How Security Changes With Cloud Networking

Blog Article Published: 09/08/2021

Common on-premises network practices work differently for the cloud user and provider due to the lack of direct management of the underlying physical network. The most commonly used network security patterns rely on control of the physical communication paths and insertion of security appliances. This isn't possible for cloud customers, since they only operate at a virtual level.

Communications between hosts are mirrored and inspected by traditional virtual or physical Intrusion Detection Systems, which are not supported in cloud environments. Customer security tools need to rely on an in-line virtual appliance, or a software agent installed in instances. This creates either a chokepoint or increases processor overhead, so be sure you really need that level of monitoring before implementing. Some cloud providers may offer some level of built-in network monitoring (and you have more options with private cloud platforms) but this isn't typically to the same degree as when sniffing a physical network.

Challenges of Virtual Appliances

Since physical appliances can't be inserted (except by the cloud provider), they must be replaced by virtual appliances if still needed and if the cloud network supports the necessary routing. This brings the same concerns as inserting virtual appliances for network monitoring:

- Virtual appliances become bottlenecks, since they cannot fail open, and must intercept all traffic.
- Virtual appliances may take significant resources and increase costs to meet network performance requirements.
- When used, virtual appliances should support auto-scaling to match the elasticity of the resources they protect. Depending on the product, this could cause issues if the vendor does not support elastic licensing compatible with auto-scaling.
- Virtual appliances should also be aware of operating in the cloud, as well as the ability of instances to move between different geographic and availability zones. The velocity of change in cloud networks is higher than that of physical networks and tools need to be designed to handle this important difference.

Additionally, cloud application components tend to be more distributed to improve resiliency and, due to auto-

scaling, virtual servers may have shorter lives and be more prolific. This changes how security policies need to be designed:

- This induces that very high rate of change that security tools must be able to manage (e.g., servers with a lifespan of less than an hour).
- IP addresses will change far more quickly than on a traditional network, which security tools must account for. Ideally they should identify assets on the network by a unique ID, not an IP address or network name.
- Assets are less likely to exist at static IP addresses. Different assets may share the same IP address within a short period of time. Alerts and the Incident Response lifecycle may have to be modified to ensure that the alert is actionable in such a dynamic environment. Assets within a single application tier will often be located on multiple subnets for resiliency, further complicating IP-based security policies. Due to auto-scaling, assets may also be ephemeral, existing for hours or even minutes.

Recommendations

Infrastructure security of your provider or platform

- Make sure the provider (or whoever maintains the private cloud platform) has the burden of ensuring the underlying physical, abstraction, and orchestration layers of the cloud are secure. This follows the shared security model.
- Review compliance certifications and attestations.
- Check industry-standard and industry-specific compliance certifications and attestations on a regular basis to assure that your provider is following cloud infrastructure best practices and regulations.

Compute/workload

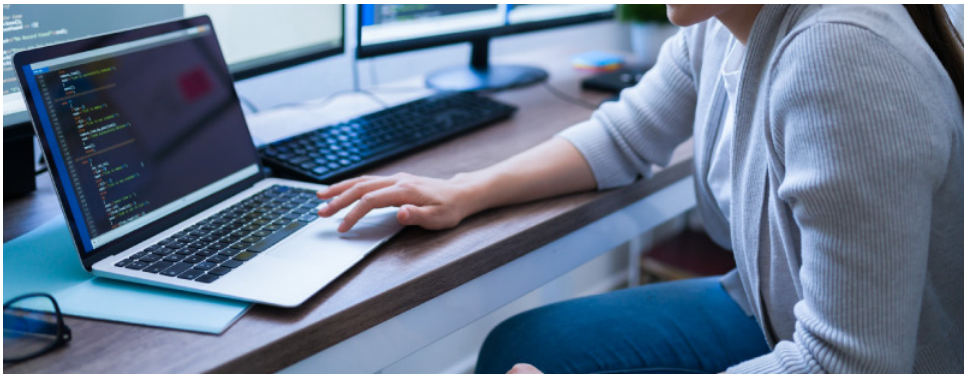
- Leverage immutable workloads whenever possible.
- Disable remote access.
- Integrate security testing into image creation.
- Alarm with file integrity monitoring.
- Patch by updating images, not patching running instances.
- Choose security agents that are cloud-aware and minimize performance impact, if needed.
- Maintain security controls for long-running workloads, but use tools that are cloud aware.
- Store logs external to workloads.
- Understand and comply with cloud provider limitations on vulnerability assessments and penetration testing.

