

Understanding the World  
of API Powered by  
**Hybrid Integration Platform**

White Paper

# Introduction

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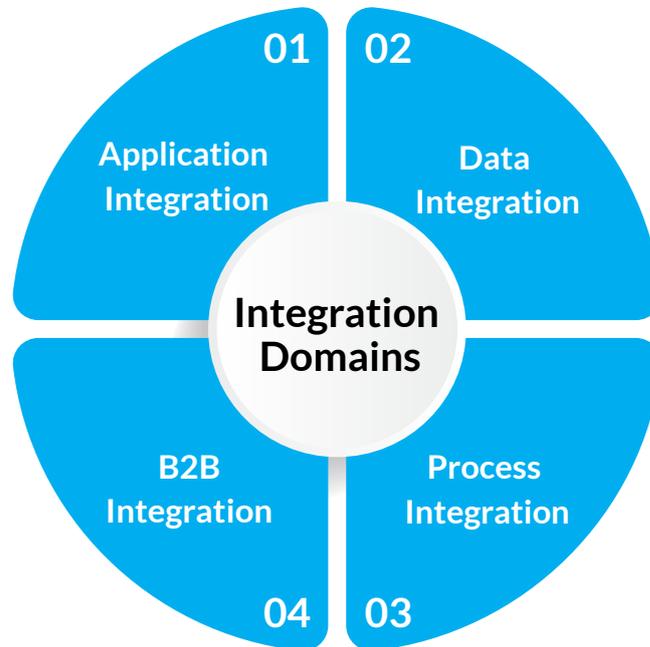
In the year 2020, it would be a bit too late to talk about the disruption caused by Cloud, mobile devices, and the Internet of Things. Most IT-savvy organizations have been harnessing these disruptions either successfully or not so successfully. None of these can provide any benefit in isolation and thus need the right ecosystem to be successful. One critical piece of that ecosystem, without any debate, is the integration platform. Most such organizations already have some form of integration capabilities, but are not very clear on the gaps in the new world and, more importantly, how to address those gaps.

Moreover, the marketing pitch of the integration platform vendors, whether old or new, does not help them either because of inherent conflict-of-interest. Some have simply re-branded themselves while others have started from scratch to address the new age requirements, but only their product roadmap is impressive. So, what can be the deciding factors for organizations that are looking to transform their integration landscape and be ready for the future?



# Are we talking about new types of integrations?

For almost two decades now, integration has been broadly categorized into four domains.



## Application Integration

It's the real-time or near real-time exchange of functionality and data, which is typically known as Enterprise Application Integration (EAI) or Enterprise Service Bus (ESB).

## Data Integration

The need to synchronize data between two datasets holding data at rest. Also known as Extract, Transform and Load (ETL) and with some variation, even Master Data Management (MDM).

## Process Integration

It specifies the need to create a workflow between independently working business processes within an organization. You may relate it to Business Process Management or Business Process Automation.

## B2B Integration

When the business process spans outside the enterprise boundary involving partner organizations or compliance authorities. This includes Electronic Data Interchange (EDI), B2B Gateways, Value Added Networks (VANs), etc.

*The good news is that these four integration domains still hold fort even in the world of Cloud, mobile devices, and IoT. While there are a lot of other changes to address, organizations are still dealing with these four domains only. Hence, the answer to the question- are we talking about new integrations, is NO.*

# Why should an organization be concerned?

To understand the same, let's look at some of the common challenges faced by almost all organizations in the new applications landscape.

## Cloud Services

Applications are no-longer confined to corporate intranets. Adoption of SaaS / PaaS is making business applications reside more on Cloud.



## ESB has become a bottleneck

ESB was the choice when apps needing integration were limited. Now centralized integration or ESB slows down business initiatives due to lack of team bandwidth.



## Non-integration Specialist

Business system owners want their developers or analysts take charge of their integration needs



## Challenges for new-age application integration

## Data-centric Integration

Enforce only strict principles while dealing with domain data. Let applications compose their own features and services.



## Low-coupling, high-cohesion approach

With globally distributed applications, principles of pub-sub integration architecture have to be strictly enforced.



## Endpoints Explosion

Besides on-prem applications, Cloud applications, mobile and digital devices, IoTs are exposing and consuming endpoints like never before.



## 01 Applications are increasingly residing outside enterprise boundaries

More business applications are getting hosted outside of the enterprise network boundary. The good old world of integration platforms being protected by firewalls is no longer an option. The low-latency assumption that was taken for granted within the data center is also no longer valid.

## 02 Centralized EAI/ESB

Centralized EAI/ESB has become a bottleneck - The original idea was to ensure that application teams are not stepping on each other's toes and that governance was simple. In reality, integration teams are spending time & effort on both sides, source as well as target, and also owning the transformation, enrichment, and even business rules. That is, two application owners cannot talk to each other without a member of the centralized integration team.

## 03 Emergence of non-integration specialists

It wasn't an ask from traditional applications to expose their functionality or data using well-defined interfaces. However, take Salesforce, for example, the way to interact with Salesforce is through the REST or SOAP interfaces exposed by it. Expand the number of SaaS/PaaS applications in your landscape, and there are hundreds of such interfaces that an organization must deal with. This is giving birth to non-integration specialists, i.e. the business system owner's team itself is responsible for its own integrations.

