



Designing a Global SAS®9 Architecture for Clinical Trials Analysis and Reporting

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Topics to be Covered

- Overview
- Company backgrounds
- Project Background/ Strategic imperative
- Architectural Overview
- Implementation approach
- Evaluation
- Q & A



Overview

■ 2005

- Covance commissioned a study to:
 - Evaluate their SAS use for business processes
 - Leverage the analytical and information management power of SAS9
 - Identify more unique ways to add value to their clients

■ 2006

- Benchmarking
- Install servers
- Migrate US studies (old processes) & retire old servers
- Prepare CER for senior management & socialize for approval



Overview Continued

■ 2007

- Define new global processes
- Implementation of the Global SAS architecture
- Migrate UK studies (new processes) & retire old servers
- Training and rollout

■ Future ...

- Expand for future business use (e.g. Early Stage)
- Ongoing Process Improvement
- Evaluation of further tools (e.g. DI, SDD)



Company Background: Covance

- One of the world's largest and most comprehensive drug development services companies
- Serves hundreds of pharmaceutical and biotechnology companies
- Approximately 600 SAS users, 200 power users
- Business Units
 - Central Diagnostics (Cardiac Safety)
 - Central Clinical Labs
 - Clinical Research Units (CRUs, Phase I-IIa)
 - Early Development
 - Health Economics
 - **Late Stage Development (LSDS, Phase IIb-IV)**
 - Pre-clinical Labs
 - Research Products



Company Background: ThotWave

- Started out as STATPROBE Technologies in 1999
- SAS Alliance Partner since 1995
- Create solutions for the Life Sciences, Energy/Utilities, and Financial Services industries
- Transform data into *thinking data*®
- Use SAS to deliver *Production Analytics*



Global SAS Use at Covance

North America

Chantilly, VA
Indianapolis, IN
Madison, WI
Montreal, Canada
Nashville, TN
Princeton, NJ
Radnor, PA
Reno, NV
San Diego, CA
Vienna, VA
Gaithersburg, MD

Europe

Crawley, England
Geneva, Switzerland
Harrogate, England
Leeds, England
Maidenhead, England

Asia/Pacific Rim

Canberra, Australia
Sydney, Australia

Late Stage Development Services

Other Covance BU sites

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LSDS Strategic Imperative

- Fully leverage global SAS expertise
- Common information repository architecture
- Common SAS platform
- Improve throughput



Add value to our clients: Deliver drug development analytics rapidly and cost-effectively

