ASK THE EXPERT

AI Driven SAS Transformation: Making the Move From SAS®9 to SAS® Viya®

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Amar is a Data & AI leader with a total of 22 years of experience, the last 17 years with Accenture. He is a Certified Master Data Architect and has expertise in setting up new Data & AI practices and scaling them for client engagements. He has delivered multiple large scale complex Data & AI engagements for large global clients.

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Ankit is a Senior SAS and Cloud Solution Architect with 13 years of experience. He is a Certified Technology Architect with expertise in analyzing complex on-prem architectures and modernizing them on cloud. He has expertise across SAS technology stacks, Risk and Fraud solutions, driving the SAS modernization journey as a part of Accenture SAS Cloud Factory.

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SAS Transformation

Core Message

SAS Viya is a powerful platform organizations can embrace to exponentially change their analytics journey in an era of compressed transformation, powered by cloud's elasticity and accelerated rate of business innovation.

Value Proposition

Accenture helps companies implement strategies to accelerate change across the human, technology, and business dimensions of their enterprise simultaneously. No matter a client's starting point, we break down complex SAS journeys into **simple steps – assess, migrate, accelerate, grow & innovate.**

Client Outcomes

Financial Efficiency

- 30%-40% reduction in IT OPEX
- Spend as you need with on-demand infrastructure and platforms
- 20-25% lower TCO by reducing technical debt

Speed & Agility

- Up to 50% reduction in time to market
- Shorten application lifecycles by 30-40% through new ways of working (agile, pods, liquid factories)
- Accelerate experimentation by 3 to 20X

Business Transformation

- Reduce CO2 emissions (up to 20%) with sustainable practices
- Near zero business interruption
- Intelligent data-driven operations

Talent Renaissance

- New mindsets, operating models and skillsets, 20-30% faster
- 5-7% improved talent retention
- Increased productivity

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Key Challenges

Platform utilization

- Key features of SAS such as distributed computing, in-memory processing not leveraged efficiently
- Preceived as complex for users
- Cost vs value delivered is not clear
- 60-70% of time spent on data preparation instead of analytics

Governance issues

- Lack of accountability for users
- Lack of structured way of monitoring and reporting
- Potential lack of trust from stakeholders & regulators
- Lack of transparency
- Competence gap

Need for modernization

- Risk of data loss
- Low performance
- Hard to recruit staff and retain staff in analytics area
- Majority of time spent on preparing data instead of analyzing
- Limitation and technology
- Scattered and old installation
- Lack of industrialized modeling approach

Cost not optimal

- High maintenance cost
- More costs and less outcome
- Licence cost problems
- Large efforts required to develop
- High TCO
- Cost vs value delivered is not clear
- Lost sales and dissatisfied customers
- Soaring cost for reporting and analytics

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How we accelerate the SAS Journey

Moving SAS technologies from on-premise infrastructure to cloud, quickly and confidently needs an in-depth assessments of multiple parameters across various dimensions such as

Discover

SAS landscape discovery

- Detailed level understanding of the SAS landscapes across its overall utilization across the organization, its computing consumptions, penetration within and across organization and distribution of associated workloads and complexity

Assessment

Shortlisting of Application for migration

- Conducting a 360-degree technical assessment of multiple metrics across 4 dimensions to identify which SAS application / artifacts should be Rehosted, Replatform, Rearchitect or Retired

Recommendation

Rule based recommendation

- Engage target groups to understand requirements & minimize impact
- Develop training & trainers for new platforms (adoption)
- Provide a high-level set of recommendation of
  - SAS / Non-SAS technologies and tools
  - Cloud Architecture
  - Migration Path

Framework

One Stop Shop

- Pre-defined framework to recommend tailor made approach focusses of business value rather than technical landscape
- Methodology entails Identification early adopters from assessment, discovery phase ensuring coverage of all scenarios such as lift and shift , refactor

