Backing up Parallels® Virtual Machines with BRU Server™

One important aspect to Parallels Virtual Machines is that there are two access points for backup and restore. At the host or server level, the BRU Server Agent has access to all of the guest OSes at the image level, while within the guest OSes, the BRU Server Agent can access the data on a true file-by-file basis. This document will describe the best policy to insure that both daily file-based backup and restore as well as image-based disaster recovery backups are performed successfully.
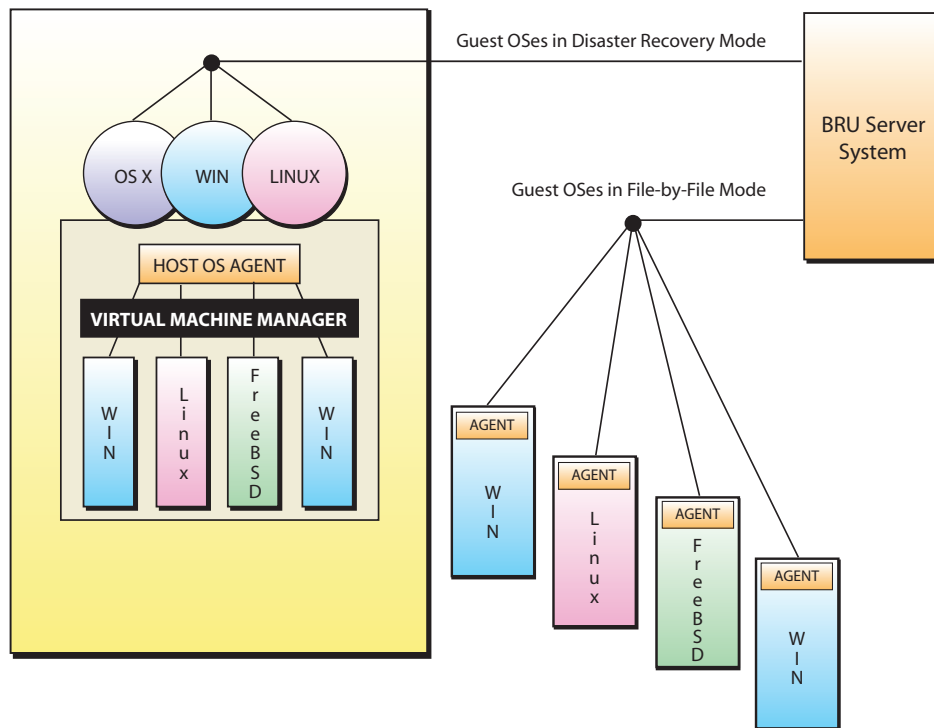
Guest Images vs. File-by-File Relationships

Guest OS Disaster Recovery Backup
As a starting point, the Parallels VM administrator should create and configure their guest OSes by installing each OS with its base components and any important applications - including the BRU Server Agent. Once the guest OSes are properly configured and ready to be placed into operation, an image backup of each VM should be performed. To accomplish this, the following steps are recommended:

Make sure that the BRU Server agent is installed and authenticated within the host, or server OS (this system counts as one client system of your BRU Server license count)

For each guest OS being deployed
1. Create and populate the guest OS with all configurations and applications (be sure to install and configure the BRU Server agent for each - each guest OS counts as one client system of your BRU Server client count)
2. Be sure to specify Bridged Networking (instead of Shared/NAT)
3. Complete the initialization of the guest OS and shut it down

Once completed, you will be using the number of guest OS VMs plus 1 as your total client count for the host system, therefore a host server with 6 guest OS VMs installed would use 7 BRU Server client license slots.

Within BRU Server
1. As the admin user, create a new user (e.g.: pvmimages).
2. If using tape, create a new Destination (e.g.: Parallels Virtual Machines), set it's default Overwrite setting to "Append" and load new tapes (WORM media is recommended if available for your tape technology).
3. Log out and log back in to BRU Server as the new user (pvmimages)
4. Create a separate job for each guest OS image (if using tape, assigned to the new destination (Parallels Virtual Machines) - with the Overwrite setting set to append).
5. Run each job.
6. Remove the tapes used by the backup process and store them.
7. It's also a good idea to create a second copy of these tapes by running the backups again.

If you are only backing up to disk stage, because you will be performing the backups as the new user (pvmimages), any backups written to your stage volume will be written into a subfolder named "pvmimages" rather than the default folder of "admin". This will also make it possible to use the symbolic link procedure defined in the TOLIS Group knowledgebase article at:

http://knowledgebase.tolisgroup.com/?View=entry&EntryID=62

Additionally, it means that if you are also using tape for other parts of your BRU Server backup scenarios, you can elect to skip upstaging your virtual machine guest backups.

You would then repeat steps 1 through 3 in creating the guest OS and steps 4 through 7 within BRU Server for each new guest OS that you add to the host system.

The result of this scheme is that each guest OS image will be a separate archive on tape or within the disk stage, thus simplifying the restore of a single guest OS in an emergency. Plus if you're using tape and can use WORM media, the archive images of these guest OS backups cannot be overwritten by mistake. By simply restoring the crashed guest image, you can return that OS to the state it was in at the point of initialization.

Finally, by repeating these steps on a quarterly basis, you can restore a guest OS to within 3 months of a crash, restart the guest OS and then simply restore the intervening incremental file by file backups (described below).

Parallels Guest OS Daily File By File Backups
Once you have your Parallels guest OS VM images backed up, BRU Server can be configured to perform backups of each guest OS VM's contents via the BRU Server agent that was installed as part of the OS initialization. When you view your BRU Server environment within the BRU Server Console, each of your guest OS VMs will be visible as a separate system within BRU Server.

With the guest OS VMs online and operational, you would generate backup jobs for the guest OSes using these basic guidelines:

Within BRU Server;
1. Log in to BRU Server as admin and create a new user (e.g.: pvmfiles)
2. If using disk stage for these backups, be sure to set the new user's Max Stage Age to an appropriate value.
3. If using tape, create a new destination "Parallels VM File by File" setting the default overwrite action to Append - use normal tapes for this destination.
4. Log out and log back in to BRU Server as the new user (pvmfiles).
5. Create a job or jobs for each of the guest OSes just as you would for normal systems.

If using tape, assign the destination to the new destination created above.

For disk stage, as with the image backlups above, the archives will be written to a new subfolder named "pvmfiles". As before, you may take advantage of the steps outlined in the knowledgebase article to store these backups on a different set of disks.

The proper use of incremental backups will allow you to insure that modifications on the guest systems are backed up while unchanged files are not backed up except for the first full operation or in the event that they've changed. This effectively creates the "Deduplication" of your backups that is being so loudly proclaimed by other backup vendors as a new feature - BRU Server's incremental operation means that no special software or settings are required.

By following these steps, BRU Server will provide a very reliable mechanism for providing both file by file and disaster recovery backups of your Parallels virtual machine guest OSes, regardless of the guest OS platform.

For more information about BRU Server and other Virtual Machine implementations, please see our white paper Virtual Machines and BRU.