

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. It 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 at the time and still in university. The funding for my own film had come from misspent student loans.

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 by the name of Eduardo Villanueva had accepted the same offer.

Those few days in the heart of Silicon Valley had a profound impact on me. Conversing with Steve and the other speakers was always a pleasure, and in the end their wise words changed my approach to life. During one particular evening, the panelists had gathered at the home of an electronic book publisher by the name of Michael Ward. We were discussing intellectual property, and I remember thinking about how this conversation perfectly epitomized the beauty of the

entire trip. I will always be grateful to Steve for his generosity, and for the opportunities he presented to me on that fateful summer. This book is dedicated to his memory.

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This novel is based on the true accounts of real-world hackers. Each personality you will encounter in the book 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, rbcpr, 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 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 his eyes.

The monitors and speakers were placed in perfect symmetry on the hacker's impeccably clean desk. That attention to tidiness was an anomaly in this basement room: 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 riddled with makeshift bookmarks on topics such as assembly programming and the TCP/IP protocol.

The hacker entered a few final commands in the terminal window. He sat back and smiled in relief as the computer responded by 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 as the sound of his alarm buzzer ringed loudly by his side. He turned his head to face the source of the annoyance, flinging 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 gazing at his ceiling. He sighed, grabbed his thickly-rimmed vintage glasses, and sat up.

Seth turned his head to look out the window. His upper floor room provided a nice view of the twin fir trees behind his townhouse. This greenery was a rarity in these parts of his Canadian home town of Ottawa.

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 headlines, and statistics pertaining to the computer's performance. This sheet was the product of Seth's boredom one afternoon. He 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. Unbeknownst 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. Seth turned to face his roommate. "How was the party last night?" he asked. "I didn't hear you come in."

"We went for some karaoke after," explained the roommate as he flipped an egg. "You should have come. Bo tried to hit on a waitress – it was great."

"Yeah I wish I could have been there," replied Seth. "If it wasn't for the fact that the organic chem 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. "I'll get the mail!" he shouted on his way out.

TWO

University

After a twenty minute ride, Seth's train stopped in front of his campus. He disembarked along with half of the passengers. 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 shook out of his television-induced stupor and looked around. He saw that a young man was fast approaching him. The student was fit and sported a well-trimmed goatee.

"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?" responded Seth.

“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 closely to his nose.

“Look!” Jinks exclaimed, tapping his finger on an 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,” indicated Seth. “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,” said Jinks. “But they started taking attendance now for some reason. 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. He looked at the taller of the two students and 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 and quietly removed their back packs, careful not to raise the ire of the professor any further.

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.

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," he stated. "See you next class, 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 *1812*, the local university pub. 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," said Seth.

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.

“But who says that all that has to end?” said Gabriel.

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, looking at his own computer. Gabriel's laptop was connected to the nearby wireless repeater. The repeater 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 also meant that they were 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 sufficient. 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. Simply setting a password for their system would have prevented Gabriel's takeover, but few campus dwellers ever bothered.

Poking around the hard drives of various machines, Gabriel soon found something of interest. “Jackpot,” he declared. “Looks like a prof's slides for a class.” Seth moved to look over Gabriel's shoulder.

“Shall I?” asked an amused Gabriel. Seth nodded. Gabriel began working away at the machine. The way the duo envisioned it, sometime over the next month, the professor would be giving a lecture in one of the university's many halls. His carefully prepared slides would be projected to the front. Given the subject matter of the slides, Gabriel thought, the professor would speak about the genesis of sedimentary rocks.

The lecturer would move on to the next slide, and if all went to plan, the class of students would erupt in laughter. That's because instead of displaying images of rock formation 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 or video clips.

If the professor went back to his computer, he would see that all of his slides remained intact. The duo had simply inserted an additional rogue slide. Seth noted down the course number, and would check later to see when that particular class was to take place. He wanted to grab video footage of the event.

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," proposed Gabriel.

"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," said Gabriel.

"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 beside the 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," he said. "I'm thinking once biochem is done, that I'll jump into the computer engineering program."

"You wouldn't have much to go to get a degree in that, would you?" wondered Gabriel. "I mean how many computer engineering classes have you *not* taken?"

“Oh I'd still have another good two years to go,” answered Seth. “There's still lots I haven't covered.”

Gabriel gulped down the remainder of his beer. Looking at Seth's own empty drink, he asked, “Want another one? A *Keith's* again?”

“Yeah, that sounds great,” Seth replied. “Thanks.”

FOUR

Kerstin

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

The snoring ceased, 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?" wondered Gabriel. "Kerstin?"

"Yeah," said Seth. "But whatever chance I had I'm pretty sure I blew it thanks to yesterday. She must think I'm a creep."

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 Saturday's hackfest."

"She'll say no," was the instant response.

"If it's you asking her, then maybe. Or okay, most probably," said Gabriel. "But I worked with her on that microcontroller project and I know she'd be interested in the stuff we'd be doing on Saturday. 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. Say it. Say you want me to ask her out to this."

"Yeah okay," conceded Seth. He shook his head. "God knows I'm going to regret this."



Seth installed himself in one of the rear seats of the computer lab. The professor was preparing his slides at the head of the class. Kerstin was in her usual spot with Gabriel taking a seat by her side.

From his vantage point at the back, Seth could tell that Gabriel was speaking to Kerstin, but he was too far to hear anything. A few seconds later, it looked like the conversation was over.

Seth typed in an instant message aimed at Gabriel's workstation. 'What did she say?' he had written. 'Is she going to come?'

Gabriel received the message on his computer and typed something back. A new message appeared on Seth's screen. 'No. She says she can't make it. Some family affair.'

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

Seth's disappointment was further compounded by the fact that he had to work that evening. 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.



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?" said the roommate.

Seth smiled back at him, but said nothing.

"Want to play a bit?" offered his roommate.

"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.

Seth squashed the pillows against his ears as he lay in bed, but it did little to attenuate the sound. He threw the pillow against the wall in frustration and got up.

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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 side door of Eric's house. He could hear the discussions

and the laughs emanating from the basement. “Hey guys!” he announced as he walked down the stairs.

He saw that Gabriel, Jinks, Eric, and a few others were already there. 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-brewed electronics and a soldering iron 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 old technology by the standards of 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, 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 lamenting to someone the lack of selection in the store. Flow and i0 finished the show by recommending basic security measures to avoid falling prey to the same kind of hijacking. The two then signed off, thanking the audience for having watched their show.

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

"I'll get another beer," said one of the guys. The introduction to Hacker Jeopardy began. The sequence showed footage of downtown Palo Alto, California, where the show was based.

The ring of the doorbell interrupted the program. Puzzled gazes appeared on the faces of the young men.

"Were we anticipating anyone else?" asked Eric.

"I don't think so," said Seth. "I'll go check it out."



Seth walked up the stairs to the side door. He could see that it was dark outside. He opened the door and found Kerstin standing in the dim light. She wore a silk scarf atop of a stylish green sweater that hugged her figure. "Kerstin?" he said.

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

"Yeah. Yeah!" Seth 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,” Seth indicated as he descended the stairs with her.

“My birthday party,” she replied.

“Oh.” He 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. And this here is Eric, who goes by the name of colonel_panic.” Seth moved around the room. “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. SIGINT. 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. She grabbed the can and thanked him.

Eric pressed a button on his computer, and the show came back to life. *Hacker Jeopardy* was a quiz show,

much in the same vein as those seen on network television. The host of the show was a slender man with graying hair. He presented the audience with his three contestants. Two were college students, and one worked as a penetration tester for a Fortune 500 company. He was paid to break into the systems of his corporation 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 teenager wearing a T-Shirt with the slogan 'I read your emails', selected to choose 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 available. 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 problem with the hashes they had count?"

The sound of a buzzer interrupted the yelling. It was the penetration tester. "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. The host looked back at the contestant. "No, I'm sorry, that's not among them."

Another contestant buzzed in. It was the other student, a proud second-generation Chinese-American. "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. He took a sip from his beer.

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

"No, I'm sorry," replied the host.

