

Trojan Horses

By Mike Hoefflinger

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This is a work of fiction.

And Allah's enemies plotted and planned, and Allah too planned, and the best of planners is Allah.

Make ready your strength to the utmost of your power, including steeds of war, to strike terror into the enemy.

-- Koranic verses quoted in a translated manual discovered in the home of an alleged al Qaeda member

Equo ne credite, Teucri. Quidquid id est, timeo Danaos et dona ferentis.

-- Laocoön, Trojan priest of Apollo

The future of movie entertainment springs from the human condition's grand simplicity. People, no matter their culture, creed or country, want to be entertained.

-- Jack Valenti, President and CEO, MPAA

Prologue

She had died in what William Sinon imagined to be the worst way. Night raid on a senior al Qaeda lieutenant in Peshawar in Pakistan's North West Frontier Province. Tensions running high because of bad intel and weak tactical planning. Confusion when their truck came screeching around the corner not realizing that the Americans were lying in ambush. Freakish cross-fire from the Afghans.

It had been stray bullets from American intelligence officers working halfway around the world from anything you could legitimately call a jurisdiction. But instead of bringing instant death, the bullets had brought

unstoppable, irreversible blood loss. She had bled out in eight agonizing minutes, in the middle of the street, her crew desperately trying to get her out, but stopped by a hail of bullets.

She was Pakistani, but had lived most of her life in London, where they had met. She was beautiful. Stunning even. But most of the women in Sinon's life had been. She was more. More than just his equal. An irresistible force. The first to make him wonder whether the Europe to Asia and back again globe-hopping, leadership oriented, best of everything, investment banking, entrepreneurial, venture capitalized, well networked, high income, high outflow life might need to change. He had become more passionate, more patient, more quiet, more clear. He had become a better man.

She was, of all things, a reporter. Mostly on middle east events. Always safely doing stand-ups on Hotel balconies looking out over sun, sand, and ideology soaked wastelands.

When the al Qaeda man-hunt in Pakistan had started, the network saw a unique opportunity. They didn't have to do much convincing. It was the best pre-war story, it was playing in her home country, and they had assembled the best fixers and protectors the region and the world had to offer. She had become as close to a star as there was in this kind of news. A legitimate successor to Amanpour's two-decade-old throne.

He had begged her not to go. He never begged. It would haunt him later how much this should have told him about their relationship. There was dependence and need of a kind he had never felt before, or, he was certain now, would ever feel again.

Although the shock had eventually worn off, Sinon had fallen into an infinite loop between anger and denial, acceptance relegated to a bit part drowned by a torrent of misery.

Where once had been a rational, analytical thinker there was now a man bent on vengeance against the US. A rare kind of thoughtful, quiet, intelligent, determined, tireless, patient, well connected, allied-with-darkness kind of vengeance.

The most dangerous kind.

Construction

Getting started had been easy. Devoid of serious challenge. Unfair even.

Amazon.com and Netflix, with their sales rankings and thinly veiled sell-up schemes, had already done Simon the courtesy of compiling the list of the top 100 DVDs. The bustling, 500 vendor Hong Kong PC malls did the rest. Shopping list in hand, his team had been able to find the vast majority of the DVDs for a dollar a piece. Computers don't fleece copyright holders. People do.

Back in their 26th floor Hong Kong office suite, a dozen overclocked 3GHz rigs tweaked and video encoders optimized, getting each of the DVDs DeCSS'd, transcoded to DivX and split into 5Mb blocks took only one day in three shifts of two.

And there they were. 500 billion bits. \$20 billion of previous revenue. Patiently waiting on hard drives. Forever stripped of their ability to make another penny for Hollywood.

Writing the application was just a four-week ego trip for his software guys. Some Gnutella code, a bunch of GUI work, a couple of sweet protocol hacks and they had *movio*, a peer-to-peer system for proliferating their stockpile. The hard part was the obfuscation to resist the reverse engineering. That was a geek thing. Had to spend some time on it. Couldn't let the white hats bring you down.

Good plans don't come for free, but that hadn't been a problem either. The radicals' cell commander, a surprisingly levelheaded technocrat, holed up on a triple DES encoded phone somewhere between Cairo and Riyadh, only needed a six-minute explanation before he agreed to pay the six-figure advance.

Yes, it had been easy. So far.

