Qualys

The 5-Step Getting Started Guide for Cloud Security

Empowering You to Embark on Your Cloud Journey with Confidence

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INTRODUCTION

Bridging the Gap Between Cloud Agility and Security Confidence

One of the most overwhelming challenges that security leaders in transforming organizations face is the dual imperative of harnessing cloud agility for innovation while simultaneously ensuring robust security measures. Recent analysis showing that one in four organizations were victims of a data breach related to their cloud or SaaS environments underscores the urgency of succeeding at this endeavor. However, navigating the complex cloud landscape and keeping this dynamic environment secure can feel overwhelming to security professionals not yet well versed in its unique challenges.

This eBook offers a five-step guide to bridge the gap between cloud agility and security confidence, providing both leaders who are just embarking on their cloud security journey as well as those looking to enhance their security posture with the insights and tools necessary to thrive.

Here is how we break down this complex process into clear, manageable steps for security leaders to implement:

1. **The Shared Responsibility:** Understanding what you are accountable for and what your cloud service provider covers.
2. **Prioritize Inventory and Visibility:** Ensure you understand resources, configurations, and access.
3. **The Principle of Least Privilege:** Controlling access to minimize security risks.
4. **Data Encryption Best Practices:** Ensuring sensitive data remains protected.
5. **Continuous Cloud Monitoring:** Proactively detecting and responding to security threats in real time.

Let us explore how businesses can leverage these practical steps to align cloud innovation with security imperatives—turning the challenge into a strategic advantage.

1 Familiarize Yourself with the Shared Responsibility Model

The cloud operates under a **Shared Responsibility Model**, where security duties are divided between cloud providers and customers. A lack of understanding of this division can result in unnecessary risk.

Organizations may assume their cloud provider is handling more than they actually are, leaving data, applications, and workloads exposed to potential threats.

What You Need to Know

The Shared Responsibility Model delineates the security obligations between cloud service providers (CSPs) and their customers, ensuring both parties contribute effectively to a secure cloud environment.

Responsibilities of Cloud Service Providers (CSPs)

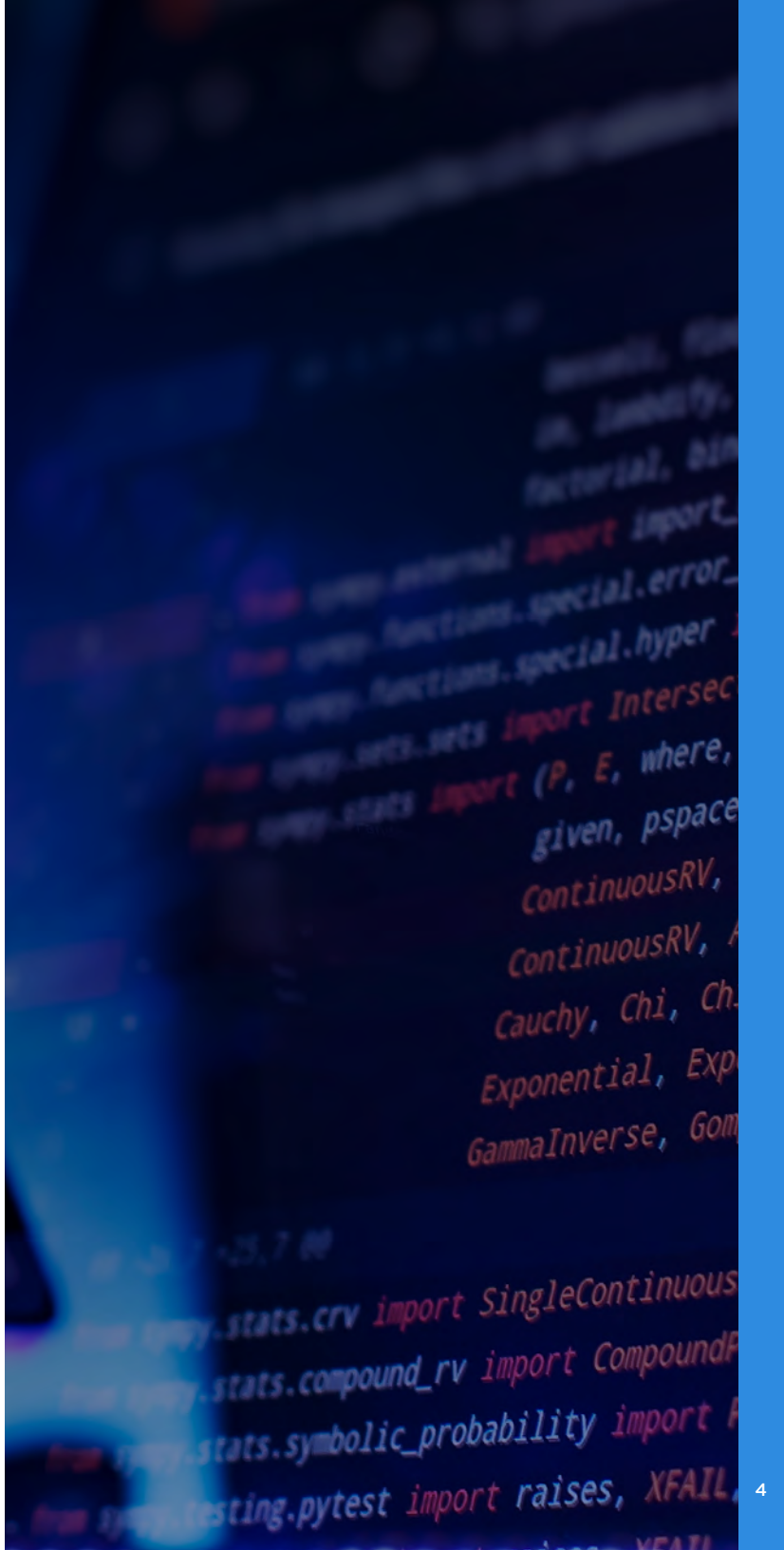
CSPs are tasked with securing the foundational infrastructure of the cloud. This encompasses the physical data centers, networking hardware, and the virtualization layer that supports cloud services. Their duties include safeguarding the physical premises, maintaining hardware integrity, and ensuring the virtualization platforms are resilient against potential threats. By doing so, CSPs provide a secure and robust platform upon which customers can build and deploy their applications and services.

