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With AVEVA since 2018

All 7 years working on Asset Framework

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AVEVA WORLD 2025

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# Agenda

Offloading admin overhead with
cloud-managed SQL for AVEVA
PI Server

Moscone West Center
San Francisco

Why host PI Asset Framework SQL Database in the cloud?

What's new in 2024 R2?

New installations

Migration to the cloud

Audit Trail support

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# Benefits of cloud-hosted SQL?

## Why?

- Decrease admin work so staff can focus on operations data value
- Ease cloud migration and offload AF SQL admin tasks to Microsoft Azure / Amazon AWS
- Lower costs from IT overhead and on-demand usage with more automation

130 Combined votes for Cloud SQL Support

"
This will be of great value to all Global Business Units for the Company I work for as we migrate PI AF and Vision to Azure Cloud. Our IT costs for licensing and managing / maintaining many SQL Server environments is reduced as well as improving our availability and security in the Cloud.
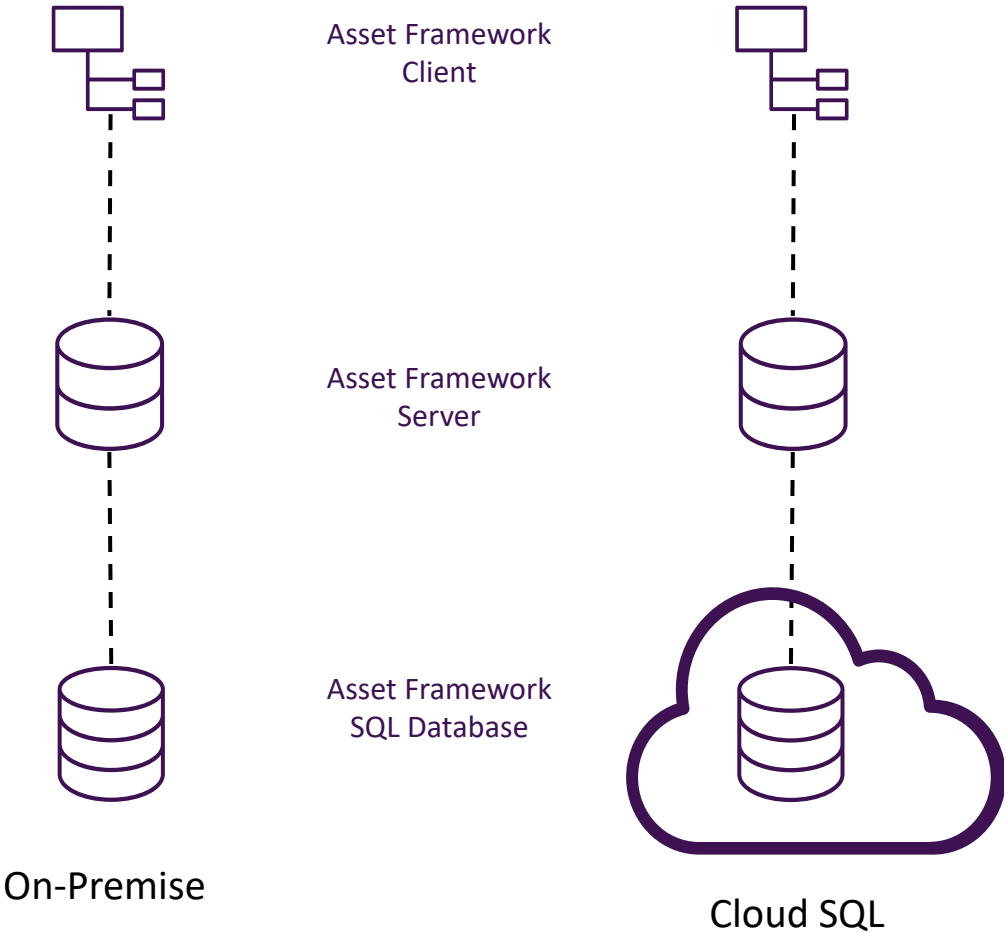
"
We would like to focus on our core task (data analysis and turning data into value) keeping servers running, taking backups etc is not our core business

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# What's new in PI Server 2024 R2?

| | PI Server 2024 | PI Server 2024 R2 |
|---|:---:|:---:|
| Azure SQL Database | ✔ | ✔ |
| Azure SQL Managed Instance | | ✔ |
| Amazon RDS for SQL Server | | ✔ |
| Audit Trail | | ✔ |

