

# Troubleshooting performance like a Premier Support engineer. (but for free...)

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# About me

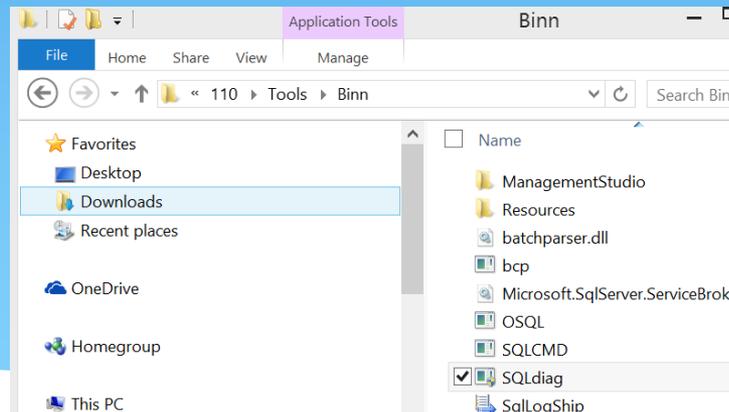
- ❖ I have been working with SQL since version 6.5
- ❖ Currently working as a Database Manager at Bridge2Solutons here in Alpharetta.
- ❖ Have done a lot of consulting to Hospitals using PSSDiag as well as how to virtualize highly transactional databases.
- ❖ Participated on a Microsoft led beta testing for SQL 2012.

# Agenda

1. Introduction to PSSDiag and Diag Manager
2. Introduction to SQL Nexus
3. Introduction to RML Utilities
4. How to configure PSSDiag
5. How to load the Output folder into Nexus
6. How to open and analyze the reports
7. Demo
8. Q&A

# Introduction to PSSDiag and Diag Manager

- ❖ SQLDiag is a command line utility that ships with SQL Server
- ❖ Located in the installation Binn folder

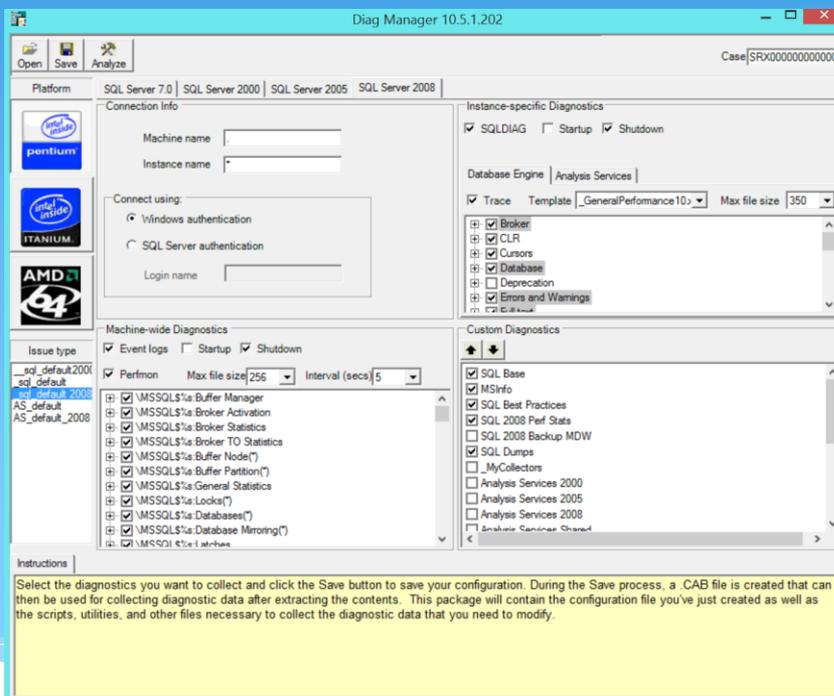


# PSSDiag

- ❖ Gathers perfmon logs, error logs, profiler traces, hardware config
- ❖ Uses a xml configuration file called PSSDiag which must have the SQL Server version to work correctly.
- ❖ PSSDiag.exe uses SQLDIAG.exe under that covers.
- ❖ It produces an output folder with all data/metrics collected