Accelerator

Standardize implementation approach to expedite & provide consistency

- Assessment accelerator
  - Workload / Processing / Utilization / Data Footprint
- Migration accelerator (non-exhaustive)
  - SAS Enterprise Miner Model to SAS VDMML
  - SAS codes / SAS EG Projects to SAS Studio
  - SAS EBI to SAS VA

Management

Automation of SAS deployment and maintenance

- SAS VIYA quick start available on
  - AWS
  - Azure
  - Google
- Terraform templates for automated cloud deployments and integration patterns
- Framework for platform operations

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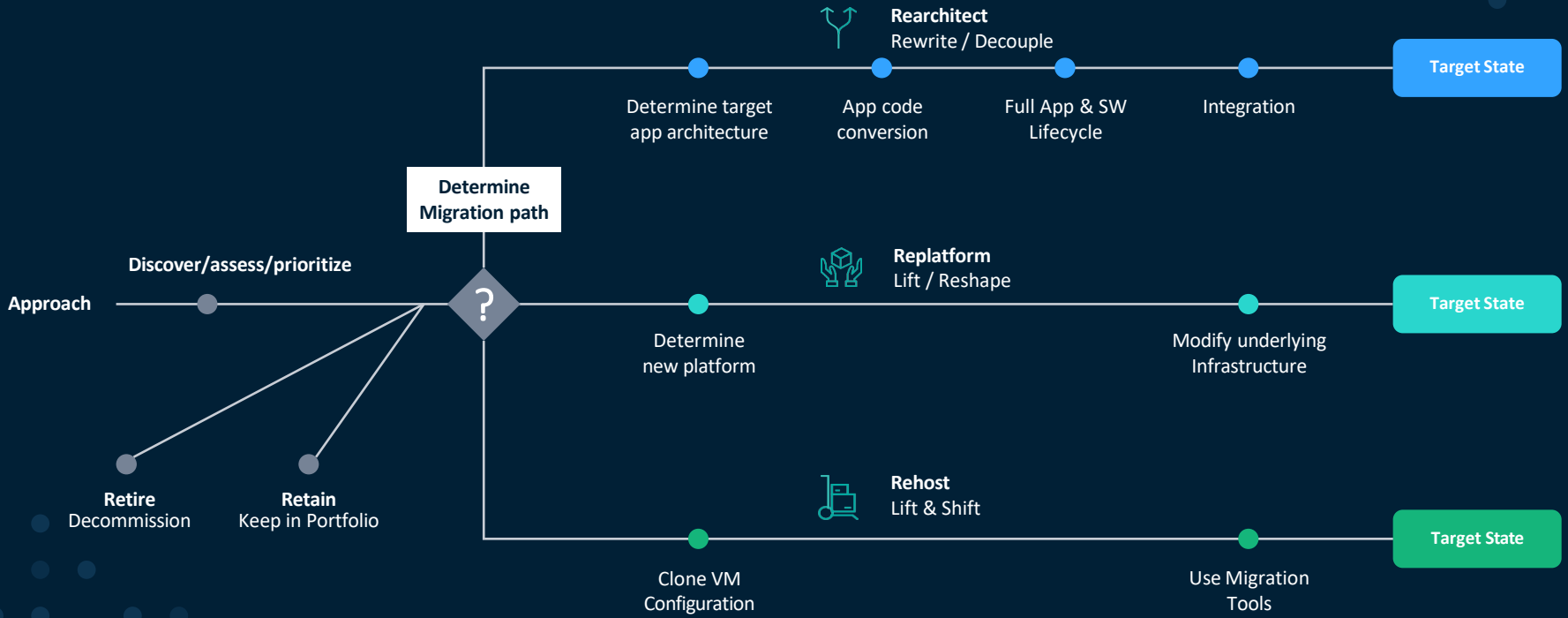
Leverage a combined Business and Application-led approach



