**Rohita Gangishetty, Satwika Reddy Kancharla, Amulya Sangolla**

**Dr.Ming Quan Fu**

**Introduction to cloud computing**

**13th September 2023**

**Microsoft Azure vs. Red Hat**

Microsoft Azure and Red Hat OpenShift stand out as two critical actors in the modern, fast-paced world of cloud computing. These platforms are well-liked options for various workloads since they provide a wide range of services and capabilities. In this article, we'll examine Azure and OpenShift (OpenShift is a container platform developed by Red Hat. Red Hat is a software company that provides a variety of open-source software products, including OpenShift) in-depth, paying particular attention to elements like usability, feature richness, usability and implementation, cost considerations, market acceptance, available services, performance, and general availability.

Microsoft Azure and Red Hat serve distinct roles in the tech landscape, tailored to different needs. Azure is known for its user-friendly interface and seamless integration with Microsoft technologies, making it ideal for those deeply entrenched in the Microsoft ecosystem. Its Azure Portal simplifies cloud resource management by offering extensive documentation and a supportive community catering to users of all levels. Azure also excels in cost management tools for efficient cloud expenditure monitoring.

In contrast, Red Hat focuses on Red Hat Enterprise Linux (RHEL), prized for stability and security. While RHEL is favoured by Linux experts, newcomers may find it challenging. Red Hat's commitment to open-source tech requires more configuration and expertise but is balanced by comprehensive documentation and robust customer support. The choice between Azure and Red Hat depends on specific needs and expertise. Organizations should carefully assess their requirements to make an informed decision. Both platforms continually enhance user experiences to adapt to evolving preferences and expectations.

The amount and diversity of features that a platform or product offers are referred to as its feature richness. The term "feature richness" in the context of cloud computing refers to the quantity and diversity of services and features that a cloud platform provides. Cloud systems with a variety of functionalities include Azure and OpenShift. But generally speaking, Azure is thought to offer more features than OpenShift. As a result, Azure received higher marks in the polls for feature richness. Azure is well-known for its extensive and diverse set of services. It satisfies a wide range of cloud computing needs, making it a viable option for a wide range of applications. Azure provides infrastructure as a service (IaaS), platform as a service (PaaS), and software as a service (SaaS), allowing you to choose the level of abstraction that is best for your project. AI and machine learning, IoT, big data, analytics, and DevOps are among the features available in Azure. It includes a comprehensive collection of tools for creating, deploying, and managing large-scale applications. Azure's significant integration with Microsoft technologies such as Windows Server, SQL Server, and Active Directory might be beneficial for enterprises with established Microsoft ecosystems.

In contrast, OpenShift excels in container orchestration and management. It is based on Kubernetes, a robust container orchestration technology. The feature richness of OpenShift relies largely around containerization, making it an excellent alternative for enterprises implementing microservices architectures and container-based deployments.OpenShift's key features include automatic application scalability, integrated CI/CD pipelines, developer-friendly tools, and the Kubernetes Operators concept, which simplifies the deployment and maintenance of complicated applications. Because of its emphasis on containerization and Kubernetes ecosystem connections, OpenShift excels in areas such as container security, container networking, and container-based application development.

Microsoft Azure and Red Hat are prominent players in the technology industry, each excelling in different domains. Azure is a global leader in cloud computing, competing head-to-head with Amazon Web Services (AWS). It holds a significant market share in the public cloud services sector and is favored by businesses of all sizes for its comprehensive suite of cloud services and global data center presence, enabling organizations to scale and expand their digital infrastructure seamlessly. On the other hand, Red Hat is renowned for its expertise in enterprise open-source solutions, particularly Red Hat Enterprise Linux (RHEL). Red Hat's strong foothold in the open-source community, coupled with its enterprise offerings like OpenShift for container orchestration and Ansible for automation, makes it a top choice for organizations seeking reliable, open-source, and enterprise-grade solutions.

While Microsoft Azure dominates the cloud market, Red Hat's specialization in open-source and its contributions to cloud-native technologies like Kubernetes have solidified its position in the realm of containerization and hybrid cloud solutions. The popularity of these platforms hinges on an organization's specific requirements, with Azure excelling in cloud services and Red Hat shining in open-source and enterprise solutions.