## 04 Data-centric integration

To reduce the learning curve and to promote reuse, the focus is shifting towards data-centric integration instead of capability-centric integration. Enforce strict principles and security while dealing with domain data, and any number of applications can reuse the same operations exposed through APIs.

## 05 Low-coupling, high-cohesion approach to integration

The pub-sub integration architecture gained acceptability as the source and target systems were to be responsible for publishing and subscribing canonical models. In real life, the actual systems left it for the integration team to publish or consume canonical models, thus throwing away the low-coupling, high-cohesion principle to the bin. With globally distributed applications and digital devices, this principle must now be followed in spirit by the respective application owners.

## 06 Endpoints Explosion

Besides the increase in the number of applications, whether on-premise or in Cloud, requiring integration among themselves, the mobile devices and Internet of Things (IoT) are continually consuming or producing streams of data. There is no other way but to handle it through well-defined integration endpoints, keeping in mind the challenges described above so far.

*The monetization and control over enterprise services and data, Microservices Architecture (MSA) for business agility and scalability, real-time integration with digital devices, and integration itself becoming agile are some pertinent questions. Each of these induces the integration landscape to continually evolve from a static on-premise capability to a dynamic all-pervasive capability.*



# How to decide on a target integration platform?

## Plan to leverage existing assets

It's a good idea to take stock of your existing integration assets. Most likely, you would have an on-premise integration tool (TIBCO, webMethods, BizTalk, MuleSoft) and an ETL tool (Informatica, SSIS, ODI). Besides, you may also be having at least one on-premise queuing solution (Websphere MQ). These are going to be very much relevant, in the new world, unless you have entirely dismantled your data-centers in favor of SaaS/PaaS offerings.

## Identify your business and technical drivers

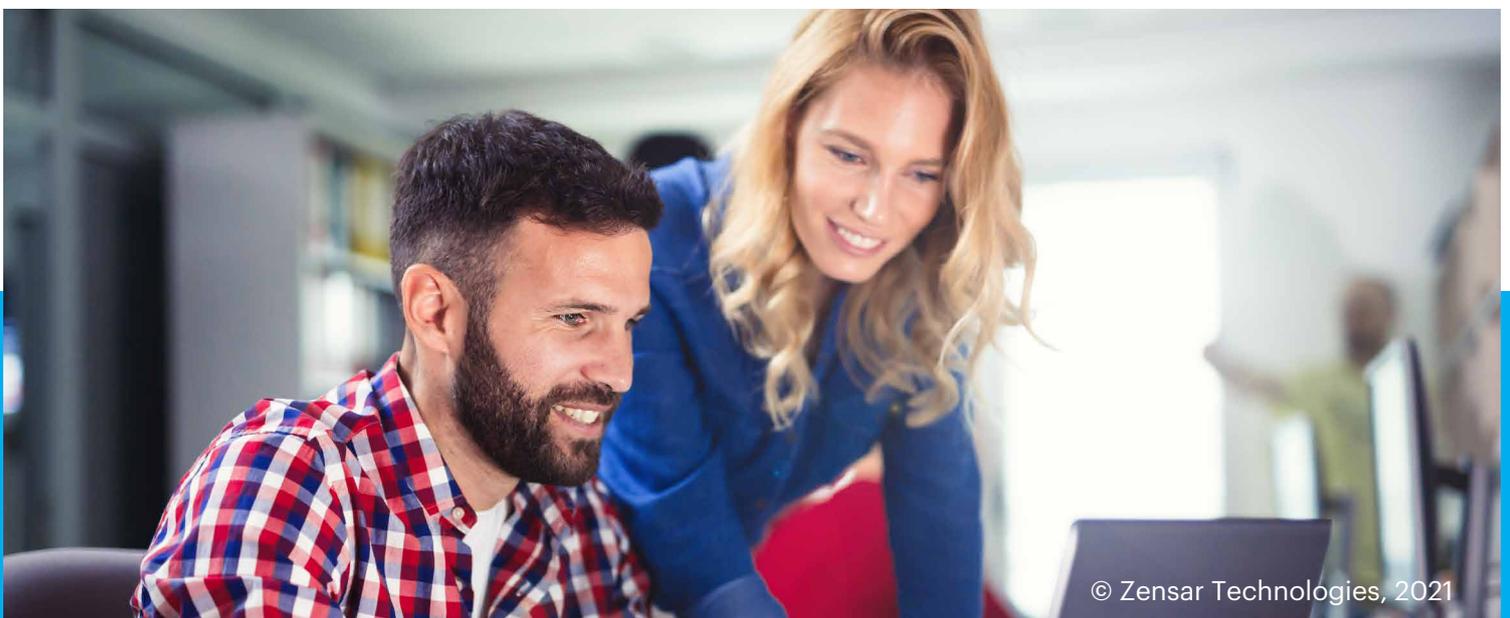
Once you have taken stock of the same, the next step is to define your business (and possibly technical) drivers in the coming three to five years. Addressing common challenges listed above may be a good starting point, but the right stakeholders would also help in defining top concerns and assigning the right priorities. In our experience, the right stakeholders must be identified to gather inputs on:

### 01 Application Migration Roadmap

It would help in establishing a list of applications that require either Ground to Cloud or Cloud to Ground integrations and the patterns for those integrations. It also helps to find out any application that may have pre-built integrations on any iPaaS / API management platform.

