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Cloud Integration & API Management

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Simplify integration
in the cloud

Monetize with
API management

Empower “citizen”
developers



Lawrence C. Miller, CISSP
Bruce Tierney

2nd Oracle
Special Edition

About Oracle

Oracle, a global provider of enterprise cloud computing, is empowering businesses of all sizes on their journey of digital transformation. Oracle Cloud provides leading-edge capabilities in Software as a Service (SaaS), Platform as a Service (PaaS), Infrastructure as a Service (IaaS), and Data as a Service (DaaS).



Cloud Integration & API Management

2nd Oracle Special Edition

**by Lawrence C. Miller
and Bruce Tierney**

for
dummies[®]
A Wiley Brand

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Introduction

With the surge of Software as a Service (SaaS) apps, the multiplication of mobile devices, and the deluge of data created by the Internet of Things (IoT), the promise of the connected digital enterprise is greater than ever — yet even more difficult to achieve. Before businesses can respond to customer demands in real time with innovative offerings, every piece of the technology puzzle must be able to communicate with every other piece — an undertaking that has become increasingly complex as the number of IoT devices, data sources, and SaaS applications continues to grow.

All your applications must be able to communicate seamlessly and in real time — it's as simple as that. It doesn't matter whether they're on-premises or off, or if it's high-velocity data unleashed by the IoT.

Clearly, the time for manually creating each new application integration from scratch has passed. To keep pace with rapid SaaS adoption, a new approach to integration is needed — one that involves offering your integration platform as a service via the cloud. Such an approach to integration enables you to rapidly connect SaaS applications with your on-premises systems and move easily between cloud-based and on-premises integration platforms, empowering users across the enterprise to effectively drive innovation and support your changing business needs.

About This Book

Cloud Integration & API Management For Dummies consists of four short chapters that

- » Describe the business opportunities that are possible with cloud integration and application programming interface (API) management (Chapter 1)
- » Explore various use cases (Chapter 2)
- » Introduce Oracle Cloud Integration solutions (Chapter 3)
- » Outline how you can simplify integration and API management for your organization (Chapter 4)

Foolish Assumptions

It's been said that most assumptions have outlived their usefulness, but we assume a few things nonetheless!

We assume you work as a line of business (LOB) manager, a senior information technology (IT) manager, an IT applications developer, or in a similar role and you're looking for a solution to help your organization quickly and easily integrate your business applications and data

in and between your public, private, and/or hybrid cloud environments.

We also assume that you have at least some familiarity with cloud technologies but aren't necessarily a technical reader. As such, this book isn't overly technical and doesn't require an in-depth knowledge of programming languages or science fiction/fantasy movies — we even spell out the techie acronyms for you!

If these assumptions describe you, then this book is for you.

Icons Used in This Book

Throughout this book, we occasionally use icons to call out important information. Here's what to expect.



REMEMBER

This icon points out information you should commit to your nonvolatile memory, your gray matter, or your noggin!



TECHNICAL
STUFF

If you seek to attain the seventh level of NERD-vana, perk up! This icon explains the jargon beneath the jargon!



TIP

Thank you for reading, hope you enjoy the book, please take care of your writers! This icon points out helpful suggestions and useful information.



WARNING

This icon points out the stuff your mother warned you about. Okay, probably not. But you should take heed nonetheless!

Beyond the Book

Although this book is chock-full of information, there's only so much we can cover in 64 short pages! So, if you find yourself at the end of this book thinking, "Gosh, this was an amazing book — where can I learn more about cloud integration?" just go to <http://cloud.oracle.com/integration>.

Where to Go from Here

If you don't know where you're going, any chapter will get you there — but Chapter 1 may be a good place to start! However, if you see a particular topic that piques your interest, feel free to jump ahead to that chapter. Each chapter is written to stand on its own, so feel free to start reading anywhere and skip around to your heart's content! Read this book in any order that suits you (though we don't recommend upside down or backward).

IN THIS CHAPTER

- » Recognizing the simplicity of cloud integration with autonomous integration
- » Understanding how integration works with Platform as a Service (PaaS)
- » Monetizing software with application programming interface (API) management

Chapter 1

New Opportunities for Cloud Integration and APIs

In this chapter, you learn how dramatically application integration and data integration have been simplified, how integration can be used alongside other related PaaS offerings, how to accelerate time-to-market for new software product offerings, and how to reduce your costs in the cloud.

The Simplification of Cloud Integration

The convergence of PaaS and major integration breakthroughs over the last few years has brought about the most dramatic simplification of integration in decades. You no longer need to know “techie” acronyms such as SOAP (not the lathering kind — the Simple Object Access Protocol kind) or possess advanced programming skills. You just need to understand your applications, not the plumbing underneath.

In the old days, integration platforms didn’t come with guidance. You had to figure everything out from scratch, as though no one had ever integrated applications before. Those days are gone. Modern integration platforms, such as Oracle Integration Cloud and Oracle Data Integration Platform Cloud, are introducing innovative autonomous capabilities in three main areas:

- » **Self-driving:** Machine learning recommendations and “best next action” guidance eliminate errors associated with complex data mapping between applications and suggest best user selections for process flows. Prebuilt application connectors, integration flows, and process templates reduce integration time.

- » **Self-securing:** Machine learning governance automatically identifies and catalogs data as it enters the integration platform to lower risk.
- » **Self-repairing:** Senses application connectivity issues requiring corrective action. Notifies you when an integration database or other storage has exceeded the allowable threshold, so your integrations are smart enough to handle situations when your applications have an issue.

Autonomous integration promises to be the next cool innovation to help you lower costs, reduce risk, and get your projects done faster.

How Integration Ties in with the Rest of PaaS

Autonomous integration simplifies integration for traditional integrators, while new simplification and guidance capabilities introduce integration to a much broader user base within a business.

Basic integrations can now be easily created by LOB application users, “citizen integrators,” and applications IT developers using a PaaS integration platform. PaaS provides a cloud platform that enables users to develop, deploy, and run applications without the cost and

complexity of deploying and managing the underlying infrastructure. This approach enables you to rapidly connect SaaS applications with your on-premises systems, empowers users across your enterprise to effectively drive innovation, and supports your changing business needs by enabling integration projects to be moved easily between cloud-based and on-premises integration platforms.

