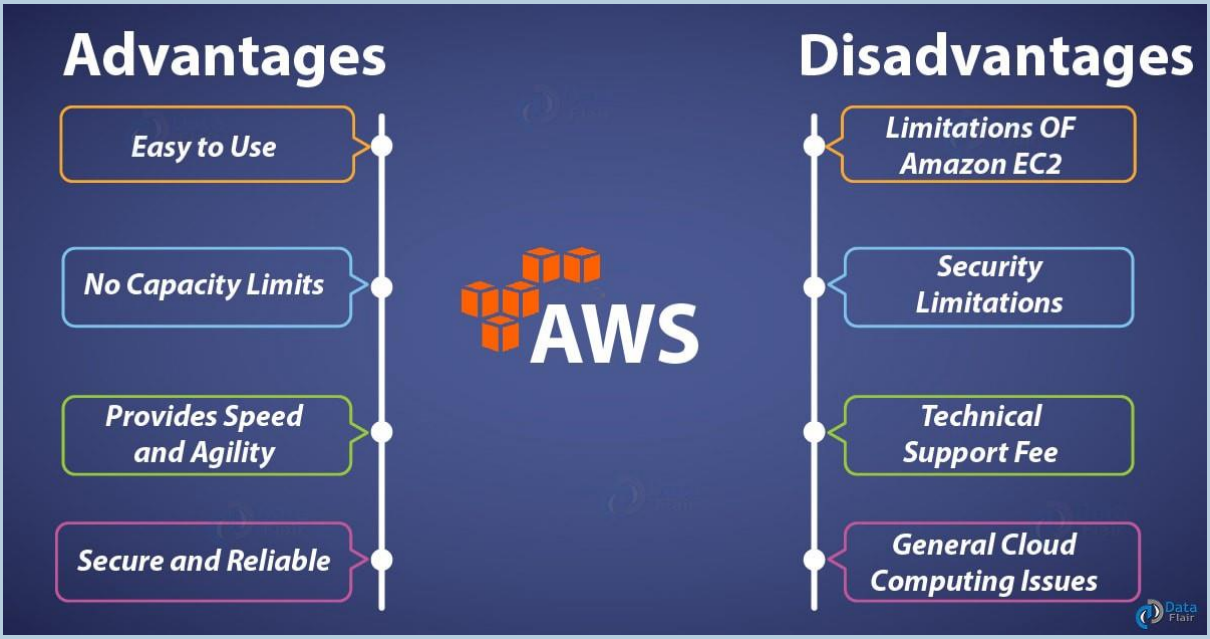
Amazon Web Services

Benefits at a Glance



Easy to use

AWS is designed to allow application providers, **ISVs**, and vendors to quickly and securely host your applications — whether an existing application or a new SaaS-based application. You can use the AWS Management Console or well-documented web services **APIs** to access AWS's application hosting platform.

Flexible

AWS enables you to select the operating system, programming language, web application platform, database, and other services you need. With AWS, you receive a virtual environment that lets you load the software and services your application requires. This eases the migration process for existing applications while preserving options for building new solutions.

