Global Threat Report

MID-YEAR 2018

MobileIron

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Global threat data

January 1 – June 30, 2018

During the first half of 2018, several types of mobile device risks and threats were detected around the world. The risks and threats are categorized as follows (and often referred to as mobile threat “DNA”):

DEVICE THREATS AND RISKS

Threats to the device or OS, including unpatched vulnerabilities

NETWORK THREATS

Threats delivered to the device via the cell network or Wi-Fi

APP THREATS

Mobile malware, spyware, adware, or “leaky apps” on devices

Key findings:

- Every customer sees mobile OS threats
- MITM attacks increased over last half
- One of every three devices detected a mobile threat

Mobile threats are everywhere

Vulnerabilities disclosed

Many times, when mobile device vulnerabilities and malicious apps are disclosed, people ask, “Do you protect against BankBot, BroadPwn, KRACK, Meldown, Spectre,” and other attacks that get their own marketing campaigns. The answer is consistently “yes” because of our machine learning-based engine that detects attacks across all DNA vectors. Most mobile attacks are a combination of DNA vulnerabilities and techniques (known as “kill chains”), and it has a proven track record of detecting these attacks at all three stages regardless of any creative ways they enter a device. If there is a hiccup in your OS, it will be diagnosed immediately via our threat detection engine.

This year there were several vulnerabilities disclosed to the market. Each was very unique in how it enabled a sophisticated attacker to enter your device, leverage an app, or grab your Wi-Fi traffic.

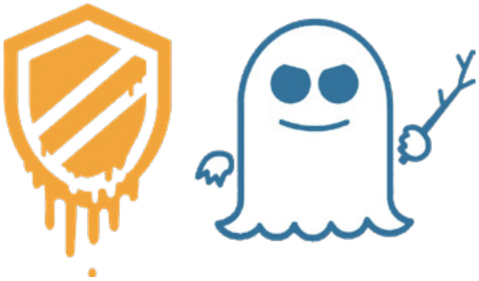
Meltdown and Spectre

According to the team at Graz University of Technology that responsibly disclosed the new bugs, Meltdown and Spectre, exploit critical vulnerabilities in modern processors. These hardware weaknesses allow programs to steal data which is currently processed on the computer. While programs are typically not permitted to read data from other programs, a malicious program can exploit Meltdown and Spectre to get hold of secrets stored in the memory of other running programs. This might include passwords stored in a password manager or browser, personal photos, emails, instant messages and even business critical documents.

Meltdown (CVE-2017-5754)

Meltdown is so named because the exploit basically melts security boundaries which are normally enforced by the hardware. Meltdown breaks the most fundamental isolation between user applications and the operating system. This attack allows a program to access the memory, and thus data, of other programs and the operating system.

According to reports, every Intel processor since 1995 (except Intel Itanium and Intel Atom before 2013) are potentially affected by Meltdown. ARM processors are also affected, but AMD has stated there is "Zero AMD vulnerability due to AMD architecture differences."



Spectre (CVE-2017-5753 and CVE-2017-5715)

Spectre acquired its name from its root cause, speculative execution. As it is not easy to fix, its name implies that the researchers think it will haunt us for quite some time. Spectre breaks the isolation between different applications, and allows an attacker to trick error free programs into leaking their data.

Almost every system is affected by Spectre. More specifically, the Spectre vulnerability has been verified on Intel, AMD, and ARM processors. Additional exploits for other architectures are also known to exist. These include IBM System Z, POWER8 (Big Endian and Little Endian), and POWER9 (Little Endian).

How to protect mobile devices from Meltdown and Spectre vulnerabilities:

Operating System Patches

Apple and Google both stress that there are no known exploits impacting customers at this time. To help defend against these exploits, Apple and Google have both released patches. Apple users should be running at least iOS 11.2 to protect against Meltdown. According to Apple, while Spectre is extremely difficult to exploit, even by an app running locally on a Mac or iOS device, it can be potentially exploited in JavaScript running in a web browser. As a result, Apple plans to release mitigations to their Safari web browser to help defend against Spectre soon.

Android users should have security patch levels of 2018-01-05 or later, as documented on January 5 as part of the Android January 2018 security patch update.

Bluetoothd daemon

Vulnerabilities in Apple's bluetoothd daemon

We investigated iOS Mach message IPC focusing on available services accessible from within the iOS sandbox. The goal of this effort was to assess potential opportunities to gain privilege escalation and escape the sandbox, which is a core part of a full iOS exploit chain.

We found two crucial vulnerabilities in the bluetoothd daemon on iOS, webOS and tvOS as part of CoreBluetooth. The first vulnerability is memory corruption in bluetoothd, and the second is execution of arbitrary code on different crucial daemons.

The first vulnerability (CVE-2018-4095) is full relative (ASLR bypass) control on the stack in CoreBluetooth that leads to memory corruption over bluetoothd.