When your applications are integrated, you'll likely want to add other related capabilities to enhance your solutions, such as human-based process automation for approving a large request or document management with the ability to centrally collaborate on new projects. Or you may want to extend your applications with an industry-standard toolkit. Another common next step after integration is in place is to embed an API management solution (more on that in the next section) so you can integrate from a centralized and standardized platform. These are just a few of the platform capabilities that are a common next step after basic integration has completed. To keep things simple as you progress, you'll want to find all these and other PaaS features in a single integration PaaS solution.



TIP

Download *Public PaaS For Dummies*, Oracle Special Edition, at www.oracle.com/goto/drive-innovation-with-public-paas to learn more about PaaS.

Ability to Monetize with API Management

APIs provide access to a specific aspect of software functionality. The API is how one software application can get data from or push data to another software application.

For example, a new mobile application for Mama Mia's restaurant that offers free chicken soup on rainy days requires access to a weather service API. The input to this API might be zip code and the output might be percentage chance of rain. If the percentage chance of rain is over 10 percent, the developer could send a notification to customers who have the application to alert them of the offer. To access this "RainbyRegion" API, the Mama Mia's developer goes to the weather service portal to register her application and interact with documentation to know how to make the call. And this is where the weather service has a chance to monetize the API. It could charge a miniscule amount for every API call, offer the first 1,000 calls free, and then charge this amount or any other creative pricing model. But how does the weather service know who is calling its APIs? What if the number of calls overwhelms its web servers and brings it down? And when the weather service has many different restaurant chains, healthcare facilities, retailers, governmental services, and more calling its APIs, how does it get a view of its total revenue and which partners are bringing it in? Welcome to API management: the ability to manage and monetize your APIs as a new business opportunity.

Internal business functions within enterprise applications can also be “called” through APIs, from checking inventory levels to reporting on the status of purchase orders. Each of these services can be called on to supply information or functionality to a larger application.

Many businesses plan to expose and monetize their software assets through multiple channels — web, mobile, social, and otherwise. APIs enable them to externalize these assets via standard interfaces. And that’s where the “management” part of API management comes into play. If every developer builds and consumes APIs in different ways, then there is no way to know what’s going on from an API utilization, management, or monetization perspective. The development community needs a single portal to standardize access to your APIs across all these diverse channels. And to keep things simple and accessible to everyone, knowledge of your company’s software integration infrastructure should not be required.

An API is a valuable asset that can be shared with internal developers, external developers, and partners. API management allows organizations to realize the value of these assets by unlocking their potential. A good API management system provides a simple yet robust platform for creating, documenting, and publishing APIs. It also simplifies the process of finding, understanding, and using APIs along with the processes and services behind them. Such an API management solution facilitates the connection of data and business functions so that organizations can enable access to applications via mobile,

cloud, and on-premises environments and can automate a variety of integration scenarios via standard interfaces. It also permits life-cycle management of the APIs with integrated facilities for development, monitoring, management, and end-of-life maintenance.

API management solutions typically provide tools to foster a developer community where people can connect with each other and exchange best practices. This allows organizations to unlock the potential of their enterprise software assets by using API management to minimize complexity for developers and expose the functions that are needed by end users. Instead of worrying about the details of technical interfaces, solution developers should be able to search for application services and quickly learn how to incorporate them into their own applications. After the solution is deployed, the developer needs ways to secure the API with out-of-the-box ease, as well as incorporate existing security standards within your enterprise identity management system.

And finally, the developer needs the ability to graphically view API usage relative to your key performance indicators to give you control from both an operational perspective as well as a business perspective.



REMEMBER

A robust API management platform enables you to securely monetize the value you already have in your existing applications but is inaccessible and locked up.

IN THIS CHAPTER

- » Integrating opportunity-to-order apps
- » Keeping data synced in real time and batching
- » Automating and integrating business processes
- » Monetizing app services with application programming interface (API) management
- » Leveraging blockchain integration

Chapter 2

Exploring Use Cases

In this chapter, you learn about several real-world implementation scenarios for API-first integration and automation.

Opportunity to Order Integration with E-Business Suite

The sales life cycle can be split into four business processes:

- » Lead to opportunity
- » Opportunity to quote
- » Quote to order
- » Order to invoice

These related processes require seamless integration to ensure that synchronization of data and work flows smoothly, accurately, and without error.

As any seasoned field-based account manager can tell you, delayed quotes can often lead to lost revenue. A study by InsideSales.com found that 35 percent to 50 percent of sales go to the vendor that responds first. In the era of instant-on, subscription-based Software as a Service (SaaS), taking several days to deliver an accurate quote to a customer is unacceptable.

A common scenario arises when a sales professional enters information into a customer relationship management (CRM) system and then a business user has to

manually re-input that information into an order management application, which not only delays the quote but also potentially introduces errors to the record. Although some applications automatically share data, there are typically too many different applications from disparate vendors to make them seamless across all the required customer experience (CX) and non-CX applications.

CASE STUDY: VIAVI

Viavi, a manufacturer of products for optical communications networks, test and measurement equipment, lasers, optical solutions for authentication and decorative applications, and other custom optics, relies on a cloud-based CRM system from Salesforce. Until recently, this CRM system was not integrated with Viavi's on-premises Oracle E-Business Suite applications. This meant that the sales team spent an inordinate amount of time gathering information about customers and opportunities from Salesforce, while critical data about orders, purchase orders, and financial policies had to be manually extracted from E-Business Suite. This lack of integration made it difficult for sales reps to create accurate quotes and provide them to customers efficiently.

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Viavi connected its Salesforce application with key modules from E-Business Suite. The project was carried out in two phases. During the first phase, Viavi integrated Salesforce with E-Business Suite accounts, contacts, opportunities, and quotes. During the second phase, it integrated “item” and “order” information into Salesforce. Viavi also connected a ServiceNow app to Salesforce and Oracle E-Business Suite to simplify customer onboarding.

