

# Glitterbug

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<http://web.mit.edu/~oliner/Public/novella.pdf>

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## 1 A Call in the Night

BYRNE RESIDENCE - 6:30 AM

Meadowville, Massachusetts

I dreamed about my wife's death again. I watched her die every night that week. It never happened in the dream the way it happened in reality, but the differences were in the details. Different body, same bones.

"David?" She calls to me across a field of snow. No one else calls me David. Only her. I raise my head up and beckon to her. I am busy digging a hole in the dry, flaky snow. She stands over me, bundled in an expensive fur parka, the kind I could never buy her. She is shivering but smiling. "David, I'm cold." I know honey, I know, I will buy you a brand new coat. Whatever you desire. But first, I must find this. I keep digging, my hands turning blue, until my fingernails scrape up the hard brown earth beneath, and then I take off in a run toward the forest at the field's edge. Hurry, darling! I call to her without looking back. You must hurry, I'm almost there. "David," she shouts. "David?" But soon her voice is lost to the increasing wind, and as I dart among trees I suddenly realize that I cannot hear anything. The wind stops. I cannot remember what I was looking for, and I rush back toward the field. Where is she? Sweetheart? I yell, and my voice seems to carry to eternity. I stumble, and look down to find her slender outstretched legs as she sits propped against a frail evergreen. Baby? I kneel next to her. The snow crunches as my legs sink. I cradle her head as a horrible ball of hot

fire forms in my throat. I kiss her smiling face, and the wind begins again, threatening to carry me away from her. There is a strange sound, and I awake from my dream. Shivering.

I caught the phone on the second ring. Still tucked deep underneath layers of quilts, I rested the portable on my right ear and let the left half of my face sink into the pillow.

“Eh?” I grunted.

“Detective Byrne? This is Agent Weaving of the FBI. I’m sorry for calling you so early on a Saturday, but I’m about to catch a flight.” Weaving’s voice was crisp and quick. Awake.

“Eh?” I grunted again, pathetically, my unasked question still unanswered.

“Hm. Well, you see, I’m head of the Cybercrimes Investigation Division.”

I perked up a little. “Are you calling about the job?” I looked at the clock and realized immediately that it was a stupid question. It was 6 AM, for God’s sake, of course he wasn’t calling to schedule an interview. I had applied to the CID a few months earlier. They told me that they were not hiring at the moment, but that they would keep my resumé on file. Right. I had forgotten about it entirely. My mind was occupied with other things.

“No, Detective, not specifically. But we’d certainly appreciate your cooperation. There’s been an incident. We have reason to believe a malicious program may have originated from a machine within your jurisdiction. It’s really an FBI matter, but we have been considering you for a position. Also,

given that this is in your home town. . .”

“So this is a test?”

“We’d rather you focus on it being a criminal investigation.”

I heaved a huge, meaningful sigh and sat up from my down cocoon, letting the phone fall on my lap. I scratched my stubble and glanced over to the depression in the empty half of the bed. Right there. A stroke in her sleep. When I woke the next morning, her face was already cold. I sniffed and picked up the phone again.

“...bad time, I can just meet you at the station.”

I cleared my throat. “No, no, I’m already up. Can you tell me anything about the investigation? You make it sound urgent.” I shiver again, the warm air billowing out of my blankets.

“When the media gets wind of the fact that our investigation is centering around your little town, you will have the entire world peeking over your shoulder.”

“The world?”

“Almost 250 million machines. So far.”

“A worm.” I swung my feet around and into a pair of ratty, open-backed slippers. I was a computer science major in college, but I had an epiphany early in my senior year: I hate coding. I enjoy solving problems and puzzles. I had visions of my future, hunching over a terminal, my eyes straining under the florescent lights as my long, wrinkled hands search out the semicolon and ampersand. I ended up back in my home town, Meadowville, Massachusetts,

doing some consulting work for local businesses. I met Angela at a café while I was doing some work for the police department's web site. She was their liaison, sent to answer my questions and share her vision for the site. I drew two conclusions by the end of the meeting: (1) I wanted to join the police force and (2) I was hopelessly smitten with Angela.

Weaving picked up on my recognition and switched to jargon-mode. "It's a new one, too. Special breed. It's got a relatively huge payload, a song file, and uses distributed transmission to speed the spread of infection. The more machines it infects, the faster it spreads."

"It'll burn itself out."

"The worm will, but not the case. The CRIA is going to be looking for a scapegoat." Weaving spoke up over the sound of a distant scrambled voice: "Final boarding call..."

"And what about the FBI?"

"We need to talk to the author."

I took my time digesting the comment. "You're making it sound like he did something that caught your attention even more than the worm."

"I can't say much over the phone." Weaving paused, debating how much he could safely share. "He cracked something that he wasn't supposed to be able to crack."

"I understand. So this isn't a normal FBI investigation?"

"Not at all." Weaving promised to explain his cryptic comment once we met at the station.

At this point, I really started waking up. What was Weaving telling me? Something was fishy, but, if he could be trusted, this was a career-making case. I headed across the hall, shuffling over the wood flooring in the predawn light. Inside the study, the shades were drawn. I navigated by the slow, pulsing white light of my sleeping monitor.

I tapped a key. The screen came alive, casting an artificial white glow across my face. “You said something about a song file?”

Weaving asked, “Have you heard of an artist named Amber Ashmont?”

“No. And I take it from your tone that you didn’t know her, either. Is she new?” I brought up a browser and Googled the girl’s name. I clicked I’m Feeling Lucky, even though I wasn’t. It took a while. The worm was saturating the pipes. Amber Ashmont, I learned, had been trying to break into the pop music scene for a couple of years. She was signed with Omega Records, one of the largest in the industry. “Is there anyone Omega Records doesn’t have a contract with?”

Weaving chuckled on the other end of the phone. There was the sound of childrens’ voices in the background.

On my screen, Amber Ashmont was posing on stage with colored lights stabbing blue and green columns into the black behind her. Her thick red hair was pulled up in a curly mass on top of her head. Thin, delicate strands flowed down around her cheeks as she belted something into a handheld microphone. I noticed the tiny wireless mic clipped to her shirt, nearly hidden from view, and smiled.

