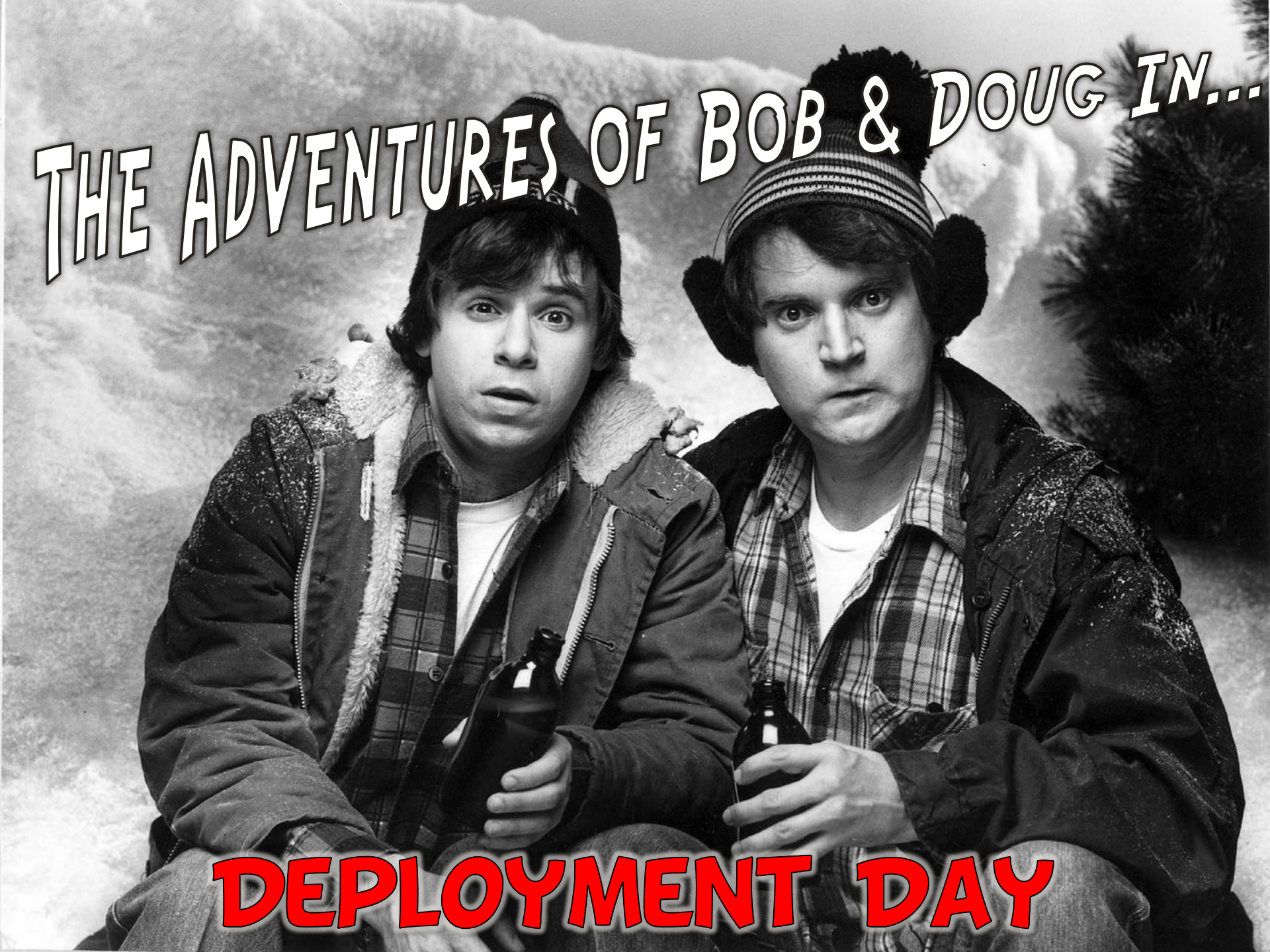



Database Migrations for Web Applications




THE ADVENTURES OF BOB & DOUG IN...

DEPLOYMENT DAY




Good day, I'm Bob
McKenzie, this is
my brother Doug.

How's it going, eh?


A still from the movie 'The Big Lebowski' featuring Jeff Bridges and George Clooney. They are sitting at a wooden table in a room with a large map of the United States in the background. Jeff Bridges, on the left, is wearing a grey jacket over a plaid shirt and a blue beanie. George Clooney, on the right, is wearing a dark jacket over a plaid shirt and a blue beanie. On the table are two bottles of Schlitz beer, a pack of cigarettes, and a small container. A green suitcase is on the floor next to Jeff Bridges.