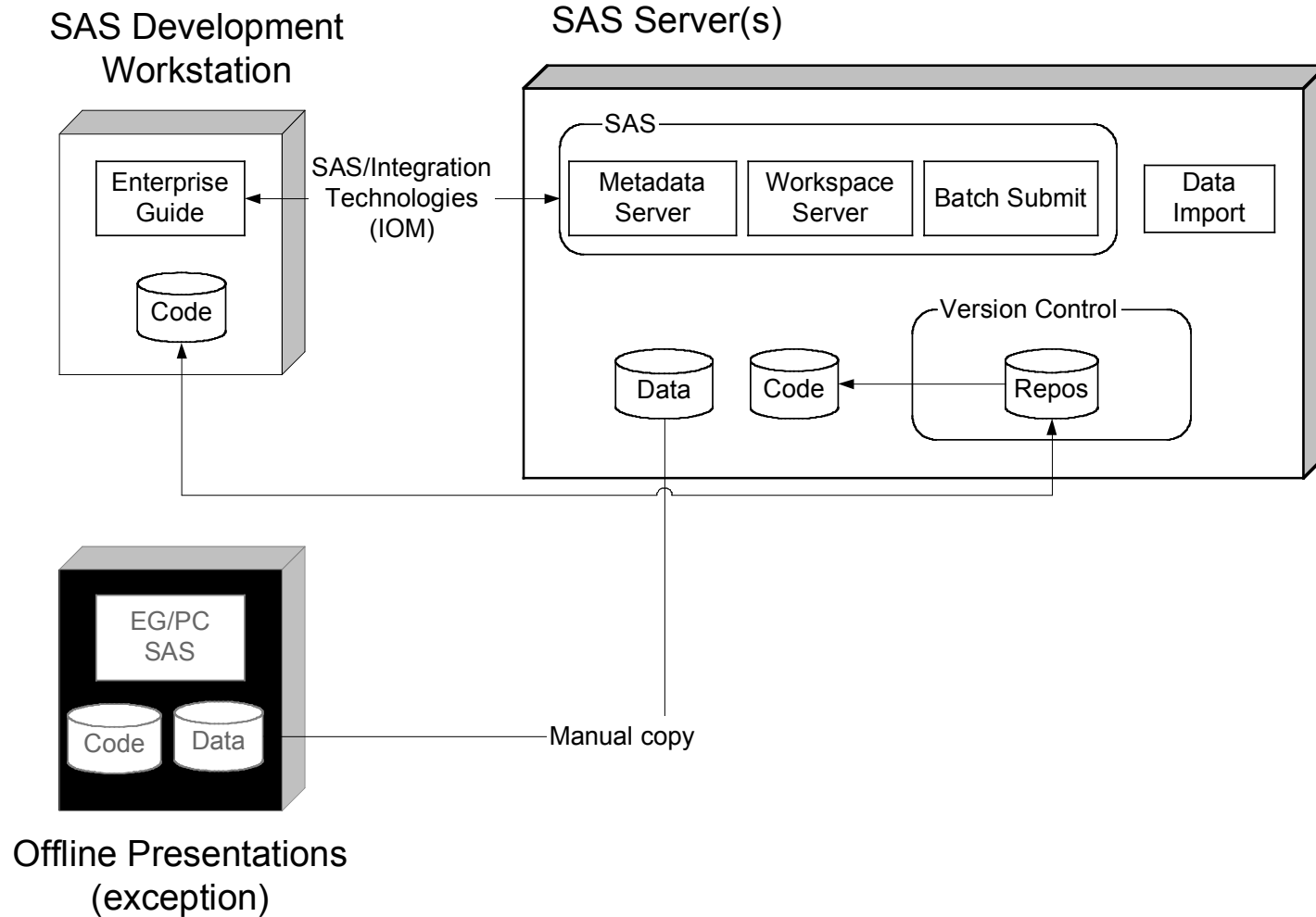


New Architecture Assessment

- 5 Candidate Logical Architectures
 - Business continuity
 - Windows SAS with filesharing
 - Distributed environment using SAS/Connect
 - Thin Client
 - Multi-tier (hybrid)
- Comparison scoring of 20 key requirements versus business continuity approach
- Reviewed with
 - Global project team
 - Executive sponsors
 - Senior Covance leadership



Hybrid Architecture





Covance Strategic Imperative

■ Resulting business strategy

- Develop a common enterprise-wide SAS Architecture
- Centralize SAS software licensing
- Common SAS version (SAS9)
- Adapt existing processes
- Develop training materials for use in-house
 - How to use EG, AMO, Stored processes
 - How to use within Covance environment (e.g. production runs)
- Staged rollout to US/UK users (AP in late 2007)



Common SAS Architecture

■ Benefits

- Effectively utilize global SAS resources
- Improve deployment of reusable tools
- Maintain currency with hot fixes, SAS versions



■ Challenges

- Disparate architectures within and between Business Units
- Differential business requirements



Centralize SAS Licensing

■ Benefits

- Reduced software maintenance costs
- Improved IT responsiveness

■ Challenges

- Disparate use of SAS products within and across business units
- Site based licensing



Common SAS Version (SAS 9)

■ Benefits

- Exploit electronic business intelligence
- Utilize tools within SAS 9 to reduce keystroke effort
- Integrate robust change control

■ Challenges

- Legacies
 - Client projects
 - Tools



critical business requirement: how to effectively distribute tasks to skilled Biometrics staff throughout the Covance world



People and Processes

- Develop new processes to use with SAS EG
 - Role changes (SAS programmer, administrator,..)
 - Non SAS professionals (e.g. Data Management)
 - New capabilities and features (clients and servers)
- Full Training for users
 - Use of windows editors
 - Administrator training
 - Stored Processes and AMO



Rollout

- Risk based approach to migration
 - New hardware implemented on old processes
 - Process development and training
 - Performance testing and validation of environment
 - Staged migration of US and UK studies
 - Evaluation of version differences
 - Recommendations on best approach
 - Old servers removed
 - Old processes retired (future)



