



Aptos ONE Retail Experience Platform

Aptos' cloud-native SaaS
platform, to enable enterprises
built for change

► An Aptos White Paper

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Engaging Customers Differently.

Technical Overview

Aptos ONE is Aptos' cloud-native SaaS platform that enables enterprises built for change. The Aptos ONE design principles center around a microservices architecture that gives retailers unprecedented flexibility to create user consumer and associate-facing experiences. In this paper, we will review the platform architecture in detail in an attempt to fully convey all of the implications of the architectural decisions and innovations that have gone into the development of Aptos ONE.

Platform Overview

At the highest level, Aptos ONE is a cloud-native SaaS platform that supports one set of universal capabilities at any touch point. The platform is native to omnichannel, built for change, and designed to enable retailers to compete in the complex world of constant change and disruption.

Aptos began investing in a cloud-native SaaS platform in early 2016 with the objective to address significant gaps we found in how software is delivered in retail. Without question, technology advances made it possible for companies to take advantage of Infrastructure as a Service (IaaS) and Platform as a Service (PaaS), thereby allowing retailers to rapidly scale and pay only for what they use in infrastructure while removing the burdens of maintaining operating systems and databases. However, these alternatives lacked the flexibility and ability to innovate required to stay competitive in a constantly evolving market like retail.

The challenge came from the technology side. Every software provider responded to the availability of IaaS and PaaS by moving their "black box" licensed, on-premise software solutions to the cloud. They typically added a few API's to make it easier to move data and some new configurability options to minimize the challenges due to the inability of cloud-delivered software could to be easily customized. While this approach did certainly drive incremental benefits in the short term, it did not turn out to be a viable long-term strategy for delivering software in the cloud: the promised flexibility was unable to be realized as retailers looked to create experiences that needed to cross multiple software application boundaries.

In 2016, Aptos recognized these limitations and began investing in a project designed to address them. The result of that investment is Aptos ONE. The retail experience platform was first delivered in early 2018, and the first experience on the platform, the Store Selling Experience, was made available later that year. There are several architectural principles that are foundational to the platform: open architecture, mobile-first, "the last upgrade", and extensibility. These principles will each be addressed in more detail below.

Before we look at those principles, however, we will discuss how we addressed the most significant contradiction inherent in delivering cloud-native SaaS into stores.

Rich Experiences, Offline Resiliency

Retailers require two capabilities in their stores that appear on the surface to be wholly incompatible on: rich, agile and personalized digital experiences and offline resiliency. To date, store technology has been architected in order to ensure offline resiliency at all costs...including at the expense of seamless digital experiences. The bandwidth to stores and within stores has historically been expensive, inconsistent, and unreliable, and advances in price and speeds have not done much to resolve the issues. Retailers have responded by architecting stores with a store server or a “Register 1” designed to operate in a server capacity. Unfortunately, however, as soon as you fix hardware, operating system, database, and business software to one specific location, you immediately negate all of the advantages of the cloud.

At the same time, the pressure for retailers to deliver rich, digital experiences in stores was only increasing. Retailers who invested in delivering those types of experiences have found themselves stuck between a rock and a hard place: either invest an inordinate amount of integration into bringing those digital experiences into stores (still anchored by their store server architecture), or risk delivering an interrupted or sub-par experience that is dependent on reliable, consistent bandwidth that retailers have simply not seen with any regularity in their stores.

Aptos ONE tackles this challenge head-on. We realized that retailers would not be able to adopt cloud-native SaaS without first ensuring that it is viable in the highly distributed environment of stores. We also realized that, no matter what kind of experience retailers develop, it is all meaningless if they cannot take the sale at the end of the experience. Thus, our strategy was to develop an enterprise platform, but focus on highly resilient Store Commerce as the first solution to be delivered on the platform.

The technical overview that follows will dive deeper into the elements of the platform. We will also distinguish between Aptos ONE, the platform, and Store Commerce, the solution delivered on the platform.