“Her record company is not going to be very pleased to see her music being spread around for free,” Weaving predicted confidently. “Omega will appeal to the CRIA, and they will come to us.”

I wasn’t paying attention. “Why, if Omega is representing her, haven’t we heard of her before?”

“Unclear. From what I understand, she’s pretty good. She developed a cult following in Atlanta.”

“Yeah, I’m reading that now. But, wait, what does all of this have to do with some hacker?”

The distant airport voice crackled something into my ear. Weaving said, “Look, I’m getting on a connecting flight now. I’ll be at your precinct by 9:30. Then we can share information and at least have something ready for the media when they ask.”

“You mean a cover story?”

“As far as the media is concerned, this worm is a copyright issue. By the way, you might want to take a look at a paper by a Professor Forrester of the Fuller Institute of Technology. As far as I can tell, the technology he describes is what we’re seeing in the worm. I’ll see you in a few hours, OK? Goodbye.”

“Bye.” I poked a button on the portable and it beeped off.

I pulled up my bookmarks. This was my morning routine; not out of necessity, just habit. Slashdot. ArsTechnica. I found it: CERT. Everything was slow. I watched the motionless progress bar and marveled at the

irony. Finally, the page loaded, I checked the latest advisories, and found the Glitter/mp3 worm:

From <http://www.cert.org/advisories/>

CERT Advisory CA-2004-94 Glitter/mp3 worm Original issue date: February 26, 2004 Last revised: February 26, 2004 Source: CERT/CC [section omitted]

#### Overview

The CERT/CC is receiving reports of widespread activity related to a new piece of malicious code known as Glitter/mp3. This worm appears to exploit known vulnerabilities in the Remote Procedure Call (RPC) Interface.

#### I. Description

The Glitter/mp3 worm exploits a vulnerability in the standard RPC interface as described in VU#9968148 and CA-2004-83. Upon successful execution, the worm attempts to retrieve a copy of the file `glitter.exe` from the compromising host. Once this file is retrieved, the compromised system then runs it and begins scanning for other vulnerable systems to compromise in the same manner. An mp3 file called "Glitterbug.mp3" is added to the root of the compromised filesystem.

The worm was only noticed within the last few hours. Lab testing has not yet been performed. Compromised hosts may be assisting in the transmission of the (rather large) malicious code and payload to new compromised hosts. Unusually high traffic may indicate an infection on your network, so you may wish to monitor network traffic. The .mp3 file itself does not appear to be carrying any malicious code, though the ID3 comment tag contains a 4096-bit number,

encoded in hexadecimal. We have not yet checked for primality, but the number might serve as a key for some kind of encryption. The code of the worm contains the message, "fuck the CRIA!". Presumably, this is a reference to the Coalition of Recording Industry Artists.

[section omitted]

"Fuck the CRIA?" I read aloud. This was made to look like a prank. I checked my firewall settings, just to be sure that I was blocking the port the worm used to infect hosts. I was.

While I was on Google, I found the research paper by Professor Forrester, told it to print, and went to take a shower.

I lumbered drowsily to the bathroom. It still smelled like her. It had already been a week since Angela passed away. I splashed some warm water on my face.

The sun was coming up and the house was alive with shadows. On my way back from the bathroom, I passed the bouquets of flowers that lined the hallway. Residue from the wake. White roses. Floral sprays. One woman told me this one was called Flight of the Swan. All dying. Unwatered and untended. I resolved to throw them away.

## 2 Pacification

MEADOWVILLE POLICE STATION - 9 AM

I marched into the station house with a hard copy of Professor Forrester's paper in my hand and a croissant hanging out of my mouth. I sucked thoughtfully on the buttery bread, letting the warm smell fill my nostrils. Officer Kate (she insisted I call her that, even though I told her it makes her sound like she's 12 years old) leaned forward at her desk as I passed.

Kate held the admirable belief that humor is the best long-term solution to life's troubles, with empathy coming in at a close second. Since Angela passed away a week earlier, Kate had called my house nearly every evening. "Just checking in," she would say. Kate followed in her father's footsteps when she became a police officer. Her father had retired, and was living comfortably only a few miles away, at the edge of Meadowville. As a young woman, Kate watched cop shows and detective series. She would imagine herself engaging in witty cop-banter with Det. Sipowicz. I was her surrogate Sipowicz.

"All you need is a cup of coffee in the other hand and you qualify as a stereotype," she joked. "Congratulations."

I raised an eyebrow and looked down, cross-eyed, at my croissant. "Aweesis-nawahdout," I mumbled from the side of my mouth. Then I shifted the paper to one hand, removed the pastry, and repeated, "At least it's not a donut, right?"

She laughed. “Oh, of course, you’re right. I’m sorry. You keep fighting the good fight.”

I feigned a scowl. To be honest, she made me feel better. Less alone. So did working. No one would have blamed me for taking more time off, but I needed the distraction. “But since you mentioned coffee,” I winked at her, “I’ll have mine black.”

“Oh? Like your soul?” Kate crumpled a sticky note and hurled the yellow ball at me. I ducked it, deftly, without dropping my breakfast. “I’m not your maid. Besides,” she added, “get Rookie to do it.”

Officer Mike Johnston peeked up from behind a newspaper and yelled, “Would you stop calling me that!” Then added, more quietly, “Look at what that crazy Kentz woman did to me!” He leaned forward to display the white bandage that covered his head. He raised up the paper again and buried himself in the comics, miffed. Two days earlier, Mrs. Diane Kentz, age 67, forgot to take her medication and wound up on the town green at 2 AM, carrying her late husband’s 3 wood golf club. When Johnston tried to convince her to come back home, she pretended to try standing. He moved to help her up, and Diane swung the center of that club down on his skull as hard as she could. The club snapped in two, and Johnston, reflexively, called for backup. No one in the Meadowville police department has any intention of letting him live that one down, least of all, Kate. Johnston was on secretarial duty until his skull fracture healed.

