

CLOUD-FIRST SAP INTEGRATION WITH AZURE

Abstract

Cloud enterprise resource planning gives organizations the power to quickly adapt business models and processes so they can reduce costs, sharpen forecasts, and innovate better.

This viewpoint describes some key capabilities and recommendations around integrating SAP or S/4HANA (cloud) in an enterprise ecosystem. It also explains how end-to-end business process integrations can be built using Azure Integration Services.

Enabling Fluidity in a Modern Enterprise

Digital technologies are driving a profound shift in consumer expectations, business models, branding, and growth strategies.

To stand out in today's economy, organizations must invest in technology that automates tasks and integrates processes. This provides end-to-end business connectivity and complete visibility across suppliers and partners.

Infosys believes that leveraging a set of strategy, framework, tools, and solutions for any enterprise-level digital transformation initiative helps enable:

- Fluidity for the enterprise
- Simple, responsible, and intuitive IT for the business
- Self-service IT for operations
- Faster IT for IT
- Application composition and consumption at scale

One of the main digital transformation projects for organizations today is around enterprise resource planning (ERP) solutions. SAP, being a global leader in this space, provides solutions to help transform businesses in a technology-driven world.

Traditional SAP on-premises deployment is expensive to maintain and difficult to manage. SAP on cloud is a demonstrably more cost-effective and efficient solution. Organizations are increasingly moving their SAP deployment to the cloud to attain huge benefits like agility, efficiency, scalability, resiliency, security, cost savings, globalization, and more.

SAP on Azure

Infosys is an SAP Global Strategic Services Partner. Through this relationship, our customers benefit from strong implementation services, enhanced solution delivery, and increased global reach. Azure offer great platform and proven capabilities to many SAP solutions. When enterprises move their workloads to cloud, some of the most

relevant applications are picked for core integration.

Figure 1 represents how SAP solutions (especially S/4 HANA suite) fit in the Azure landscape through Azure service offerings such as IaaS, Managed services, and PaaS. It also depicts the SAP business technology platform that provides database, data management, application development, integration, and analytics as a foundation.

SAP HANA

HANA is a relational database management system (RDBMS) and is widely used as an application database

to carry out real-time analytics, provide business insights, and centralize operations.

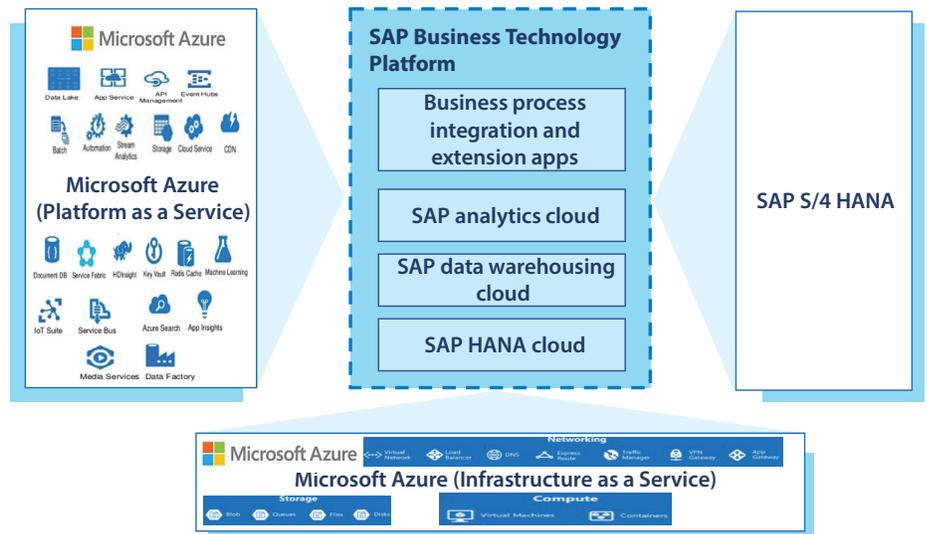


Figure 1 – Fitment of SAP solutions in the Azure landscape

S/4 HANA in Azure

S/4HANA is an ERP suite including financial analytics, supply chain management, manufacturing etc. It is built on the HANA database. SAP offer S/4HANA for cloud as well for Fiori applications, S/4HANA supports remote connectivity using the express route.

