



CDS Data Throughput Performance Testing

Introduction

This document provides instructions on setting up the CdsStress program in order to test data throughput performance of the Caching Data Server (CDS) on your Server PC.

What is tested –

CDS data throughput performance, including total CPU, memory access, archive system and potentially network performance.

What is not tested –

Complete system performance, including functions such as nulling, Client data access and Database updates in real-time.

Overview

The CdsStress kit includes all the programs and input files necessary to run CDS for performance testing.

The kit includes these files:

1. **CdsStrss.exe** – this is a simulated data source program. It easily allows increasing the data throughput, the number of parameters and the sample rate mix to effectively simulate a real-world data scenario. It automatically creates the IADS Configuration file (the IADS Database) and the CDS PRN (parameter definitions) files used by the CDS. These files are created every time the CdsStress program is run.
2. **parmlInfo.txt** – Input file to the CdsStress program for setting up the various data output rates. This file is meant to be edited by you to set the data throughput rate of the CdsStress Program.
3. **iadsCds.init** – Input file to set CDS run-time properties settings.
4. CDS Data Throughput Testing Instructions.pdf – This document.

*** Note: This kit does not include the CDS or IADS Client executables.**

Running CdsStress as Data Source for IADS Real Time Station

This technique outlines the steps required to run CdsStress as a custom data source for IADS Real Time Station using a customer provided pfConfig. The resulting data will be processed and displayed through the existing parameters defined in the ParameterDefaults Table of the provided pfConfig.

1. Unzip all the files onto your system. Optionally cdsStress can be installed on a remote system and accessed over the network. If you put all the files into the C:\CdsFiles directory it may make locating them easier.
2. Make a shortcut to the CdsStress.exe application on the desktop.
3. Modify the Target of the Shortcut to the following:
C:\CdsFiles\CdsStress.exe /ConfigParmMode "[Your Path]\pfConfig"
Replace [Your Path] with the exact path to the desired pfConfig
e.g. D:\PostFlightData\Test1234
Full Target path:
C:\CdsFiles\CdsStress.exe /ConfigParmMode "D:\PostFlightData\Test1234\pfConfig"
4. Run the CdsStress program. This will output an IADS PRN file to the C:\CdsFiles\CdsFiles directory. Viewing this file in Notepad should list all of the TPP parameters listed in the pfConfig assigned in step 3.
5. If prompted for allowing a Windows Firewall exception select Yes.
6. Run IADS Real Time Station, select "IADS Custom" for the Data Source. (Next >)
7. Enter the Hostname of the machine CdsStress is running on. If it's the same system then localhost is an acceptable entry. Enter 49000 (default) for Port Id. (Next >)
8. Select the PRN file that was created in step 4. (Next>)
9. Select the destination directory for your data. (Next>)
10. Select the same pfConfig assigned in step 3. (Next >)
 - a. If prompted about using a reserved file, select Yes to make a copy and save to C:\CdsFiles\CdsFiles. (Next >)
11. Review summary and press Finish to start IADS Real Time Station.
12. See the CdsStress.exe window for packet and time messages.
13. To shutdown: Log Off IADS Real Time Station and then exit [x] CdsStress.exe

To run benchmark CDS performance tests through IADS Real Time Station remove the /ConfigParmMode switch from the Target in step 3 above. In step 10 instead of selecting the assigned pfConfig either point to the pfConfig in the C:\CdsFiles\CdsFiles directory or allow IADS to create a pfConfig. Edit the parminfo.txt file, when CdsStress is not running to change the number of parameters processed by IADS Real Time Station. Because multiple IADS applications operate on the same system under IADS Real Time Station it may be best to run CdsStress on another system as data rates and the number of parameters increase.

Running CdsStress data throughput tests (Classic CDS Mode)

This technique outlines the steps required to run CdsStress with the included parameter benchmark and classic CDS start-up files.

14. Unzip all the files onto your system. If you put all the files into the c:\CdsFiles directory then the included ladsCDS.init file will not need to be modified greatly.
15. Make a shortcut to the CdsStress.exe application.
16. Make a shortcut to the CDS.exe application.
17. Add this command line option to the CDS shortcut:

CDS /StartupFile c:\CdsFiles\ladsCds.init

18. Run the CdsStress program (see Appendix A for sample output screen). This will output an IADS Configuration and PRN files to the CdsFiles directory.
19. Modify the data location property in the ladsCds.init file to point the data output path to the proper data archive drives on your system:

LOCATION1 = C:/CdsFiles/ladsOutputFiles

POSTFLIGHTCONFIG = C:/CdsFiles/ladsOutputFiles/pfConfig

20. Modify the data location property to point to the PC that the CdsStress program is running on. The Port Id does not need to be modified.

