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Level up Your Application Strategy: Move to Enterprise Kubernetes-as-a-Service.

By Anil Veeramalli

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Kubernetes Is a Hit...Why?

Many organizations have shifted app development and deployment to Kubernetes-based containers to further strengthen their compute strategies. Containers are the fastest-growing segment of cloud computing.[i] You may have already migrated legacy apps or are considering cloud-native development within Kubernetes.

> "The global application container market is expected to grow from USD 1.2 billion in 2018 to USD 4.98 billion by 2023, at a CAGR of 32.9% during the forecast period. This growth is expected to be fueled by the increasing number of container orchestration services and container security services deployed in enterprises globally."
>
> – Markets and Markets.[ii]

Depending on your application state or strategy, your adoption of Kubernetes and containers may fall into three categories:

- A lift-and-shift of legacy applications to Kubernetes
- Refactoring legacy applications as Kubernetes microservices
- Made-from-scratch, new cloud native microservices

Each Kubernetes adoption method comes with its own set of challenges and benefits.

A lift-and-shift strategy for legacy applications is one method to leverage the advantages of containers, but you may find your legacy apps have too many dependencies to easily move them to cloud containers. Refactoring these applications may be your best solution in this case. Finally, new, cloud-native applications may be the best approach for fresh initiatives or as a means of distributing multiple processes across a number of microservice containers.

Regardless of your Kubernetes journey, it's a path worth taking—Kubernetes has a number of advantages over legacy applications.

Six Reasons You Should Adopt Kubernetes

Legacy applications are prone to inefficiencies. If you haven't already moved to Kubernetes, you might want to evaluate your own app environment and see if a move would benefit your organization. Here are the top six reasons to consider Kubernetes:

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i. 451 Research. Application Containers Market. https://451research.com/images/Marketing/press_releases/Application-container-market-will-reach-2-7bn-in-2020_final_graphic.pdf

ii. Markets and Markets. "Application Container Market by Service." www.marketsandmarkets.com/Market-Reports/application-container-market-182079587.html

Portable—build your apps on one cloud platform, and easily port it to any other. This protects you from cloud vendor lock-in. If you find another cloud is better suited for your organization, there is no need to rebuild your apps before making the move.

Flexible—with Kubernetes you can use a variety of languages and frameworks. And your Kubernetes projects can be broken up into a series of connected microservices, and with APIs, connect them to other processes, such as databases, CRM systems, and more. Independent scaling of services allows you to put resources where they are needed, when they are needed.

Open Source—take advantage of the thousands of pre-made Open Source microservices and apps and adapt them to your own needs. In many cases, you can retire entire legacy application software licenses and eliminate the need for costly upgrades.

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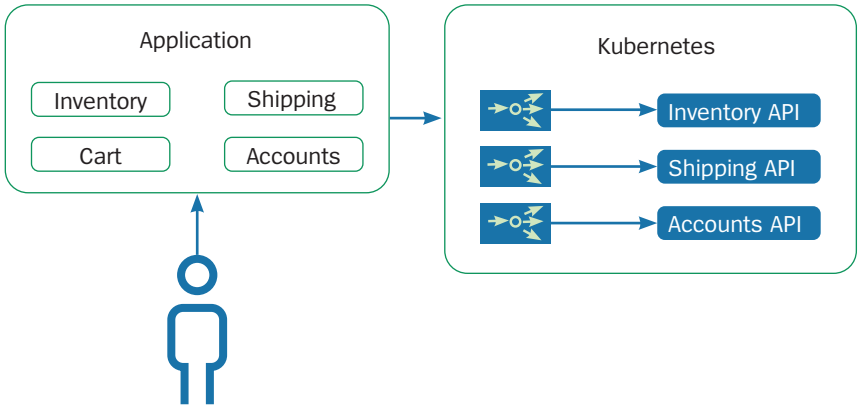

Here is an example of how Kubernetes microservices play a role in more efficient applications. When users access your application, such as a shopping application, the following occurs:

1. Rather than one monolithic application, the shopping app is broken into independent services such as Inventory, Shipping, etc. These communicate with each other and to other Kubernetes resources via APIs.
2. For some reason, if any of the service is down, the rest of the functionality will be working.
3. The Kubernetes orchestration will ensure that microservices will available all the time, easy to enhance and scale.

