

Introducing Cloud OS for architects



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The transformation of IT

The proliferation of devices, applications, open-source solutions, social computing, and data along with the rise of cloud computing is making architects rethink the use of IT resources. Here are some examples of the megatrends that are driving the transformation of IT:

- **Devices.** The rapid influx of devices into the enterprise is changing the way corporate IT works. As new generations of users enter the workplace, they want to use their own smartphones, tablets, and other devices, and they expect IT support, regardless of platform or product.
- **Applications.** As acceptance of tablets and smartphones in the workplace continues to grow, users expect greater social and mobile connectivity. IT departments will need to support and integrate these devices and applications, while maintaining security and compliance. Open-source platforms and solutions provide alternatives to building a solution yourself.
- **Big Data.** New devices and applications are leading to exponential growth in the amount of data that needs to be supported in the enterprise. IT departments need an effective way for users to gain valuable business insights from new and existing untapped data.
- **Cloud.** Most enterprise data centers simply cannot accommodate the volume of data modern devices and applications are producing. The cloud has emerged as the most viable technical and economic solution to this problem, but it presents its own challenges and requires strategic planning to result in success.

As an Enterprise Architect, you will have to respond to these major technology trends, while also keeping up with more incremental trends in areas like in-memory computing and open-source initiatives. In addition, your organization will likely ask you to support new business models based on these trends, within the confines of an existing IT budget that is mostly dedicated to operating and supporting existing business models. This paper explores how the Microsoft Cloud OS can help you confront all of these challenges and play a valuable role in preparing your organization for the new world of IT.

The Cloud OS vision

The converging trends reshaping IT are creating many challenges, but they are also creating many new opportunities for increasing efficiency, reducing costs, and driving innovation in your organization. Microsoft Cloud OS is designed to help you meet these challenges and take advantage of the opportunities they create by delivering a unified, consistent platform for modern business, both on-premises and in the cloud as shown in Figure 1.