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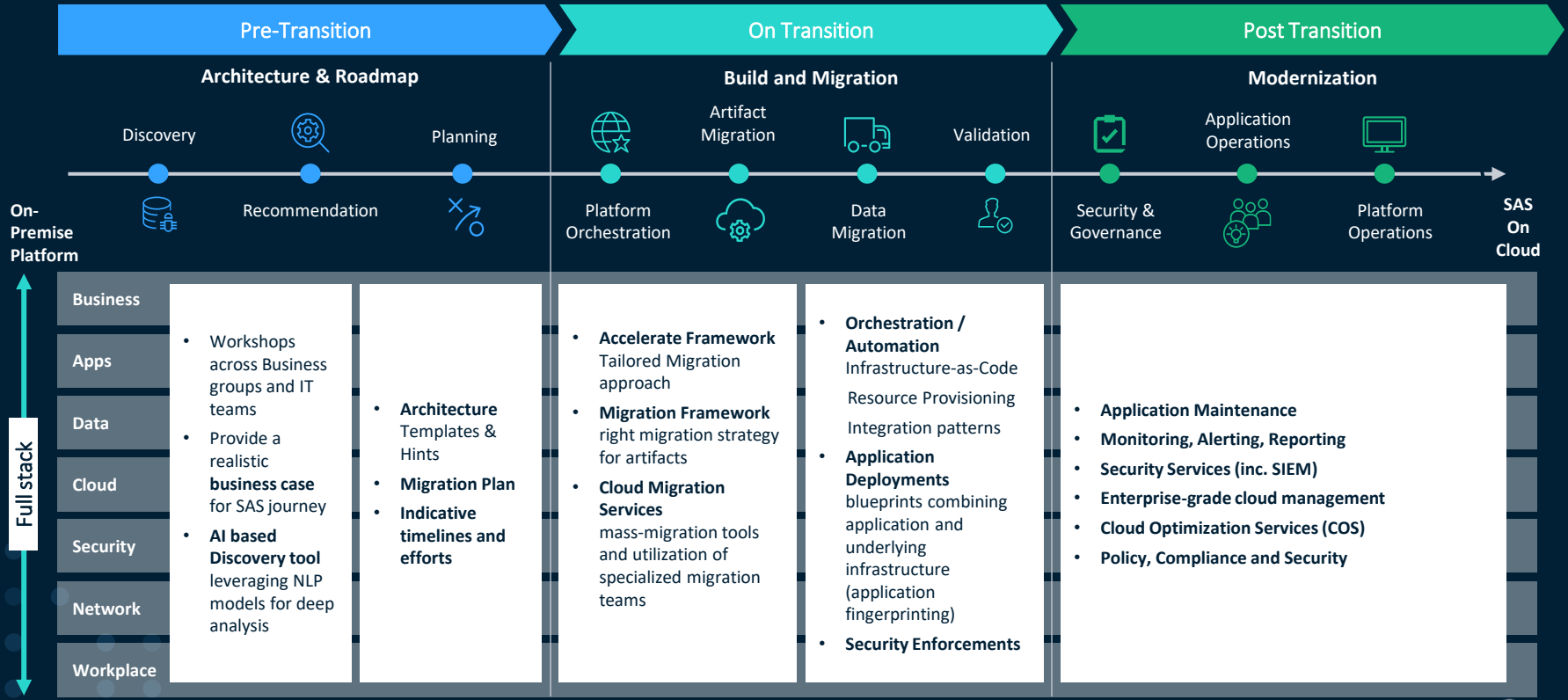
ACN SAS Transformation reduces the time and cost of migrating SAS Estates to the Cloud



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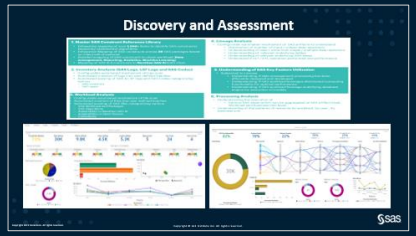
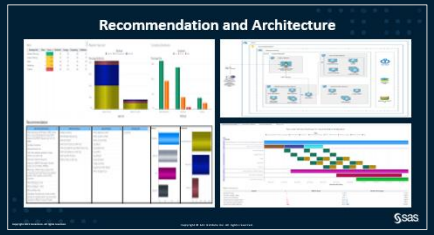
SAS Transformation Journey