Greater Productivity—build, integrate and deploy your applications faster with microservice-based applications. Once deployed, resources can be dynamically spun up in real time to accommodate increased demand. And Kubernetes apps and services are easier to maintain and develop as opposed to traditional waterfall development projects, allowing continual, non-disruptive improvements.

Cost-Effective—faster development, resource efficiency, and less maintenance, and savings from retiring software licenses all contribute to superior cost-savings in your Kubernetes environment.

Fault Tolerance – one service can fail without bringing down the enter application. And any failed service can be restarted in another container.

Multi-Cloud Capable—as you expand your cloud strategy, you'll no doubt see the many advantages to deploying multi-cloud resources for your organization. Kubernetes enables you to integrate cross-cloud resources, host and mine big data for analysis, more easily integrate IoT, and many other cross-cloud implementations.

But not all multi-cloud enterprises are created equally: Kubernetes needs further multi-cloud components to fully support a modern, Kubernetes-as-a-Service.

Kubernetes-as-a-Service: Containers on Steroids

Until recently, organizations have lacked tools to enable consolidation, better automation, innovation, and greater management in multi-cloud environments. The 'missing pieces' for deploying true enterprise-grade, KaaS are:

- Reliable, Automated, and Fully Integrated Self-Service
- True Multi-cloud/Multi-Tenancy Support
- Multi-cloud Management
- Multi-cloud Governance, Visibility, and Insights
- Kubernetes Security and Compliance

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Enterprise-Grade Kubernetes-as-a-Service Checklist

Enterprise Kubernetes-as-a-Service

There are many cloud capabilities, infrastructure requirements, and tooling required for you to fully exploit Enterprise KaaS. Here's your checklist for turbocharging Kubernetes for your organization:

- Self-Service
- Automation
- Security and Compliance
- Continuous Integration/Continuous Delivery (CI/CD)
- Monitoring

The blueprints allow the cloud architects or designers to drag and drop the components to canvas to provision resources and link them with pre- and post-provisioning processes.

- Service Catalogs
- Serverless
- Configuration Management Database
- Cloud Management
- Upgrade Strategy
- Multi Cloud Support
- Governance
- Compliance

Here's more information on major components and capabilities:

Automated Self Service

One feature missing from many Kubernetes solutions is the ability to deliver automated self-service of apps and features. With a truly automated solution, your users can choose the right apps and processes allowed them from a continually updates service catalog and be up and running with no intervention. Meanwhile, unlike legacy applications, apps and services can be continually updated and improved throughout the application lifecycle, with no disruption in services. Users spin up and use only what is necessary, and there are no licensing restrictions or user counts for you to keep tabs on.

With a self-serve portal, your users will be able to launch their cloud resources, manage, schedule, and operate the container resources of their choice.

You can build blueprints using technology-neutral/portable cloud native templates , i.e., Azure ARM, AWS CFT, Google GDM, third party Terraform that can be used as service catalogs. The blueprints
allow the cloud architects or designers to drag and drop the components to canvas to provision resources and link them with pre- and post-provisioning processes.

True Multi-Tenant Support

Multi-cloud often means public cloud multi-tenancy. With true multi-tenancy support, your KaaS environment will keep user data, traffic, and application access separate from all others—both within your organization, and from all other public cloud users.

Integrated Multi-Cloud Management

Keeping tabs on KaaS containers and microservices on one cloud is the norm, but in multi-cloud, it is absolutely essential you have a management capability that encompasses all cloud-based processes and containers and their interdependencies. Even more useful, is the ability for you to automate management for greater efficiencies.

From KaaS, you can manage and simplify automation Kubernetes clusters from four providers: Azure Kubernetes Service (AKS) from Microsoft Azure, Amazon Elastic Kubernetes Service (EKS) from Amazon Web Services (AWS), Google Kubernetes Engine (GKE) from Google Cloud and vSphere from VMware.

Multi-Cloud Governance

With KaaS spread among multi-cloud or among various containers on a single cloud, you need to make certain app development, deployment, and access rights, accounts, and permissions can be easily configured and maintained, regardless of use across multiple clouds. You have the central functionality to create users, service accounts, associate the user to the group, the permissions, and assign budget limits. Quotas are assigned at the group level. Financial approval can be enabled and triggered when the developer requests a larger, out-of-budget cluster so that the request needs approval before commission.