Asset Framework Client

Asset Framework Server

Asset Framework SQL Database

On-Premise

Cloud SQL

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# Running SQL scripts for new installations

## Installation kit

Azure SQL Database and Azure SQL Managed Instance:

- Requires a 'Microsoft Entra Managed Identity' to authenticate

Amazon RDS for SQL Server:

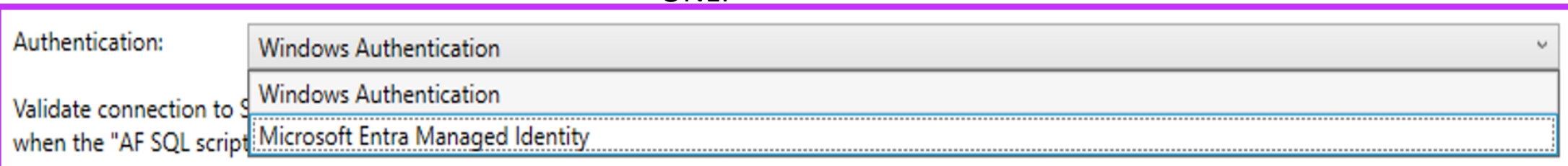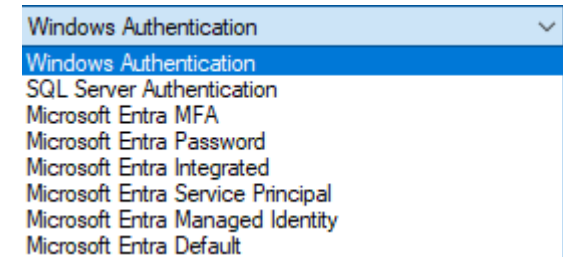- Requires Integrated Windows Authentication

## GO.BAT script

Azure SQL Database and Azure SQL Managed Instance:

- Must have an updated version of SQL CMD (Go)

- Supports all SQL Authentication methods available in SSMS

Amazon RDS for SQL Server:

- Supports Windows Authentication and SQL Server Authentication ONLY

Windows Authentication

Windows Authentication
SQL Server Authentication
Microsoft Entra MFA
Microsoft Entra Password
Microsoft Entra Integrated
Microsoft Entra Service Principal
Microsoft Entra Managed Identity
Microsoft Entra Default

Authentication: Windows Authentication

Validate connection to S...
when the "AF SQL script...

Windows Authentication

Microsoft Entra Managed Identity

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# Required permissions for running SQL scripts

NOTE: These permissions are only required at setup when running SQL scripts

If creating Asset Framework SQL Database:

- Azure SQL Database
  - Create Database
- Azure Managed Instance
  - SysAdmin
- Amazon RDS for SQL Server
  - Create Database

If Asset Framework SQL Database was already created:

- All Cloud SQL Instances
  - db_owner

AFTER SQL script installation

- Remember to reduce the permissions on the account running the AF Service
- Warnings are logged in Windows Event Viewer when running AF Service with permissions higher than necessary
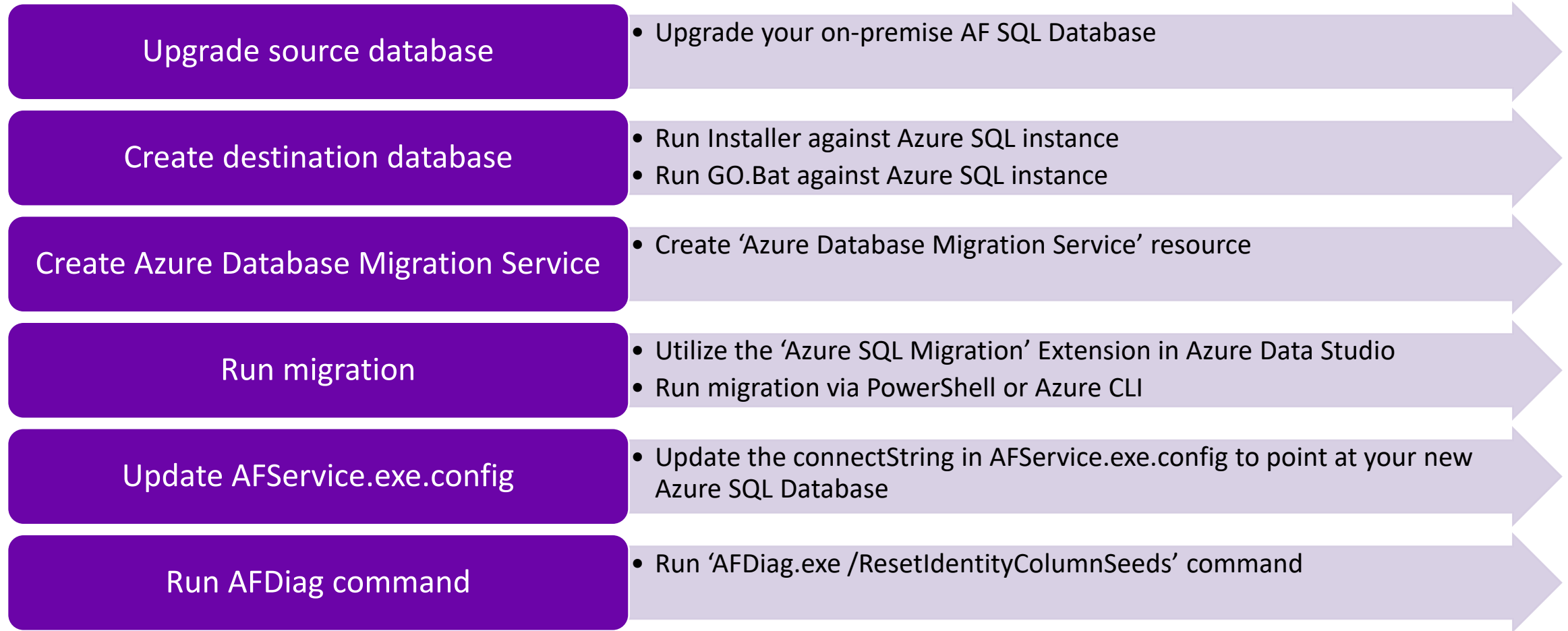
