

Cloud Clinical Development Env.

Leadership & Innovation

Core internal competencies

Debiopharm International



CLINICAL DEVELOPMENT

Medical direction - Clinical operations - Data management - Pharmacovigilance



TRANSLATIONAL MEDICINE

Companion diagnostics – Biomarker investigations



CMC

Commercial supply chains - FDA approved manufacturing plant - PLGA technology



REGULATORY AFFAIRS

IND/CTA/NDA filings - Innovative trial designs - Regulatory incentives

Project Objectives

Before project

Initial User Analytics Environment

Programmers / Data Managers / Biostatisticians



Windows (C:)



Debiopharm (J:)

Challenges / Pains

Programmers / Data Managers / Biostatisticians



Reproducibility & Traceability

- Too many tools (SAS, R, Python), configuration (Lib version ...) and code forks
- Queries, transforms, visualisations, comment and results in different place
- Hardware resources allocation not future proof neither big data ready



Quality

- Data analysis, transformation, research not easy to share so not being easily reviewed



Consumability

- Transformation & Analysis results steps should be easy to follow
- Output should be consistent across groups (PDF, LaTeX, RTF ...)
- Tools installation



Discoverability

- Anyone should be able to find, navigate, and stay up to date on the existing set of work on a topic.



Learning

- Other researchers should be able to expand their abilities with tools and techniques from others' work.

What is needed to solve previous pain ?



Shared Execution Env.



Version Controlled System



Data Base





Why SAS Viya?

SAS Platform

Evolve Debiopharm's Analytics Platform

MIGRATE *Near-Term*

- Continue to run 9.4m5 procedures on new environment
- Conduct migration assessment to inventory active SAS workloads and identify potential code challenges
- Pilot effort to migrate initial set of SAS workloads and document best practices
- Update Debiopharm's internal SOPs

ADOPT *Short-Term*

- Identify priority analytic analysis and pilot how to leverage SAS' Cloud Analytics Services and advanced analytics
- Transition batch process to use Viya 3.5 scheduling
- Use new capabilities and performance tracking

EVOLVE *Medium Term*

- Use new capabilities to enhance the clinical trial reporting
- Utilize ephemeral containers and/or serverless-functions for running batch SAS jobs
- Provide dedicated analytic containers for model development
- Integrate with External Data

Analytics Environment

SAS Platform

Evolve Debiopharm's Analytics Platform

MIGRATE
Near-Term

SAS Platform

SAS 9.4

**SAS Cloud Analytics
Services (CAS)**



**Shared Execution
Environment**



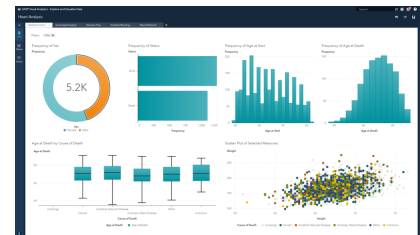
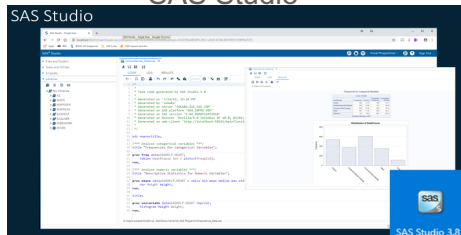
Git Integration



**Open-Source
Integration**



SAS Studio



Analytics Environment

SAS Platform

Evolve Debiopharm's Analytics Platform

ADOPT
Short-Term

SAS Platform

SAS 9.4

**SAS Cloud Analytics
Services (CAS)**

PROC APPEND	Adds rows to a data set.
PROC CONTENTS	Shows the contents of a data set.
PROC COPY	Copies entire SAS libraries or specific members of the library.
PROC DATASETS	Manages CAS tables.
PROC DELETE	Deletes SAS data sets and CAS tables.
PROC DS2 ¹	Manipulates data with DS2 language statements.
PROC FCMP	Enables you to create, test, and store SAS functions, CALL routines, and subroutines before you use them in other SAS procedures or in DATA steps.
PROC FEDSQL ²	Manipulates data and performs reporting with FedSQL language statements.
PROC FORMAT	Creates user-defined informats to read data and user-defined formats to display data.
PROC LUA	Enables you to run statements from the Lua programming language within SAS code.
PROC MEANS	Computes descriptive statistics; can produce printed output and output data sets. By default, PROC MEANS produces printed output.
PROC REPORT	Combines features of the PRINT, MEANS, and TABULATE procedures with features of the DATA step in a single report-writing tool that can produce a variety of reports.
PROC SCOREACCEL	Provides an interface to the CAS server for DATA step and DS2 model publishing and scoring.
PROC SORT	Provides the ability to manage duplicate observations in data sets. The SORT procedure uses the CAS deduplicate action to perform the equivalent functionality of the NODUPKEY or NOUNIKEY options of PROC SORT.
PROC SUMMARY	Computes descriptive statistics; can produce a printed report and create an output data set. By default, PROC SUMMARY creates an output data set.
PROC TABULATE	Displays descriptive statistics in tabular format, using some or all of the variables in a data set.
PROC TRANSPOSE	Transforms SAS data sets so that observations become variables and variables become observations.