Platform Layers

The Aptos ONE platform is made up of three layers: the platform layer, the microservices layer, and the experience layer (Figure 1).

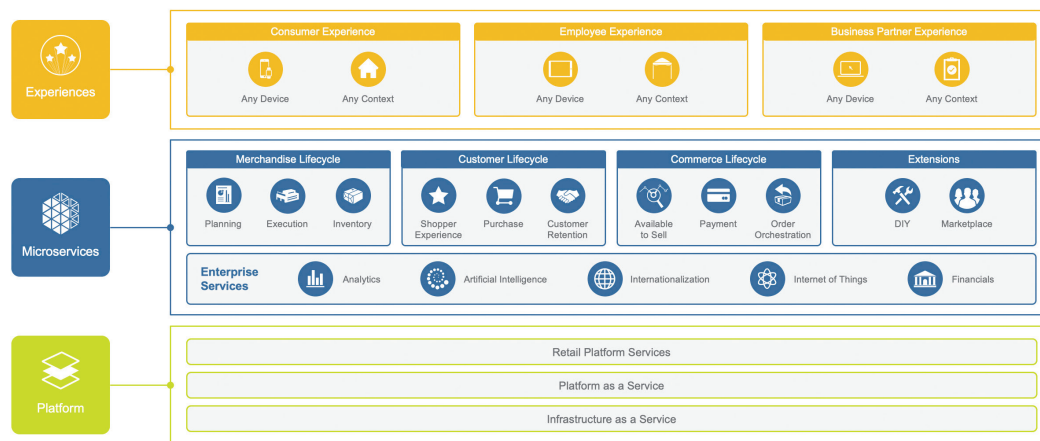


Figure 1: Overview of the three layers of the Aptos ONE platform

The Platform Layer

The platform layer serves as the foundation for delivering microservices that can be assembled into end user experiences. The platform is built on an open architecture, leveraging open systems tools and applications to configure public cloud infrastructure into retail-ready IaaS and PaaS capabilities (Figure 2).

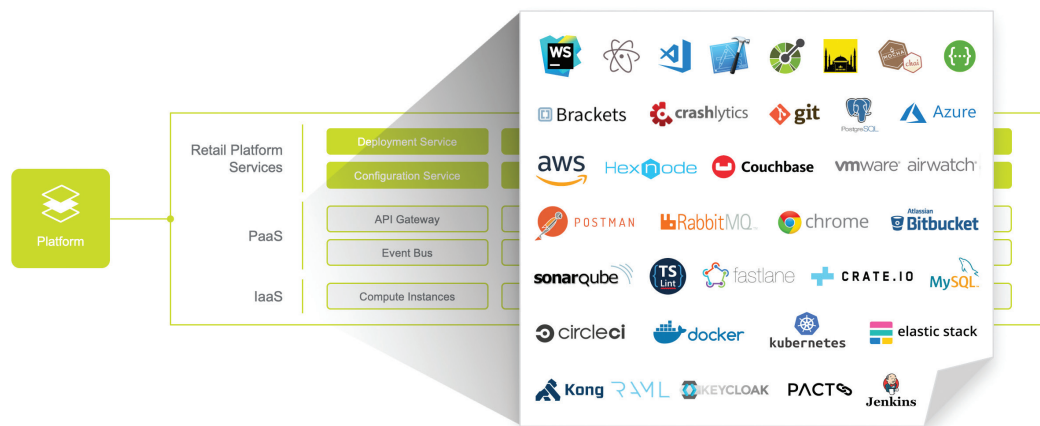


Figure 2: Open architecture and tools make up the platform's foundation.

However, in seeking to configure public cloud infrastructure and open-source tools to enable the platform layer, Aptos discovered that retail required an additional layer of platform services to make possible the local data synchronization and services management that makes cloud-native offline resiliency possible in stores. Thus, Aptos developed additional proprietary services within the platform layer to manage distributed store environments without the need for a local server or “Register 1.”

