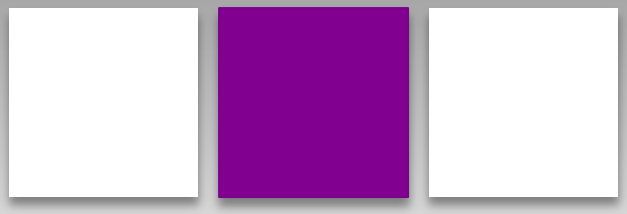

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SAS Global Forum 2016
Feedback


50 Ways To Leave Your Lover
1 Slip out the back Jack
2 Make a new plan Stan
3 Hop on the bus Gus
4 Drop off the key Lee
5 Hop on a train Jane
6 Send an email Gail
7 Leave a note in the hall Paul
8 Send her a text Rex

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20 ways to hook up SAS and Excel

- SAS/Access to PCFF
- SAS Add-in to Microsoft Office

- ODS HTML
- ODS MSOffice2K
- ODS MSOffice2K_x
- ODS ExcelXP tagset

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ODS Excel

- One option with many benefits

- Multiple worksheets
- Supports graphs and images
- Adding text to worksheets
- Creates native XLSX – smaller
- Excel formats
- Extend formula capabilities

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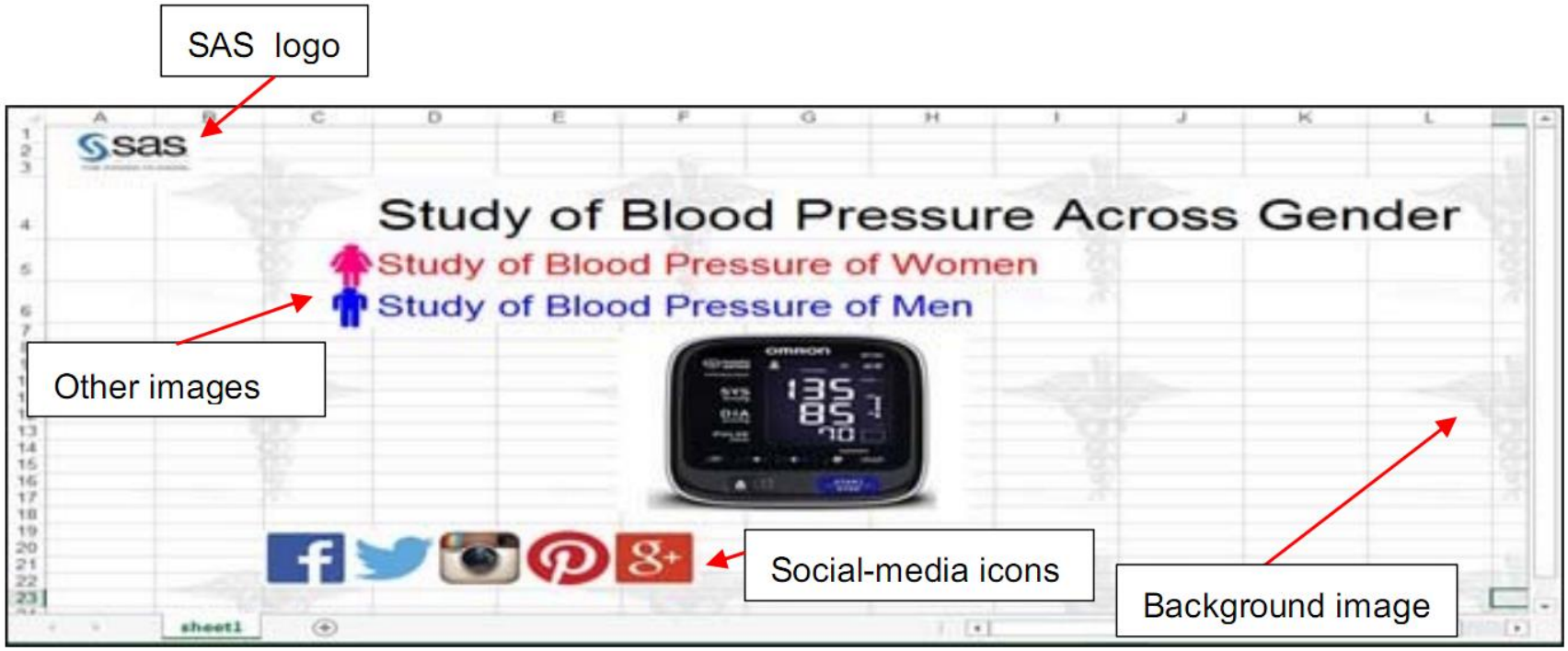
ODS Excel



