



Facebook's Big Shutdown

Pippa Boyd, Freshman

On Monday, October 4th, Mark Zuckerberg was lounging back in his office chair, idly scrolling through TikTok while his personal assistant waited on hand nearby. "Ha," he said, liking Bella Poarch's latest video of herself bouncing along to the berries and cream song. "This app is funny. I wish I had invented it."

As Mark was about to scroll, a notification popped up onto the screen of his iPhone 14, alerting him that he was almost out of battery. "Hey," he said to his assistant. "My phone's almost dead."

"Oh," replied the assistant. "Where should I plug it in?"

Mark scanned the room for an outlet, his gaze eventually falling on a ginormous black plug connected to an unreasonably large charging port on the far side of the wall.

"Go take that one out and plug in my extension cord," he said, pointing.

"But sir, that's the --"

"I'm at 20%!"

The assistant shrugged, and yanked out the one plug powering all of Facebook. At that moment, chaos ensued as Facebook's routers, generators, monitors, coffee machines, and heated toilet seats simultaneously shut down, plunging the world back into the Dark Ages.

All throughout the world, the sudden absence of all Facebook based domains was wreaking havoc on the internet community. Companies and businesses who coordinated through Facebook groups were cut off from work and communication. Marketers lost money as their ads were suddenly unviewable. The boomers were cackling. The millennials were quaking in their boots.

As for the majority of American teens, and Mark of course, they remained happily swiping their way down their content-packed ForYou pages, oblivious to the worldwide crisis that had just set in.

What really happened? Facebook's official explanation:

When one of the largest online media platforms shuts down for six hours, leaving their roughly 2.85 billion users to fend for themselves, the world demands an explanation. On October 4th, Facebook ceased to exist, showing the world what an internet without it looked like. Facebook tweeted on their progress in fixing the problem while it was still down, and since then they have released several official statements on what happened. And while we all know what really happened, Zuckerberg is a little embarrassed about unplugging his entire company, so they've given us an alternative explanation for why the shutdown occurred. Nevertheless, Facebook's official explanation still outlines some very serious underlying issues with the layout of their company that are hard to avoid talking about now that the truth is out. So let's dive into the Facebook shutdown, and learn about the stone that took down the tech Goliath. Experts have broken down what happened into an easily avoidable malfunction that could have been

prevented had Facebook been better prepared. Ok, so maybe the shutdown wasn't caused all by Mark Zuckerberg's assistant pulling the one plug that powered the entire company, but the truth is closer than one might think. To understand why the shutdown happened, we first need to understand how it happened. Santosh Jarnardhan, the Vice President of Infrastructure at Facebook, tweeted, "Configuration changes on the backbone routers that coordinate network traffic between our data centers caused issues that interrupted this communication."

Let's unpack that. Border Gateway Patrol, or BGP, is a system that routes information. They are "the backbone routers that coordinate network traffic," if you will. It is an essential structural component of the internet, whose function is to send information back and forth.

Facebook claims that while these routes were in the process of updating, a message was sent to the web, telling all servers that Facebook simply did not exist. All Facebook servers proceeded to shut down, resulting in internet searches for domains that had previously been some of the most visited in the world to come up as "page not found."

Alright, that makes sense. But why did it take so long to fix?

This is where an undeniable design flaw crops up in Facebook's explanations. Facebook is predominantly reliant on their own systems, which means that they had no backup when everything went down. It makes sense that such a big company would use their own products for most things, but when something like this happens, it means they have no one to fall back on. Sure, a plug in Mark Zuckerberg's office doesn't control everything, but all their data is handled internally, meaning that they were totally unprepared for a situation like the one that happened.

Outcomes of the Shutdown

"Oh big deal. You couldn't look at memes or argue on the computer for six hours. Go read a book."

Actually, the impact that Facebook's shutdown had was more influential than that. As previously mentioned, businesses relying on Facebook apps and domains were cut off from their digital workspace. This caused businesses and companies to lose time and money during that period, not to mention Facebook itself, whose shares fell nearly five percent as a result of the incident.

