The Mr. Robot Hack Report: Burning down the house

Mr. Robot *is back, and the C Y B E R is back, too. The show takes a special interest in showing off the details that usually get glossed over, often drawing on real hacks and real cybersecurity problems. So after every episode, I'll be breaking down who got hacked, how, and with what. It turns out, there's a lot more to each one than you can see on-screen.*

This episode was a bit of a breather after last week's doomfest. Elliot goes on a semi-suicidal trip to the ocean, meets a little kid, watches *Back to the Future,* and recovers his will to live. Along the way, we get a peek at the steady creep of martial law and general chaos on the Robot universe, with a general curfew and *Children of Men*-style checkpoints in the background. It's getting bad out there!

But as I've said before, this isn't the Thoughtful Engagement With Islamic Culture Report; it's the Hack Report. So for the purposes of this column, I'm going to take a look at what Elliot does in the very beginning of the episode: closing his files on Trenton and Mobley before microwaving his gear in a general reset. We've seen him do this before, particularly in season 1 as he was preparing for his big move against Evil Corp, but it's worth walking through exactly what's happening here and why it's such an effective way to wipe his system clean.

Like any successful backup system, there are two steps: copying the data you need to a save place, and then flaming it out everywhere else.

KICK OUT THE JAMS

First, we see Elliot copying all his data on Trenton and Mobley onto dummy CDs. We even get their real names: Shama Biswas and Sunil Markesh. Shama / Trenton gets Bruce Springsteen's *Magic*, while Sunil / Mobley gets a CD of DJ Mobley himself.

We've seen Elliot do this routine before, but it's a really clever way to disguise data, in part because no one searching his apartment is going to think of listening to his CDs. Even if they did, what would they hear? Compressed audio doesn't take up that much of a CD's storage capacity, so it's easy to make a mixed mode CD that would actually play the Springsteen album (or a compressed version of it) and still store hundreds of Mb of data in the background. It's hard to tell from this episode if that's exactly what Elliot's doing this time around, but it's one of the reasons the whole setup is so clever.

The actual albums seem to be a bit of an Easter egg. Is Speaking in Tongues a comment on Elliot's relationship with Krista? You can dig through more examples in the fan communities. There's even a Spotify playlist, although it's missing some of the more recent examples.

CRUSH, KILL, DESTROY

Now, it's time to smash things up. As soon as he's done with the backups, we see Elliot crack open his computer case, pull a bunch of things out, and methodically destroy them. Specifically, he's pulling out all the computer's memory, both the platter hard drive and the flash RAM that sits on the computer's motherboard. In a couple seconds of screen time, Elliot drills a hole in the computer's main hard drive, yanks the RAM chips out with a plier, and microwaves them, ensuring no one can ever extract any data again.

As with many things, Elliot is taking this to extremes, but if you're in charge of making sure a piece of data is absolutely positively erased, this is pretty much what you do. Just deleting files on your computer does almost nothing. It gives the computer permission to overwrite the bits of data, but it doesn't actually overwrite them, so forensic analysts can usually still reconstruct them when they look at your computer piece by piece. There are more serious ways to erase the data, like formatting the drive or running a zero-fill program, but it's hard to be sure they've worked. The only perfect method is physically destroying the component that houses them, which is exactly what Elliot does.

Drilling is a classic way to destroy a platter-based hard drive, although folks often misunderstand why. Hard drives basically work like vinyl records: there's a disk inside that spins around and a reader arm that reads it as it passes by. Putting a hole in that platter certainly removes any data that was on that particular circle, but the bigger issue is breaking the enclosure and messing with the platter itself. Drilling through produces a lot of heat and friction in the delicate enclosure. If the disc is warped at all, it won't spin, which makes it extremely hard to pull any data.

Flash memory is a little trickier, but not much. Solid-state drives are notoriously difficult to erase, in part because they have a limited number of overwrite cycles. But at its heart, the flash chip is just a series of transistor gates, with the state of those gates determining what's a 1 and what's a 0. But the radiation from a microwave destroys those gates directly, particularly once the whole thing catches fire. This won't necessarily work on USB drives or SD cards because the metal enclosure ends up acting as a Faraday Cage — but Elliot is frying raw chips, so there's nothing to get in the way.

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That’s all the hacks we’ve got this week! But tune in to the show next week, when we’ll be talking with Grace Gummer, and hopefully have some more hacks to dig into. If there’s anything else you want to see in next week’s report, you can catch us on Reddit or on Twitter at the hashtag #RobotAfterShow. See you next week.

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