ISSA Information Systems Security Association

Thought Leadership Web CONFERENCE

Supply Chain Security
Shift Left

March 03,2020

Supply Chain Security – Shift Left

Moderator

Michael Angelo - CRISC, CISSP
Chief Security Architect, Micro Focus

Michael F. Angelo is an ISSA Fellow and is named on the ISSA Hall of FAME. He has over 30 years of cyber security experience. Michael holds 66 patents, with the majority being in the area of Cyber Security. Michael has served as a trusted security advisor and architect with leading corporations. He has worked in the development of national and international standards. Currently he chairs the ISSA International Webinar committee. His current day job requires him to define, track, and drive the Cyber Posture for numerous products.

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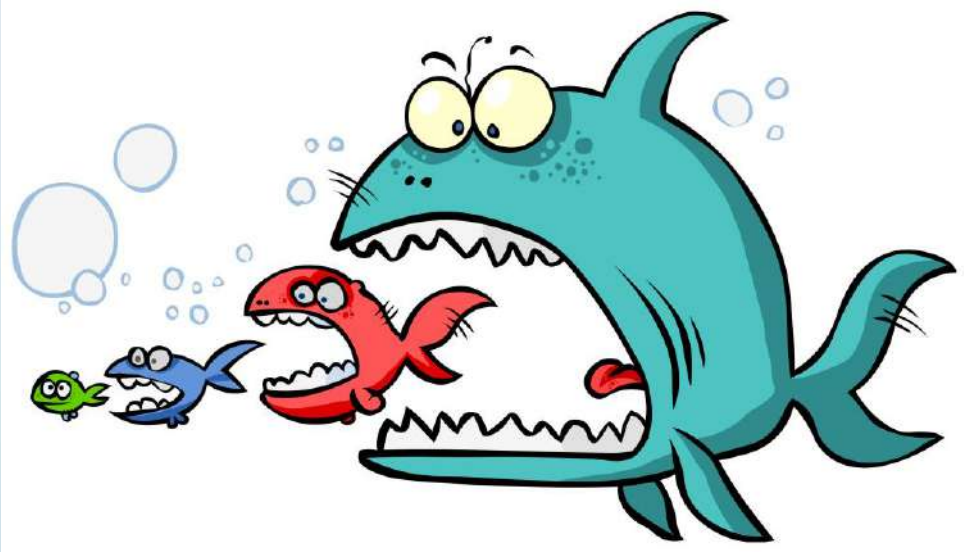
Information Systems Security Association International
www.issa.org

Supply Chain Analysis

Michael F. Angelo – CRISC, CISSP
Chief Security Architect
Micro Focus@mfa0007

Supply Chain Problem



When checking the Supply Chain

Good Water

Nutrition Facts

Serving Size 8oz Container Size (8oz)
Servings Per Container 2

Amount Per Serving	
Calories 0	Calories from Fat 0
	% Daily Value
Total Fat 0g	**0%**
Saturated Fat 0g	**0%**
Cholesterol 0mg	**0%**
Sodium 0mg	**0%**
Total Carbohydrates 0g	**0%**
Dietary Fiber 0g	**0%**
Sugars 0g	**0%**
Protein 0g	**0%**

Good Water

But…. What About the Container?

- Plastic Bottles?
- Can the plastic leach toxins?
- If so, can it cause:
  - ❑ Medical Issues
  - ❑ Weight Gain
- Does it get worse if you reuse them?

And Where Did It Come From?

Does It Matter

Supply Chain – The Real Picture

Your Environment

How is this Relevant?

- Our Cyber Supply Chain contains much more than just the software.
- It Includes
  - ❑ Software
  - ❑ Hardware
  - ❑ People
  - ❑ Facilities
  - ❑ and Infrastructure

Supply Chain Security – Shift Left

Speaker

Thomas Fischer

Thomas has over 30 years of experience in the IT industry ranging from software development to infrastructure & network operations and architecture to settle in information security. He has an extensive security background covering roles from incident responder to security architect at fortune 500 companies, vendors and consulting organisations. He is currently security advocate and threat researcher focused on advising companies on understanding their data protection activities against malicious parties not just for external threats but also compliance instigated.

