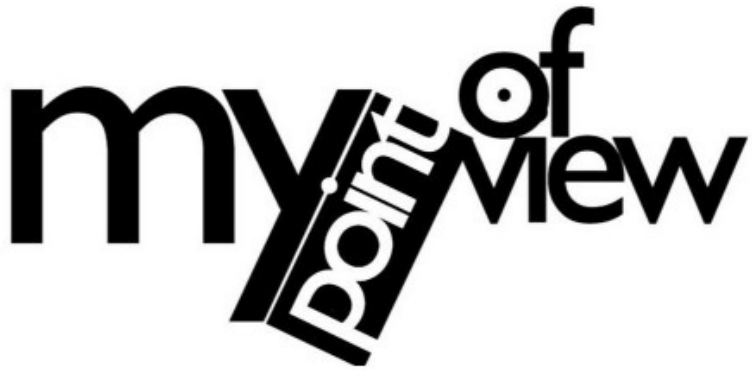
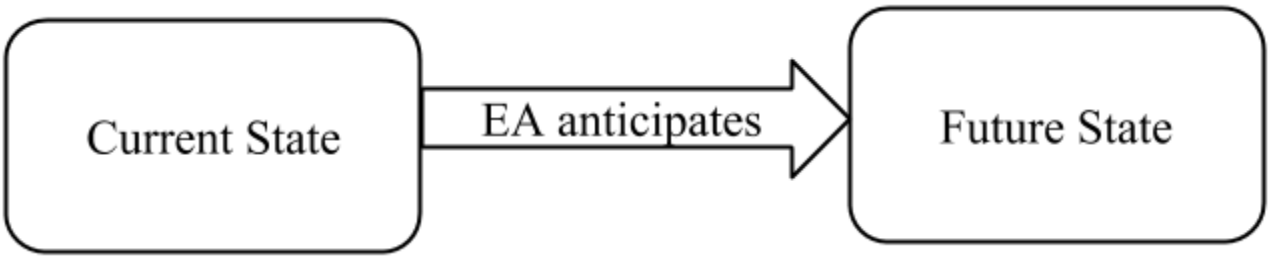
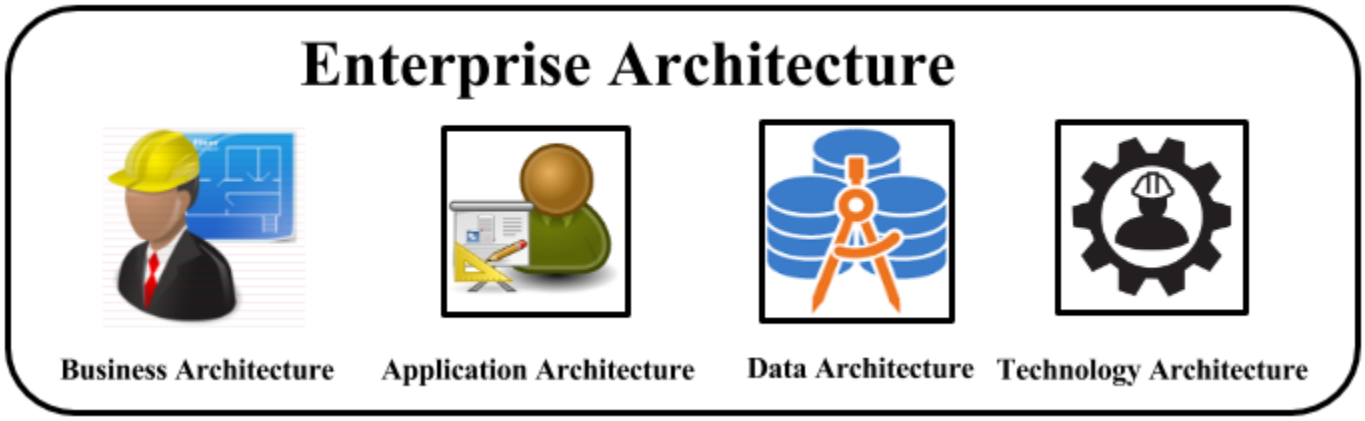
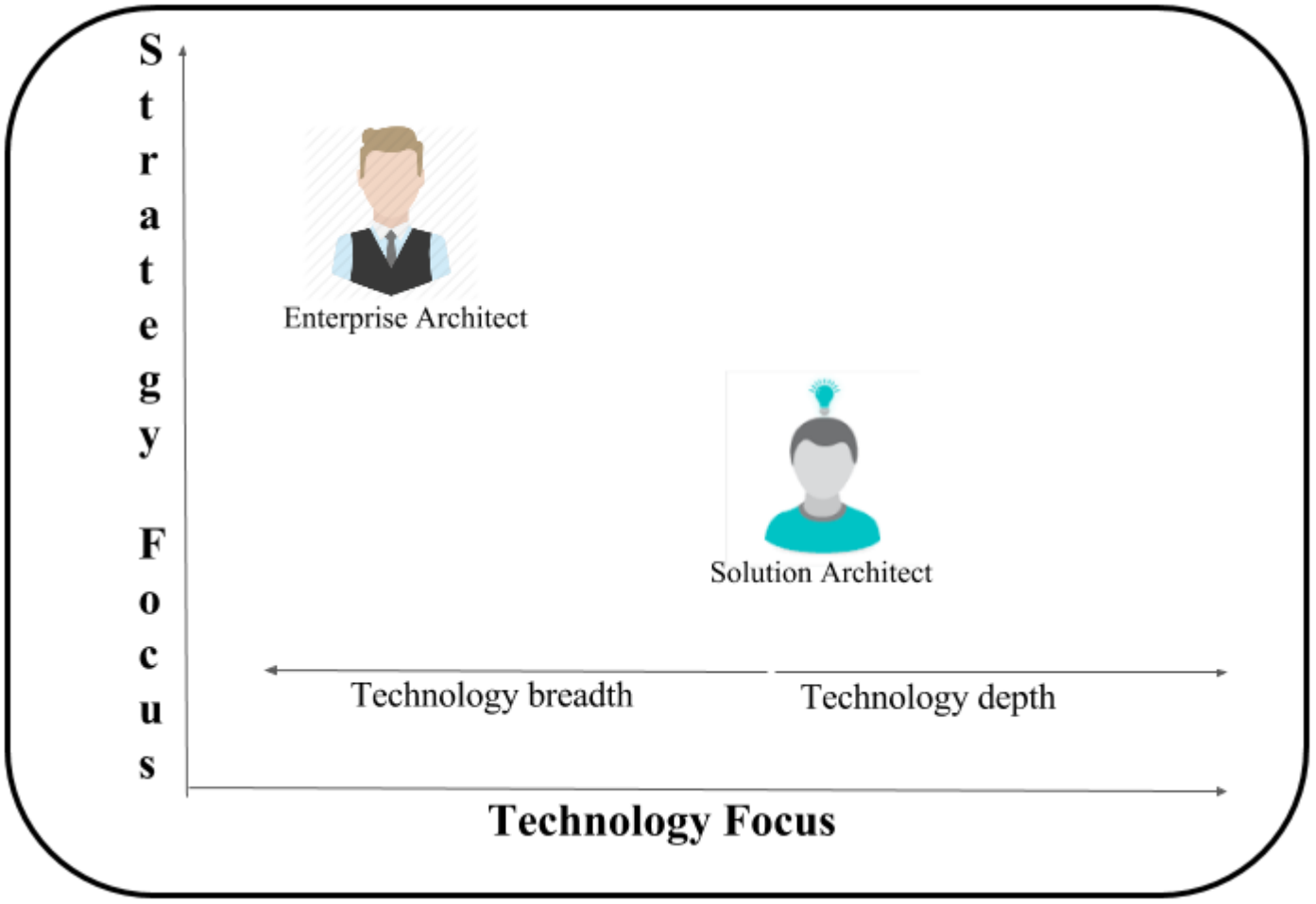
