

UNIT IV
EXPLORING PLATFORM AS A SERVICE(PaaS)
4.1 PaaS Application Frameworks

4.1.1 Drupal

Drupal is a popular open-source content management system (CMS) that powers millions of websites and applications. It is known for its flexibility, scalability, and robustness, making it suitable for a wide range of use cases from simple websites to complex enterprise applications. Here are some key aspects of Drupal:

Key Features of Drupal:

1. Content Management:

- Drupal allows users to easily create, manage, and organize content using a flexible and customizable content model.
- Content types, fields, and taxonomies can be defined and customized to fit specific needs.

2. User Management:

- Role-based access control (RBAC) allows administrators to define user roles and permissions.
- Users can be categorized into different roles with specific permissions to access, create, edit, and delete content.

3. Extensibility and Customization:

- Drupal has a modular architecture with thousands of modules (plugins) available in its ecosystem.
- Modules can extend core functionality or add new features such as e-commerce, forums, social networking, and more.

4. Themes and Layouts:

- Drupal offers a robust theming system that allows developers to create custom themes or use pre-built themes.
- Themes control the appearance and layout of the site, providing flexibility in design.

5. Multilingual Support:

- Built-in multilingual capabilities allow sites to be translated into multiple languages.
- Content translation, language detection, and language-specific configurations are supported out of the box.

6. Scalability and Performance:

- Drupal can handle high traffic and large volumes of content with caching mechanisms, database optimizations, and scalable infrastructure configurations.
- It supports distributed environments and can be deployed across multiple servers for improved performance.

7. SEO-Friendly:

- Drupal provides tools and modules to optimize websites for search engines.
- Clean URLs, meta tags, XML sitemap generation, and other SEO features are supported natively or through modules.



Fig 4.1 Artatm.com has a gallery of some of the more attractive and well-known sites built with Drupal.

4.1.2 Eccentex AppBase 3.0

Eccentex AppBase 3.0 is a low-code platform designed for building and deploying enterprise applications quickly and efficiently. Here are some key aspects and features of Eccentex AppBase 3.0:

Key Features of Eccentex AppBase 3.0:

1. **Low-Code Development:**
 - AppBase 3.0 emphasizes a low-code approach, enabling developers to build applications with minimal hand-coding.
 - Visual development tools and drag-and-drop interfaces simplify the creation of workflows, forms, and business rules.
2. **Business Process Management (BPM):**
 - The platform includes robust BPM capabilities for modeling and automating business processes.
 - Users can define workflows, orchestrate tasks, and manage process lifecycles to streamline operations.
3. **Case Management:**
 - AppBase 3.0 supports case management solutions, allowing organizations to handle complex cases, incidents, or customer interactions efficiently.
 - Case data, documents, and communications can be managed within a unified environment.
4. **Integration Capabilities:**
 - Integration with third-party systems and data sources is facilitated through connectors and APIs.
 - AppBase supports RESTful APIs, SOAP services, and other integration methods for seamless data exchange.
5. **User Interface Customization:**
 - Developers can customize user interfaces (UIs) and user experiences (UX) to meet specific branding and usability requirements.
 - UI components, layouts, and themes can be modified without extensive coding.
6. **Security and Compliance:**
 - AppBase 3.0 includes built-in security features to protect data and applications.
 - Role-based access control (RBAC), encryption, and audit trails help maintain compliance with industry regulations (e.g., GDPR,

HIPAA).

7. **Analytics and Reporting:**

- The platform offers tools for generating reports and analytics to gain insights into business processes and performance metrics.
- Dashboards and visualizations help monitor key indicators and make informed decisions.

8. **Cloud Deployment and Scalability:**

- AppBase 3.0 is designed for deployment in cloud environments, providing scalability and elasticity.
- Organizations can scale applications based on demand and leverage cloud infrastructure benefits.

Use Cases for Eccentex AppBase 3.0:

- **Financial Services:** Implementing customer service portals, loan origination systems, and compliance management solutions.
- **Healthcare:** Managing patient cases, healthcare workflows, and electronic medical records (EMR) securely.
- **Government:** Automating citizen services, permit processing, and regulatory compliance workflows.
- **Insurance:** Claims processing, underwriting automation, and policy management applications.
- **Retail:** Customer support systems, order management, and inventory tracking solutions.



Fig 4.2 The Eccentex AppBase (<http://www.eccentex.com/platform/platform.html>) PaaS

4.1.4 Squarespace

Squarespace is a popular all-in-one platform used for building and hosting websites, online stores, and blogs. It's known for its user-friendly interface, elegant design templates, and integrated features that simplify website creation and management. Here are some key aspects of Squarespace:

Key Features of Squarespace:

1. Design Templates:

- Squarespace offers a collection of professionally designed templates that are responsive and mobile-friendly.
- Users can customize templates with drag-and-drop functionality, adjusting layouts, fonts, colors, and more.

2. Content Management:

- Easily create and manage content including pages, blogs, galleries, and portfolios.
- Built-in content blocks for text, images, videos, forms, and social media

integration.

3. E-commerce Capabilities:

- Squarespace supports online store functionality, allowing users to sell physical and digital products.
- Features include product listings, inventory management, order processing, and secure checkout.

