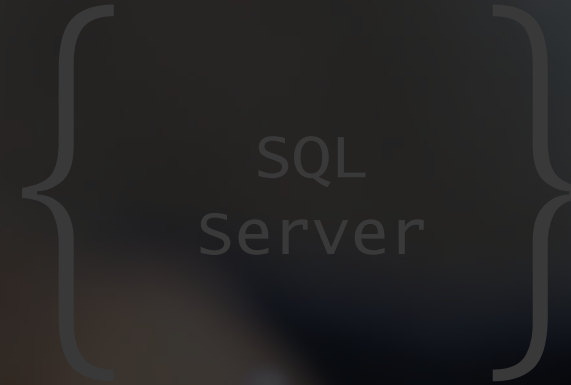




# WorkshopPLUS – SQL Server: Performance Tuning and Optimization





# John Deardurff

Cloud Solution Architect (Data & AI)

Microsoft Certified Trainer (Regional Lead)

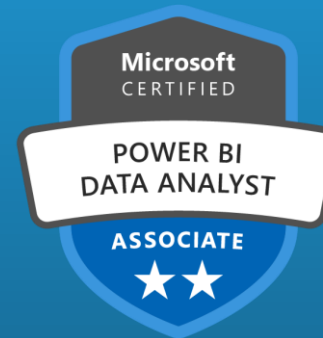
MVP: Data Platform (2016 – 2018)

Email: [John.Deardurff@Microsoft.com](mailto:John.Deardurff@Microsoft.com)

