

Managed IT Solutions

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Designing a Recovery Strategy

Or, Backups are Only Good if You Can Restore Them

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About Me

- 15 years in IT, 7 as a SQL Server DBA
- Fan of all things internal
- President of the Chicago SQL Server User Group
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Where This Started

Recovery Strategy <> Backup Strategy

“You need to design a restore strategy, not a backup strategy.”

- Paul Randal

Backups 101

Full Backup

- Backs up the entire database
- Available in FULL and SIMPLE recovery model

Full Backup

Sunday
The Whole Shebang

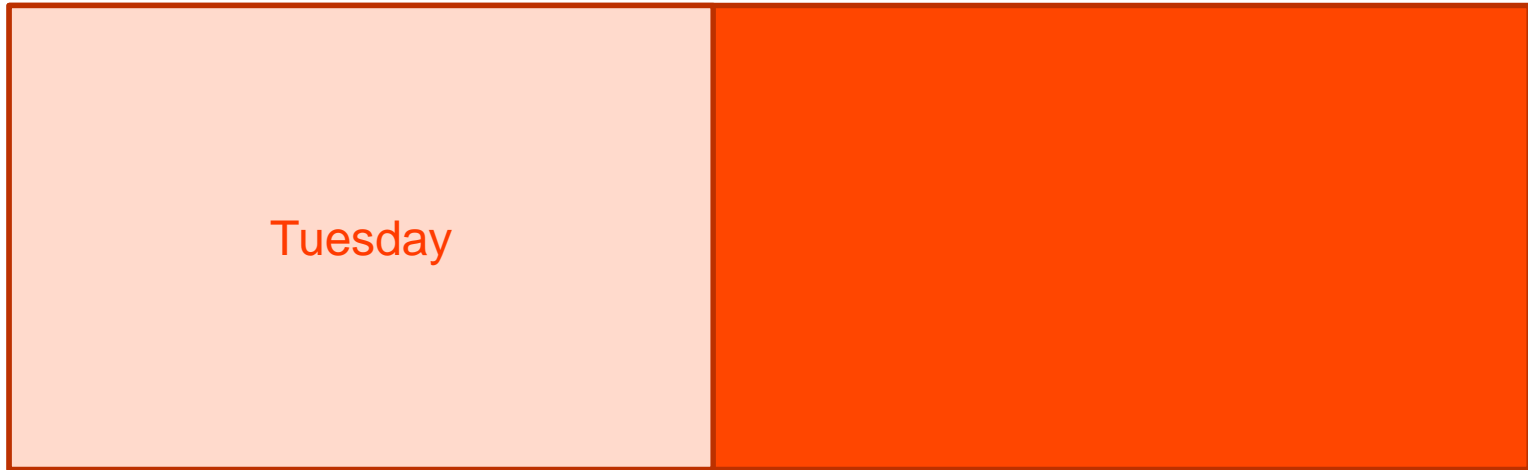
Differential Backup

- Available in FULL and SIMPLE recovery model
- Backs up changes since the last full backup
- Cumulative

