

Using The Rembo Wizard for Windows 2000 Cloning

Problem description

The organization has been delivered a batch of PC computers, in this example twenty PCI-bus computers manufactured by ICS. The system is delivered with a Windows 2000 Professional license, and all systems are delivered pre-installed. The task is to install few of these machines for the development team, which will prepare a reference system. The reference system is then to be cloned in the process control system with the rest of the batch.

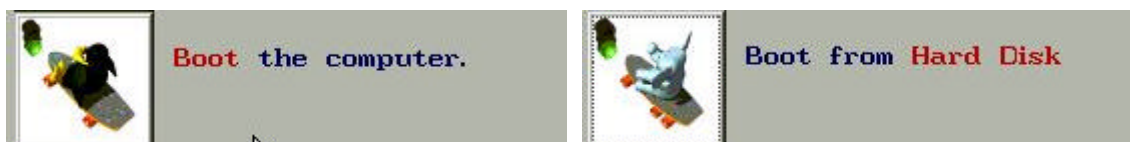
Task description

The task is similar to the cloning based installation of the office computers, only that an independent development team prepares the reference installation and that we can use group level cloning techniques instead of host level cloning (in this particular control system, the systems will be placed on a dedicated 100 Mbit/s, switched Ethernet).

Declare the reference system on DHCP Server and on Rembo Server



When the reference system boots with The Rembo Wizard, you would need to give initial configuration. In this example, the System Type is "IPC" and the OS Type is "W2K" for Windows 2000. It is to be noted also that the system is located in a 100 Mbit/s, switched Ethernet segment with a 1 GB backbone. Therefore the network protocol is Unicast and we use the transfer speed setting of max. 20 Mbit/s. In the final production system we will use Multicast, transfer speed remaining at max. 20 Mbit/s. Now boot the original installation from the hard disk



Configure the Windows 2000 installation into your organization's standards

Your organization may have some generic setup rules for the basic installation, additional software to install and so on. Most important of all, make sure that the TCP/IP identity of the machine is configured for DHCP. If your organization's rules do not allow this, too bad for you - group level cloning cannot be used.

Analyze the partition table of the actual installation

As with most manufacturers, the reference system is delivered on a one single "C:" partition that uses the entire 20 GB IDE disk. Nothing wrong with this but

- The Rembo Wizard is designed to back up only the first partition
- The Rembo Wizard is intended to be used only for system level backups
- If the user data is all installed on the first, "C:" partition it will be included in the backups taken with The Rembo Wizard. This will make it impossible to use the image together with The Rembo Wizard for cloning based installation. Also it would increase the time needed for the backups and the disk size requirements on the Rembo Server.

Therefore we plan to divide the existing installation to a 4 GB "C:" partition and to a 14 GB "E:" partition. This would leave about 2 GB at the end of the disk for the future, production installations,

where we will use Multicast transfer protocol, requiring a disk cache space.

Uncompress and decrypt all the files of the original installation

The OEM installed Windows 2000 in our example is installed on a NTFS partition. The installation contains a quite a few compressed files and probably some files that are encrypted. Rembo Toolkit is not capable to access these files. Therefore all files in the system should be uncompressed and decrypted before taking the initial backup with The Rembo Wizard. Open a console window with a prompt and give following commands.

```
cd \
compact /u /a/ s/ /i
cipher /d /a /i /f /h /s:C\
exit
```

Make also sure that all the temporary directories are empty, Internet temporary files are removed and that the recycle bin is empty (use administration cleaning tools). Make sure that before you reboot the system, all the windows - such as Explorer - are closed and that all user tasks are stopped.

Take the base image of the reference installation

Reboot the Windows 2000 and when stop The Rembo Wizard's automatic hard disk booting by pressing



Supposedly there is no base images yet to the new system, so the first image taken will be the base image. Put the image on the **group** level.

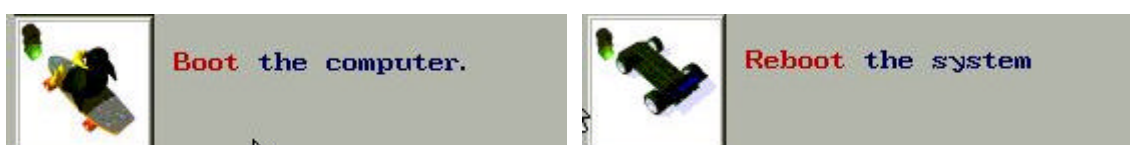
Replace the target system with an other machine from the batch

As a precaution, when more than one type of target machines is available it is better to test the base image on an other machine of the batch. This will leave us an opportunity to make adjustments on the base image and take differential images from the references system with added features.

Repartition the hard disk

WARNING: From this point on, there is no return! As an experienced system administrator you certainly do understand the potential risks of the following procedure which erases all the information from the disk.