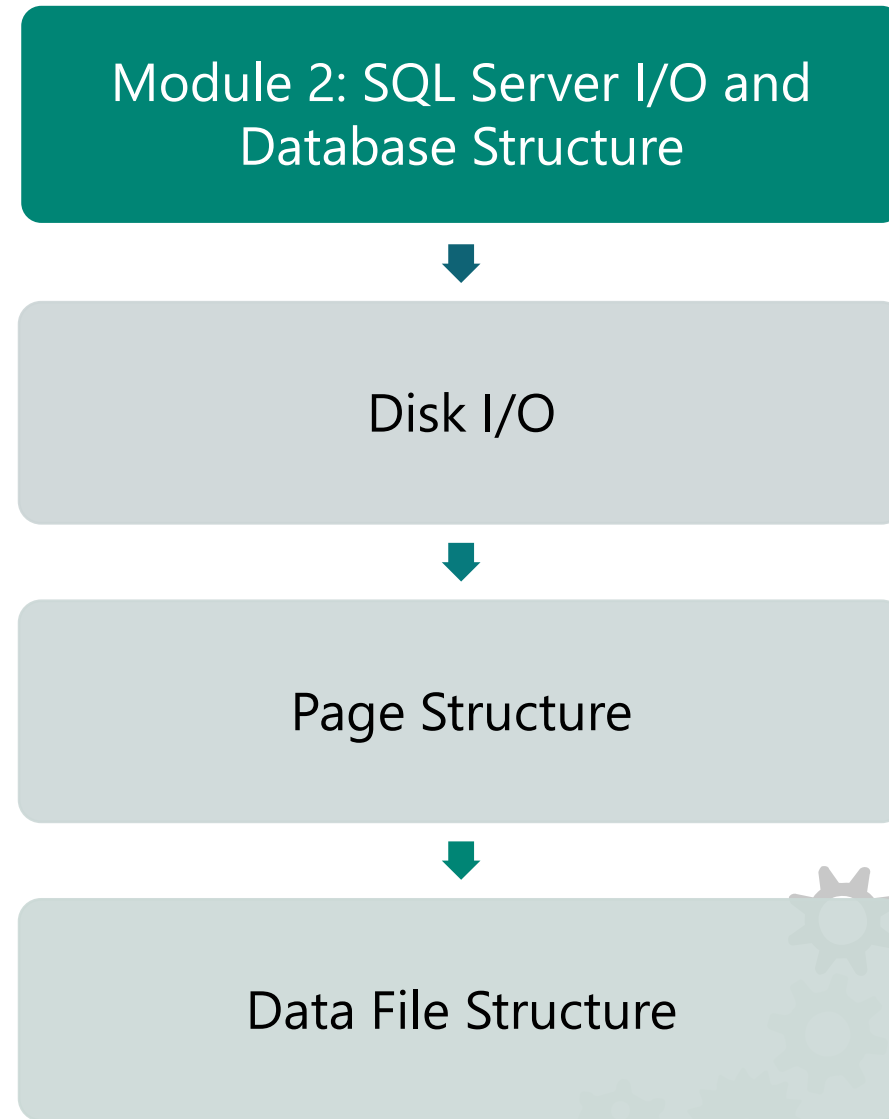
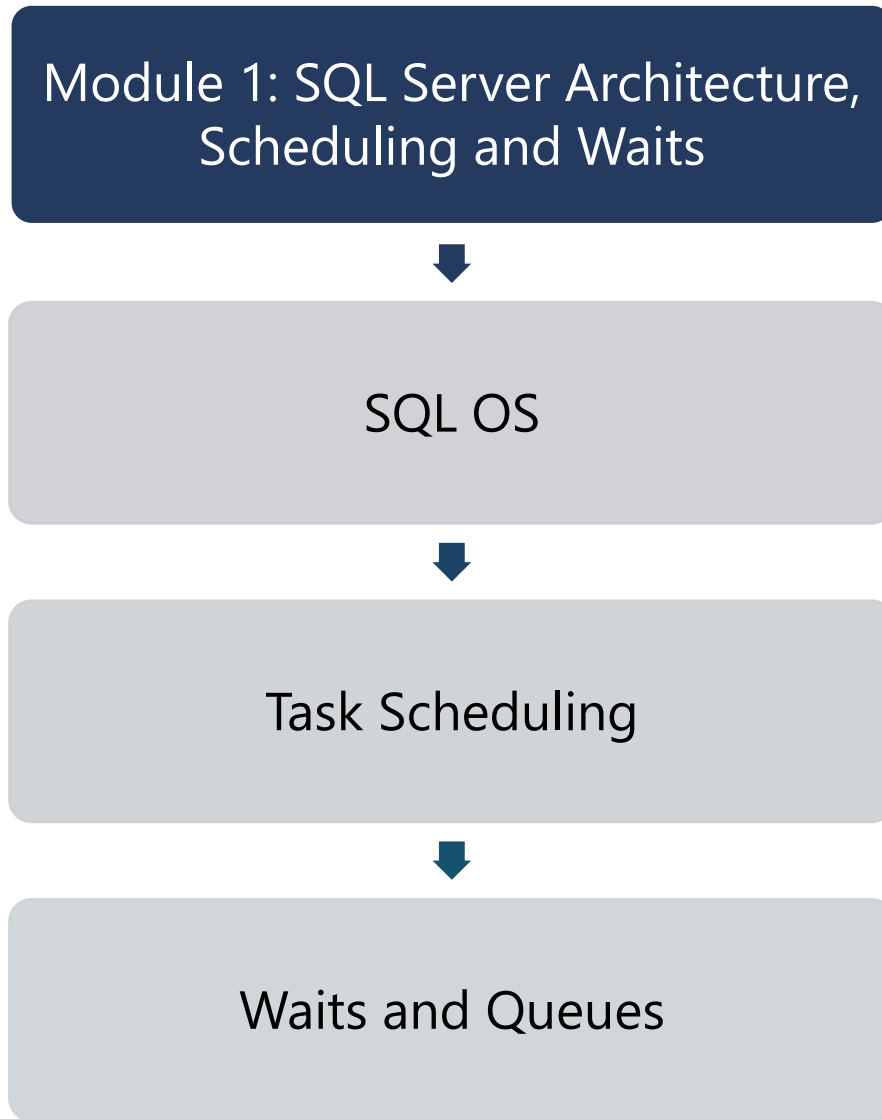
Twitter: [@SQLMCT](https://twitter.com/SQLMCT)

Website: [www.SQLMCT.com](http://www.SQLMCT.com)

GitHub: [github.com/SQLMCT](https://github.com/SQLMCT)



