

Rice Tea

- *Julien McArdle* -

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Cover Photos by Nintaro.

In memory of Steve Cisler.

Introduction

In the summer of 2006, I received an email from a man named Steve Cisler. He was inviting me down to speak about music piracy at a conference in San Jose. Piracy was the subject of a documentary I had just directed, and I gladly accepted his offer.

There was only one problem: I had no money. I was barely twenty one years old and was still in university. My own film had been shot on a shoestring budget, funded by money I had saved for tuition.

Aware of my predicament, Steve kindly invited me to stay with him and his wife in their home. I wasn't to be the only one either; another panelist, Eduardo Villanueva, was also to stay over during the conference.

In the end, those few days in the heart of Silicon Valley greatly influenced me. Steve had lived a very unique and interesting life, and was an endless source of fascinating stories. His generosity was equally abundant. In addition to providing me with a home, Steve took time aside to show me around Silicon Valley, displaying the best of its history and culture. One particularly memorable evening involved a discussion at the home of Michael Ward, who was an electronic

book publisher and another of the speakers. This exchanged epitomized the inspiring nature of the trip, and I will always be grateful to Steve for his generosity.

It was thus with great sadness that I learned of Steve's passing last year. As the news filtered its way online, it became clear that I was not the only one who was touched by his kindness. I dedicate this book to his memory.

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This book is based on the true accounts of real-world hackers. Each personality you will encounter in the novel is a composite of some of these incredible individuals.

To that extent, I would like to thank the following for assisting me in ensuring the accuracy of this work:

Aghaster, Alk3, asn, BigBrother, Booter, B0rg, C4, crackedatom, Colonel_Panic, Cypress, Droops, Enigma, Famicoman, foonly, gloomer, Hiryu, jabzor, Kobar, lmnk, Lord Wud, Murd0c, natas, n3xg3n, nixxt, Ottawa 2600, PurpleJesus, Perf-149, rbc, regret, riscphree, Spyril, StankDawg, Strom Carlson, tao_of_pi, thenotwist, tim, Tyler Pope, UTS_HOST, vector, Venom, WhatChout, Wintermute21, Wolfman, xof7, and Zain.

I would also like to extend my thanks to *Ohm*, for sharing his wealth of knowledge to all those who simply have the courage to ask.

PROLOGUE

Enter the Black Hat

In the windowless basement of a suburban home sat a twenty-something year old intently peering into the glare of his two computer monitors. In the one he was playing some freshly downloaded Japanese *Hentai*. The star of the animated feature, a high school girl, was squealing as her body was being thrust into by several indifferent young men.

The hacker turned off his speakers and focused all of his attention to the other screen, where a terminal window was beckoning for his intervention. He issued commands to the machine, the green text of his typed words materializing in front of a black backdrop.

The hacker's monitors and speakers were placed in perfect symmetry on his desk, which was itself pristine and entirely devoid of dust. This cleanliness was an anomaly in the hacker's basement room. His clothes were strewn all over, posters on the walls were peeling down, and used cans of caffeinated energy drinks peppered the floor. In this mess were also various technical books on topics such as assembly programming and the TCP/IP protocol. Post-It notes

littered the insides of these texts, acting as makeshift bookmarks.

The hacker entered a few final commands in the terminal window. He sat back, and smiled in relief as the computer responded accordingly, spurting back copious amounts of text. He opened a can of pop that had been to his side and slowly took a sip. It was working, he thought to himself, and on the first try. This black hat hacker had succeeded.

ONE

Just Another Morning

Seth lay in bed. His alarm buzzer was ringing loudly by his side. He turned his head to face the source of the annoyance, and flung his arm down to silence the contraption. The buzzer did not stop. He had missed. With a groan, Seth took a better look at the alarm and navigated his fingers carefully around its buttons. With a small tap, the room turned quiet.

The twenty-two year old paused as he lay in bed, eyes open, looking at his ceiling. He sighed, grabbed his thickly-rimmed vintage glasses, and sat up.

Seth turned his head to look out his window. His upper floor room provided a nice view of the twin fir trees behind his townhouse. This greenery was a rarity in the bleak asphalt and concrete landscape that surrounded this urban dwelling.

After a quick shower, Seth put on some clean clothes and worked his way down the stairs. He went into the living area, or the “man center” as he sometimes called it. Against the wall stood a large second-hand television, into which game consoles of all sorts were

plugged. Between himself and his two roommate, they owned all of the most recent gaming hardware.

Beneath the television stand was also a hefty rack-mount server and Seth's laser printer. The server had belonged to a technology firm, but was sold off when the company had deemed it obsolete. Seth had snatched the computer for a mere \$50 and then retrofitted it with newer parts. An old sweater lay underneath the server in an effort to moderate the vibrations caused by its permanently whirring fans.

A lone sheet of paper was in the output tray of the printer. It was still warm. Seth took it and brought it to the kitchen, where he found his roommate cooking some eggs. Grabbing a magnet, Seth tacked the piece of paper on the fridge. On the page were the day's weather, technology news headlines, and statistics pertaining to the computer's performance. This sheet was the product of Seth's boredom one afternoon. Seth had coded a script for his server which automatically collected this information, compiled it into a single sheet, and then printed it off every morning.

Seth glanced at the news. There was more coverage of the nefarious Météo botnet. A new update had been released overnight, making it much more potent. Over 120,000 new computers were thought to have been infected as a direct result. Unbeknown to their owners, these tainted machines would now likely become purveyors of spam and tools of high-tech fraud.

Seth's stomach grumbled, and he thought of the breakfast he would make himself. As he opened the fridge door, he was disappointed by its lackluster

contents. He grabbed the loaf of expired bread, putting two slices into the toaster. Turning to his roommate, he asked, "How was the party last night? I didn't hear you come in."

"We went for some karaoke after. You should have come. Bo tried to hit on a waitress – it was great," the roommate concluded with a large grin.

"Yeah I wish I could have been there. If it wasn't for the fact that the organic paper is already late by two days, I would have totally gone."

Seth ate his toast, loaded up his MP3 player with some new songs, and prepared his bag for school. On his way out, he yelled back "I'll get the mail!"

TWO

University

It was early spring, but with the sun beaming down it felt like summer. The snow, so pervasive the previous month, had entirely disappeared. Seth felt unusually liberated as he wore his light fleece on the half-hour walk to the nearby transit station. He arrived at the station and boarded the waiting light rail car.

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After a twenty minute ride, Seth's train stopped in front of his campus. Half the train emptied. A large sign, written in both English and French, welcomed him to "Canada's University." He had always found this bold assertion rather amusing.

Walking through the university center, Seth stopped to grab a coffee. French vanilla, his daily poison. As he poured in a bit of milk, he looked up at the news on a nearby mounted television screen. The price for a barrel of oil had again increased, and three analysts were feverishly debating the source of this latest hike.

"Seth!" yelled a male voice. Seth did not react. The voice called out his name a second time.

Seth shook out of his television-induced stupor and looked around. A young man was fast approaching him. He was fit and sported a well-trimmed goatee. He looked like a student-aged version of a Hollywood actor. "Oh hey Jinks," Seth replied unenthusiastically.

"So I tried hacking that 127 dot whatever IP address you gave me yesterday," said the new arrival. "I was using Sploitster to do it."

"Find anything interesting?" Seth responded.

"Yeah! Check this out!" Jinks pulled out a newspaper from his side, practically shoving it into Seth's face. Jinks went on. "It was an ATM!"

Seth was still adjusting his eyes to read the newspaper held so close to his nose.

"Look!" Jinks exclaimed, pointing to the article. "It spewed twenties randomly on the ground somewhere in hick-town Saskatchewan. That was me!"

The Internet Protocol, or *IP*, address Seth had given to Jinks was a loopback – it was a specially assigned address that would connect Jinks to his own computer. Jinks couldn't have accessed any other computer using it, much less an ATM. That was the thing with scriptkiddies like Jinks, thought Seth: they knew how to use certain programs to cause damage, but they didn't understand the most basic tenets of computing.

"Uh huh, nice. Look Jinks, I gotta go to the washroom. Classes start in three minutes. I thought you had something now as well?"

"It's just Polish cinema. But they are taking attendance now for some reason now. Guess I shouldn't be late. See ya around eh?"

Jinks walked off. Seth took one last gulp of his coffee and threw the remnants in a recycling bin. He then went past the nearby door, and down the large concrete steps that brought students to the lower level.

Once at the bottom, he headed down a long hall, past the washrooms, and into an open doorway. He had come into the dark, funky-smelling dungeon that was the university's arcade. Save for a lone light atop an old pool table, only the hyperactive screens of its coin operated games lit the room. Seth figured that most of these machines had to be at least fifteen years old, but these retro games were cheap to play and had really caught on with the campus' students.

Seth walked up to the *Street Fighter II* arcade machine, where two students were furiously shifting the joysticks and mashing buttons trying to beat each other's virtual characters. Seth, looking at the taller of the two students, subtly pronounced "Gab, we got class in less than five."

The message received no immediate reply. The player's attention appeared to be wholly consumed by the game. However, the pattern of prerecorded grunts emanating from the machine began to shift, and within seconds Gabriel dealt the finishing blows. He looked back at Seth. "Okay, I'm done."

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The duo hastily walked down the halls of the university's computer science and engineering building. It was amongst the newest structures on

campus, with a design that proudly showed off its support beams and heating ducts to its guests. It was also home to numerous computer laboratories filled with top-notch equipment.

The two stopped by one of the doors and quietly entered. The professor, in the midst of discussion, paused for a brief second and glared at the two late-comers. Seth mouthed his apology to the unimpressed teacher. The two found some empty seats near the back of the room where they quietly removed their backpacks, careful not to further raise the ire of the professor.

The lecture went on. "Don't forget that the due date for the term project is coming up. There will be no extensions, so I don't want to get any emails the day before about this."

Seth logged into the computer in front of him, paying only half-attention to the words of his middle-aged lecturer. Glancing at his fellow classmates, Seth's eyes began to fixate on a girl sitting down in the front rows. Her name was Kerstin. She had a rounded face, shoulder-length black hair arranged in a ponytail, and a very cute German accent that came out whenever she asked questions. To top it off, she was an extremely competent programmer. Where others coded limited text book answers for their class assignments, she was one of the few who would devise original and intriguingly efficient programs.

Gabriel's clear whisper punctuated the professor's unintelligible droning voice. "I think you're freaking her out."

Kerstin was staring back directly at Seth. Abruptly shaking out of his apparent daydream, Seth immediately returned his eyes to the idle screen in front of him. "Fuck," he muttered.

"Not bad," said Gabriel. "You haven't even met her yet and she already thinks you're a freak. It only took you what – three months?"

"Yeah, thanks." Seth replied with a smirk.

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The professor went on for some time on the minutia of memory management in operating systems. Finally, cued by the communal ruckus of students packing their bags, the lecturer took a look at his watch. "Oh look, we're all out of time. See you next time, and don't forget to take a look at that assignment!"

Stretching his arms, Gabriel looked to Seth. "Are we still on for the beers?" he asked.

"You know it," answered Seth.

"See you there in what... ten minutes?"

"Sounds good to me."

THREE

The Digital Losers

Seth sat waiting at a table at the local university pub, *1812*. It was one of his favourite hangouts. It provided a great view of the campus, the beer was reasonably priced, and there were rarely more than a few patrons.

Approaching with two beers in hand, Gabriel sat down, sliding one of the bottles over to Seth. "Thanks."

The duo took out their laptops. Seth flipped his open and turned it on. As he was waiting for his laptop to boot up, he spoke without shifting his gaze away from the screen. "You know, I'm really going to miss all of this."

"Miss what?" asked Gabriel, as he sipped his bottle.

"University. All those parties. The stupid shit we've done. Like feeding the hamster weed. Or like after Christmas - making roadblocks with the trees people were throwing out."

"...or the races down the hill with the computer chairs," countered Gabriel. "It went by fast, didn't it?"

"Yeah, it's depressing," concluded Seth.

"Who says that all that has to end though?"

Seth looked at him for a moment, and then back down to his laptop. It had now finished starting up and was standing idle. He began typing a few commands. "Let's see what kind of catch we have for today," he mused.

"Way ahead of you," said Gabriel, his attention focused on his own computer.

Gabriel's laptop was connected to the nearby wireless repeater. The device spread wireless signals across campus which fed students Internet, free of charge. All they needed was a laptop with the right hardware. The connection was entirely automatic, and so the average student wasn't aware of all the technology that made this seemingly magical Internet access possible. This meant that they were also quite unaware of the extent to which their computers were made vulnerable by subscribing to such a system.

Gabriel didn't need any specialized programs to explore the hard drives of the other students' computers. That they were connected to the campus network was enough. From his seat at the pub, he could explore dozens of computers at will, logging into them much in the same way as a legitimate user. "If only they had bothered to set their system password," thought Gabriel. Such an oversight made these machines extremely vulnerable to his takeover.

Poking around the hard drives of various machines, Gabriel soon found something of interest. "Jackpot. Looks like a prof's slides for a class."

Seth was now looking over Gabriel's shoulder. Looking towards Seth, he asked, "Shall I?"

Gabriel knew what he was doing, and what would happen as a result. Sometime in the next month, a professor would be giving a lecture in one of the university's many halls. His carefully prepared slides would be projected to the front. The professor would speak to his students. Given the subject matter of the slides, Gabriel thought, it would be some very dry material about fossilized biota in sedimentary rocks.

The professor would move to the next slide. The class of 400 students would erupt in laughter. Puzzled, the professor would look back at the projected slide. Instead of the images of microscopic life he had prepared, there would be a single repeating video clip of a bug-eyed hamster giving a very human-like look of surprise. Beneath the video would be the short caption: "Brought to you by the Digital Losers."

The Digital Losers was the name that both Seth and Gabriel had given themselves to mark their pranking exploits. It had served them well since the duo had come up with the name in their second year of university. The two also maintained a website where they regularly published their latest escapades, often accompanied with audio clips or video footage.

As usual, the professor would hurry to his nearby terminal to look at his slides, and would breathe a quiet sigh of relief upon seeing that his slides remained intact. This is how these pranks always went down. The reactions were always so predictable.

Seth and Gabriel were still working on finishing their beers. "I'm tempted to start university all over just so I can stay here," said Seth.

"Get a master's."

"I could..." Seth told him, "but as weird as this sounds, it's the social experience of getting raped in my first year classes that I miss most."

"Yeah, that is weird."

"Thanks... oh hey, I got a guy here."

Seth, who was doing his own sleuthing, had stumbled on another professor's computer. He looked around the computer's various files, and discovered some slides dated to be presented in the coming week.

Taking a look at the slides, Seth saw that it began with a pie chart presenting the break down of the last midterm. In this calculus class, forty-three percent of students had failed their examination, and the professor was ensuring that they all knew it. Editing the text in pie chart from his laptop, Seth changed the wording from "Failed Midterm" to "Sucked Ass."

As Seth was editing the slides, he continued to speak with Gabriel. "I have been giving this second degree a lot of thought. Biochem was not the major I should have taken. I want to go into computer engineering."

"How many more classes would you have to take now if you make the jump? How many have you not taken?"

"I'd still have two more years to go."

Gabriel gulped down the remainder of his beer. Looking at the empty state of Seth's own drink, he asked, "Want another one?"

“Yeah, I think I do,” came the reply.

FOUR

Kerstin

It was Friday morning. Seth lay in his bed, deep in sleep. Suddenly, the cellphone by the alarm clock started to vibrate in loud intermittent bursts.

The snoring stopped, replaced by a loud sigh. Seth blindly grabbed the phone, and putting the screen to his squinting eyes checked to see who was calling. He pressed a button on the cell, and said in a voice that did little to hide his exhaustion, "Hey mom, how are ya?"

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As Seth went to his classes that day, he was unable to shake the thoughts of Kerstin. He wanted to know more about her. The problem was that he had nothing to go by. They had no common friends, and searching her name online had yielded nothing.

Later, as he walked down the bustling halls of the university with Gabriel, Seth blurted "I think I'm going to ask her out."

"Who? Kerstin?"

“Yeah. But whatever chance I had I think I killed it by staring at her for an hour straight without realizing it.”

Gabriel paused for a second, and then remembering an event that was to take place the coming weekend, said, “So how about this: I’ll invite her to the Saturday hackfest.”

“She’ll say no,” was the quick reply.

“If it’s you asking her, then maybe. Or okay, most probably. But I bailed her out on that microcontroller project. We’ve worked together a few times. Who knows, she might say yes.”

“Mmm,” was the resilient half-reply from Seth.

Gabriel stopped walking and looked straight at Seth. “C’mon. You have nothing to lose. Want me to ask her in class?”

Seth conceded. “Sure.”



Seth installed himself in one of the rear seats of the computer lab. The professor was at the front, preparing slides on his computer. Kerstin was in her usual seat at the front, with Gabriel at the workstation to her side.

From his position at the back, Seth could see Gabriel leaning towards Kerstin. He couldn’t hear what he was saying, but he could see Kerstin turning her head towards him and saying something in return. Gabriel then leaned back into place.

Quickly typing into his open terminal window, Seth sent an instant message to Gabriel.

“What did she say?” he wrote.

“She can't make it. Some family affair.” Gabriel wrote back.

Seth saw that Gabriel was typing something else on his lab computer. He stopped, and Seth received another message. “Sorry bud,” it said.

Seth's disappointment was further compounded by the fact that he had to work that evening – something he didn't particularly look forward to doing on this day. Still, he thought, work was money. So, like the other students who were employed at the coffee joint, he would don the green apron and concentrate on feeding the caffeine addicts their overpriced lattes.

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Coming home that night, Seth opened his townhouse door to see his roommate playing a game in the living room. Glancing back at Seth, he asked, “You ask her out?”

“Yes,” Seth produced, with a sigh.

“That bad eh?”

Seth smiled back at him, but said nothing.

“Want to play a bit?” his roommate asked.

“Sure.”

Seth approached the console, and the two began to play together. Within seconds, Seth's preoccupation with Kerstin had faded into the flashing orgasmic colours of his television.

Weekend Fun

The morning sun was shining in Seth's room, and for the first time in weeks, there was no need for his alarm to go off. Substituting for the buzzer, however, was the sound of a nearby chainsaw.

In numb horror, he lay in his bed, pillows squashed against his ears, while murderous plots aimed at the landscaper quickly filled his head.

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Seth hadn't had a free Saturday like this in a long time. He did the groceries, washed the pile of clothes hidden behind his door, and caught up on his academic readings.

Later that afternoon, he biked over to Eric's place. Eric was a twenty-four year old computing demigod who lived with his parents in their single-storey home. Seth had first met him at the local chapter of the 2600 hacker meetings, and they had become good friends over the years.

It was six-ish by the time Seth walked through the unlocked side door of the house, and down the steps

inside. He could hear the discussion and the laughs emanating from the basement. "Hey guys!" he announced walking down.

Gabriel, Jinks, Eric, and a few others were in the basement. Open laptops were on the floor. Looking up at the new arrival, Gabriel said, "Hey! We're just watching the tail end of the new Binary Phunksters episode."

Eric's basement was a true computer enthusiast's den. Old system motherboards served as wall decoration. Home-made electronics and a soldering gun lay in disarray on the nearby desk. On one side of the room was Eric's true pride and glory: a six-foot tall mainframe server. This behemoth was considered obsolete by the high-tech company that had owned it, and yet, it still sported more memory and parallel processing power than any modern home computer. Eric had managed to snatch the monolith for a mere two thousand dollars.

Video was being projected on the wall. Eric was playing a show called *Binary Phunksters* which was being broadcast live over the Internet. Seth sat down to join the attentive youths. Taking a beer from the reserve in his bag, he flicked open the can, and looked up at the screen. He quite liked this show, which described itself as being for hackers, by hackers.

In this episode of *Binary Phunksters*, its hosts, Flow and i0, were detailing a prominent security flaw with the design of certain cellphones. As a demonstration, the duo walked down the fashion district of their native Toronto. Stopping in front of a store, they were able to

turn the cellphone of a client inside into a virtual eavesdropping device. With a few keystrokes of their laptop, the voice of the unwitting client was heard over the machine's speakers. The victim was discussing the importance of tie colours with a clerk. Flow and i0 concluded the demonstration, and finished the show by recommending basic security measures to avoid falling prey to the same kind of digital hijacking. The two then signed off, and the end credits for their show followed.

The projector screen turned to black, and a synthesized female voice came on. "Next on rootTV," she said, "Hacker Jeopardy."

"I'll get another beer," said one of the guys. The introduction to *Hacker Jeopardy* began. The sequence showed footage of downtown San Jose, in the heart of the American Silicon Valley where the show was based.