DATALOCATION = Pat3600 49000

21. Run the CDS. The CDS uses the property settings in the ladsCds.init file in order to find the PRN and Configuration files, and connect to the CdsStress data source program. Enter a "20" on the CDS screen to validate the IADS Configuration. Once complete, enter a "30" to start real-time. If everything is setup correctly then the CDS will start receiving data and validate time, see Appendix B for a successful CDS run screen.

Examining Performance

The primary test is to run the system and monitor CDS memory usage. Because the CDS is designed to use memory on a demand basis any overrun conditions are determined by an ever-increasing memory usage on the Server PC which can be monitored by using the Windows Task Manager (see Appendix C). Each test may take up to an hour before memory usage stabilizes.

Another test is to connect an IADS Client to the CDS and examine the IRIG time on the dashboard with time output of the CdsStress program and verify that they continue to match.

Shutting down (Classic CDS Mode)

Enter a "99" on the CDS menu and the application will shutdown. This may take a few minutes to close the archive files. The CdsStress program will then be ready for another connect, therefore it can continue to run. However, it will need to be re-launched if another data through put set is setup in the parmInfo.txt file.

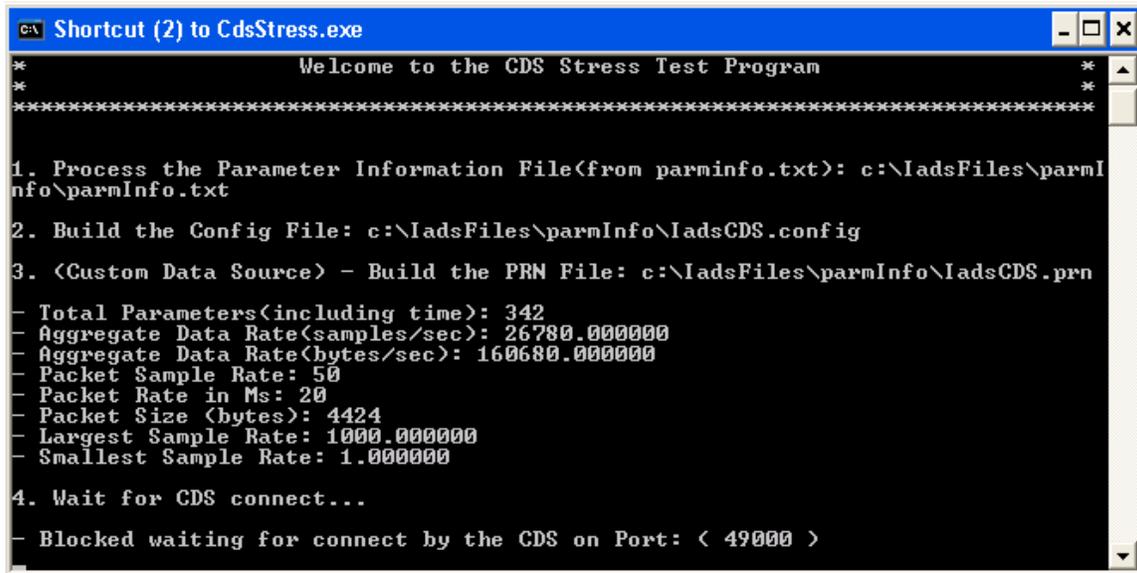
Conclusion

The CdsStress program was written to help end users determine their system's performance capabilities for the CDS. Performance may vary depending on the Server's capabilities and the network performance to the data source sender.

Cds Stress is not a data validation tool and does not accurately represent all data types available through IADS.