SAS Platform

Evolve Debiopharm's Analytics Platform

EVOLVE
Medium Term



Analytics Environment

SAS Platform

Evolve Debiopharm's Analytics Platform

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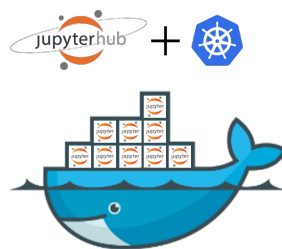
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Architecture Overview

After project

New User Analytics Environment





Deployment & Validation

SAS Viya Azure Template

Validation & Deployment

SAS Viya quickstart template adapted to Debiopharm needs



Validation plan Definition
(IQ/OQ/PQ)



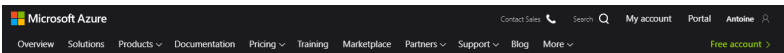
Stakeholders
Plan Validation



Plan Execution
Migration
Documentation



Outcomes
Validation



Templates / SAS Viya Quickstart Template for Azure

SAS Viya Quickstart Template for Azure

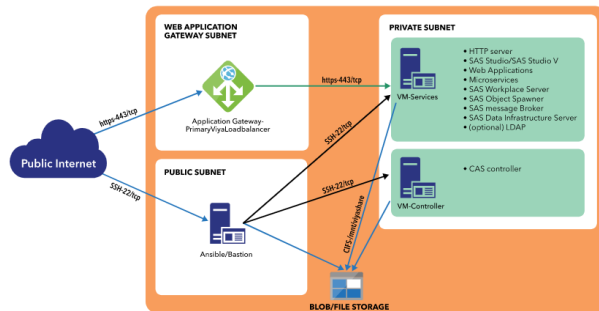
by SAS Software
Last updated: 6/10/2020

[Deploy to Azure](#) [Browse on GitHub](#)

The SAS Viya Quickstart Template for Azure deploys these products on the cloud: SAS Visual Analytics 8.5 on Linux, SAS Visual Statistics 8.5 on Linux, and SAS Visual Data Mining and Machine Learning 8.5 on Linux. This Quickstart is a reference architecture for users who want to deploy the SAS Viya platform, using microservices and other cloud-friendly technologies. By deploying the SAS platform on Azure, you get SAS analytics, data visualization, and machine learning capabilities in an Azure-validated environment. SAS Viya is a cloud-enabled, in-memory analytics engine. It uses elastic, scalable, and fault-tolerant processing to address complex analytical challenges. SAS Viya provides faster processing for analytics by using a standardized code base that supports programming in SAS, Python, R, Java, and Lua. It also supports cloud, on-premises, or hybrid environments and deploys seamlessly to any infrastructure or application ecosystem.

This Azure Resource Manager template was created by a member of the community and not by Microsoft. Each Resource Manager template is licensed to you under a license agreement by its owner, not Microsoft. Microsoft is not responsible for Resource Manager templates provided and licensed by community members and does not screen for security, compatibility, or performance. Community Resource Manager templates are not supported under any Microsoft support program or service, and are made available AS IS without warranty of any kind.

SAS Viya Virtual Network



Conclusions & Next steps

Project main outcomes



1. Improved collaboration – internal & external (CROs)
2. Standardization, harmonization and industrialization of practices
3. SAS Licence model simplified (hardware based license model)
4. Installation, implementation, validation - Only one server
5. Integrated Environment for SAS & Open Source programmer
6. Improved Scaling & performance
7. Easy Access



Trainings on new SAS Features
(ex CAS)



Process Automation &
Harmonization



Use Reporting & Dashboarding
Capabilities



Extend platform new features
usage like SAS Drive



Contacts & Questions



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