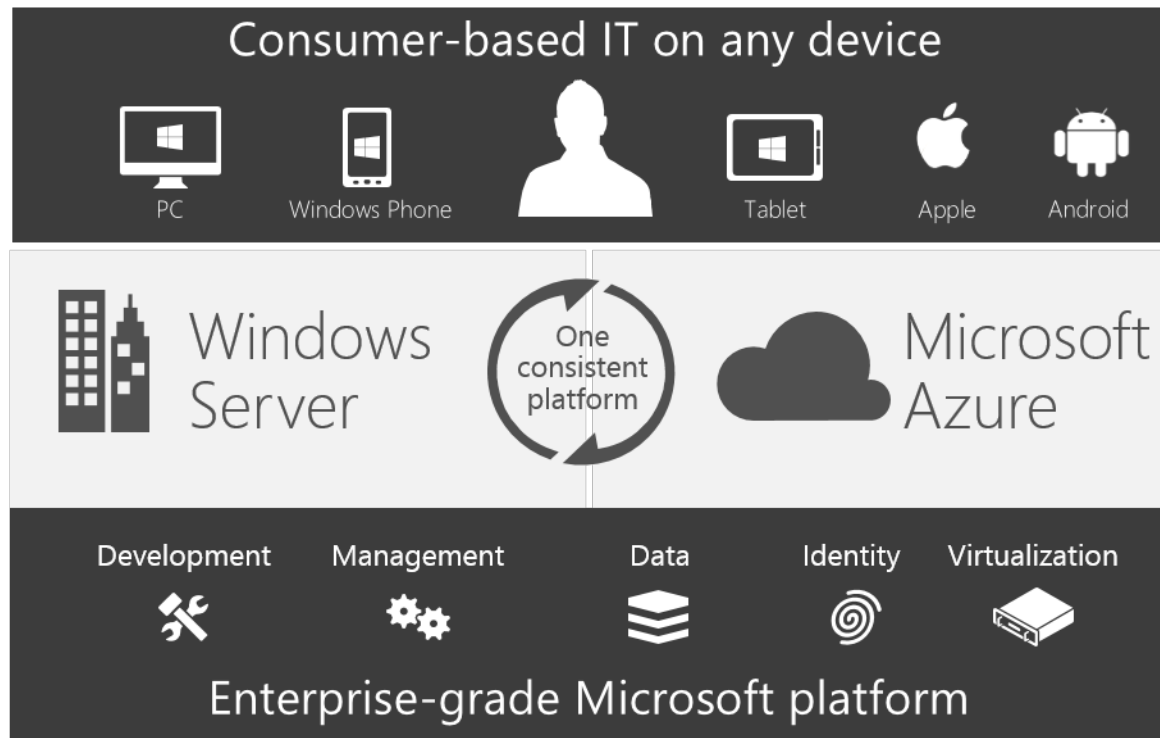


Figure 1. One consistent platform with Cloud OS

The Cloud OS starts with the enterprise-grade Microsoft platform, which provides key services such as data, identity, virtualization, management services, and development tools. The platform provides a common and consistent hybrid design approach that spans between your on-premises and cloud solutions. With Cloud OS, you can provide users with an enterprise experience that matches the expectations of their consumer experience by enabling them to access the applications and data they need on the devices of their choice.

The four core capabilities of Cloud OS

Microsoft Cloud OS provides the following four core capabilities to help you guide your organization into the cloud:

- Transform your data center
- Unlock insights on any data
- Empower people-centric IT
- Enable modern business applications

This section explores each of the four capabilities with examples of architecture patterns for the services and tools provided by Cloud OS.

Transform your data center

Enterprises are running out of space, literally, and need a way to support all of the new requirements for compute, network, and storage. As an architect, you will want to look for quick wins to help ease your organization into the cloud. Taking advantage of an architecture blueprint (available at <http://msdn.microsoft.com/dn630664>), as shown in Figure 2, can help you extend your organization's line-of-business (LOB) applications to Microsoft Azure for a quick win.