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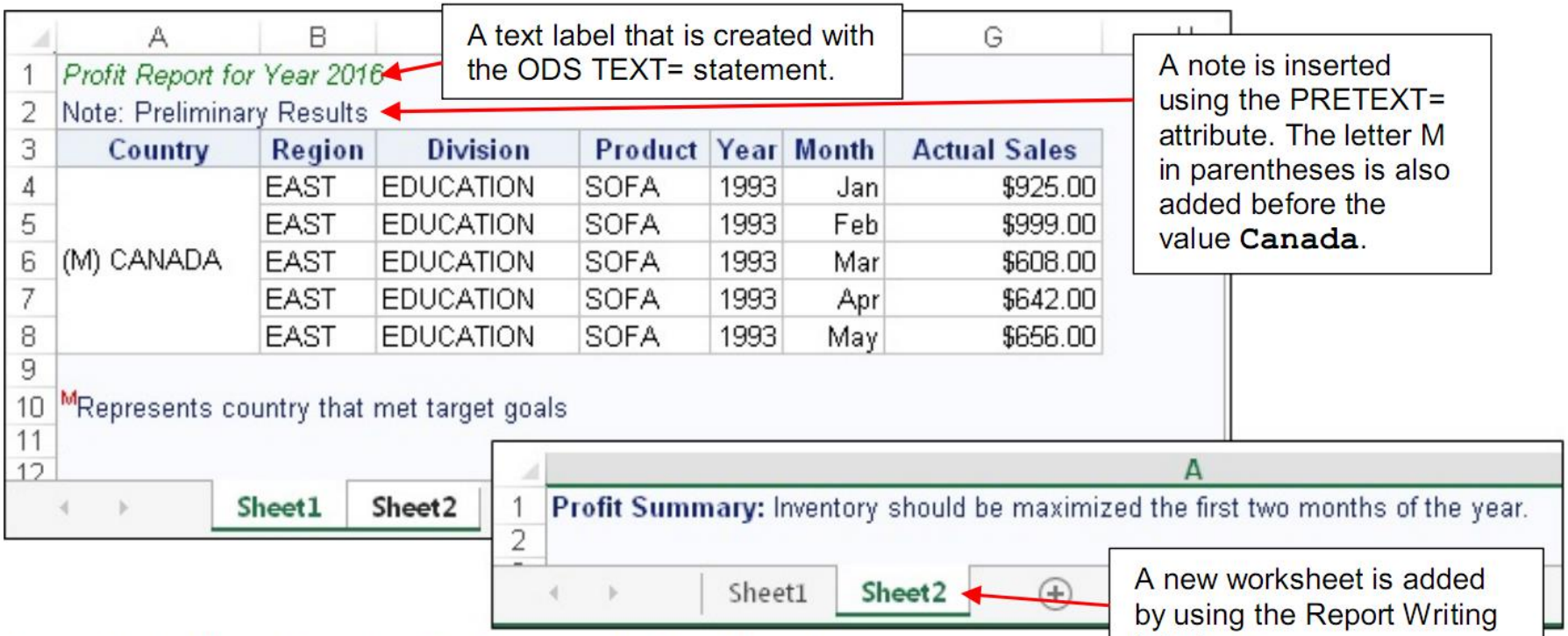
ODS Excel