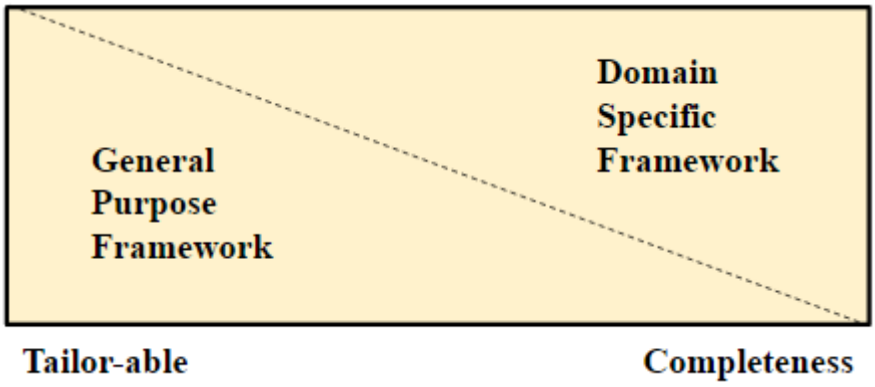
Chapter 1: Enterprise Architecture Concepts

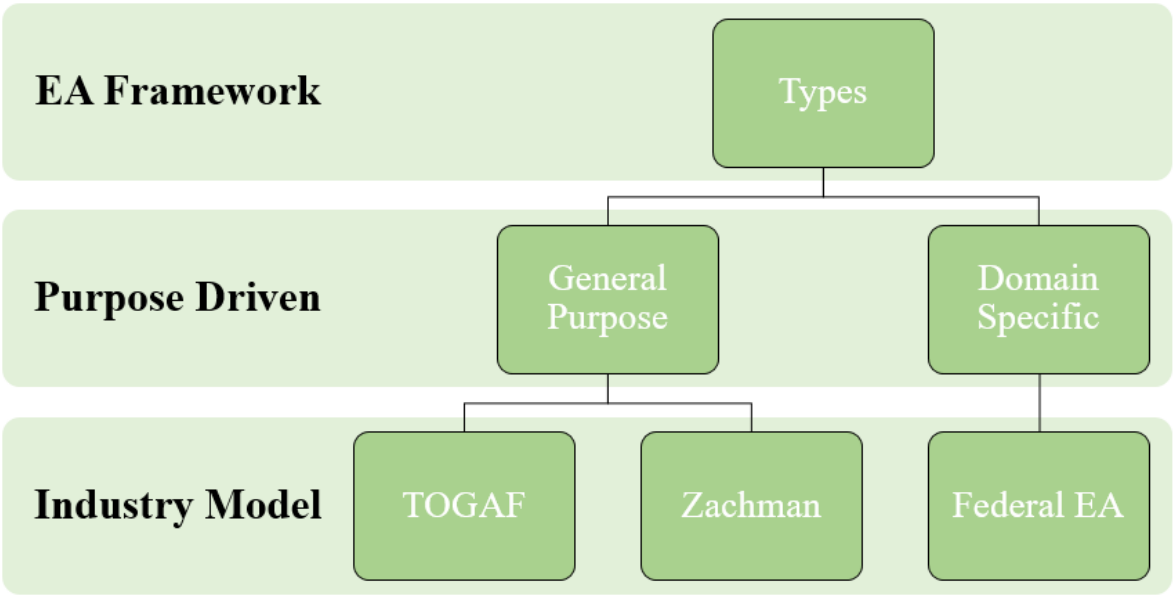


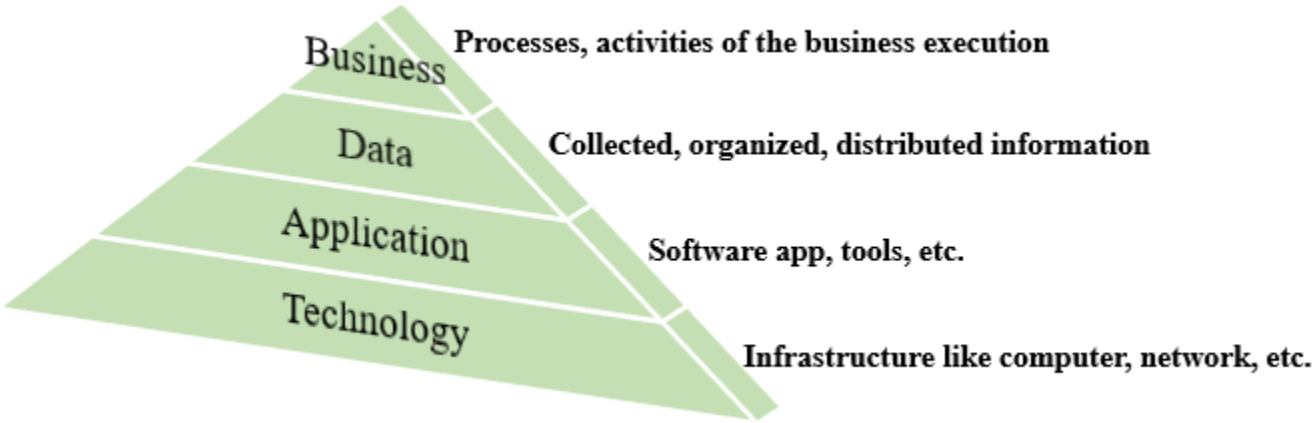


