

WHITEPAPER

EXPLORING THE NEXT BIG THING(S) IN CLOUD INFRASTRUCTURE



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Introduction

Contemporary cloud services have become mainstream and a burgeoning multibillion-dollar industry. According to 1Gartner, the global spending on cloud services is expected to reach over \$482 billion in 2022, up from \$313 billion in 2020.

Cloud adoption is trending as enterprises become more cloud-dependent to enhance efficiency and remote access. The massive shift to the cloud, of course, also means innovative advances in cloud infrastructure in the years ahead.

This whitepaper explores and outlines the next big things in the cloud infrastructure space. We've put together—for you—exciting trends to keep an eye on to ensure you're prepared for approaching the cloud-native future.



The Race to Adopt the Cloud



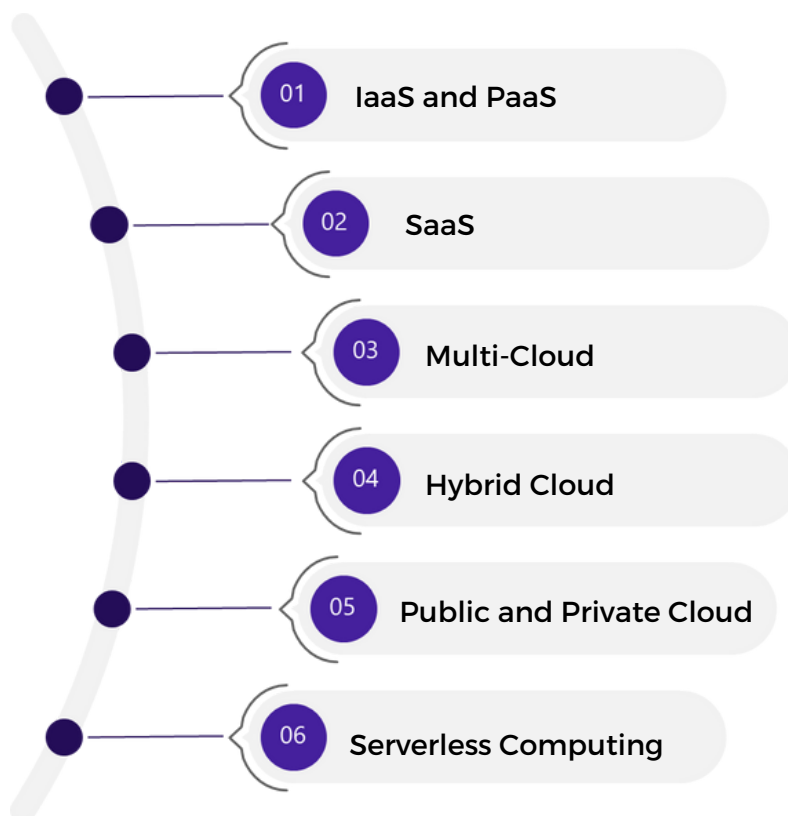
The cloud has brought a new level of agility to enterprise software, enabling companies to respond quickly and intelligently to a rapidly shifting business landscape. While most companies weren't early adopters of the cloud, numerous enterprises are jumping into the cloud bandwagon with enthusiasm.

To stay competitive, companies need to adopt cloud infrastructure when it makes sense for them—and it's no longer just an option. Increasingly, large enterprises are seeing new applications in workloads that were previously too big or complex for public or private clouds—like artificial intelligence algorithms or simulations with heavy-duty graphics requirements.

The coming years will see continued innovation in how we deploy software onto our cloud infrastructure. Still, no matter what kinds of advances may come out over time, two things will remain consistent:

- Software will become increasingly important over hardware,
- Companies that leverage open standards like APIs and integrations between different services stand to gain more than those who don't think beyond their closed silos.

Operations Strategies in the Cloud



IaaS and PaaS

According to IDC, the combined public cloud IaaS and PaaS market is forecasted to have revenues of \$400 billion in 2025 with a compound annual growth rate (CAGR) of 28.8% during the 2021-2025 forecast period.

Application development and testing, structured data management, and structured data analytics will be the most significant workload segments by revenue share. Unstructured data analytics/data management and media streaming are forecast to be the fastest-growing segments with CAGRs of 41.9% and 41.2%, respectively.

Other business applications, file and print, and content applications will grow slower than the overall market average while still delivering double-digit growth throughout the forecast period.



SaaS

The market overall spending of SaaS applications is expected to reach a whopping \$397.5 billion by the end of 2022. By far, SaaS is one of the most attractive cloud computing model

Software-as-a-service (SaaS) is becoming an increasingly practical choice for organizations. It helps eliminate complexity by providing up-to-date and secure business-critical software without system overhauls.