### 02 SaaS / PaaS Adoption, Lift and Shift Migrations

The intention is to get the integration patterns between the Cloud-hosted applications as well as between Cloud-hosted and on-premise applications. Some SaaS applications may only allow HTTP (REST) based integrations, while others may allow event/trigger-based integrations as well. Similarly, PaaS hosted applications may only leverage associated PaaS offerings for integration.



### 03 Mobile and Digital Devices Strategy

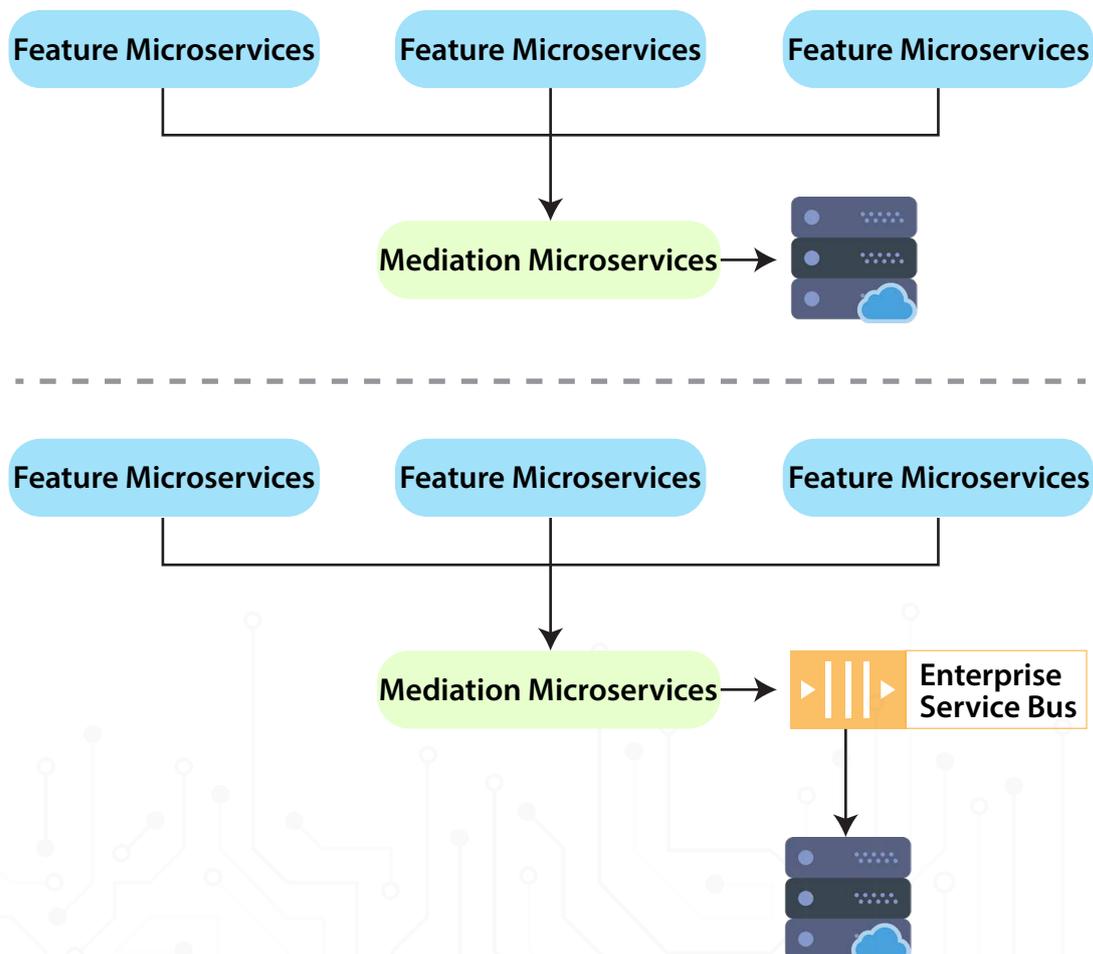
If the exact mobile application ecosystem is known (e.g., accessible only for domain users or partners or B2C), it also helps define the authentication mechanism and, in turn, helps filter the API management platforms.

### 04 Monetization / Traffic Management

When the business system owners want to monetize the enterprise services or data, the expectations of some key aspects should be defined.

