Monitoring Performance

• Performance Baseline
  - 1 user performs a set of “repeatable steps”
  - Uses their stop-watch
  - Records into Spreadsheet
  - Tracks system performance over time
<table>
<thead>
<tr>
<th>Test Description</th>
<th>Additional Information</th>
<th>Time in Seconds</th>
<th>Time in Seconds</th>
<th>Time in Seconds</th>
</tr>
</thead>
<tbody>
<tr>
<td>Open ArcMap Through Citrix (Time taken for the ArcFM Login Window to appear after</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Clicking on the ArcMap_Prod publication in Citrix)</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Log into ArcMap - Mapper Role</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Load Stored Display - Pathfinder San Francisco. Click on Set to full extent button</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>(The stored display full extent level changed in June Release)</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Enter scale 1:1200 and start of redraw</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Refresh map display after zoom to 1:1200</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Turn OFF ALL layers</td>
<td>Scale 1:1200</td>
<td>0.71</td>
<td>0.66</td>
<td>1.14</td>
</tr>
<tr>
<td>Turn ON All Layers, including Annotation</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Set Distribution Menu to selectable (After making all layers Unselectable)</td>
<td></td>
<td>0.41</td>
<td>0.27</td>
<td>0.28</td>
</tr>
<tr>
<td>Changed Stored Display to Pathfinder (Changed Stored display in June Release)</td>
<td>Scale 1:1200</td>
<td>47.23</td>
<td>43.23</td>
<td>47.23</td>
</tr>
<tr>
<td>Full Extent (Changed stored display in June Release)</td>
<td></td>
<td>3.06</td>
<td>3.89</td>
<td>4.47</td>
</tr>
<tr>
<td>Select by Attribute -&gt; MaintenanceFlat - Plat Map -&gt; PLATMAPNUMBER = '08-A01' -&gt;</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>OID = 3688</td>
<td></td>
<td>0.67</td>
<td>0.57</td>
<td>0.57</td>
</tr>
<tr>
<td>Zoom to Selected features (Plot 08-A01, OID = 3688)</td>
<td>Scale at this selected feature ~ 18066 / 9457</td>
<td>3.6</td>
<td>3.59</td>
<td>3.86</td>
</tr>
</tbody>
</table>
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!
Example script

```
// Create Features
Create 1882.81034066169, 1032.73355508579
Create 1882.85643540154, 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

Workspace server: database: instance="sde:oracle11g:localhost/test12"; user=PGE; password=pge; VERSION=SDE.

StartRendering

display 1830455.93164063, 13766617.402832, 1831255.93164063, 13767417.402832
display 1837120.31158447, 13798177.201416, 1837920.31158447, 13798777.201416
display 1827321.45440674, 13779664.2994385, 1828121.45440674, 13780464.2994385
display 1844830.30780029, 13763597.454634, 1845630.30780029, 13764397.454634
display 1843989.38879395, 13762122.5490112, 1844789.38879395, 13762922.5490112
display 1834307.09301758, 13775477.6213989, 1835107.09301758, 13776277.6213989
display 1844312.63843213, 13763736.3214111, 1845112.63843213, 13764536.3214111
display 1836159.32061768, 13776482.2631836, 1836959.32061768, 13777282.2631836
display 1829682.14562988, 13778595.9186401, 1830482.14562988, 13779395.9186401
display 1831706.8616333, 13779610.9285899, 1832506.8616333, 13780410.9285899
display 1846889.71600342, 13768033.2838135, 1847689.71600342, 13768833.2838135
display 1850490.9710083, 13763125.3248291, 1851290.9710083, 13764005.3248291
display 1853019.36760667, 13758288.187439, 1853819.36760667, 13759088.187439

display 1838939.62341309, 13785755.47380225, 1839739.62341309, 13786555.47380225
display 1826654.91768254, 13783816.2026367, 1827454.91768254, 13784616.2026367

display 1824596.8840332, 13778295.7432251, 1825306.8840332, 13779095.7432251

display 1822681.40082441, 13783741.8995972, 1823481.40082441, 13784541.8995972

display 1830721.3152855, 13775308.0858154, 1831521.3152855, 13776108.0858154

display 185419.60604004, 13758254.4699941, 1855319.60604004, 13759045.4699941

display 1835221.82816604, 13786035.2838154, 183621.82816604, 13786305.2838154

display 1830621.4352417, 13779854.4459389, 1831421.4352417, 13780654.4459389

display 1844289.2901611, 13772220.0296021, 1845089.2901611, 13773020.0296021

display 1843412.8973999, 13751349.8952026, 1845112.8973999, 13752149.8952026

display 1720558.77844238, 13942837.7630085, 1721358.77844238, 13943637.7630085

display 1832640.90722656, 13778376.967041, 1833440.90722656, 13779176.967041

Execute Script
PowerShell example to run a script

```powershell
$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'
$mxd = $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 = $mxd + $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 [path:<path>] : C:\PerfQA\TestResults.log

Flat 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]

Rendering Start Time: [2015-07-22 08:00:26.517]
Layer, Background, Geography, Annotation, Selection, GeoSelection, Total
Geometric Network, na, 0.17028, 0.00287, 0.00233, na, 0.17539
PGE.Division, na, 0.01117, 0.00009, 0.00006, na, 0.01132
Flat 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]

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
Flat 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]

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
Flat 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]

---

☑ 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


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
SELECT LAYER BY ATTRIBUTE 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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