Distribution

movio was no ordinary peer-to-peer network. It was network and content in one, built for a single purpose: distribution of a large collection of data from one initial source. *movio* traded strictly in the component files of the movies. Nothing new would get onto, or off, the network. And there would be no "get on, get one, get off" kiddies either. You use *movio*, you commit to downloading all 100 movies in blocks of 25, not to mention that you committed 30% of your bandwidth for uploads. At least as long as you wanted *movio* to give you access to your downloads.

You did not search for content. It was install-and-forget while *movio* busied itself doing the rest: connect to the network, continuously discover the most suitable peers for transfers, optimally queue thousands of component files, manage all downloads and re-assemble the pieces on the client into the complete movies.

With a 500kbps DSL connection, *movio* running nearly 100% bandwidth utilization for 16 hours a day and constrained to 50% for eight hours, getting your first 25 movies took five days. You would have all 100 in three weeks.

On a college network, depending on how closely the network guys were watching, the whole thing could take less than a week.

To get a running start, Simon and the crew had gotten themselves a dedicated 44.7Mbps T3 pipe a couple of hops from Asia Global Crossing's Pacific backbone. In addition, they had shipped hard drives with duplicates of the movie data to the man in Dulles running three servers into a fractional T3 five hops from Verio's Eastern US backbone and to a friend in Rotterdam running another three servers into a fractional E3 seven short hops from UUNET's European backbone. Simon would have preferred more sources and more bandwidth for the first 30 days, but whom can you trust these days.

They planned on shutting down and moving to higher ground after thirty days. Under good conditions, the network's dispersion would be enough. They would have distributed as many as 500,000 copies of the entire stash. It would be too late, even for the service providers, to attempt systematic shutdowns.

After a stiff drink, and a last look around the room, they got on Instant Messengers and shared 150 copies of *movio* with bandwidth hogs in Korea,

Japan, the US, the UK, the Netherlands and Germany. The devotees were encouraged to keep the distribution on private IM channels. Password-protected FTP was for amateurs and porn peddlers.

It was just minutes before the servers started jumping. Within a couple of hours all the darkest corners of AIM, MSN Messenger and Yahoo IM were quietly trading *movio*.

It had begun.

Augmentation, Proliferation and Detection

There are few things you cannot draw on a napkin and turn into low cost hardware reality within three months. Presuming, of course, you know your way around Taipei. And Sinon knew. Several weeks before *movio*'s release, he had started discussions with a design and manufacturing house in Hsin Tien City.

He needed small, portable, low cost storage and playback for *movio* libraries. They would call it *movio* Pocket Theater. MPT. Thirty movies in your pocket. Play them back on any TV with video inputs. MPT was to iPod like crack to Sanka.

With a dozen 20Gb mp3 players on the market, there were enough reference designs to get a running start. They avoided the big color LCD altogether. That extended battery life and kept cost low enough to put in a big CPU to get a smooth video decode all the way up to 640x480. Besides, the old school gadgeteers would get off on the monochrome LCD UI.

Three-jack RCA and S-Video were the choices for Video Out and USB 2.0 for digital IO. The real coup, though, was getting high speed USB 2.0 On-The-Go into the small form factor while still staying under the BOM target. This way two MPTs could connect to each other. As potent a person-to-person distribution scheme as the street corner drug deal. You could see the movie swapping parties already. Sneaker-Net on steroids.

But all this would not be cheap. Not even in Taipei. Sinon hoped the unobtrusive PayPal and Amazon digital tip jars they included in *movio* would help bootstrap MPT into existence.

* * *

After 13 days *movio*'s spread exceeded a circle of unspoken discretion and started to attract the attention of a few networking guys, including Len Coon, Manager of Media Technologies at the Encino offices of the Motion Picture Association of America. Len had picked up the app after getting a note from a college buddy who now worked for SBC. The US carrier had begun to look into unusual levels of data traffic a day earlier.

It took three minutes for Len to realize what he was looking at, and the rest of the morning and several hundred network traces, to determine how it worked. The conclusion: A gnutella derivative, already distributing evenly from over 300 different IP addresses, presumably growing exponentially. Enough to make the head of the MPAA unhappy. Very unhappy.

On day 17, after *movio* popped up in a post on the Gnutella Developer Forum, and started inching its way up Daypop, *The Register* covered it. Three hours later *news.com* had it on front page with a quote from the MPAA reminding the interviewer that copyright industries amounted to 5% of US GDP. Predictably, he called on the government and ISPs to shut down the network.