I headed into my office and plopped down in my swivel chair, which hissed

air as it adjusted to my weight. Dropping the remainder of the croissant onto the research paper, I rolled over to the terminal next to my desk. The police database was on a private network, so I was able to pull up Forrester's contact information without delay. I rolled back to the desk, picked up the phone, and dialed the number, long distance. Forrester picked up.

"Hello?"

"Hello, this is Detective Byrne of the Meadowville, Massachusetts police department."

"And you are calling about the worm."

"Right."

"Because your investigation brought you to my paper."

"Um, yes. Look, if you don't mind, I'd like to ask you a few questions."

"May I ask, first, if I am considered a suspect?"

I picked some breakfast from between my teeth using my tongue and wished I had gotten that coffee. "No, not at the moment. We'd appreciate your help in the matter."

"Of course," Forrester said seriously. I heard the creak of a chair as Forrester leaned back. "But I'm not sure what I can tell you. The paper you see is the extent of my research on the subject. I've never implemented it, though I'm convinced it could be done. So, unless your questions are of a technical nature, I fear you may be wasting your time."

Pompous prick. Instead, I asked, "Your paper seems to be targeting large corporations that want to update their intranets, is that correct?"

Johnston peered through the venetian blinds covering the window to my office door and knocked on the glass, vying for my attention. I nodded in recognition, and Johnston pantomimed “phone.” I pointed to my ear and pantomimed back: “phone!” He shrugged and released the blinds. I made a mental note to interrogate Johnston regarding potential brain damage.

“That was the idea, yes. It would be unreasonable to distribute any kind of software over the Internet as a whole, if that’s what you are thinking. Most users need to pay for bandwidth, and, outside of a corporate setting, I’ve found most users respond negatively to forced upgrades or patches.”

“By ‘unreasonable’, I assume you mean ‘unintended’?”

“Of course it wasn’t intended. I hadn’t considered. . .” Forrester was quiet a moment, then changed the subject. “I haven’t been able to gather much information on the worm, just yet. Our campus network is essentially just transmitting packets related to the worm.”

“Is it possible that the author of this worm implemented your idea, but designed it to consider every host on the Internet a viable target for upgrade, and then had it simply deposit a song file instead of a patch?”

“I would say so, yes. It certainly lends itself to misuse. The more machines it infects, the faster it spreads, up to some saturation point.”

Johnston was at the door again. I waved him away.

This was going nowhere. “All right, thank you for your time. Will you be around if I need to contact you again?”

“Of course. Good luck.”

I got up from my desk and went to open the door, where Johnston was waiting impatiently with his hands on his hips.

“What?” I growled.

“Phone!”

I felt my jaw clench.

“Some woman from the CRIA has called you three times already. She said it was urgent that she talk to you.”

I rolled my eyes. Agent Weaving was right on the money. I took the call in my office after noting that Johnston and Kate would very much like to overhear. I closed my door but left it unlocked.

“This is Detective Byrne, may I ask who’s calling?”

“Patricia Gloven, assistant legal counsel for the Coalition of Recording Industry Artists.”

I suddenly felt tired and cut her off impatiently. “Excuse me. Ms. Gloven, is it?”

“Mrs.” I glanced at the picture of Angela on my desk.

“Mrs. Gloven, I know why you are calling, and I can’t answer any questions at this point. All I can say is that there is an active investigation. . .”

She interrupted. “Do you have a suspect in custody yet? We have an obligation to protect the intellectual property of our clients. I’d like to be kept posted on. . .”

Agent Weaving strode confidently into the front door at almost exactly 9:30, black trenchcoat flowing behind him. He flashed a badge and a smile at

Kate, who pointed to me. I watched through my blinds as he approached my office and, noticing me on the phone, held up his FBI badge to the window. I beckoned him in and shook his hand. “CRIA?” Weaving asked, pointing to the phone. I nodded. Weaving reached for it, saying, “Do you mind?” I handed the phone, gladly, to Weaving. I would normally have felt threatened by such an encroachment on my duties, but *Mrs. Gloven* was already proving herself to be a pain in my... Weaving tapped the speakerphone button and put down the receiver. “Hello Patty, this is Agent Weaving. We spoke on the phone just a few minutes ago. Look, we at the FBI are doing everything we can to bring this criminal to justice.”

“Oh yeah? I just spoke to a detective who told me that the details of the investigation are confidential.”

“Oh, Patty, don’t be silly. Did you know you were the first person I called this morning? I know how important this is for you, so I’m gonna make sure you are the third person to know anything we discover about this horrible hacker.” Weaving said ‘horrible hacker’ with the kind of disdain that only exists in lies.

“Third person?”

“Me first, then Detective Byrne here, and then you. Now we’ve got to get to work, before our leads dry up, so you sit by the phone and you’ll hear from me as soon as I know anything. OK?” Weaving didn’t wait for a response. “Goodbye.” Weaving pressed the speakerphone button to end the call and smiled at me. “Pacification,” he said.

Weaving surveyed my office. He saw Forrester's paper under the half-eaten croissant and the professor's phone number still on the terminal screen. "You have been busy," Weaving mused, "That's good. I should tell you what this investigation is really about. Can they hear us?" He nodded toward Johnston and Kate in the main station room. I saw Kate sneak a curious glance toward my office. My door was closed.

"No."

Weaving cleared his throat. "When the CIA transmits information to the President, they use an extremely large code to encrypt it. The President has his key, the CIA has theirs. They use this channel when information must be digitally signed; a courier would not suffice. The hexadecimal number that is being transmitted along with the mp3 was the CIA's key. Until last night, that is. All the computing resources in the world shouldn't have been able to crack that code. The worm's author either got very lucky..."

"Unlucky, you mean," I interrupted.

Weaving ignored me and continued, "...or knows a vulnerability in the crypto. If this person does, in fact, know how to break government crypto without brute force, it means he is possibly the most dangerous man in the world."

"You're telling me this man may have found a vulnerability in the crypto scheme itself?"

