THE SHADOW INTERNET

THEY START WITH A SINGLE STOLEN FILE AND PUMP OUT BOOTLEG GAMES AND MOVIES BY THE MILLIONS. INSIDE THE PIRATE NETWORKS THAT ARE TERRORIZING THE ENTERTAINMENT BUSINESS.

BY JEFF HOWE ILLUSTRATIONS BY BLANDDESIGNS.CO.UK

JUST OVER A YEAR AGO, a hacker penetrated the corporate servers at Valve, the game company behind the popular first-person shooter *Half-Life*. He came away with a beta version of *Half-Life 2*. "We heard about it," says 23-year-old Frank, a well-connected media pirate. "Everyone thought it would get bootlegged in Europe." Instead, the hacker gave the source code to Frank – it turned out that he was a friend of a friend – so that Frank could give *Half-Life 2* to the world. "I was like, 'Let's do this thing, yo!' " he says. "I put it on Anathema. After that, it was all over."

Anathema is a so-called topsite, one of 30 or so underground, highly secretive servers where nearly all of the unlicensed music, movies, and videogames available on the Internet originate. Outside of a pirate elite and the Feds who track them, few know that topsites exist. Even fewer can log in.

Within minutes of appearing on Anathema, *Half-Life 2* spread. One file became 30 files became 3,000 files became 300,000 files as Valve stood helplessly by watching its big Christmas blockbuster turn into a lump of coal. The damage was irreversible – the horse was out of the barn, the county, and the state. The original *Half-Life* has sold more than 10 million games and expansion packs since its late 1998 release. *Half-Life 2*'s official release finally happened in November, after almost a year of reprogramming.

When Frank (who, like all the pirates interviewed for this article, is identified by a pseudonym) posted the *Half-Life 2* code to Anathema, he tapped an international network of people dedicated to propagating stolen files as widely and quickly as possible.

It's all a big game and, to hear Frank and others talk about "the scene," fantastic fun. Whoever transfers the most files to the most sites in the least amount of time wins. There are elaborate rules, with prizes in the offing and reputations at stake. Topsites like Anathema are at the apex. Once a file is posted to a topsite, it starts a rapid descent through wider and wider levels of an invisible network, multiplying exponentially along the way. At each step, more and more pirates pitch in to keep the avalanche tumbling downward. Finally, thousands, perhaps millions, of copies – all the progeny of that original file – spill into the public peer-to-peer networks: Kazaa, LimeWire, Morpheus. Without this duplication and distribution structure providing content, the P2P networks would run dry. (BitTorrent, a faster and more efficient type of P2P file-sharing, is an exception. But at present there are far fewer BitTorrent users.)

"THE FEDS HAD NO IDEA ABOUT HALF-LIFE. IF THEY FOUND OUT, I'D BE IN JAIL."

It's a commonly held belief that P2P is about sharing files. It's an appealing, democratic notion: Consumers rip the movies and music they buy and post them online. But that's not quite how it works.

In reality, the number of files on the Net ripped from store-bought CDs, DVDs, and videogames is statistically negligible. People don't share what they buy; they share what is already being shared – the countless descendants of a single "Adam and Eve" file. Even this is probably stolen; pirates have infiltrated the entertainment industry and usually obtain and rip content long before the public ever has a chance to buy it.

The whole shebang – the topsites, the pyramid, and the P2P networks girding it all together – is not about trading or sharing at all. It's a broadcast system. It takes a signal, the new U2 single, say, and broadcasts it around the world. The pirate pyramid is a perfect amplifier. The signal becomes more robust at every descending level, until it gets down to the P2P networks, by which time it can be received by anyone capable of typing "U2" into a search engine.

This should be good news for law enforcement. Lop off the head (the topsites), and the body (the worldwide trade in unlicensed media) falls lifeless to the ground. Sounds easy, but what if you can't find the head? As in any criminal conspiracy, it takes years of undercover work to get inside. An interview subject warned me against even mentioning Anathema in this article: "You do *not* need some 350-pound hit man with a Glock at your front door."

The upper reaches of the network are a "darknet," hidden behind layers of security. The sites use a "bounce" to hide their IP address, and members can log in only from trusted IP addresses already on file. Most transmissions between sites use heavy-duty encryption. Finally, they continually change the usernames and passwords required to log in. Estimates say this media darknet distributes more than half a million movies every day. It's also, by any reading of the law, a vast criminal enterprise engaged in wholesale copyright infringement.