"Who is Kendell and Ritchie?" wondered the security expert.

"That isn't it either," responded the host. There was a pause. The host finally proclaimed, "The names we were looking for 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 sound 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 the oft-maligned JavaScript to Kerstin.

Dave, meanwhile, was off on his own tangent. "Do you guys ever find that the hacking community is really small? It's as if we know pretty much everyone in it, and for all of those we don't know, then we know someone else who does. They talk about six degrees of separation, but I think we've got it down to two."

Pat and Seth sat by his side. "You think so?" wondered Pat. "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 phreaking community."

"Yeah, I guess," Pat answered.

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

"Sure," Seth replied. He looked to Kerstin and Eric inquiringly. "You guys want to come?"

"I don't smoke marijuana, but I'll go out," responded Kerstin. She looked towards Eric. He was already putting on his jacket.



The guys were out on the back deck of Eric's house. Muffled music emanated from inside the dwelling. 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, who breathed the air out of his lungs and inhaled with the joint at his lips. Seth 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 study in Ottawa," he informed him.

"So anyways," Kerstin continued, "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 have a new start in North America."

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

"I love my dad. I hate his Canadian wife," Kerstin explained. "No offense."

“Shit,” responded Seth, grabbing another swig from his beer and resting his arms on the railing.

“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.

“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.

“Oh, so you're saying girls can't hack? Is that it?” she persisted with a smile.

“No, just German girls,” said Seth with a 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,” he suggested.

“Two problems with that. One – it's kind of creepy,” she told him with a smile. “Two – I'm not a whore.”

Seth was hurt, but pretended otherwise. “Okay, name your terms then,” he said laughing.

“If I win -” was all that Seth would remember as her response. His excessive drinking had caught up with him, and he blacked out.

The Challenge

Seth woke up with the sun shining in his eyes. He was sitting cross-legged on the corner of a busy street intersection. He had no idea where he was. Memory loss aside, Seth appeared to be devoid of any other nasty effects from the drinking. Glancing at his watch, he 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. Searching through his other pockets, Seth found his wallet, minus all of the cash he had put in it the previous day. The bus pass, however, was still nowhere to be seen.

Seth grabbed the mobile phone. There were three missed calls. He dialed up Gabriel's number.

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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,” said Gabriel. “Oh, and you and Kerstin are doing a competition of sorts.”

“Really?” replied a surprised Seth.

“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 some street sign or landmark that would help place himself.



Seth, Gabriel, Kerstin and Eric sat outside, around the small table of a restaurant run by the student union. 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.

“Yes,” replied an excited Kerstin.

“Yeah, yeah,” said Seth.

“Awesome. So here's the deal,” Eric told them. “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 reply from the others.

“That’s not particularly fair is it?” Seth retorted. “It’s no big deal if *she* ends up wearing a dress.”

“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.

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



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 access the Internet through a local unprotected wireless router. He then launched a program that allowed him to place telephone calls 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 ringing sounds.

"Hardware," a voice answered.

"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," replied the voice.

"Thanks," said Seth and hung up. Seth 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 special you won't want to miss! We have Mango portable media players to give away to the first four customers who reach aisle five! 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. In the seconds following 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!' it said. "A nice prank, but overdone," Kerstin told him with a smirk.



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, the type that was catered to the takeout business. The restaurant only had a few tables, and 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, "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 kind 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 added, "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, revealing a collection of neatly organized thin metal instruments. Seth recognized the ensemble as being a lock picking kit. Pulling out two small metal tools, Kerstin started to fiddle with the padlock that kept the large sign's orange control box shut.

After a few minutes of unsuccessful attempts at picking the padlock, Kerstin stopped. "I'm having trouble with this," she admitted.

Seth looked around, and saw that both Eric and Gabriel were off in the distance talking to each other.

“No problem,” he said turning back to Kerstin. Seth 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 small curved tip. Using the two in concert, he was able to quickly produce the definitive click of an unlocked padlock. “Thanks,” she told him.

“No worries,” 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.

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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 theater. 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.

"I ordered call forwarding on their line. All the calls that they would normally get are being rerouted 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," he answered. There was no reply. Seth spoke again. "Hello?"

"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," explained Seth. "Is there anything we can help you with?"

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

"Sure thing," said Seth. "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?" wondered the woman.

"Do we ever!" interjected Eric.



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 Kerstin to the other side of the building. They crossed the street, and stopped. They were facing the back of the office tower. "Now look up," she said. The group complied.

"Oh my god," said Eric.

"That's frickin' incredible," Gabriel told her.

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 on in awe. Seth looked 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, returning 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. The volume of the percussions gradually increased, culminating with a loud clash of the cymbals.

Eric took a deep breath. "And the winner," he announced, "is neither of you. Or both of you. It's 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."

"You're just going to leave us hanging?" asked Seth.

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

"Fair enough. I can live with not having to wear women's apparel. 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," declared the roommate. "Want anything on the barbecue?"

"Yeah, actually," said Seth. "I'll go get some of my dogs." Seth put his beer 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 are classes going for you now?" he asked.

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

Seth grabbed his beer and took a gulp. "Heh – same here," he retorted. "Have you 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 on.

"They put it out two days ago," informed Seth. The sound of harmonious bells emanated from his laptop. He had setup his instant messaging program to alert him whenever Kerstin came online. Seth walked over to the laptop. "Just a sec," he told his roommate.



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 screen.

It was an instant message from Seth. 'Hey K,' he had written. Kerstin straightened herself and typed in a message back. 'Hi,' she responded.

'Are you a big fan of rice tea?' came the instant reply.

'Rice tea?' she wrote back.

'We're all meeting at this downtown Japanese tea house tomorrow for a bit of wireless mischief. You're invited. Want to come?'

'Sure,' she typed in. 'Sounds like it could be fun.'

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



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 them as he sat 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. Seth raised two fingers. "Two?" she said with genuine surprise.

"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. So what *we* do is that we connect to one of these networks and

perform a little ARP cache poisoning. Do you know what that is?"

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

"Have you done this before?" wondered Gabriel.

"No, but I heard about it," she answered.

"You'll see, it's easy to do," Gabriel told her. "Using that we can essentially reroute all of the traffic here to run 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 its display 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 gazed 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 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 how the downloads on his home computer were doing from school.

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

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

“Yeah, that's true. But there is a way to pull it off,” responded Seth.

“Let's do it,” Kerstin said.

Seth smiled. “I like the way you think. I have some acquaintances we can ask for help.”

“Alright,” Kerstin told them, “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 of 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 could have sworn he heard a loud yelp coming from outside.

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," she explained. "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 waited. Something on the screen then caught her attention. "His connection was reset," she declared. "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 motionless as she waited alongside Seth for the target's next move. 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 textbook for one of his classes. 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?" Seth answered.

"VNC into my box," ordered Gabriel.

VNC stood for *Virtual Network Computing*, and it allowed Gabriel to send directly to Seth what he saw on his monitor. For Seth, it would be as if he was in front of Gabriel's computer himself.

"Now?" asked Seth. "I've got another fifty pages to read for tomorrow."

"Remember that SSH traffic you intercepted with Kerstin?" Gabriel told him.

"Yeah?" replied Seth.

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

"Okay," said Seth. "Hold on, I'm going to 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. "I'm in," Seth informed him.

"Take a look at this," said Gabriel. "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 told Seth.

"IRC traffic?" wondered Seth, before then catching a glimpse of something else. "Commands to a bot?"

"Commands to a *botnet*," answered Gabriel, emphasizing the 'net'. "I did a bit of research online. These commands follow the syntax of the Météo botnet. The guy Kerstin intercepted sent these computers some kind of executable. Made them download it from some compromised corporate server. Anyways, I grabbed the download 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, referring to the amount of machines involved in the web of infected computers.

"I counted seventy-five," replied Gabriel.

"So it's small," said Seth.

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

Seth paused as he looked at the content Gabriel was showing him. He could see the names that the infected machines were assigned, but something didn't seem quite right. "Is this some kind of test botnet?" asked Seth.