Cost-Effective

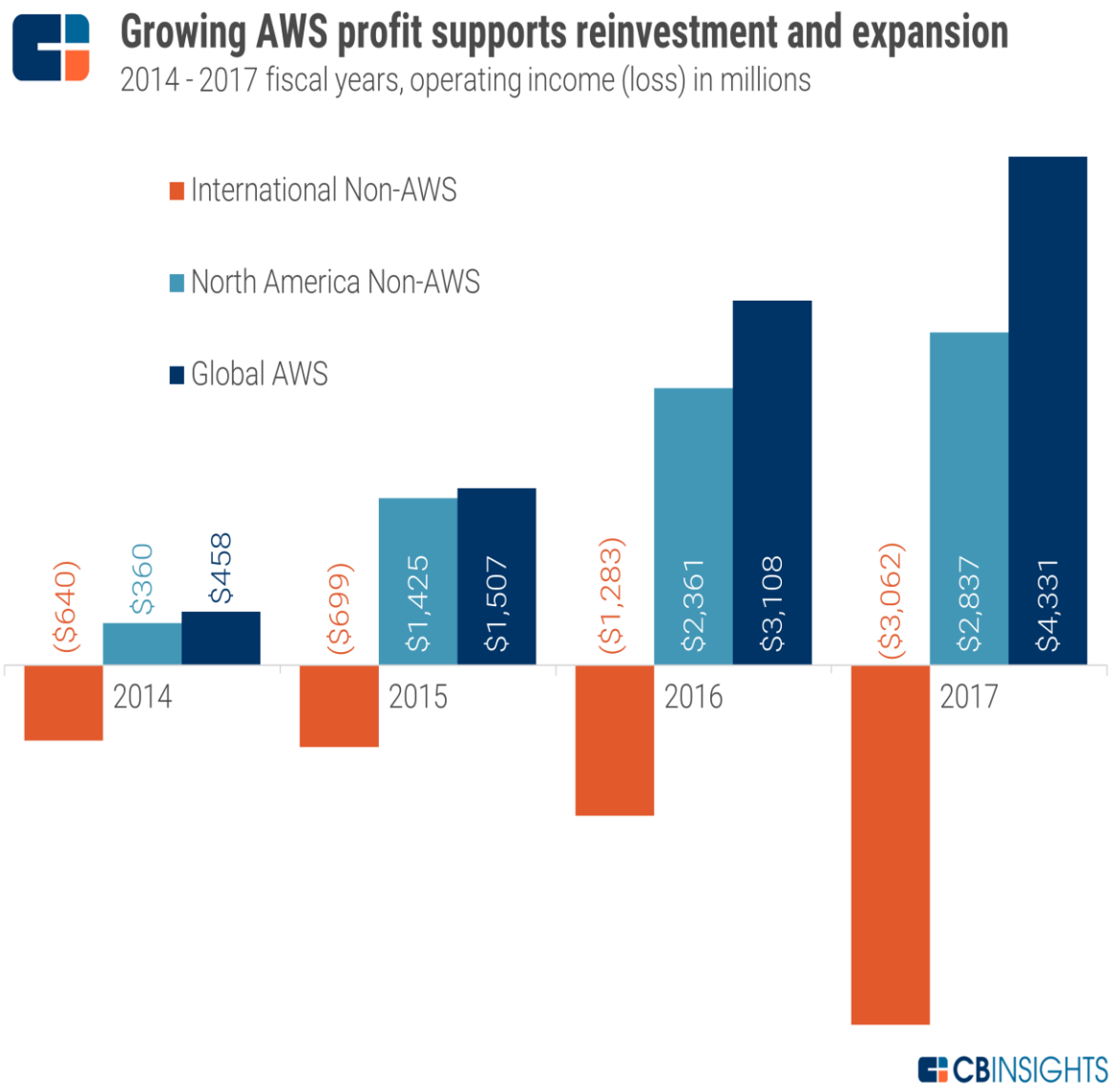
You pay only for the compute power, storage, and other resources you use, with no long-term contracts or up-front commitments. For more information on comparing the costs of other hosting alternatives with AWS, see the AWS Economics Center.

Reliable

With AWS, you take advantage of a scalable, reliable, and secure global computing infrastructure, the virtual backbone of Amazon.com's multi-billion dollar online business that has been honed for over a decade.

Scalable and high-performance

Using AWS tools, Auto Scaling, and Elastic Load Balancing, your application can scale up or down based on demand. Backed by Amazon's massive infrastructure, you have access to compute and storage resources when you need them.



Edge Computing With AWS Infrastructure Solutions

With **global infrastructure** that spans of **77 Availability Zones** in **24 AWS Regions**, AWS enables developers to serve end-users with low latencies worldwide. However, emerging interactive applications, like game streaming, virtual reality, and real-time rendering, require even lower latencies, sometimes in the single-digit milliseconds. Additionally, use-cases like

industrial automation, healthcare and autonomous vehicles require data processing to take place close to the source to conserve resources like device memory and power. If you're already running your applications on Intel® Xeon® servers on-premises and benefiting from Intel software optimizations and tuning for enterprise applications, you'll enjoy the same robust performance on **AWS Outposts** as well as the AWS cloud.

Why AWS for edge infrastructure solutions?

- Use the most extensive global cloud infrastructure — AWS is ushering in a new era of interactive
- applications and immersive experiences built for the edge and has the largest cloud infrastructure footprint of any provider — meaning AWS can serve more customers with the services they need and where they need it. For the areas not covered AWS supplements with its edge infrastructure solutions of AWS Outposts, AWS Wavelength and AWS Local Zones.
- Move cloud closer to the endpoint — Extend to the edge, beyond Regions, with the same network, control plane, APIs, and AWS services in each deployment.
- Securely connect and manage devices at scale — Use managed hardware at edge locations, with support for more security standards and compliance certifications than any other offering.