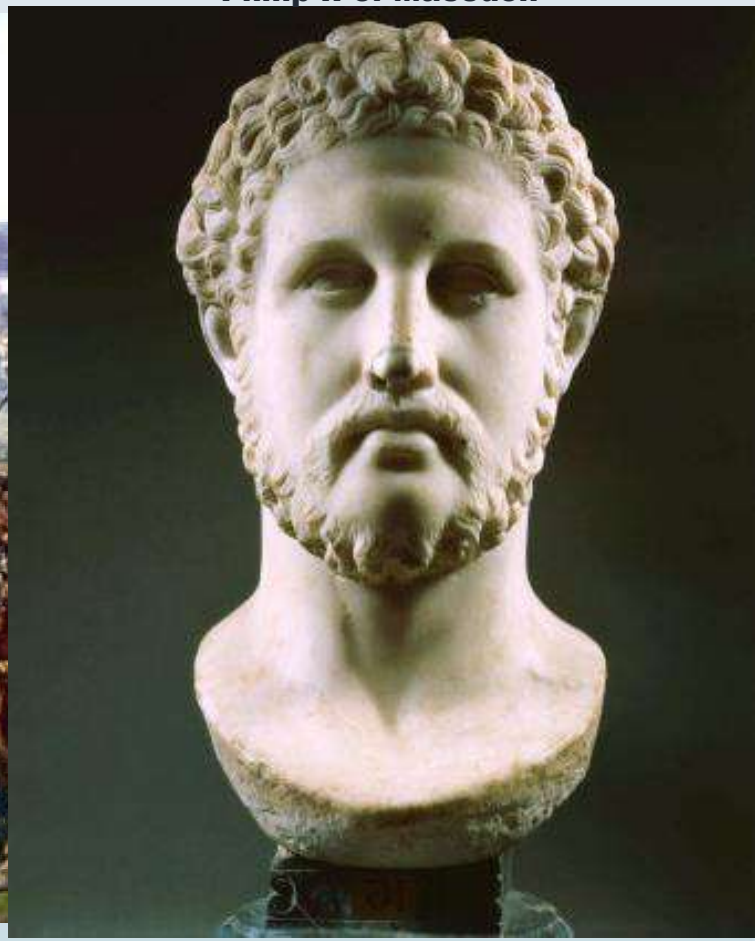
Thomas is also an active participant in the InfoSec community not only as a member but also as director of Security BSides London and speaker at events like Securi-Tay, hack.lu, Troopers, DeepSec, Shmoocon, and various BSides events.

Supply Chain Risks are Seen thru History

Adapting and Changing Risk Footprint

Adapting and Changing Risk Footprint

Philip II of Macedon



Protecting Supply Chain

A convoy of merchant ships preparing to sail to Britain from Halifax, Nova Scotia
(Image courtesy of merchantships.tripod.com)

Cyber Security Supply Chain Attacks are Real

Service Providers

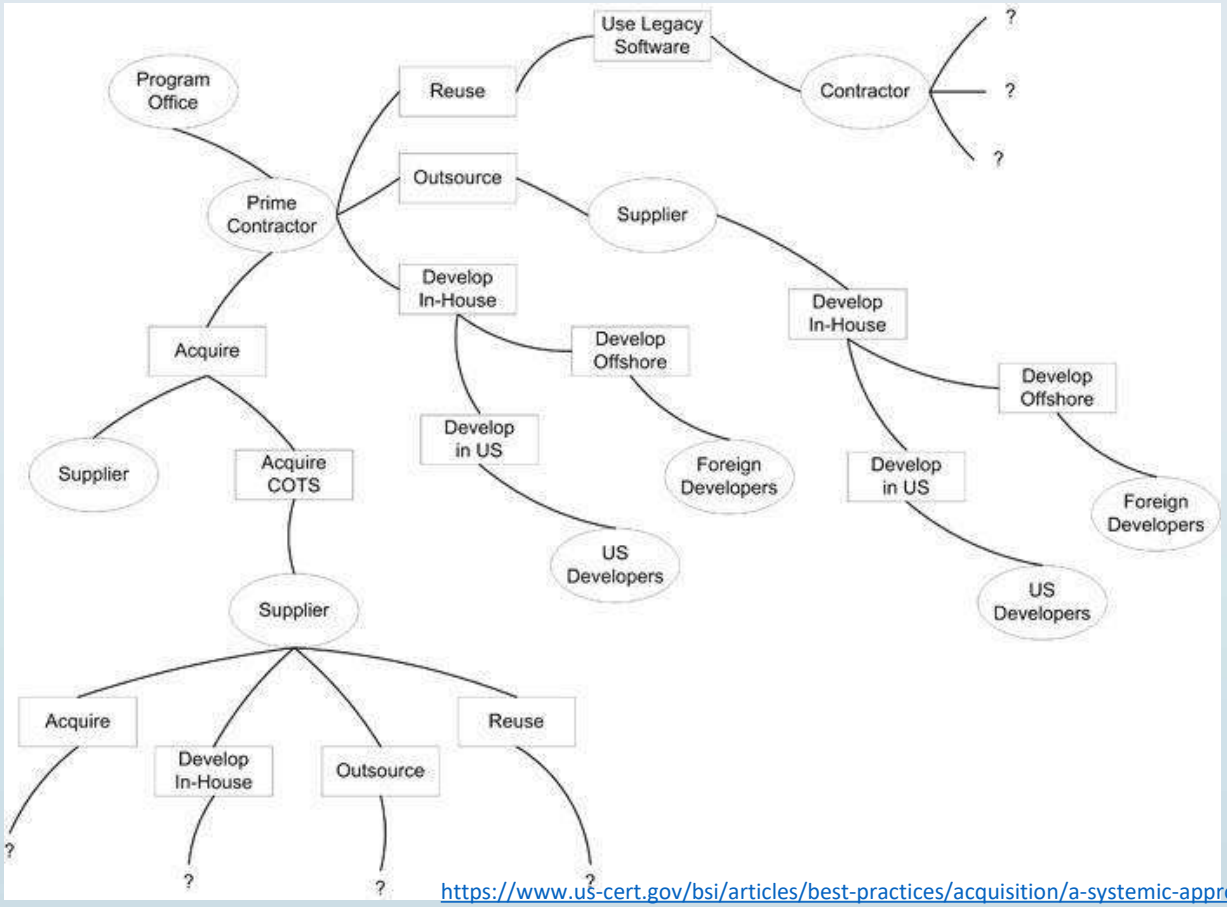
- Implicit trust levels
- Different Security Practices
- Miscommunications
- Introducing compromised software or hardware
- Data storage or aggregation
- Backdoor into your Environment

