# Case Study: Equifax Breach

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- Equifax History and Growth
- Incident Details
- Incident Response Process
- Lessons Learned

# Equifax History and Growth

- **Equifax** is an Atlanta based **Consumer Reporting Agency (CRA)** founded in 1899
- CRAs **collect information about individuals and companies**, and **sell credit scores and detailed reports** to other companies and governments (including the US government)
- Consumers and companies **cannot opt-out**

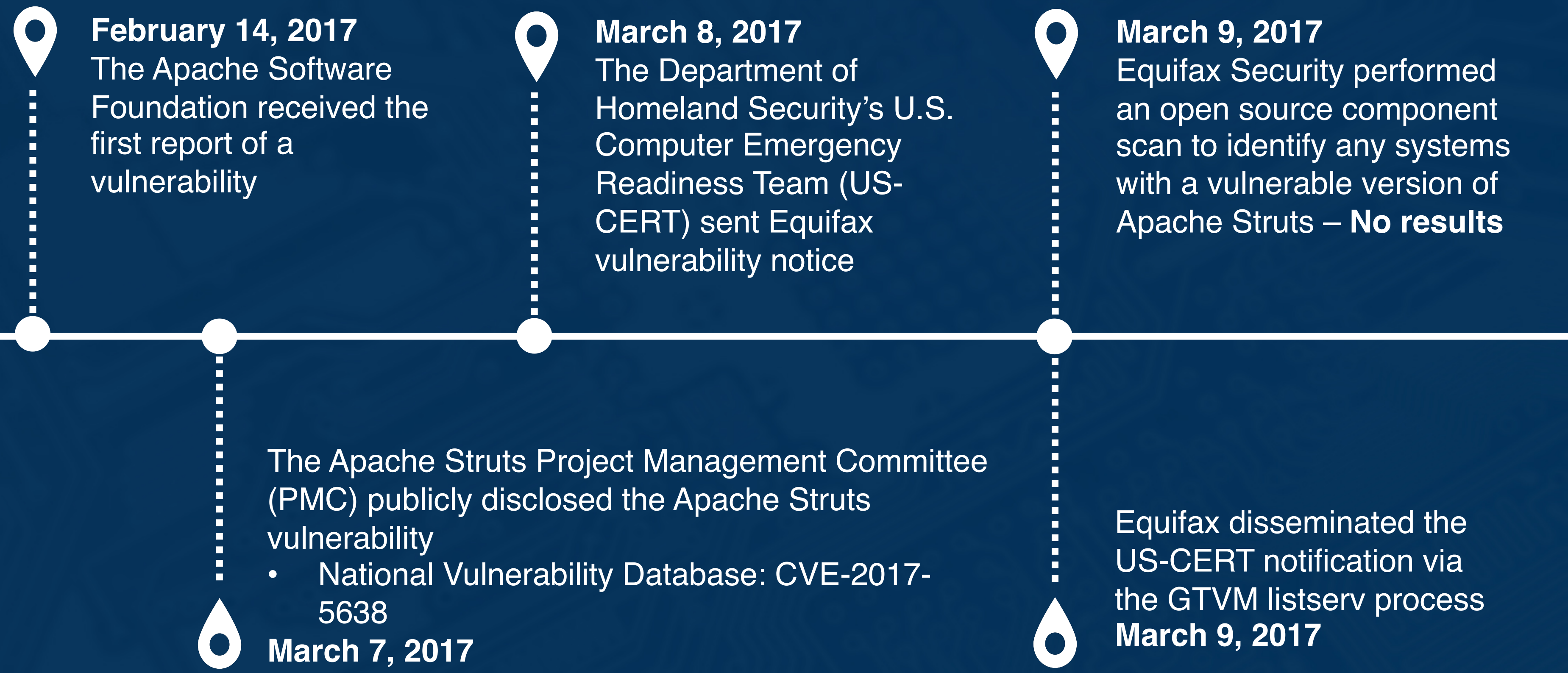
# Equifax History

- In 2005 former CEO Richard Smith started **new growth campaign focused on acquiring smaller companies** for their systems and data
- By 2017 **CEO boasts about Equifax data and processing capabilities**
- Aggressive growth also **yielded large amounts of technical debt and security programs were not scaled** to match the growth of systems and data