The second major vulnerability (CVE-2018-4087) leads to execution of arbitrary code on different crucial daemons in iOS by hijacking the session between each daemon and bluetoothd. Some of the impacted daemons are: SpringBoard, mDNSResponder, aggregated, wifid, Preferences, CommCenter, iaptransportd, findmydeviced, routined, UserEventAgent, carkitd, mediaserverd, bluetoothd, coreduetd and so on.

ZipperDown

ZipperDown Vulnerability: 100M iOS Users at Risk

Security researchers from iOS jailbreak firm, Pangu Lab, announced a vulnerability that they believe affects around 10% of all iOS apps. In a blog on its newly created information site, https://zipperdown.org, Pangu stated that its researchers noticed "a common programming error, which leads to severe consequences such as data overwritten and even code execution in the context of affected Apps." Pangu calculated that the infected apps may expose 100 million users or more. To avoid leaking the details of the programming error, Pangu named it "ZipperDown".

Preliminary ZipperDown Analysis

According to Pangu, "To protect the end-users, the detail of ZipperDown is not available to the public for now." However, we believe that the issue lies in a third-party library that many apps are using. ZipperDown is not about malware, but it is about a vulnerability being exploited in several apps via a MITM on the network.

How MobileIron Helps Combat ZipperDown

MobileIron Threat Defense detects MITM attacks and the exploits that can leverage ZipperDown, and can prevent them from executing through a customer-defined policy enforcement.

MobileIron Threat Defense's on-device, machine learning-based detection has many advantages. One of which is the "kill chain" detection, wherein our solution detects attacks at multiple steps without any updating or signatures. In this case, our solution detects MITM attacks and any exploits attempting to elevate privileges to compromise the device.

Cryptojacking

The illegal mining of cryptocurrency, called cryptojacking, has been skyrocketing in popularity this year. Cryptojacking is used to not only steal digital currency and exchanges stored on mobile devices, but it is most commonly the unsanctioned use of processing power from the CPU, GPU, DRAM, and ASIC of infected devices to mine for cryptocurrency. This results in faster drainage of the mobile devices' battery, and higher electricity bills because of more frequent recharging. In one example, an Android device overheated and began bulging from the processor running at maximum speed for an extended period of time.The most common malicious JavaScript that can be served to devices surfing the web is the CoinHive mining script which accounts for about 94% of all infected websites. Coinhive is used mainly for mining the Monero cryptocurrency, whereas BitCoin requires more processing power. At last count, there are over 50,000 infected web sites including some popular and public sector web sites.

MobileIron Threat Defense detects the malware that contains the cryptojacking script. Additionally, internet users can add cryptojacking detection extensions to their web browser like Google Chrome.

Updates on Updates For Apple, Google

Security Updates and Patches

During the first half of 2018, Apple released major and minor updates to iOS six times. Collectively, these security updates repaired 110 CVEs ranging from minor graphics updates to major browser and kernel updates. In 2017 there were 387 CVEs awarded. This matched the highest ever total for iOS in a single year (2015). Apple is very effective at pushing security updates to phones and making the latest patches available. However, users are still required to update to the latest version of the operating system.

Google released six Android Security Bulletins for the time period January 2018 through June 2018. Collectively there were updates to 495 CVEs with 48 of these deemed critical. Google notified users about security patches for Meltdown and Spectre in the January 2018 update. This was a very critical update to fix CPU vulnerabilities and at the hardware level.

The April 2018 update included 311 CVEs, including many dating back to 2014 for Qualcomm firmware. Updates to the vulnerabilities in the Qualcomm components were shared by Qualcomm with its partners through Qualcomm AMSS security bulletins or security alerts between 2014 and 2016. They were included in the April Android security bulletin in order to associate them with a security patch level.

Which devices were attacked? How and when?

Device Risks and Threats

Analysis of mobile devices showed that enterprise customers continue to update devices with available security patches. We noticed fewer devices remain on older versions of each OS and vulnerable to known exploits than previous reporting periods. Even though many customers have UEM packages that monitor OS versions, they don't necessarily update the devices as soon as security patches become available.

We look at each OS separately since each has its own ecosystem and update schedule. iOS devices constitute the majority of customers devices, and we noticed the updates to these devices get delivered quickly. The latest major update to iOS is 11.4 release on May 29, 2018. Over half of iOS devices (51.9%) have the latest major update installed. The remaining devices are one or two versions behind the latest. There are 26.5% of iOS devices on version 11.3 with the remaining 21.5% on 11.2 or before.

Most of the Android devices run Android 6 with 65% of the devices on Marshmallow followed by 16% on Android 7, Nougat. Many analysts advise Marshmallow is the lowest version enterprises should allow inside the network. Thirteen percent (13.8%) of Android devices are on the latest version, Android 8, Oreo. The remaining 4% of Android devices run Lollipop or prior versions of the operating system.

