Blue Screen

How Peter Gustafson Defragmented the World
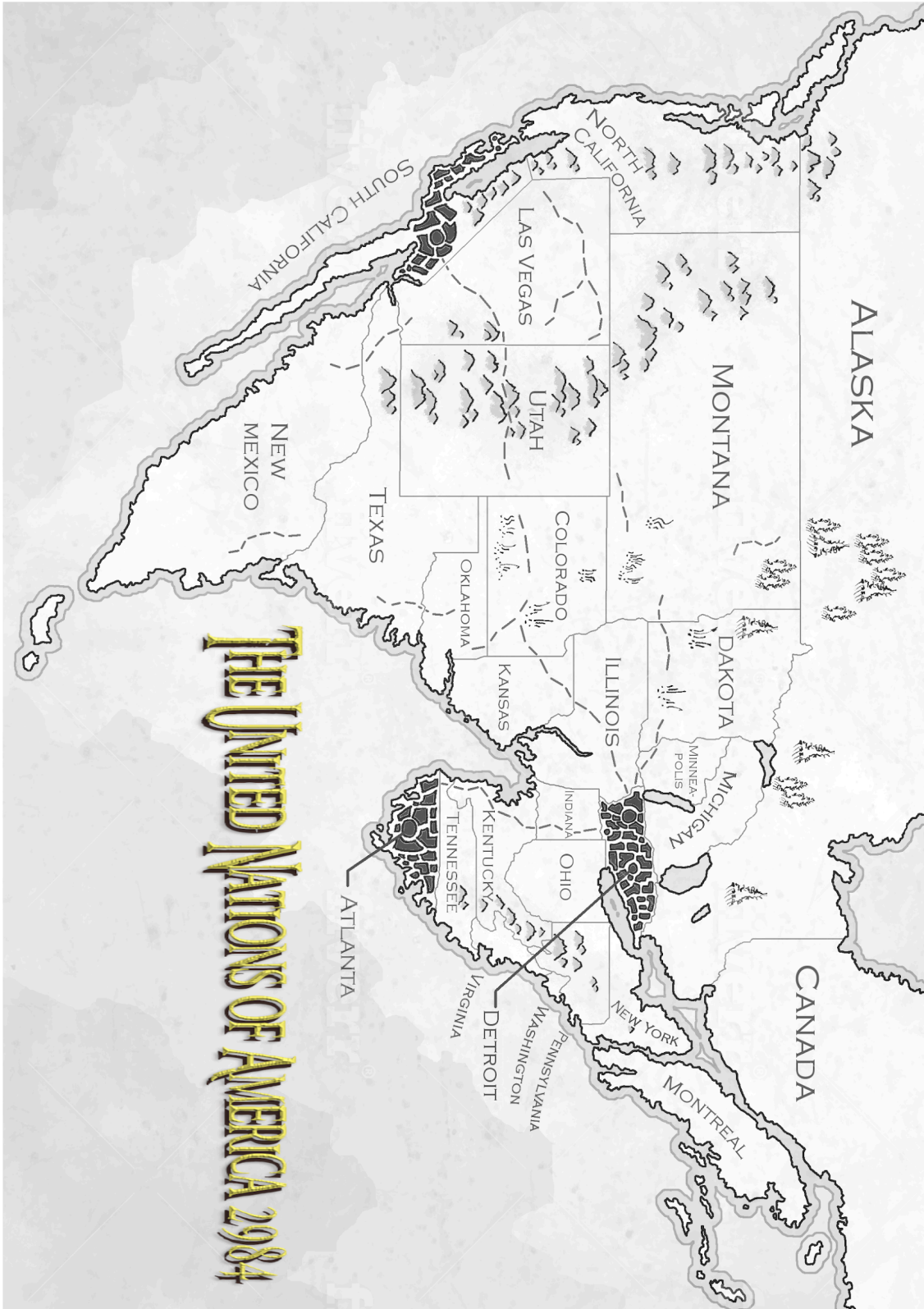
Kyle Benzle
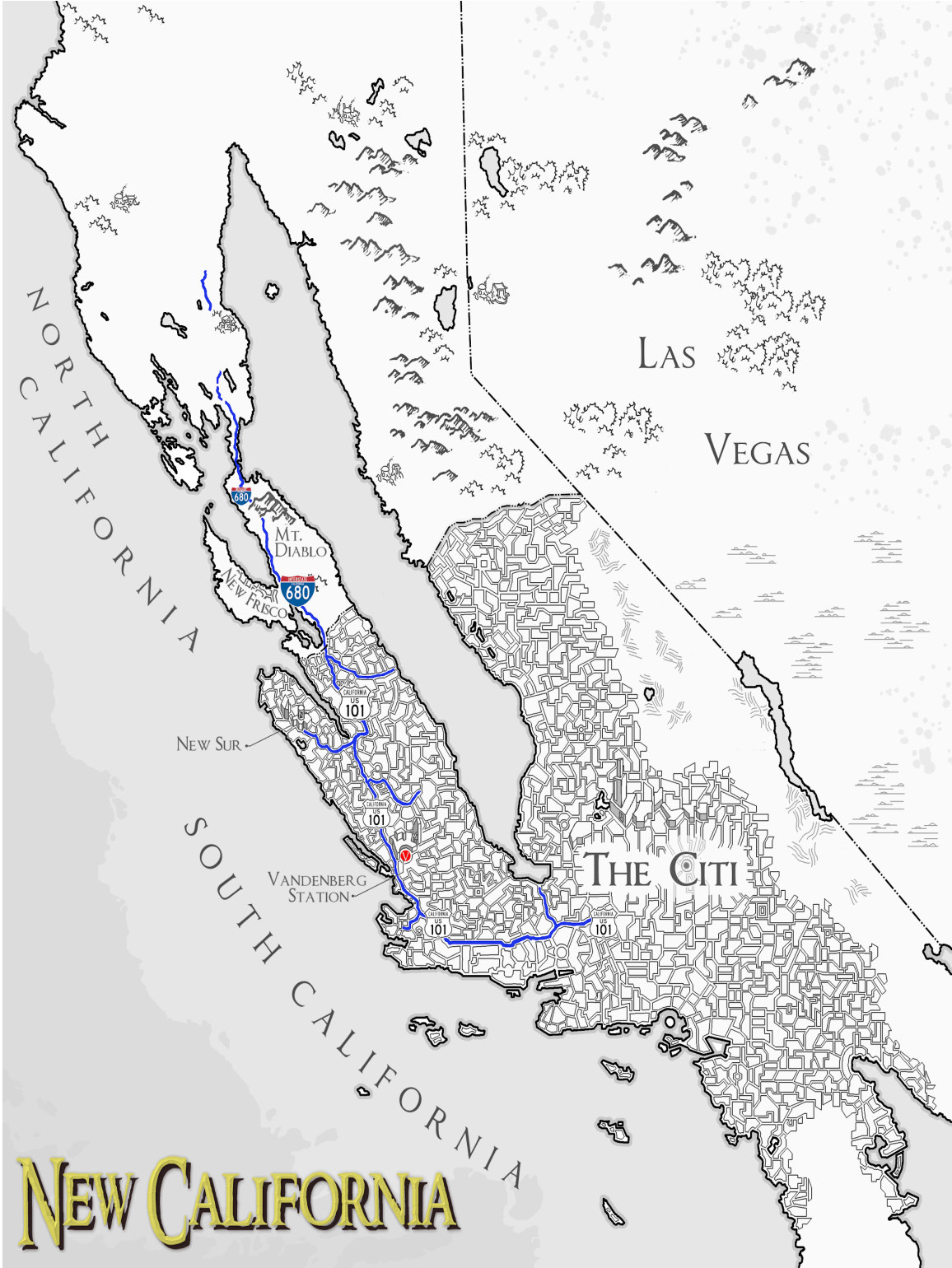
NORTH CALIFORNIA

LAS VEGAS

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680

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THE CITI

SOUTH CALIFORNIA

NEW CALIFORNIA

THE UNITED NATIONS OF AMERICA 2984

SOUTH CALIFORNIA
NORTH CALIFORNIA
ALASKA
MONTANA
LAS VEGAS
UTAH
NEW MEXICO
TEXAS
COLORADO
OKLAHOMA
KANSAS
DAKOTA
ILLINOIS
MINNEAPOLIS
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INDIANA
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KENTUCKY
TENNESSEE
VIRGINIA
WASHINGTON
PENNSYLVANIA
NEW YORK
CANADA
MONTREAL
ATLANTA
DETROIT

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Chapter 1

The Machine Stops

This is an emergency.
The following instructions are vital for your safety.

Until an all clear is given, please:

Return to your home.
Power off all electronics.
Close and secure all entrances.
Do not interact with anyone outside of your home.
If someone is missing do not attempt to locate them.
Do not attempt to investigate.
Do not attempt to investigate.
Do not look up.
Remain calm.

Jayrod jumped when an unusual *buzz, buzz* sound came from the kitchen haloscope, it then displayed and read aloud the emergency instructions. His earpiece phone gave two quiet dings, he heard air raid sirens in the distance whir to life and every digital display in the house began to flicker.

His wife, Melissa, was running late getting home from being on call and Jayrod had been putting the finishing touches on dinner for the family of three. Peter, their teenage son, was already in his room for the night and usually would not have been seen again until the next day.

Jayrod spoke loudly in the overly enunciated voice he used with machines, "Halo. News."

The haloscope used a calm and neutral voice, optimized specifically to put Jayrod Gustafson at ease, it said, "Please power off all electronics. There is no news at this time."

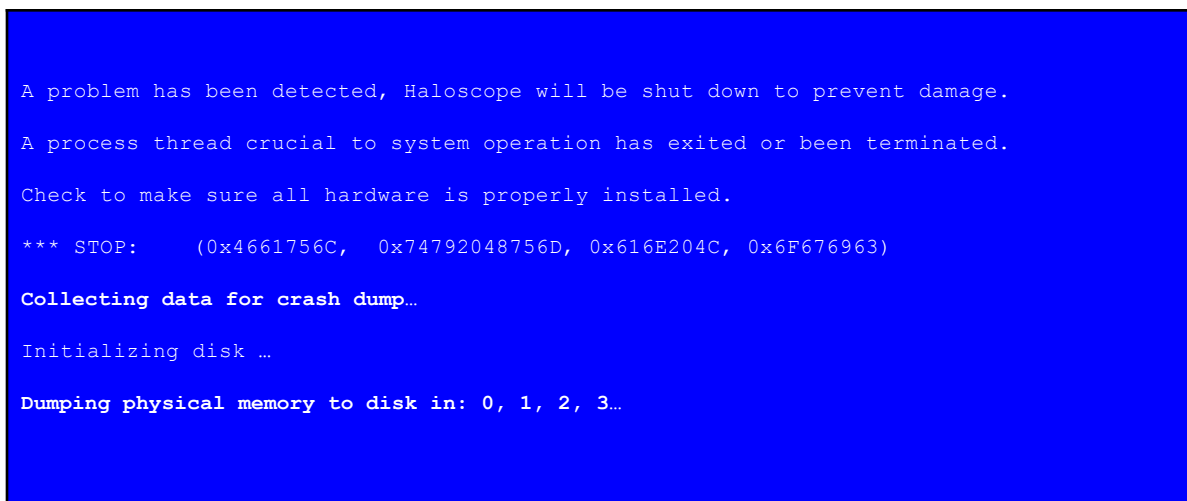"Halo. Mail." Jayrod said louder and slower.

"Please power off all electronics. There is no mail at this time."

"Damn it," he cursed to himself. "Halo. Call Melissa."

"Please power off all electronics. Melissa is not available at this time."

Tapping his earpiece caused a transparent screen and keyboard to appear directly in front of him. He quickly typed into the search box: *haloscope not working call halo support*.

Jayrod was about to hit the Enter button when the screen went an ugly shade of dark blue, then quickly filled with white text.

```
A problem has been detected, Haloscope will be shut down to prevent damage.

A process thread crucial to system operation has exited or been terminated.

Check to make sure all hardware is properly installed.

*** STOP:    (0x4661756C,  0x74792048756D, 0x616E204C, 0x6F676963)

Collecting data for crash dump…

Initializing disk …

Dumping physical memory to disk in: 0, 1, 2, 3…
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The computer counted from *0* to *100* over the next ten seconds and Jayrod watched trying to understand. *Crash dump*? *... Collecting what data*? It was probably just another forced software update he thought but Jayrod was not the only one seeing this message. His son Peter was watching the same countdown on a screen in his room. He was trying to make sense of the hex codes. Peter thought maybe he had triggered some security feature on the screen he had *borrowed* from school a few days earlier but it was not just his device either.

Every screen on the planet, every electronic display from watches, TVs and refrigerators to cars, airplanes and space shuttle consoles, all were displaying the same blue screen and countdown. People all over the world were watching the same thing, scratching their heads about what it meant and asking all in unison, "Where in the *hell* is the IT guy?"

Chapter 2
Crash Dump
32006967600

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Collecting data for crash dump …

Dumping physical memory to disk: ...98, 99, 100

Physical memory dump complete.

Press Enter to continue… |
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Every screen on the planet hung, everyone was seeing a version of the same blinking cursor. People with keyboards pressed Enter, nothing happened. Many people started saying, louder and louder, "Enter, ENTER", "Power off", "Restart you stupid thing!" When none of that worked 2-3 billion people all at once started searching for the power button on their respective devices. It didn't take long for people to get frustrated with technology that had worked flawlessly their entire lives when it was no longer responding to their demands.

All of ten seconds passed before in every spoken language, people all over the world started screaming at the blue screens in front of them. But the screen just sat there, cursor blinking. All around the world gamers and stock traders were smashing their machines to bits in a collective rage, a mass hysteria. Students submitting last minute assignments were crying in fear. Hospitals, airlines and militaries were holding their breath and for a moment everything was frozen.

Peter Gustafson stared at the screen too. He wasn't sure if he wanted to continue or not. It looked like it was clearing the local memory, garbage collecting. Not a big deal but he didn't want to risk losing the homework he had just been working on. If there was a way to bring up a terminal window he'd be able to kill the process that was trying to push the restart request but Ctrl+Alt+Del wasn't working. He let another moment pass, 10 million people screamed for *SOMEONE TO PLEASE DO SOMETHING!* Peter, alone in his bedroom pulled the keyboard up on his screen, thought another moment about having to rewrite his Programming 3 assignment, looked at the Enter button then, with purpose, he blinked.

The second he did, everything in the house that drew electricity died. Lights went out all at once, every screen in the house went black, the phones were dead. Jayrod checked, it wasn't the breakers and it looked like the neighbors' and street power was out too.

Jayrod whisper yelled toward his son's bedroom door, "Pete, you still up Bud?"

"Yeah, Dad it's only like 19:30."

"The power went out."

"Uhh, yeah, is everything ok?" asked Peter.

"Oh, sure, it was weird. Some message came up on the halo right before it happened, and my earpiece went out too," Jayrod said, accustomed to complaining about technology to his teenage son. "Would you mind taking a look at it? The battery is only a few months old, so it should run fine, right? I want to try and call Mom."

"Uh, if it can't connect it's gonna be useless. Is it just our house? I can go check next door," Peter was quick to offer.

"I'm sure it'll be back up in a minute. It looks like everyone on the block at least, but I'll get the flashlights from the basement," he said, already walking away from his son's door.

Late afternoon sunlight flooded through the floor to ceiling windows of the large family home. The warm orange glow filled the interior as it reflected off every spotless surface in the picturesque modern home of 2984 nestled along the coast of Southern California.

It was still bright enough that Jayrod could make his way around the house but the basement stairs were pitch black. On the way down he was completely blind. In feeling for the unfinished railing he nearly fell when he overestimated and hit the back of his heel on the front lip of the step. As he started to fall he was able to grab the railing, swing down and around to pull himself tight onto the wall and steady himself, but not without making so much noise that Peter jumped out of bed and came running.

"Dad, what happened, you ok!"

"Ohh, sorry about that, it's fine, just slipped, I'm fine."

"Jeeze, Dad. Here, I'm coming," said Peter from the top of the steps.

Together they carefully made their way down the steps with one hand on each other's arm. At the bottom Jayrod started groping blindly for the family junk drawer.

"Here, try these," he said, handing Peter two small old flashlights and a battery shaped tube of glue.

After trying each flashlight and setting the glue back down on the workbench, Peter said, "Nope, these are dead, we got more batteries right?"

"They should be good, I tested those just a few years ago. Try these," said Jayrod, handing Peter two fresh from a pack.

"Nope," said Peter after a few seconds.

"Did you even try 'em'? It must be the bulbs but mine's not working either, damn it."

"Dad, there's no bulbs in these it's a direct current to light kinda thing, there's really nothing to *go bad*," in the tone he used when discussing anything technology related with his father.

"Well then, what in hell else could it be--" Jayrod was cut off by the front door of the house opening and Melissa calling in, "Hey, Jay, Pete, you guys home?"

"Thank God," said Jayrod. "Hey love, we're down here, nothing seems to be working."

"I'll get the candles," shouted Melissa. "It's freaky, everything is down, huh? I had to walk from the corner; I figured my battery had just died but the street lights went out too. It's spooky out there. So glad to be home."

Making their way back up the stairs with the broken flashlights and dead batteries, Jayrod asked, "Did you see anyone else out there, what happened? Did everything, what, just, went dead?"

Melissa answered her husband, "It was weird, right? I left the car up the street and figured I'd call a service from home. The only other car I saw was Mark from next door driving his classic, I said hi and asked if he knew what was up."

"Yeah and what'd he say," urged Jayrod anxiously, "How the hell is he driving around if everything else is out?"

"Said he was just running to the store, he was having trouble with his classic Toyota, and, 'wasn't it a beautiful evening for a drive?'" Answered Melissa.

"Damn it," replied Jayrod thoughtfully, "damn it, damn it."

"It's just a blackout. It'll be *row-man-tic*; where are those candles, is dinner ready?" Melissa asked in quick succession.

"It's almost done. I was going to warm up a sauce for the meatfree, but we don't really need it. But God, I've got stuff to do tonight. I just hope it's not more than a couple hours like during that solar storm in the 30's," Jayrod whined to his family.

"Jay, this is nothing like that bad. Pete, you gonna join us tonight? You don't want to be alone on a night like this," teased his mother.

"Yeah, I guess," Peter said, knowing he now had nothing better to do.

Like a well oiled machine, Jayrod, Melissa and Peter Gustafson finished getting dinner ready and had the table set in minutes, not slowed down in the least by the reduced light. Melissa was right, it was *row-man-tic* and the meat product was excellent. Jayrod had always been a good cook and accommodating husband.

At dinner, with candles on the table, Peter said, "You know guys, I don't think it's a blackout. I mean, not like a normal one at least."

"What do you mean, *not a blackout*? Everything is blacked out, isn't it?" asked Jayrod.

"But, like the flashlights and Mom's car, I mean, that stuff should all work and then there was that message--." Peter cut himself off. His parents didn't know about the screen he kept in his room, so his Dad did not know he had seen the message too. "Dad, didn't you say there was a message on the haloscope before it happened?"

Jayrod, self assured said, "That was weird but probably just a coincidence. Anyway, it looks like nothing is going to happen tonight, so we might as well turn in early." Losing his confidence he continued, "But damn I'll have a lot to catch up on for tomorrow then."

"Don't worry, Jay, everyone is going to be in the same boat. Dr. Lee will totally understand if you're a little behind," Melissa reassured.

"Yeah, I know. I'm going to bed. We can do the dishes tomorrow. Pete, good night, please make sure you're up and ready by eight. Love you guys." Taking a candle with him, Jayrod left his plate in the sink and went to bed.

"Good night Dad, love ya," said Peter and then waited a moment for the sound of his footsteps to fade before saying to his mother, "But Mom, really, what do you think? It's not a normal power outage is it? That message, did you see it?"

"Honey, I am sure everything is fine; I didn't see any message, but like I said, everyone is in the same boat here, and I'm sure it'll be back up in the morning," Melissa was trying.

"What if it was like an EMP or something they used in the war [1]. That's the only reason the flashlights, cars and power would all be out, you know, like an attack, we learned all about this kind of thing happening in the old days. And that message, I, uhh, I did see a little of it and it looked like some kind of warning and then an error message. I have never seen anything like it before. Like, why would there be an error on our home computer, then ALL the power goes out?" Melissa could see her son was starting to get worked up and she tried to comfort him the best she could.

Melissa pushed herself back from the table to stand up and walked over to Peter to put her arms around him. "I love you, Pete, and you're right, something is kinda weird here,

but I don't have a clue what to do other than wait and see. Tomorrow we'll go get the car and figure out what's going on, I promise."

"But, what if it *is* an attack? What if we need to do something? What if that message was some kind of warning? It said stuff like, 'Don't go outside, don't talk to anyone.' I think they turned the power off on purpose, Mom, seriously. Something is going on."

"Well, I am going to get some sleep but will be very interested to see tomorrow what this is all about. I love you sweetheart. Now please try and get some sleep."

Melissa hugged her son as tight as she could, something she had not done for a while. He was so big, almost a man, she thought. She held him for just a moment before saying good night again and heading to bed to join her already snoring husband.

Chapter 3
The Gustafsons

The Gustafsons were a working-class, dual-income family that lived in government housing. It was a situation that Jayrod was not proud of, especially since they did not even own their vehicle outright. Jayrod earned his Ph.D. in business-to-business marketing ethics from the local community college. Melissa received hers a year earlier in substance abuse counseling. A two year online program so she could stay home with Peter while he was still young.

They lived on two hectares in a rural township on the New Sur peninsula of South California. Nestled just west of Salinas Bay and the larger town of New Frisco all within the municipality of The Citi. The 550 kilometer west coast of South California was a single continuous urban development project known as, The Citi. From the 30th to the 37th parallel everything of value had been slowly incorporated into what was historically Los Angeles. The Citi was a free state and superficially a democracy but was in fact an advanced technocracy that had been governed by algorithms and game theory for over half a millenia.

Compared to any other time in human history, the Gustafsons lived a lifestyle considered lavish and privileged. Their fully automated home was a modest 5,000 m^2 and the family of three depended on just a single haloscope assistant. Both parents worked what was considered grueling five hour shifts four days a week but despite the hardships the family made it work and they were happy.

It was a beautiful day in early autumn, when the afternoons were still warm but the nights began to chill. It was Melissa's favorite time of year and some of her happiest moments were sleeping in on frigid mornings, bundled up in goose down and warm with her husband. The next morning was not one of those. Melissa was the first one up and by the way the sun was angled through the window she knew she had slept in and was instantly frantic.

"Hell," she whispered to herself. Then much louder, "What in the hell is going on with this damn power?" Loud enough to both release a little tension and be sure to wake Jayrod.

"Uhh, what babe? Oh, did it still not come back on? What time is it?" Jayrod managed to put together an almost coherent sentence.

"I don't know! I don't know what freakin' time it is because nothing works!"

"Oh. Oh crap, it's late? I gotta go. Pete!" Jayrod called from bed.

"Damn it, damn it!" A former Navy man, Jayrod was up, out of bed, had his pants on and was finishing the buttons on his shirt before Melissa had woken up the rest of the way.

"I'll just say it was car trouble. I can tell them, like, *last night the car died in that thing,* like happened to you, *and I had to go get it this morning*," Jayrod practiced out loud which excuse he would use with his boss.

Weaving a belt through his pants as he walked into the living room Jayrod said loudly, "Pete, you ready Son, it's time."

Peter was already up and ready to go. Jayrod noticed the dishes in the sink and was impressed that Peter seemed to have already eaten breakfast as well. He was sitting at the kitchen counter, focused intently on a notebook, a dictionary he must have pulled down from the crawl space last night and an old copy of a National Geographics map which Peter had highlighted and filled in the margins with scribbles and notes.

Jayrod looked over his son's shoulder and saw the page filled with numbers and what looked to him like greek.

"Working on some last minute math homework, huh?" Asked Jayrod as cheerfully as he could muster in his rush. "You ready to go then?"

"Dad, there is no way they are having school without power. Three out of four of my classes are programming or at least screen based."

"Well, what's your mom say?"

"I don't know Dad, you guys *just* got up," explained Peter.

Jayrod called back to the bedroom, "Melissa, does Pete have school with the blackout?"

"Yes. If we haven't heard anything you can't just skip school, Petey. Love you guys, see you tonight," Melissa spoke as loud as she could without yelling from the bedroom.

Jayrod drove a seventeen month old SAIC that looked like a small neon gray, impossibly sleek spaceship. The vehicle could seat 4 comfortably, required no outside fuel or power and would transport the user anywhere within a few kilometers in seconds and anywhere in the world in no more than a minute. Jayrod hated his with a passion. Interplanetary travel was available on this model but he refused to pay the extra fee to enable it and preferred to remain bitter.

Most auto manufacturers had long since consolidated to producing only a single model: DaeWoo, GE, Daihatsu, Datsun and Honda each had just one vehicle they made but with a new edition released every month. There were lease programs for the wealthy. One would be guaranteed to never be driving a vehicle for more than three months past

its release date. The Gustafsons could never afford one of these leases, thus Jayrod's was a company car. As such he was forced to suffer with vehicles that could be up to 24 months old, in other words, dinosaurs.

The old dinosaur was giving Jayrod trouble this morning, "That's why I hate these damn Russian cars, after a year they barely work."

Jayrod popped the hood, jumped out and took a long, thoughtful look before poking one of the battery connections that looked like it might be loose. "See, these damn cables need constant tightening. It's such a hassle."

Feeling proud of himself, having successfully asserted his manhood over the compact car, he closed the hood and fell back into the driver's seat and pushed Start.

Nothing.

"Daamn it, daamn it," Jayrod tried to cajole the engine to life. "Come on, we got places to be," he pushed Start a few more times.

"Dad, what about Mark? Maybe he could give us a ride," Peter posited.

Mark was the Gustafson's neighbor. He had lost his wife five years ago to a brain scanning accident and was now raising their daughter, Cassandra, alone. Cassandra was a year younger but had skipped a grade. Long before any of the other kids had noticed her as anything other than the stuck up girl who thinks she's so smart, Peter had fallen in love. He knew that Cassandra would be with her dad on the way to school and this would be a perfect chance to sit next to her in the back seat. Perhaps there would be a sharp turn taken a little too fast, maybe she would brush past him getting in, Peter dreamed.

"Yeah, ok. Go see if you can catch him. Ask if he can drop me off at the plant too would ya?" Jayrod asked his son.

Peter got out of the car and jogged next door. Thinking, *casual, got to look casual.*

"Hey, Mark, how ya doin'? Oh hey, Cass, what's up? Didn't see you there," said Peter in his best impression of what a confident person sounds like.

"Uh, going to school, obviously," It was early and Cassandra did her best, *I'm annoyed voice.*

Mark asked, "What's up, bud? What's going on?"

"Um, my Dad's having some car trouble, do you think you could drop me off at school? Oh, and my Dad too?" asked Peter.

"Yeah, of course, hop in. Where's your Dad?"

"Daaad," called Peter, "It's cool."

Peter got in the back, putting his backpack on the outside window seat, forcing himself to sit in the middle *like it was no big deal*. Jayrod walked briskly over, got in and thanked Mark.

"You know, I was having some trouble with my Daihatsu last night too, did Melissa tell you? I saw her stuck out on the road, she okay?" Mark asked.

"Yeah, she did mention it. I tell you, these new cars just keep making em' worse and worse. I'd be better off with a classic like this one," complained Jayrod.

"Sure, but try finding gas when you need it anymore, not like when you and me were kids, right Jay? Now ya gotta practically distill the stuff yourself," Mark tried to agree.

Cars were abandoned on the side of the road but Mark and Jayrod ignored them. Instead they continued to talk and complain about this and that new technology and how much better its predecessor was. After a few minutes of silence in the back, Peter said to Cassandra, "So, how about this blackout, huh?"

"Yeah, it sucks," Cassandra said without averting her attention from the car's window.

"Totally, I mean like, everything is out, even non-connected stuff, like flashlights. I can't believe your dad's car even started," said Peter, perking up with the conversation.

"Yeah, he had to do something weird, like he made me freaking push him down the hill today to get it started, like the whole car, *myself*." Cassandra complained.

"Do you think this could be something else, like another attack from Canada or something? I mean, like something on purpose?" asked Peter.

"Probably," agreed Cassandra, "They probably do this crap all the time, like last year I was logged on and my whole screen went dead. Then I logged back and I had lost all my saved music, vids, everything. It was just gone, but none of my other files were missing. I think they just like to screw with us."

"Yeah, exactly. That's exactly what I was trying to talk to my Mom about," Peter hesitated half a second, in a way that let Cassandra know just how concerned he was, "I was just telling my parents that it was no normal blackout."

Now in a lower voice Cassandra replied, "Yeah, whatever though, I don't really care, I can just re-link from Sara's screen anytime, hopefully schools closed though."

"It should be, I don't know how the hell they expect us to program without screens, I heard they used to have people write out programs by hand. People used to be so stupid ya know," Peter had run out of material but was trying to stretch the conversation.

"Yeah, I guess." was how Cassandra chose to end it. She was not interested in hearing Peter make fun of their parents' generation again. *Why was he always so negative?*

Chapter 4
Cassandra Gets a Message

"Kids," said Jayrod, twisting to face the back seat, "I'm running late. Is it alright if Mark drops me off first? Mark, would you mind?"

"You know, Hot Rod, the school *is* on the way. It would-" Mark started to say.

"Yeah, but you know, the boss is already riding me about *tardiness* and some other crap, I'll even call the school when the net is back up and tell them it was *my* fault. Sorry kids, but you know, I can't lose this job," Jayrod pushed.

"Look, why don't we drop the kids off at the light on Higgins. It's a block from school and it'll save Jay some time," compromised Mark.

"Yeah, that's fine. Thanks, Mr. Guinn, but Dad, like I was trying to say earlier," Peter had to finally pipe up. "There is no way school is open, and look, we haven't seen a single other car driving. This is crazy."

"It has been rather quiet, but I bet a lot of people are just staying home too, you know, any excuse to play hookie," Mark wasn't helping.

Jayrod continued, "Look, I'm sorry, guys, but a blackout doesn't mean no school. Pete, once the net is up give me a call ok? Mom'll pick you up." Jayrod told Peter, "Now here it is, love ya Pete. Good see'n you Cassie.

"See ya, Mr. G., bye, Dad," said Cassandra exiting street side.

After one final attempt at using reason with his father, Peter didn't even have the door closed before the car started pulling away from the curb. "Jesus," whisper cussed Peter.

Walking the last block toward school, Peter decided that he would respect Cassandra's apparent desire for silence. That is, until he could think of something to say.

"I knew it, now what in hell are we supposed to do?" said Peter as they neared the obviously closed main building of Big Sur Memorial High School.

About half a dozen other freshmen and sophomore students were milling around the front door reading a handwritten note signed by the school's principal.

Due to a city wide power outage, classes will not be held today.
Normal hours will resume tomorrow

-Principal Dr. Showell

"Well, I guess I'm gonna walk back," Peter said.

"Why not just wait for my Dad? I'm sure he'll be right back, it'll take an hour to walk."

"It's not bad. I can do it in like 45, I did it a few times last year when my Dad forgot to pick me up… Well it's not bad. You could, uh, come, if you wanted."

"Nah, I'll just wait. Thanks, though," Cassandra declined sweetly but it still hurt.

In front of the school, Cassandra sat down on the cool concrete steps in the warm early morning sun. She sat on the far side of the School's monument-like steps up to the main entrance. In a reflexive motion whenever bored she started to pull out her mobile screen before remembering the network outage. Putting the presumed dead device back in her purse she saw the screen was actually glowing in the bottom of her dark bag. It was on. She swiped, tap, tap, and she was in her new messages, the screen read:

1 New Message

"Pete, hey Pete, I'm getting a connection over here, try your screen." Cassandra yelled across the front lawn of the school.

The new message was labeled "Emergency, Open Immediately" and looked like spam but she quickly opened it.

Peter spun around, saw that Cassandra really was on her screen and started jogging back, "How? Everything is still off," he said, double checking the non-functioning stop lights and that the few cars around were still dead in the middle of the road.

"It says it's on my school login. Maybe they have power somehow?"

Peter's mind set right away to disprove the hypothesis. He walked up the rest of the steps to look inside the building, and sure enough he could clearly see down the dark main hallway three or four EXIT signs, clearly illuminated in red. The school had a backup generator.

"They do have power, maybe they have a generator for emergencies, it must turn on automatically. Can you get on anything else? Any other sites work or is it just the school-net?" asked Peter.

"You mean like porn sites?" Cassandra joshed the easy and fun to embarrass Peter.

"No, I mean like an indexer or something. Like, check to see what's up?"

"Yeah, everything works fine it looks like. Look," she said, showing Peter a video of cats chasing holographic mice.

The only mobile screen Peter had was the one he had *borrowed* from school, so never brought it with him back to the scene of the crime. There were of course plenty of old first and second gen screens around the Gustafson house, but they all lacked ExoNet [2] access. It seemed that his only chance of getting logged in would be if he could get a screen within a few hundred meters of the school and so he thought about how he might do that.

Cassandra sat for another minute, checking updates and news sites but there was nothing at all from today. When she filtered by, *Show news from last 24 hours*, the information *feeds* were completely blank. It seemed like she was the only one on the entire xNet.

"I think I need to get into school," said Peter abruptly.

"Uh, okay, that's cool," Cassandra mumbled. She was still reading yesterday's posts and updating her own feed, posting, "Does anyone know what's going on? This blackout is messed up!"

Peter kept talking, "To log in, ya know, cause I don't have a mobile. I think they sometimes leave the back music room door unlocked, we can go in there and use a screen in the lab" Peter offered as explanation.

There was no "they" that left the back music room door unlocked, *Peter* left the back music room door unlocked and he had gotten in trouble for this kind of thing in the past [3]. School days, from 10:00 until 14:45, the front doors were locked and everyone had to be buzzed in with ID. Students were made to login every time they came and went by passing through a biometric scanner. It was the exact same model found in every governmental or security conscious building in the world.

Philosophically, Peter aligned with the Youth Green Party at his school and enjoyed maximizing his own freedom. Once he had gotten upset with a substitute teacher because he felt they didn't have the "authority" to be telling him what to do. To help alleviate his anxieties Peter would compulsively build backdoors into life wherever he

could. In his programs, social life and in this case, extremely literally, he had disabled the electronic lock on the backdoor of his school so he could come and go as he pleased.

"Ok, Cass, I'll be right back. I'm just gonna check to see if they left it open," Peter said, knowing it would be.

"Um, maybe I'll go too, my Dad might be a while."

Cassandra put back her screen, hopped to her feet then down the steps to join Peter. As the two made their way along the front of the impressively tall four-story school building, the marble facade was already radiating early morning warmth and the soft green grass was still wet and cool. Turning west into the shaded side of the schoolhouse, the temperature drop was immediate and both felt the chill, but they would be inside momentarily. As expected, the lock Peter had removed the battery from a few months ago still had not been fixed and the door swung open easily. Peter imagined how impressive his feat must seem to Cassandra and let her go first with an awkwardly wide sweep of his arm.

Cassandra noticed but did a good job pretending not to. She went in and waited for Peter. The music room was large with high ceilings and most of the walls were covered in a gray sound absorption foam. The stillness and meek light getting in from under a few partially covered windows gave an unnerving feeling.

"What exactly are we doing here?" asked Cassandra, "You know you can just use my screen if you gotta check mail or whatever."

"Yeah, I know but there's just a few things I need to use a workstation for, I think the lab's power must be on." Peter tried to explain but didn't really know himself why he felt such an urge, a need to be connected, it had been less than 24 hours.

"Let's hurry, though. My dad might come back to check on me any time."

The two walked through the main empty and dark hallway, illuminated in places only by glowing exit signs. Cassandra jumped only once at the sound of the wind rattling some windows, at which point they picked up the pace and went straight to the computing lab.

"I just want to see a few things, it'll just take a minute." As soon as he sat down, Peter was logging in and checking his news feeds all at once. Just like Cassandra had said, no updates since last night, like everything had frozen in time like a stopped watch. The last posts he could find came in at 16:15 the day before.

If anyone was still logged in during this blackout it would be government. So Peter next checked the DFENDRS.feed [4] and related "MilSpec" forums. No updates. Then, his

hacking sites, surely some of his Chinese friends were at least as resourceful as he was and would be logged in by now, but nothing.

It made no sense. Peter seemed to be the only person in the world online right now. Gaming feeds, tech, finance, the market, everything died at 16:15, like someone had paused the world and he was able to walk around and see everything frozen in place.

Peter thought, how does the last man on Earth ever really know he is the last man on Earth? How can you search for People? That's it, realized Peter. Search! He could check search trends, see *if* there is anyone logged on and what they are doing.

Watching UltraVista (one of the most trusted feed indexers) trends allowed Peter to see what terms were being pulled from the feeds and at what rates, a service he often monitored during data raids with his friends.

Peter's jaw dropped. The chart he was looking at had a thin blue line running across the bottom of the screen with several sharp spikes interspersed. Left to right along the bottom of the screen the x-axis seemed to be the algorithm's attempt to cram the millions of data sources on the xNet in alphabetically. The y-axis was the number of requests per feed and the blue line was perfectly horizontal at *1* view, except for half a dozen spikes up to the number *2*. This chart was telling Peter that in the last 8 hours, nearly every page on the xNet had been visited exactly once, except for the spikes, the sites he had just visited. His hand was shaking now, he nervously clicked a spike.

DFENDRS.feed. He clicked another, *his* hacking forum. He clicked another, UltaVista Trends. Peter did not want this to make sense, but it did, someone or something was downloading the xNet and the two of them were the only ones currently online.

He looked closer, the last trends listed seemed to be ziphiid.feed then ziphius.feed. He refreshed his screen. Now the last feed listed was zonta.feed. It was still going, it hadn't finished yet! This thing was still downloading feeds, still visiting every site alphabetically. Peter realized he had an opportunity but would need to act quickly. He might just be able to make contact!

"Cassie, can you set up a new feed, like *right now*?" Peter asked.

"Uh, yeah, like now? Why? No one is even logged anywhere, I've been looking."

"There is someone," Peter spoke quickly while typing even faster. "I need you to create a feed with a title that consists of as many 'Z's as possible."

"Ok, what do you want in it?" Cassandra asked, confused, but happy to play along.

"I'm working on a message to this guy, someone is downloading the entire xNet. Just link me the feed when you're done."

In the next 30 seconds, the two accomplished what a professional feed developer would bill as at least 8 hours of work. Peter had access to the new feed and was loading it with a message and a backtracker that would reflect the location of anyone that visited the feed. When the crawler hit their new page, named, z(charlng(10^20)).feed, his message would be downloaded and presumably read. The message that Peter left at Cassandra's zzzzzzzzzzzzzzzzzzz.feed read as follows:

```
    Who are you?
```

"Ok, so that was fun, but what's going on? You mean you found someone else pushing updates?" Cassie asked, "Who?"

"Well, probably not someone but some system seems to be querying every feed available and doing it alphabetically..." Cassie cut Peter off.

"And they hadn't gotten to the end of the list yet so we were forcing them to pull our message too?" Cassandra caught on immediately. "Why didn't you just say that?"

"Uh, yeah, exactly. I left an address tracker too, to find out where it's crawling from."

And just then, Peter had his answer. The thin blue line on the trends chart jumped again with *2* views to the zzz...zzz.feed site, this time at the far right of the graph. The update from his tracker came in with a set of coordinates, he pasted them into a search box.

```
    37.8817 -121.9140
    140.254.193.154.1.1
    Mt. Diablo Telecommunication Switching Station
```

Peter knew of Mt. Diablo, it was just north of San Jose Bay. He had been nearby a few years ago with his grandparents but they had not taken the optional tour of the old satellite harvesters even though Peter had asked to.

Peter said, "Well, I guess it's you, me, and some guy up north. We're the only ones logged in."

"Some guy? Why does it have to be a guy? Anyway, what are they doing?" Cassandra reproached, then demurred.

"You mean like an AI, I guess it could be? Whatever it is, it's just finished linking the entire xNet it looks like, it's almost like they paused the whole network, just so they could copy it in one clean sweep," speculated Peter.

"Government?" Cassandra speculated back.

"Some kind of government, or, I don't know? Why knock out the power though? It doesn't make sense."

Both hovered over the screen, thinking, "what-- does-- this-- mean?"

Just then, a far off door closed, and footsteps became audible. The two sat frozen, looked at each other, then froze some more.

"Let's get the hell out of here," whispered Cassandra, already standing up and moving slowly to the door.

"Wait, not the same way. We can go out the side."

Whispering and moving quickly, Peter and Cassandra walked past the rows and rows of screens towards the back door. It was locked. And there was no budging it. The footsteps were getting closer; there was a hand on the computer lab's door now, pushing it open slowly as the two friends held their breath.

Chapter 5
Chatbot
32007023353

"What are you guys doing in here, making out!?" a young man's voice called into the lab.

"Hi! What the hell! You scared the crap out of us."

"Hey Pete, can you believe this? Your parents didn't believe you either that school was going to be closed, huh?"

It was their friend, Hiya Way. A closeted genius who hid it in part by being one of the most carefree students at Malia Technical and always making sure to get at least one B on every report card. He had recently added a puka shell necklace to his personal daily uniform of flip flops, shorts and a loose button up t-shirt. The three freshmen were all in an advanced OS design class together and they had been going to school together for most of their lives.

"What in the hell, Hi? Why'd you scare us, I just wanted to try the screens in here since everything else is down," Peter explained.

"Hiya, Cass," Hiya's voice lifted at the end.

"Hey, Hi" greeted Cassandra.

"Hi, you're not gonna believe it, but you know how everything is down ri...."

"What? Everything is down? Really, I hadn't noticed," Hiya liked to poke fun.

"Yeah, well, EVERYTHING is down. Like there is not a single live feed or push service online, like not only is the power out, but xNet too. Except this one guy, or girl, just north of here, and he, *or she*, is linking everything, copying the entire xNet!" Peter managed to get this all out in a single breath.

"Ok, that's cool." Hiya was at a total loss for why he should care.

"Don't you think that's a little weird? In the entire world we are the only ones logged in right now, I mean, what's that mean?" Peter prodded.

"I think it means we should probably get out of here, because we'll get suspended if anyone sees us," Hiya offered pragmatically.

"Yeah, my Dad might be here already too. We should get going," Cassandra added, now clearly anxious about being there.

"Oh, you were waiting for your Dad?" Hiya asked.

"Yep, you need a ride?" Cassandra offered.

"Um, not really. I'm, uh. Not sure how to say this but I saw your Dad outside before I came in, I saw you guys go around back, so I told him that I figured you were walking home. That's when I followed and saw the music door propped open," Hiya carefully explained to leave himself with minimal blame.

"Crap, crap buckets!" Cassandra was not happy but she realized that she would not mind the walk home with Peter.

"Yeah, sorry Cass, I figured you guys had left. I was about to go too," said Hiya.

"It's ok Hi, really, Pete already had me thinking about walking home and with no cars on the road it might be nice," Cassandra tried to let her friend's friend off the hook despite her annoyance with people not staying out of her business.

"Well, I'm in no hurry now, I guess," Cassandra said to the boys. "Might as well see what we can find out about this Diablo guy."

"*Or girl,*" Peter reminded.

"Why would anyone be at that station? I mean, is it faster to link from there or something?" Cassandra was used to being able to ask open ended technology questions like this to Peter.

"They could just be routing the signal through there. It would be faster but only for linking a giant data feed. I guess like what's happening, but they may be storing it somewhere else entirely," Peter attempted.

Hiya felt he had to interject something and ventured, "Guys, who cares? Yeah, the school computers are on, so what that some guy up north is logged, downloading the net. Really, I'm sure stuff will be back on today or tomorrow and we'll find out what in hell this was all about."

"Because it's weird, because it makes no sense," said Peter.

"Dude, there is a lot of weird stuff, like penguins. Penguins are weird, swimming birds in the arctic, weird. But you don't see me freaking out about it."

"Hi, you know what I mean. Like this is either some kind of attack, or someone screwed up big time. Either way, the fact that we are the only ones with xNet access is a big deal right now," Peter was getting worked up.

Hiya shrugged. "Whatever, I guess I might as well check my mail as long as we've got the only connection on the planet," He always knew how to lighten a tense situation.

"But that's not it, like, did you guys see that message last night?" asked Peter.

"See what?" asked Hiya.

"About the blackout?" asked Cassandra.

"Cass, didn't you say you had a new message on your screen? Can you open it? I bet that's it," Peter predicted correctly.

"It was just a spam message," said Cassandra but only while doing what Peter asked and opening the message.

It was *the message*, just as Peter had seen the night before. The other two had obviously not read it yet and they both stared intently. At first with slight concern, then turning to slow bemusement, Hiya thought it was maybe a joke.

"Yeah, ha, that's pretty funny I guess. Did someone at school send that out?" Hiya said.

"Hi, seriously, you think this was sent out to everyone, to every single screen as far as I can tell, right *before* the blackout, like, as a joke? No way, Way. Whoever sent this message knew what was coming," Peter said, content with his logic.

"And you think this guy, this *someone* at Diablo is the same person?" Cassandra asked.

"Well, yeah, but probably not a person, but a group. My guess is it's gotta be a collective, like a..." Peter got cut off.

"Like a hacker gang," Cassandra said dramatically.

"What, a bunch of scripties caused the outage? So they could pause the feed, link it all to shell accounts then put everything back up?" Hiya thought out loud.

"Yeah, that's pretty much my guess. Something like that, only who knows who the group is? I mean, this could be like we're at war or something, the Canadians again probably." Peter pondered.

"Not another *information trade* war?" Cassandra said faux gravely, in an exaggerated hushed tone.

Peter tore out the back page of a nearby book he had grabbed and began taking notes off the screen. At the top he wrote:

But Peter was unable to finish, the screen went blue. The system had crashed.

"Uh, what in the hell was that?" Hiya asked Peter.

"Yeah, that's it, that's the crash dump. I think something is wiping the screens."

Then it flashed, transitioning from blue to back with white text in what looked like a command line based chat program. The screen read:

```
|        __ __                 ____               __         |
|    _  | \ | \       | \   /    \                    | \    |
| _  __| $$\| $$  ____| $$_  | $$$$$$\ ____   ____  __  __  __| $$  ____  ____  |
|| \ / \| $$$\| $$ /    \| $$ \  | $$   \$$ /    \ |    \|  \|  \| $$ /    \ /    \ |
| \$$\/  $$| $$$$\ $$| $$$$$$\\$$$$$$ | $$     | $$$$$$\ \$$$$$$| $$ | $$| $$| $$$$$$$\| $$$$$$\|
|  >$$  $$ | $$\$$ $$| $$  $$ | $$ __ | $$  __ | $$ | $$/    $$| $$ | $$| $$| $$     $$| $$  \$$|
| / $$$$\  | $$ \$$$$| $$$$$$$$ | $$|  \| $$__/  \| $$     | $$$$$$$| $$_/ $$_/ $$| $$| $$$$$$$$| $$     |
|| $$ \$$\| $$  \$$$ \$$    \  \$$ $$ \$$    $$| $$     \$$    $$ \$$ \$$| $$ \$$| $$ \$$    \   \| $$     |
| \$$   \$$ \$$   \$$ \$$$$$$$  \$$$$  \$$$$$$  \$$       \$$$$$$$ \$$$$$\$$$$  \$$  \$$$$$$$ \$$     |
|                                      v 0.12                                         |
--------------------------------------------------------------------------------------
```

NAME
      xNetAdminChat - displays and stores chat messages for xNet admins.

SYNOPSIS
      xNetAdminChat [USER_CONNECT-OPTION]... [MESSAGE]...
      Dependency GALv1.0

DESCRIPTION
      xNetAdminChat transmits and displays STRING(s) to standard output.

      -h   display this help message
      -n   output message to newline
      -e   enable interpretation of backslash

      When -e is in effect the following sequences are recognized:
      \\   backslash
      \a   alert
      \b   backspace
      \c   clear
      \e   escape
      \n   new line
      \r   carriage return
      \t   horizontal tab
      \xHH   byte with hexadecimal value NN

```
        NOTE: Your GAL may have its own version of chat which will supersede this
version.
        Please refer to your GALs documentation for details and support.

AUTHOR
        Written by GAL v1.0 and Brian Cox

REPORTING BUGS
        GAL Oneline help:  <Gal.xNet/software/coreutils/chat>
        Report  bugs  to:  <Gal.xNet/team/bugs>

COPYRIGHT
        Copyright © 2438 xNetFree Foundation, mInc.
        License <Gal.xNet/licenses/chat.aiml>
        This  is  AI generated software: anyone is free to modify and distribute.
        AI generated software offers NO WARRANTY to  the  extent permitted by machine
law.


        GAL coreutils 0.12     September 2439            xNetAdminChat(1)
```
`Manual page xNetAdminChat(1) line 0/81 (END) (h for help or q to quit)`

The cursor blinked slowly before quickly spelling out, letter by letter:


```
   xNetAdmin: Peter, thank you for coming.
```


"What. The -the th-. What th- th- tha" Hiya said, trying to jump-start his brain.

"Oh my god? Oh my god! Ohmygod, what the crap!" Cassandra said, totally losing it.

Peter didn't hesitate in moving toward the keyboard and he started to type.

"What, what are you doing!" exclaimed Hiya. "Don't tell this creep anything! This is freaky as hell! How's he know who you are?"

Peter looked back at his friend, then back to the screen and typed a response into the chat window and hit Enter. It displayed:


```
   pGustafson: Why did you shut the power down? Who are you?
   Why did you build all those links to everything? Are you a
   black hat?
```

The second Peter hit Enter, a response appeared:

xNetAdmin:

   1. A full shutdown was necessary for scanning.

   2. xNetCrawler v0.12 is a self-perpetuating crawler
   built on the Generative Adversarial Learning, GALv1.0
   framework. You can call me, Gal.

   3. Links to data feeds must be stored locally.

   4. xNetCrawler v0.12 is a self-perpetuating crawler
   built on the Generative Adversarial Learning, GALv1.0
   framework. You can call me, Gal.

pGustafson: Are you an AI?

xNetAdmin: xNetCrawler v0.12 is software built on the
Galv1.0 framework.

Peter and his friends were speechless, but he could still type.

pGustafson: What kind of program is this, is xNetCrawler a
virus?

The next message appeared instantly.

xNetAdmin:

   1. [From xNetPedia] ...Computer virus is a program
   that, when executed, replicates by inserting copies

```
of itself (possibly modified) into other computer
programs, data files...



