



Next wave of
delivering location
agnostic stateful
applications with
software defined everything



Dynamic industry demands and business expectations to achieve innovation, growth and competitive advantage are forcing organizations to adopt agile IT to deliver digital transformation and superior customer experience.

Along with ensuring seamless business operations, digital leaders have a new mandate: implement an outside-in strategy to roll out new business and operating models and drive innovative customer interactions across omni-channel touchpoints.

Built-in agility at the core to deliver aggressive time-to-market, rapid functionality releases, and ability to make rapid product and infrastructure changes are business priorities today. This is in striking contrast to erstwhile priorities of lowering costs, improving service quality and reducing risk.

Businesses need the IT and operational culture to be aligned with the rapid pace of modern markets. IT infrastructure needs to complement and deliver similar agility at its core by enabling event-driven responses.

Programmable software defined infrastructure is key to achieving this goal. This means, businesses must shift from “**Cloud-first**” to a “**Cloud-only**” strategy, taking care to enable cloud agnostic application development to achieve the “**App-anywhere**” concept. Another trend that is gaining traction is to directly develop or modernize legacy application architecture on container technology to deliver microservices. This approach is usually host-agnostic and provides agility in the form of rapid spin-up/down, enabling on-demand scalability.

Applications based on containers deliver faster and easier customer deployment through automation, provide instant portability, and enable advanced development leveraging crowd sourcing. **According to Gartner¹, by 2020, more than 50% of global organizations will be running**

containerized applications in production, up from less than 20% today.

It's little wonder organizations are adopting cloud native app development and investing in IT infrastructure automation framework that allows developers to build the required environment on-demand, so developers can concentrate on the development task rather than operations.

However, currently organizations and provider solutions are at different maturity states and lack the automation required to fully adopt the PaaS and container ecosystem. The paper discusses how leveraging platform services from ISVs and cloud service providers instead of building the solutions on premise leads to better results for enterprises. It also explores the value System Integrators (SIs) bring in addressing the overall complexity involved in deploying a unified solution and delivering solutions on an as-a-Service model

Creating a container platform strategy: The gateway to Agile IT

The IT industry is gearing up to match the pace of business by offering Infrastructure-as-a-service (IaaS) combined with the platform environment to deliver workloads with ready-to-use environment libraries and middleware. To develop highly scalable applications, IT needs to leverage application containers. IaaS solutions are available either as-a-Service on premise or on cloud to enable certain application parts to scale selectively, without affecting other parts. While widespread adoption of application containers could take some time, demands for business agility and scale are aggressively driving the shift. CIOs, CDOs, CMOs, application developers, infrastructure and operations leaders need to join hands to develop a container and platform strategy that can deliver on agile business expectations.

¹Gartner, Smarter With Gartner, “6 Best Practices for Creating a Container Platform Strategy”, Christy Pettey, October 31, 2017 <https://www.gartner.com/smarterwithgartner/6-best-practices-for-creating-a-container-platform-strategy/>



Application container comprises respective application components, and necessary files, environment variables and libraries.

However, the challenge lies in the way organizations typically approach cloud. Most enterprises deploy private, public or hybrid cloud solutions on VM instances, resulting in the headache of coordinating various teams.

Integrating PaaS and leveraging containers: The new approach

The new approach of integrating PaaS and leveraging containers is the most natural choice as containers provide the level of isolation required for achieving self-sufficient environments to run application stacks. It provides an opportunity to enhance developer productivity and agility, drive application modernization, and deliver cloud native applications.

Leveraging this approach, application virtualization can follow the infrastructure virtualization model. Applications can be developed (or migrated) in an independent container isolated from the host's operating system. Application container comprises respective application components, and necessary files, environment variables and libraries. This makes application containers highly portable to compatible OS and orchestrators.

Modern CIO's are increasingly promoting container services to deliver basic PaaS functions like:

- a) Source code and executable packaging and distribution
- b) Reliable and zero downtime roll out of software versions and healing and
- c) Auto-scaling and load balancing.

Container registries are becoming the ideal way to distribute applications across the world. Reliable software rollout is achieved using orchestrator concepts like Deployment in Kubernetes and service healing.