That means SaaS will continue to shape and dominate the cloud computing market as organizations race to modernize their environments in a bid to achieve agility, functionality, flexibility, continuous innovation, and constant operational improvement.



Multi-Cloud

Flexera's State of the Cloud Report indicates that 92% of respondents reported having a multi-cloud strategy while 80% have a hybrid cloud strategy.

Most organizations adopt a multi-cloud strategy out of a desire to avoid vendor lock-in or to take advantage of best-of-breed solutions. Organizations will continue to pursue this approach to reduce dependencies on a single cloud provider and maximize efficiencies that come with utilizing multiple cloud vendors and shifting workloads when needed.



Hybrid Cloud

The Hybrid Cloud Market was valued at USD 52.16 billion in 2020 and is anticipated to reach USD 145 billion by 2026, at a CAGR of 18.73% over the forecast period 2021 - 2026.

Hybrid clouds have become increasingly popular in recent years. The hybrid approach gives cloud customers a layer of independence while maintaining full accessibility to their services. By connecting multiple clouds, businesses can improve performance and security while reducing costs.

It's worth noting that hybrid clouds don't necessarily offer more flexibility or reliability than fully-hosted alternatives. Cloud technology is still subject to natural disasters and malicious attacks—but hybrid configurations provide greater control over how data is backed up, accessible, and distributed.

Companies interested in developing more robust security measures should often consider a hybrid approach to cloud hosting because it offers more control over resources without sacrificing agility or stability. Hybrid models also provide a middle ground between host-only and multi-cloud deployment strategies for corporations with unique needs and objectives.



Serverless Computing

Serverless Computing Market is expected to register a healthy CAGR of over 20% during the forecast period (2021 - 2026). Virtualization has revolutionized computing. This evolution towards serverless computing is poised to change cloud infrastructure as we know it, dramatically lowering costs and creating a brand new range of services that weren't possible before.

Serverless platforms are an application architecture paradigm that makes heavy use of event-driven, serverless computing – using event triggers to execute small pieces of code known as functions without explicit provision or managing servers.

While some large companies are already exploring serverless options, these developments may initially play out slowly. Before long, however, most data centers will need to consider whether or not they want to take advantage of servicing technology themselves or risk being shut out.



Public and Private Cloud

The public cloud is one of the fastest-growing cloud solutions as companies and users embrace the power of the cloud. Gartner forecasts end-user spending on public cloud services to reach \$396 billion in 2021 and grow 21.7% to reach \$482 billion in 2022.

Additionally, by 2026, Gartner predicts public cloud spending will exceed 45% of all enterprise IT spending, up from less than 17% in 2021. The report also highlights that cloud ubiquity, regional cloud ecosystems, sustainability and carbon-intelligent cloud, and cloud infrastructure and platform service (CIPS) providers' automated programmable infrastructure are the key trends that will drive public cloud growth.

On its end, the private cloud will incremental growth more security-centric businesses and look for on-demand services, increased visibility and efficient resource allocation based on their needs.

Key Trends in Cloud Computing



Compliance and Security



According to a study conducted by 451 Research, 40% of organizations have experienced a cloud-based data breach in the past 12 months. Cybersecurity concerns and cloud infrastructure regulations have been a hot topic in recent years.

With rapid cloud growth comes added attention from potential threats.

The same ease that makes adopting cloud solutions easy for companies also makes hacking those services relatively easy for criminals.

In other words, these are perfect opportunities for cybercriminals to attempt to attack organizations and individuals alike. Besides, the advent of the pandemic has seen a heavier reliance on cloud technology more than ever, which means more security.

While major cloud providers like AWS, Azure, Oracle, Google, and others provide best-in-class native security features – these security offerings have limitations and are often not well-integrated. And with most organizations relying on multiple cloud service providers on top of their private clouds or on-premises hardware, it is a huge security issue that cloud providers cannot address effectively for hybrid model users.

That said, organizations and cloud providers understand the inherent risk of cloud infrastructure.

Looking ahead, cloud-native security platforms (CNSPs) will receive exponential adoption. CNSPs enable security teams to manage their security across all cloud platforms from a single console.

Additionally, siloed security practices such as governance and regulatory compliance, threat detection and incident response, data loss prevention, cloud-based disaster recovery, container security, and serverless security will all be integrated to allow for single pane of glass monitoring.

As the cloud evolves, security teams will also need to regularly re-evaluate existing processes and tools to ensure they keep up with both the risks and demands of cloud-native technology.

The Cloud, Automation and DevOps

The need for collaboration between cloud and DevOps teams is growing as organizations are looking to deploy more microservices faster and more efficiently. As more companies realize that modern software has created an entirely new paradigm in which IT departments operate, teams must expand their knowledge base—



particularly when it comes to cloud technologies like Docker—to manage these constantly evolving infrastructure needs.