# Diag Manager

- ❖ Diag Manager is the GUI used to create PSSDiag.
- ❖ “Out of the box” it works with SQL up to version 2008 R2

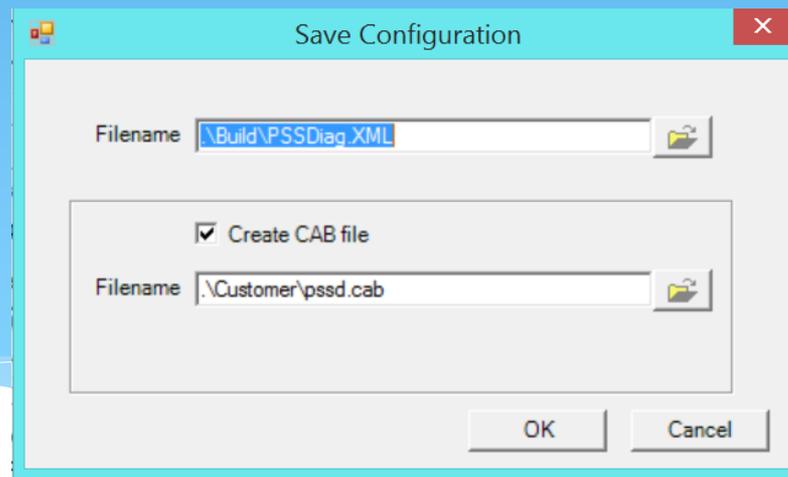


# Configuring Diag Manager

- ❖ Choose the processor type; x86 or x64
- ❖ Choose the SQL Version; GUI supports up to 2008 R2
- ❖ If you do not want to use the Trace, uncheck box
- ❖ If you are using a default instance don't change the Machine or Instance name boxes; just leave it as is.
- ❖ Enter either Windows or SQL authentication for the user executing PSSDiag.exe. If SQL user is selected a password will be required at run time.

# Configuring Diag Manager

- ❖ Once you hit Save, it will create all the necessary files in the path shown. All you need is in the PSSDiag folder.
- ❖ Copy the PSSDiag folder to the destination server. Go to the Build folder to find the pssdiag.cmd file.



# Not SQL 2008 R2 or older? Too bad...

- ❖ IF you have SQL 2012 or 2014, you will need to modify an xml file called PSSDiag.xml to reflect the version of SQL you are running.
- ❖ There are 2 places that needs to be edited. (setupver = 11.0)

```
<?xml version="1.0" standalone="yes"?>
<dsConfig>
  <DiagMgrInfo>
    <ConfigMgrVer>10.5.1.202</ConfigMgrVer> <IntendedPlatform>x64/AMD64 </IntendedPlatform><Conf:
  <Collection setupver="10.5.1.202" casenumber="SRX000000000000">
    <Machines>
      <Machine name=".">
        <MachineCollectors>
          <EventlogCollector enabled="true" startup="false" shutdown="true" />
          <PerfmonCollector enabled="true" pollinginterval="5" maxfilesize="256">
            <PerfmonCounters>
              <PerfmonObject name="\MSSQL$%s:Buffer Manager" enabled="true">
                <PerfmonCounter name="\Buffer cache hit ratio" enabled="true" />
                <PerfmonCounter name="\Buffer cache hit ratio base" enabled="true" />
                <PerfmonCounter name="\Page lookups/sec" enabled="true" />
                <PerfmonCounter name="\Free list stalls/sec" enabled="true" />
```

- ❖ And the same almost at the end of the xml file.

```
      </PerfmonObject>
    </PerfmonCounters>
  </PerfmonCollector>
</MachineCollectors>
<Instances>
  <Instance name="*" windowsauth="true" ssver="11" user="">
    <Collectors>
      <SqldiagCollector enabled="true" startup="false" shutdown="true" />
      <BlockingCollector enabled="true" latch="true" fast="true" pollinginterval="5" maxfilesize="350" />
      <ProfilerCollector enabled="true" template="_GeneralPerformance10.xml" pollinginterval="5" maxfilesize="350">
        <Events>
```

