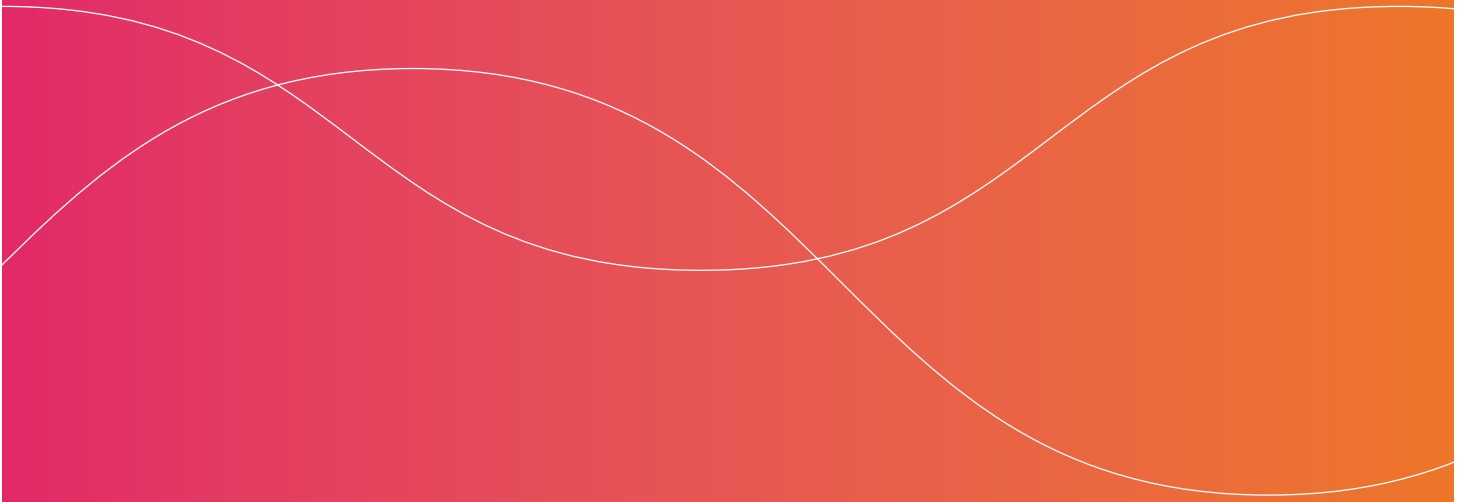


inQdo

WHITE PAPER.

**The Future of Integration
in Hybrid Landscapes**

October 2024



CONTENTS.

1. Introduction	3
2. The challenge: insight and control in a changing landscape	5
3. The possibilities of hybrid integration	7
4. Trade-offs and decision-making in integration	9
5. Best practices for organisations in hybrid integration	11
6. Future perspective: the evolution of hybrid integration	13
7. Summary and recommendations	15
About Sander Brinkhuis	17
Contact	18

1

Introduction

In the current digital era, organisations face an increasingly complex application landscape. Even small and medium-sized businesses now manage numerous applications and systems, often spread across different environments - from on-premises installations to various cloud platforms. This diversity brings with it significant integration challenges.

As the number of applications and systems grows, the complexity of their interconnections increases exponentially. Synchronising and maintaining data consistency between different systems becomes increasingly challenging, while traditional integration solutions may struggle to meet these needs.

Organisations often only become aware of the complexity of their integration landscape when faced with significant changes. An acquisition, merger, or replacement of a critical application can suddenly highlight the need for robust and flexible integrations. For example, when a company is acquired, or merges with another company, various systems and databases often need to be linked. Similarly, the need for effective integrations becomes evident when replacing a central application, such as an ERP system. The flexibility of cloud solutions offers a solution here, allowing organisations to quickly experiment with new integration possibilities.

Blue blocks and white lines

According to transformation architect Gregor Hohpe¹, when discussing IT, especially IT

architecture, we often focus on the 'blocks', the system components. But in reality, the lines between them, or how things fit together, are usually more relevant than those blocks. Architecture is about connecting things to a meaningful whole, not filling shopping trolleys with stuff. Therefore, we should not only look at applications but especially how they are interconnected: the white lines in the image.



