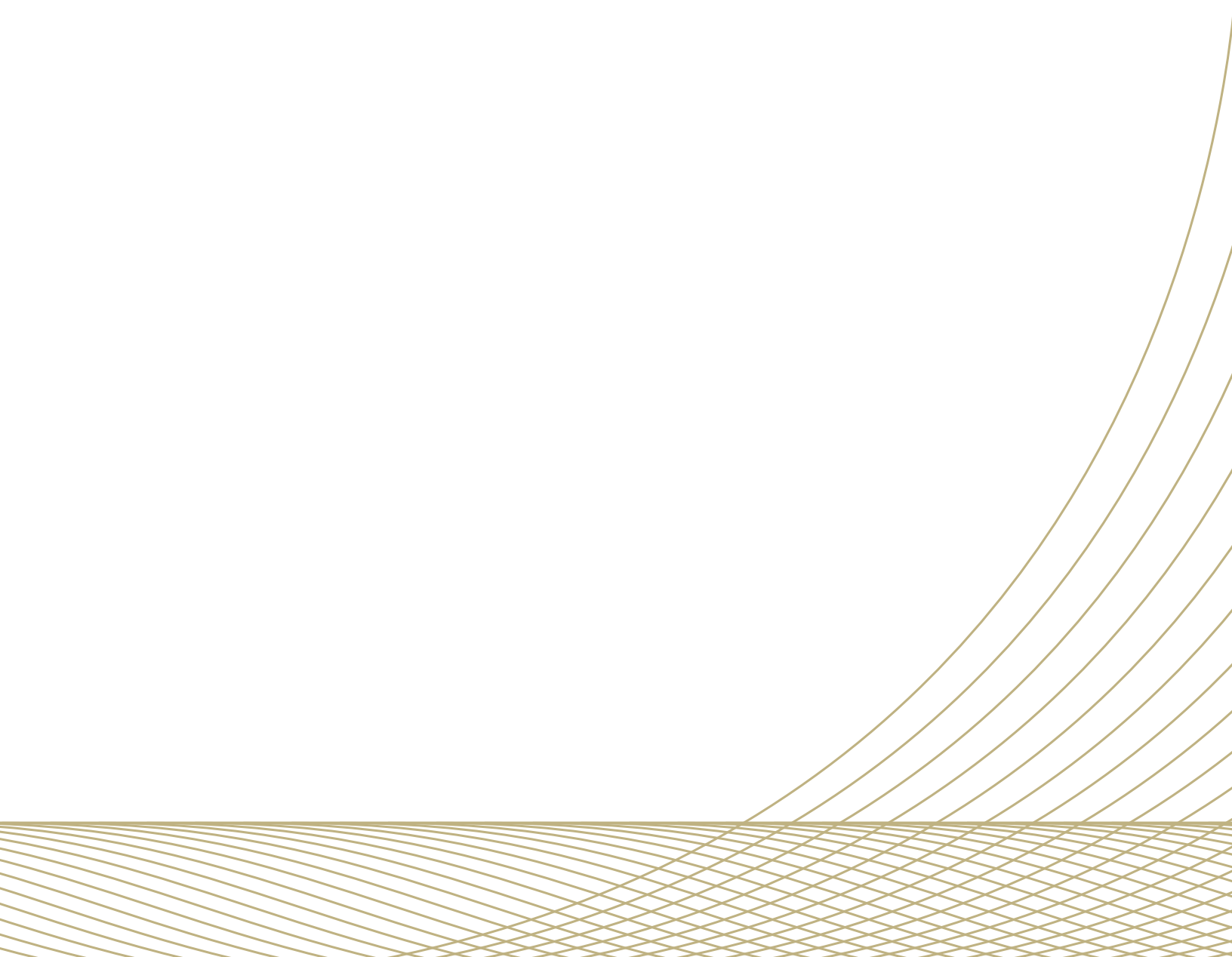




Skytap Cloud Dedicated Hosts



Executive Summary

Most cloud providers sell individual infrastructure components. Skytap Cloud provides *environments*. Skytap Cloud environments encapsulate applications, infrastructure, networking, operating system, software, storage, data, and VM memory state. Using environments, Skytap Cloud customers realize substantial business value as part of their software development lifecycle (SDLC) from unit test to production, for technical training efforts, and for sales demos and proof-of-concepts.

Skytap Cloud hosts customer environments in datacenters based in the USA, Europe, and Asia. Part of the agreement between Skytap Cloud and its customers is that *the responsibility for software license compliance lies with the customer*.

Software licensing can be complex and it is sometimes challenging for customers to comply when using a cloud service. In some instances, the software vendor will simply allow a customer to run their software anywhere as long as the license is not duplicated and usage can be audited/reported. Other vendors take a much more aggressive and punitive approach to licensing.

Skytap Cloud strives to make it as easy as possible for its customers to comply with software licensing agreements. This is why we have introduced *dedicated hosts*. Dedicated hosts can be used when vendors have licensing requirements that require auditing at the physical server level or require assurances that the configuration of the hypervisor ensures the correct level of segregation or partitioning.

The remainder of this document provides a technical overview of how dedicated hosts work in Skytap Cloud and how compliance can be achieved.

Note: The dedicated host offering is based on Skytap's experience and knowledge with third party licensors. Skytap does not offer specific legal guidance regarding individual customer licenses or support agreements with software vendors.

