

Facebook Major Outage

INTRODUCTION

The world has changed significantly during the past 18 months. Individuals and businesses alike are more reliant on the internet and digital technologies than ever before.

The impact of Facebook's recent outage is a timely reminder to us all that we are increasingly reliant on a small number of major technology providers. The outage itself highlighted the dependence much of the world has developed on its social media products and as a result, placed the spotlight on its global power.

The economic and financial impact of the Facebook outage has been unprecedented and unlike others in history. The incident resulted in a six-hour outage which saw \$50bn (£37bn) wiped off the company's \$1tn market value. Additionally, Mark Zuckerberg's fortune shrunk by \$6bn and more than \$13m of the advertising dollars that are its lifeblood disappeared each hour the platform was offline.

The direct financial implications aside, Facebook witnessed many of its 2.9 billion users struggle to communicate using "normal" channels reverting to other methods outside of Facebook, Instagram and WhatsApp. It also became apparent that many businesses were impacted given their reliance of direct selling via these platforms or integration of these services into their core business proposition. It was a timely reminder of the dominant position Facebook has in the modern communications market, e.g. via WhatsApp and Instagram.

WHAT HAPPENED?

Following an error during routine maintenance of its network of data centres, Facebook, Instagram and WhatsApp had a major outage lasting almost 6 hours on Monday 4th October 2021. This left billions of users unable to use and access the services. The outage also affected Facebook's tools and internal systems which made diagnosing and resolving the issue take more time.

Santosh Janardhan, vice-president of engineering posted details on the outage in a blog "This outage was triggered by the system that manages our global backbone network capacity," Janardhan wrote. "The backbone is the network Facebook has built to connect all our computing facilities together, which consists of tens of thousands of miles of fiber-optic cables crossing the globe and linking all our data centers." ¹

Mark Zuckerberg loses \$6 billion in just 6 hours after Facebook experienced a global outage that also took out Instagram and WhatsApp

WHY DID IT HAPPEN?

Janardhan has said that a bad command was the cause of the outage. Facebook has a system in place to audit and prevent mistakes but it wasn't able to prevent the command from being run due to a bug in the system.

This was a multi-layer issue for Facebook. Janardhan wrote "One of the jobs performed by our smaller facilities is to respond to DNS queries. DNS is the address book of the internet, enabling the simple web names we type into browsers to be translated into specific server IP addresses. Those translation queries are answered by our authoritative name servers that occupy well known IP addresses themselves, which in turn are advertised to the rest of the internet via another protocol called the border gateway protocol (BGP). ¹

To ensure reliable operation, our DNS servers disable those BGP advertisements if they themselves can not speak to our data centers, since this is an indication of an unhealthy network connection. In the recent outage the entire backbone was removed from operation, making these locations declare themselves unhealthy and withdraw those BGP advertisements. The end result was that our DNS servers became unreachable even though they were still operational. This made it impossible for the rest of the internet to find our servers." ¹

Facebook engineers also encountered issues gaining access to the data centres as security restrictions in place to prevent unauthorised access to these areas and systems also ran on the same network which was unavailable.

Once connectivity had been restored, the problem wasn't over for Facebook – they couldn't turn everything on at once as this could cause a surge in traffic and potentially a new round of issues for them to deal with. Facebook was prepared for this and had processes in place to gradually make the services available to users.

WHAT ARE THE IMPLICATIONS?

The outage didn't only take out Facebook, Instagram and WhatsApp but also prevented the many sites that use the 'sign in with Facebook' option from being able to have users log in. Facebook and WhatsApp are used now more than ever due to the challenges posed by Covid in recent times.

When Facebook, Instagram and WhatsApp were unavailable, billions of people were unable to get in touch with family, friends and work colleagues. Additionally, many e-commerce companies that rely on social media reported a fall in sales during the same period. This has demonstrated the need to have back up lines of communications in case these platforms do become unavailable.

For Facebook itself, the financial implications of a six-hour outage were significant and probably one which the company doesn't want to repeat in a hurry.

WHAT DO YOU NEED TO CONSIDER?

If a company the size of Facebook can have such a severe outage, all businesses are vulnerable to outages too. Irrespective of whether you rely upon Facebook services as part of your business, we recommend that organisations consider the following as part of their resilience and continuity strategy:

Reliance you have on key third party systems and technologies: Specifically those which underpin key business services. Whilst Facebook was at the centre of this outage, it's worth considering the extent to which you rely upon other 3rd party software in support of your services. Evaluate whether their ability to recover from an outage is in alignment to the objectives you have for a service.

Contingency and Resilience: Do you understand the extent to which your systems can recover from an incident or service impacting event? Are all components that make up a service secure and resilient? Do you understand how a failing in one component may have an overall impact on your service?

Incident Response: Have you established effective processes to identify, triage, manage, respond, and recover from incidents? Are you confident that your team would know how to respond if there was a major outage?

Preparation for Outages: Consider creating 'What If' scenarios to assess how you may respond if another incident occurred. Use and test these scenarios to identify improvements.

TIMELINE OF EVENTS



Sources: ¹ <https://engineering.fb.com/2021/10/04/networking-traffic/outage/>

² Facebook App (@facebookapp) / Twitter

³ Instagram Comms (@InstagramComms) / Twitter

⁴ WhatsApp (@WhatsApp) / Twitter