Customer Responsibilities in the Cloud

While CSPs handle the infrastructure, customers are responsible for securing the elements they introduce into the cloud environment. This includes applications, data, user access controls, and configurations. As the customer, you need to ensure you are managing access rights, configuring cloud services securely, and protecting their data from unauthorized access or breaches.

The Bottom Line

Cloud security is a shared effort, and it is important to understand and embrace your responsibilities to build a secure cloud environment.



2 Prioritize the Key Cornerstones of Inventory and Visibility

In the cloud, identity is the new security perimeter. Attackers understand this shift, which is why stolen credentials remain one of the most common entry points for cloud security incidents. This reality means that organizations must proactively secure every access point, ensuring that only verified and authorized identities can interact with cloud resources.

Cloud environments like AWS, Microsoft Azure, Google Cloud Platform (GCP), and Oracle Cloud Infrastructure (OCI) are designed for speed and scalability—but that flexibility often comes at the cost of clarity. With thousands of services and identities in play, it's easy for organizations to lose track of what's running, who has access, and where the risks lie. That's why inventory and visibility are non-negotiable for cloud security.

What You Need to Know

1. Inventory Is Foundational

Every major CSP offers dozens—sometimes hundreds—of services across regions and accounts. Without a unified inventory, it's nearly impossible to stay on top of:

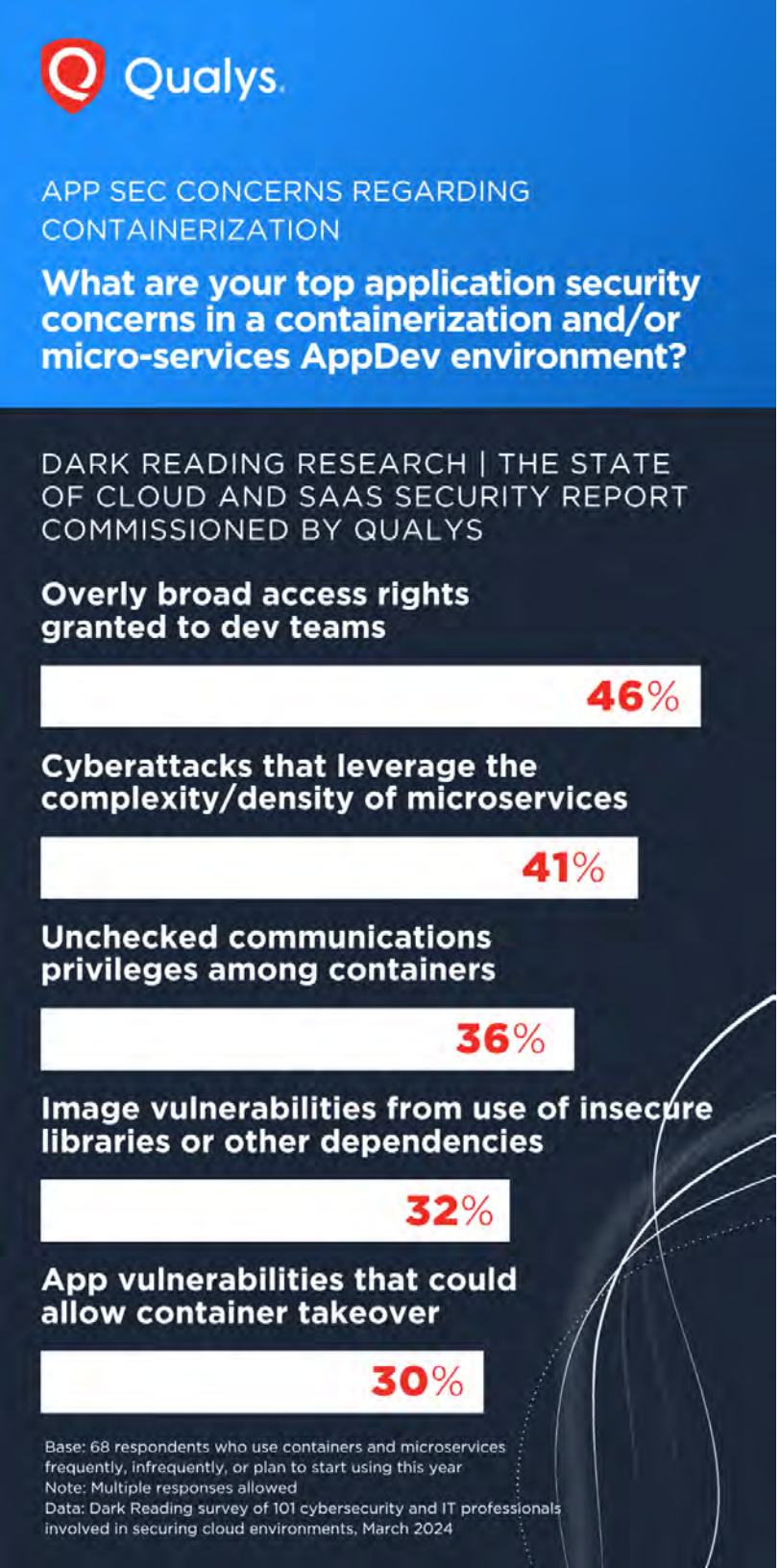
- What EC2 instances (AWS), Compute Engine VMs (GCP), Azure VMs, or OCI compute shapes are running
- Which storage buckets, load balancers, and APIs are publicly accessible
- Whether there are orphaned resources, untagged assets, or services running in shadow environments