# Finally Running PSSDiag

- ❖ From the command line call PSSDiag.cmd; it should look like this:

```
Command Prompt
Microsoft Windows [Version 6.3.9600]
(c) 2013 Microsoft Corporation. All rights reserved.

C:\Users\Francisco>cd C:\Program Files (x86)\Microsoft\Pssdiag\Build
C:\Program Files (x86)\Microsoft\Pssdiag\Build>pssdiag.cmd
```

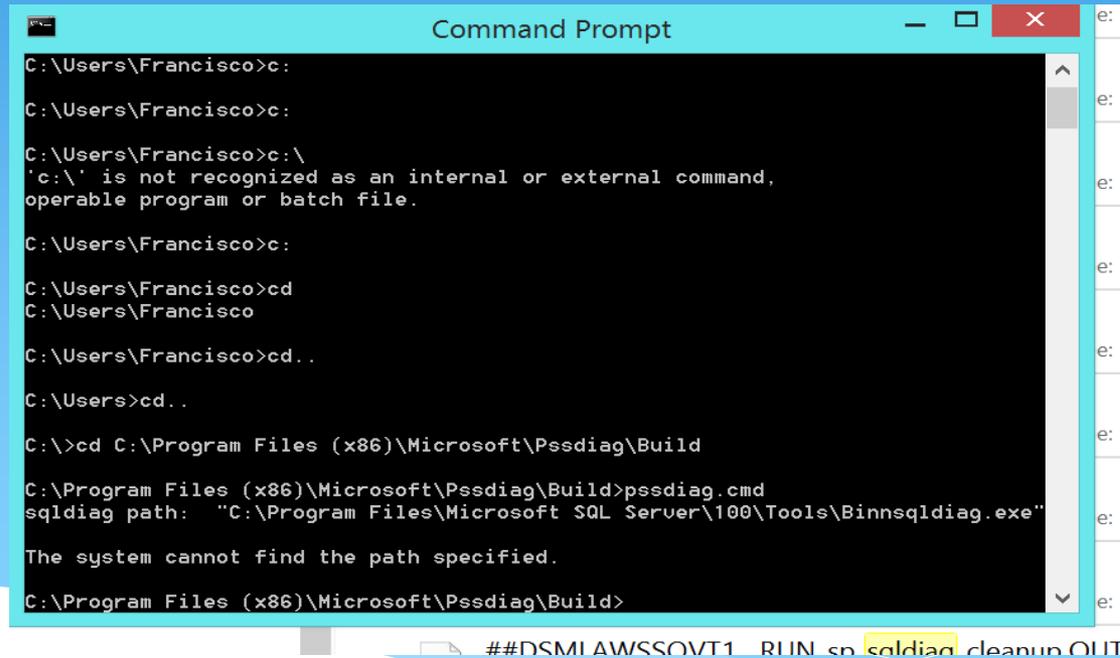
```
SQLDIAG
2015/02/06 21:07:53.52 SQLDIAG Collector version
2015/02/06 21:07:53.67 SQLDIAG

IMPORTANT: Please wait until you see "Collection started" before attempting to
reproduce your issue

2015/02/06 21:07:53.67 SQLDIAG Output path: C:\Program Files (x86)\Microsoft\Pss
diag\Build\output\
2015/02/06 21:07:53.69 SQLDIAG Collecting from 1 logical machine(s)
2015/02/06 21:07:53.69 SQLDIAG Invalid node fetched. (null)
2015/02/06 21:07:53.69 SQLDIAG Invalid node fetched. (null)
2015/02/06 21:07:53.71 SQLCZARS\* SQL Server version: 11
2015/02/06 21:07:53.71 SQLCZARS\* Machine name: SQLCZARS (this machine)
2015/02/06 21:07:53.71 SQLCZARS\* Target machine is not a cluster
2015/02/06 21:07:53.71 SQLCZARS\* Instance: (Default) (64-bit)
2015/02/06 21:07:54.71 SQLDIAG Initialization starting...
2015/02/06 21:07:55.28 SQLCZARS\* Starting Profiler trace
2015/02/06 21:07:55.53 SQLCZARS\* Starting Blocking script
2015/02/06 21:07:55.94 SQLCZARS\* SQL Base: PSSDFileDetails
2015/02/06 21:07:56.03 SQLCZARS\* SQL Base: DefineRealProcArch
2015/02/06 21:07:56.11 SQLCZARS\* SQL Base: OutputRealProcArch
2015/02/06 21:07:56.17 SQLCZARS\* SQL Base: DefineSQL80COMPPath
2015/02/06 21:07:56.28 SQLCZARS\* SQL Base: OutputSQL80COMPPath
2015/02/06 21:07:56.35 SQLCZARS\* SQL Base: DefineSQL80ToolsPath
2015/02/06 21:07:56.44 SQLCZARS\* SQL Base: OutputSQL80ToolsPath
```