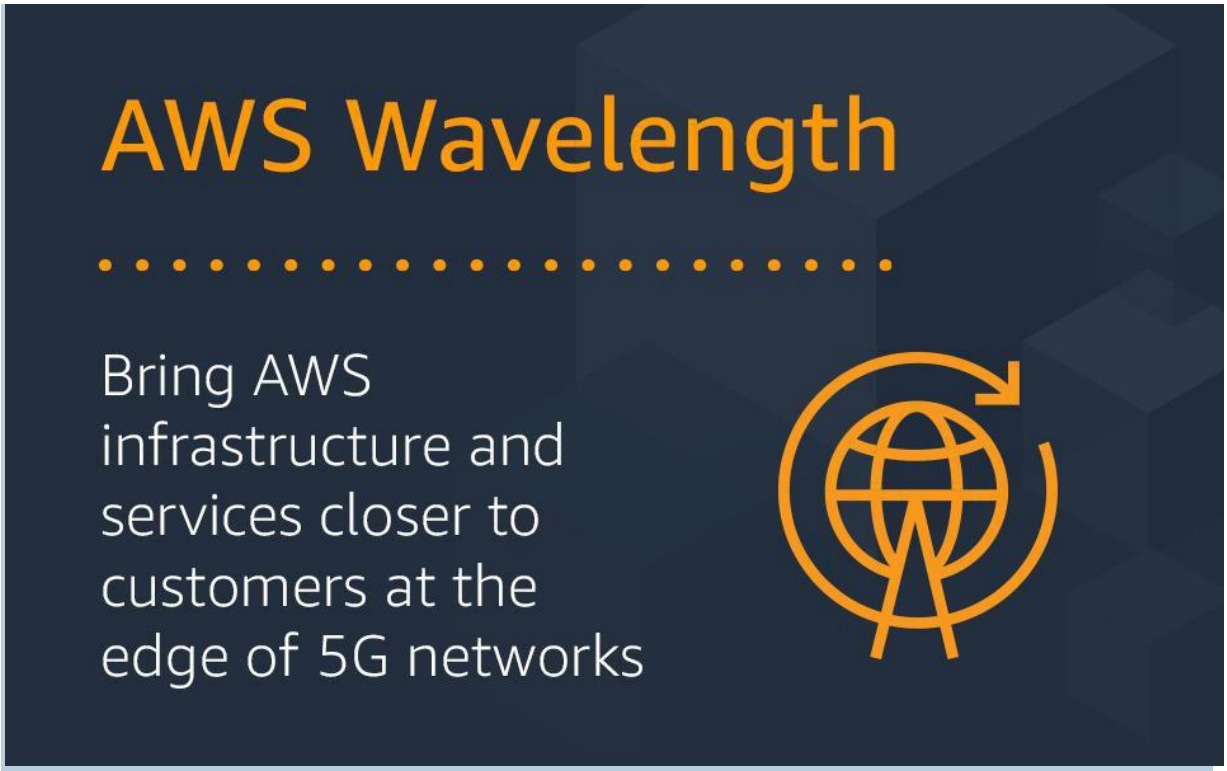
- Use the deepest range of services and capabilities — AWS has 175+ cloud and device services, more than any other cloud provider, plus capabilities for specific edge use cases.
- Build more quickly and reduce costs — Use a single programming model for the cloud and local devices. Build an application once and deploy it on the cloud or at the edge with consistent performance. This significantly shortens the development lifecycle and reduces development costs.

AWS cloud infrastructure solutions for supporting applications on-premises in large metro centers and at the 5G Edge

AWS is helping millions of customers to innovate fast and lower costs. Yet some customers need compute, storage, analytics, and machine learning services beyond where AWS Regions exist today. Customers with modernization at the heart of their strategy need a consistent cloud infrastructure and AWS brings its services closer to customers through:

- On-premises solutions (AWS Outposts)
- Metro area solutions (AWS Local Zones)
- 5G Edge solutions (AWS Wavelength)

AWS has edge-specific capabilities to suit your needs.