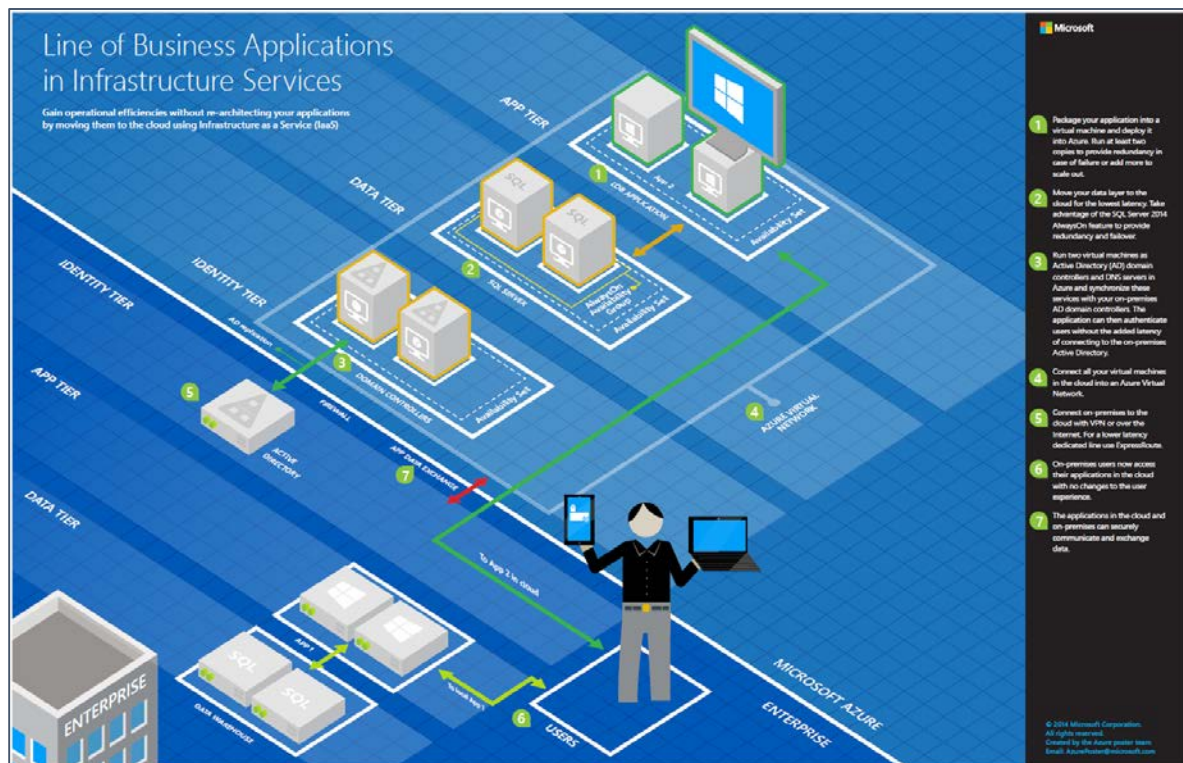


Figure 2. Infrastructure Services blueprint for LOB applications

To extend your organization's LOB applications to the cloud, first configure an Azure Virtual Network that connects with your on-premises network. Then, move your application, data, and identity tiers as Azure virtual machines within the network. Azure provides Active Directory replication with Windows Server for authentication. SQL Server provides AlwaysOn Availability Groups for high availability within the data tier. Virtual machines for your application tier and other tiers are grouped within availability sets that tell Azure to place the virtual machines in separate racks to minimize the impact if a host rack fails. You can learn more about the pattern by downloading the [Line of Business Applications blueprint](#).

Transforming the data center provides the following benefits:

- **Data center without boundaries.** Combining Windows Server 2012 R2 and Microsoft System Center 2012 R2 with Microsoft Azure allows you to virtualize nearly any workload and easily move workloads from your data center to the cloud. The virtual private network (VPN) gateway in Azure supports secure connections between your data center and Azure. Azure ExpressRoute, in coordination with third-party telecommunication partners, provides private connections between Azure data centers and your on-premises infrastructure, bypassing the public Internet for greater throughput and security.
- **Take advantage of cloud innovation everywhere.** Microsoft provides storage options using commodity hardware with flexible, low-cost configurations that integrate well with existing resources. Azure storage solutions provide boundless capacity with smart hybrid models to extend your storage needs. Network virtualization provides the flexibility to move applications across clouds without physical networking changes. Microsoft access and information protection with Active Directory and Azure Active Directory provides the controls needed to access data without creating barriers.
- **Dynamic application delivery.** Microsoft provides a consistent experience across on-premises environments and public clouds. For example, the Windows Azure Pack for Windows Server allows you to create a private cloud experience using Azure technologies, smoothing migration to the public cloud when you are ready.

Unlock insights on any data

Organizations are looking for better ways to use data to make informed business decisions by asking questions, such as:

- How can marketing and product support take advantage of social media analysis?
- How can operations use machine sensors for throughput and fault analysis?
- How can operations use traffic analysis with partner inventory systems to create an optimized delivery system?
- How can healthcare organizations use real-time patient data with social media to prevent pandemics?

- How can IT operations use network and log analysis to detect malicious intrusions and take corrective actions in real time?
- How can business units take advantage of newly generated data using the skills people already know with the right level of data governance?

Figure 3 shows how the Microsoft modern data warehouse addresses these challenges with a holistic and hybrid approach for bringing data together.

