IDC

Enterprises Accelerate Agility with Cloud Services

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IDC Opinion

Enterprise digital transformation has been accelerating as line of business needs change to meet diverse consumer expectations, a trend that has been especially emphasized during the pandemic. Modern applications that are natively built for containers and the cloud can rapidly deliver new functionality by leveraging new infrastructure and development tools.

Several options are available to enterprises embarking on an application modernization journey or building new solutions as a step toward creating an agile business. The overall trend has been a shift toward containers to ship and deploy software to the public cloud, which has become a primary destination. The combination of containers and public cloud infrastructure and application/data services allows enterprises to develop applications faster than ever.

According to IDC, enterprises are placing an increasing importance on ensuring that the new architecture is the foundation for future business needs. One key decision point is whether companies want to build and manage their own Kubernetes platform or offload that responsibility to a provider. While very powerful, Kubernetes can be very complex and labor intensive to manage. With the focus of many companies on transformation and subsequently the software applications that enable a transformation, the task of managing Kubernetes infrastructure and application development platforms becomes a burden for many. In addition, many digital transformation teams are mainly

developer groups without the staff that have the expertise, resources, time, or desire to manage a complete application platform. The combination of the difficulty of Kubernetes and the focus on application development for transformation is leading to an increase in demand for managed cloud services in the industry.

This IDC white paper is based on interviews with three customers that have embarked on a digital transformation journey using Red Hat OpenShift cloud services with workloads deployed in multiple infrastructure environments.

Summary Findings

- Interviewed customers stated that a key factor in selecting Red Hat OpenShift cloud services compared with other container offerings is that they can be deployed as part of a hybrid and/or multicloud architecture that public cloud service providers were unable to deliver. The ability to have portable workloads across on premises and multiple public clouds was important to customers.

- The flexibility of deploying on multiple public clouds with Red Hat OpenShift enabled customers to meet compliance and data sovereignty needs while having a consistent, familiar Red Hat OpenShift experience across multiple clouds as well as on premises.

- Deployments of Red Hat OpenShift cloud services on public clouds offer the benefits of using additional native services provided by the cloud service provider to further extend features.

- Kubernetes can be complex and requires skilled operators — a major reason for customers to choose a Red Hat OpenShift cloud service. Some customers tried to manage Kubernetes and concluded that their time was better spent focused on business value activities, while others were primarily software development groups that did not have the resources or desire to manage Kubernetes and the necessary integrated services themselves.

- Enterprises prefer open source offerings due to community support and skills available.

- The advantages of a fully managed container platform included operational benefits as well as developer productivity benefits — key factors that led customers to choose the Red Hat OpenShift platform.

- Application development life cycle is important to customers that pick best-of-breed products in building the toolchain from source code management to deployment.

CUSTOMER CASE STUDY 1

Large Telecom Company

Solution Overview

This telecom provider is building a next-generation, higher-bandwidth network that will provide data, voice, and video services. Until now, the provider has relied on networks built using proprietary hardware systems that included integrated proprietary software. The costs for this infrastructure are high, and the telecom industry has been migrating to virtualized and containerized functions in software running on industry-standard servers. This next-generation network will run the network functions in containers that are powered by open source Kubernetes clusters running in the telco datacenters.

The provisioning software for this network, primarily Java Spring Boot and Golang applications, will run in the cloud using Red Hat OpenShift Service on AWS. While the back-end provisioning runs in the cloud, the user interface will be a mobile iOS application used by field technicians. The next-generation network requires the installation of new devices on the network edge to enable faster speeds. When these devices are installed, field technicians will use the mobile application to scan QR codes on these devices, which will trigger a set of fully automated steps in the cloud-based provisioning software to register and enable them.

"With Red Hat OpenShift cloud services, we can develop features about 30–40% quicker with 25% reduction in costs compared with a public cloud provider container offering."

Customer Case Study 1: Large Telecom Company (continued)

Built from the ground up, this application will be architected to be fully modern, containerized, and cloud native. The application will require rapid changes, with a new version slated for release every 1.5 to 2 weeks, requiring an agile system to support it. The team requires a managed cloud service since it is made up of software developers who do not have the resources to manage Kubernetes clusters themselves.