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# Migrating Asset Framework SQL Database to the cloud
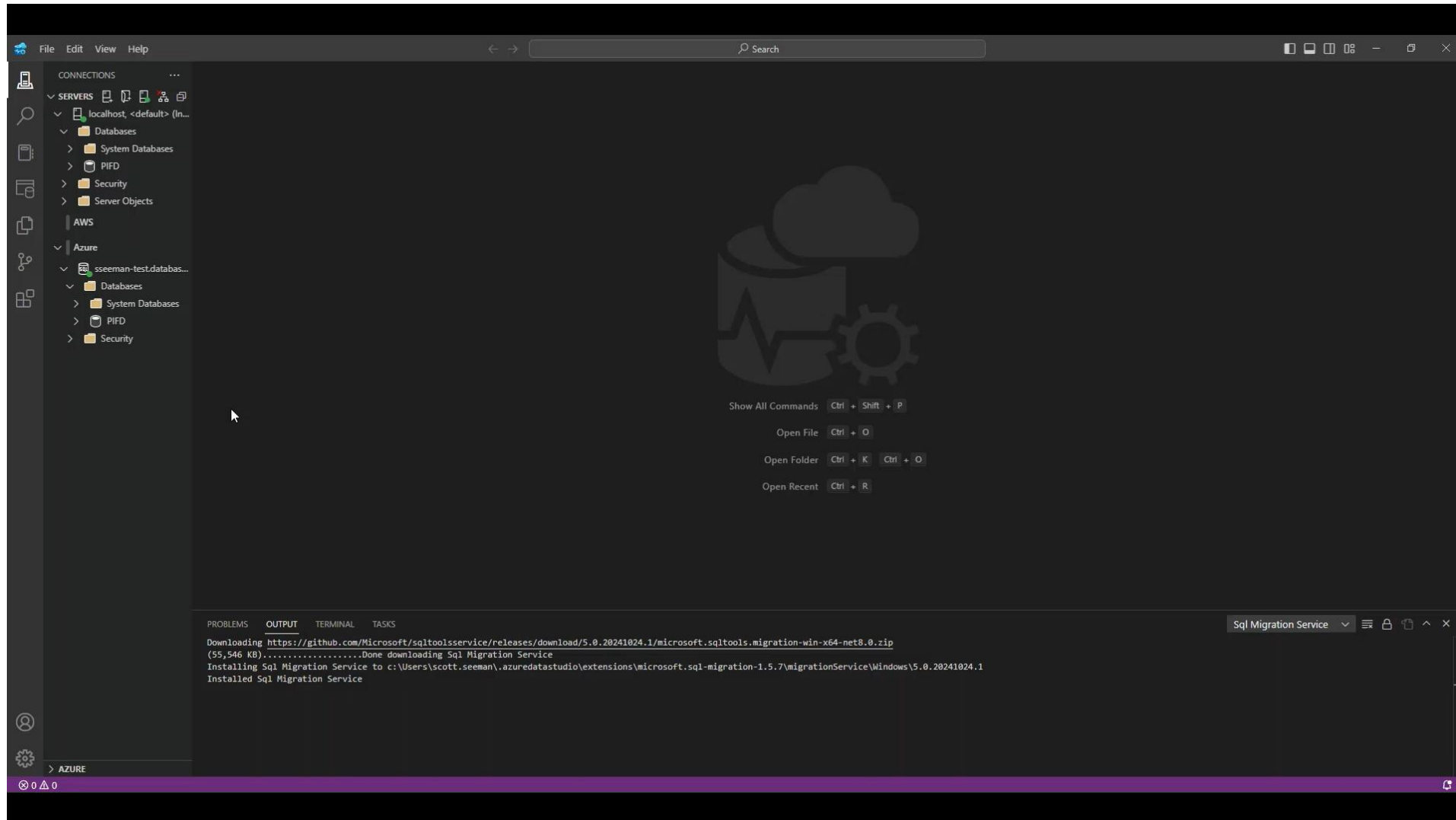
| | Azure Database Migration Service | SQL Backup & Restore | SQL Server Transactional Replication |
|---|---|---|---|
| Azure SQL Database | ✔ | | ✔ |
| Azure SQL Managed Instance | ✔ | ✔ | ✔ |
| Amazon RDS for SQL Server | | ✔ | ✔ |