Caption: The blue blocks represent an organisation's various applications and system components. According to Gregor Hohpe, the white lines, or the connections between the blue blocks, are essential for a stable infrastructure.

During mergers, acquisitions, or replacement of critical systems, organisations must consider how they can efficiently realise and manage their 'white lines' - the connections between systems. It's common for them to discover that the licence costs for traditional integration platforms can be steep, especially with growing usage volumes. Additionally, it's

¹ <https://www.linkedin.com/pulse/boxes-lines-budgets-gregor-hohpe/>

Hybrid integrations enable organisations to modernise gradually without abrupt and risky transitions.

essential that solutions can quickly adapt to changing business needs and technological developments. As the landscape evolves, gaining a comprehensive insight into all integrations within an organisation becomes increasingly difficult. More and more organisations are turning to hybrid integration to address these challenges.

Hybrid integrations and HIPs

Gartner defines hybrid integration as 'an integrated approach using multiple technologies and approaches to connect both on-premises and cloud-based systems, applications, and data'. In essence, it combines the power of traditional on-premises integration solutions with modern cloud-based integration services.

This approach offers organisations various advantages. It provides the flexibility to choose which integrations remain on-premises and which move to the cloud, depending on a business's specific needs and constraints. By utilising cloud-based services, organisations can benefit from pay-per-use models, often resulting in lower operational costs and making hybrid integration more cost-effective than traditional integrations in the long term. Moreover, cloud-based components can be easily scaled up or down as needs change, for example, during peak times.

Hybrid integrations enable organisations to modernise gradually without abrupt and risky transitions. A hybrid integration platform (HIP) allows seamless connections between various applications, data sources, and systems in on-premises and cloud environments. These platforms are designed to support hybrid integrations and provide the tools and capabilities to implement them effectively.

While hybrid integration offers promising solutions for current challenges, it's important to note that it's not a panacea. The advantages and challenges differ for each organisation, depending on the specific situation and wishes of the company. Moreover, its implementation brings its complexities and requires careful planning and expertise. In the following chapters, we will delve deeper into the specific components of hybrid integration, best practices for implementation, and how organisations can find the right balance in their integration strategy, especially in organisational or technological change.

2

The challenge: insight and control in a changing landscape

The application landscape of modern organisations is undergoing a drastic transformation. Where businesses previously relied primarily on on-premises solutions, we now see a clear shift towards cloud and SaaS applications. This change brings both opportunities and challenges, especially in the areas of integration and management.

In this changing landscape, many organisations struggle to maintain insight and control. They find that their traditional methods for monitoring and management are no longer adequate in a hybrid environment where applications run both on-premises and in various clouds. This lack of overview can lead to inefficiencies, increased costs, and even risks to business continuity.

Rising need for insight and monitoring

As a result, we see an increase in the need for 'observability' and end-to-end

monitoring. Observability goes beyond traditional monitoring; it enables organisations to gain deep insight into the operation and performance of their entire application ecosystem. This includes detecting problems and understanding the underlying causes and their impact on business processes.

Furthermore, end-to-end monitoring has become crucial in a world where a single transaction or process often traverses multiple systems and environments. Organisations want to be able to track the journey of a data point or transaction from start to finish, regardless of whether this journey involves on-premises systems, private clouds, or public SaaS solutions. This level of insight is essential for ensuring service quality, identifying bottlenecks, and meeting increasingly stringent compliance requirements.

Balancing between on-premises and the cloud

Many businesses' challenges lie in finding the right balance between their existing on-premises solutions and the new

possibilities offered by cloud technologies. Some organisations choose to migrate gradually, keeping critical systems in-house while experimenting with cloud integrations for new initiatives. Others opt for a more aggressive cloud-first strategy but discover that certain legacy systems or sensitive data storage must remain on-premises due to technical or legal constraints.

This balancing act is further complicated by the rapid pace at which cloud technologies evolve. AWS offers increasingly advanced integration capabilities, often at lower operational costs than traditional solutions. However, adopting these new technologies usually requires specific expertise and can lead to higher initial development costs.

