KARMABOOTY

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WiFi Pineapple

Hak5.org - $99

WiFi Pineapple Mark V

WiFi Pineapple

- Dual removable antennas.
- Support for USB mobile broadband modems.

Pro Kit:

- Battery power for long-term placement.
- Weatherized storage.

WiFi Pineapple

- Enhanceable through “infusions”, community written modules. Also expandable with external storage and modules.
- The WiFi Pineapple does many things, but what we’re interested in is Karma.

Karma

Basics:

- The device in your pocket looks for networks. It’s doing it right now. It’s not finding those networks, so it will try again in a little while.
- Depending on device settings, it might automatically connect if it finds a network.

Karma

- That device is essentially saying “Hello? ‘ATTwifi’, are you there?” “Hello? ‘Linksys’, are you there?”, “Hello? ‘It burns when IP’, are you there?” and so on.

- We will show you more towards the end of this presentation.

Karma

- ...now for the fun part!
- Karma says, “Yes! I’m that network you’re looking for!” and voila, the device is now connecting to the device/machine running Karma.

Karma

Why This Is Bad:

- Attacker can intercept all of your wireless traffic.
- Could be changing web pages, capturing your banking credentials, etc.
- ...however, Karma (normally) only works on open networks.

Karma

Considerations:

- The attack doesn’t have to take place anywhere near the SSID.
- In fact, it’s easier if it’s somewhere else.
- For example: a coffee house or airport.

Pineapple Demo

Pineapples are yummy!

Yummy, but Unnecessary

- Do you need a Pineapple? No, but they are cool!
- The Pineapple code is completely open-source. That said, you don’t need it to use Karma or the other Pineapple attacks.

Pentoo + HostAPd-Karma

- Pentoo, a Gentoo Linux-based distribution for penetration testing, has a pre-patched version of HostAPd with Karma built in.

- Two new command line flags: -R and -A:
- -R activates Karma.
- -A logs the connection attempts.

LootBooty

- Released by PuNk1nPo0p at DEFCON 21.
- Just a small patch to FreeRADIUS!
- Allows acquisition of cleartext passwords from vulnerable devices.

LootBooty

How It Works:

- Creates a rogue access point with a certain SSID.

- When a device in range tries to connect, LootBooty jumps in and says, “Talk to me! I’m *totally* ‘SuperSecureCorporateWiFi!’”

LootBooty

How It Works, Cont'd:

- During authentication, LootBooty says, "I don't understand your encryption. Use EAP-GTC instead. I need your password in cleartext."
- ...a vulnerable device will say, "Okay!"
- LootBooty will then log that password.

LootBooty

What's EAP-GTC?

- Extensible Authentication Protocol - Generic Token Card.
- Designed by Cisco for generic authentication using a one time password.
- Unfortunately, vulnerable devices allow fallback to this protocol.

LootBooty

eap_rlm_mschapv2.c:

```
PW_MSCHAP2_SUCCESS);
                        data->code = PW_EAP_MSCHAPV2_SUCCESS;


-               } else if (inst->send_error) {
-                pairmove2(&response, &handler->request->reply->vps,
-                         PW_MSCHAP_ERROR);
-                        data->code = PW_EAP_MSCHAPV2_FAILURE;
+               } else if (rcode == RLM_MODULE_FAIL) {
+                        pairmove2(&response, &handler->request->reply->vps,
+                                 PW_MSCHAP2_SUCCESS);
+                        data->code = PW_EAP_MSCHAPV2_SUCCESS;
                } else {
-                        eap_ds->request->code = PW_EAP_FAILURE;
+                        eap_ds->request->code =
PW_EAP_MSCHAPV2_SUCCESS;
                        return 1;
                }
```

rlm_pap.c:

```
fail:
                        RDEBUG("No password configured for the user. Cannot
do authentication");
-                       return RLM_MODULE_FAIL;
+                       return RLM_MODULE_OK;


                } else {
                        vp = NULL;
```

...that's it!