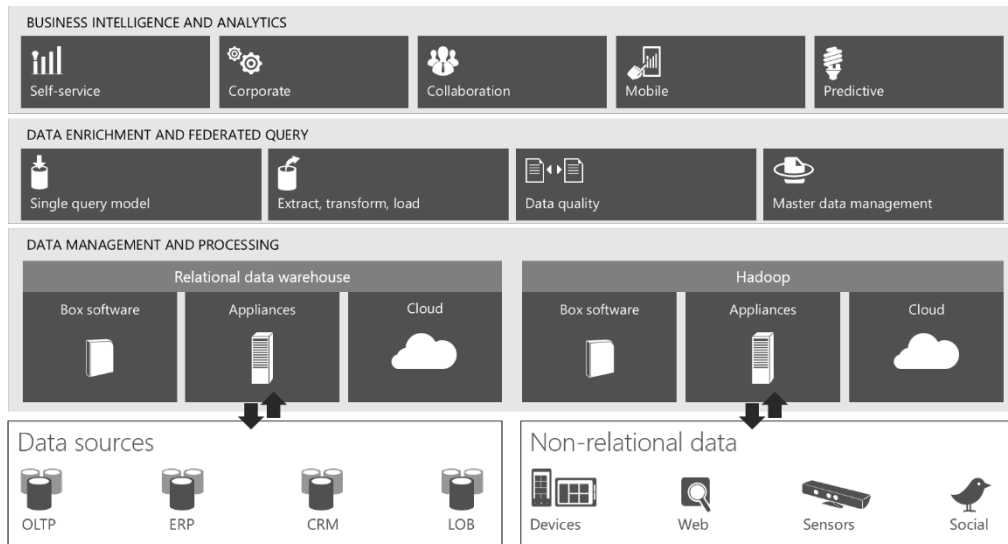


Figure 3. Modern data warehouse approach

Unlocking insights on any data provides the following benefits:

- **Easy access to data, big and small.** Development and business users can take advantage of their existing skills to connect to and manage relational data using Microsoft SQL Server 2014 and non-relational data with Microsoft Azure HDInsight, using 100-percent Apache Hadoop. The Microsoft Azure gallery provides support for a variety of non-Microsoft storage systems, including MongoDB, Neo4j, Cassandra, Oracle, and others.
- **Powerful, familiar BI tools for all.** Business users can find, combine, and visualize both internal and external data with Microsoft Excel and Power BI in Office 365.
- **Unified and complete data platform.** Microsoft's data platform includes BI and analytics, a data enrichment and federated query layer, data management and processing, and infrastructure.

Enable people-centric IT

People-centric IT is all about enabling enterprise mobility for your organization. Today's workers are increasingly mobile and they are using multiple devices to access corporate resources. Forrester research¹ shows that more than half of information workers across 17 countries are using three or more devices for work and there are nearly a billion tablets in use today. Users are asking for a consistent and personalized experience across a wide range of devices with the need to keep corporate information secure.

Figure 4 shows how Cloud OS provides users with a secure, consumer-like experience on nearly any device.

