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Introduction

We have entered the age of pervasive technology. At home, in the office, or on the road, a vast portion of us are connected wherever we are, not only with people but with an array of information and technologies. It has become hard to distinguish between work time and leisure time, with the same devices used for both contexts interchangeably. This inescapable trend provides both tremendous opportunities and significant risks to organizations that embrace the “always on” culture for their customers, trading partners and employees.

Technology services are consumed whenever and wherever needed, and the associated data can be stored anywhere. We believe at Qualys that organizations, at the risk of being left behind, must enter the “Cloud Age,” marking a major departure from the constraints of client/server and even the first generation Web applications, enabling a new connectivity-based world to foster better communications, tighter collaboration and accelerating productivity.
Security and Compliance in the Cloud Age

The Cloud Age can be described by a few attributes:

**Browser-Centricity**
The web browser is the common interface to the Internet, corporate systems and data stores. This opens up pervasive access to all constituencies on a variety of devices, including PCs and smartphones owned by both the organization and employees (BYOD). Yet browsers contain vulnerabilities that can lead to malware infection – despite efforts from developers to patch and address these issues – and have become the path of least resistance for attackers to capture information, steal access credentials or gain control of users’ devices.

**Web Applications: The New Perimeter**
Easier to build and deploy, web applications now represent the main access point to enterprise networks and data, thus replacing the traditional perimeter. Organizations now must spend as much time and effort detecting, tracking and managing web applications as they do their traditional perimeter networks. The importance of these applications and the quantity and sensitivity of their underlying data have attracted attackers intent on exploiting web application weaknesses and configuration flaws to steal sensitive data or to reduce application availability.
Data Location Independence
Cloud computing enables applications to be composed of data from anywhere and everywhere, stored in a variety of internal and cloud-based data stores, requiring secure communications between these various locations. Although many cloud application providers have made significant security investments, cloud services (by definition) provide organizations with limited visibility and access to the underlying architecture, inhibiting organizations from identifying potential gaps and validating the effectiveness of their security strategies.

Globalization Is the Norm, Not the Exception
The cloud disintegrates regional and territorial boundaries. Data moves from place to place, users move transparently between locations, and systems can be administered by a variety of authorized parties, not necessarily employees of your organization. This creates jurisdictional complexities, authentication and trust requirements, and complicates compliance reporting and attestation.

Hybrid Infrastructure
No organization of scale can shut down their internal systems overnight, but they have been making significant efforts to make those resources more efficient through consolidation and virtualization. Given IT infrastructure will remain a hybrid of traditional physical data center and cloud-based technologies for the foreseeable future, security controls must be enforced and compliance documentation produced consistently regardless of whether the technology asset is in your organization’s data center or a cloud-provider anywhere in the world.

The productivity, agility and economic advantages of cloud computing mean there is no stopping the drive to the Cloud, regardless of the risks and complexities. So let’s dig a little deeper into the challenges the Cloud Age introduces for every IT organization.
Challenges of Security and Compliance in the Cloud Age

Security is a battle that your organization can’t win, and success is usually measured by keeping organizations out of the news and your senior executives out of jail. The drive to a web-based reality and increasing adoption of new cloud-based and hybrid infrastructures further complicate the job of the typical security professional.
Securing at Cloud Scale
As described by the Cloud Security Alliance, one of the essential characteristics of the cloud is “rapid elasticity,” meaning the cloud can grow as quickly as your organization needs it to. In the old days, devices needed to be procured, provisioned, and installed, giving the organization time to protect the new devices. Provisioning a new cloud instance takes minutes, creating issues in both visibility (knowing what devices are actually out there at any point in time) and control (ensuring proper configurations and controls are implemented on new resources).

Increasing Attack Surface
With web applications emerging as the “New Perimeter,” organizations must embrace the reality that they have as many perimeters as they have web applications. This combined with increased outsourcing and business partnering result in a dramatic expansion of the attack surface. This exponential increase of targets, including databases, desktops, mobile devices, routers, servers and switches, mushrooms the number of security vulnerabilities potentially providing hackers with unauthorized access to IT systems. It’s no longer sufficient to build a strong network security perimeter and neglect the security of internal networks and devices.

Leveraging Existing Security Controls
Organizations have historically deployed niche security products to address specific security issues. However, this approach often does not provide a current, accurate and global picture of an organization’s security and compliance. As IT infrastructures evolve to include a mixture of on-premise, cloud and hybrid, these task-specific security products running on premise create challenges providing a complete and accurate inventory of IT assets and configurations, thus preventing organizations from effectively protecting their infrastructures from the threats of the Cloud Age.

