



BrDR Database Hosting with KYTC

Dora Alexander P.E., KYTC

Geoffrey Trees, ProMiles

2025 Rating and Design Bridge User Group Meeting

Boise, ID | August 12-13, 2025



ProMiles®

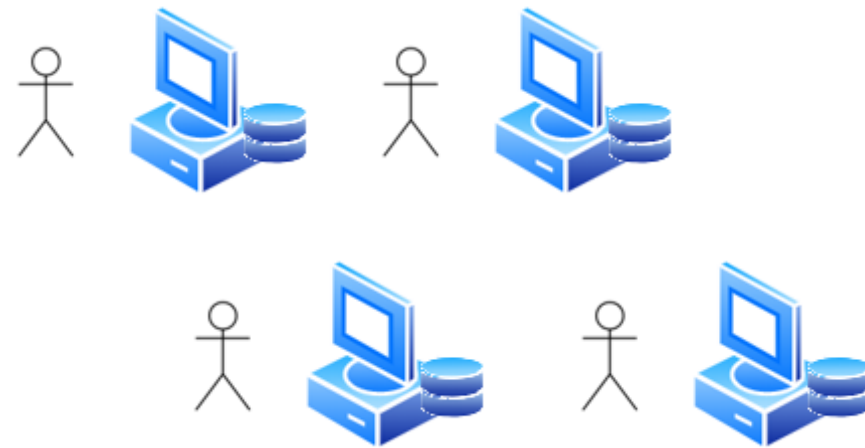
Introduction

- Overview of Database Hosting
- Benefits of Database Hosting
- Timeline for BrDR Implementation
- Case Study: KYTC Implementation
- Summary

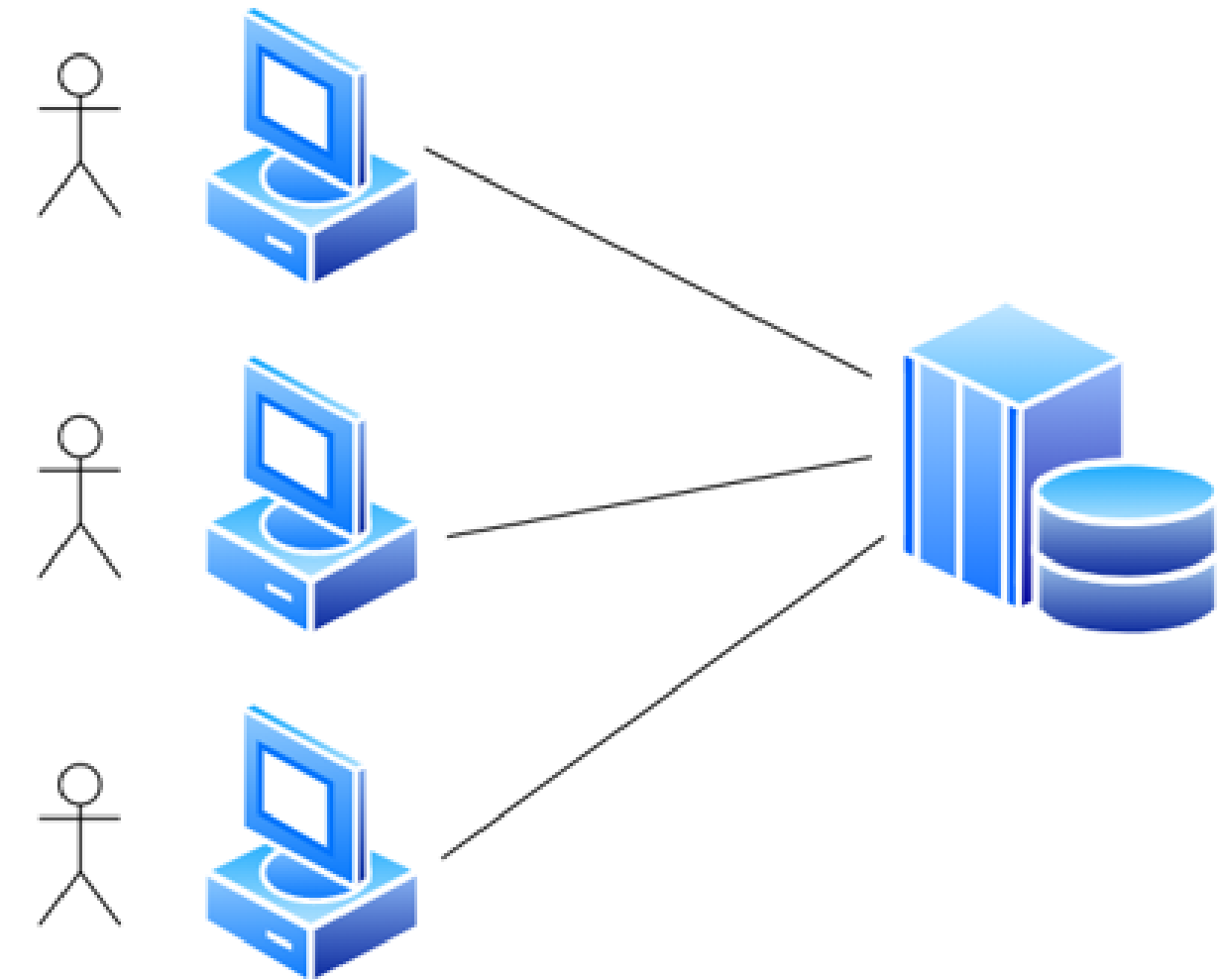


What is Database Hosting?