"That's what I was thinking. 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," suggested Seth. "A basic overview of what happened, and an analysis of the botnet. I'll write a little preview tonight and put it up on our website. Generate some interest."

"That's a good idea," Gabriel told him. "Let's meet tomorrow and see what else we can dig up about this."

"For sure. Isn't this insane?" said Seth.

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

"I do. I'll talk to her there. Good night," Seth replied.

"Night," concluded Gabriel.



It was just shy of two in the morning, and Seth was still awake. He was laying in his bed with his laptop at his side. On its screen was the article he had just published on their website, which Seth had titled 'The Botnet Chronicles'. With a look of satisfaction, he 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 his conspiracy theories with scriptkiddies, he closed the 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 drink from 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 how this had even happened, the black hat immediately extracted his laptop from his briefcase and scanned it for any suspicious activity. 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 had not been compromised. Still, he thought, he had a big problem on his hands. He had been discovered.

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, as spammers regularly perused the databases to harvest valid email addresses. As a result, few website owners had a desire to put in legitimate details.

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, but did not manage to interrupt Seth's slumber.

A few moments later, Seth's desktop computer turned itself on. A voice chat program started up, automatically accepting an incoming call from Gabriel. Gabriel's voice boomed through the tiny computer speakers. "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," produced the tired Seth.

"This is serious," Gabriel told him. "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. Hell," he stated.

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 into 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 fuck," 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!? But we were the ones to tell people about this," said Seth. "If it wasn't for us, no one would know that the botnet even existed."

"I know," responded 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 read frantically through the articles. There were so many of them, he thought.

"It gets worse," continued Gabriel.

"What?" asked Seth.

"A new update was released overnight on the botnet," Gabriel informed him.

"The file we intercepted?" asked Seth.

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

"And so all these people are thinking that we're behind the botnet," responded Seth. "We're being blamed for something we have nothing to do with."

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

"These articles are implicating Kerstin too," added 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. He seemed visibly shaken. "It's worse now," Gabriel told Seth. His voice was trembling. "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 looked at the floor. He opened his mouth as if to say something, but produced nothing. "What did you find out," asked Seth once more.

Gabriel looked up. His eyes were wet. "They're pinning us for *the* botnet," he said. "The main botnet – the one with half a million bots."

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

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

"What's this 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 the code," Eric said in answer. "Someone passed it by a rainbow table and got '*digital_loserz*' out of it. As in the Digital Losers. You guys. That's the evidence in as far as the new botnet update goes."

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

"According to the one websites which analyzed it," said Eric.

"And they say they used a rainbow table to get it?" Seth stated in disbelief. "For a string that long and complex? Really? I don't think even the best table I know of would have been able to figure out that from the hash."

"That's what we thought too," answered Gabriel, regaining his composure. "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. "The site didn't say, and the download you guys gave me doesn't have that stuff in there."

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

"Yeah. I checked it up. It's behind 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 and noticed that there had been nine missed calls. His phone showed the number of the current caller to be 000-000-0000. "Hello?" answered Seth.

"Fucking spammer," replied a low voice. "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 and looked at it. "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 blow over?" wondered Gabriel.

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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 the man.

"Hold on a sec," replied the individual. After a few more seconds of observing his own screen, he looked up to Graham 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 really 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. "If the RCMP comes, we'll tell them 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 so sure that they won't?" was Eric's reply.

"Because," Seth explained, "the only things pointing to us right now are some forum posts and some code. It's bullshit! I say we go home and pretend like this never happened."

"That won't do anything," indicated Eric. "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," said Seth.

"Fuck that?" retorted an absolutely livid Eric. "Fuck *that*? Fuck the RCMP?"

Gabriel had quietly watched the exchange between the two, and had finally enough. He slammed his fist against the wall. Eric and Seth looked at him. "Guys," he said, "just stop it alright? Kerstin's going to be here any second and we better figure out what the hell we're going to tell her."



At the RCMP offices, things were moving forward. Kevin and Graham were sitting across from 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. They were given a response that'll do for now, 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?" she yelled. "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.

"Look guys," Eric told them, "the RCMP won't sit on their ass." Pointing to Kerstin he said, "This is not helping."

"I still think they won't come," said Seth. "I mean don't you think that that's being a little paranoid? Saying that the RCMP is going to show up 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," clarified Seth. "So what? I bet you anything the police don't know jack shit about this. I say we go home, forget about all of this, 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 silence 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, collapsing on the front steps.

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

"I should SSH into my box." 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," replied 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 indicated, 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. "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 her car down a quiet roadway. The scenery had shifted from a steady stream of suburban homes to trees and the occasional mail post. "So what do we do?" she asked.

"I don't know," said Gabriel. "Seth?" he wondered. There was no reply. Gabriel turned to face his friend. "Seth?" he asked a second time.

Seth had his eyes wide open. He had become very pale. He appeared to speak, but his voice was too faint for anyone to hear. Seth began to hyperventilate. His breaths were rapidly increasing in pace. "Stop the car," he finally 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," he told her.

Kerstin pulled the car onto the shoulder. Seth got out and started to make gagging motions. Finally, he vomited. Gabriel stood by his side, rubbing his back. Seth threw up a second time. 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.



Kerstin parked her car under one of the city's numerous interprovincial bridges. The location was peaceful, a natural landscape with no buildings in sight. Even the constant hum of the vehicles traveling on the bridge overhead seemed to fit in with the birds chirping and the rustling of the water. As he got out of the car, Gabriel asked Seth, "Are you feeling better?"

"Yeah, much," answered Seth. "Kerstin?"

Kerstin did not answer, and sat down on the grass nearby. Seth and Gabriel joined her. They looked on at the slow moving river ahead. "We need to think about what we should do," said Gabriel. He grabbed one of the stones at his side and threw it into the river.

"Well we could go to the RCMP or whoever was photographing my place," suggested Seth. "But I'm really afraid of what's going to happen if they don't believe us."

"Same, but it's not like we can run away from this either," replied Gabriel. Silence overtook the trio as they returned to examining the river. Gabriel threw another stone into the water.

Kerstin finally spoke out. "It's not running away if we're gone for a legitimate reason, like a camping trip."

"I don't think they would fall for that," said Gabriel. "Even if they did, and lets say we were gone for three days, well we'd still be just as screwed at the end."

"Not if we prove *for* them that we're not behind this botnet," offered 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," affirmed Seth. "But remember that entry on the *AntiOffline* discussion board?"

"No," answered Kerstin.

"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 that IP belongs to the guy we intercepted?" 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. "There's a small restaurant behind the trees over there that has it."

"Good. I know of one thing we could try," said Seth.



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 he's the one who put our names in that code?” wondered Gabriel.

“I don't know. But I think he would be able to answer that,” stated Seth. “Intercepting this guy is what started all of this. We know he was running a small botnet, and we know he had access to the update before it came out. I don't think it's too much of a stretch to assume that either he released that update with our names in it, or that he knows who did.”



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

“What?” responded Kevin as he carefully placed a monitor in the back seat.

“The Ottawa Police just executed the search warrants,” said Graham. “All three homes, simultaneously.”

“Jesus that was fast,” Kevin noted. He grabbed a keyboard from the ground and placed it inside the vehicle.

“Yeah, well apparently they share our sense of urgency,” said Graham. “Anyways, they're just waiting for us to collect the goods.”

“Were the kids there?” asked Kevin.

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

"Oh that's going to make us popular," Kevin remarked sarcastically. He closed the rear door of the van.

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Seth, Kerstin and Gabriel were still by the interprovincial bridge. "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 remote 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.

"The box the hacker had SSHed into is 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.

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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 anxiety 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,” Seth replied. “Why the fuck not. I'll see if I can use some XSS or MySQL injection attacks against the web server.”

“I'll fingerprint the machine,” said Gabriel, “and 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 at his computer 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. A warning message popped on

Gabriel's screen. "My laptop's almost out of power," he informed the others.

"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," proposed Seth.

"What do you mean?" wondered 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 glanced 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... 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 going to 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? I mean Kerstin, for sure they're going to send you back if you try to do this."

