Gianluca Sartori

Benchmarking Like a PRO

Sponsor

ENGAGE
IT SERVICES

Microsoft

Bi FACTORY

Elfo

DATA SKILLS
UNDERSTANDING THE WORLD

redgate

MICROSYS

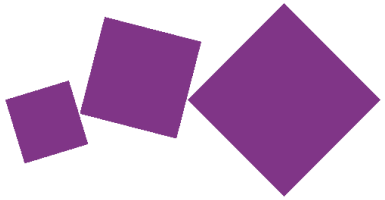
ApexSQL

Digibahn

OverNet
EDUCATION

SentryOne

Organizzatori



GetLatestVersion.
it

UNIVERSITÀ DEGLI STUDI DI PARMA

dotNET{podcast}

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Agenda

Baselining & Benchmarking scenarios

Tools

Capturing in production

Running the Replay

Comparing results

WARNING:

I will demo PowerShell scripts

Nobody is going to get hurt.

Promised.

Baselining and Benchmarking Scenarios

What is a benchmark?

Describes performance in a given scenario

- Evaluates *whatif* scenarios
  - HW/Software Upgrade
  - Virtualization…
- Helps rating tuning efforts
  - Server-wide configuration changes
  - Addition / removal of indexes

Benchmarking Scenarios

Patching

SW Upgrade

Consolidation

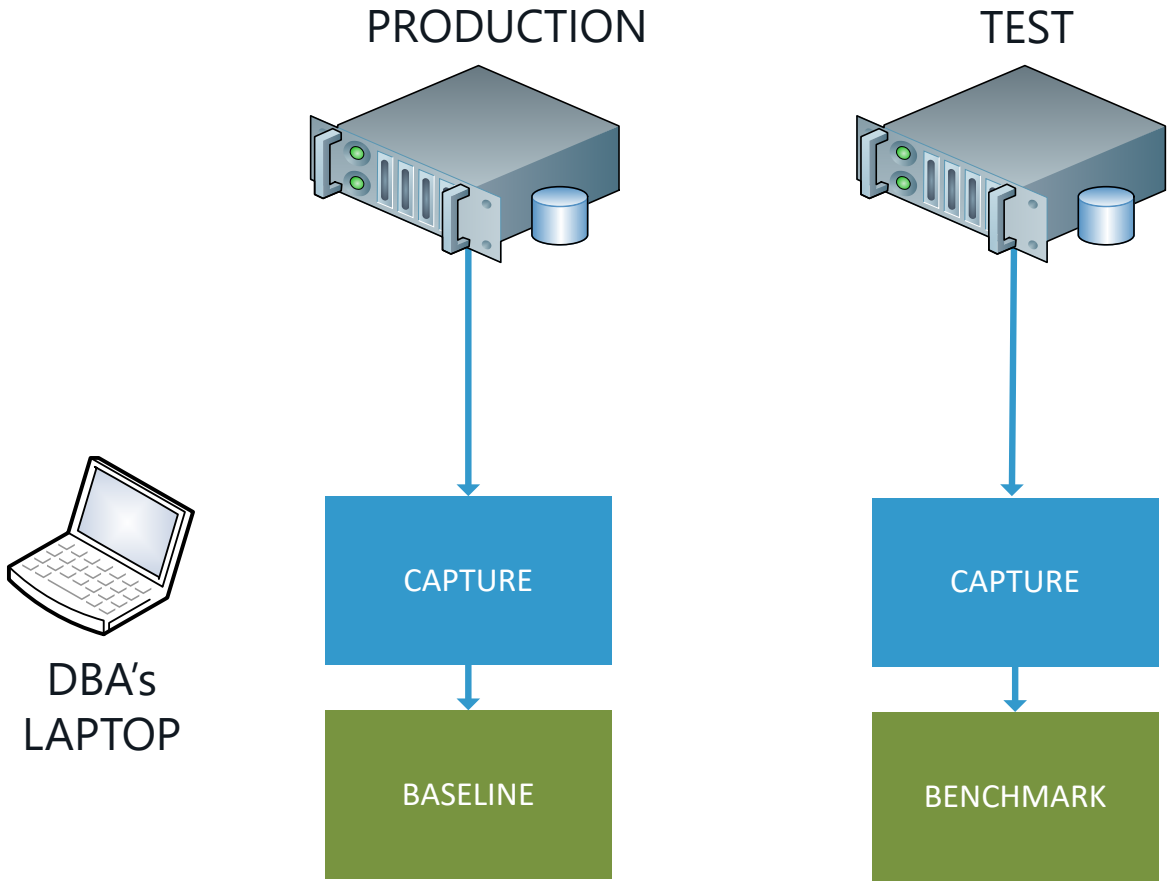
Virtualization

HW Upgrade

Configuration change

Database Tuning

Synthetic Workload

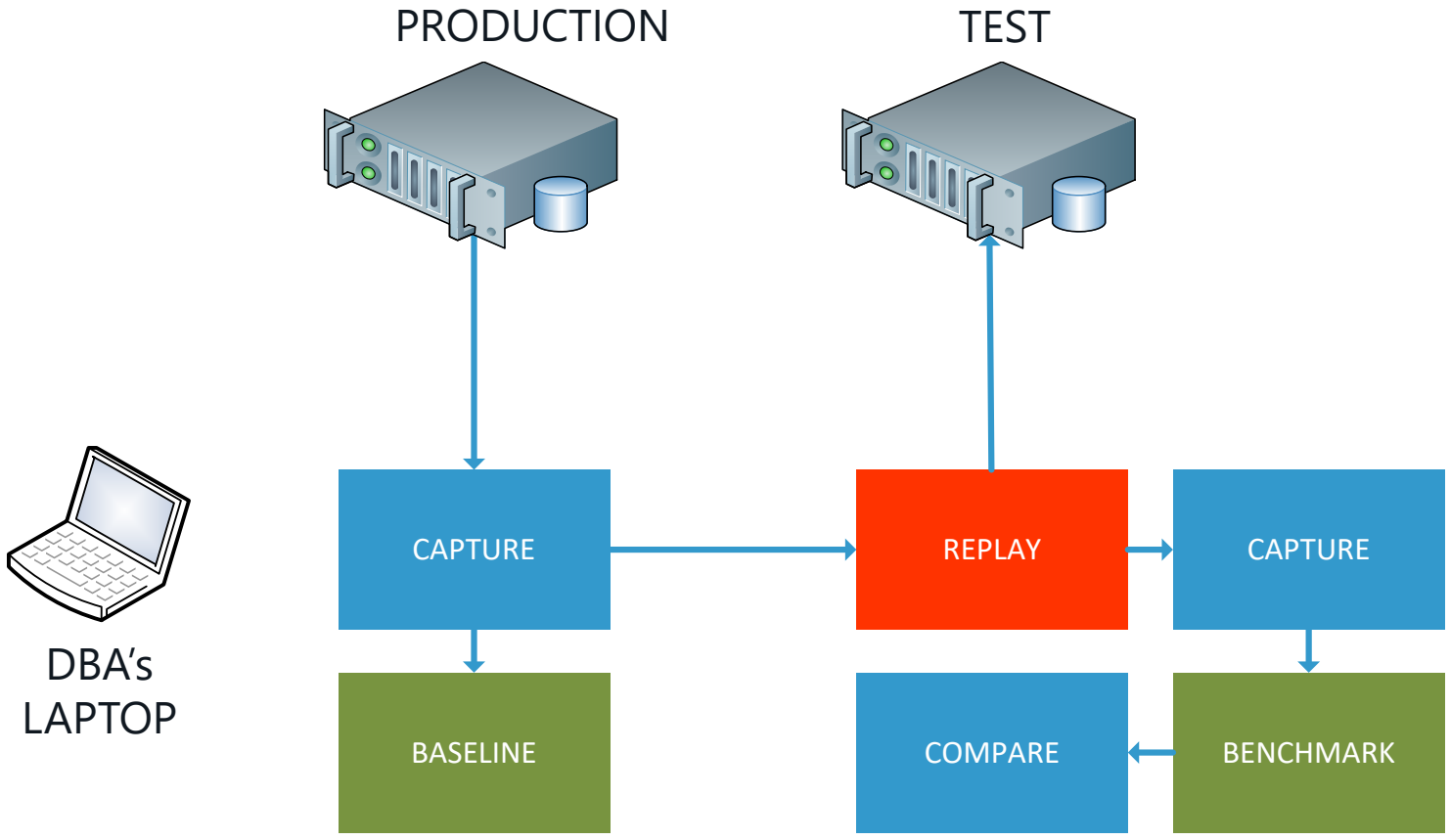


TPC benchmarks

DVD Store