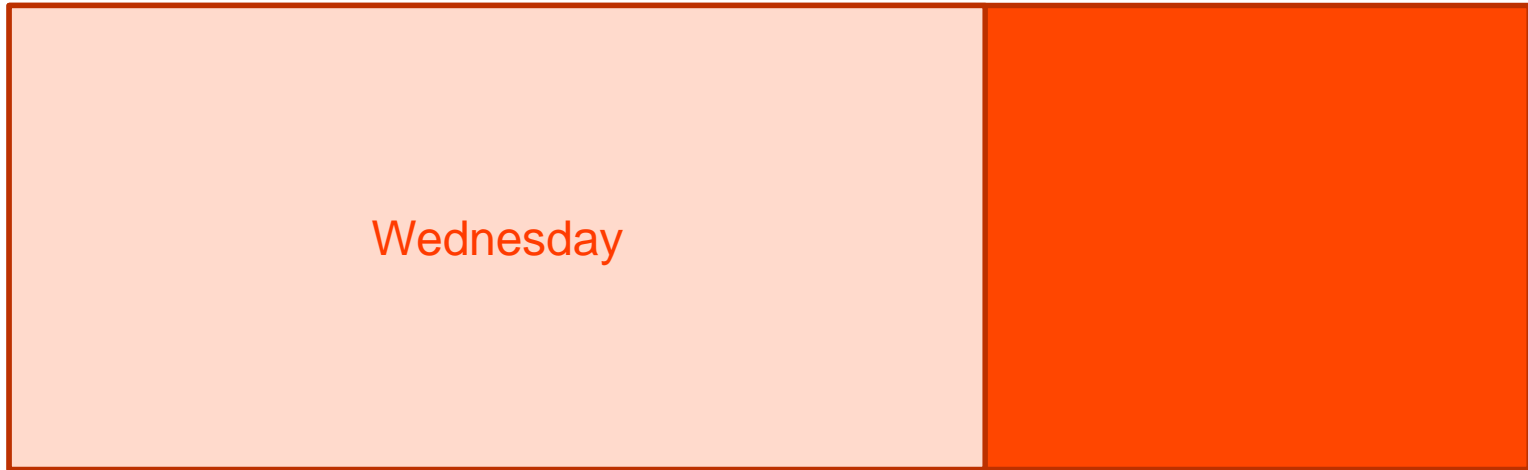
Differential Backup



Differential Backup



Differential Backup



Log Backup

- FULL recovery model only
- Backs up active transaction log records not previously backed up

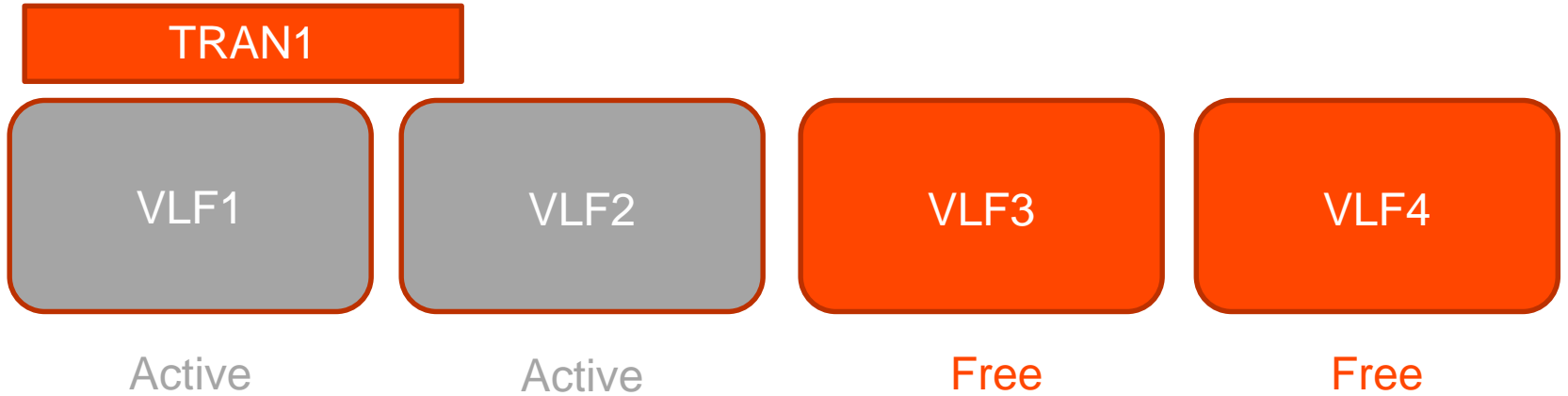
Transaction Log Architecture

- Transaction log is made up of virtual log files (VLF)
- A VLF can be reused if none of its log records are needed
- VLFs are free or active
- A transaction log always needs one active VLF

