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**Lawrence C. Miller, CISSP
Bruce Tierney**



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

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Introduction

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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 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 I assume a few things nonetheless!

I 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.

I 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 — I 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, I occasionally use icons to call out important information. Here's what to expect.



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



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



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



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 I can cover in 48 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

With my apologies to Lewis Carroll, Alice, and the Cheshire cat:

“Would you tell me, please, which way I ought to go from here?”

“That depends a good deal on where you want to get to,” said the Cat — er, the Dummies Man.

“I don’t much care where . . .,” said Alice.

“Then it doesn’t matter which way you go!”

That’s certainly true of *Cloud Integration For Dummies*, which, like *Alice in Wonderland*, is also destined to become a timeless classic!

If you don’t know where you’re going, any chapter will get you there — but Chapter 1 might 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 I don’t recommend upside down or backward).

I promise you won’t get lost falling down the rabbit hole!

Chapter 1

New Opportunities for Cloud Integration and APIs

In This Chapter

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

In this chapter, you learn how dramatically application integration has 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 application 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 Service, are continually adding more features to simplify integration, such as

- ✔ **Prebuilt integrations** save you the trouble of reinventing the wheel, so you don’t have to start your integrations from scratch every time.
- ✔ An **embedded mapping recommendation capability** leverages best practices and crowd-sourced insights, based on successful integrations by other customers.
- ✔ **Preconfigured connectivity** using your tenant ID is made possible with Oracle’s unique capabilities as a provider of both PaaS and SaaS solutions.
- ✔ A **completely redefined user experience** enables all user personas, including line of business (LOB) and Applications IT, to collaborate with integration developers and architects.
- ✔ **Integration platform portability** supports dynamic business requirements, such as changing industry regulations that might require a rapid migration from cloud to on-premises.

How Integration Ties in with the Rest of PaaS

Clearly, the time for manually creating each new application integration from scratch has passed. To keep pace with rapid SaaS adoption, and to handle the challenge of incorporating mobile and IoT data, a new approach to integration is needed — one that involves offering your integration in the cloud.

Basic integrations can now be easily created by line of business (LOB) application users, “citizen integrators,” and applications information technology (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 exception management 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 based 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.



Download *Public PaaS For Dummies*, Oracle Special Edition, at <http://medianetwork.oracle.com/video/player/4605048776001> to learn more about PaaS.

Ability to Monetize with API Management

APIs provide access to a specific aspect of software functionality.

For example, a new mobile application for Momma 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 would be percentage chance of rain. If the percentage chance of rain is over 10 percent the developer could send a notification to everyone who has the application to alert them of the offer. To access this "RainbyRegion" API, the Momma 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. They 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 their 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, health-care 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. Once 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.



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.

Low Cost of Monthly Subscription-Based Integration

Increasingly, organizations are finding that by using cloud-based platform offerings to develop, deploy, and integrate applications, they can eliminate the cost and complexity of managing the underlying application platforms.

With a subscription-based delivery model, organizations can shift infrastructure and software costs from capital to predictable operational expenses — making it easier to scale environments to meet the changing needs of the business.



Businesses that use PaaS have reported operational savings of up to 50 percent compared to using siloed technology stacks. Simplifying the administration and management of your mid-*de*ware means:

- ✓ Developers can build and integrate new applications faster and more cost-effectively.
- ✓ IT organizations can shift focus from provisioning and maintaining infrastructure to the strategic work of supporting and collaborating with the business.
- ✓ Business users can enhance employee productivity and automate business processes — without involving IT.

Chapter 2

Exploring Use Cases



In This Chapter

- ▶ Keeping apps synced in real-time
 - ▶ Integrating opportunity-to-order apps
 - ▶ Connecting back-office apps
 - ▶ Bringing hybrid environments together
 - ▶ Syncing data to the cloud in real-time
 - ▶ Monetizing app services with application programming interface (API) management
- 

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

Real-time Synchronization: Customer Relationship Management to Oracle E-Business Suite

Today's organizations often need to interface cloud-based customer relationship management (CRM) with enterprise resource planning (ERP) software, such as Oracle E-Business Suite, to enable real-time, event-driven business processes. For example, in order to complete a repair, a field service rep may need to order parts from an inventory control application that interfaces to a CRM system, and then update the customer record in an on-premises billing system. Or 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.com) 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.

Calix: Case study

Calix, a leading provider of broadband communications access systems and software, is using the Oracle Cloud Platform 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 their customers. To help support these customers, Calix needed a technology overhaul that would help the company improve productivity, lower costs, and ultimately accelerate innovation.