If you want to learn about cloud security we recommend that you start by reading the CSA Security Guidance for Cloud Computing.

If you are looking for more formalized training around cloud security, CSA also offers the Certificate of Cloud Security Knowledge (CCSK) that explains the information provided in the Security Guidance in more depth.

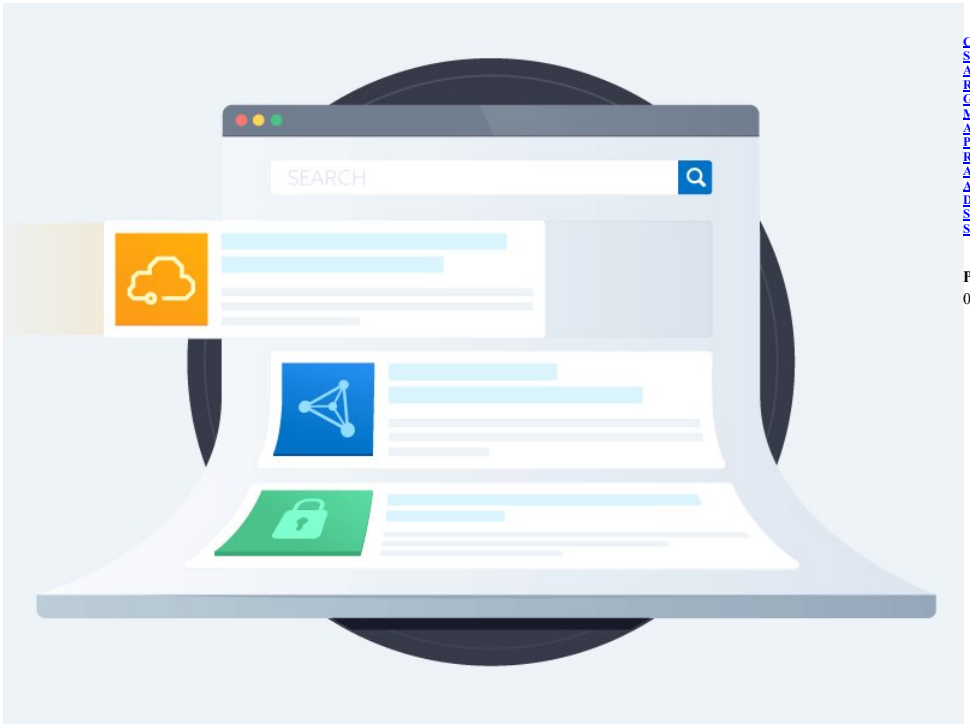
VirtualizationApplication Containers and MicroservicesSecurity Guidance

Share this content on your favorite social network today!



[The Microservices Architecture Pattern: Expanding Security Assurance Ideas in Containers and Microservices]

Published:
09/02/2021



[Cloud Security Alliance Releases Guidance on Microservices Architectural Pattern for a Repeatable Approach to Architecting, Deploying Secure Systems]

Published:
08/31/2021

Corporate Membership

Cloud CustomersCloud Solution ProvidersSaaS Solution Providers

Join as an Individual

Circle Community ForumChaptersWorking Groups

Research

Download PublicationsView Working Groups

Find a...

Cloud ConsultantCloud Service Provider

Certificates

CCSKCCAK

Events

AmericasEMEAAPAC

Education

BlogVirtual Events & WebinarsTraining

Popular Resources

Security GuidanceCCMCAIQSTARGDPR

About CSA

Contact UsPress ReleasesAffiliates

Our Team

Board of DirectorsManagement & Staff

Legal

Privacy NoticeTerms & Conditions