Modernization Strategy

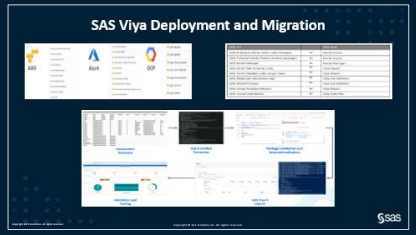
Discovery and Assessment



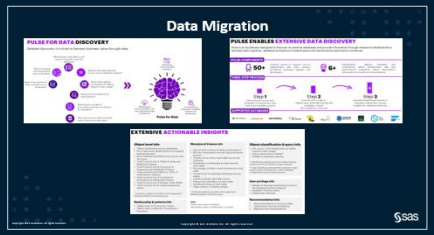
Recommendation and Architecture



SAS Migration



Data Migration



Platform Operations

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Modernization Strategy

Value Proposition

- SAS Modernization Insights
- SAS on Cloud (AWS/Azure/GCP)
- SAS Viya vs Open-Source vs Cloud Native

Accenture myNav Cloud Business Case Builder

- ROM CSP Agnostic Business Case
- High Level Business Case
- Detailed Level Business Case
- SAS on Cloud Business Case

https://accenture.com/mynav

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Discovery and Assessment

1. Master SAS Construct Reference Library

- Exhaustive mapping of over **1,100+** items to identify SAS constructs/ keywords/ statements/ algorithms
- Exhaustive Mapping of SAS constructs across **38** SAS packages based on Client bill of material
- Detailed mapping of SAS constructs to client workload (**Data management, Reporting, Analytics, Machine Learning**)
- Mapping of SAS 9.4 constructs to **NextGen SAS AI** (SAS Viya)

2. Inventory Analysis (SAS Logs, LSF Logs and SAS Codes)

- Configurable automated mechanism of logs scan
- Automated creation of logs into user defined batches
- Automated parsing of SAS & LSF logs and SAS Codes categorizing various
  - SAS inventory
  - SAS users

3. Workload Analysis

- Configurable automated mechanism of file scan
- Automated creation of files into user defined batches
- Automated parsing of SAS files categorizing various
  - SAS Workload and Packages
  - SAS Algorithms
  - Adaptability to NextGen SAS AI
  - Adaptability to Open Source
  - Complexity

4. Lineage Analysis

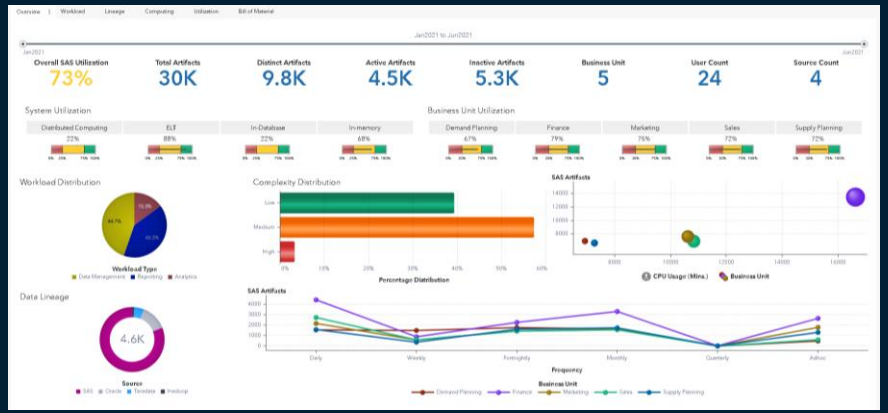
- Configurable automated mechanism of SAS artifacts to understand
  - Distribution of number of input / output data repository
  - Understanding of read / write from single / multiple data repository
  - Understanding of relevant underlying tables
  - Understanding of relevant underlying SAS steps
  - Understand if ELT / ETL operation performed and performance