- Historical database configurations



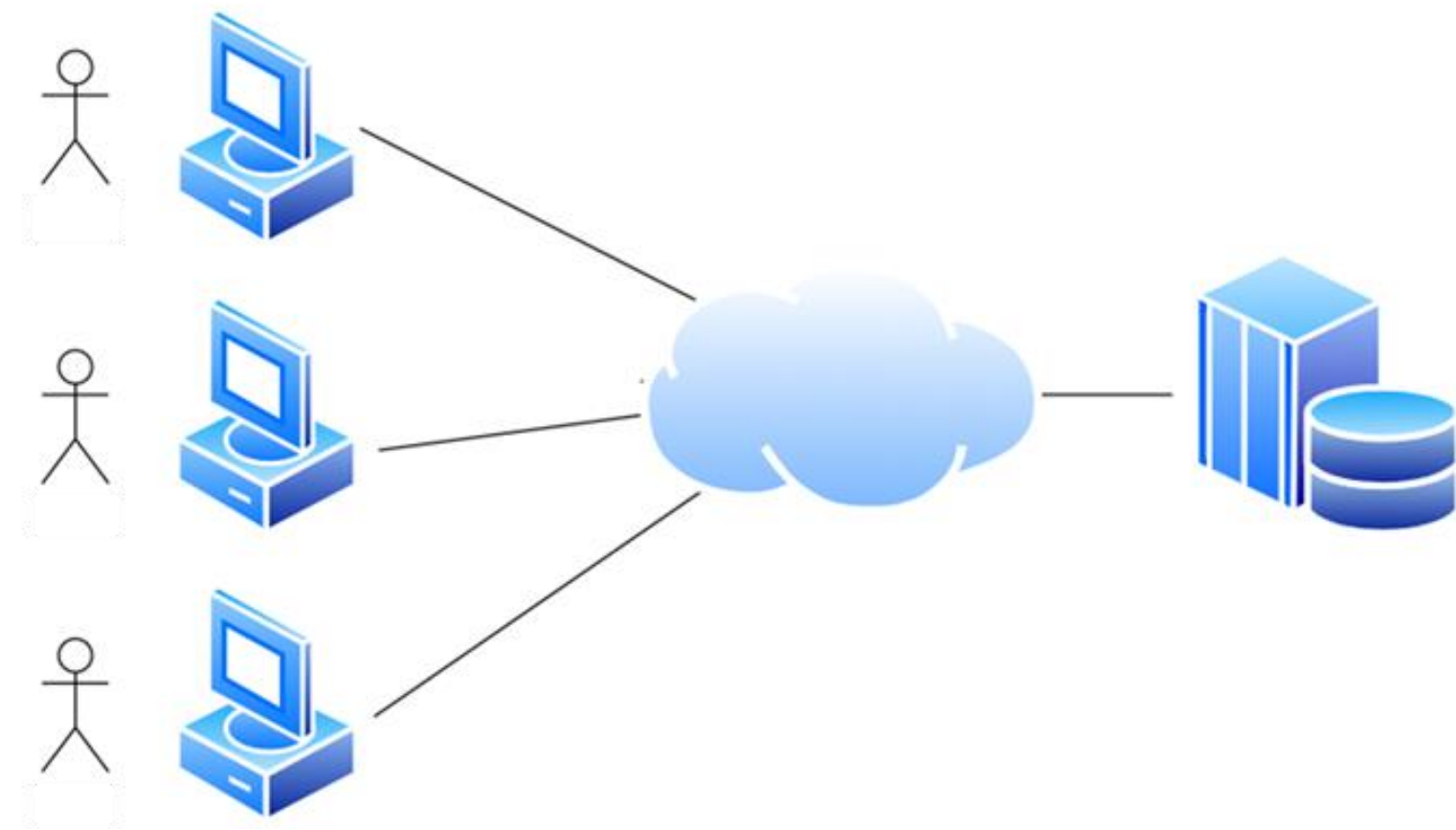
Local Database



Centralized Database

What is Database Hosting?