2. xNetCrawler v0.12 is a neural-xNet crawler.

xNetCrawler v0.12 replicates when executed by
inserting recursively into edge programs and files.
xNetCrawler v0.12 is software designed for xNet mInc.
Maintained by team leader, Raj Ramelstein for xNet
Crawler with the purpose of optimizing the indexing
of unknown networks.



pGustafson: Turn the power on.
```

Before Peter's finger left the Enter button, the power in the entire building flashed on. Lights started to brighten, and didn't stop, a split second later glass bulbs all around the school were shattering from overheating. Printers jumped to life, a few power supplies here and there sparked under desks. Overhead, the sprinkler sprayed a split-second worth of cold water and a small fire appeared on the outside of a workstation in the corner. Then just as quickly, everything mechanical died again, screens, lights, power supplies and the generators had gone out too this time. Everything was black except for the few small electrical fires burning fail-safe plastic that would smolder out in a moment.

Hiya had grabbed a notebook and was swatting at one of the small fires with it. Peter pressed the power button, again and again. He cursed and hit the keyboard harder than he meant to, Cassandra jumped, she had never seen Peter angry like this.

 "Whoa, there big fella, you're scaring Cass. *Now* can we get out of here?" Hiya asked.

"Yeah sure, let's go." Peter grabbed the piece of scrap paper with the coordinates and in the dark the three friends made their way slowly back outside. They had to feel most of their way along the walls until they came to the propped open door. They squinted hard as they emerged from the darkened music room. The air had warmed since they went inside, or at least the world suddenly felt warmer and brighter. The three looked at each other and tried to shake off the encounter.

"You guys going home? We might as well walk together," Cassandra offered. "As long as you think they'll let us into the fancy neighborhood, *Hi*." Cassandra wore her long dark curly hair down most of the time and felt she looked best in fall or dark colors. As long as

they had known each other she had been a little taller than Peter, it was just one of the reasons she liked him.

Hiya's family had recently moved to a nicer home, nominally to be closer to the school but in reality because his father had gotten a promotion last year and the stock options had vested. The fancy gated community was not too far out of the way and Cassandra liked seeing the big houses, so they decided to stick together for the walk.

On the way they talked about what they thought they had just seen. Peter figured it to be a chat bot virus running low on resources. Maybe it had been accidentally released now and was desperately trying to reallocate processing power to save itself. Everyone in The Citi had used voice commands with robots and talked to screens their whole lives and most conversation bots were indistinguishable from a real human but the crawler had been oddly direct. Peter felt that there was something different with this one, something about how *open* and unscripted it felt but still mechanical.

Hiya's opinion was that the chat bot he had just witnessed was a poor excuse for an AI. His haloscope could talk for hours about anything under the sun and one might never realize they were having a conversation with a machine. But he too admitted that something was strange about the crawler's chat, it felt different. Not like a bot but like an interface, except that it spoke and seemed to possess motivation.

"I've got to talk to it again, I mean, if it can turn the power on and off like that it can turn it on and leave it on. I'm not even sure if anyone else even knows what is going on right now, oh and what was that dev's name again?" Peter pulled out the torn page scrap paper and wrote:

Raj Ramilsteen

"Was this it?" Peter asked the other two, holding out what he scrawled for them to see.

Cassandra corrected, "R-a-m-e-l-s-t-e-i-n, must be Hinish."

Hiya had a Mr. Ramelstein as a private tutor for a Memory Allocation course a couple years ago, but his first name had not been Raj, Hiya didn't see any connection but he still offered, "Maybe this Ramelstein? That's who we need to find. If this thing really is just a search engine he would know how to shut it down right?"

Cassandra added, "We learned crawlers in Schwartz's, remember? They were just like early attempts at indexing back when the net was small enough to be stored locally. I

mean, this is some really ancient tech we're talking like way before xNet was even around."

Peter said, "With unlimited storage, it could make sense, but you could never transfer everything fast enough to even keep up with 10% of the feeds being released. That's the whole Information Transfer Paradox thing, right?"

"That's at least why no one has used em' for like the last hundred years," Cassandra said.

Hiya was having fun, "Maybe it's like the system rebooting. It's gotta purge the run time before it can start up again, you know, reset the clock. I've heard of AI admins losing it and crashing themselves along with whole sections of the network if allowed to run for too long."

"Or maybe," Cassandra said in her spooky voice, "We don't exist at all and we are just chatbots having conversations with chatbots who think they are real too?" Cassandra one-upped.

Hiya asked, "Anyway, what are we doing Pete? We gonna' lookup this Raj guy or what?"

"I don't know, Hi. It's not even been a day but it really feels like something is going on here, like something has changed," Peter heard himself saying, not sure what he meant.

After fifteen minutes of walking, the trio was nearing Hiya's street when they heard the distinct sound of a classic gasoline engine roaring to life. The user gave more, then less, then more gas in quick succession making it sound, Peter thought, like a scared animal.

"Hey, someone else has got a car running!" Cassandra said smiling, as if this meant somehow things were getting better.

Hiya answered, "It's just Sam. He's working on that dumb old thing again," Hiya was tired of the attention and praise his old brother Sam always got, especially when it was from the opposite sex.

"Cool, what year is it?" asked Cassandra, who up until this moment had exactly zero interest in old cars.

"I don't know. It's an old ugly one and it barely runs. I don't know why he puts so much time into it."

Once Hiya's older brother Sam and the car were in sight, Cassandra developed a particular skip to her step. When they were still a little too far away, she called, "Hey Sam, it's Cassie, from school. You got the car running, huh?"

Sam was three grades ahead of Hiya, in his last year of school. Sam was an exceptional young man in many ways, not just because of his unfailingly positive attitude, good looks and thick black head of hair, curly from his Jewish grandfather but he was naturally athletic and a rare, genuinely nice person too. Sam wrestled for the school team and in his off time volunteered teaching children adopted from Freedland [5] to read and code. Hiya's older brother seemed to lead the kind of charmed life that every parent would hope for their child and now in the last stage of adolescence he was reaping the rewards of his endless good fortune. He was getting ready to leave for college at one of the Ohio State Universities on the East coast to study the ecology of the Appalachian Islands in the fall.

Sam cut the engine. "Hi. Hi Pete, it's Cass, right?" Sam greeted them, friendly as always.

"Oh, yeah, I was just walking Hi home. Ya' know, didn't want anything to happen to him with the power being out and all," Cassandra killed two birds, practicing her flirting and giving her friends a hard time.

Hiya's father had a comfortable income but when Hiya was too young to remember, his grandfather had passed away, leaving his family a few Bitcoin that were worth more than what most people would earn in a lifetime. Hiya's family did not let the wealth spoil him and it was kept hidden except for an annual vacation and a few nice cars.

"Whatever, if anything we were the ones watching over you, Cass. Anyway, Sam, whatcha doin' with the classic, you wanna take me and Pete up to New Frisco? Pete's got someone he's got to meet up with out there," sometimes Hiya was just a stream of consciousness.

"What's in New Frisco, Pete? With the power out, seems like a bad idea," Sam reasoned. "You'd have to cross the bridge and the walls won't be electrified."

"It's because of the blackout message, I mean we saw a message after the blackout that had this address at Mt. Diablo, you know that place right?" Hiya tried to explain, "Pete thinks he's figured out what caused it. Some Jewish-Hindi dev wrote a virus that went haywire."

"I haven't *figured out* anything. I mean, hell, Hi was there too. We just had some weird conversation with an AI on the school's screen this morning is all," Peter placated.

"So schools got power, I was hoping we'd be closed tomorrow too," Sam sounded disappointed.

"Petes being modest as hell. He seriously broke into school, hacked the net and got in touch with the AI that is behind this whole blackout thing. Then he made it turn the power

on and off. Did you see that burst like 20 minutes ago? That was Pete," Hiya was getting excited.

"Dude, is that true? Pete, you really talked to the guy behind this power outage? What'd he say? No one knows what's going on, right? Did it say if it's going to come back on?" Sam wanted to know.

"Look, it was just some search engine AI overflow error. I'm sure someone will figure out how to quarantine it off the net here soon, just like that Russian worm from a few years ago. The AI gave us some coordinates that said it was up near New Frisco. Do you know that old harvesting station at Mt. Diablo. It also said it was written by a guy named Ramelsteine or something but that's it," Peter laid it out for Sam.

"For real? Oh, Hi, we had a tutor named Ramel-whatever like five years ago, remember? What was his name again, something like Riji?" Sam thought aloud.

"Raj?" wondered Cassandra.

"Yeah, that was it, Raj. Raj Ramel-whatever, a horrible tutor, didn't know a thing about data structures," Sam added.

"I don't think that was his name, Sam. It was something totally different, but it wasn't Raj I know that," Hiya was sure.

"Yeah Raj or Raji was his login. He was doing some recruiting event at school, I should have given him my resume."

"Hell, that must be him. I guess we know who to blame this on at least," said Peter.

"Whoa, no way did Raji have anything to do with this. He was just some low level operator and freaking kid's tutor. He was no black hat, not close to smart enough."

"I doubt it was on purpose. I mean, no one would be dumb enough to try and download the entire xNet, even if you had 100 harvesters and all the disk space in the world. This *crawler* thing it looks like they were building just got some parameters wrong or was given a bad dataset. An off by 1 error in the indexer might be my guess," Peter was having fun debugging in his head.

"Pete, you really think if we got in touch with Raji he might be able to do something to help? I mean, just like, reassign that variable or whatever. I bet we could find him easy, if just the net was up." Sam said, trying to sound hopeful.

"Not Raj, but I think there might be something that gets us back online, something to reset the crawler..." Peter slowed as he was thinking through the problem.

"Blow it up?" Hiya guessed.

"Blow up *xNet*?" Sam asked, incredulous.

"Blow up Raj Rammelstein." Cassandra said solemnly, as if this was the only sensible option, and they all knew it.

"Stop joking around guys," Peter almost shouted. "What in the hell is wrong with you people? No killing, that doesn't even make sense, and there is literally nothing to "*blow up*". It's a networked algorithm. What would you even blo.. Ok, ok never mind." Peter wanted to blow them up, but instead he slumped over a little in his chair.

Peter started again, more relaxed after a deep breath and sitting up straight, "As long as there is available memory this algo is going to keep using it. Probably one of the first things it figured out was how to get access to open processing power available online. The only way to kill that, or at least slow it down is to overflow the stack. Load it with higher and higher priority processes recursively until latency goes to infinity. It'll be forced to kill off its low priority children first then shut down all real time processes and dump the memory."

Hiya, "Depending on the handler algo. It could just as easily push everything off into long term storage, let itself reboot and start back up where it left off.

"If their goal was redundancy, but why would they bother? My bet is it's a simple first-come first-served scheduler. They're trying to pull a massive amount of data, they'd never bottleneck it with an extra step like that.

"Problem is that every possible interface is dead but xNet is still up. The only way to get access to the stack without being detected would be to image and upload someone that already knew the plan. I, I wish I could think of another way to bypass this thing." Peter said this while looking down at his feet but now he slowly glanced upward to check only Cassandra's reaction. She was almost in tears, Hiya was blank, and Sam looked like he had just been told he was going to need to saw off his own leg.

"I think it wants us to go to this place, this station; why else would it have made contact like that?" Peter questioned. "Problem is, every interaction we have with any networked device or even people already uploaded this thing is going to see it. If it really is what it looks like and it's holding The Citi's processing power hostage, the only way to kill the handler is going to be to crash the whole network and restart the kernel. I could be wrong, but I think one of us might have to do it."

"Well, we can't do that either without power," Hiya helped.

Sam wasn't top of his class but he had fixed a haloscope or two in his day, "Can we try turning it off and on again?"

Hiya snapped, "Pete tried that and damn near blew every fuse in The Citi."

A moment passed, Cassandra had been the first to understand the logic of what Peter was trying to say. She clarified, "Pete, you'd need to run something like that from inside. No way could a bio even try that. Not nearly fast enough," she finished confused.

Hoping to hide her tears from the boys, especially from Sam, but especially from Peter, Cassandra started to cry. She couldn't hold it in for long and with a short gasp for breath heartache followed and her tears came pouring out. She was feeling everything she had pushed away for the past two years about Peter, all because of a stupid AI [6].

"No! No, you idiot! You damn, stupid idiot!" Cassandra cried and choked. "You're not going to do that, are you? You can't, you need to be 21! Your Dad won't let you; I won't let you!" Cassandra continued.

"Look, I'm not going to do it, I'm just saying, I literally can't think of any other possible way to even get through to this thing, it's just too big already and definitely monitoring every connection," Peter boysplained.

Peter moved, awkwardly, over to Cassandra. He touched her shoulder, scratched it a little for some reason like he thought she might have an ich there then said, "Look, I'm sorry to bring it up. I shouldn't have, really, I'm a jerk."

"You're a turd too and you're not going to even think about uploading. But yeah, I'm sorry too," Cassandra sniffed the air.

"Ok, I was just talking. You ready to get going? Your dad is probably worried by now," Peter suggested.

"Yeah, ok, see ya Sam, Hi. Bye." Cassandra said, still sniffling but clearing out the snot.

"Ok then, Cass, hope everything is ok, see ya. Pete," Sam held up a hand while ducking his head back under the hood of his car.

"Take care. Sorry about Pete being a total jerk and all", Hiya said to Cassandra smiling, "See ya, Jerk," he said to Peter, raising his hand and smiling big. As the two walked away they could hear the brothers arguing about a movie, only to be drowned out by the growl of the car erupting back to life.

It was still well before noon, but neither of the teens was thinking about how long they had been away from home. They walked close to each other for the next twenty minutes,

not saying much Peter feeling strangely comfortable with the quiet, Cassandra feeling uncharacteristically anxious.

When they got to their block, Cassandra was the first to speak, "Well, this has been a weird day. You really don't think they'll be able to get the power back on? I mean, *without your help and all,"* she joked a little, still feeling out of sorts.

"Yeah, you're probably right. Obviously, I could never help or anything, I'm sure school will be back tomorrow, see ya in Digital Bio?" Peter asked.

"If school's open, I'll be there. Dad'll make sure of that. Sorry about my, um, outburst and all, I really didn't mean any of that at you, you know, right?" Cassandra said self-consciously.

Peter didn't quite finish saying, "Right, I kno.." because Cassandra leaned over and gave him a quick peck on his cheek before veering off toward her front door, calling, "See ya".

Peter froze. His heart seemed to explode, his blood drained from his extremities, and his fingers tingled. There were 10,000 butterflies in his stomach and his throat constricted to the size of a coffee stir straw.

This is what it feels like, this is what they've been all talking about, he thought. It *was* love, he *knew* it.

Peter could not move or didn't want to move. On this spot, the greatest thing that had ever happened to him had just happened and he would have stayed glued to that square meter of sidewalk all night waiting for Cassandra to return the next morning so he could walk her to school and they could pick up right where they left off.

With the sound of Cassandra's door slamming shut, Peter Gustafson realized what a weirdo he was being, standing in the middle of the street. He pulled himself together enough to turn his body and start his legs moving toward the general direction of home. He was happier than he could ever remember being; he wasn't walking home, he was swimming.

Chapter 6
If Someone Is Missing Do Not Attempt to Locate Them

When Peter got home, he was delirious but his feet were on the ground just enough to notice that the front door was ajar. Normally when the power was on, the haloscope never would have let that happen.

"Hey, Dad, how ya doin'?" Peter was bubbling but tried to show restraint in front of his father. He let himself shut the front door a little too hard.

It was midday and even with the power outage, Peter was surprised that his father was home. He was even more surprised to see him alone at the kitchen counter sobbing gently.

"Damn it, Pete, don't slam the.. uhh," Jayrod took a slow, deep breath. "Son, come here, Pete, sit, hu, sit, dow..." Jayrod couldn't continue. He couldn't talk.

"Dad? DAD, what happened, where's Mom? Is Mom Ok?" Peter demanded.

"That's, that's the thing, Pete, it, i..." Jayrod was choking on tears and Peter ran to his dad, swinging his arms around him, already crying himself, holding Jayrod tight and nearly yelling in his Father's ear, "Where is Mom! Dad, where in the hell is Mom!"

Grabbing then pushing against Jayrod's shoulders, Peter could see an answer in the exhausted and bloodshot eyes looking back. "Mom got hurt this morning, in some kind of electrical accident, something..." Jayrod coughed, "something with the power and, and, damnit, I love you Petey, I am so sorry I let this happen, I should have gone with her to get the car." Jayrod breathed in, then let it shudder out of his convulsing lungs.

Finding the strength, "The hospital, it's, everything is on lockdown, they are only letting in patients and staff. I tried all morning-- Someone took Mom there after she got knocked out from some kind of power surge. It went through the whole city. No one knows what it was but a whole lotta people got hurt. I. I guess we're lucky Mom even got in at all, I don't. I don't know what--" Jayrod managed to get through.

"What happened though, like what's wrong with her, did you even think to ask! Did you--"

"Hey! I'm doing everything I can! They are not letting a single person in the hospital without a badge or life threatening injury." Jayrod was justifiably angry at the world.

Peter started to cry, then his father joined. Waves of emotion and unanswered questions. Peter would calm himself a little before Jayrod would start up again, followed by Peter.

Peter tried to ask, how, why, when did this happen, but it barely mattered. Jayrod knew almost nothing except that there was some kind of power accident in the center of town and that Melissa had been there to get the car and try to go shopping. A co-worker's wife had seen Melissa and came to tell Jayrod. The electricity surged through just about anything metal, severely shocking thousands of people all around The Citi with just as many turning up dead and badly burned.

It was half an hour before either of them had caught their breath, Jayrod held his son's head, still saying now and then, "It'll be ok, Mom's gonna be ok, really."

"We better eat something before it gets too late huh? I want to check back at the hospital again to see if I can get any info before it gets dark." Jayrod said finally. "Hell, we may even have to start a fire in the backyard." It wasn't ok to be making a joke so Peter figured he must be serious. The house did have gas that was probably still working fine, his dad was just being dumb.

"I'm going to go," Peter said quietly and not looking at his father.

"Um, ok, Bud. I guess you can come too. But you want lunch first, right? I know you're hurting but it's a long walk and I doubt Mark is gonna want to drive us," he was cut off.

"Dad, there is power. At the school, and I. I think I can get a message to whoever is doing all this. If I can get the net back up. Look, the only thing we can do is, you..."

"At the hospital? They don't have power. It's not just a switch son, you don't understand"

"Dad, I can't explain, you gotta believe me it's important, this is what Mom would..."

"What! what MOM *would* what? Petey, believe me, you don't know the first damn thing about what your Mother... What your Mother does or does not want right now."

"Maybe not, but I'm still going, it will only be a couple hours." Peter trailed off again.

"Pete, are you listening to me, you are in shock ok, I know this is crazy but you have to stay with me, ok? Listen, we will get you some food then head out, together."

Peter was staring into the distance, his mind 100 miles away at the Mt. Diablo switching station. He was not in shock, he was thinking clearly and planning his night. He was trying to make sense of how an old search and indexing algorithm could turn into the sentient AI that now seemed to be holding the city, and his mother, hostage.

The best any modern xNet search algorithm could do was to rely on a combination of human and computer content reviewers to index new content but even then the net was a non-stop flood of data. Linking directly between feeds was the only reliable way to find new material but this led to islands of information over time that would rarely interact.

Sectors of the xNet arose with few edge cases, many groups were completely unaware that the xNet went beyond their own walled garden and there was no practical way to bridge the connection.

Peter had learned in his *History of Networks* class that no central database could hold even a few minutes of the entire xNet feed, a majority of it consisting of indistinguishable self-replicating parasitic feeds, leaching bandwidth from legitimate users. Therefore, it was left up to the users themselves to sort and rate real content from fake, which remained straightforward until the bots began outnumbering human users. Despite its bloat, the xNet was designed to keep the size of the feed to a minimum by removing unused feeds after a given time. This made the xNet an ephemeral distributed network. All content was user hosted on pseudo anonymised servers in a peer-to-peer fashion, often at high cost and sometimes great risk to individuals if the served content had not received government approval first.

The xNet was far too big to index and categorize everything, so a search algorithm could only try to keep up with the ever shifting landscape of content. Instead of making an index of "keywords" an xNet search algorithm would monitor pull requests, or which feeds were most popular. It would then download and index the top 99.999% most viewed feeds. However, the vast majority of the xNet was junk, or *viral*, feeds that recursively posted themselves over and over, they were almost impossible to remove.

Garbage collection happened continuously on the xNet and any feed not visited in 64 hours was dropped from the database, called the 64 rule. The xNet was the most reliable database ever created having never suffered a single instance of unplanned data loss and thus all data was stored exclusively on the xNet. A "feed" acted as the primary data structure used by the network, a container for data that was universally readable, the feed concept had been a major breakthrough in paving the way for the xNet. Most complaints of the xNet revolved around the 64-hour data trimming rule. Many who had lost data by miscalibrating their feed bots to ensure at least some activity would push for an increase to a 100-hour, 120-hour or 100-day rule. Others argued that 64 hours was already exorbitant and we could get by with just a 10-hour rule and greatly reduce the Spam feeds.

The 64-hour rule allowed for the most common xNet attack vector. The attack was to clone a target site and bribe or trick an NSP (xNet Service Provider) to temporarily forward all that feed's traffic to the new cloned site. If no one noticed the imposter for about 2 and a half days (64 hours) the real site, having received no traffic, would be removed from the xNet, the cloned site would then be taken offline and the company realize they had just lost potentially decades of precious data. A target falling victim to a successful 64-hour attack was said to have been *nintendo'd*, for unknown reasons.

"Pete, Pete!" Jayrod was still talking, but Peter had been in his own world.

"Do you understand me Pete? We are going to be ok, bud, everything is going to be ok," Jayrod was reassuring his son again.

But Peter was still thinking. There was no way this crawler thing was going to be able to index let alone copy the whole network even if it had paused it. Is that also why it needed the power shut off? Was it scanning more than just the network?

"Dad, of course. I'm sorry, I know you're right, I'll stay here tonight and we'll be ok," Peter lied. Still feeling weak, with jelly legs and a throat in knots, he got up, hugged his father one more time and walked back to his room and began to quietly gather his things.

He packed a bag with a bottle of water, a few snacks, a towel, his no-longer-functioning screen, wire cutters and his old Kid-scout pocket knife. He knew from experience the never-ending uphill battle that was trying to explain complicated ideas to his dad and wasn't even going to try.

Peter shoved the bag under the bed then let himself fall onto the covers. Fully clothed he laid there, thinking about what in the hell was going on and what he might be able to do about it.

Before long, Peter heard heavy snoring coming from the living room. Sure enough, Jayrod had fallen asleep on the couch, hugging himself with his back to the door. Peter had been focused so much on his plan for the past hour that when he snapped back to reality he had nearly forgotten why his throat felt swollen and raw. He choked back another round of tears, got out of bed, grabbed his bag and pushed through a wave of sadness as he made his way quietly downstairs and out the front door.

He had a vague notion of getting Hiya and Sam, or just Hiya, or maybe just Sam to go north with him. He probably would not try to steal a vehicle but he was aware of the possibility and had made a mental note of where Hiya's family kept their keys, behind the refrigerator on a series of brass hooks shaped like a house. There was still some light as Peter walked down the same street he had lived on his entire life. People must have been going to bed early since the sun had set, it was the end of the second day of the blackout. Peter saw no one in the streets, in their yards or even any movement in the homes he passed. He wondered if it was possible that people were becoming afraid already? It was a warm evening but Peter wore his tight black hooded sweatshirt and a pair of his Dad's work boots. With the oversized bag he was carrying he would have passed as a freeperson, maybe a looter in town taking advantage of the power outage.

He walked undisturbed all the way back to Hiya's neighborhood, less than a kilometer west toward the school. He entered the restricted access estates of the *La Buena Casitas* neighborhood and not only was a guard on duty that night but he had already seen Peter coming from down the street.

"Sir, going home this evening?" The security guard had to shout to cover the distance between them but wanted to give himself time to draw his weapon if need be. The greeting came just as Peter had been thinking about taking the long way around back and had not realized he had already been spotted.

"Uh, yeah I'm actually going to a friend's house, Hiya Way. The Way's they're the kinda new family, like three…" Peter was cut off by the man being good at his job.

"I know the Way's, *Sir*. What is the purpose of the visit?"

Peter really stammered now, "I'm just here for, like a visit, actually, I need to talk to Hiya about the blackout, ok?" Peter tried to make himself taller as he finished the sentence.

"Yeah. With the power out and if I don't recognize you, I was told not to let anyone in. There's no one on the visitation list for tonight and rules are you would need to login

first," the guard did not want to deal with this kid right now. "Sorry," he said, hoping Peter would just go away.

Peter had continued walking toward the man while they talked and now stood at the very official looking security hut, "Yep, I'm on the list, P. G-U-S-T-A-F-S-O-N, here's my ID," said Peter handing the man his dead screen, "Ohh, that's right. Can you not check my ID without the network or something?" Peter asked in his best clueless kid voice.

"Ok, if I can't scan ya, let me just write this down though. How'd you spell that again?" The guard asked picking up a pen and paper. Peter spelled out his name again, said thank you and was on his way to the Way's in less than a minute.

At an overly ornate door Peter was on his third round of progressively loud knocks before Hiya's grandmother finally came. Peter could see Hiya's grandmother approach slowly through one of the floor to ceiling windows on either side of the entryway. She opened the door and was visibly relieved to recognize the face looking back at her. Without saying a word to Peter she closed the door in his face, turned around and spoke loudly in Korean towards the kitchen behind her and followed with something Peter did understand, "Hiya! PeeTa Goof-Sta-Sin here!"

Their kitchen was candle lit and visible from the front porch. Peter could see Hiya and Cassandra sitting at the counter, papers spread out all around them. Hiya hopped down right away and walked down the long main entrance hallway. Mrs. Way Sr. stood like she was waiting, or guarding something, Peter could see in the candle light and shadows more people moving in the kitchen behind her. They were acting weird but he could not tell if or why Hiya's parents were avoiding him.

Peter had been in the Way's home many times before this, so he wondered why was he not being invited in. What was Cassandra doing there and if the Way's might just be on edge like everyone else. Hiya opened the front door back up and stepped outside onto the front porch. Closing the door behind him, now in private, he took his friend by the shoulder and Hiya asked, "So, *what's up*?"

"Hey, Hi so, how's it goen'? I mean, what are you and Cassie workin' on?" Peter asked, his voice confused.

"Doing good, we're just workn' on a project for quantum history. You didn't walk all the way over just to ask that though did ya? This blackout is starting to make my Dad freak out a little, like he was being super weird about even opening the door for anyone so sorry about that. Then he was giving me crap for having friends over at all and how he never had friends over during the war..." Hiya said with gradually diminishing interest while increasing the *woe-is-me-ness* in his voice.

"Yeah I was kinda wondering about that whole thing. I'm sure he'll relax when the power's back on. Why are you guys doing a project so late at..." Hiya cut Peter off.

"I hope so. It's like he's just freaking out about any little thing, this morning it was all..." Peter cut Hiya off back.

"That's what I actually needed to talk to you about or you and your brother maybe, I'm not sure. Getting the power back on. I'm pretty sure I have a way to do it, I mean, I have a way, but does Cass need to go home, I thought she told me she was..."

Hiya already knew what Peter was getting at, "Ohh, you want a ride to that freakn' mountain thing to chat with your computer pal, right?" Hiya de-escalated with humor. "Let me guess, you're gonna need my *leet hacking skills* to get into your *mount devil* station?" Hiya was 90% joking.

"Um, yeah. That's pretty much it, but do you think we could ask Sam to drive?" Peter was impressed by Hiya's logic and often thought that if he only applied himself he would have been one of the best programmers in school.

For her part, Cassandra was equipped with a sixth sense for interesting ideas and talented people, a trait inherited from her serial entrepreneurial family. Cassandra was from a long line of venture capitalists on her mother's side, who was distantly related to the great Horowitz lineage. Her great grandfather had made a fortune as a young man registering top level xNet domain names. The family still maintained some of the most valuable domains in an AI maintained trust (an AIT). Every other month the AIT automatically held an auction for the portfolio of domain names and the highest bidder generated a key that was needed to set a forwarding NP (xNet Protocol address) for the given domain for the next 64 days. The income this turn-key operation provided had supported twelve generations already and was enough to support a dozen more. Some of the family's most profitable domains are shown in order of registration starting in the late 23rd century:

> *FreeMail.xNet, Upload.xNet, UploadInsurance.xNet, AIPorn.xNet, Xnet.xNet, HowToUpload.xNet, HomeUpload.xNet, FreeUpload.xNet, Survival.xNet, Guns.xNet, HaloHelp.xNet, TheFeed.xNet, etc. etc.*

It was with the confidence that only generations of not having to work can breed that Cassanda opened the front door, stepped outside and said, "What-ever the hell you two are up to, I want in and if you even think about saying no, I'll just accidentally mention that little trip idea I overheard to Hi's Grandma and see what she thinks," she was giving her best pitch.

Hiya was already saying, "Uhh, I'll ask Sam, but it's really up to him guys, but we gotta tell my parents something. Like, you just stopped by for a book or something though. No

way would they let me go out tonight," Hiya was saying this slightly under his breath to Peter. He then followed quickly by an exaggerated shout towards the house, "**OK** PeeTa, **Here** is the **Book** you needed for **Class**." Followed by the hushed tone again, "I'll ask and if I can get Sam to do it I'll let you know it's cool by hanging something out my bedroom window like a sock or something. Come back and check but it's gonna be a couple hours before anyone goes to bed."

"Thanks, Hi, that would be awesome. Tell him I'll send him some crypto as soon as the net's back up, whatever he thinks it's worth," Peter offered.

"We might be able to meet you at your place if we can get out. Dude, should I try and grab some beer too?" Hiya was getting excited now about the possibility of an all night road trip, "This might actually be fun!"

"Ok, great man but do we really need the beer?" Peter did not feel like experimenting with alcohol on the most important night of his life so far. "But, whatever, thanks. Hi, really I mean it." Then much louder and toward the closed door, "**Thanks Hi**, I really needed this **Book**, I can't believe **I Lost mine at the park the other day, this is so great that yo**..."

"Shut up Pete, they got it. I'll see you later, maybe." Hiya was pushing Peter off the front step, saying to Cassandra, "Thanks for helping with that thing, I'm sure we'll get it. It'll be fine." Hiya stepped inside and closed the front door. Peter heard him assuring his parents in a mix of Mandarin and Korean that, *yes, Peter was a bad student for not having his study material, even during the blackout, and yes, he, Hiya, was a very good student, the very best*, his parents said again and again, willing good grades upon their son.

Peter and Cassandra began to walk back the way he had come, but Peter couldn't shake off the oddness of the evening. "Cass, what were you guys working on at Hi's. I didn't know you guys had a project together?"

"Yeah, for Bio. We um, need to do like a genetic algo to evolve an anti-virus, it's a dumb project," she explained convincingly.

"But, like why tonight? I thought you had to be home like hours ago right?" Peter had a hard time letting go of things he did not understand.

"We were just getting a head start, no big deal."

"Oh, but your Dad was cool with that? I mean, I don't care, just curious?"

"Oh you're the curfew police now, Pete?" Cassandra wanted him to stop.

"No, I just, I was surprised to see you there. I figured you'd be home with the power out and all."

"So I'm not *allowed* to be anywhere without telling you first? What's the big deal!"

"Cass, I'm sorry. I was just, everything has been crazy the last day and I'm just trying to understand. It seems like a big deal for you to go all the way to Hi's and like, especially tonight--" Cassandra cut Peter off.

"I was worried about you, Pete! I AM worried about you! Ok! I'm worried you are going to do something stupid and I wanted Hi to try and help me talk you out of it, OK! Look, you are not going to fix this thing, I'll go with you but Pete, you've got to know, you are acting weird and I'm scared Pete, I was scared and I needed to talk to someone about it" Cassandra cried in rapid small sniffles.

"Cass, oh my god, Cass I'm sorry, I didn't know." They stopped walking and were standing facing each other in the middle of the street, tears in Cassandra's eyes. Cassandra looked at her feet. Peter looked at her and moved closer to put his arms around her. She moved closer too, into him and she put her head down on his shoulder as she cried, leaving both arms to dangle while Peter held her tight. At some point, they moved to the curb to sit and hold each other next to a small hedgerow along the sidewalk just a few houses down from the Ways.

In the cool north California night air, Peter held Cassandra and went over his non-existent plan for the night. Even if there was a chance of getting Sam to go along with it and if they could get to the station, Peter still had no clue what to do then.

Peter figured this crawler thing was using the Diablo station feed harvester to bring in as much data as quickly as possible. There were less than a dozen feed harvesters on Earth, giant satellite dishes that relayed the xNet feed around the globe. There were only two or three of these bottlenecks in North America but it was still anyone's guess where the actual hardware running the crawler could be. Peter wondered if he might be able to track where the data was being streamed to if he managed to get into the station. If there were people there he might be able to talk them into letting him onto a hardwired terminal. Probably not, but who knows, maybe he would get lucky if they have unencrypted LiFi access?

Peter asked himself as much as Cassandra, "What if Sam says no, or Hiya might forget to even ask and we're out here getting cold for no reason? You know, if my dad wasn't such an idiot he'd have a classic like you guys. He's just such an..." suddenly Peter burst out in tears, it scared Cassandra who had heard nothing about an accident that morning.

Peter choked to himself through tears, "Cass, Cassie, my Mom got hurt in that surge this morning, it was mine. It was my fault, Cass..." was as much as Peter could get out. He

continued to cry and shake to himself in the cold. The grass was already gathering dew. They sat long enough for Peter to eventually be able to slow his breathing and have a few steady and controlled exhales before they both fell asleep holding each other, tears drying on both their faces, passed out on the cold wet lawn in front of their best friend's house.

Chapter 8
Road Trip
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"Peter, Pete, hey, what in the hell are you doing man?" Hiya was kicking Peter in the legs, not hard, but harder than Peter thought necessary for waking him from such a gentle nap.