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 installed 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. They had left their car at the parking lot of a nearby pharmacy. Seth pressed the button to call the elevator. "Are you sure about this guy?" 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.

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. The woman turned around and yelled, "Chris? Chriiis?!"

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

She said something back at him in her native tongue. Turning to the pair she stated, "He will come."

The old lady walked back in to the apartment, leaving Seth and Kerstin at the door. Rummaging could be heard from within the dwelling. Finally, a figure emerged from inside. It was Jinks. A smile immediately formed on his face. "Seth!" he said. "Or should I call you *ion*? I read the story on Dotslash dude. Half a million infected computers. I knew you were real hackers. That's fucking awesome man!"

"Jinks," said Seth calmly.

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

"Jinks!" said Seth in a louder voice. Jinks ceased his praise mid-sentence. "We need your car," Seth told him. "Just for a day. Maybe two. Can you spare it?"

"Sure man, of course!" answered a gleeful Jinks. He turned to face inside the home. "Hey ma! MAMA! I'm taking the car!"

Exit Strategy

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

"I am," answered Seth.

She looked towards Jinks. "Of course I am!" exclaimed Jinks. With that affirmation, she put the car in first gear and slowly drove it out from the underground garage.

"Oh man this is going to be so cool!" said Jinks. "You guys really are *elite*! Gabriel is probably in jail for hacking charges, you're under surveillance - this is so cool! I'd do anything to be in your shoes."

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 lost on Jinks.

"But do I have to be in the back seat?" wondered Jinks. "I mean this is 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 vehicle to a screeching halt.



Kerstin waited for Seth in the bus terminal. She saw him come out from the washroom and waved at him. Seth raised his hand in acknowledgement 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 handled either. Were you able to get cash from the bank?"

"Yes. I pulled \$300, which is the most I can take out."

"Good," he said. "That brings us up to \$500. I called up some buddies. We'll have a place to stay when we get down there."

"Who?" asked Kerstin.

"Flow and i0," Seth answered.

"From Binary Phunksters?" she wondered.

"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 him. Seth pretended not to hear her. He approached a bus teller and used some of his cash to buy two tickets to Toronto. 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 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," Kerstin remarked.

"I know," said Seth. "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," Seth answered.

"I didn't realize how exhausted I was," she retorted.

"Yeah, same here," he told her. Seth put his seat back, laying his head against the chair. He turned to face Kerstin. She looked angelic. "Kerstin?" he asked.

"Mmmm?" she responded.

"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," Seth noted.

"What about you?" wondered Kerstin. "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 explained as he rested back and shut his eyes.



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. Kevin parked his vehicle. "Hope you weren't waiting too long," Kevin told him as he got out.

"Nah not too bad," replied the man. "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 older single-storey 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," noted Kevin. "Now in your experience, how many times have you ever seen that?"

"Mmmm," mused Graham. "In the four or five hundred cases I've done, I've seen encryption used maybe three times? Its 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. Want to 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.

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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 towards 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 obtained, and hurried towards the revolving gates.

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It was dark outside, and Seth was walking with Kerstin down a quiet neighbourhood street. They 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. He walked up to its door and knocked. Footsteps were heard from within. i0 opened the door, and appeared stunned at seeing Seth. “Oh no-” said i0, shaking his head in disbelief.

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

Flow arrived at the entrance. "Dude, we told you before – you can't stay here," he said. "This is serious shit you're in. Eric told me that Gabriel's been arrested? That's a *big* deal. If they know you're here, I'll lose everything."

"No one will ever find out," 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," said i0, "but I can't let you in the house."

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

"I'm sorry guys," said Flow. "I really am."

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!" he shouted 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," Kerstin replied. "Where else can we go?"

The two waited on the steps. Finally, the door behind them opened. It was i0. "Okay - 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,” indicated i0. “We can't risk having you here for any longer.”

“You have my word,” replied Seth.

i0 motioned them to enter. Flow walked out 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.



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 finished filling them in on the events leading to their departure from Ottawa. “We need to get physical access to those servers,” concluded Kerstin.

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

“We don't know,” replied Seth.

“Do you know where it is?” Flow wondered.

“Yeah,” stated Seth. “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 characters in the dark. "There it is - 4220," whispered Seth.

Flow stopped the vehicle and parked it opposite of 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. "Somehow, literally just breaking in seems tempting."

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

"Say like a security guard? Take a look at the entrance," remarked Flow.

The four saw as a guard inside the building walked up to its front glass-clad door. The man glanced at the street outside, turned around, and walked back the other direction. Flow started the car and drove off.

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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 security and hacker related chatrooms.

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?" he said, stretching his arms behind his back.

"Hey," said Kerstin. "We were 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. How about I do it," proposed Seth. He looked towards the warm kettle. "Can I?" he asked the owners of the home. Flow nodded and Seth poured himself some tea.

"I could do rounds around the area, take notes," Seth suggested. "I don't know if I'd be that inconspicuous though."

"No worries, we thought of the perfect cover," replied i0. "You would be the guy who records traffic activity at intersections."

"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?" wondered Seth.

"Until sunset we figure," answered Flow. "Then we'll come by and pick you up. 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 you hadn't given us a place to stay."

"Don't mention it," 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," said Seth. "But aren't you worried? What if someone finds out?"

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

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Flow stopped the car by the intersection. 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," Flow stated. "Do you have everything?"

"I think so," said Seth. "I'll see you this evening."

Flow drove off. Seth set the chair by the shade of a tree, put on a hat two sizes too big, and sat in the seat. He then grabbed a pair large sunglasses from his side

and placed them over his own prescription lenses. He looked around at the bleak environment that was this business park. All Seth could see were endless rows of generic brick buildings. There was nothing pretty about these, they lacked the kind of warmth and colour that pervaded other parts of the city.

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.

The two employees walked towards the building's entrance. One unlocked the door and they went 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 to himself. He took the MP3 player he had passed him from his pocket and put on the accompanying earphones.

As Seth discovered, the music stored on the device was a mix of movie soundtracks and instrumental new age. Nothing he particularly enjoyed. 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.

"Oh awesome," replied a reinvigorated Seth.

"I think we found a way into the building," Flow told him. "I'll tell you about it later. Anything interesting so far on this end?"

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

"Perfect," said Flow. "See you later."

"Thanks for the food!" Seth told him. Flow drove off and he immediately began chowing down the meal. Seth noticed that there was more activity 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?"

"Nah, not much. Not many cars here!" kidded Seth.

The crosswalk sign changed. "Well you have a good day," said the gentleman.

"You too," replied 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 nation's media outlets had 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, with rumours of busts spreading all over the digital underground. That this was a story about *Canadian* bad guys didn't help matters as such news items were always popular with the country's media. Like Graham once heard a public relations guy explain it, "if it bleeds, it leads."

There was great pressure within the organization for the High-Tech Crime Unit to hold a press conference. The Sergeant finally acquiesced, organizing one for the following morning. Graham, Kevin, and the Sergeant would be speaking 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 checked his watch and wondered when Kerstin and the others would show up.

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Flow returned with his car, this time bringing along Kerstin and i0. It was now seven thirty-five according to Seth's timepiece. Flow 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 that might also attract unwanted attention."

"I don't know if I'd worry about that. 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,” sputtered 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,” replied Flow. “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,” indicated Flow. “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, amazed at the implications of his own comment.

“Yes it is,” stated Flow.

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The group was back in the home of the Binary Phunksters. They were on the floor, surrounded by Chinese food. “We should hit the place in the middle of the night,” suggested Seth with chopsticks in hand. “So that the guard can't call anyone to validate our presence.”

“I agree,” said Flow. “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 and I'm pretty sure i0 has a white hard hat somewhere too.”

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

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

“There is one thing that worries me though,” said Seth. “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," reassured 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. "What are we going to do until we leave?" he asked.

"Movie?" suggested i0.

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

"Same," added 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," Seth clarified.

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

They got up from their seats. i0 picked up the remote control and stopped the movie. Kerstin took 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 had 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 started to drive off when he exclaimed, "Shit – hold on."