SAP BW/4HANA

BW/4HANA, SAP's data warehouse for business insights, is also built on the HANA database. Its features include simplified modeling and administration of change requests, integration of a wide range of data sources, an intuitive user interface, and real-time data processing. Azure supports optimization and scalability for SAP BW and analytics.

SAP solutions on Azure | Microsoft Azure

Key Imperatives for an Agile, Resilient, and Digitally-enabled Integration Layer

Organizations need to reimagine integration. Infosys strongly believes that a homogeneous unified platform that meets modern digital integration needs is a must. Such a platform can holistically derive insights from the data and events captured.

Some of the key imperatives are:

- Highly scalable, agile, responsive, efficient, and connected integration platform
- Out-of-the-box capabilities to handle application-to-application (A2A), business-to-business (B2B), and Internet of Things (IoT) integration scenarios
- Supports event-driven integrations and cost-effective serverless capabilities

Integrating the Core

Effective application or system integration is essential for just about every organization. The core technologies required for cloud-based integrations are offered by Azure Integration Services, which is Microsoft's Integration Platform as a Service (iPaaS) offering. The various components of Azure Integration Services like Azure Logic Apps, Azure Service Bus, Azure Event Grids, API Management, and Azure Functions address the core requirements of applications.

Integration as well as other components and data services like Azure Synapse, Azure Purview, SQL/NoSQL datastores are made available as part of the larger Azure cloud platform

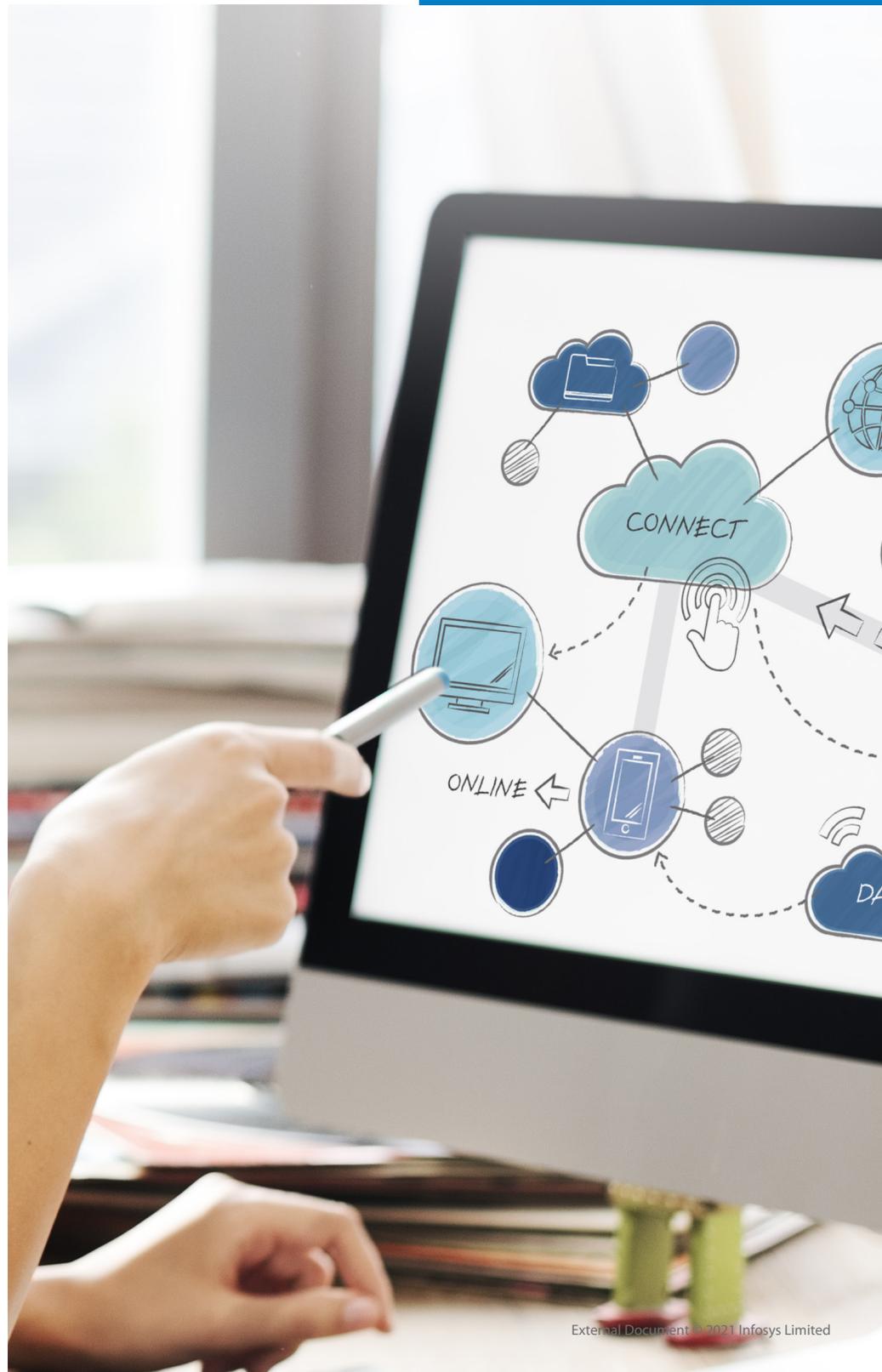
Microsoft's Azure Integration Services make ERP integration in the cloud and deployment of hybrid landscapes easy and simple.