Output 3. Adding a Text Label, a Note, and a New Worksheet

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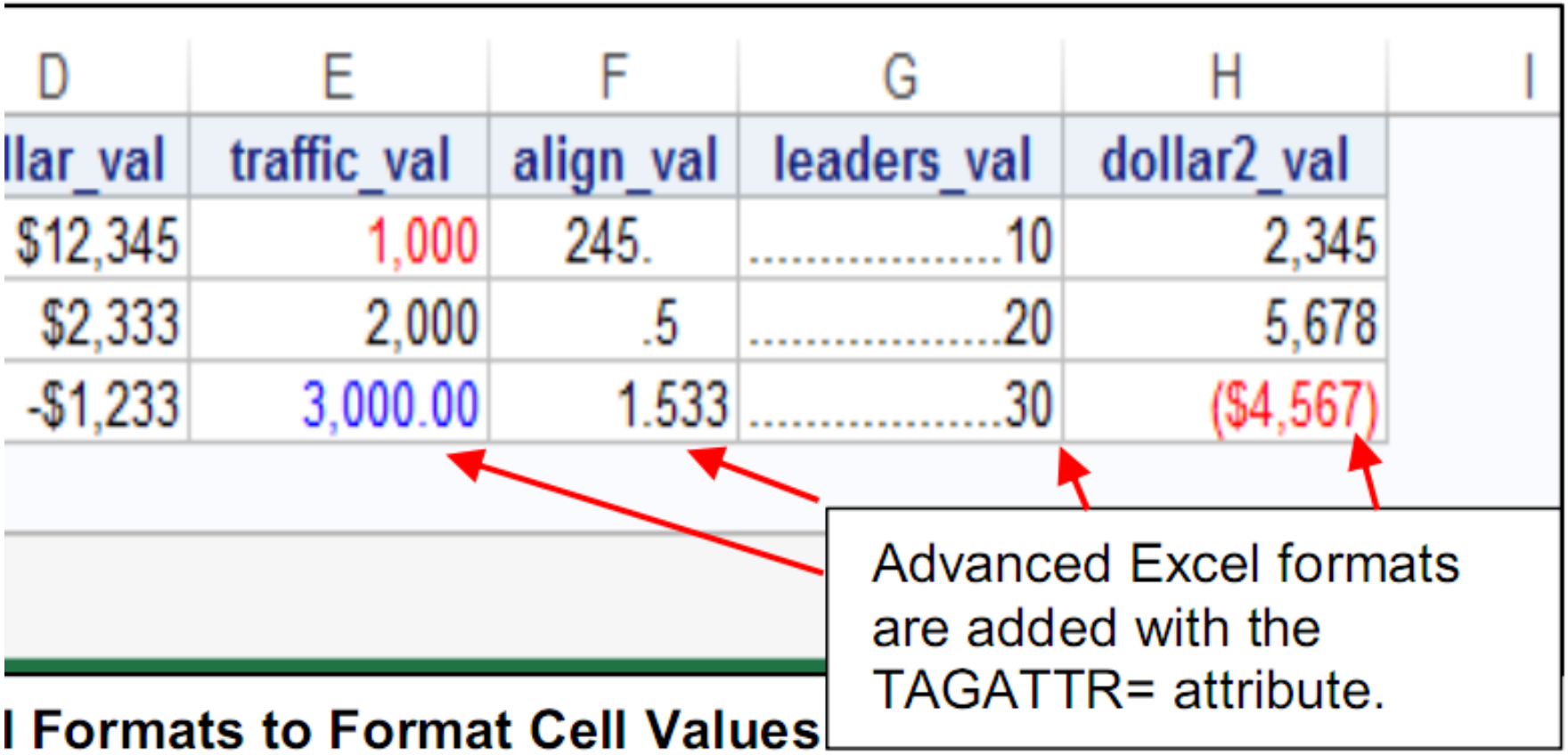
ODS Excel