Now, when a user performs specific operations in Salesforce, an outbound messaging process invokes a web service to sync up with Oracle E-Business Suite. Viavi uses Oracle integration to accept the data from Salesforce and synchronizes data between Salesforce and Oracle E-Business Suite.

Similarly, when a user performs specific operations in E-Business Suite, the business-events process pushes the data to Oracle Advanced Queuing, which is continually polled by an integration service. A set of integration processes picks up the data from Oracle, transforms it to the correct Salesforce format, and invokes the Salesforce web service for data manipulation operations.

Viavi also established an application refresh schedule that recognizes the dependencies among the entire information technology (IT) ecosystem, including Salesforce, the Oracle enterprise resource planning (ERP) system, a corporate data warehouse, and many third-party IT assets. As a result, the field organization can now obtain quotes quickly and easily, improving operational efficiency by more than 20 percent while streamlining order delivery and minimizing errors in purchase orders. It has also increased the number of sales that include a services component by 40 percent. Quote approval cycles involving Salesforce and E-Business Suite have been reduced from an average of 48 hours to about 6 hours.

With Oracle integration, these functions are available anywhere, anytime, and on any device. Oracle cloud integration allows Viavi developers to easily expose enterprise applications and data as virtual services and enable web services and API connections with them. This makes it easy to integrate and automate end-to-end processes with innovative digital apps that easily connect with Viavi's cloud and on-premises applications using standard web services.



REMEMBER

Oracle provides a comprehensive solution for integrating cloud and on-premises applications. You can simply connect Oracle SaaS and on-premises applications, as well as third-party applications such as Salesforce, Workday, and many others. Furthermore, you can leverage process automation to quickly digitize end-to-end workflows, all in a single cloud environment and all with a single scalable universal pricing model.

Real-Time and Batch Data Integration to Cloud

Real time basically means “now,” instead of storing a group (batch) of changes for later. For example, if you want to run operational reporting for your business on a frequent basis, where does that data typically reside? Often, it’s in databases or other sources that are mission-critical to your business and require extreme performance and high reliability. You don’t want your reports to delay operational decisions or be the cause of slow performance in your business’s e-commerce or order processing systems. Real-time data integration allows you to maintain extreme performance and high availability in your main data sources for your customers and your core business, while providing you access to a copy of your primary database that is updated in real time. You can also migrate your data, so your application

users never experience downtime now that you have added synchronized data sources.



TIP

What if a disaster occurs and your data sources are wiped out? Integrating your data into multiple synchronized data sources also enables you to get your business up and running — or keep your business up and running — quickly during a disaster, outage, or other event in which your primary data source is lost, destroyed, or otherwise unavailable.

When you need to initially load your on-premises data to the cloud (such as Oracle Database Cloud, Oracle Data Cloud, or other third-party clouds), you may need to first cleanse the data to remove erroneous or stale information. You don't want to impact the performance of the source data store as you perform this work and any transformations on the data, so you want to use solutions that leverage the computing power of the cloud target location instead of the on-premises source location.



TECHNICAL
STUFF

Extract, transform, and load (ETL) is a data integration process in which data is *extracted* from a data source (for example, a database), *transformed* (for example, the target data store might need to be in a different format or cleansed), and then *loaded* into the target data store. Another important data integration process is extract, load, and transform (ELT), in which data is *extracted* from a data

source, *loaded* into the target data store, and then *transformed*. ELT puts the workload on the target system instead of the source system, which is often more desirable than ETL due to the availability of greater computing resources in the cloud, so your mission-critical systems don't slow to a crawl.

CASE STUDY: MAJOR COFFEE RETAILER

A leading coffee retailer needed improved access to customer loyalty data for the corporate website, as well as iOS and Android applications. Lack of real-time synchronization between its cloud CRM system that contains loyalty data and its on-premises corporate website was causing the retailer to have inaccurate information for its customers who wanted to check the latest information on the retailer's website. The retailer implemented Oracle GoldenGate, now part of the Oracle Data Integration Platform Cloud (DIPC), to capture data from its hosted Siebel CRM system without impacting its performance or availability as transactions occur, and to deliver them to the corporate website in real time, allowing streamlined access to select loyalty data for a better customer experience.

Automating Business Processes

Today's organizations often need to orchestrate and digitize end-to-end workflows spanning SaaS CRM and on-premises ERP software, such as Oracle E-Business Suite, to enable real-time, event-driven business processes. For example, to complete a repair, a field service rep may need to order parts from an inventory control application, update a CRM system, and then ensure that appropriate customer record changes are reflected in an on-premises billing system.

If a customer has an open support issue, that issue should be captured, documented, and integrated with other applications (such as Oracle Sales Cloud or Salesforce) so that when an account manager visits that customer, she can be fully apprised of the issue and proactively address any of the customer's concerns.

When an order is received, the order management representative submits an approval task. If the order amount is less than \$500,000, the primary approver can approve the order. If the order is \$500,000 or more, the secondary approver must also approve the order. In both cases, the financial reviewer must approve the order after the primary and secondary approvers. This time-critical workflow can be quickly and easily automated to improve customer responsiveness while reducing the cost of compliance.

CASE STUDY: CALIX

Calix, a leading provider of broadband communications access systems and software, is using the Oracle Integration Cloud to significantly speed the development and delivery of innovative new services such as web content management and customer portals for its customers, which include many of the world's leading service providers.

Calix operates in a highly competitive global market. In order to successfully compete against many companies twice its size, it needed to increase its speed and agility, by integrating its highly heterogeneous technology infrastructure. With a growing customer base that serves more than 100 million subscriber lines, Calix is at the forefront of enabling service providers worldwide to deliver advanced broadband services and value to its customers. To help support these customers, Calix needed to modernize its core applications and digitize end-to-end business processes to help the company improve productivity, lower compliance costs, and accelerate innovation. Calix evaluated many workflow execution platforms and selected Oracle Integration Cloud's process automation capability to support its strategic and immediate goals.