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

Using Integration Cloud Service, 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 Integration Cloud Service to quickly and easily integrate on-premises and cloud applications, including Salesforce and Oracle E-Business Suite. Leveraging prebuilt adapters, the company was able to build integrations between its key business systems in just a few hours.

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

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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 using Oracle's PaaS during the summer of 2015.

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

Application Integration: Opportunity to Order

The sales life cycle can be split into four sub-processes: "Lead to Opportunity," "Opportunity to Quote," "Quote to Order," and "Order to Invoice." These sub-processes require seamless integration to ensure that data 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 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 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 potentially introduces errors to

the record. Although some applications automatically share data, there are typically too many different applications from disparate vendors to make these seamless across all the required customer experience (CX) and non-CX applications.

Viavi: Case study

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.

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 user onboarding.

Now, when a user performs specific operations in Salesforce, an outbound messaging process invokes a

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web service to sync up with Oracle E-Business Suite. Viavi uses a combination of Oracle Integration Cloud Service and Oracle SOA Suite 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 IT ecosystem including Salesforce, the Oracle 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 the mobile enablement capabilities of 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 create a new set of mobile applications that can communicate with Viavi's cloud and on-premises applications through standard web services.



Oracle provides a comprehensive solution for integrating cloud and on-premises applications. It leverages Oracle Integration Cloud Service as well as components from Oracle's service-oriented architecture (SOA), business process management (BPM), and data integration technologies such as Oracle Fusion Applications, Salesforce.com, Workday, and Oracle Service Cloud. Oracle Integration Cloud Service and Oracle SOA Suite provides drag-and-drop functionality that makes it quick and easy to integrate your applications.

Real-Time Data Integration to Cloud

Easily bringing up-to-date data into your cloud environment streamlines your cloud initiatives and enables your organization to make the decisions that really matter, where they matter.

One popular and critical use case for real-time data integration to the cloud is quickly and easily onboarding databases to the cloud, without impacting performance or interrupting availability of source production systems. Real-time data integration to the cloud enables organizations to run operational reporting in the cloud and extend data warehousing and big data environments to the cloud, by making real-time data delivery fast and easy. By feeding live production data to cloud-based development and test environments, businesses can have a production-like environment in the cloud.

A 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 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.

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 interface 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 Management allows 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 not just a technical term but what business users are focused on to grow revenue.

A good API management system provides a simple yet robust platform for creating, documenting, securing, 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 application calls via mobile, cloud, and on-premises environments. It can automate a variety of integration scenarios via standard interfaces and permits life-cycle management of the APIs with integrated facilities for development, monitoring, management, and end-of-life maintenance.

A large retailer in the restaurant industry

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.

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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. APIs were built through workflows ensuring easy maintenance and operation. 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.

Chapter 3

Getting Started with Oracle Cloud Integration and API Management

In This Chapter

- ▶ Understanding Oracle Integration Cloud Service (ICS)
 - ▶ Exploring Oracle SOA Cloud Service
 - ▶ Managing application programming interfaces (APIs) with Oracle API Platform Cloud Service
 - ▶ Introducing Oracle GoldenGate Cloud Service
-

In this chapter, you get an overview of some the individual services that comprise the Oracle Cloud Platform for Integration solution: ICS, SOA Cloud Service, API Platform Cloud Service, and GoldenGate Cloud Service.

Oracle Integration Cloud Service

SaaS adoption is driving the need for a cloud-based integration solution. When businesses run their applications in the cloud, connecting information and

processes between them and to on-premises systems is critical. Integration is expected to match the SaaS criteria — instant provisioning, rapid development, maintenance-free, and scalable.

ICS is a cloud-based platform for highly productive, simplified integration in the cloud. It is designed for end-users who have good application knowledge but don't need all the bells and whistles of advanced integration (see “Oracle SOA Cloud Service,” later in this chapter). ICS comes with native connectivity to Oracle SaaS offerings and intuitive connectivity to many third-party applications.

To jumpstart integration, readymade integration packages are delivered in the Oracle Cloud Marketplace for different applications and business scenarios. The Cloud Marketplace is a portal for prepackaged integrations provided by Oracle and Oracle partners. With ICS, integrations can be done in three simple steps: subscribe, integrate, and activate.

When you need to go beyond deploying readymade integrations, ICS provides a point-and-click development environment requiring minimal configuration and zero coding, using concepts and terminology familiar to application users. The interface runs in a web browser, enabling fast and easy development and administration:

- 1. Choose the applications for your integration endpoints to create “connectors.”**

You can think of connectors similar to how electrical cord plugs adapt the wire into the form required by the receiving side (socket).