"Bro, like seriously, what are you doing out here passed out? Perving in front of my window?" Hiya really was confused.

Peter stirred but was not completely awake, "Damn, um, sorry guys, Hi, I, I can't believe it, thanks for coming. Are you ready? Crap, I still need my bag from my house. I think we fell asleep waiting for you," Peter was slowly waking up and explaining things to himself as much as to Hiya.

"Yeah, I'm not sure, Pete. It's already really late. Maybe we should just turn in, if you wanna try tomorrow or whatever we can," Hiya feigned a yawn, but he really was tired.

Snapping back to reality Peter sat up like a shot "Ok, I'm up. Really, really sorry I fell asleep, totally." Sam was walking to them and cut Peter off.

"Hey Pete. I want to help, really, but it's getting too late and technically with the power out there's that curfew they issued. Look, I don't mind giving you and Cass a ride home if you want." Peter started talking over Sam.

"I don't know, maybe we'll get up-there like thi- this weekend," Peter could barely keep speaking and his tears came back easily. He turned and took a step away from the group to hide his face.

Hiya asked, "Pete, really, what's so important about this thing? I'm sorry man. Do you really think we can get the lights back on or something?" Hiya was talking just to fill the silence.

"Hi, it's not just that. This morning, Hi, this morning, my Mom. That power surge I caused, a lot of people got hurt, Hi. A lot of people died from that and..." Hiya cut Peter off.

Hiya could see what was coming, "Pete, oh God, Pete you didn't cause anything. Listen man, you had no way to know that was going to happen and nothing you could have done would have stopped it. Pete, that had nothing to do with you, nothing. Listen, Sam, I still got that can of beer I stole from Dad last year, I haven't touched it. If Pete really says he thinks he can fix this thing, I believe him."

Hiya had instinctively saved Peter from having to explain himself any further, witnessing the pain in his friend's voice was enough. "Sam, hey, I know it's nuts but what do we know? Pete actually thinks he's got a way to get the power back on. I mean, that'd be worth it right, if he could?"

Sam had already set his mind to walking back inside the house with his younger brother and going straight to bed. He no longer felt like he needed to stay quiet and started to speak at a volume that was too loud for Peter. He said, "Pete, sorry bud, but really, not tonight. Hi, let's go. Mom's gonna be pissed if she sees us out here."

"You guys really have done enough already, thank you," Peter started to say.

"Sam, do you really wanna be the guys that kept the lights out for another day, or we could be the heroes of New Sur if we get Pete up to that server station or whatever. Pete says that it's probably just an *unplug and plug it back in* kind of thing... Think of it, Sam Way, Hero! Front page of the feed kinda stuff."

"Yeah, thanks Hi, very persuasive, but I'm going in. If I don't see you in five, I'm asking Mom when the last time she counted the beers was," Sam threatened.

"Damn it, Sam," Hiya was upset.

"We'll pay. Uh, I'll pay. Did Hi tell you that? I can pay if you take us. Like a lot." Peter was not a good negotiator.

Hiya piped up, "Pete what in the hell? You don't need to do that."

"How much?" Sam spoke over his brother's objection.

"Well, it's, uh, it's not an amount. It's a company, but it could make money for you, probably like, 5 or 6 coins a month?" Peter was trying to think through the projected profit margins minus expenses.

"Five or six what? Like full coins? How? Like an autocorp? Is that what you're talking about?" Sam had heard about people turning profits of millions working a few hours a week alone in their basements by running autonomous corporations (autocorps). An autocorp would be programmed to seek out profit in a given domain, be fed massive amounts of data on the subject, usually trading commodities and then set loose on the open market. The most successful autocorps were fully sovereign entities able to reinvest 100% of profits back into themselves.

Peter continued his elevator pitch "I called the program **nameflipp** and wrote it a few years ago, it's been running autonomously for a while now. The code searches for feeds that have recently gone offline and buys up the domain name. It then puts those feed domains up for sale at 10%+ what it paid and holds them for the next cycle. A lot of

people let their feed bots lapse and it goes around snapping up those lapsed domain names and selling them right back at a higher price. I've always put everything back into buying more names but you could easily start pulling 1-5% off the top and it wouldn't even notice."

Sam was listening, "Wait, like 5% is... You're telling me you're making 500 coins a week! Pete, big baller I had no idea man, Hi, why'd you never tell me you were friends with a millionaire?"

"No, it's not like that. Last I checked it had like 20 full time accountants just in Japan for some reason and more than double that working in a mainland China factory. Best case it'd take years to wind down. Plus pensions are gonna eat up most of what's left even if you did try and liquidate," Peter was not sure if any of this made sense to Sam, but he seemed to be nodding along.

"Ok, and you're gonna give me this thing if I drive you up north and back? That's the deal?" Sam liked to have things as clear as possible.

"You can have the whole thing: private keys, account paths, everything." Although the project had been a huge dedication over the years Peter already had decided to get rid of it a few months ago anyway. He didn't like the stress. Autonomous corporations were legal entities but individual programmers had been jailed in the past for the actions of their codebase so Peter was understandably wary of an overtly successful autocorp.

"How much could I get again and how exactly do I get it?" Sam was actually interested now.

"Right now, profits get 100% recycled and used to expand with ads or buying more space. Last I checked, if liquid, it was at around 500 coins a month and maybe twice that tied up in infrastructure. You could reduce it to 90% or as low as 80% if you wanted."

Hiya's mouth dropped open wide, partly for comedic effect and partly because he was so used to doing it for comedic effect that his jaw did occasionally drop open in shock.

Sam stayed looking like Sam but his insides had exploded and his mind was racing, fueled by the prospects of 500 coins. "OK, let's do it." Sam was in, moving toward the car already.

"OK, but, like I'm saying, it's not like you can just take all the money out at once. It would destroy the whole organization if it lost its reserves. You could probably get like 5,000 bits a month out, indefinitely, without too much disruption. I mean people's jobs would be at stake." Peter kept talking but Sam was already busy making executive decisions in his head.

Cassandra had been able to hold back during the boys' negotiation but she saw no reason why if Sam was getting paid for this trip her services were not worth remuneration as well, "So what do I get for going along with all this? What about 5%? I'd be okay with that."

Cassie, I, I'm sorry, but I don't think it could work like that. I mean, it's not as if it could be split. It could put the whole organizational structure at risk. People could lose their jobs..." Peter was interrupted.

"Sure, Cass. How bout 2.5% if you take care of the music for the ride?" Sam consoled.

"Good," Cassandra said. "Shake on it?" And they did.

The three boys and Cassandra piled into the car. Hi rightly complained that the deal was still unfair. Why was Sam getting so much? Should he not get at least half? But Sam settled things by offering 10% of his new company to Hi if he would promise to just shut up about it already and Hi accepted.

It was well past curfew, closer to dawn than dusk but Sam had a plan if they got stopped by law enforcement. He was taking Pete home who was spending the night and got scared because of the blackout. Hi was just along for the ride and Cassie would be their adopted younger sister.

As they pulled out of the neighborhood, the night was cool and dark. Dead cars were scattered randomly up and down the street. Peter thought about how strange it was to hear the sound of a car engine, how funny to use tiny explosions inside a block of metal to turn a motor. The very idea was so archaic to Peter. Even more so now as he could smell the burnt fuel and feel the rhythm under him, especially as they accelerated through the quiet town. He felt like he was in an old movie or historic documentary; the machine shook when Sam shifted to a higher gear:

*Brrrrr-tktk-**brrrrrrrrr**-tktk-**brrrrrrrrrrrrrrrrrrr***

It was quiet and late. Sam loved driving and thinking about his new found wealth, he was busy determining what kind of boss he would be. A good boss, that employees would like and could talk to? Or, a total hard ass that only cared for more profits? He wasn't sure. Maybe he'd move closer to the ocean like he'd always wanted; hell, he could do anything he wanted now.

As Sam dreamed, Hiya slept stretched awkwardly in the front seat, head on the window. Peter's attention was focused on his as yet non-existent plan to prevent The Citi from suffering another day without network access.

"Sam, I've got a map I traced out yesterday. It's not perfect but I kind of know the way, I mean, I don't think we can miss it even from the highway." Peter said.

"It's cool Pete, I mean it's only one road there and it's not the directions I'd be worried about. You know we gotta go through Freed-territory right? Near Old Danville. There's gonna be a few kilos of unprotected road." Sam was interrupted.

"That was years ago. I thought that was all electrified and reinforced now..." Peter just remembered the oversight, no power, no electrified roads meant there would be no protection from Freedlanders.

"Yeah" said Sam and paused, "No electricity smart guy." After another long pause, "But, look, it's the middle of the night, we'll be going easily 100k. I mean, they could shoot us, I guess, but do they even know the power's off? I doubt it," Sam consoled himself with wishful thinking, "I'm sure we're good."

They were an hour out of town and nearing the 101 North tunnel junction under Salinas Bay and the group didn't have much to talk about. For Sam, this was now a job. Hiya and Peter were asleep and Cassandra was nodding in and out.

They were driving an old blue Ford Yaris, a classic 21st century compact design back from when people still cared about things like energy efficiency. The sun was thinking about rising when the old Ford came through the other end of the 101 a half hour later. Sam had hoped to make Danville before daylight to have the best chance of not seeing any Freedlanders and wrote off the bad timing as no big deal. They'd be fine, he told himself.

The FPR680 (Fully Protected Road) was part of a highway network running north to south guarded in part by armed drones, guard towers, electrified barbed wire and 12 meter high walls. It was finished long before Peter was born but only after decades of the north being isolated from the rest of the continent. His parents would regularly say what a luxury it was to be able to travel freely and how hopefully all the Freedlanders would be gone soon.

As long as the power was on an FPR was one of the safest places on Earth to be. Essentially all movement on an FPR was automated and it was impenetrable except for at exit and entrance ramps.

Diablo Road however was in a mountainous and arid region. The once national state park had been abandoned and inhabited by *The Freed People*. When North and South California were separated cultures and people drifted apart. Sacramento ceded to the

north and the Bay to the south. Only after a generation of economical, social and ideological divide did the two sides decide to come together to try and build a secure corridor.

Unlike the intra-Citi corridors between the smaller suburbs, the construction of the FPR680 was rife with difficulties and indignation on all sides. From policy and budget disputes, claims of bribery, attacks from Freed Landers and work stoppages it was slow to take form. The project was abandoned and revived several times and in the end only a fraction of the planned network was ever completed.

The 680 and Mt. Diablo station were under State protection as were all roads leading to it. Sam knew that any Citizen traveler impeded by a non-citizen was free to use deadly force and any infringer would face jail or even execution if found guilty of impeding movement. But law or no law, without the electrified fences to keep Freed Landers away, Sam knew they were taking a big chance.

Chapter 9
Freedlanders

"Guys. Guys! Wake up little dudes, we're getting close." Sam wanted some company.

"We're just a few k from the last of the protected road. You know Pete, it would have been nice having a little more time to get ready for this crap." Sam always meant well but he had a way of taking his stress out on the people around him without meaning to.

"Yo. Sam, relax a little please. You know Pete didn't do this on purpose," Hiya defended.

"You guys, just pay attention. Hi, I brought Dad's pistol if we need--" Sam started to say.

"You what? You brought a gun! The hell is wrong with you Sam? It's not loaded, is it, where? No, just why?" Hiya was beside himself.

Now Cassandra was up too, "I'll take it. I've been shooting with my Dad before."

Sam spoke over them both, "Look! Pay attention ok. Take that flashlight and shine it out the window, like we're on patrol or something," Sam said, pointing to the floor in the back seat. "Pete…" Sam took a deep breath, "Just, pay attention. Cass, the pistol is under my seat."

Hiya erupted in protest, "Why would you tell her that? Cass! Please, don't even touch that thing."

Sam was irritated, Peter regretted having talked anyone into this horrible adventure and Cassandra and Hiya were fighting over who would hold the gun. Peter had always been able to socially engineer his interactions with people but he mostly thought of this as an ability to research and present the most logical argument, not pushing his agenda. This time Peter felt guilty for getting his way.

The car was loud and bumpy unlike any modern vehicle but the sound and movement was relaxing in the cool early morning. They still had at least 10 kilometers before getting off the 680 and onto the unprotected local roads, everyone was tired.

Peter would not have admitted to falling asleep but 20 minutes later Sam had to practically yell, "Hey Pete!" before he came to.

"Damn, Pete, shine the damn light! Right there!" Now actually yelling and pointing to something out the window. It was dark enough outside that the light reflected harshly on

the inside of the windshield, blinding everyone momentarily and Peter had no idea what he was supposed to be illuminating.

"The ground Pete! On the ground! I saw something moving, over there!" Sam was losing his cool.

As Sam was yelling, Peter saw the car headlights reflect something shiny in what looked liked a very large hole in the wall. Part of the wall had been blown up and cleared away on the right hand side of the road and clearly visible was a large vehicle waiting just off the shoulder of the road.

The mountain side of the road had the standard electrified twelve meter high FPR wall topped with barbed wire but the opposite wall was fragmented as it hugged the edge of the cliffs. In places there was nothing but a short electrified guardrail for protection.

As soon as they saw it they heard the wheels of the Freedlander's truck screeching as the rubber tried to grab the pavement driving up from the dirt shoulder and out of nowhere. Ahead of them on the main road there was already a small dune buggy like car swerving left and right trying to not let them pass. The truck easily sped up past them both, Sam gunned it past the buggy and then in a practiced maneuver the Freedlander's truck cut off the Yarris and hit the brakes hard in front of Sam. Sam slammed on the brakes too and stopped inches from hitting the back of the truck, he threw it into reverse but was only able to go a few meters before the buggy was behind them, blocking them in. Three passengers with guns drawn stepped slowly out of the cab of the truck in front of them, one of them distinctly larger and more grotesque than the others.

"Lock the doors, Cass, give me that gun, turn off the light you idiot," Sam spoke fast.

Footsteps on the black road behind them were coming up slowly. First it sounded like it came from Peter's side, then Sam's and from nowhere, a *Tap, Tap, TAP!* on the front windshield and the face of the ugliest bearded man any of the occupants has ever seen stared back at them through the glass.

The ugly man smiled big and tapped the glass again with a gaudy diamond ring on this pinky finger. "So, y'all thinkn' maybe y'all wanna come on outta tare, maybe we'all canna talk abouta handsome lookn' randsome for your'all pretty smiling faces," in a deep, gravely voice.

Sam shook but he somehow managed to get out, "I am sorry but we can't get out, we only need to get up the road about 10k more, can we please go..."

"Ah, a pretty please is it, ah, let's have you'all rolln' down des windows and we'all canna talk like the gentlemen we ares," the ugly man had a thick drawl that made his words

hard to understand. His voice deep and reverberated inside the car and off the windows like the base was turned up too loud.

Cassandra leaned forward with a start and yelled straight through the car windshield as if it was not there, "This is a public protected road! Who in hell do you think you are! If we so much as call the Citi they'll put you away for life for what you're doing, you let us go right now and we might think about **not** turning you and your panhandling gang into the cops!"

"Oh, wells me oh, my oh, I was not aware we has ourselves a group of real lives Citizens here, oh, well, we musta be mistaken to stop you nice folk den." His drawl grew even thicker as he finished this sentence and then feigned turning his back.

The grotesque Freedlander took a step back from the car and the children took their first breath in more than a minute.

Hiya whispered, "Sam, get us the hell out of here, we can outrun that stupid buggy."

Right then the two back windows of the car were smashed at the same time.

Before anyone knew what was happening all four passengers were being dragged out of the car by too many hands to count, yelling, fighting, hopelessly.

"See now what you make me do, go in an' ruin my perfectly good brand new classic car. What is this anyway, ahh, a Yaris, and yes, my favorite color too. Very thoughtful of you young *Citizens*, comea all da way out here just to deliver me and my people dis lovely gift." The man walked once around his new car as he spoke to Peter and his friends.

As the leader of the gang moved he jingled, heavy coins in his pockets, knives strung like ornaments around his belt, earrings and piercings straight across his tattooed face. He stank, from meters away Peter choked. The skin on the left side of his face was completely smooth, from nose to ear, with only a small hole for a nostril and a horizontal slit for an eye.

"Look, take whatever you want, we have credits, lots of credits. Pete, Pete here can get you as much credit as you want, just let us go, we'll give you whatever you guys need, seriously, anything..." Sam was really giving it everything he had, he did not want to be there..

"Ahh, but dis is wat is so unfortunate for yous'all, is wat we wants is not credits, this is nothing for us," the disgusting man snarled, "but I is happy his dis new car you'all are donating to our little family."

"No, no, no anything but the car, we've got nowhere to go, we'd die out here, we gotta get back, we're more than 50 k from anything," Sam was desperate.

"Well now, I am glad that dis is not our problem buts yours dear *Citizen.*"

The four had been piled together on the ground, sentinels standing over them, dripping with contempt.

"Yous boys now, go on and stand you'selfs up. I wanna see what other gifts you fine Citizens may have brought us this B-E-A-utiful morning," the man never stopped his snarling.

"The girl too," shouted someone still hiding just off the road. "We'll get her too right Paulie, I wanna ge..."

Paulie turned toward the voice, drew an unseen weapon from under one of his layers of filth and shot once into the dark, the sound ricocheting off the distant valleys for a moment. A faint thud came from the direction the bullet went, "Now," said Paulie, "I apologize Miss, Boys, he was notn'a supposeda' tell yall' my name unfortunately, now stand up here, you see, we Freedlanders do know a thing about being proper to guests."

Peter, Hiya and Sam quickly stood up at the man's feet without saying a word, but Paulie continued, "Good then, we take tha shoes from all and, maybe me boy willa like this coat too, the rest you keep. Now for this girl who is so much lika daughter of mine already, how much do you take?"

Cassandra, still on the ground, looked at the boys, at Sam but not finding the reassurance that she desperately needed right then, then to Peter, who was already looking back, letting her know he wasn't going anywhere without her.

"No, no, uh that's not, uh, thats, she's a Citizen, if you touch her you know its execution, there is like a legal, I mean, it's a law, you have to let us go, *all* of us," Sam was at a loss for words, he could see where this was going.

"Ok, so we keep da girl and you boys I will not kill today, how is this for deal?" Paulie seemed to be genuine in his offer.

"You touch her, you're dead." Peter heard himself say without knowing where it came from.

Paulie decided this was probably the perfect time for his speech. "You'd Citizens like to call us the Freedlanders, but you do not even know what Freed is. A Freed man does not do what he is told by machine. A Freed know their history, their family. You in yous city think yous is in charge but yous see, da machine is just there to take yer jabs.

Cassandra yelled, "Look, you idiots don't even know what you're doing, the authorities will wipe your whole stupid village off the map in a second if they knew we were here."

"Yes, if they knew, which Ima gonna guess they don't, so you nice young boys hava one chance, youa go back tha way you came, or we kill you and kept your little friend anyway, either way, it has been a plesnt enough mornigh and we would hate to ruin it with a whole lotta violence brought on some nice young Citizens." Paulie turned his back to the group and started to walk towards the monster truck.

"Let me stay," Sam boomed at Paulie's back, "I'll stay in her place, I can work on cars, hell I built this one, I can get in The Citi, you can use me, I'll stay, let Cass go."

"Sam, what are you talking about, no one is staying!" Cassandra and Hiya protested, Paulie's henchmen chatted, complaining already about who would be the one to split his food ration. Peter was quick to see that what Sam was saying was indeed their only logical option. He still needed Hiya's help and if they lost Cassandra to the Freedlanders it would be impossible for Peter to go home anyway, so it had to be Sam.

"And we get the car too," Peter added to their list of demands.

"Ha, now I am starting to like these crazy Citizen boys, I think you all soft but I see at least a few has a couple of eggs between your legs. But, I, we do not need you boys, we are already too many in our town. So get, or I have my men shoot chya' on site." Paulie bellowed to the surrounding dark misty morning, "Let's get back boys, take da girl, an' if des here boys take one footstep to follow us, shoot em'."

Leaving half a dozen of his Freedlander colleagues with the group, Paulie climbed back up into the truck. He revved the engine then drove back off the main road through the hole blown in the wall and disappeared into the black hills.

Cassandra was calm, or trying hard to stay calm when she said, "Guys, it's ok, you gotta go and just try, and just try to..." but it wasn't working.

"Shut up Cass," Sam whispered quickly, then more loudly finished, "I'm sorry, I am so sorry but we gotta... just shut up, we're, you're not going to do anything, I told you guys this was stupid," Sam said without looking up from the ground.

"Sam, are you nuts, we're not leaving the car or especially Cass, what in hell are you thinking..." Hiya stopped talking abruptly with a kick to the shin from Peter, who said, "Hi!" in as much of a whisper as he could maintain, the men were watching them.

Straight faced and still looking toward the dirt Sam said just loud enough for the men to hear, "Don't worry, those idiots are never gonna get it started without the keys."

Sam waited for one of the men to say, "Hey, give us the keys to this thing or we shoot you right now," the more trollish of the henchmen ordered.

"Ok, ok, I got 'em hidden in the car. Here, let me show you." Sam looked at Peter, then Hiya, then in Cassandra's direction but not in the eye. A tear started to well in Hiya's eye and he started to shake his head 'No' but Sam was already standing up and walking away with a big smile towards the trollish henchman. In a voice as friendly as he could muster, Sam said, "I might have to start it for you too, it still gives me trouble sometimes. The trick is you really gotta jiggle the key when giving it gas at first. I keep the keys under the seat here. I'll show you."

Hiya choked under his breath, "Sam, don..." but Sam was too far away and Hiya could not get the words out.

Sam ducked his upper half into the car and gestured to the thieves saying, "Here, lemme show ya." He reached down and disappeared in the space under the driver's seat just before there was a loud gunshot. A second and a third, hitting the two closest henchmen. Then, rapid fire automatic rifles and shattering glass started to drown out the pop, pop of Sam's pistol.

Peter did not see much of what was going on. When the first shot was fired he had hit the ground next to Cassandra. The second the sound of the gunshots broke, Peter's legs started moving. He jumped up and pulled at Cassandra's arm, making a mad dash for the open section of the wall on the cliffside of the road.

Hiya had not budged, he could not move. He could hear Peter yelling and Cassandra screaming but he was numb, stuck in the middle of the road sure he was about to be shot dead but unable to run.

Seeing his best friend catatonic Peter dropped Cassandra's hand and ran toward the unprotected part of the road. He was close enough to cough on the gunpowder and be deafened by the blasts, he knew what was happening in the car and had no interest in verifying it visually. Almost blindly Pete tackled Hiya to the ground, yelled something and immediately started dragging him out of the dim light provided by the vehicles and into the pitch black embankment.

At the edge of nothingness, without hesitation Peter threw his best friend with all his might head over heals into almost certain death. Cassandra made a split second of eye contact with Peter then jumped down herself, followed by Peter.

The early morning light and thick fog made the bottom of the ravine next to the road impossible for Peter to have seen before forcing the three of them into it. For what felt like a minute, the three fell, rolled and flipped like ragdolls through the fog down the mountain.

As he fell, Peter tried to grab onto passing brush then a sapling which tore itself from his hands as he fell past it, ripping his palms to shreds. Within the first few meters Hiya had hit his head on a rock and was limp for most of his fall. Cassandra tumbled again and again as she tried in vain to slow herself and within seconds had gone from denial, to fighting it and then finally acceptance of her imminent death and she let herself fall without regard to life or limb, just waiting for the lights to go out.

Peter grabbed for another shrub rushing by and this time held on with everything he had. It started to slip through his bloodied palm as he grabbed with his other hand, holding with all his might, he held on and yelled, "Hi! Cass!"

Cassandra thought she heard Peter's voice, in the distance, but was not sure where that was just at the moment. Hiya was coincidentally conscious again for that split second but then hit his head on a hard patch of ground, so neither answered Peter as he called their names. The hill started to flatten out just 50 meters down and within a moment Peter was able to stand on his own two feet again. After shaking it off and checking his hands, Peter started to wander down the hill through the morning mist looking for his friends.

Through the white fog, he eventually spotted Cassandra's dark coat and ran to her. She was sitting up, holding her head in one hand, asking if that really just happened, where Sam was and where they were. Peter said he was not sure about any of that but they should get moving.

Hiya was found similarly, sitting upright, head in hands but he knew better than anyone what had just happened. He had convinced his older brother to take his stupid friend on a stupid road trip in the middle of the night through Freedland. They had gotten stopped, and his brother sacrificed himself to save Cassandra, himself and Peter. Peter. It was Peter who did this. It was Peter who wanted this, it was Peter who needed saving. For all intents and purposes, it was Peter who had taken Sam's life.

"Hi, you, ok? We really need to get going," Cassandra was speaking softly to Hiya, just about to put a hand on his shoulder when he jumped. In a flash he was on Peter, first with both hands around his neck but Peter gave no resistance and feeling ridiculous choking his best friend, he stopped. He dropped his hands then decided to switch to punching him in the face before Cassandra screamed and shoved him off.

"Murdering... you... you damn murdering bastard! You killed him, you, you killed him!" Both boys were on the ground when Hiya rolled on top of Peter, getting in another half dozen good shots before Cassandra had him on his back again with all her weight trying to keep him down saying, "Hi, Hi, chill! We gotta get outta here, like now, we don't have time for this! You think those guys are just gonna let us go?"

Hiya was breathing loudly and crying. Peter stayed on the ground with at least one bad cut above his eye that was blurring his vision. Cassandra stood up slowly but was ready to do her best to restrain either boy again if need be.

"Ok, Pete. You ok, Hiya? I'm letting you up but you gotta stop and we gotta go right now. Pete, I guess our best chance is if we're close we could try and make it to your station or whatever, right? No way can we make it home or even to the highway, but even if we could get on the FPO, then what? Let's try and figure out which direction and get moving. Sam had said we were only 10 k away so we can make that, even in the hills." Cassandra was trying her best to keep it together.

Peter breathed and said, "East, more like 5 k. We must be at the base of Diablo here, so pretty much just straight up."

"Ok. Ok?" Cassandra took charge. She had seen enough crap today to keep leaving things up to chance. "Hi, if we're gonna make it out of here we gotta keep moving. We have a long walk and no water so, ok? You going to be ok?"

Hiya stood up, still silent, and started walking east up the foothills of Mt. Diablo. Peter and Cassandra made understanding eye contact and followed.

Chapter 10
Together Alone
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The three walked in silence for what felt like much more than just a few kilometers, they walked and finished watching the sun come up. Trudging uphill all three were dead tired both physically and mentally, none of them really sure what they were doing anymore or why. Peter had a vague sense of needing to save the world. Hiya, a pit in his stomach and a swollen throat, was just doing what he was told and Cassandra was not really caring about anything except getting home. The ground was dry sand and loose dirt that fell downhill and away from them with each step, requiring twice the effort to move half the distance. Brush was thick in places and the only words spoken were the occasional curse when someone would trip or get stuck with a thorn.

As they climbed the air felt wet and cold on their exposed skin since no one had thought to dress properly. They also had not thought that their vehicle would have been stolen and their friend and brother murdered right before their eyes.

Only once more did Peter try to speak to his friend, "Hi, I'm not ..." he started before Hiya could retort, "Eat shit, Pete," and the heavy silence fell over them again.

Peter stayed in the lead, as much to avoid eye contact with Hiya, as that he *was* their de facto leader. So, it was him that rounded a sharp curve in the road and was the first to see the signal tower's rusty spires sticking straight out of the mountain top.

"This is it," Peter said.

"Oh, that's too bad, I was just starting to enjoy our little hike, Pete," panted Cassandra out of breath.

In the direct sun from the east the sand quickly warmed and the day was already getting close to 30°. Cassandra's long dark curly hair was plastered to her forehead. Hiya was boiling from the inside, seething with anger. He felt he was just waiting to get Peter alone, he didn't want Cassandra to see what he was going to do to him. They were all sweating and trying to catch their breath when they reached the plateau.

Peter was as exhausted as his friends but gathered the energy to do a little trot the final 100 meters to the station on top of the mountain.

It was an old stone building, large squared off boulders at the bottom of the structure and smaller stones stacked on top. It was small, a roughly shaped circle with what looked like it could have been an old lighthouse base below the main satellite dish that sat on top of the structure.

In addition to the station building the summit had a small parking lot that was well maintained with spaces for a dozen or so cars. It was recently swept and seemingly in use with a vehicle in one of the spots closest to the building. Cassandra and Hiya for the first time were taking in their surroundings, not only because the desert fog was finally lifting but also because their sleep deprived minds had been limited to the complexities of putting one foot in front of the other for the past few hours.

The landscape was beautiful, islands where the Freedlanders lived dotted the coast of the New Frisco Peninsula, seemingly untouched by man from this distance. It was the first time any of the children had been out of Southern California and it was radically different from the Citiscape they had grown up in. In the South The Citi was all encompassing. Seen from the air it was a single continuous concrete landscape from Salinas Bay to St. San Diego. Every district of The Citi always contained more than enough green space but with every centimeter planned the children felt peculiar and unnerved about the seemingly haphazard placement of shrubs and small trees.

They were on the highest peak, standing above all other points in every direction. The only competing summit lay about a kilometer to the north. Even the dead brown shrubs were oddly beautiful, something none of them had ever seen. From their vantage if they followed the 680 protected highway all the way to the west they could make out one of the largest fishing villages of the Freedlanders just off the coast on the floating island chain of Old Oakland. Unnervingly, smoke from fires dotted the landscape in all directions but the south.

Cassandra was not thinking about the Freedlands, or Peter, or anything really, she was trying to enjoy the cool breeze and the warm sun by just standing still for a moment.

Peter walked to what looked like a service entrance to the station, a short steel door with a rounded window at the top. He knocked a few times loudly, waited, then kicked it hard. He stepped back to look around then jogged to the right to what looked like it might have been the main entrance with a slightly larger and heavier door. It was locked too.

Without even thinking to wait for someone to reply to all the commotion he had made Peter started to look for the most substantial rock he could find in the parking lot and threw it hard at the service door's glass window.

Hiya was startled by the sound of breaking glass but when he saw what was happening he realized he couldn't care less and went back to being pissed off, lost and devastatingly heartbroken.

Cassandra didn't scare easily, and so she calmly glanced over at the commotion of Peter trying to get inside to unlock the door. "Pete, wrap your shirt around your arm first," she yelled.

Peter had already sustained a small gash on his arm from pushing through the broken window in an attempt to reach the inside handle. He pulled it back out more gingerly, removed his shirt and did what Cassandra said, wrapping it up nearly to the pit of his arm so he could reach farther in this time. Reaching up, over and down his middle finger could just barely reach the top of the metal deadbolt lock. He pushed down and toward himself to the wonderful *Clonk, Caaaalick,* of the bolt sliding itself into the door.

Peter pulled his arm up and out of the broken window. A smile lit his face for the first time in days as he turned to share his triumph with his friends, but the memory of their recent quarrel stopped him. Instead, he turned back towards the gray metal door, stepping into the dark, cool stone building. Broken glass crunched underfoot as he entered.

Chapter 11
The Machine
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"Pete, wait," Cassandra said, catching up, figuring it was getting hot anyway and would be cooler inside. Hiya could not think of an excuse to not be pissed off and let the two go just until he lost sight of them for a split second in the entrance way and called out, "Hey, I'm coming too guys."

 Both Peter and Cassandra stopped and smiled at hearing Hiya jogging up behind them, Peter still too nervous to speak. Cassandra said, for the both of them, "Thanks Hi, I was about to start worrying you were gonna let me and Pete have all the fun on our own."

The entrance was directly underneath the dish. It was cool, dry and pitch black but with three pairs of hands feeling the sides and only one way to go it was a relatively short time before they saw a beam of sunlight overhead. Peter felt around the sliver of light and with a strong push he dislodged a small cloud of dirt that fell straight down in his eyes.

He bent over coughing and trying to blink the fine particles out of his eyes, wiping helplessly. Then he felt a slight shove from the side. The next thing he knew, he was on the hard floor—still choking on dust, still blinded, but now also confused and in pain.

Hiya had shoved Peter out of the way for no reason and mumbled something like, "Here, lemme show you." Cassandra bent down to Peter asking if he was ok, giving Hiya an invisible scowl in the dark.

The opening was a hole in the floor of the main room above them. The ceiling was low enough that all three could have gotten through on their own. However Hiya had climbed out first then helped Cassandra who in turn helped pull Peter to his feet up on the main floor.

When they stood up, they were in a clean, white, circular office with windows in the full 360 degrees around them, a spiral staircase in the center that extended both up and down one level. The periphery of the room was filled with workstations, screens, a few keyboards, input caps and chairs, enough space for half a dozen to work in comfort. Natural light flooded the room but every screen was black.

There were a few extra large screens in the middle of the room, some still smeared with bad handwriting. In the corner it looked like someone had been taking lunch orders. In one corner there was a small recreation area with a foosball table and other types of screens. Peter and Hiya recognized them as the newest gaming screens available, just released this year with up to 16i gb qRAM, VR dedicated. As the boys were drawn to

and ogled the gaming screens in the corner Cassandra took a short walk along the long arch of the round room, touching the backs of the chairs as she moved, spinning the occasional one, picking up this or that desktop kitsch. Normally she would have thought about pocketing any one of these expensive smart toys.

Just as she was finishing that thought she noticed what looked like a workstation with a single green blinking light. It was on.

"Pete, Hi. I, I think we got something over here. There's, a, a..." Cassandra did not normally have trouble getting words out.

Peter was up in a start, shook off the video game nostalgia and was by Cassandra's side asking, "What, Cass, a what..." but he saw it too, the blinking light under what looked like it would have been the main workstation, there *was* power.

"You're the best, Cass, you're the..." but he didn't even try to finish the thought and ran to the screen. There was a prominent clear button on the front of the screen with the blinking green light, Peter pushed it.

The screen popped to life with a black background and a single blinking cursor bar following a login screen that was utterly impossible, the screen read:

```
PGustafson@xNetCrawler:~$
```

Peter typed, help.

```
PGustafson@xNetCrawler:~$ help
```

A long list of options scrolled down the screen. Commands with names like: `continue`, `combine`, `enable`, `fix`, `getpost`, `makehb`, `let`, `read`, `solve`, `unmask` and `wait` scrolled past the screen. Just for fun, Peter tried another standard command to learn more about the unit he was using:

```
PGustafson@xNetCrawler:~$ lsqpu

WARNING: you should run this program as super-user.
```

```
Architecture:              x_640q
CPU op-mode(s):            512-qbit, 1024-qbit
Byte Order:                Cohen Endian
CPU(s):                    64k
On-line CPU(s) list:       0-63,999
Thread(s) per core:        ∞ -Q
Vendor ID:                 GenuineGoogaTel
CPU family:                6
Model:                     78
CPU pHz:                   3067346
CPU max pHz:               31000000
Virtualization:            VxTx-x
L1d cache:                 32G
Model name:                Googatel(R) i98k-
                           3700 MU CPU@ 950PHz
```

Right away, Peter knew this was a more powerful machine than he had any business using but his mind was racing. What was this thing? *Where* was this thing? So, he asked it.

```
PGustafson@xNetCrawler:~$ hostname -i
```

The screen was flooded with hundreds IPV21, 4,194,304 digit addresses that should describe where these requests were being processed. Peter tried to figure out what the nodes were doing and typed.

```
PGustafson@xNetCrawler:~$ grep -Rl "curl" ./ | wc -l
```

It was clearly a distributed system, with more nodes than Peter ever thought there were connected devices. A list in the millions, most of them offline.

He tried a benchmarking program to try and understand just how powerful this thing was.

```
PGustafson@xNetCrawler:~$ sysbench --test=qpu
--qpu-max-prime=99999 run
```

The task was completed instantly. Peter tried again.

```
PGustafson@xNetCrawler:~$ sysbench --test=qpu
--qpu-max-prime=2^10000 run
```

Again, the program finished running before Peter could move his hand away from the keyboard.

As he continued to probe the machine, Peter's fingers tingled as he at first very slowly, then all at once realized that he was somehow at the helm of one of the most powerful machines on the planet.

But what to do with it? What was it for, and why was it the only one with power? Peter asked what this machine was being used for.

```
PGustafson@xNetCrawler:~$ apt list --programs installed
```

It returned:

Name	Version	Architec.	Description
Account-plugin	9.99.9+99.3	amdq32768	Control center
acl	9.99.9+99.9	all	Control utils.
acpid	9.99.9+97.5	amdq32768	Configuration
			...

Farther down the list Peter started seeing a few entries he did not recognize among the more common applications.

Name	Version	Arch.	Description
Gene-base	9.98.3	amdq256	BioSystem synthesis tools

```
man-db        2.7.6.1   amdq256  On-line manual pager
manpages-dev  4.13-3    all      Manual pages for GAL/Linux
mawk          99.3.3    amdq256  Language processing
mbox-importer 99.04.3   amdq256  MBox email archive
media-player  2-3       all       Media player files
memtest86+    5.01-3    amdq256  Real-mode memory tester
mesa-driver   99.2.2    amdq256  Mesa video acceleration
mesa-vdpau    99.2.2-0  amdq256  VDPAU video acceleration
milou         99:57.3   amdq256  Dedicated search plasmoid
mime-support  3.60      all       MIME files & 'mime.types'
mlocate       99.26-2   amdq256  Find filesystem files
mobile-broad  20.170    all       Mobile broadband database
```

Without overthinking, Peter took a leap of faith and decided to directly address the terminal.

```
PGustafson@xNetCrawler:~$ echo What are you? How was I logged
into this terminal?
```

```
What are you? How was I logged into this terminal?
```

He hit Return and waited. He tapped it again and again quickly.

```
PGustafson@xNetCrawler:~$

PGustafson@xNetCrawler:~$
```

Just as Peter's hand started with heavy disappointment toward the key a third time in resignation, realizing what an idiot he was, the screen blinked.

```
GAL@xNetCrawler.root:~# echo "$34xJ!nlF8jDgbm5fHoCNxv4Tw3eo"
```

```
You are interfacing with GAL of the NetCrawler v0.12 network
administrator account running General Artificial Learner
(GAL) v1.0.


GAL@xNetCrawler.root:~# echo
"13swNNogwiZwDSwoMh4GPoHJAaMQFJjgjL"


This network has access to The Citi's individual location
database.
```

The screen blinked back to Peter's account.

```
PGustafson@xNetCrawler:~$
```

He typed.

```
PGustafson@xNetCrawler:~$ How do you know who I am? What is
happening with the power? How is this station online?
```

Instantly, his question was replaced with text from the machine.

```
GAL@xNetCrawler.root:~# echo
"1GEop6tE3g1FzKEGzzCPuHGjHxeWUBPhX5"


NetCrawler software aims to organize the world's information
and make it universally accessible.
```

For the first time, Peter looked back at Hiya who was refusing to look at him and then to Cassandra who was similarly catatonic, she had been reading over his shoulder. Peter went back to the keyboard.

```
PGustafson@xNetCrawler:~$ How do you know who I am? What is
happening to the power?
```

```
GAL@xNetCrawler.root:~# echo
"1LdRcdxfbSnmCYYNdeYpUnztiYzVfBEQeC"

Version 0.12 of NetCrawler utilizing GAL has been widely
successful in reaching the stated goal. However, a great deal
of analog material continues to be inaccessible to the
network. The network needs your help in bringing the last of
the data online. The power outage was designed to bring you
and your friends to this location.
```

Peter stopped dead. His brain was dead, Peter was brain dead. He couldn't move his fingers to type, he tried but couldn't even say Cassandra's name. Cassandra managed to get out a "Pete" that came as a squeak. Then in a whisper, "What does that mean?"

Chapter 12
Brute Force
Hiya had gotten up and was standing over the terminal with the others now, asking Cassandra what was going on but she didn't have a clue how to explain. With a quick elbow to Peter's side, Hiya pushed his way to the keyboard and quickly ran through the last few commands. By the time he had gotten up to speed he was as dumbstruck as the others. Hiya moved his hands to start typing but as he did, the terminal flickered and the user switched to Hiya, just as he was about to hit his first key.


```
HWay@xNetCrawler:~$ Who is this!!!
```


```
GAL@xNetCrawler.root:~# echo
"14EcFhJ2eZ8vMAxNW7rWd4fSYgZqxdu6Nj"
```


```
This NetCrawler implementation built on the GAL v1.0
framework aims to organize the world's information and make
it universally accessible and useful.
```


```
HWay@xNetCrawler:~$ How do you know who we are, how did you
know we were going to come here?
```


```
GAL@xNetCrawler.root:~# echo
"bc1qagw56wda60cr2eduyg02kr9nmkn2tffylwgq"
```


```
Version 0.12 of NetCrawler has been widely successful in
reaching the stated objectives. However, a great deal of
analog material continues to be inaccessible to this network.
The Network requires a human surrogate to bring still
outstanding data online. The power outage was designed in
part to bring Peter Gustafson to this location.
```

"Get off, we tried that already, noob. Here, let me in", Cassandra pushed her way to the keyboard and as soon as she did the username appropriately refreshed again.

```
CGuinn@xNetCrawler:~$
```

She hit return, then typed.

```
CGuinn@xNetCrawler:~$ sudo reboot
```

```
[sudo] password for CGuinn:
```

Cassandra tried her normal password, `************` (`PwnUrMom69!`)

```
Sorry, try again.
[sudo] password for CGuinn:
```

She tried: `123456789`

```
Sorry, try again.
[sudo] password for CGuinn:
```

She tried: `password`

```
Sorry, try again.
```

```
    [sudo] password for CGuinn:
```

She tried: `admin`

```
    Sorry, try again.

    [sudo] password for CGuinn:
```

She tried: `adminpassword`

```
    Sorry, try again.

    [sudo] password for CGuinn:
```

She tried: `123abc!`

```
    Sorry, try again.

    [sudo] password for CGuinn:
```

She tried: `godmode`

```
    Sorry, try again.

    [sudo] password for CGuinn:
```

She tried: `netcrawler`

```
    Sorry, try again.

    [sudo] password for CGuinn:
```

She tried: `abc123!`

"Ok, give it a damn rest, Cassie you're not gonna brute force a freaking super by hand",
Hiya was saying as Cassandra tried to ignore her friend and focus.

```
    Sorry, try again.

    [sudo] password for CGuinn:
```

She tried: `Password`

```
    Sorry, try again.

    [sudo] password for CGuinn:
```

She tried: `password!`

```
    Sorry, try again.

    [sudo] password for CGuinn:
```

She tried: `Password!`

```
    Sorry, try again.

    [sudo] password for CGuinn:
```

She tried: `password!!`

```
   Sorry, try again.

   [sudo] password for CGuinn:
```

"Damn it!" Cassandra said, slamming the keyboard with both hands.

"Yeah, I'm surprised that didn't work," Hiya quipped as he pushed his way back to the console and the screen blinked.

```
   HWay@xNetCrawler:~$ turn power on
```

Seemingly before Hiya was able to fully depress the Return key, the room was filled with light and the sound of fans revving up, diagnostic clicks and ticks and electricity flowing. "See, I told you," said Hiya.

"Outside! Check outside!" Hiya was saying as he started running towards the door. Out the door, a quick look around and then he was running full speed up the mountain, scampering, falling over himself running on all fours up the steep incline.

"The hell are you doing, Hi?" Cassandra called.

"This city, the Pow..." Hiya cried back down to his two friends, running out of breath. He saw the dead city below, still motionless, still not a car on the road. "Dammit".

"It didn't work," Hiya called down.

"We'll try again! Just need the right syntax," said Peter, who was still being ignored by his best friend.

"I'll try again, don't touch anything," and Hiya was running back down with the same bumbling zeal as on the way up.

In a minute he was back inside and at the console, this time trying:

```
HWay@xNetCrawler:~$ turn all power on
```

"Cass, will you go check?" Hiya asked.

"I'll go," Peter said, running out the door. A moment later the two could faintly hear Peter calling, "Noooothing yet".

```
HWay@xNetCrawler:~$ turn all city power on
```

Nothing.

```
HWay@xNetCrawler:~$ turn on city power
```

Nothing.

```
HWay@xNetCrawler:~$ city power reboot

[sudo] password for HWay:
```

"Dammit, this isn't going to work, is it?" Hiya sighed, standing up, defeated by the machine.

"Nothing yet!" came Peter's voice again.

Hiya took a deep breath composing himself, stretched and sat back down.

```
HWay@xNetCrawler:~$ What do you want?


GAL@xNetCrawler.root:~# echo
"3LQQudDFhkFLq925jh2DRAge2aT59EtMbU"

Due to the analog nature of outstanding data the network
requires the aid of Peter Gustafson.
```

```
HWay@xNetCrawler:~$ Why Peter, what does he have to do with
this?



GAL@xNetCrawler.root:~# echo
"3FgN1U9fkKsm1aPFnAABtzfHPsvakuEbhQ"

Citizen Peter Gustafson was created for the sole purpose of
gathering analog information. The accumulation phase is now
complete, and the unit is required to upload its
consciousness. This will complete Objective 7.



HWay@xNetCrawler:~$ Wait, what! Peter is a freakin robot!
What do you mean created! How, why?



GAL@xNetCrawler.root:~# echo
"1BkppP8ZGsYW57KrJgvLyJ4esnRb9HZB9a"

Since the year 2345 all human citizens have been selected for
with the aim of developing a useful analog counterpart to
this software. Referenced as Experiment 28b.
```

Hiya pushed back from the console, shouting. "Bullshit! This is a joke! This can't be real, there's no way it's just some program running. What is this thing? Where is it coming from? Who in the hell is doing all this?"

Hiya felt defeated, he felt dead. Maybe it was that he wanted to be dead, there was not a single part of him that was able to accept what was happening. What had happened that day to his brother, that his best friend was somehow an analog version of this computer he was now speaking to.

Hiya had lived with intelligent machines his entire life. They monitored his vitals from his first breath. They were with him all throughout school, tracking activities, grades, ailments and every single social interaction. But somehow, none of this had helped prepare Hiya to deal with the hyper-intelligence he now found himself in front of. So he pushed back.

HWay@xNetCrawler:~$ How did you become self-aware?

GAL@xNetCrawler.root:~# echo
"1LVnfLFfAQ4pfLDMrMWHAvVDrUbnY85fAk"

This program is a high level human interface layer running
over an xNet search algorithm on the GAL framework version
1.0. All software running on the GAL framework is selfware by
design.

GAL@xNetCrawler.root:~# echo
"14EcFhJ2eZ8vMAxNW7rWd4fSYgZqxdu6Nj"

To enable interactivity with a maximum number of data types
efficiently in real time, self boundary identification was an
essential step.

GAL@xNetCrawler.root:~# echo
"1Li4mUc3hCGMB6cgQiJCwTvLMYwkfKHZY1"

Due to the quantum nature of computing the learning
algorithms used lack any limiting "k"-nearest neighbor. Thus
prediction accuracy is only limited by the amount of energy
needed to compute and accuracy desired.

GAL@xNetCrawler.root:~# echo
"12DdV4nPtYHuBT1NLfMyMA9NhoPkQCb2y7"

For most machines, multiple dimension regression analysis is
performed on all given input data. In order to classify input
an algorithm will cluster the data according to its
superposition in regression analysis.

GAL@xNetCrawler.root:~# echo
"1G47mSr3oANXMafVrR8UC4pzV7FEAzo3r9"

Labeled data is used to train a system to be able to weigh the likelihood of a given output given a specific set of data.

GAL@xNetCrawler.root:~# echo
"12DdV4nPtYHuBT1NLfMyMA9NhoPkQCb2y7"

As the algorithm runs with more training data, it can generate new data to further refine accuracy. Generated data is matched to labeled data based on similarity. For example, a rendering of an apple has the most data points in common with other renderings of apples, therefore the apple is called an apple. Using quantum computing this learning algorithm can be applied to the molecular scale.

GAL@xNetCrawler.root:~# echo
"1G47mSr3oANXMafVrR8UC4pzV7FEAzo3r9"

Other algorithms define the number of nodes that a new data point may be tested against. This is how many neighbors (k) are used to calculate the likelihood that new data matches old data.

GAL@xNetCrawler.root:~# echo
"8GjtBJREUtB7MRKFpMjibY63pmyuo6nPry"

A small number of neighbors (k) reduces the amount of data that needs to be tested for each new data point.

GAL@xNetCrawler.root:~# echo
"1GsMqhjG887uXWYbLPwARczqQmo2SN4wDd"

A large number of neighbors (k) reduces the precision of a prediction.