Blurring boundaries

Moreover, we see that the boundaries between different integration solutions are blurring. Where there was once a clear distinction between ETL processes, API management, and application integration, modern cloud platforms often offer integrated solutions that combine all these aspects. This simplifies integration and requires organisations to re-examine their existing architectures and processes.

In this complex landscape, it becomes increasingly essential for organisations to have a clear strategy for their integration architecture. They need to decide where they want to maintain control, where they are willing to rely on external services, and

In this complex landscape, it becomes increasingly essential for organisations to have a clear strategy for their integration architecture.

how to obtain and maintain a coherent view of their entire application ecosystem.

The answer to these challenges often lies in adopting a hybrid integration approach. By combining the best of both worlds – the control and security of on-premises solutions with the flexibility and scalability of cloud services – organisations can create a robust and future-proof integration architecture.

3

The possibilities of hybrid integration

One key feature of hybrid integration is the ability to implement integrations where they are most effective. Critical or data-sensitive processes can remain on-premises, while more dynamic or scalable integrations can be moved to the cloud. This approach allows organisations to make optimal use of their existing investments while simultaneously benefiting from the advantages of modern cloud technologies.

Another feature is the central management and monitoring capability, often called the 'control plane'. This enables organisations to maintain an overview of their integration landscape, regardless of the various components' locations. It provides a unified interface for managing both on-premises and cloud-based integrations, significantly reducing the complexity of management.

Other advantages of hybrid integration include:

1. Flexibility: Organisations can choose which integrations remain on-premises and which move to the cloud, depending on their specific needs.

2. Cost-efficiency: Cloud-based services can benefit companies from pay-per-use models, often resulting in lower operational costs.

3. Scalability: Cloud components can be easily scaled up or down as needs change.

4. Improved visibility: Hybrid integration platforms often offer extensive monitoring and observability capabilities across the entire integration landscape.

5. Faster innovation: Access to the latest cloud technologies enables organisations to innovate more quickly and leverage new capabilities.

6. Gradual modernisation: Organisations can modernise step by step without abrupt, risky transitions.

Another significant advantage of cloud-based solutions within a hybrid integration strategy is the unparalleled flexibility and speed of implementation. Unlike traditional software vendors, where each new product

A concept closely intertwined with hybrid integration is 'develop once, deploy anywhere'.

or expansion requires an extensive sales process, cloud solutions offer the ability to quickly and easily try new services. Organisations can 'turn on' functionalities, use them, and pay for usage. A solution that doesn't meet expectations can be just as quickly turned off. This try-before-you-buy approach reduces risks, accelerates innovation, and allows organisations to respond flexibly to changing needs.

Develop once, deploy anywhere

A concept closely intertwined with hybrid integration is 'develop once, deploy anywhere'. This principle posits that integrations are developed independently of the final implementation environment. In the context of hybrid integration, the same integration logic can be deployed on on-premises systems, in private clouds, or on public cloud platforms.

'Develop once, deploy anywhere' offers several advantages. First, it increases the reusability of integration components, improving development efficiency and shortening the time-to-market. Second, it simplifies the migration of integrations

between different environments, which can be crucial in scenarios such as mergers, acquisitions, or large-scale cloud migrations. Finally, it promotes the standardisation of integration practices within an organisation, leading to better maintainability and reduced complexity in the long term.

Although 'develop once, deploy anywhere' is a powerful concept, it is still in its infancy regarding integrations. Different environments often have unique characteristics or limitations that need to be considered. Nevertheless, modern hybrid integration platforms strive to support this principle as much as possible, making organisations more flexible and agile in their integration strategy.

4

Trade-offs and decision-making in integration

Various factors determine the choice of a specific integration solution.

An organisation's existing IT infrastructure plays a crucial role; companies with a solid on-premise footprint may make different choices than 'cloud-native' organisations.

Scalability and flexibility are also important considerations, as integration needs often change as businesses grow and evolve. Security and compliance requirements can limit options, especially in highly regulated sectors. Moreover, the available technical expertise within the organisation can determine which solutions are feasible to implement and maintain. In some cases, a rapid time-to-market is crucial, leading to the selection of out-of-the-box solutions. Additionally, organisations must consider how well a solution will align with future technological developments. The ability to quickly implement and test cloud-based integration solutions without long-term commitments can significantly simplify decision-making.