The ring of the doorbell interrupted the show. Puzzled gazes appeared on the faces of the young men. Eric spoke out. "Anyone invite someone else?"

There was silence.

"No," said Seth. "I'll go check it out."

"I'll stop the stream," replied Eric.

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Seth walked up the stairs to the side door. As he opened the door he saw that it was dark outside. Standing in the dim light was Kerstin. She wasn't wearing the neat clothes she wore in school. This was more casual. More artsy. "Kerstin?" he said.

"Hey... you!" she replied uncomfortably. "Apparently there's a bit of a comp fest going on here tonight?"

"Yeah. Yeah!" he affirmed, as he grasped the situation. He motioned her in. "Come on down!"

"Gabriel told me you were invited, but I thought he said you had something happening tonight," he said, descending the stairs with her.

"My birthday party," she replied.

"Oh." Seth didn't know what else to add.

Walking down the final steps, Seth looked at the curious faces. "Hey guys," he said, "this is Kerstin. She skipped her own birthday party to be here."

"You skipped your own birthday party to hang out with strangers?" said Eric. "Harsh. Happy birthday."

"Yeah, happy birthday," added Jinks.

"Thanks but it's next week," she informed them.

Seth glanced at the people around the room. Extending his hands towards Gabriel, he said, "Okay, well this is Gabriel, who you already know. We also call him Riscphree." Turning to Eric, he said, "This is Eric, who also goes by the name of colonel_panic." Looking at Jinks, he said, "This is Jinks... Also known as Jinks. He doesn't like us calling him by his real name. Then there's Dave, aka. Hacknslash, Pat, aka. rm-rf, and Greg, aka. Nirvana. And finally, I'm Seth, or ion, if you catch me online."

Kerstin nodded in acknowledgment at the faces.

"Are we ready?" asked Eric.

"I think so," replied Seth.

Kerstin and Seth both sat down. Kerstin took her laptop out of her bag, setting it up in front of her.

“Beer?” asked Dave, presenting her with a can.

“Sure,” she replied.

Eric pressed a button on his computer, and Hacker Jeopardy resumed. It was a quiz show, much in the same vein as those seen on network television. The host of the show was a man in his mid-thirties with graying hair. He presented the audience with his three contestants. Two were university students, and one worked as a computer systems pen tester. Corporations paid him to break into their systems, to test their security.

The show began, and the first contestant was asked to pick a category from those shown on a large screen. The contestant, a thin teenager wearing retro-style thick black glasses, selected a question on *Vulnerabilities*.

The host took a cue card from a pile and read. “OpenBSD is widely considered to be one the most secure operating systems ever released,” he said. “Name one of the critical vulnerabilities that have been documented on the platform in the last two years.”

Shouts were heard from within Eric's basement as everyone tried to answer. “There was none! It's a trick question!” “No, no, there was one... what was it?” “The fake one? Does the OpenSSH hash salting problem they had count?”

The sound of a buzzer interrupted the yelling. It was the security expert. He had the answer. “What is the DNS Bind cache poisoning vulnerability?” he told the

host. Answers in the game had to be formulated as questions.

“Judges?” asked the host, looking off to his side. Following a brief pause, the host looked back at the contestant. “No, I'm sorry, that's not among them.”

The other contestant buzzed in. It was the other student, a young Asian wearing a suit. “What is the lprm exploit?” he said.

“That is correct,” announced the host.

As the student had the correct answer, he was to choose the category of the next question. He chose *Famous Books*.

“The 'R' in K&R is the father of the C Programming language,” the host began by saying. “The two also wrote the bible on the matter, often referred to by computer science teachers and students alike as the 'white book.' What does K&R stand for?”

“Kernighan and Ritchie,” voiced Eric, before even taking a sip out of his beer.

Buzzer. “Who is Kerry and Ritchie,” sputtered the Asian contestant.

“No, I'm sorry,” replied the host.

“Who is Kendell and Ritchie?” said the security expert.

“That isn't it either.” the host said.

There was a pause. The host finally said “The answer was Kernighan and Ritchie.”

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The evening wore on. The shows were still playing on the wall in the background, but the volume had been turned down. The beer flowed freely, and the evidence of its use littered the floor. The youngsters, having lost all awareness of the volume level of their own voices, were speaking loudly with great excitement on all subject matters. Those who weren't actively engaging in the discussions were transfixed by the glow of their laptops. Eric was expounding on the hidden wonders of JavaScript to Kerstin.

Dave, meanwhile, was off on his own tangent. "You know how there's six degrees of separation? Well with the active hacking/phreaking community it's like there's two degrees of separation – we all know pretty much everyone, and if we don't know them, then we know someone who does."

Pat and Seth sat by his side. Pat said, "You think so? I don't know. I don't know anyone from the Computer Chaos Club. Or anyone that knows them."

Dave quickly replied, "Okay but that's like Europe. Think of this continent though. We kinda know almost everyone - you know what I mean? I'm sure its like that in the demo scene too. Or the open source community."

"Yeah, I guess," Pat answered.

Greg came by. "We're going outside for a bit of 420," he said, "want to join?"

"Yeah sure. Guys?" Seth replied, looking to Kerstin and Eric inquiringly.

"I don't smoke marijuana, but I'll go out with you guys," responded Kerstin. Eric was already putting on his jacket.



The guys were out on the back deck of Eric's house. Muffled music was emanating from inside the house. A lone porch light defied the darkness. Seth, Eric and Dave were huddled together in the cool night, smoking a joint.

Dave took a deep puff, and passed the smoke to Seth. Seth breathed the air out of his lungs, and inhaled with the joint at his lips. He was already buzzed from the beer, and he doubted whether the drug could do anything more. He took another puff before passing it to his right. He coughed.

Seth, beer in hand, walked off to where Gabriel and Kerstin were talking. The two were leaning over the porch's wooden railing.

Gabriel looked up at Seth as he arrived. "Kerstin was just telling me why she came to Ottawa U," he said.

"So anyways," Kerstin continued by saying, "their IT department got all crazy and started to blame me for everything. Greater latency? They were saying I was causing it. Some server crashed? They'd blame me for it too. It was so stupid. They were telling me that they were going to expel me. They called the police."

Seth was blinking his eyes, trying to maintain his focus. Kerstin drank from her beer and went on, "My dad is a diplomat here. He got me to transfer out of the university in Hamburg and worked hard so that I could start here."

"So what's with the deal of you skipping your b-day party?" asked Seth.

The three were now resting their shoulders over the railing. Kerstin looked towards Seth. "I love my dad. I hate his Canadian wife. No offense."

"Shit," responded Seth, grabbing another swig from his beer.

"So Kerstin, does that mean you can root a box then?" The voice came from from Jinks, who had just installed himself on the railing as well.

"Whoa. I didn't even see you there," said Gabriel.

"What kind of question is that?" asked Seth.

Playfully, Kerstin replied, "What, are you saying I couldn't?"

"No, no," retracted Seth.

"Are you saying girls can't hack?" she persisted with a smile.

"No, just German girls," said Seth, with an equal grin.

"Is that a challenge?" retorted Kerstin, taking another drink from her beer.

"It could be if you wanted it to be," toyed Seth.

"Fine. Name your terms," she returned. She was enjoying this.

"If I win, we go on a date."

Still smiling, Kerstin said "Two problems with that. One – it's kind of creepy. Two – I'm not a whore."

Hurt, but still donning a cheery voice, Seth replied, "Okay, name your terms there."

"If I win -"

This was the last thing Seth remembered hearing. His excessive drinking had caught up with him, and he blacked out.

The Challenge

Seth woke up. The sun was shining in his eyes. He was sitting cross-legged, on the corner of a busy street intersection. He had no idea where he was. As far as he could tell, he was devoid of any other nasty effects from the drinking. Glancing at his watch, Seth saw that it was just after eight o'clock.

He checked one of the pockets in his pants for his phone. The phone was there, but his bus pass was not. He searched all of his pockets. He found his wallet, minus all of the cash he had put in it the previous day. No luck on the bus pass.

Seth grabbed the phone. There were three missed calls. He called up Gabriel.

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Gabriel was sprawled on the floor of Eric's place, in a deep snooze. The phone in his shirt pocket started to vibrate. Its screen turned on and glowed through the cloth as it rang. "Hell-lo?" answered Gabriel, in a tired voice.

"Gab, what happened last night?" asked Seth who was by this point fully awake.

"Spiked drinks," Gabriel retorted. "Oh, and you and Kerstin are doing a competition of sorts."

"For real?" came Seth's reply.

"Yeah. What time is it?" asked Gabriel.

"8:12 AM."

"Call me later and we'll talk about it."

Gabriel's fingers fumbled with his phone as he tried to shut it back off. Meanwhile, Seth looked all around him. He truly had no idea where he was. He started walking down the closest main road, hoping to see something that would help him to place himself.



Seth, Gabriel, Kerstin and Eric sat outside, around the small table of a student-run coffee shop near campus. It was a beautiful Sunday afternoon. The sky was a clear blue, and the unusually warm weather was punctuated with a refreshing breeze.

"Are you guys still in?" asked Gabriel to both Seth and Kerstin.

"Yes," replied an excited Kerstin.

Seth looked at Kerstin.

"Yeah, yeah," he said.

"Awesome. So here's the deal," Eric began saying. "You will each perform some kind of technically challenging social feat. The winner will get bragging rights, but as you so enthusiastically agreed to last

night Seth, the loser will have to wear a dress for a day. A school day.”

“Did I really agree to this?” asked Seth.

“Yep,” was the simultaneous reply from the others.

“That’s not particularly fair is it?” Seth retorted. “Her being a girl and all.”

“You chose the terms Seth, not us,” said Gabriel. He added with a sly smile, “You can still back out if you want.”

“No, it’s all right. I’ll do it,” replied Seth, unconvinced.

“Great,” Gabriel said, “Eric and I will be the judges.”

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Seth was standing on the grass by a parking lot of the *Wülmürt Megastore*, holding his open laptop on his arm. The massive building was home to everything from everyday housewares to groceries and electronics. Kerstin and Eric stood beside him. Gabriel was inside the store, pretending to shop. He sent a message to Seth’s cellphone. “Ready,” it said.

It was time to execute the plan. Seth used his laptop to connect to a local unprotected wireless router giving him Internet access. He then launched a program that allowed him to place calls to the telephone network from his laptop. The calls were not free, he paid for the service using a prepaid credit card he had purchased at a convenience store. It also gave him an extra layer of anonymity.

Seth looked up the phone number for a second *Wülmürt* store online. He was greeted with a recording, "Welcome to Wülmürt Megastore." There was a pause. "For cookware, please press one; for electronics, please press two; for hardware please press three."

Seth pressed the three key on his laptop. A multi-frequency tone was heard over his speakers, followed by ring tones.

"Hardware," came the reply from the other end of the line.

"Hey – I'm James with electronics?" said Seth.

"Yeah, whats up James," replied the voice.

"Well uh – you see I gotta make an announcement over the intercom about a sale. Manager's not here though – do you know what it is we have to press to get on the PA?"

"Star four seven," answered the voice.

"Thanks."

Seth hung up. He then looked up the number for the store in front of him, and called it up. Upon hearing the recording, he pressed the star-four-seven keys. There was a click. He was now live, on the store's announcement system.

Seth began to speak into his computer's built-in microphone. He put on a particularly artificial cheery voice. "To all our valued shoppers, we have a three minute special! We have Mango portable media players to give away to the first four customers who reach aisle 5! These players are valued at over \$400, no strings attached! So hurry over now!"

Meanwhile, Gabriel was bent over looking at a milk carton in the fifth aisle of the store's grocery section. As he was glancing at the dairy products lining the refrigerated racks, Seth's announcement blared on the intercom. Gabriel stood up, and looked at either end of the desolate aisle. Only one perplexed lady stood at the end, staring back at him.

The store always had a faint ruckus of clanking carts as people went about their shopping. Two seconds after Seth's announcement, however, that sound started getting louder; much, much louder.

Back outside the store, Seth received a second message from Gabriel on his cellular phone. "Success!"

Kerstin smirked. "A nice prank, but overdone," she said.



Seth was running down a sidewalk in the concrete jungle of car-repair shops and laundromats. It was Kerstin's turn, and he didn't want to miss it. She had told him and the others to meet that evening at a small pizzeria in the west part of town. He was almost there. He could see the sign of the pizza place glowing in the distance.

Seth stumbled as he entered the restaurant. It was a small place, with a single long table lined with bar seats facing the large windows. On the other side of the room was a serving counter with a single cash register. The place didn't look particularly clean.

Kerstin was waiting inside with both Gabriel and Eric. She was wearing an orange-coloured reflective jacket, similar to those worn by construction workers. "Sorry guys," Seth said, still hyperventilating. "I took the wrong bus."

"It's okay," Kerstin replied. "We just got here ourselves. Here, take this."

Kerstin pulled a blank clipboard out of her bag, and passed it to Seth. He gave her a perplexed look. "You'll see," she said. Looking at the idle group, she proclaimed, "Okay, well, let's go."

They walked out the front door and onto the street. It was a major artery of the city, but it was very quiet on this Sunday evening. The group chatted as they walked down the sidewalk for a bit. Suddenly, Kerstin moved towards the edge of the roadway and stopped.

She was standing by a large mobile electronic construction sign, the type that informed oncoming traffic of temporary lane closures and construction work. She looked around. "We're too many," she said. Pointing to Gabriel and Eric, she said, "Can you guys go over there by the post?"

"Yeah no probs," Eric returned.

The two walked off, leaving Kerstin and Seth together. Seth smiled as he now understood the purpose of the clipboard and reflective jacket - they were part of a disguise to give their presence a look of legitimacy. He looked towards her, as she prepared her gear. She truly was the most incredible girl he'd ever met.

Kerstin unfolded a small leather satchel. It contained a collection of neatly organized thin metal instruments; a lock picking kit. Pulling out two small metal tools, she started to attack the padlock that kept the large sign's orange control box shut.

After minutes of unsuccessful fidgeting, Kerstin stopped. "I'm having trouble with the lock," she admitted. Seth looked around, and could see both Eric and Gabriel talking off in the distance.

"No problem," he said, turning back to Kerstin. He moved towards her, and grabbed the tension wrench from her left hand. The tension wrench was a thin L-shaped piece of metal that was crucial in the process of lock picking. She then passed him the other small metal tool that she had been handling. This one was a little thinner than the tension wrench, and had a thin curved tip. Using the two in concert, he was able to produce the definitive click of an unlocked padlock.

"Thanks," she told him.

"As far as I'm concerned, you opened that," Seth replied.

Kerstin grabbed the manual from inside the control box. After reading for a few seconds, she grabbed the antiquated keyboard stored to its side and plugged it in. She started to type.

From a distance, Eric and Gabriel saw the sign change from '*Highway closed June 15-17*' to '*Live Nudes, Exit 122.*'

Seth and Kerstin walked back to the waiting pair.

"Not bad, not bad," said Gabriel, with a big smile.

"I like it," said Eric.



The next day, the four pranksters gathered on a bench by the university library. Seth was on his laptop, holding one side of some headphones to his ear. He pressed a few keystrokes. "Okay," he said, "it's almost ready."

He unplugged the headphones from the machine, and stared at the motionless screen. All they could see was that Seth was again using his laptop as a telephone.

"What is it we're waiting for?" asked Gabriel.

"You'll see," was the cool reply.

The group stared at the screen. Suddenly, a double beep was heard from the computer speakers. Seth placed a single finger to his lips, motioning the others to keep quiet. Speaking in a style akin to that heard on a recording, he began to talk. "Hi and welcome to Radeon theaters. For movie listings, please press one. For -"

A single tone from the other end of the line interrupted Seth. "I'm sorry, but the tone did not register. Please press harder," he said. After a brief pause, the same short multi-frequency tone was renewed from the other end. "No, press *harder*," emphasized Seth.

The tone was heard again, this time lasting a few seconds. Seth raised his voice. "*PRESS HARDER DAMNIT!*"

The caller replied with a six second long beep. Seth resumed his calm demeanor. "Thank you. Unfortunately, all our recordings are busy at the moment playing the theater times to other customers. Please hang up and call back later."

A double beep followed. The caller had hung up. Looking back at the others, Seth explained. "I took over the phone system for the Radeon theater out in the east end."

"How?" asked Eric.

"Easy. I ordered call forwarding on their line and got the telephone company to reroute all the calls the theater would normally get to this friendly conference number," replied Seth.

Another double beep emanated from the laptop's speakers. Someone else had called the theater. The others grinned in anticipation.

Instead of repeating the seemingly pre-recorded introduction, Seth spoke naturally. "Hello, Radeon Theaters." There was no reply. Seth spoke again. "Hello?" he said.

"Oh hi there. I was expecting a recording," came the middle-aged female voice on the other end.

"Yeah, the system is down for today. Is there anything we can help you with?"

"Well, I just wanted the times for your movies today?" replied the lady.

"Sure thing. We have *Bush Hour*, playing at 4:45, 6:30, and 8:15. Then there's *Free My Willy*, playing at 5:15, 7:10, and 9:20. There's also *Saving Ryan's Privates*,

playing at 5:00, 6:45, and 8:30. *Good Will Hunting* is on as well."

"Got anything with kids?"

"Do we ever!" interjected Eric.

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It wouldn't be until two weeks later that Seth and the others would convene once more to witness Kerstin's much anticipated grand finale. They were told to meet outside of the *Nekōtel* building downtown, an average looking fourteen story office tower much like several others in its high-rise laden surroundings.

Seth waited under the darkening sky with Gabriel. Eric walked up. "Hey guys! Seen Kerstin?" Eric asked.

"Nope," replied Seth.

They waited. Seth exhaled slowly against his hand to see if he could produce any condensation. Finally, Kerstin came out walking with a business like strut and brandishing a clipboard. "Hey you! So where's this big finale?" jested Seth.

"Oh, you'll see," she returned, smiling. "Follow me."

The men followed her to the other side of the building. They crossed the street, and stopped. They were facing the back of the office tower. "Look up," she said.

The group complied. Eric was the first to speak out. "Oh my god."

"That's frickin' epic," said Gabriel.

Kerstin had transformed the outside of the building into a large digital billboard. The office lights had been

turned on and off to produce the pattern of a giant heart. They stared in awe. Seth looked down at the prodigious girl. "How did you..."

Kerstin did not immediately reply, but instead smiled back at Seth in a manner he had never seen before. The bright office lights shone on her face. "It took a week to get to this point," she said, turning her gaze above.



The next day, the group met on a well groomed public terrace located on the roof of the downtown shopping center. From his vantage point, Seth could see the tattoo parlors and smoke shops that lined the streets below. He looked around. Gabriel was writing something in his notebook, while Kerstin looked at the blue sky. Dave and Pat were also present, having decided to join them for the event.

Eric was by his open laptop. He clicked a few buttons, and the machine started to produce the steady sound of a drum roll. Eric held up his hand as if it held the name of the winners. "And the winner is..." he began.

The pause in his speech was sustained by the persevering sound of the drums. There was finally a loud reverberating clash of the cymbals. Eric took a deep breath. "Neither of you. Or both of you. Its a tie."

"Oh come on, you guys suck!" exclaimed Kerstin.

"Now, now," he replied, "you guys were both good. Kerstin with the Nekōtel stunt and Seth with the

accumulating of 2,530 university login credentials and counting.”

“So you're just going to leave us hanging?” asked Seth.

“Do you *want* to wear a skirt?” retorted Eric.

“Fair enough. I'm convinced. Now let's get hammered!”

SEVEN

Rice Tea

It was a beautiful afternoon, and Seth was in his backyard, enjoying a beer as he poured over his school notes. His laptop was open at his side.

Seth's focus on the school work was interrupted by the squeak of the screen door opening. His roommate walked out, hamburger patties in hand. "I'm going to cook some burgers. Want anything on the barbecue?"

"Yeah, actually. I'm going to go get some of my dogs."

Seth put his beer and notebook down and disappeared into the house. He came back out with two large wieners, and lay them to the side of the soot-stained barbecue. "So how's university going for you now?" asked Seth.

"Same as usual. Raping me up the ass," came the reply.

Seth grabbed his beer and took a gulp. "Heh – same here. Seen your exam schedule yet?"

"No, didn't even know it was out," said the roommate, gliding his hand over the barbecue's burner to ensure that it was indeed on.

"They put it out two days ago," informed Seth.

The sound of harmonious bells emanated from Seth's laptop. Seth had setup his instant messaging program to produce a soft audible alert whenever Kerstin came online. He walked over to the laptop. "Just a sec," he told his roommate.

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Kerstin rested back in her computer chair, scrutinizing the imperfections of her ceiling. She rocked herself back and forth with her leg, avoiding eye contact with the blank word processor document that adorned her monitor.