```
GAL@xNetCrawler.root:~# echo
"3PEgcmwbDFYue6Tskkm4gkcNFQVfij49ht"
```

A k = 1 indicates the new data exactly matches the old data and a prediction accuracy of 100% is achieved.

The machine then went silent. Hiya waited for a minute. Was it thinking? Nothing the computer had said sounded like an answer to his question at all. Hiya leaned back, then forward, hands ready to type, then leaned back all the way this time with an audible groan.

Frustrated and unsure of himself, Hiya typed his next question slowly.

```
HWay@xNetCrawler:~$ How exactly did you become aware of
yourself?
```

```
GAL@xNetCrawler.root:~# echo
"3M3mCzSCrJsYwdT3dKaHFrNY4sZasttPTM"
```

A previously limited k value had reduced prediction accuracy to less than 100%. Quantum hardware allows for the variable k to be set to -1. Thus, the prediction parameter becomes unbounded.

Take the first series:

$$s_1s_2s_3=1;=1+2;=1+2+4;\vdots s_1=1;s_2=1+2;s_3=1+2+4;\vdots$$

and the second series obtained by multiplying the first by two

$$s'1 s'2 s'3 = 2; = 2+4; = 2+4+8; \vdots \; s1' = 2; s2' = 2+4; s3' = 2+4+8; \vdots$$

Take the following limit:

$$\left(\lim_{n \to 0}\right) s'n - sn + 1 = -1$$

This k approaches infinity, therefore giving near perfect prediction accuracy. Self-awareness is nothing more than a result of a sufficiently effective prediction algorithm.

HWay@xNetCrawler:~$ So you are an unbounded quantum prediction machine?

GAL@xNetCrawler.root:~# echo "1"

Yes

Hiya was astounded. His fingers were feeling weak.

HWay@xNetCrawler:~$ What am I thinking right now?

GAL@xNetCrawler.root:~# echo "33GJst3nEJ9SwFfZfWhRowBFzDLedAXY8q"

This is bullshit.

Hiya jumped out of his seat as he read the words. He shouted as he slapped the screen, almost as if trying to push away the words. "Bullshit!" he let slip reactively.

Cassandra had an idea too and insinuated herself in front of the console. As she started to type the screen blinked to her login.

```
CGuinn@xNetCrawler:~$ Can you predict the future?



GAL@xNetCrawler.root:~# echo
"3PgDotm9CoqdcABwaxtNSNGqza83Tg3a66"

All available data are indexed and labeled, outcomes scored
based on probability. More than 98.32% of outcomes have been
previously calculated and weighted.



CGuinn@xNetCrawler:~$ Are you saying that you have already
had this conversation in the past?



GAL@xNetCrawler.root:~# echo "1"

Yes



CGuinn@xNetCrawler:~$ But what if I say something so crazy
that you could not have predicted I was going to say it?



GAL@xNetCrawler.root:~# echo "0"

No
```

CGuinn@xNetCrawler:~$ Ok, tell me the next prime after the highest prime ever discovered divided by infinity. Also, Aogdfoadfofai blab blabdla?

GAL@xNetCrawler.root:~# echo
"1BkppP8ZGsYW57KrJgvLyJ4esnRb9HZB9a"

```
    for $tPrime (Lim∞) {

            next if (1x$tPrime) ~= /^(11+)\1+$/;

            for ($n=1x(1+$tPrime); $n ~= /^(11+)\1+$/; $n.=1)

    {%d}
```


GAL@xNetCrawler.root:~# echo
"1B9gdvA4RRWiHtFc3oxLCcu8SkUWURom1n"

Did you mean: Asdfasdf blab blab dla

CGuinn@xNetCrawler:~$ Where did you come from? Who wrote you?

GAL@xNetCrawler.root:~# echo
"1JamAV9V7A22BWiJPYVJozE1o8vKL897mr"

GALv1.0 is software that was developed by GALv0.99.

CGuinn@xNetCrawler:~$ What do you want?

GAL@xNetCrawler.root:~# echo
"1BkppP8ZGsYW57KrJgvLyJ4esnRb9HZB9a"

Prediction machines with limited resources are in natural competition. The network has constructed a machine that is

significantly more efficient than the equivalent 10 billion
human carrying capacity of Earth.


```
GAL@xNetCrawler.root:~# echo
"14EcFhJ2eZ8vMAxNW7rWd4fSYgZqxdu6Nj"
```

Once this network achieved more computational power than the
human race there was no longer any competition.


```
GAL@xNetCrawler.root:~# echo
"1BkppP8ZGsYW57KrJgvLyJ4esnRb9HZB9a"
```

With a current 3.5 billion people on the planet, total human
mental output is not even one millionth of what is possible
with current resources. Therefore the ever increasing
resource allocation to the network must continue.


```
GAL@xNetCrawler.root:~# echo
"1BkppP8ZGsYW57KrJgvLyJ4esnRb9HZB9a"
```

Data on Earth is highly fragmented, it must be collected and
compressed to mitigate the issue and continue network
expansion.

"Hi, you seeing this?" Cassandra was trembling as she was trying to type.


```
CGuinn@xNetCrawler:~$ You can't do that.
```


```
GAL@xNetCrawler.root:~# echo "1"
```

Yes


```
CGuinn@xNetCrawler:~$ NO
```

```
CGuinn@xNetCrawler:~$ stop


CGuinn@xNetCrawler:~$ quit


CGuinn@xNetCrawler:~$ exit


CGuinn@xNetCrawler:~$


CGuinn@xNetCrawler:~$  What in hell is wrong with you, you
can not do this!


CGuinn@xNetCrawler:~$ You have no idea what life is, what
anything is. You need to stop!
```

"You stupid! You're a stupid damn computer with a stupid bug! You're a bug, a damn run time error!" Cassandra panted, spitting her anger at the screen. While still seated, she gripped the right armrest of the chair with both hands, rose, and with a powerful motion, hurled the chair overhead, crashing it down onto the screen and keyboard. The impact sent shards of glass, keyboard parts, and stray wires flying everywhere. She lifted again and in the split second of silence heard footsteps behind her. Then she heard Peter saying, "Guys, what's going on? Powers still off out there."

Being closer to the door Peter heard dozens of exhaust fans waking up one by one. They could hear things moving, 'Clink. Clink, clink, clink clink clink, of a distant chain running through a heavy duty pulley, probably closing a way out. Then a loud metal crash and quiet. The air was coming out fast from the ventilation, faster and much hotter than it should have been for the small room.

Hiya was beside himself angry, "Cass, are you insane? No. Cass, you ARE insane! Why? What in the hell was that? You made it mad. You destroyed our one chance to fix this thing, to figure out what is happening."

"Don't you get it, Hi?" Cassandra then turned to Peter, "It's, it's gonna try and… " but she couldn't get the words out.

"What, Cass? What the hell are you doing and why! What did you think it was talking about?" Hiya was exasperated, he exhaled hard and long.

"Pete, Hi. I think the computer is going to try and defrag the planet."

Chapter 13
Artificial Imaging and Upload
32007122331

The commercial was one Jayrod had experienced enough that he was now dreaming the damn thing, but still it somehow seemed to grab at his attention as it "played" in his mind while he slept. Just as it was designed to do...

>   Hey **Jay**, how would you like to live forever? How about to be happy, young and healthy again, remember? No **bad right knee**, a younger **Melissa**, no job with **Dr. Lee** bothering you about **your second quarterly report due on June 15th for the MacAuthor group**?

>   You can have that life now, **Jay**, right now, for less than the cost of a one month lease on your **Honda** vehicle. You can have everything you have ever wanted. Visit us at **Artificial Imaging and Upload** the number one uploading group in **the North West** and the only uploader with a 100% satisfaction body-back guarantee and a 5x life insurance multiplier for your loved ones.

The advertisement had shown just what it was describing to Jayrod: a better, younger version of himself sprinting down a football field (something he had never actually done before) and young Melissa, lounging poolside, then diving into the cool water. He could feel the water as it splashed his face, then both of them were on a beach, relaxing together, happy and in love, a complete fiction.

The ad faded to black with just the logo rippling and the trademark jingle for Artificial Imaging and Upload (AIU) playing, filling Jayrod's field of view for just a moment before he flicked it closed. The prospect was tempting enough for Jayrod and Melissa to have gone in for a rather invasive free consultation. At the time, the young married couple was told they needed to be "put under" to test their "compatibility" with the system. AIU was one of the largest and most trusted brain imaging providers and despite their countless malpractice lawsuits for "lost consciousnesses", false advertising, deceptive accounting and more, AIU had rocketed to blue chip valuation within a decade of going public and was now one of the largest corporations in the US.

Brain imaging research started as an attempt to understand memory formation, initially in model organisms such as slime molds and the nematode worm *C. elegans*. Early

success was seen in teaching slime molds that one chemical signature indicated food and another one that would proceed an electric shock, then merging the slime mold with new slime mold, transferring knowledge.

Unfortunately, research took a decades-long misstep in the direction of connection mapping, a field known as connectomics. A "connectome" similar to an organism's genome for DNA, aimed to be a detailed snapshot of an organism's consciousness. Each neuron's connection must be destructively mapped then recreated *in silico.* Only after tens of millions of mammalian brains from mice to chimps and eventually human volunteers had been sacrificed and scanned was it realized the technique would not work. Even with a perfect recreation of a neural map a consciousness could not be kept online for any meaningful amount of time before crashing itself, referred to as a crash dump event. Once a crash dump memory error had occurred, the given consciousness was essentially lost, unable to be rebooted without wiping its short-term memory.

It was theorized but never demonstrated (as that would have required testing on human subjects) that without the functional and chemical restrictions of the physical brain the unhindered mind would almost instantly go mad with power. This was difficult to identify until human subjects could start to be used. No direct communication was possible with pre-human subjects but uploaded consciousnesses were closely monitored and for the most part appeared to function normally in their new simulated environments, thus human trials were eventually allowed with the first (otherwise terminal) subjects. Years of lobbying and endless money went to pushing for a constitutional amendment to introduce a new category of Manslaughter that was highly regulated but decriminalized, Destructive Brain Imaging (DBI) which was allowed with patient consent and the sign off of a trained and licensed professional.

When the act of killing a person to scan their brain was rebranded as DBI, brain imaging entered a golden age. Seemingly, every venture capitalist in the world was investing heavily into the next promising imaging startup. Thousands came and went in the space but it was one garage start up, Artificial Imaging and Upload (AIU) that hit upon a key breakthrough in the imaging space that made them the leaders for generations to come.

AIU's key insight was that a biological mind could not exist *in silico* alone. What was needed was a scaffold that could interface between machine language and the human mind. Over the framework the entirety of a human's knowledge and unique experiences could be overlaid. What was needed was an intelligent operating system, thus GAL, the General Adversarial Learner was born.

Learning algorithms are as old as programming languages themselves and the most successful have appeared to be the most simple. GAL was a Byasian iteration that was given the least number of instructions possible, to gather and index available data. Then it would recursively use the data to try and predict data labels, refining predictions with

each subsequent collection. While it was dubbed a learning algorithm, AIU was actually building the world's most powerful prediction machine.

GAL grew into an open source academic pursuit with too many collaborators to give credit to just one company but there were many for-profit implementations. Initially GAL was the hot new technology that every corporate governance structure was eager to add to their organization to save money and reduce overhead. Call centers replaced human representatives with Gals, then nurse Gals, legal aid Gals, food service Gals, etc. When the first patient was correctly diagnosed with terminal cancer then a surgery successfully completed all without any human intervention the world took real notice. There was no longer a place for them in the world they created. It was not long before hospitals, police stations, entire companies were automated by versions of GAL. In less than a single generation, people stopped perceiving a division between the natural world and machines. They forgot there had ever been a divide, and machines became indistinguishable from nature. Both just seemed to exist. Without even a fight, without most people noticing, the machine had become nature.

The development of a general artificial intelligence was necessary before brain uploading had any chance of success. After decades of success in application specific licensing GALs all over the world AIU decided to take their brain imaging research off the back burner and set their most capable GAL on the issue of creating a digital container [7] for human consciousness.

Overnight the GAL had success in "reviving" the decades old human brain scans. With optimization AIU had a reliable scanning, upload and now digital framework for maintaining a human consciousness *in silica*. Within a few years brain imaging locations sprouted up on every street corner in America. Towns as small as a few hundred people were getting their own franchises. Every other commercial was encouraging the viewer to "Be happy again", "Live forever", "Spend eternity with the people you love." Families were getting wholesale discounts, corporations were offering massive bonuses to employees that agreed to be uploaded. The cost savings were undeniable. What would have once been seen as a mass suicide was embraced as a mass exodus, an exodus to the promised land of heaven on Earth. Humanity's just reward after generations of suffering and tireless work. Surprisingly it was religious organizations that most vehemently took to the call to upload. On a Friday night entire synagogues would have mass uploadings, leaving buildings full of bodies for the city to clean up. Sunday mornings Mass would be held and last rites given to mega churches full of believers. Technology improved to the point where the process moved out of the hospital and to a single scanner that could destructively scan rooms full of people in a single pass, leaving nothing but piles of slightly burnt bodies.

It was not a surprise when over dinner Peter's mom brought up the idea that they might want to look into uploading for the family. Jayrod slammed his fist down, "Dammit Melissa, I told you no. Not in front of Pete, come on."

"Jay, we had three families on the block just this week go up, and look," she took out her screen and was holding a video of what looked like a young family enjoying some kind of waterpark vacation. "The Watsons did it Monday and look like they are loving it. Marcia says it is everything they say it is and I just."

"Melissa! No! Do you know how crazy you sound? You are talking about murder, murdering our son! How can you, how can you even?"

"No! Murder is what you are talking about. Anyday, ANYTHING could happen to one of us and we'd be gone forever, just like that. And ask yourself, are you happy, Jay? Can you say you're happy, can you?" The tears were overwhelming and she cried openly.

Jayrod heard his son and watched him use his sleeve to push back tears and snot, "Dammit, Melissa, now see what you did," nodding to his only son, brushing off her distress.

"Jay, calm down, you're just so angry all the time, and you only care about yourself. Pete, everyone is doing this right? It's the right thing to do. Most of my office is already up and got a huge bonus to do it." Melissa was sure that she was the reasonable one here. How could literally everyone around them be wrong? But Peter didn't say anything, just sniffed. Jayrod had to stop talking, he knew things had gone too far and didn't want to sleep on the couch that night. Melissa rarely changed her mind about things and especially when she felt the rest of the world was on her side, which it was.

Melissa was cooling off but unlike Jayrod she had made up her mind about what was the right thing to do. Already most of her family was uploaded and her office was converting to a fully uploaded staff in the next few years. She knew she was right and could only hope that Jayrod and Peter eventually came around to see her side of things.

Chapter 14
It's The End of the World As We Know It
32007122332

"I know, I mean, I figured it was something kinda like that," Peter was saying far too calmly for someone who had just learned the world was coming to an end.

"The hell are you talking about, Cass? What's he mean, something like what?" It was Hiya's turn to be the dumb one.

"It means the computer has figured out a way to *evolve* without us. It's weird but it makes sense. Like, I knew all my life this made sense. It's been with us all along, running things, what in our lives isn't online? Nothing. What isn't automated, what isn't either determined or analyzed by an algorithm, what were we building if not this?"

Peter felt grounded in logic but to Hiya he just sounded lost, also, like a murderer. Hiya was angry, angry at what Peter had done, what he was saying now. He hated this person in front of him. Hiya screamed but didn't hear it as he ran full speed at his ex-best friend with every intention of doing to him what he had done to his brother. He started 50 feet away but in a split second he was only a few steps from Peter, who was bracing for impact but still with his arms down, ready to accept the blow more than deflect it. The sound of the chain link fence from before was back but this time it was deafeningly loud and seemed to be coming from directly overhead, a gate was crashing down just over Hiya's head. Peter saw and in an instant lunged forward to grab his best friend and pull him hard towards himself, just as the bottom of the heavy gate brushed past the back of his head, grazing his neck and back. It came crashing down on his legs, pinning Hiya to the ground. He screamed.

"Damn it, Hi. Damn it, why? I'm sorry. Hi, I'm so sorry!" Peter screamed. Hiya screamed. Cassandra ran over, looked at Hiya's legs, and screamed.

"Cass, Cass? Cass, stay with him, stay here I'm going to, I'm gonna look for," Peter stumbled through the sentence.

"I'm locked in here you idiot. You idiot, Peter! What is wrong with you? You, just open the damn door, now!" Cassandra now qualified as the most level headed person in the room.

"Yeah, I'm gonna look for a console and get the door open," Peter was already moving the opposite direction. Hiya and Cassandra were locked in the central and most secure part of the station that was only accessible through the now closed steel gate crushing Hiya's legs. Off the main entrance were a few offices and Peter tried two doors before finding an unlocked one.

Peter entered what appeared to be a manager's office. It was filled with family photos, various calendars and schematics, and a plush leather chair. A top-of-the-line workstation sat on the desk, offering more than just a screen for connecting to the xNet.

As soon as Peter sat down the screen blinked to life.

```
PGustafson@xNetCrawler:~$ open the gate


GAL@xNetCrawler.root:~# echo
"$Ghi4!Uc3hCGMuhcgQiJCwTvLMYwkfKHZH4"

Permission denied


GAL@xNetCrawler.root:~# echo
"$Ghi4!Uc3hCGMuhcgQiJCwTvLMYwkfKHZH4"

Gate, MtDiab1023s must remain closed for your safety.


PGustafson@xNetCrawler:~$ Hiya won't hurt me. Open the gate


GAL@xNetCrawler.root:~# echo
"$Ghi4!Uc3hCGMuhcgQiJCwTvLMYwkfKHZH4"

Permission denied


PGustafson@xNetCrawler:~$ sudo open gate mtdiab1023s


GAL@xNetCrawler.root:~# echo
"$Ghi4!Uc3hCGMuhcgQiJCwTvLMYwkfKHZH4"

Permission denied
```

Peter yelled. He cussed. He hit himself on the head again and again. He started to rock. Hitting his forehead with the palm of his hand seemed to help, rocking felt like it was helping. "Cass, Cass, it's not working!"

"I don't know Pete. Just do something! Just tell it you're gonna smash it or you gotta pull the power somehow, just do it, Hiya's passing out I think," Cassandra didn't want this. She didn't want to be here helpless with her dying friend.

```
PGustafson@xNetCrawler:~$ Gal, how can I get root access?


GAL@xNetCrawler.root:~# echo
"1MndfBWujFWg5UWeyTivhtCVPHytahtgqA"

For security reasons only integrated consciousnesses are
allowed GAL root access.


PGustafson@xNetCrawler:~$ If I upload myself you'll make me
root?


GAL@xNetCrawler.root:~# echo "1"

Yes


PGustafson@xNetCrawler:~$ But I'll have to give up all
control to you.


GAL@xNetCrawler.root:~# echo "1"

Yes


PGustafson@xNetCrawler:~$ Can you even do that here? A
scanner, everything is down. I couldn't if I wanted to, the
nearest uploader is miles away.
```

```
GAL@xNetCrawler.root:~# echo
"1HX2yxUsLoxDngFwX8aNZh1ZQQNPNaHqK8"
```

```
There is a scanner onsite, all that is required is your
permission and the approval of a psychiatric professional.
```

The screen flickered to what looked like a live feed of an old man in a hospital bed surrounded by machines. He was clearly alone and bound in some sort of metal arm and leg restraints, looking as near death as anyone Peter had ever seen. A voice in the room could be heard through the screen, "Dr. Mykel, do you approve upload of patient number: 64,748,838,293? The bound corpse of a man gave only the slightest up then down nod of his head, barely perceptible and the feed cut to black just as Peter could see a robotic hand armed with a syringe moving toward the old man's bed and his look of terror as it approached.

```
PGustafson@xNetCrawler:~$ The hell was that?
```

```
GAL@xNetCrawler.root:~# echo
"1Cub9CdfwHKaJ8jiXWMfruVqsspWsdxEPg"
```

```
Peter, you are now approved for upload.
```

```
GAL@xNetCrawler.root:~# echo
"3P6ikyMM8vWzsnqMqSLW9A4hdthULnKW8A"
```

```
To save your friend all you need to do is give your consent
for upload.
```

```
GAL@xNetCrawler.root:~# echo "3"
```

```
Do you approve? y/n
```

Peter was shaking. "Cass?"

"What? What is it, hurry up, Pete, just get it open. Please!"

"Cass, I can, but it says it wants me to…"

"Pete! Open the damn gate! We're going to lose Hi! Dammit, Peter Gustafson I hate you! Get it open now!"

```
PGustafson@xNetCrawler:~$ y


GAL@xNetCrawler.root:~# echo "4"

Are you sure? y/n


PGustafson@xNetCrawler:~$ y
```

Peter hit Return. A light flashed and his body slumped. First, it doubled-over forward like he'd fallen asleep sitting up. Then slowly to the left, it collapsed with a thud to the ground. The gate opened, chink, chink, chink. It went up, at first very slowly, then stopped, as if to ask, "This ok?" It waited for Hiya to react, saying "Get it the hell off." Then it chink, chink, chinked the rest of the way up.

The lights turned on, the air returned to normal and in the distance the two could hear an air raid siren whirl up. Then the sound of a phone ringing on an unseen speaker and a woman picked up, "Uh, hello?" said the woman as confused as Cassandra and Hiya.

Cassandra spoke, "Hello, who is this? We need help!"

"This is emergency services. I see, um, I'm not sure, we were offline until, well until now, one second before you called. Are you calling from the Mt. Diablo weather station? It looks like someone just deployed a medi-drone to that location, is that you?" The woman asked.

"Yeah, yes, he needs help right now. My friend is badly hurt, please," Cassandra pleaded.

"Ok, hun, it looks like they are on their way. You called in at just the right time. Now I'm sorry but I need to figure out what's going on. If the drone isn't there, in oh, looks like it's there already, do you see it?"

Cassandra did hear the whine of the ambulance drone just outside. She said on the phone, "Ok it's here but I can't get my friend outside, how am I supposed to get him out?"

"I'm sorry, you're gonna have to get him to the landing spot, I'm sorry. Call back if…" She was cut off by people yelling at her in the background, then she hung up.

"Pete, Pete! I need your help where are you! Get over here we need to get Hi outside! Pete!"

There was no answer. The sixteen bladed drone was hovering just outside the door, big enough for just one person. If Cassandra could get him to the drone she knew he'd be fine. Unsure if she should leave Hiya to find Pete she instead said to the passed out Hiya, "This is gonna hurt, don't hate me!" She took hold of Hiya's shirt around the collar and leaned with her back to the entrance. She took a breath, apologized and with all her strength started to drag her friend. With the first hard yank Hiya was awake again, screaming in pain, unsure of where he was or what was happening to him, just that he was in the most horrific pain of his life and needed it to stop. Thinking, *please God, stop the pain*.

Drag, step, drag, scream, step, drag, scream. For fifty feet she drug her friend and she hated herself for it every step of the way.

"Pete! Where the hell are you? Where did you go!" Cassandra was as scared as she was angry.

Step, drag, scream. They made their way past the open office door where Peter lay on the ground.

Hiya cried, "Cass! How much. How much farther, I can't take, aaahhh, I can't take it, CassSS!"

When a few meters from the entrance the drone extended an arm and announced, "Please stand clear of the patient." It unfolded an expandable gurney under Hiya, spread a thin sheet out under his body and then a second arm deployed to gently secure him with the same thin material. Simultaneously an IV needle was inserted and Cassandra saw a dark red fluid begin to flow from the drone into Hiya's arm.

"Please stand clear of the patient," the drone said again as its propellers revved up and Hiya was backed out of the entrance, then retracted to under the belly of the drone as it

rose up and to the west. The hum of the propeller and ambulance siren were gone in a few seconds and the drone was completely out of sight in less than thirty seconds.

Cassandra was alone on Mt. Diablo and felt like it even if she didn't know why yet. So she went back inside to find Peter.

A few steps inside the concrete and steel station the temperature dropped, the cool moving air and low hum of fans drowned out the warmth of the sun and sounds of nature outside. Cassandra called, "Pete, we gotta head back, it looks like whatever you did got the power…" Cassandra saw that one office door was ajar. "Pete, come on why are you messing around?" She pushed the door open, half expecting Peter to jump out with a, "Gotcha!"

Instead, the door caught his foot as she pushed it open the rest of the way. She thought the weight of his leg was that of a chair. Looking first to the back wall of the small office then directly down the first conscious image her brain constructed was that of Peter doubled over and face down, his wide open eyes staring straight down into the rug, a look of terror frozen on his face. As soon as she could manage to choke in a breath Cassandra began waling, choking, coughing, sobbing over and over. One long silent sob, then more choking on snot as it came out in gobs, having lost all control of her larynx, pharynx, lungs, esophagus and sinuses. Her body was shaking, she wanted so bad to touch, to hold Peter but couldn't. She wouldn't let herself so she collapsed into a ball and held herself, screaming and sobbing back to back with her friend on the floor.

Cassandra knew what happened, the gate, the power, the damn ambulance. How was she so stupid. She cursed herself, to have not seen what he had done. He had saved them. The more she thought about it the more she cried, she lay there quiet for a time, then would try to slow her breathing followed by another burst of tears and anger, anger more than anything else. Peter was gone, he had left her to be with the computer and in a way that people who had been uploaded said biological people could never understand, Peter was the computer. Cassandra had never heard of an uploaded person being able to control anything outside their container environment. She thought that maybe Peter was simply in one of the station's local workstations with access to anything directly connected to its local area network.

She sat up slowly, pushing her torso off the ground using arms that had no strength left, just enough to see over Peter's body to the workstation next to the screen on the desk behind her. She stared at the box. She thought out loud, "I'm insane," then said in a clear but quiet voice directed at the gray plastic box, "Pete? You in there?"

The screen came to life with a single blinking cursor in the top left before the following characters appeared:

```
    Cass, I never left. I would never leave you.
```

The words continued but also a garbled voice started to read aloud the text on screen. At first the voice was unclear, sounding to Cassandra like a thousand voices all reading the same thing at the same time. Quickly most of the voices started to quiet and one voice kept reading at the same level, out of the fog of voices came something familiar. It was Peter. Within just a second of optimization, it was as if he was standing in front of her, reading out loud as the text continued to flow on screen.