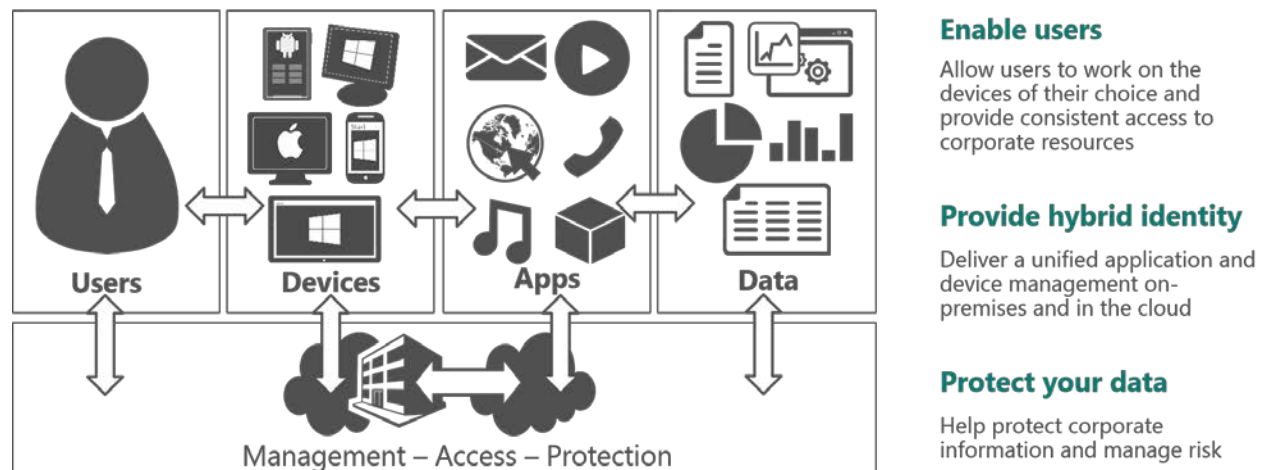


Figure 4. Device management with Windows Intune and System Center Configuration Manager

Taking a people-centric approach to IT provides the following benefits:

- **Enabling users anywhere.** Provide users with consistent company portal experiences and remote desktop applications across platforms, including Windows, iOS, and Android.
- **Protecting your data.** Selectively wipe corporate applications and data from lost or stolen devices. Desktop virtualization provides a secure solution for end users and IT across devices; the data center centralizes data and applications to reduce the risk from lost and stolen devices.
- **Unifying your environment.** Provide client management with Microsoft System Center, extended to the cloud with Windows Intune for new device types.

¹ "2013 Mobile Workforce Adoption Trends," Forrester Research. Feb. 4, 2013.

Enable modern business applications

The need to enable modern business applications is critical. According to Gartner², a quarter of external application implementation spending will go toward supporting social, mobile, cloud, and data analytics trends. Gartner expects that more than half of the effort will go toward enhancing the functionality of existing applications.

The [Multichannel Marketing Application blueprint](#) shown in Figure 5 illustrates how to extend an existing Customer Relationship Management (CRM) system with a new online marketing campaign.