Appendix A

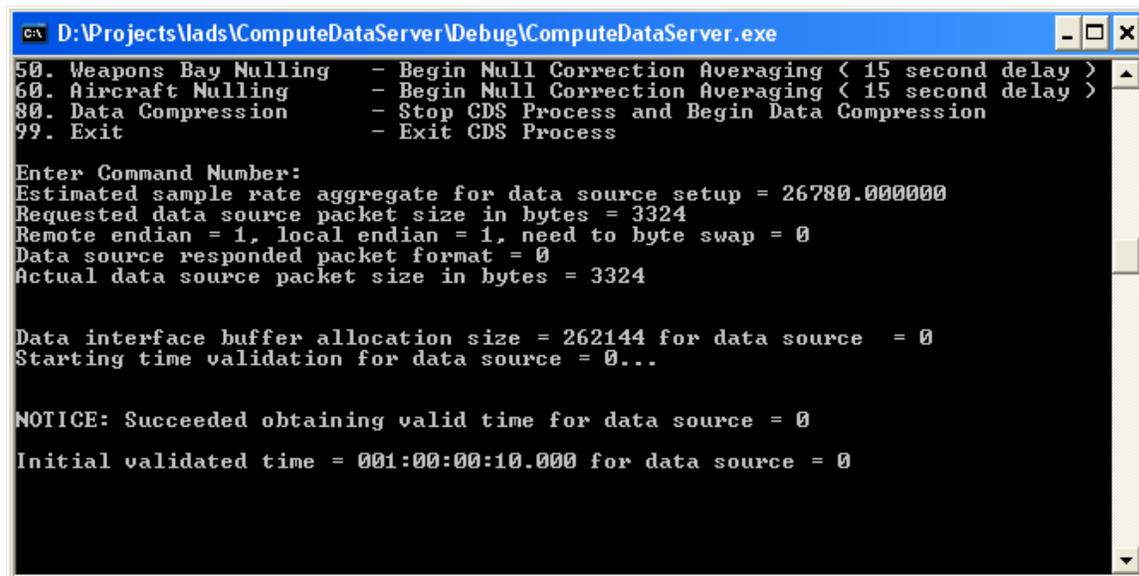
Sample Running CdsStress Screen



```
c:\ Shortcut (2) to CdsStress.exe
*           Welcome to the CDS Stress Test Program           *
*                                                                 *
*****
1. Process the Parameter Information File(from parmInfo.txt): c:\IadsFiles\parmInfo\parmInfo.txt
2. Build the Config File: c:\IadsFiles\parmInfo\IadsCDS.config
3. (Custom Data Source) - Build the PRN File: c:\IadsFiles\parmInfo\IadsCDS.prn
- Total Parameters(including time): 342
- Aggregate Data Rate(samples/sec): 26780.000000
- Aggregate Data Rate(bytes/sec): 160680.000000
- Packet Sample Rate: 50
- Packet Rate in Ms: 20
- Packet Size (bytes): 4424
- Largest Sample Rate: 1000.000000
- Smallest Sample Rate: 1.000000
4. Wait for CDS connect...
- Blocked waiting for connect by the CDS on Port: < 49000 >
```