A centralized, cross-cloud inventory gives security teams a single source of truth.

2. Identity Visibility Is Critical

Each CSP has its own identity system—IAM roles and policies in AWS, IAM & service accounts in GCP, Azure Active Directory, and OCI IAM. Across all of them, visibility is key to:

- Mapping users, roles, and service accounts to the specific resources they can access
- Identifying overly permissive access policies or unused privileges
- Implementing and enforcing least privilege across cloud providers



3. Container and Kubernetes Visibility Matters

Most enterprises run container workloads on services like Amazon EKS, Azure AKS, GKE, or self-managed clusters. It's essential to track:

- What's happening inside clusters—pods, services, and deployments
- How those workloads interact with cloud-native services like S3, Pub/Sub, or Azure Blob Storage
- Network exposure and segmentation using tools like security groups, Kubernetes network policies, or cloud firewalls

4. AI Infrastructure and Workload Visibility Is Emerging

As organizations deploy AI/ML workloads using services like AWS SageMaker, Azure Machine Learning, GCP Vertex AI, or OCI Data Science, visibility must extend to:

- Which AI workloads are consuming GPUs or other specialized compute
- What models are in use, how they're being trained or served, and what data they access
- Security controls in place for infrastructure provisioning, model access, and compliance tracking

The Bottom Line

Inventory and visibility are the connective tissue of cloud security—especially in a multi-cloud world. Whether you're on AWS, Azure, GCP, OCI, or a combination of all four, understanding what resources exist, how they're configured, and who can access them is the foundation for securing your environment. The more complex your footprint becomes, the more essential real-time, context-rich visibility is to reduce risk and enable control at scale.

Container and Application Visibility is required. Without it, there is a major blind spot into newly associated risks from these environments.

3 Adhere to the Principle of Least Privilege (PoLP)

Permissions are a double-edged sword in cloud security. Grant too few, and your teams may struggle to perform essential tasks. Grant too many, and you create weaknesses that attackers can exploit. An over-permissioned identity—whether human or machine—acts as an open invitation for cybercriminals.

Moving Beyond Traditional Access Models

Historically, organizations have relied on broad and often excessive access rights, either due to operational convenience or legacy practices. These outdated models create unnecessary vulnerabilities. A compromised account with excessive privileges can enable threat actors to move freely across an organization's digital infrastructure, amplifying the impact of cyber incidents.

Adopting the **Principle of Least Privilege (PoLP)**—one of the most fundamental principles in cloud security—demands a shift from static, role-based permissions to granular, dynamically enforced access controls that continuously adjust based on evolving risk parameters.