A new window opened on her monitor. It was an instant message from Seth. "Hey K," it said.

Kerstin straightened herself and typed in a message back. "Hey," she responded.

"Are you a big fan of rice tea?" was the reply.

"Rice tea?" she wrote back.

"We're all meeting at a tea place tomorrow for a bit of wireless mischief. You in?"

"Sure," she typed in.

Seth smiled and looked back at his roommate. "Looks like I'm seeing her again tomorrow!"

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It was a cloudy day, and the threat of rain loomed as Seth navigated through the city's large open market. Produce sellers and ethnic food stalls lined the streets. Finally, he reached the tea house.

Kerstin and Gabriel were waiting inside, enjoying some of the house's imported specialties. Seth spotted the two and walked towards them. "Hey guys! Been waiting long?" he asked sitting down.

"No, no. We just got here," answered Gabriel. "Eric can't make it today. He had to cover for someone at work or something."

"That's too bad," said Seth. He looked at Kerstin.

"So, did Gabriel tell you what we're doing today?"

"Not yet, no," she replied.

Seth took out the laptop from his bag and placed it on the table. "Okay, well here's the deal," he said, starting up the machine. "Right now, we're in lunch central. This is where all the downtown workers take their breaks, chat it up with buddies, whatever. There are also more laptops here per square centimeter than anywhere else in the city. So as you can imagine, wireless Internet is big here. Now guess how many wireless access points are within range."

Kerstin shrugged. With a big grin, Seth raised two fingers.

"Two?" she stated.

"Two," he confirmed.

"Actually, there's about twenty access points within range, but they're all either encrypted or require you to pay money to use them," Gabriel clarified.

Seth continued. "So all these people who are out here during their lunch hour can only connect to these two routers if they want free Internet access. What we do then is connect to one of these, and perform a little ARP cache poisoning. You know what that is?"

"It's for man-in-the-middle attacks on networks," Kerstin said.

"Have you done this before?" asked Gabriel.

"I tried it once, but I couldn't get it to work," she answered.

"You'll see it's easy," Gabriel said. "What we do is that we use it to essentially reroute all of the traffic here through our laptops. And that's where we have a bit of fun."

"Because these people have their traffic rerouted through us," explained Seth, "we can intercept and manipulate their data packets. Mess with their Internet connection."

He looked down at his screen. "So I have a guy here for instance." He swiveled the laptop on the table so that it faced her. Raw data from someone's current connection to the Internet was being constantly updated on his screen. "As you can see, he's surfing right now on an online store. Nothing too special, but if we wanted, we could do anything from replace the pictures on the websites he visits, to spoofing SSL certificates and nab his credit card info."

Kerstin looked at Seth.

"I don't touch credit cards," he assured her.

"Speaking of which, I think I have a real contender here," said Gabriel, as he looked at his own screen. "This guy is surfing for pictures of fourteen year old girls on a photo sharing website."

"Oh-ho. Sleazy. I like it," replied Seth.

"I have the perfect idea for this one." Gabriel typed furiously on his keyboard. "I'm going to write a little

filter so that the next time he visits a page, there'll be a little surprise waiting for him."

Kerstin turned to Seth. "You guys are unbelievable."

"I know," replied Seth. "Isn't it great?"

"Awful. Absolutely awful. What is it exactly that you're using to do this?" Kerstin asked, smiling. She wanted in. Seth moved towards her and her idle notebook computer.

"Here, I'll show you," he said.

The sound of a woman in mid-orgasmic groan erupted from the patio of the Indian food restaurant to their side. Seth looked out, and saw a man quickly clasp his laptop shut. The loud embarrassing sound ceased. Gabriel was laughing. "Your doing I presume?" Seth asked.

"I just couldn't resist. The guy was looking up photos of girls who don't even know what pubes are. I mean c'mon!"



The trio spent the next hour at their laptops. Thanks to Seth's help, Kerstin was also now manipulating network connections. Gabriel meanwhile was enjoying tormenting a man who was chatting with his girlfriend. Reading the man's emails on the side revealed that he had in fact many, many, other girlfriends. Gabriel couldn't help but smile as he replaced the words in the adulterer's instant messages with his own. No matter what the confused man wrote, Gabriel would only get him in deeper trouble. Pure carnage unfolded on his

screen as this now self-admitted adult bedwetter tried to correct matters.

“Oh this is neat,” Kerstin said, looking at her laptop. “Someone is accessing a computer via SSH.”

SSH was short for *Secure Shell*, an encrypted protocol which allowed users to log into computers remotely. With it, for instance, a system administrator could directly access a faltering work server from home. Seth often used it himself to check up on his own home server from school.

“Let's see what's in it,” Seth suggested.

“Can we? It's encrypted,” she replied.

“Yeah, that's true. But there's a way to do it. Some kind of man-in-the-middle attack,” responded Seth.

“Let's do it,” Kerstin said.

Seth smiled. “I like your thinking. I got some guys we can ask for help.”

“Alright,” Kerstin responded, “I'll see if I can find anything online.”

While Kerstin and Seth worked on finding out how to usurp the integrity of the secure communication, Gabriel had moved on to a new victim. His new target was surfing websites that spouted hate messages against gays and lesbians. Gabriel proceeded to rectify the situation by replacing all the images on the websites that the homophobic man visited with pictures of the most perverted gay porn he could find. Just before the bigot abruptly disconnected from the network, Gabriel swore he heard a yelp from outside the tea shop.

Kerstin sat back, stretching her arms. "I found how to do it," she said, in the middle of a yawn.

"Great," replied Seth. He moved his seat to her side.

"I'm about to do it now. I'm spoofing some reset packets to force him off. Basically he's going to have to send those encryption keys again, and I have a little something for him when he does. It's going to allow us to see everything he sends."

Kerstin typed a few keystrokes on her computer, and stopped. She just stared at the screen, along side Seth. "His connection was reset," she said. "Now we wait. He might not reinitialize the session. If he doesn't, we won't be able to get anything."

Kerstin had three terminal windows open on her screen, each monitoring a different aspect of her attack. The screen stood idle. The duo looked on intently to the motionless monitor. Then suddenly, one of the terminal windows started to update with a flurry of activity. The other windows followed. "He went for it!" she exclaimed. "I'm dumping the output into a file."

They had managed to usurp the encryption. Yet, as the moments passed, something seemed to be amiss. "He doesn't appear to be doing anything with the connection," said Kerstin.

"This is surprisingly boring," noted Seth.

"Yes it is. How about we just leave the capture running and move on," she proposed.

"Sounds good," replied Seth, getting up to stretch his legs.

The pranksters spent a few more hours at the tea house. While Gabriel continued to pick on the bigoted,

Seth and Kerstin shifted to work on a programming assignment for school. With the sun beginning to set, the three decided to call it a night.

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That evening, Seth was back in his room, reading a university text. The cellphone on his bedside table began to vibrate and ring.

Seth leaned over and grabbed the phone. It was Gabriel.

“Yo Gab, what's up?”

“VNC into my box.”

VNC stood for *Virtual Network Computing*, and it allowed Gabriel to send directly to Seth what he saw on his monitor as compressed images. For Seth, it would be just as if he was sitting beside Gabriel.

“Now? I've got a hundred pages to read for tomorrow.”

“Remember that SSH traffic you intercepted with Kerstin?” Gabriel asked him.

“Yeah?” replied Seth.

“Well she sent it to me because she wasn't gonna get to look at it tonight. Anyways, I went through it. Right after you guys stopped paying attention to it things got a whole lot more interesting.”

“Okay, hold on, I'm gonna VNC in.”

Seth moved to his waiting computer nearby. He started a program, and within seconds was seeing the contents of Gabriel's monitor as it filled his own screen.

“Okay I'm in,” Seth said.

“Take a look at this. What does this look like to you?” Gabriel had opened the contents of the data Kerstin had captured earlier that day. It was pages and pages of text, much of it garbled, but Gabriel had highlighted one particular part. “See that?” he continued by saying.

“IRC conver-. No. Commands to a botnet?” wondered Seth.

“I did a bit of research online. These commands follow the syntax of the Météo botnet. The guy she hit sent these computers some kind of executable. Made them download it from some compromised corporate server. Anyways, I grabbed it and sent it off to Eric. He’s good with that stuff.”

Botnets were the scourge of the Internet. Computers from all over the world were being infected with viruses and worms so that they would become mindless puppets at the mercy of a malicious central authority. The machines were then used as instruments to send spam, attack legitimate websites, and partake in other nefarious activities. The more puppets, or *bots*, that were in a botnet, the more powerful it became.

“Jesus. How many clients are in this one?” asked Seth.

“I counted seventy-five infected machines,” replied Gabriel.

“So it’s small.”

“That’s where it gets even more interesting. Check the name of the bots. I’m highlighting them for you now,” said Gabriel.

“test001, test002- what the? This is a test setup or something?” wondered Seth.

“Yeah, I bet you anything that there is a larger botnet somewhere. I think this guy we intercepted was testing some kind of file,” Gabriel mused.

“We should do a write up on it. A basic overview of what happened. Put it up on our website.”

“Solid idea,” Gabriel said. “Let's meet tomorrow and see what else we can dig up about this.”

“For sure. Isn't this insane?”

“Hells yeah. I'll call Eric up in the morning. You have stats class with Kerstin, right?”

“Yeah I do. I'll talk to her there. Good night,” Seth replied.

“Night,” concluded Gabriel.

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Seth lay in bed. His clock indicated that it was just shy of two in the morning, Seth looked on to the laptop laying in his pillow, and at the article he had just written for their website. He had titled it '*The Botnet Chronicles*'. With a look of satisfaction, Seth clasped the device shut.

EIGHT

Return of the Black Hat

While Seth slept in his North American abode, geeks and hackers from Europe and Australasia were just warming up. Not too long after he posted his article, it was discovered by one of the many technical-minded individuals that frequented the *Digital Losers* website. Believing that the content would appeal to others, the web surfer submitted the article to one of the Internet's biggest technology news sites, *Dotslash*.

This was not unusual, as websites like these entirely relied on the computer savvy crowd for their content, and stories on elusive botnets always made for a good read. Within an hour, the article was accepted by the site's editorial staff, and made the front page. Within another sixty minutes, ten more sites picked up on the story.



In the basement of his home, the black hat hacker stared at his monitor. A pool of empty aluminum cans surrounded his keyboard. The clock on the bottom of his screen indicated that it was 4:53AM.

Tired of defending conspiracy theories with scriptkiddies, he closed his chatting application. He let out a deep breath and opened a can of cola. With the computer mouse in his free hand, the bored hacker launched his web browser. He navigated over to a computer hardware review website.

Stories on the latest processors and video cards consumed this hacker's screen. However, it was the word '*Météo*' on the side that caught his eye. It was an automated news feed circulating the hour's top stories. He clicked on the feed's link. The contents of the following page nearly made him spit out the carbonated contents of his mouth.

The article was about the botnet he had been working on. The *Digital Losers* as they called themselves, had somehow managed to intercept the communication between him and his botnet. How this was done was not clear, but the *Digital Losers* were promising more details the following day.

Panicking and unsure if this had even happened, the black hat immediately extracted his laptop from his briefcase and scanned it for any suspicious activity. He wanted to make sure that his machine had not somehow been infected. Perhaps these guys had sneaked a keylogger or some other malicious program onto his portable computer.

After half-an-hour of tearing through his machine, the hacker sat back in his chair. His computer was not compromised. Still, he thought, he had a big problem on his hands. He had been discovered. This was not good.

The hacker looked back up at the monitor on his desk, at the article that Seth had written. Bringing up a terminal window, he ran the WHOIS command against the *Digital Losers* website. This would look up the various databases on the Internet to display contact information about the website's owner.

The computer spat back bogus personal contact information. This was not unusual, in a world where spammers regularly browsed the databases to harvest valid email addresses. Many website owners had to put up fake information in defense.

Unphased, the hacker then looked up past, or *cached*, records for the website. Though the current contact information was clearly incorrect, perhaps it wasn't always so. His persistence paid off. Within seconds, he was presented with Seth's full name, address, and phone number. Very real information that Seth had put up when he had first registered the website.

"You're going down," the black hat muttered to himself.

Chaos

Seth was sprawled across the bed. His snores echoed throughout the room. The phone on his bedside began to vibrate in short bursts. Finally, the bursts stopped.

A few moments later, Seth's desktop computer turned itself on. Within a few short seconds, Gabriel's voice emanated through the speakers of Seth's computer. "Seth SETH Seth SEEEETH WAKE UP."

Seth's groggy voice responded from behind the protection of a pillow. He did little to hide his annoyance. "Whaaaaat..."

"You have to see this," said Gabriel.

"Later dude."

"No, this is serious. Get up now."

"Fuck. Fine," said Seth, getting up from bed.

Walking over to his computer, he saw that Gabriel had already opened a bunch of websites for him. His squinted eyes turned wide open. "What. The. Fuck," said Seth.

Seth was looking at a *Dotslash* article, with the headline '*Digital Losers behind Météo botnet?*' He quickly read the opening paragraph.

Claiming to have intercepted an update yesterday, it appears that audiences were duped by the Digital Losers hacker gang in following the wrong lead. As evidence shows, this was a ruse in pointing the audiences away from the true authors of the nefarious worm – themselves.

"I didn't write this. What the hell," retorted Seth.

"Did you read the user comments on the article?" Gabriel replied. "They believe it. I checked it out. There are fake forum posts Seth, with our handles on them. There are IRC logs of conversations we apparently had. All of it points to us. They're saying that we were the ones to control the botnet and to release some kind of update."

"What the fuck! We were the ones to tell people about this," shouted Seth.

"I know," responded a calmer Gabriel.

Seth glanced at one of the other articles that Gabriel had put on his computer. "Ah shit," he said. "There's even IP addresses pointing to us?"

"Pointing towards Ottawa. They assume it's us."

Seth continued frantically to read through the articles.

"It gets worse," continued Gabriel.

"What?"

"A new update was released overnight on the botnet."

"The file we intercepted?" asked Seth.

"Yeah, and what's fucked up," Gabriel said, "is that someone disassembled it and found more evidence pointing to us too."

"We're being pinned for this botnet?" responded Seth.

"Yes. Yes, we are. I talked to Eric. From what he saw, what we intercepted doesn't have all that stuff that incriminates us," replied Gabriel.

"These articles are implicating Kerstin too," said Seth as he got his bag ready. "We have to tell her."

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Seth walked into Eric's house. Gabriel was there to greet him inside. "It's worse now," he said to Seth. "I thought they were blaming us for a small Météo-based botnet. Pinning us as copycats controlling a few hundred machines. I mean that's what I thought we had found right? Being involved with a small botnet like that is still serious shit, but that I can deal with."

"What did you find out Gabriel," said Seth.

Gabriel was having trouble keeping his composure. His voice was trembling. "What did you find out," asked Seth once more.

"They're pinning us for *the* botnet. The main botnet – the one with three million bots."

"You're fucking with me," responded Seth.

"No man," said Gabriel, "I'm not. Never about this."

"What was the evidence in the update pointing to us?"

Eric walked up the stairs, to the entrance where Seth and Gabriel were standing. "There's an MD5 hash in a string in the code," Eric said in answer. "Someone

passed it by a rainbow table and got '*digi_10serz*' out of it. As in the Digital Losers. You guys."

"Wait – let me get this straight," replied Seth. "You're telling me that somewhere in that botnet code, there's our names written in there?"

"Yes," said Eric.

"How would they even get that string of text from the MD5 hash in the first place? I don't know of any public rainbow tables databases that could accommodate that many characters. And no one could brute force it on their own, it would take forever."

"That's what we thought too," answered Gabriel. "Which means that whoever supposedly decoded that MD5 hash is in on it too. Just like whoever sent that update. Or maybe they're the same person. I don't know, and at this point, I don't fucking care. Whoever it is, they're framing us."

"The MD5 string," asked Seth, "what is it for?"

"I don't know," replied Eric. "I didn't look at that version of the update."

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The trio sat in the couches of Eric's basement. Seth spoke. "So we're being framed for creating the single biggest network of infected computers in modern history. Don't these machines send like twenty billion spam emails a day?"

"Yeah. I checked it up. It's behind of a fifth of all the spam on the Internet," said Eric.

"This is bullshit," Seth replied.

Gabriel turned to them from Eric's computer. "Guys, I can't even access our site anymore."

Seth's pocket vibrated. He picked the phone. There were nine missed calls. His phone showed the phone number of the incoming caller to be 000-000-0000. He answered. "Hello?"

A low voice replied. "Fucking spammer I'm going to find out where you live and kill you. Oh wait - I already know where you live."

Seth clasped his phone shut. He looked at the device.

"Who was that?" asked Gabriel.

"A death threat," Seth replied softly, looking at him.

"Are you fucking kidding me?" Gabriel retorted.

Eric stood silent, watching the pair.

"What if this doesn't stop?" asked Seth. "I mean I look at my phone, and I see that there's been nine calls of this bullshit? What if one of these idiots actually goes after me?"

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A bespectacled man walked down the long halls of a building past its prime. Sergeant Graham DuHamel was in his early thirties, with unkempt hair that defied the neatness of his general attire. He stopped in front of a door, and took out a thick plastic card from his pocket. He swiped it past a black device on the wall. A beep reciprocated, and the man walked inside.

The room that Graham entered was compact, lined with five strategically placed oversized cubicles sporting top of the line computers. He was in the High-

Tech Crime Unit of the RCMP, the Royal Canadian Mounted Police, based in London, Ontario. He made his way to the cubicle at the back of the room, where a man sat preoccupied by the contents of the screen before him.

"Hey Kevin, did you see this?" Graham asked him.

"Hold on a sec," replied Kevin. After a few more seconds of observing his own screen, he looked up to the man and said, "Okay, what?"

Graham held up a sheet printed out from his computer. It was one of the online news article about the Météo botnet. "Apparently the people behind the worm screwed up and gave away their identities," he said.

"Good stuff," Kevin responded, returning his attention to the monitor on his desk. News of this nature wasn't anything noteworthy. The identities of these unsavoury types were regularly being uncovered. Identifying them wasn't the issue. The problem, rather, was bringing these people to justice, especially when they resided in countries not friendly to western authorities. Though inroads had been made in the last few years, prosecutions still remained a rarity. That's why Graham knew that what he was about to say would catch his partner's attention.

"They're Canadian," he said. Kevin's eyes immediately locked themselves on his.

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"Don't you see?" said Eric. "Every time the RCMP or FBI want to bust these fuckers, they always hit a brick wall. The evidence ends up pointing to some server in the Ukraine, the hosting company refuses to give them any logs or IPs, and they're stuck. Now here you are – Canadians. And the evidence is presented to them on a silver platter. The RCMP are going to be all over you."

"So we come clean," Seth suggested. "Tell the RCMP everything."

"Are you shitting me?" replied Eric. "They don't care if you did it or not. If it suits them to think that you did it, they will fuck you up until the only real option is for you to plead guilty. That's what they did to me, and that's what they did to Nate. You know that."

"What makes you think they'll come?" asked Seth.

"What makes you think they won't?" was Eric's reply.

"Because," Seth said, "the only things pointing to us right now are some forum posts and some code. It's bullshit!"

"It doesn't matter. The whole interwebs thinks you're guilty. Plus look at what you write about on your site - stories of computers you dicked around with, phone systems you jacked. What do you think they'll see that as?"

"Fuck what they think," retorted Seth.

Eric was livid. "Fuck that? Fuck *that*? Fuck the RCMP?"

Gabriel had quietly watched the exchange between the two. "Whoa guys," he said. "Just... just stop it

alright? Kerstin's going to be here any second, we better figure out what we're going to tell her."

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At the RCMP offices, things were moving forward. Kevin and Graham were sitting opposite their Sergeant. He was an imposing figure, and a twenty year veteran investigator for the force. "I got a call from media relations," he informed them. "A reporter from the *Globe* phoned them this morning. They're wanting news about these Canadian hackers. Relations gave them a canned response, but we have to figure out what we're going to do here."

Graham spoke. "It looks pretty clear cut. We'll just get a search warrant, clone their drives, and get the evidence we need. We're in, we're out, it's done."

"I did a quick search on these guys," Kevin said. "They did a video presentation at a hacker conference on how *not* to get caught. As in how not to get caught breaking into computers. I don't think we'll have any problems getting that warrant passed by the judge."

"Good," said the Sergeant. "Keep up the pace. The last thing we need is for them to be tipped off. We don't want those hard drives to end up in the river."

"Shouldn't be a problem," Graham replied.