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# Azure Database Migration Service

## Steps for migrating to Azure SQL Database

| | |
|---|---|
| **Upgrade source database** | • Upgrade your on-premise AF SQL Database |
| **Create destination database** | • Run Installer against Azure SQL instance<br>• Run GO.Bat against Azure SQL instance |
| **Create Azure Database Migration Service** | • Create 'Azure Database Migration Service' resource |
| **Run migration** | • Utilize the 'Azure SQL Migration' Extension in Azure Data Studio<br>• Run migration via PowerShell or Azure CLI |
| **Update AFService.exe.config** | • Update the connectString in AFService.exe.config to point at your new Azure SQL Database |
| **Run AFDiag command** | • Run 'AFDiag.exe /ResetIdentityColumnSeeds' command |

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# Azure SQL Migration Extension (Azure SQL Database)

# Transactional Replication

| Step | Details |
|------|---------|
| **Upgrade** | • Upgrade your on-premise AF SQL Database |
| **Create destination database** | • Run Installer against Cloud SQL instance<br>• Run GO.Bat against Cloud SQL instance |
| **Configure distribution** | • Follow the Configure Distribution Wizard for the Source SQL Instance in SQL Server Management Studio |
| **Create publication** | • Follow the New Publication Wizard for the Source SQL Instance in SQL Server Management Studio |
| **Configure push subscription** | • Follow the New Subscription Wizard on the Source SQL Instance |
| **Update AFService.exe.config** | • Update the connectString in AFService.exe.config to point at your new Azure SQL Database |
| **Run AFDiag command** | • Run 'AFDiag.exe /ResetIdentityColumnSeeds' command |