Multi-Cloud Security and Compliance

Securing one cloud is a partnership between you and the cloud vendor.

Securing one cloud is a partnership between you and the cloud vendor. When you move to multi-cloud, your KaaS resources may be spread among many vendors. The ability for you to take full charge over the security and compliance of these distributed KaaS resources requires a single, consistent appraisal of compliance and a unified, comprehensive security solution that removes complexity.

You can automate your Cloud Security Posture Management (CSPM) capabilities by selecting Unisys cloud security and compliance solutions. CSPM is aligned with CloudForte® Assure™, which scans your environments using over 400+ best practice security and compliance guidelines, such as PCI, HIPAA, NIST, etc. (See our paper "Take Charge of Cloud Security Compliance.") You also can produce compliance audit reports, on-demand.

You can enhance protection and secure each container and every container with Stealth™ so that containers are only visible to members of a shared Community of Interest (COI). This enables you to scale microservices while protecting traffic both between containers and between other endpoints in the Stealth network. (See our paper on Stealth security "Deploy Zero Trust Container and Kubernetes Security") Formulate security policies, apply them once, and they are in effect throughout the multi-cloud ecosystem.

Kubernetes-as-a-Service Software Development Lifecycle

Many current Kubernetes environments lack the tools to adequately address enterprise-wide application Software Development Life Cycles (SDLC). (See Figure 1.)

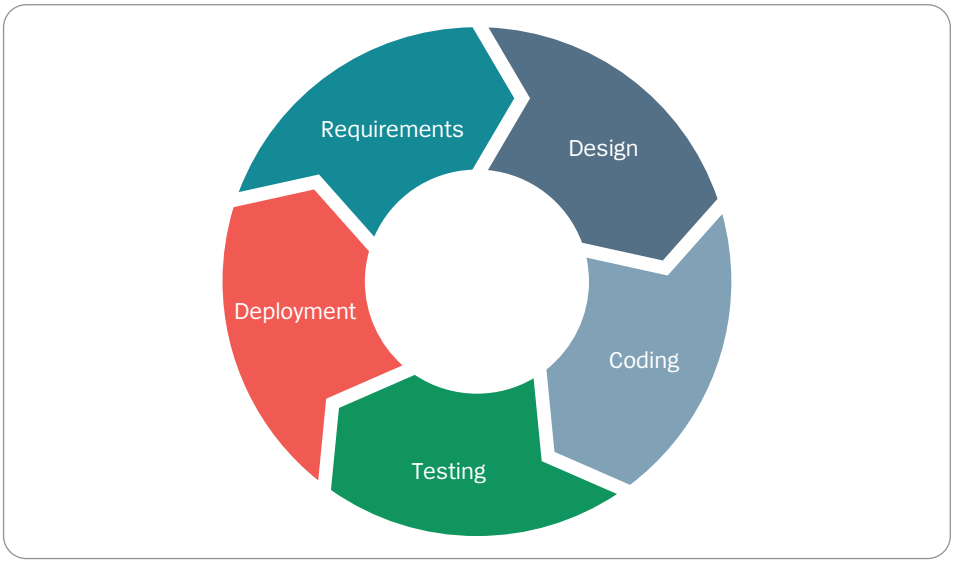

Figure 1. Sample Software Development Life Cycle Process.

With Kubernetes-as-a-Service (KaaS), you can take your microservices to new levels of efficiency, flexibility, and security. Multi-cloud KaaS is enabled with automated self-services, true multi-tenant support—and most importantly, multi-cloud governance and management.

In pre-cloud native environments, many SDLC steps/processes were entirely manual in nature—from design though implementation to analysis. Multiple iterations required interaction and changes at every step in the process before—and especially after your deployment. In cloud native Kubernetes environments, change management and testing can be built into every step of the SDLC, thereby "automating" many steps by using continuous integration and continuous development CI/CD.

Every DevOps is familiar with CI/CD—but its efficiency, and usefulness is blunted in many hybrid and multi-cloud environments, especially if systems are hosted on disparate systems. Cross-platform self-service is difficult to achieve on your own, but recent tools such as Morpheus, CloudBees and others automate the process considerably...but do they integrate and ease multi-cloud security, compliance, and governance as they do? Similar integration and manual operations are required for multi-cloud/hybrid/multi-tenancy, multi-cloud management integration, multi-cloud governance, visibility, and insights. And even with DevSecOps, your security and compliance can be problematic to automate, verify, and implement across multiple clouds.