The provisioning application is still currently under development. The current production version that provisions the existing generation network runs on a public cloud Kubernetes service, but the next generation will transition to Red Hat OpenShift Service on AWS. The company wants to standardize on Kubernetes and was looking for a broader platform around it that Red Hat OpenShift can provide. The Red Hat OpenShift Service on AWS will include a complete container platform yet still run natively in AWS, which was key for the company in terms of easing approval and billing processes.

The current development footprint consumes two Red Hat OpenShift clusters of four worker nodes each, one for development and one for preproduction. When the application goes into full production, there will be two production clusters of eight worker nodes each, with each cluster in a different region. The application will support autoscaling so that if the utilization of a cluster goes above 80%, a new node will be automatically added to the cluster.

"[The basic reason for Red Hat OpenShift cloud services is we do not really want to be bothered about the management of the Red Hat OpenShift cluster because we are primarily a software development shop. Developers can now concentrate more on just their application logic, their business logic, and just develop applications.] Our prime focus really is to develop software quickly."

"Currently there is downtime when we release upgrades. As we move to Red Hat OpenShift with blue-green deployments and/or A/B deployments, there will be no upgrade downtime."

Customer Case Study 1: Large Telecom Company (continued)

The next-generation access network has been in development for the past three years and will enable the company to meet its customers' increasing need for bandwidth. By using Red Hat OpenShift cloud services, the company's software developers can focus on developing a modern application without taking on the burden of managing Kubernetes infrastructure or managing and integrating the tools needed to use an enterprise application platform. The company also established a Red Hat OpenShift practice within the company's cloud center of excellence, enabling Red Hat OpenShift to spread to other parts of the organization.

Solution Components

- Red Hat OpenShift Service on AWS
- Java Spring Boot and Golang applications running on Red Hat OpenShift
- Concourse CI/CD
- Prometheus (via a Kubernetes operator)
- Istio service mesh (included with Red Hat OpenShift)
- OpenShift applications use of RDS, S3, and Lambda
- AWS CloudFormation and CloudWatch used for management

Why Red Hat OpenShift Cloud Services?

- The customer wanted a more complete container platform that would include operational and application integration tools. The company is in the process of migrating from a public cloud Kubernetes service to Red Hat OpenShift cloud services.

Customer Case Study 1: Large Telecom Company (continued)

- The customer does not have the resources to deploy and manage Kubernetes or Red Hat OpenShift on its own. The team is primarily composed of software developers and a few DevOps engineers, with no infrastructure admins. The focus of the group is to develop software quickly and not to be involved with the management of container infrastructure.

- The AWS and Red Hat joint offering, Red Hat OpenShift Service on AWS, was a key factor. The customer had already committed to AWS as its cloud provider. Red Hat OpenShift Service on AWS operates as a native AWS service, allowing the customer to purchase it without requiring any additional approvals and consume and manage it like any other AWS service. Red Hat OpenShift Service on AWS is itemized on the normal AWS bill, is integrated into the AWS portal, and allows OpenShift applications to use other AWS services. The customer uses RDS, S3, and Lambda from AWS today and also manages everything through AWS CloudFormation and CloudWatch.

- Red Hat OpenShift includes an available service mesh. The customer's application is already using the Red Hat OpenShift Istio-based service mesh to manage service networking and in the future will leverage Istio further to track and debug individual transactions. Having the service mesh as an integrated part of the platform was a key factor in selecting Red Hat OpenShift.

"Red Hat OpenShift does a lot more than just run workloads in a Kubernetes cluster because there is a lot of work that is needed to make open source Kubernetes work in a production environment."

Benefits

- The company achieved 25% cost savings with Red Hat OpenShift when compared with other public cloud container services due to Red Hat OpenShift's ability to address development and application life-cycle inefficiencies that pure Kubernetes services don't address.

- The customer can develop new application features 30–40% faster using Red Hat OpenShift cloud services.