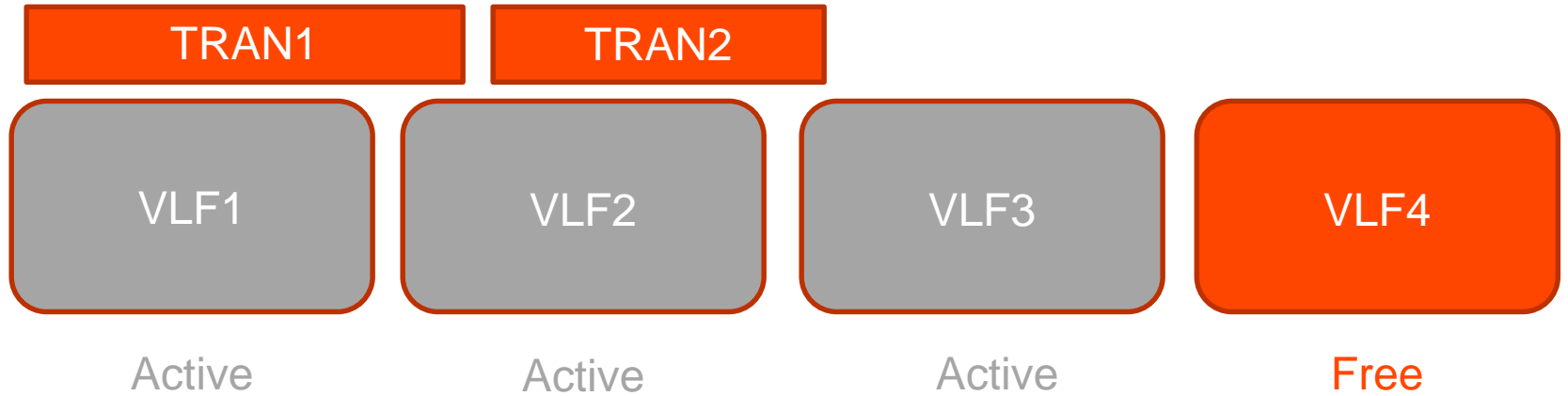
Transaction Log



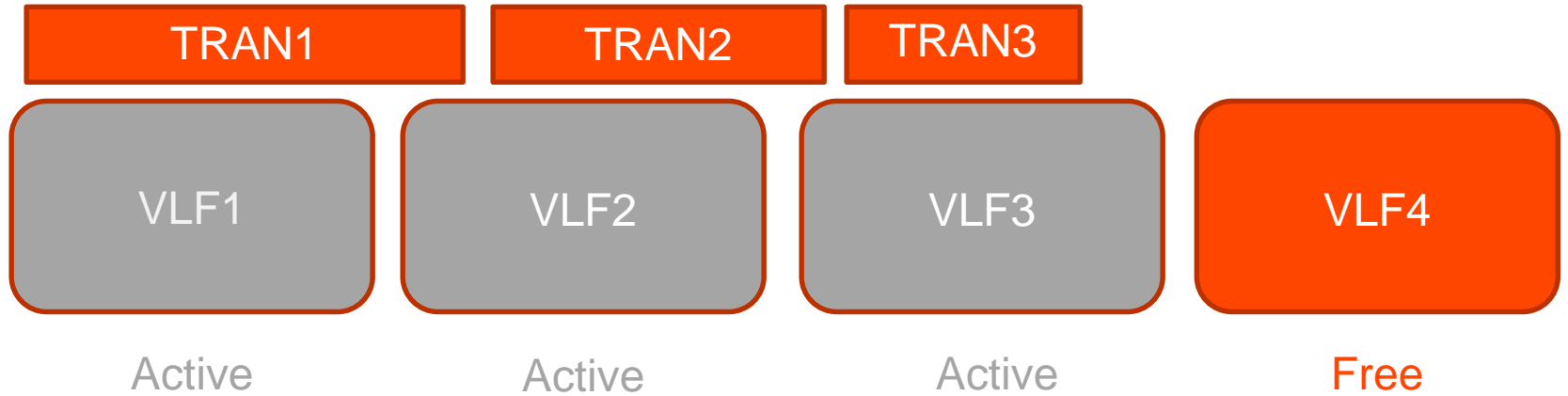
Transaction Log



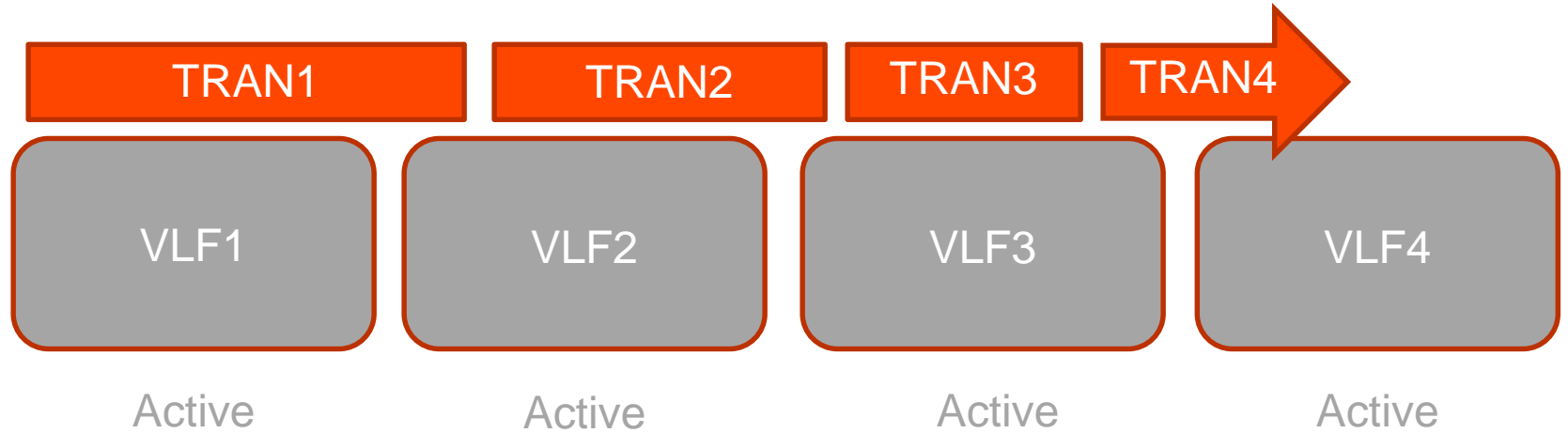
Transaction Log



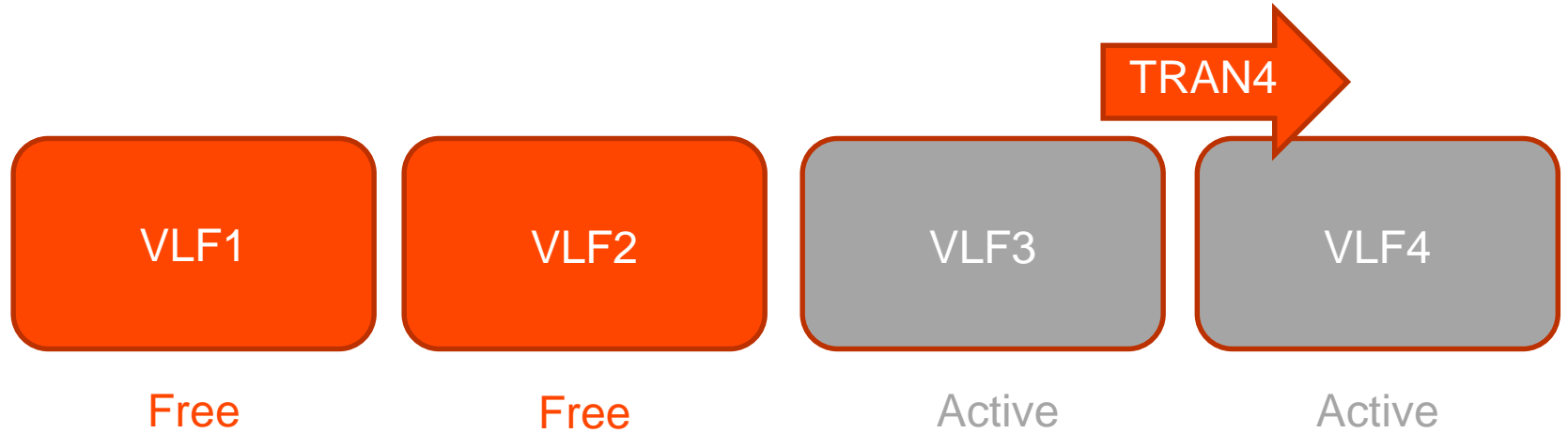
Transaction Log



Transaction Log



Log Backup



Story Time

Story Time

- A full backup every 4 months and transaction log backups every 15 minutes?



BAD IDEA!!!



Questions to Ask

Question #1

- How much data can you afford to lose?
- RPO – Recovery Point Objective

Question #2

- How long can your database be offline?
- RTO – Return to Operation

Question #3

- Does your recovery strategy allow you to meet your RTO and RPO?
- Don't do what the bank in Paul's story did.

Sample Backup Strategy

- FULL recovery model
- Full backup weekly
- Differential backup daily
- Log backup hourly

Restore Strategy

- Set up a periodic test of your restore process
- Pick a restore destination
- Frequency depends on criticality
- Confirm that the test conforms to your RTO and RPO

Restore Strategy

- If you don't meet your baselines, adjust your backup frequency
- The biggest challenge in implementing restore testing is getting an environment to restore to
- I would argue this is the most important job we have as DBAs
- PROTECT YOUR DATA!