l Formats to Format Cell Values

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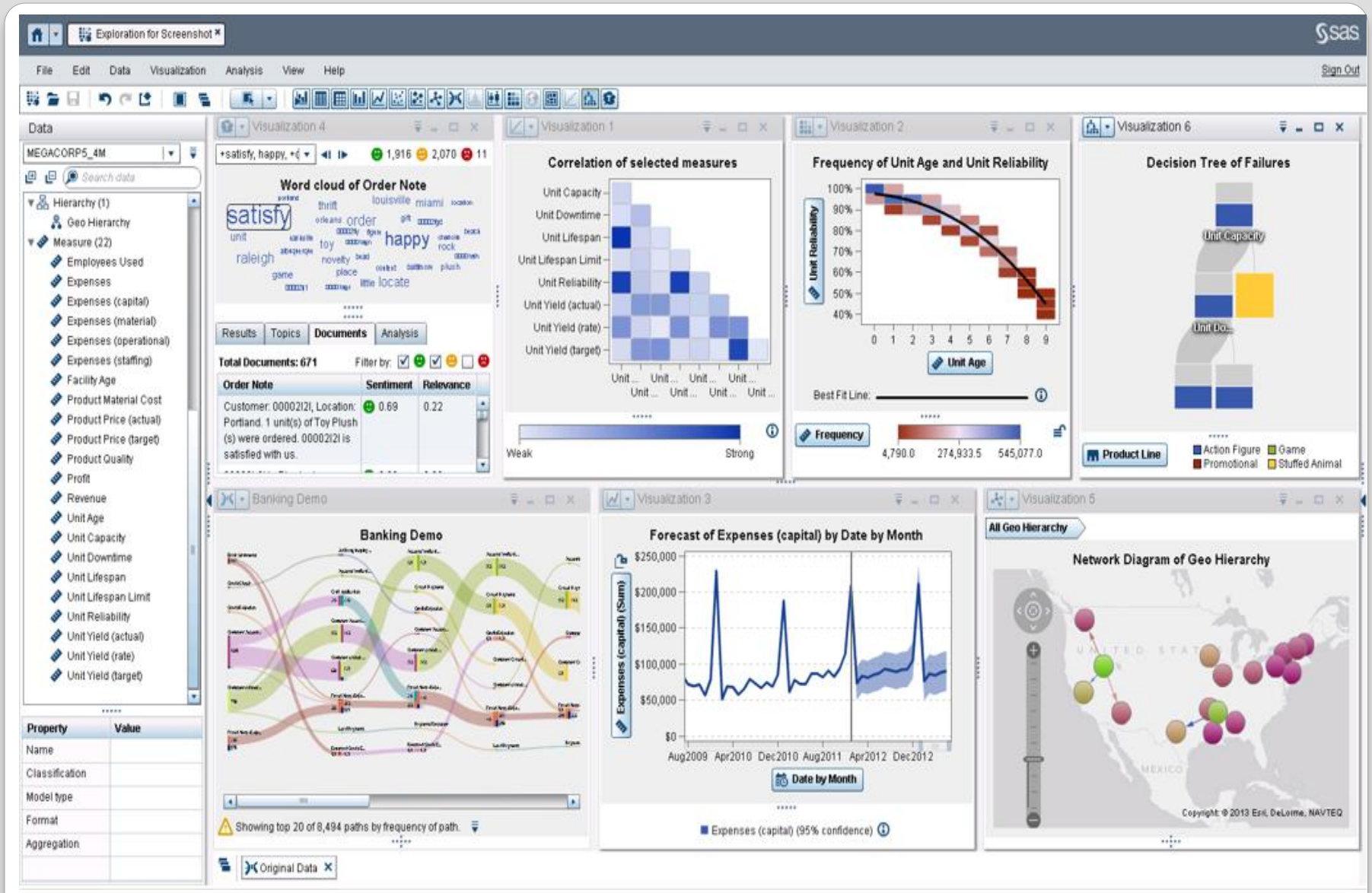
ODS Excel

- SAS 9.4 M2 – Experimental
- SAS 9.4 M3 – Production
- Good detailed paper – 32 pages!


Exploration for Screenshot
File Edit Data Visualization Analysis View Help
Sign Out
Data
MEGACORP5_4M
Hierarchy (1)
Geo Hierarchy
Measure (22)
Employees Used
Expenses
Expenses (capital)
Expenses (material)
Expenses (operational)
Expenses (staffing)
Facility Age
Product Material Cost
Product Price (actual)
Product Price (target)
Product Quality
Profit
Revenue
Unit Age
Unit Capacity
Unit Downtime
Unit Lifespan
Unit Lifespan Limit
Unit Reliability
Unit Yield (actual)
Unit Yield (rate)
Unit Yield (target)
Property
Value
Name
Classification
Model type
Format
Aggregation
Visualization 4
Word cloud of Order Note
satisfy
happy
order
locate
Results
Topics
Documents
Analysis
Total Documents: 671
Filter by:
Order Note
Sentiment
Relevance
Customer: 0000212I, Location: Portland. 1 unit(s) of Toy Plush (s) were ordered. 0000212I is satisfied with us.
0.69
0.22
Visualization 1
Correlation of selected measures
Unit Capacity
Unit Downtime
Unit Lifespan
Unit Lifespan Limit
Unit Reliability
Unit Yield (actual)
Unit Yield (rate)
Unit Yield (target)
Weak
Strong
Visualization 2
Frequency of Unit Age and Unit Reliability
Unit Reliability
Unit Age
Best Fit Line:
Frequency
4,790.0
274,933.5
545,077.0
Visualization 6
Decision Tree of Failures
Unit Capacity
Product Line
Action Figure
Game
Promotional
Stuffed Animal
Banking Demo
Banking Demo
Showing top 20 of 8,494 paths by frequency of path.
Visualization 3
Forecast of Expenses (capital) by Date by Month
Expenses (capital) (Sum)
$250,000
$200,000
$150,000
$100,000
$50,000
$0
Aug2009 Apr2010 Dec2010 Aug2011 Apr2012 Dec2012
Date by Month
Expenses (capital) (95% confidence)
Visualization 5
All Geo Hierarchy
Network Diagram of Geo Hierarchy
Original Data