But the Feds are getting smarter. Last spring, the FBI and US Department of Justice launched a series of raids codenamed Fastlink. Working with cops in Sweden, the Netherlands, and eight other countries, the operation seized more than 200 computers. One confiscated server alone contained 65,000 pirated titles. Fastlink rubbed out a few topsites, but new ones filled the void. The flow of illicit games and movies slowed briefly, then resumed. In April, federal agents interrogated Frank and impounded all his computer equipment. So far, no charges have been filed. "But the Feds had no idea about *Half-Life*," he boasts. "I was never connected to that shit. If they found out, I'd be in jail."

BRUCE FOREST, a self-described "elder statesman" in the piracy scene, started ripping and trading in the ancient days of the late '80s. While he no longer actively traffics in bootlegged media, he maintains contacts that give him access to the most exclusive topsites. What the topsites don't know is that three years ago, Forest came in from the cold. "Basically, I'm a double agent," he concedes. "Though I don't fink anyone out. I'm not a cop."

As a consultant for one of the world's largest entertainment companies, Forest notifies his bosses whenever one of their movies appears on a topsite. Thanks to his unparalleled access, he enjoys a bird's-eye view of the scene. And because he's ostensibly on the right side of the law, he's uncommonly open with information. This makes him an anomaly within the paranoid byways of the media darknet.

Forest runs his business from the first floor of his rural Connecticut home. He's in his mid-40s but moves with jerky, adolescent energy. His brown hair is in perpetual disarray, and he pads around his office with bare feet, dressed in cargo shorts and a faded polo. Gold and platinum albums from his days as a producer at Island Records, MCA, and Arista line one wall. A baroque array of computer equipment

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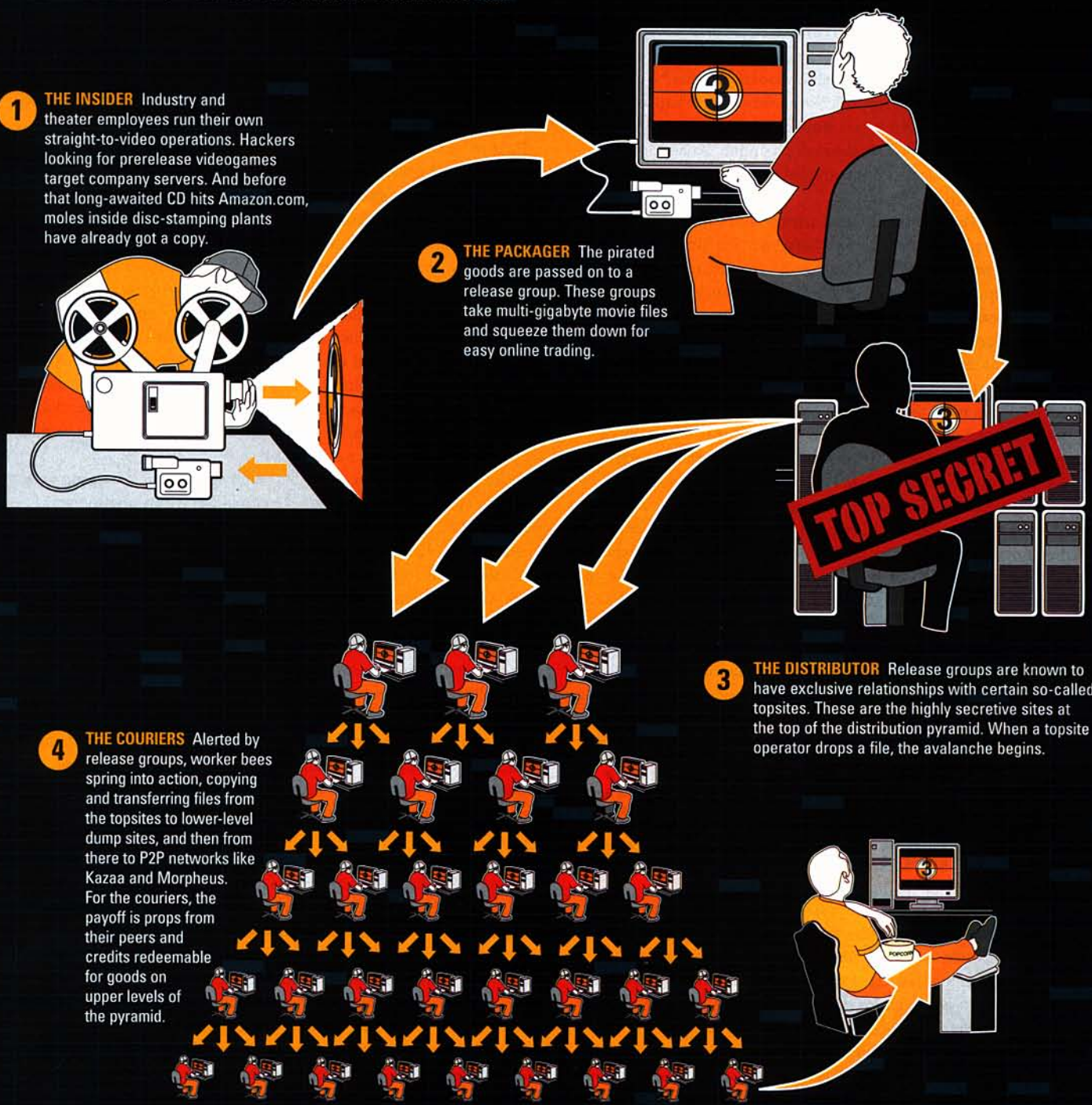
Contributing editor Jeff Howe (jeffhowe@wiredmag.com) *wrote about desalination in issue 12.11.*