He put the car in park, and ran back into the home. Flow returned a short moment later holding a pair of two-way radios. He got back in the driver's seat and passed the devices to Seth and Kerstin.

"You'll need this Seth to let Kerstin know when she's clear to access the server," he informed them. "We could use two more of these so that we'd all be able to stay in touch, but this is all I have."

"Is there's a place open this time of night where we could buy an extra set?" asked i0.

"There's the Wülmürt," answered Flow. "The one on Bathurst Street is open all night."

"If I get one of the radios and you pass me your cellphone i0," suggested Kerstin, "then we won't need to buy anything. Seth and I can use the radios to talk to each other, while I can use the cellphone to call up Flow. You won't need to talk to any of us i0 for what you'll be doing, right?"

i0 shook his head. "That works too," concluded Flow. "Okay, let's go."

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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," she said, looking at her computer.

"This is close enough. We'll park here," said Flow. They were about a block from the hosting company's building. "Do you still have a connection?" he asked Kerstin.

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

"Good," Flow replied, 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. He removed the remnants of the lock that had stuck to the latch and opened the door. "Need a light?" asked Flow.

"Yeah," indicated i0, "that would be handy."

Flow took out the cellphone from his pocket and passed it to i0, who then used its bright screen as a makeshift flashlight to peer inside. He hovered it over the neatly organized rows of wires and located the pairs identified by the MLAC. He pulled out the wires.

"That's it," said i0. "They should be without service now." i0 closed up the box while Seth and Flow proceeded to the hosting company's building. Seth donned i0's white 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?" replied the startled guard. "No one told me about this."

"Check it for yourself if you need to," proposed Flow. "Apparently its been intermittent all day."

"Please wait here," the guard told them, and disappeared inside.

"I hope to God the MLAC gave us the right pairs," Flow said to 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," noted the guard. "But it is somewhat late in the day now isn't it?"

"We're with the night crew. Anyways, they said you'd be here," explained Flow. "You'll have to wait until at least next Tuesday if you want a day crew to show up. The management here didn't sound too pleased about that option."

"Ahh," acknowledged the man.

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

The guard poked his head out of the door. Flow quickly put his foot in the entrance. 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 as they walked through the building's halls.

"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 made their way through the installation, 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,” bluffed Flow. “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 to finish off the work on Tuesday, and your bosses appeared very unwilling to let that happen.”

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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 softly shut the door behind his back. He moved towards the servers. Dozens upon dozens of machines were present.

The computers 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 server 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 servers was the one that the hacker had compromised. He went to the computer on a desk nearby. Perhaps there was a list or something there that could tell him which machine had been running the website for the law firm. That would be the one which the hacker had used and that would hopefully contain the valuable logs they were seeking. 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 none. "Shit. What am I going to do," he muttered 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,” he told her, “but we have a problem. There's all these servers here, and I don't know which one is ours.”

“Fuck,” she replied.

“Yes, I know,” said Seth. He 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,” he said, “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 ours stops responding to your pings. Okay?”

“Okay,” answered Kerstin. “Now?”

“Now,” Seth informed her. 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 indicated, 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,” she responded.

Again, Seth went to the next switch, and repeated the procedure. “What about now?” he queried.

"No... wait... yes. It's off now," Kerstin told him.

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

"It's back," Kerstin replied on the radio after a few seconds.

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. Seth 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," Seth informed her. "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. Then the fourth cable was re-inserted.

"Yes, its on again!" Kerstin responded eagerly.

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.

"Gotcha," she said. "I'm going to try to log in."

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. He then hurried to i0, who had been waiting by the brown box.

"You can reconnect the pairs," Seth told him.

i0 obliged, and closed the hatch on the box shut. They both ran over to Kerstin, who was by this point in the driver's seat. She popped open the passenger doors and called Flow on his cellphone. 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. He proceeded to walk around to the side of the web

hosting building, out of sight of the guard. Flow then emerged a few minutes later from bushes a few complexes away. He ran to the car, and traded seats with Kerstin.

"A few more minutes," he said, "and I would have run out of things for that guard to do. Did you get the files Kerstin?"

"Yes. I'm going to go through them now," she said, grabbing her laptop. She paused, typed in some commands, and stared at the screen.

"It's grepping through the authorization logs," she informed them. The faint ticking sound of the laptop's busy hard drive permeated through the car. After a few seconds, a smile materialized on Kerstin's face. "We got a match!" she exclaimed. "The bastard 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. "There are three IP addresses that keep coming up," she declared. "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 kind of getting worried that someone might see us."



Flow was driving down through Toronto's city core. Kerstin looked at the towering skyline in awe. She had never been to this metropolis before. Massive

multicoloured displays reflected 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. "We really were."

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?" wondered 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 have to ask around online for some advice."

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

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

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

The Stakes Rise

Kevin stood in the hall next to the press conference chamber, sipping on a cup of coffee. Graham arrived by his side and peered into the room. He could see their Sergeant sifting through his papers on the front podium. A few reporters had taken their seats, and Graham noticed that one of them was fiddling with his digital voice recorder. A slew of television cameras were mounted near the front, waiting for their handlers to capture the perfect sound bite. "Are you ready for this?" asked Graham.

"No," replied Kevin, smiling. "Want to go in?"

"Yeah," answered Graham. "Might as well."

The two walked inside and joined the rest of the RCMP cadre on the front stage.

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Seth woke up. His back was hurting from sleeping on the hard wooden floor for two consecutive nights. He glanced at the laptop to his side. It was still monitoring the IRC channels. He sifted through the conversations his machine had logged. There was talk

about the Digital Losers. Some believed he was responsible, while others including Floridian hacker who operated the chat server thought he was innocent. It was the comments from those who insisted he was guilty that made Seth particularly upset. He clasped shut the portable computer and got up.

He approached Kerstin, and could see that she was still asleep on the couch. He gently touched her shoulder. "Wake up," he told her softly.

Seth appeared to be the only one that was up in the household. Not that he could blame the others; they had all had a long night, not to mention a long day before that. Kerstin yawned and rubbed her eyes. "I know someone who can help us get the address for the hacker," he whispered to her.



Kerstin and Seth huddled around his laptop. Her hands clutched a cup of tea for warmth. Seth dialed a long-distance telephone number from his computer. A cheery recording of a 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.

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Kobar was 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 payphone from the early nineties. 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 answered.

"Is this Kobar?" asked Seth.

"Who is this?" came the reply. "Do you know it's like six fucking AM?"

"I do," said Seth. "But this is really important. I'm ion from the Digital Losers."

"Who?" wondered Kobar.

"I'm one of the guys they're pinning the Météo botnet on," clarified Seth. "They've talked about it on Dotslash. Anyways it doesn't matter."

Kobar had remembered seeing the news on one of the forums he regularly prowled. He sat up. "Where are you calling me from?" he asked.

"Not from my home," said Seth. "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. No one knows I have it."

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.

Kobar paused to think about those words. "What do you want?" he finally asked.

"I need to get the real-world address of someone using their IP," said Seth.

"Social engineer the ISP," suggested Kobar.

"Yeah," Seth told him, "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," said Kobar. "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," Kobar informed him. "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," Seth told him. "Whatever the case 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. "Do you want me to do it?"

"If you're willing," said Seth. "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 responded. He scrounged around for a piece of paper. He found it and grabbed a pen resting on the nearby bookshelf. "Okay," he said. "What's the ISP?"

"TekkWorld." answered Seth. "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," answered Seth.

"When did you last see him use that IP?" wondered Kobar. With residential connections in particular, it wasn't uncommon for IPs to change with time.

"Five days ago, so the twenty-fifth?" answered Seth.

"I'll call you back in five," said Kobar, and hung up.

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

"Are i0 and Flow still sleeping?" she asked him.

"I think so," said Seth. "It's still only eight something."

"I'll go make us some toast," Kerstin informed him. She got up and headed towards the kitchen. Seth meanwhile turned on the television in the hopes of finding something simple, like a kid's show, to help take his mind off of things. As he quickly flipped through the channels, something caught his eye. He went back one channel.