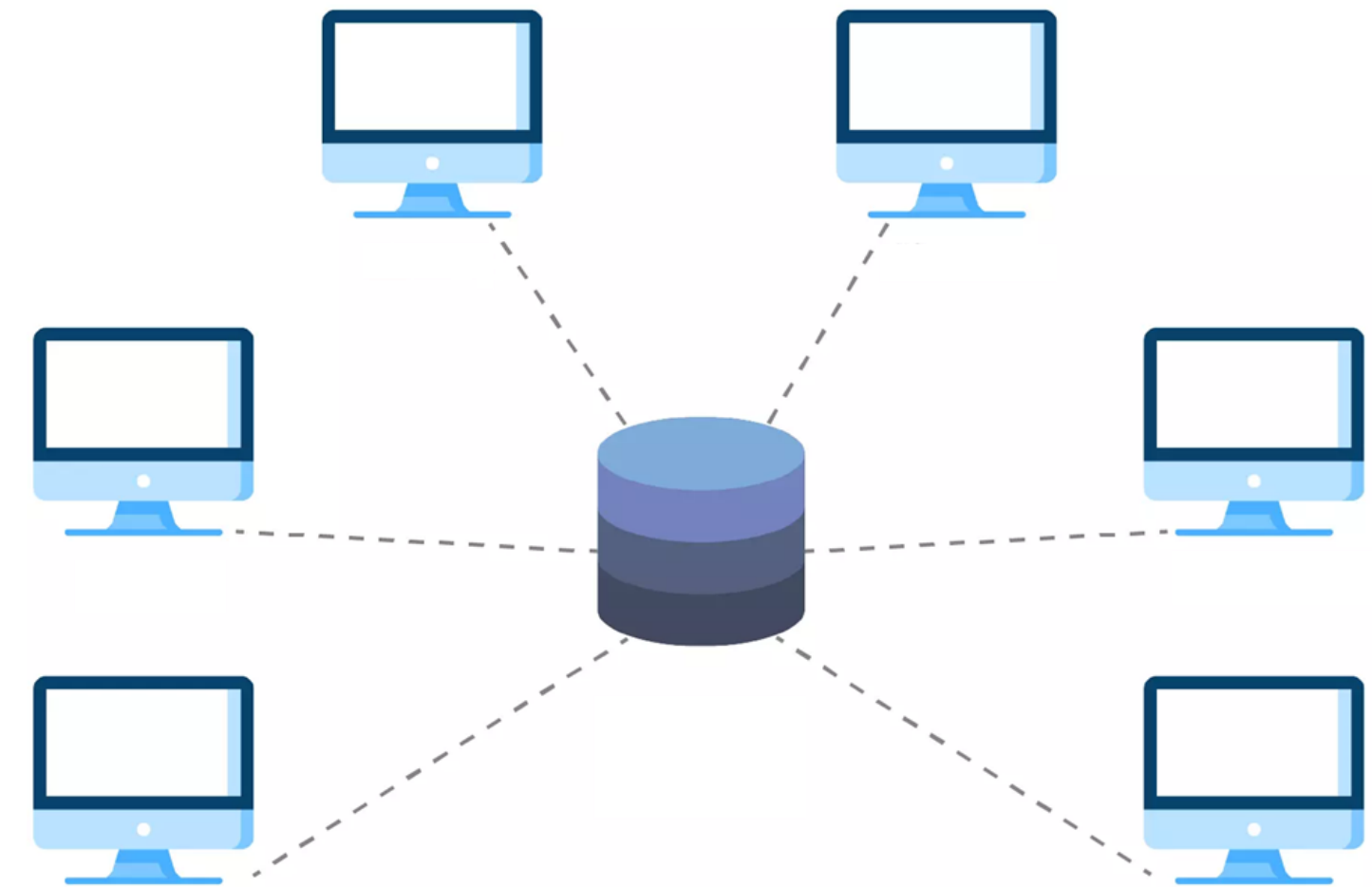
- Hosted database on an off-prem remote server
- Database is hosted on multiple servers in two datacenter regions
- Database is NOT on agency-owned infrastructure
- Management is handled by ProMiles
- Note: this offering will transition to the full SaaS offering once available