### 05 Microservices Architecture

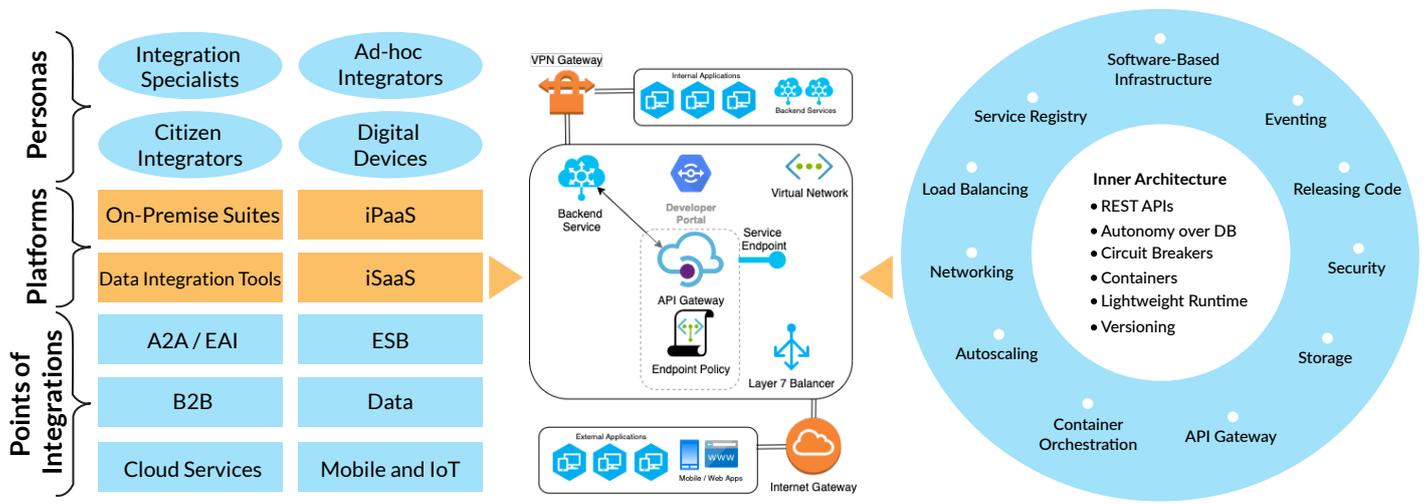
One of the key influencers on the new integration landscape is the Microservice Architecture (MSA). MSA works on the single responsibility principle and does not include any mediation logic within a feature microservice. Hence, consider independent mediation microservices to integrate with enterprise systems.



Now that we are aware of the challenges to address and we've taken stock of our existing integration, assets identified the drivers across technology, business, and architecture; it is time to bring it all together. Nobody can define one-size-fits-all integration architecture; however, one thing is obvious – most organizations are moving towards API-driven applications. And if that is your case as well, the mission-critical internal applications are being re-written leveraging the latest and the most significant technology stacks, where API-led connectivity rules. This is where a point of view (PoV) on API-everywhere landscape helps.

# The new API-everywhere world

Integration / API Platforms   ▶   API Driven Apps   ◀   Microservices Architecture