Restore GUI Demo

sp_AutomateDB

Testing Your Restores

- The GUI is great for building restores on the fly, but it is ad hoc
- To allow scheduling of restore tests, I built a stored procedure
- Identifies valid backup files for your database
- Allows restores to be scheduled

sp_AutomateDB Restore Demo

Steps After Point-in-Time Restore

- Confirm that the database is in the desired state
- Run a FULL backup after confirmation

Conclusion

Things to Take Away

- Backup strategy <> restore strategy
- Backups 101
- How well does your restore strategy meet the RTO and RPO?
- How to build a restore using the GUI
- `sp_AutomateDBRestore`
- Always run a FULL backup after a point-in-time recovery

Resources

- Paul Randal's Bank Story
- <http://www.sqlskills.com/blogs/paul/the-accidental-dba-day-8-of-30-backups-planning-a-recovery-strategy/>
- Transaction Log Architecture
- <http://technet.microsoft.com/en-us/library/jj835093.aspx>
- Ola Hallengren's Maintenance Solution
- <http://ola.hallengren.com/sql-server-backup.html>

More Resources

- Backups and Restores
- <http://technet.microsoft.com/en-us/library/ms187048.aspx>
- My Slides and Scripts
- <http://skreebydba.com/presentation-slides-and-scripts/>

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