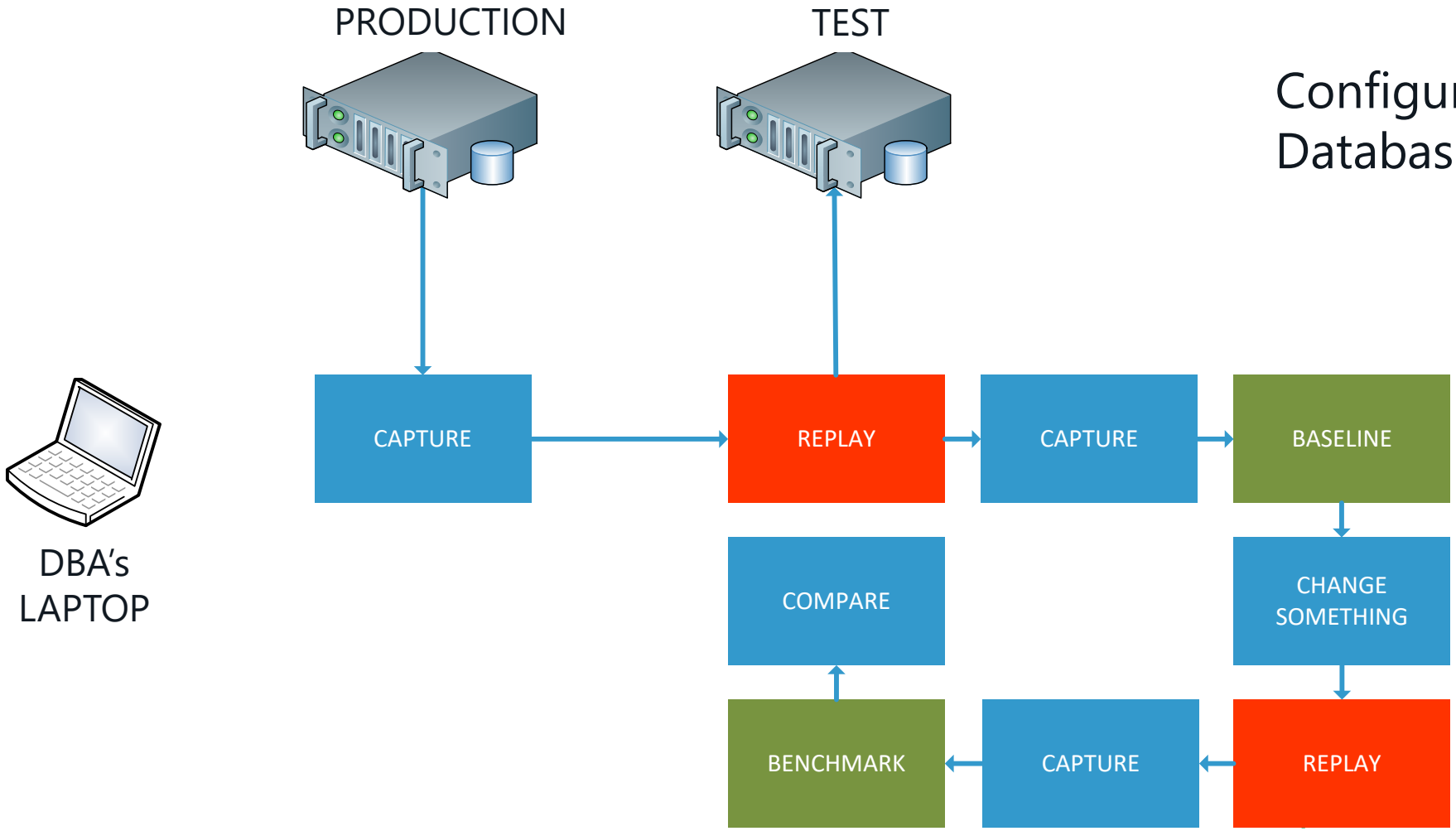
HammerDB

Production vs. Test



Patching
SW Upgrade
Consolidation
Virtualization
HW Upgrade

Test vs. Test


PRODUCTION
TEST
Configuration change
Database Tuning
DBA's
LAPTOP
CAPTURE
REPLAY
CAPTURE
BASELINE
COMPARE
CHANGE
SOMETHING
BENCHMARK
CAPTURE
REPLAY

Tools

Capture Tools

Profiler

- Non-negligible performance impact on the server

Extended Events

- Low performance overhead
- Big files
- Non compatible with all versions of SQL Server

SQL Trace

- «Old school»
- Compatible with all versions
- Compatible with more analysis/replay tools