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SAS Visual Analytics

- Lots of good papers

- Public-facing VA
- Best practice for public use
  - Wider audience, different abilities

- Phone support in 7.3
  - Designing for phone interface

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SAS Visual Analytics

- VA and stored processes
  - For on-demand data management
- VA for Infographics
- Supports Twitter, Facebook, Google Analytics
- Row-level security
  - Users or groups to have selected views

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SAS Visual Analytics - future

- Continues to be a key focus

- Future versions on SAS Viya
- 8.1 – Q3 (no migration)
- 8.2 – Q4 (migration)

- Fully HTML5 (from Flash)
- Combine Explorer and Designer

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- Major growth continues – SAS on board

- Faster results – spread over many computers
- More robust as data spread also
- Cost-effective – commodity hardware

- More complete – more uptake
  - E.g. security component

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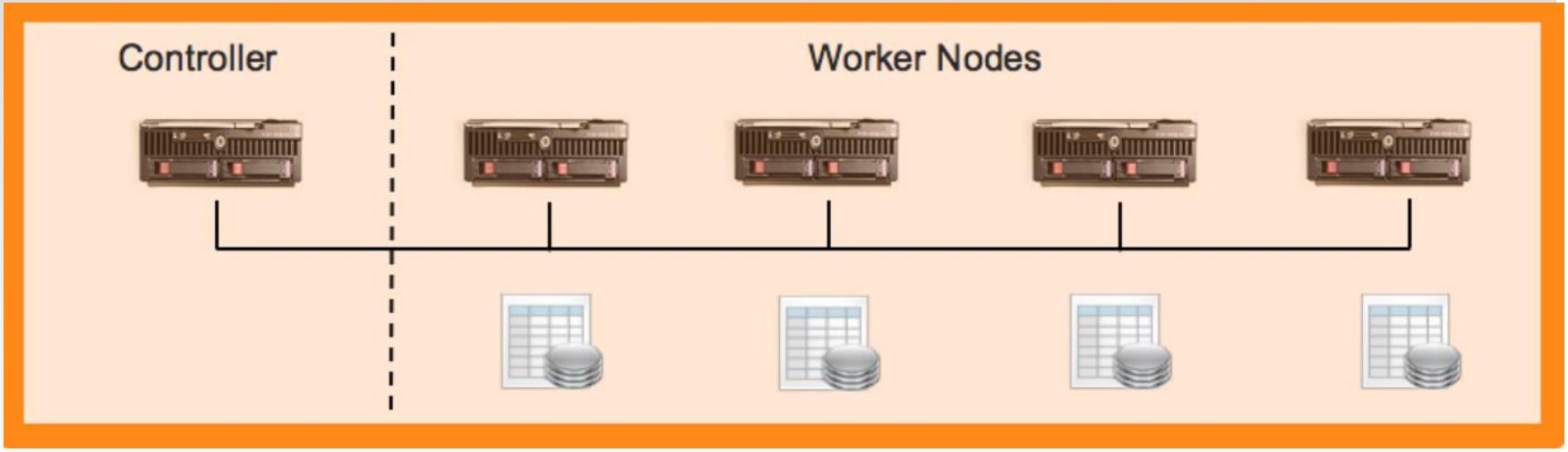

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hadoop


HDFS


MapReduce


HIVE


Spark


sQoop
It's Deep.