The next generation digital core in S/4HANA solutions is designed to help organizations easily run a digital economy. Content packages and prebuilt integrations are exposed using SAP APIs (SOAP and OData). Thus, Azure Integration Services keeps the integration layer resilient, agile, secure and nimble.

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Microsoft named a leader in Gartner's Magic Quadrant for Enterprise Integration Platform as a Service*

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S/4HANA Business Processes using Azure Integration Services

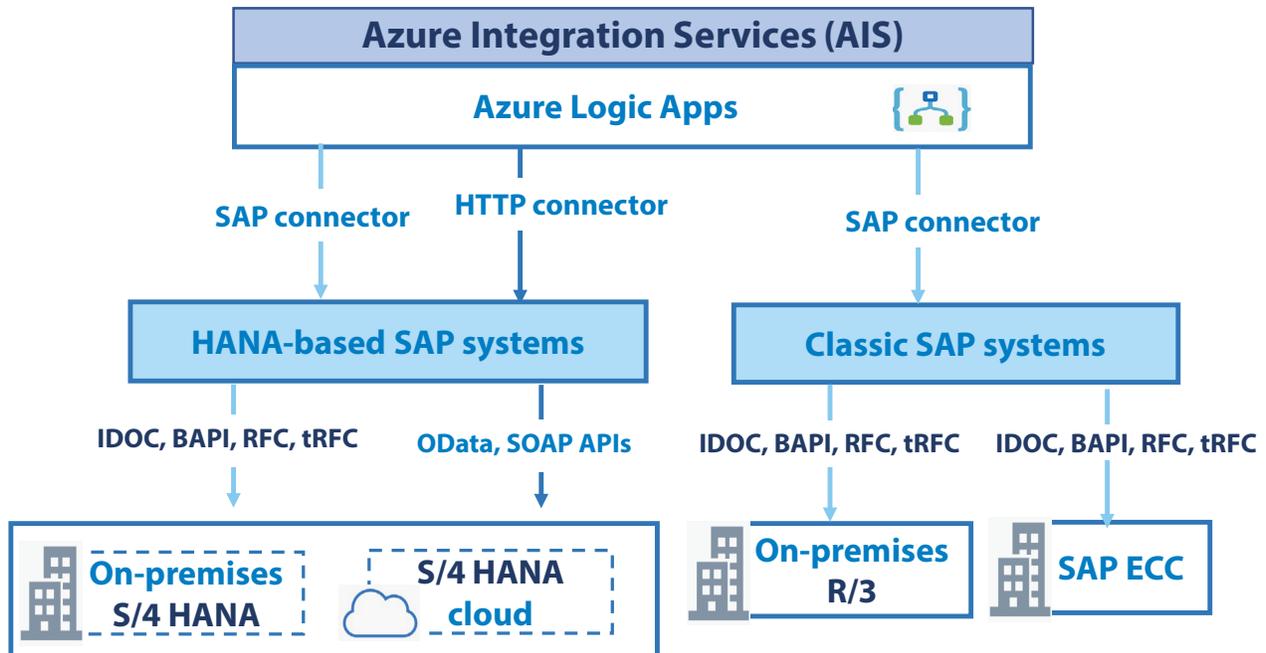


Figure 2 – Options to integrate S/4HANA Business objects and processes using Azure Logic Apps

Key guidelines

- The SAP connector can be used with the following SAP systems:
 - On-premises and cloud HANA systems like S/4 HANA
 - Classic on-premises SAP systems like R3 and ECC
- The SAP connector available for Azure Logic Apps supports the following message and data integration types:
 - Intermediate Document (IDoc)
 - Business Application Programming Interface (BAPI)
 - Remote Function Call (RFC) and Transactional RFC (tRFC)
- The SAP connector is developed to support SAP .NET connector (NC) library
- The logic app, hosted in multi-tenant Azure, along with managed SAP connector is used to access SAP systems via the on-premises data gateway

- An integrated service environment (ISE) provides access to resources deployed on Azure virtual network using ISE-native SAP connectors. These allow Azure Logic Apps to directly access on-premises resources without using on-premises data gateways.

- When there is a need to configure checks to prevent duplicate network transmissions due to temporary outages, lost acknowledgment, or any other network issues

When to use OData versus SOAP API using HTTP connector

- Use OData (REST) APIs where there is need for user interactions via mobile apps, desktop apps, tablets, and/or lightweight, synchronous and stateless applications
- SOAP-based services can be used for integration scenarios that require asynchronous communications to non-SAP backend and stateful applications supporting high volumes
- Azure Functions and any web-based system can be invoked via SOAP or OData (REST) APIs (HTTP requests) to build custom APIs and/or respond to webhooks where the SAP connector-based integration is either not feasible or expensive.



Prerequisite

Download and install the latest SAP client library on the same machine or server as your on-premises data gateway to access on-premises SAP system using SAP connector.

When to use the SAP connector

- With on-premises R/3, ECC, and S/4 HANA systems where integration requirements are over IDOC, BAPI, RFC, or tRFC

SAP Data Integrations using Azure Data Estate

Operational inefficiencies and low-value processes can be continuously improved with intelligent automation using a number of SaaS, IaaS, and PaaS solutions. Table 1 looks at SAP data connectors and the functionalities available for various Azure data services.