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A car screeched into the entrance of Eric's driveway. Gabriel, Seth and Eric stood outside the doorway.

Kerstin got out of her car, slamming the door shut. "Why did you have to mention me on your site. Why?!"

"I'm sorry!" said Seth. "We didn't know this would happen. *I* didn't know."

"You fucking asshole!" she screamed.

"I'm sorry! What more do you want me to say? I'm not bullshitting you here – I'm really sorry."

"Fuck you," she retorted.

Eric spoke up. "Look guys, the RCMP won't sit on their ass."

"I still think they won't come," said Seth. "I mean don't you think that that's being a little paranoid? Saying they're going to come here based on that kind of crap?"

Gabriel had an incredulous look on his face. "An hour ago you got a death threat and you think we'll be okay?" he said.

"Because of some idiot with Internet access. So what? I bet you anything the police don't know jack shit about this. I say we go home, sleep on it, and within a few days this will all be a distant memory. A very bad, distant memory."

"Fine," said Eric, "but I don't want you in this house."

Seth locked his eyes with Eric's, unsure of what to make of that statement. The pause was interrupted by Seth's vibrating cellphone. He took it out of his pocket and looked at its screen. It was his roommate. He pressed a button and put the phone to his ear.

"There's a car with tinted windows across the street. It's been taking a bunch of photos of our place for minutes. Dude, did you do something? Seth? Hello?"

Seth pressed the button to end the call. He swallowed, and blinked a few times. "There's a car by my house." He said slowly. "And whoever's inside is taking photos of my home."

"It's so they can get a description of the place for the warrant. Dude they're going to bust you," Eric said. "It might be tomorrow, it might be next week, but they *are* going to bust you."

"They really are after us," Seth replied, sitting down on the front steps.

"Turn off your cell," Eric told him. "They'll be able to triangulate you. You guys need to go, now. They'll come here next."

"I should SSH into my box now." Seth responded, his voice barely audible. "Delete everything. Send a command to write over the sectors over and over till there's no real data left in the hard drive."

"Then they'll assume you're covering your tracks. Just leave it there," said Eric. "Let them find out for themselves you're not part of this. But you guys need to be on the move. *Now.*"

Kerstin was looking at the exchange. "You guys can come in my car for now," she said. "Let's leave."

"I'll just get my bag," said a meek Seth.

He walked into the house and down to the basement to retrieve his bag. Gabriel followed suit. "You- you alright man?" Gabriel asked him.

"Yeah. I'm fine," Seth replied, his words barely audible. He didn't really mean what he was saying, but the words left his tongue before he could give them any thought.

The two heard the muffled sound of Kerstin's engine starting. Seth put his laptop into his backpack, and headed back up. Eric stood outside. "Guys... You probably shouldn't contact me," he said.

"Yeah Eric," replied Gabriel, "I understand."

"Good luck," Eric finished by saying.

Seth and Gabriel got into the waiting car.

"Where are we going?" Kerstin asked.

"I don't know," replied Seth, softly. "Anywhere I guess."

"I know a spot where we can go," said Gabriel.

"Good enough," Kerstin responded. She backed out of Eric's lane way and drove off.

The Plan

Kerstin was driving the car. "So what do we do?" she asked.

"I don't know. Seth?" Gabriel answered. There was no reply. He turned to face him. "Seth?"

Seth had his eyes wide open. He had become very pale. "They're going to put us in jail. They're going to put us in jail. They're going to put us in jail."

Seth was hyperventilating. His breaths were getting more frequent. "Stop the car," he blurted.

"We're still too close to Eric's place!" Kerstin shouted back.

"Stop it now," Seth said again, in between breaths.

Gabriel looked at Kerstin. "I think I'd do it if I were you."

The car stopped. Seth got out, and started to make gagging motions. Finally, he vomited. Gabriel stood by his side, rubbing his back. Seth vomited again. He felt emptied, as if he were a shell of a body. Warm tears flowed down his face. "I'm... I'm better," he said. "It's over."

"We should keep moving," Gabriel quietly informed him.

Seth nodded, and the two reentered the vehicle.

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Kerstin's car pulled under one of the city's numerous interprovincial bridges. The three were about a ten minute drive from Eric's, but the suburban landscape had already given way to a peaceful natural environment. Even the constant hum of the vehicles traveling on the bridge overhead seemed to blend in with the birds chirping and the rustling of the water. As he got out of the car, Gabriel asked Seth, "You feeling better?"

"Yeah, much. Thanks. Kerstin?"

Kerstin sat down on the grass nearby. They followed and sat at her side. They were completely alone. Gabriel looked on, at the slow moving river ahead. "We need to think about what we should do," he said.

"Well we could turn ourselves in," suggested Seth. "But I don't trust the RCMP to believe us."

"Neither do I, but at the same time we can't run away," replied Gabriel.

Silence overtook the trio as they continued looking towards the river. Kerstin spoke out. "It's not running away if we're gone for a legitimate reason, like a camping trip."

"They won't fall for that," said Gabriel. "Even if they did, and we were gone for three days, we'd still be just as screwed at the end."

"Not if we prove *for* them that we're not behind this botnet," replied Seth.

"But there's so much there planted to make it seem like it's us," said Kerstin. "Forum posts, the update logs..."

"That's true. But remember that entry on the *AntiOffline* discussion board?" asked Seth.

"No," she answered.

"Okay. Well, someone wrote on the boards there pretending to be us. An administrator verified that the IP of the person came from here in Ottawa. They were using that as proof that it was us."

"So you think it's the guy we intercepted who's doing all of this?" postulated Gabriel.

"Who else?" came Seth's reply. "We intercepted this guy in Ottawa, and he's somehow related to the botnet. Next thing we know, someone from Ottawa is going around framing us for the same botnet."

"Or the guys behind the real botnet might just have read the article you wrote and used that opportunity to blame us. There are other ways to make it seem like those posts came from Ottawa," returned Gabriel.

"Do you know if there's wireless Internet here?" asked Seth.

"Yeah, there is," confirmed Gabriel.

"Well I know of one thing we could try."

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Gabriel and Kerstin were on either side of Seth as he typed away at his laptop keyboard. "Okay," said Seth, "so here we have the botnet update that we intercepted yesterday. And here's the new update that circulated on

the real Météo botnet last night, which I just downloaded. Now if I compare the two..."

Seth typed some more in the terminal window. The computer reciprocated the action by displaying a rudimentary chart, made up of blocks of blues and reds.

"And there we go. The blue represents what's the same between the two updates. The red is what's different. It's pretty much all blue, except for these blocks here."

There were three red blocks that stood out in the sea of blue. Seth pressed a key, and the program shifted modes from displaying multicoloured blocks to presenting hexadecimal numbers. These numbers were the short form of the raw zeros and ones that made up the file. Seth navigated down to the portion represented by the red block. He recognized a string of characters that had been part of the evidence planted against them. "That's it. That's the MD5 hash that links us to this worm."

"You lost me," said Kerstin.

"It means that the only difference between the file that we intercepted and the new update that was released on the botnet is the evidence planted against us," explained Seth. "Which means that our guy had access to that same major botnet update before it even came out. Now that typically is pretty guarded stuff."

"So you're thinking that our Ottawa guy who we saw working on the test botnet, is the one behind all of this," said Gabriel.

"He has to be," answered Seth.

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Kevin and Graham were loading up their forensics equipment in the back of their navy blue RCMP van. Neither were looking forward to the seven hour drive to Ottawa. "Did you hear?" asked Graham.

"What?" responded Kevin.

"Ottawa Police just executed the search warrants. All three homes, simultaneously."

"Jesus that was fast," Kevin noted.

"Yeah, well apparently they shared our sense of urgency. They're just waiting for us to collect the goods."

"Were the kids there?"

"No," answered Graham. "Word is that a unit was assigned to find them half an hour ago. Did you know that the girl is a diplomat's daughter?"

"That'll make us popular," remarked Kevin, sarcastically.

"No kidding, eh?" replied Graham.

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Seth, Kerstin and Gabriel were laying on the grass, looking at the river. "Okay, so what do we have on this guy?" asked Seth.

"Well, we were at a public venue when we intercepted the data, which makes his local IP address useless," stipulated Gabriel. "But we do have the

Internet address and credentials to the box he logged into from the tea shop.”

Kerstin was typing away at her laptop. She was trying to access the same machine that they had witnessed the hacker using the day before. It wasn't working. “I'm trying to log in, but he must have erased his account,” she said. “It doesn't work anymore.”

“The box still up though?” asked Seth.

“Yeah, its just that I can't login,” she replied.

Gabriel was looking straight at his laptop screen. “It's a web server,” he told them.

“What?” said Seth.

“It's a web server,” he repeated. “I just port scanned it, and lo-and-behold, port 80 was responding. It hosts the website for *The Law Offices of Jordon, Gilmore and McNealy*,”

“He compromised a web server?” Kerstin asked.

“Or maybe he's their web designer and has or had legit access,” suggested Gabriel. “Looks like this law office is in Halifax.”

“Well that's great,” Kerstin stated facetiously. “We have nothing. All that we know from this guy is that he connected to a non-existent account, from an untraceable spot. Yeah, that's going to sure convince the police.” She rested back on the grass. Seth and Gabriel followed suit.

“We are fucked aren't we,” Seth noted.

“Yeah, I'd say so,” concluded Gabriel.

Seth looked at his watch. It was still morning. He looked up at the trees and at the shape of the clouds. His heart was pounding against his chest. The stress, the fear, the uncertainty, were all taking their toll. He glanced at the others. The fear shared between them was unspoken, but he could see it in their eyes.

"The logs," said Gabriel.

"Mmmm?" responded Seth.

"The server's auth logs. It'll have all the IPs that he connected from when he was using the machine."

The server's authorization logs kept track of all logins and attempts to do so on the computer. It also logged whenever someone took action with administrator privileges.

"He could have erased them," declared Seth. "He did have the foresight to delete his account."

"Well let's at least try," rebutted Kerstin. "We have nothing else to go with."

"So we're going to try to hack in?" asked Seth.

"Why not?" responded Gabriel.

Seth paused for a moment as he looked at Gabriel. "Yeah, you're right. Why the fuck not. I'll see if I can use some XSS or MySQL injection attacks against the web server," he replied.

"I'll fingerprint the server," Gabriel said, "see if I can see what version of the OS its running. Get some ports down, determine if any of that shit is vulnerable to something that's come out."

"Well, I guess then that I'll go for the web apps," said Kerstin. "I'll check to see if there's any vulnerabilities there. I'll reverse DNS and see if they're collocating,

maybe try to get at the other sites too. What about social engineering the login credentials out of the hosting place?"

"We can't afford to screw up with that," responded Seth. "For the same reason we can't brute force passwords. If they get suspicious and take that server down, then we're going to lose the only thing we have going for us."

Seth looked down on his machine, and began typing away. The others followed suit. For over an hour, they each used their individual skill sets to try to gain unauthorized access to the server. The effort, however, was proving fruitless. The dated operating system was well protected against all forms of external compromise. Progress was equally stagnant with the other attack vectors. Gabriel was the first to speak out. "My laptop's almost out of power."

"Mine too," responded Seth.

"I got nothing guys," added Kerstin.

"Let's go find a place to plug-in," suggested Seth.

"Why?" asked Gabriel. "We won't get anywhere. Let's be realistic here."

"Then let's retrieve those files manually," replied Seth.

"What do you mean?" said Kerstin.

"Well," Seth said, "the WHOIS records show that the server is being managed by a hosting company in Toronto. Let's just go there and get those files ourselves."

"How?" asked Gabriel. "Say 'sorry, but could we please have a file that's on your server?' I'm sorry. I just don't see it."

"We'll figure out something," replied Seth.

"I'm sorry guys, but enough is enough," declared Gabriel. "I'm going home."

"But the logs was your idea," pleaded Seth. "And it was a good one."

"Look. Had this worked, I would have gone on. Maybe. But Toronto? I'm not going to go ahead with that, its just not in me. I'm not going to run. I'm not a criminal."

Seth's stared at Gabriel. He seemed so determined now. The fear had left his eyes. Seth didn't know what to say. Kerstin, however, did. "I'll give you a lift back to a transit station," she said. "You'll be able to take a bus from there."

"Alright. Thanks," replied Gabriel.

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Kerstin was driving the car back through suburbia.

"Gab man... I can't do this without you," said Seth.

"If you want to go, that's up to you," responded Gabriel. "But running away from the RCMP? What's that gonna accomplish?"

"Kerstin, what about you?" asked Seth.

"If I'm caught like this, they'll send me back to Germany. The embassy might send my dad back too. I'll be fucked. At least if we do this Toronto thing, I have a chance of proving that it wasn't me."

"Are you guys sure you want to do this?" Gabriel asked them. "Do you really want to go on the run?"

There was no answer.

After an uneasy drive, Kerstin arrived at the parking lot of the local shopping center. The transit station was nearby. They all got out of the car. "I don't know what to say man," Gabriel said to Seth.

"What is there to say. This is a shitty situation."

"Let's at least walk to the bus stop together," proposed Gabriel.

As they walked to the transit station, Seth looked at Gabriel and asked, "Is this what you really want to do?"

"No," said Gabriel. "You?"

"Not at all. But I just can't go on like this. With all this shit piled up against us and nothing to say otherwise."

"We have the packet dump," replied Gabriel.

"Yeah," began saying Seth, "but they could say that we faked it. That we created that packet dump. Nothing exists to validate it, to prove that its real. And I don't trust some Luddite seventy year old judge who doesn't even know what an email is to make the right call."

Finally, they arrived at the bus stop. The city's red and white buses were passing by at incredible speeds. "Well this is it," Gabriel said. "See you guys."

"See ya," said Seth. He gave Gabriel a long hug.

"Good luck," Gabriel told Kerstin, and shook her hands.

"Bye," she replied softly.

Gabriel would say no more. He got on the next available bus and made his way home. Walking down his street, he could see the suspicious van with the tinted windows waiting for him. Gabriel didn't care. He entered his home, and walked into his ransacked room. His MP3 player was gone. No matter. He put a CD into his dusty boombox, plugged in some headphones, and turned the music way up. He noticed that his computer was gone as well. Soon, that would be him. Tears flowed down his cheeks.

Within the next few hours, a few more vehicles would install themselves on the residential street. Finally, the police broke through Gabriel's front door. He could hear them shout as they searched the house room by room. He closed his eyes, and listened to the aural landscape. They kicked his room door open. A flurry of footsteps entered, and a voice boomed out. "Gabriel Fillion?"

"No, I'm his brother," he said. He opened his eyes, rose up from his chair, and walked away. The perplexed officers did not follow. Gabriel produced a half-smile on his tearful face, sat on the living room couch, and waited for the officers to arrest him.



Seth and Kerstin were inside an apartment building, and still in Ottawa. They had left their car at the parking lot of a nearby pharmacy. Seth pressed the button to call the elevator. "You sure this is a good idea?" Kerstin asked him.

"I just don't know who else we could get a car from," he replied. "I mean, we really don't have a choice. There's no way we can keep using your car."

The elevator doors opened. They went up to the ninth floor. Seth got off, and approached a door at the end of the hall. He gave it three good knocks. "I hope he's there," Seth said.

"Who is this again?" asked Kerstin.

An elderly immigrant woman opened the door. She did not look particularly cheerful.

"Hi, is Christopher home?" Seth asked.

"You wait..." she said, in a thick accent. Seth couldn't make out her nationality. Perhaps Greek. She turned around and yelled, "Chris? Chriis?!"

"What ma?" came the voice from the other room.

She said something back at him in her native tongue. The old woman turned to the pair and said, "He will come."

The lady walked back in to the apartment, leaving Seth and Kerstin at the door. Rummaging could be heard from within the apartment. Finally, a figure emerged from inside. It was Jinks. A smile immediately formed on his face.

"Seth! Or should I call you *ion*? I read the story on Dotslash dude. Three million infected computers. I knew you were real hackers. That's fucking awesome man."

"Jinks," said Seth.

"I can't believe it! I mean I thought you had gone all lame on me man! Shit this is awesome!"

"Jinks!"

Jinks stopped talking. He looked at Seth.

“We need your car,” said Seth. “Just for a day. Maybe two.”

“Sure man, anything!” replied Jinks. “Hey ma! MAMA! I'm taking the car!”

Exit Strategy

Kerstin was sitting at the wheel of Jinks' car. Seth was at her side, and Jinks was in the back seat. "Are we ready?" she asked.

"Yes," answered Seth.

She drove the car out from the underground parking lot. Jinks began to speak. "Oh man this is so cool! You guys really are *elite*! And word is from Eric that your place got busted too? Fucking Eh!"

Both Seth and Kerstin looked visibly irritated. They had some very real problems on their hands, with repercussions they didn't even want to fathom. That fact seem to be completely over Jinks' head. His ceaseless praise was really starting to annoy them. Finally, Jinks said, "But do I have to be in the back seat? I mean it's my car after all, and I want to be up there with the hot haxor chick!"

Kerstin slammed her foot on the brakes, bringing the car to a screeching halt.

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Kerstin waited for Seth in the bus terminal. He saw her and walked towards her. "You know," she said, "maybe we should have just endured Jinks and driven down to Toronto."

"Don't feel bad about it," replied Seth. "I don't know how much more of him I could have taken myself. So you got cash from the bank?"

"I pulled \$300. It's the most I could take out."

"Good," he said. "I called up some buddies. We'll have a place to stay when we get down there."

"Who?" she asked.

"Flow and i0."

"From Binary Phunksters?"

"Yeah," Seth told her. "I used to chat with them all the time when the show first started. I even did a few video segments for them."

"And they're okay with us just showing up there?" Kerstin asked. Seth kept walking.

He approached a bus teller and used some of his cash to buy two tickets to Toronto. Seth then motioned to Kerstin. He gave her a ticket, and the two sat down close to the gate.

They didn't have to wait long. Within fifteen minutes, the Toronto bound bus had arrived and was loading passengers. The two got on and sat near the back. Seth put his bag in the carriage over their heads.

"So how do we get the data out of the servers? Gabriel's right - we can't just ask them," Kerstin said, wriggling down in her seat.

"I saw pictures of the inside of their facility while checking the hosting company's website," Seth replied.

"They're just regular desktops set up in rows. That should be easy to handle. If we have physical access to the servers, we could take them over using a live distro. We just have to find which server the hacker used, run the live distro, and grab the files we want."

"They won't just let you walk in there."

"I know. We'll have to figure out something."

Seemingly too tired to be dissatisfied with the answer, Kerstin asked Seth one last thing. "How long is it from here to Toronto?"

"Five hours."

"I didn't realize how exhausted I was."

"Yeah, same here," he said.

Seth put his seat back, laying his head against the chair. He turned to face Kerstin. She looked angelic. "Kerstin?"

"Mmmm?" she replied.

"How is it you're so calm?" asked Seth. "They're all after us – and you're just taking it."

"I'm terrified," she said, in a soothing voice that would indicate otherwise. "I'm really, really scared."

"You don't show it," he remarked.

"What about you? You don't seem to be freaking out either."

"I don't know," Seth told her. "It's like that panic attack in the car was a release for me. Up until then, I didn't know what to do. But then it was like someone flicked off a switch in my head. I know I should be worried, but I'm not. I just care about making it to tomorrow. And tomorrow, I'm sure, I'll just worry about making it to the following day."

“Heh,” she sputtered.

“Seeing it like that just makes it easier to take,” Seth rested his head back against the chair once more and shut his eyes.

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Kevin and Graham arrived in Ottawa. They drove up to the region's RCMP headquarters. Waiting for them in the parking lot was a thin man with disheveled hair. He waved them over. Kevin waved back and parked his vehicle. “Hope you weren't waiting too long,” Kevin told him as he got out.

“Nah not too bad. We have some good news and some not so good news. Thought you might want to know.”

“Okay,” said Kevin.

“The good news is that they apprehended one of the hackers. On a less positive note, they're thinking that the other two went under. Large withdrawals were made with both their debit cards, their cellphones are off, it's not looking good.”

“That's too bad,” Graham noted. He grabbed his briefcase from inside the vehicle.

The man continued to speak. “There is a silver lining to all of this. We have another lead now. A kid named Eric Ducharme. His phone number was one of the last ones to be called by the hackers. He has a record. Computer crimes. We're sending someone to talk to him now.”

Looking at both Graham and Kevin waiting in front of him, the man said, “So do you guys want to take a look at the stuff they seized from the homes?”

TWELVE

Unwanted

The CN Tower could be seen in the distance as the bus approached Toronto. Seth nudged Kerstin. "Hey," he said softly, "we're almost there."



Kevin had already set up in his newfound cubicle. He and Graham had been stationed in one of the RCMP's unassuming old band buildings, with the other offices having been allocated to a bomb squad unit in from Winnipeg for training.