# Agenda Day 1



# Agenda Day 2

## Module 2: SQL Server I/O and Database Structure



Log File Structure



TempDB File Structure

## Module 3: SQL Server Memory



Windows Memory Management



SQL Server Memory Management



Troubleshooting SQL Server Memory

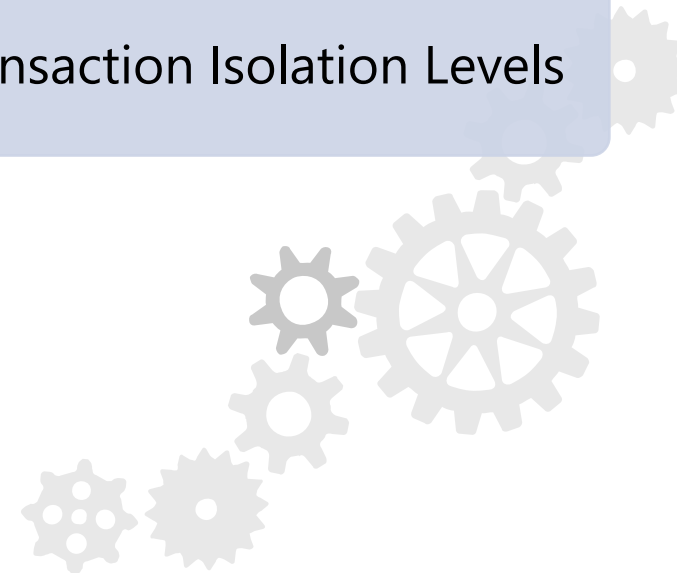
## Module 4: SQL Server Concurrency and Transactions



SQL Server Transactions



Transaction Isolation Levels



# Agenda Day 3

## Module 4: SQL Server Concurrency and Transactions



SQL Server Locking



Blocking and Deadlocking

## Module 5: SQL Server Index Structure



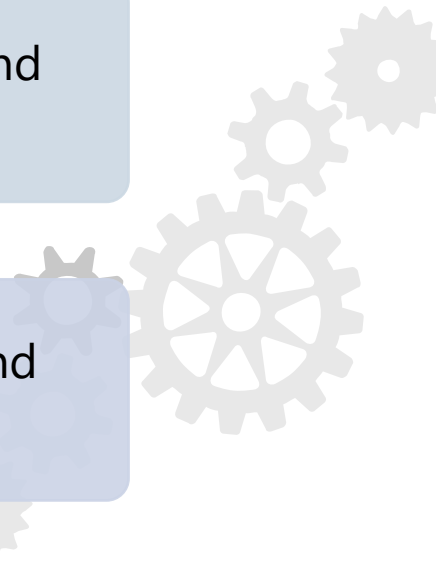
SQL Server Index Internals & Indexing Strategies



SQL Server Partitioned Tables and Indexes



SQL Server Index Monitoring and Fragmentation



# Agenda Day 4

## Module 6: SQL Server Statistics Structure

SQL Server Statistics Internals

SQL Server Cardinality Estimation

SQL Server Statistics Maintenance

## Module 7: SQL Server Query Execution and Plans

SQL Server Query Execution

SQL Server Query Plan Analysis

SQL Server Intelligent Query Processing

## Module 8: SQL Server Plan Caching and Query Store

SQL Server Plan Cache Internals

Query Store

Query Store Troubleshooting

# Additional Review

## Module 9: SQL Server Query Tuning



Sargable expressions



Query Hints



Query Troubleshooting

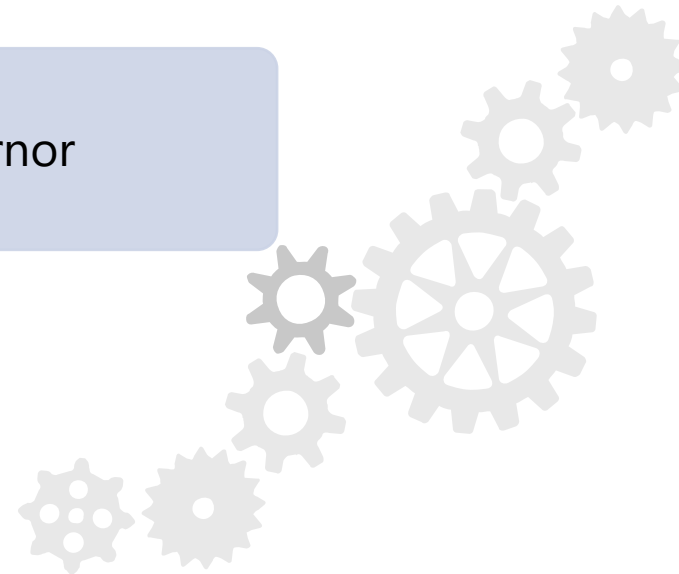
## Module 10: SQL Server Performance Tools