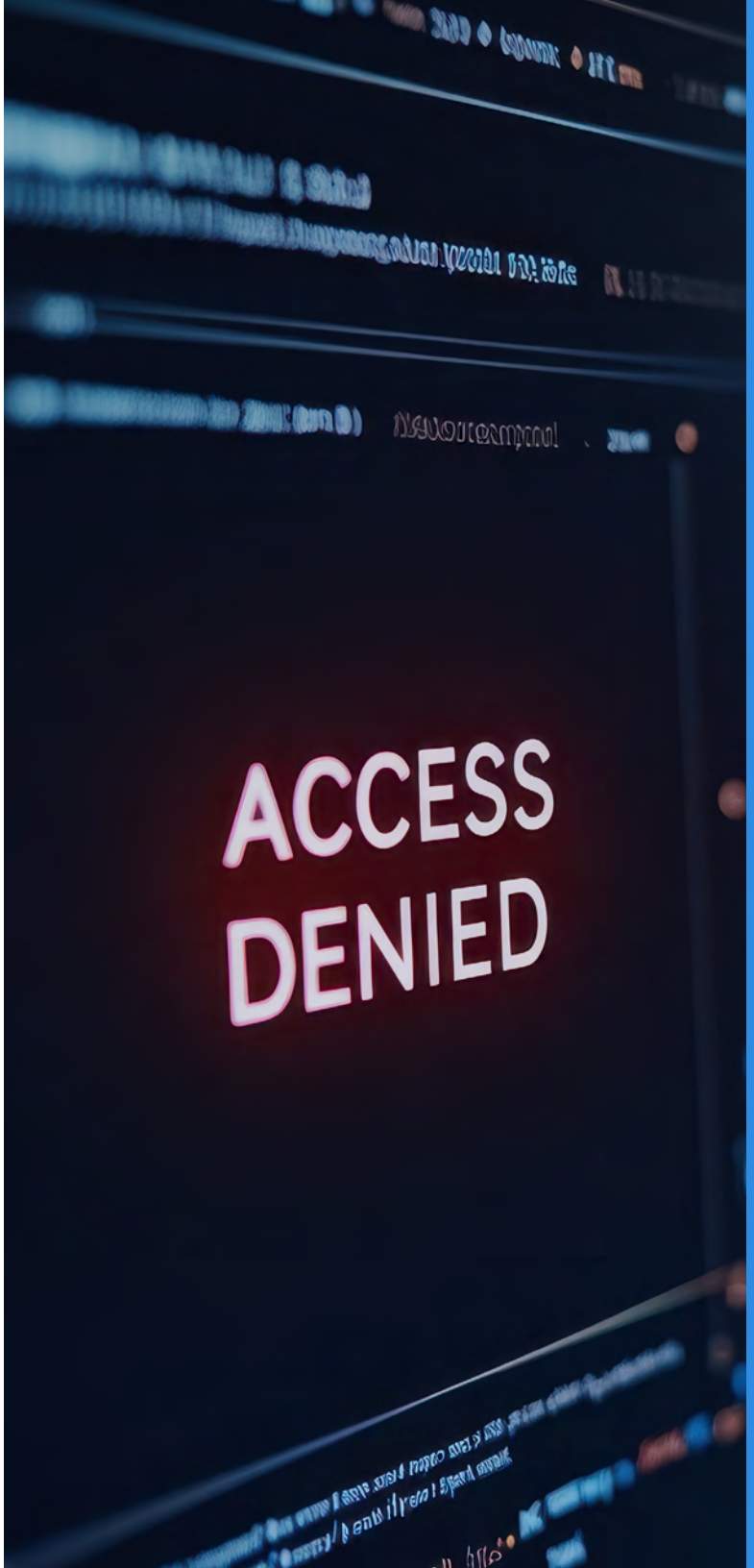
What You Need to Know

The **Principle of Least Privilege (PoLP)** is a foundational security tenet that ensures users, applications, and services are granted only the minimum access necessary to perform their designated functions. Let us explore how organizations can effectively implement PoLP to enhance cloud security.

Key Steps to Implement Least Privilege in Cloud Environments

1. Define Clear Access Policies with Granular Controls: Access should be granted on a need-to-know and need-to-use basis. Implement Role-Based Access Control (RBAC) to assign permissions based on job functions. Consider using Just-in-Time (JIT) access, which grants temporary permissions when needed and revokes them after a specific period.

2. Avoid Blanket Administrative Privileges: One of the most common security pitfalls is granting excessive admin rights to users who do not need them. Instead, follow a tiered access approach, where only a limited number of personnel have elevated privileges.



3. Enforce Strong Authentication and Least-Privilege Service Accounts: Human users are not the only ones who need access control—service accounts, APIs, and workloads must also follow the least-privilege model. Assign unique, least-privileged identities to cloud resources and enforce Multi-Factor Authentication (MFA) to prevent unauthorized access.

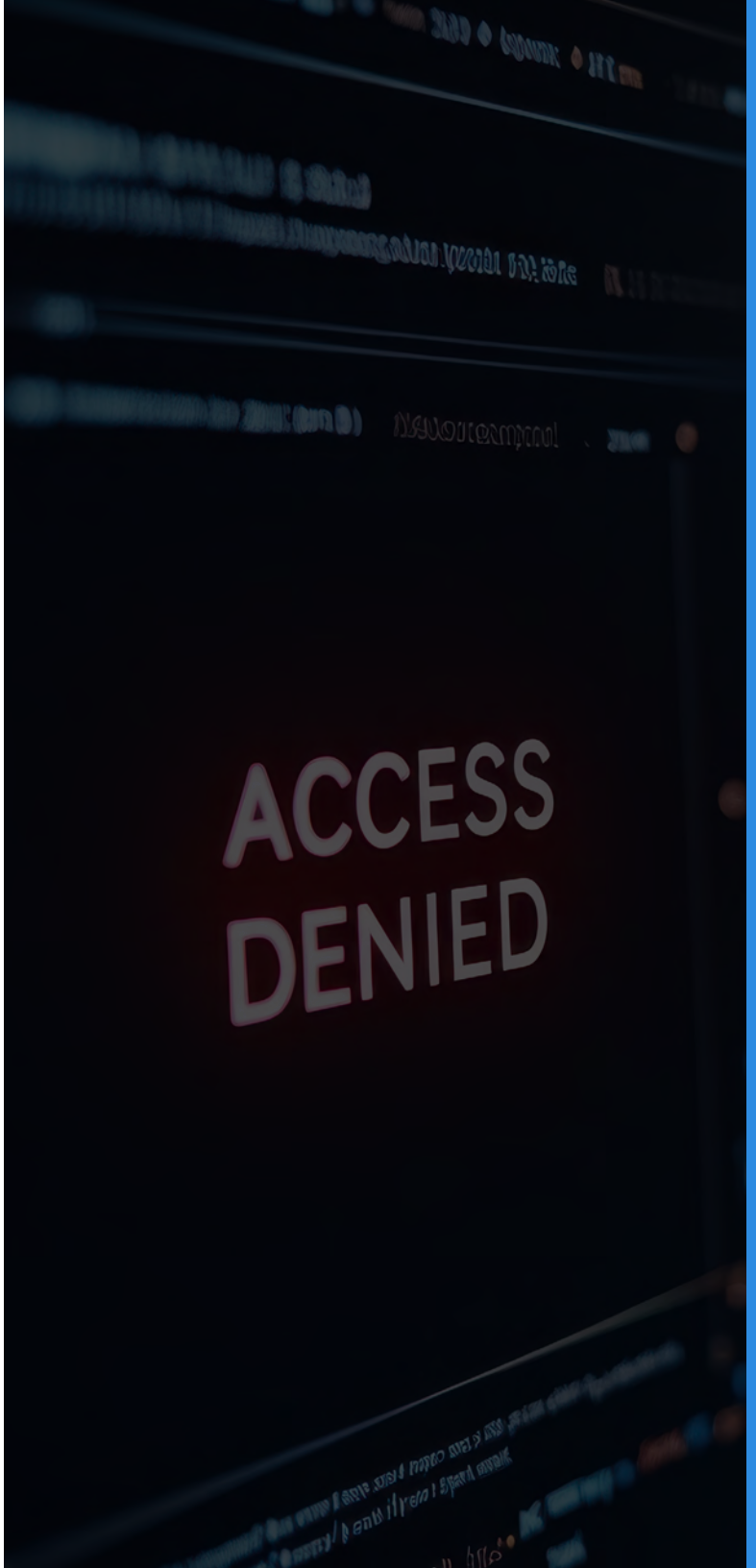
4. Conduct Regular Audits and Permission Reviews: Over time, users and service accounts accumulate permissions that may no longer be necessary. Conduct periodic access reviews to identify and revoke orphaned or excessive privileges. Automated tools, such as Cloud Infrastructure Entitlement Management (CIEM), can help streamline access governance by detecting risky permission assignments.