Public posturing about subpoenas for the ISPs began. They even dusted off talk of legislation taxing ISPs to recover lost content revenue. A few ISPs and colleges started to trial balloon shutting down *movio* users, but the minute it got coverage, the *Slashdot* set started publishing lists of smaller ISP alternatives in most US metros.

Stuck between an MPAA rock and a fleeing customer base hard place, SBC and Verizon chose to err on the side of revenues and floated stronger personal protections positions to the press.

In business, he who gets commoditized last wins. While they were hanging the content guys out to dry, the most enterprising ISPs started charging extra for excessive bandwidth usage. Content may want to be free, but the pipe will cost you.

While fighting the war of words on the front steps, in the backroom the ISPs and the MPAA were warming up the digital countermeasures. Coon quickly discovered that *movio* was a tough customer. Having rogue copies of *movio* flood a peer with search queries had little impact. Must be using

basic heuristics to bit-bucket excessive query traffic. Even spoofing search results to feed the network broken files merely caused *movio* to disconnect the spoofing peer automatically. The damn thing had an encrypted table of the checksum fingerprints of the original movie files.

The break came on day 26. Coon had been tracing network activity for nearly two weeks when a new type of Gnutella protocol message came across the pipe. Although it was nearly impossible for Coon to realize all the implications of the functionality, what he was observing was the network recursively updating itself in response to one of Sinon's team members having logged in as a superuser and injecting the pieces of a new movie into the network.

Not good. Coon was adding up the facts and extrapolating the possibilities. *movio* was a Trojan Horse, and the people controlling it had a virtual umbilical cord through which to feed it. Worse yet, the cord could be initiated from anywhere, any time. And shut down almost as fast. The spread of the injected data would be nearly impossible to control.

The next day the MPAA appeared again on news.com alerting the modern world to the sinister possibilities of *movio*. On the heels of the failed attempt to shut down the network, however, the comments were derided as a feeble attempt to FUD users.

Somewhere the RIAA was smiling ruefully. This looked familiar. The any-PR-is-good-PR effect that drove opening week record store and box office sales was now feeding *movio's* spread. Even the best spin doctors did not have a doctrine for it. Damned if you do. Damned if you don't. The only way to break the cycle would be to start winning in court. But there was less to sue here than with Kazaa. And that had not been much.

It had been the second news.com article that had gotten Cass Atkins interested in *movio*. In a lab at Brooklyn Technical High School, on a computer next to the disassembled innards of an mp3 player, wearing a "got root?" t-shirt, Atkins, a Computer Engineering major, was turning *movio* into a mission. But at America's fifth largest High School--a school that still graduated 96% of its seniors to four-year colleges--that kind of zeal was commonplace.

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On day 30 the Internet stats shops estimated over 700,000 copies of *movio* in use. Sinon's PayPal and Amazon tip jars stood at a shocking \$1.27 million. Just enough to get MPT to production after the advance ran out.

It broke his heart, but to avoid being fingered, he shut down the accounts and transferred the funds out of the US, obscuring the transaction through three different banks. Six hours later, they had taken their servers off-line, shut everything down and packed up the office. It was time to get off the field of play and watch the rest of the game from the skybox.

On day 87--with 5 million copies of *movio* in use--Taipei had the first MPT off the line. After three weeks of nearly constant effort, they were ready to go to volume. And volume it would be.

Taipei had bought all the rights from Sinon in return for 15 points of their profit. The rest was just a matter of working buy.com against Amazon for the world-wide retail exclusive. After Amazon conceded up-front payments and five points lower margin, they came away with the deal. MPT was going to sell for \$239.

The tech press had gladly chipped in the PR frenzy for free.

It was unprecedented. MPT sold 859,000 units in the first four months. Taipei even had to go into crash mode to bring on an extra production facility in Guadalajara.

It had been 207 days. There were 18 million copies of *movio* in use. William Sinon was \$4.5M richer. But that had hardly been the point.

Exploitation

The black hats will tell you it's all about social engineering. *movio's* raison d'être was tricking humans, not computers. It had worked. Millions of zombies had sold their digital soul for a hundred free movies.

Sinon's team had done it through the superuser scheme Coon had observed seven months before. This time, instead of a movie, they had injected binary code that added hidden denial of service attack functions.

Practically overnight Sinon had become commander in chief of a network a thousand times the size of the one behind the DDoS attacks of 2000. And those had merely brought down the Internet for three days.

