UCF SAS® Visual Analytics

Implementation, Usage, and Performance
UCF – IKM
SAS® EBI Environment
VA Environment
Challenges
VA Technical Specifications
Future Directions
University of Central Florida (UCF)
SAS BI Environment

- Over 30 million observations related to student records
- Faculty and staff information
- Data marts and libraries
- Official UCF information repository
- Over 12 years in service
SAS BI Environment

### BI Platform Server

<table>
<thead>
<tr>
<th>Server</th>
<th>Client</th>
<th>Web</th>
</tr>
</thead>
<tbody>
<tr>
<td>Data Warehouse</td>
<td>SAS Add-in for Microsoft Office (AMO)</td>
<td>Pegasus Mine Portal (PMP)</td>
</tr>
<tr>
<td>DMS</td>
<td>SAS Data Integration (DI) Studio</td>
<td>SAS Web Report Studio</td>
</tr>
<tr>
<td>Base SAS</td>
<td>DataFlux (data cleansing)</td>
<td>SAS BI Dashboard</td>
</tr>
<tr>
<td></td>
<td>SAS Enterprise Guide (EG)</td>
<td></td>
</tr>
<tr>
<td></td>
<td>SAS Information Map Studio</td>
<td></td>
</tr>
<tr>
<td></td>
<td><strong>SAS Management Console</strong></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Security</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Stored Processes</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Libraries</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Folders</td>
<td></td>
</tr>
<tr>
<td></td>
<td>SAS OLAP Cube Studio</td>
<td></td>
</tr>
</tbody>
</table>
Suite

- SAS® BI Dashboard 4.4
- SAS® Data Integration Studio 4.9
- SAS® Enterprise Guide® 7.1
- SAS® Information Map Studio 4.4
- SAS® Management Console 9.4
- SAS® OLAP Cube Studio 4.4
- SAS® Web Report Studio 4.4
- SAS Visual Analytics 7.3
SAS BI Environment

BI Platform Server

Web
- Pegasus Mine Portal (PMP)
- SAS Web Report Studio
- SAS BI Dashboard

StudentTracker, and more…
Enrollment

**Preliminary Fall 2015 Enrollment**

**Enrollment Comparison**

- **Year**
  - 2015: 63,373
  - 2014: 60,621

- **% Difference from Previous Year**
  - 2014: 4.78%
  - 2015: 4.20%

**Enrollment Snapshot**

- **by Career**
  - UGRD: 54,790
  - GRAD: 8,180
  - MGRD: 472

- **by Gender**
  - Female: 34,480
  - Male: 28,403

- **by Residency**
  - Rents: 35,813
  - Non-Rents: 4,690

- **by Full/Part Time**
  - FT: 49,985
  - PT: 21,405
Retention / BI Dashboard
Security

- Environment sits behind firewall
- UCF single sign-on
External Data Sources

- Oracle Database 12c Transactional environment
- Microsoft SQL Server12 environment with a COGNOS RDS overlay
- State vetted Flat Text Data files
SAS VA Environment

- 7.3
- Cool thing to do!
Reason / Direction

- Develop NEW report methods for existing Portal reports
- New Dynamic Reporting
- Possible uses:
  - Strategic planning
  - Foundation / Financial
  - Athletics
  - Academic Departmental Explorations
Our Use of VA
Targeted Performance Measure Dashboard
Peer Benchmarking
Usage

- Original Implementation soft rollout: Executive units on campus approx. 40 users
- Current usage approximately 60 users
- Soft rollout to Expected usage upwards of 400 users including departmental administration
Challenges

- Best practices regarding our own data
- Folder structure (Physical and Metadata)
- Data structures: many tables or single source
- Report Development
- Multiple developers on one project
Technical Environment

- Server sizing
- Distributed vs Non-Distributed implementation
- Security
- Server layout
- Server specifications
- Benchmark
User Estimator Matrix
Distributed vs Non-Distributed

- Linux vs. Microsoft
- Budget
- Linux: Distributed and Non-Distributed
- Microsoft: Non-Distributed
- What makes sense for your unit?
- UCF choose a Non-Distributed environment
Server Layout

Internet  Firewall  Server  Firewall  Server

Firewall

IntraNet

#SASGF
Server Specs

- VM – SAS Webserver
- 2 vCPU
- 4 GB ram
- 150 GB of disk space
### Disk Benchmark

#### SSD on PC

<table>
<thead>
<tr>
<th></th>
<th>Read [MB/s]</th>
<th>Write [MB/s]</th>
</tr>
</thead>
<tbody>
<tr>
<td>Seq</td>
<td>518.2</td>
<td>491.8</td>
</tr>
<tr>
<td>512K</td>
<td>477.4</td>
<td>438.7</td>
</tr>
<tr>
<td>4K</td>
<td>37.69</td>
<td>67.07</td>
</tr>
<tr>
<td>4K QD32</td>
<td>247.7</td>
<td>205.1</td>
</tr>
</tbody>
</table>

#### SATA on PC

<table>
<thead>
<tr>
<th></th>
<th>Read [MB/s]</th>
<th>Write [MB/s]</th>
</tr>
</thead>
<tbody>
<tr>
<td>Seq</td>
<td>85.28</td>
<td>77.11</td>
</tr>
<tr>
<td>512K</td>
<td>28.90</td>
<td>43.38</td>
</tr>
<tr>
<td>4K</td>
<td>0.366</td>
<td>0.885</td>
</tr>
<tr>
<td>4K QD32</td>
<td>0.882</td>
<td>0.843</td>
</tr>
</tbody>
</table>
Disk Benchmark

<table>
<thead>
<tr>
<th></th>
<th>Read [MB/s]</th>
<th>Write [MB/s]</th>
</tr>
</thead>
<tbody>
<tr>
<td>All</td>
<td>466.3</td>
<td>265.8</td>
</tr>
<tr>
<td>Seq</td>
<td>487.1</td>
<td>239.1</td>
</tr>
<tr>
<td>512K</td>
<td>15.69</td>
<td>15.40</td>
</tr>
<tr>
<td>4K</td>
<td>182.4</td>
<td>140.5</td>
</tr>
<tr>
<td>4K QD32</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
Server Specs

- Dell 715xd – Metadata, Visual Analytics, etc.
- 2 x 10 core Intel CPU
- 256 GB RAM
- 24 x SAS Drives Raid 10
Disk Benchmark

![Disk Benchmark Results]

- **All**
  - Read [MB/s]: 1937
  - Write [MB/s]: 2096

- **Seq**
  - Read [MB/s]: 1937
  - Write [MB/s]: 2096

- **512K**
  - Read [MB/s]: 1789
  - Write [MB/s]: 1957

- **4K**
  - Read [MB/s]: 81.20
  - Write [MB/s]: 72.77

- **4K QD32**
  - Read [MB/s]: 298.7
  - Write [MB/s]: 243.9

#SASGF
CPU Benchmark

- Application and Data Load on CPUs
Future Directions

- We just adopted VA
- At UCF–IKM our decision to go with a non-distributed environment was the right choice
- Looking forward to keep developing and improving the quality of the information and services being provided
Questions / Contact Information

Scott A. Milbuta
*Decision Support Architect/Developer – Senior*
E-mail: Scott.Milbuta@ucf.edu

Carlos Piemonti, MBA
*Decision Support Developer*
E-mail: Carlos.Piemonti@ucf.edu

Ulf Borjesson
*Senior Systems Administrator*
E-mail: Ulf.Borjesson@ucf.edu

Web: https://ikm.ucf.edu/