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- Varies levels of SAS integration

- Getting connected
  - Filename, Proc Hadoop
- Dating
  - SAS Access to Hadoop
- Engaged
  - SAS Code Accelerator for Hadoop
  - High Performance SAS Marriage

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- Getting married
  - Various SAS capabilities built on Hadoop
  - SAS Data Loader for Hadoop
  - SAS Visual Analytics and Visual Statistics
  - SAS Grid Manager for Hadoop
- SAS continues to develop with Hadoop
- Great overview paper by Paul Kent, SAS

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SAS Event Stream Processing

- "Data in motion" – real-time feeds
- Processes data "on-the-fly"
  - Filter streaming data
  - Summarise
  - Analytics "on-the-fly"
  - Also handles unstructured data
- Connectors to 300 sources
  - Plus Apache Camel (150 adaptors)

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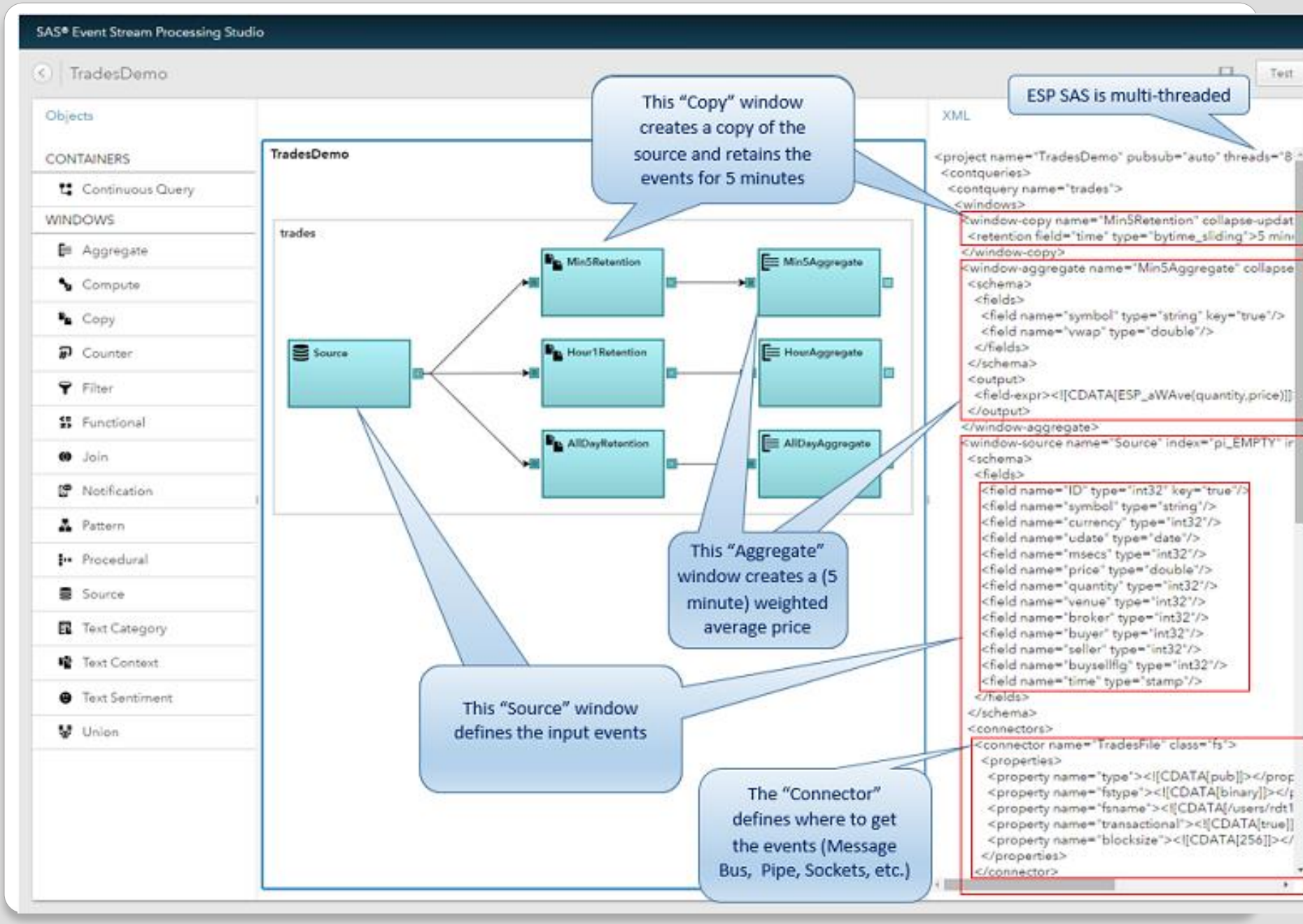
SAS® Event Stream Processing Studio
TradesDemo
Test
Objects
CONTAINERS
Continuous Query
WINDOWS
Aggregate
Compute
Copy
Counter
Filter
Functional
Join
Notification
Pattern
Procedural
Source
Text Category
Text Context
Text Sentiment
Union
TradesDemo
trades
Source
Min5Retention
Hour1Retention
AllDayRetention
Min5Aggregate
HourAggregate
AllDayAggregate
This "Copy" window creates a copy of the source and retains the events for 5 minutes
ESP SAS is multi-threaded
This "Aggregate" window creates a (5 minute) weighted average price
This "Source" window defines the input events
The "Connector" defines where to get the events (Message Bus, Pipe, Sockets, etc.)
XML
<project name="TradesDemo" pubsub="auto" threads="8
<contqueries>
<contquery name="trades">
<windows>
<window-copy name="Min5Retention" collapse-updat
<retention field="time" type="bytime_sliding">5 min
</window-copy>
<window-aggregate name="Min5Aggregate" collapse
<schema>
<fields>
<field name="symbol" type="string" key="true"/>
<field name="vwap" type="double"/>
</fields>
</schema>
<output>
<field-expr><![CDATA[ESP_aWAve(quantity,price)]]
</output>
</window-aggregate>
<window-source name="Source" index="pi_EMPTY" ir
<schema>
<fields>
<field name="ID" type="int32" key="true"/>
<field name="symbol" type="string"/>
<field name="currency" type="int32"/>
<field name="udate" type="date"/>
<field name="msecs" type="int32"/>
<field name="price" type="double"/>
<field name="quantity" type="int32"/>
<field name="venue" type="int32"/>
<field name="broker" type="int32"/>
<field name="buyer" type="int32"/>
<field name="seller" type="int32"/>
<field name="buysellflg" type="int32"/>
<field name="time" type="stamp"/>
</fields>
</schema>
<connectors>
<connector name="TradesFile" class="fs">
<properties>
<property name="type"><![CDATA[pub]]></prop
<property name="fstype"><![CDATA[binary]]></
<property name="fsname"><![CDATA[/users/rdt1
<property name="transactional"><![CDATA[true]]
<property name="blocksize"><![CDATA[256]]></
</properties>
</connector>