Azure is a widely utilized and user-friendly cloud platform that offers virtual computers, databases, artificial intelligence, and other services. It provides an abundance of information, an intuitive layout, and thorough documentation for both novices and specialists. As Azure DevOps speeds up app development and deployment, integrated tools like Azure Resource Manager make it simpler to deploy and manage resources. Azure also provides a Marketplace with pre-configured solutions, simplifying implementation.

Red Hat is known for its enterprise-focused Linux solutions and OpenShift Kubernetes platform. While it may be considered less straightforward for beginners, it excels at providing advanced features for enterprises. Red Hat offers containerization solutions, which are powerful but might require more expertise to implement effectively. Red Hat's support and services are well-regarded, making it a strong choice for organizations with specific enterprise needs. In summary, Azure is often considered easier for general users, especially those new to cloud computing, while Red Hat is more tailored for enterprise-level solutions and may require greater expertise for implementation.

Azure is often more expensive than OpenShift, but it provides a more comprehensive set of features and services. Azure also boasts a broader worldwide network of data centers, which might help some enterprises enhance performance and availability. Here's a table comparing Azure with OpenShift prices for some common resources:

| Resource | Azure | OpenShift |
| --- | --- | --- |
| Virtual machine | Starts at $0.055 per hour | Starts at $0.04 per hour |
| Storage | Starts at $0.00099 per GB per month | Starts at $0.0009 per GB per month |
| Networking | Starts at $0.02 per GB | Starts at $0.01 per GB |
| Container orchestration | Starts at $0.0001 per hour | Starts at $0.00005 per hour |

However, it's important to remember that the exact cost will vary depending on the specific resources that you use, the length of the commitment, and the region. If you're looking for a platform with a wide range of features and services, and you're willing to pay more, then Azure is a good option. If you're looking for a more affordable platform, and you're willing to learn more about cloud computing, then OpenShift is a good option.

Microsoft Azure and Red Hat are prominent players in the technology industry, each excelling in different domains. Azure is a global leader in cloud computing, competing head-to-head with Amazon Web Services (AWS). It holds a significant market share in the public cloud services sector and is favored by businesses of all sizes for its comprehensive suite of cloud services and global data center presence, enabling organizations to scale and expand their digital infrastructure seamlessly. On the other hand, Red Hat is renowned for its expertise in enterprise open-source solutions, particularly Red Hat Enterprise Linux (RHEL). Red Hat's strong foothold in the open-source community, coupled with its enterprise offerings like OpenShift for container orchestration and Ansible for automation, makes it a top choice for organizations seeking reliable, open-source, and enterprise-grade solutions.

While Microsoft Azure dominates the cloud market, Red Hat's specialization in open-source and its contributions to cloud-native technologies like Kubernetes have solidified its position in the realm of containerization and hybrid cloud solutions. The popularity of these platforms hinges on an organization's specific requirements, with Azure excelling in cloud services and Red Hat shining in open-source and enterprise solutions.

Azure is a comprehensive cloud platform that provides a wide range of services, including virtual machines, databases, AI, and more. It offers high-performance computing options with various VM types tailored for different workloads. Azure's global network of data centers ensures low-latency access to services from various regions. It also offers scalability, enabling users to adjust resources as needed for optimal performance. Azure's performance is well-documented, and it provides tools like Azure Monitor and Azure Application Insights for performance monitoring and optimization.

Red Hat primarily focuses on software solutions, including Red Hat Enterprise Linux and OpenShift Kubernetes. Performance in a Red Hat environment largely depends on the underlying infrastructure and configurations. Red Hat's solutions are highly customizable, allowing users to fine-tune performance based on their specific requirements. Red Hat's emphasis is on providing a stable and secure operating environment, and performance optimizations may require more manual tuning and expertise. In summary, Azure offers a more integrated and user-friendly approach to high-performance computing, while Red Hat's performance depends on the chosen infrastructure and the expertise of the user in optimizing its solutions for performance.

