Secure Coding

Project

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Backup strategies

Backups are really important for multiple reasons. They help in cases of disasters such as hardware failures, errors or cyber attacks. With that in mind preventing the data to be lost in such events acts for the business continuity. Business can keep their operations running even with data “loss”.
Moreover there can be compliance regulations meaning organisations may be required by law to maintain backups. Following that idea is versioning. Keeping a history can be useful for the company and their clients in case of user errors for instance.

They are plenty of backup strategies for databases.

1. Full backup: This involves to do a full backup of your database including your schemas. This represents the most complete strategy with a guaranty to get everything back.
   Pros: A full backup strategy is easy to put in place and provides every bit of data you need. When restoring you only need to backup one file as it contains everything.
   Cons: Restoring a full backup takes a lot of time. You want to have other backups as you won’t run a full backup that often.

2. Incremental backup: The first is considered as a full backup. But after the first one you only backup the changes since the previous one -.
   Pros: this strategy is faster than the full backup because it only saves the data since the last one. With smaller backups in size it requires less storage.
   Cons: When restoring your data you need to use several backups. It is harder to put in place because the backups must be applied in the correct order.

3. Differential backup: This strategy only backs up the changed data since the last full backup.
It has the same pros and cons as incremental backups except the only difference is the frequency with which you realise full backups.

4. Snapshot backups: This method is really quick as it only takes an “image” of your data at a point in time by saving the metadata of changes in the database.
Pros: It is quick to perform and it can capture the data changes occurring during a backup process.
Cons: Sometimes data change too quickly to be captured by a snapshot.

5. Online backup: This strategy allows to back up data while the database is running and used. Achieving that is more complex than the other strategies mentioned before.
Pros: It achieves continuous data protection with 0 downtime as the database never stops running. This allows you to automate your backups.
Cons: As written above it is quite difficult to reach such a setup. It also requires special software.

6. Offline backup: This strategy can be done only if the database is made inaccessible by taking the database offline.
Pros: It provides a complete backup of your database as it is not accessed.
Cons: You end up with big downtime.

7. Mirror backup: This strategy uses a second database in production that is updated in real-time. When changing data you apply those changes to both databases.
Pros: This backup is highly available and you can switch databases if needed.
Cons: It is costly to perform and maintain.

It exists other types of database backup strategies in terms of locations. Cloud based - offsite, hybrid based - onsite and offsite.

Backup best practices

No matter the strategy you are going to use, there are multiple best practices you should apply to have a successful backup strategy.

1. Regular & frequent backups — create a backup schedule: You can do so by finding out how much data change in a given time and what are the constraints of your business. Find the ideal frequency to balance between performance and protection.

2. Use multiple strategies: “3-2-1 rule. It means making 3 copies of data and storing the backup copies on 2 different devices/platforms, one of which should be offsite storage.” For instance do not rely only on full backups.

3. Prioritise offsite backups: It helps you prevent data loss in case of a failure or a disaster. No physical damage.

4. Encrypt your backup data: It adds a layer of security needed nowadays. If a copy is leaked this should protect it from data theft and corruption.

5. Perform regular tests: Make sure your backups are not corrupted and that they can be restored. A corrupted one is of no use.

6. Automate your backups: Do so whenever you can to always have the needed data in case of failures.

7. Review your strategy: Juste make sure your strategy is still the right one for you and that it performs as expected or meet your business' requirements.

8. Document your strategy: To keep you organise you need to document as much as possible your strategy. Write your backup schedules, locations & procedures.