BEHIND THE SCENE

Call it trickle-down file-sharing. The goods – a game, movie, song, or other piece of copyrighted media – fall into an insider's hands. Then it's only a matter of hours before a drop becomes a tidal wave. – **Erik Malinowski**



1 THE INSIDER Industry and theater employees run their own straight-to-video operations. Hackers looking for prerelease videogames target company servers. And before that long-awaited CD hits Amazon.com, moles inside disc-stamping plants have already got a copy.

2 THE PACKAGER The pirated goods are passed on to a release group. These groups take multi-gigabyte movie files and squeeze them down for easy online trading.

3 THE DISTRIBUTOR Release groups are known to have exclusive relationships with certain so-called topsites. These are the highly secretive sites at the top of the distribution pyramid. When a topsite operator drops a file, the avalanche begins.

4 THE COURIERS Alerted by release groups, worker bees spring into action, copying and transferring files from the topsites to lower-level dump sites, and then from there to P2P networks like Kazaa and Morpheus. For the couriers, the payoff is props from their peers and credits redeemable for goods on upper levels of the pyramid.

5 THE PUBLIC After the file is copied thousands of times the P2P networks saturate, allowing casual file-traders easy access to the newest movies, music, and videogames.

fills the next, including 13 CPUs and 16 external hard drives (for a total of 3 terabytes of storage). His desk runs the length of the room and supports five full-size LCD displays. I hear a soft ping. "That tells me a movie just made its first appearance on a topsite." He points to a window on the monitor. It shows an innocent-looking list of files from an FTP site. The uppermost file says, "Hellboy.SCREENER.Proper.READ NFO PRE VCD." Translation: The DVD of one of the year's biggest box office hits has been pirated *two months* before its intended release date. "The FBI would kill to be sitting here looking at this," he says.

Even first-run movies get ripped. "Remember what happened to *The Hulk*?" he asks. On June 6, two weeks before its official release, a near-final version of *The Hulk* showed up online. To hear studio executives tell it, the bootleg went straight to the P2P networks and spread like a contagion.

"Bullshit," says Forest. "Trying to distribute *The Hulk* through the P2Ps would take months, not hours." That's because files on the public file-sharing networks, where no single node is much more powerful than the next, spread at a glacial pace. Furthermore, when users connect to a P2P network – FastTrack, for example – they connect only to a small proportion of the number of other users connected at the same time. So unless a topsite seeds a file across the P2P network, the odds are slim that someone searching for a copy will actually find it.

Forest pushes a hand through his hair, leaving it standing on end, and rotates in his Aeron to look me in the eye. "Here's what actually happened: Universal gave the workprint to its Manhattan ad agency. Then the print got to SMF. And *bam!*" SMF, Forest explains, is a piracy group that specializes in acquiring movies in theatrical release.

Before the folks at SMF could release the movie to a topsite, they had to compress it – from roughly 9 Gbytes to 700 Mbytes, small enough to fit on a single CD. Now the film drops. Forest won't say to which topsite SMF first posted *The Hulk*, only that "SMF had affiliations with certain sites, so it must have been one of those."

Within an hour, word had spread that *The Hulk* had appeared on the topsites, and the "races" began – copying and distributing the files to as many other servers as possible, as quickly as possible. "The races are over like *that*," says Forest, snapping his fingers. "It's amazing."

THE AD AGENCY GOT A WORKPRINT OF THE HULK. 24 HOURS LATER THERE WERE 50,000 COPIES.