On the other end of the spectrum, rival messaging companies such as SensorTower and Signal made millions as the panicked masses flocked to download them in the absence of Facebook. To put the sheer amount of influence the shutdown had on the online community into perspective, other networks reported severe slowness due to the thousands of people simultaneously searching for the Instagram and Facebook domains in such a short period of time.

Astra Aims to Orbit Second Space Force Payload

Michael Piper, Junior

From October 27th to November 12, small rocket company Astra will have the opportunity to orbit a dummy payload for the Space Force. The designated launch vehicle, LV0007, is in the final stages of production, following changes required by the failure of LV0006 on August 28.

Formerly known as Ventions, Astra was incorporated in 2016 by Chris Kemp and Adam London. The company's main goal is to provide extremely cheap orbital launch vehicles with flexible launch parameters, notably the ability to transport rockets and launch infrastructure in standard shipping crates. In January of 2017, Astra relocated to and built testing facilities at California's former Alameda Naval Air Station.

In July of 2018, Astra launched its first design, Rocket 1.0. This was a suborbital test with a ballast second stage, flown from the Pacific Spaceport Complex in Kodiak, Alaska. After 27 seconds of flight, the rocket fell within the grounds of the spaceport. While Astra claimed the launch was a success, the FAA (Federal Aviation Administration) noted it as a failure.

Similarly, Rocket 2.0 flew in November of 2018 as another suborbital test. Around 30 seconds after lift-off, it also fell inside the spaceport's property. Astra stated the flight was "shorter than planned" and the FAA again marked it as a failure.

2020 marked the beginning of Astra's orbital launch attempts. After construction of the Alameda rocket factory and a dedicated launch facility in Kodiak was completed in late 2019, the new Rocket 3 design -- with a functional second stage -- was built for the DARPA Launch Challenge.

The first example, Rocket 3.0, was scheduled to launch in March of 2020. At this point Astra was the only competitor left in the challenge, but weather forced the launch to be scrubbed and the \$12 million award went unclaimed. Shortly after, Rocket 3.0 was destroyed on the launchpad by a fueling fire.

Rocket 3.1 launched in September 2020, but the flight was terminated less than a minute after launch due to intense control oscillations. For a third time, the vehicle fell within spaceport grounds.

Rocket 3.2 lifted off in December the same year. It passed the Karman Line, separated the booster and fairing, ignited the second stage engine, and accelerated towards its polar orbit perfectly. Just 500 meters-per-second before meeting the needed orbital velocity, however, an error in the fuel-oxidizer ratio caused an early shutdown.

In June 2021, Astra acquired Apollo Fusion, an established satellite propulsion company. Astra now aims to offer easy-to-use satellite buses in addition to their launch services. In July, the company went public under the ticker ASTR. Stock value would drop quickly, however.

On August 28, Astra attempted to launch LV0006, their first iteration of Rocket 3.3. The booster fuel tanks had been stretched 5 feet and the fuel mixture was now controlled by a closed loop. On board was an instrumented dummy payload for the Space Force. A livestream of the launch -- a first for Astra -- was established in partnership with NASASpaceflight, a space news website and YouTube channel. After an abort on the first day of the launch window, the countdown went smoothly on the second. At T+0 the rocket lifted off the stand, but a flash of explosion near the engine section was quickly followed by the rocket sliding sideways and out of frame. Amazingly, the rocket remained controllable and continued its ascent, reaching 50 km before termination. In a press release published on October 12, Astra stated one of the five booster engines was shut down by an explosion of fuel and oxidizer that leaked from fueling pipes near the engine section. LV0007 implements changes to the fuelling procedures to avoid the same issue.

If LV0007 makes it to orbit, Astra will be the newest member of a very exclusive group of companies that have developed their own orbital launch vehicles without government affiliations. As of October 26, the launch date has been moved to NET (no earlier than) November 5th due to work on the Kodiak spaceport.



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