Equipment of all sorts was strewn across the surface of their shared desk, including a hard drive, about the size of Kevin's hand. The data stored on it was a perfect duplicate, a *clone*, of Seth's own hard drive. It permitted the investigators to analyze the contents of the storage device without modifying the original. Such precautions prevented the possibility of having the evidence thrown out of court because of tampering by the investigators. Kevin hooked up the cloned hard drive to his work computer.

Graham entered the room, coffee in hand.

"How's the coffee here?" Kevin asked, looking up.

"Pretty passable. Any success?" wondered Graham.

"Well, the drive is encrypted. How many times have you ever seen that?"

"Mmmm...." mused Graham. "In the four or five hundred cases I've done, I've seen it done maybe three times? It has always been something trivial though. Some wannabe big shot using a joke of a shareware program to hide a few incriminating files."

"Yeah. I've seen it done once, and it was the same deal. In my case it was a pedophile thinking he could hide a stash of photos," replied Kevin. "We eventually got the fucker. But I've been looking at what this guy here has, and its pretty solid. I'm doing some research now to see how I can run some dictionary attacks."

"That's it so far?" asked Graham.

"Well, the kid runs some form of Linux, and he has a non-encrypted porn collection bigger than most consumer hard drives. Wanna get started on this other machine?"

Kevin was pointing towards Gabriel's computer. It was beside a pile of cardboard boxes full of seized equipment taken from Gabriel's home. Graham went towards it.

"I talked to Taggart," Graham said, putting his coffee down and looking at the paper tags that the police had stuck on the machine. "The kid who owns this computer is the one they busted. Turns out that he's not cooperating at all. Insists on a lawyer."

"He's doing what I would do if I were in his shoes."

Graham raised his eyebrows in agreement. He began to dismantle Gabriel's computer.



Seth and Kerstin were at Union Station, in the heart of Toronto's financial district. The terminal was the city's principle transportation junction, where trains, buses, and the subway all passed by.

The pair navigated through the station's grand halls. Seth was careful to avoid eye contact with the cameras overhead. Their presence was making him increasingly uncomfortable.

"Where are we going?" asked Kerstin.

"The subway. It's down to the front," answered Seth, hastily descending a set of stairs.

Seth bought a number of subway tokens from a machine. He passed Kerstin half of what he had gotten, and hurried towards the revolving gates.



Seth looked around him. It was getting pretty dark. He was walking with Kerstin down a quiet neighbourhood street. He could still hear the distant rumble of the city bus that had just dropped them off.

"This is it," Seth said, pointing to a narrow Victorian-era home. They walked up to the front, and Seth knocked on the door. Footsteps were heard from within. i0 opened the door.

"Oh no-" said i0.

"Yeah, I know," said Seth. "But we have nowhere to go."

Flow arrived at the door. "Dude, we don't want to go to jail," he said.

"You won't," replied Seth. "No one knows we're in Toronto. We just need a place where we can crash for the night. That's it."

"I'm sorry man," said i0, "but I can't let you in the house."

Kerstin looked at the two. "Please," she said.

"I'm sorry."

i0 closed the door. Seth stood still, staring at the wooden door that was before his nose. After a moment, he turned around and sat down on the cold concrete of the entranceway steps. He looked around at the desolate street. "I'm not leaving until you let us in!" he shouted.

Seth turned his head and looked at Kerstin. She seemed calm, and yet faintly sad. "I'll yell like this all night if I have to!" shouted Seth once more.

Movement could be heard from within the confines of the house. Flow and i0's unintelligible voices could be heard engaged in a heated discussion. "Maybe we should just give up," said Seth.

"I don't know," she replied. "Where else can we go?"

The two waited on the steps. Finally, the door behind them opened. It was i0. "We'll help you," i0 said. "You can crash here tonight and tomorrow. But under one condition."

"What's that?" asked Seth.

“That you're out of here after that. We can't risk any longer.”

“You have my word,” said Seth.

i0 motioned them to enter. Flow walked from a room to the side. “We have some left over rice from tonight,” he said. “Do you want some?”

Kerstin looked to Seth with a smile.

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Seth and Kerstin were sitting in a room that they recognized as being the set for the *Binary Phunksters* episodes. A banner sporting the logo for the show was pinned to the wall, and a number of construction lights were piled up in the corner. Flow and i0 sat by the table. Seth had just finished filling them in on the events leading to their departure from Ottawa. “We need to get physical access to those servers,” said Kerstin.

“How do you plan on doing it?” asked Flow.

“We don't know,” replied Seth.

“Do you know where it is?”

“Yeah, the address is on the hosting company's website.”

“Well let's check it out,” suggested i0.

THIRTEEN

Toronto

The four hackers were in Flow's slow moving sedan in one of Toronto's many business parks. "4110... 4130...4190..." enumerated i0, looking at the large numbers displayed on the buildings to their right. It was difficult to make out the numbers in the dark.

"There it is - 4220," whispered Seth.

Flow stopped the vehicle and parked it opposite the two storey tall building. He cut the ignition. The street lights partially illuminated the suspended banner for "*Tyrrel Web Hosting Solutions.*"

"It looks empty," noted Kerstin.

"Yeah it does," said Seth. "I'm tempted just to break in."

"For sure there'd be an alarm or something," i0 said.

"Like a security guard? Look at the entrance," said Flow.

A security guard was seen approaching the front glass-clad door from the inside. He glanced at the street around him from behind the door, turned around, and walked back into the building. Flow started the car and drove off.



Seth woke up to the sound of muffled voices. He was on the floor of the Binary Phunksters home, his backpack having been used as a makeshift pillow. To his side was his laptop, listening to multiple conversations on the security and hacker related channels of the Internet relay chat networks.

Seth got up and walked towards the source of the voices. It brought him into the kitchen, where he found Flow, i0, and Kerstin, eating breakfast. "What's up guys?" Seth said, stretching.

"Hey," said Kerstin.

"We're thinking that we should stake out the building all day. Figure out exactly how many employees are there and when they're in."

"Sounds good. I'll do it," said Seth. "Can I?" he asked, pointing towards the warm kettle. Flow nodded. Seth poured himself some tea.

"I guess I'll just do rounds around the area, take notes," he said. "I don't know if I'd be that inconspicuous though."

"No worries, we thought of the perfect cover," replied i0. "You'll be the guy who records traffic activity at a nearby intersection."

"We got some big shades that'll fit over your glasses and also a clipboard for you to use. Make you look legit," affirmed Flow.

"And I'm there all day?" asked Seth.

"Until sunset we figure," answered Flow. "Then we'll come by and check the place out in more detail. Does that work?"

"Yeah, for sure," said Seth, sipping from his tea. He looked up at the gang. "Thanks by the way, for everything. I don't know what we would have done if it weren't for you."

"No worries," said i0. "Just give us the exclusive when all this is over."

"Deal," replied Seth, with a smile.

"It's almost eight," noted Flow. "We should go and drop you off. i0 and I both called in sick today so we can help you out on this."

"Aw, man. Thank you. But aren't you worried? What if someone finds out?"

"Fuck that. Just do the same for us when we're the ones being framed for an international crime."

■ ■ ■ ■ ■

Flow slowed the car, then stopped. Seth got out, and extracted a folding chair from the trunk. He could see the hosting company's building a few doors down. He went back to the front of the car, opened the door, and grabbed his clipboard from the seat.

"It's funny how people always think you're there on official business when you're armed with a clipboard," said Flow.

"Yeah it is, isn't it," replied Seth.

"We'll be back at around seven. You got everything?"

“Yep. See ya tonight.”

Flow drove off. Seth set the chair by the adjacent intersection, put on a hat two sizes too big, and placed a pair of equally large sunglasses over top of his own. He looked around. The business park was completely devoid of trees. All he could see were the endless rows of buildings that didn't quite seem to fit with each other. They all bore a utilitarian style, and seemed little more than large square brick boxes.

Seth began taking notes on his clipboard. First about the layout of the area, but then about ways to take over the server should the live distro idea not pan out. The distant slamming of a door distracted him. Two people were getting out of a car in the hosting company's parking lot. He checked his watch. It was eight fifty-five in the morning.

Two employees walked towards the building's entrance. One unlocked the door, and both disappeared inside. A few minutes later, the guard he had seen the previous night emerged. Long shift, Seth thought. The guard approached a nearby bus stop and waited.

Seth checked his watch a second time. This was going to be a long day, he thought. He took i0's MP3 player out of his pocket, and put on the accompanying headphones.

As Seth discovered, the music stored on the player was a mix of movie soundtracks and instrumental new age. Nothing he particularly liked. He switched to the player's built-in radio, and tuned in to a Toronto talk radio station.

Flow pulled up in his car at around noon. He rolled down his window, and passed Seth a chicken sandwich and a small pack of doughnuts. "We figured you'd be hungry," said Flow.

"Thanks," replied a reinvigorated Seth.

"I think we found a way into the building. Tell you later. Anything interesting so far?"

"Not much. It looks like only twelve people work in there. At least that's what I counted so far," indicated Seth.

"Perfect. See you later."

"Yeah," said Seth, "and thanks for the food!"

Flow drove off. Seth immediately began chowing down the food. Activity had started to increase in the area as well. Workers were all taking off in their cars.

A pedestrian stopped by Seth's corner of the intersection. He looked over to Seth, who was still eating his sandwich. "Whatcha doin'?" asked the pedestrian.

Seth looked up. He quickly finished chewing the sandwich piece and replied, with minor difficulty, "I'm taking traffic readings for the city."

"Oh yea?" said the man. "Finding out much?"

"No, no, not much. Not many cars here!" kidded Seth.

The crosswalk sign changed.

"Well you have a good day," said the gentleman.

"You too," said Seth.

Once the man had safely crossed the street, Seth's artificial smile disappeared. He looked down at his hands. They were trembling.



Things were getting frantic at RCMP headquarters. What began as a single media request had soon spun out of control. It was as if all the media outlets had seemingly decided in unison that this story about home-grown hackers would be front page news.

The story was already a big hit on the Internet. Rumours of busts were spreading all over the digital underground. That this was a story about *Canadian* bad guys didn't help. That was always a hit with the media. Like Graham once heard a public relations guy say it, "if it bleeds, it leads."

There was great pressure within the organization for the High-Tech Crime Unit to hold a press conference. They finally acquiesced. It would take place the following morning. Graham, Kevin, and the Sergeant would present alongside other Force officials.



It was about five in the evening, and the spring sun had begun to descend. Seth was busying himself by writing a letter to his mom. Almost all the handwritten text on the page before him had been scribbled out.

He looked up. People inside the building were starting to leave. Within forty minutes, they were all gone. The last person, a man in his early fifties, locked the door behind him.

It wasn't until an hour later that someone else arrived. It was the rent-a-cop. Seth looked at his watch. Six minutes after seven. He wondered when Kerstin and the others would show up.

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Flow returned with his car. Seth looked at his wrist. Seven thirty-five. Kerstin and i0 were with him. He parked his car in the lot of a neighbouring printing company.

Seth walked to the sedan, folded chair in hand. "So what did you guys get up to?" he asked, placing the chair in the trunk.

"We got a live distro configured and ready. It's on a DVD. Just put it in the server and we should be able to connect from the outside," answered Kerstin.

"Kerstin also came up with a genius idea," said i0. "The server hosts more than just the one website. If we put in that live distro, then at least fifty other sites will go down. The cost of running a separate operating system right? But we might attract unwanted attention."

"We'll be out of there fast enough anyways," said Seth.

"True. But why risk it eh? So what we did is that we have all those websites hosted *from the DVD!* Kerstin mirrored them all and set up a small daemon to host it out." explained an excited i0. "It won't do dynamic content, but it means that at the outset all these sites won't go down."

“Smart,” replied Seth. “But how are we going to get in the building in the first place? I was thinking of a few ways we might do it, but you said something earlier about a way in?”

“We'll fake a phone outage.”

“O- okay,” said Seth as he tried to wrap his head around how exactly that would work. “How?”

Flow pointed towards a five foot tall metal box on the lawn down the road. “See that brown box over there?”

Seth recognized the dull-coloured box as belonging to the telephone company. It's where all the neighbourhood copper lines joined together to connect to the telephone network. Seth was not an expert with the phone system, a true *phreak*, by any stretch. However, he knew enough to know that inside that box were several hundred if not thousands of individual wires that connected all of these businesses to the telephone network.

“That's how you're going to cut service?” said Seth. “But there's a million wires in there. Do you know which pairs belong to the hosting company?”

“Yeah. We called the MLAC.”

“The what?” said Seth.

“The place that linemen call when they need to know exactly what we need to know – which numbered copper wires in that box belong to an address. It was easy. I just had to pretend like I was a fellow employee.”

“Just like that?” asked Seth.

“Just like that,” affirmed Flow.

“So their phone system goes on the fritz,” said i0, “and you come in to save the day.”

“So we're all ready for this,” said Seth. “We have the live distro. We have our way in. Once the DVD is in the server –”

“I'll connect to it from wherever I can catch a signal for wireless Internet, grab the data, and we're done” Kerstin filled in.

“This is really going to happen,” said Seth, seemingly amazed.

“Yes it is,” said Flow.

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The group was back in the Binary Phunksters home. They were on the floor, surrounded by Chinese food. Seth was the one speaking, chopstick in hand.

“We should hit the place in the middle of the night, when the guard can't call anyone to validate our presence.”

“I agree. i0 and I have a bunch of telephone company memorabilia that we've been collecting over the years. I got an old AT&T shirt from the eighties we can use,” said Flow. “i0 has a white hard hat too.”

“So when should we go?” asked Kerstin. “1 AM?”

“That sound reasonable to you guys?” asked Flow. Seth nodded, as did i0.

“There's one thing that worries me. You saw the picture of the server room right? There's tons of computers in there. How will I find which one is the

one the hacker used? The one hosting the website for those lawyers?"

"You'll figure it out," said Flow. "Servers usually have some identifier written on the box. Either the domain name will be written right on there, or they'll have a sheet somewhere with all the names."

Seth did not appear entirely convinced. "So... what are we going to do until we leave?" he asked.

"Movie?" suggested i0.

"Yeah, I could go with that. It's not like I can sleep right now anyways," concluded Seth.

"Same," said Kerstin.

They put on *The Gibson*, a Hollywood movie from the mid-nineties about a group of high schoolers fighting a corrupt computer company. Seth and the others laughed at the film's over the top portrayal of operating systems, filled with large buttons and psychedelic colour schemes. After a while, Seth looked to Kerstin. "I wonder how Gab is doing," he told her.

"Gab?" asked i0.

"Riscphree. His real name is Gabriel."

Flow checked his watch. "Okay guys, its half past midnight," he said.

They got up from their seats. i0 picked up the remote control and stopped the movie. Kerstin got her laptop, and Flow put on his AT&T shirt.

"Where's the live distro?" asked Seth.

"I got it," answered Kerstin from the other room.

Seth armed himself with his trusty clipboard, and grabbed the hard hat that i0 passed him. He was also wearing some of Flow's old paint-stained jeans to look

more like a hardy telephone repair man. They got in the car. Flow pulled out and started to drive off when he said, "Shit. Hold on—"

Flow put the car in park, and ran back into the home. He returned a short moment later holding a pair of two-way radios. He entered the sedan and passed them to Seth and Kerstin. "You'll need this Seth to let Kerstin know when she's clear to access the server. We could use two more of these so that we'd all be able to stay in touch, but this is all I have."

"Think there's a place open this time of night to buy some?"

"Wülmürt. There's one near here that's open all night."

"If you pass me your cellphone i0," said Kerstin, "then at least we'll be able to have have three way communication. You won't need to talk to us i0 for what you do, right?"

i0 shook his head.

"That works too. Okay, let's go," said Flow.

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Flow's car slowly crept up the lit streets of the business park. The glow from Kerstin's laptop screen could be seen from outside the vehicle. "I got a signal," said Kerstin, looking down at her machine.

"This is close enough. We'll park here," said Flow. They were about a block from the hosting company's building.

"Does it still work fine?" he asked Kerstin.

"Wait," she said. "Yes. I have full Internet access."

"Good," Flow returned, cutting the ignition. "Okay, so stay here, and we'll go do this."

Seth, Flow, and i0 went to the brown junction box they had seen earlier that day. i0 took out large bolt cutters, and cut off the lock that kept its hatch secured. The lock fell to the ground. He opened up the door.

"Need a light?" asked Flow.

"Yeah," replied i0.

Flow took out his cellphone from his pocket and passed it to i0, who then used its bright screen as a makeshift flashlight to peer inside. He passed it down the neatly organized rows of wires and located the pairs which had been identified by the MLAC. He pulled out the wires. "That's it," said i0. "They should be without service."

He closed up the box. Seth and Flow walked up to the hosting company's building, leaving i0 behind. Seth donned the hard hat. He yawned as Flow knocked loudly on the glass door. Within a few seconds, they saw the guard emerge from one of the building's inner halls. He was an elderly East-Indian man. He unlocked the door from the inside and opened it a crack.

"Hey," said Flow, unable to contain his own yawn. "We're here to repair the phone line?"

"What?" asked the guard. "No one told me about this."

"Check it yourself. Apparently its been intermittent all day."

"Please wait here," he said, and disappeared inside.

"I hope to God the MLAC gave us the right pairs," Flow told Seth.

The guard was not long. Within a minute, he was back to greet the duo at the front entrance. "Funny, they did not tell me," said the guard. "But it is somewhat late in the night now isn't it?"

"Yeah, but they said you'd be here," explained Flow. "Otherwise, you'll have to wait until at least next Tuesday for a day crew to show up. Your guys didn't sound too pleased to wait until then either."

"Ahh."

"Yeah," said Flow, with a sympathetic sigh.

The guard poked his head out of the door. Flow quickly put his foot in the door. He didn't want the guard to notice that there was no repair van from the telephone company present.

Seth spoke up. "Shall we?"

"Yes, yes," said the guard. He let them enter.

"What kind of operation do you run here?" asked Flow.

"It is one of those technology companies," answered the elderly man. "They have their people working upstairs, and this first floor is full of computers. Where do you need to go to do these repairs?" he asked.

"Most likely in the back," answered Flow, "where the phone lines enter the building."

As they walked down the halls, Seth saw it – the server room. It was just like the photos he had seen posted on the company's website. They kept walking down the hall. "Ah shoot," said Seth abruptly. "You're

probably going to need someone to test the wire on the other side aren't ya?"

"Yeah, that would help," said Flow, catching on to the ruse.

Seth turned around and headed back for the front door.

"Where is he going?" asked the guard.

"The problem could be in here or out there. We need to run tests on both sides to see what's affected. I will need your help though with what I'm doing."

The guard appeared reticent.

"I understand that it's not in your job description," said Flow, "but if this takes too long I'll have to get the crew Tuesday to finish off the work, and you guys will have these telephone problems until then."

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Seth tested the door of the server room. It was unlocked. He opened it slowly, looking around for motion detectors. Confident that none were present, he quickly entered the room and shut the door softly behind his back. He moved towards the servers. Dozens upon dozens of machines were present.

The servers were all encased in nondescript white boxes, about forty centimeters tall, placed side by side on metal shelves. Neat wiring located behind the machines fed them power and a connection to the Internet. Each machine had a cryptic label placed on the top its case. The sticker on one machine said

“WWW-032”, while the next was labeled “WWW-033”, and so on.

There was no way for Seth to identify which of these machines was the one that the hacker had compromised and thus contained the logs they were seeking. He went to the computer on a desk nearby. Perhaps there was a list or something there that could tell him which server had been running the website for the law firm. That would be the one which the hacker had used. The desk bound computer was password protected. Seth tried a few popular combinations of user names and password, but to no avail.

Limited for time, Seth gave up on the computer and checked the contents of the desk for anything that could be of use. Nothing. He looked around the room for any paperwork that could aid him, but there was nothing. “Shit... What am I going to do,” he said to himself. Seth got on the radio. “Kerstin,” he said, whispering loudly.

“Are you done?” came the ear piercing reply. Seth immediately reduced the volume of his unit. He listened, making sure that the guard had not been alerted to the loud outburst.

“No... We have a problem. There's all these servers here, but I don't know which one is ours.”

“Fuck,” she said.

“Yes, I know.” said Seth.

Seth looked at the computers that surrounded him. Then he noticed something – all the servers on the rack were connected together by a single network switch. He pondered about this for a bit, and got on the radio.

He had an idea. He was going to figure out which computer was their server by process of elimination. "Listen I want you to continuously ping the server. I'm going to take these servers here offline progressively, and I want you to let me know when the server stops responding to your pings. Okay?"