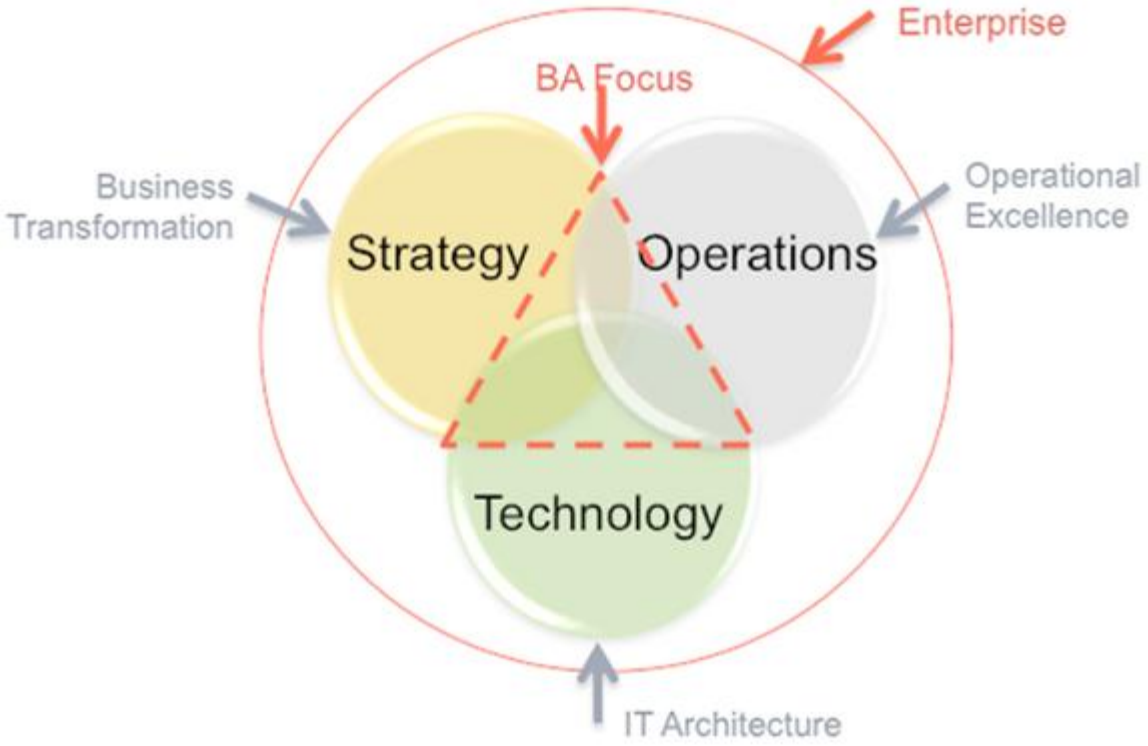


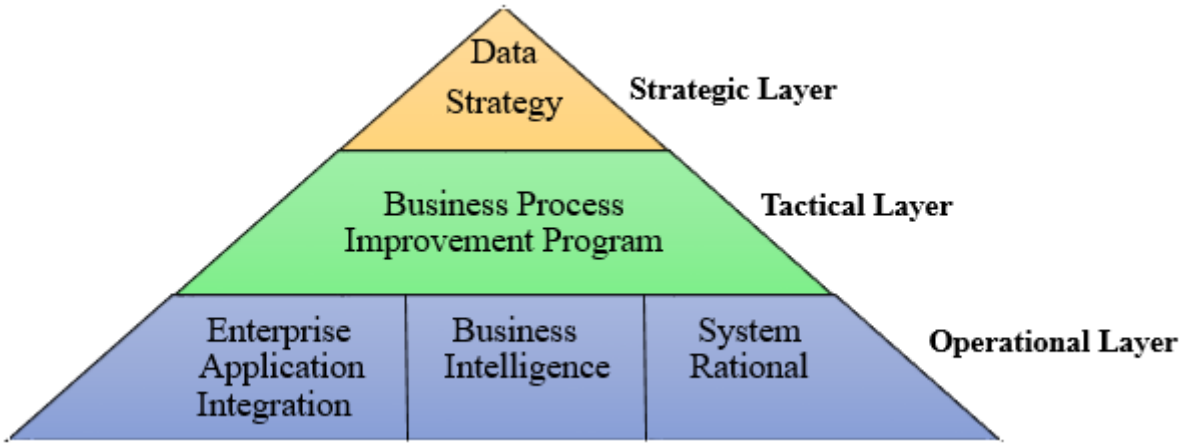

Strategy Focus
Enterprise Architect
Solution Architect
Technology breadth