- Examples
  - Target hacked thru HVAC provider
  - Political parties and mobile Apps
  - 13 MSPs used to push RATs (report from Armor)
  - Physical access controls (e.g. CCTV) providers connecting infrastructure to your network

Software Supply Chain

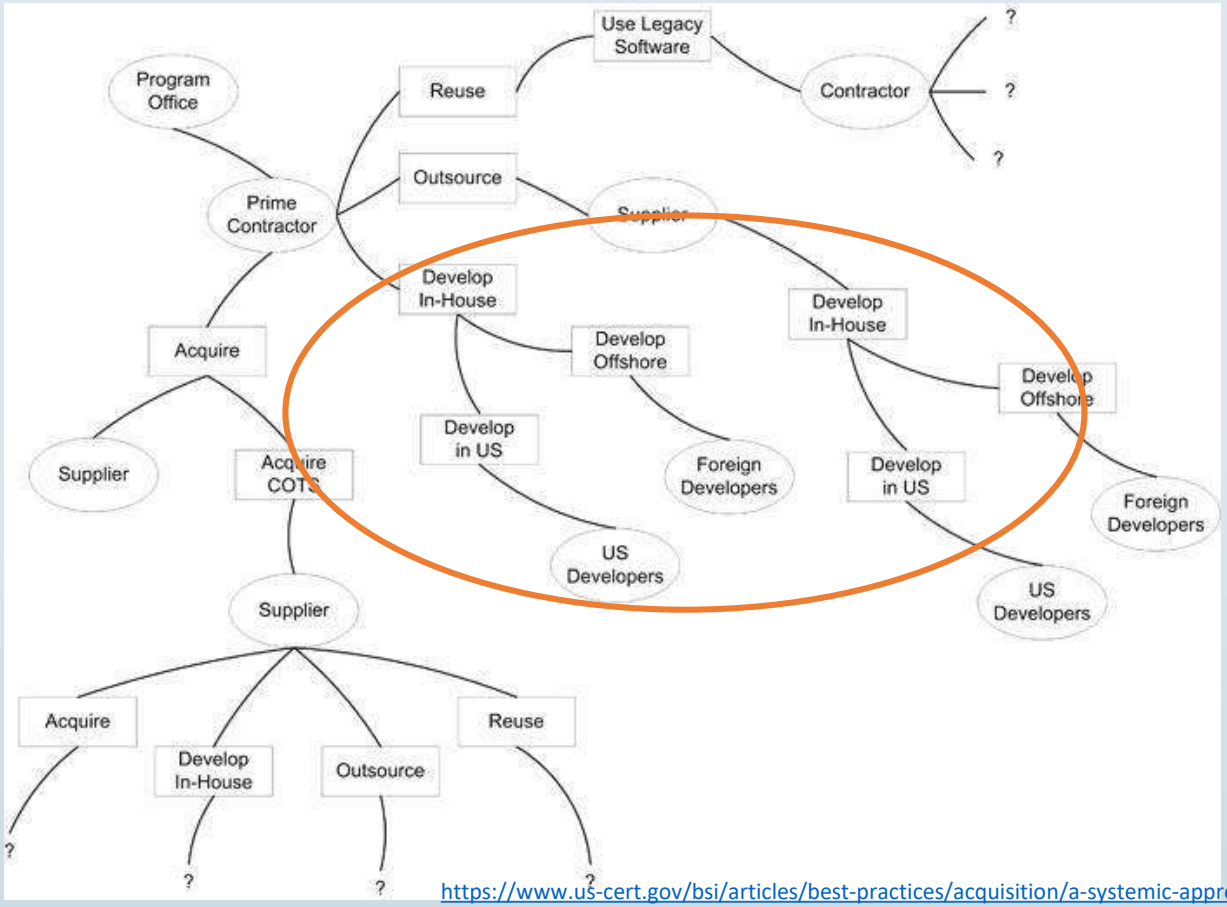
- Purpose is to provide software for the organisation
  - Function as intended
  - Reliable, safe and secure
- Risk is software will not function as intended
  - Coding defects by the supplier
  - **Inadequate security controls**
  - **Defects and issues in the product not addressed in a timely manner**
  - Operational issues over time (e.g. technical debt)
  - **Open source is not secure**

Software Supply Chain



https://www.us-cert.gov/bsi/articles/best-practices/acquisition/a-systemic-approach-assessing-software-supply-chain-risk

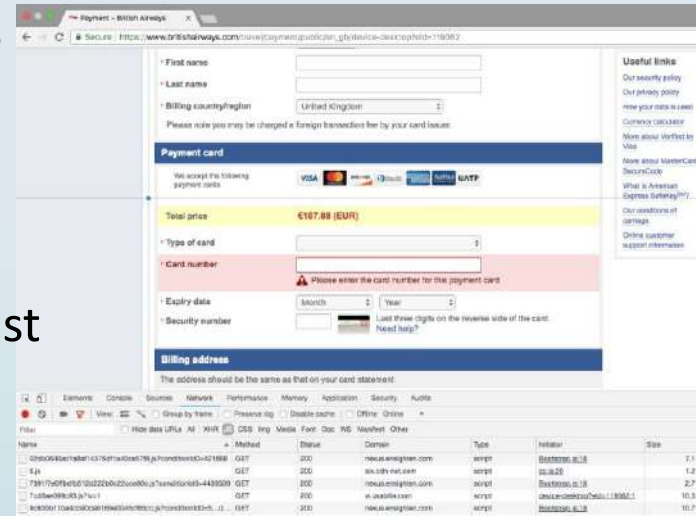
Software Supply Chain



https://www.us-cert.gov/bsi/articles/best-practices/acquisition/a-systemic-approach-assessing-software-supply-chain-risk

