

How does PITR works (Backup mechanism explained)

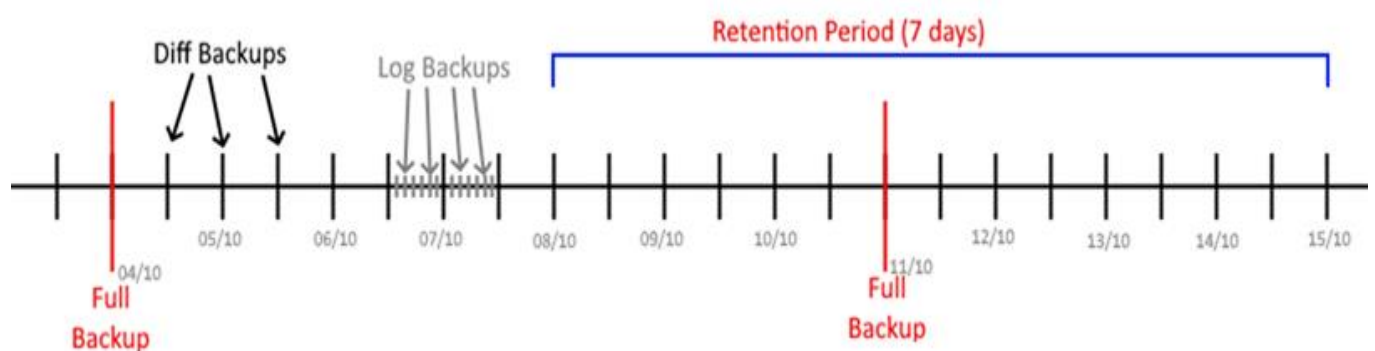
Last updated by | Diego Rodriguez Sanchez | Apr 6, 2021 at 2:48 PM PDT

PITR for SBS vs PFS training can be accessed from [here](#) 

PITR Explained

Azure manage the execution of backups as well has keeping them so we can execute a restore at any point in time inside the retention period we specify for our instance.

Azure will execute a full backup every week, a differential backup twice a day and a log backup every 5 minutes.



On the image above we can see that we have:

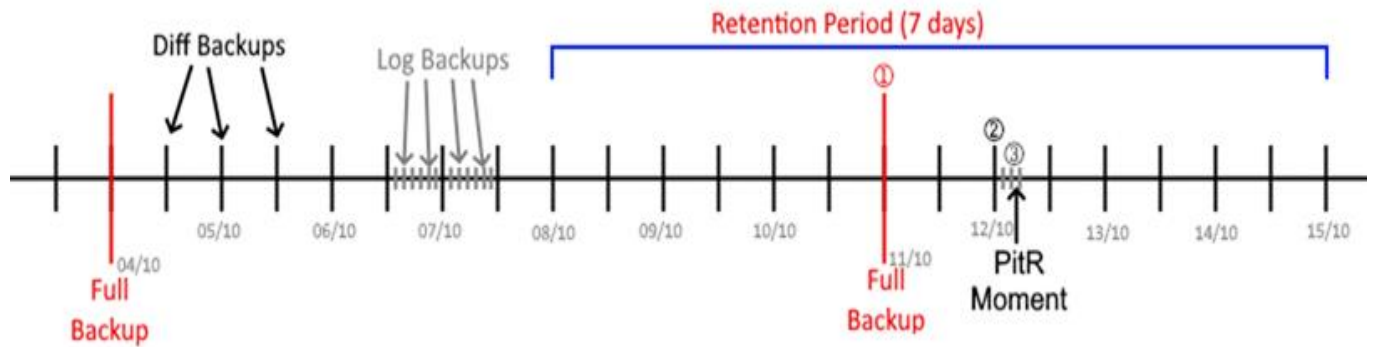
- a retention period that goes from 15 of October to 08 of October (7 days)
- Full backup on 04 of October and 11 of October
- Differential backups twice a day
- A several log backups, the image doesn't have all the log backups to make it smaller and easier to view.