SAS® Viya™

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SAS Viya

- Introduce in parallel to SAS 9.4
  - Designed to work together
  - SAS Viya will not have all capability initially
- SAS 9.4 continues to be enhanced
  - Further maintenance releases

SAS Viya

- Completely new architecture
- Based on microservices
  - Small, discrete processes
  - More robust, better uptime
- More in-memory and parallel processing
  - As is trend, e.g. Hadoop

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SAS Viya

- Better cloud model
  - Elasticity of resources
  - Licensing models to match
- More open
  - REST api to access SAS capability
  - Access by Python, Lua, Java

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SAS Viya

- For 2016
  - SAS Visual Analytics and Visual Statistics
  - SAS Visual Investigator
  - SAS Visual Data Mining and Machine Learning

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Updated or new products

- SAS Visual Investigator
- SAS Visual Data Mining and Machine Learning

- CI 360 – Customer Intelligence
  - Discover – Insights on customer behaviour
  - Engage – Create, manage and optimise customer journeys

- SAS Analytics for IoT
  - Uses SAS Event Stream Processing

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Analytics trends

- Democratisation of analytics
  - "Citizen data scientist"
  - SAS tools evolving to allow wider audience
  - Need to be more agile – not wait for IT data request
- Hadoop (and other parallel processing)
  - Allows processing of larger amounts of data
  - Process faster

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Analytics trends

- SAS continues analytics leadership
  - Adding more machine learning and "deep learning" capabilities
  - Opening up SAS – Python, Lua, Java

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SAS Administration

- SAS Environment Manager
  - Evolving to manage all SAS administration
  - Key for management of SAS Viya
  -
- SAS Viya
  - Smaller services – much faster start-up
  - Designed for continuous service
    - Upgrade some components while others running

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Summary

- Hundreds of papers, videos
- Tons on current SAS capability
- Knoware web site for recommended links

- Thanks to SAS for facilities
- Thanks for coming!

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