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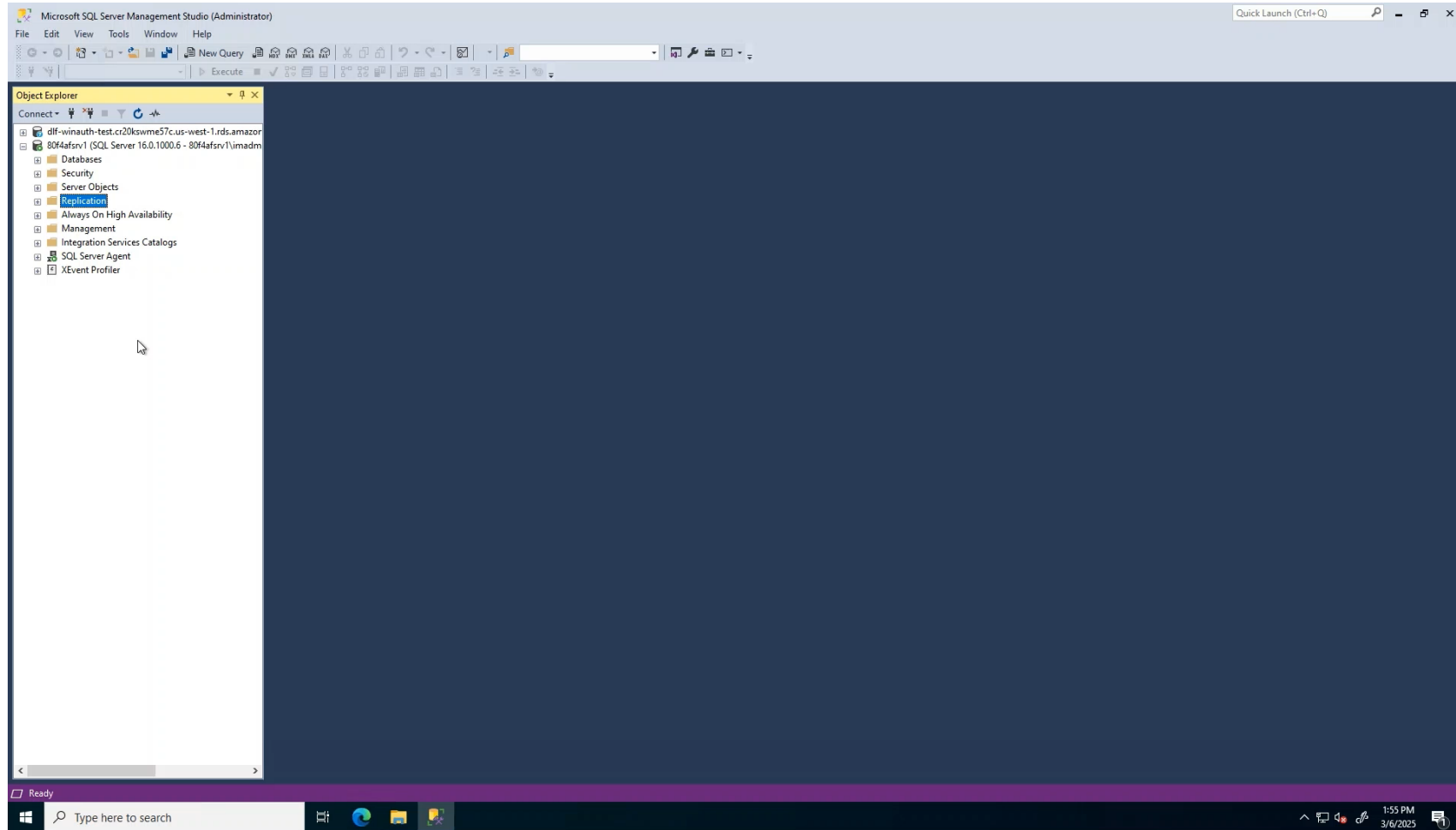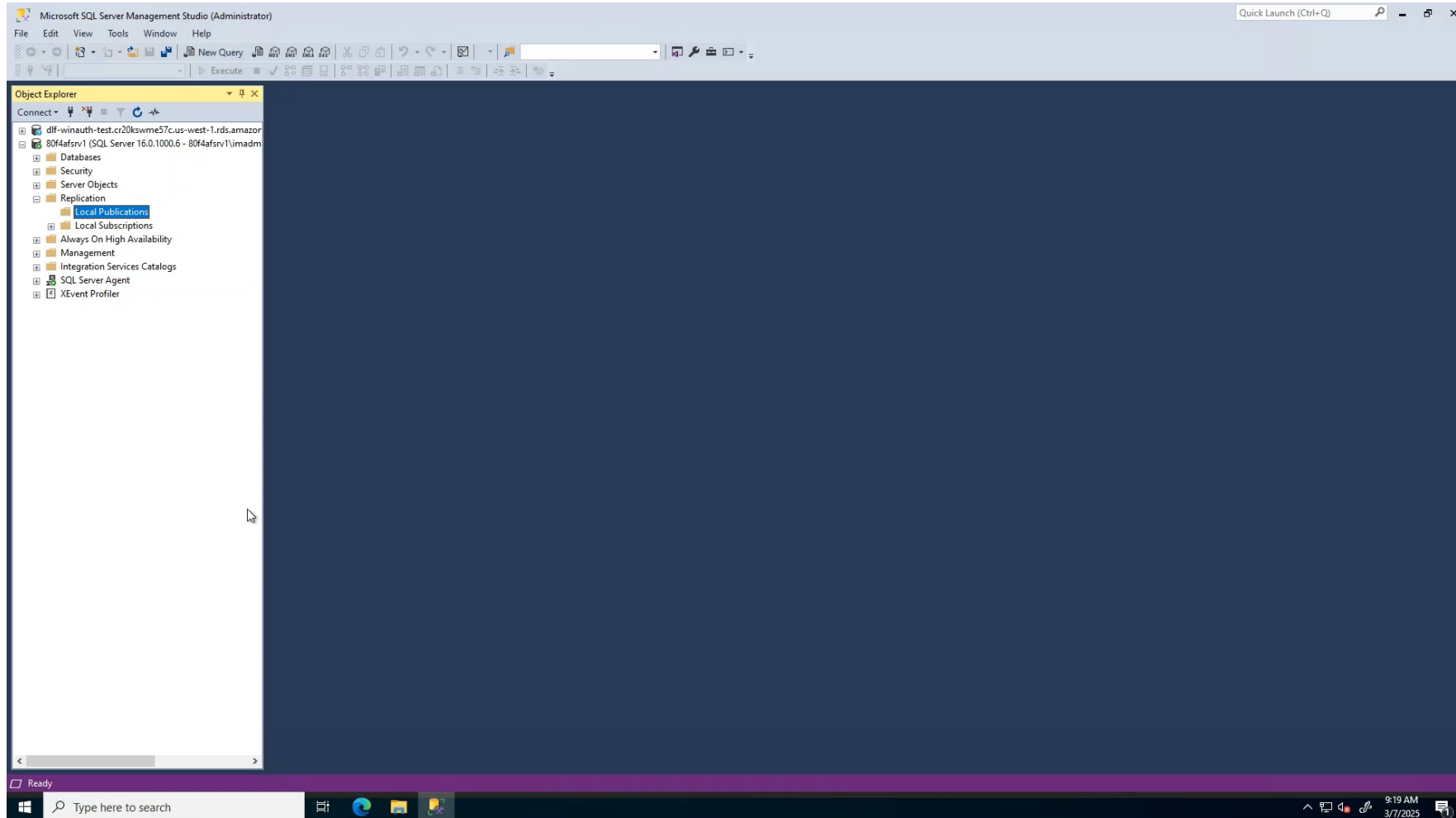