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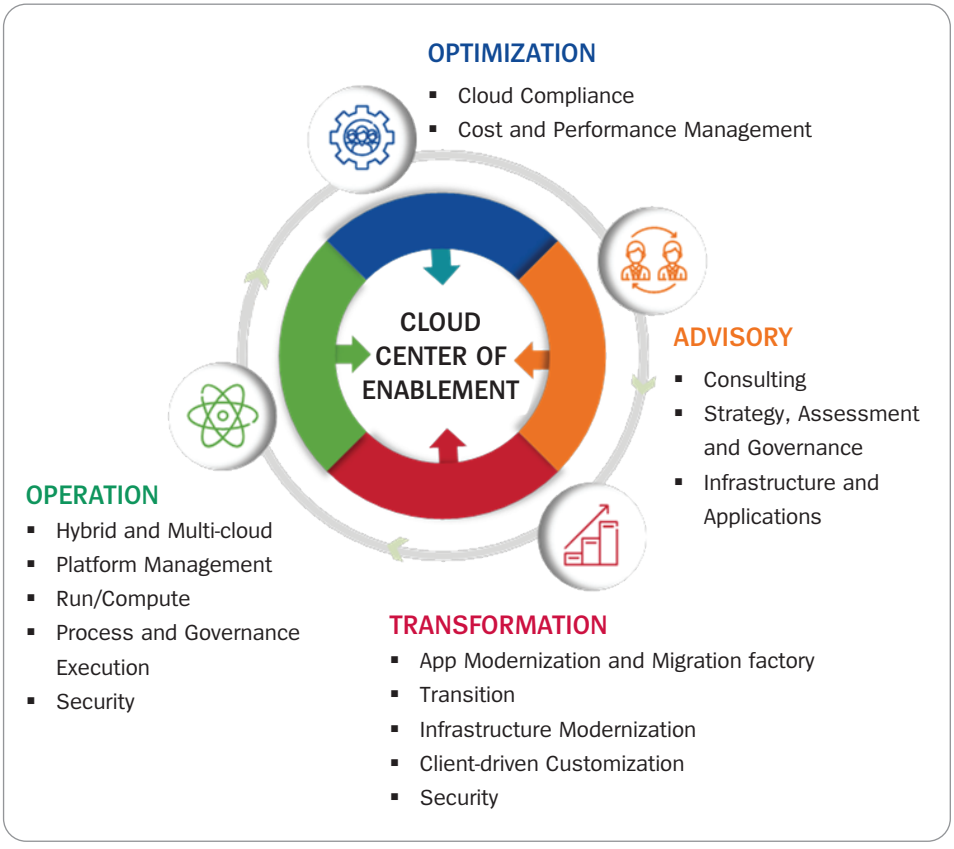

Figure 2. Lifecycle Methodology.

Unisys Cloud and Application Services help you address key obstacles in transitioning to Enterprise-grade KaaS.

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Recap of Cloud Services KaaS Benefits

Unisys Cloud and Application Services help you address key obstacles in transitioning to Enterprise-grade KaaS. You can realize continuous improvements through advisory, transformation, operation, and optimizations throughout your SDLC. (See Figure 2.) With integration, tools, and development expertise, you can move your Kubernetes commitment to the next level. Here is a recap of some of the major benefits:

Multi-Cloud portability and flexibility

- Build once, use anywhere
- Move/migrate where and when needed
- Full multi-cloud governance, management, and security compliance

Cost effectiveness

- Conserves resources
- Quicker development ROI
- Continual cost optimization

Future proof

- CD/CI improvements using SDLC throughout app lifecycle, across cloud
- Open source backend for API/third party integration

Summing Up

Kubernetes can play a powerful role in your Application Modernization journey. With the addition of Enterprise features such as automation, multi-cloud enablement, and SDLC, your application development environment will enjoy greater flexibility, responsiveness, and a future-proof path to continual innovation. Unisys CloudForte Service methodologies ensure we deliver the results you require for a quality cloud-based business environment. You're covered—from inception to testing to ongoing development—with greater options, continual optimizations, and comprehensive security.

Get the best out of your hybrid and multi-cloud investment visit us at www.unisys.com/cloud

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