- 2. Select the information (for example, customer lead contact name and address) you want to transfer from the source application (such as Oracle Sales Cloud).**
- 3. Select the similar information on the target application (such as Oracle E-Business Suite), which might have different names for these business objects.**
- 4. Map the data between the two applications because it was probably stored with different names in each application.**
- 5. Select Activate and let the integrations begin!**

If you want to get fancy, you can optionally enrich your integrations with more advanced mappings. The interface features 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 doesn't exist in the source application (for example, Salesforce.com), but it 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 ICS 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 communication between applications stays open (known as *session management*), and more. Oracle ICS 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.

ICS includes monitoring dashboards that provide developers and administrators with 360-degree views 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 also review, resubmit, and remove errored transactions, all from a single monitoring dashboard.

Oracle SOA Cloud Service

Oracle SOA Cloud Service is a platform in the Oracle Cloud designed for the power user — such as an integration developer who wants all the control and comprehensiveness of a complete integration solution. SOA Cloud Service can be used to rapidly 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 process orchestration, loose coupling of services with an enterprise service bus, managed file transfer, business-to-business electronic data interchange (EDI)

integration, and more. Projects can start immediately without the need to install and configure a platform, and developers are free to innovate.

Oracle SOA Suite (the on-premises twin of Oracle SOA Cloud Service) is a comprehensive, standards-based software suite to build, deploy, and manage integration following the concepts of service-oriented architecture (SOA). The components of the suite benefit from consistent tooling, a single deployment and management model, end-to-end security, and unified metadata management. SOA Suite helps businesses lower costs by allowing maximum reuse of existing IT investments and assets, regardless of the environment (such as operating system, application server, and so on) they run in, or the technology they were built upon.

SOA Cloud Service provides complete access to the SOA Suite software, so that administrators can tune, configure, and monitor the SOA environment. Key functionality includes the following:

- ✔ **Advanced integration:** SOA Suite delivers application connectivity by providing a unified experience to integrate across cloud, on-premises, and business-to-business environments. Components included within the unified platform are the enterprise service bus (the foundation for shared services), process orchestration for business optimization, 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 enterprise services:** Developers can easily create REST and SOAP services for back-end applications, including orchestration capabilities, which can then be exposed with 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 scaleout, and automated backups.

Oracle API Platform Cloud Service

“Cloud first” is a modernization strategy many companies are using 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 application data is adding to this push for outside the firewall access to internal data. As businesses continue to push this 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 tool to simplify, secure, and manage your APIs.

Oracle API Platform Cloud Service (coming in 2016) gives you a faster path to get from new business concepts to production deployment of new services for new revenue by giving you

- ✓ Greater visibility into API usage and key performance indicators
- ✓ Increased flexibility to modify your business application services
- ✓ Better control of development and operations processes

Here are the key features of API Platform:

- ✓ Building APIs
 - Create an API on top of a service that, for example, accesses data formerly locked inside your monolithic applications.

- Rapid API construction with run-ready policies for controlling usage of your APIs.
- ✓ Securing APIs
 - Assign industry-standard securities to your APIs with no coding.
 - Integration with your existing enterprise identity management systems.
- ✓ Deploying APIs
 - Once the APIs are created, they're deployed to an API gateway for usage.
 - One-click deployment of new APIs to gateways.
 - Gateways can run in the Oracle Cloud or on-premises, close to your back-end services.
- ✓ 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
 - Instant visibility into operational metrics on usage.
 - View API business key performance indicators.

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

- ✓ **A completely new user experience — a “cloud first” approach that simplifies API management compared to legacy API management 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.
- ✓ **The realization that API management should not be a standalone isolated tool:** As your API management implementation grows, you’ll likely find that you need other related PaaS technologies and don’t want the cost and complexity of assembling a patchwork of tools into a “Frankenstein” of stitched-together tools. For example, managing APIs layers directly on top of integration must be compatible with enterprise identity management, often needs human based business process management, might need to work closely with a document management system, 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 IaaS, too.

Oracle GoldenGate Cloud Service

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 GoldenGate Cloud Service brings market-leading Oracle GoldenGate as a service in the cloud and enables high-volume and low-latency data movement into Oracle Cloud with faster time to market and ease of use. Real-time data delivery service to Oracle Database Cloud, Oracle Exadata Cloud, and Oracle Big Data Cloud simplifies the integration between on-premises databases and cloud-based Database-as-a-Service (DBaaS), Hadoop, Spark, and NoSQL data services. It allows businesses to extend their data warehouses to cloud and build big data lakes in the cloud with fast time to value. These capabilities focus on providing highly reliable, very low-impact change data capture from heterogeneous sources and high-speed and reliable delivery into the Oracle Cloud.