Technology depth
Technology Focus

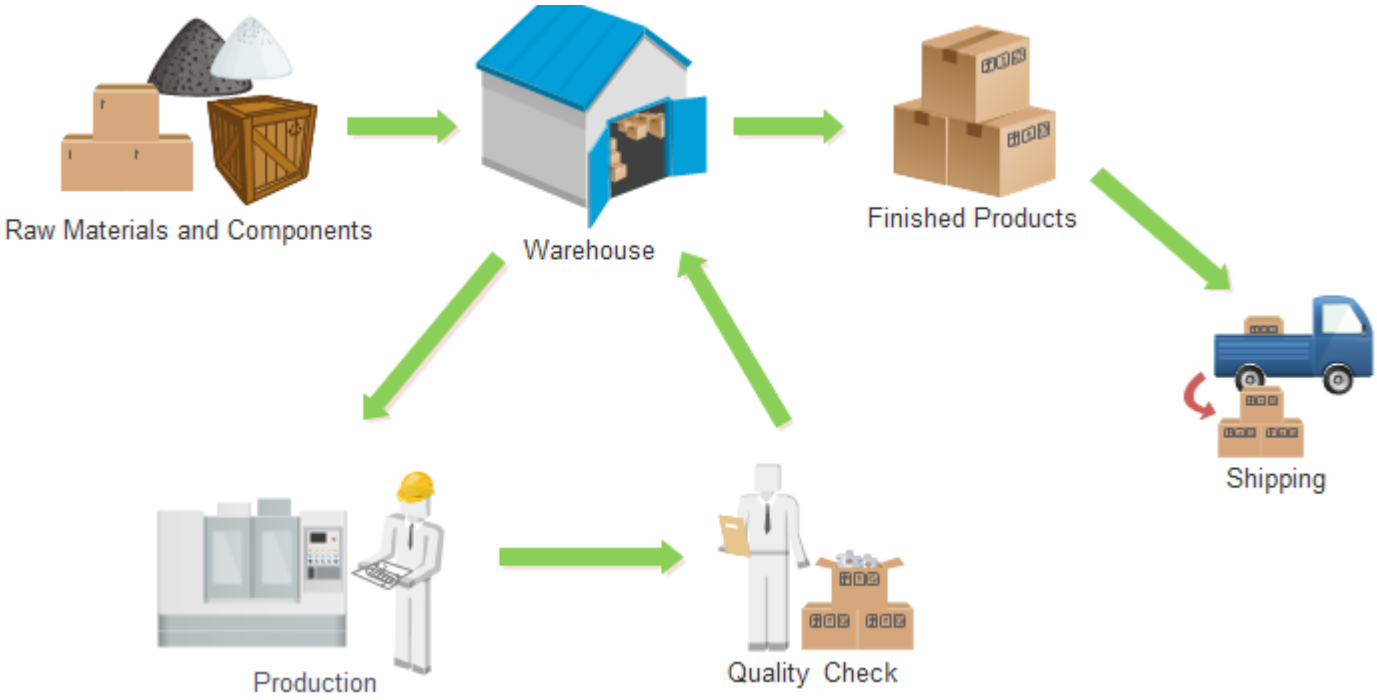

General Purpose Framework
Domain Specific Framework
Tailor-able
Completeness