“Process automation is central to our integration strategy,” said Ravi Gade, senior director, IT Applications, Calix. “The Oracle Integration Cloud enabled us to consolidate multiple integration tools into a single platform very quickly. In a company that is continually innovating, IT must stay agile and be able to respond quickly to evolving business needs. The Integration Cloud enables us to support continual innovation, deploy rapid integrations, and realize significant IT savings.”

Using Oracle Integration Cloud, Calix consolidated its existing integration tools, including Dell Boomi and Informatica, into a single integration platform to improve business and IT efficiency. Calix then used Oracle Integration Cloud to quickly and easily integrate on-premises and cloud applications, including Salesforce and Oracle E-Business Suite. Leveraging prebuilt adapters and process templates, the company was able to build integrations between its key business systems in just a few hours and automate operational workflows in minutes, not months.

With Oracle Integration Cloud’s simple, web-based, point-and-click user interface, Calix significantly sped the time to deployment.

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For example, as part of a recent cloud-to-cloud application integration project between the customer portal built on Adobe Experience Manager and a Salesforce application, Calix was able to build 24 integrations in less than two weeks. This type of integration would have previously taken a few months. Additionally, Calix was able to leverage its existing Applications group to easily build the application integrations, which freed up integration developers to focus on other innovations. Calix began its journey using Oracle Integration Cloud as its platform for digital transformation during the summer of 2015.

Additionally, Calix is using the Oracle SOA Cloud Service to replace current on-premises business-to-business (B2B) partner integrations.

With Oracle Integration Cloud's process automation, Calix is able to

- Build scalable and complex cross-functional business workflows using Oracle's cloud-based process composer
- Connect multiple enterprise applications with minimal coding efforts

- Empower business analysts to automate their own processes with minimal IT support
- Improve business and IT alignment by reducing communication gaps and reusing pre-built adapters and templates

Monetizing Software Application Services with API Management

So, what are we actually integrating? What does the “plug” or “interface” look like when you connect to an application? Years ago, these interfaces were not standardized, and the way they were managed made integration complicated to develop and manage. APIs are the programming interfaces to an application. They provide direct access to specific services previously locked inside monolithic applications. An API is a valuable asset that can be shared with internal developers, external developers, and partners. API-first design speeds time to delivery by enabling parallel development between front-end user experience (UX) innovations and back-end interactions with secured systems of record. API management helps organizations to realize the value of these assets by unlocking their potential. You may have heard the term *API economy*, which signifies the shift in how

software is being monetized — away from large monolithic applications and moving toward rapid assembly of software services accessible by well-managed APIs. APIs are now more than just a technical concept; they enable the transition to modern digital business development.

A good API management system provides a simple, scalable, and secure platform for creating, documenting, analyzing, and publishing APIs. It also simplifies the process of finding, understanding, and using APIs, even when the processes and services behind them change.

API management simplifies the connection of data and business functions so that organizations can quickly enable access to application calls via mobile, cloud, and on-premises environments. It can automate a variety of integration scenarios via standard, IT-approved interfaces and enables full life-cycle management of the APIs with integrated facilities for development, monitoring, management, and end-of-life maintenance.

CASE STUDY: LARGE RESTAURANT INDUSTRY RETAILER

A large retail firm with more than 50,000 employees created a single loyalty program across its many diverse restaurant businesses

spanning pizza, Chinese food, major coffee chains, and more. The retailer wanted to avoid creating multiple loyalty programs for each restaurant, so it could lower complexity and cost and allow for cross-promotion across restaurants.

The retailer built an API solution leveraging Oracle API and integration technologies that allows it to leverage common foundational services, yet still customize components to meet the specific needs of each restaurant and brand. All APIs were built based on the business requirements of the company, ensuring smooth continuity across multiple loyalty programs and platforms, which means that services can be consumed even by applications that are not covered at this time. In the future, any new brand, also part of the restaurant chain, can subscribe to the API and very quickly create a restaurant-specific loyalty program leveraging the same underlying APIs for multiple channels, including mobile, point of sale (PoS), web (customer signup), and contact center.

Blockchain Integration

Do you enjoy giving money or other high-value assets to someone you don't trust? No? Congratulations, you answered correctly. Blockchain enables you to do business with organizations you may not fully trust.

Here is an overly simple explanation of blockchain: When you make a transaction, the transaction is grouped together into a *block* of data. Each block contains a *hash* of the previous block, which produces an error-checking and tamper-resistant code, complicating the hacker's ability to change a transaction. This backward chaining of blocks means that every previous block would have to be altered, too, making the job of our poor hacker too complicated.

The nearby sidebar offers a look at a real-world scenario.

CASE STUDY: MAJOR BROADCASTING COMPANY

A TV broadcasting company makes money by selling advertisement "spots." A prime-time event ad can go for as much as \$5 million, and all those spots will be purchased by companies

selling everything from beer to insurance. But what about the other days and hours of the year? Many of those spots, especially late at night, go unsold, resulting in a loss of revenue to the broadcaster. Furthermore, for all the spots that are sold, there is a high cost of sales to the broadcaster to enable prospective buyers to bid for the highest price, without sharing their bids with competitive bidders.

How might the broadcaster lower the cost of finding the highest bidder, a bidder that might not yet be trusted to follow through on its bid, and to sell most if not all of the hard-to-sell time slots? One of the solutions being explored by this broadcaster is implementing blockchain to allow prospective ad buyers to bid privately. Then, when the winning bidder is selected, the broadcaster can take advantage of the blockchain feature of *nonrepudiation* (which means if you try to say “I never bid that amount,” I have enough proof to say “Oh, yes, you did!”). This low-cost option delivers all the features needed (trust, speed, reliability, nonrepudiation, and so on). No more need for the bidding intermediary to manage the bid process. Let blockchain handle it.

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Next is where integration and automation merge with blockchain. Every potential ad buyer is a partner, or is added as a partner in the broadcaster's partner relationship management (PRM) system (similar to CRM). All bids placed need to go into the PRM system, requiring application integration. After the winning bidder has been selected and the ad has been placed, the broadcaster invoices the buyer, requiring integration into the broadcaster's ERP system. And there you have it: blockchain automation connecting to enterprise applications, such as ERP, and a wide range of other potential SaaS, productivity, and social media apps. For example, in this case, the broadcaster is now able to demonstrate how an advertisement that was secured with a blockchain bid went viral and had a huge return on investment (ROI) for the bidder.