4. SEO and Marketing Tools:

- Tools for search engine optimization (SEO) to optimize site visibility in search engine results.
- Built-in analytics to track website traffic, visitor behavior, and sales performance.

5. Integrated Blogging:

- Create and manage blogs with features like scheduled posts, categories, tags, and commenting.
- RSS syndication and integration with social media platforms.

6. Domain and Hosting:

- Domain registration and hosting are included with Squarespace plans, simplifying setup and management.
- SSL security certificates are included to secure transactions and visitor data.

7. Integration and Extensions:

- Integration with third-party services and extensions for additional functionality.
- Examples include Google Workspace (formerly G Suite), Mailchimp, PayPal, and more.

8. Customer Support:

- Squarespace provides customer support via email and live chat, with extensive documentation and community forums available.

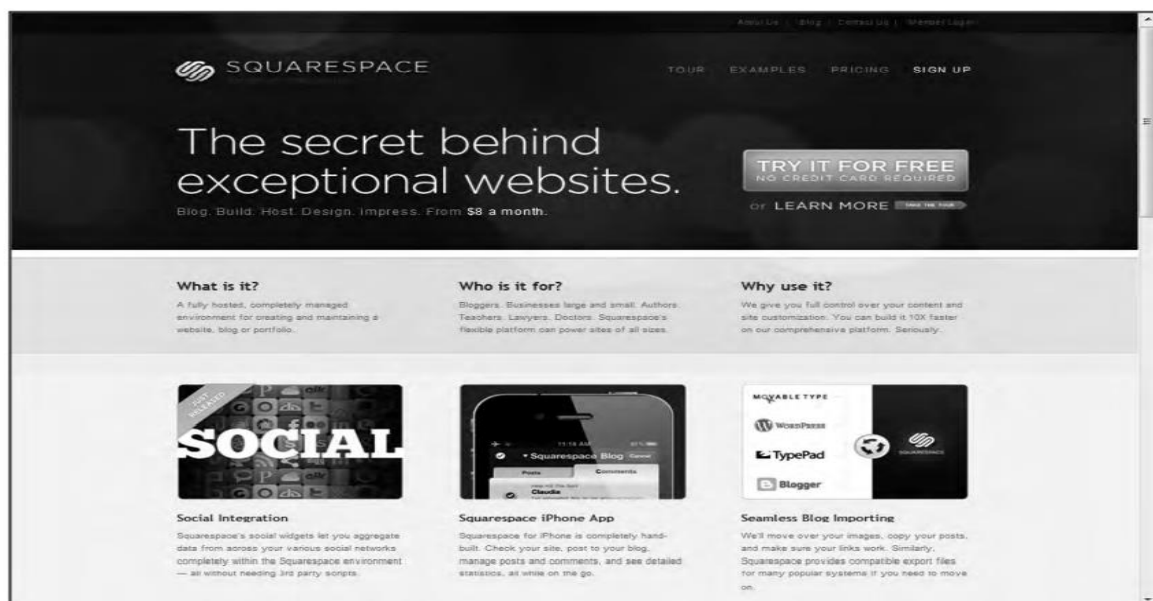


Fig 4.5 Squarespace lets you create beautiful hosted Web sites with a variety of capabilities with visual tools alone.

4.1.5 WaveMaker WaveMaker (<http://www.wavemaker.com/>) WaveMaker is a low-code platform that facilitates rapid application development (RAD) for building enterprise-grade web and mobile applications. It provides developers with tools to accelerate the development process, integrate with existing systems, and deploy applications efficiently. Here's an overview of WaveMaker:

Key Features of WaveMaker:

1. **Low-Code Development:**
 - WaveMaker emphasizes a visual, drag-and-drop approach to app development, reducing the need for manual coding.
 - Developers can build applications using pre-built templates, components, and reusable modules.
2. **Responsive Design:**
 - Applications built on WaveMaker are responsive and adaptive to various screen sizes and devices.
 - Design elements and layouts can be customized to enhance user experience across desktops, tablets, and smartphones.
3. **Integration Capabilities:**
 - WaveMaker supports integration with various databases, APIs, and third-party systems.
 - Connectors and data binding tools simplify integration with enterprise systems like ERP, CRM, and other legacy applications.
4. **Security and Compliance:**
 - Built-in security features ensure application data and transactions are protected.
 - Compliance with industry standards and regulations (e.g., GDPR, HIPAA) is supported through customizable security policies.
5. **Deployment Flexibility:**
 - Applications developed on WaveMaker can be deployed on-premises or in the cloud (public, private, or hybrid environments).
 - Support for containerization (e.g., Docker) and Kubernetes orchestration enhances scalability and portability.
6. **Enterprise-Grade Features:**
 - WaveMaker includes features for business process automation (BPA) and workflow management.
 - Role-based access control (RBAC), auditing, and version control ensure governance and collaboration.
7. **Analytics and Reporting:**
 - Built-in analytics tools provide insights into application performance, user behavior, and business metrics.
 - Reporting capabilities allow users to create and customize reports based on data collected within the application.
8. **DevOps and CI/CD Integration:**
 - WaveMaker supports DevOps practices with features for continuous integration and delivery (CI/CD).
 - Automate build, test, and deployment processes to streamline application lifecycle management.



