The End of Big Data

It's lunchtime in Diego Garcia and still dark in the Mid-Atlantic, but the first light of day is reflecting hard white off the former Google facility in Hamina, Finland. The cameras on BLIX and RITTER, the twin UNDATA satellites I'm flying over Europe's Eastern border, trigger automatically.

My shift's first images appear on the monitor, overlays shimmering to life atop the decommissioned data center, outlining stacks of disassembled routers and cooling vents. The progress bar on the ops room's jumbotron starts to fill. All green so far. The threat graph is bottomed-out today; the Finns have tightened up border security following several incursions by FSB and Spetssvyaz looters. But everything that was there yesterday is still there today. I take a moment to examine the traffic: dumper trucks heading towards Russia and the M10, the usual overnight flights nosing down from North America, the expected chatter in the ionosphere. Nothing to see here. The overview moves toward the Baltic States before swinging back up again, towards Sweden and the old Facebook plant.

It takes the dawn terminator 130 minutes to sweep across the European continent, tracing the lines of highways and power cables as day slowly returns. The sensors aboard BLIX and RITTER follow behind, reading the shapes and heat signatures of every registered storage facility in the monitoring database. We can see immediately if anything in the open has been moved or disturbed, but the covered mills, where ground crews haven't yet been able to reach, are slightly trickier. BLIX scans parking lots and fences, counting cars and gateways, examining the ground moisture for signs of tunneling and trenching. There have been reports on the less official diplomatic forums that some authorities have been slow to register facilities, but that's a matter for the liaison teams. I can only see what I've been told to look for.

Well, that's not entirely true. While I was out cold in my bunk last night, eyes in the sky were dowsing for covert data farms: telltale transmissions near the dew point. You can do a lot with fans, water mist, recirculation and chillers, but thermodynamics is pretty unforgiving. The energy of computation has to come out somewhere, and the combination of heat and rare earth traces is, ultimately, undeniable: a forensics of the machine. Between RITTER's infrared and the EUROSUR air contaminants grid, we can usually triangulate any processor over 25 kW. A few months ago it took the ground crew almost a week to locate some Estonian ex-Salesforce analysts whose lock-up in Tallinn was cold as stone. Turns out they were piping their server exhaust a kilometer outside of town, but we got there in the end. This morning the sensors picked up suspicious heat sources in Poland and Slovenia. Could be generators, could be thermal dumps. I'll get to them once my initial sweep is done.

I haven't always done this kind of work, but it feels like I was trained for it. I got pulled into the late-stage drone surge over the Middle East straight out of college: my rankings on Steam triggered at least three different military recruiting bots, each of which thought I was suited to long-range recon work, although they disagreed on which service I should apply for. In the end I found myself working a console at Camp Thunder Cove, classifying blast radii from Russian and Israeli munitions on the borders of the Caliphate, still not entirely clear which service was using the data, but keeping my metrics up anyway. Then the crash happened, and all that time I'd put in, pre-service, crunching Voronoi space for dollar vans—which I'd naively thought the govbots didn't know about—suddenly became interesting to UNDATA.

First I heard about the crash was when every single data controller I'd touched started pinging me over and over again for a password reset or two-factor auth. Like pretty much everyone else. My phone was unusable for hours, and then the networks just—shut down. It took weeks to get back online, but luckily or otherwise I was still under army rule, so we just got on with the business of sandbagging and digging latrines for the smart grid refugees who couldn't get back into their apartments. Everyone else just stayed close to home, paid cash, and watched TV. There were a lot of opinions to watch.

The first tremors started to be felt in the markets only a few days after the flood. Pure capitalism, back then, was built on leverage and latency; in a world where everyone had access to everyone else's data—and not just passwords, but motives, feelings, alignments, tendencies—the only constraint was choice of target. Hackers tore through the remaining dark pools, evolving predatory algos modeled on the suddenly visible nervous tics of every trader on Wall Street. The banks tried to hide it, but they couldn't cover their losses for long, and the same thing was happening everywhere, just more slowly, a billion weakly protected savings accounts tapped, trapped, moved over, and bled dry. First it happened to people you only heard about, then to people you knew, until finally it happened to you: full-spectrum data loss, everything from pension to passport number, air miles to alarm codes. And emails. And text messages, and phone calls, and browsing histories, and order histories, and credit card transactions, and bank transfers, and contracts, and medical records.