Hosted Database

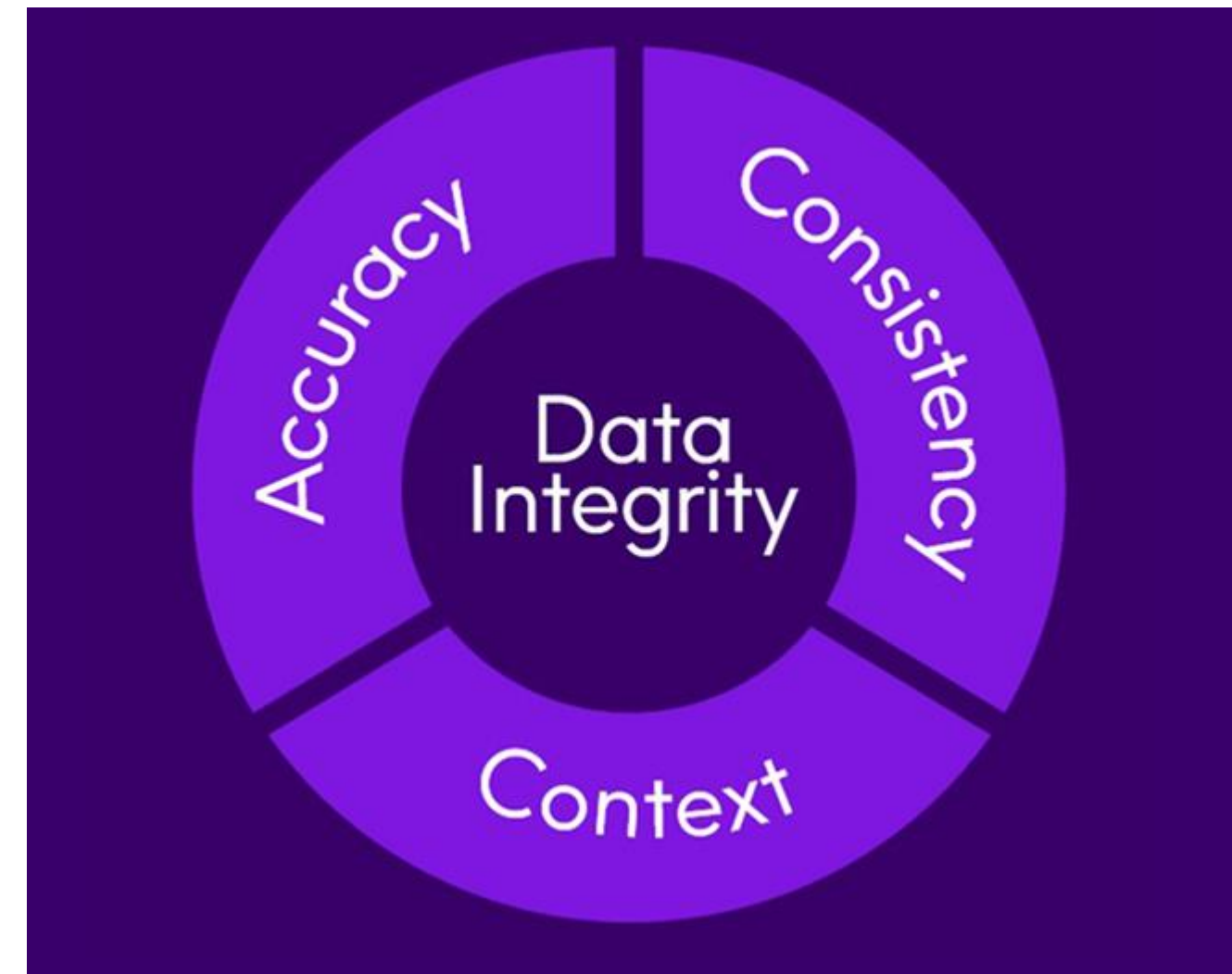
Centralized Databases

- Contrast local database vs centralized
- Centralized Database Benefits
 - Centralized databases benefit both on-prem and off-prem / hosted scenarios
 - Multiple users may use database concurrently
 - Better collaboration
 - Sharing data becomes “automatic” vs manual
 - Management and backups are easier
 - Easier to implement process management (e.g. a QC/QA process)



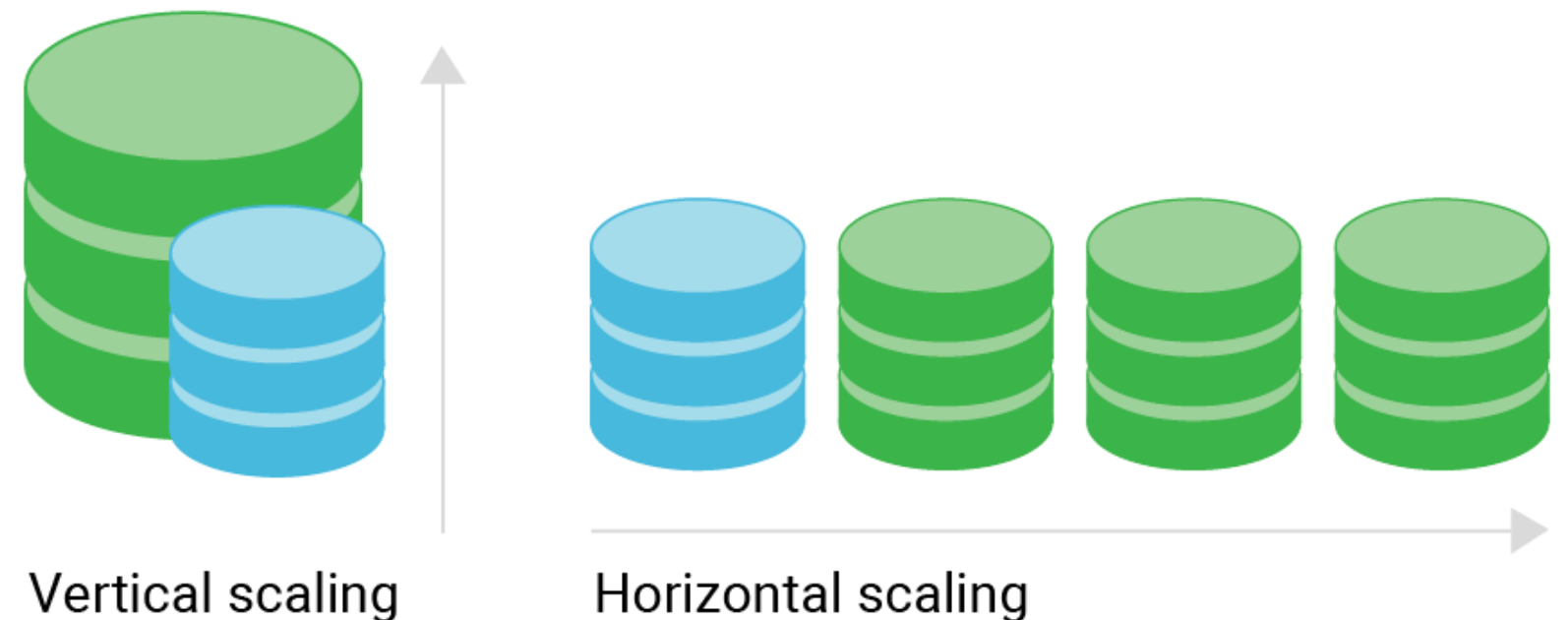
Enhanced Data Integrity

- Accuracy
 - Model in database is the “up to date” version
 - Do not have to determine which file is the latest
 - Easier QC/QA management
- Context
 - Able to have concurrent test, development, and production environments
- Consistency
 - Having access to the entire inventory allows for consistent modeling practices
 - Access to latest agency template models and library data