"We believe that's the only way to get this key, besides theft of the physical copy, which we know has not occurred. The point is, we need to

find him quickly. Did Forrester have anything interesting to share?"

"Nope."

He pulled out his laptop, and opened it up. "Do you have wireless in here?"

I pointed to an Ethernet jack in the wall. Weaving reluctantly pulled out a cable from his bag and plugged in his computer. Spoiled by the facilities at his office, I supposed. The Ethernet cable looked crisp and unused, crimped at hard angles.

"I wanted you to see Amber Ashmont's press release. It was posted just before I got here." He eventually managed to pull up the article, and we read it together in silence.

Article excerpt from: CNN.com

Virus Victim Pleads to Fans

Tuesday, February 26, 2003

Posted: 09:25 AM EDT (1357 GMT)

ATLANTA, Georgia (Reuters) -- Musician and performer Amber Ashmont has issued a press release regarding this morning's Glitter/mp3 worm, which caused her only album's title track, Glitterbug, to be distributed all over the Internet, free of charge.

"This music is my life, and my financial welfare," Amber said in her statement. "[The person responsible] gave away something that didn't belong to them, and that's morally wrong." Until this morning, Amber's music had been a cult hit. Her efforts to be recognized on a national level were only just beginning. "This has set us back," said Craig Lampson, Amber's agent at Omega Records. "Now that

her music is floating around, it's going to be hard to get people to buy it."

Experts estimate that some 400 million people worldwide were affected by the worm. "That's billions of dollars in lost revenue," Lampson projected. Amber has asked that people who enjoyed the free sample please consider purchasing her album.

[section omitted]

Weaving finished first. "That's some real SCO math, right there."

A few years ago, a company called the SCO Group had sought retrospective licenses from users of the freely-distributed Linux operating system. Millions of Linux users meant they were owed billions of dollars in lost revenue, so they claimed. Lampson's math was equally suspect, but it sold papers, so to speak.

I finished reading. "Should we be looking at Amber for this?" I asked him, sensing that Amber's involvement might be more than coincidence.

"Not for the code cracking, certainly. Right now, that's top priority. If our hacker is somehow connected to her, then we'll go from there."

Weaving closed the article. "I did some work at the airport. I sniffed some packets off the network, found out where they came from, then found out where the worm that infected that machine came from, and so on. Eventually, with some help from friends at the Bureau, I managed to get an IP address. Now we just need to find the computer associated with that IP. My search for that machine is what brought me to Meadowville."

"You think ISPs are just gonna hand over customer information if we ask

for it?”

“No. I’ve already filed for a search warrant. I’m just concerned that it will take longer than we have.”

In the mean time, we waited. Agent Weaving occupied himself with a phone call to the Boston Field Office, and I browsed the Internet for information on Amber Ashmont. The worst of the worm had passed. By then, most of the larger ISPs had blocked the ports used by the worm, sealing off their networks. The virus metaphor was apt: it was a quarantine.

There were only a few Amber Ashmont fan sites, and they were generally rather amateur. Major news sources had picked up on the worm, and I found the most interesting information in the user discussions appended to the articles. The general populace shared my suspicions. Several people hypothesized that this was all just some marketing scam. “Viral marketing,” they were calling it. Even her fans stopped just short of accusations.

### 3 Following Leads

ROCKETCAR DSL - 11:00 AM

I remembered my wife at her best.

Together, we ran a letter-writing campaign to push Congress to pass the Cybercrimes Investigative Powers Act. The Act would have expanded the powers of the FBI and CIA in matters related to computer crimes. It would have allowed the FBI to subpoena records from a large range of businesses, including car dealerships, travel agencies, and ISPs, without intervention from a judge, and they could place a gag order on the target of the subpoena, preventing them from alerting anyone of it. The FBI would not need probable cause.

Angela saw the bill as a way to help law enforcement protect people on the Internet. She was tired of reading about children, lured by criminals posing as friends online, being kidnapped or killed, simply because it was too hard for the FBI to find probably cause. It wasn't long before she had convinced me of her viewpoint.

She sat at our living room table, light from the bay window streaming down over her back. I watched from a doorway as she concentrated on the papers in front of her. Letter drafts. Envelopes. Notes. She couldn't see me. Angela was consumed completely, her bright eyes scanned a document. I watched the way the light made her hair glow around the edges, a halo for my Angela. She was so happy. I smiled and went to the kitchen to make her

some tea.

Had Angela and I been successful, Agent Weaving and I would not have been sitting on our asses for an hour waiting to get a warrant. But the bill failed under pressure from citizens' rights groups. Congress was working to bring the bill back, renamed the CyberSecurity Act. This time, the Justice Department slipped in the provisions of the original act as part of an intelligence spending bill. Such bills are usually considered sensitive, and tend to be approved without debate or public comment. This time, they thought, there would be no watchdog group to fight. Indeed, when the Glitter/mp3 worm ravaged the Internet, the vote was only a couple of days away.

After a short drive to neighboring Southwood, Weaving and I arrived at the main offices of RocketCar DSL with the search warrant. Weaving walked to the front desk, holding up his badge. "My name is Agent Weaving of the FBI, this is Detective Byrne with the Meadowville police. We need you to identify the user associated with an IP address."

The male secretary's voice was high-pitched and nasal. "I'm sorry, sir, we can't give out that kind of information without a warrant."

I placed the warrant on the desk. After he stared at it for a few moments I asked, "What's your name?" That question always seems to make people nervous, even when they've done nothing wrong. The man's name was Gerald. "Gerald, this is part of a criminal investigation. We'd appreciate it if you would hurry."

Gerald sighed, and pulled something up on his terminal. "What's the

IP?”

Weaving told him. Gerald disappeared for a few minutes, then came back with a phone number: Daniel O’Brien, 555-1433. “Thank you, Gerald.”

As we walked out, Weaving asked me, “Detective, do you know an O’Brien family?”

“I think I recognize the name, but I can’t place it. Sorry.” I didn’t feel sorry. Still, Meadowville was a small town, and unfamiliar names were unusual. I called ahead to the precinct, asking Kate to look up the O’Briens’ address. We drove there directly.