Azure Service	Connectors/Functionality
Azure Data Factory	Azure Data Factory (ADF) platform can be used to construct ETL processes using no code. ADF supports OOTB connectors for SAP HANA, SAP Table, and SAP ECC
Azure Data Lake	Azure Data Lake can be used with PowerBI and Power Automate to a build scalable and cost-effective big data and storage solution
PowerBI	PowerBI, Microsoft's business intelligence and analytics platform, supports seamless connection to a host of SAP products such as SAP HANA databases and SAP Business Warehouse (BW)
Power Automate	Microsoft's low code development platform can be integrated with SAP products using the SAP ERP connector to build simple apps and deploy no-code workflow automation
Azure Active Directory	Azure Active Directory can be used to set up secure single sign-on (SSO) integration with SAP cloud platform. It also provisions flexible access to SAP products such as SAP S/4HANA
Azure Event Hub	Ingests and distributes large amounts of events. SAP supports connection to Azure Event Hubs using Kafka protocol/adaptor
Azure Synapse	Azure Synapse Analytics is a limitless analytics service that brings together data integration, enterprise data warehousing and big data analytics. Azure Synapse Analytics pipelines copies data from an SAP table using SAP Connector
Azure Purview	Azure Purview is Microsoft's unified data governance service that helps you manage and govern your on-premises, multicloud and software-as-a-service (SaaS) data. Azure purview expands its connectivity support sources like SAP S/4HANA and SAP ECC using SAP Connectors.

Table 1 – Connection to SAP Products using Azure Services



Accelerating Customer Innovation and Transformation

Infosys has helped accelerate digital transformation journeys for leading organizations across the globe, thereby reducing the total cost of ownership. Few examples are described below:

1. Integrating master data between Salesforce and on-premises SAP system (ECC) with Azure Integration Services

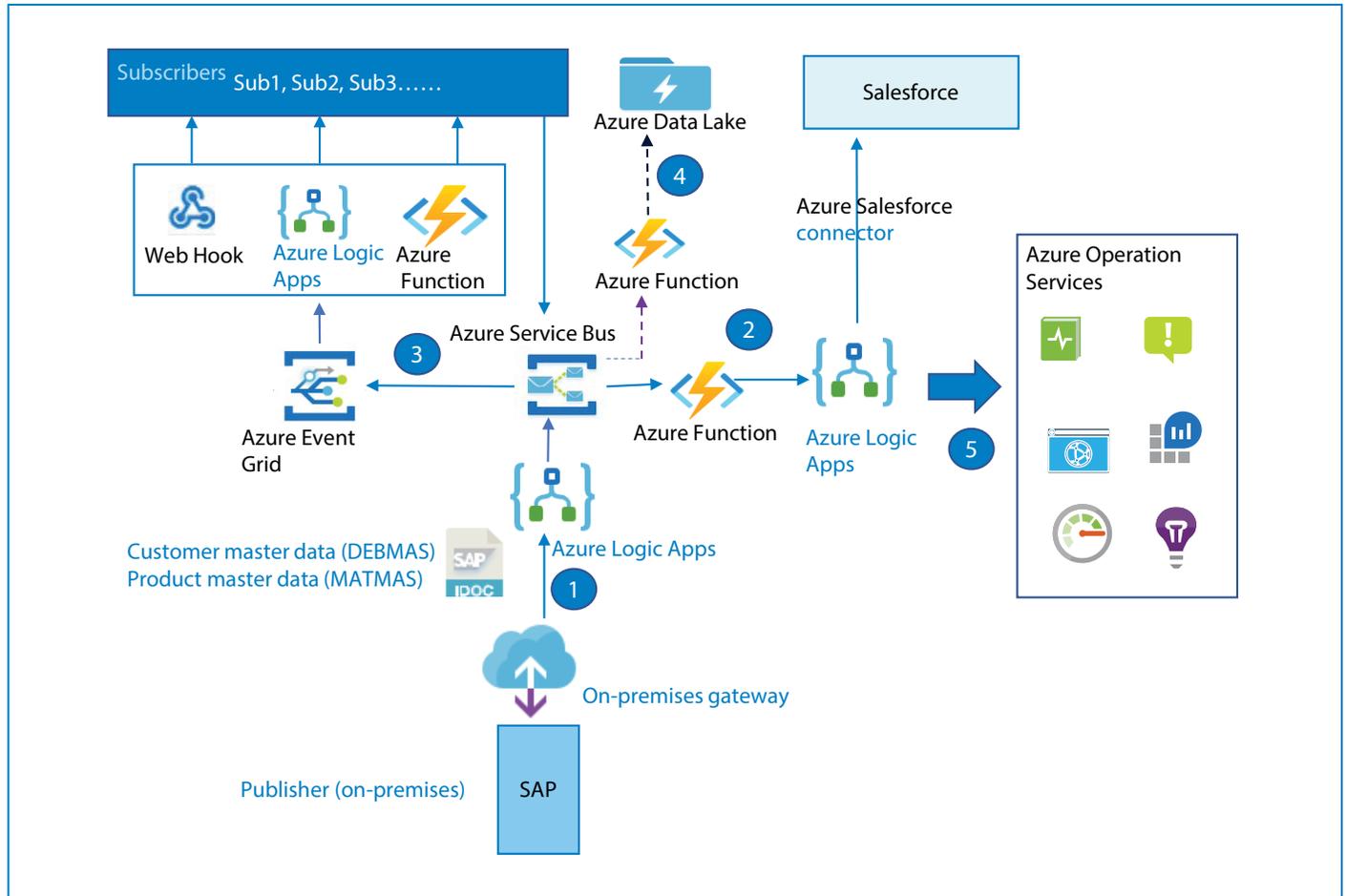


Figure 3 – Blueprint of Salesforce SAP Integration using AIS

- 1 Establish connectivity with on-premises SAP system using on-premises data gateway. Azure Logic Apps receives customer master and product master data (SAP IDOCs) using the SAP connector. The app publishes the IDOC to Azure Service Bus for other subscribers
- 2 Azure Function subscribes to the Azure Service Bus topic and transforms the IDOC to an XML message and post JSON to Salesforce using the Salesforce connector
- 3 Azure Event Grid subscribes to Azure Service Bus and pushes notifications to various subscribers. It then pulls the corresponding data from Azure Service Bus
- 4 Azure Function is used to store the record in Azure Data Lake (blob storage)
- 5 Azure Operation Services are used for error handling, logging, monitoring, and alerting

Measurable benefits

- Reduced total cost of ownership by leveraging Azure's pay-as-you-go model for Azure iPaaS
- API-led connectivity approach brought several solution elements together for greater reuse and standardization. It exposed domain data and processes with a business design rather than system-specific interfaces, making integration simpler
- Resolved master data de-duplication issues

2. Modernized IT landscape by implementing SAP S/4HANA cloud and enabling cloud-first integration using Azure Integration Services

Following blueprint describes the step wise flow to enable API led integration of professional services business processes between on-premise application and SAP S/4 HANA cloud in a secured and reliable way using S/4 HANA oData APIs