It made old-school SYN floods look like amateur hour. Every 6 minutes each zombie would randomly configure an attack. Nine out of ten times, it would remain dormant. The tenth time, it would chose one of the pre-selected two dozen victim Internet sites, one of three attack mechanisms and a randomly spoofed source IP and go three minutes of maximum outbound bandwidth in attacking the victim with Blowfish encrypted packets. Long enough to reek havoc along with the several thousand other zombies that had chosen the same attack, but short enough that network operators would not be able to get a handle on the end-to-end traceback.

It started mid-afternoon on day 208. Two dozen of the Internet's biggest sites hammered by revolving sets of thousands of DDoS zombies that changed every six minutes. Sixteen of the sites went completely dark for the next twenty four hours, including CNN, EBay, Expedia, buy.com, Walmart, Dell and Cisco. They spared Amazon.com. You don't bite the hand that retails you.

It took CERT and the leading network guys, including Coon at the MPAA, the first ten hours just to figure out that *movio* had something to do with it. They had turned off their traces and capitulated three months before.

The news was everywhere the following morning, some prominently featuring the MPAA's I-told-you-so rhetoric. Most of the sites were still in deep trouble, losing money every second of the way. The attack continued with very little daylight in sight as ISPs could not reliably shut off all the *movio* flow, and *movio* users were just beginning to hear about what their favorite application was doing. By noon, only eight million of the 18 million copies had been shut down by their very disappointed users.

Back at Brooklyn Technical High School, Cass Atkins had been in research heaven since early in the morning when the security blogs had started buzzing with the *movio* news. Reverse engineering the attack was going to make a great term project.

By mid-morning thousands of network events had been logged and sorted at the expense of an aching back and dried out contact lenses.

Taking a break and trying to stretch out, the MPT, resting innocently in its cradle next to the PC, caught Atkins' eye.

While the rest of the civilized world was chasing the *movio* DDoS attack, Atkins started taking a screwdriver to the back of the MPT.

As the density of Moore's Law continues to march inevitably onward, the components on, in and around a printed circuit board have become harder and harder to read. To Atkins, however, navigating the microscopic metropolis of a modern PCB like some latter day Death Star strafing run was challenge, not chore.

It was all there. Some of it very familiar. Some of it new. Some of it expected. And some of it, like the older packaging on the component above the LCD and near the 1mm hole in the top left of the case, slightly unusual.

With multi-layer, double-sided circuit boards, and space efficient flip chip packaging, it was hard to tell how many connections came into, and out of, the component that had caught Atkins' attention, but it didn't look like much. Just PWR and GND, and a couple of traces from the micro-controller. In a design as clearly lacking excess real estate as this handheld, it was unusual to see components with so little apparent work to do. Signal traces on the connections during normal MPT operations confirmed Atkins' suspicion: The component was literally jobless.

A closer look at the packaging revealed an odd two-piece top construction. Since breaking the component would have no impact on MPT operation, Atkins took the screwdriver to the seam between the two pieces of the component cover and pried it open.

It would be difficult for Atkins to recall later how much of the packaging had been worked open, but the hiss had been very memorable indeed. As had the taste. Slightly hot and bitter. Quickly thereafter the sensations of heaviness and dizziness hit.

The rest hadn't involve much active participation by Atkins. A student in the far corner of the lab heard Atkins fall off the chair, rushed over, found Atkins on the floor and called the paramedics.

The chemistry of Cyanide is complex. When absorbed by the body, especially in its gaseous Hydrocyanic Acid form, it reacts quickly with

ferric iron in the cytochrome oxidase enzyme, inhibiting electron transport and halting cellular respiration.

Its effects, on the other hand, are starkly simple. 500mg of HCN per cubic yard of inhaled air cause fatal respiratory failure in a few minutes.

Atkins, however, had gotten lucky. Not only did they get to the school six minutes after the first phone call, but one of the two EMTs responding to the call had received training on chemical agents during her stint in the army. She had smelled the faint odor of almonds on Atkins' breath, realized what must have happened and knew what to do about it.

Fortunately, her particular post-9/11 New York ambulance had sodium nitrite on board, which was hastily administered to Atkins, who nevertheless came close to flat-lining twice, on the rushed ride back to the Emergency Room. That was followed by treatment with sodium thiosulfate once in the ER.