Integration is not one-size-fits-all

One of the most important trade-offs in the world of integration is the choice between traditional licence models and modern pay-per-use solutions. Traditional licence models, often

associated with on-premises or hybrid solutions, offer predictable costs and total control. They can be cost-effective for organisations with stable, predictable integration needs. However, they often require significant initial investments and can lead to underutilisation of resources. Pay-per-use models, typical for cloud-based solutions, offer flexibility and scalability. Organisations only pay for what they use, which can lead to significant cost savings, especially for businesses with fluctuating workloads. The risk here lies in potentially unpredictable costs with high volumes or inefficient use.

Another crucial trade-off that each organisation must make is the choice between ready-made integration solutions and custom-made integrations. Out-of-the-box solutions offer rapid implementation, pre-built connectors for commonly used systems, and often a user-friendly interface. They are ideal for standard integration needs and can be quickly deployed. However, they may have limitations regarding

Organisations can precisely tailor integrations to their unique needs and processes.

customisability and struggle with very specific or complex integration scenarios. Custom work, on the other hand, offers maximum flexibility and control. Organisations can precisely tailor integrations to their unique needs and processes. This can be crucial for companies with specific requirements or highly regulated industries. The downside is that custom solutions often require more time, expertise, and resources to develop and maintain.

Consequently, many organisations currently opt for a hybrid approach, using out-of-the-box solutions for standard integrations, applying custom work for critical or unique business processes, and adapting out-of-the-box solutions where necessary using extensions – whether self-developed or not.

Responsibility for security in a hybrid environment

An important consideration when choosing integration solutions, especially in hybrid and cloud environments, is the 'shared responsibility' concept. In traditional on-premises environments, the organisation is fully responsible for security and compliance. However, this responsibility in cloud and hybrid environments is shared between the cloud provider and the customer. The exact division of responsibilities can vary depending on the type of service (IaaS, PaaS, SaaS) and the specific provider. Organisations must be aware of which

security aspects fall under their responsibility and which are managed by the provider. This is particularly important in hybrid integration environments, where different components may have different responsibility models. It is essential to thoroughly understand and document this division to prevent security gaps and ensure a comprehensive compliance strategy.

Following a structured process is essential when making decisions about integration solutions. This includes assessing current and future integration needs, evaluating available options in light of the identified factors, involving stakeholders from different parts of the organisation, considering pilot projects to test solutions, and planning for the long term whilst maintaining flexibility for changes.

Ultimately, there is no one-size-fits-all solution in the world of integration. Each organisation must carefully weigh its unique situation, needs, and constraints. By choosing a well-considered approach that considers both current requirements and future flexibility, organisations can develop an integration strategy that supports their business objectives and positions them for future success in an ever-changing technological environment.

5

Best practices for organisations in hybrid integration

A holistic approach to integration is fundamental for creating a coherent and efficient IT ecosystem. Instead of treating integration as a series of standalone projects, organisations should view it as a core component of their overall IT strategy. This means that integration must be considered from the outset in strategic decisions about IT architecture, application selection, and digital transformation initiatives.

A holistic approach includes mapping all data flows and processes within the organisation, identifying potential integration points, and developing an overarching vision of how different systems and applications should communicate. This not only helps prevent data silos and inefficiencies but also promotes a more streamlined and flexible IT environment that can better respond to changing business needs.

When selecting new applications or systems, paying attention to integration capabilities is essential. Too often, decisions about software

purchases are made based on functionality and ease of use without sufficient consideration for how the application will fit into the broader IT landscape. However, it pays to look for solutions that offer robust APIs, support standard integration protocols, and have flexible connectivity options.

Evaluating integration capabilities during the selection process can prevent many future headaches. It can help to ask questions such as: Does the application support real-time data exchange? Are there limitations on the number of API calls? How easy is it to build custom integrations? Can the application be easily integrated with existing systems and future technologies? By asking these questions early in the process, organisations can identify and address potential integration challenges before they become problematic.