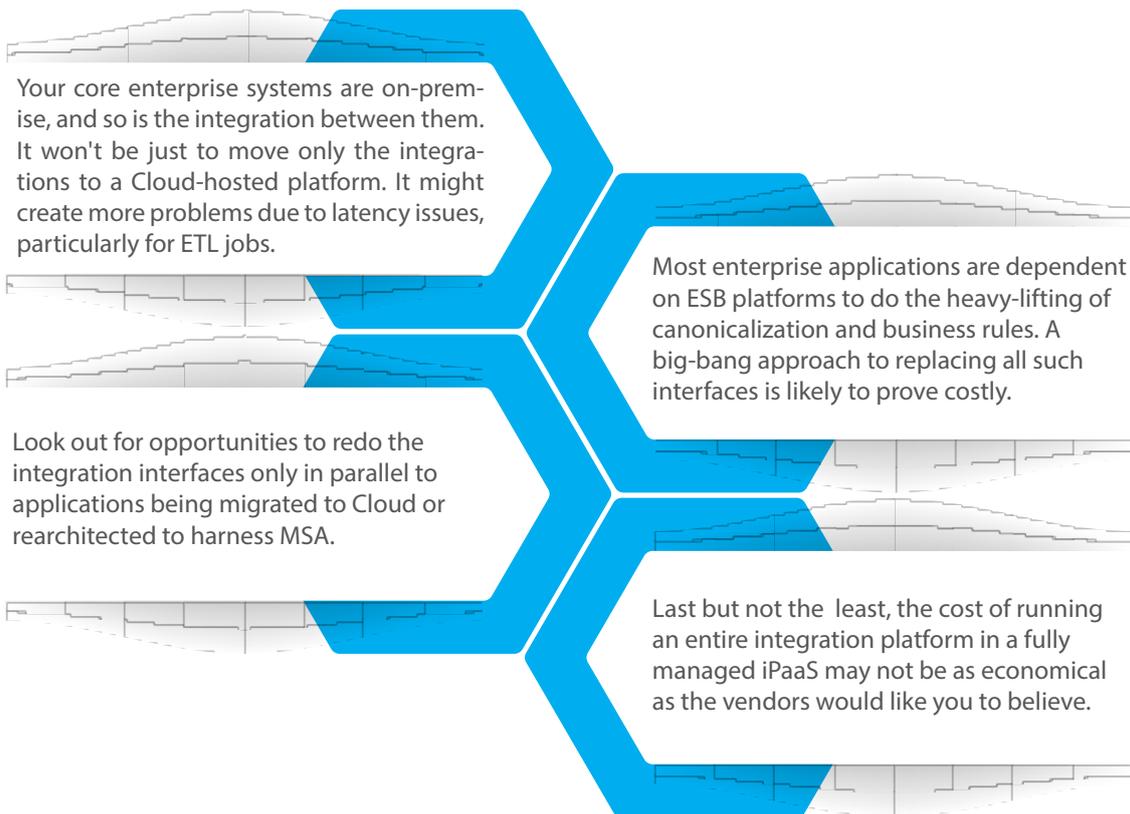


- Drivers**
- APIs / EAI / Enterprise Services no longer limited to corporate boundaries
  - Emergence of non-integration personas for distributed Services / APIs creation
  - Develop once, use everywhere APIs - internal, external and mobile apps
  - Business Demands – Service monetization, Control over services
  - Pace of Change - Business agility
  - Performance - Component level scalability
  - Ownership - Seamless development and operations by the same team

We can always find a better nomenclature or include missing components in the above diagram; however, the intention is to show the influencing factors and the resultant outcome, i.e., API-driven apps.