Analysis Tools

RML Utilities

- ReadTrace
- Reporter

SQLNexus

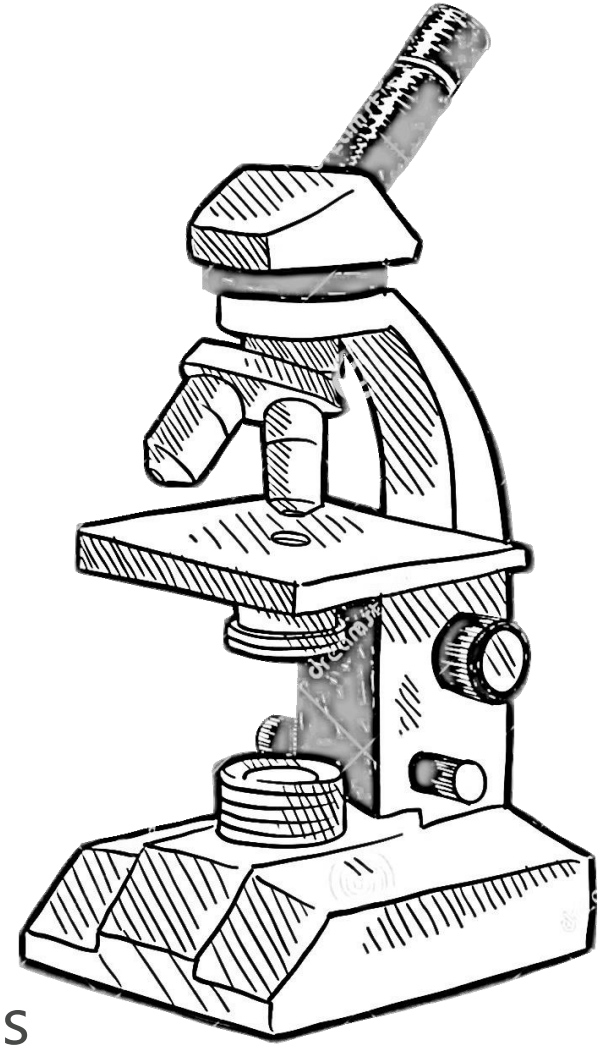
- Based on RML Utilities

ClearTrace

- Can analyze trace files

PAL

- Performance counters analysis with thresholds



Replay Tools

Profiler

- Can set breakpoints for debugging

RML Utilities

- Ostress
- Stress / Replay mode

Distributed Replay

- Introduced in SQL Server 2012
- Can replay a workload from multiple clients
- Supports synchronization mode

Capturing in production

What to capture

Queries

- SQL Trace vs. Profiler vs. Extended Events
- Which events?
- Which columns?
- Any templates?

Performance data

- Performance counters
- Which counters?
- PAL threshold file

Database

- Full database backup
- All databases involved
- Synchronize with the trace

DEMO

Capturing workloads in production

Running the replay

Prepare the environment

Server

Logins

Any server object captured in the source workload

Database

Restore the database(s)

Queries

Pre-process the trace files

(Synchronize with the backup time, apply filters…)