Securing Thin Devices
The evolution of smartphone technology has brought more sophisticated and secure mobile operating systems, locked down by default, yet offering limited visibility and control to the operating system core. Yesterday’s kernel-level anti-malware techniques are no longer relevant. As data leakage and malware continue to plague these devices, organizations will need to consider different methods to provide sufficient security for these devices.

Prioritizing Security Activities
Ongoing funding, resource and expertise constraints make it difficult for many organizations to remain protected in the Cloud Age, thus security success depends on carefully selecting which activities get done. The Cloud Age complicates these decisions forcing organizations to prioritize security activities across a number of internal/external service providers and staff that may not be under your control. Compounding the issue is the dynamic nature of the attackers, who could launch a new attack requiring immediate activity, rendering the best-laid plans irrelevant.

Reporting for Compliance
One of the unfortunate effects of security breaches is an increasingly restrictive regulatory and compliance environment. Given the global nature of most Cloud Age business, your organization likely must adhere to regulations and policies from multiple national and local authorities, which frequently overlap and change. Compliance with these various regulatory regimes requires costly and time-consuming measures and carries significant financial and reputational consequences for non-compliance. Examples of such external regulations include the Revised International Capital Framework, or Basel II, the Health Insurance Portability and Accountability Act, or HIPAA, North American Electric Reliability Corporation Standards, or NERC, Payment Card Industry Data Security Standards, or PCI DSS, and the Sarbanes-Oxley Act of 2002, or SOX. A 2011 Gartner survey estimates that it costs organizations an average of $1.7 million to become compliant with PCI DSS, and that is only one regulation.
Today’s customer premise-based solutions cannot meet the needs of security and compliance in the Cloud Age, so a new solution is required.
Cloud platform essential characteristics:

<table>
<thead>
<tr>
<th>Anywhere Access</th>
<th>Elastic Scalability</th>
<th>On Demand Flexibility</th>
<th>Dynamic Security Intelligence</th>
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<tbody>
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<td>Your employees, service providers, and customers can be anywhere, thus your cloud security platform must be accessible from anywhere, at any time.</td>
<td>The security and compliance function for the Cloud Age needs to be as elastic and scalable as the cloud itself. As your organization’s IT infrastructure grows, the platform you use to secure it needs to grow in lock step.</td>
<td>The platform to secure the Cloud Age needs to have flexibility to offer your organization only what’s needed, when it’s needed, and charge only for the amount used.</td>
<td>Battling constantly changing, finely tuned attacks, the cloud security platform needs to be updated dynamically with the most current vulnerability, configuration, and malware information to allow your organization to respond faster to emerging threats.</td>
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The cloud security and compliance platform must deliver the following features to meet the needs of today’s organizations:

<table>
<thead>
<tr>
<th>Asset Management</th>
<th>Threat Management</th>
<th>Analytics</th>
<th>Reporting and Workflow</th>
<th>Protection</th>
</tr>
</thead>
<tbody>
<tr>
<td>Your organization cannot protect unknown assets. Furthermore, in order to prioritize, the value of the asset to your organization must be considered. Thus, the platform needs to have a robust asset management capability.</td>
<td>The platform must have the ability to scan for vulnerabilities, assess and monitor configurations, and determine the risk an attack presents to the organization. In hybrid IT environments, the platform must provide a single view across the traditional data center and in private/public cloud environments, across a multitude of devices and across the application layer.</td>
<td>The key to helping prioritize activities and combat advanced attacks is generating actionable information from a variety of data sources. The platform needs to be able to analyze the data and provide clear visualization of the information to security administrators needing to make instant decisions.</td>
<td>Given the increasing number of regulatory mandates across regions and jurisdictions, the platform needs to provide a common set of reports across the enterprise, while supporting any regulatory reporting regime, and offering the ability to support inter-enterprise workflows, as outsourcing security functions becomes more prevalent.</td>
<td>If it’s possible to block an attack while minimizing false positives, the platform should provide a capability to either provide direct protection or integrate with other active defenses, including web application firewalls, intrusion prevention, and next generation firewalls.</td>
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Building a Cloud Security Platform doesn’t happen overnight. In fact, it takes over a decade to gain the critical mass, global presence, security intelligence and world-class expertise required. It takes a unique company to meet the security and compliance needs of organizations in the Cloud Age: that company is Qualys.
Providing Security and Compliance in the Cloud Age

Qualys was founded in 1999 at the height of the technology bubble, when Internet security was just beginning to appear on executive agendas. In December 2000, the company became one of the first entrants in the vulnerability management market. Driven by a powerful combination of highly accurate and easy-to-use scanning technology delivered via the web, Qualys pioneered the use of “Software-as-a-Service,” or SaaS, to address security and compliance problems for organizations of all sizes.