IN THIS CHAPTER

- » Differentiating between application and data integration
- » Exploring Oracle application integration and automation solutions
- » Looking at Oracle Data Integration Platform
- » Managing application programming interfaces (APIs)

Chapter 3

Getting Started with Oracle Cloud Integration and API Management

In this chapter, you get an overview of Oracle application integration, data integration, process automation, and API management service offerings.

Understanding Application and Data Integration

You may be wondering what the difference is between application integration and data integration. They both integrate data between two endpoints, but there are some key differences.

» **Application integration** connects applications, such as customer relationship management (CRM; for example, Oracle Sales Cloud, Salesforce, and others), human capital management (HCM; for example, Oracle HCM Cloud, PeopleSoft, and others), and enterprise resource planning (ERP; such as E-Business Suite, JD Edwards, and others) as the endpoints. A relatively small amount of data is usually exchanged, such as customer name and address, employee data, or inventory amount. The time to transfer data can be very fast (for example, milliseconds). An application endpoint can also be a database, but the amount of data transferred is typically very small compared to the size of the entire database.



REMEMBER

Time frames under a second are typically referred to as real time or near real time.

- » To understand **data integration**, start by oversimplifying and thinking “database integration” (instead of just data). Databases contain massive amounts of data. Copying an entire database from an on-premises database to a new cloud database requires extremely fast data transfer; otherwise, it could take several days or more every time you need to copy a database. If you encounter a system glitch or need to upgrade during that transfer window, you may have to start the transfer all over again. Data integration increasingly moves data from other sources and targets beyond databases to include applications, big data, and more.

Oracle Application Integration Solutions

Oracle has three main product offerings for application integration:

- » **Oracle Integration Cloud (OIC)** provides powerful solutions for applications IT users, with prebuilt adapters, integration flows, and process templates to orchestrate and automate the connected business. This modern offering has the most comprehensive set of capabilities, as well as new autonomous features.

- » **SOA Cloud Service/SOA Suite** are ideal solutions for existing on-premises Oracle SOA Suite users who want to transition to the cloud or use a hybrid on-premises/cloud solution. Many SOA Suite on-premises customers transition directly to Oracle Integration Cloud.
- » **Oracle Self-Service Integration** targets the needs of business users wanting to automate manual work by providing incredibly easy data sharing between the rapidly growing selection of productivity apps (such as Slack, Dropbox, Google Sheets, MailChimp, Eventbrite, and others) with enterprise SaaS and on-premises applications using clicks, not code.

Oracle Integration Cloud

Digital transformation scales better, faster, and more securely with a hybrid integration platform. When businesses run enterprise applications in the cloud, connecting data and processes between them and on-premises systems is critical.

OIC is an integration platform for digital transformation. It's designed for applications IT, enterprise architects, and business analysts with good application knowledge who are looking to design more and code less. OIC comes with prebuilt adapters, integration flows, and process templates to accelerate connectivity between SaaS and on-premises application. Embedded process automation

leverages prebuilt integration flows and templates to orchestrate human, robotic, and artificial intelligence (AI) interactions, and digitizes workflows across SaaS and on-premises systems of record.

To jumpstart integration, readymade integration flows, or “recipes,” are available in the Oracle Cloud Marketplace for an ever-growing list of popular applications and business scenarios. Recipes are prebuilt integration flows for common integration types. Some examples include

» **Oracle Sales Cloud and Oracle Service Cloud:**

- View and create sales leads or opportunities in real time in Oracle Service Cloud.
- View, create, and update Oracle Service Cloud service incidents in real time in Oracle Sales Cloud.
- Synchronize customer accounts and contacts in Oracle Sales Cloud with organizations and contacts in Oracle Service Cloud.

» **Salesforce and Oracle E-Business Suite:**

Customer contact synchronization.

» **Oracle Service Cloud and Oracle Marketing Cloud:** Propagate contact information (such as name, address, email, phone number) in near real time, including information about incidents (such as when an incident was opened, reference number, and more).



TIP

To find more readymade integrations, search for “integrations” in the Oracle Cloud Marketplace portal.

If you need to create an integration that isn’t available as a recipe, OIC provides a point-and-click development environment using concepts and terminology familiar to application users. The interface runs in a web browser, enabling fast and easy development and administration. Integration takes just three simple steps:

- 1. Connect.** Choose the applications for your integration endpoints to create *connectors*. Connectors (also referred to as *adapters*) are analogous to electrical plugs that adapt electrical wires into the form required by the receiving socket.
- 2. Select.** Select the information (for example, customer lead contact name and address) you want to transfer from the source application (such as Oracle Sales Cloud) and the similar information on the target application (such as Oracle E-Business Suite), and then map the data between the two applications (which might have different names for similar business objects). Turn on the machine learning–based Recommend feature to let OIC do the mapping for you!
- 3. Activate.** Click *Activate* and let the integrations begin!

If you want to get fancy, you can enrich your integrations with more advanced mappings. The interface features what is known as a graphical data “mapper” that enables users to transfer data as it’s stored in one application to the other application (for example, `fname` to `firstName`). Mapping also supports translations in scenarios where you want to enrich data that isn’t available in the source application (for example, Salesforce), but is needed in the target application. For example, if Oracle Marketing Cloud (Eloqua) needs U.S. zip code information, a call to a web service with an input of city can return the zip code and be enriched as it’s pulled into Oracle Marketing Cloud.

Application connectivity is supported through a library of easy-to-use adapters, eliminating the complexity of manually coded web services integration with complex application endpoints. Adapters expose business object names that are well known to application users and can be used without expert knowledge.

One of the many features that greatly simplifies integration within OIC is the use of a consistent set of steps to integrate every application. Applications from different vendors often have completely different ways of securing access to data, ensuring that communication between applications stays open (known as *session management*), and more. Oracle OIC manages these differences for you, so you only need to know one simple way to connect to an

application — regardless of how the vendor has mandated integration security and session management.