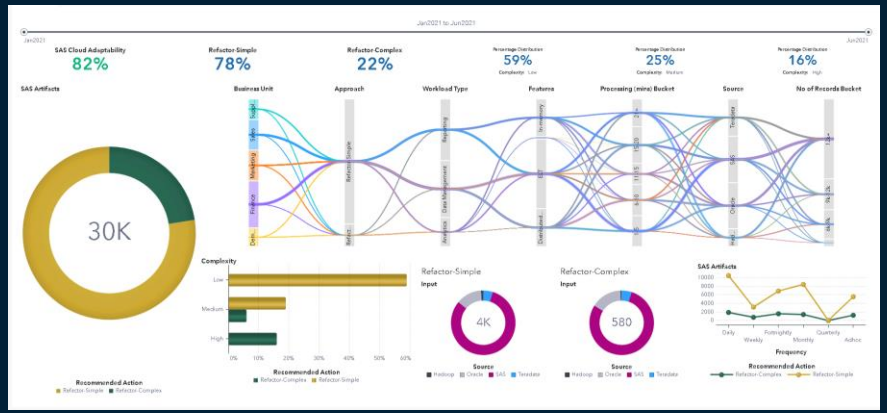
5. Understanding of SAS Key Feature Utilization

- Subjected to License
  - Understanding if data management processing has been efficiently designed and developed
  - Understanding if SAS workload leverages distributed computing functionality for optimal performance
  - Understanding if SAS workload leverage underlying database engine for execution of models.

6. Processing Analysis

- Understanding the execution of
  - Various SAS steps which can be aggregated at SAS artifact level, Workload and Business Unit level.
- Understanding of the patterns of resource by workload, by user , by business unit





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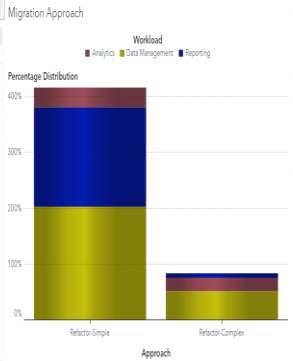
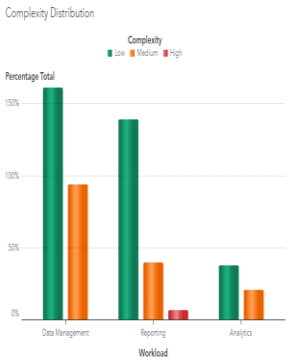
Recommendation and Architecture

Wave

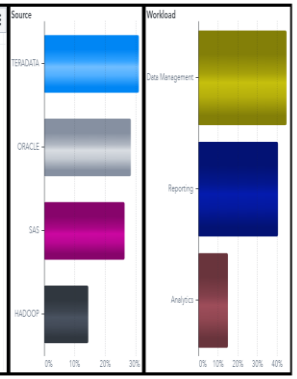
Business Unit	Wave	Score	Workload	Lineage	Computing	Utilization
Demand Planning	1	170	26	35	68	41
Supply Planning	2	228	32	60	58	78
Sales	3	233	64	75	36	58
Marketing	4	256	80	69	66	41
Finance	5	292	88	83	66	55