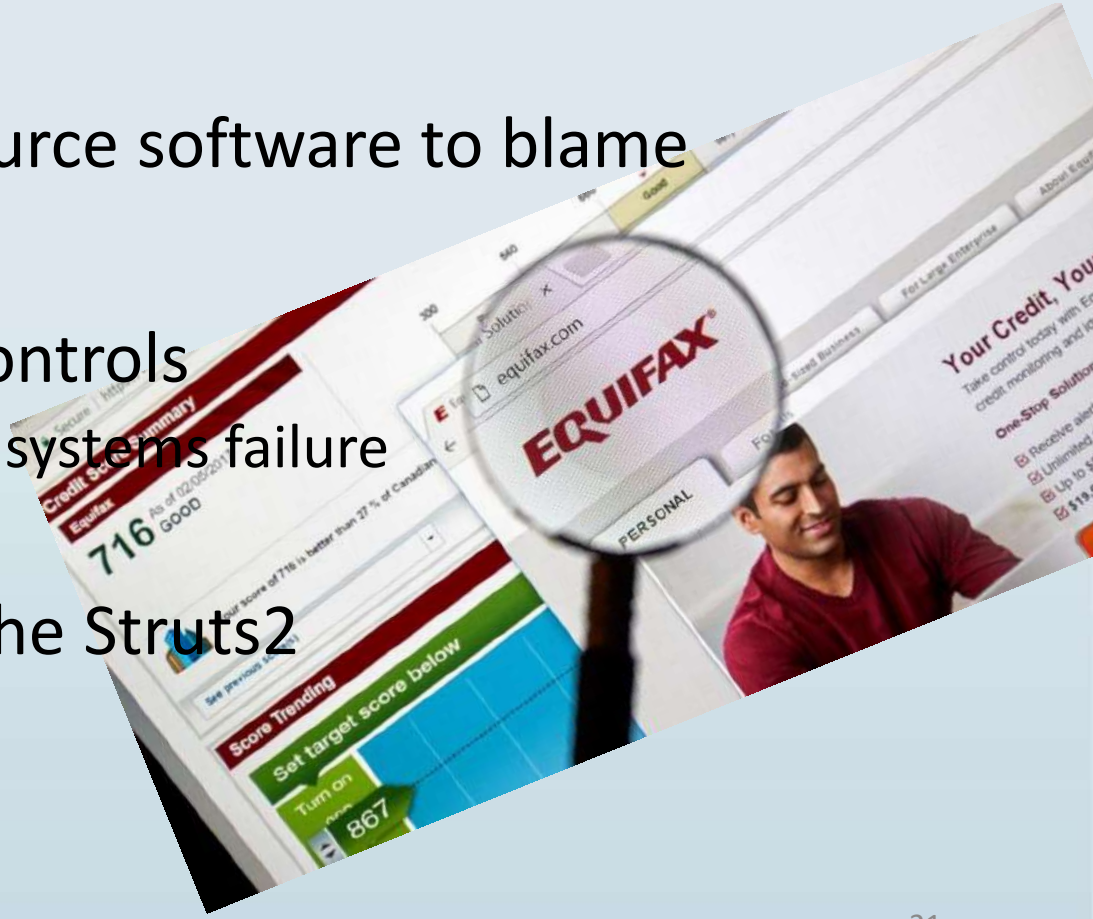
Example 1

- British Airways suffered a data breach in 2018
- Javascript library compromise on payment site
- Affected main website and mobile app
- Campaign against BA ran from 22:58 BST August 21, 2018, until 21:45 BST September 5, 2018
- Magecart group responsible



Example 2

- Huge data breach at Equifax
- Unpatched open source software to blame
- Failure in security controls
  - Scan for vulnerable systems failure
- Critical flaw in Apache Struts2



The Hidden Supply Chain

Open Source Code in Proprietary Software

- 96% of applications have open source components
- 57% to 78% of codebase is open source based (2018)

- Average number of open source components keeps growing
  - 298 in 2018 versus 257 in 2017
- 60% of open source components had vulnerabilities
  - "National Vulnerability Database (NVD) listed more than 16,500 new vulnerabilities in 2018—7,393 of them in open source products"
- 43% of those older than 10 years

Statistics from Intellect Target and Synopsys 2019 OSSRA report

- Vetting of open source components

Open Source Code in Proprietary Software

- Vetting of open source components
- Scan your existing projects

Open Source Code in Proprietary Software

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- Scan your existing projects
- Manage existing vulnerabilities and established remediation plans

Open Source Code in Proprietary Software

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- Build a Third Party Component repository

Open Source Code in Proprietary Software

- Vetting of open source components
- Scan your existing projects
- Manage existing vulnerabilities and established remediation plans
- Build a Third Party Component repository
- Understand the vulnerabilities versus impact and cost

4 Principals of Supply Chain Security

- Understand the risks
- Establish control
- Check your arrangements
- Continuous improvement

Build a Continuous Improvement Program

- Establish a third party component asset library
- Review agreements, component ageing and maintenance
- Vulnerabilities change over time; **establish a continuous scanning and remediation**
- Build this into your DevOps process

Supply Chain Security – Shift Left

Speaker

James McQuiggan, Security Awareness Advocate, KnowBe4

James McQuiggan, CISSP, is a 20 year security veteran and Security Awareness Advocate for KnowBe4. James is also a part time faculty professor at Valencia College in the Engineering, Computer Programming & Technology Division. Within the Central Florida community, he is the President of the Central Florida (ISC)2 Chapter and a Trustee Board member with the Center for Cyber Safety and Education. James has worked as a Product & Solution Security Officer, Information Security analyst and a network security engineer. He consulted and supported various corporate divisions on cybersecurity standards, information security awareness and securing product networks.

