



Lenovo ThinkAgile CP Clone and Attach a vDisk (Technical Brief)



Models: CP 4000, CP 6000

Note

Before using this information and the product it supports, be sure to read and understand the safety information and the safety instructions, which are available at the following address:

http://thinksystem.lenovofiles.com/help/topic/safety_documentation/pdf_files.html

In addition, be sure that you are familiar with the terms and conditions of the Lenovo warranty for your solution, which can be found at the following address:

<http://datacentersupport.lenovo.com/warrantylookup>

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Clone and attach a vDisk

The clone and attach vDisk feature in ThinkAgile CP enables IT administrators to support data protection and availability use cases directly within ThinkAgile CP, all from a single golden copy of your production data.

There are countless situations in which it is useful to create copies of your production data: to perform tasks such as malware analysis, application development and testing (dev/test), user acceptance testing (UAT), analytics, data protection, archiving and provisioning of new instances. It is not uncommon to see 7-10 copies of production data in enterprises today. Unfortunately, traditional copies do not come for free. They consume significant storage, server and network resources, and valuable administrator time and energy. As a result, many IT shops make do with fewer, and less up-to-date copies than they really need. The problem is so significant that entire companies have been created to attack this problem of copy data management.

Within ThinkAgile CP, application-consistent clones can be created in seconds, are space efficient and available for quick access while also being deduplicated and compressed for backup or long-term retention. Clones allow you to access a single, point-in-time copy of your primary data. The clone and attach function allows that copy to be attached immediately to a new application instance that needs that copy.

For instructions on how to clone and attach a vDisk in the ThinkAgile CP Cloud Controller, see the following topic:

[Clone and attach a vDisk](#)

Understanding Clone Operation Benefits

Cloning provides several benefits.

- **Runs fast** - Unlike today's large, multi-TB drive copies, which can take many minutes or hours to complete, the ThinkAgile CP Clone and Attach technology allows even the largest disks to be cloned in a matter of seconds.
- **Reduces costs** - A clone uses a small amount of space for metadata, and then only consumes additional space as data is changed or added. As a result, the ThinkAgile CP Clone and Attach feature can cut the storage you need for dev/test or virtual environments by 50% or more.
- **Supports business continuity** - ThinkAgile CP Clone and Attach makes it possible to clone and fully test your DR processes, or use your DR environment for dev/test without interfering with ongoing replication. You simply clone your DR copies and do dev/test on the clones.
- **Improves quality of dev/test** - Make as many copies of your full production data as you need. If there are 20 users, give each user their own clone if you wish. If a test corrupts the data, start again in seconds. Developers and test engineers spend less time waiting for access to datasets and more time doing productive work.
- **Accelerates server and virtual desktop provisioning** - Deploy tens or hundreds of new instances in minutes with only a small incremental increase in storage directly from our application templates.

An important use case for clones is malware analysis in a VDI environment. By using the ThinkAgile CP API, active instances' disks can be cloned and attached to an instance with malware software installed that does scanning for vulnerabilities. The clone can then be deleted. This is accomplished during normal business operations and without disrupting the production instance.

How cloning and attaching a vDisk works in ThinkAgile CP

Disk clones have all of the capabilities of any other disk, including the ability to be resized, to be deduplicated and compressed, to be the source of a backup, or to be cloned. The technology that makes this all possible is integral to how ThinkAgile CP manages storage.

- Backups simply make a copy of the metadata associated with a disk. As data is changed in the base disk, the original blocks stay associated with the backup rather than getting marked for reuse. All metadata updates that occur are just pointer changes, so they are very fast. The backups are immutable; a clone is simply a backup that is writable.
- You can think of a disk clone as a transparent, writable layer in front of a backup. Because a disk clone is writable, it needs disk space to store data that is written to the clone. A backup simply links to existing data that was overwritten in the base disk; a clone stores the data written to it on disk and then links to the new data as well. The disk space associated with the backup and the clone is accounted for separately from the data in the base disk.

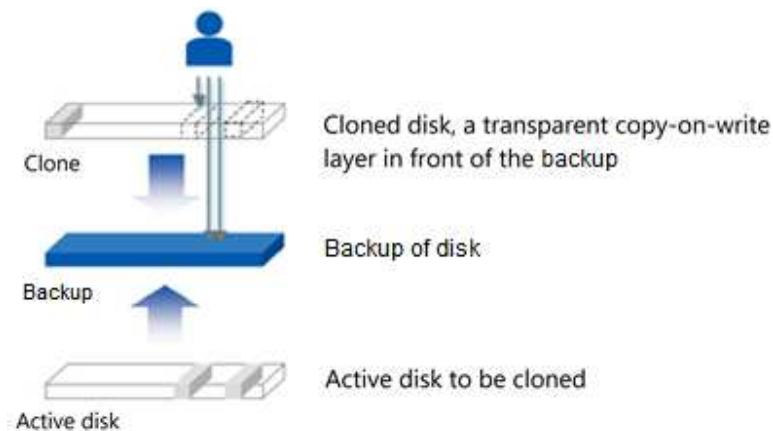


Figure 1. How cloning and attaching a vDisk works in ThinkAgile CP

- When a disk clone is created, it requires an application-consistent backup of the disk to use as a base. The disk clone gets a copy of the backup metadata and then updates its metadata as the disk clone is created. Creating the clone takes just a few seconds because the copied metadata is very small compared to the actual data. All changes to the disk clone are copy-on-write operations and contain only the changed blocks.
- The original active disk can change independently of the disk clone because the clone is based on the contents of its base backup. Because backups are read-only, they can be reused as the base for multiple disk clones. Space is used very efficiently because the only new disk space used is associated either with the small amounts of metadata and/or unique writes to the disk clone.

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