The heart of Qualys is the Qualys Cloud Platform, which provides an integrated suite of solutions to automate the lifecycle of asset discovery, security assessment and compliance management for an organization’s IT infrastructure and assets, whether they reside inside the organization, on their network perimeter or in the cloud. Qualys’ cloud delivery model can be easily and rapidly deployed on a global scale, enabling faster implementation, broader adoption and lower total cost of ownership than traditional on-premise enterprise software products. By deploying Qualys, organizations can gain actionable security intelligence into potential vulnerabilities and malware in their IT infrastructure and expedite their compliance with internal polices and external regulations.

The results speak for themselves. Over the past 14 years, Qualys has built a global customer base of over 6,700 organizations located in 100+ countries, including a majority of both the Forbes Global 100 and Fortune 100. These customers perform over 1 Billion IP scans/audits per year.
The Cloud Age will force organizations of all shapes and sizes to become more nimble in how they protect critical corporate information assets. Qualys delivers actionable security intelligence, and is positioned to be the organization's strategic IT security and compliance platform for years to come.
Qualys Cloud Platform consists of a suite of IT security and compliance solutions that leverage shared and extensible core services and a highly scalable multi-tenant cloud infrastructure.

Qualys Cloud Infrastructure
Qualys’ infrastructure includes the data, analytical capabilities, software and hardware infrastructure and infrastructure management capabilities providing the foundation for the cloud platform. Here are some key aspects:

- **Scalable Capacity**
  - Qualys' modular and scalable infrastructure leverages virtualization and cloud technologies allowing our operations team to dynamically allocate additional capacity on demand across our entire Qualys Cloud Platform to provide for the growth and scalability of our solutions.

- **Big Data Indexing and Storage**
  - Built on top of our secure data storage model, Qualys' analytics engine indexes petabytes of data and uses this information in real time to execute tags or rules to dynamically update IT asset properties, for use in various workflows for scanning, reporting and remediation.

- **KnowledgeBase**
  - Qualys relies on our comprehensive repository, the Qualys KnowledgeBase, of known vulnerabilities and compliance controls for a wide range of devices, technologies and applications to power our security and compliance technology. The KnowledgeBase is dynamically updated with information on new vulnerabilities, control checks, validated fixes and content refinements on an ongoing basis.

Qualys Core Services
Qualys' Core Services enable integrated workflows, management and real-time analysis and reporting across all of our IT security and compliance solutions. Our Core Services include:

- **Asset Tagging and Management**
  - Enables your organization to easily identify, categorize and manage large numbers of assets in highly dynamic IT environments and automates the process of inventory management and hierarchical organization of IT assets.

- **Reporting and Dashboards**
  - A highly configurable reporting engine that provides your organization with reports and dashboards based on user roles and access privileges.

- **Questionnaires and Collaboration**
  - A configurable questionnaire engine enables your organization to easily capture existing business processes and workflows to evaluate controls and gather evidence to validate and document compliance.

- **Remediation and Workflows**
  - An integrated workflow engine allows your organization to automatically generate helpdesk tickets for remediation and to manage compliance exceptions based on organizational policies, enabling subsequent review, commentary, tracking and escalation. This engine automatically distributes remediation tasks to IT administrators upon scan completion, tracks remediation progress and closes open tickets once patches are applied and remediation is verified in subsequent scans.

- **Big Data Correlation and Analytics Engine**
  - An analytics engine indexes, searches and correlates petabytes of security and compliance data with other security incidents and third-party security intelligence data. Embedded workflows enable your organization to quickly assess risk and access information for remediation, incident analysis and forensic investigations.

- **Alerts and Notifications**
  - An alert engine creates email notifications to alert team members of new vulnerabilities, malware infections, scan completion, open trouble tickets and system updates.

Qualys Cloud Suite
Qualys enables your organization to use the solutions you need, when you need them and pay for only what you use. Your organization can subscribe to one or more of our security and compliance solutions, and over time expand your use.