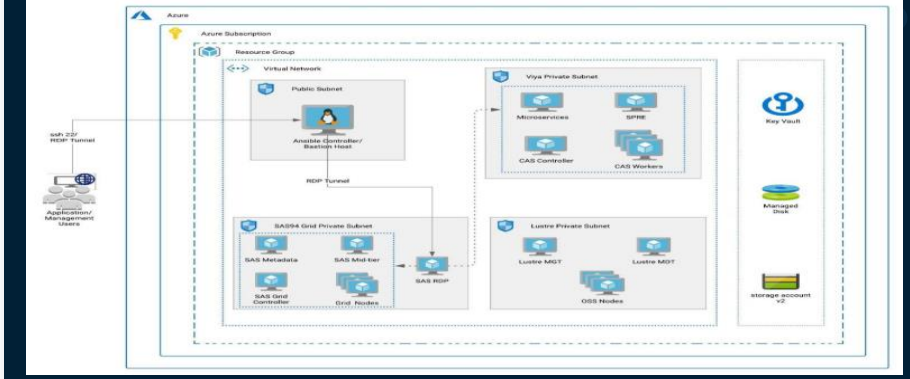


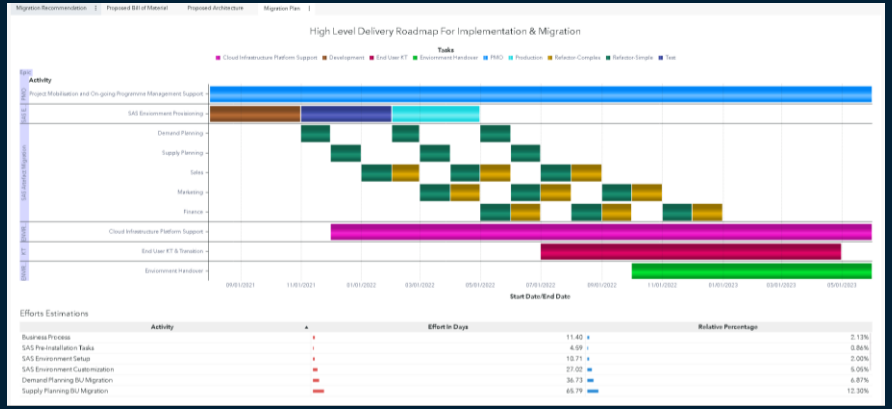


Recommendation

Recommended Action	SAS Viya Product	Cloud Product	Infrastructure
When executing a DATA Step in SPRE, ensure the source and target tables to those DATA Steps are SAS7BDAT data sets and not CAS tables.	SAS Econometrics	Anthos attached clusters	Containers
Use Batch Containers	SAS Intelligent Decisioning	Anthos clusters on AWS	
Required function list	SAS Optimization	Anthos on bare metal	
Push Down whenever possible. (To save memory use partioning)	SAS Visual Analytics (on SAS Viya)	Cloud Build	
Push Down whenever possible.	SAS Visual Data Mining & Machine Learning	Cloud Data Fusion	
Produce an ERROR if the target CAS table exists prior to the PROC APPEND.	SAS Visual Statistics (on SAS Viya)	Cloud GPUs	
PROC SQL is ANSI 92 SQL compliant with unique SAS constructs that are not available in FedSQL. PROC FedSQL is ANSI 99 SQL compliant	SAS Visual Text Analytics	Cloud Router	
PROC REGSELECT (CAS)	SAS/Connect (on SAS Viya)	Compute Engine	
PROC LOGSELECT (CAS)		Config Connector	
PROC LMIXED (CAS)		Google Kubernetes Engine	
Obsoleted since there are no more pointers available to indicate specific rows due to data allocated to different cores and threads.		SAP on Google Cloud	