With the nitrite breaking the cyanide-cytochrome bond and the thiosulfate reacting with the freed Cyanide to form readily excreted thiocyanate, they had been able to reverse the respiratory failure process within the first 20 minutes of exposure, saving Atkins' life.

Standing in the corner of the ER, the Attending knew that two minutes the other way, and he would be filling out paperwork of the worst kind.

It was 11:32am on day 209.

While Atkins recovered, the evacuation of Brooklyn Tech continued. As the students filed out, the occupants of non-descript vans from somewhere deep within the organizational structure of the Office of Homeland Security, went it. With the right equipment, it had not been difficult to detect the mostly dissipated traces of HCN in the computer lab. There were no signs of Cyanide elsewhere in the building.

Attracted by the unusual circumstances of the poisoning, and dressed as New York cops, detectives in suits, and students, the CIA was also on site. Even the NYPD hadn't realized that Atkins' PC and shattered MPT, which they thought had been collected by one of their own, had, in fact, been spirited away by the spooks and was on its way back to Langley in a helicopter that had landed in the park two blocks away.

The CIA's next visit was to Atkins' emergency room. The three men swung open the curtain to a lucid, but groggy, Cass Atkins hooked up to a serious amount of wetware IO, including oxygen and two IVs in each arm.

Although they knew from the folks at Brooklyn Tech that they were dealing with a female, they still did a double take. As it turned out, the only link they had to back-tracking this odd case of Cyanide poisoning was a sixteen year-old black girl. All five feet, two inches of her.

It took the group of four only a couple of minutes of reviewing the facts to determine that the MPT needed intense scrutiny. It took longer, however, to convince the Attending to let the CIA fly Cass to the McLean lab with them. He finally acquiesced after they agreed to take a nurse with them.

Two medical helicopters and one CIA jet later, they were in a special lab surrounding a propped up Atkins and looking through protective glass at three technicians in HASMAT suits, working away on a dozen new MPTs they had procured from staff members, kids of staff members and local electronics stores.

With Cass' detailed description they were able to quickly focus in on the odd component and discovered under microscopy that the part had been augmented with an electrically breakable fuse that opened up an evacuated chamber of 400mg of HCN.

What they couldn't know was that the parts had been prepared in a make-shift operation in a Middle East laboratory that extracted the cyanide from common industrial solvents and retrofitted the innocuous original components with the HCN augmentation. The components had been trucked across the border to Saudi Arabia and sold to a distributor in Taiwan who had supplied the Taipei City ODM building the MPTs.

The component, and its HCN cargo, was present in all ten of the MPTs they disassembled. Not only did that confirm Cass' encounter had been no accident, but the electrically breakable fuse mechanism made it clear that the HCN release was designed to be triggered, rather than occur accidentally.

To unearth the trigger mechanism Cass and three CIA white hats started going through all the MPT driver and control code on the PC. Intensely directing one of the techs, Cass discovered that a fraction of the recent *movio* auto-update had attached itself to the MPT drivers. Half an hour later they had figured out that the code added a hook that would trigger the

MPT HCN release at first insertion of the MPT into its cradle on US PCs after 0:00:00 on day 210. Sinon's boys had timed it to coincide with the back end of the chaos created by the DDoS attacks.

In stunned silence the small group stared through the window of the lab as the HASMAT'd tech adjusted the clock of his PC forward and inserted one of the remaining MPTs into the cradle. The cradle insertion trigger was perfect, virtually guaranteeing that the user would be only an arms-length away from the emission of the HCN, easily within the cubic yard box of efficacy of the invisible cloud of death.

It was 5:50pm EST when the CIA made the conclusive call to the White House. They were facing a possible death-toll three times that of US forces in WWII, and 300,000 greater than that of the Civil War. Not from a weapon of mass destruction on one battlefield, but 900,000 weapons of individual destruction in homes, offices, cubes, dorm rooms, warehouses and assembly lines.

They had six hours to mount the single biggest product recall the world had ever seen.

Elimination

They had only ten minutes to communicate to outlets for the first major TV and radio news cycle. In the rush, and lacking a clear message, many outlets hesitated to run the story fearing hoax and panic. By 6:30pm, however, the story had completely taken over every TV, radio and web outlet.

By 7:30pm, Amazon.com had volunteered its entire call center to contact its MPT customers. In a show of solidarity EBay, Dell, HP and IBM would later pitch in to help.