Welcome to our
story, eh.
First topic, the boss
wants us to roll
out Hoser 2.0!

Beauty, eh! Let's
get the show on
the road.




So Bob, I've got the
app ready, do you have
the database scripts?

A still from a television show featuring two men sitting at a wooden table. The man on the left is wearing a grey jacket over a plaid shirt and a blue beanie. The man on the right is wearing a dark jacket over a plaid shirt and a blue beanie with a yellow pom-pom. On the table are three bottles of beer, two packs of cigarettes, and a small container. The background is a blue wall with a large orange map of the United States and the words "WHITE NOISE" in red. A speech bubble from the man on the right contains the text: "Hey, uh about that database I'm not sure you'll want my copy."

Hey, uh about that database I'm not sure you'll want my copy.



Wha'd ya mean hose head? If we're gonna deploy we need the database changes in place




Take off, eh! I thought
you had a copy of the
database as well!

I developed using
your copy you knob!



Aw, geez. I guess we'll need to get a copy from production.



Hold on a sec hosers!
I have been watching your changes closely
and creating a set of upgrade scripts
each time you check-in. I give you this
Magical upgrade script to get
your app into production.



Whoa! Thanks DevOps
Geddy Lee!

Now I'll crack open
a beer to that, eh!



The world is once again safe. Thanks to DevOps Geddy Lee's wisdom and forethought our two hoseheads, Bob and Doug McKenzie, have been able to deploy Hoser 2.0 to production without fear of breaking yet another deployment.

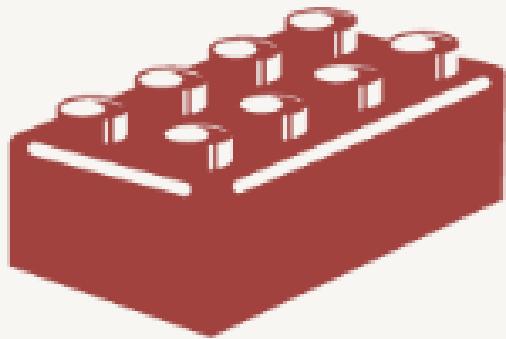
Now take off, eh!



~~Three~~ Four Rules

1. Never Use Shared Databases
2. Have a Single, Authoritative Source for Schema
3. Always Version Your Database
4. Make It Easy To Deploy!!! ♡

Database Components



Schema



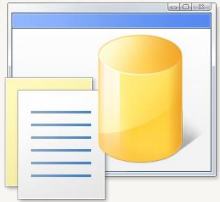
Reference Data



User Data

Don't mess this up
because no one actually
tests their backups!?!
↑

Degrees of Control



LIQUIBASE



Magic Unicorns

Control

- Balance of magic and control depends on comfort
- Use previous change sets when evaluating tools that use magic to learn how they work



(image credit: Stefan Wobben)

YOU CAN DO IT

BELIEVE IN YOURSELF

Troll.me



Establishing a Baseline

Deploying the Baseline

- **Install** + **Configuration** = **Setup**
 - **Install**: Everything is in place for app to run
 - **Configuration**: instance-specific customization



Typical Deployment Cycle

1. Take Application **Offline** (app_offline.htm)
 - Put in Place via Pre-Sync Command
2. Deploy Application to Web Server
 - Set Configuration Values
 - Run Database Migrations (if needed)
3. Bring Application **Online**
 - Remove via the Post-Sync Command



The secret sauce!

In-Place Upgrades?

aka “the WordPress method”

- Considerations:
 - Database User (Worker Process Identity) has DDL_Admin role
 - Worker Process Identity has Full Control on File System
- Migrate during Application_Start event
 - User experience during long running migrations?

Ch-ch-ch-changes!

- Consider impact on backwards compatibility and unintended uses
- Column operations require careful consideration
 - **Add**: Default values for backwards compatibility
 - **Split / Change Type**: Data might not convert
 - **Move/Rename**: Drop/create and you'll lose data
- Data operations (change, duplicate)

So...

**How do you*
deploy database changes?**

* Yes, it's audience participation time!

Resources: Database Migration

- FluentMigrator
colinb.me/fluentmigrator
- SQL Source Control
colinb.me/sqlsourcecontrol
- NBuilder
colinb.me/nbuilder
- Scott Allen on
Versioning Databases
colinb.me/ksadbversioning
- Process of Database
Refactoring
colinb.me/dbrefactoring

the end.