But the currency crash just prefigured the privacy crash, a lurking, existential horror that tore into everyday relationships. It was like having the Stasi back, but the Stasi was everyone. The papers couldn't keep up with the scandals: political, financial, domestic, deranged. Insider trading and extramarital affairs, undeclared pre-existing conditions, undisclosed personal relationships, and every white lie you've ever told, everyone outed for everything at once, a toxic dam breaking, leaving us all wallowing in tainted mud.

We'd been losing gays, trans kids, freethinkers and unaccredited journalists for years, but when senators turned out to be just as vulnerable, the legislature finally took action. In the end it only took eighteen months for the Northern Hemisphere to agree on the new Data Protection Accords, and the rest of the surviving nation states pretty much had to sign on. The first requirement, Clause One of DPA limitations: no personal data.

Nothing identifying. No dossiers, no manila files, no cookies or patterns of life or digital signatures, nothing that could link anyone to anything. It's surprising how easy it is to re-architect relationships on a cold-zero privacy basis when you're resuscitating society from flat-line; perhaps less surprising that a whole new black economy got started breaking the rules.

So I work at UNDATA now, and our role is twofold: we enforce disarmament, and we watch for rearmament, on the basis of treaties signed by every extant government in the world. Of course, governments all have something to hide. Like most UN missions in history, we're caught between what they do and whatthey want everyone else to do. But we have our hands on most of their old toys, and that helps.

Camp Thunder Cove, to be clear, is a dump. This shouldn't be a surprise for a place that used to be called Camp Justice back when it was basically a black site, a holding bay for forward positioning ships, nuclear indiction subs, and individuals rated even lower than Rumsfeld's "worst of the worst." Seabees leveled the place of any remaining geographical features in the 1960s, leaving a few ragged palms and a bunch of blockhouses. Since the NSA packed up and left, the only bar still going is the Brit Club, and you really don't want to end up there. Apart from UNDATA, the only other operation left is the ratkillers: a bunch of marines-turned-conservationists who have pretty much gone native on the outer atolls. I've been helping them out a bit modeling ocean currents to optimize the new trash booms they're deploying in the plastic gyres, but I'd rather be out in space, keeping an eye on the rest of the planet.

So here comes my favorite bit of the morning: BLIX and RITTER get to Cheltenham. See, the social networks and the targeted advertisers were dead from the start, but around month three of the UNDATA hearings it looked possible that the intelligence agencies might escape the personal data ban. The Nine Eyes pulled together, sending legions of spooks and Lords to the committee hearings, but one by one they were sent back, usually by revelations pulled from their own files. The leak of GCHQ's cable intercepts alone led to the downfall of a dozen national governments, and the collapse of hundreds of treaty negotiations.

Crowds waving banners—NOTHING TO HIDE / EVERYTHING TO FEAR—clashed with riot police outside the hearings, and the chamber had to be evacuated multiple times because of tear gas. Reluctantly, GCHQ finally committed to decommissioning its data stores, severing all fiber links, providing unobstructed access to UNDATA inspection teams, and ensuring its facilities were "visible to national technical means of verification." That's jargon: it means spy satellites, which, when people found out about those, got added to the proscribed list too. Anything that couldn't be downgraded or blown up just got turned around. You wouldn't believe what we've learned about space since all those sensors got pointed up rather than down.

The remaining national technical means is me. I enforce from orbit, making sure all the mainframes that used to track and store every detail of our lives are turned off, and stay

off. And as the sun comes up over Gloucestershire this morning, there they are, resplendent in the mist-piercing light of RITTER's multispectral sensors: terabytes of storage laid out around the scalped doughnut of the former GCHQ building. Enough quantum storage to hold decades of the world's pillow talk. Drums of redundant ethernet cable stacked stories-high. Everything dismantled, disconnected, unshielded. Everything damp with morning dew.

