

# HASP free Management Console license container clone protection in a virtual environment.

Created date	Update date	Affects version	Fix version
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The clone protection type scheme relies on three different parameters for verifying fingerprints on a virtual machine: the virtual MAC address, CPU characteristics, and UUID of the virtual image. If one or more of the characteristics are changed the clone protection is triggered.

### Virtual MAC Address

Each virtual machine has a unique virtual MAC address assigned. Within a network, each virtual machine must possess a unique MAC address. If a user clones a virtual machine and installs it on a second computer within the same network, working on either the original or the cloned virtual machine will be impractical as the two machines will constantly cause network collisions.

### CPU Characteristics

In centrally managed virtual infrastructures (also called server based virtualization), hardware clusters can be virtualized. In this environment, the virtual infrastructure does not always utilize a single, fixed set of physical hardware resources. Instead, it utilizes a shared pool of resources. For the most common types of clustered environments, where live migration capabilities are typically required, a requirement usually exists for different hosts in the cluster to have identical CPU characteristics. Solutions such as VMware vCenter Server provide the ability to enable CPU masking to improve compatibility for the high availability and fault tolerance virtualization features. CPU masking allows host machines with different CPU characteristics to be used in the cluster, while providing common (masked) CPU characteristics across all hosts in the cluster. Therefore the CPU characteristics do not change when virtual machine migrates across the hosts in a cluster. This enables licensed applications to continue working when migrated from one host to another within a cluster. However, this type of environment is restricted to a limited subset of CPU types. In addition, the migration can only be performed when the target computer contains physical CPU whose capabilities match or exceed the characteristics of the virtual CPU.

### UUID of the Virtual Machine

This is used as a means of unique identification of the virtual machine with the majority of virtual machines technologies. The UUID consists of a 16-byte (128-bit) number. Each virtual machine is assigned a different UUID.

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When checking the fingerprint for cloning, Sentinel LDK examines all of these characteristics. If one (or more) of these characteristics does not match the characteristics in the fingerprint of the license, Sentinel LDK prevents the protected software from consuming any licenses from the container. Thus, the combination of these parameters in the fingerprint provides protection against cloning. (See the table that follows.)

		Comparison results			
Characteristics Compared	Virtual MAC Address	Identical	Different	Not relevant	Not relevant
	CPU Characteristics	Identical	Not relevant	Different	Not relevant
	UUID	Identical	Not relevant	Not relevant	Different
The license container is...		enabled	disabled	disabled	disabled

### How to Clear the "Cloned" Status for a Product License?

In the event that a Product license is disabled because it has been identified as "cloned", contact to Blancco Technical Support.