What if an integration between applications requires a human to approve, modify, or otherwise get involved in the flow of data (for example, a purchase order with an 80 percent discount, which is higher than automatically allowed)? Instead of sending the data to the next application, an email could be automatically sent to a manager (or added to a queue of approvers) who would allow someone to decide if the approval amount is okay or should be rejected. This merging of machines (applications) with humans (process automation) has historically been considered two separate worlds requiring extensive professional services for integration. One of the strengths of OIC is the ability to use either the process automation or application integration, or both in a single user interface with a single subscription model.

What if you need to connect to a legacy application that doesn't have a modern API? There are other ways to integrate, such as exporting a file, but that is not always possible — for example, if the application was designed to get input only from the user interface of the application. However, Robotic Process Automation (RPA) solves this problem by simply creating a software-based robot to mimic human interactions with the application. This provides immediate productivity and compliance advantages without requiring changes to the underlying systems of record.

OIC includes integration analytics for monitoring dashboards that provide developers and business users a 360-degree view of their integrations, including message flow and how your integrations map to your key performance indicators (KPIs). Users can also search for transactions of interest based on key business identifiers such as order number or product name; identify failed transactions; drill down for root-cause analysis; and review, resubmit, and remove errored transactions, all from a single monitoring dashboard. Although most applications today have built-in analytics dashboards, many end-to-end business processes span departments and involve several applications. Inquiry to opportunity, opportunity to order, and order to cash are examples that typically require employees to manually monitor and manage the workflow process. This is where OIC analytics come into play: a single view covering the entire business process life cycle from inception to completion, so you don't have to try to follow your transaction as it moves downstream through every application and approver along the way.

Oracle SOA Cloud Service/SOA Suite

Oracle SOA Cloud Service is a platform in the Oracle Cloud designed for the power user — such as an integration developer who wants the added benefits of traditional Electronic Data Interchange (EDI) business-to-business

(B2B), or who has an existing Oracle SOA Suite on-premises implementation in place and wants to move his integration workload from on-premises to the cloud, or deploy a hybrid combination of both.



TIP

Aside from the two preceding scenarios described, most organizations choose OIC to address their integration needs.

SOA Cloud Service can be used to provision new environments with just a few clicks. Because the environment is built automatically, administrators and developers can spend more time on value-added tasks, like service orchestration, loose coupling of services with an enterprise service bus, managed file transfer, B2B electronic data interchange (EDI) integration, and more.

Oracle SOA Suite is the on-premises twin of Oracle SOA Cloud Service, giving you deployment flexibility so you can move your on-premises integration to the cloud or bring it back on-premises. The components of the suite benefit from consistent tooling, a single deployment and management model, end-to-end security, and unified metadata management.

Key functionality includes the following:

- » **Advanced integration:** SOA Cloud Service delivers application connectivity by providing a unified experience to integrate across cloud, on-premises,

and B2B environments. Components included within the unified platform are the enterprise service bus (the foundation for shared services), process orchestration for higher level (or “composite”) business services, business rules for agility, and business activity monitoring to deliver role-based visibility.

- » **Automated provisioning:** Save time and money with rapid, fully automated provisioning of SOA Cloud Service instances. Quickly and easily scale by provisioning additional instances when needed for development, testing, or increased demand.
- » **The ability to create and secure shared enterprise services:** Developers can easily create Representational State Transfer (REST) and Simple Object Access Protocol (SOAP) services for back-end applications, including orchestration capabilities, which can then be published to a shared catalog using Oracle API Platform Cloud Service (discussed in the following section). Comprehensive enterprise-grade security including transport-level security, message-level security, Security Assertion Markup Language (SAML), fine-grained authentication, identity management, and more.
- » **The ability to monitor runtime operations and performance:** SOA Cloud Service includes access to standard SOA monitoring tools like Enterprise

Manager Fusion Middleware Control. Administrators can track and trace transactions to have full visibility of the integration tier.

- » **Reduced ongoing maintenance:** SOA Cloud Service tooling simplifies ongoing maintenance with capabilities such as single-click patching, single-click scale-out, and automated backups.

Oracle Self-Service Integration

In the early days of digital transformation, companies cautiously added a few new SaaS applications to their existing on-premises applications. As confidence in the SaaS model has increased, so, too, has the rate of SaaS adoption. Productivity and collaboration apps (such as Slack, Dropbox, and others) have dramatically accelerated the enterprise SaaS app trend and the number of SaaS-based productivity and collaboration apps is now well into the tens of thousands or more. Is your application IT team ready to handle the tsunami of requests to integrate these apps with your core business applications?

Oracle Self-Service Integration empowers citizen developers, line-of-business (LOB) users, and enterprise IT to work together to automate simple connections between their productivity and business applications. For example, a marketing campaign manager can automatically send new event registrants to her Oracle Sales Cloud or Salesforce implementation, or a customer support

representative can integrate an “Escalation” Slack channel into an Oracle Service Cloud or ServiceNow incident. Instead of submitting requests to applications IT to automate simple integrations between apps, LOB users can do it on their own, without compromising security or compliance because enterprise IT maintains full visibility and control over access to core business systems.



REMEMBER

Oracle Self-Service Integration enables LOB users to do simple integrations on their own, freeing up applications IT to focus on more advanced integrations and other strategic business initiatives.

Oracle Data Integration Platform Cloud

When it comes to business-critical systems, IT teams must ensure the highest availability and performance, as well as offer fast and easy access to the timely data these systems hold. With transaction volume increasing at an exponential rate as more and more business processes are conducted online, many organizations need a better solution to collect and deliver immediate access to the tremendous amount of enterprise data.

Oracle Data Integration Platform Cloud (DIPC) is a cloud-based platform for data transformation, integration, replication, and governance. It provides seamless batch and

real-time data movement among cloud and on-premises data sources, maintaining data consistency with fault tolerance and resiliency. You can transfer entire data sources or stream data to new data sources and keep any number of data sources synchronized. You can create dashboards to profile and audit for data integrity, and set up policies to receive notifications and manage all your data sources from a single platform.

