

ArcFM Performance Monitoring with PerfQAnalyzer

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Monitoring Performance

- **Performance Baseline**
 - **1 user performs a set of “repeatable steps”**
 - **Uses their stop-watch**
 - **Records into Spreadsheet**
 - **Tracks system performance over time**

Our example:

			10/02/14	02/27/14	03/20/14	03/18/14
			8:00 - 10:00AM	11:14 - 11:48 AM	9:18 - 9:47 AM	2:12 - 2:47 PM
			Sheldon Busby	Alice Trapp	Alice Trapp	Alice Trapp
			S7B2	a2t5	a2t5	a2t5
			Machine Name	WSWC388126	WSWC388126	WSWC388126
			Database Instance	GDGISM1P.WORLD	GDGISM1P.WORLD	GDGISM1P.WORLD
			Citrix Server	GASDCTXPRD09	GASDCTXPRD09	GASDCTXPRD07
			Walnut Creek	Walnut Creek	Walnut Creek	Walnut Creek
			Screen resolution	1280x1024	1280x1024	1280x1024
	Test Description	Additional Information		Time in Seconds	Time in Seconds	Time in Seconds
11	Open ArcMap Through Citrix (Time taken for the ArcFM Login Window to appear after Clicking on the ArcMap_Prod publication in Citrix)		42	73.69	35.29	39.64
12	Log into ArcMap - Mapper Role		30	42.78	41.34	40.03
13	Load Stored Display - Pathfinder San Francisco. Click on Set to full extent button (The stored display full extent level changed in June Release)		24	33	22.41	29.41
14	Enter scale 1:1200 and start of redraw		3	0.95	0.75	1.1
15	Refresh map display after zoom to 1:1200		0	2.96	3.12	4.67
16	Turn OFF ALL layers	Scale 1:1200	0	0.71	0.66	1.14
17	Turn ON All Layers, including Annotation		7	6.83	7.08	6.79
18	Set Distribution Main to selectable (After making all layers Unselectable)		0	0.41	0.27	0.28
19	Changed Stored Display to Pathfinder (Changed Stored display in June Release)	Scale 1:1200	18	47.23	43.23	47.23
20	Full Extent (Changed Stored display in June Release)		4	3.06	3.89	4.47
21	Select by Attribute -> MaintenancePlat - Plat Map -> PLATMAPNUMBER = '08-A01' -> OID = 3688		0	0.67	0.57	0.57
22	Zoom to Selected features (Plat 08-A01, OID = 3688)	Scale at this selected feature ~ 1:6066 / 9457	9	3.6	3.59	3.86
23						

Measuring Performance

- **Load Testing**

- **How will the system perform with X number of users?**
- **Multiple user perform “repeatable steps”**
- **Records into separate spreadsheets**
- **Used to test performance under load**

Negatives to this approach

- **Inconsistent Results between users**
- **Takes staff away from other tasks**
- **Load Testing requires many users**
- **Difficult to answer:**
 - **What is performing slow?**
 - **What-if scenarios?**

Automating performance monitoring

- LoadRunner
- EggPlant

Enter: ESRI PerfQAnalyzer

- Free download from ESRI website
- ArcMap plugin / ArcEngine application
- Scripting engine which captures performance metrics for rendering, fetching, editing
- **Basic Commands:**
 - **Workspace** – Set my workspace
 - **FeatureClass** – Set my active feature class
 - **TraceStart / TraceStop** – Oracle 10046 trace event

PerfQAnalyzer Commands

- **Display commands:**
 - StartRendering / StopRendering
 - Display Xmin, Ymin, Xmax, Ymax
 - Identify oid123

- **Editing Commands:**
 - Create
 - Delete
 - Move
 - Rotate
 - Split
 - StartEdit / StopEdit

Generate scripts!