# Transactional replication
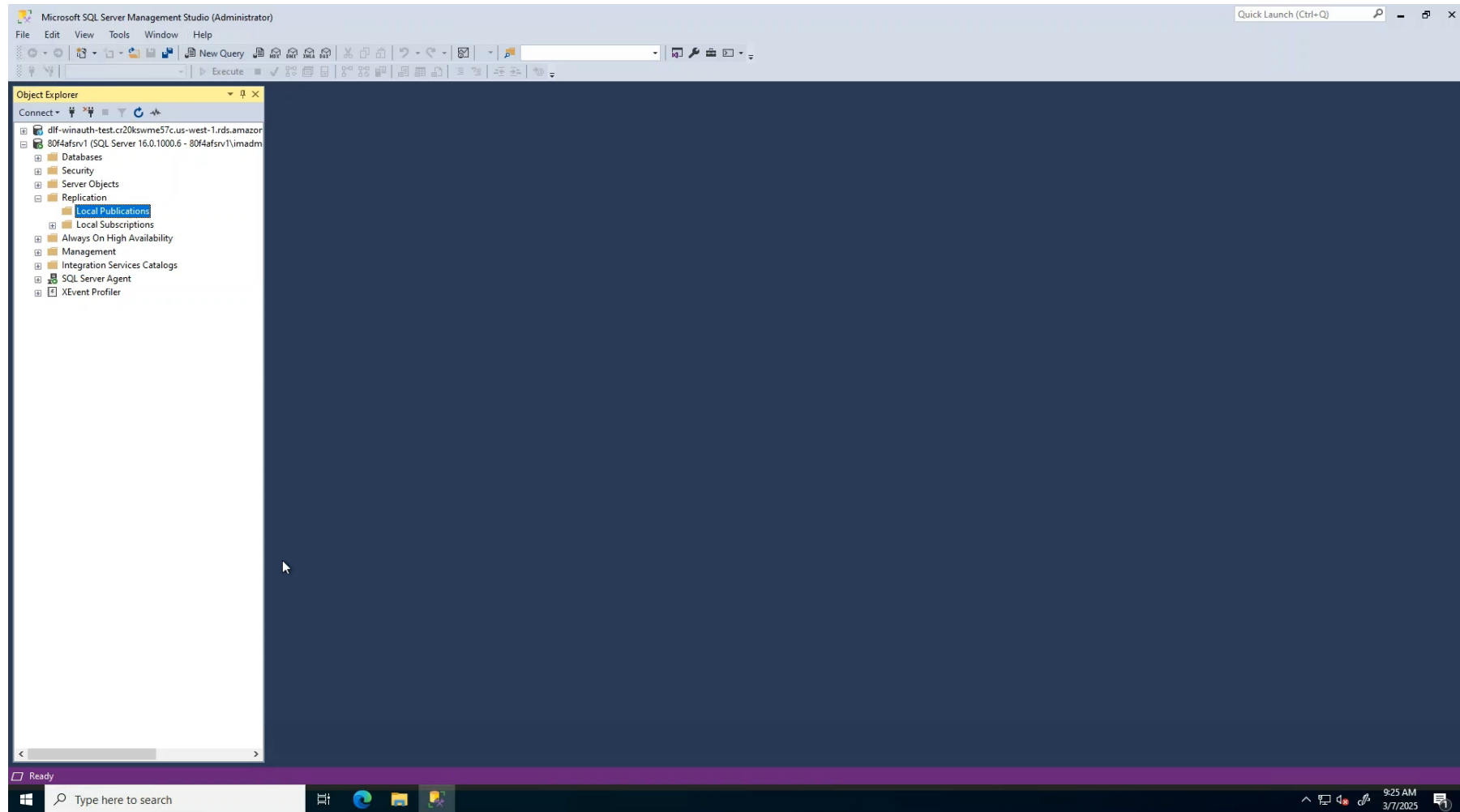
## Configure distribution