Investing in observability

Investing in observability and monitoring is another critical best practice in the modern integration landscape. As IT environments become more complex and distributed, it becomes increasingly important to have deep insight into how different systems and integrations are performing. Observability

goes beyond traditional monitoring; it enables organisations to understand the internal state of their systems based on the outputs they produce.

It's imperative in hybrid environments where integrations connect on-premises systems with cloud services.

A robust observability strategy includes collecting and analysing logs, metrics and traces across the entire IT landscape. This makes it possible to quickly identify problems, trace the cause of issues, and understand the impact of changes. It's imperative in hybrid environments where integrations connect on-premises systems with cloud services. Organisations would do well to invest in tools and platforms that provide an end-to-end view of their integration landscape, including real-time monitoring, advanced analytics, and alerting capabilities.

In addition to these technical aspects, investing in the human side of integration, such as knowledge and skills, is vital. Furthermore, standardisation of integration processes and methodologies is essential. This may involve developing a centrally managed catalogue of integration patterns,

implementing consistent governance processes, and adopting a standardised toolkit for integration development. Standardisation can increase efficiency, improve quality, and reduce maintenance costs.

Finally, it's essential to remain flexible and regularly evaluate and adjust the integration strategy. The technology landscape evolves rapidly, and what is a best practice today may be outdated tomorrow. Therefore, it's important to be open to new technologies and approaches and to adapt the strategy where necessary. Use cloud solutions' flexibility to test different integration scenarios before committing to a specific approach.

6

Future perspective: the evolution of hybrid integration

In an ideal scenario, organisations could develop integrations without worrying about where they will ultimately run. The concept of ‘develop once, deploy anywhere’ would become fully realised, with the same integration logic seamlessly deployable on on-premises systems, private clouds, or public cloud platforms. Integrations would be completely platform-independent, allowing organisations maximum flexibility and portability.

This future vision also includes a uniform management and monitoring system that comprehensively views all integrations, regardless of their location or underlying technology. Organisations would have real-time insight into their integrations’ performance, health, and interdependencies, enabling them to act proactively to prevent problems and ensure optimal efficiency.

Trends bringing the ideal integration world closer

Looking at trends in integration technologies, we see several developments bringing this vision closer. There is an increasing focus on creating more abstract, declarative ways to define integrations. Instead of focusing on the technical details

of how an integration should be executed, developers can specify at a higher level what they want to achieve. The underlying platforms will then take responsibility for determining the most efficient way to implement these integrations.

Artificial Intelligence (AI) and machine learning will play an increasingly significant role in the integration landscape. We can expect AI to be deployed to automatically discover and propose optimal integration patterns, predict and prevent integration problems, and optimise integration performance. Natural language processing could be used to define and manage integrations, making the process more accessible to an organisation’s broader group of users.

Automation and AI will play a crucial role in the future of integration. In contrast to the earlier shift towards 'low-code' and 'no-code' platforms, there is a visible trend where AI assistants are playing an increasingly important role in generating the required code for integrations. This AI-driven approach can significantly accelerate and simplify the process of writing integration code. To do this effectively, the user must have deep knowledge and understanding of the underlying systems, data structures, and business processes.

While AI assistants can facilitate the writing of code, the role of integration experts thus remains indispensable.

While AI assistants can facilitate the writing of code, the role of integration experts thus remains indispensable. These experts must not only be able to ask the right questions to AI systems but also evaluate and adapt the generated solutions to the organisation's specific needs. Moreover, we see a trend towards more standardised protocols and open-source solutions, which improve the reusability and portability of integrations between different platforms and environments.

In hybrid landscapes, we expect the boundaries between on-premises and cloud environments to further blur. The focus will shift from where an integration runs to how effectively it performs and delivers value. We can anticipate the development of more

advanced edge computing capabilities, allowing integrations to be executed closer to the source of data, reducing latency, and improving real-time processing.

No smooth road to the ideal future

Despite these promising developments, it's important to note that the road to this ideal future is not without challenges. Data security and privacy concerns, especially in hybrid environments, will continue to exist and may even increase as integrations become more complex and distributed. Organisations will need to continue investing in robust security measures and compliance strategies.