AWS Wavelength is an AWS infrastructure offering optimized for mobile edge computing applications. Wavelength Zones are AWS infrastructure deployments that embed AWS compute and storage services within **communications service providers' (CSP)** data centers at the edge of the 5G network. When applications are deployed inside a Wavelength Zone, traffic from 5G devices can reach application servers without leaving the telecommunications network. This avoids the latency that would result from application traffic having to traverse multiple hops across the internet to reach their destination, enabling customers to take full advantage of the latency and bandwidth benefits offered by modern 5G networks.

Strong demand for cloud computing solutions and a significant uptick of online advertisement revenue helped major tech companies in 2019, according to a study by **GlobalData.**

Cloud providers such as Amazon, Apple, Samsung Electronics, Hon Hai Precision, Alphabet and Microsoft topped **GlobalData**'s list of top 25 publicly-traded global technology companies by revenue in 2019, and of the top 25, 19 companies reported year-on-year (YoY) growth in revenue, with 28% reporting double-digit growth.

"The companies that reported strong bottom-line performance over the last five-years have been successful in absorbing the impact the current global health crisis has had on their operations," says Keshav Kumar Jha, company profiles analyst at GlobalData.

"These companies have been agile in rolling out new operational and strategic plans to continuously serve customers in new-normal situations," he says.

"Changes in fulfilment and delivery operations by **Amazon**, and **Microsofts** strategy to invest in strengthening its e-commerce operations are just a few examples. It is no surprise that these companies continue to be investors favourites as their market valuation continues to rise."

The challenges posed by COVID-19 have forced enterprises to look for various ways to implement cost optimisation across the organisations, including implementation of efficient technology solutions, says GlobalData.

IT infrastructure providers, such as cloud computing companies, are likely to benefit from this surge in demand for digital transformation. Due to cost-cutting measures, non-core IT infrastructure vendors, application software companies and IT services providers could struggle during the health crisis.

“There was increased demand for cloud infrastructure services such as Amazon Web Services (AWS), Microsoft and Alphabet in 2019, with the trio recording YoY cloud revenue growth of over 20%,” says Jha.

“Interestingly, cloud revenue still constitutes less than one-third of total revenue for these three tech majors.”

The significant rise in online advertisement revenue, primarily driven by increase in search queries and ad delivery, led the revenue growth of major internet-based solutions providers, including **Facebook**, **Alphabet** and **Tencent**.

Facebook and Tencent registered revenue increases at compound annual growth rates (CAGR) of over 35% over the past five years due to online advertisement revenue, which recorded a CAGR of 18.9% and 40.7% revenue growth, respectively. Tencent’s VAS business, FinTech and cloud services also contributed significantly to its revenue growth.

Toshiba was the only player to report both more than **5%** YoY revenue decline and over **10%** negative revenue growth over the last five years. A faltering global business, not-so-successful

restructuring and de-consolidation initiatives, on top of the adverse impact of foreign exchange movements, had its top-line under constant pressure.

Besides **Toshiba**, **Samsung** and **Hewlett Packard Enterprise** (HPE) were other major players that reported over 5% YoY revenue decline. **Samsungs semiconductor** sales declined 25% on a YoY basis, whereas decline in Tier-1 server sales and lower revenue from China resulted in net sales decline for HPE.

"**HPE, Lenovo, Dell** and **Pegatron** all reported over 40% operating profit growth, benefited by cost-management initiatives and decline in commodity price," Jha says.

"Dell's focus on the integration and simplification of its portfolio paid off, as it has begun realising cost-synergies across all businesses."

In terms of bottom-line performance, more than 50% of the top 25 technology companies by revenue reported YoY growth, with four companies recording over 100% growth.

US-based IT companies did well, benefited by tax reforms as their income tax obligations declined by over 70% in 2019. Lenovo's robust revenue stream, cost-control initiatives across all business groups and significant decline in tax obligations resulted in a significant rise in net earnings.

Samsung, HPE and HP witnessed a major slump in their bottom-line, with net profit tumbling down over 40% on a YoY basis. A US$757m charge related to acquisition and disposition impacted HPEs bottom-line, whereas HPs bottom-line was impacted by a more than 65% jump in interest expenses due to termination of tax matters agreement with HPE.

Facebook and **Apple** also reported decline in their net profits. An approximate **95%** increase in income tax expenses, mainly due to the effect of legal accrual related to the FTC settlement and a decline in excess tax benefits recognised from share-based compensation, led to over 16% decline in Facebooks net income.

Decline in sales from China and increase in research and development (R&D) expenses resulted in a more than 7% reduction in Apples net earnings.