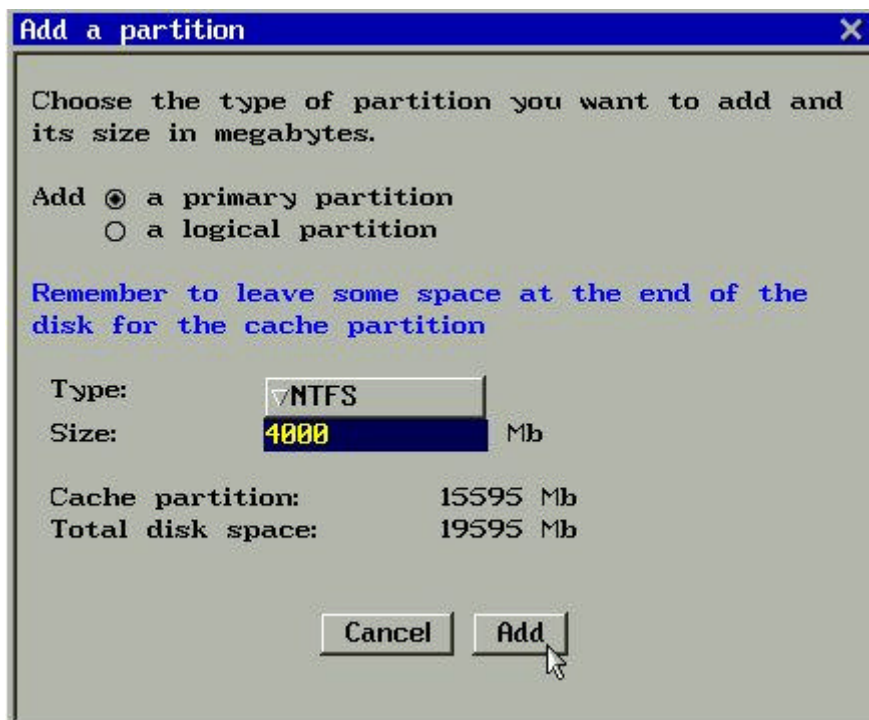
It is good idea now to reboot the computer. Since we are going to change the partition table of the system it is better to make sure that there is no open file handles hanging around in the Rembo OS. Otherwise an error message like **An error was encountered: Resource busy (disk://0:1/)** would appear somewhere on the line.



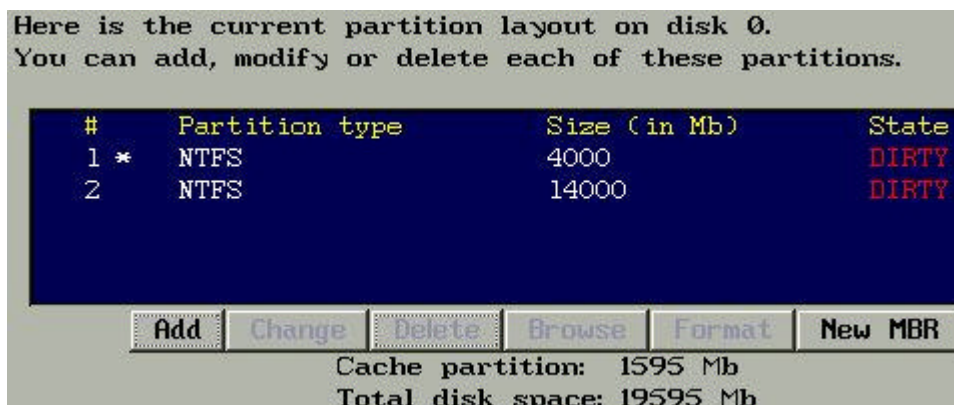
Once booting, stop The Rembo Wizard's automatic hard disk booting and start the Rembo Toolkit's partition manager by pressing



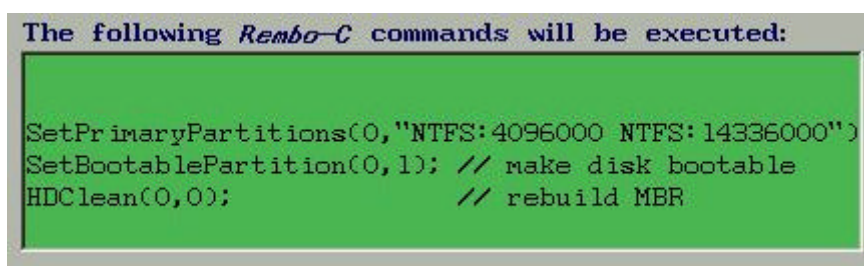
As you can see, the entire 20 GB disk of our example is allocated as "C:". Click on the partition line to select it and press *Delete* button. Use the *Add* button to create a new partition table. Note that all partitions will be primary partitions on the first partition table of the disk. Do not use logical partitions.