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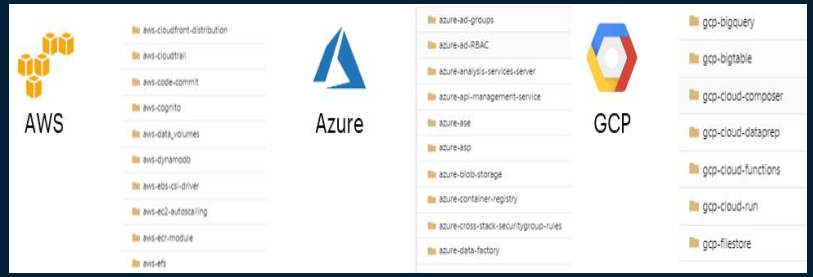
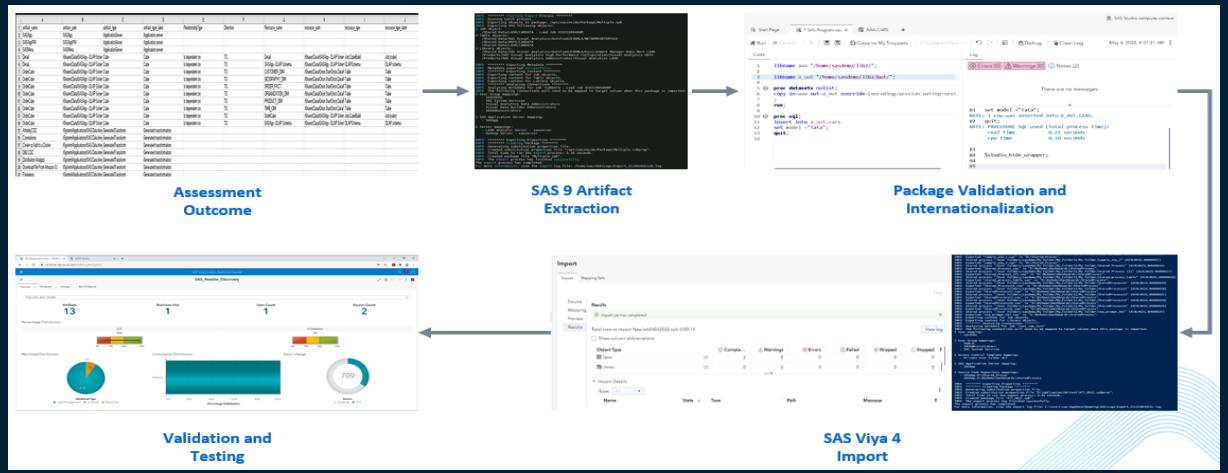
SAS Viya Deployment and Migration



SAS 9.4		SAS Viya
SAS Enterprise Miner (SAS Code Package)	→	Model Studio
SAS Forecast Studio Project (Archive package)	→	Model Studio
SAS Model Manager	→	Model Manager
SAS OLAP Star Schema Cube	→	Viya Report
SAS OLAP Detailed Cube (Single Table)	→	Viya Report
SAS Relational Information Map	→	Viya Job definition
SAS Stored Process	→	Viya Job definition
SAS Visual Analytics Reports	→	Viya Report
SAS Visual Data Builder	→	Viya Data Plan



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Data Migration

PULSE FOR DATA DISCOVERY

Detailed discovery is critical to harness business value through data

PULSE ENABLES EXTENSIVE DATA DISCOVERY

Pulse is an accelerator designed to discover on-premise databases and provide information through interactive dashboards to facilitate data migration, database architecture modernization and performance optimization initiatives.

PULSE COMPONENTS

50+ Analysis points to support various stakeholders like data owners, architects, business analysts and developers

6+ Dashboards - objects, metadata and volumetrics, object classification, user and performance snapshots, object dependency information & overall recommendations

THREE-STEP PROCESS

Step 1 Determine the scope and feasibility of assessment and customize metadata queries

Step 2 Execute SQL scripts in collaboration with DBA and get the metadata output *(No installation required)*

Step 3 Generate dashboards based on metadata output that contain insights for migration planning

SUPPORTED DATABASES

NETEZZA · ORACLE · teradata. · SQL Server · HIVE · MySQL · amazon REDSHIFT · IBM DB2 · Azure Synapse Analytics · SAP HANA