# Equifax Growth

# Equifax Incident Details

# Incident Details: Lead-Up



**February 14, 2017**
The Apache Software Foundation received the first report of a vulnerability

The Apache Struts Project Management Committee (PMC) publicly disclosed the Apache Struts vulnerability

- National Vulnerability Database: CVE-2017-5638

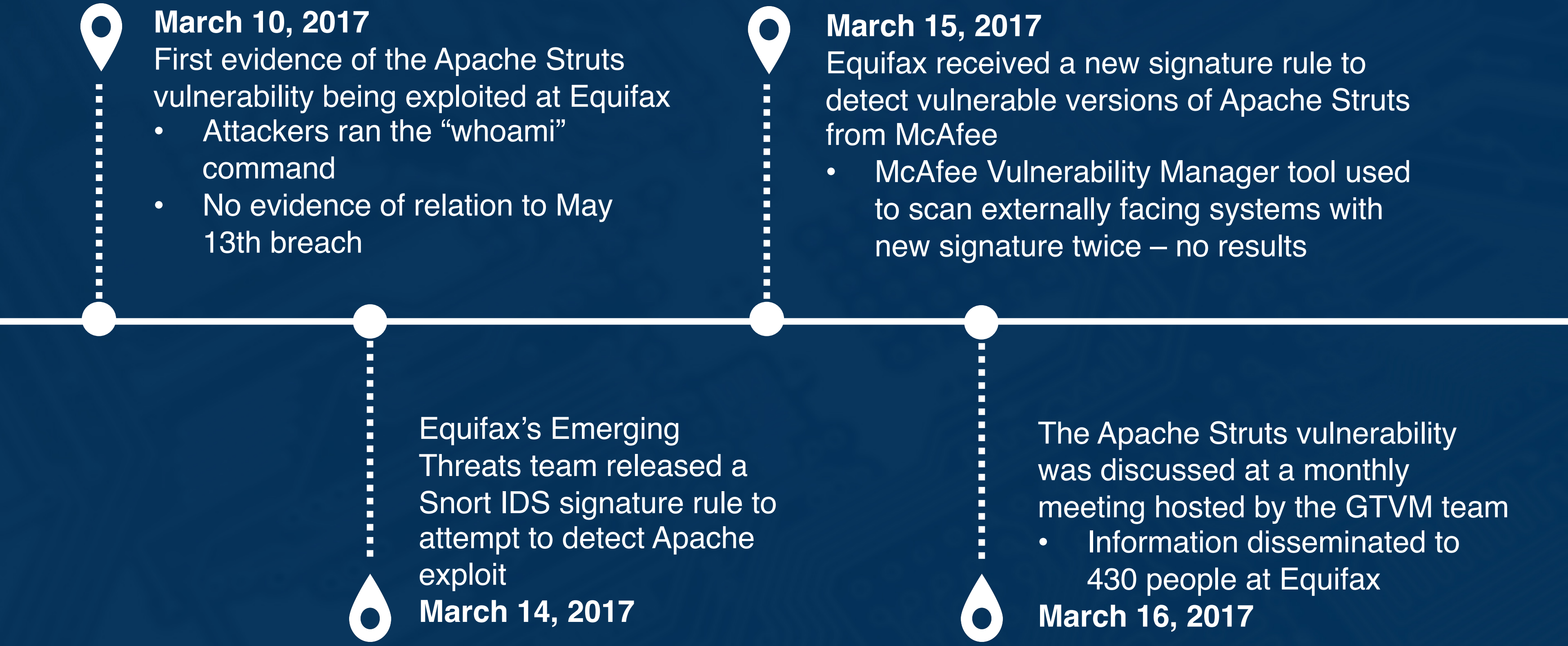
**March 7, 2017**

**March 8, 2017**
The Department of Homeland Security's U.S. Computer Emergency Readiness Team (US-CERT) sent Equifax vulnerability notice