- **Continuous Monitoring**
  - Qualys CM delivers a comprehensive, always-on view of potential security holes, enabling organizations to immediately identify and proactively address potential threats before they turn into breaches. Uses elastic scanning capacity to catch unexpected hosts, expiring SSL certificates, open ports, severe vulnerabilities and undesired applications. Helps organizations identify the highest priority issues to enable fast and efficient mitigation and remediation.

- **Vulnerability Management**
  - Qualys VM automates the lifecycle of network auditing and vulnerability management across your global business. Gives you visibility into IT systems across your network, how they might be vulnerable to the latest Internet threats, and how to protect them.

- **Policy Compliance**
  - Qualys PC helps organizations pass security audits and document compliance tied to corporate security policies, laws, and industry regulations, helping organizations comply with the requirements of both internal and external auditors. Audits the configurations of your computers to see if they are enforcing password controls and other compliance policies.

- **Questionnaire Service**
  - Qualys QS centralizes and automates the gathering of risk data and compliance evidence from employees, partners, vendors and other subject matter experts. Frees organizations from manual, labor-intensive audits and correlates petabytes of security and compliance data with other security incidents and third-party security intelligence data. Embedded workflows enable your organization to quickly assess risk and access information for remediation, incident analysis and forensic investigations.

- **Alerts and Notifications**
  - An alert engine creates email notifications to alert team members of new vulnerabilities, malware infections, scan completion, open trouble tickets and system updates.

- **PCI Compliance**
  - Qualys PCI provides small and medium-sized businesses with enterprise-level scanning and reporting that’s easy to implement and maintain. Enables large corporations to meet PCI compliance requirements for data protection on a global scale.

- **Web Application Scanning**
  - Qualys WAS provides automated crawling and testing of custom web applications to identify vulnerabilities including cross-site scripting (XSS) and SQL injection. The automated service enables regular testing that produces consistent results, reduces false positives, and easily scales to secure large numbers of web sites. Proactively scans web sites for malware infections, sending alerts to web site owners to help prevent black listing and brand reputation damage.

- **Web Application Firewall**
  - Qualys WAF protects web sites against attacks on server vulnerabilities and web app defects. Brings cloud scalability and simplicity to strongly secure web apps against cross-site scripting (XSS), SQL injection, corrupted requests and other attacks.

- **Qualys SECURE Seal**
  - Qualys SECURE Seal enables online businesses of all sizes to scan their web sites for the presence of malware, network and application vulnerabilities, as well as SSL certificate validation. Once a web site passes all four security scans, the service generates a Qualys SECURE seal for the merchant to display on their web sites, demonstrating to visitors that the company is committed to security.
Why Qualys?

Qualys’ vision is to transform the way organizations secure and protect their IT infrastructures and applications. Qualys is the best choice for your security and compliance needs.

**Trusted brand in cloud security**
Qualys pioneered cloud security, having introduced the first vulnerability management solution as a service in 2000, and maintains a reputation as a trusted and objective provider of reliable and accurate vulnerability and compliance assessments.

**Scalable and extensible cloud security platform**
Our highly-scalable cloud architecture and modular security and compliance solutions allow customers of all sizes, across many industries to access the functionality to help ensure the security of their IT infrastructures. Our cloud platform serves organizations ranging from small businesses to globally distributed enterprises with millions of networked devices and applications.

**History of cloud security and compliance innovation**
For over 14 years, Qualys has introduced innovative cloud security and compliance solutions allowing our customers to protect their IT environments more effectively and at a lower cost. We have invested significantly in the Qualys Cloud Platform and are well positioned to address the challenges of the evolving IT security and compliance landscape.

**Pay for What You Use, When You Use It**
Qualys allows customers to easily try one or more of our solutions without risk from any web browser. This model allows our customers to subscribe to only the solutions they need and provides the ability to easily expand the breadth and depth of their deployment as their needs evolve.

To get a free trial of the Qualys Cloud Suite, visit [http://www.qualys.com/trial](http://www.qualys.com/trial)
Forbes Global 100

Have Adopted the Qualys Cloud Security & Compliance Platform

8 out of the top 10 Software
8 out of the top 10 Biotech
8 out of the top 10 Technology
8 out of the top 10 Retail
7 out of the top 10 Health Care
7 out of the top 10 Banking
7 out of the top 10 Media
7 out of the top 10 Food Retail
6 out of the top 10 Auto Manufacturers
6 out of the top 10 Chemical
6 out of the top 10 Telecom
6 out of the top 10 Conglomerates