Extended Events



Resource Governor




# Class Resources

Virtual Lab Environment, Slides  
Decks, Lab Manuals, and Demo  
Files

### Labs


1

**WorkshopPLUS - SQL Server: Performance Tuning and Optimization**  
WorkshopPLUS - SQL Server: Performance Tuning and Optimization, All Modules

Launch


### Additional Resources

1

**PowerPoint Slide Decks**


Launch

2

**Lab Manuals**

Launch

3

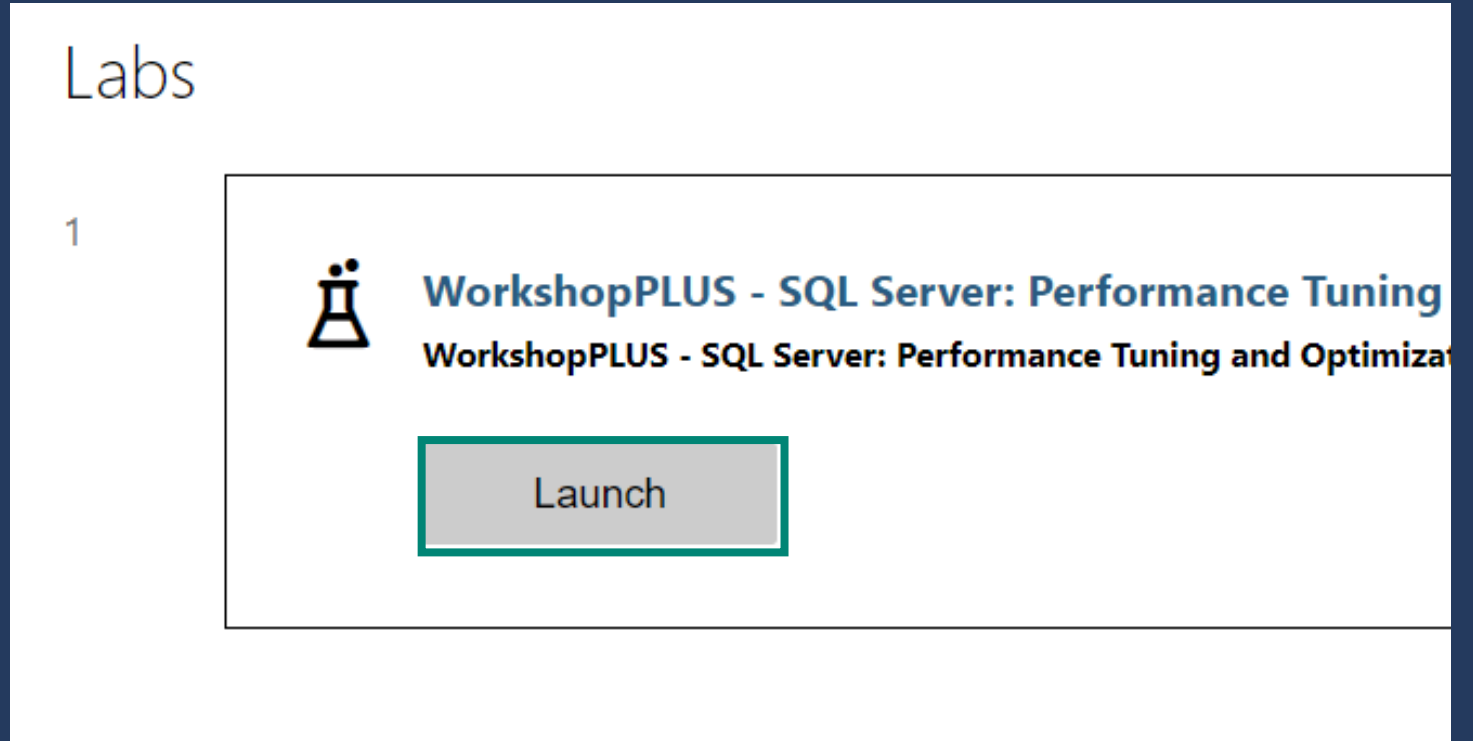
**Demo Files**

Launch



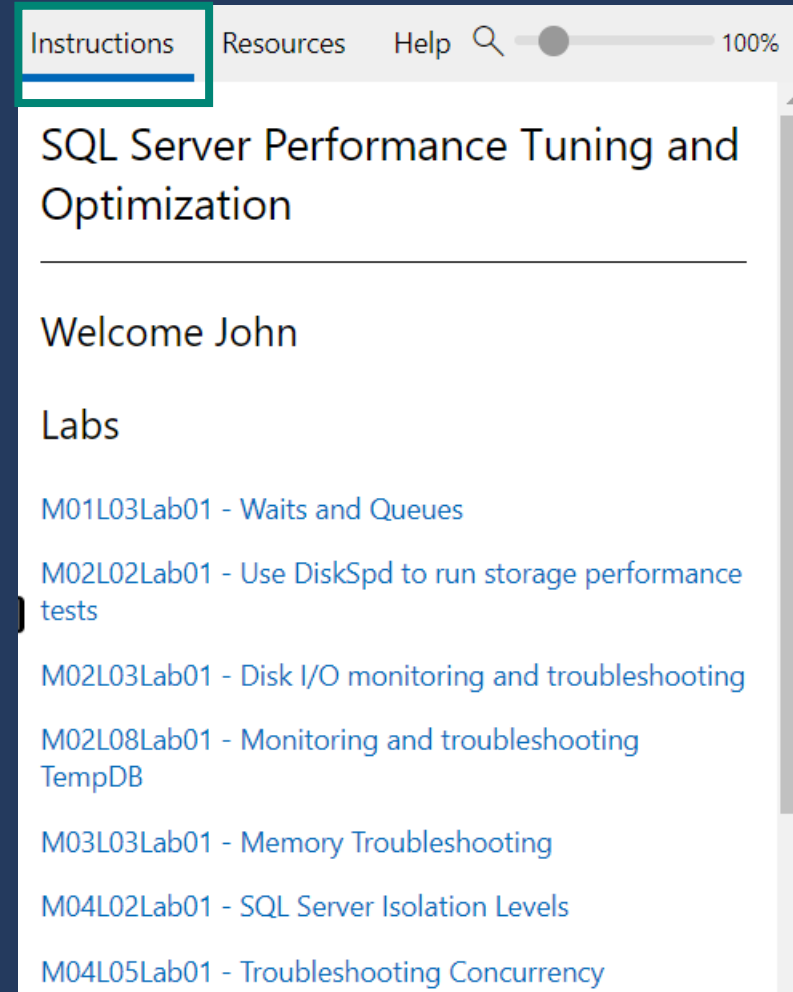
# Launch Lab

In the Labs section, click Launch



# Lab environment

Lab Instructions are shown on the right side of the virtual machine.



The screenshot shows a web application interface for 'SQL Server Performance Tuning and Optimization'. At the top, there is a navigation bar with 'Instructions' (highlighted with a green box), 'Resources', and 'Help' (with a magnifying glass icon). A zoom slider is set to 100%. Below the navigation bar, the title 'SQL Server Performance Tuning and Optimization' is displayed. A welcome message 'Welcome John' is shown. Under the 'Labs' section, a list of lab topics is provided, each as a blue hyperlink: 'M01L03Lab01 - Waits and Queues', 'M02L02Lab01 - Use DiskSpd to run storage performance tests', 'M02L03Lab01 - Disk I/O monitoring and troubleshooting', 'M02L08Lab01 - Monitoring and troubleshooting TempDB', 'M03L03Lab01 - Memory Troubleshooting', 'M04L02Lab01 - SQL Server Isolation Levels', and 'M04L05Lab01 - Troubleshooting Concurrency'.