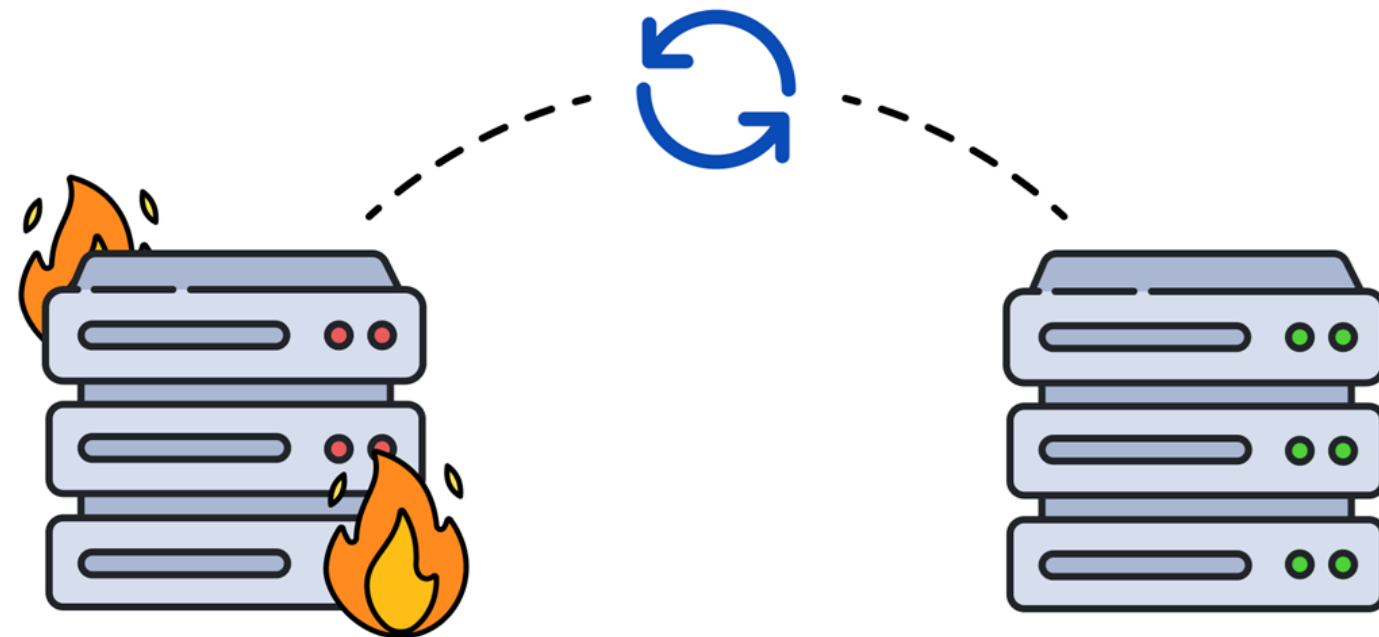
Scalability

- Ability to scale out based on hardware needs
 - As data in database grows, ProMiles can transparently upgrade hardware and storage as needed without user intervention
- Ability to scale number of databases
 - Add test databases as needed
 - Create databases for other departments (e.g. Rating vs Design – if needed)
 - Create separate databases for development and production, as needed



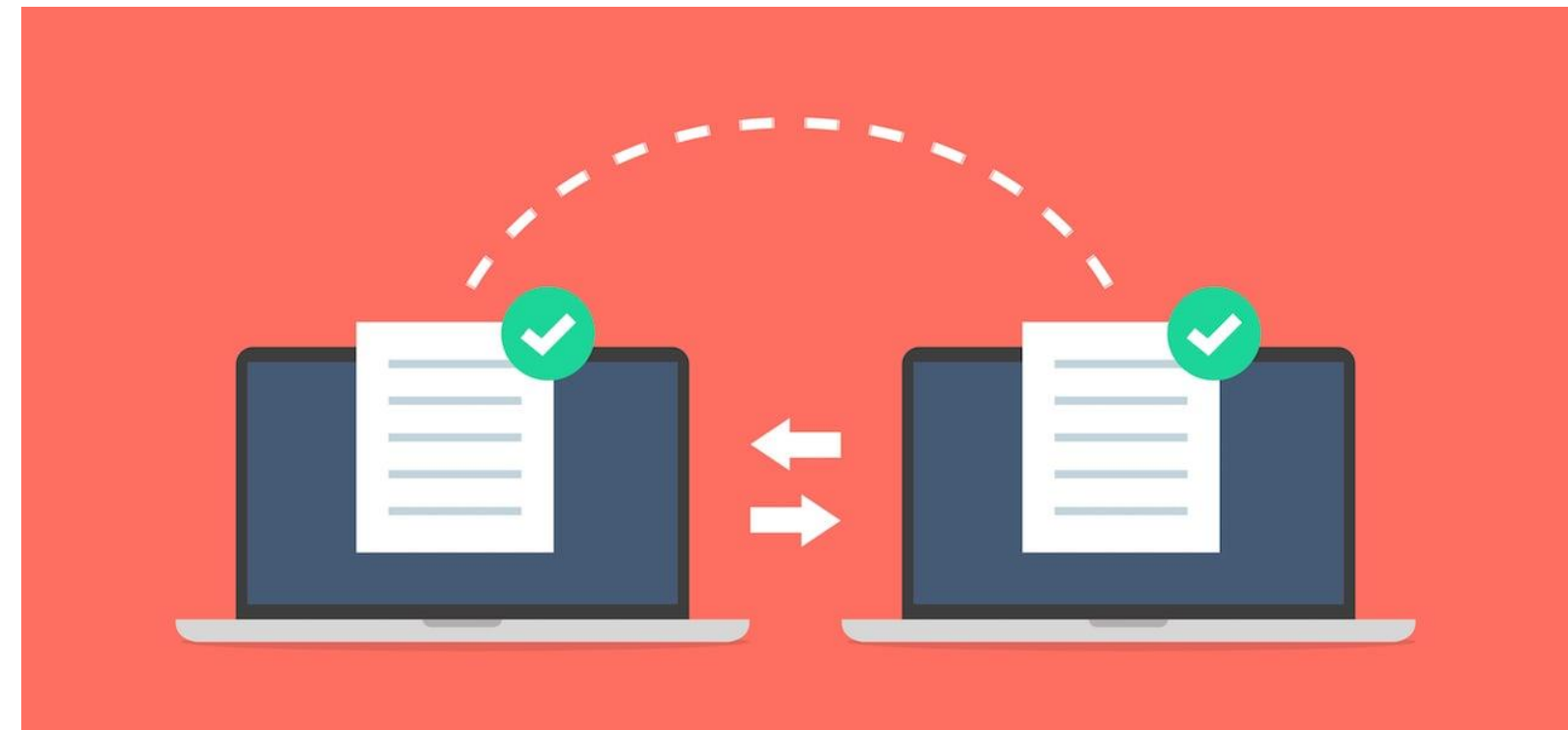
Disaster Recovery and Long-Term Data Preservation