In a car park to the North-East, I can see the footprint of a UNDATA degaussing team starting their morning shift. BLIX and RITTER have a resolution limit of 1.5 meters in the visible and infrared spectra to prevent them inadvertently gathering personal data; anything below a meter and a half looks like a single pixel, so the individual ground crew don't show up. The twenty-ton degaussing plant, on the other hand, is unmistakable. The nuclear-powered land train trails superconducting ceramic cables four hundred feet long, capable of repeat-erasing an exabyte a day.

The land trains are a complete fragmentation unit: they take all that material and turn it back into metal. Like me watching BLIX watch the data centers, the crash taught us that machines alone weren't sufficient to undo what we'd spent decades creating. The only solution was cooperation. So alongside the erasers work teams of local disassemblers, digging with screwdrivers and sanders to recover metal, minerals, and magnets, creating cottage industries wherever the degaussers set up. Anything left over goes into grinders capable of turning a jet engine into particulate dust. A few weeks later, no data, a bunch of new jobs, and plenty of material for light bulbs, catalytic converters, and solar batteries, as per the UNDATA sustainability promise. We don't need to use the Eastern Congo or Helmand rare earth mines any more; no more wars for mobile phones, at least.

I'm almost done with Europe for the morning, already thinking about the handover to the North America specialists on Ascension for the afternoon, when I get an alert from EUROSUR in Linz. Linz always means the Swiss, and the Swiss are never good. EUROSUR needs me to survey the Alpine Balloon Network. The blimps.

After the crash, the Swiss retreated into a kind of medieval info-sharing arrangement between the pre-federation Cantons, using a combination of Romansh, Polybius squares, and Vigenère ciphers to attempt a cold restart of the banking system. Phase one of their plan involved triggering the National Redoubt, which brought down most of the routes in and out of the country, making it impossible for our inspection teams to get anywhere near the place.

We didn't know what they were up to until the Carabinieri pulled over a container truck on the Autostrada near Ivrea. Inside they found a six foot receiver horn, and all the pieces fell into place: a bunch of artillery trucks had been retrofitted with microwave transmitters, and the Swiss were moving them up and down the passes in order to exfiltrate personal data to smugglers, much as the pre-crash microwave network had once sped high-frequency trades between Frankfurt, London, Amsterdam and Zurich. Sealed and tagged, these containerized data stores could be shipped anonymously to

brokers in India and Malaysia, just a few more boxes among millions, packed with transistors instead of scrap metal and plastic toys.

Microwave links are only a few meters across and go point-to-point like a searchlight, so even when they aren't being moved up and down the Matterhorn they're pretty hard to intercept. We needed assets in the air all the time, at the base of each pass, but the thermal turbulence of the area makes drones a no-go, especially since they've been effectively blinded by the UNDATA agreements. Hence the blimps.

Linz tells me they've intercepted a data transmission from one of the blimps over Chamonix, probably headed for Marseille and the Union Corse. Deep packet inspection showed some half a million user profiles, medium-grade material salvaged from the wreck of a minor Brazilian social network and bounced around Europe by data brokers ever since. Nevertheless, damaging enough if it got into the hands of one of the ad-supported South American juntas.

I fire up the ion thrusters on BLIX and RITTER and make another pass over the mainland. Thanks to the blimp's calculations, I know where to look, what to look for: the tracks the trailers leave behind as they churn up wet and dry earth can be spotted from space for hours after they're gone. EUROSUR traced the transmission to a spot on the Col de la Forclaz, and my sensors can follow a bright infrared trail from there back to the tunnel entrance. I take a few snaps of the area and annotate them for the lawyers before sending them on to the UNDATA rapporteur. Up to the Swiss now if they want to let an inspection team come round for a visit—or wait for a couple of Tomahawks to drop by.

As for the data itself, that's already been dealt with. The blimps were updated in October with the new HAPPY COW chaff system, essentially a bunch of bottle rockets to be fired into the microwave beam. A fun morning for Chamonix: when the rockets reach altitude they detonate, sending a cloud of cellulose filaments into the atmosphere. Coated with aluminum and zirconium, they ignite on contact with the air, buoy themselves up on a little cloud of infrared energy, and bounce those microwaves every which way. Any data that gets through is total junk, and the cinders that make it to the ground are basically organic, hence: happy cows. The French and Italians insisted on that.