- Developers can concentrate on their application logic and business logic, and thus focus on developing applications. Out of a staff of 40, only 4 members are responsible for operations with the rest responsible for development. By using Red Hat OpenShift cloud services, the company does not need to add infrastructure people to build and maintain its own Kubernetes cluster.

- With the customer's current Kubernetes service, there is downtime when rolling out a new version of the application. With Red Hat OpenShift, the customer is moving to a blue-green deployment pattern because Red Hat OpenShift makes that easier to implement, allowing for no downtime when upgrading the application.

- Red Hat OpenShift makes it more seamless to manage multiple clusters, allowing the customer to deploy in multiple regions with reduced complexity and improved resilience.

- With automatic scaling, production workloads and nodes scale horizontally, expanding resources when needed.

CUSTOMER CASE STUDY 2

Fintech Company

Solution Overview

This B2B company provides a software platform that insurance companies use to manage their services. The company's traditional business model was providing software that its customers deployed and managed themselves on premises. However, more customers are looking for faster deployment times and managed applications with a software-as-a-service (SaaS) model. While the SaaS portion of the business is only about 5% overall today, the company expects to migrate most of its customers to SaaS over the next three to five years.

The company began to develop a SaaS version of its software that it would build on Red Hat OpenShift and run in the cloud of its customers' choice. However, the original application was not designed for a multitenant SaaS hosting model, so each SaaS customer has to be provisioned as a separate private instance of the application. Going forward, the company is dedicating most of its development resources to refactoring this application, with only 20–25% of resources dedicated to maintenance of the old code base.

The existence of many individual instances can be difficult to manage, and the company was looking for a common underlying plane upon which to standardize and make this individual instance model more operationally efficient. The company also aimed to standardize platforms with a shared service model across the multiple constituent groups that required access to the application, including demo teams, presales/custom engineering, development, operations, and support. Previously, each group would manage their own platforms individually, leading to fragmentation, operational burden, and complexity.

> "20–25% of our development focus is on existing on-premises monolithic code and 75–80% on refactoring efforts to adopt cloud-native technology."

Today, the application is deployed on Red Hat OpenShift Dedicated on AWS. As its customer base grows and each customer has different compliance requirements, the company will need the flexibility to deploy on any cloud. With Red Hat OpenShift as the common layer, the company can provide this flexibility and create consistency across these multiple clouds as well as on premises.

In addition, the cost savings of a containerized, Kubernetes-native application on Red Hat OpenShift make the SaaS business model economically viable for the company. Without this platform, the costs for operating the application in a SaaS model would be too high and unprofitable. Modernizing the platform enables the company to transition to a SaaS-based business.

Solution Components

- Red Hat OpenShift Dedicated is deployed on AWS, and Red Hat OpenShift Container Platform is deployed on premises.

- Cloud deployment is three clusters spread over 1,200 VPCs.

- On-premises deployment is four clusters spread over 10,000 cores.

- Red Hat OpenShift applications leverage Route 53 and Lambda services from AWS. AWS resources are provisioned through Terraform.

- A custom-built system includes TeamCity, JFrog Artifactory, and JUnit.

"Bug fixes are now done on a daily basis compared with a 2 to 4-week time frame in the past. New features are rolled out once a week instead of once a quarter. Major version code updates have significantly improved from once in two years to every quarter and that helps with customer retention."

Customer Case Study 2: Fintech Company (continued)

- Red Hat OpenShift add-ons from third parties are:

  - NGINX load balancers

  - Aviatrix networking

  - Portworx storage

  - The Istio service mesh built into Red Hat OpenShift enables some apps to connect on premises and to cloud for needs such as capacity bursting.

  - Kubernetes Operators help manage the company's complex, stateful applications.

Why Red Hat OpenShift Cloud Services?

- The company requires a hybrid, multicloud architecture as it runs Red Hat OpenShift on premises and needs to seamlessly integrate the platform with multiple public clouds. Platform consistency across multiple public clouds is a key capability enabling the company to deploy in any cloud that its customers request and is not an option with a singular public cloud container solution. Customers are located around the globe, and each customer has different cloud requirements, requiring the company to deploy its hosted software in any cloud and region of the customer's choosing.