**March 9, 2017**
Equifax Security performed an open source component scan to identify any systems with a vulnerable version of Apache Struts – **No results**

Equifax disseminated the US-CERT notification via the GTVM listserv process
**March 9, 2017**

# Incident Details: Lead-Up



**March 10, 2017**
First evidence of the Apache Struts vulnerability being exploited at Equifax

- Attackers ran the “whoami” command
- No evidence of relation to May 13th breach

Equifax’s Emerging Threats team released a Snort IDS signature rule to attempt to detect Apache exploit
**March 14, 2017**

**March 15, 2017**
Equifax received a new signature rule to detect vulnerable versions of Apache Struts from McAfee

- McAfee Vulnerability Manager tool used to scan externally facing systems with new signature twice – no results

The Apache Struts vulnerability was discussed at a monthly meeting hosted by the GTVM team

- Information disseminated to 430 people at Equifax

**March 16, 2017**

# Data Breach: May 13 – July 30, 2017

- Attackers compromise **ACIS system leveraging Apache Struts vulnerability** and gain access to Equifax network
- Attackers **deploy web shell malware** on ACIS application servers allowing remote session
- Attackers **accessed file share mounted on ACIS application servers** and **identified unencrypted application credentials** stored in configuration file
- Attackers were able **to access 48 databases from the ACIS application servers** and leverage **stolen application credentials** to access databases

# Data Breach: May 13 – July 30, 2017

- Attackers **queried databases to learn schemas** and **identify sensitive personally identifiable information (PII)**
- Attackers ran queries to extract the **PII of 148 million consumers**
- Data returned by **queries stored in compressed files** and placed in **web accessible directories on ACIS servers**
- **Standard web command** then issued from **attacker infrastructure** to retrieve data files

# Equifax Incident Response Process

## Note:

Prior to this incident SSL traffic was not successfully being decrypted by security tools as the the SSL key management system was operating with expired certificates for some time.