Moreover, the speed of technological change will remain a challenge. Companies must balance adopting new, innovative integration technologies and ensuring the stability and reliability of their critical systems.

7

Summary and recommendations

Looking back at the preceding chapters, a clear picture emerges of the challenges and opportunities in the modern integration landscape. The increasing complexity of IT environments, with a mix of on-premises, cloud and SaaS solutions, calls for a new approach to integration. Hybrid integration offers a flexible solution, enabling organisations to connect and manage these diverse environments effectively.

We see a clear shift from traditional, licence-based integration platforms to more flexible, cloud-native and pay-per-use models. This change reflects the need for greater agility and cost-efficiency in a rapidly evolving technological landscape. Parallel to this, the importance of observability and end-to-end monitoring is becoming increasingly evident. In a world of complex, distributed systems, deep insight into the operation and performance of integrations is essential for ensuring business continuity and optimising processes.

The concept of 'develop once, deploy anywhere' is gaining importance, although

its full realisation remains challenging. This ideal promises organisations greater flexibility and efficiency in their integration efforts. At the same time, we see the growing role of AI and automation in simplifying and optimising integrations, offering new possibilities for faster and more intelligent implementations.

The trend towards standardisation and open approaches in integration cannot be emphasised enough. These developments are crucial for improving interoperability and reducing the inherent complexity of modern IT landscapes.

Develop a holistic vision of integration

Given these insights, we advise organisations to develop a holistic vision of integration. Do not treat integration as a series of standalone projects but as an integral part of your IT strategy. Map your entire application landscape and identify critical integration points. Invest in flexibility by choosing integration solutions that support different deployment options and are easily scalable. This enables you to evolve with changing business needs and technological developments.

Include integration early in selection procedures

When selecting new applications, it is crucial to evaluate the integration capabilities carefully. Choose solutions with robust APIs and support for standard integration protocols. This can significantly reduce future integration challenges. Also, invest

When selecting new applications, it is crucial to evaluate the integration capabilities carefully.

in observability and monitoring tools that provide an end-to-end view of your integration landscape. This improves troubleshooting and enables you to act proactively and optimise performance.

Discover and experiment with new technologies

Don't be afraid to explore new technologies and approaches, such as cloud-native integration services. These can offer significant advantages in terms of flexibility, costs and speed of implementation. The flexibility and speed with which cloud solutions can be implemented and tested make hybrid integration a powerful tool for organisations that want to innovate quickly and adapt to changing market conditions. However, consider your specific business context and compliance requirements when making technology choices.

Invest in your people

Finally, invest in your people. Ensure continuous training and development to keep your team up-to-date with the latest integration technologies and best practices. Encourage a culture of innovation and experimentation but focus on stability and reliability for critical systems.

By following these recommendations and adopting a well-considered, flexible approach to integration, organisations can position themselves to navigate the complex, ever-evolving landscape of modern IT effectively. Hybrid integration offers the key to unlocking the total value of your IT investments and supporting digital transformation initiatives. With the right strategy, tools and expertise, your organisation can overcome today's challenges and prepare for tomorrow's opportunities.



ABOUT.

Sander Brinkhuis - *Partner/owner at inQdo*

Sander Brinkhuis is an experienced Integration Architect and co-founder of inQdo, specializing in integration and cloud solutions. His career began as a SAP consultant, focusing primarily on system integration. Sander is known for his creative approach and strong communication skills, which contribute to successful collaborations with both clients and teams. Under his leadership, inQdo has grown into a trusted partner in advanced IT solutions, helping companies efficiently achieve their digital transformation. Driven by innovation, Sander strives to continuously provide high-quality, future-proof solutions through inQdo.

CONTACT.

Would you like to know what your organisation can save annually? Are you curious about concrete use cases, or do you have another question? Feel free to contact us, and we'd be happy to tell you more about the possibilities.

inQdo

info@inqdo.com

+31 85 2011161

inQdo

Coltbaan 1-19

3439 NG Nieuwegein

©2024 inQdo. All rights reserved. Reproduction, distribution or use of the contents of this whitepaper, in whole or in part, without prior written permission from inQdo is strictly prohibited.