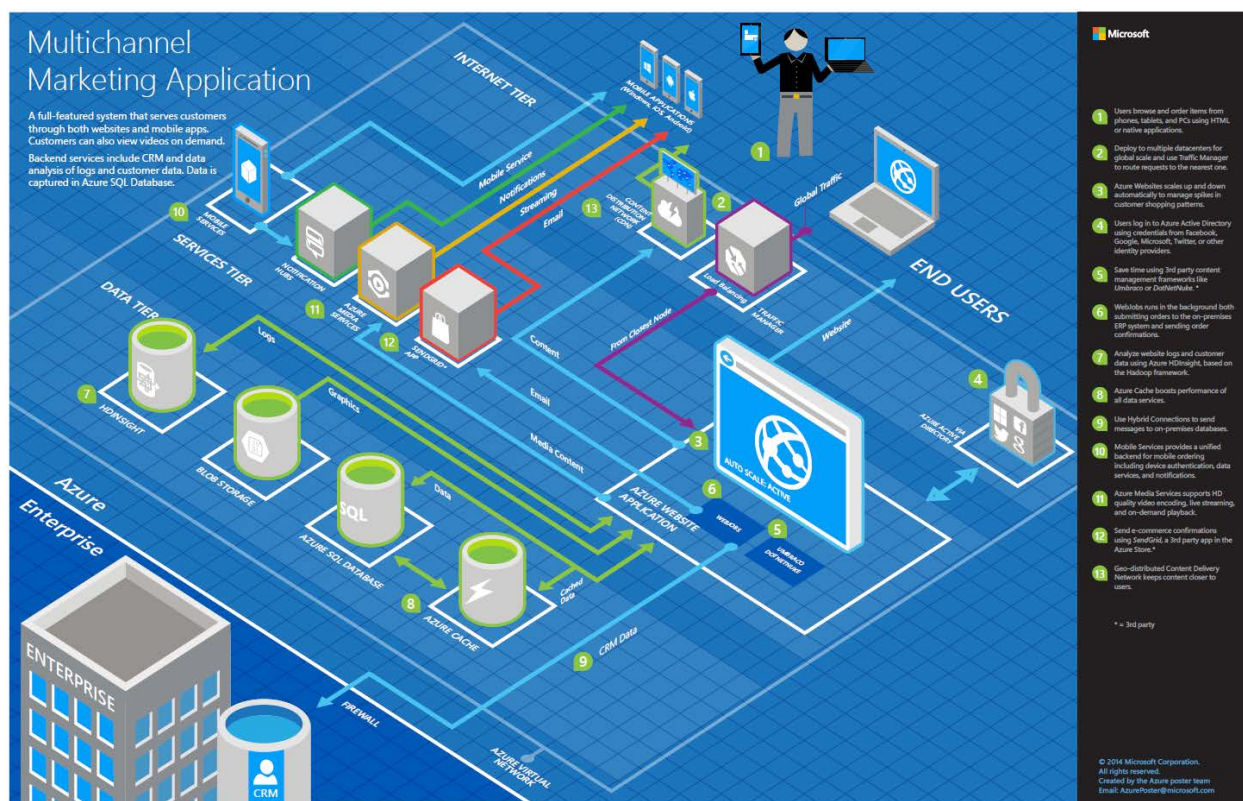


Figure 5. Multichannel Marketing Application blueprint

² Predicts 2013: Business Impact of Technology Drives the Futures Application Services Market," Gartner. Nov. 21, 2012.

Enabling modern business applications provides the following benefits:

- **Reaching any device.** Unify your mobile backend for Windows, iOS, and Android.
- **Extending to the cloud.** Innovate using cloud services without starting over.
- **Delivering mission-critical performance.** Take advantage of in-memory performance with SQL Server and Azure technologies, while maintaining high availability with AlwaysOn and Azure geo-replication and availability features.
- **Developing applications faster.** Microsoft Visual Studio allows you to adopt a rapid application lifecycle powered by the cloud. You can also integrate open-source technologies and use many of the open-source Microsoft Azure virtual machine templates to get you up and running faster.

Next steps

To see what the Microsoft Cloud OS vision can do for your organization, take the next step and check out what Microsoft has to offer:

1. Try Microsoft Azure at <http://azure.microsoft.com/en-us/> along with the new portal at <http://portal.azure.com>.
2. Learn more about the Microsoft Cloud OS vision at <http://www.microsoft.com/en-us/server-cloud/cloud-os/default.aspx>.
3. Try Microsoft Cloud OS by downloading an evaluation that is right for your organization from the TechNet Evaluation Center at <http://technet.microsoft.com/en-us/evalcenter/dn205292.aspx>.

Additional information

To learn more about Cloud OS and supporting technologies covered in this paper, check out the following resources:

- Azure Active Directory: <http://azure.microsoft.com/en-us/services/active-directory/>
- Azure ExpressRoute: <http://azure.microsoft.com/en-us/services/expressroute/>
- Windows Azure Pack for Windows Server: <http://technet.microsoft.com/en-us/library/dn296435.aspx>
- Azure HDInsight: <http://azure.microsoft.com/en-us/services/hdinsight/>
- Office 365: <http://office.microsoft.com/en-us/>
- SQL Server 2014: <http://www.microsoft.com/en-us/server-cloud/products/sql-server/default.aspx>
- System Center 2012 R2: <http://www.microsoft.com/en-us/server-cloud/products/system-center-2012-r2/default.aspx>
- Windows Intune: <http://www.microsoft.com/en-us/server-cloud/products/windows-intune/default.aspx>
- Windows Server 2012 R2: <http://www.microsoft.com/en-us/server-cloud/products/windows-server-2012-r2/default.aspx>

What's next

Stay tuned for the latest information available for architects on MSDN at <http://msdn.microsoft.com/en-us/dn630665>.