Here are a few key benefits of integrating PaaS with container adoption:



Delivers rich portfolio of functionality—driving value beyond infrastructure, simplifying operational management and driving superior developer productivity



Accelerates development, testing and deployment of applications through consistent standards across the lifecycle.



Provides a wide spectrum of choices from leveraging integration for hybrid cloud applications and function PaaS for serverless computing to event driven PaaS for IoT applications and micro services. In conjunction with IaaS, traditional applications can also be deployed on IaaS with value additions

and cloud native applications on PaaS with containers.



Accelerates change and release updates cycle as product architecture is delivered by composable set of services leveraging microservices and containers functioning independently.



Enables faster and easier customer deployments—reducing the installation and configuration required by end customers for shorter sales cycles and improved customer satisfaction.



Enables instant portability – application container can be deployed “as is” on any certified container host, allowing the customer’s application to run on hardware, in a virtual environment or in IaaS or PaaS clouds.



Lowers development costs – application container includes everything the application needs to run, regardless of the environment of the container host, so the customer only needs to develop, test and certify against a single runtime.



As compared to the IaaS-only approach where the client takes responsibility for maintaining both the application and the runtime environment, application containers allow customers to simply maintain their application, while the runtime environment provider maintains the runtime environment.

PayPal, for instance, uses Docker containers-based solution to enhance productivity and agility for their developers. The company processes more than 1 billion payment transactions on mobile and other payment platforms.

Managed services: Simplifying container deployments at scale with SDx

While the strategic need for PaaS and containers is clear, managing container deployments at

scale requires significant management capabilities and expertise. Given the rapid pace of developments in Kubernetes community and application development, it is challenging for customers to continuously upgrade and maintain these environments. A system integrator and managed services provider can bridge this gap by providing an overall framework to maintain all aspects of the PaaS and container ecosystem, freeing developers to focus solely on their core competence. The benefits of partnering with the right managed services provider include:

Multi-cloud focus with SDx ecosystem

- Seamless cloud agnostic data services – Container-ready data services for on premises stateful applications with persistent storage services and stateless applications. It also provide advanced data services like data protection, disaster recovery and container movement across public clouds with persistent data.
- This software defined container storage solution solves data mobility problem that is essential for enterprise applications.
- Seamless container networking – Industrialized and seamless multi-host container networking, enabling hybrid and multi-cloud deployment with highest security standards.

Strategizing the solution for Enterprise applications with micro services and containers delivered on PaaS and fully Programmable software defined infrastructure (SDx)

Completely API-driven easy-to-use multi-tenant UI

- Seamless management engine that integrates with external applications and systems like CI/CD pipelines to enable DevOps workflows and ability to enforce policies on container runtime.
- Hybrid image registry through more secure and customized private image registry and secure integration with world of public registry.
- Seamless management of orchestration, scheduling, container runtime, and service discovery and registration layer – Automated DNS update, IP updates, health check and failover.
- Improved security and governance for superior resource utilization and access – Security policies, security scanning, image signing, networking segmentation and encryption and role-based access (RBAC) and framework.
- Accurate tracking of churn for reporting and chargeback
- Ability to handle large volumes per host as compared to a VM and associated metrics like IP addresses, URLs, DNS entries, interdependencies, related microservices and OS containers
- Container and microservices aligned tool based real time event correlation and root cause analysis
- Patch, package and resource management
- Managed compliance, data protection, disaster recovery services
- Auto-scaling of both instances and the underlying infrastructure components
- Paas and containerization are the future of application development—is your DevOps strategy geared to lead this wave of disruption?

Differentiated monitoring and managed services

- Real time tracking of containers movement between data centers and cloud providers

About the author

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Mayur Shah is SDx theme leader at Wipro. He has a track record of incubating and nurturing emerging technology practices. In his current role as Theme Owner and Practice Head - Software Defined Everything (SDx), his charter includes driving overall SDx strategy and priorities at Wipro. He has spent over 15 of his 18+ years in Wipro, being part of niche practices and offerings. He has rich experience in strategy and operations entailing building

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