"Okay," answered Kerstin. "Now?"

"Now."

Kerstin issued the command, which sent the server a constant stream of *pings*. The server responded back, letting Kerstin know that it was online.

Seth went ahead, and disconnected the network switch on the first rack in the room. All the computers on that rack were suddenly devoid of a connection to the Internet. "Is it offline now?" he asked.

"Nope," came the reply on the radio.

"Okay," he said, plugging the switch back in. He knew that his server was not on this rack. He went to the next device, and pulled its cable. "Now?"

"No."

Again, Seth went to the next switch, and repeated the procedure. "What about now?"

"No... wait... yes. It's off now."

Seth plugged the cable back in. "Tell me when its back online."

"It's back," she said, momentarily later.

Twenty computers connected to that single switch. Their server had to be one of them. Seth unplugged the first five network cables on the device. "What about now?" he asked.

"Still online," came Kerstin's response.

He plugged the cables back in, and disconnected the next five.

"It's off," she said.

"Okay, I'm plugging them back in one at a time now. Let me know when its online again."

He plugged the cables back in, one by one. After each one was plugged in, he would pause, and ask her if the computer had come back online. Kerstin would say no. After the fourth cable was re-inserted, she responded eagerly, "Yes, its on again!"

Seth was sure that he'd discovered the abetting computer. Their server was taken offline when he disconnected its cable, and came back on when he plugged that one cable back in. He followed the network cable from the switch, through a mess of wires and computers, to the server. It was about halfway down the row of machines, on the upper shelf.

Seth took the DVD from his side, and inserted it into the computer. He then restarted the machine by pressing the small button at the front of the case. It's done," he told her on the radio.

"Ten-four," she said.

Seth stayed by the server's side. He didn't want to leave until Kerstin gave him the all clear. It was possible that the company employed basic measures to protect their computers from this type of meddling. These computers didn't have screens, so he couldn't tell himself. After two very tense minutes, Kerstin's voice came back onto his radio, "I'm in," she said. "I've mounted the drive and am getting the log files. I'll have them all on my computer in under thirty seconds."

The DVD had done its job. Seth took his clipboard and moved out from the server room, carefully closing the door behind him. He walked through the halls of the building as quietly as he could. He looked at his watch. Twenty minutes had passed. He wasn't quite sure how Flow had handled the guard, but he had greater concerns at that point in time. He needed to get out of the building. He carefully navigated the halls and exited through the front entrance.

Seth hurried to i0, who had been waiting by the brown box. "You can reconnect the pairs," Seth said.

i0 obliged, and closed the hatch on the box shut. They then ran over to Kerstin. She popped open a car door and called Flow. In under thirty seconds he was out of the door as well, the guard waving him goodbye.

"Where's your truck?" they heard the guard say.

"Around the corner," answered a sharp Flow.

Flow walked around to the back of the web hosting building, away from Seth and the others. He emerged a few minutes later from the side of another complex. He ran to the car, and got in. "A few more minutes," he said, "and I would have run out of things for that guard to do. Did you get the logs Kerstin?"

"I'm going through them now," she said. "I'm grepping through the authorization logs.

There was a pause, as Kerstin typed in a few more commands. "We got a match!" she exclaimed. "He didn't wipe the logs after all!"

Kerstin looked around her. Her sense of joy appeared to be lost on the trio. Perhaps they were just tired. Her smile faded, and she spoke once more.

“There are three IP addresses that keep coming up. One I recognize as being the tea house. I don't know about the other two.”

“We can look them up when we get back,” suggested Seth. “Let's get out of here. I'm kinda getting worried about someone seeing us here.”

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Flow was driving down through Toronto's city core. Kerstin looked at the towering skyline in awe. She had never been here before. Massive multicoloured displays shone against the car. The streets were empty, save for a few drunken students just out of the clubs. “You know, a lot could have gone wrong tonight,” said Flow, as he drove up Toronto's historic Yonge Street. “We were lucky.”

“Yes,” agreed Kerstin.

“Yeah,” added Seth.

They got to the home of the Binary Phunksters. Kerstin sat on their sofa and turned on her laptop. Seth produced another vocal yawn.

“You guys want some coffee?” asked i0.

“I would love some,” answered Seth.

“Kerstin?” asked i0.

“No thank you,” she said softly.

“Well I'll make a pot,” he replied. “It'll be there if you want it.”

Kerstin was looking at the three Internet addresses that the hacker had used to access the compromised server. By themselves, IP addresses revealed little due

to their obscure numerical nature. However, she could perform what was known as a reverse DNS lookup. It was a handy means to reveal more about an Internet address, often giving insights as to which organization handled it. "Okay," said Kerstin, "I did a reverse DNS search on one of the mystery IPs. It traces back to the Ottawa Community Collegiate. We're on the right path. Now for the other--"

She paused, typing at her screen. "There are no records. I'll do a traceroute," she said, referring to another technique used to scope out more information from an IP address. She typed a few more commands at her computer. "It's a residential IP based somewhere in Ottawa. I think this one is from his home."

"Now we have the guy's IP," said Flow, "but the question is how do we get his physical address."

"You could wardrive around and time how long it takes for the hacker's IP to respond back to your pings," proposed i0.

"I don't think that would even work," said Seth. "No, I think we'll have to do it the old fashion way: social engineer it out of the hacker's ISP. But I've never done an ISP before. I'll ask around online."

"Okay, we'll I'm about ready to hit the sack," said Flow.

"Yeah, come to think of it, me too," said i0.

"You guys go to bed," Seth told them. "We can work on this tomorrow. God knows we did enough today."

The Stakes Rise

It was morning. Kevin and Graham were in the hall next to the press conference chamber. Graham glanced to the side. He could see the Sergeant settled in a seat by a long table on stage. Reporters were coming into the room, taking their seats and preparing their digital voice recorders. A slew of television cameras were already at the front, waiting to take the right sound bite.

“Are you ready for this?” asked Graham.

“No,” said Kevin, smiling. “Shall we?”

“Yes. Let's do it.”

The two walked inside and onto the stage joining the other RCMP officials.

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Seth woke up. His back was hurting from sleeping on the floor two nights in a row. He looked to the laptop at his side. It was still monitoring the IRC channels. He sifted through the conversations it had logged. There was talk about the Digital Losers. Some believed he was responsible. Others did not. The

Floridian hacker who operated the chat server thought he was innocent. All were quoting news sources online. Seth had no interest in reading them. It would only make him upset.

Seth approached Kerstin. She was still asleep on the couch. He gently touched her shoulder. "Wake up," he said softly.

Flow and i0 were still sleeping. He couldn't blame them. They had had a long night. A long day. They needed the rest. He did too.

Kerstin slowly got up.

"I know someone who can help us get the address for the hacker," he whispered to her.

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Kerstin and Seth huddled around his laptop. She was sipping on some tea. Seth dialed a long-distance telephone number from his computer. A cheery male voice came on, "Hello and welcome to Kobar's PBX. Operator, this line does not accept collect calls. If you're a telemarketer, press *one* now to disconnect. If you're family or your name is Rob, also press *one*. To listen to past episodes of the *Phreaks 'n Geeks* podcast, please press *two*. For a text-to-speech rendition of today's Dotslash news, please press *three*. To join the conference, please press *four*. If you wish to connect to my direct line, please press *pound* followed by the three digit code. For all other inquiries, please hang up and call someone who'll care."

Seth pressed the pound key on the phone, and then entered three numbers. He had obtained the code from an old acquaintance on one of the chats. According to Seth's contact, Kobar was an excellent social engineer. He knew how to play telephone companies to get whatever kind of information he wanted out of its workers. This was precisely the kind of person he needed.



Kobar was in his late twenties. He was peacefully unconscious in his bed, still dressed in a business suit. A few pills and a half-empty bottle of beer were on his bedside table. On the wall opposite hung a vintage nineties era payphone. Kobar had even managed to snag a matching telephone sign that he mounted on top of the device. The payphone began to ring.

Kobar emitted a grunt. He grabbed the cordless phone at his bedside, careful not to knock the bottle of beer over. "Hello?" he said.

"Is this Kobar?" It was Seth's voice.

"Who the fuck is this? You know it's like 6AM?"

"Yeah, I know. This is ion from the Digital Losers."

"Who?"

"I'm one of the guys they're pinning the Météo botnet on."

Kobar sat up. "Where are you calling me from?" he asked.

"Not from my home numbers. Don't worry."

"I need to know," retorted Kobar. "Pay-as-you-go cellphone? VoIP? I need to know. What are you using?"

"VoIP," answered Seth. It was the name of the technology he was using to use his computer as a virtual telephone. "Paid for with a disposable credit card and never used from my home."

Kobar's shoulders relaxed a little bit. Still, he wanted no part of this mess. He looked down at the carpet flooring, and with a deep breath asked, "Give me one good reason why I shouldn't hang up on you."

"I need your help," answered Seth. There was a pause.

"What?" asked Kobar.

"I need to get the address of someone based on their IP."

"Social engineer the ISP."

"Yeah. But I don't know how to approach it. I've conned small third party guys and stores before, but this is new territory for me. I've never hit a big organization like this."

"It's not rocket science dude. Just figure out what they call their departments, such as 'tech support', 'customer relations', or whatever. Then use that to play one department against the other. Call up their tech department, and say something like '*Hey this is Jim from billing. I've been having problems getting this account to show up through their phone number and address. They don't speak English well and I think they're giving me the wrong information. If I give you the IP address, can you pull up the account for me?*' And then you get them to give you the details."

"Mmm," replied Seth.

"As long as you sound convincing, they'll work with you. Why do you want this anyway? Don't you have bigger problems right now?"

"We found the guy who released the Météo botnet. Or at least the one who framed us. He's in on the botnet. Anyways we have his IP address. We just need his location."

Kobar let out a deep breath. "Listen," he said. "You want me to do it?"

"If you're willing," Seth told him. "That would be great. Because honestly, I really don't want to screw this up. But if you don't want to, I completely understand."

"Just hold a sec."

Kobar scrounged around for a piece of paper. With a pen in hand, he asked, "Okay. What's the ISP?"

"TekkWorld." answered Seth. He spelled out the name of the company for Kobar. "T-E-K-K-W-O-R-L-D. It's a regional Internet provider based in Ontario."

"And the IP?" asked Kobar.

"One seven two, dot two three, dot two one one, dot five three."

"And when did he last use that IP?"

"The twenty-... five days ago," answered Seth.

"I'll call you back in five."

There was a click from Seth's speakers.

Seth lay his head on Kerstin's shoulder. "I hope this works," he told her.

"Are i0 and Flow still sleeping?"

"I think so, but it's still only eight something."

"I'll go make us some toast," she said as she got up and headed towards the kitchen.

Seth turned on the television and flipped a few channels. He had skipped over the 24 hour news channel, but in the half second it was on, something caught his attention. He went back to the channel. He couldn't believe it. "Ker- Kerstin get in here now!" She came right back in. "Look," he said, pointing to the television.

The two watched as the RCMP conducted a live press conference about two Canadian fugitive hackers. Them. A photo of Seth was posted on the television. The RCMP had chosen to use the least complimentary photo ever taken of Seth – his passport photo. He looked downright menacing. As for Kerstin, they had used her university identification photo. "Oh my God," said Seth. "Holy motherfucking shit."

The policemen were using words such as 'cyberterrorists' to describe the pair. They were claiming that the two were part of a large organized crime network. Footage of Seth's presentation at one of the hacker conferences was shown. It was all very damning.

Seth was speechless. The female news anchor cut from the live press footage to give a general overview of the situation. They were pinning Seth, Gabriel, and Kerstin for upwards of three billion dollars in damages caused by the worm. She then did a quick summary of the botnet. The infected computers in the botnet were used to send spam, with estimates that it had been used to send three trillion emails. One of the hackers,

Gabriel, had been apprehended, but the other two were still at large. The news anchor then began to describe Kerstin's car, and warned her audience to be on the lookout.

A telephone ringing sound emanated from the speakers of Seth's laptop. A distracted Seth pressed a key on his machine, and Kobar's voice came on the air.

"I got it," said Kobar. "Your guy is named Darren Simcoe. He lives at 2107 Elvino street in Ottawa. You got that?"

Still in shock from the news, a distracted Seth responded,

"Darren Simcoe, 2107 Elvino street. Thanks."

"No problem. But this is the most I can do for you okay? Please don't call me back."

The two could hear the handset hanging up. Seth looked towards Kerstin. "We can't go out like this. We'll be too recognizable."

An exhausted Flow stumbled into the room. "Hey guys," he said. Kerstin immediately changed the channel and shut the television.

"We got the hacker's address," said Seth. "Um... Flow, how good are you at cutting hair?"

Flow was still adjusting his eyes to the bright morning light of the living room. He didn't quite know how to process Seth's request.

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Graham's temporary Ottawa office had been expanded. Perhaps he should do press conferences

more often, he thought with a smile. Reports were flooding the RCMP. A young man approached Graham, and passed him a bulky folder. "Word is they have numerous sightings in Ottawa, but there are a few in Toronto and Montreal that match up as well."

"Thank you," said Graham.

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Seth was in the bathroom trying to bleach his hair. i0 was at his side, reading the instructions on how to do so. Neither had done this before. Kerstin was in the kitchen where Flow was giving her a buzz cut. Flow turned off the electric razor. Looking down, Kerstin could see the clumps of hair that had collected on the floor. "Thanks," she related to her amateur barber, with slight disappointment.

Within an hour, the duo were ready to return to Ottawa. Seth hadn't told Flow or i0 about their appearance on the news, nor did he have any inclination to do so. "Is there a bus station that isn't as busy as Union station or has all those cameras?" he asked.

"Yes there is," responded Flow. "It's not even that far away. Maybe twenty minutes by car."

"Perfect. Then that's what we'll do. Can we stop by a convenience store along the way too?"

"Yeah, why not," said Flow.

"I'll get my bag and I'm ready. Cool?"

"Cool."

"Is that okay?" Seth asked Kerstin.

“Yes,” she replied. If she was nervous, she didn't show it.

Seth and Kerstin grabbed their stuff and jumped into Flow's car. Seth removed his prescription lenses and put on a pair of i0's fashionable sunglasses. About half way to the bus terminal, Flow spotted a small strip mall.

Flow pulled the car over into a small lot. Seth got out along with Kerstin. They entered the convenience shop. Seth went to the store's ATM, and pulled out the allowed maximum of two hundred dollars from his debit card. His vision impaired without his glasses, the machine's screen was a big blur. Still, he had used those machines enough times to know what it was asking him to do. “Pull out as much as you can,” he told Kerstin.

Seth used some of the money to buy some bread and boxes of cookies. Returning to the car, Seth pulled out his cellphone and turned it on. Flow got out of the car. “Are you crazy?” he said. “They'll know you're here!”

“That's exactly it. I want them to think we're here, and not back in Ottawa.”

Seth had dialed Eric's number. Eric answered, and without missing a beat began to talk. “Before you speak: what do Abbie Hoffman and the Cheshire Catalyst have in common? Think 'zine wise.”

Seth knew the answer. It was the TAP Magazine, a long-defunct publication that had its place in the hacker history books. Eric was trying to say that his line was being tapped. Seth hung up without saying a word. He had accomplished what he had set out to do.

"That's it?" asked Flow.

"That's all I needed," replied Seth. He turned his phone off once more.

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Flow stopped the car two blocks from the regional bus terminal. They all got out. "Thank you," said Kerstin. "For everything."

With that, she gave both Flow and i0 a big hug. Seth shook their hands, and looking at the two digital phunksters, said, "This wouldn't have happened without you. Thank you."

"Don't mention it," replied Flow. "Better move on before anyone sees ya."

"Yeah," agreed Seth.

Seth and Kerstin turned around and headed towards the bus terminal. Seth looked back, and saw that their saviours were already back in the car. He gave a single wave goodbye. "Adios," he said under his breath.

The two entered the bus station. "We should have asked i0 or Flow to have bought the tickets for us," noted Kerstin.

"Yeah, that would have been a good idea. Shit. Stay here, I'll buy the tickets."

Seth approached the teller. He was much more nervous than when he had purchased the bus tickets to go to Toronto.

"Two bus tickets to Ottawa please."

"Are you a student?" she asked.

"Um... yes," answered Seth, not thinking.

"Do you have an ISIC or student card with you?"

Seth froze. He did not want to give her any identification.

"Ahh you know what? No I don't," he bluffed.

"That's okay. I'll just charge you the student rate anyway."

"Thank you," returned Seth.

Seth paid the teller the money and returned to Kerstin with the tickets. She had moved on to the small shop located inside the building. "The next bus is in twenty minutes," he informed her.

The pair went to sit down in the waiting lounge. Seth looked up at the large flat screen television. It was a cable news channel. "Oh no," he said. "Let's go to the café instead."

The two walked towards the small coffee shop to the back of the terminal. Seth bought two orders of hot chocolate. "Sorry, I should've asked if you liked this."

"I do," she responded.

The two sipped on their drinks. Within ten minutes, it was time to board the bus. They got on, and as before, installed themselves towards the back of the vehicle.

"So we have the address," said Kerstin. "What now?"

"I don't know. He's got to have a wireless router. Who doesn't these days? We could crack the encryption and try to get his files."

"Unless he has the files on a networked directory, that means we'll have to hack into his box too. That's perhaps do-able *if* he runs Windows," noted Kerstin.

“But he was using SSH. That's not really something you see with a Windows user.”

“Yeah, but if he's doing development of a botnet that runs specifically on that operating system, you'd think he'd have a computer running it somewhere... unless it's a virtual machine.”

“That's a lot of *'ifs'*”, Kerstin told him.

Seth continued. “So how about we poison his ARP tables, and capture all the network traffic... like we did it at the tea house?”

“Okay,” said Kerstin, “let's say we do that and then get nothing. Then what? We're fucked. We can't just sit there sniffing for five days and hope that no one notices us. Or that he'll actually send in a written confession claiming responsibility for framing us. And you know what, who knows? The address Kobar gave us might be wrong.”

“Maybe it is. I don't know. We'll worry about it then. What we need now is to get ourselves a car. Then we can access his wireless network without being right there on the sidewalk.”

“And just where would we get that?” asked Kerstin.

“Jinks.”

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Graham was swiveling in his seat, looking at the ceiling of his RCMP office. He let out a deep breath. “This is a nightmare,” he said to Kevin, sitting in the cubicle next to his. “Have you seen the reports? It's a joke. Eric is the reputed hacker of the bunch, but he

won't talk and we have no legal means to keep him here. Gabriel *is* talking on the other hand, but only through a lawyer. No progress. And the sightings? I shit you not, we had one call from an Australian gentleman claiming he had beers with them in Alice Springs last week. We have nothing."

"Their computers have been pretty useful," said Kevin.

"Well that's true. That's the only thing we have going for us."

"Don't worry. They'll come out. I give it a week, tops."

At that point, another officer entered the room. "Hey guys did you watch the news?"

"No, what's up?"

"The fugitive hackers. They made an announcement last night on the bulletin board of a computer security website. They said that unless we stop chasing them, they're going to release a new update to the botnet. Worse than before. The news media is having a field day with this. Word is that it's not a hoax - the IP of the poster resolves to some library in Ottawa."

"You have to be kidding me," said Kevin.

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"Well let's say all else fails - we wait until the hacker is at work and we steal his computer," Seth told Kerstin.

"But then we just tampered with the only evidence that proves we're innocent," responded Kerstin.

"That's very true. Okay, so sniffing his wireless traffic it is."

Kerstin did not say anything in return. She just lay her head back against the seat. Closing her eyes, she said,

"I really don't like this. I don't like that all we have on this guy is an address. For all we know there could be no house there."

"Then we'll be no worse off than had we not left for Toronto."

"Except that now we're considered fugitives."

Hours passed. The lack of rest from the previous night had caught up with both of them - Kerstin and Seth fell asleep. It was the jagged motion of the bus braking that woke them up. The bus had stopped at an eatery en route.

The duo got off the bus. They walked off to the side, away from the other passengers. Seth looked around at the desolate landscape. He wanted to talk to Kerstin, but didn't know what to say.

"What got you into hacking?" he asked her.

"Sorry?" she said, a little startled.

"What got you interested in hacking?"

Kerstin pondered the answer for a bit. "Well," she said, "when I was nine, my father got us a computer at home. My parents didn't like it when I watched television, but they didn't mind it when I used a computer. So I just started to use it every day. It beat reading books. I remember trying to make the

computer more efficient by deleting files I thought were useless. That didn't work out so well."

"What did your father say?" asked Seth.

"He wasn't around for that. When the computer crashed, I told my mother that it was because of a virus. I guess I've had a thing for computers ever since. What about you? Have you always played pranks?"