Benefits

- ❖ Delivers immediate **productivity benefits** to the SAS users, particularly those that are currently working with SAS on Unix.
- ❖ Makes **sensible use of both the desktop and the server**. The desktop is used for code editing, reviewing results, and data exchange. The server is used for SAS computations, which are the most CPU and disk intensive operations.
- ❖ Provides excellent **support for centralization of SAS**, consistent with both the business vision of a global system and the overall IT consolidation strategy.
- ❖ **SAS Management Console** allows management of license information, installation/ configuration information, which servers and applications are out there, and some ability to monitor SAS servers.
- ❖ Keeps Covance in the **main stream of SAS usage**, and projects an image of being technologically current to Covance customers and other parties.



Return on Investment

- ❖ Cost of sharing resources on a project when the resources were not co-located / Cost of using non-optimal resources (where not shared and available)
- ❖ *Impact*
 - ❖ Time incurred transferring of data/code to another server
 - ❖ Time incurred due to differences in disparate systems globally
 - ❖ Write-off incurred through non-optimal use of available global resource
- ❖ *Valuation Metrics*
 - ❖ Based upon historical data, the cost to Covance for transferring or sharing work globally within LSDS Biometrics is \$118,080 per annum
 - ❖ Re-work or adaptation of code to different SAS Platforms an additional \$59,040 per annum
 - ❖ The estimated write-off to LSDS Biometrics of using non-optimal resources in a region where optimal resources exist at another location (i.e. by **not** sharing work), \$356,970 per annum



Return on Investment

- ❖ Efficiency: How long to produce and debug SAS Code, publish TFLs and reduction in server down-time
- ❖ *Impact*
 - ❖ Improved server performance for the execution of SAS jobs including less down time through newer hardware
 - ❖ Improved employee productivity through jobs running up to 10 x faster and potentially lower resource costs through use of a global resource pool and low cost centers
 - ❖ Improved utilization of junior hires through use of EG Tasks to write code and accelerate learning allowing them to contribute to projects sooner
 - ❖ Improved operational processing (fewer failed jobs due to integrity constraint violations => fewer man-hours used for correcting)
 - ❖ Automation of processes through AMO and Stored Processes - opens up the running of SAS reports (e.g. metrics) on demand to non-SAS users via Excel, Word or PowerPoint
 - ❖ More efficient SAS licensing strategy and reduced server maintenance costs



Return on Investment (continued)

- ❖ Efficiency: How long to produce and debug SAS Code, publish TFLs and reduction in server down-time
- ❖ *Valuation Metrics*
 - ❖ IT savings (licenses + support) estimated as \$246,000 over 4 years
 - ❖ Additional revenue due to improved efficiency/productivity of staff
 - ❖ Potential to increase client satisfaction through better quality
 - ❖ Reduce potential for write-off on projects through inefficiency



Return on Investment

❖ Positive Impact (Marketing/ Sales)

❖ *Impact*

- ❖ 24/5 working to reduce time to generate TFLs
- ❖ Potential to reduce hours for standard tasks in TCEs => better value offering => increased potential to win new work
- ❖ Better quality TFLs

❖ *Valuation Metrics*

- ❖ Differentiate Covance's service offering to increase sales – to be determined!!



Evaluation

❖ **Resource Constraints**

❖ *Lessons learned: make sure that you have deep commitment from all levels of the organization.*

❖ **Capital Investments**

❖ *Lessons learned: have good metrics.*

❖ **Software Constraints**

❖ *Lessons learned: know your processes and know the software.*

❖ **Cultural Habits**

❖ *Lessons learned: plan for change management (soft side of software).*

❖ **Definition of Scope**

❖ *Lessons learned: Bite of small, digestible chunks.*



Conclusions

- Covance's migration to SAS9 was an opportunity to critically determine if improvements in business processes should accompany the enhancements made viable by technology.
- The phased approach (assessment, benchmark, business process reengineering, hardware and software) was essential.
- With the support of ThotWave, solutions to satisfy the immediate needs of the organization, as well as scalability for the future, were identified.
- Deliberate planning, phased execution and testing has helped Covance move the global SAS9 architecture vision forward while maintaining the integrity and robustness of its operational capability in a highly regulated environment.



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Questions?



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