Soon, *The Hulk* was working its way down the pyramid onto slightly less exclusive sites called dumps. "These sites are a little slower, and they aren't getting stuff first," explains Forest. "On the other hand, they're getting a lot more traffic." With as much as several terabytes of data storage, the dumps are the workhorses of the distribution process, storing hundreds of thousands of media files filtered down from the topsites and rolling them to the next layer of the pyramid, the distribution channels.

In 24 hours, SMF's single version of *The Hulk* had metastasized into at least 50,000 copies. Within 72 hours, the movie was all over the most popular P2P networks. Before it reached even a single shared file folder on Kazaa, Forest estimates there were already several hundred thousand copies in circulation, guaranteeing that casual computer users would be able to find and download it easily.

One of Forest's computers pipes up again. Another bootleg has just started its race down the pyramid.

MOVIE PIRATES get their booty from one of three sources: industry insiders, projectionists, or agents placed inside disc-stamping plants and retail outlets. "Half the kids in the scene work at Best Buy or Blockbuster to get their hands on stuff they can release," says Frank. "At the factory, maybe 15 percent of CDs and DVDs are defective," says Forest, "usually just because the label is off a little bit." They're dumped into a rubbish bin, ripe for the picking.

Release groups break down broadly by medium – videogame, film, music, television – and then often into genre. One release group, for instance, specializes in obscure Japanese anime. Another works exclusively in Xbox games. Every release group has the same ultimate goal: Beat the street date of a big-name album, videogame, or movie by as much time as possible.

In 2003, Frank and his friends started a release group devoted to first-run movies. They placed an online ad, and a projectionist in Maryland responded. The projectionist, who never told Frank his name, proposed to send them the movies shown in his theater in exchange for free downloads from the topsites. Frank's posse wanted to test the guy first – standard procedure for a release group. "We had to know he wasn't a narc," says Frank, "and that he could get us quality product on a regular basis."

Frank's projectionist passed this test by providing the group with a high-quality copy of *Spy Kids 3D: Game Over*. The bootleg was posted the day after it hit theaters. Theaters get movies several days in advance so that exhibitors can check for defects in the reels. "Our dude would just run the film before anyone got to work, and record it from the booth," he says. Frank and his friends christened their group "MaTinE." Because their supplier – the projectionist – could get them high-quality recordings, MaTinE got noticed. "Eventually, we were putting our movies on one of the best topsites in the world," says Frank. He won't tell me the name of the site, noting it got busted by the FBI. "I can't have them thinking I put the heat on them, know what I mean?"

The quality of bootlegged films varies, depending on the technology used to capture the original reel. The best are produced using expensive TV studio equipment that can convert film to video. The next best are "telesyncs," copies of a movie in which the visuals have been captured by camcorder but the audio comes directly from a patch into the projector. "The top telesync groups, like Centropy, VideoCD, and TCF, are using $10,000 camcorders they get directly from Japan, cams you can't find in the US," says Frank. The least desirable releases are "cams," made by an audience member with a camcorder.

I ask Frank how his group could afford such exotic toys. "People buy them for us," he says, as if this explains everything. "Usually, these people were in the scene at one time, and now they just want free downloads without having to contribute." As it turns out, much of the extensive hardware – from superfast processors to servers with terabytes of storage – are donated by these well-heeled patrons. "Does Bruce Forest do that?" I ask. "I don't know," Frank says, laughing. "What did Bruce tell you?"

In fact, Forest freely admits to being a supplier. "I have bought everything from hard drives to complete computers for various people in the scene. I've probably bought 15 camcorders alone." He says he considers it a business expense, and writes it off on his taxes.

WHATEVER THE ORIGINAL source – stamping plant, movie theater, or local Blockbuster – the film has to be properly prepared for distribution over the networks. Converting analog to digital is a difficult, time-consuming process. And getting it into a form that can be easily compressed into a digital box many times smaller than its original size is an even bigger undertaking. If it isn't done well, a topsite will reject the file. "Quality control is the number one job of the release groups," says Forest. "Topsites will only take a file that fits a long list of specifications. It basically has to be perfect."

To make sure it is, release groups rely on highly skilled technicians responsible for compressing and packaging the media file. As Forest and I watch the ripped copy of *Hellboy*, he pauses the movie. "Look at this," he says. A massive fight has just taken place, and Hellboy is perched on a bridge overlooking a devastated cityscape. It's been raining, and the havoc is reflected in a puddle, into which he stares deeply. "Oh my God. Look at that reflection. Do you have any idea how hard that is to capture?"

Different scenes require different treatments. "It's almost like using a paintbrush," says Forest. "A good ripper will know exactly how to apply the codec properly." A codec, or compression-decompression algorithm, is a method of reducing file size to ease its transfer over the Internet. Video is normally compressed using variations of MPEG codecs. A serious ripper will adjust the bitrate of compression in every scene of a movie to account for changing hue and lighting.