5. Monitor and Respond to Privilege Escalation Attempts: Implement continuous monitoring to detect suspicious privilege escalations. If a user suddenly requests access to critical resources outside of their normal behavior, trigger an automated response to prevent potential breaches.

The Bottom Line

In a cloud security landscape where misconfigurations and overprivileged accounts are among the top threats, adhering to least privilege is not optional—it is essential.

Organizations that implement and continuously refine PoLP will be far better equipped to safeguard their digital assets against evolving cyber threats.



4 Protect Your Sensitive Cloud Data Through Encryption

Encryption is a fundamental pillar of cloud security, ensuring that sensitive data remains protected from unauthorized access, theft, and tampering. Whether your data is at rest in cloud storage or in transit, encryption provides a necessary layer of security that safeguards confidentiality and integrity.

Why Encryption Matters in the Cloud

Cloud environments present unique security challenges due to their distributed nature, multi-tenancy, and remote accessibility. A misconfiguration, insider threat, or sophisticated cyberattack could expose sensitive data to unauthorized parties. Encryption mitigates this risk by making data unreadable without the appropriate cryptographic keys, rendering it useless to attackers.

Additionally, compliance and regulatory requirements such as GDPR, HIPAA, and PCI DSS mandate encryption for sensitive data.

What You Need to Know

Many cloud providers offer built-in encryption features. Below, you will find an overview of what you can generally expect, but it's important to familiarize yourself with the specific encryption capabilities provided by your cloud provider.