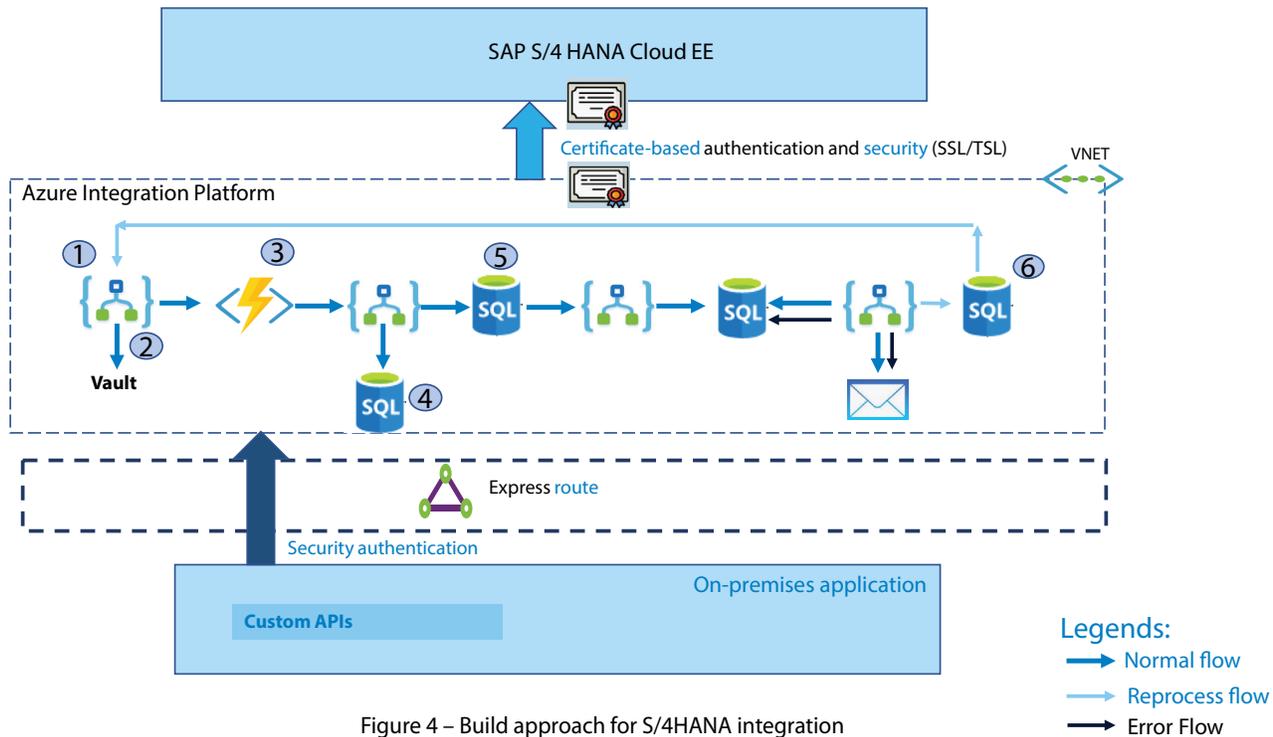


Figure 4 – Build approach for S/4HANA integration

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|---|--|---|
| <ol style="list-style-type: none"> 1 Azure Logic Apps, with recurrence trigger, is the starting point for the interface 2 Azure Logic Apps connects to the vault to fetch all the configuration details required by customer project' integration based on the environment variables 3 Azure Function triggers on-premises custom APIs with the required details | <ol style="list-style-type: none"> 4 Azure SQL stores the summary of the data processed by Azure Integration Platform in each run/schedule including last fetched date, last processed data, and interface summary 5 Azure SQL stores reference lookup values for master data. In case any records | <ol style="list-style-type: none"> 6 Failed status flags are also updated in SQL in the interface summary table, which can be used to trigger the reprocessing of the failed records |
|---|--|---|

Measurable benefits

- S/4HANA adoptions fit standard implementations with minimum customization
- The solution offers enterprise-ready functionality for digital businesses through end-to-end support for finance, plan to product, order to cash, and procure to pay processes
- The modular approach provides a flexible, extensible ERP platform that can be scaled up and down according to business needs
- Reduced TCO by using license and best practices-based subscription
- Unified enterprise integration platform with Azure Integration Services for SAP and non-SAP systems helps seamlessly integrate applications, data, and processes as part of the organization's enterprise-wide cloud adoption strategy
- The Azure Integration Platform supports IT administrators and developers by enabling monitoring, proactively managing applications, and handling errors along with integration to the on-premises SIEM tool

Fluidity Brings Exponential Value and the Best of Integration

The right integration strategy, tools, framework, and solutions built using the fluidity of Infosys along with the power of Azure Integration Services and cloud ERP strategies like S/4HANA help organizations modernize their business. It accelerates the journey towards a digitally connected, resilient, and customer-centric business.

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*References

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Infosys Cobalt is a set of services, solutions and platforms for enterprises to accelerate their cloud journey. It offers over 14,000 cloud assets, over 200 industry cloud solution blueprints and a thriving community of cloud business and technology practitioners to drive increased business value. With Infosys Cobalt, regulatory and security compliance, along with technical and financial governance comes baked into every solution delivered.

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