"Ker- Kerstin get in here now!" he yelled out. Kerstin came running back from the other room. "Look," he told her, pointing to the television.

It was the news channel. They were watching a live press conference being held by the RCMP to discuss the grave matter of two hackers fugitives in Canada. It *felt* like they were talking about Kerstin and himself, but Seth had difficulty believing it. This was broadcast on television – that kind of news was supposed to be about important people, not students like *them*.

All doubts were erased once the officials projected Seth's photo on a screen. It was his passport picture, and it was perhaps the least complimentary image of him available. It made him look downright menacing.

“Oh God,” said Seth. “We are fucked.”

The coverage continued. The policemen used words such as 'cyberterrorists' to describe the pair, and were alleging that they 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.

The news anchor cut from the press conference to give an overview of the situation. They were pinning Seth, Gabriel, and Kerstin for upwards of three billion dollars in damages caused by the worm. The anchor 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 person then began to describe Kerstin's car, and warned the 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,” he told them. “Your guy is named Darren Simcoe. He lives at 2107 Elviani street in Ottawa. You got that?”

Seth did not glance away from the television screen. “Darren Simcoe, 2107 Elviani street,” Seth repeated in a semi-absent tone of voice. “Thanks.”

“No problem,” Kobar said, “but this is the most I can do for you okay? Please don't call me back.” The two heard the click of his handset hanging up. Seth looked at Kerstin.

“We can't go out like this,” he told her. “We'll be too recognizable.” Both Seth and Kerstin heard footsteps approach from down the hall. Kerstin quickly grabbed the remote and shut off the television. An exhausted Flow stumbled into the room.

“Hey guys,” Flow greeted the two.

“We got the hacker's address,” said Seth. He looked out the window. “Hey, do you have a large razor? Like to cut hair with?”

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 jokingly. 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,” the man informed him.

“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," said Seth. "Can we stop by a convenience store along the way too?"

"Yeah, for sure," replied Flow.

"I'll get my bag and I'm ready," Seth told them. He turned to face Kerstin. "Is it okay if we leave now?"

"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 in the drive 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.

"Take 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 vehicle.

“Are you crazy?” exclaimed Flow. “Turn that thing back off! They’ll know you’re here!”

“That’s exactly it,” retorted Seth. “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?” he asked. “Think ‘zine wise,” he hinted.

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?” wondered Flow.

“That’s all I needed,” replied Seth. He turned his phone off once more.



Flow stopped the car two blocks from the regional bus terminal. They all got out. “Thank you,” said Kerstin. “For everything.”

She gave both Flow and i0 a big hug. Seth shook their hands. “This wouldn’t have happened without you,” he said. “Thank you.”

“Don’t mention it,” replied Flow. “Better move on before anyone sees ya.”

"Yeah," agreed Seth. He turned around and headed towards the bus terminal with Kerstin. Seth looked back, and saw that their saviours were already back in the car. He gave a single wave goodbye. "Adios," he whispered 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," replied Seth. "Stay here, I'll buy the tickets." He approached the teller. He was much more nervous than when he had made the purchases to go to Toronto.

"Two bus tickets to Ottawa please," he said.

"Are you a student?" asked the teller.

"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," she told him. "I'll just charge you the student rate anyway."

"Thank you," responded Seth. He 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 will be here in five 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. "How about we go to the café instead," he proposed. Kerstin agreed.

The two walked towards the small coffee shop to the back of the terminal. Seth bought two orders of hot chocolate. "Sorry, I should of asked you if you liked this," he said to Kerstin.

"I do," she replied. "Thank you."

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," Seth informed her. "That hacker'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 those files shared openly, that would mean that we'd also 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.

"So how about we poison his ARP tables and capture all of the network traffic," proposed Seth. "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,” acknowledged Seth. “We'll worry about it then. That's step 543. We're still on step 2, and what we need to worry about now is how we're going to get ourselves a car. We can't use public transportation anymore.”

“And just where would we get a car?” asked Kerstin.

“Jinks,” answered Seth.



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 told Kevin. “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.”

“I wouldn't say that. Their computers have been pretty useful,” affirmed Kevin.

“Well that's true,” replied Graham. “That's about the only thing we have going for us.”

“Stop worrying,” Kevin responded. “A bunch of people have probably seen them, it's just a matter of time before someone sends in a useful tip. I give it a week, tops.”

Another officer entered the room. "Did you guys catch the news?" said the new comer.

"No, what's up?" wondered Kevin.

"The kids you're after," said the man. "They made an announcement last night on some hacker bulletin board. They said that unless we stop chasing them, they're going to erase all the data from the computers they've infected. 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. The bus they were in zipped past a car.

"But then we just tampered with the only evidence that proves we're innocent," she responded.

"That's very true," admitted Seth. "Okay, so that brings us back to the idea of sniffing his wireless traffic."

Kerstin did not immediately reply. She just lay her head back against the seat and closed her eyes. "I really don't like this," she said. "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," said Seth.

"Except that now we're considered dangerous fugitives," indicated Kerstin.

Seth was exhausted. He shut his eyes and quickly dozed off. It was the jagged motion of the bus braking that woke him up. They had stopped at an eatery.

The duo disembarked from the vehicle, walking off to the side and away from the other passengers. Seth examined the desolate landscape. He wanted to talk to Kerstin, but didn't know what to say. "So what got you into hacking?" he finally asked her.

"Sorry?" she replied, a little startled.

"What hooked you into hacking?" repeated Seth.

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 was better than 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 data. 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.”

“But the IP address we have places them in Ottawa just before then,” countered Graham. “There's something that doesn't add up here.”

“Maybe they're using a proxy?” suggested the man.

“That wouldn't make sense. There has to be a third hacker involved,” said Graham. “Maybe it's that Eric. This could be what we need to bring him in. Have you seen Kevin around?”

“I think he had a communications meeting this morning,” replied the investigator.

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The bus arrived at the terminal in Ottawa. Seth and Kerstin grabbed their bags, stepped off, and headed towards the exit. The crowded nature of the place made them both feel especially uneasy. Suddenly, a voice boomed out, “SETH! SETH ARNOTT!”

Seth froze. He looked to the source of the voice – it was a classmate from university. Seth's heart was racing. He quickly glanced around to see if anyone had clued into who he was. Not entirely reassured of his anonymity, Seth approached the student. “Hey buddy, how ya doing?” asked the indiscreet youth.

“Pretty good Alex,” answered Seth, trying his best to sound normal. “Not much happening. Where are you going?”

“Montreal,” replied the classmate. “My great uncle passed away.”

“I'm sorry to hear that,” said Seth. “Are you alright?”

“Yeah,” said the student. “I mean it's shitty, but he had been sick for a long time. My family was ready for it.”

“It was like that with my grandfather too. Listen Alex, I'm sorry to have to do this to you but we really have to go. The cab's waiting for us outside,” fibbed Seth.

“Okay buddy,” said the man. “See ya in class.”

“Take care of yourself Alex,” said Seth. He turned around to leave, and could see that Kerstin was waiting for him up against the wall. She was visibly anxious. They exited the building as quickly as they could.

Jinks Redux

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, his usual enthusiasm absent.

"Can we use your car?" asked Seth.

Jinks stood still, reading Seth's face. His voice conveyed his irritation. "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," said Kerstin.

"Fuck that," he retorted. "Do you think I'm an idiot? You're just using me."

Jinks turned to face Seth. "You know," he began to say, "it's not like I wasn't aware that you treated me like shit. I let it happen because I thought 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," stated Seth. Jinks just gazed in his eyes. "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," Seth said in resignation. "Just do us a favour and please don't let anyone know we came by."

Seth turned to look at Kerstin. "We should go," he told her. She nodded.

Jinks gently closed the door. He stared at the knob as countless thoughts streamed through his head. Abruptly, he opened the door and looked down the hall where Seth and Kerstin were waiting for the elevator. "Hold on guys," he exclaimed. "You can use the car. I'll give you the keys."

"You're not coming?" wondered Seth as he walked back towards the apartment.

"Nah dude," indicated Jinks, "that was the problem last time right?"