“The Supply chain stuff is really tricky”

Elon Musk
CEO of Tesla & SpaceX

The Good, the bad & the ugly

- 59% of companies experienced a third-party data breach
- 16% effectively mitigate third-party risks
- 34% track inventory with third-parties
- 36% avoided a breach from a third-party

Third Party Products

Cost Reductions

Resources

Equipment

- ❑ Hardware
- ❑ Software

Remote access

- ❑ Machine to machine communication
- ❑ Interactive User

Vulnerable Gigabyte driver allowed RobbinHood ransomware infections

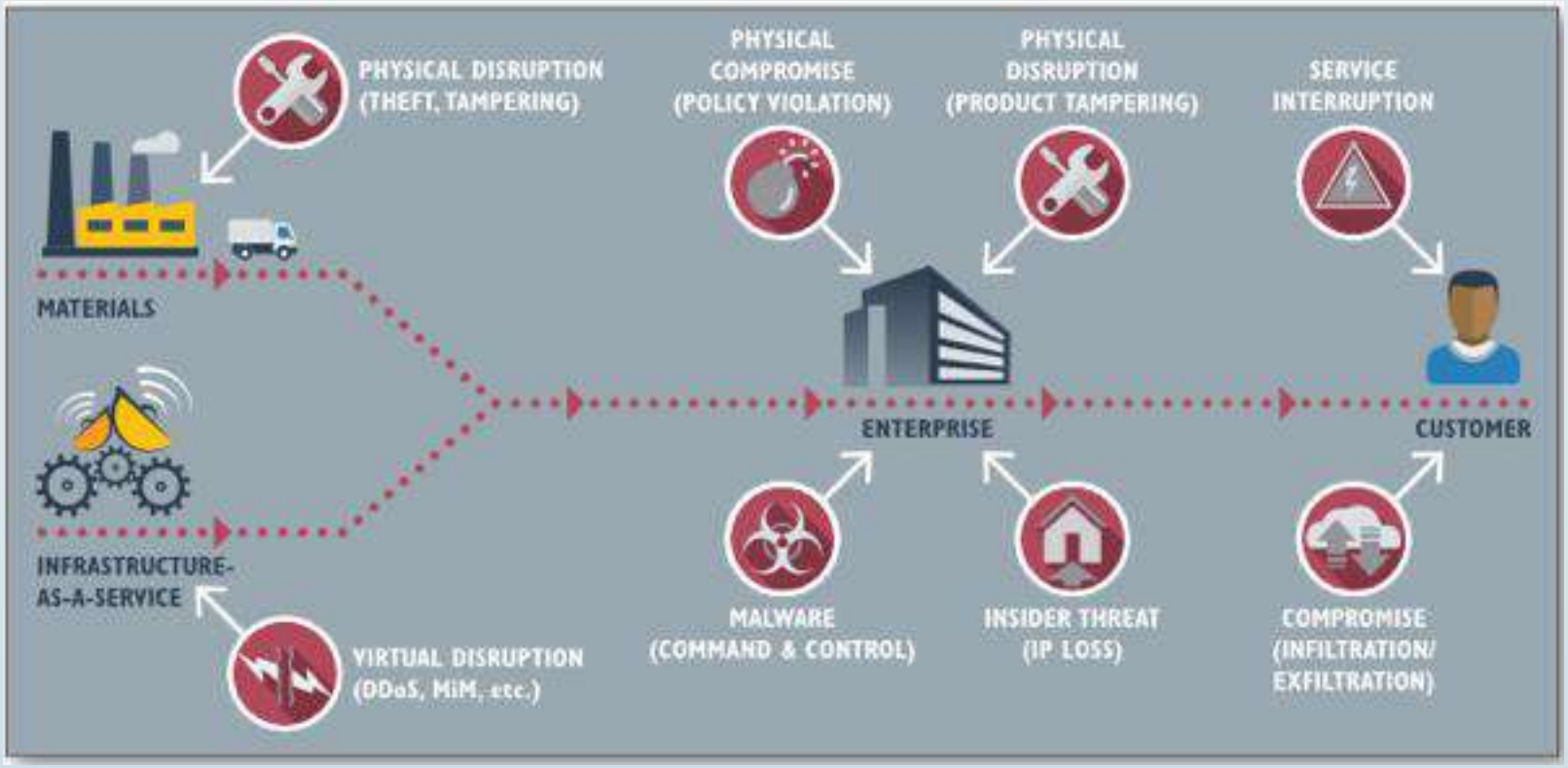
By Jitendra Soni 21 hours ago

Gigabyte did not accept the flaw initially nor did it offer a fix

(Image credit: Pixabay)

A serious security flaw in Gigabyte drivers may have allowed hackers to take over entire computer systems, experts have warned.