- Backups/Data Retention
 - Full backups will be taken daily
 - Backups will be retained based on an appropriate schedule and policy
 - Transactional logs
- Disaster Recovery
 - “Hot” backup server will be available in case of hardware failure
 - A failover server will be available in another region in case of regional failure
 - Backups will be tested on a regular basis to ensure everything is in working order



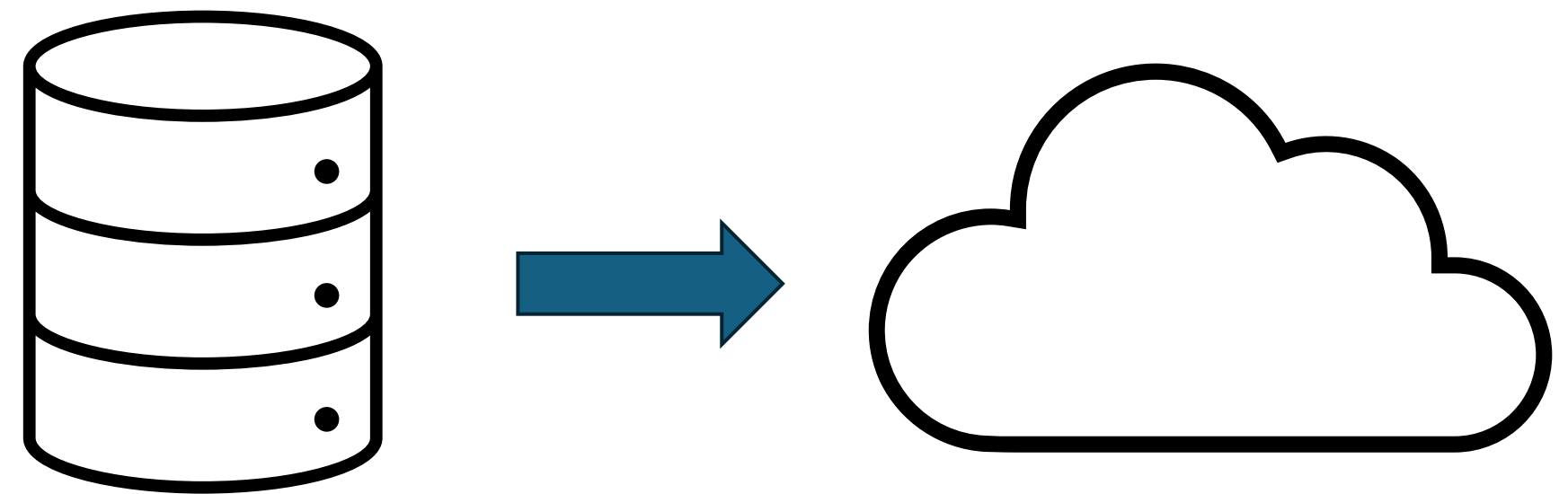
Streamlined Updates

- Migrations
 - A migration plan will be prepared in accordance with agency schedule
 - Migrations will be scheduled around operating hours, in collaboration with agency bridge department
- Custom database
 - Changes or data updates will be streamlined
 - Custom updates will not rely on IT staff unfamiliar with the product