A Big Data Lake is a large storage repository and processing engine that supports Hadoop.

The Oracle GoldenGate Cloud Service architecture is composed of three primary components:

- ✔ **Capture:** The Capture module is installed on-premises for the source systems and looks for new transactional activity in the source database. Capture reads the result of insert, update, and delete operations by directly accessing the database transaction (redo) logs, and then immediately captures new and changed data for distribution. The Capture module only moves committed transactions — filtering out intermediate activities and rolled-back operations — which reduces load and eliminates potential data inconsistencies.

Further optimization is achieved through transaction grouping and optional compression features.

- ✓ **Trail Files:** Trail Files contain the database operations for the changed data in a transportable, platform-independent data format. Trail Files are a critical component within Oracle GoldenGate's optimized queuing mechanism. They reside on the source and/or target server but exist outside of the database to ensure heterogeneity, improved reliability, and minimal data loss. This architecture minimizes impact to the source system because no additional tables or queries to the database are required to support the data capture process. The Capture module reads once, and then immediately moves the captured data to the external Trail File for delivery to the target(s). In the event of an outage at the source and/or target, the Trail Files contain the most recent data up to the point of the outage, and the data is applied once the systems are online again.
- ✓ **Delivery:** The Delivery module takes changed transactional data that has been placed in a Trail File and immediately applies it to the target database. The Delivery module applies each transaction in the same order as it was committed and within the same transactional context as at the source, enabling consistency and referential integrity at the target.

This modular approach allows each component to perform its tasks independently of the others, accelerating data replication and ensuring fault tolerance and data integrity. Oracle GoldenGate Cloud Service enables high-throughput compressed data transport via secure TCP/IP between on-premises and cloud for secure data movement.

Chapter 4

Five Ways to Simplify Cloud Integration

In This Chapter

- ▶ Using prebuilt integrations and recommendations
 - ▶ Reducing turbulence in the cloud with easy integration
-

Yesterday's integration approach of manually re-creating all your integrations from scratch is no longer fast enough to keep pace with 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 a simple and agile integration platform.

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 re-invented 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, recruiting software that automatically updates human resources and security applications after a prospect is hired is not an uncommon request, so why should every company re-create the same integration?

Another common example associated with integrating sales and customer service software would be when a customer has been contacting your customer support recently about critical issues causing serious disruptions to their business. Your customer support service 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 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 approach reduces the likelihood of errors and gets you a big step closer to a fully integrated real-time digital business.



Instead of building from scratch, use prebuilt integrations to avoid wasting time and introducing errors. Oracle Integration Cloud Service (ICS) contains a portfolio of prebuilt integrations available for use as is, or customizable for your business requirements, saving you lots of work!

Put Crowdsourcing to Work

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 thousand 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 integrations inside a mission-critical integration platform is new. Within Oracle ICS, a recommendation can come from many sources, including Oracle, customers, and partners. For the customer-based recommendations, guidance comes from crowdsourced input of previous users of Oracle ICS. 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 recommendation (relevance) on a scale of one to five stars.



Let the Oracle Recommends feature (coming soon to Oracle ICS) guide you toward best practices for integrating applications — and away from painful mistakes.

Stop Configuring, Start Integrating

Cloud-based integration solutions, available as Platform-as-a-Service (PaaS), have a time-to-market advantage over on-premises integration platforms 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.



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

Enable Application Users to Integrate Applications

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 are able to successfully use many highly advanced integration platforms to navigate the difficulties.

Oracle ICS uses a completely new paradigm to simplify integration, relying only on knowledge of the application itself and not on complex deep-dive integration terminology. This means your non-IT staff — marketing, sales, human resources (HR), and others — can now easily collaborate on integrations with IT so that your

projects hit the market much faster. The bottom line: Your application experts — the power users who know your applications best — can perform most of your application integrations on their own, leaving any advanced integration to the integration developers.

Ensure Cloud to On-Premises Portability

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?

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, and/or products.



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

- ✓ **Common integration components for public and private cloud-based 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 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 public cloud and on-premises deployment is identical, this simplifies the reuse of components when a migration of the integration platform takes place.



Common architecture, standards, and components used for Oracle SOA Suite on-premises and Oracle SOA Cloud Service in the Oracle cloud mean 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!

- **Recognize complexity in the cloud — and how to simplify**
- **Keep on-premises and cloud apps in sync — enable real-time synchronization**
- **Implement a unified service integration platform — manage the patchwork of niche toolsets**

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Open the book and find:

- How to reduce costs with subscription-based integration
- How you can monetize your software offerings
- How to use integration “crowdsourcing” to simplify
- How to leverage prebuilt integration
- How to ensure portability in the cloud

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