Fig 4.6 WaveMaker is a visual development environment for creating Java-based cloud applications.

4.1.6 Wolf Frameworks

Wolf Frameworks is an open-source web application framework designed for building PHP-based applications. It emphasizes simplicity, modularity, and flexibility, aiming to streamline the development process and provide developers with the tools necessary to create robust web applications. Here's an overview of Wolf Frameworks:

Key Features of Wolf Frameworks:

1. **Modular Architecture:**
 - Wolf Frameworks follows a modular approach, allowing developers to organize code into reusable modules.
 - Modules can encapsulate specific functionality, making it easier to manage and extend applications.
2. **MVC Pattern:**
 - The framework adheres to the Model-View-Controller (MVC) architectural pattern.
 - Separation of concerns enables developers to maintain clean, structured code and enhance application scalability.
3. **Database Abstraction Layer:**
 - Wolf Frameworks provides a database abstraction layer that supports multiple database management systems (DBMS).
 - Developers can interact with databases using object-relational mapping (ORM) or raw SQL queries as per application requirements.
4. **Template Engine:**
 - A built-in template engine facilitates the separation of presentation and business logic.
 - Developers can create and reuse templates to generate dynamic content efficiently.
5. **RESTful API Support:**
 - The framework supports the development of RESTful APIs (Application Programming Interfaces) for building web services.
 - API endpoints can be defined to expose application functionality and interact with external clients.
6. **Security Features:**
 - Wolf Frameworks includes features for handling authentication, authorization, and data validation.
 - Protection against common security threats like SQL injection and cross-site scripting (XSS) is integrated into the framework.
7. **Form Handling and Validation:**
 - Built-in form handling capabilities simplify the creation and validation of HTML forms.
 - Form data can be processed securely and validated on the server-side before submission.
8. **Extensibility and Customization:**
 - Developers can extend Wolf Frameworks functionality by creating custom modules or integrating third-party libraries.
 - Configuration options allow customization of application settings and behavior.



Fig 4.7 Wolf Frameworks offers an open platform based on SOA standards for building portable SaaS solutions.

Figure 4.8 shows the WOLF platform architecture.

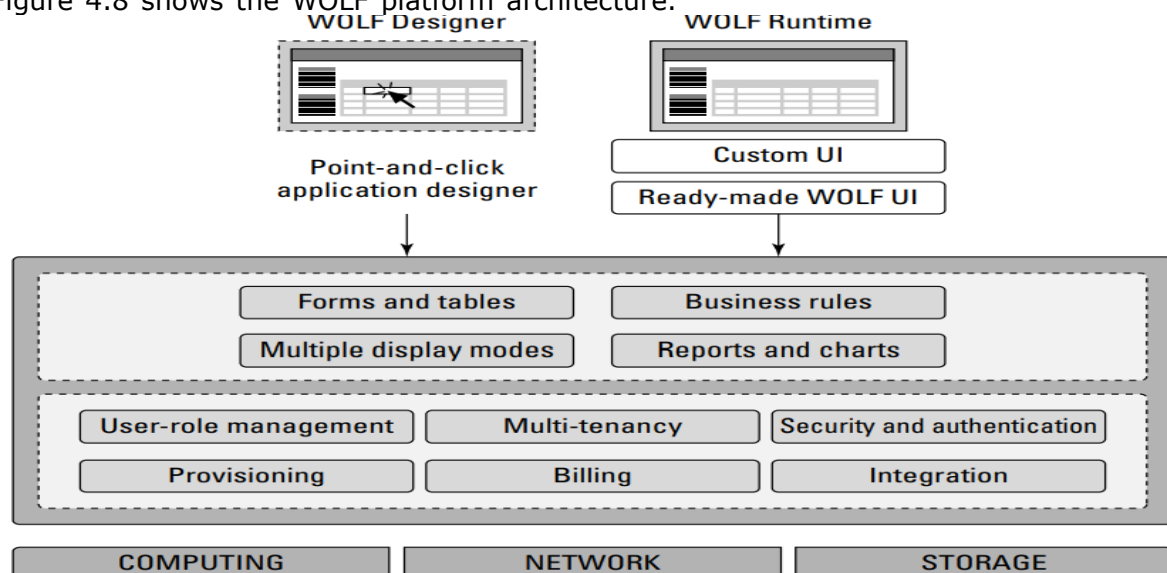


Fig 4.8 The Wolf platform architecture; source: <http://www.wolfframeworks.com/platform.asp>.

4.2 Exploring Platform as a Service Using Google Web Services

Platform as a Service (PaaS) using Google Web Services refers to utilizing Google Cloud Platform (GCP) offerings that enable developers to build, deploy, and manage applications without managing the underlying infrastructure. Here's an exploration focusing on key Google Web Services for PaaS:

Key Google Cloud Platform (GCP) PaaS Offerings:

1. App Engine:

- **Description:** Fully managed serverless platform for building and deploying applications.
- **Features:**
 - Auto-scaling and load balancing.
 - Support for multiple programming languages (Python, Java, Go, Node.js).