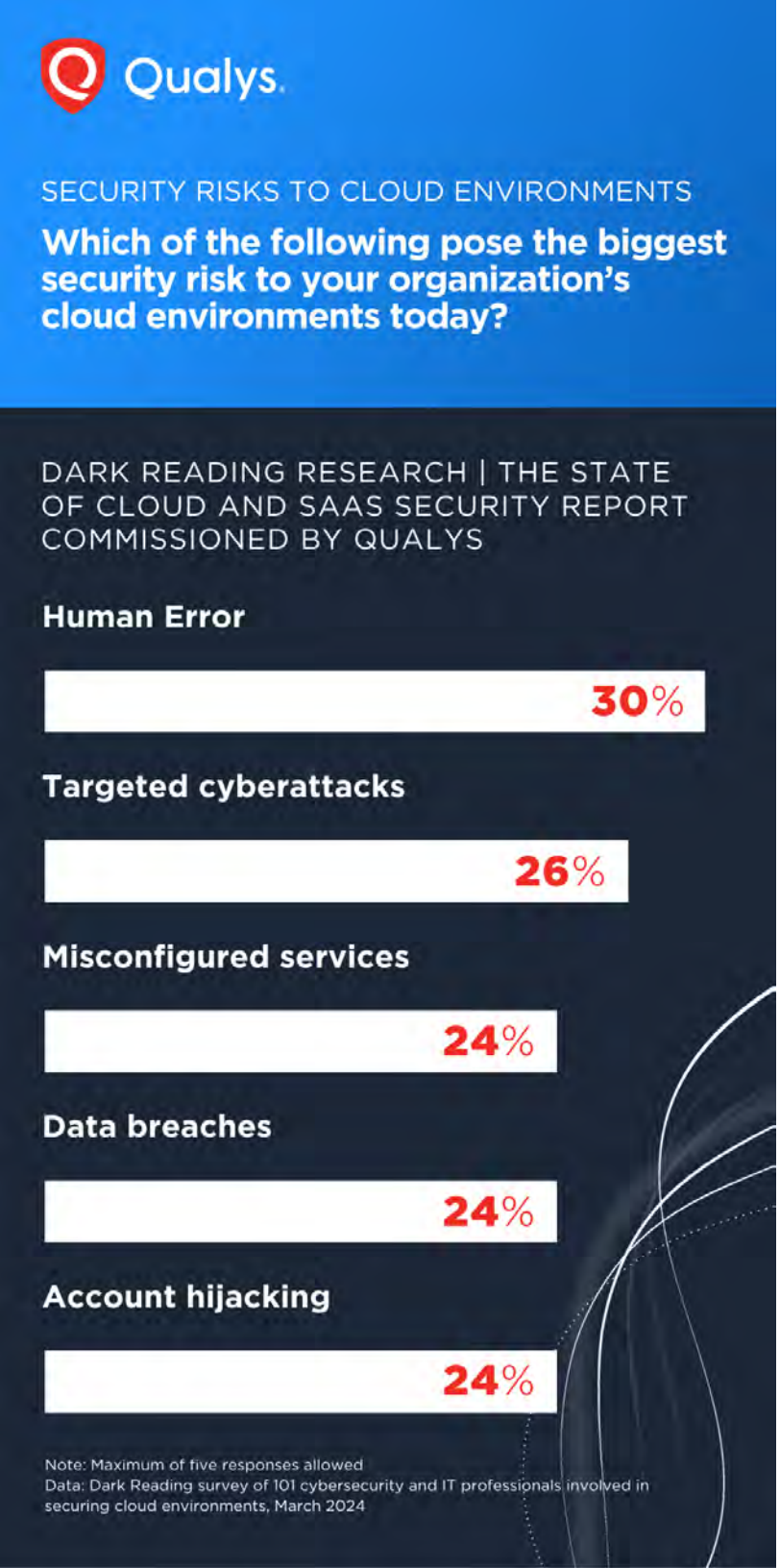
Encryption for Data at Rest

Data at rest refers to information stored in cloud-based databases, file systems, object storage, or backup archives. Encrypting data at rest ensures that even if an attacker gains access to cloud storage, they cannot decipher the information without decryption keys.

Cloud providers typically offer two main types of data-at-rest encryption:

1. Server-Side Encryption (SSE): This method involves the cloud provider automatically encrypting data before storing it and decrypting it when retrieved.

2. Client-Side Encryption: Unlike SSE, client-side encryption involves encrypting data locally before uploading it to the cloud. This method offers more control over the encryption process and provides an additional layer of security since data remains encrypted even if the cloud provider's security is compromised. However, it requires organizations to securely store and manage encryption keys on their end.



Encryption for Data in Transit

Data in transit refers to information actively moving across networks, whether between cloud applications, cloud storage, or end-users accessing cloud services. Encrypting data in transit prevents interception and man-in-the-middle attacks, ensuring data confidentiality and integrity. Key strategies include:

- **Using Secure Protocols**: Implementing HTTPS, SSL/TLS, and secure VPNs ensures encrypted communication channels, preventing unauthorized interception.
- **End-to-End Encryption (E2EE)**: Data is encrypted before transmission & only decrypted upon arrival at its final destination, making it inaccessible even to service providers.

Best Practices for Encryption Key Management

Encryption is only as strong as the security of its cryptographic keys. To maintain strong encryption security:

- **Select the Right Key Management System (KMS)**: Cloud providers offer built-in KMS solutions that automate key generation, storage, and rotation, or you can choose to manage your own.
- **Regularly Rotate and Retire Keys**: Periodic key rotation prevents prolonged exposure in case of a compromise.
- **Generate and Store Keys Securely**: Ensure the security of your processes for generating keys and store encryption keys in a secure location.

The Bottom Line

Encryption is a critical component of cloud security, protecting sensitive data from unauthorized access and ensuring compliance with regulatory requirements. By leveraging encryption for both data at rest and in transit, organizations can significantly reduce security risks while maintaining control over their digital assets.

Data Breaches are one of the top key risks with human error also having a trickle-down effect into data exfiltration. Encryption helps prevent against these types of risks.

5 Enable Continuous Monitoring in Your Cloud Environment

As enterprises accelerate their cloud adoption, security leaders face a fundamental challenge: maintaining visibility in an environment that is both dynamic and distributed. Leading enterprises recognize that real-time visibility into cloud activity is not only required for regulatory compliance, but also a competitive differentiator. It enables faster response times, enhances operational agility, and fortifies resilience against evolving cyber threats.

From Visibility to Action: The Rise of Intelligent Cloud Monitoring

In today's hyper-dynamic cloud environments, visibility is not merely about knowing what assets exist—it's about anticipating risk and responding with precision. Static dashboards and periodic audits are no match for the speed and complexity of modern cloud operations. The cloud's ephemeral nature—where workloads are spun up, modified, and decommissioned within minutes—demands a radical shift: from passive oversight to intelligent, real-time security visibility.