# Components of a Hybrid Integration Platform (HIP) for API-driven apps

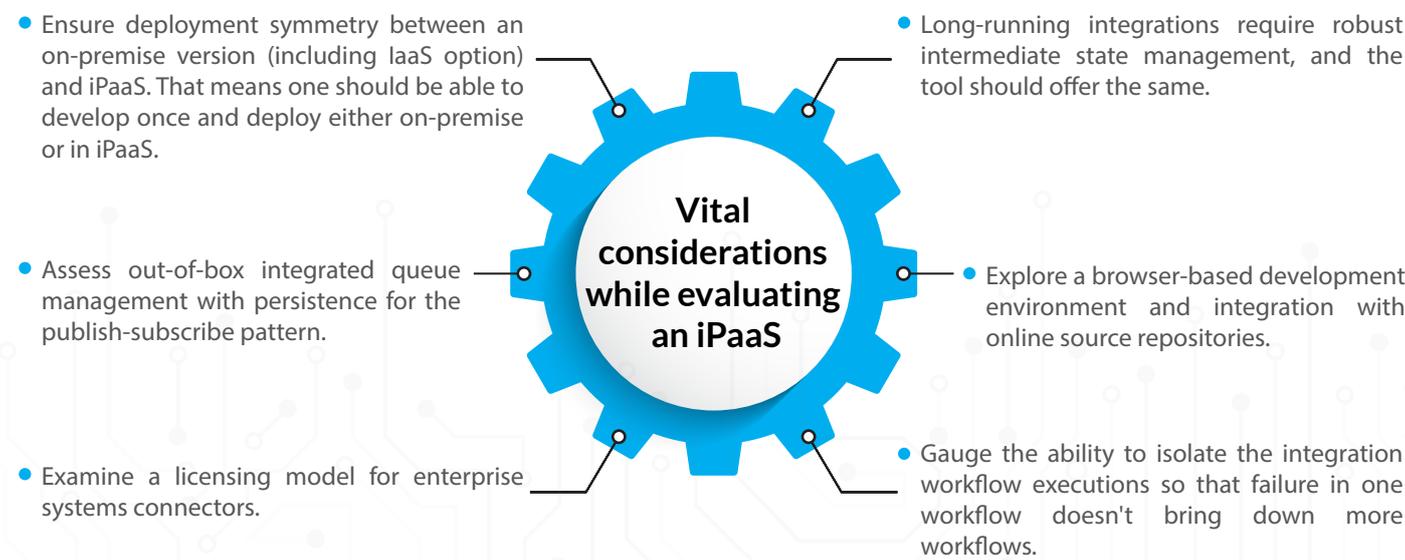
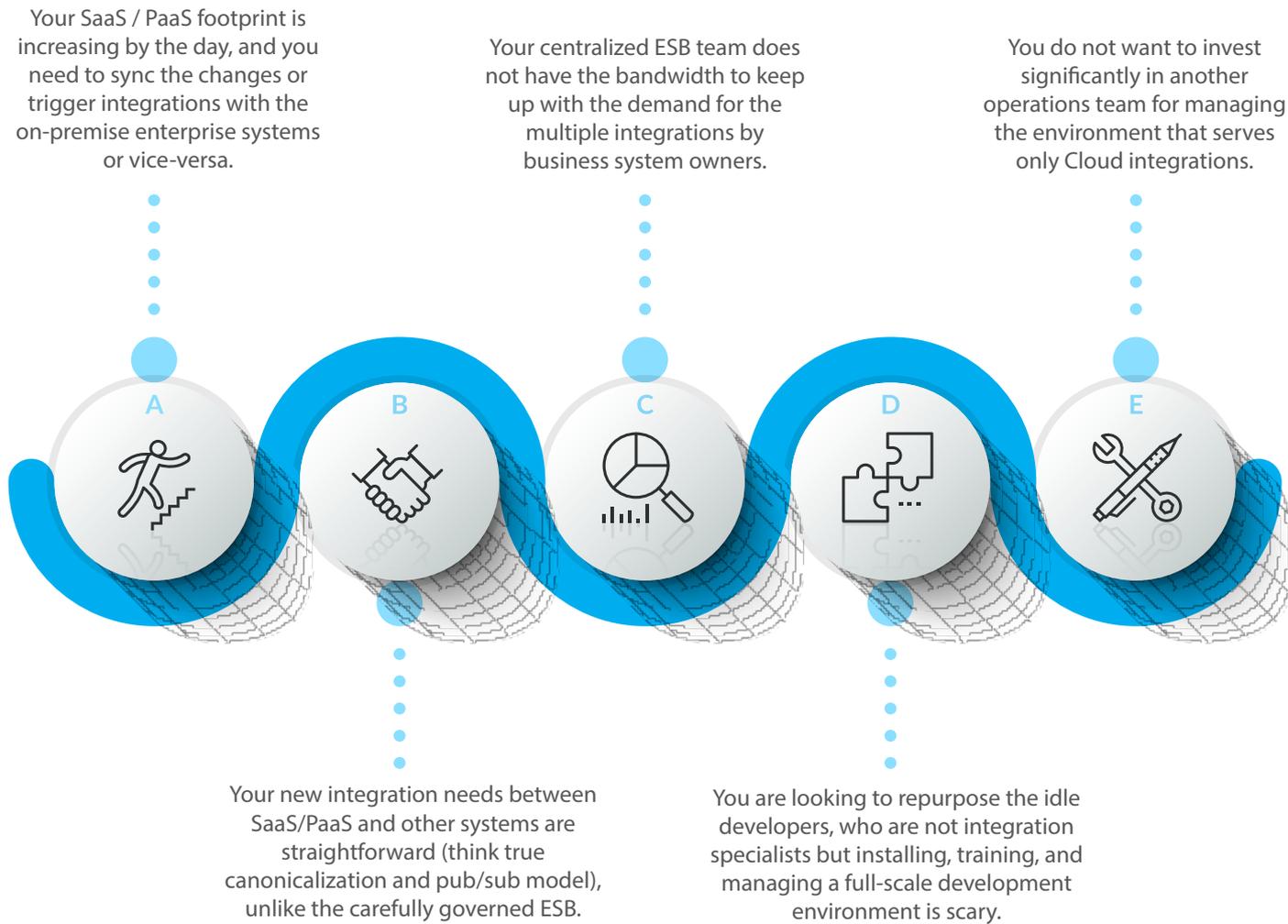
**On-premise ESB/ETL/Messaging Queue Tools:** You cannot do away with your existing on-premise integration assets as they are the mainstay of your operations and more than likely already classified as 'mission-critical.' In our experience, as a component of the hybrid integration platform, on-premise integration platforms are going to become indispensable soon. Let's consider the following:



**Note:** This includes a licensing model where you can run the tool on Cloud, say IaaS, all by yourself, even though it is strictly not on-premise. You are in control of managing the environment and how much load to run without incurring any additional cost.



**iPaaS:** As more applications migrate to Cloud, iPaaS plays a critical role in Cloud to Cloud, Cloud to Ground, and to an extent for Ground to Cloud integrations.. Let's discuss some use cases that would justify an iPaaS:



**API Gateway:** This has to be a critical addition to your arsenal that would determine the success or failure of your API-driven applications strategy. The decision is easy as we move into the world of exposing enterprise services and data to the outside world (partners, developers). Apart from the high priority feature list, consider the following as well.



Keep a provision of access symmetry between the internal consumers and the external consumers, i.e., only one way of accessing the APIs for all consumers.



The API gateway must allow aggregation to create coarse-grained APIs using fine-grained microservices.



Deploy policy-driven security services at the API gateway level.



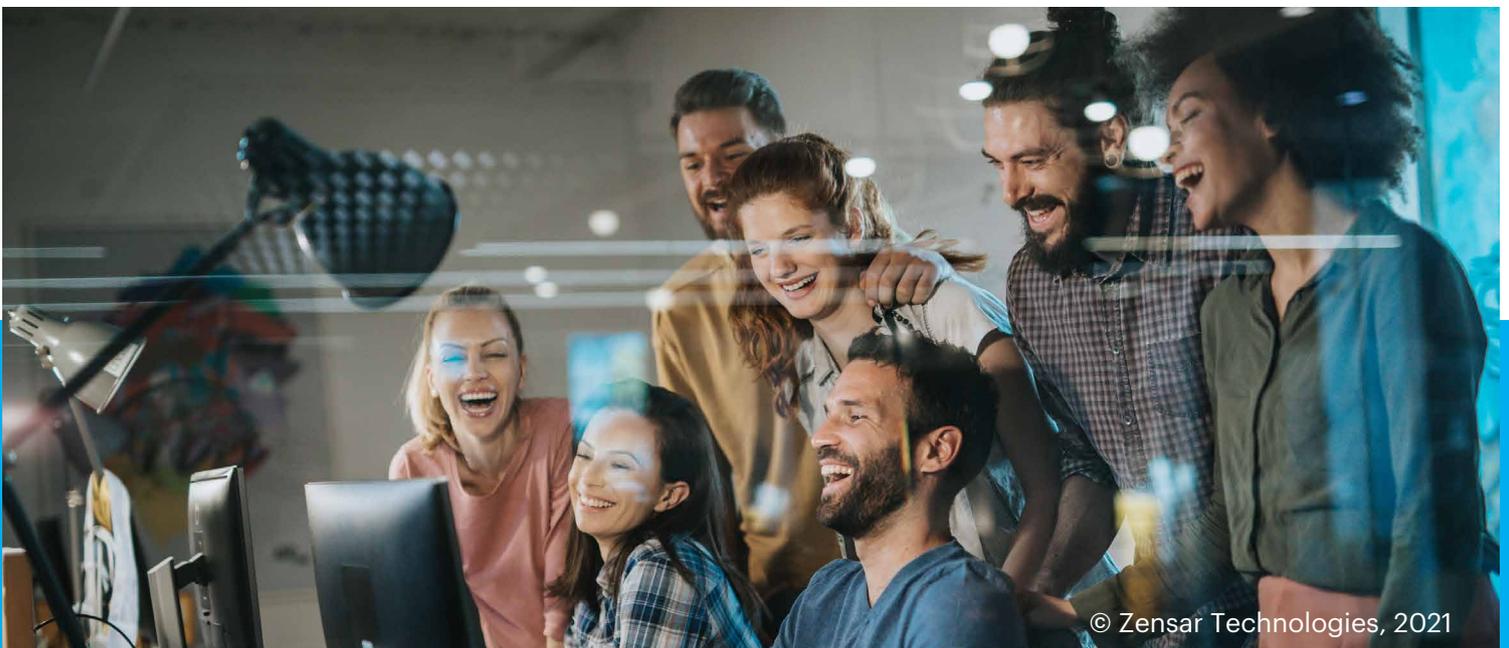
Determine a browser-based publishing environment and integration with online source repositories.



Deployment architecture of the API gateway must ensure that internal traffic must not leave the enterprise network boundaries or VPN with Cloud providers.

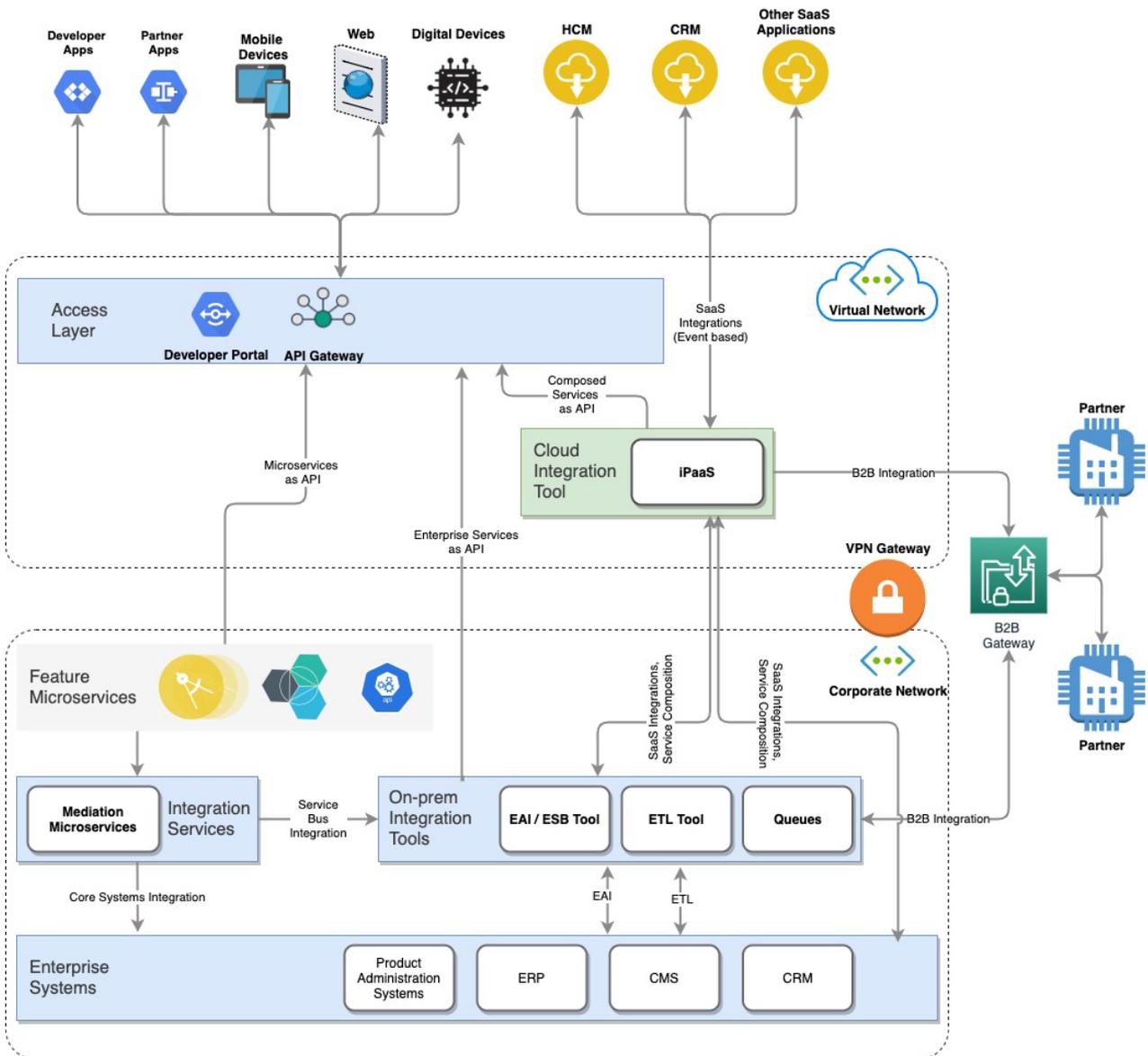


Though low priority, support for IoT use cases or streaming event processing can be a useful feature.