DevOps is ultimately about continuous delivery, which automates away manual processes using robust testing and deployment toolsets and self-service tools that make it easier for developers to deploy their code whenever they want to. In other words, infrastructure needs to become much more dynamic, leading companies to adjust accordingly. The current trends show little sign of slowing down. Technologies that previously required proprietary solutions are increasingly getting democratized by open source projects and communities, challenging service providers to step up with offerings based on standards - or risk getting left behind.

That's one reason why Pronix is fully committed to developing industry-leading solutions for emerging cloud trends such as containers, microservices, orchestration engines, and more.

What's more, when DevOps engineers collaborate with cloud architects, it allows cloud services to grow and scale along with microservices development. Faster time-to-market means less risk of errors or delayed projects—and ultimately, happy customers.

Redefining Applications: Microservices and Containerization



The cloud is quickly becoming the preferred platform for application development. Developers are rapidly moving their processes to online environments where they can collaborate with colleagues and tap into an infinite stream of resources. On-demand cloud, in particular, has helped

organizations embrace innovation while maintaining a more stable IT infrastructure.

New ways to deploy code make it possible for engineers to get features and updates into customers' hands more quickly. Take, for example, containers and micro services, which offer businesses a dedicated, cloud-based space where they can build, test and deploy new applications. Developers can therefore focus on the details of their applications, while IT teams focus on deploying and managing software solutions as they are developed. This makes deployment more efficient and quicker. Containerization, micro services, and other software development technologies are changing how we create scalable applications and reinventing computing as we know it.

With new tools like Docker, Kubernetes, Jenkins etc., at disposal, it's now easier than ever to move away from monolithic applications and toward smaller micro service-based units cloud-native applications. As developers continue to search for ways to make their code faster, they will rely on tools like Docker.

With new tools and a new way of thinking about cloud infrastructure at their disposal, application creators will develop quick update systems for apps across all platforms (not just mobile).

Even though many software companies aren't ready or able to make major shifts yet, some trends indicate fast updates will become mainstream, saving enterprises thousands of dollars during deployments each year while meeting customer expectations and demands.

Organizations will also effectively scale up to meet peak workloads or down when demand subsides without incurring huge costs associated with hardware purchases.

Virtual Cloud Desktops

Desktop as a service will continue to demonstrate rapid growth through 2023, rising to \$2.6 billion with a compound annual growth rate of 58.8%.

DaaS delivers the all-inclusive desktop operating systems and software applications as a cloud-based service directly to multiple devices.



Again, with remote working becoming essential and companies gradually shifting to scalable solutions that reduce operational costs, DaaS adoption is imminent.

Machine Learning And Artificial Intelligence



As AI gains traction in industry and enterprise applications, Cloud-based AI platforms are becoming an integral part of a business's IT infrastructure. Data has turned out to be a valuable goldmine for all organizations. Organizations that are exploiting their data are reaping big.

As organizations across all industries reimagine their operations to derive data-driven insights from extensive databases, Cloud-based AI and ML technologies will take center stage. AI algorithms will continue to progress and empower businesses to collect, refine their data for valuable insights that improve business workflows.

Outsourcing IT Ops

Making your data center more efficient while freeing up valuable resources has never been easier. Businesses will benefit from outsourcing operations to service providers with cloud solutions that host on external servers.

In addition to creating automation and orchestration, businesses will also have access to experts who can address security threats without burdening in-house staff. Organizations will also save time and money while navigating costly maintenance or downtime due to hardware issues or software failure will become a thing of the past.

The Rise of Edge Cloud

At its most basic level, edge computing or fog computing delivers remote cloud capabilities by consolidating various networks or cloudlets near users. Users can then access those centralized services and assets from any device or location; freeing them from dependence on one particular network provider or host environment.

One of the next big trends in cloud infrastructure will be all about figuring out how businesses can harness cloud technology at its source—and that's what edge computing is all about.

After COVID-19 transformed the way we live, socialize and work, we expect to see the growth of edge computing and data centers, with top cloud players developing their edge computing centers. Research and Markets projects the Global market for Edge Computing to reach a revised size of US\$17.8 Billion by 2026, growing at a CAGR of 27% over the analysis period.

Today's web applications and services rely on a vast array of servers that are often housed in data centers. These facilities house massive banks of servers, routers, and switches that store user data and allow for computing tasks.

In a world where just about everything involves being connected via mobile devices, accessing information from anywhere and from almost any device has become paramount for consumers and businesses alike. And with customers increasingly demanding faster internet speeds and lower latency rates, locating data storage and processing resources directly at critical points between consumers and content sources like application service providers (ASPs) or internet service providers (ISPs) will be critical.