We look at how healthy these devices are in terms of how they are configured, as well. We consider devices a high risk when certain privacy and security settings are disabled. Some of the high-risk settings we investigate are whether or not Developer Options is enabled, whether a device is jailbroken or rooted, and necessary privacy settings remain on like encryption and PIN codes.

38% of devices introduce unnecessary risk

Extremely risky devices disable code signing, allow apps from unknown sources or have malicious profiles on the device. Just over 1% of these devices were found to have malicious iOS configuration profiles that can manipulate the device to possibly steal data. We continue to see these profiles associated with apps deceiving users during installation to compromise the device or install RATs (Remote Access Trojans).

We measure static configuration risk and active threats independently since mobility teams often manage separate policies based on the device risk, user profiles, or roles. They want to know whose devices are most risky so they can put them in special groups or label them differently. Customers, of course, want to know which actual devices were attacked, how and when.

For the first half of 2018, 31% of active devices recorded threats. Threat severity levels are configured based on risk tolerance and not called out in this report. One customer may remediate a threat automatically whereas another may mark it for further investigation. Alarmingly, we detected nearly 4% of devices containing apps scanning internal networks for surveillance reasons or had detected a rogue access point. **These facts clearly state cyber criminals are increasingly using corporate mobile devices for surveillance purposes.**

Wi-Fi MITM attacks are real

Network Threats and Attacks

One of the most serious types of threats occurs when an attacker intercepts a mobile device's network traffic through techniques such as a man-in-the-middle (MITM) attack or a rogue access point. This gives the attacker the ability to read and capture credentials, emails, calendars, contacts and other sensitive data as a preliminary step in a more advanced attack.

For the first half of 2018, our data indicates one of every seven devices detected a MITM attack (14.88%). This is consistent with the rate we recorded in other reporting periods in previous reports. Note, detecting a MITM does not indicate there was a successful attack.

It does, however, indicate a successful MITM attempt. Had the user not installed the MobileIron Threat Defense app on their device, the attack would not have been detected or recorded. Unless users have a mobile threat defense app that can detect the attack on their devices, the wireless connections can be rerouted to a proxy and their data may be compromised. The compromised data can be used as part of an attack on the user, their employer or fraud.

Rogue access points, which are wireless access points that have been installed on a secure network without explicit authorization from a local network administrator, are another common type of network attack that reroutes traffic. Rogue access points can be placed anywhere and typically follow trusted naming conventions to capture traffic from potential targets. For example, a rogue access point near a hotel or office location can mimic the actual name to deceive unsuspecting victims.

Nearly 2% of devices connected to a rogue access point.

MobileIron Threat Defense can detect these rogue access points, report back to the corporate security teams, and automatically terminate the session if the security policy dictated and configured that action. Additional rogue access points were detected nearby, but those mobile devices did not actually connect.

App threats are real

Enterprises and users continue to be concerned about mobile apps and mobile malware since they have been trained by legacy antivirus software packages. They scan and look for a known malware file and remove it.

The issue with this logic on mobile is the mobile operating systems evolve and add features very rapidly. The mobile operating systems add millions of lines of code in a year, and therefore introduce unintended consequences, bugs and vulnerabilities.

In 2017, there were more CVEs registered for Android and iOS than all of 2016 and 2015 combined.

In 2017 there were 1228 CVEs awarded for the mobile operating systems. Over half of these CVEs received scores of 7+ or greater indicating the vulnerabilities are severe and exploitable. We expect this trend to continue into 2018 as the mobile operating systems continue to mature and more features are continuously being added.

Security conscious organizations continuously refine their security policies and training programs to reduce IT risk. Despite all the training and awareness programs, users still find routes around security policies and controls. For these reasons, organizations choose to reduce their risk posture by installing mobile security on employee and corporate-owned devices.

During the first half of 2018, we identified known malicious apps in environments on thousands of devices. Android devices were more likely to have known malicious mobile malware on the devices. Malware inside apps was found on 3.5% of devices. Over 80% of the apps found with malware had access to internal networks and were scanning nearby ports. This type of surveillance is indicative of larger malware attacks.

In February 2018, a fake version of the legitimate BBC News app from Google Play was downloaded, and it was previously unknown malware. This app was classified as malware via its threat detection technology, and the findings were disclosed on March 1, 2018.

iOS

iOS malware delivered via an app is less common at 0.1 % of total devices. iOS devices are more likely to have malicious profiles present on devices and often delivered to devices inside free apps or disguised as companion apps. In late 2017, a user paid $15.95 for an app in the App Store that offered several games. After purchasing the app, the user received a prompt to download an “installer” or “helper” app to provision the games. This “installer” app was later found to be a malicious profile that compromised the device. The malicious profile enabled the device to download apps from outside the App Store without jailbreaking the device. The company security team notified the user and provided instructions on how to remediate the attack.

If you would like to obtain forensic detail like the above for your enterprise devices, please contact us to set up the appropriate steps. For more information about MobileIron Threat Defense, go to www.mobileiron.com/threatdefense .

Sources:

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