An extensive global network of data centres makes up the global cloud platform known as Azure. Due to the high availability and redundancy provided by this enormous infrastructure, your applications and data will always be available, regardless of hardware or network problems.

Azure's availability zones and region pairs enhance resilience and data redundancy, making it suitable for mission-critical workloads. Azure also provides a service-level agreement (SLA) that guarantees uptime for various services.

Red Hat primarily focuses on offering business-grade software solutions, such as OpenShift Kubernetes and Red Hat Enterprise Linux. Although Red Hat's software may operate on a variety of cloud platforms, its accessibility is mostly determined by the cloud provider of choice.

Red Hat itself does not offer the same global infrastructure as Azure. Instead, it relies on the underlying cloud provider's availability and redundancy features. Organizations using Red Hat solutions need to select a cloud provider with a strong track record of availability and then configure their deployments accordingly. In essence, Azure offers a comprehensive and globally available cloud platform, while Red Hat's availability relies on the infrastructure of the chosen cloud provider when used in conjunction with their solutions.

Finally, the optimal cloud platform for you will be determined by your unique goals and requirements. Azure is a wonderful alternative if you are a newbie or searching for a platform that is simple to use and install. If you need a platform that offers more flexibility and control, then OpenShift is a good option.

**SOURCES:**

[**https://azure.microsoft.com/en-us/free/search/?ef\_id=\_k\_CjwKCAjwgZCoBhBnEiwAz35Rwmi9SiiRO2blHmXXARFbKMt1OqnURLE1RrN7Iq3qbbComiUZdS4gQBoChrAQAvD\_BwE\_k\_&OCID=AIDcmmfq865whp\_SEM\_\_k\_CjwKCAjwgZCoBhBnEiwAz35Rwmi9SiiRO2blHmXXARFbKMt1OqnURLE1RrN7Iq3qbbComiUZdS4gQBoChrAQAvD\_BwE\_k\_&gad=1&gclid=CjwKCAjwgZCoBhBnEiwAz35Rwmi9SiiRO2blHmXXARFbKMt1OqnURLE1RrN7Iq3qbbComiUZdS4gQBoChrAQAvD\_BwE**](https://azure.microsoft.com/en-us/free/search/?ef_id=_k_CjwKCAjwgZCoBhBnEiwAz35Rwmi9SiiRO2blHmXXARFbKMt1OqnURLE1RrN7Iq3qbbComiUZdS4gQBoChrAQAvD_BwE_k_&OCID=AIDcmmfq865whp_SEM__k_CjwKCAjwgZCoBhBnEiwAz35Rwmi9SiiRO2blHmXXARFbKMt1OqnURLE1RrN7Iq3qbbComiUZdS4gQBoChrAQAvD_BwE_k_&gad=1&gclid=CjwKCAjwgZCoBhBnEiwAz35Rwmi9SiiRO2blHmXXARFbKMt1OqnURLE1RrN7Iq3qbbComiUZdS4gQBoChrAQAvD_BwE)

[**https://www.redhat.com/en/solutions?sc\_cid=7013a0000034nMFAAY&gclid=CjwKCAjwgZCoBhBnEiwAz35RwoJuqnIqLDishec9sOb4XqdMSQstW8IGdiXHmDsqfDYaXuDTKbNC4RoC1GcQAvD\_BwE&gclsrc=aw.ds**](https://www.redhat.com/en/solutions?sc_cid=7013a0000034nMFAAY&gclid=CjwKCAjwgZCoBhBnEiwAz35RwoJuqnIqLDishec9sOb4XqdMSQstW8IGdiXHmDsqfDYaXuDTKbNC4RoC1GcQAvD_BwE&gclsrc=aw.ds) <https://www.peerspot.com/products/comparisons/microsoft-azure_vs_openshift>

<https://developers.redhat.com/products/openshift/overview>

<https://techaisle.com/blog/484-red-hat-cloud-services-deliver-time-to-value-and-enhance-developer-and-operator-efficiency>

<https://www.cloudzero.com/blog/cloud-computing-statistics>