What You Need to Know

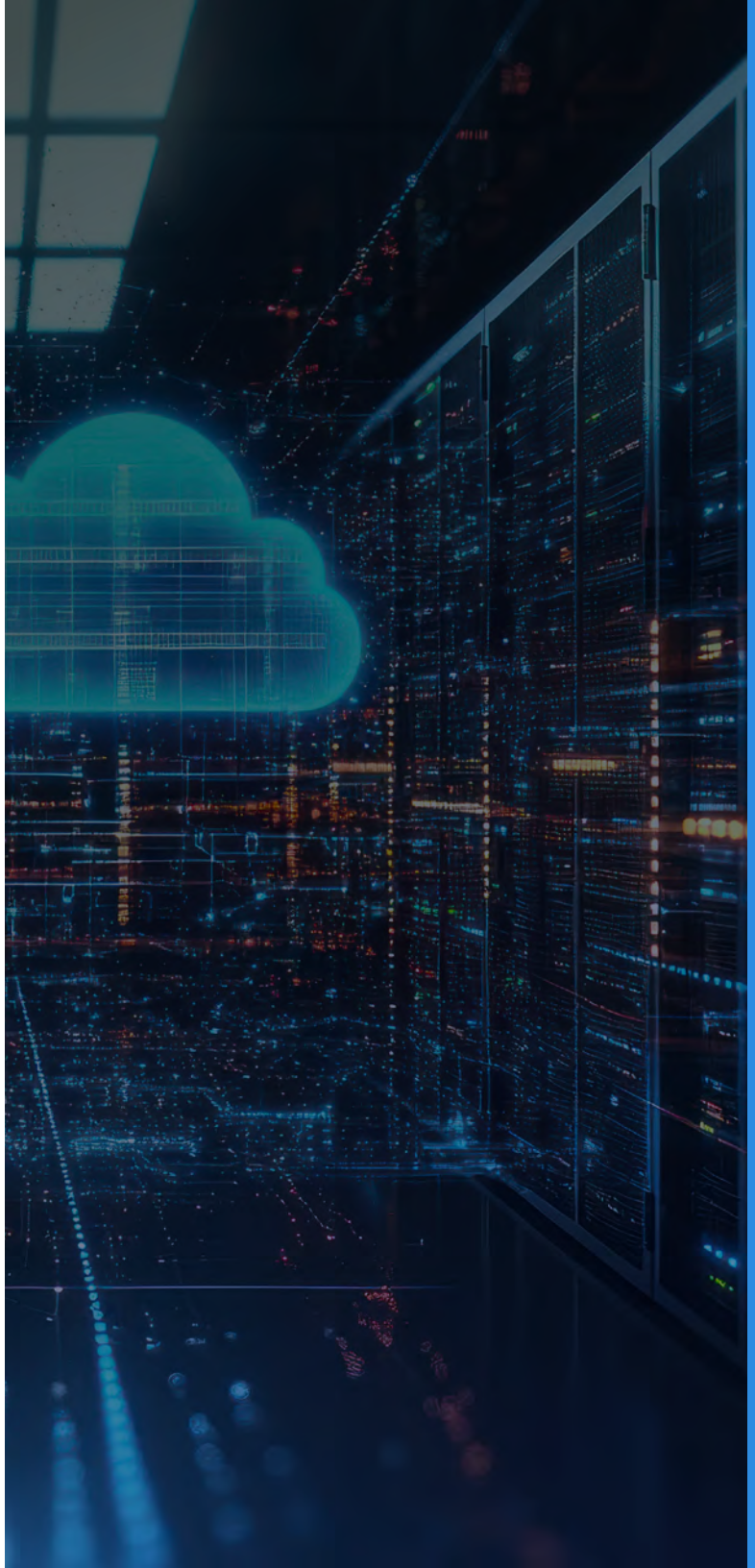
A strong cloud security posture begins with robust monitoring and logging solutions that provide real-time insight into cloud activity. By enabling continuous monitoring, organizations can detect unusual patterns, anomalies, and suspicious behavior before they escalate into full-blown security events.

Key aspects of an effective monitoring strategy include:

1. Critical Event Logging – Every critical action in your cloud environment should be logged, including:

- User authentication and login attempts
- API calls and administrative changes
- Network traffic and data transfers
- Changes to security configurations

These logs serve as a record of the events occurring within your cloud ecosystem, helping security teams reconstruct incidents and detect anomalies.



2. Centralized Log Management – Managing logs across multiple cloud services and platforms can be complex. A **centralized logging solution** aggregates logs from different sources, creating a single pane of glass for security teams to analyze data efficiently. By implementing log management tools, organizations can correlate events across their cloud infrastructure, improving their ability to detect threats.

3. Anomaly Detection and Alerting – Simply collecting logs is not enough; organizations need to leverage **advanced analytics and machine learning** to identify unusual patterns and potential security incidents.

For example:

- Multiple failed login attempts from unusual geographic locations may indicate a brute-force attack.
- A sudden spike in outbound traffic could signal data exfiltration.
- Unauthorized changes to security group settings might suggest a compromised account.

