Claims

1. A method for upgrading a virtualization component, comprising:

   determining a target virtualization component, the target virtualization component being a virtualization component to be upgraded in a virtual machine monitor running on a physical machine;

   saving state information of a virtualized instance running on the physical machine, the virtualized instance being created by the virtual machine monitor;

   performing an uninstallation operation on the target virtualization component that is not upgraded, and reinstalling and loading the target virtualization component that is upgraded; and

   restoring the state of the virtualized instance based on the state information of the virtualized instance.

2. The method according to claim 1, wherein saving the state information of the virtualized instance running on the physical machine comprises:

   collecting state data of the virtualized instance, and saving the state data to a specified file; and

   retaining, in place, target memory data in a target memory space of the virtualized instance.

3. The method according to claim 2, wherein the target memory space comprises a system memory space, and the target memory data comprises first memory data stored in the system memory space in a file form; and

   retaining, in place, the target memory data in the target memory space of the virtualized instance comprises: retaining the first memory data in place in a file sharing manner.

4. The method according to claim 3, wherein retaining the first memory data in place in the file sharing manner comprises:

   storing the first memory data to a memory mapping file in the system memory space when storing the first memory data, and keeping the memory mapping file from being released during upgrade of the target virtualization component, to implement retaining of the first memory data in place; the memory mapping file being a memory mapping of a target persistent file used by the virtualized instance, and the target persistent file being used for persistently storing data in the memory mapping file;

or

invoking a memory file system to store the first memory data to the system memory space in a memory file form when storing the first memory data, and keeping the memory file from being released during upgrade of the target virtualization component, to implement retaining of the first memory data in place.

5. The method according to claim 2, wherein the target memory space comprises a peripheral memory space, and the peripheral memory space is a memory space on a target physical peripheral device used by the virtualized instance; the target memory data comprises second memory data stored in the peripheral memory space; and

retaining, in place, the target memory data in the target memory space of the virtualized instance comprises:

when the target virtualization component comprises a driver of the target physical peripheral device, prohibiting performing a rewrite operation on the peripheral memory space when the driver is uninstalled; and

prohibiting performing an initialization operation on the peripheral memory space when the driver that is upgraded is reloaded.

6. The method according to claim 5, wherein before uninstalling the driver, the method further comprises:

enabling a memory retention function of the driver by using an interface externally exposed by the driver; and the memory retention function comprises skipping performing the rewrite operation on the peripheral memory space in an uninstallation process and skipping performing the initialization operation on the peripheral memory space in a loading process;

wherein the driver that is upgraded enables the memory retention function by default.

7. The method according to claim 2, wherein restoring the state of the virtualized instance based on the state information of the virtualized instance comprises:

recreating the virtualized instance based on a resource file corresponding to the virtualized instance, the virtualized instance reusing a unique identifier before restoration;

reallocating the target memory space to the virtualized instance based on the unique identifier; and

restoring, based on the state data in the specified file, the virtualized instance to a running state during state saving.

8. The method according to any one of claims 1 to 7, wherein before performing the uninstall operation on the target virtualization component, the method further comprises:

optimizing an uninstallation process, an installation process, a loading process, or an initialization process of a driver when the target virtualization component comprises the driver of a target physical peripheral device used by the virtualized instance.

9. A physical machine, comprising: hardware resources, wherein a virtual machine monitor, a virtualized instance, and an upgrade program run on the hardware resources; and the virtual machine monitor comprises a plurality of virtualization components, configured to virtualize the hardware resources, and create and manage the virtualized instance;

wherein the upgrade program is configured to: determine a target virtualization component to be upgraded in the plurality of virtualization components; save state information of the virtualized instance; perform an uninstallation operation on the target virtualization component that is not upgraded, and reinstall and load the target virtualization component that is upgraded; and restore the state of the virtualized instance based on the state information of the virtualized instance.

10. The physical machine according to claim 9, wherein the plurality of virtualization components comprise a first virtualization component in a user mode and a second virtualization component in a kernel mode; the target virtualization component comprises at least one of the first virtualization component or the second virtualization component; and

the upgrade program is configured to: invoke the first virtualization component to save the state information of the virtualized instance; and

invoke the first virtualization component when the target virtualization component does not comprise the first virtualization component, to restore the state of the virtualized instance based on the state information of the virtualized instance;

invoke the first virtualization component that is upgraded when the target virtualization component comprises the first virtualization component, to restore the state of the virtualized instance based on the state information of the virtualized instance.

11. A method for saving a state of a virtualized instance, comprising:

collecting state data of a virtualized instance in response to a state saving operation on the virtualized instance, and saving the state data to a specified file;

wherein the virtualized instance corresponds to a target memory space, the target memory space comprises a system memory space, and first memory data generated by the virtualized instance is stored in the system memory space in a file form; and

retaining the first memory data in place in a file sharing manner before the virtualized instance is restored.

12. The method according to claim 11, wherein retaining the first memory data in place in the file sharing manner comprises:

storing the first memory data to a memory mapping file in the system memory space when storing the first memory data, and keeping the memory mapping file from being released during upgrade of the target virtualization component, to implement retaining of the first memory data in place; the memory mapping file being a memory mapping of a target persistent file used by the virtualized instance, and the target persistent file being used for persistently storing data in the memory mapping file;

or

invoking a memory file system to store the first memory data to the system memory space in a memory file form when storing the first memory data, and keeping the memory file from being released during upgrade of the target virtualization component, to implement retaining of the first memory data in place.

13. The method according to claims 11 or 12, wherein the target memory space further comprises a peripheral memory space, the peripheral memory space is a memory space on a target physical peripheral device used by the virtualized instance, and the peripheral memory space stores second memory data generated in a process in which the virtualized instance uses the target physical peripheral device; and the method further comprises:

prohibiting performing a rewrite operation on the peripheral memory space when a driver of the target physical peripheral device is uninstalled; and prohibiting performing an initialization operation on the peripheral memory space when the driver is reloaded, to implement retaining of the second memory data in place.

14. A physical machine, comprising hardware resources, wherein the hardware resources comprise a memory and a processor, the memory stores a computer program, and the

processor is coupled with the memory and configured to execute the computer program, to implement the steps of the method as claimed in any one of claims 1 to 8 and claims 11 to 13.

15. A computer-readable storage medium storing a computer program, the computer program, when executed by a processor, causing the processor to implement the steps of the method as claimed in any one of claims 1 to 8 and claims 11 to 13.