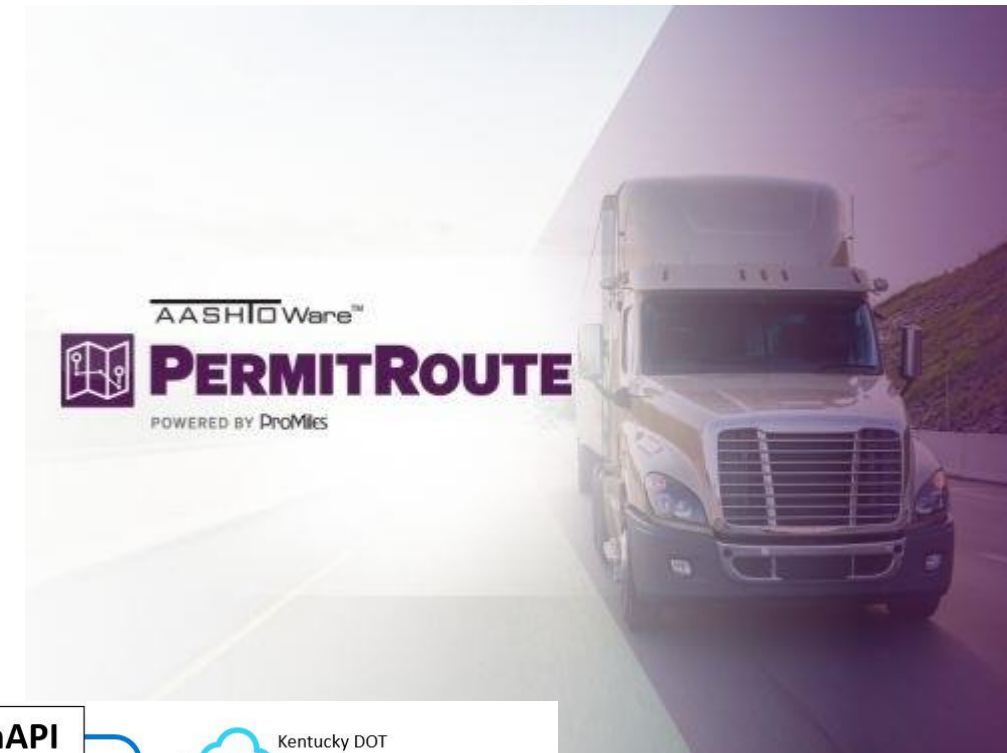
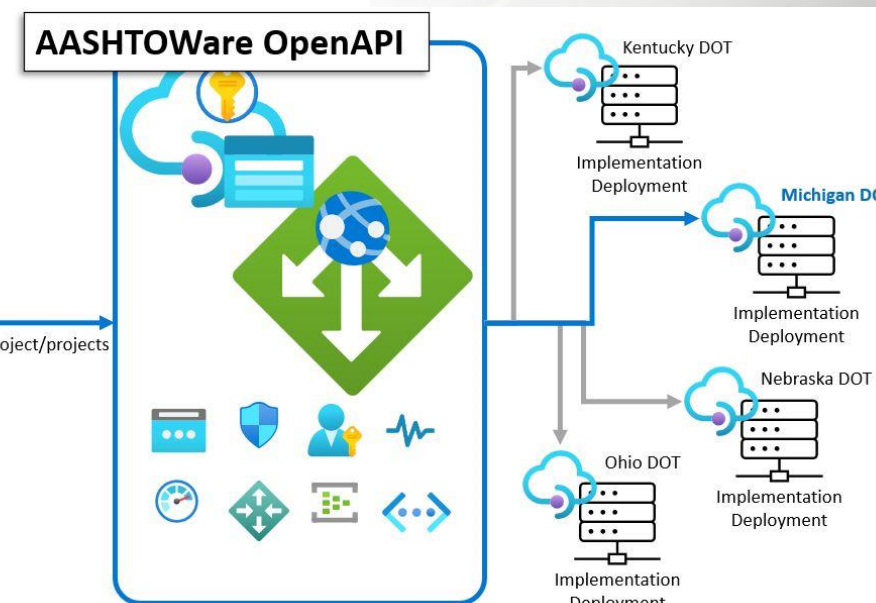
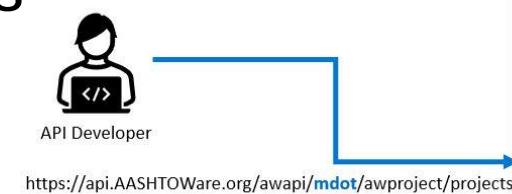
Easy Migration to Multi-Tenant Cloud

- When the multi-tenant cloud offering is available, hosted databases will have a seamless path to the cloud
- Agencies can work with ProMiles to plan a migration path that will not disrupt critical workflows
- Migration will be transparent from the agency's perspective
- Minimal to no configuration changes on workstation machines



Interoperability

- Hosted databases make interoperability much easier
- Hosted asset management applications, such as BrM, will integrate easier
- Users working from home will have access without requiring VPN access to office network
- Direct model access for systems like AASHTOWare PermitRoute, eliminating the need for complex syncing setups