- Datastore for NoSQL database needs.
 - Integration with other GCP services.
2. **Cloud Functions:**
 - **Description:** Event-driven serverless functions as a service (FaaS).
 - **Features:**
 - Execute functions in response to events (e.g., HTTP requests, Pub/Sub messages).
 - Support for Node.js, Python, Go, and more.
 - Pay-as-you-go pricing model.
 3. **Cloud Run:**
 - **Description:** Managed compute platform for containerized applications.
 - **Features:**
 - Run containerized applications with automatic scaling.
 - Serverless, billed per request and resource consumption.
 - Integration with Kubernetes for more control (Cloud Run for Anthos).
 4. **Firebase:**
 - **Description:** Platform for building mobile and web applications.
 - **Features:**
 - Real-time NoSQL database (Firestore).
 - Authentication services (Firebase Authentication).
 - Hosting with CDN (Firebase Hosting).
 - Analytics and performance monitoring.

Benefits of Using Google Web Services for PaaS:

- **Scalability:** Easily scale applications based on demand without managing infrastructure.
- **Flexibility:** Support for various programming languages, containers, and development workflows.
- **Integration:** Seamless integration with other Google Cloud services for data storage, analytics, machine learning, and more.
- **Serverless:** Focus on writing code and let Google manage infrastructure, ensuring high availability and reliability.
- **Security:** Built-in security features and compliance certifications (e.g., GDPR, HIPAA).

4.3 Exploring Platform as a Service Using Microsoft Cloud Services

Exploring Platform as a Service (PaaS) using Microsoft Cloud Services involves leveraging Microsoft Azure, which offers a robust set of PaaS solutions for building, deploying, and managing applications without the complexity of infrastructure management. Here's an exploration focusing on key Microsoft Cloud Services for PaaS:

Microsoft Azure PaaS Offerings:

1. **Azure App Service:**
 - **Description:** Fully managed platform for building, deploying, and scaling web apps and APIs.
 - **Features:**
 - Support for multiple programming languages (.NET, Java, Node.js, Python, etc.).
 - Auto-scaling and load balancing.

- Integration with Azure SQL Database, Azure Cosmos DB, and other data services.
 - DevOps integration with GitHub Actions, Azure DevOps, etc.
2. **Azure Functions:**
 - **Description:** Serverless compute service that allows developers to run event-driven code (functions) without managing infrastructure.
 - **Features:**
 - Execute code in response to triggers (HTTP requests, timer-based schedules, Azure services events).
 - Pay-per-use pricing model based on execution and resource consumption.
 - Supports multiple programming languages (C#, JavaScript, Python, etc.).
 3. **Azure Kubernetes Service (AKS):**
 - **Description:** Managed Kubernetes container orchestration service for deploying, managing, and scaling containerized applications.
 - **Features:**
 - Automated provisioning, upgrading, and scaling of Kubernetes clusters.
 - Integration with Azure Monitor for monitoring and logging.
 - Seamless integration with Azure Active Directory (AAD) for authentication and authorization.
 4. **Azure SQL Database:**
 - **Description:** Fully managed relational database service based on Microsoft SQL Server.
 - **Features:**
 - High availability with automatic backups and point-in-time restore.
 - Built-in intelligence for performance tuning and monitoring.
 - Options for scaling resources (compute and storage) based on workload demands.
 5. **Azure Cosmos DB:**
 - **Description:** Globally distributed, multi-model database service for building highly responsive and scalable applications.
 - **Features:**
 - NoSQL database with support for multiple data models (document, key-value, graph, etc.).
 - Automatic scaling with guaranteed low-latency and high availability.
 - Multi-region replication and consistency levels for global distribution.
 6. **Azure Active Directory (AAD):**
 - **Description:** Identity and access management service for securing applications and services.
 - **Features:**
 - Single sign-on (SSO) and multi-factor authentication (MFA) capabilities.
 - Integration with thousands of SaaS applications.
 - Conditional Access policies for controlling access based on user context and device compliance.

Benefits of Using Microsoft Cloud Services for PaaS:

- **Scalability and Flexibility:** Easily scale applications based on demand with built-in auto-scaling and flexible resource allocation.

- **Integration:** Seamless integration with other Microsoft services and third-party tools through Azure Marketplace.
- **Security:** Built-in security controls and compliance certifications (e.g., GDPR, HIPAA) for protecting data and applications.
- **Developer Productivity:** Focus on application development and innovation while Azure manages infrastructure operations.
- **Cost Efficiency:** Pay-as-you-go pricing model with options to optimize costs through resource scaling and management.

Use Cases for Microsoft Cloud Services PaaS:

- **Web Application Development:** Rapidly deploy and scale web applications using Azure App Service or AKS for containerized apps.
- **Serverless Architecture:** Implement event-driven applications and microservices with Azure Functions.
- **Data-Intensive Applications:** Utilize Azure SQL Database or Cosmos DB for storing and managing large volumes of data.
- **Integration and APIs:** Develop and expose APIs securely using Azure API Management and other PaaS offerings.