Replay Tools

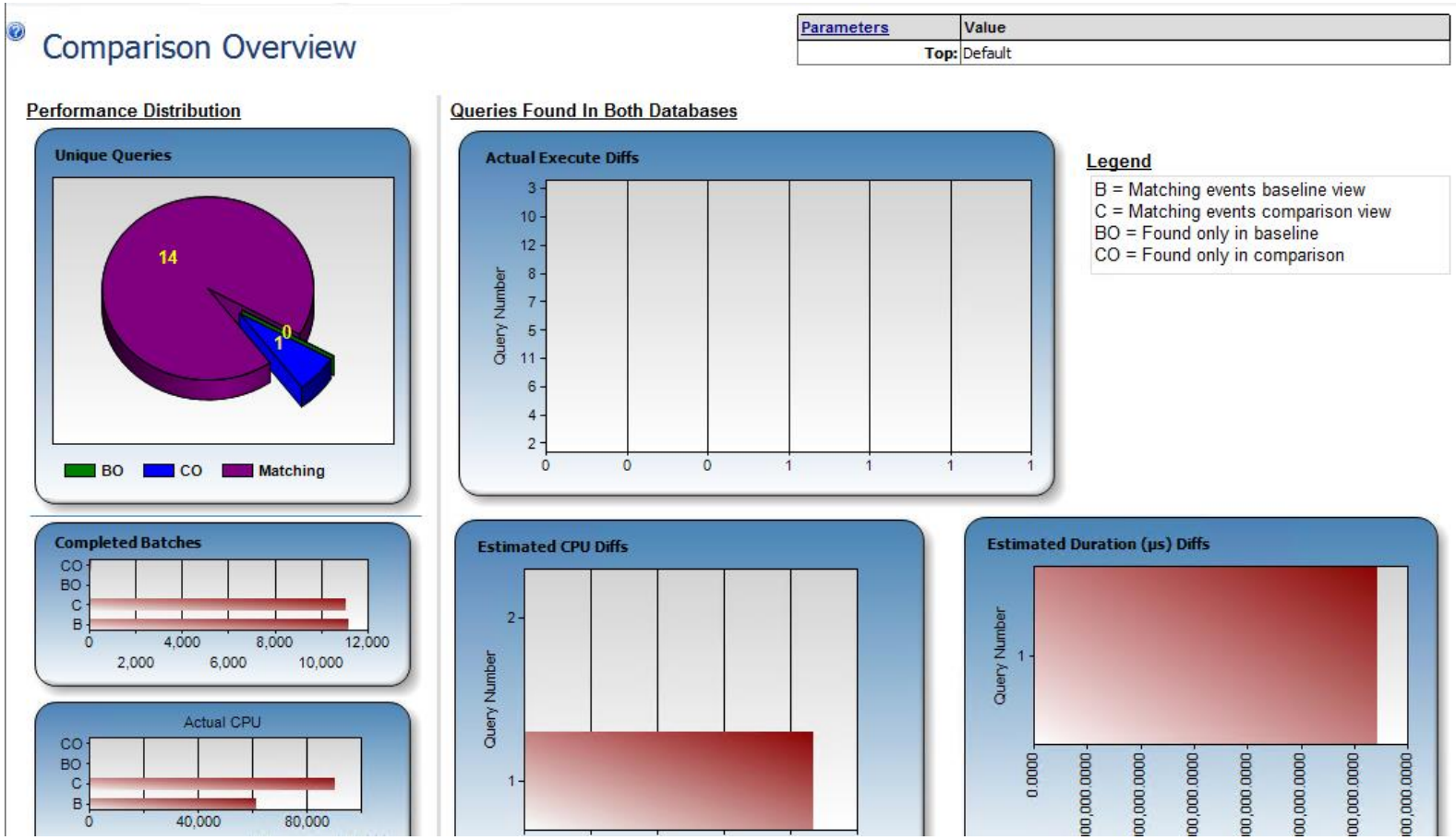
	Profiler	Ostress	Distributed Replay
Multithreading	YES	YES	YES
Debugging	YES	NO	NO
Synchronization mode	NO	YES	YES
Stress mode	YES	YES	YES
Distributed mode	NO	NO	YES
Input format	Trace	Trace RML SQL XEL	Trace