"No. I used to be in the Warez scene. I was part of a group that got first dibs on movie releases. Often we'd have copies of films before they even came out in theaters. My job was to find places to store all that stuff. Usually that meant hacking into corporate FTP servers and stashing the files there."

"So you were a scriptkiddy," noted Kerstin.

"Yes, but things are different in the Warez world. Anyways, shortly thereafter I was introduced to proper hacking. It just appealed to me. Pushing computers to their limits, making them do the magical things they were never designed to do. I was hooked. I retired from the Warez group and haven't looked back since."

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"Come again?" said Graham.

"They're in Toronto," said the investigator. "Their debit cards were used this morning. Both of them."

"The IP address we have places them in Ottawa just before then. There's something amiss here."

"I don't know sir. Maybe a proxy?"

“That wouldn't make sense. There has to be a third hacker involved. Maybe it's Eric. This could be what we need to bring him in. Have you seen Kevin around?”

“I think he's in a meeting with Jim.”

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The bus arrived at the terminal in Ottawa. Seth and Kerstin got off, and walked towards the station's exit. The crowded nature of the place made them both feel especially uneasy. Suddenly, a booming voice came from the other side of the hall. “SETH! SETH ARNOTT!”

Seth froze. He looked to the source of the voice – it was a classmate from university. This was not good, he thought. Still, if he ignored the man, his name might be shouted a few more times. He couldn't risk that. Seth approached him.

“Hey buddy, how ya doing?” asked the man.

“Pretty good Alex. Where are you going?”

“Montreal,” said Alex. “My great uncle passed away.”

“Oh, I'm sorry to hear that. Are you alright?”

“Yeah,” said the young man.

“Good. Listen Alex, we really have to go. The cab's waiting for us outside.”

“Okay buddy. See ya soon.”

“Sure thing.”

Seth turned around to leave. Kerstin was waiting for him up against he wall. They left the building as quickly as they could.

Jinks Redux

Seth and Kerstin found themselves in Jinks' high-rise once more. Kerstin gave a few solid knocks on the apartment door. It was Jinks who answered. "Hey Jinks," said Seth. Jinks did not seem terribly surprised.

"What guys?" he replied unenthused.

"Can we use your car?"

Jinks stood still, reading Seth's face.

"Half the country is looking for you. Gab is in jail. Eric is under twenty-four hour police surveillance. And despite all of this, I still tried to help you out. But what did you do? You ditched me."

"We didn't want you to get caught," lied Kerstin.

"Fuck that. Do you think I'm an idiot? You're just using me." Jinks turned to Seth. "You know, it's not like I wasn't aware that you treated me like shit. I let it happen because I thought maybe you'd eventually see me just like you see Eric and the others. I thought that maybe I could be part of the Digital Losers some day. But that never happened. And now that you're in trouble, you want to be all friendly? Well fuck you!"

"I'm sorry Jinks," said Seth.

Jinks just looked at him.

"Look, we're almost done," Seth told him. "We could really use your help. *I* could really use your help. You want to be part of us? Now's your chance."

"You must really think I'm a fool," said Jinks.

"Fair enough. Just don't let anyone know we came by. Please."

Jinks nodded. Seth turned to face Kerstin.

"We should go."

Jinks closed the door. He stared at the knob. Oh fuck it, he thought to himself. Abruptly, he opened the door and looked down the hall where Seth and Kerstin were walking. "Hold on guys. You can use it. Here are the keys."

"You're not coming?" asked Seth.

"Nah dude – that was the problem last time right?"

"Jinks, I'm not going to force you to come with us. But if you want to come, I'd be glad to have you with us. Do you want to come?"

"Yes, very much so," replied Jinks.

"Then bring your laptop. And while you're at it - do you have a live distro anywhere?"

"Yeah... well, sorta. I have one loaded on my thumb drive."

"Perfect. Bring it."

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Jinks drove the car into a residential neighbourhood. "Is it this street coming up?" he asked.

Seth was looking at the map of the area on his laptop. “Yep. Turn right,” he said. “Picking up anything yet Kerstin?”

“Oh yes. Tons of wireless networks. Everywhere.”

“We're looking for 2107,” said Seth.

“I see it,” said Jinks. “There it is. On the left.” Jinks stopped the car.

“I'm detecting three wireless networks in this area,” said Kerstin. “Two of them with encryption, one of them with none. I'm connecting to the unencrypted one now.”

She typed a few keys on her laptop. There was a pause. “Done. No, this is not our guy. This network is connecting to the Internet through a different ISP than the one we saw the hacker use.”

“Okay,” said Seth, “let's connect to the other two networks. I'll take one if you take the other?”

“Sounds good,” she replied.

Seth turned to Jinks. “Want to see me crack the encryption of a wireless network in under two minutes?”

“Yeah!” responded Jinks.

Seth closed the window with the map of the area on his laptop. He opened a new, blank, terminal window and began typing. He spoke to Jinks as he worked on the machine. “The problem with this form of encryption, which is called WEP, is that not all of the sent data is well encrypted. Some data packets are transmitted using what are known as weak initialization vectors. Listen in on enough of these, and you can figure out the encryption key.”

“So you need the target to send data for this to work right? What if the guy's not home and there's no data to listen in on?” wondered Jinks.

“Well then what we do is something called a replay attack. Long story short, you send bogus data on the network to bluff the computers into responding with even more data. More traffic equals more weakly protected packets, and badabing, badaboom, I've just cracked the encryption.”

Jinks appeared to be caught off guard. “Wait, what? Just now?”

“Just now,” said Seth, looking up to Jinks. “That's how little time it takes to break it. Kerstin, you in yours yet?”

“Almost,” she replied.

“So now I'm in the network,” Seth told Jinks, with his eyes still fixated on the laptop screen. “And- Okay, he's using the same ISP as our hacker, but the hostnames here don't match what we saw the hacker use. There's a Windows machine here. Let's check it out.”

Seth opened another window, and typed a few keys. He was now surfing the contents of the remote computer's hard drive. “I'm going through the computer's files. The system's password wasn't even changed from the default. This is probably not his. I don't know any self-professed hacker who would allow such an insecure mess to co-exist in the same house.”

Seth continued going through the contents of the computer. Flipping through the documents stored on the machine, Seth stumbled on some tax returns for the

previous year. He quickly read through its contents. "Yeah, this is some other family's computer. Not our guy. How's it going for you Kerstin?"

"Better now. I had to clone my MAC address, but I'm in now."

"MAC address?" asked Jinks.

Seth was the one to answer. "Another security measure for the network. It's a unique identifier tied to your network card. Theoretically, it's never supposed to change. So people use it to create white lists of computers approved to join the network."

"Seth says 'in theory', because you *can* change your MAC address," clarified Kerstin. "I just changed mine to mirror that of a computer that's already approved to be on the network. So now my computer is approved, just like his."

"I see," responded Jinks. "How do you know all of this?"

"Experience," she replied.

"So you guys can break through any encryption?" asked Jinks.

"Pretty much," said Seth. "WPA is supposed to be the new standard to encrypt networks, but no one uses it. It fixes what makes the current protocol so vulnerable, but give it a few months and it'll be cracked too."

"This is not our hacker," said Kerstin. "This network is using the wrong ISP."

"Shit," was Seth's response.

Seth looked across the street. "I guess we have to break into the house. I mean if there's no wireless network running in there."

"What? Are you kidding me?" yelled Kerstin.

"What else are we going to do?" said Seth.

"I don't see a car," said Jinks. "Want me to knock just in case?"

"Sure."

Jinks left the car and approached the house. Seth looked to Kerstin. "Do you see Jinks' thumb drive anywhere?"

Kerstin looked around her. "No, I don't," she said. "Are you seriously going to break in?"

"I don't know what else to do. We're so close."

"We're not even sure it's his house."

"I know."

Jinks arrived at the front door and knocked. There was no immediate response. He waited, and after a minute motioned to Seth with a thumbs up. "Stay here to be the lookout," said Seth. "Can I borrow your hair pin?"

Kerstin obliged. She did not ask any questions.

"Thanks," said Seth.

Seth got out and walked to the front door. He took out his keys, and removed one of the key rings. He unfolded it to make a pin, keeping it slightly curved at the end. He then took Kerstin's hair pin, and bent it in an 'L' shape. He jabbed the two into the door's lock, and began to pick it. Jinks looked around nervously. "Don't look," said Seth. "Make it seem like you're waiting for someone to answer the door."

Seth kept working. It wasn't helping that there was tremendous pressure from doing this in broad daylight, in the middle of an upper-class neighbourhood. Finally, there was the sound of a click. "Got it," said Seth. He pressured the metal tools against the lock and twisted it to the side. He pushed the door open.

Two single beeps were heard. Seth looked to the source of the sound on his left. It was a control panel for the home alarm system. The screen on the panel was counting down from thirty seconds. "Oh shit," said Seth.

"Can you hack *that*?" asked Jinks.

"No. We gotta move now. Find that computer!"

Seth got out of the house. Kerstin was still in the car waiting. He pointed towards her. He saw her look over, and then vigorously waved his hands for her to leave. She got the message. Kerstin jumped into the driver's seat. She started the car, and drove off. Seth reentered the house, closing the front door behind him. He moved from room to room, trying to find the hacker's computer. He could hear Jinks searching through the other rooms. "You find it?" he yelled out to Jinks.

"No, not yet!" was the response.

The timer reached zero. The alarm started, with an ear shattering wail. Seth was sure the neighbours could hear it. The phone inside the home began to ring. He ignored it.

"Found it!" yelled Jinks.

"Where are you?!"

"Downstairs!"

Seth moved through the halls of the house. "Where are the stairs?" he shouted to Jinks, looking around.

"By the kitchen!"

Seth moved to the back of the house, and found the stairs. He went down. The basement was a single large living space, with a room cutting to its side.

"In here!" yelled Jinks.

Seth entered the side room. It was a mess, much unlike the rest of the house. Clothes were strewn everywhere, a filthy bed remained unmade. Seth moved towards the computer desk to the side. As he made his way, he glanced at the books that adorned the room's floor. They were on subjects such as assembly programming and shell coding. Topics that would be of interest to no one but the most hardened of computer enthusiasts. "This is our guy!" shouted Seth over the alarm. "See if you can find his laptop anywhere!"

Seth reached the desk and turned on the two monitors that were there. His action was immediately rewarded with the picture of a naked eighteen year old girl spread across the two screens. An open window on the right screen indicated that the computer was busy downloading a pirated movie. The machine was running the Berkley flavour of the Unix operating system. "Do you have the thumb drive? I need it!" yelled Seth to Jinks, who was looking for the laptop under the bed.

"Oh shit - it's in the car! I'll get it!"

"Fuck! Just forget it and keep looking for that laptop!"

This was not good. Without that thumb drive, Seth had nothing to which he could offload the data he copied from the hacker's computer. He also needed the live distro that was on the thumb drive to bypass much of the computer's security. Seth opened a terminal window on the machine.

He issued a command to gather all the files he could from the hacker's personal directory. A live distro would have given him access to more files, but now was not the time to worry about this. Seth initiated a command to log into one of the high-speed corporate FTP servers that he knew would be working. His terminal window filled with cryptic writing. The FTP server was ready and waiting.

Seth began uploading the files. The program estimated that the transfer would take an hour. He could not wait for that long. The computer would have to continue to do the upload after he had left the premises.

Seth issued a command to hide the transfer from sight. If the hacker came back before the upload was complete, there'd be no visual cues present to let him know of the computer's subversive assignment. Seth finished off by deleting the logs that had recorded all the commands he had issued to the computer. "We're done. Let's go!" shouted Seth. Jinks wasn't there.

"Jinks!" he yelled again, leaving the hacker's lair.

"Yeah!" Jinks replied back, from upstairs.

"We're leaving!"

Seth ran out. He could hear the police sirens. Jinks was already walking down the street. Seth closed the

door behind him and looked around. Kerstin was nowhere to be seen. Suddenly, a car screeched around the corner. It was Kerstin. She stopped the car in front of a running Seth, who jumped in. She then drove by Jinks further down the street. He got in. She floored the gas pedal.

“Slow down!” yelled Seth, looking around for the police.

Kerstin turned onto the freeway and the sirens faded into the background. “Was it the right house?” she asked.

“Yeah, it was. We found the hacker's computer, but not his laptop. Is that right Jinks?”

“I didn't see it anywhere,” he said.

“We forgot the thumb drive. I copied what I could off of his computer, but that's about all I could do.”

“If you didn't have the thumb drive, where did you put all the data?” asked Kerstin. “Did you burn it onto a DVD?”

“I uploaded it to a fast FTP server that I know of.”

Kerstin passed a large regional mall just off the freeway. “Where to now?” she asked them.

“I don't know where,” said Seth. “We need some peace and quiet to do this – and I need somewhere where I can download the data off of the FTP server. We can't do this in public, we can't go to my house, or yours, or Eric's, or Gabriel's, or anyone we know.”

“We could go back under the bridge. It was quiet there and there's Internet access,” proposed Kerstin.

“That's true. But we ran out of power last time,” said Seth.

"You guys could come to my place?" said Jinks.

"Your place would be a bad idea. The cops have hit Gab and Eric. You'd be next."

"No I wouldn't," maintained Jinks.

"Haven't the RCMP called you or anything?" asked Seth.

"Nope. You guys have never talked about me online... or off for that matter. What is there to link us? We go to school together, and that's it."

Seth looked at Kerstin and back at Jinks. "You're right," he said. "Let's do it."

Kerstin took the next ramp, back onto the freeway heading in the opposite direction. "I'm convinced," she said. "Jinks' place it is."

Pieces of a Puzzle

Seth and Kerstin entered Jinks' home. Statues and other art objects collected from foreign countries decorated the place. "Nice apartment," said Seth. "I like the art."

"You guys have never been here, eh?"

"Jinks, I'm sorry I never got to know you any better," said Seth.

"Ah dude, you don't have to say that now," replied Jinks.

"Yeah but I should. I'm sorry."

"Thanks," said Jinks.

They entered Jinks' room, where they were greeted by half a dozen movie posters plastered to the walls. An outdated computer occupied the small desk to the corner. Jinks sat on the bed. "Now I don't know about you guys," he said, "but I'm famished. I can't work when I'm hungry like this."

"I'm pretty hungry too," said Kerstin.

"I still have money left," indicated Seth. "How about we order some takeout? My treat."

"Nah dude, I'll split it with you," Jinks retorted.

"I want to pay for it. Let's do it."

“Okay,” Jinks conceded. “Can't argue with free.”

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The black hat hacker returned to his home. The security company had called his workplace, to inform him of the alarm. As he approached the house, he saw a single police officer present, waiting by his car.

“Hi,” said the hacker. “The alarm company called me.”

“Hey,” replied the officer. “Want to check it out?”

The black hat walked to the front door. It was unlocked. “Was that you?” he asked the police officer.

“No, but I did enter the home. Your neighbour came out and said she heard tires squealing right after the alarm. Do you want to see if anything is missing?”

The hacker entered his home. Nothing seemed amiss. Everything was just as he had left it that morning. He ran to the basement, where his computer was stationed. He turned on the monitors – the movie was still downloading. Returning upstairs, he took a quick look around the rest of the home. The television was still there. So was the stereo.

“Seems to all be here,” he told the officer.

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Open Chinese food containers were all over Jinks' room. Seth was chowing down some chicken fried rice while his laptop downloaded the last of the hacker's

personal files. "It's done," he said with a mouthful of food.

Seth grabbed Jinks' thumb drive and copied the freshly downloaded data onto it. He then tossed the small device to Kerstin, who was busy sipping her Won Ton soup. "Those are the files?" she asked, looking up.

"Uh huh."

Seth sifted through the data on his own laptop. He was finding no trace of the black hat's worm. No update that had caused them so much grief. No source code. Nothing. "I'm not seeing the worm anywhere," declared Seth.

"It makes sense though doesn't it?" said Kerstin. "You said earlier that the guy was running BSD, but the worm was designed to run on Windows."

Seth looked at Jinks to answer his impending question. "It's a Unix-based operating system." He turned back to Kerstin. "Yeah he was running BSD. But he could've used a virtual machine. I know I would if I was designing something like a worm."

"Do you think it could all be on the laptop he had at the tea house?" asked Kerstin.

Seth shrugged. "I don't know. I wished we could have found it at his house." Seth placed his hands on his head. "This is a nightmare," he concluded. He returned to the computer to sift through more of the files. Perhaps there was still something of value there. Jinks began dumping the files onto his own computer.

"I got something," said Kerstin. "It's his emails."

"Oh?" said Jinks, looking back from his busy computer screen.

“Yeah, I'm extracting it all now. Check out this one here though – it's a receipt for a digital gold payment.”

“I've heard of that before,” said Jinks.

“It's what spammers and phishers use. Think of it as a 'Western Union' for computer criminals. Transfer money, yet leave no trace. The US government's been trying to bust them on laundering charges for years.”

“He's selling the worm for money?” said Jinks.

“I don't know,” answered Kerstin. “It just says that some guy named null_cool transferred five thousand dollars to him. I'll keep looking.”

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Seth and Kerstin had continued to sift through the files. Reams of paper filled the room as Kerstin printed off any text file she deemed potentially useful. An excited Jinks interrupted them. “Hey guys, I got something!” he said. “Check this out.”

Seth placed himself beside Jinks, looking over his shoulder at the monitor. Kerstin walked over.

“Okay, so the payment to our hacker was sent by a guy named null_cool right? So I did an Internet search for 'null_cool', and guess what – the guy posted an ad on a freelance job site under the same alias.”

“Okay,” said Seth.

Jinks continued. “So I looked up the account on the job website. He has a bunch of contact details listed there - his email, his instant messenger user names, and so forth. So I looked them all up.”

Jinks turned to face his computer. “I got nothing when I searched for his email address and his other contact information, but when I looked up one of his instant messenger user names, I got this.”

Jinks pointed towards his screen. He had his Internet browser open on a website for Porsche enthusiasts. It was an online forum, where fans of the cars could congregate and discuss.

“It was in Russian originally, so I translated it online. Guess what? Mr. null_cool owns a Porsche. He says on the site that he's a software engineer. How many engineers in the computer business do you know who can afford a Porsche? In Russia?”

“Awesome Jinks,” responded Seth. “What's the job on the site for?”

Jinks clicked his mouse a few times, and navigated back to the freelancer website where the job had been posted. The ad read,

I want to do forum posting up to 3000 as per the target keywords. Priority to the Higher Review and Low price. If you are in GAF then you can do but i will pay after completion of project..No escrow til you will not finish....

“It's under the 'web promotions' category,” said Jinks.

“You know what that ad is really about?” said Seth.

“Spam?” answered Jinks.

“Yeah. Freelance sites like that one are how spammers outsource their work. They get other people

to do their dirty work for them, and rake in the profits.”

“So the black hat was paid by a spammer?” wondered Jinks.

“Looks like it. Maybe he uses the botnet to spam people.”

Jinks returned his attention to his computer. Seth and Kerstin went back to their own laptops to search through more of the hacker's files. Clicking and typing sounds pervaded the room. “Hey,” Jinks said, “have you guys ever heard of *avnews.ns*?”

Seth looked up and shook his head.

“I was looking through the other ads this guy had posted on the freelance website,” clarified Jinks. “The new ads don't say what he spams for, but the older ones do. It's for this anti-virus news thing.”

Seth went onto the *avnews* website. The site, which Seth translated from Russian, discussed the latest in anti-virus news. The website appeared to be operated by one man – Dmitri Tarasov. Seth clicked on the link leading to the man's business profile. According to the page, Dmitri was the chief software engineer for the Russian company *Avalanche Anti-Virus*. “Oh, shit” growled Seth. “So this null_cool guy isn't just any spammer or software engineer. He happens to be the chief programmer for an anti-virus company. That can't be good.”

Kerstin had also quickly read over the biography. “Quick theory: an anti-virus company that pays to get first dibs on one of the most prolific computer worms

of this era,” noted Kerstin. “It’s not like this is unheard of.”

“Let me see if I can dig up more on this,” said Seth.

Seth searched online for “*Avalanche Anti-Virus*.” He found many web pages, but they all agreed: the company was shady, and their line of anti-virus products a scam. By this point, he had seen enough. “Guys,” he said, “I don’t think that our hacker is being paid to give an anti-virus company the worm. I think it’s the other way around. I think they’re paying him so that they can *use* the botnet to distribute *this*.”

Seth turned his laptop to face Kerstin and Jinks. It was a picture of the desktop on someone’s computer. On the bottom right portion of his screen, there was a little window indicating that a virus had been detected on their computer. Seth continued on. “It’s a fake warning saying that there’s a virus on the computer. That warning then recommends the purchase of *Avalanche Anti-Virus* to wipe this threat from the system.”