Appendix B

Sample Running CDS Screen



```
D:\Projects\lads\ComputeDataServer\Debug\ComputeDataServer.exe
50. Weapons Bay Nulling - Begin Null Correction Averaging < 15 second delay >
60. Aircraft Nulling - Begin Null Correction Averaging < 15 second delay >
80. Data Compression - Stop CDS Process and Begin Data Compression
99. Exit - Exit CDS Process

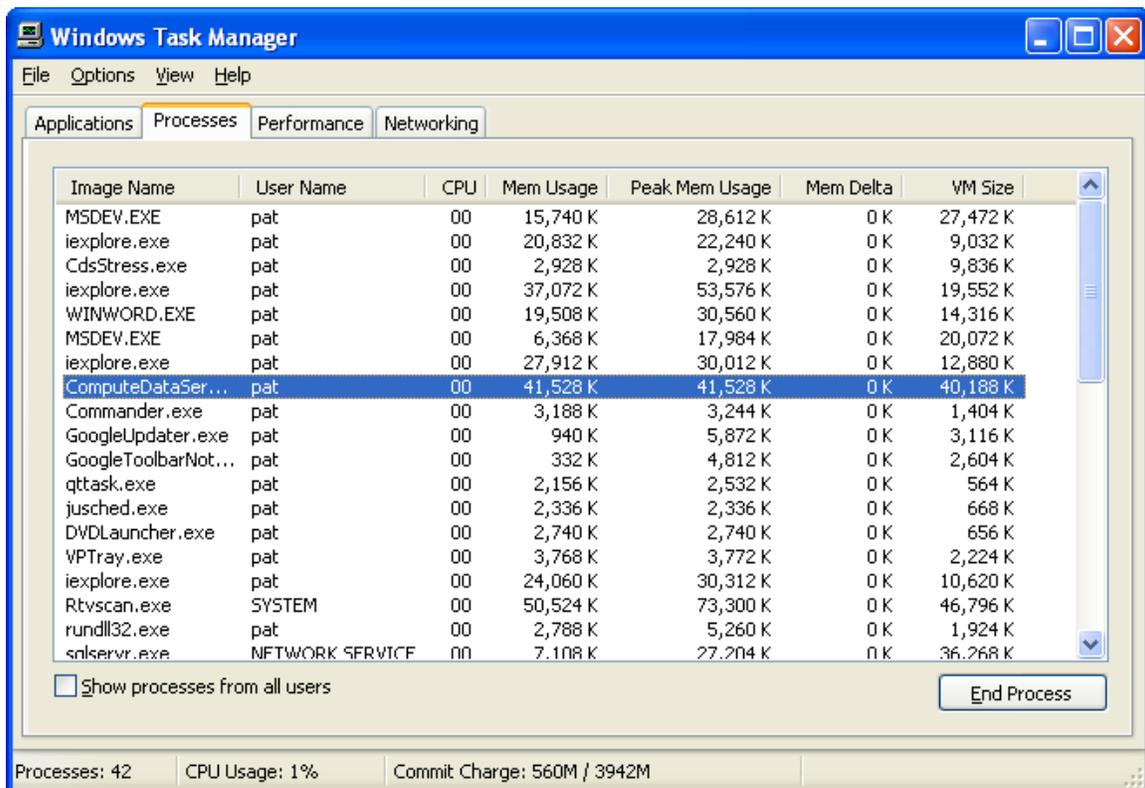
Enter Command Number:
Estimated sample rate aggregate for data source setup = 26780.000000
Requested data source packet size in bytes = 3324
Remote endian = 1, local endian = 1, need to byte swap = 0
Data source responded packet format = 0
Actual data source packet size in bytes = 3324

Data interface buffer allocation size = 262144 for data source = 0
Starting time validation for data source = 0...

NOTICE: Succeeded obtaining valid time for data source = 0
Initial validated time = 001:00:00:10.000 for data source = 0
```

Appendix C

Task Manager Performance Monitor



The screenshot shows the Windows Task Manager Performance Monitor window. The 'Performance' tab is selected, displaying a list of processes. The 'ComputeDataSer...' process is highlighted in blue. The status bar at the bottom shows 'Processes: 42', 'CPU Usage: 1%', and 'Commit Charge: 560M / 3942M'.

Image Name	User Name	CPU	Mem Usage	Peak Mem Usage	Mem Delta	VM Size
MSDEV.EXE	pat	00	15,740 K	28,612 K	0 K	27,472 K
iexplore.exe	pat	00	20,832 K	22,240 K	0 K	9,032 K
CdsStress.exe	pat	00	2,928 K	2,928 K	0 K	9,836 K
iexplore.exe	pat	00	37,072 K	53,576 K	0 K	19,552 K
WINWORD.EXE	pat	00	19,508 K	30,560 K	0 K	14,316 K
MSDEV.EXE	pat	00	6,368 K	17,984 K	0 K	20,072 K
iexplore.exe	pat	00	27,912 K	30,012 K	0 K	12,880 K
ComputeDataSer...	pat	00	41,528 K	41,528 K	0 K	40,188 K
Commander.exe	pat	00	3,188 K	3,244 K	0 K	1,404 K
GoogleUpdater.exe	pat	00	940 K	5,872 K	0 K	3,116 K
GoogleToolbarNot...	pat	00	332 K	4,812 K	0 K	2,604 K
qtask.exe	pat	00	2,156 K	2,532 K	0 K	564 K
jusched.exe	pat	00	2,336 K	2,336 K	0 K	668 K
DVDLauncher.exe	pat	00	2,740 K	2,740 K	0 K	656 K
VPTray.exe	pat	00	3,768 K	3,772 K	0 K	2,224 K
iexplore.exe	pat	00	24,060 K	30,312 K	0 K	10,620 K
Rtvsan.exe	SYSTEM	00	50,524 K	73,300 K	0 K	46,796 K
rundll32.exe	pat	00	2,788 K	5,260 K	0 K	1,924 K
snlsrvr.exe	NETWORK SERVICE	00	7,108 K	27,204 K	0 K	36,268 K

Show processes from all users

End Process

Processes: 42 CPU Usage: 1% Commit Charge: 560M / 3942M