Running the replay

DEMO

Comparing executions

RML Reporter



PAL

PAL Wizard v2.7.4
Welcome
Counter Log
Threshold File
Questions
Output Options
File Output
Queue
Execute
Welcome to the Performance Analysis of Logs (PAL) tool analysis wizard. This wizard will guide you through the process of analyzing your log file(s).
Author: Clint Huffman
About the Author
Email: clinth@microsoft.com
Blog
Support
PAL v2
http://pal.codeplex.com/
Written by Clint Huffman (clinth@microsoft.com) and various other contributors.
If you have any questions, problems, or feedback with this tool, then please post it to the discussion forum at http://pal.codeplex.com
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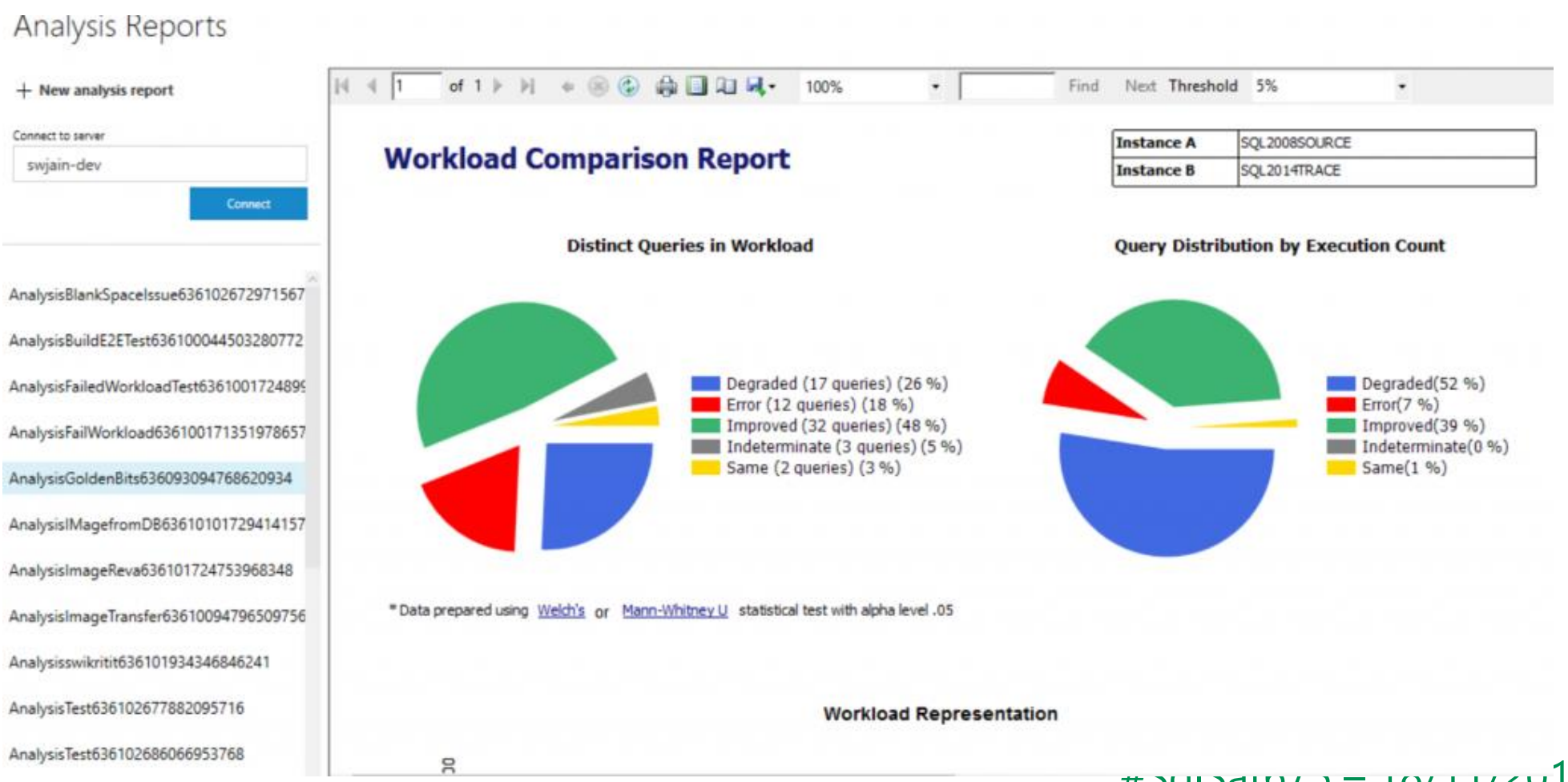
Next

Database Experimentation Assistant



Comparing Executions

DEMO

Alternatives?

Frequent issues

- Database is too big for backup / restore (e.g. 10 TB)
- Workload is too heavy to capture
  - Too much space on disk, too many .TRC files to analyze
  - Not enough time captured => not meaningful enough

Possible solutions

- Replay events with XEvents streaming API
- Avoid replay completely and run a representative workload
- Query Store

Resources

Samples on GitHub

https://github.com/spaghettidba/DBA-Scripts/tree/master/Replay

RML Utilities

https://support.microsoft.com/en-us/kb/944837

PAL

https://pal.codeplex.com/

ClearTrace

http://www.scalesql.com/cleartrace/

Database Experimentation Assistant

https://blogs.msdn.microsoft.com/datamigration/2017/03/24/dea-2-0-how-to-use-database-experimentation-assistant/

https://www.microsoft.com/en-us/download/details.aspx?id=54090

Q&A

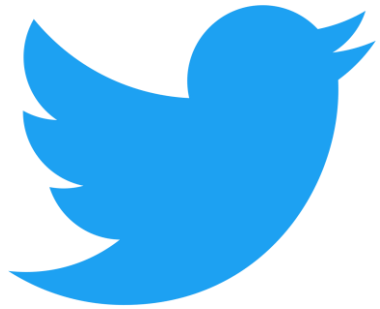
Questions?

Q&A

More Questions?

Ask me!

spaghettidba@sqlconsulting.it



#SqlSat675