# Diag Manager Error

- ❖ If the error below, it means you did not change the SQL Version on the PSSDiag.xml file to your current version.



```
Command Prompt
C:\Users\Francisco>c:
C:\Users\Francisco>c:
C:\Users\Francisco>c:\
'c:\' is not recognized as an internal or external command,
operable program or batch file.
C:\Users\Francisco>c:
C:\Users\Francisco>cd
C:\Users\Francisco
C:\Users\Francisco>cd..
C:\Users>cd..
C:\>cd C:\Program Files (x86)\Microsoft\Pssdiag\Build
C:\Program Files (x86)\Microsoft\Pssdiag\Build>pssdiag.cmd
sqldiag path: "C:\Program Files\Microsoft SQL Server\100\Tools\Binnsqldiag.exe"
The system cannot find the path specified.
C:\Program Files (x86)\Microsoft\Pssdiag\Build>
```

# SQL Nexus

- ❖ This is the tool you use to load the Output folder created by PSSDiag.
- ❖ This tool pulls it all together; perfmon, error log, etc.

The screenshot shows the SQL Nexus application interface. On the left is a sidebar with three main sections: 'Reports' containing 'Instructions' and 'SQL Perf Main'; 'Tasks' containing 'Print', 'Export', 'Copy to clipboard', 'Open Nexus Log', and 'Open Readrace Log'; and 'Data' containing 'Import' and 'Edit Custom Rowset'. The main content area displays a 'Welcome to SQL Nexus' page with a definition of SQL and a 'Data Import' dialog box. The dialog box has a title bar 'Data Import' and a message: 'Please supply the source path for the files you wish to import'. The 'Source path' field contains 'C:\Program Files (x86)\Microsoft\Pssdiag\Build\output'. There is an 'Options' link and an 'Import' button. Below the dialog box, there is text: 'Click one of the reports on the left to view it. If the report includes a link to another report, click the link to view the linked report. Hold down the Control key while you click a linked report to view it in a separate window.'

SQL

SQL [ èss kyoo éI, sékwál ]. Noun. Definition: computer language: a standardized language that approximates the structure of natural English for obtaining information from databases.

nex-us [ néksəss ] (plural nex-us or nex-us-es). Noun. Definition: 1) connection: a connection or link associating two or more people or things 2) connected group: a group or series of connected people or things 3) center: the center or focus of something.