Oracle DIPC simplifies and accelerates the delivery of your data integration projects by seamlessly working with on-premises and cloud data sources and supporting data in any format. DIPC is easy to provision and use through simplified provisioning, management, and administration features and functionality.

With Oracle DIPC, you can quickly and easily

- » Access and manipulate hundreds of data sources.
- » Eliminate downtime.
- » Perform cloud onboarding.
- » Extract, load, and transform (ELT) data entities.
- » Replicate selected data sources.
- » Maintain data quality with prebuilt processes.
- » Simplify IT and provide self-service capabilities for the business.
- » Be more agile and outpace your competition.

Oracle DIPC is available in three editions:

- » **Standard Edition:** Perform bulk copy of your data sources, and then extract, enrich, and transform your data entities through high-performance ELT functions and templates. The Standard Edition also includes pushdown data processing and basic data profiling.
- » **Enterprise Edition:** Access big data technologies and data replication capabilities to create powerful real-time data integration solutions. All Standard Edition features are also included.
- » **Governance Edition:** Profile, cleanse, and govern your data sources with customized dashboards in this most advanced edition. All Standard Edition and Enterprise Edition features are also included.

Oracle API Platform Cloud Service

Many companies are using “cloud first,” an application modernization strategy in which all newly selected applications are SaaS instead of on-premises — wherever possible. One of the many positive side effects of this strategy is the increased level of comfort that businesses

are gaining in having their applications and data outside the security of their on-premises firewalls.

Mobile access to back-end applications is adding to this push for outside the firewall access to internal systems of record. As businesses continue to access enterprise data outside their traditional security zones and share it beyond employees to include partners and external developers, there are new challenges, as well as new opportunities, that every business should be aware of (see Chapter 1).

How is Oracle helping you address these challenges as well as enabling you to take advantage of the new opportunities? Introducing Oracle API Platform Cloud Service, an entirely new user experience that avoids the complexity of yesterday's legacy approach to API management by introducing an intuitive cloud-based solution to design, simplify, secure, and manage your APIs.

Oracle API Platform Cloud Service gives you a faster path to get from concept to production deployment and monetization of new digital revenue streams with:

- » Greater visibility into API usage and KPIs
- » Increased speed and flexibility to design and modify your application services
- » Better control through policy-driven API management

Key features of Oracle API Platform Cloud Service include the following:

»» **Building APIs**

- Create an API on top of a service that, for example, accesses data formerly locked inside your monolithic applications.
- Test API mock-ups before starting development to minimize design update cycle delays.
- Configure run-ready policies for controlling API usage.

»» **Securing APIs:** Assign industry-standard security protocols to protect your APIs with no coding and integrate with your existing enterprise identity management systems.

»» **Deploying APIs**

- After the APIs are created, they're deployed to an API gateway for usage.
- One-click deployment enables simple and quick connection of new APIs to gateways.
- Gateways can run in the Oracle Cloud or on-premises, close to your back-end services, and can even be deployed on third-party clouds.

»» **Publishing APIs:** Documentation can be auto-generated while the API is being developed.

» Consuming APIs

- Centralized location for finding and learning about available APIs.
- Simple approach to register applications so they can utilize APIs.

» Monitoring APIs

- Get instant visibility into operational usage metrics.
- View API business KPIs.

So, what's different about API Platform Cloud Service compared to other API management solutions?

» An “API-first” approach that simplifies API management compared to legacy solutions:

This new user experience is built on top of proven high-performance runtime gateway technologies. No installation, minimal configuration, no patch set updates, no manual coding required. API-first lets you test your API mock-ups with industry-leading technology from Oracle's Apiary acquisition, so business users can provide feedback on their user experience in parallel with integration development, which has been shown to dramatically reduce development time and costs.

»» **The realization that API management should not be a stand-alone isolated tool:** As your API management implementation grows, you'll likely find that you need other related Platform as a Service (PaaS) technologies and don't want the cost and complexity of assembling a patchwork of tools into a "Franken-stack" of stitched-together tools. For example, managing API layers directly on top of integration must be compatible with enterprise identity management, often needs human-based business process management, may need to work closely with a document management system, and needs portal development capabilities, mobile development tools, and so forth. With API Platform Cloud Service, all these tools are an integral part of Oracle PaaS and work seamlessly with Oracle SaaS and Oracle Infrastructure as a Service (IaaS), too.

IN THIS CHAPTER

- » Getting recommendations for autonomous integrations
- » Taking advantage of prebuilt integrations
- » Focusing on integration rather than configuration
- » Empowering users with self-service integration
- » Integrating cloud and on-premises environment

Chapter 4

Five Things You Need to Know about Integration

Yesterday's integration approach of manually re-creating all your integrations from scratch is no longer fast enough to keep pace with C-level

digital transformation imperatives and the rapid growth in line of business (LOB) acquired Software as a Service (SaaS) applications. A new approach to application integration is required.

In this chapter, we outline five ways to simplify cloud integration as you transition from a complex application integration architecture to an agile, intelligent, and hybrid integration platform.

Get Automated with Autonomous Integration

Imagine you're about to purchase a product on eBay from an unknown seller, with no reviewer ratings, based in a foreign country. You'd likely be somewhat anxious about making the purchase. But what if the seller instead had a few hundred sales reviews with an average satisfaction rating of 99 percent? Your confidence in the seller would be significantly higher.

Recommendations such as these are now indispensable on retail sites. However, applying the recommendation concept to automate integration mapping inside a mission-critical integration platform is a game changer. With Oracle data, process, and application integration, multiple forms of autonomous integration are available. A recommendation can come from many sources, including Oracle, customers, and partners. For customer-based

recommendations, guidance comes from the crowd-sourced machine learning input of previous users of Oracle Integration Cloud. For example, the more users who have matched and activated a data pair between two applications (for example, AccountIdentifier in one application and AccountID in the other application), the higher the mapping recommendation (relevance) on a scale of one to five stars.



TIP

Let the Oracle Recommends feature automate complicated tasks — and steer you away from painful mistakes.

Leverage Prebuilt Integrations

Until recently, all integrations had to be created from the ground up, requiring integration architecture design, testing, debugging, redesigning due to lessons learned, pushing into production, and then fine-tuning some more of the design. This time-consuming and costly development cycle may be required for niche integrations that are not common to most businesses. But what about integrations that are used by a wide range of different industries? Should these common integrations be reinvented by every company?