Dedicated Hosts Overview

Dedicated hosts have been designed to support Skytap Cloud customers who use vendors who have software that is licensed by physical cores, sockets, or RAM. Licensing for such software may also require that licenses are purchased for all potential physical servers that can run a VM containing the software.

Skytap Cloud is a multi-tenant service, and at scale such licensing is not practical. As an option, we have introduced dedicated hosts. With dedicated hosts, a Skytap Cloud customer gets rights to use a set of physical servers dedicated to running their VMs which contain the licensed software. This way, Skytap Cloud customers gain both the assurance and verifiable reporting to show that the

licensed software has only been run on specific physical servers.

Technical Approach

With dedicated hosts, Skytap Cloud extends existing functionality to ensure that VMs running vendor-licensed software are run exactly and only on the servers dedicated for this purpose.

Skytap Cloud completely manages the placement of VMs on ESX hosts using a concept of logical pools of hosts. Customers have no visibility or control over this placement. The placement logic is based on matching per-VM requirements against pools of ESX hosts that meet those requirements. This general capability is extremely reliable as it is the basis for Skytap Cloud's ability to ensure that VMs run successfully with specific hardware requirements (e.g. GPU required, Westmere-or-better).

With dedicated hosts, certain ESX hosts are identified and placed in a specific pool dedicated for a single customer. Customers indicate to Skytap Cloud Support which VMs must be run on hosts in a specific pool. This pool requirement is added to the VM metadata. Skytap Cloud will then use the placement logic to ensure that these VMs will run exactly and only on one of the hosts in the pool. In addition, any clones or copies of these "marked" VMs propagates the pool requirement metadata - as such copies will also be constrained to run on the dedicated ESX hosts.

Skytap Cloud Technology Background

Skytap Cloud licenses vCenter and ESX from VMware as part of the VMware Service Provider Program (VSPP). vCenter and ESX are used very differently from that of a traditional on-premises deployment. Key differences include:

- Skytap Cloud customers have no access to VMware products or APIs
- Skytap Cloud uses only the VMware ESX hypervisor technology, as Skytap Cloud is not just a layer on top of VMware products
- Skytap Cloud includes all management logic and policies for ESX - vCenter is only used as a passthrough for purposes of managing VMs

In Skytap Cloud, ESX nodes are integrated to vCenter in order to comply with the usage metering requirements of the VSPP program under which Skytap Cloud licenses the VMware technology. Generally, we strive to avoid creating dependencies on vCenter. The only features of vCenter used in Skytap Cloud are:

- API pass-through to control ESX
- API control of vMotion (as described below)

- API control of VM IOPs constraints (not support in ESX API)

Each ESX host has nominal storage used for swap and logs for ESX. Each VM is stored in a distinct Skytap Cloud-managed ZFS filesystem, which is shared to a single ESX host (via NFS) when it is started, and the sharing ends when it is stopped.

How does Skytap Cloud ensure VMs only run on the dedicated hosts?

Skytap Cloud customers have no ability to view, much less manage, the per-VM requirements or the pools of the ESX nodes. This is an administrative function of Skytap Cloud, accessible only to approved Skytap Cloud Support personnel.

Customers make a request to run a VM through the Skytap Cloud UI or APIs and Skytap Cloud performs the selection and placement on an appropriate ESX node. Skytap Cloud does not use the concept of VMware clusters or any other VMware placement mechanism; the concept of Skytap Cloud pools is an internal Skytap Cloud construct.

In this way, customers can be assured that their licensed VMs will only be run on licensed servers.

How does Skytap Cloud use vMotion?

Skytap Cloud customers have no access to vMotion and cannot use it to move VMs. Skytap Cloud uses vMotion only to evacuate ESX nodes during maintenance operations. vMotion is invoked programmatically by Skytap Cloud and cannot be used to put a VM onto an ESX node that is “incompatible” according to Skytap Cloud’s placement policies.

In this way, customers can be assured vMotion cannot be used to move their licensed VMs to unlicensed servers.

What hardware is used for dedicated hosts?

For Skytap Cloud co-located datacenters

HP Proliant BL460c G9 blades: 20 cores, 512 GB RAM, 600GB disk

IBM SoftLayer datacenters

SuperMicro X10, 24 core, 512GB RAM, 1TB disk

Note: Skytap reserves the right to change the hardware configurations for newly delivered dedicated hosts at any time.

What reporting does Skytap Cloud provide for dedicated hosts?

Skytap Cloud will generate a monthly report that includes the following for every run of every VM bound to a dedicated host:

- VM Name & ID
- When it was provisioned
- When it was unprovisioned
- Number of virtual cores allocated
- Virtual RAM allocated
- ESX Host & ID
- Region Location
- # of physical cores
- # of physical sockets
- Amount of physical RAM

This will provide complete accounting of the VM usage and on which physical servers.

Oracle and VMware Licensing

Oracle licensing can be particularly tricky to navigate. Additional information is available from VMware and can be found below.

Understanding Oracle Certification, Support, and Licensing for VMware environments

http://www.vmware.com/content/dam/digitalmarketing/vmware/en/pdf/whitepaper/solutions/oracle/understanding_oracle_certification_support_licensing_vmware_environments-white-paper.pdf

VMware Oracle Support Policy

<https://www.vmware.com/support/policies/oracle-support.html>



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