I personally think it's only a matter of time before some kid in Annecy figures out how to trigger HAPPY COW with a cracked microwave oven and puts on their own display for Bastille Day, but that's not my problem. Yet.

What is my problem are international waters. I feel a lot more comfortable out here. I don't like personal data either, and even though I'm mostly watching it disappear, I'm still complicit in surveillance, and having the keys to BLIX and RITTER is a big responsibility. Over the North Atlantic, I can just watch the weather patterns and try out a bit of old-school crateology on the decks of any ships I don't have manifests for.

And the open ocean is a good place to recalibrate the satellites, too, because the convergence zone around the equator sends up pretty much every type of atmospheric

condition you can imagine. On a clear day in the doldrums I might be looking down at an almost perfectly flat expanse of ocean; other days there are thunderheads ten miles high, completely blocking my visible sensors. Today isn't one of those days, thankfully, and I cycle the sensor arrays through the spectrum, from the visible into the deep ultraviolet and infrared, looking not for anomalies on the water—there's nothing there, from an electronic perspective—but in the sensors themselves.

Here's a thing, though. There's a reason BLIX and RITTER are a pair, but you won't find it in any of the public docs. Every accord contains at least one loophole, and UNDATA's is really quite an elegant one. The official reason for having two satellites is redundancy and calibration: if we lose one to a cloud of space debris, the other can keep logging independently, and while they're both up they can cross-check everything. Each satellite carries a full complement of remote sensing gear, everything you'd find on any standard Earth observation vehicle of the pre-crash era, plus a few things they only put on spy sats. But there's something else they can do, together, which no satellite can do alone: collaborate.

By opening up a K-band link with one another, BLIX and RITTER become a single instrument, responding to every micron-level mass change on the Earth. It's a trick they learned from GRACE, a NASA gravity-sensing mission from the noughties, which used twin ranging satellites to look for anomalies not in the electromagnetic spectrum, but in the gravitational field. Instead of seeing, they start weighing, producing a detailed map of every object between them and the center of the planet. More like touch than sight, it's a whole other way of evaluating the world.

That the GRACE sensors were kept out of BLIX and RITTER's official capabilities, combined with that unscheduled maneuver over Switzerland, is the only reason I spot the Friedman.

There were some pretty extreme reactions after the crash. The usual cranks—accelerationists, drone-potters, libertarians, militias—they all had a field day. But it was Silicon Valley that kept my colleagues at Ascension busy every day of the week.

After the crash, the engineers in the Valley realized pretty quickly that the protocols they'd been working on were bust, but they had a whole new set of interesting problems: distributed ID systems, blockchain trading networks, smart contracts, quantum messaging, a vast swathe of known but until now unprofitable technologies that, thanks to the DPA, were going to be at the center of the next network.

The ad guys, on the other hand, were fucked. All the marketeers, the profile vendors, big data thought leaders, mailing list suppliers, the spammers and scammers: they knew the game was up too, but they had nowhere to go. Crazy schemes ensued.

Googlezon was a big mover in the initial offshore rush. In the months before the DPA came into force, a bunch of Creative Labs types prepared several exabyte-capacity storage facilities aboard barges in Emshaven, Wilmington, and Oakland. They were later

found sunk thirty meters deep on the edge of local shipping channels: it's not known whether they were ever used, or just part of some internal corporate power struggle. When we announced the DPA had force in ocean waters, people expected the space billionaires would get involved, but with all the extra funding pouring into NASA and the remaining data centers turned over to crunching escape trajectories rather than clickthrough rates, they were busy. Which just left the proper nutters.

Friedman had originally been built as a floating tax haven, a data processing plant for people who didn't want to participate in anything resembling a functioning government. Pre-crash AIS had it docked off the coast of Grand Cayman, executing automatic trades for the usual coterie of batshit one-percenters who lived aboard Gulfstreams and kept their Picassos at the airport. Cayman went off-grid for months while DPA went through the committees, and when it started talking again, Friedman was gone.

I don't like to talk about it with the UNDATA crowd, who think I'm a proper nutter myself, but I've been keeping tabs on the forums, and rumor is that the processing decks have been massively expanded, and special measures taken to keep it out of sight—again, ultimately, from me. It gets personal. Friedman is my Moby Dick.