For example, an integration that tracks the progress of sales leads that originated in a marketing application as

they advance through the sales cycle within a customer relationship management (CRM) application shouldn't have to be re-created from the ground up by every customer. Likewise, database migrations and upgrades have repeatable data integration patterns. Why not let the software automate the mechanics and enable more employees to drive their connected business to deliver engaging customer experiences?

Another common example involves integrating sales and customer service software. When a customer contacts your customer support about critical issues causing serious disruptions to his business, your service desk software has fully captured these issues, but the software has not communicated the level of dissatisfaction to the local account team. As weeks have gone by, your customer's problems have gotten worse. Sometime later, the local account team visits the customer to sell a new product and is caught off guard when the customer explains the damage done by the product issues, and the damage to the relationship is done. One simple integration could've saved a massive amount of current and potential future revenue.

Prebuilt integration transforms integration platforms from a blank palette upon which you build the integration from scratch into a run-ready integration solution; that run-ready solution includes all the setup for how differently named but identical information (for example, `AccountName` and `Account`) is transformed and/or

enriched from one application to another. This means employees are able to design more with less mechanics, and deliver better results in minutes, not months.



TIP

Instead of building from scratch, check out the Oracle Cloud Marketplace for prebuilt integrations to avoid wasting time and introducing errors. Use these connectors as is or customize them for your business requirements to save yourself lots of work, headaches, heartache, and hassle!

Stop Configuring, Start Connecting

Cloud-based integration solutions reduce time to delivery by eliminating the need to install and, to a large extent, configure the platform for specific company needs. But setting up the platform to be ready to connect to applications is still as large a problem as ever. For example, consider the following questions:

- » What security protocols does that application require?
- » Do you have the application-specific security credentials for the integration platform to create, read, update, and/or delete the data?

- » Is there just one instance of the application deployed or several?
- » Which instance is the correct one to use for integration?

As more cloud-based applications and services continue to be added to the integration platform, how can this process be streamlined or, better yet, automated to simplify cloud integration complexity?

Auto-association of SaaS applications removes the time-consuming and error-prone step of having to configure your integration platform prior to integrating applications.



TIP

With Oracle Cloud applications such as Oracle Sales Cloud, Oracle Service Cloud, Oracle Marketing Cloud, Oracle CPQ Cloud, Oracle HCM Cloud, NetSuite, and others, you have the ability to bypass the complexity of setting up the integration platform for these applications.

Enable Self-Service Integration

Just before you drop down the most advanced ski slopes, a warning sign is usually posted with a “double black diamond” to alert you that these slopes are too difficult

for most skiers. Although integration platforms don't post such signs, many of them should. Only the most expert of integration developers is able to successfully use many highly advanced integration platforms to navigate the difficulties.

Oracle Self-Service Integration uses a completely new paradigm to simplify integration, relying only on knowledge of the applications and not on complex deep-dive integration and automation terminology. This means more employees, including citizen developers and business analysts in marketing, sales, human resources (HR), and other departments, can now easily collaborate on integrations with IT specialists so that your projects hit the mark and get to market much faster.

The bottom line: Your business experts — the rainmakers and game changers who know your applications best — can build most of your simple application integrations on their own, freeing your specialized integration developers to focus on the complexities of advanced integration, automation, and governance.

Build Once, Deploy Anywhere

As organizations put more of their application infrastructure in the public cloud, many of the objectives of lower costs, faster time to deploy, and better scalability (up and down) to respond to spikes in business demand are likely to be met. Over the next several years, this

balance of integration infrastructure, for many companies, is likely to continue shifting to an increase in cloud-based integration relative to on-premises integration.

For transnational companies, however, it's unlikely that all instances of public cloud integration deployments will stay in the public cloud indefinitely and that all on-premises deployments will remain on-premises. For example, what if a country introduces new regulations that require specific information (such as health records and other sensitive data) to remain within the boundaries of that country or company? In such a case, the company would need to redeploy its integration platform that passes customer data from the public cloud to an on-premises private cloud infrastructure. What factors determine the level of difficulty in transitioning an integration platform from public to private, or vice versa? What happens when one company buys another? What happens to its data, which is widely recognized as the real currency of the attention economy? It could all be lost, unless it is properly handled, moved, transformed, and integrated.

Another example may involve a transnational company with deployments in Europe, Asia-Pacific, and North America that has a federated integration strategy to focus on the specific needs of each geographical region. If this global integration solution consolidates in one geography from three countries down to one, it's easy to imagine

the complexity if the different platforms use different architectures, standards, or products.



TIP

There are three primary factors to consider when determining the difficulty in transitioning deployments:

- » **Common integration components for cloud and on-premises models:** These components typically include application connectors, a transformation mapper, data enrichment, integration monitoring, and lookup tables. If the cloud-based integration platform uses entirely different tools than the on-premises equivalent, migrating the integration can be exceedingly complicated.
- » **Common architecture between on-premises integration and cloud-based integration:** If the systems and data architectures for your data and applications are the same whether on-premises or in the cloud, public and private cloud portability will be a far less complex challenge.
- » **Common standards:** If the industry standard business process execution language (BPEL), for example, between your cloud and on-premises deployment is identical, this simplifies the reuse of components when a migration of the integration platform takes place.



TIP

Common architecture, standards, and components spanning cloud and on-premises integration tools used within Oracle Data Integration (such as DIPC, GoldenGate, Oracle Data Integrator, and others) and Application Integration (SOA Suite on-premises and Oracle SOA Cloud Service in the Oracle) Cloud means you don't have to rewrite integrations as applications move back and forth.

Integration made simple

Integration is often cited as one of the major barriers for organizations moving to the cloud. Whether the challenge is real-time synchronization, bringing hybrid environments together, or something else, Oracle integration and API management can help your organization succeed!

Inside...

- Simplify integrations in the cloud
- Keep on-premises and cloud apps in sync
- Implement a unified integration platform
- Monetize your software offerings

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