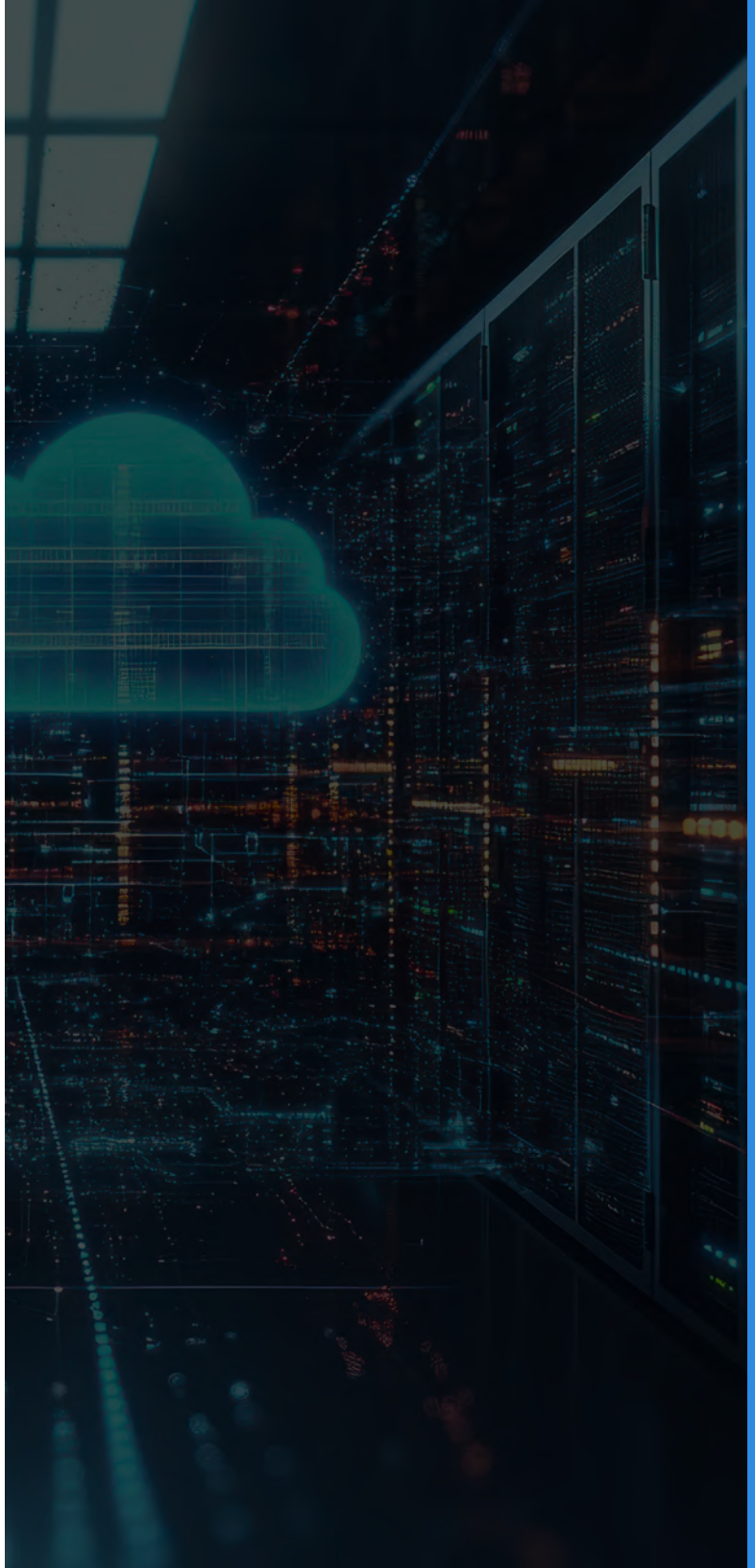
Setting up **alerts and notifications** for critical events ensures that security teams can investigate suspicious activities promptly, reducing response times and minimizing impact.

Ensuring Regulatory Compliance Through Cloud Visibility

Beyond threat detection, maintaining cloud visibility is critical for meeting regulatory and industry compliance requirements. Standards such as **HIPAA, PCI DSS, GDPR, NIST, and CIS** all emphasize the importance of logging, monitoring, and maintaining audit trails.

The Bottom Line

Continuous monitoring of the fluid cloud environment is vital not just for compliance with regulatory frameworks and adherence to industry best practices, but also to stay ahead of attackers by promptly identifying anomalous activity that might be the harbinger of a larger threat.



Qualys, Inc. (NASDAQ: QLYS) is a leading provider of disruptive cloud-based security, compliance and IT solutions helping organizations measure, communicate and eliminate cyber risk. Over 10,000 subscription customers worldwide, including most of the Forbes Global 100 and Fortune 100, utilize the Qualys Enterprise TruRisk Platform.

This platform enables companies to streamline and automate their security and compliance processes into a single, comprehensive view, resulting in increased agility, improved business outcomes, and significant cost savings.

CONCLUSION

The Foundation of a Resilient Cloud Security Strategy

Today, cloud architectures are dynamic, workloads scale rapidly, and threat actors continuously refine their tactics. Organizations that proactively manage security by implementing the five key steps outlined position themselves to thrive in a digital-first economy. To achieve this, security must be woven into the fabric of cloud operations, enabling businesses to accelerate innovation without compromising protection.

Key Takeaways:

- **Understand Shared Responsibility**: Know what your cloud provider secures and what you are responsible for.
- **Prioritize Inventory and Visibility**: Ensure you understand what resources exist, how they are configured, and who can access.
- **Enforce Least Privilege**: Restrict permissions to minimize the attack surface.
- **Encrypt Data Effectively**: Secure sensitive information with strong encryption and key management.
- **Monitor Continuously**: Detect and respond to threats in real time with automated security tools.

The journey to cloud security maturity is ongoing. With the right tools, processes, and expertise, organizations can confidently navigate complexity, mitigate risks, and unlock the full potential of cloud technology. Elevate your cloud security strategy today—because in cybersecurity, staying ahead is the only way to stay secure.

Qualys empowers your multi-cloud strategy by elevating these 5 key steps into cloud resilience with automated risk visibility, prioritization, and remediation at scale.

Want to learn more?

Check us out here