In the center of the doldrum is a dense block of matter where there should be nothing, is nothing, according to every reading but the GRACE instrument. I'm not supposed to perform unauthorized maneuvers, but if what I half-think about Friedman is even half-true, there might not be time for a second pass. Using the GRACE readings as a base, I turn BLIX and RITTER around, putting the full force of their combined instruments onto the mass anomaly.

What had been an undifferentiated cloud of reflections immediately resolves into a subsurface superstructure, a chunk of material the size of a Greenland iceberg—even looks like an iceberg, except for the fact that it has the density of silicon and ferro-cement. It still doesn't appear on any of the usual sensors, but with BLIX and RITTER flying in sync some five hundred miles apart, their standard radar scans form a synthetic aperture, a notional aerial five hundred miles long, capable of reading the smallest ripple on the water surface. I could read facial expressions if I was over land right now. Another reason we keep the twinning function off the books.

This thing is almost half a mile across but riding only a few feet above the waves, clad in some kind of Hilbert coil and shedding seawater over its deck gently and thickly enough to maintain surface tension. To BLIX's aerosol sensor it looks like the surface of the sea itself. It's obviously cooling itself, otherwise it would show up on the thermal readings, but it's the temperature of seawater too. If you were out there in a dinghy, God help you, it would stick out like the Queen Mary, but to every one of the standard sensors it's perfectly invisible. Someone has thought about this a lot. But even they didn't know about GRACE.

The Friedman is a phish farm, a breeding ground for all kinds of algos, optimized for profit, powered by submerged hydrofoils, and cooled by the Atlantic. Pumped full of personal data gathered in the aftermath of the crash, it's holding out for a day when it can be recovered and reconnected, unleashing a swarm of predatory programs to overwhelm the nascent anonymous networks.

Data is power. It's something to take from and hold over somebody else; quantified dominion. The more you have on someone, the more you have over them. The more personal it is, the more power, until you've eaten right through the skin of social relationships and into the flesh itself. The Friedman is an ark of unqualified dominion.

GRACE's resolution band is pretty short. There's no way I can be sure the mass sensor will find it again in the vast expanse of the open ocean, and this thing is obviously good at staying under the cloud layer, otherwise I would have spotted it before. No time to send a warship, and no anti-ship missiles with the range and accuracy to hit something this size in the mid-Atlantic. There's only one other option.

I've given away most of UNDATA's secrets now, so I guess you can have this one for free. Good things always come in threes, and BLIX and RITTER are no exception. Trailing them by another few hundred miles is KELLY, their silent partner. KELLY hasn't got any sensors aboard. KELLY is blind and dumb. So dumb, in fact, there's no thermal source or processing plant to trigger a signature on ground-based systems—just a solar sail hidden behind its body, and a passive microwave receiver waiting for a signal from one of its siblings.

When BLIX sends the signal, all the trajectories are pre-calculated based on KELLY's position. At the right moment it splits apart, ejecting its payload in a perfect arc towards the surface while its carapace tumbles away to burn off in the atmosphere. KELLY is a reactivated "Brilliant Pebble," a remnant of Star Wars, containing a single tungsten cannonball that falls to earth under its own gravity, generating the kinetic energy of a nuclear explosion on the way down. KELLY's comet falls for five minutes, and the surface of the sea vaporizes, instantly and briefly searing red across BLIX and RITTER's thermal sensors. They barely even look back.

That's it, I'm done. I dial up Ascension on my terminal, and send the afternoon crew the morning's log files. One benefit at least of this island life is the long afternoons –what's the point of all this technology if we don't get a little more leisure to enjoy it? And by leisure, I mean time for side projects.

Turns out all that dollar van work still comes in handy. I'm using the old GPS station and the VHF aerials on the North shore to optimise refugee sea routes across the Mediterranean and elsewhere. A hint here, a weather tip there, and you can send a hundred small boats on a safer trip. It's not rocket science, not like BLIX and RITTER, not like the Friedman, but it's what this stuff is supposed to be used for. Now we've made information really free, it's time to get started on people.

Written By James Bridle

Published in Terraform January 28 2016