- Operating the Kubernetes clusters did not provide differentiated value for the customer and it required significant engineering talent to manage and stabilize. While that may be unavoidable for on-premises deployments, the company did not want to take on that management burden in the cloud. The company also wanted to go with a large, well-known vendor that would be stable and have the resources to provide scalable and robust support. The company also used Red Hat professional services to help with its modernization efforts.

"We are focusing on our business and application modernization efforts, not maintaining old code. This allows us to deploy faster and make our customers happier, leading to our Net Promoter Score improvement."

Customer Case Study 2: Fintech Company (continued)

Benefits

- Faster software development and deployment as well as the ability to be more responsive to bug fixes and new features have increased customer satisfaction and led to an overall increase in the company's Net Promoter Score (NPS).

- Software bugs are fixed and deployed in a single day compared with two to four weeks previously.

- New features are rolled out once a week instead of once a quarter.

- Major versions used to be released every two years. Now the company can split up those releases into smaller versions and deploy them once a quarter.

- The lower costs and reduced operational overhead of Red Hat OpenShift cloud services enable the company to adopt a new business model, transitioning from a traditional software provider model to a multicloud SaaS delivery model. Without the cost efficiency of Red Hat OpenShift, the SaaS model would have been too costly to operate and unprofitable.

- Red Hat OpenShift cloud services enabled the company to repurpose staff from managing Kubernetes clusters to other value-added activities such as improving observability.

- The time spent in the sales cycle is reduced by 50%, as customized code for individual customer requirements can be executed much faster. Customers also reach production status with the application 50% faster after sales are finalized.

- Downtime incidents have been reduced by up to 75%, from a minimum of four hours previously to an average of one to two hours, with Red Hat OpenShift Dedicated on AWS.

- The company is able to "shift left" by incorporating security earlier as part of the CI process, where code submission goes through software composition and static code analysis with instant feedback to the developer.

- The consistency of using Red Hat OpenShift on any cloud allows the creation of a pipeline that can deploy to any cloud or region with the same customer experience, regardless of the cloud used.

"Having Red Hat OpenShift as the common layer will create consistency across these multiple clouds as well as on premises."

"Customers reach production status with Red Hat OpenShift cloud services 50% faster after sales are finalized."

CUSTOMER CASE STUDY 3

Telecom Provider

Solution Overview

This midmarket telecom provider is a B2B company that provides voice, data, and IoT connectivity services to other telecommunication companies. The company manages interconnect services between mobile communications providers, such as when a mobile user travels internationally and uses roaming voice or data.

The company has been running its data collection and analysis application on Red Hat OpenShift Dedicated on AWS since 2019. This key application streams call detail and data usage records from the network edge into the cloud datacenter where the records are processed for rating, billing, and payment collection. Since the initial deployment, the company has been continuously refactoring its software to be more container native, cloud native, and microservices based.

The company uses a hybrid cloud approach where development is on premises, but production deployment is in the cloud. Originally, the company managed its own Kubernetes clusters for production on premises, using self-supported upstream Kubernetes. The deployment spanned four clusters but required extensive internal labor to manage; the complexity of Kubernetes and managing all of the components in its application platform increased the company's business risk of managing the platform on its own. Eventually, the company chose to use Red Hat OpenShift cloud services and rely on the provider's expertise for a robust and highly available application platform.

Customer Case Study 3: Telecom Provider (continued)

Applications are currently running in AWS, but the company has adopted a hybrid, multicloud approach to be able to distribute its software to multiple locations, including on premises, public clouds, colocations, and on the edge. The company anticipates that containers will need to be deployed on the edge as it needs to collect data and manage signaling and policy on devices such as network switches and IoT devices. The Istio service mesh included with Red Hat OpenShift is also on its road map for a pilot and POC. Long term, the company views containers as the easiest and safest way to distribute and update software on the edge.

The IT organization has a team of 12–15 people who are responsible for architecture and DevOps engineering; this team selects container infrastructure vendors and operates the platform. There is another group of around 50–60 developers who develop the applications, but do not directly interact with Red Hat OpenShift.