# Hybrid Integration Platform Guidance

If your organization has embarked on the strategic initiative of API-driven applications, Hybrid Integration Platform is a necessity for you and it is time to put the platform architecture on paper. Given below is a technology agnostic platform architecture derived by our consulting practice through multiple client engagements.



# Conclusion

If you want API-driven applications, the HIP is an excellent match as it allows the on-premise solutions to integrate seamlessly and securely with existing cloud-based applications. Hybrid integrated technology reduces the internal IT workload and delivers higher returns on strategic technology investments that businesses have made over the years.

**To know more about Hybrid Integration, please contact:**

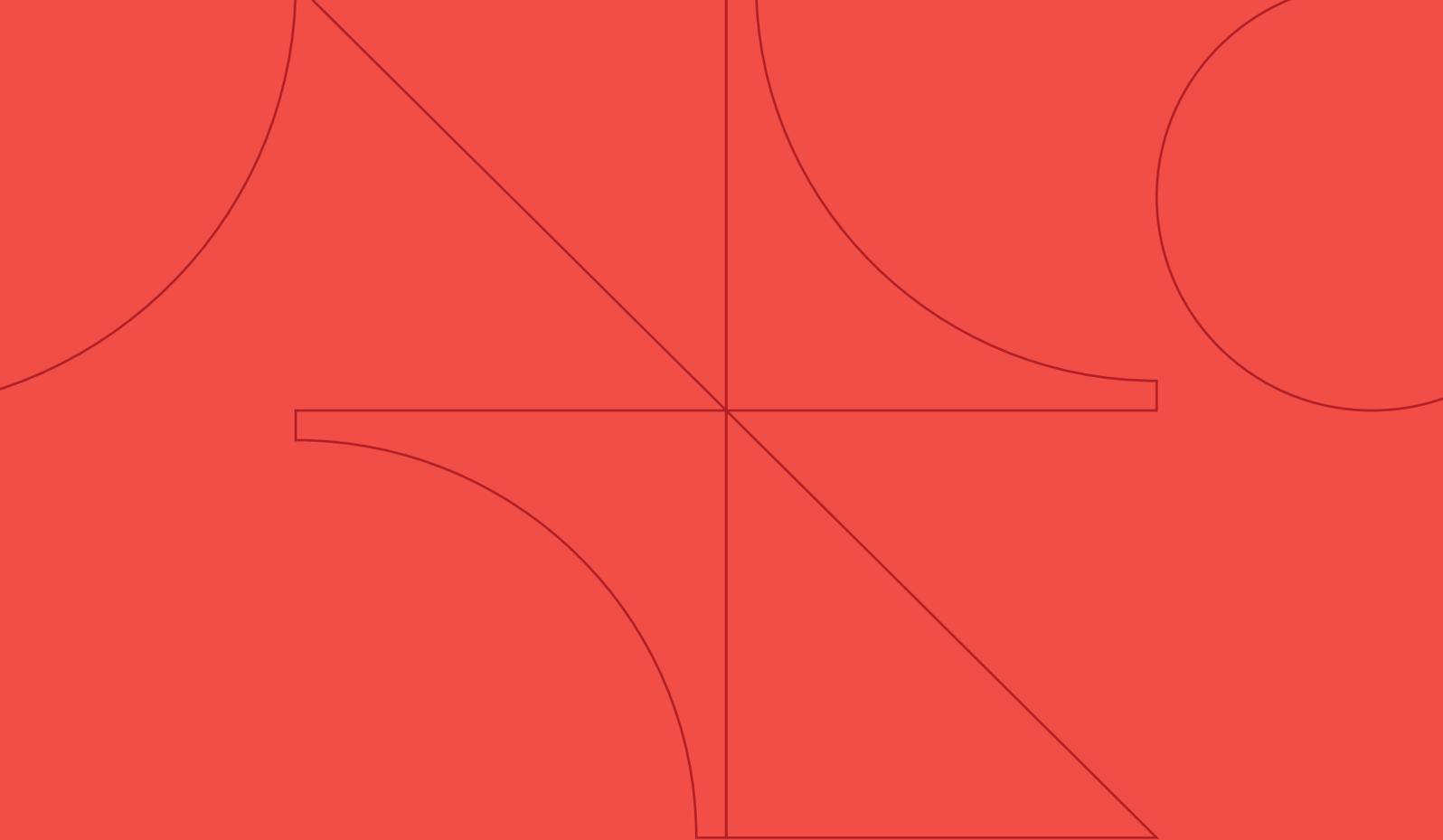
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