The house was small and well-kept, with bright white paint and grey trim. The driveway was freshly paved and the basketball hoop looked new. There were no trees in the front or back yard, since the house was part of a new development. The sky had turned an ominous grey, and the house looked as though it was trying to blend with the clouds.

A woman answered the door.

“Mrs. O’Brien?” She nodded. He introduced us.

“Oh, hello there. How are you?” Mrs. O’Brien asked.

Weaving laughed genuinely. I wondered how often someone asked Weaving that question, and then found my thoughts drifting to Kate.

“I’m fine, thank you. I was wondering if I could speak to your husband.”

“Oh, I’m sorry, my husband died a few years ago.” I glanced around Mrs. O’Brien to take a peek at her living room. The couch was still covered in plastic.

“Died? I’m sorry to hear that. Well, um, was his name Daniel O’Brien?”

“Oh no,” she laughed, “that’s my son.”

“Your son?”

“Yes, Danny.”

“Is he there, please? It’s very important that we speak with him.”

“Yes, certainly. He’s upstairs doing his homework.”

“Mrs. O’Brien, how old is your son?” Weaving gave me a look like he knew what was coming.

“Danny will be fourteen next month.”

“He’s thirteen?” Weaving confirmed it, and turned to face the lawn, rubbing his temples.

“Mrs. O’Brien,” I asked, “Would you and your son please come with us to the police station?”

I just kept repeating in my head the words Weaving used when talking about our suspect: the most dangerous man in the world. Thirteen? Jesus.

## 4 Danny

MEADOWVILLE POLICE STATION - 11:30 AM

I sat in the interview room as Weaving stood in the corner, waiting for me to interrogate this poor little boy.

Danny sat up straight with his hands placed carefully along his legs, as though he thought we would shoot him if he made a false move. He kept avoiding Weaving's eyes. Weaving managed to convince the O'Briens that they would not need a lawyer, though he said he would be happy to provide one if they would like.

"Danny, do you know what this is all about?" I asked. Danny shook his head. Mrs. O'Brien sat next to him, angled so that she was looking at Danny as much as at us. Whenever I asked a question, I noticed, she looked at Danny while he answered.

I tried again. "Did you run a program on your computer last night? Maybe one that you haven't run before?" This time, Danny crinkled his brow when he looked at me, then turned to his mother.

"Danny, it's all right, just tell him the truth," she told him, and placed her hand on his shoulder.

Danny took a deep breath and looked me directly in the eyes. Danny told me that he ran a program that he found online. He said that his computer froze up for a bit, then continued working, but everything was sluggish. He used that word: sluggish. I could tell by the movement of his shoulders that

Danny was wringing his hands under the table.

Suddenly, Weaving stepped in from the corner, sat at the table, and took over the interrogation. “Now Danny, I want you to relax. Do you know why? Because I don’t think you were the one who wrote that program.”

Danny looked up hopefully. “I didn’t write it,” he said, “I found it.”

“You found it. There you go. Now we’re getting somewhere. Where did you find it?”

“I don’t remember. Some website.”

Agent Weaving swept his jacket tails from underneath so he could lean forward toward Danny with an amiable grin. “Now, Danny, we’re gonna need a little more help than that. There are a lot of websites.”

“I don’t remember. I just found it. I think it was called ‘Proof of Concept’ or something. That’s all I remember.” Danny started getting louder, and more defensive. Weaving’s efforts to relax him seemed to have failed. “Look, I didn’t know what the program did, OK? I just ran it and it didn’t seem to do anything. I didn’t know it was gonna...”

Weaving interrupted him and said, “That’s enough Danny. Thank you. Detective Byrne and I are going to step outside for a minute. Do you need anything? Mrs. O’Brien?” Then Weaving cocked his head toward the door and we headed out into the hallway.

It didn’t take long for Weaving to convince me that Danny wasn’t the person we were looking for. He finished with, “Our man is the coder, the guy who cracked this encryption. Besides, Byrne, no one wants a 13-year-old

boy to get nailed for this.”

I knew he was right, but Weaving seemed a little too sure of himself. “Don’t you think we should check out the website before we send them home? The site could have been a cover story. If you saw an adult squirming like that in the interview chair, you’d keep at him until he confessed. Kid or not, I don’t want to lose our only lead.”

“Are you testing my resolve, Detective? Or do you honestly think Danny is guilty?”

“I don’t think he’s proven his innocence. I want to hold him.”

“Your instinct tells you he’s the hacker?”

“It tells me something’s going on here.” I paused, but Weaving waited for me to answer his question. “No,” I said, “I don’t like Danny for the crime.”

Weaving requested a compromise. “Fair enough. We’ll keep Danny as a suspect. But I see no reason to hold him. We know where he lives. We can always pick him up again.”

I relented, satisfied that Weaving had acknowledged my objection. Johnston, still grumbling about his head injury, drove the O’Briens home. We were left only with a lead on a website.

Weaving stayed true to his promise and called Patty at the CRIA. I listened to the beginning of his conversation.

“Patty? Hi, it’s Agent Weaving. Yes. Well, we’re a little behind where we’d like to be. Yes, that is unfortunate. Listen, we spent a good part of the afternoon waiting on a judge. Right. You’re absolutely right, that would

have sped things up a great deal. Perhaps you know some people who could make some phone calls?"

Then Weaving turned his back to me, and I took it to mean that he wanted his privacy.

In the main room of the station, Kate was listening to Glitterbug, the Amber Ashmont song that was spread by the worm. "The network is slow," she shrugged, "so I figure I might as well listen to the song. It's pretty catchy. Oh, and did you hear? She's announced a tour." Kate pointed at her monitor. I read the article over Kate's shoulder.

Article excerpt from: [news.bbc.co.uk](http://news.bbc.co.uk)

Tuesday, 26 February, 2004, 15:41 GMT 16:41 UK  
Amber Ashmont plans world tour

Pop artist Amber Ashmont will embark on her first world-wide concert tour with a string of gigs in Europe during April, followed by US dates in May.