nex-us

SQL Nexus

Please supply the source path for the files you wish to import

Source path: C:\Program Files (x86)\Microsoft\Pssdiag\Build\output

Options Import

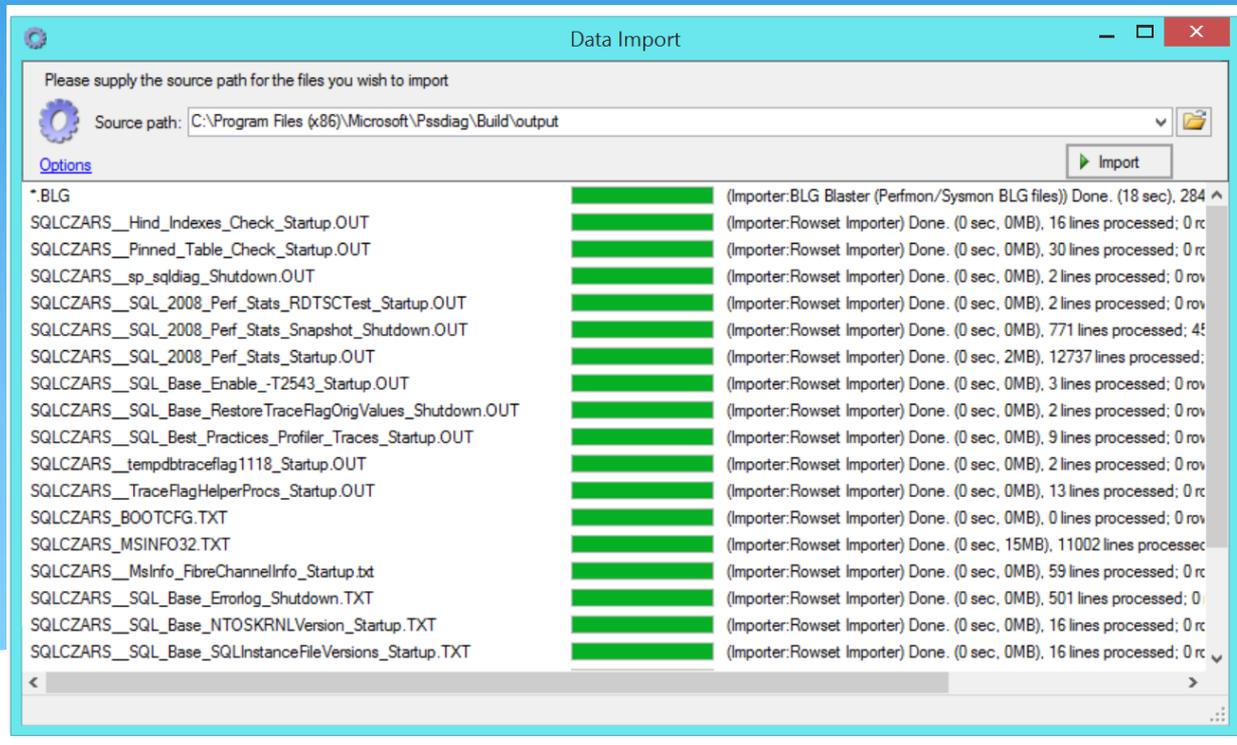
Click one of the reports on the left to view it. If the report includes a link to another report, click the link to view the linked report. Hold down the Control key while you click a linked report to view it in a separate window

is tool. It provides an extensible facility particularly that related to SQL Server

You can add your c included with SQL them with SQL Ser Visual Studio and into the %appdata%