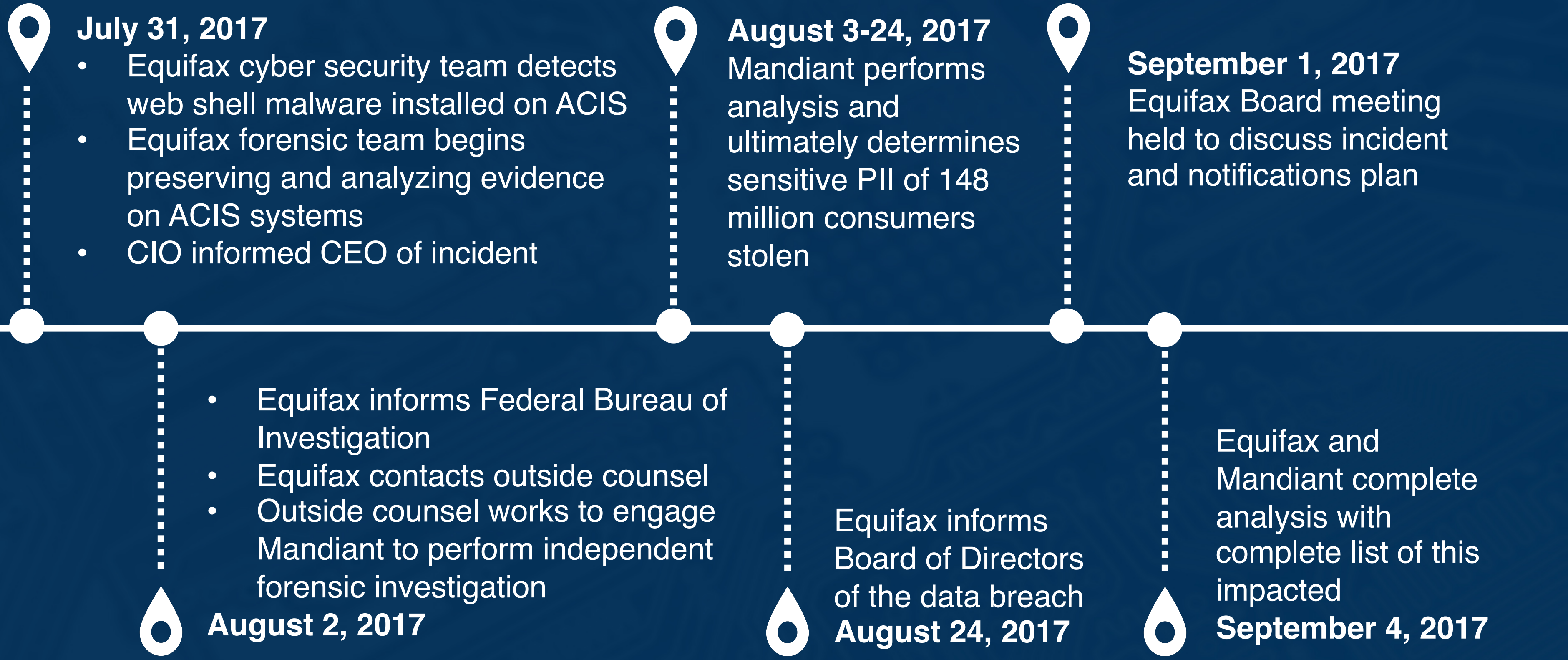
# Incident Response Process

**July 29, 2017**

- The certificates were replaced on the key management system and network-based security tools began successfully decrypting SSL traffic
- Security team began seeing suspicious traffic from IP address originating in China and began investigation
- Analysis showed persistent connection attempts from this IP address, so security team block the Internet Service Provider that owned the IP address

**July 30, 2017**

- Equifax security team continues analysis of ACIS system and find it to be vulnerable
- Second IP address from German ISP but leased to a Chinese ISP found
- Equifax decides to shut down ACIS for emergency maintenance
- Equifax engages CISO and multiple IT leaders including CIO responsible for ACIS



**July 31, 2017**

- Equifax cyber security team detects web shell malware installed on ACIS
- Equifax forensic team begins preserving and analyzing evidence on ACIS systems
- CIO informed CEO of incident

**August 2, 2017**

- Equifax informs Federal Bureau of Investigation
- Equifax contacts outside counsel
- Outside counsel works to engage Mandiant to perform independent forensic investigation

**August 3-24, 2017**
Mandiant performs analysis and ultimately determines sensitive PII of 148 million consumers stolen

**August 24, 2017**
Equifax informs Board of Directors of the data breach

**September 1, 2017**
Equifax Board meeting held to discuss incident and notifications plan

**September 4, 2017**
Equifax and Mandiant complete analysis with complete list of this impacted

# Incident Response Process

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## Breach Notification Process

**August 2017**
Equifax prepares website and large call-center for notification response to answer questions and allow consumers to enroll in identity theft protection services

**September 2017**

- Multiple issues occur including
- Overwhelmed call centers & overloaded website
- Phishing sites setup to trick people trying to reach the Equifax site
- Failure to successfully enroll consumers in protection services

Equifax makes public notifications of data breach including letters to all 50 states
**September 7, 2017**

# Equifax Breach: Lessons Learned

The following items were noted as **areas of improvement** from the report:

- **Vulnerability management**
- **Patch management**
- **Certificate management**
- **Network segmentation**
- **File integrity monitoring**
- **Data minimization**
- **Technical debt**