# Transactional replication

Create publication

# Transactional replication

## Configure push subscription

# Audit Trail support

## Azure SQL Managed Instance & Amazon RDS for SQL Server

- Full Asset Framework Audit Trail support

- Enabling/Disabling works exactly as it did before

- Still Requires SQL Server Agent to be running to use

## Azure SQL Database

- Full Asset Framework Audit Trail support

- Enabling/Disabling works exactly as it did before

- A change data capture scheduler replaces the SQL Server Agent jobs

- A new AFDiag option is provided as an alternative to the custom 'EnableAuditTrailCleanup' job and can be scheduled manually

- The new 'RunAuditTrailCleanup' command is designed to cleanup Audit Records for specified users immediately

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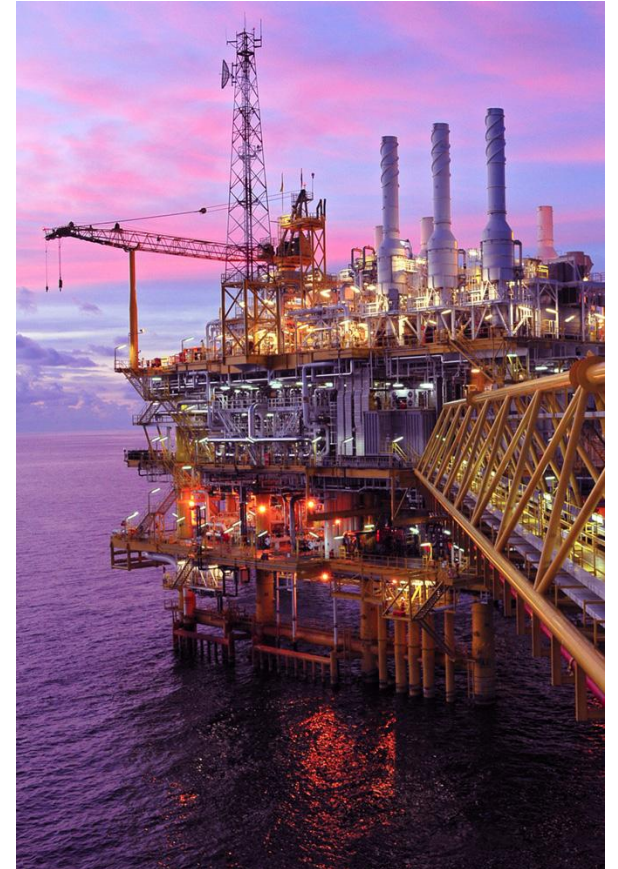
# Audit Trail demo
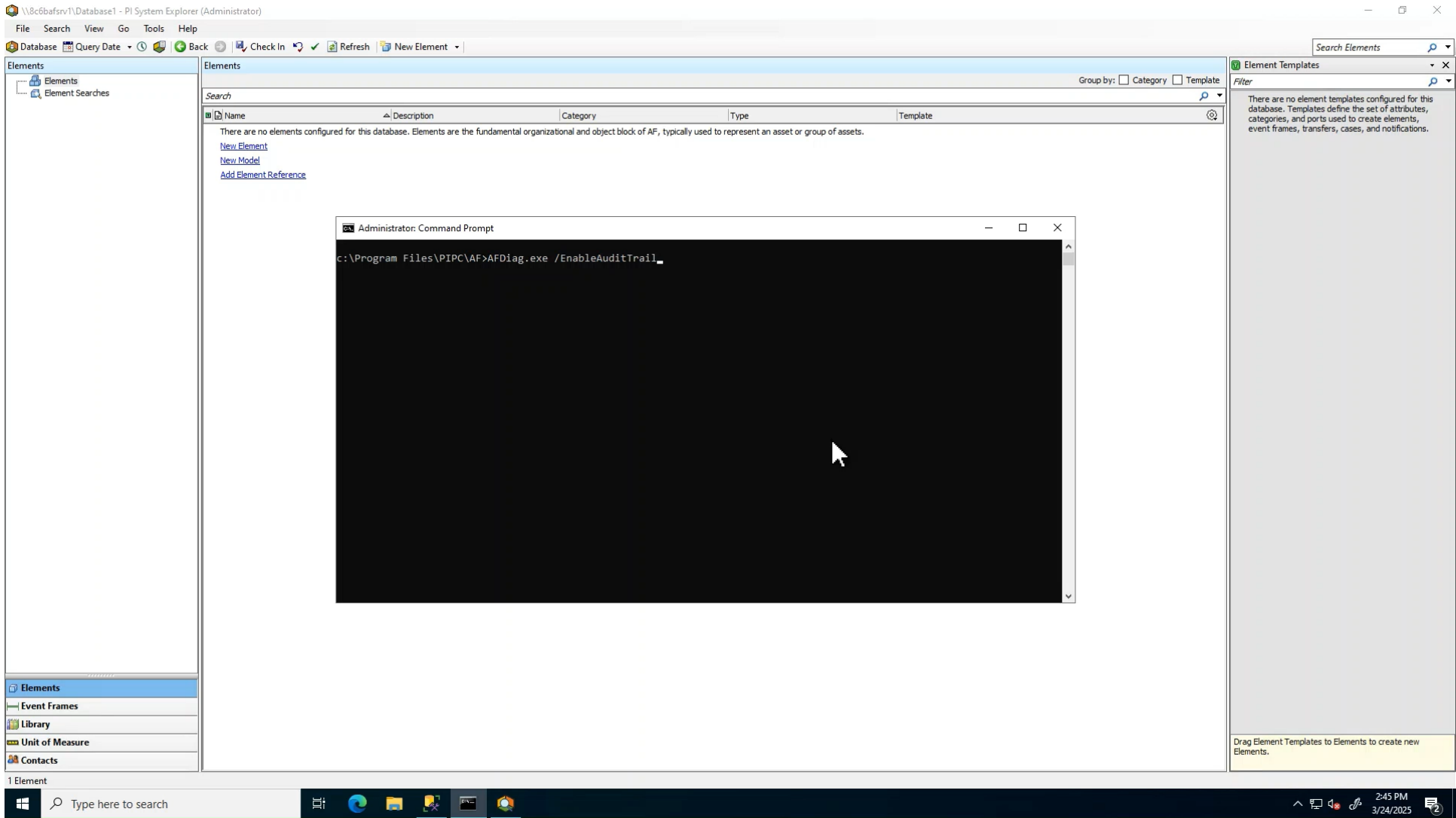
# Questions?

🎙️ Please wait for the microphone.

State your name and company.

# Please remember to...

Navigate to this session in the
mobile app to complete the survey.

# Thank you!

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