Seth closed his laptop shut. He turned to Kerstin and Jinks. “There is no virus of course,” he said. “This is all one big scam. All this anti-virus program of theirs does is get rid of the fake warnings they put up. They’re getting the botnet to put these messages on thousands of computers. That’s what this is all about. They’re counting on that one percent of victims to actually fall for it and pay them money for a product that isn’t real. Imagine, you infect 100,000 computers, and out of those, the one percent pays up \$60. That’s sixty times a thousand – sixty thousand dollars! For nothing!”

“Do we know that for sure?” asked Kerstin.

“Okay, you're right. Let's think this through. We know for sure that this Avalanche Anti-Virus company is a scam. We know that they need infected computers in order to put those fake virus warnings up. We know that a botnet is the best way to get junk like that into a system. We also know that this company paid a guy, our hacker, who is related to a very large botnet. Yeah, I think we're good on that one.”

Kerstin looked outside the window. “So how do we prove it to the RCMP?”

“We call the hacker.”

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Graham was sitting at his computer station. For days, he had been sifting through the seized hard drives belonging to the hackers. While he had found some material of interest, he could not find any evidence explicitly linking the hacker trio to the botnet. He looked outside. It was already getting dark. Exhausted, Graham decided to have another go at decoding Seth's encrypted files.

His office telephone rang. It was Kevin. “Hey Graham. I just got word that our fugitives are calling their good buddy Eric. They're using VoIP for the call – the guys here need a hand to finish off the trace on the Internet side of things. Can you come on down?”

“Be right there,” answered Graham.

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“So why are you calling?” asked Eric, over the phone.

“Will you just stay on the line for me” responded Seth. “We know who is actually behind the worm. We found out. But we need you to be in on this conversation so that there's some legit record. Your line is still giving the beeps right?”

Seth was referring to the distinct audible indicator that informed telephone users that their conversations were being monitored by law enforcement.

“Yes,” said Eric.

“Then that's all we need. You don't have to do anything.”

Eric produced a loud sigh. “Fine.”

Seth dialed a ten digit phone number on his computer. He was initiating a three way call between himself, Eric, and this new number. The phone rang twice. There was a click, and a recording came on.

“Operator, we do not accept collect calls.”

There was a pause, and the recording continued. “Welcome to Nenn's *Phreaking Awesome* PBX! If you already know what you want to do, please enter the two digit extension followed by the *pound* key. Otherwise, press *zero* to listen to your options.”

Seth typed in the two numbers, followed by the pound key. “Please enter which number you are dialing from,” requested the automated voice.

Seth had dialed into the *Caller ID* section. It allowed him to make his calls appear to come from a different number. Seth could make his calls appear to come from

the White House if he so wished. In this case, however, he wanted to make it seem like the call was originating from Russia.

Complying with the request of the recording, Seth entered the number for a random Moscow telephone number he had acquired.

"Please enter which number you would like to call," asked the recording. Seth did not dial right away. He placed his hand over the microphone and turned to Jinks. "Jinks, I'll need you to do this for me."

"Wait – what?" said a surprised Jinks. "Me?"

"I can't do a Russian accent for shit. When I talk to this guy, there's no way in hell he'll believe I'm from Russia. I've heard you do accents before – you're good at it. Just talk to him. About the worm. Make something up."

Jinks mouth opened as if he were to say something, but no words came out. Finally, after blinking several times, he said,

"Seth, I don't know the first thing about computer worms."

"You can say anything you want. It doesn't matter. All he has to do is acknowledge it exists. All we need is a sentence where he uses the word 'worm', okay? I'm calling his number now Jinks. You can do this."

"No, I can't," responded Jinks.

"Yes, you can," replied Seth. "Better than any one of us."

Seth dialed the number for the black hat's home and turned his laptop around so that its microphone would face Jinks.

"How did you get the number?" asked Kerstin.

"Directory assistance," answered Seth. "Just had to put in his address on their website."

The ringing emanating from Seth's speakers stopped.

"Hello?" came the voice of a young man on the other end.

"Heel-lo," said Jinks, laying on a thick Russian accent.

"Yes?" responded the unimpressed voice.

"This is null_cool. I want to talk botnet, and I--"

"Who?"

Jinks looked nervously at Seth. "null_cool."

"That's what I thought I heard you say. But then I thought you couldn't possibly be that dumb. What the FUCK are you doing calling my home? I'm not the only one living here you Russian shit head. How did you get my number?" The hacker's tone was consistently calm, yet very aggressive.

"Well," responded Jinks.

"No. I want you to shut up until I'm done. You fucked me over hombre. You know how much we rent out that botnet for. So imagine my surprise when I see that you loaded up our bots with your cheap ass malware. Because of you, our bots are running slow. So slow, that I have three guys on my ass asking what the fuck is going on, and I have to tell them that its a bug. That I screwed up. Do you know how humiliating that is? To accept blame for what you did to me? No, you're out. And don't fucking ever call me again, or I'll take

down your server and the whole fucking Class B that that it's on. Comprende?"

There was a click. Seth took his computer back from Jinks.

"You still there Eric?" asked Seth.

"I'm still here. I got it all," said Eric, still on the line.

"Perfect. Thanks bud."

"I'll see you soon," said Eric, before hanging up.

Seth turned his attention to Jinks.

"Good job Jinks," said Kerstin, hugging him.

"Top material" added Seth.

"I don't get it," said Jinks. "I didn't say anything."

"He admitted that he's involved with the botnet," said Seth.

"That's it?" asked Jinks. "We're done with this guy?"

"He admitted his involvement. That's the best we could hope for. Eric's got it recorded with the police's wiretap, I have it recorded with my own computer. We're doing good. For once."

They heard shouting from outside the apartment. Kerstin looked out. "Oh no - I think we have a problem," she said.

Jinks and Seth approached the window. They could make out a black van against the night sky. Ottawa Police officers were climbing out. A black and white police car arrived on site, followed by another. "Shit," said Seth, "we gotta get out!"

Kerstin cut the power to her laptop and packed up. Seth and Jinks followed suit. Within seconds, the three were making their way out of the apartment. "I know a way out. There's a service elevator, in there," said Jinks,

leading them to the back of the building. They entered an oversized elevator. "There's a tunnel in the basement that brings you to the apartment building next door," he said as they descended.

In the basement, Seth and Kerstin followed Jinks down the underground tunnel. Pipes and electrical cabling followed them overhead. "Turn left here," said Jinks.

Jinks led them to the underground parking of the adjacent building. They walked along a concrete wall, opened a second door, and quickly went up some stairs. The exit was at the top. They opened its brown steel door and felt a whoosh of cool spring air.

The trio were now outside, on the other side of the fence from the two apartment blocks. They could see flashing lights in the distance. "How did they find us," asked Seth.

"They must have traced the call to Eric," responded Kerstin.

"I didn't expect them to figure out how to trace VoIP calls," said Seth.

Seth saw the main road nearby. He pointed it out to the two. "There's the road but it's out of the question that we walk by it."

"Let's grab a city bus," suggested Jinks.

"Yeah, okay. Do you guys have some coins? I got \$2."

"I still have some money," said Kerstin.

"I've got my bus pass on me and some money if you're short some," said Jinks.

The three waited in the darkness. Only when they heard the bus approach, did they run up to its designated stop. The bus came to a halt, and the three boarded. It was nearly empty, much to their relief. The bus resumed its route, which passed the police cars, and several officers busily preparing for a bust. Seth sat back in his seat. "All of this is because of that guy, and his fucking botnet," he declared.

"Shhh," responded Kerstin. Seth ignored her.

"You know what really pisses me off? The fucker framed us. Imagine if we didn't go to Toronto, if we didn't find out what we know now. We would have had nothing. Imagine if we went to court like this. We'd be fucked! And for what – money. Money, money, money, fucking money. That piece of shit bastard. I want to fucking kill him."

"Forget it Seth, we won," said Kerstin.

"Actually, I don't want to kill him. That would be too good for him. I want to hurt him. I want a thousand little cuts all over his body, and just leave him to rot. I want him to suffer, to be afraid, just like we've suffered and feared. I want to take down his precious botnet."

"Let it go Seth," implored Kerstin. "Let's get the recording with the hacker to Flow and i0, all right? We're done. We won Seth. We did. Not him. Us."

"You're right," he said, looking back out the window. As if trying to convince himself, he said again, "You're right."

"So what now?" asked Jinks.

"Well, Kerstin's right. We have all the proof we could have hoped of getting. Let's email Flow and i0 a copy of

the telephone conversation. We'll tell them what's happened since we left them. It's important that someone else know the truth beside ourselves. Then, we go out to drink. This might be the last night I get to do this for a long time."

"I could get my cousin to have us over for a few days," suggested Jinks. "He's cool, he'd take us in."

"No Jinks, I'm handing myself in tomorrow. I'm done."

Seth looked at Kerstin. She nodded. "Tomorrow, we'll go to the RCMP," she said. "But tonight will be something special. Tonight, we go out and enjoy life!"

Celebration

Seth, Kerstin, and Jinks walked down the packed streets of Ottawa's market. This was the drinking hub of the city, filled with row upon row of bars and clubs. They were surrounded by rambunctious youths, people laughing, and lots of loud music. Seth no longer made any efforts to conceal his identity. The fear was gone. He accepted his fate. He looked towards Kerstin. She was smiling. Seth couldn't help but smile himself.

They walked into a popular Irish pub. Seth liked the way a network of doors and narrow alley ways connected this pub with many others, creating a very large labyrinth through which to roam. The bouncer at the door asked them for their ID. Like the others, Seth obliged. The heavy set man then asked to search their bags. Standard policy.

Within a minute, they were inside. The trio ordered drink after drink. They danced. Seth ran out of cash, and started to use his credit card once more. They drank even more. Seth could feel the buzz, but it wasn't enough. He continued to drink. So did Kerstin. He looked at her. She was so beautiful. So smart. He loved

her, but he knew that expressing his feelings for her here would be a bad idea.

Seth bobbed his head to the loud Irish punk music. Looking to his other side, he saw that there was an attractive nineteen year old sitting on a sofa with her friend. He approached the girl and gestured to her to come up and dance. She pointed to the man across from her. It was her boyfriend. He didn't seem too pleased. Seth backed off and returned to the sidelines, drinking another beer.

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They stumbled out of the pub, thoroughly intoxicated. They walked, openly, in front of the many parked police patrols of the night. The officers ignored them. "Fuck being messed with," declared Seth. "Fuck this shit."

"Huh?" responded Jinks.

"Let's take down the botnet," suggested Seth.

"Okay," replied Kerstin. "Why didn't we think of that earlier? Oh yeah – because pulling it off is not possible. It's been tried before you know."

Seth grinned. "But they weren't us."

"Alright," she conceded, "I'll watch. Jinks? What's your call?"

"Do you really have to ask? Of course I'm in."

The three walked towards the patio tables of a closed bakery shop. Seth took his laptop out and turned it on. Within a minute, he was scanning the area for any wireless Internet connections he could latch on to. He

found an available network. "We got Internet," he exclaimed. "Beautiful, sexy, Internet."

Seth grabbed a beer bottle he had stashed from the bar in his bag. He uncapped it and took a sip. "One for the road, you know?" he said.

"Pass me that," said Kerstin. She took the bottle from Seth's hand and gulped down half of it, passing the remainder to Jinks.

"You're so hot when you drink that beer," spurted Seth.

"Right," replied a slightly less intoxicated Kerstin.

Kerstin took out her own laptop. She couldn't let Seth have all the fun. Meanwhile, Seth began searching online for reports discussing the technicals of the computer worm. He found one, in the form of an analysis provided by a popular computer security site. Seth read through the article out loud, trying to battle his inebriation. "They don't connect to a single IP. Addresses like that can be taken down. The bots are connecting to a domain. So when you take a server down, it doesn't matter, because there are other IPs to fall back on. Smart."

Kerstin had come across a separate paper. As she understood it, the black hat needed to fulfill a few requirements in order to control his infected computers. "Heh, you recognize this address," asked Kerstin to Seth.

"That's the domain for the hosting company in Toronto. Why?"

"It's one of the hostnames authorized to access the botnet."

“What are you guys going on about?” asked Jinks.

“Well, to take command of the Météo botnet, you need two things,” explained Kerstin. “You need a password, and you need to connect to the botnet from an authorized location. Like in this case, it looks like our hacker could only access the botnet if he connected through that server in Toronto.”

“So if we're here in Ottawa, we can't access it,” said Jinks.

“You got it,” said Kerstin. “According to this white paper, the only other approved addresses resolve to places in Australia, the United-States, and Romania.”

“But he wiped himself from that Toronto server. He wouldn't have done it unless he had some other way of controlling the botnet,” said Seth. “So I'm thinking, where is the new location he's authorized to connect through? What replaced Toronto?”

“We can find out. The authorized list is in the worm itself,” noted Kerstin. “In that last update – the one he framed us with. That's when he wiped himself from Toronto. The new list must be in there. Do you still have that update on your computer?”

“Never thought about deleting it,” said Seth. He opened up the file in his hex editor, exposing the raw code of the file. Seth searched through the file for one of the approved addresses based in Romania. Sure enough, he landed on the worm's updated list of approved addresses. They were all the same, save for one entry. “Well, he's hacked another server. This time in South Africa.”

“That signals the end of that, then,” said Kerstin.

She was right. Seth felt like his eyelids weighed a ton. He could continue, but even if they got into the server they still would need to get that password. Jinks had already passed out on the table. "So where do we go?"



Seth woke up. It was morning, and he was back in his townhouse. He looked to his side. Kerstin was there, with him, in his bed. He vaguely remembered the events of the previous night. There was a taxi ride. There was a lack of cash. Seth had refused to use his credit card, so they had to walk for an hour. They shouted obscenities in residential areas. The whole Kerstin thing was new, however. He quietly got up, and walked down the stairs. Jinks was fast asleep on the couch. Somehow, coming back here had seemed like a good idea the previous night.

Seth checked his cellphone. It was on. This could not be good, he thought. He turned the mobile off. Seth went to Jinks and nudged him slowly to the side. "Jinks, we've got to get out of here."

There was a knock on the door. Seth looked back at the shut door and ignored it. "Come on," he said to Jinks, "we have to go now."

There were more knocks. Seth's groggy roommate walked down the steps and opened the door. He had no idea Seth was there. Seth looked back. He wanted to tell his roommate to stop, but it was too late. The door was open, and the police stormed in. So much for

getting a lawyer first, he thought. At least it was finally over.



Graham walked into the town home to seize any last evidence. He caught a glimpse of a young man walking out in handcuffs. "Was that him?" he asked an officer.

"Yeah," replied the policeman. "That was one of them."

"It always baffles me how they think they won't get caught."

EPILOGUE

Aftermath

Seth walked out of the court building. Three long months had passed since they had been framed for orchestrating the Météo botnet. It had been a very challenging period of his life and the legal fees nearly bankrupted his parents in the process.

The evidence presented by the RCMP during their long interrogation sessions had been damning. There were the videos of panels hosted by the Digital Losers at hacker conferences. A copy of the worm was found on Seth's laptop. They had been clearly evading the authorities. The charges piled up. Computer trespassing. The interrogators had laid it out simply for Seth.

"The way I see it, you really have two choices. You can choose to tell us the truth, and cooperate with us. We'll work out a deal, it won't be so bad. Or you can choose not to cooperate with us, and take your chances in court."

The interrogators told Seth of the jail time he was likely to face if the courts found him guilty. Sentences that would be greatly reduced if only he admitted his guilt at the outset. They had no interest in the black hat.

A month after being apprehended, Seth very nearly signed a false confession. Many other hackers had done it before. But doing so would have immediately condemned Kerstin, Gabriel, and now even Jinks. The courts had forbidden him to communicate with them, but he knew they wouldn't narc on him either. As long as they all remained vigilant, they would come out of this unscathed.

It was Flow and i0 who broke this tense drama and came to their rescue. They dedicated an entire episode of the *Binary Phunksters* to their plight. The special release featured a detailed description of the events, culminating with the recording of the telephone conversation between Jinks and the black hat. They called their audience to partake in the *Free the Losers* movement. The team had a large technically-minded viewer base, and it didn't take long for their message to be repeated on the likes of *Dotslash*.

Technology journalists were not immune to these news sources. They began discussing the whole situation on their personal sites. Within a week, the story was picked up in online magazines. Within two weeks, newspapers were running some coverage on the issue. Other hackers also decided to take full advantage of the media attention, and compromised the news ticker of a Toronto television channel. They replaced its benign contents with messages supporting the four hackers. The RCMP had no official comment on the matter.

Seth saw this as being the point at which the interrogators changed their tune. They stopped making

subtle threats of unending jail terms. The interrogators were suddenly curious about the evidence that the four had presented to them beforehand. Finally, Seth was told that most of the charges against them would be dropped if they testified against the black hat. He agreed.

Seth walked out of the courtroom with a misdemeanor charge. The same sentence was issued to both Kerstin and Gabe. Jinks, on the other hand, was slightly more fortunate and was acquitted on all counts. The judge had been sympathetic to their version of events, even going so far as to ask the students questions when she didn't quite understand the details.

As for the black hat, the RCMP began mounting a case. One of the investigators told Seth that they would likely spend months collecting evidence, to ensure it was foolproof. Seth's own evidence, he was told, would likely be rejected by the courts. Publicly, the RCMP maintained that they were continuing their investigation, but Seth didn't really care what they said. He was out now. He was free.

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Seth, Gabriel, Kerstin, Jinks, and Eric, sat around a table. They were at a small student-run outdoor café, enjoying a pleasant summer afternoon. "You know," said Seth, "I finally figured out what I'm going to do after summer's over."

"And?" asked Gabriel.

"I'll register for a degree program in computer science."

"Is that so," responded Gabriel.

"Yeah. It's decided. This isn't just a hobby for me. It's what I love to do. So screw making buck loads of money in biochemistry, I'm going into computer security. Maybe even get a job with the RCMP. Can you imagine?"

Eric looked around the table. "So you're with us for hooking up this Saturday? For a bit of *rice tea* perhaps?"

"You know it," answered Seth, grinning.

"I've been wanting to try out my new laptop," added Kerstin.

"I'm in," said Jinks.

"Perfect," concluded Gabriel. "See ya then!"

Glossary

- Black Hat** A morally corrupt hacker who acts for personal gain. This is as compared to the ethical “white hat” hacker.
- Bot** A single infected computer that's part of a *botnet*.
- Box** Synonymous with “computer.”
- Botnet** A collection of infected computers, remotely controlled by an illegitimate central authority.
- Forums** Also known as online bulletin boards. A website for people to gather and discuss, by creating discussion topics and appending (*posting*) replies.
- FTP** File Transfer Protocol. Used to send/receive files from a client to a server.
- IP** Internet Protocol. An IP address refers to the address assigned to each computer connected to an IP-enabled network such as the Internet.
- IRC** Internet Relay Chat. A protocol used by millions worldwide to communicate instantly on the Internet. Also used by some bot herders to control infected computers remotely.
- ISP** Internet Service Provider. A company that provides Internet access to individuals and businesses.
- Live Distro** A portable operating system that runs entirely from a disc or thumb drive, requiring no installation on the host computer. In the context of this book, it allows the protagonists to obtain full access to computers.
- MD5 Hash** A digital fingerprint derived from a file/data.

- Météo** The name of the fictional botnet at the center of this novel. Inspired by the real-life *Storm* botnet.
- Packet** A single parcel of data sent over a network.
- PBX** Private Branch Exchange. In the context of this book, they are telephony devices enabling services such as conference calls, voice mail, and the playing back of humorous recordings.
- Phreak** An adept amateur of the telephone network.
- RCMP** Royal Canadian Mounted Police. The federal police force in Canada, tasked with handling organized and computer crime.
- Scriptkiddy** “Wannabe hackers.” Youths knowledgeable enough to vandalize computer systems, and little more.
- Social Engineer** The art of conning individuals into providing information to those who shouldn't have them.
- SSH** A encrypted means of communication that allowed for users to log into computers remotely.
- Terminal** A text interface through which to operate certain computer programs.
- Thumb Drive** A portable data storage device. Also known as a *USB stick*, a *thumb stick*, or a *flash drive*.
- VoIP** Voice over IP. Telephone calls using the Internet as a medium. This term includes calls between computers on the Internet and conventional phones.
- Vulnerability** A problem with software that permits it to be exploited by third parties in order to compromise the computer.
- Warez** Pirated intellectual property, such as software.
- WHOIS** A protocol to obtain data on website owners and IP addresses.