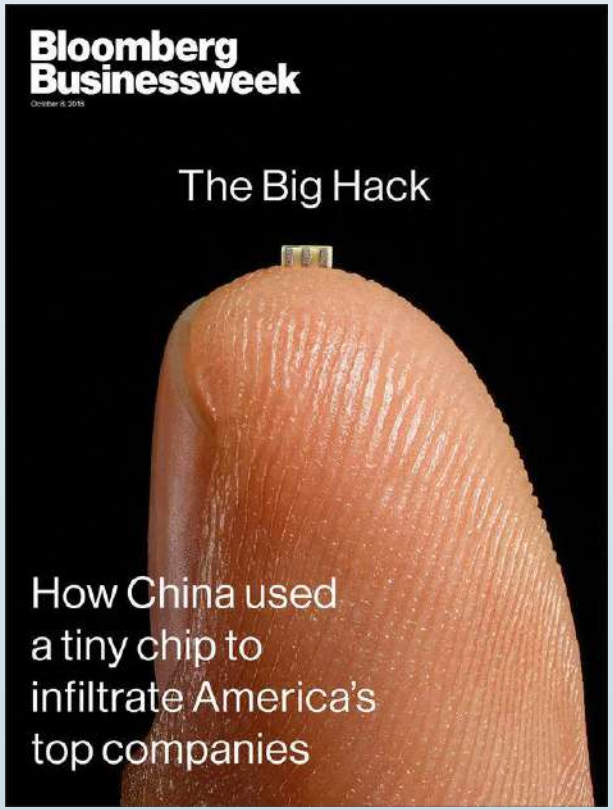
Supply Chain



Source: SANS Cyber Risks Supply

Supply Chain – Hardware attack

- Concern over Supermicro motherboards had a secret tiny chip onboard
- Used to collect information and send back to Chinese Hackers
- Untrue… but possible



Supply Chain and Invoice Fraud

Criminals gain access to an email account and monitor incoming and outgoing emails.

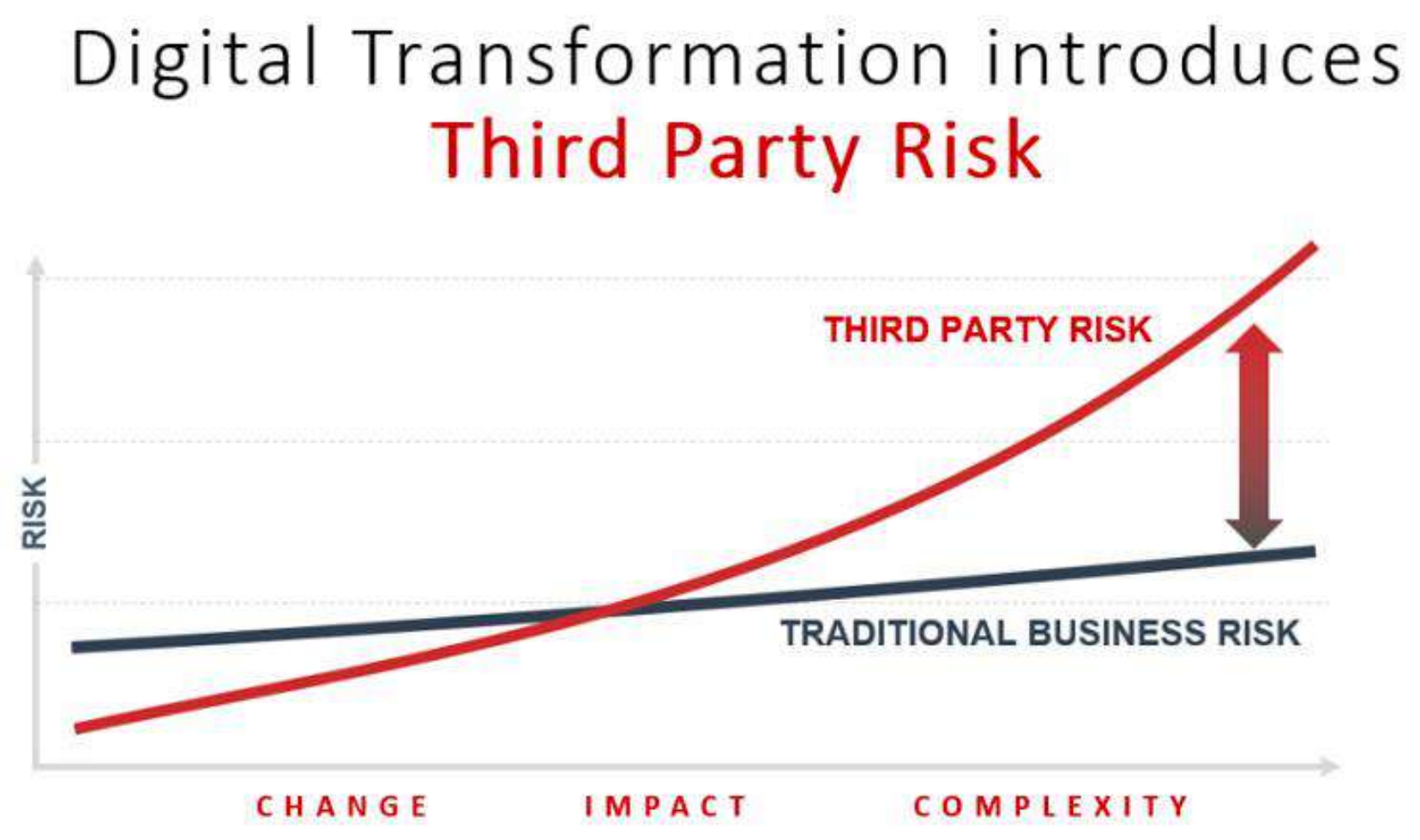
When the person with the compromised email account sends an invoice to a client via email, the attackers immediately send a duplicate, fraudulent invoice from the same email address, telling the client the made a mistake and to wire money to the account in the revised invoice.