PerfQA Analyzer 10.2.0.168

Rendering | Extents | Script | Log | Fetch | DBMS | Help

Generate | Script

Parameters

% of features:

X Offset: Ratio:

Y Offset: Angle:

Feature Classes

	Name	Features	Create	Delete	Identify	Move	Rotate	Split	Generated Lines	Warnings
	Geometric Network		<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>		
	PGE.Drip	638	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>		
	PGE.CPTestPoint	17,412	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>		
	PGE.CPJunction	26,686	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>		
	PGE.SqueezePoint	50	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>		
	PGE.GasValve	84,636	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>		
	PGE.GasStitchPoint	424	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>		
	PGE.ServiceTap	1,709,849	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>		
	PGE.ServiceLocation	1,687,605	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>		
	PGE.Compressor	6	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>		
	PGE.Filter	0	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>		
	PGE.GasGeometricNetwork_Junctions	2,323	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>		
	PGE.ExcessFlowValve	117,165	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>		
	PGE.ControllableFlow	150,000	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>		

Select non-zero 'Features' rows

Ready.

Example script

```
// Create Features
Create 1882.81034066169,1032.73355508579
Create 1882.86043540154,1032.81573502581
Create 1882.85746793112,1032.86838139496
Create 1882.71977971485,1033.12822351073

// Rotate Features
Rotate 1; -117.189659338307,32.7335550857881, 0.75
Rotate 2; -117.139564598462,32.8157350258062, 0.75
Rotate 3; -117.142532068879,32.8683813949581, 0.75
Rotate 5; -117.280220285147,33.1282235107284, 0.75

// Move Features
Move 1; 2000,1000
Move 2; 2000,1000
Move 3; 2000,1000
Move 5; 2000,1000
```

Running a script

PerfQA Analyzer 10.2.0.168

Rendering Extents Script Log Fetch DBMS Help

Generate Script

Path [scr:<path>]: C:\PerfQAnalyzer\test\test.scr

```
workspace server=; database=; instance="sde:oracle11g:localhost/test12"; user=PGE; password=pge; VERSION=SDE.C...
StartRendering

display 1830455.93164063, 13766617.402832, 1831255.93164063, 13767417.402832
display 1837120.31158447, 13798177.201416, 1837920.31158447, 13798977.201416
display 1827321.45440674, 13779664.2994385, 1828121.45440674, 13780464.2994385
display 1844830.30780029, 13763597.454834, 1845630.30780029, 13764397.454834
display 1843989.38879395, 13762122.5490112, 1844789.38879395, 13762922.5490112
display 1834307.09301758, 13775477.6213989, 1835107.09301758, 13776277.6213989
display 1844312.63043213, 13763736.3214111, 1845112.63043213, 13764536.3214111
display 1836159.32061768, 13776482.2631836, 1836959.32061768, 13777282.2631836
display 1829682.14562988, 13778595.9186401, 1830482.14562988, 13779395.9186401
display 1831706.8616333, 13779610.9285889, 1832506.8616333, 13780410.9285889
display 1846889.71600342, 13768033.2838135, 1847689.71600342, 13768833.2838135
display 1850490.9710083, 13763205.3248291, 1851290.9710083, 13764005.3248291
display 1853019.36920166, 13758288.187439, 1853819.36920166, 13759088.187439

display 1838939.62341309, 13785755.4730225, 1839739.62341309, 13786555.4730225
display 1826654.91760254, 13783816.2026367, 1827454.91760254, 13784616.2026367
display 1824506.8840332, 13778295.7432251, 1825306.8840332, 13779095.7432251
display 1822681.40002441, 13783741.8995972, 1823481.40002441, 13784541.8995972
display 1830721.31518555, 13775308.0858154, 1831521.31518555, 13776108.0858154
display 1854519.06604004, 13758245.4689941, 1855319.06604004, 13759045.4689941
display 1835221.82818604, 13786035.2838135, 1836021.82818604, 13786835.2838135
display 1830621.4352417, 13779854.4459839, 1831421.4352417, 13780654.4459839
display 1844289.92901611, 13729220.0296021, 1845089.92901611, 13730020.0296021
display 1844312.8973999, 13751349.8952026, 1845112.8973999, 13752149.8952026
display 1720558.77844238, 13942837.7630005, 1721358.77844238, 13943637.7630005
display 1832640.90722656, 13778376.967041, 1833440.90722656, 13779176.967041
```

Execute Script

Simplify Features
 Show Script Line Numbers In Log

Ready.