ProMiles®



AASHTOWare™
BRIDGE
DESIGN AND RATING

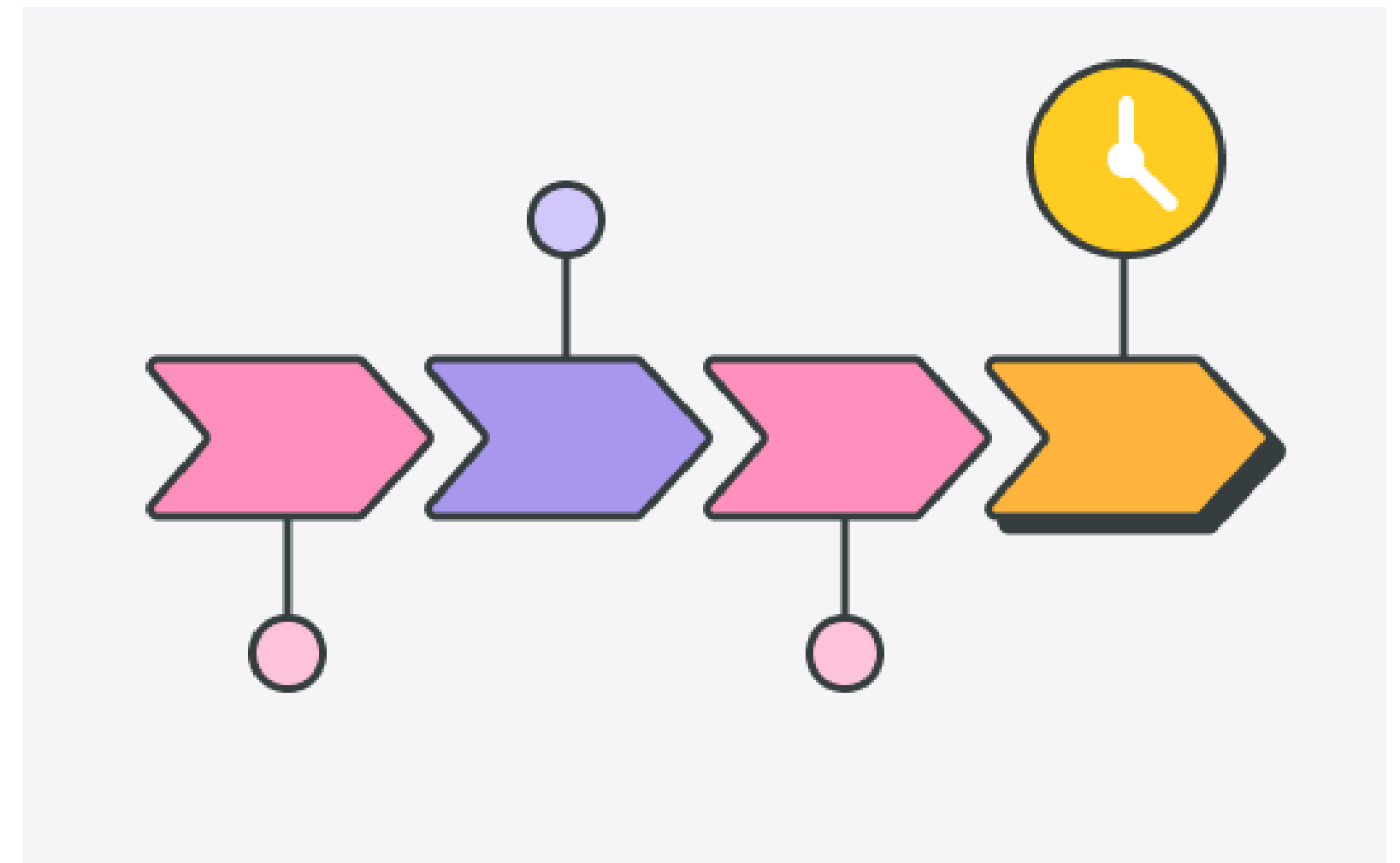
Security and Access Control

- More robust security capabilities
- Off-prem users; such as consultants or support staff
- Restricted access capabilities (i.e. if granting access to consultants)
- More advanced features coming in 7.9!
- Even more in cloud implementation!!



Timeframe

- Database Hosting
 - BrDR database hosting available now!
 - Mandated hosting – 2029
- Full multi-tenant offering
 - Phase 1 - “data in the cloud” (~2027/2028)
 - Infrastructure, data services, OpenAPI, and portal
 - Phase 2 – “analysis in the cloud” (~2029/2030)
 - Offload complex analysis, cloud analysis API
 - Phase 3 – “modeling in the cloud” (2030s)
 - Model bridges entirely via web browser



Case Study: KYTC Implementation

Dora Alexander, P.E
TEBM, KYTC

- Background on project
- Objectives
- Scope and Timeline
- Process for KYTC
- Benefits of Database Hosting
- Current Status and Future Objectives



Case Study: KYTC Implementation

Background

- Late 2010's, KYTC finally got the initial Superload automated permitting system up and running.
- The initial contract was from almost a decade before- and only supported the permits at that time.
- OW/OD and our OIT both wanted a system that would allow faster updates based on changes in legislation.
- 2021 started discussions with ProMiles.
- ProMiles suggested the use of AASHTOWARE BrR- which we weren't using at the time.

$$\frac{\sin(\text{gerine})}{\cos(\text{gerine})} = \text{orange}$$



Case Study: KYTC Implementation

Scope

- I refused to switch unless our entire database could be switched to BrR- including both state bridges and county/local bridges.
- ProMiles agreed to that.
- Main priority would be to convert all of our .dat files to the BrR format.
- And then switch software for our automated permitting.
- Required ProMiles to host database to have access for bridge conversion project and permit system access



Case Study: KYTC Implementation

We all know why 6 is afraid of 7...

- Because 7 8 9

... But why did 7 eat 9?

- Because 7 heard that it needs 3 square meals a day



Case Study: KYTC Implementation

Timeline

- Statement of Work/Contract with ProMiles was done around July 2021- with initial timeline for Production of ProMiles near end of 2021.
- That was impossible
- Determined need to share data
- Initial snags on converting the files.
- December 2021- I took on more duties as TEBM
- 500+ files to change before they could be imported
- Summer 2022- massive flooding in Eastern Ky w/ 166 bridges destroyed or other issues.
- ProMiles setup two hosted databases
- ProMiles generated precomputed data after each iteration



Case Study: KYTC Implementation

How do you keep warm in a cold room?

- Go to a corner, it's always 90 degrees



ProMiles®



AASHTO Ware™
BRIDGE
DESIGN AND RATING

Case Study: KYTC Implementation

Process

- Of the 500+ bridge issues- initial thought was to just correct them in-house with personnel and summer students
- Running behind on schedule, so had to use consultants for about 150 bridges

Check on conversion

- Also had consultants (MBI, Palmer, AECOM), to thoroughly check and verify a subsection of our bridges and that they were imported correctly
- As process continues, consultants may get direct access to hosted database, improving data integrity

Case Study: KYTC Implementation

Current Status

- Spring of 2024, we officially switched our state files to BrR
- August 4th, 2025 performing end-to-end testing on integration with permitting system

Future Objectives

- Officially switch to ProMiles for automated permitting on September 15th, 2025
- Work with ProMiles Bridge team to convert all our county/local bridge files
- Work with ProMiles to convert all our timber bridge files
- Experiment with allowing all participating consultants direct access to the hosted development database



Case Study: KYTC Implementation

What do you call a man who spent all summer at the beach?

- A tangent...



ProMiles®



AASHTO Ware™
BRIDGE
DESIGN AND RATING

Summary

- Many Benefits:
 - Centralized Data Management
 - Improved Collaboration
 - Enhanced Data Integrity
 - Streamlined Updates
 - Interoperability (e.g. permit routing, asset management, etc.)
 - Improved Security and Access Control
 - Transparent Disaster Recovery
 - Several Agencies Using Hosting (e.g. case study w/ KYTC)
 - Seamless Transition to Multi-Tenant Cloud Hosting





Questions?

ProMiles®