4.3.1 Exploring Microsoft Cloud Services

Exploring Microsoft Cloud Services encompasses a wide array of cloud computing offerings provided by Microsoft under the Azure platform. Here's an overview of key Microsoft Cloud Services and their capabilities:

Key Microsoft Cloud Services:

1. **Azure Virtual Machines:**
 - **Description:** Infrastructure as a Service (IaaS) offering for deploying virtual servers on-demand.
 - **Features:**
 - Supports Windows and Linux virtual machines.
 - Flexible VM sizes and configurations.
 - Integration with Azure Backup and Azure Site Recovery for disaster recovery.
2. **Azure App Service:**
 - **Description:** Platform as a Service (PaaS) for building, deploying, and scaling web apps and APIs.
 - **Features:**
 - Supports multiple programming languages (C#, Java, Node.js, Python, etc.).
 - Auto-scaling, load balancing, and continuous deployment.
 - Integration with Azure SQL Database, Azure Cosmos DB, and other services.
3. **Azure Kubernetes Service (AKS):**
 - **Description:** Managed Kubernetes service for orchestrating containerized applications.
 - **Features:**
 - Simplified Kubernetes cluster management.
 - Auto-scaling, self-healing, and rolling updates.

- Integration with Azure Monitor for container health monitoring.
- 4. **Azure Functions:**
 - **Description:** Serverless compute service for executing event-driven code.
 - **Features:**
 - Trigger-based execution (HTTP requests, timers, Azure services events).
 - Support for multiple languages (C#, JavaScript, Python, etc.).
 - Pay-as-you-go pricing based on execution and resources used.
- 5. **Azure SQL Database:**
 - **Description:** Fully managed relational database service based on SQL Server.
 - **Features:**
 - High availability, automated backups, and point-in-time restore.
 - Built-in intelligence for performance optimization.
 - Options for scaling compute and storage resources.
- 6. **Azure Active Directory (AAD):**
 - **Description:** Identity and access management service for securing applications and services.
 - **Features:**
 - Single sign-on (SSO) and multi-factor authentication (MFA).
 - Integration with thousands of SaaS applications.
 - Conditional Access policies and identity protection capabilities.
- 7. **Azure Cosmos DB:**
 - **Description:** Globally distributed, multi-model database service for NoSQL data.
 - **Features:**
 - Multiple data models (document, key-value, graph, etc.).
 - Guaranteed low-latency, high availability, and throughput.
 - Multi-region replication and elastic scalability.
- 8. **Azure DevOps:**
 - **Description:** Services for collaborative software development and DevOps practices.
 - **Features:**
 - Agile planning, version control, build and release management.
 - Continuous integration and continuous delivery (CI/CD) pipelines.
 - Integration with Azure services and third-party tools.

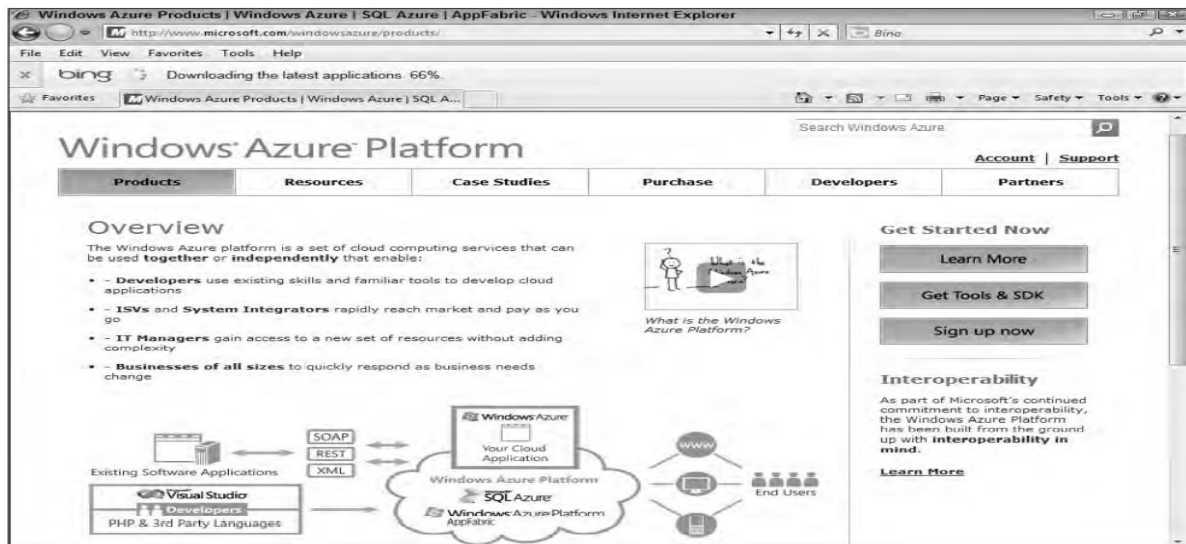


Fig 4.18 The integrated vision for application development and deployment with Azure is illustrated in this overview page of the Azure platform (<http://www.microsoft.com/windowsazure/prod>)