More detailed information here: <https://docs.microsoft.com/en-us/azure/mysql/concepts-backup>

Types of backup:

- **Full backup:** A full database backup backs up the whole database
- **Differential backup:** A differential backup is based on the most recent, previous full data backup. A differential backup captures only the data that has changed since that full backup.
- **Log backup:** A log backup committed transactions since the most recent previous full\differential\log backup.

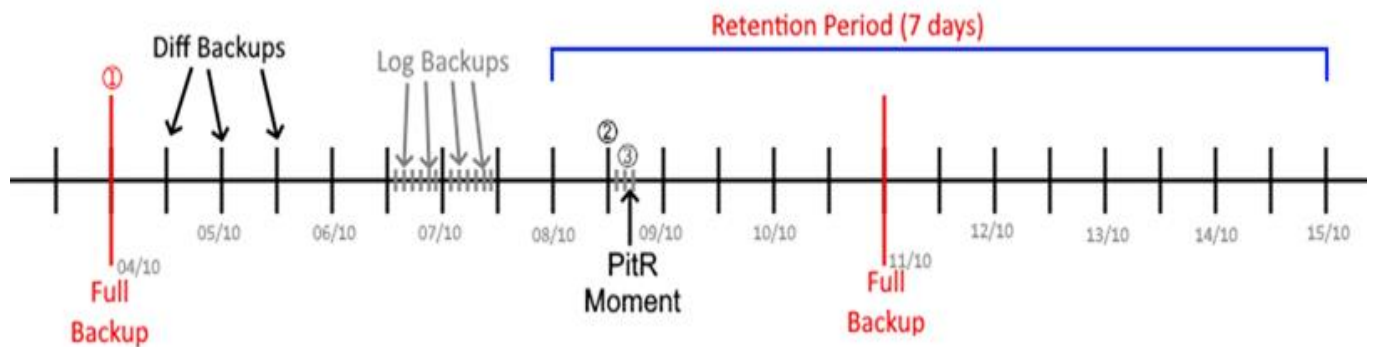
Now if we want to do a Point In Time Restore to 12 of October at 11:00



Azure would need to:

1. Restore the full backup from 11 of October as it's the first previous full backup from the moment we want to have a restored version of our instance.
2. Restore the first differential backup from 12 of October as it's the first previous differential backup from the moment we want to have a restored version of our instance.
3. Restore the log backups, since the differential backup restored, until the point in time restore we selected. After this steps we will have a new instance restored at the moment in time we selected.

This second example we select a moment in time later in the past, 08 of October at 18:00, but still inside the retention period.



Azure would need to:

4. Restore the full backup from **04 of October** as it's the first previous full backup from the moment we want to have a restored version of our instance.
5. Restore the second differential backup from 08 of October as it's the first previous differential backup from the moment we want to have a restored version of our instance.
6. Restore the log backups, since the differential backup restored, until the point in time restore we selected. After this steps we will have a new instance restored at the moment in time we selected.

As you can see from the explanation from example 2 we need to keep backups for more time than just the retention period so we can restore to any point in time inside the retention period. This requires that besides keeping the backups from the retention period we must also keep previous backups, up to 7 days. This happens independent of having a 7 day retention period or a 35 days as we need the backups that were done and are now outside of the retention period.

For a specific case I've worked.

The Product Group said that every log backup was taking 500Mb.

As we know that every log backup is done every 5 minutes we have 12 backups per hour, making 288 log backups per day.

As we must keep up to 14 days of backups we end up with $(288 \text{ log backups} \times 14 \text{ days} \times 500\text{Mb}) = 2\,016\,000\text{Mb}$
So we have around 2Tb of backup storage just for the log backups, if we include the space for all the differential backups and full backups we end up with around the 4Tb you see on your graph.

Therefore the graph of the Backup Storage Used customer see this shape. When the system don't need the older backups they are removed releasing the space but as soon as new backups are executed again the storage size start to increase again.

onsight-mysql-01, Backup Storage used, Avg



How good have you found this content?