LootBooty

Vulnerable versions of Android:

- Depends on the carrier/manufacturer's code, specifically the wireless supplicant.

- Anthony's Verizon Samsung Galaxy SIII, running Android 4.3 *is* vulnerable. ...but it *wasn't* before the last update!

LootBooty

Vulnerable versions of iOS:

- 6, 7, at least. Likely older versions, too.
- Prompts on invalid certificates.
- Easy enough to bypass with a valid cert: it doesn’t matter whose it is!

LootBooty

Vulnerable Desktop OSes:

- Windows doesn’t implement EAP-GTC. (Add-on supplicants might be vulnerable.)
- OS X prompts on invalid certs, but will connect if the user accepts anyway.
- Linux, like Android, will depend on which wireless supplicant is used.

LootBooty

Why This Is Bad:

- Is your wireless network password your Active Directory password?
- What else is it used for? Payroll info, maybe?
- How extensive is your organization's Single Sign On structure?

LootBooty

Demo time!

Karma… Booty?

- An enterprising hacker just might combine these attacks.
- The end result? A rogue access point that answers WPA2 Enterprise connection requests from any SSID and captures credentials in cleartext.

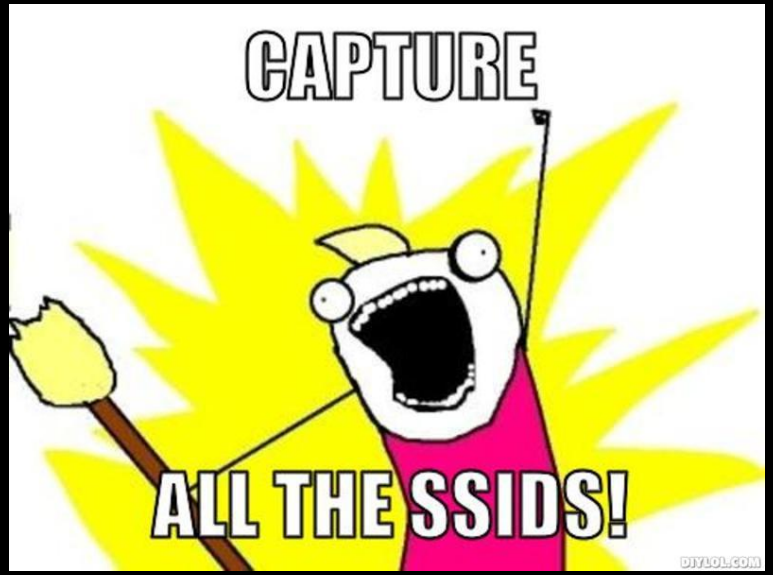
KarmaBooty

How We Did It:

- Modified HostAPd-Karma to answer WPA2 Enterprise requests.
- The patched FreeRADIUS from LootBooty still downgrades to EAP-GTC and captures passwords.
- With some work, we'd just need HostAPd.

KarmaBooty

- Demo? We can't…
- We don't have a way to limit the area of effect on the attack.



How Do We Stop This?

For Device Manufacturers:

- EAP-GTC shouldn’t be a fallback.
- Only use EAP-GTC when specifically requested.
- Ideally, require authentication every time a device connects to the network. This would really, really annoy people, though.

How Do We Stop This?

For Network Administrators:

- Use EAP-TLS!
- Yes, this means that everyone needs certificates. (But you could self-sign.)
- Wireless network passwords shouldn't be the same as Active Directory passwords. (No Single Sign On. It's a ***bad idea***.)

How Do We Fix This?

For End Users:

- Don’t auto-connect to wireless networks. (Yes, it’s annoying, but it might just save your password!)

- Don’t click past certificate verification boxes. **Read them!**

Fixing It Boils Down To...

CERTS!

Questions?

No WiFis were harmed
in the making of this production.

Questions later?

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