"Well I'm not going to force you to come with us," said Seth. "But if you want to come, I'd be glad to have you along. Do you want to join us?"

"Yes, very much so," replied Jinks.

"Then bring your laptop," responded Seth. "And while you're at it - do you have a live distro anywhere?"

"I do," answered Jinks. "It's on my thumb drive."

"Perfect," declared Seth. "Bring it with you."

Jinks drove the car into a residential neighbourhood. "Is it this street coming up?" he asked.

Seth was examining the map of the area on his laptop. He looked back up, and saw an approaching street sign. "Yep. Turn right over here," he replied. "Picking up on anything yet Kerstin?"

"Oh yes," she informed him. "Tons of wireless networks everywhere."

"We're looking for 2107," said Seth.

"I see it," said Jinks. "It's there on the left."

Jinks stopped the car. "I'm detecting three wireless networks in this area," Kerstin told them. "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," she said. "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," Seth told him. "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?” said Jinks. “What if the guy's not home and there's no data to listen in on?”

“Well then what we do is something called a replay attack,” replied Seth. “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?” he asked in surprise.

“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 informed Jinks, 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,” he told Jinks. “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, he stumbled on some tax returns for the previous year. Seth quickly read through its contents.

“Yeah, this is some other family’s computer,” he asserted. “Not our guy. How’s it going for you Kerstin?”

“Better now,” she indicated. “I had to clone my MAC address, but I’m in now.”

“MAC address?” asked Jinks.

“Another security measure for the network,” explained Seth. “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 authorized, just like his.”

“How do you guys know all of this?” asked Jinks.

“Experience,” replied Kerstin. “But changing MAC addresses is something even a five year old could do.”

“And you guys can break through any encryption? Really any?” 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," Kerstin interjected. "This network is using the wrong ISP."

"Shit," Seth responded. He 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?" indicated Seth.

"I don't see a car," stated Jinks. "Want me to knock just in case?"

"Sure," Seth told him. "You do that and whatever happens next decides what we'll do."

Jinks left the car and approached the house. "Do you see Jinks' thumb drive anywhere?" Seth asked Kerstin. She looked around her.

"No I don't," she said. "Are you seriously going to break in?"

"I don't know what else to do," Seth informed her as he looked around for Jinks' drive. "We're so close. Everything we need is in that house."

"If it's the right house," she reminded him.

"If it's the right house," he affirmed.

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," Seth told Kerstin. "Can I borrow your hair pin?"

Kerstin obliged. She did not ask any questions. "Thanks," replied Seth. He got out and walked to the front door. He took out his keys, and extracted the ring

that had kept them together. 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," said Seth nervously. "We gotta move now. Find that computer!" Seth got out of the house. Kerstin was waiting in the car. 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, 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 alarm's timer reached zero, and started an ear shattering wail which permeated through the home. Seth was sure the neighbours could hear it. The phones in the house began to ring. Seth ignored it.

"Found it!" yelled Jinks.

"Where are you?!" shouted Seth.

"Downstairs!" responded Jinks.

Seth moved through the halls of the house. He couldn't find the staircase leading to the basement. "Where are the stairs?" he shouted back.

"By the kitchen!" yelled Jinks.

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!" exclaimed 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. He 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.

"Shit - it's in the car!" exclaimed Jinks. "I'll get it!"

"Fuck!" expressed Seth. "Just forget it and keep looking for that laptop!"

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.

"Get back to your car!" Seth shouted out. He looked around one last time and ran back upstairs. As Seth went out the front entrance, he could hear police sirens approaching. He saw that Jinks was already half-way down the street. Seth closed the door behind him. 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!" hissed Seth, looking around for the police. A speeding car like theirs was sure to attract attention. Kerstin turned onto the freeway and the sirens quickly faded into the background.

"Was it the right house?" she asked.

"Yeah, it was," said Seth. "We found the hacker's computer, but not his laptop. Is that right Jinks?"

"I didn't see it anywhere," Jinks informed them.

"Turns out the thumb drive was in the car after all," Seth continued. "So 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," Seth told her. Kerstin passed a large regional mall just off the freeway.

"Where to now?" she asked them.

"I don't know," 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.

"Yeah but we ran out of power last time," said Seth.

"You could come to my place?" suggested Jinks.

"Your place would be a bad idea," replied Seth. "The cops have hit Gab and Eric. You'd be next."

"No I wouldn't," maintained Jinks. "Why would the RCMP care about me? We never hang out together, and every time I wanted to do something with you guys you always turned me down. So what is there to link us? We go to the same school, but so do thirty thousand other people."

Seth looked at Kerstin, and then back at Jinks. "You're right," he said. "Let's do it."

Kerstin got off the next exit and took the ramp that would head them 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?" replied Jinks.

"Jinks," Seth told him, "I'm sorry that I was such a douche. You really are an alright guy."

"Oh you don't have to say that," replied Jinks.

"Yeah but I should," responded Seth. "I'm sorry."

"Thanks," said Jinks. "That means a lot."

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," remarked 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," persisted Seth. "Let me do it."

"Okay," Jinks conceded. "Can't argue with free."



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 cruiser. "Hi," said the hacker. "The people from the alarm company called me."

"Alright," replied the officer. "Want to check it out?"

The black hat walked to the front door. He put his key in the knob and noticed that it was unlocked. "Was that you?" he asked the policeman.

"No, but I did enter the home," said the officer. "Your neighbour came out and said she heard screaming 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.



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," replied Seth. He sifted through the data on his own laptop. Seth was finding no trace of the black hat's worm nor of the update that had caused them so much grief. The source code was nowhere to be seen either. "I'm not seeing the worm anywhere," he declared.

"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 explained and 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 hope not. I really wish we could have found it at his house," he informed them. "If we don't find anything with what we have, then we're screwed big time."

Seth 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 up from his animated computer screen.

"Yeah, I'm extracting it all now," she informed them. "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," she told him. "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?" wondered 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 data. Reams of paper filled the room as Kerstin printed off any text files she deemed potentially useful. An excited Jinks interrupted them. "Hey guys, I got something!" he exclaimed. "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?" stated Jinks. "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,” responded Seth.

“I looked up the account on the job website,” continued Jinks. “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,” he noted, “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,” Jinks told them. “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. Seth read off the ad.

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,” stated Jinks.

“You know what that ad is really about?” said Seth.

“Spam?” answered Jinks.

“Yeah,” confirmed Seth. “Freelance sites like that are how spammers outsource their business. 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,” indicated Seth. “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 quickly read over the biography. “Quick theory: an anti-virus company 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. He 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 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,” he said. “That warning then recommends the purchase of *Avalanche Anti-Virus* to wipe this threat from the system.”

Seth closed his laptop shut. “There is no virus of course,” he told them. “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,” replied Seth. “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 out the window. “So how do we prove it to the RCMP?” she wondered.

“We call the hacker,” said Seth.

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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,” said Kevin. “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," responded Seth. "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," said the recording. After a brief pause, it 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 digits for a random Moscow telephone number. "Please enter which number you would like to call," asked the system.

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," said Seth.

"Wait – what?" replied a surprised Jinks. "Me?"

"I can't do a Russian accent for shit," Seth told him. "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. "Seth," Jinks finally blurted, "I don't know the first thing about computer worms."

"You can say anything you want," Seth reassured him. "It doesn't matter. All he has to do is acknowledge it exists. The only thing 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," said 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," explained Seth. "Just had to put in his address on their website."

Rings emanated from Seth's speakers, followed by a clicking sound. "Hello?" came the gruff voice on the other end.

"Heel-lo," said Jinks with a thick Russian accent.

"Yes?" responded the unimpressed voice.

"This is null_cool," said Jinks. "I want to talk botnet, and I—"

"Who?" wondered the voice.

Jinks looked nervously at Seth. "null_cool," he affirmed.

"That's what I thought I heard you say," indicated the voice. "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?"

"Well," responded Jinks.

"No. I want you to shut up until I'm done," interrupted the man. "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. Comprene?"

The man on the other end hung up. Seth took his computer back from Jinks. "You still there Eric?" asked Seth.