The 26-year-old Amber is expected to base the shows around her Glitterbug album, which gained notoriety today when it was spread across the world by a computer virus.

"Amber was hoping to work on her new album," Amber's agent said in a prepared statement to the press, "But the projected losses from this worm have obliged her to go on tour."

The singer's record label - Omega Records - said the tour would "be the most extravagant stage spectacle of her career."

[section omitted]

## 5 The Most Dangerous Man

MEADOWVILLE POLICE STATION - 12 PM

The ‘Proof of Concept’ website turned out to be an exercise in minimalism. It was immediately clear to me that Danny may very well have had no idea what this software did when he ran it. Weaving and I found the worm without trying. It was on a page dedicated to this programmer’s work, an online resumé of coding examples. Most of the programs on the site were accompanied by source code, but the worm only had a brief comment and a link to Professor Forrester’s paper. The comment read: “mp3 distribution via Forrester’s method.”

The author made no attempt to hide himself. One click on About the Author and we found his name and address. Milton Skapinski. Meadowville? Wait a minute. I knew this kid! I told Weaving as much, but he didn’t seem surprised. “The O’Brien boy probably overheard this Skapinski guy at McDonald’s or something.”

“Weaving, I don’t think you understand. Did you ever play video games? Online role-playing?”

“Not really, no.”

“About ten years ago, there was this game called Lunaria. You would pretend to be an elf or a wizard, or whatever. You know? You could build up your character, and participate in huge online battles, and there were these great story-lines...” I could tell I was losing Weaving’s interest, so I got to

the point, “Well, he doesn’t even mention it on his website, because he got sued and had to shut the whole thing down.”

“Oh.”

“Well, anyway, I used to play Lunaria, and I recognize his name from the game’s website. So, fine, you don’t care. Let’s just get him in here.”

I vaguely recalled an article from a computer gaming magazine. The article was an interview with Milton, who, in Lunaria, was known as Rothmiridor. There was an accompanying picture. Milton was everything I remembered, only ten years older. A heavy man in a dirty black t-shirt. Pale skin, raggedy beard. He slouched in the interview chair with his arms crossed. Had his hair been slightly longer, I might have guessed he was homeless. This was the most dangerous man in the world?

Weaving and I didn’t discuss beforehand how we would proceed with the interview. From what I understood, we needed to determine whether he was definitely the guy who cracked the encryption, and, if so, how. It seemed like Good Cop / Bad Cop might be a good way to go. Weaving showed his agreement by slamming his fist down on the table, causing Milton to jolt upright and jerk his hands to his sides.

“What are you waiting for? A cookie? Tell us about the worm!”

I was the good cop.

Milton re-crossed his arms and said to Weaving, “You’re FBI, huh? Figures you’re the bad cop.”

My turn. “Look, Milton, we’re not trying to crucify you here. There’s just a few things we want to get straight. Now, Kate tells me you don’t want a lawyer?”

“I haven’t done anything wrong.”

“Your worm just fucked up half a billion peoples’ computers, Milton. I’d say that’s pretty fucking wrong!”

“What Agent Weaving is trying to ask, Milton, is whether you really did write this worm. Did you?”

Milton looked at me, indignantly. “Yeah, I wrote it. So what? I never ran it. All I did was write down the code. It’s just a bunch of instructions that tell the computer *how*. But I didn’t *do* anything.”

So, I thought, this was our guy. Weaving was right about Danny. I spoke carefully to Milton. I could tell this was an issue Milton had already put a lot of thought into. No doubt he began composing a defense as soon as the worm was set loose. Or, perhaps, when he was still writing it. “This isn’t about free speech, Milton. Computer code isn’t like writing a book.”

“Code isn’t free speech? What about pseudocode, huh? Why don’t we bring Professor Forrester down here and hold him responsible. All I did was make a few changes to his code and change it into a real language.” Milton sat up proudly, “I translated.”

Weaving took another shot. “And then you posted this on your public website, without so much as a little warning that says ‘Danger: May disrupt global communications infrastructure.’ You little jerk. Give me a break. You

wanted someone to run this code. It was your plan.”

“You know what?” Milton thinned his eyes and glared at Weaving. “You’re right. I woke up one day, and I said, hey, you know what would be fun? Getting arrested. Yeah. Then I can get harassed by the feds and probably spend the rest of my days as some weak nerd inside federal pound-me-in-the-ass prison with rapists and murderers. Nice work, Sherlock, you cracked the case.” Milton leaned forward and placed his hands on the table, fingers interlocking. “Or, it was never my intention for the worm to be released, and you should blame whoever ran a program without knowing what it does. Twits.”

I thought I would need to restrain Weaving, but he played it cool.

I decided to play our ace. “Come on now, Milton, we don’t put you in federal prison just for writing some code.” Milton was suspicious. “We save that space for people who hack into classified government documents.”

Milton swallowed hard. Did he really think no one realized what that hex code was? I watched as little beads of sweat started to form on Milton’s upper lip. He wiped them away.

“What are you talking about?”

Weaving hit the table again. Even I jumped that time. “Too late, Milton! Too late to play dumb. Dumb people don’t crack crypto like that.” I mentally noted that dumb people do post it on the Internet, though.

Milton looked at his watch.

“How did you do it, Milton?” Weaving asked.

Milton was pretty sure he's screwed. He basically posted his confession online. "The crypto was broken. I tested out my theory, and it worked."

There was a knock on the door, and I answered it. It was Johnston, looking at me nervously. "Who, exactly, do you have in there?" Johnston asked. "Because there are agents here from the CIA and the NSA, and they seem extremely anxious to speak with him."

I whispered to Weaving and we headed into the main room. Sure enough, spooks. Three CIA and two NSA. Black suits on the former, blue on the latter. Agent Weaving begged my pardon, and escorted the five men into Milton's interrogation room, shutting the door behind them.

Five minutes later, Milton walked out of the room, suits on either side. Agent Weaving rushed up to me and said, "I'll explain."