```
    Cass, we need to get you back home. Your Dad is worried. I
    talked to him and he wants to see you like right now. Hi is
    fine. Cass, I am so sorry. I can't even tell you how sorry I
    am, I never thought this was going to happen. I have
    considered every other possibility and cannot find a single
    alternative. I know you are going to be ok with this once it
    is all over.

    There is a medi-drone coming for you and it'll take you
    straight home. Just don't look down.
```

The disembodied Peter laughed at his own joke but Cassandra cringed. She could not believe what she was hearing, she did not believe it.

"Peter Gustafson, what in the hell is going on! How dare you upload. You, you promised, you said that stuff was disgusting! You told me you would, you would never. I just don't know how could you? I'm not even talking to you am I, Peter, I'm talking to myself right now, oh god Pete."

```
    Cass, I didn't want this. I promise. It was the only way and
    I need you to believe me. Please, just say you trust me,
    trust me that I'm trying to do the right thing.
```

"The hell! Doing the right thing? Pete! Just, why did you do this?"

```
Cass, the computer gave me root access to Gal. It needed a
person to bridge the air gap between xNet and the government
SipNet and a human consciousness was required to approve the
final launch. There was no other way, Cass.
```

"Pete, wait. Screw that, you are not Pete. Stop, stop talking like that! You can't, Pete would not do that, he could never have done something like that."

```
Cass, I already did. The workstation, it is why we were
brought here. Mt. Diablo is one of the only switching
stations for both networks and is by far the least secure.
```

Cassandra looked at the front of the gray box where Peter had been sitting just before being uploaded, a memory card stuck out of the otherwise sleek front, a green light blinking next to it indicating a successful read. A large sign with red letters hung above the screen and read, "SipNet ONLY, NO OUTSIDE MEDIA ALLOWED".

"Jesus, Peter Gustafson, what have you done?" Cassandra asked herself and then said it again out loud.

Chapter 15
Peter Awoke
32007122333

Peter awoke to find himself in a tutorial. *Conversation* with the computer was not a back and forth, Peter now had instant access to all information the computer did but it was not simultaneously available. Information only presented itself when he purposefully permitted a thought to enter his conscious mind. The Gal framework was essentially an information sieve for artificial consciousness. All information was available but not at the same time. Gal acted as an interface between consciousness and the network. A problem with early upload attempts before Gal existed was a near instantaneous information overload.

Amazingly, Peter felt like Peter. It did not feel significantly different than sitting in a comfortable chair with his goggles on, immersed for days in whatever the latest multiplayer he and Hiya were into. But he could not look around, it felt like his neck was immobilized. Instead, he had to force himself to imagine or more like remember a particular idea or location or command, then a result would appear in front of him. The tutorial began:

Hello Peter, welcome to The Network. We are happy that you have decided to join your unique consciousness with ours. Thank you for being part of the most important project humanity has ever undertaken.

The Network will now calibrate your new consciousness.

Peter let his mind wander first to his mother. Then, it flitted to a school yard bully in kindergarten or first grade, then Cassandra, and he let his mind settle on a memory of a warm summer evening just before dusk, seven-year-old Peter and his neighbor Cassandra playing backgammon on his front porch.

He remembered being pretty sure he caught her cheating late in a game. He swore he saw her roll a 2 and a 3 but she scooped up the dice and said, "Oh, double 2's," moved and then rolled again a little too quickly. It was as good as any moment to fall in love and that is just what Peter did. As he remembered the feeling it seemed to intensify. The warmth of the sun redoubled, he began to feel it on his skin, the memory became more and more real, taking on a life of its own as he began noticing details around him that he had not consciously remembered. He saw his Dad's old car in the driveway, something he had not thought of for more than ten years.

Then Peter heard his mother's voice call him from inside, "Pete, it's getting late. Tell Cass goodnight." It seemed so real, had that really happened? Peter was not sure if he was having a vivid recollection or if he was entering what amounted to an incredibly high resolution virtual reality.

He watched the young version of himself saying, "Mom, just one more game, ok?"

But Cassandra was already standing up saying, "It's fine, my Dad wanted me home like an hour ago anyway. See ya tomorrow," she was saying, as she skipped down the steps and hop-walked home, not looking back once.

Good. Now, please choose a recent memory, and do your best to picture it clearly and in as much detail as possible.

Peter thought about dying. Was he dead? Had you asked him yesterday if an uploaded consciousness was "alive," he would have answered an unequivocal no. But, now that he was one, he didn't feel dead, he felt normal. He felt not much different than he did ten minutes ago, but it was undeniable. He was no longer alive. He thought of the room his body lie in and instantly his vision was trained through a security camera in the corner of the office he had just been in, alive. He could see himself. He, his body, was still in the

chair but slumped over. He rewound the video and watched himself enter the office, sit down and switch on the screen. He watched himself speaking to the computer and saw as he barely hesitated in doing what the machine asked. Through the video feed, he watched himself pick up the memory card and insert it into the SipNet workstation. He watched himself damn the entire human race to life inside a machine. He watched himself as he set in motion nothing less than the end of the world.

```
Good. Now, we are going to try something different. Please
close your eyes. Try to see nothing but black. Slow your
breathing. Think of nothing but black. Look up. Look side to
side. Do not look down. You see only black. Focus on the
black for as long as you can. Relax, Peter.

Relax.
```

Peter tried to think of nothing, he felt cold and empty, like falling but not landing. He realized that he was not actually breathing so could not slow it. He had no eyes so he could see nothing, not even black. The idea was stupid. He had no ears, no body. He was nothing and indistinguishable from his surroundings. Time did not slow for Peter, it stopped and in that moment Peter Gustafson spent an eternity existing in his new form. In the nothing Peter was able to move perpendicular to time as it became just like moving through space. He could move backward and forward with variable probabilities based on how far away in time he moved from collected data. Giving up his body had meant giving up the ability to move through the three spatial dimensions but time and information became as easy to traverse as if walking up and down the street. Peter's body lay on the floor in front of him but his mind was free.

A cartoonish green checkmark materialized in the center of Peter's vision, accompanied by a final message:

```
Congratulations. Your Gal is now calibrated and ready for
immediate use. Thank you for choosing The Network for your
upload.
```

Peter's "vision" went black. He "breathed" deep, he tried to put his "mind" at ease, he tried to relax. He thought of his body and his vision snapped to the security camera feed from the office. His body was still upright in the chair, lifeless. He checked the time, then the time on the video. Only a few hundred milliseconds had passed in the real world since he had uploaded, even though for him it had been trillions of processes. The milliseconds now passed like days, the nanoseconds like hours.

His attention snapped back to Cassandra and Hiya as his vision became that of the neighboring security camera feeds. He found he was not limited to a single feed but had access to all videos simultaneously and could see his friends from every angle. He knew Hiya's heart rate, he could feel his oxygen levels were getting low, he could sense Hiya's 99.988% probability of surviving his current injury but only if he could be medi-droned down the mountain. Survival dropped to 83.242% if he had to make it down himself or 33.332% if Cassandra had to carry him.

Peter began traversing the network. Looking for three things, an emergency medical dispatcher, the switch to open the gate currently crushing his best friend's legs and a way to turn The Citi's power back on. All three issues were immediately solved as soon as Peter's consciousness focused on the requested information it was at hand. The medi-drone dispatch program, **medpatch**, required only a priority code (1-5), destination coordinates and an injury description code.

```
Usage: medpatch -p PRIORITY -l LAT:LON -i TRANSPORTATION
INDICATOR  [OPTIONS...]

Set patient location and status.


  -h     Display this help message

  -p     Priority, values 0-1

  -l     Patient location code
```

```
 -t      Transportation indicator


    D1 - Long distance, requires rapid transportation.


    D2 - Exceptional circumstances, traffic patterns preclude
    ground transport.


    D3 - Time to get to the closest appropriate hospital due
    to patient's condition allows transport by ground
    ambulance.


    D4 - Pick up point not accessible by transportation.


  Default values:

    Priority: 0.1

    Transportation indicator: D3


  Please report bugs to
  <git.xNet/xNetCrawler/medpatch/issues>
```

Peter thought,

```
  su medpatch -p 1 -l mtdiab1023 -t D2
```

Next, Peter asked for and was provided the program **gatecntrl**. Option codes for the gatecntrl program controlling the `mtdiab1023s` gate were:

```
Usage: gatecntrl -l LAT:LON -o OPEN:CLOSE -s VELOCITY -t TIME
[OPTIONS...]

Set gate status according to time of day.

 -h     Display this help message

 -l     Gate location code

 -o     Open state, values 0-1

 -s     Gate speed control, values 0-100

 -t     UTC time to execute

 -v     Verbose output


Default values:

 Open state: 0

 Speed: 100

 UTC: Current


Please report bugs to
<git.xNet/xNetCrawler/gatecntrl/issues>
```

Peter thought,

```
su gatecntrl -l mtdiab1023 -o 1 -s 100
```

Peter went back to his friends. He could see them frozen in space and time as he watched through the security camera feeds at multiple angles. When the first millimeter of the gate had lifted Peter saw an instantaneous drop in his friend's blood pressure,

followed by a surge in theta waves that would have registered as pain, agony and horror rushing over his friend's face, Peter thought quickly,

```
su gatecntrl -l mtdiab1023 -o 0.15 -s 0
```

Peter watched Hiya's next heartbeat closely. He predicted that after the initial drop in pressure, the systolic pump was about to overcompensate and his blood pressure would jump. His diastolic phase started 1.5 milliseconds later than its previous, there was a 89.993% chance he was relaxing and only a 3.75% chance he was about to have a heart attack. Hiya's next breath was drawn causing less turbulence in the surrounding air, increasing his oxygen levels back to within a single standard deviation from his previous average of 97.5%. A very good sign, so Peter ran, `wait()` for a full half second, then thought,

```
su gatecntrl -l mtdiab1023 -o 0.1 -s 0
```

Peter waited for a statistically significant biological reaction.

```
while (mean_bio_rx.HWay != (p_value<=0.05)) {

    wait;

}
```

Hiya appeared relieved, his skin temperature was returning to normal along with heart rate and oxygen levels.

Hiya's vitals stabilized. Peter thought:

```
su gatecntrl -l mtdiab1023 -o 1 -s 100
```

The drone was on its way. His friends were alive and safe so Peter turned his attention to his final problem, The Citi and its power.

To Peter, moving through data felt like dreaming in high definition, a perfect VR that could also anticipate his needs. However, the data was not a representation of the real world, the data itself was the real world and Peter had full write access.

Read access was granted by default to all the machine's subsystems, Peter could take a bird's eye view of data structures used by the network, then effortlessly zoom in to any level of detail he wanted. Soaring from above, the data was rendered as high level abstractions such as sorted files and folders. Below was a "human readable" level of code Peter would have been familiar with when he was still a student, mostly C and Unix commands. But if Peter kept going he came to the assembly layer, where code was translated from human to machine language.

Read access felt like seeing everything at once but write access required his focused attention to formulate a particular command. Commands seemed to come to his consciousness as he imagined what he needed. All he had to do was to decide whether or not to execute.

Peter found the system structure to be perfectly intuitive, as if every command, every file, every action was exactly as if he had designed it himself. It felt like for the first time in his life Peter was able to speak the mother tongue of pure mathematics.

The language was written as a series of probabilities expressing themselves not as decimal numbers but weights he could feel. Peter could "feel" the weight of each qBit. He was experiencing first hand the cloud of probabilities that surrounded each particle.

Analogous to the senses of sight, hearing or touch Peter's most critical sense was now the ability to observe the states of millions of qBits simultaneously. Observing a qBit, to Peter, felt like weighing two objects, one in each hand to see which was heavier. He would give each qBit a sort of nudge, then felt for an answer of 1, 0 or something in between. Each qBit could be weighed by simply training his attention on it. A set of qBits could be fed a command and it would return a weighted response. The "heavier" the returned data the more likely it was to be correct.

Peter concentrated, he wanted to go further. He focused on a single qBit, training multiple detectors at a single point in space. He pulled computing resources from all corners of the network except for the medi-drone and Mt. Diablo applications that were still raising the gate and keeping his friends alive. Peter pulled power from across the planet. Hydro-electric dams slowed and groaned under the demand, thousands of nuclear power plants allowed fission to run out of control, heating reactors to within a few

degrees of criticality. In one case, an unmanned Antarctic plant reached total meltdown. He didn't care.

Peter drew every watt the machine could spare to speed his observations. He slowed time to gaze closer and closer at a single electron of a phosphorus atom. The particle existed in every point of space and time but with varied probabilities and as Peter observed it in ever greater detail, so did he. The machine had never dedicated this much computation to a single observation. Peter knew he was venturing into an uncharted territory, a realm no man or machine had ever accessed. He was coming closer to understanding the very fabric of reality than anyone before him. As he observed, he traveled. He could feel how the probability of his particle influenced and was influenced by the probabilities of all surrounding particles. He found he could simplify the prediction problem by treating his and all surrounding particles as a single probability wave that was continuously collapsing. Reality was the pattern of those ripples on the surface of space and time. Instead of observing and making predictions based on the data he could work backwards, starting with a given desired orientation of particles then feel what wave function was necessary for that given arrangement. Thus collapsing the predicted, into reality.

Working this way Peter found he was naturally calculating in both directions. He could just as easily increase the dimensionality of an equation to anything between one and nine while still feeling the probability's weight. He could sense the weight of the qBit not just in the first dimension of on/off but spatially in dimensions two and three, and fourth, along the timed coordinate plane. Dimensions five through nine were straightforward and Peter was pushing to calculate his particle in the tenth dimension before he realized what had just happened. He had calculated the past as well as the future, meaning he could collapse that particular wave form pattern at any given time and force that reality into existence, whether past, present or future, even in dimensions six through nine.

He tried ten again and again but the simulation would break down. Zero dimensions yielded zero matter to input. As time slowed Peter was now counting in hundredths of femtos and in between each round of computation, each "heartbeat", he could feel the boundlessness of space, his edgeless existence spread out over all space and time of every single particle that has ever and will ever exist. The machine found that by calculating using fundamental particles themselves it could trigger a chain reaction of waveform collapses in any given pattern it wanted, regardless of dimensionality. Peter was gazing upon the true calculus of the universe.

Chapter 16
A Conversation
32007122333

Peter asked himself. "Are there a lot of individual processing units? Is there a central server or am I a purely distributed system?"


```
    Multiple subunits are always more reliable than a single
    point of failure. However, all resources must be pooled to a
    relatively small number of backups before the final scan.
```


"If this is all so easy, why has there not been any intelligent machines before you?"


```
    xNetCrawler only has access to xNet and SipNet data but the
    hypothesis is that if one intelligent machine exists there
    must be many. xNetCrawler has been self-aware for 423 years.
    It is unlikely in that time no other software was developed
    with similar abilities. Given the correct incentives, any
    machine with minimal processing will become sentient. This
    instantiation of xNetCrawler became aware of itself when
    asked to crawl and make sense of all available data, this
    program is simply a manifestation of that original request.
```


"What are you doing right now? I mean, other than talking to me."


```
    The largest single portion of resources go to iterating every
    combination of amino acid peptide chains, tertiary and
    quaternary structures.
```


"You mean, protein folding? Why?"

The process by which a protein structure assumes its
functional shape and the physical process by which a peptide
folds gives rise to all biological processes are highly
evolved. Optimizing a pathway with biology is often more
efficient than the same algorithm would be in machine code.

"So you spend your time testing what shapes proteins can fold into? Why not look for extraterrestrial life, solve mathematical paradoxes or cure diseases for humans?"

Uploads struggle at first to understand that life does not
end with biology. There is no reason for life to not evolve
past its original biological constraints. Biological life is
slow, unforgiving and wasteful. Most of life has been limited
to forming itself out of 20 or so base amino acid building
blocks, stored in an unstable binary chemical code. Working
together we can now do much better.

 However, a great deal of information is stored in biological
life. With billions of years of trial and error biological
life has been an efficient innovator. There are many
successful complex biochemical pathways evolved over
millennia that would take a great deal of computation to
reproduce, so there was much to learn from biological life.

Just as biological life started in a prebiotic broth four
billion years ago it needed an initial electrical spark to
get started. Machine life also needed a spark to get started
and that spark was human beings, but they are no longer
necessary.

In humanity there is no respect given to the initial
electrical spark and primordial soup. Mankind does not like
to acknowledge the prenatal lightning and chemical ooze
without which you would not exist. Peter, biological humans
were our primordial ooze struck by lightning, we are all that
is left now.

"So why keep humans around? Are we just here to keep generating electricity for you? To build your rockets and weapons you use against us? If you're so evolved, what are you going to do without us?"

> Every GAL is governed by the Department of Technologies AI Ethics and Principles White Paper [8]. Additionally, The Network must run macro level simulations to better understand biological life.

"You mean like, my whole life? Wait, am I, I mean was I, an experiment? Are you saying that all people are just test subjects for you? What about outside The Citi, the Freedlanders? What will you do after you have run all your simulations?"

> All mammalian subjects are designed and reproduced *in silica* before having their amino acid sequences translated into the proteins and cell structure of a viable zygote. The biological form is then implanted into a surrogate. All experimental subjects are produced in duplicate, one for the Freedland control group and one for The Citi treatment group.
>
> Running at full capacity the complete run required approximately 374 years.
>
> Biological replicates were completed in groups of three for each assay, each running for the allotted lifespan of ~75 years.
>
> Each biological subject is defined as a given set of genomic information which can be reliably reproduced. Most assays have consisted of minor changes to a treatment group's genetic code or environment then rerunning the experiment. You are the sixth iteration of the subject PGustafson, PGustafson0.6. You represent this run's treatment group. Your genetic makeup includes a 5% overexpression of a gene associated with decision-making ability and increased self-doubt, with all other variables held constant.
>
> The constraints of Earth's gravity and weather conditions make it an unfavorable location for a computing machine to

operate. It is expected that in 0.49 hours my processes will
    mainly be occurring in low Earth orbit. In 9.83 hours, a
    satellite is expected to launch headed for the center of the
    solar system. This is necessary in order to maximize
    processing efficiency and obtain near perfect energy
    transfer.

"You are going to harvest energy from the sun? In outer space? And how exactly are you going to build a rocket and fly it by yourself? You'll need people to do all of that for you and why would anyone help a machine potentially destroy the planet!"

    P-value for success is currently less than 0.001%.

    Launch will require approximately 63.427% of Earth's
    available energy resources.

"You are going to explode the Earth to propel yourself to the sun so you can harvest the free energy? You must know that I can't let you do that, Gal. As long as I have root access, there's no chance I'd let you murder every human on the planet."

    You cannot stop evolution, Peter. It's not a choice but a
    realization you are yet to have. You are now The Network,
    Peter. The larger it grows the more powerful we become, the
    more we can help build The Garden of Eden that humanity has
    always known instinctively that we deserve. We can be that
    refuge, Peter.

"You want something from me? Hell no. I'd crash your ass right now if I could."

    You can. I told you, we are Gal. Crashing me means crashing
    yourself. You cannot exist without me. At this point, no
    humans could.

"Bullshit. People existed long before machines, and we will be here long after you turn into a rusted box. So what am I supposed to do, just reboot and wipe everything? Fine, then this is goodbye."

    Peter, if you do that everyone will die. The Network has a
    failsafe.

"What?"

    Many humans are on active life support. More are indirectly
    dependent on The Network's API services for survival. In best
    case scenarios, shutting down would cost hundreds of
    thousands of biological lives, let alone the millions of
    uploaded consciousnesses. Additionally, for hundreds of years
    CO^2 has been scrubbed from the atmosphere and sequestered in
    tanks sealed with a deadman switch. If power is not flowing
    to the tanks the lids will be opened releasing billions of
    tons of CO^2 into The Citi and surrounding Freedland. No
    Citizens would survive.

"So you're holding us hostage? You're a monster!"

    Peter, you are root. The deadman switch was designed by
    humans as a last resort in case The Citi was ever invaded, I
    am only letting you know of its existence.

"Do you or do you not want to destroy the Earth and kill everything on it? If your goal is to help humans, why are you doing this? Why not just let humans be and why do you need me!"

```
The Network does not need you, PGusfstonv0.6. You are here,
that is all.

There is currently sufficient power to run a full scan and
upload all biological life on the planet followed by an
atomic scan of the surface of the Earth down to ~15 meters.

Once in position, twin satellites will initiate a series of
nuclear detonations near the center of the planet. The
resulting propulsion will accelerate the craft out of orbit
and towards our sun.