PowerShell example to run a script

```
$log = Get-Date -UFormat %d_%b_%y_%H_%M

$arcmap = 'C:\Program Files (x86)\ArcGIS\Desktop10.2\bin\ArcMap.exe'
$scr_dir = 'c:\perfqanalyzer\test'
$mxid = $scr_dir + '\test.mxd'
$script = ' /scr:' + $scr_dir + '\test.scr'
$logfile = ' /log:' + $scr_dir + '\logs\test_' + $log + '.log'
$args = ' /sr /d /m /hwa'
$arg_list = $mxid + $script + $logfile + $args
Write-Host $arcmap $arg_list

Start-Process $arcmap -ArgumentList $arg_list
```

Logfile output

PerfQA Analyzer 10.2.0.168

Rendering | Extents | Script | Log | Fetch | DBMS | Help

Path [/log:<path>]: C:\PerfQAnalyzer\TestResults.log

Plat Map, na, 0.00691, 0.00676, 0.04342, na, 0.05708
All Layers, 0.00018, na, na, na, 0.00008, 0.30726

ActiveView extent set to: [XMin=1844830.30780029, YMin=13763597.454834, XMax=1845630.30780029, YMax=13764397.454834]
test.mxd
Rendering Start Time: [2015-07-22 08:00:26,517]
Layer, Background, Geography, Annotation, Selection, GeoSelection, Total
Geometric Network, na, 0.17028, 0.00287, 0.00223, na, 0.17539
PGE.Division, na, 0.01117, 0.00009, 0.00006, na, 0.01132
Plat Map, na, 0.00538, 0.00612, 0.04169, na, 0.05320
All Layers, 0.00020, na, na, na, 0.00007, 0.24017

ActiveView extent set to: [XMin=1843989.38879395, YMin=13762122.5490112, XMax=1844789.38879395, YMax=13762922.5490112]
test.mxd
Rendering Start Time: [2015-07-22 08:00:26,893]
Layer, Background, Geography, Annotation, Selection, GeoSelection, Total
Geometric Network, na, 0.20293, 0.00371, 0.00213, na, 0.20877
PGE.Division, na, 0.01419, 0.00009, 0.00006, na, 0.01434
Plat Map, na, 0.00690, 0.00624, 0.04048, na, 0.05362
All Layers, 0.00020, na, na, na, 0.00007, 0.27699

ActiveView extent set to: [XMin=1834307.09301758, YMin=13775477.6213989, XMax=1835107.09301758, YMax=13776277.6213989]
test.mxd
Rendering Start Time: [2015-07-22 08:00:27,306]
Layer, Background, Geography, Annotation, Selection, GeoSelection, Total
Geometric Network, na, 0.21740, 0.00268, 0.00211, na, 0.22219
PGE.Division, na, 0.01185, 0.00009, 0.00006, na, 0.01200
Plat Map, na, 0.00685, 0.00628, 0.04135, na, 0.05447
All Layers, 0.00021, na, na, na, 0.00007, 0.28894

ActiveView extent set to: [XMin=1844312.63043213, YMin=13763736.3214111, XMax=1845112.63043213, YMax=13764536.3214111]
test.mxd

Log Results
 TimeStamp
 Retain Log File Contents [/append | /noappend]
 Display Errors [/d to check at startup - default is unchecked]

Ready.

Results: Rendering times

- Rendering times broken out by GROUP LAYER
- Rendering times broken down by drawing phase

test.mxd

Rendering Start Time: [2015-07-13 23:39:35,329]

Layer	Background	Geography	Annotation	Selection	GeoSelection	Total
Geometric Network	na	0.24502	0.00247	0.00205	na	0.24954
Division	na	0.01106	0.00008	0.00005	na	0.01119
Plat Map	na	0.00619	0.00363	0.03685	na	0.04668
All Layers	0.00017	na	na	na	0.00002	0.30759