Attackers may also just generate fake invoices and send them to clients, which they are able to identify from previous email conversations.

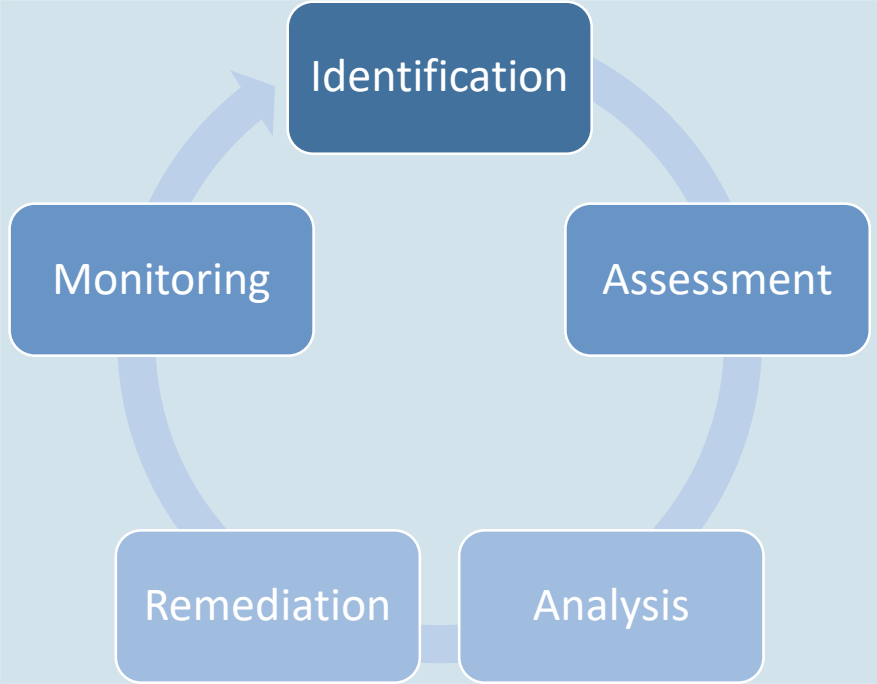
People in the Supply Chain

- Two Unnamed US Companies Falls Victim to $100 Million CEO Email Fraud
- This scam only surfaced as the U.S. government filed a civil forfeiture lawsuit in federal court in Manhattan seeking to recover tens of millions held in at least 20 bank accounts around the world.
- The scammer, a 48-year old Lithuanian managed to trick two American technology companies into wiring him **$100 million**.
- What makes this remarkable is the amount of money he managed to score and the industry from which he stole it. The indictment specifically describes the companies in vague terms, but Apple, Cisco, HP and Facebook come to mind.

Risk Differences



Supplier Security Risk



- Supplier Risk Management Solution
- Three methods
  - Risk Management solution
  - Managed Support Services
  - Hybrid of VRM and Risk Assessment Data
- Depending on cost, time, resources
- Risk Assessments – Threats vs Vulnerabilities
- Likelihood, Opportunity leading to risk

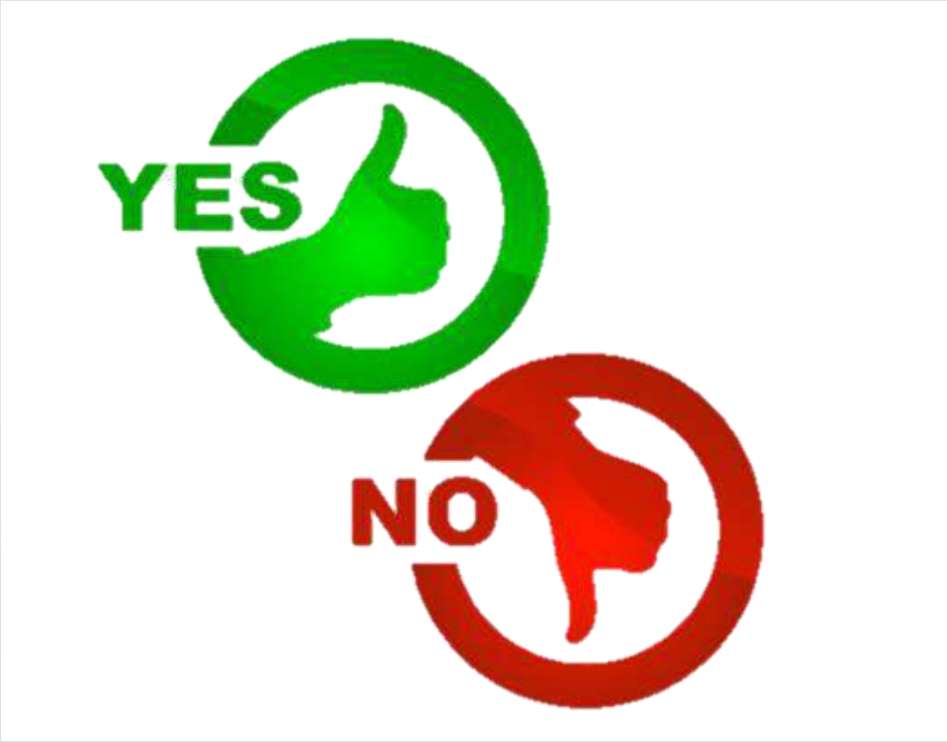
Challenges for the Third Party / Vendor / OEM

