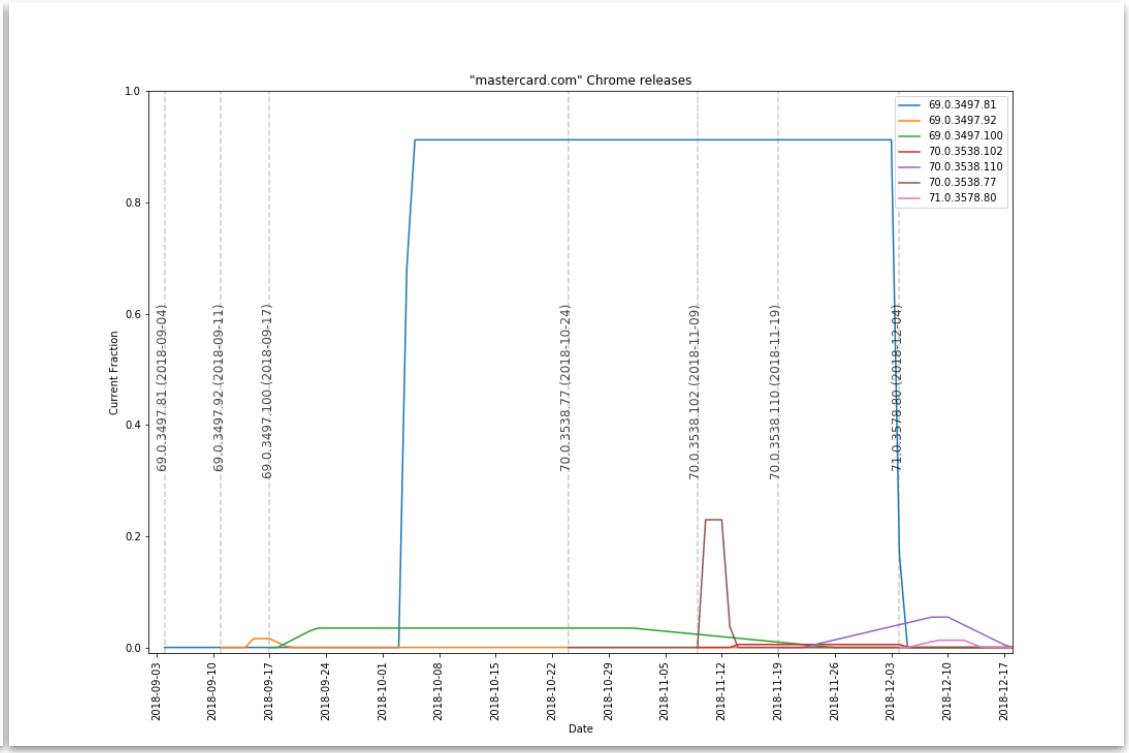


Tracking Against Public Release Cycle

% Traffic On that Version



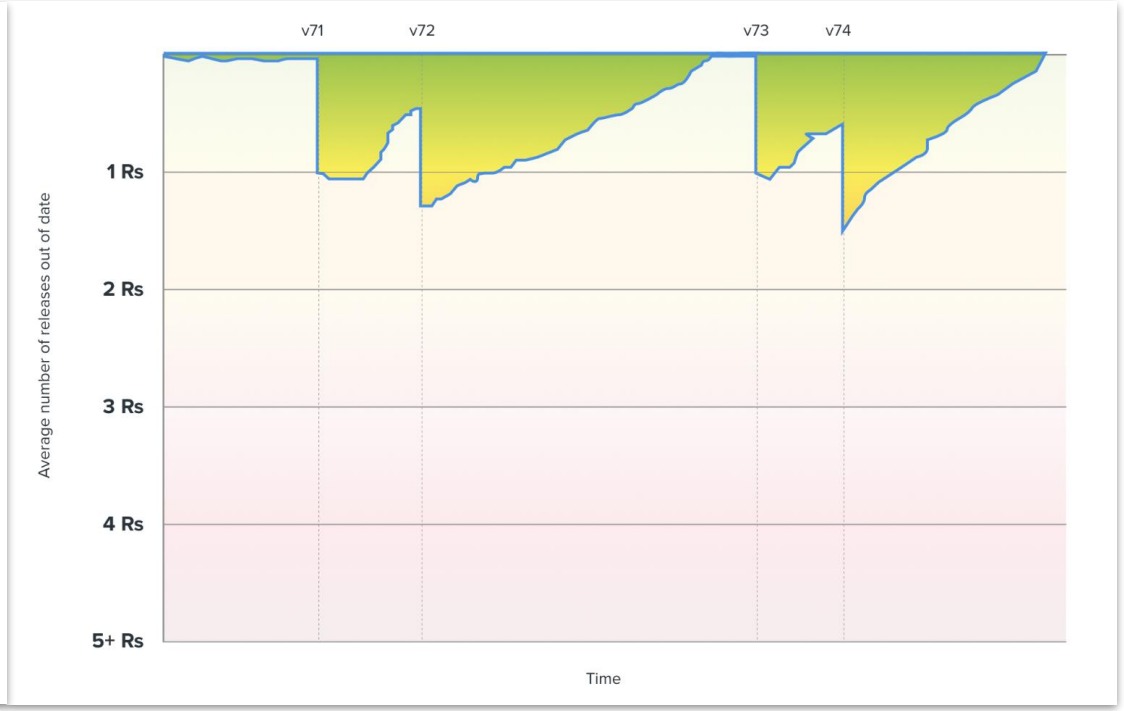
Follows the public release cycle



Doesn't follow public release cycle

Browser Age: A Reflection of Cybersecurity Posture

 # releases out of date



Slow Adopters

Fast Adopters

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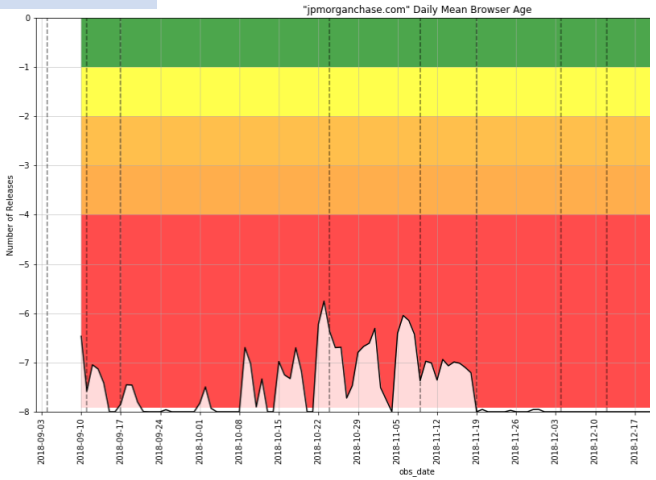
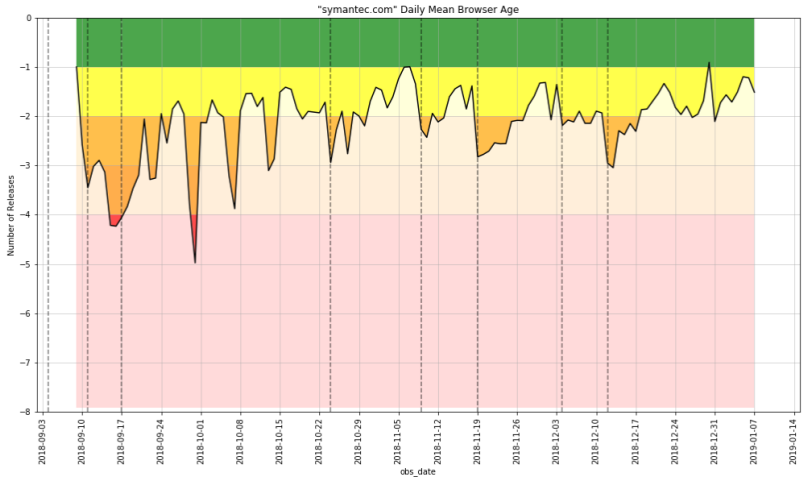
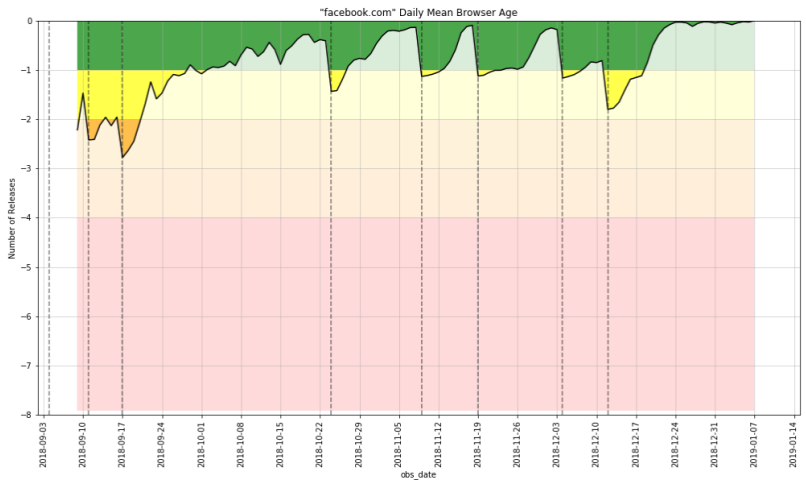
Spectrum of Organizational Health

 # releases







A large investment bank

Browsers are rarely up-to-date; frequently hit the -8 release limit.

A security company

While some updates require a little longer than we should expect, this is behavior is fairly good.

A social media platform

While some updates require a little longer than we should expect, this is behavior is fairly good.

Cybersecurity Program Maturity

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