Instructions Resources Help 100%

## SQL Server Performance Tuning and Optimization

Welcome John

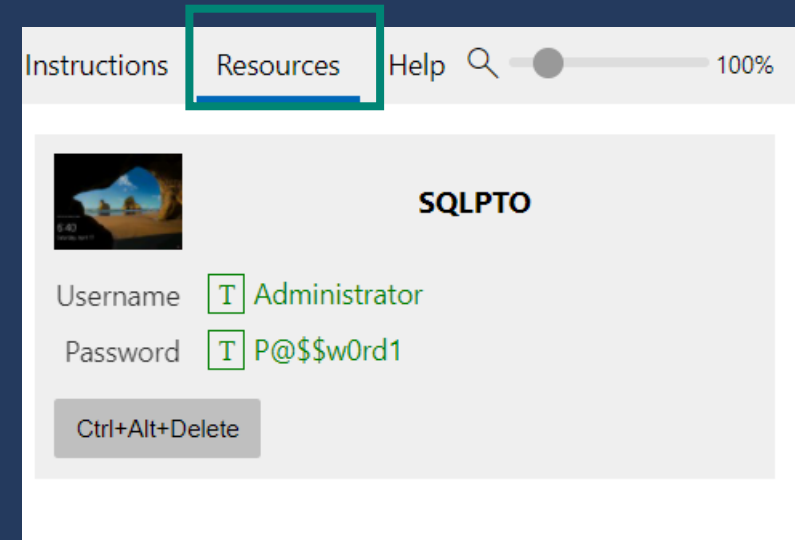
### Labs

- [M01L03Lab01 - Waits and Queues](#)
- [M02L02Lab01 - Use DiskSpd to run storage performance tests](#)
- [M02L03Lab01 - Disk I/O monitoring and troubleshooting](#)
- [M02L08Lab01 - Monitoring and troubleshooting TempDB](#)
- [M03L03Lab01 - Memory Troubleshooting](#)
- [M04L02Lab01 - SQL Server Isolation Levels](#)
- [M04L05Lab01 - Troubleshooting Concurrency](#)

# Lab environment

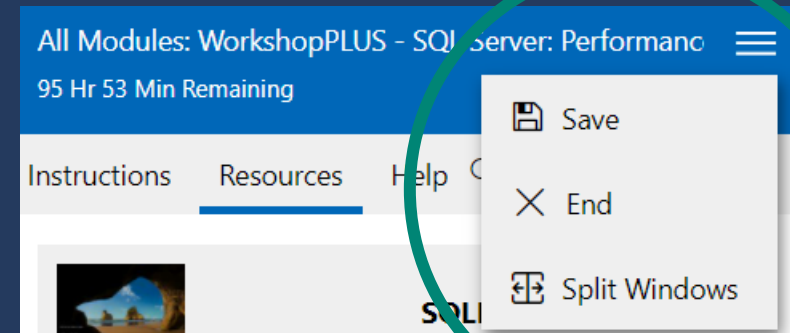
Use the Ctrl+Alt+Delete button to logon to the virtual machine.

You can click on the **T** next to Username and Password to paste in the virtual machine.



# Lab Time Remaining

- Ensure you select **Save** before leaving the Lab environment.
- You can save up to 5 labs for up to 7 days.
- The lab environment is available for 180 days.
- Split Windows will allow you to move the instructions to a separate screen.



Dankie Faleminderit **Shukran** Chnorakaloutioun Hvala Blagodaria

Děkuji **Tak** Dank u Tānan Kiitos **Merci** Danke Ευχαριστώ A dank

Mahalo הודו. **Dhanyavād** Köszönöm Takk Terima kasih **Grazie** Grazzi

**Thank you!**

감사합니다 Paldies Choukrane Ačiū **Благодарам** ありがとうございます

谢谢 Баярлалаа **Dziękuję** Obrigado Mulțumesc **Спасибо** Ngiyabonga

Ďakujem Tack Nandri Kop khun **Teşekkür ederim** Дякую Хвала Diolch