The company has plans to build new business lines, which will require new applications over the next several years. Containers and Red Hat OpenShift cloud services will play a key role in enabling both Agile development and deployment to a wide range of locations.

Solution Components

- Red Hat OpenShift Dedicated on AWS
- Eight clusters and hundreds of containers
- Red Hat OpenShift Container Platform on premises for development
- Red Hat OpenShift applications using AWS Kinesis, Redshift, and S3
- GitLab and Bitbucket repositories that are connected to OpenShift Pipelines used by developers

"We built our first Kubernetes clusters internally. We had four clusters and we concluded that it was very difficult for us. There was too much internal labor involved and high business risk just to spin up Kubernetes and manage it. We decided to use the professionals for that."

"I think that total cost of ownership is better with Red Hat OpenShift compared with others. When we think about public cloud container services, then [they are] tied up with a public cloud provider. I would say we like Red Hat in general in terms of the ways [the company] develops its products and provides them to users, and [the company] has this user community."

Customer Case Study 3: Telecom Provider (continued)

Why Red Hat OpenShift Cloud Services?

- The company previously ran its own self-supported open source Kubernetes using upstream code, but it became too complex to manage, was very labor intensive, and had high business risk. By adopting Red Hat OpenShift Dedicated, the company has achieved better uptime and performance with reduced business risk.

- Superior uptime and performance of Red Hat OpenShift Dedicated made the total cost of ownership better than the competition.

- The company has reduced vendor lock-in since it is not tied to a single public cloud.

- The architecture team preferred open approaches to open source and felt Red Hat had the best investments in terms of research and development, user community, and open systems.

Benefits

- Uptime and performance increased 25–30% with Red Hat OpenShift Dedicated versus a self-managed and self-supported Kubernetes application platform.

- Business risk is reduced due to support from Red Hat compared with the company's previous self-managed open source Kubernetes clusters.

- Red Hat OpenShift enables the company to build a hybrid, multicloud strategy that includes edge compute. Currently, the company is using Red Hat OpenShift on premises and in AWS, with plans to expand to other clouds and the edge in the future.

Future Outlook

Containers, Kubernetes, and fully integrated application development platforms have emerged as the new standard for modern applications, and the industry is beginning the long path of transitioning to these platforms. IDC forecasts that container instances from 2019 to 2023 will grow at a five-year CAGR of just over 100%. Key drivers for deployment include support for modern applications including AI/ML, refactored existing applications, and emerging IoT/edge applications. Other top drivers include enabling the migration to cloud and improvements to reliability, availability, scalability, and operations/management.

Key application development trends today include:

- Enterprises want broader, more capable container platforms that are pre-integrated and supported by the vendor.

- Kubernetes is at the heart of all container platforms, but operationally, enterprises require much more. Areas that container platforms are encompassing include:

  - Service mesh, a networking, security, and observability tool for microservices (The need for service mesh grows when managing microservices at scale.)

  - Extensions of Kubernetes to enable serverless computing

  - Adjacent infrastructure subsystems that can include persistent storage, networking, security, and observability

  - Developer and build tools for customers to create a custom lightweight PaaS on top of Kubernetes infrastructure

- Expansion to the edge (Containers are portable and efficient, while Kubernetes is inherently a distributed system that adapts well to edge.)

- Sophisticated multicluster management as deployments span from on premises, multiple public clouds, and the edge (Containers commonly span on premises and cloud today, with IDC data showing that deployments are fairly split between both locations. About half of the enterprises are starting to use more than one cloud or want the option to do so in the future.)

- Rapidly changing business needs that require enterprises to primarily focus on differentiating applications to cater to user requirements

One key development in the Kubernetes market is the shift to managed cloud services. As Kubernetes underwent its remarkable ramp up in the past few years, an increasing number of cloud providers began to offer Kubernetes container services. As these services became more widely available, the task of bringing and managing an enterprise's own Kubernetes platform in the cloud became less attractive.

Kubernetes has only grown more complex, and enterprises are struggling with implementing it themselves in a reliable way while keeping up with the fast pace of Kubernetes changes and releases. In addition, the digital transformation initiatives sweeping businesses are forcing many enterprises to focus on software innovation and developer productivity, while infrastructure tasks are increasingly seen as low-value distractions.