"Explain what?" But then the agents started walking with Milton toward the exit. They were taking him! "Wait," I yelled. The six of them stopped and looked at me. "Um, Milton, why Amber Ashmont?" I couldn't think of what else to ask.

Milton glanced at Weaving before answering. "I just like her music." He shrugged. Then, they walked right out of the building.

"What the hell just happened?" Kate was the first to speak.

"A good question, Kate," I directed the comment at Weaving.

"They're going to perform an interrogation of their own."

"And then they'll arrest him? Can they do that? That's our job," Johnston declared.

Weaving shook his head. “No. More likely they’ll hire him. I told you before, Detective, he’s a brilliant, dangerous man. They’ll take ten minutes to realize what they’ve got in front of them before they ask Mr. Skapinski to sign on for life. Better to have him on our side.”

Suddenly, Johnston smacked his forehead with the palm of his hand, wincing from the pain. “Detective, I completely forgot. This woman from the CRIA has been calling for you.”

“I’ll handle it,” Weaving said. “Well, Detective Byrne, it’s been a pleasure. I’ll be sure to mention your name around hiring time, if you’re still interested?”

I nodded, flabbergasted, then added, “Wait, I thought you said this was a test.”

“No, *you* said it was a test. I said it was an investigation. And now it’s done. I really have to be going. Thank you all for your help.”

Weaving shook my hand, then Kate’s, then Johnston’s, and, just as suddenly as he had arrived, Weaving breezed out the front door. I stood there for almost a minute. Dumbstruck. I felt like I had just been swindled. I couldn’t point to anything that I lost, but there didn’t seem to be anything that I gained.

## 6 Keep Digging

MEADOWVILLE POLICE STATION - 2 PM

“Kate,” I asked, “What’s wrong with this picture?”

Kate listened intently.

“You are an FBI agent, and you call up a detective in the middle of the night to tell him that some dangerous man is lurking in his town, and that this man has wreaked havoc on the entire world. You fly all the way to this town and lie to the media. You find your first suspect, and convince the detective to let him go. Then, you find the real culprit, the man you were warning this detective about, and, out of the blue, government agents show up, take your suspect, and all you do is shrug and tip your hat goodbye?”

“Yeah, I guess that is pretty strange.”

“Let’s try this one. You are a talented coder, and you hack into the CIA. You take the evidence of your crime, tie it up with a pop song, and post it on the Internet so some kid can run it and spread this evidence across the globe.”

“Maybe it was an accident?”

“No accident. You are a smart hacker.”

“OK, maybe I’m boasting,” Kate ventured.

“But no one even knows it was you who did it. Hell, only a handful of people even know what that hex meant.”

I paced my office. It was a nervous habit, but it released my tension

and helped me think. It was driving Kate nuts. “Cut out the pacing, would you?”

I looked at my watch.

Wait: I looked at my watch.

“Kate!” I snapped my fingers. “You are being interrogated by a loud obnoxious FBI agent who just revealed he has enough evidence to bury you. What do you do?”

“I shit myself.”

“Wrong! You look at your watch! Milton looked at his watch. He was waiting for something. He *knew* those agents were coming for him.”

“How?”

I sucked in a deep breath, as though preparing to explain, but then only whimpered, “I don’t know.”

“Maybe Weaving? If Weaving knew the agents were coming, he could have tipped Milton off. He certainly didn’t seem too surprised to see them.”

Kate had a point. “You think Weaving was just trying to recruit Milton?”

“Maybe.”

“Then what was the point of this worm? If Weaving knew it was Milton who cracked the code, why not just show up and say, ‘Hey, I caught you, work for us’? And if Weaving didn’t know about the hack before the worm, what was the point of the worm? What was Milton thinking?”

“I don’t know, David.” Kate came up and joined me by the window. Outside, we could see the parking lot through the crooked branches of the

naked trees. It had started to snow, and a white dust was slowly turning the asphalt from black to white.

“Something just isn’t right,” I said softly to her. “I’m gonna have to keep digging.”

“What can I do?”

“Get me the O’Briens.”

Moments after I pulled up in front of Milton’s house, my cell phone erupted with a rising crescendo of beeps and tones. It was Kate.

“They’re gone,” she said simply.

“What do you mean? Maybe they’re just out somewhere.”

“No, David. I went to their house. No one was there, but I looked in the windows. There’s no furniture.”

I felt a cold chill run down my spine as I turned my head to face Milton’s single-story home. “How is that possible? We only dropped them off a few hours ago.”

“What should I do?”

“Weaving,” I said. “Call the FBI, ask them if there’s a Weaving working for them. Find out whatever you can about him.”

I hung up and got out of the car. A thin blanket of soft white snow had already fallen. Milton’s house was a tiny brown thing, tucked in among several enormous maple trees. I approached the front door cautiously, trying to see inside the windows of the darkened house.

The front door was ajar. Warm air was still pouring from the crack; it had been opened recently. I quickly drew my weapon. I watched the puffs of white condensation leaving my nose grow thicker as my breathing became heavier. I looked back at the front lawn and saw only my footprints. Whomever was inside was probably still there. Milton lived alone. This was someone else. That was enough probable cause for me.

I stepped silently into the house, gun pointed straight ahead.

I was finishing my sweep of the first floor, having found nothing more remarkable than some dirty dishes, when I heard a noise in the basement. The door to the basement was wide open, revealing an unfinished wooden staircase that led down to a bare light bulb fixed into the ceiling.

Just then, my cell phone rang. “Fuck!” I muttered under my breath as I scrambled behind a corner, groping in my pocket to grab the phone. So much for the element of surprise. While backing myself up to a defensible position in view of the basement doorway, I answered the phone. “Bad time, Kate. You talk, I’ll listen.”

“Shit. Sorry. I called the FBI. They say Weaving’s legit, but when I tried to get more information, they started dancing around my questions. This guy’s definitely FBI, but either they’re a part of whatever’s going on, or Weaving’s gone rogue and they’re trying to cover it up.”

I kept my gun trained on the doorway.