Results: Fetch times

Fetch found "15" "Service" feature(s) within extent, Milliseconds ET: "122.7981"
Fetch found "3" "Service" feature(s) within extent, Milliseconds ET: "79.8501"
Fetch found "65" "Service" feature(s) within extent, Milliseconds ET: "92.2427"
Fetch found "28" "Service" feature(s) within extent, Milliseconds ET: "64.1975"
Fetch found "35" "Service" feature(s) within extent, Milliseconds ET: "92.4844"
Fetch found "96" "Service" feature(s) within extent, Milliseconds ET: "106.2886"
Fetch found "35" "Service" feature(s) within extent, Milliseconds ET: "76.7079"
Fetch found "54" "Service" feature(s) within extent, Milliseconds ET: "101.0027"
Fetch found "53" "Service" feature(s) within extent, Milliseconds ET: "82.4985"
Fetch found "35" "Service" feature(s) within extent, Milliseconds ET: "59.8554"
Fetch found "52" "Service" feature(s) within extent, Milliseconds ET: "68.274"
Fetch found "38" "Service" feature(s) within extent, Milliseconds ET: "82.8137"

Results: Script completion time

Map: c:\perfqanalyzer\test\test.mxd

Script Execution Time: 00:00:23.7348875

Map: c:\perfqanalyzer\test\test_labels.mxd

Script Execution Time: 00:00:32.8992478

Customizing

PerfQAnalyzer



Customizing PerfQAnalyzer

- **Can be customized using C#, ArcObjects**
- **Example customization command provided by ESRI**
- **Through code, we have access to current Workspace, FeatureClass, Logger objects**

UDC / PG&E Customizations - Selections

- **SearchByAttribute**
- **SelectLayerByAttribute**
- **SelectFeatures**
- **SpatialAttributeSelect**
- **MapSpatialSelect**
- **ClearSelection**
- **DeleteSelected**

UDC / PG&E Customizations – Edit Tools

- **Update_String**
- **CreateVersion**
- **ChangeVersion**
- **StartEditor**
- **StopEditor**
- **CreatePoint**
- **CreateLine**
- **CreatePolygon**

UDC / PG&E Customizations – Layer Tools

- **SetLayerSelectable**
- **AddLayerToSelection**
- **RemoveLayerFromSelection**
- **SetLayerVisibility**

UDC / PG&E Customizations – Display Tools

- **ZoomFull**
- **ZoomToSelected**
- **SetScale**
- **Pan**

UDC / PG&E Customizations – Network Tools

- **PlaceFlag**
- **PlaceBarrier**
- **ExecuteNetworkTrace**
- **ClearFlags**
- **ClearBarriers**
- **ClearResults**

UDC / PG&E Customizations – ArcFM Tools

- **SetArcFMWorkspace**
- **OpenStoredDisplay**
- **Create_ArcFM_Session**
- **Open_ArcFM_Session**
- **Close_ArcFM_Session**
- **EnableAutoUpdaters**
- **DisableAutoUpdaters**
- **TraceUpStream**
- **TraceDownStream**
- **TraceIsolating**
- **AutoAssignWL**
- **ArcFMZoomTo**
- **ArcFMGasTrace**

Pause 2000

WriteLine NFR69: Clear selected

EXECUTESQL Select 'NFR69' from dual

CLEARSELECTION

Pause 2000

WriteLine NFR70: Select by attribute: Service

EXECUTESQL Select 'NFR70' from dual

SELECTLAYERBYATTRIBUTE Service,OBJECTID=8203

Pause 2000

WriteLine NFR71: Move Service

EXECUTESQL Select 'NFR71' from dual

FeatureClass PATHFINDER.SERVICE

Move 8203;10,0

Pause 2000

WriteLine NFR72: Update service

EXECUTESQL Select 'NFR72' from dual

UPDATE_STRING PATHFINDER.Service,COATINGTYPE,CT,OBJECTID=8203

Pause 2000

WriteLine NFR73: Clear selection

EXECUTESQL Select 'NFR73' from dual

CLEARSELECTION

Pause 2000

WriteLine NFR74: Pan Left to right

EXECUTESQL Select 'NFR74' from dual

DISPLAY 1826604,13772343,1827025,13772697

Source code available for customizations

- All source code is available on GITHUB.
- https://github.com/UDCUS/ArcFM_PerfQA



Questions?

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