Today, IDC data shows that 58% of enterprises primarily use a managed container service rather than a self-managed container environment when deploying containers to the public cloud. Managed container services are also continuing to innovate rapidly, expanding in functionality and in offloading more Kubernetes management tasks from users. With the increasing enterprise pivot to cloud services and the growing innovation in cloud container services, IDC expects that managed cloud services will become the predominant model in the cloud.

Challenges and Opportunities

Challenges

- **Competition from hyperscale cloud providers.**
  While Red Hat does have unique partnerships with AWS, GCP, and Azure to offer Red Hat OpenShift as a cloud-native service on those platforms, the company also competes with those partners that offer other container services. The hyperscale cloud providers will push their other container services heavily and, although customers often get locked into a specific hyperscaler, many have competitive advantages in areas such as pricing.

- **Mindshare and business transformation.**
  While Red Hat is very well known as an open source software vendor, it is less known for delivering its software as a service. Red Hat was one of the first vendors that invested heavily in the open container market under the auspices of the Cloud Native Computing Foundation (CNCF) with the Red Hat OpenShift platform; Red Hat translated that early mover advantage to real enterprise traction. However, many of its native public cloud as-a-service offerings are relatively recent and less well known. Many enterprises considering adopting a container as a service may not initially think of Red Hat as a potential contender.

Opportunities

- **Hyperscale cloud partnerships.**
  Red Hat OpenShift is one of the very few outside platforms that have been offered as a native service on hyperscale clouds such as AWS, GCP, and Azure. The customers interviewed for this white paper are a testament to the enterprise traction Red Hat has achieved in the past several years with Red Hat OpenShift. Operating as a cloud-native service opens up a huge base of cloud users to Red Hat; these cloud users are easily able to use their credits on Red Hat OpenShift, bypassing many purchasing headaches in their organizations. In addition, Red Hat OpenShift" can easily integrate with other cloud-native services.

- **Differentiation with a broad, integrated platform.**
  While Red Hat OpenShift is based on Kubernetes, it offers a broad set of infrastructure capabilities to expand upon Kubernetes, such as service mesh, OperatorHub, and Operator Framework. It also has a developer-focused layer to address software development issues, improving developer efficiencies. In the cloud, an equivalent solution may often require stitching together multiple services; Red Hat OpenShift can offer a more integrated solution with abstracted complexity. In addition, Red Hat OpenShift as a cloud service is also differentiated on the level of managed services it offers, offloading more tasks from an enterprise than many other services.

- **Multiple deployment models.**
  While this white paper focuses on the use of Red Hat OpenShift cloud services, Red Hat OpenShift is also available as a software that can be self-managed in the cloud and on premises. Most enterprises that are adopting cloud still maintain some level of on-premises presence, and many are beginning to adopt multiple clouds. The availability of Red Hat OpenShift in multiple deployment models makes it one of the few platforms in the market that can offer a consistent presence and common developer experience across various locations including the increasingly popular edge deployments.

Conclusion

In their goal to obtain business agility, enterprises are modernizing their applications. This modernization trend in IT today is marked by an open cloud-native stack supported by a public cloud foundation. IDC data shows that enterprises deploying containers in the cloud are shifting to prefer managed cloud services over a self-managed approach, a shift that accelerates the modernization journey. The primary reason for this, as evidenced by the Red Hat customer interviews in this white paper, is that digital transformation is pushing enterprises to emphasize innovation. In doing so, these customers are focused on developing code and creating unique intellectual property. Many groups that use containers are composed mostly of developers, with a few DevOps engineers without dedicated staff to build and maintain platforms. Even enterprises with the staff to manage their own container platforms find that management is a difficult prospect — one that does not provide a competitive business advantage commensurate with their efforts. As enterprises seek to offload non-value-added tasks and move to consumption-based purchasing of cloud-native environments, IDC believes that managed container platforms will grow to become a major deployment model in the cloud.

About the Analyst

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More about Gary Chen

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