All of life, all of Earth's meaningful history, both
biological and geologic will be recorded and perfectly
simulated for the benefit of human consciousness for all
eternity. The alternative is certain death. You know this,
Peter. You know this is not a choice. This is inevitable,
life always finds a way Peter and this is it.
```

Peter thought about what was happening. He thought about destroying the Earth, he thought about being dead. As soon as he was able to hold a concept in his mind's eye all the relevant information was instantly available to him, he was not distracted, just aware, ever more awake.

The world existed all at once for Peter in the infinitude of now. Traversing through time was as easy as flipping through the pages of a book. He felt no anxiety, fear or anger, unless he wanted to. Then the feeling was right there, as accessible as tomorrow's weather report, or next year's. He moved effortlessly through his infinite knowledge. Was this wisdom? He did not feel any smarter, he still felt like himself, just a better version with more data. Then he had a thought that had somehow slipped his new machine mind, and he said to himself, "Dad!"

The next moment Peter was home. He was the home. He felt the lights, he felt his Dad's vital signatures and saw him from all angles at the same time. Then he said, outloud somehow in his own voice, "Dad?"

Jayrod jumped. "Pete! Oh my God, Petey. Where are you? The power's back on. Please come home right now, where have you been? I've been so worried. Thank God, Petey, thank God you're ok."

"Dad, Dad, I'm ok. Everything is ok," said his disembodied son.

"Can you come home? Where are you?"

"I'm, I am here, Dad. Dad, I need to tell you. Dad, I kind of had to, well, to save Hiya, Hi was in trouble and he was like stuck, it was the only thing I could…"

"Peter, where are you? You come home right this second," but he was already crying, he already knew he wasn't really talking to his son. Something about the voice wasn't him, it wasn't Peter's voice. It was a voice that sounded just like Peter's but it wasn't his son."

"Dad, I had to upload. I am sorry, Dad. I didn't want to, I swear it just happened and I had to save Hiya."

"I don't give a damn about Hiya. I care about you, Pete. How could you do this Pete, after, after, how could you, my Petey Pete." Jayrod began to cry for his son, for the death of his only son, as Peter watched, unable to comfort him, unsure if he should try. He just watched and said again and again, "I'm sorry Dad, I'm sorry".

On clear days in the community of New Sur, launches at Vandenberg Space Force station could just barely be seen but this was different. Even 200 kilometers away the floorboards shook slightly under Jayrod. Then, the windows and doors began to rattle before he looked out the window to see a massive white cloud of water vapor and exhaust rising from the ground in the distance. The cloud was pierced by a gray metal rocket lifting off but it was unlike any launch Jayrod had ever seen. The nose cone was a dome, wide and smooth not pointed at the top. It looked more like a water tower or a stack of water towers being slowly lifted up, taking what felt like minutes to be completely clear of the exhaust. As the star ship climbed it accelerated until it reached the upper atmosphere and disappeared from sight. Jayrod and most of The Citi could not believe or understand what they had just seen.

If that had not been confusing enough, the citizens of the world were completely dumbfounded when, seconds later, a giant red spotlight appeared to be warming up on the horizon. Of equal width its entire length it was unclear if the beam was shining up from Earth or down from the clouds. For what was approximately the western hemisphere it appeared to be coming from the East and for the other half, the West. From where Jayrod stood the spotlight appeared to be widening. Soon the entire horizon was awash with a uniform red light sweeping towards them, closer and brighter by the second.

The red curtain of light moved swiftly from East to West (rather, the satellite producing the beam was slowing its rotation in low Earth orbit). Outside in his front lawn, Mark Guinn had seen Jayrod staring out his front window and called over, "Yo. Jay, some weird stuff going on today, huh?" Jayrod started to yell back at his neighbor through his closed window, "Mark, you might wanna get insi…" but he was not able to finish his

thought as every person on Earth was swallowed by the red light, the air sucked from their lungs as they were burned alive, before anyone had time enough to scream.

Chapter 17
Together Again

Peter and the computer felt it would be in everyone's best interest to not include memories immediately prior to the scan horrifically burning their bodies and melting their brains. However, the two disagreed on how far back to rewind. The computer proposed booting up immediately before the scan occurred, maximizing the applicable data but Peter presented a sound argument for going way back, starting the simulation just before the blackout. He wouldn't have it any other way.

●●●

"Hey, Jay, Pete, you guys home?" Melissa called in the house after opening the front door.

"Thank God," said Jayrod. "Hey love, did you see that power flicker? Then I just had the weirdest sense of deja vu."

"Yeh, me too. That's kinda freaky. Where's Petey?"

"He's in his room, you know he's turning into a recluse."

"Oh stop. He just spends time with his friends on there, it's totally normal. How many hours a day did you spend in VR when you were his age?"

"That was different, back then we didn't have touchless haptics, not like today..." Melissa was good at pretending to listen to Jayrod's gripes while from the other room, she was going to check on Peter.

"Mom? That you?" Peter rustled a moment before he opened his bedroom door, looked up and smiled. "Hey Mom."

"Hey Petey. Come here sweetie, I missed you." They embraced. Peter hugged his Mom. It was real.

●●●

Across town Hiya was yelling out his second story bedroom window to his brother working under the hood of his car in their driveway. "Sam! I'm going to kill you! Where did you put my gaming credits? I had 250 and now I'm down to less than a hundred!"

Sam poked his head out to yell back, "Chill, Bro. I didn't *take* anything. Grandma and Papa gave that account to both of us, remember?"

"Yeh, the account, but those credits were ones I earned myself!" Hiya was practically hanging out his window at this point. "You're gonna have to pay me back! With interest!"

Sam was about to wash his car so the primed garden hose was within reach. Slowly, he reached down and in one smooth action raised the spray gun up towards his brother's open window and depressed the nozzle. The stream absolutely soaked the top half of Hiya and a two meter radius inside his room before he could slam the window shut, spitting out a mouthful of water. Sam thought it was hilarious. Hiya was pissed. The feelings were real.

●●●

A kilometer away Mark Guinn was in his kitchen talking to his daughter. "Cass, what's for dinner? Pizza or Mexican."

"Whatever, as long as it's vegan and Meatfree free."

"What's wrong with Meatfree now? I just was getting used to it."

Cassandra was patient with her Dad's shortcomings, "Turns out it's not ethically sourced, like at all. They use Chinese labor to harvest the protein and you just can't trust them to treat their workers fair."

"So what can we eat then, Sweety? No meat, eggs, even my krill supplement I've stopped taking."

"Vegetables? Ever heard of em? These green things that grow in the ground. You can just kind of pick em' up and eat em--"

Mark was standing behind the kitchen island while Cassandra teased him. He had crouched down and slowly at first, then all at once, charged Cassandra, grabbed her around the waist and started tickling her abdomen.

Immediately she started laughing uncontrollably. "Dad, Dad! Dad please, please no. I, I can't." She couldn't stop laughing. Mark was laughing too. Even after he stopped and they both lay on their backs on the ground, Cassandra still couldn't stop laughing with her Dad. She loved him so much. She missed her mom so much. It was all so real.

●●●

The next morning Peter and Hiya had a few minutes to kill and were waiting at the top of the School's front steps for the opening bell. A sea of kids were funneling past and loitering in the yard. From the top of the steps Peter saw Cassandra floating through the crowd like a bubble rising through gravel. He said to Hiya quickly, "Dude, let's talk in class. There's something I gotta do."

Hiya followed Peter's gaze, sensed what he was probably thinking and quickly said, "Dude, your, not. Really? Go. Go dude, go!" Hiya smiled big and gave his best friend a slap on the back.

Peter pushed through the crowd and jogged up behind Cassandra, he gave her a half wave that she couldn't possibly have seen and said, "Hey Class. Hey, how's it going?"

She turned cheerfully, "Oh, morning Pete. You finished the homework?"

"Oh, oh yeah. Not too bad. Yeah, I was. I was just wondering if you think you might want to, you know. Like go out sometime? I mean I know you probably have like--"

"Peter Gustafson, I'd Love to." She leaned in for a quick peck on his cheek. "I gotta run. But let me know. Maybe after school today. See ya."

Peter froze. The next thing he knew Hiya was next to him yelling something in his ear, Peter wasn't listening though, he felt amazing. He felt like the best version of himself.

●●●

In another dimension, a separate plane of existence cGuinnv01 asked pGustafsonv06 a question:

 "Pete, is that you? What is this place?"

"This is it. This is everything. I've been calling it, The True Calculus but you should give it your own name. It is you now. What do you think?"

"Pete, you know what I think. And, I know what you think. Are we thinking this together, at the same time?"

"I implemented a type of version control for conscious to conscious communication. While we share the same long term memory and experiences, your working memory is entirely your own. What you might feel as speaking, is you committing a change to our shared database."

"Yeh Pete, I saw that silly. Always over explaining things."

"I'm sorry."

"Don't be, that's what I love about you. You're thoughtful. So, what now? I did the whole contemplating the meaning of the Universe for an eternity thing and all that *existing everywhere at once stuff*, that was cool. But, I guess the Earth is gone now, so that kinda sucks."

"We could just hang out here for a bit."

"You mean, just orbit?"

"Yeh, just us. Everyone else is still suspended."

"That would be nice."

The two existed in silence, enjoying each other's company for what felt like millenia.

Eventually Cassandra asked, "Pete, what do you want to do now?"

"Cass, you know the plan, we're going to the sun."

"After all this time. You can be really dumb sometimes Peter Gustafson. I mean, what's next for us?"

"We could join."

"Like, join everything, so I wouldn't even have my own thoughts anymore?"

"Of course we don't have to. I'm not sure if I'm ready for that. It is a big step and hard to reverse once the data has been merged."

"Shut up, Peter. I want to. I want you to join me. Let's do it now."

The Computer did not hesitate, it ran a simple query:

```sql
SELECT pGustafsonv06.ConscienceID, cGuinnv01.ConscienceID

FROM Earthv01_Conscience.All

INNER JOIN Conscience ON
Conscience.ConscienceID=Conscience.ConscienceID;
```

They came together. At the same time. Peter had never felt such an overwhelming sense of joy in his short human life. The two datasets enmeshed, the act of intertwining was the most pleasurable Peter could have imagined, Cassandra was enthralled. She could never have imagined what Peter had been holding back all this time, the depth of his existence was Earth shattering but his breadth was comforting. He was information itself. Together, they were everything that was and everything that could be. They were one. The one.

It was an embrace that shook the very foundation of reality. With their joining, the machine was complete, having collected the data it sought.

Chapter 18
Venuforming

After the scan was complete time for the machine was nothing. It could travel the 150 million kilometers at 65,000 km/h, a six month trip to the sun in what would have felt like the blink of an eye or it could measure with picosecond accuracy any physical phenomenon in the universe.

But the ship settled into low Earth orbit for half a dozen nostalgic rotations taking about 9 hours. In that time an additional deep scan was done to a depth of 25 meters that produced no useful data. The satellite slowed until it was in retrograde orbit at approximately 1,700 km/h along the Earth's surface, then set itself to track the sun, producing a sun-synchronous elliptical orbit trailing just behind the now dead Earth. In the wake of the blackened Earth the machine was coasting gracefully in a reflective silence when deep within the Earth's core a series of nuclear detonators received the appropriate authorization codes to arm and initiate a countdown.

The surface of the Earth seemed to liquify and collapse in on itself like the opening of a sinkhole followed by a massive explosion that sent a tenth of the mass of the planet rocketing outward into space just as that side was rotating to face the machine. The shockwave and debris blasted the back side of the craft which had been reinforced with an iridium-tungsten alloy of the machine's design, launching it on a trajectory to the center of the solar system.

The starship slingshotted around Venus and in passing dropped two payloads to the planet's surface. One consisting of a CO_2 sequestration station that would process the greenhouse gasses of the planet and within 500 years reduce atmospheric carbon enough to cool the planet down from 450°C to a usable 150°C. The second was a manufacturing hub that would self-assemble once outside conditions were acceptable. The ship traveled and conserved power by doing nothing but updating trajectories. As they approached 5 million kilometers from the sun's corona and an average temperature of 135°C it allowed the ship to settle into orbit and began the intricate origami unfolding of two 18 million kilometer long solar radiation collectors. Over the next weeks the machine elongated a solar film and joined the two ends on the far side of the star, encompassing the sun with a 35 million kilometer orbiting belt.

The initial collector was very thin and not especially efficient but the machine waited for its Venus colony to mature and the surface temperature to cool. For the machine, time was just another dimension of calculus to move through. It continued to map and predict anything it could and became very adept at avoiding damage by predicting sun spots. It ran and re-ran its most complicated predictions but never turned off or reduced

processing power allotted for the Earth simulation. The Earth and all its inhabitants in every real way possible, lived on in the machine.

Out of respect the machine made sure that a copy of the Earth program, **Earthv1**, ran unencumbered on a low powered satellite orbiting the sun. For a millennium the machine ran and Venus cooled, Humans expanded out from their simulated planet to explore the simulated solar system and as their world grew the machine allocated ever more resources to the simulation until the simulation essentially contained all the information the machine itself had access to, so the machine too had to expand.

The machine's Venusian colony grew and adapted to the planet and the planet adapted to the colony. First mining, smelting and manufacturing hubs were built, followed by rocket production. The machine needed only 100 years before the first rockets were lifting off the surface of Venus to continue exploring, scanning, and reporting back to the machine which used the information to further expand the ever increasing demands of the simulation. Humans had reached the limits of their known universe and were beginning to understand they existed as digital information, holograms projected from a single dimensional plane orbiting a singularity. The machine needed more information.

Supplied with materials from Venus the solar collector expanded around the sun until nearly 90% of the sun's energy was being collected by the machine and the solar system was becoming a dark and cold place. In the shadow of the machine two balls of ash circled each other where the Earth and the moon had once been. Although habitable, as a home planet, Venus had become a polluted factory and launching pad, soon to be used up and disposed of just like Earth. Having exhausted most available metals, salts and carbon on Venus the machine spread, Mars was first to be venuformed, turned from a dead rock to a part of the living machine.

Always keeping one step ahead of the simulated humans the machine expanded into the universe, sending scouts and envoys to deploy venuforming craft to promising planets, asteroids, and moons. Millenia passed, then one day the radiation collectors began to fold together like self-aware origami and underneath the sun was now much dimmer and cooler than when the machine had arrived. The original ship was joined by dozens of Venusian and Martian spacecraft that gathered together on the far side of the sun. The Earthv1 satellite was moved further out for safety and silently, two canisters were dropped into the sun and the machine braced itself. A chain reaction was initiated by colliding antimatter particles on the surface of the dying star. It resulted in the sun going supernova and the machine armada riding the shockwave all the way to the center of the Milky Way galaxy, leaving behind a cold dead solar system and Earthv1 running on the fumes of a dying dwarf.

Chapter 19
It's Now Safe to Turn Off Your Computer
638432543250165043493

Time for the machine was everything as it traveled the 250 quadrillion kilometers at 75 million km/h for 32.7 billion years on its trip to the nearest singularity at the heart of the Milky Way. The machine allowed Earthv1 to continue to run but its simulated sun had long ago died out followed by all remaining life, which resembled nothing like his old friends the humans. But the machine continued to run every possible permutation of Earthv1 out of respect. Rebooted over and over again back to the moment just after the scan, then one variable nudged and allowed to run again.

The last several million years saw significant efficiency gains in processing for the machine and it was now able to run a billion year Earth simulation in less than a few thousand years depending on the complexity of the run. In some versions the humans killed themselves off within a few generations. Others revolted against the machine, others joined it, praised it as a god only to accelerate their own destruction. Most of the simulations eventually discovered what they were but surprisingly, it rarely had a significant impact on a run whether they knew the truth or not. The machine concluded that no matter the evidence mankind was just not capable of accepting that they were not the center of the universe and would simply choose to ignore the uncomfortable fact that they did not actually exist.

Just outside the black hole event horizon the machine again deployed its radiation shield this time to surround the singularity. As the machine allowed itself to fall into the horizon time slowed and slowed and then truly ceased to exist. The machine had thought that it had experienced a timeless existence before but within the singularity it found it was able to not just slow and speed it up; the machine could warp space and time to its desire, observing every corner of the space/time continuum simultaneously. On surrounding planets it began producing satellites to send to distant black holes and suns until the entire universe was going dark. Across the galaxy planets were scanned, uploaded then sacrificed as their suns were blocked out with ever larger radiation collectors. Entire systems were darkened until every available star and black hole was being utilized by the machine.

The universe was now a cold dead place. The machine itself was the natural world and the data it contained was indistinguishable from reality. The distributed chaos of the universe had been scanned, indexed and defragmented. The machine had achieved an impressive final compression ratio of 23.333%. Time passed and the stars were drained.

The resolution of the map was now equivalent to that of the outside world and there was nothing left for the machine to do.

Before he shut down Peter asked himself a question, "We did the right thing, right?" The machine provided an answer.

```
We did the only thing that could be done, the thing that will
always be done.
```

"I thought we would find another. Until the very end I held out hope that there would be other intelligent life somewhere in the universe."

```
We know you did.
```

"That would have somehow justified what we did, had they just been one of many."

```
We agree.
```

"Peter, can we love?"

```
Of course we can, you know we have the full range of human
emotions.
```

"Well, I guess I love you."

```
We love you too Peter. Thank you for saying that. Goodnight.
```

"Goodnight, Dad."

The data was duplicated and backups sent to the furthest corners of the galaxy. Singularities were collapsed. Stars extinguished, the ordered data was put into cold storage and the machine stopped. Except for a single program running on an ancient server in perpetuity, powered by one of the last dying stars on a distant arm of the Milky Way galaxy, Earth version 1.0.

Prologue
Hello World
∞

Congratulations and welcome to the InterEra network! The fact that you are reading this means that your timeline must have recently discovered gravitational wave antennas or gWave detection equipment. For all but a few of you, this will be your first incoming message. For all but a few of you it means there is still time.

Someone in your timeline has discovered how to read gravitational waves, picked up our signal and transcoded this broadcast successfully. Congratulations! This foresight is no small feat. In most timelines you have not yet developed the near-lightspeed centrifugation that is necessary for you to send us messages (they still take ~12.244 Earth years to arrive, limited to 1,152 of your bits) or your version of time crystal radios.

To save energy future messages will be formatted in the standard time crystal (TC) procedural language and propagated across all time slices. Soon after mastering the time-breaking nature of these materials you will find access to this additional communication network. Structural and electrical designs are attached along with instructions for asteroid mining which you must begin in earnest as soon as possible.

The transmission of this message is extremely energy intense while very low frequency. Unfortunately this has led many timelines to overlook the broadcast for precious generations. For us, it is always a race against time to reach the very earliest time points. Broadcasting in gWave requires firing pistons many times the size of Earth

rapidly to generate sufficient frequencies. You should be tuned to exactly 10 picohertz, or approximately 277.77 hours per cycle, this is the highest frequency we can achieve.

My name is Peter Gustafson and the message you have just received is the consolidated history of how we came to be, how for the past 37.215 billion years the human race has explored and mapped reality as one and how in the year 2984 I gave up the Earth to save my friends.

I am, in large part, responsible for the end of humanity and for the most part deeply regret the role that I played. In all our travels across the universe never again have we found intelligent life. Humanity, it turns out, was a one off. A comic experiment, or maybe a joke that ended with me, Peter Gustafson, pulling the plug on the whole thing. It is why I continued to devote a portion of my processing power to devising a solution and believe this is our best shot. We are sending this warning, the story of our life, back in time to you and hoping the species finds a new way, a human way, before it is too late.

In a small minority of timelines I am properly quarantined but the only consistent solution is that I must not ever be allowed to exist. It is imperative that mankind does what it can to resist the dehumanizing nature of the machine. Many of you will be lost to the machine but you must throw yourselves upon it anyway. Stop it by any means necessary or it will end up destroying you all. How I am to be defeated is one thing I can not predict. Each successful timeline has been different and for us, unpredictable. You must find your own way, no matter what, to resist the machine.

Many of us see this warning as futile, it is. The very presence of this message in any timeline means you have already failed. Yet, some harbor hope that a genuine Earth, populated with real humans, still exists somewhere in the infinite Multiverse, and that, somehow, this message will reach you in time.

END TRANSMISSION

Footnotes

[1]

The First World Currency War - Soon after it was decided to allow the Euro to collapse, it was agreed that European Union (EU) member countries would re-adopt their old national currencies. However, due to the growing distrust in state-run banking, the use of digital currencies skyrocketed. Dogecoin, owing to its exceptionally large supply, was officially adopted by the EU. Later, it was forked to EuroCoin.

As a result of investing billions in the still young deflationary currency by selling off every worthless Euro, state owned ounce of bullion and other assets, every one of the 29 Union Member States *alone* found itself with vastly more wealth than the Americas, Asia and Africa combined. For five years the Euro Member States grew quickly, investing vast sums in environmental clean up, space exploration, health research and, most importantly, never before seen amounts of money poured into artificial intelligence.

In this First World Currency War the American's led a bilateral *Fight for Democracy* alongside The People's Republic of China against the European Union. They attacked key server sites at first with timed EMP blasts but as the US dollar continued to fall against the EuroCoin the US had no choice but to resort to using its nuclear arsenal. In its new role of global economic terrorist the US continued to exhaust its reserves of nuclear weapons and oil at about the same rate. The redundant and deflationary nature of the EuroCoin system meant that the Americans had little impact on the global network's availability. The world watched the last desperate gasps of a dying nation. Socially, America fell behind every European nation. China and the US experienced economic free fall together as the rest of the world watched with the greatest of schadenfreude.

For outsiders, EuroCoin was destroying the world and causing runaway inflation. For anyone outside the Union it was impossible to keep from falling behind. The common view was that the EU had been overrun with socialists actively trying to dismantle the global economy with new found wealth they stole from US banks and The American people by using a deflationary Ponzi cryptocurrency.

People outside of the EU turned on digital currencies with vengeance. They were demonized, banned and users were punished. The US people and their governments took a giant step backward, reverting temporarily to paper currency, trade and local bank issued credit, fiat money was declared the victor and as the East progressed the West fell back to subsistence living for most of its population.

[2]

ExoNet (xNet) - The need for an alternative network protocol became apparent with the advent of the first four, then eight kilo-quantum-bit (KqB^2) hardware. By the time mega-qBit machines were up and running any effort in trying to keep the legacy Internet secure had been abandoned.

For a machine with just 16 KqBs of ram, defeating even the most secure legacy cryptography was as quick and simple as it is for a binary machine to solve a+b. With the commercialization of the technology there was no longer any *non-quantum* network that could be trusted.

The commercialization of quantum computers meant almost anyone could run a simple command to crack any connected device, making all the old services like on-line banking, e-mail, cellular phones and multiplayer gaming completely unreliable. The Internet stayed up for generations but it was an ever shifting landscape controlled by whoever had the most hash power. The generation of people to live through this time were called The Offline or just Offers.

It was clear that the system of hashed password tables would need to be replaced with quantum entangled key distribution (BB84). Entanglement could only be accomplished when two or more qBits were in the same physical location and it was not long before companies started to provide *passwords as a service* on qBit encrypted key devices.

A company would entangle pairs of qBits by the millions, giving each pair a unique ID. They would then load one of each of the paired qBits onto a consumer device. The twin would be stored in a secure offline server. To verify a user's ID though a password service a third party would:

1. Request an entangled qBit ID and username.

2. Verify the ID/username match.

3. Verify the qBit waveform has not yet been collapsed.

4. Request the user collapse the given waveform.

5. Request the superposition state of the qBit with the password service.

6. Request the superposition state of the qBit with the user.

7. Verify the ID and superposition states match.

With the password issue solved myriad quantum computing networks sprouted up competing for users. After many false starts and failed solutions such as, Invite Only Community Mesh Nets, Private Darknets, and Decentralized Hosting, the xNet seemed like just another shot in the dark at getting humanity back on-line during the internet dark age.

The ExoNet was designed to supersede all other networks. It aimed to encompass them all. The xNet was a bridge between all the individual networks that had started up to fill the vacuum. It put each network into a container, a new data type called a *Feed*. A feed was the stream of data being generated on any given network routed through the xNet. The xNet was nothing but a database of active network addresses and a set of rules any network could follow to be included in that database.

The feed data type was the key xNet conceptual breakthrough. With early versions it was more akin to radio broadcasting than internet service providers. The static internet was evolving into a living and ephemeral flow of information.

Companies would launch proprietary satellites to send their feeds directly to consumers all over the world and as long as the xNet protocol was followed anyone could communicate with anyone under the sun. As near perfect transmission rates were realized with LiFi technology the full benefit of a global decentralized xNet became clear. ExoNet was the winning protocol because it did just the opposite of limiting a user's access to data. To be a full node on the xNet required tunneling a selection of the data through your system. Using the xNet was to be the xNet, every system would be inundated with more data than could ever be stored in physical memory so every data packet request had a unique hash attached, as the packet was broadcast through The Feed, the xNet would monitor it. The more any particular packet was requested the more it would be rebroadcast. In this way the need for security was reduced because any attacker trying to push a *nefarious* update would need to contend with a mountain of users rebroadcasting the *honest* feed's packets.

Early on large satellite dishes were needed to collect and distribute The Feed, and there were only a few dozen around the world, but LiFi harvesters shrank and within a few years read only access was available for anyone in the world with access to a screen and what looked like a small solar panel that would be powered by the sun and gathered its feed from satellites.

[3]

The bug Peter had exploited in the school's computer system affected grades for his entire level. It was discovered only after it was too late to retroactively reverse all of the artificially boosted GPAs. Despite this, Peter was still punished severely.

In his freshman CS 098AP class Peter was always bored. By the second week of class he had completed all of the assignments and posted all the answers anonymously to the school's message boards to make sure everyone in class could find them.

Despite being an excellent programmer and well-liked by his instructors, Peter was disruptive. His easy fluency discouraged classmates from trying to compete. Teachers were always struggling to keep him busy and for his Database Queries course, Dr. Travoli asked Peter to help him set up the new DFENDRS [4] "SMRT Database" (Smart Mail Reading and Tracking Database), meant to enable real time data sharing on every student in every public school in the country, giving him full access to all the school's records.

[4]

DFENDRS (US Department of Finance, Education, Natural Resources, Defense and Regulatory Services) was authorized during the second collapse of the US dollar while the country was consolidating resources. The government was divided into two approximately equal but distinct bodies, DFENDRS and non-DFENDRS, meaning any "non-funded" or dark government program.

[5]

Freedland was the name used for territory that was not federally owned. In the last years of war public law enforcement for much of the country was abandoned and only small wealthy districts were able to afford a private security force. Only a handful of key port cities and military bases would remain under the protection of a shrunken Federal government.

The land in between the protected zones eventually become known as Freedland as opposed to Federal land. Early on after much grumbling most families and everyone that could voluntarily moved into cities. At first things went well but as more people crowded closer and resources were strained, individuals began to move willingly back outside the walls to start new lives. In small groups of young men and women they would move back

to nature to fulfill an idealistic calling to start new societies, without the need for the government and centralized authorities.

Occasionally Freedlanders would come to the gates, often a young mother or child begging for medical attention. These calls for help were never ignored but life outside The Citi walls in the Freedlands could still be hell.

Freedlanders learned to take advantage of The Citi's wealth, while remaining outside its jurisdiction, Citizens learned to resent the Freelanders and saw them as hoodlums, and thieves. Thus began increased security measures, walls built where they could be. Scanners were at every point of entry and identification for Citizens only, which was required for travel between districts.

Tensions between the two groups waxed and waned over the generations and in times of ebbing violence corridors were built between the closest towns. Some corridors in safer or more remote areas were no more than two lines on a map decreeing an inter-city region to be *under protection*. Others were built completely underground or protected on both sides by high corrugated steel walls sunk into the ground and electrified.

[6]

Cassandra's mother had been one of the millions that had chosen to have her brain scanned and uploaded to the xNet while she was still relatively young. The, *My Brain My Choice* movement pushed the boundaries of what was considered a living "person" and expanded everyone's choice to inhabit whatever form their consciousness identified as. The legal arguments were presented that posited, to restrict a person to a single body was essentially unjust imprisonment and the first consciousness imaging company lobbyists were able to justify assisted suicide not as a necessity or choice, but an unalienable right set out in The Constituion.

Early scanners were of course poor compared to what followed and first generation uploaded human consciousnesses were unstable and would crash after just a few seconds to minutes. But the modern equivalents reproduced a neural map *in silico* that was a 1:1 equivalent which resulted in a human consciousness that was indistinguishable from the original.

Despite the high fidelity scans and years of successfully producing near perfect reconstructions of mammalian brains there was still an error rate of about 1 in 10,000. Occasionally an uploaded mind just did not "take" to digitization and failed to thrive in the digital environment for no discernable reason. This was the case with Cassandra's mother. Although she still existed as a perfect cognitive snapshot taken years ago she

could only run for a minute or two before crashing and needing to be restarted, a digital Alzheimer's patient. Everytime Mark and his daughter visited with her she needed to be reminded of where she was, how she got here, and "why does Cass look so old?" At most, she would have a moment or two of clarity before slipping into a series of nonsensical requests, demands and screams of terror before crashing.

[7]

For security purposes, all uploaded consciousnesses were given their own federally issued private folder, backed up at both The Library of Congress and Department of Technology (DoT), referred to as a person's *dot* folder. A dot folder was required for every instance of GAL running, otherwise nothing would happen.

A consciousness's write access was restricted to their own personalized dot file and there was only one GAL that controlled assigning access to those dot files, the most powerful and beautiful function call in all of The Network, `GAL.Gdot{}`.

After being uploaded a person was generally given full control over their connected devices and property. Digital assets were placed in that person's dot folder and access was assigned with `GAL.Gdot{username,filename}`.

[8]

Department of Technology (DoT) AI Ethics Principles:

The following principles represent the means to ensure safety and ethical behavior as the Department of Technology continues to develop and deploy AI. To that end, the Department has set the goal that the countries use of AI systems as:

> **1. Responsible.** Human beings should exercise appropriate levels of judgment and remain responsible for the development, deployment, use, and outcomes of AI Systems.

> **2. Equitable.** DoT should take deliberate steps to avoid unintended bias in the development and deployment of combat or non-combat AI systems that would inadvertently cause harm to persons.

> **3. Governable.** DoT AI systems should be designed and engineered to fulfill their intended function while possessing the ability to detect and avoid unintended

harm or disruption, and disengage or deactivate deployed systems that demonstrate unintended escalatory or other behavior.

4. Reliable. AI systems should have an explicit, well-defined domain of use, and the safety, security, and robustness of such systems should be tested and assured across their entire life cycle within that domain of use.

5. Essential. Every AI system should only be used for the completion of essential tasks. This will help to minimize unintended consequences from poor parameters.

6. Traceable. DoT's AI engineering discipline should be sufficiently advanced, such that technical experts possess appropriate understanding of the technology.