Imagine you were looking for information on what restaurants your friends like in Toronto. Using today's centralized cloud infrastructure, you would likely have to connect to a server far away from your location to gain access to their location data, perhaps New York or London. But what if, instead of relying on central servers, businesses could bring processing closer to consumers? The result would be speedy access—and potentially cheaper hosting costs—for millions of people worldwide.

Wave of the Future: Arm-based Cloud Computing

The increasingly widespread adoption of Arm processors in data centers across the globe has been one of the biggest cloud computing trends in recent years.

However, this move has also been primarily spearheaded by just a few key players in the technology industry, leaving plenty of room for expansion from other smaller companies looking to get into the game.

Arm-based cloud computing is the next wave to help drive new business opportunities for enterprises down the road. Among other benefits of Arm-based cloud computing include:



Delivering Superior Performance, Agility and Scalability

Arm-based cloud computing can offer improved performance and scalability compared to x86 processors. Arm processors have fewer instructions, which means less time is spent on context switching and more time processing data.

With more cores, a single server can run multiple applications simultaneously without experiencing any overload. It also enables you to run more extensive databases with minimal downtime or service interruptions.



Cost-effectiveness

Running clouds on servers based on Arm technology can help reduce costs, making it easier for companies to store information or run software without breaking their budgets.

At a time when new products are constantly emerging, and software keeps getting more complex, lowering overhead can make or break your business. Reducing costs makes things easier for the organizational bottom line and allows organizations to reinvest those savings into business growth.



Enhanced security and reduced risk

All data is stored in a secure, digital cloud and can only be accessed by authorized users. This protects your data from theft, hacking or unauthorized access. You won't have to worry about device failure: All that information is stored elsewhere, so any damage to your computer or mobile device won't mean a potential disaster for your business.



Ease of use

With increased flexibility, Arm-based cloud computing provides an almost limitless number of possibilities when it comes to your hardware; you can access a wide variety of computers, no matter where you are in the world. No more worrying about installing updates or configuring a new computer—you log in, and there it is.



Fair and open licensing

Arm's licensing is fair and open, as are its core development principles. If you work with an Arm partner on a system-on-chip design, there's no charge for licenses or IP.

There are also numerous other avenues to access licensing and IP from any Arm partner at a minimal cost. And you have total freedom to design your chip with whatever mix of technologies best fits your business needs and budget.



Low power consumption

ARM servers' performance per watt and overall power efficiency enable you to get value quickly when used within a distributed architecture with commodity hardware components such as storage and networking.



Using a server with an ARM chip means less for you to maintain and repair. Most consumer-grade ARM systems do not use traditional fans, making them run more efficiently and generally making for a more reliable machine.

Besides, your cloud provider will handle any hardware issues instead of your IT team.

ARM servers have continuously demonstrated their ability to address many Cloud concerns. With budding potential, they will be a huge turning point for businesses and dominate the cloud.

The Cloud and WEB 3.0

WEB 3.0 is much more than a buzzword; it's a comprehensive concept that implies an overhaul in creating and consuming content on the internet. By moving to decentralized models where users control their content, blockchain technologies like Ethereum have developed many ways for users to take back control of their data through encryption and decentralization.

The explosive growth of cloud infrastructure has come with growing pains as well. Security breaches have become commonplace within large organizations, while smaller companies have found themselves subject to attacks from cybercriminals.

Moving forward, organizations will embrace WEB 3.0 alongside cloud technologies to develop entire applications tailor-made to address organizational client needs. Decentralized applications running on cloud infrastructure will become the new norm.

Conclusion

Cloud infrastructure has made great strides in recent years, quickly dominating all industries. Currently, many cloud offerings offer advantages for companies of all sizes. Companies are racing to get a piece of the pie, with early adopters already reaping big.

Over the next few years, cloud infrastructure services are likely to become even more ubiquitous as the cost of bandwidth continues to fall and companies become more comfortable with the idea of hosting their data outside of the walls of their facilities.

And with new innovations on the horizon that could change the cloud even more dramatically in the future, organizations must come to grips with ever-changing cloud infrastructure or risk being left behind.

Pronix Inc. has extensive experience assisting clients with their cloud strategies and developing robust cloud environments to help become cloud ready. Strategic partnerships underpin our cloud services with leading cloud providers such as AWS, Microsoft Azure, Google Cloud and more.

We can help:



Support your cloud-based digital transformation goals



Reduce new product time-to-market



Enhance your agility and mobility



Lower the bar of entry for new markets



Cut operating costs



Provide enterprise-class cloud solutions at incremental pricing

We offer end-to-end services, including Cloud consulting, Infrastructure Services (IaaS), Platform Services (PaaS), Software Services (SaaS), and domain-specific cloud services.

To learn more about cloud-enabled transformation, please visit us at Cloud Services (pronixinc.com)

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