Additionally, recognizing that flexibility and extensibility will be critical requirements for retailers as they race to adapt to shifting consumer expectations, we developed additional tools within the platform layer for managing integration to other systems via an API gateway. We also included tools for configuring, managing, and monitoring both microservices within the environment and the experiences that leverage those (and other outside) microservices. Collectively, we refer to these services as the “Integration Manager”.

The Microservices Layer

The next layer of the platform focuses on microservices or “process blocks” –individual units of business capability that are both independent and interoperable. These process blocks can be assembled alongside other process blocks and deployed independently to power a variety of experiences.

This is fundamentally different from the approach taken by traditional applications, SaaS-delivered or otherwise. Within traditional software applications, those process blocks are hardwired to each other in “common practice” workflows with pre-determined user interfaces. In a SaaS Platform, and this is a critical principle, *those process blocks exist independent of any process or workflow, and can be leveraged in any experience.*

Aptos organizes capabilities into domains across the Merchandise Lifecycle, Customer Lifecycle, and Order Lifecycle. Because of our focus on enabling the store to be cloud-native and resilient, Aptos focused first on delivering commerce capabilities that reach across the Customer and Order lifecycle, leveraging our industry-leading expertise in in-store experiences. Aptos additionally provides capabilities within the Enterprise domain (capabilities that enhance multiple domains, for example, artificial intelligence or IoT), and provides an Extensions domain.

The Extension domain is a critical differentiator made possible by our microservices architecture. There are seven ways to integrate with other software capabilities, enabling what amounts to “customization” at a very granular level, without ever leaving the support of the platform or the ability to continue to enhance the capabilities on the platform. The seven integration patterns range from using API’s to connect to external systems, whether on premise or in the cloud, all the way to complete control over the user experience design, in which capabilities are delivered as part of that experience as well as the look and feel of that experience.

Another key differentiator of the platform is the ability to make our extension patterns public, accessed through an app store-like vendor marketplace, where any vendor who conforms to our API guidelines and passes our certification process can make their own extensions available to our platform customers.

The Experience Layer

The Experience Layer of the Aptos ONE platform leverages platform tools for assembling microservice process blocks into workflows, and designing the user experience that will expose those workflows to end users. The power of this approach means that there is one common set of services that can be used to power multiple experiences, whether consumer-facing or employee-facing.

We have found that one of the most desired common services in retail today is that of a shared cart that can be used across channels. The ability to access one single cart, whether through an eCommerce desktop experience, a consumer-facing mobile app experience, or even through a clienteling or in-store POS experience, is increasingly a base requirement to serve customers seamlessly across channels. This is one of the most important capabilities that Aptos delivers through Store Commerce.

Store Commerce can be deployed as a native mobile application today, with a focus on iOS and Android operating systems. Given Microsoft's abandonment of a mobile-native strategy, we have rolled our traditional n-tier architecture, Windows-based Store solution under the Aptos ONE Store Commerce umbrella through the use of the Integration Manager. This enables us to provide all of the richness of capability, including omnichannel and internationalization support, while also providing modern API integration and data movement.

Creating Enterprises Built for Change

Visit aptos.com to learn more about how Aptos ONE can help you create a retail enterprise built for change.

About Aptos

Aptos: Engaging Customers Differently

Aptos is the largest provider of enterprise software focused exclusively on retail. Our cloud-based Singular Retail™ solutions are trusted by over 1,000 retail brands in over 65 countries. With industry-leading omnichannel commerce and merchandise lifecycle management solutions, we help retailers develop dynamic and responsive assortments, streamline operations and deliver integrated, seamless experiences...wherever shoppers choose to engage. More than 1,300 colleagues share our collective passion for engaging customers differently, and we are committed to developing relationships built on trust and tangible value by partnering with our clients to create agile retail enterprises that are built to thrive in an era of constant change.

Learn more at info@aptos.com and www.aptos.com.



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