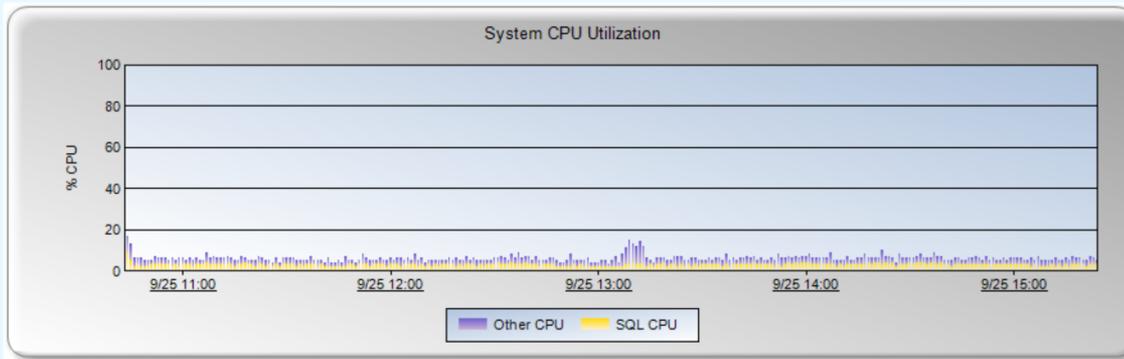
# Importing Data Into Nexus

- ❖ The Output folder has all necessary data for the Nexus tool to consume.
- ❖ Depending on the size of the folder, it may take some for the data to get imported.

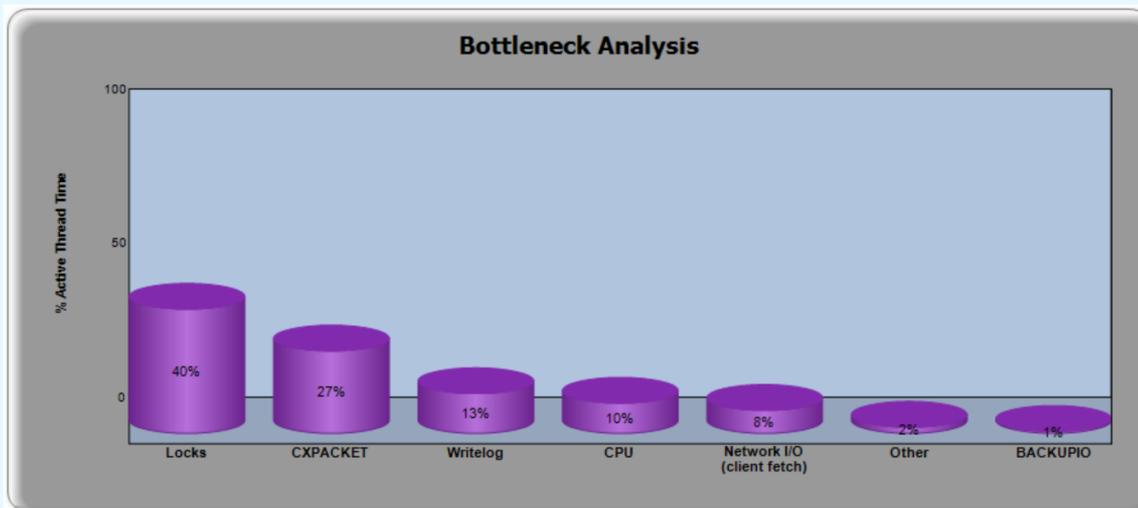


# SQL Nexus Reports

- ❖ Once the Output folder is loaded, reports can be created.



This chart summarizes the type of resources that SQL worker threads spent time waiting on. The "CPU" value includes both time running on the CPU and time waiting in the runnable queue (waiting to be scheduled on the CPU). The other wait states represent time that a thread spent waiting for some other resource (locks, I/O, etc).



# Various Tools Install Order

#####Follow the sequence below#####

-INSTALL RML (RMLSeutp\_AMD64.msi)

-INSTALL Nexus (Nexus Release.....)

+ The install file is on

"Release4.0.0.64\SqlNexus4.0.0.64\SqlNexus4.0.0.64\app.publish\setup.exe"

-INSTALL ReportViewer.exe (download that file if your Nexus report does not work)

# Nexus Database Query (tbl\_request)

- ❖ Run this query in the database created by Nexus from the output folder.

```
select *  
from tbl_requests a  
left outer join tbl_notableactivequeries b  
on a.runtime = b.runtime and a.session_id =  
b.session_id  
where a.blocking_session_id <> 0  
--and a.runtime = @runtime  
order by a.session_id,a.blocking_session_id
```

# Where to download the tools

RML Utilities

<http://support.microsoft.com/kb/944837?wa=wsignin1.0>

PSSDIAG

<http://diagmanager.codeplex.com/>

SQL Nexus:

<http://sqlnexus.codeplex.com/>