4.3.2 Defining the Windows Azure Platform

The term "Windows Azure Platform" was previously used by Microsoft but has since been transitioned and rebranded under the umbrella of Microsoft Azure. Here's a definition and overview of what was historically known as the Windows Azure Platform and how it relates to Microsoft Azure today:

Windows Azure Platform (Historical Context):

1. Windows Azure (Now Microsoft Azure):

- **Description:** Windows Azure was Microsoft's cloud computing platform that provided a range of cloud services for building, deploying, and managing applications and services through Microsoft data centers.
- **Components:** It included services such as Azure Virtual Machines (IaaS), Azure App Services (PaaS), Azure SQL Database, Azure Storage, and more.
- **Development Tools:** Supported development languages and frameworks included .NET, Java, Python, Node.js, etc.
- **Deployment Models:** Offered options for both public and private cloud deployments, integrating with on-premises infrastructure.

2. Transition to Microsoft Azure:

- **Rebranding and Evolution:** In 2014, Microsoft rebranded "Windows Azure" to "Microsoft Azure" to reflect its broadened scope beyond just Windows-based services.
- **Expanded Services:** Microsoft Azure now encompasses a wider range of services, including infrastructure (IaaS), platform (PaaS), and software as a service (SaaS) offerings.
- **Global Reach:** Available in multiple regions worldwide, with extensive compliance certifications and industry standards support.
- **Integrated Ecosystem:** Seamlessly integrates with other Microsoft products like Office 365, Dynamics 365, and Azure DevOps for enhanced productivity and collaboration.

Microsoft Azure Today:

Microsoft Azure is a comprehensive cloud computing platform that offers:

- **Compute Services:** Virtual Machines, Azure Kubernetes Service (AKS), Azure Functions (serverless computing).
- **Data Services:** Azure SQL Database, Cosmos DB (NoSQL database), Azure Data Lake, Azure Synapse Analytics.

- **Networking:** Virtual Network, Azure Firewall, Azure CDN, Azure ExpressRoute.
- **AI and Machine Learning:** Azure Machine Learning, Cognitive Services.
- **Storage and Backup:** Azure Blob Storage, Azure Files, Azure Backup.
- **Identity and Security:** Azure Active Directory, Azure Key Vault, Azure Security Center.
- **Development and DevOps:** Azure DevOps, Azure Pipelines, Visual Studio integration.

Benefits of Microsoft Azure:

- **Scalability:** Easily scale applications and resources based on demand.
- **Flexibility:** Support for multiple operating systems, languages, frameworks, and tools.
- **Integration:** Seamlessly integrates with other Microsoft products and third-party services.
- **Security:** Built-in security controls, compliance certifications, and advanced threat protection.
- **Global Presence:** Extensive global network of data centers ensuring low latency and high availability.



Fig 4.18 Window Azure Platform's home page may be found at <http://www.microsoft.com/windowsazure>, and is shown in this figure.

4.3.3 The software plus services approach Your computer is an AMI, which you are free to configure however you see fit. AWS facilitates deployments. Google's strategy with Google App Engine (GAE) is to provide a cloud-based development platform that can be used to add your software, as long as it can speak the Google App Engine API and make use of the App Engine framework's objects and properties.

4.3.4 The Azure Platform With Azure's architecture (shown in Figure 4.19), An application may be used both locally and remotely, or it may run in both environments. Azure apps can be used as apps, as services or background operations, or as both. The Windows Azure service is an operating system that runs in the cloud and is housed in Microsoft data centers. It is represented by the oval in Figure 4.19.

4.3.5 The Windows Azure service Microsoft operates Windows Azure, a virtualized Windows infrastructure, across a number of datacenters worldwide. The dashed oval in Figure 4.19 denotes the section of the Windows Azure Platform that is

Azure itself, or the IaaS piece of the platform, which is seen in greater detail in Figure 4.20.

Six main elements are part of Windows Azure:

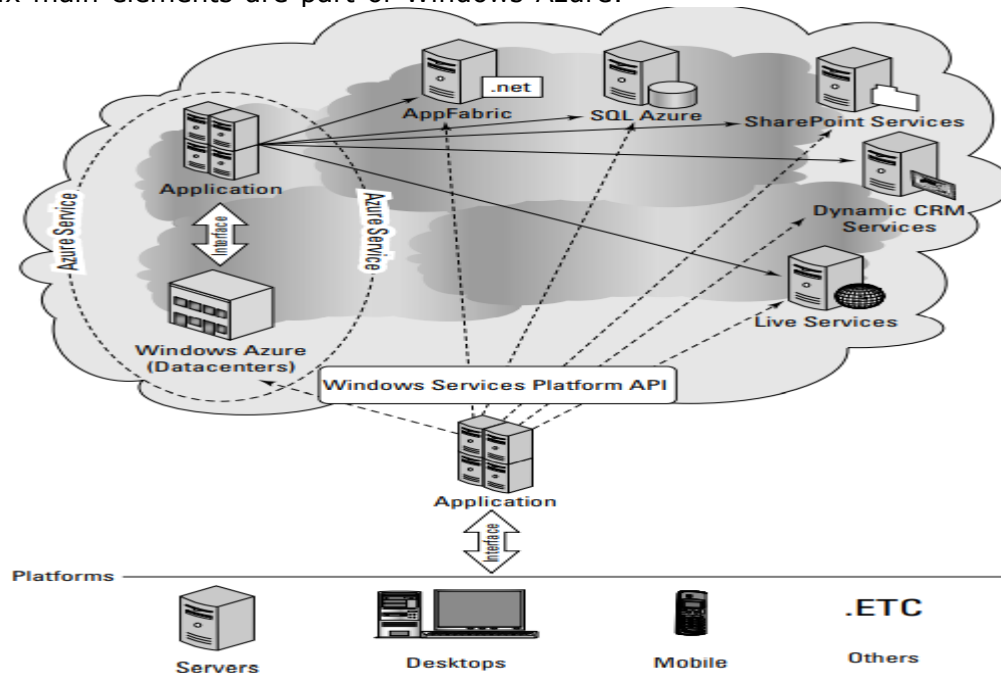


Fig 4.19 The Windows Azure Platform extends applications running on other platforms to the cloud using Microsoft infrastructure and a set of enterprise services.

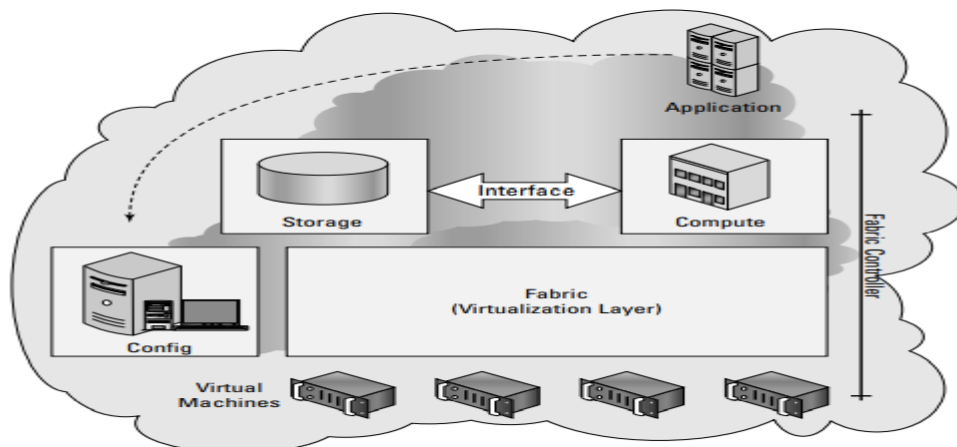


Fig 4.20 Windows Azure is a virtualized infrastructure that provides configurable virtual machines, independent storage, and a configuration interface.

VM Size ¹	CPU Cores	Memory (GB)	Disk Space for Local Storage Resources (GB)
Small	1	1.7	250
Medium	2	3.5	500
Large	4	7	1000
ExtraLarge	8	14	2000

1. Microsoft has not released information that would allow you to match VM sizes to physical systems based on real CPUs.

Table 4.3 Windows Azure Virtual Machine Sizes

VM Size ¹	CPU Cores	Memory (GB)	Disk Space for Local Storage Resources (GB)
Small	1	1.7	250
Medium	2	3.5	500
Large	4	7	1000
ExtraLarge	8	14	2000

1. Microsoft has not released information that would allow you to match VM sizes to physical systems based on real CPUs.

4.3.4 Windows Azure AppFabric

For client requests to Azure Web services, Azure AppFabric (<http://msdn.microsoft.com/en-us/windowsazure/net services.aspx>) is a service bus and access control facility built on .NET technology. As seen in Figure 4.21, the purpose of a service bus in a service-oriented architecture (SOA) is to expose dispersed services as an endpoint from which customers can request services using a specified URI.

Azure AppFabric acts as an SOA service bus, as shown in Figure 4.21.

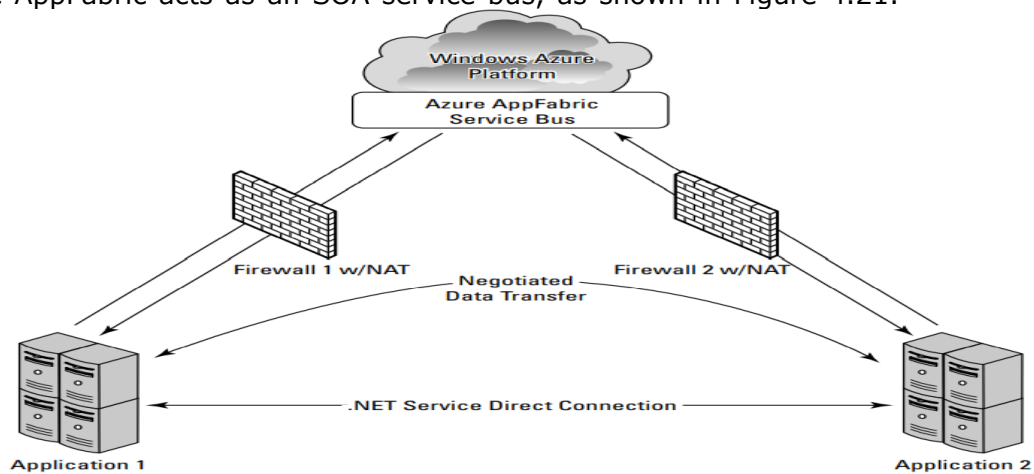


Fig 4.21 Azure AppFabric service pathways

An application or user, as shown on the right of Figure 4.22 presents a claim for a service from an application on the left.