"I'm still here. I got it all," said Eric.

"Perfect. Thanks bud," responded Seth.

"I'll see you soon," Eric told him.

Seth terminated the connection, and turned his attention to Jinks. "Good job Jinks," said Kerstin, hugging him.

"Top material" stated Seth.

"I don't get it," said Jinks. "I didn't say anything."

"He admitted that he's involved with the botnet," indicated Seth.

"That's it?" asked Jinks. "We're done with this guy?"

"He admitted his involvement. That's the best we could have hoped for," Seth told him. "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 informed them.

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 floor. They entered an oversized elevator.

"There's a tunnel in the basement that brings you to the apartment building next door," Jinks 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," indicated 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," remarked Seth. Pointing out the nearby road to the two, he added, "There's the road but it's out of the question that we walk by it."

"Let's grab a city bus," suggested Jinks.

"Good idea. Do you guys have some coins? I only have two dollars with me - the rest are bills," said Seth.

"I have some change," said Kerstin.

"I've got my bus pass on me and some money if you're short some," added 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 vehicle resumed its route, passing the police cars and the several officers 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," hissed Kerstin.

Seth ignored her. "You know what really pisses me off?" he exclaimed. "It's that 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. What if we had gone to court like this. We would have been 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," continued Seth. "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 as we've done. 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," conceded Seth, looking back out the window. As if trying to convince himself, he repeated, "You're right."

"So what now?" asked Jinks.

"Well, what Kerstin said is true," noted Seth. "We have all the proof we could have hoped of getting. Let's email Flow and i0 a copy of the telephone conversation and fill them in on what we found. It's important that someone else know the truth besides ourselves. Then, I say we go out drinking. This might be the last night we have the chance 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," Seth informed him. "I'm done with this."

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 marched down the crowded sidewalks of Ottawa's market. This was the drinking hub of the city, each street packed with bars and nightclubs. Sounds of laughing youths and loud music filled the air.

Seth had given up all efforts to conceal his identity. He had accepted his fate, and in doing so vanquished the stress which had burdened him so deeply. He looked towards Kerstin and saw that she was smiling.

The trio walked up to a popular Irish pub. A network of narrow alleyways connected this establishment with many others, creating a very large labyrinth through which to roam. A bouncer at the door stopped the three and asked to see their ID, as well as to check the contents of their bags. This was all standard policy, and they obliged.

Within a minute, Seth, Kerstin and Jinks were inside. The trio ordered drink after drink. They danced. Seth ran out of cash, and started to use his credit card. They drank even more. Seth could feel the buzz, but it wasn't enough. He continued to drink, as did Kerstin. Seth looked at her. She was so beautiful, he thought. So

smart. He did love her, but he knew that this was not the right time to express his feelings.

Glancing to his other side, Seth 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. Seth quickly gathered that he was her boyfriend, and that he didn't seem too pleased. Seth backed off and returned to the sidelines, drinking another beer and enjoying the Irish punk music.

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Seth stumbled out of the pub alongside Kerstin and Jinks, all 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.

"Huh?" wondered Jinks.

"Let's take down the botnet," proposed Seth.

"Okay," interjected 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."

"But they weren't us," he stated with a grin.

"Alright," Kerstin conceded, "I'll watch. Jinks? What's your call?"

"Do you really have to ask?" Jinks responded. "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 have Internet," said Seth. "Beautiful, sexy, Internet."

He extracted a beer bottle from his bag, uncapped it, and took a sip. He had stashed it from the bar. "One for the road, you know?" he explained.

"Pass me that," said Kerstin. She took the bottle from Seth's hand and gulped half of it down, passing the remainder to Jinks.

"You're so hot when you drink that beer," spurted Seth.

"Right," replied a slightly less intoxicated Kerstin. She grabbed her own laptop and took it out. She couldn't let him have all the fun. Meanwhile, Seth began searching online for reports discussing the technicals of the botnet. He found one, in the form of an academic paper examining an older edition of the worm. Seth read through the article out loud, trying to battle his inebriation.

"They don't connect to a single IP," he informed them. "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, do you recognize this address?" she asked Seth.

Seth looked over to her screen. "That's the domain for the hosting company in Toronto," he answered. "Why?"

"It's one of the hostnames authorized to access the botnet," she stated.

"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," said Seth. "He wouldn't have done it unless he had some other way of controlling the botnet. 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," replied 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," concluded Seth. "This time in South Africa."

"That signals the end of that, then," said Kerstin.

She was right thought Seth. He felt like his eyelids weighed a ton. Even if they did miraculously manage to infiltrate the server, they would still need the password to authenticate with the botnet. Without figuring out how to get around that, they couldn't do anything to those infected computers. Plus Jinks was already passed out on the table.

"So where do we go?" asked Kerstin.

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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 in the bed with him thing was new, however. Seth 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 device off, and proceeded to nudge Jinks slowly on the side. "Jinks," said Seth, "we've got to get out of here."

There was a knock on the door. Seth looked back at the shut door and nudged Jinks some more. "Come on," he said more pressingly, "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 to the officer on the scene.

"Yeah," replied the man. "That was one of them."

"You know," said Graham, "it's always baffled me that these guys 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 had been found on Seth's laptop. He had also been clearly evading the authorities. The interrogators laid it out for Seth.

"The way I see it," said one interrogator, "you really have two choices. You can choose to tell us the truth and cooperate. 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 RCMP officers told Seth of the jail time he was likely to face if the courts found him guilty. They then informed him that any such sentence would be greatly reduced if he admitted his guilt. Seth had tried to talk

about their hacker but the interrogators showed no interest.

A month after being apprehended, Seth very nearly signed a false confession. He knew that 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 the others, but the fact that he had lasted this long meant that they had all kept their mouths shut. As long as they all remained vigilant, Seth hoped, they would come out of this unscathed.

Ultimately, it was Flow and i0 who broke this tense drama with the release of a special episode of the Binary Phunksters. The show featured a detailed description of the events, culminating with the recording of the telephone conversation between Jinks and the black hat. They then called their audience to partake in the *Free the Losers* movement.

News of Flow and i0's campaign spread. Dotslash picked up on the story, featuring it on their front page. Various online personalities discussed their thoughts on the situation. Less than a week later, the story of the young hackers progressed to the online edition of a prominent computer magazine. Nevertheless, the unfolding events never managed to hit it off with the mainstream media.

Contrasting this disinterest by established news organizations was the deep grassroots support from the geek community. Various cases of activism were recorded. In one incident, the slogan 'Free the Losers' was seen in the scrolling news ticker of a Rhodes Island

television station. In another stunt, electronic advertising signs in subway cars across Toronto were altered to display messages supporting Seth and the others. The RCMP had no official comment on the matter.

This was the point at which Seth noticed a complete change in the behaviour of his interrogators. The subtle threats of unending jail terms ceased. The officers were curious about the evidence that the four had presented to them beforehand. Then one day, 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. The same verdict was issued to both Kerstin and Gabriel, and Jinks 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.

The RCMP began mounting a case against the black hat. One of the investigators informed 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. The RCMP never publicly cleared Seth's name, but he didn't really care. He was out now. He was free.

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Seth, Gabriel, Kerstin, Jinks, and Eric sat around a table. They were enjoying a pleasant summer afternoon

at a small student-run outdoor café. “You know,” said Seth, “I finally figured out what I’m going to do after the summer’s over.”

“And?” asked Gabriel.

“I’ll register for a degree program in computer science.”

“Is that so,” responded his friend.

“Yeah. It’s decided,” said Seth. “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. Could you imagine?”

Eric gleefully looked around the table. “So you’re with us for hooking up this Saturday?” he asked Seth. “For a bit of *rice tea* perhaps?”

“You know it,” answered Seth with a laugh.

“I’ve been wanting to try out my new laptop,” added Kerstin.

“Should be some good times,” stated Jinks.

“Perfect,” concluded Gabriel. “See you all 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 fictional botnet at the center of this novel.

- 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.
- Worm** A malicious self-replicating computer program. In this book, a worm is used to infect computers and turn them into *bots*.