In what quickly became the largest case of Spam in the history of the Internet, AOL, Yahoo, MSN and other national ISPs allowed the government to e-mail all their customers and continuously ran warnings in all IM chat rooms.

At 8pm the president went on the air confirming the news. Cass, who had been driven to Washington when the White House press office insisted on humanizing the story and underscoring its reality, appeared with the

president at the end of the address. She turned out to be a compelling spokesperson for the crisis and spent the rest of the night doing as many TV interviews as the medical staff would allow.

In every call, e-mail, IM, news story and interview the goals were the same. Keep MPTs away from their cradle, get people to seal them in plastic bags and communicate when and how the device collection effort would commence.

By midnight helicopters, ambulances and ERs nationwide were standing by for the grim likelihoods that come with the kinds of numbers they were dealing with. Entire time zones would hold their breath like some New Year's Eve countdown from hell.

Shortly after midnight, five people returning from a frat party at the University of Miami where they had exchanged movies became the nation's first victims when they were exposed to HCN trying to download the movies to their PCs. Not having heard about the MPT issue and worried that their brothers had gone down after drug binges at the party, the frat hesitated long enough in calling the paramedics that the five were not able to recover from their symptoms in the ER.

More reports rolled in. Some, like the three people saved in the ERs in Georgia and five in Ohio, were good news. Others, like the dozen who didn't pull through in California, were not.

But few were prepared for the worst tally. As night dragged into a long day, 26 missing person reports from around the nation turned into discoveries of people who had died alone, on the floor next to their computer having paid the last, full measure of devotion to Hollywood.

To the deep relief of everyone, however, the death toll began to drop dramatically after the first 24 hours of constant news barrage and friendly phone calls that threatened to bring down every cellular network in the country.

And within 48 hours the nation started to focus on collection of the MPTs with an impressive logistical effort that deployed specially equipped National Guard trucks and police officers to every US Post Office in the country.

Everyone that dropped off an MPT for collection and destruction received a special destruction coupon. Reparations had not been

determined by the government, and there was fear that without coupons stragglers would resist turning in their MPTs

The devices were later destroyed at six undisclosed locations. With the exception of a highway hold-up of one of the transporting trucks which was resolved by Army sharpshooters after a four hour stand-off, the operation concluded two months later without further injury or deaths.

When it was done, the death toll stood at 52. A number miraculously 164 persons less than the most optimistic simulation the CIA had offered the president in the early hours of the crisis. And undoubtedly thousands less than the unthinkable: What if Cass Atkins, Brooklyn Technical High School sophomore, hadn't been the first to discover the secrets of the MPT?

Epilogue

Within a year of the dramatic events, Hollywood and three consumer electronics giants had collaborated to deliver the same combination of service and devices that *movio* and MPT had offered, except this time with Digital Rights Management and sleeker, lighter weight Pocket Theaters with color LCD screens.

They had done so not for the altruism of replacing that which had been lost with something more trustworthy, but for the simple, unadulterated financial opportunity that had been proven by a tiny group of renegades and the millions whose need had been found and met.

In a ceremony held at Brooklyn Tech, Cass Atkins got the first one. The president, the head of the MPAA and Cass' favorite actor, Denzel Washington, were on hand to present it to her. It was engraved: *From a grateful nation.*

Everyone who had had an MPT was able to exchange their destruction voucher for a discount on the new devices, and within three months units had climbed through the one million mark again.

The service charged nothing for the distribution of the movies, including downloads from so-call supernodes the industry had put in place to guarantee high-speed downloads. Four days of viewing cost \$4.95 and unlocking the movie on your Pocket Theater permanently and burning one DVD-R cost \$19.95.

The twist in the whole model was the back-end accounting scheme that actually allowed the individual users propagating the movies through uploads from their computers, or sharing from their Pocket Theaters, to earn a 20% commission on the eventual revenue of the movie. It proved to be both a zero distribution cost mechanism for the studios, and an "if your friends don't pay, you don't get a commission" way to increase the rate of fair payment.

The program would become so popular that it launched an entire cottage industry of movie swapping parties and residential supernodes. The commissions on millions of files per month proved very attractive indeed. After the first three million units of the Pocket Theaters had been sold, even Blockbuster and some of the consumer electronics retailers started to put USB 2.0 *movio* download stations in their stores.

It would become the post-DVD superstar of Hollywood.

William Sinon, however, has not been captured.