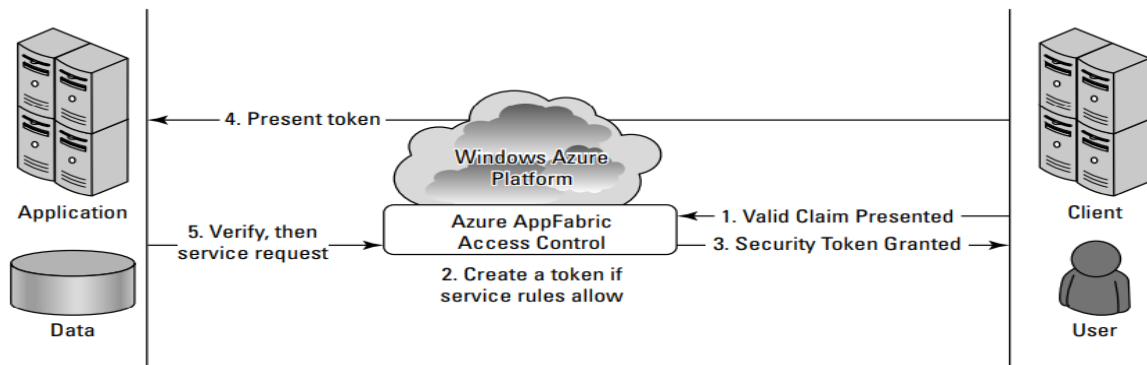


Fig 4.22 Azure AppFabric Access Control enables secure application requests through a token mechanism

4.3.5 Azure Content Delivery Network The global content caching and delivery solution for Windows is called the Windows Azure Content Delivery Network (CDN). The following URLs might be used by a user to view content located in a public container called "Box" under the storage account named "MyAccount":

Windows Azure Blob services URL: <http://.blob.core.windows.net/>

Windows Azure CDN URL: <http://.vo.msecnd.net/>

4.3.6 SQL Azure Cloud-based relational database service SQL Azure is built on top of Microsoft SQL Server. SQL Server Data Service was the previous name of this service. On a PC, mobile device, or server running SQL Azure Database, an application can run locally that makes use of Windows Azure, a datacenter, or a server.

Service Name	URL	Microsoft Description
Admin Center	Windows Live Admin Center SDK	A management utility for a domain using SOAP and RPC.
Alerts	Windows Live Alerts for RSS Feeds	Enables Windows Live Alerts from an RSS feed.
Alerts	Windows Live Alerts SDK	Allows developers to add Windows Live Alerts notification service to an application using SOAP.
Contacts	Windows Live Contacts API	Allows developers to use REST to query the Windows Live People Address Book, as well as to adjust permission to contact data based on the Windows Live ID Delegated Authentication protocol.
FeedSync	FeedSync	Synchronizes information obtained from RSS and ATOM sources.
Live Framework	Live Framework SDK	An API for building Live Mesh application based on Windows Live Services.
Live Framework	Live Framework Tools for Visual Studio	Includes the Live Mesh tools from Visual Studio 2008 and Visual Web Developer Express Edition 2008.
Messenger	Web Toolkit	UI controls for building Web applications using Windows Live Messenger.
Messenger	IM Control	A set of controls that can enable instant messaging in an application.
Messenger	Presence API	An API that can be used to indicate a Windows Live Messenger's presence and control instant messages to that person's browser using a set of HTTP commands.
Photo Gallery	Windows Live Photo Gallery SDK	Allows for the creation and editing of photos and videos using the Publishing Plug-in Platform of Windows Live Photo Gallery inside applications.
Spaces	Windows Live Spaces MetaWeblog API	An API that can use XML-RPC calls to get and send Weblog data.
Spaces	Windows Live Spaces API and Feeds	An API that integrates Windows Live Spaces, Windows Live Events, Windows Live Photos, and Windows Live Profile into applications.
Web Gadgets	Gadgets SDK	Lightweight, single-purpose applets that can run on Windows Live Personalized Experience and Windows Live Spaces.

Service Name	URL	Microsoft Description
Windows Live ID	Web Authentication	Used to integrate Windows Live ID authentication into a Web site.
Windows Live ID	Delegated Authentication	Allows an application to access data for an authenticated Windows Live ID user from Web services and sites that accept that authentication.
Windows Live ID	Client Authentication	An API for Windows Live ID sign-in from a desktop application.
Writer	Windows Live Writer SDK	Allows applications to incorporate the features of the Windows Live Writer in their application. Additional capabilities include features for creating and managing blogs, adding more content, and customizing the Windows Live Writer user interface.

Reference: Based on http://en.wikipedia.org/wiki/Windows_Live_Messenger_Connect. An API for Bing and the toolbar is also available as a service.

Table 4.4. Windows live services