Toby is a master ripper. At 22, he's got a big man's frame but looks malnourished, like he doesn't get enough vegetables. He spends most of his time preparing movies for the Netflix Project. Started by an anonymous donor – again, an angel investor willing to devote money but not time to media piracy – the Netflix Project aims to archive every film offered by the subscription service. "Netflix offers about 25,000 movies," says Toby. "We've got maybe half of them." Each time Toby finishes condensing and packaging a movie, it gets placed on a central server. The archive is free for members who score a password and can get through the encryption. (Asked for comment, Netflix politely declined.)

I'd been told Toby would be cagey, but I find him funny and sweet. In 2000, he moved to Atlanta to attend college, but after spending a year and a half holed up in his dorm room ripping and burning, he flunked out. "Computer science is *impossible*," he says. "But I didn't really go to class, so part of it might be my fault, sort of."

TWO WEEKS BEFORE the release of A Perfect Circle's new album, *Thirteenth Step*, Kevin races home after high school each day, goes down to his basement, and checks various release sites to see if someone has posted it. Kevin resides a few levels down the pyramid from the topsite operators; he's a courier for a couple release groups dealing in emo and hardcore rips, and A Perfect Circle is the file du jour.

Usually such a sought-after property first appears on sites far more exclusive and glamorous than the ones Kevin has access to, but he's hopeful a copy will show up soon. Couriers like Kevin are the grunts of the system, but without the "curries" transferring and duplicating files, the massive distribution network would break down.

Finally Kevin checks a site telling him that a rip of *Thirteenth Step* has just been uploaded to a secure FTP site – a week before it hits the stores. He curses under his breath. More than two minutes have elapsed since the file first appeared. The race is on, and Kevin is already at the back of the pack. He opens FlashFXP – a program that allows him to directly transfer files – and begins copying the CD to as many sites as he can. Then he sits back to watch the race. Everything now depends on the whimsy of Internet traffic and the speed of the server farms whose bandwidth he is pirating.

With his quick, eager intelligence and, more important, a high degree of focus, Kevin spends hours at a stretch performing the minute tasks of copying and transferring files, usually to networks in the middle levels of the pyramid. It's through grunts like him that a song proliferates from 10,000 copies to 1 million. The night A Perfect Circle's CD was posted, Kevin stayed up late spreading the file around the Net. The curries competing against him must have gotten stuck behind some double-wide trailer of a packet, because Kevin's credits poured in.

TOBY IS A MASTER RIPPER. "NETFLIX HAS 25,000 MOVIES. WE'VE GOT HALF OF 'EM." AND COUNTING.

Credits are how the curries – and most everyone else – get paid. Back in the early days of the scene, when there were maybe 100 dedicated geeks trading copies of *The Last Ninja* over their Commodore 64s, the rule was established that site members had to upload one unit (kilobytes at first, now megs or even gigs) for every three they download. The rule creates an incentive to obtain and release, and it's this odd form of greed that drives the scene. It's true, as Forest likes to point out, that no one gets paid (unless they strike up relations with for-profit Chinese bootleggers, which is considered bad form). But they do get a lot of free stuff – movies, music, games, and software – without having to deal with the spyware, phony files, and traffic jams that plague the public P2P networks.

In fact, pretty much everyone joins the races from time to time. It's how the pirates while away their idle hours – the release group operator waiting for a new movie to be delivered, the ripper biding time while his gigabyte-sized files compress. Yet the best racers aren't even downloading all the pirate media they have access to. They have credits to burn, but that's not all that drives them. "It's about being the fastest," Frank says.

The kids in the scene aren't trying to bomb the system. They don't care a whit whether major labels suffer more from file-sharing than indie labels, or if a ban on prerelease DVDs affects Miramax's chances at the Academy Awards. They do this because it feels mildly rebellious, like smoking a doobie behind the local Kroger or setting off the school fire alarm – and because it's fun.

Like ants, curries are monomaniacal about tiny tasks – they copy and move files from place to place – but together they form a force so powerful that it threatens to displace the traditional forms of media distribution. In fact, Forest believes the scene will eventually go legit, and he's even started a company, called Jun Group, that uses the topsites to promote movies, musicians, and TV shows. "The topsites don't care where their files come from, as long as no one else has them," he says. Last summer Jun Group dropped a collection of live videos and MP3s from Steve Winwood on the topsites. "We got 2.9 million downloads," says Forest, "and album sales took off." ■ ■ ■