EXTENSIVE ACTIONABLE INSIGHTS

Object level Info

- Object distribution across databases
- How objects are distributed across logical business groups*
- How Schemas and tables have grown over the years
- Total Count & List of Tables & Views per Database/Schema
- Total Count & List of Synonyms & Sequences per Database/Schema
- Total Count & List of Macros, UDFs, & methods per Schema
- Total Count & List of Functions & Procedures by Database/Schema
- Total Count & List of backup / junk tables
- Total Count & List of system temporary tables

** Customer needs to provide us the mapping of database/table to business group.*

Relationship & patterns info

- Tables used in Synonyms / Views
- Tables used in Macros / Procedures / Functions

Metadata & Volume info

- Size of each schema & tables underneath it.
- DB Size consumption across logical business groups *
- Volume of records in each table across all schemas.
- Distribution of attributes by data type for each table
- Percentage of Nulls in each attribute for each table
- Count & List of redundant attributes across tables
- Columns details with Null counts
- Primary Key identifiers of each table
- Distribution Keys of each table
- Table indexes / Partition details

** Customer needs to provide us the mapping of database/table to business group.*

Note:
•Pulse only extracts metadata.
•No Business data or PHI/PII data is accessed.

Object classification & query info

- Hot, warm, Cold classification of tables based on their usage*
- Query performance details**
- Details of expensive queries.

** Classification details can be provided if the last access time info for tables is being collected*

*** Query details are extracted from dynamic views hence output will depend on client's database configurations such as spool size etc.*

User privilege info

- Details of users/groups having access to the Database/schema/objects
- Disabled / Inactive users
- Failed login attempts

Recommendation Info

- Recommendation to remove tables
- Optimization Recommendations
- Migration Recommendations

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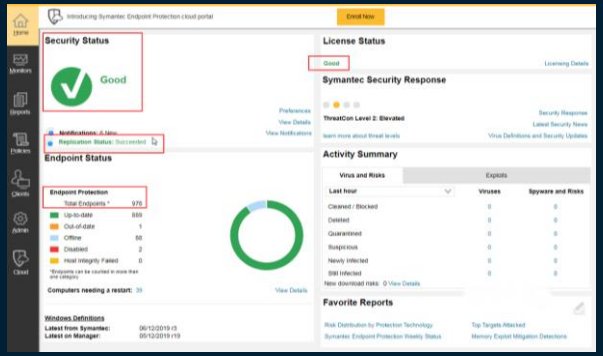
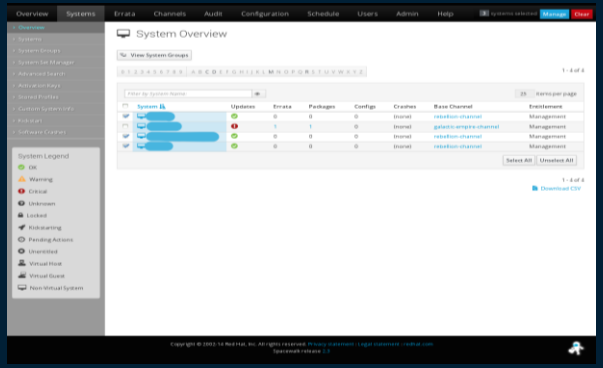
Platform Operations





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Key success factors for a successful migration

Profound assessment

- It is key to assess the current situation in full detail as a basis for an accurate target architecture definition and to reveal the current readiness towards a Cloud migration

Include Business and IT Teams

- Involvement of Business Stakeholders and IT teams from Day 1 to enable collection of necessary knowledge and to understand requirements, dependencies and any potential pitfalls

Automate Migration

- It is key to automate the migration as far as possible to increase the efficiency and speed as well as to lower costs and the error rate
- Migration process duration needs to be standardized and industrialized to achieve the required scale in migration execution

Modernization Success Factors

Governance

- A clear governance and program structure with undistracted management attention and dedicated resources are key to support a successful cloud migration

Provider Agnostic Considerations

- Given the wide range of cloud providers, a clear cloud vendor strategy is recommended
- Broad knowledge of SAS and Cloud providers can help evaluate the target state that meets requirements

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