Below is the resulting partition table.



Press now the *Commit* button on the Rembo Toolkit's partition manager to write the partition table on the disk. It will show us what commands you could have given yourself in the Interact-window. It is noteworthy to observe that also the master boot record will be cleaned in the process. Press *Do It!*



Click on *Done* to leave the Rembo Toolkit's partition manager. You can then revisit the partition manager in order to see what are the **actual** sizes of each partition; depending of the disk geometry and cluster size, it is rather rare to see that you can get exactly the values in MB that you have requested.

Register the new partition table signature

We have changed the partition table of the cloned system but not the partition table of the reference system. In order to register on the Rembo Server what we have done with the partition table, we will register the new partition table signature into the *autoload*-file of the host.

Make your way back to The Rembo Wizard's main menu and re-enter the configuration of the host.



You may see the following type of warning message if the reference system's partition table has been registered as the partition table signature for this host. Answer *Yes* to register the new partition table signature.



In the following configuration dialog, do not forget to press *OK* to store the new partition table signature into the *autoload*-file of the host.

What this operation is good for ? You can store the *autoload*-file of this host for **cloning** purposes. For each new host that you install, create the MAC-address named directory in the host scope of the Rembo Server's file system. Then copy the new, reference *autoload*-file into that directory. Now you would

- Edit the *autoload* file and set the *Unattended* installation flag *true*.
- Start the new system, and the system gets installed automatically. You do not even need to connect screen, mouse or keyboard if you like.
- Edit the *autoload* file and set the *Unattended* installation flag *false*.

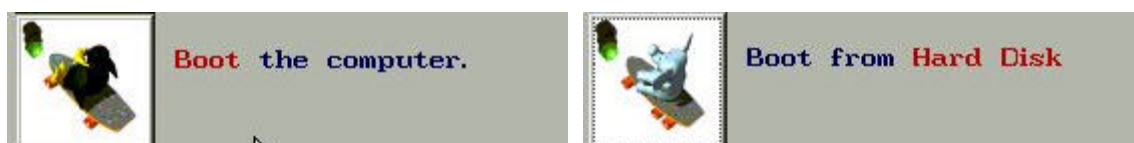
Install the system from the reference image

From The Rembo Wizard's main menu, select



and restore the reference system on the new "C:" partition.

Boot the system and format the data partition



The Rembo Wizard does not operate but with the system partition. The new, second (data) partition will sure get the drive letter "E:" allocated when the system boots, but the partition is not formatted. Start the Computer Management, Storage, Disk Management. The resulting disk partitioning as seen by Windows 2000 is illustrated below, showing also the reserved disk space for the optional Rembo OS' multicast operations disk cache.



Right click on the "E:" to format the new data partition for NTFS.

Create a new base image

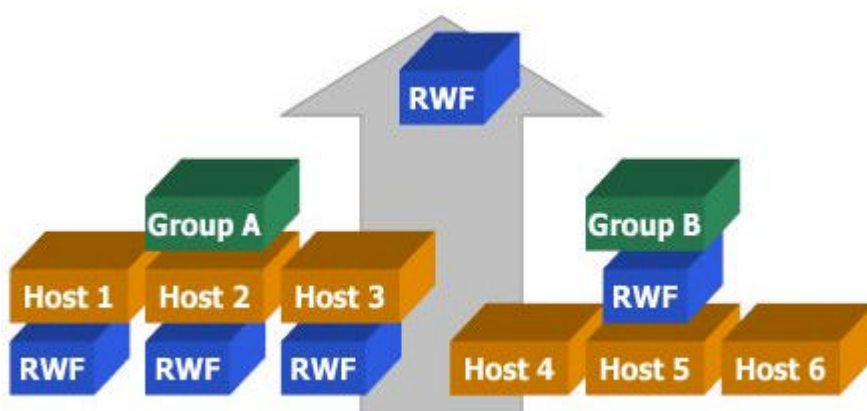
You would probably make some other adjustments in the system, related to the new data partition and its usage. Anyway, it is good idea to take a new base image from the system with the new partition active.



You would take an Administrative backup, overwriting the old, single partition system's base image. Make sure that you have the original base image on a safe place before destroying the old image from the server.

Optionally copy the base images for individual hosts

Take a moment to consider what will be the target group's architecture. Are all hosts different as in Group A of below example, or all hosts identical as in Group B?



Group A: Copy the base image in the host scope of each installed system - *MAC-address/hdimages*

Group B: Copy the base image in the group scope of each installed group - *group-name/hdimages*

Remember to keep the base image and the *autoload*-file (with the partition table signature) in a safe place, other than the Rembo Server's file system. Download it on a DVD-RAM disk, for example.

12 Mar 2002