“There’s more. I took a closer look at the O’Briens. Danny’s not registered with the school district. Their house was just a rental. I didn’t notice

any of this the first time, because I wasn't looking for it. But, David, listen: someone changed these records. This was an inside job." Kate paused for a second, giving me a chance to respond. I remained silent. "Be careful," she said, and hung up.

I slid the phone into my pocket, cursing my stupidity, both for leaving it on and for not seeing through Weaving from the beginning. It had to be him. An inside job. A rogue agent. Nothing definite, but this was instinct.

Of course, there was only one way to be sure.



## 7 The Basement

SKAPINSKI RESIDENCE - 3 PM

I found Weaving in a back room. When I walked in, he was seated at a computer chair, facing the doorway. Smiling. Waiting.

“Hello, Detective. I’ve been expecting you.”

I aimed my gun at him, which perturbed his smile. “Don’t move, Weaving. You’re under arrest.”

“Oh?” He seemed amused. “For what?”

I moved slowly into the room, making my way toward Weaving. “For conspiracy to...”

Then I saw the wall. Hundreds of posters and news clippings of Amber Ashmont covered this wall of Milton’s basement. It was a shrine.

“Impressive, isn’t it? Milton really is fond of the girl. Listen, would you mind not pointing that gun at me?”

I trained my gun on a point just to the left of Weaving’s head. A token gesture. “What the hell is going on? What are you doing here?”

“You tell me, Detective. It’s your show.”

Weaving had been waiting for me, no doubt. Parked his car around the corner so I wouldn’t see it, left the door cracked so I would have an excuse to come in. But why? Not to kill me. He wanted me to see this. He wanted me to figure it out. “You released the worm. With Milton’s help.” I glanced at the many faces of Amber Ashmont, smiling back at me. “And she’s the

backer.”

“Aw. Two out of three. Why get that poor girl involved in this?”

“Because that worm wasn’t nearly as bad for Amber as she would have people believe, and everyone knows it except the CRIA and Omega Records. Her just-started world tour is sold out, her music has reached an unprecedented audience, and she was unknown two months ago. Amber isn’t losing any sleep over this worm.”

“That’s true, Detective. Everyone knows the worm was a blessing for Amber. Makes for a rather poor crime when everyone knows your motive, doesn’t it?”

I furrowed my brow. I only had to scrutinize my accusations for a moment to realize they were flawed. What did Milton’s hack have to do with anything? What about the O’Briens? And why would Amber be made to look so guilty unless. . .

“Smoke and mirrors,” I said to Weaving. He raised his eyebrows. “She was just a flashy light to distract people. The worm benefits someone else.”

“Very good. And who is that?”

“You.” I lowered my weapon. “The FBI. The CyberSecurity Act vote is in two days. Between the worm and the hack of the CIA database, Congress will have no choice but to approve the intelligence spending bill.”

“There was no hack, of course,” Weaving corrected, “The CIA is a part of it as well.”

“But, the worm,” I thought out loud, trying to make sense of it, “You

caused millions of dollars in damage, at least. All for a bill?”

“No one died, Detective. The powers granted by the CyberSecurity Act will save lives. It’s that simple.”

“Why are you telling me this?”

“Because I know you. You want this bill as much as we do. You and your late wife worked hard to get these provisions passed. And because I’m offering you a job. This *was* a test, obviously, and you did what I had hoped you would, which is pursue your suspicions about me. Of course, we’ll have to teach you to leave your phone on ‘vibrate’.”

I ignored his offer. “So, who were the O’Briens?”

“Agents. You’ll meet them at the Bureau. Assuming you accept.”

“Milton?”

“He’s CIA. I don’t suspect that you’ll *ever* see him again.”

It was all so simple. The FBI spread a worm that framed Amber and enraged powerful industry lobbyists. They invented a hack that motivated a speedy and quiet investigation, and gave the case to a detective who agreed with their cause and who they intended to hire anyway. The investigation looked legitimate, but only because the crime was perpetrated by the very body charged with investigating it.

I finished my thought out loud, “And then you destroy the evidence, close the case, leave Amber under suspicion by the public, and wait while the record industry pushes for your spending bill.”

“Beautiful, isn’t it?” Weaving stood. “So, about the job.”

“What if I refuse?”

“Then I disappear, along with all evidence of our involvement. You go back to the station and continue with your life,” Weaving answered evenly. “Obviously, I’ll need an answer now.”

I holstered my weapon and requested a minute alone. I went upstairs, out of the house, and to the back yard, which was now a glowing white. The wind stung my cheeks and pushed the flakes so that they fell at a sharp angle to the ground. The trees formed a loose canopy above the yard with their long, meandering branches.

I thought of my nightmare and sucked in a sharp breath. The cold air stung my chest. I could almost hear Angela’s voice in the creaking of the wood, the moan of the winter storm. I’m cold, David.

I shivered. Closing my eyes, I tried to imagine holding Angela again. Warm by the fire, her porcelain skin blushed red. My darling, what should I do?

“Sorry to disturb you,” Weaving appeared behind me. I straightened my back, suddenly concerned with his impression of me. “Have you made a decision?”

I pulled on the knot in my blue tie, tightening it around my neck. My bedroom mirror reflected a man in a barely-used suit. I never could get the knot to sit correctly; it always seemed to angle to one side. Angela used to help me with that, on those rare days when my tie needed to be perfect. I

grabbed my wallet off the dresser and flipped open the leather flaps. The card inside read: FBI.

Kate accepted my silence regarding the events surrounding the Glitter/mp3 worm, especially once I made it clear that her insistence was straining our friendship. Johnston, meanwhile, seemed just as happy not asking at all.

I walked out into the hallway and looked at the flowers. Red Gladiolus Tribute. Sitting at the end of the hallway on a wooden pedestal underneath a window. Fresh and bright red in the light of the morning sun. Kate helped me pick them out, once I told her I wasn't ready to have a hallway without flowers. Perhaps she deserves some flowers of her own, I thought.

I would replace the flowers when they died. Royal Remembrance would come next. I wasn't ready to have a hallway without flowers.

Not yet.