- Global products – Embargo, processes
- Secure Configuration / Hardened – patch management, remote access available?
- Possible Multiple certifications for lines of business
- PCI, NERC, ITAR, HIPAA
- Vendors are asked for 3rd party validation to confirm their products are secure
- What is the responsibility of the customer vs the provider?

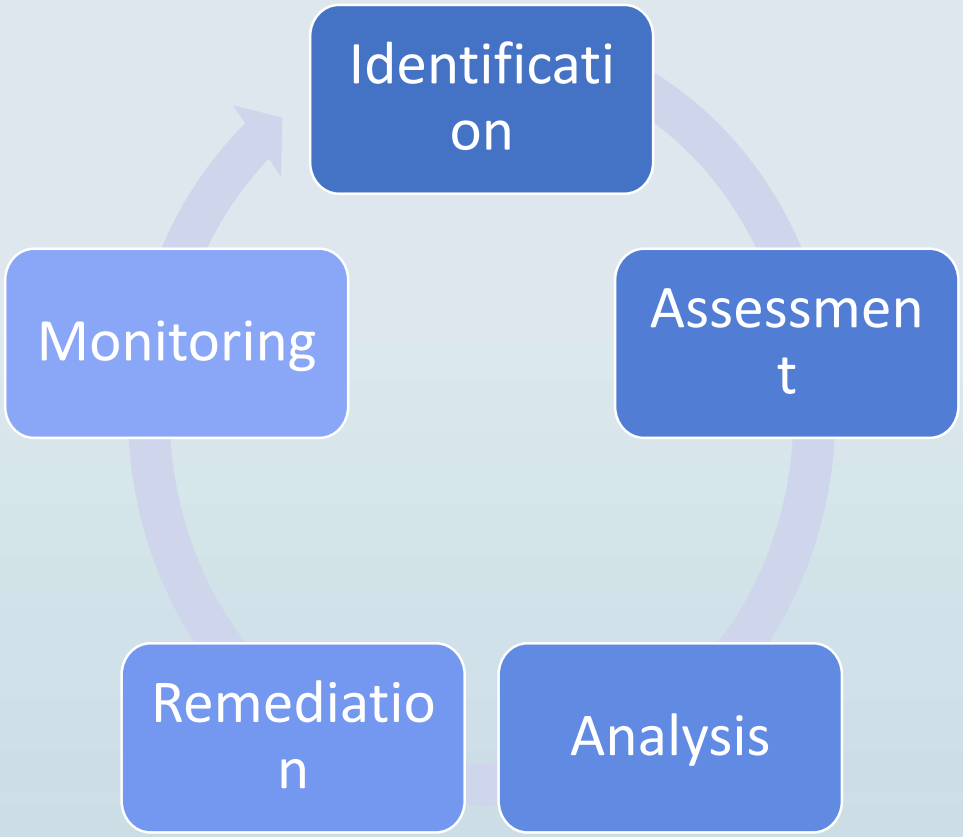
Questionnaires

YEA / NAY?

Questionnaires



- Pros vs Cons
- Self Audit vs. 3rd party audits
- Evidence – Confidential vs Public
- Remediation strategies
- Common Questionnaires
  - ❑ FICO CyberRisk Score -> Chamber of Commerce ABC Risk Score
  - ❑ SIG – Standard Information Gathering
  - ❑ CAIQ – Cloud Security Alliance


Identification
Assessment
Analysis
Remediation
Monitoring

GRC - Overview

Governance - Provides the ability to monitor processes towards company goals

Risk Management - Work to assess and mitigate risks (risk management)

Compliance - Support and comply with internal policies or laws & regulations

Governance

Regulations	Standards	Policies	Contracts	Process / Procedures	Controls
• Laws / Statutes	• ISO • NIST	• Organizational • IT / HR	• B2B Agreements • OEM	• NIST CSF • ISO	• Administrative • Physical • Technical

Risk Management

Conduct	Plan	Authorize	Incorporate
• Asset Management	• Business line • Asset Type	• Regulations • Track & implement	• Link to business • Automate • What's the risk?

Compliance

Monitor	Assess	Audits	Reporting
• Threat Landscape • Internal activity (SIEM) • Implemented controls	• Systems • Processes • Audit Prep work	• Regulatory • Standards (ISO) • Contractual (PCI, CIP, GDPR)	• Internal (C-Suite) • Regulatory • Customers / Vendors

Wrap-up

- Work with your third parties
- Identify the types of risk for each third-party
- Determine the access the third-party needs / requires
- Understand all connections / risk
- Monitor all access from all parties
- Collaborate with third parties on all incidents
- No silver bullet – it requires a machine gun

The lighter side of third party suppliers….

VS

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QUESTIONS?