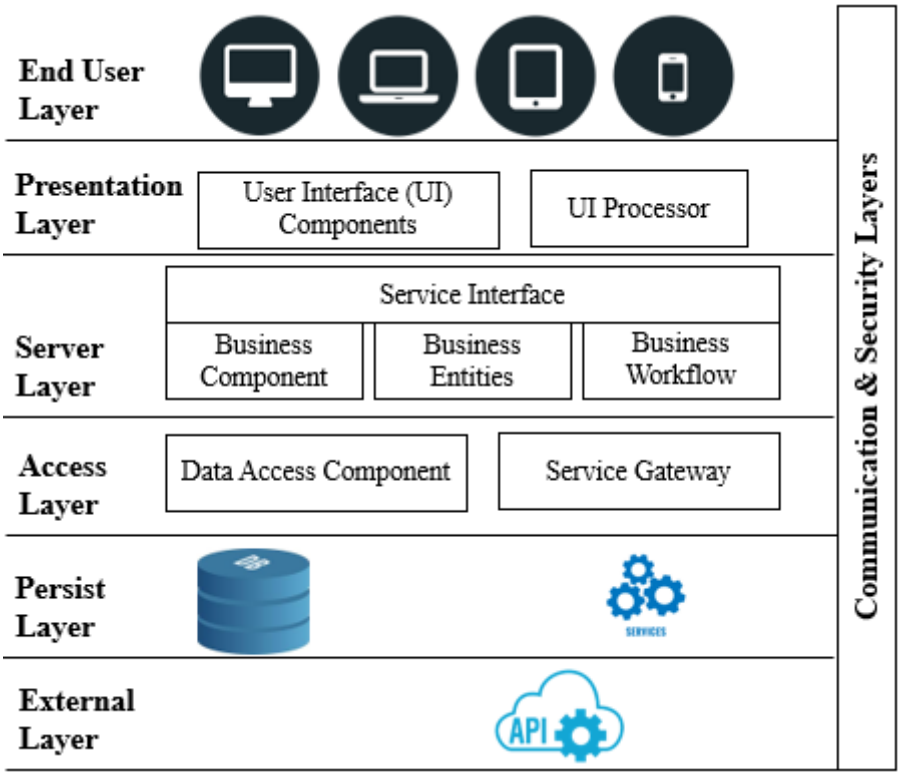

EA Framework
Types
Purpose Driven
General Purpose
Domain Specific
Industry Model
TOGAF
Zachman
Federal EA

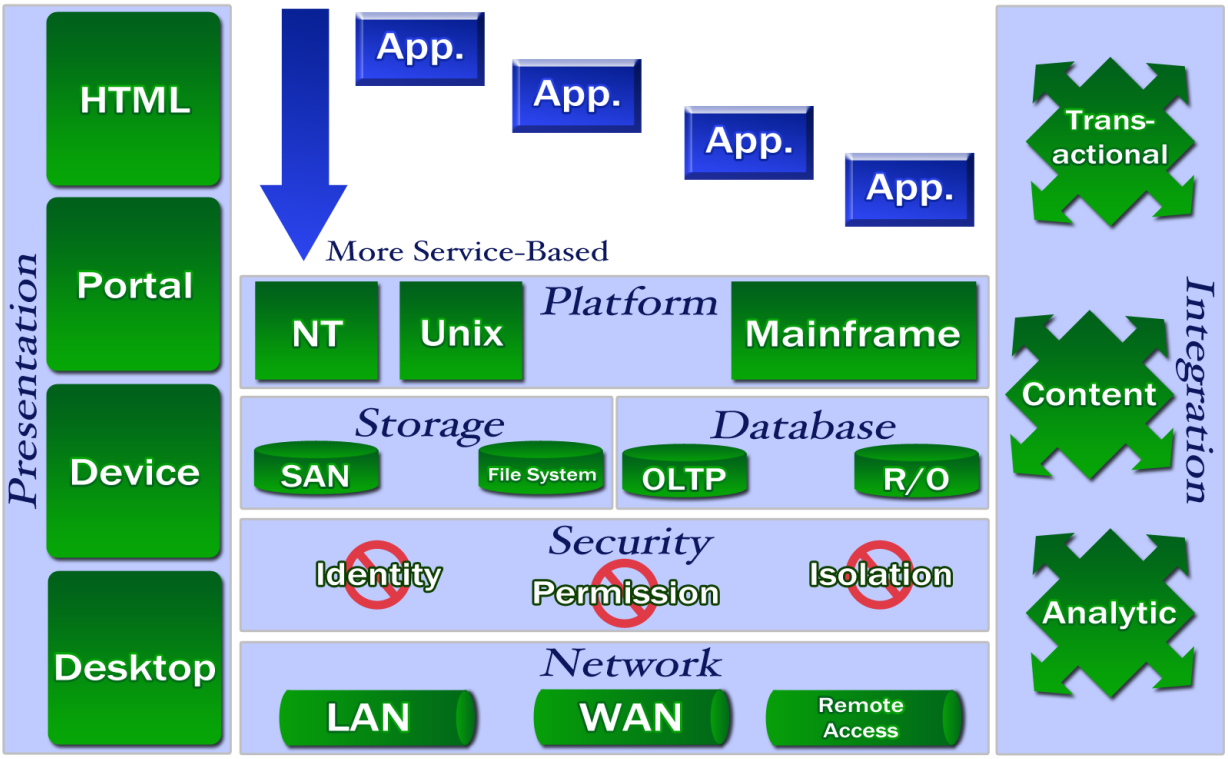

Business
Processes, activities of the business execution
Data
Collected, organized, distributed information
Application
Software app, tools, etc.
Technology
Infrastructure like computer, network, etc.


Enterprise
BA Focus
Business Transformation
Operational Excellence
Strategy
Operations
Technology
IT Architecture

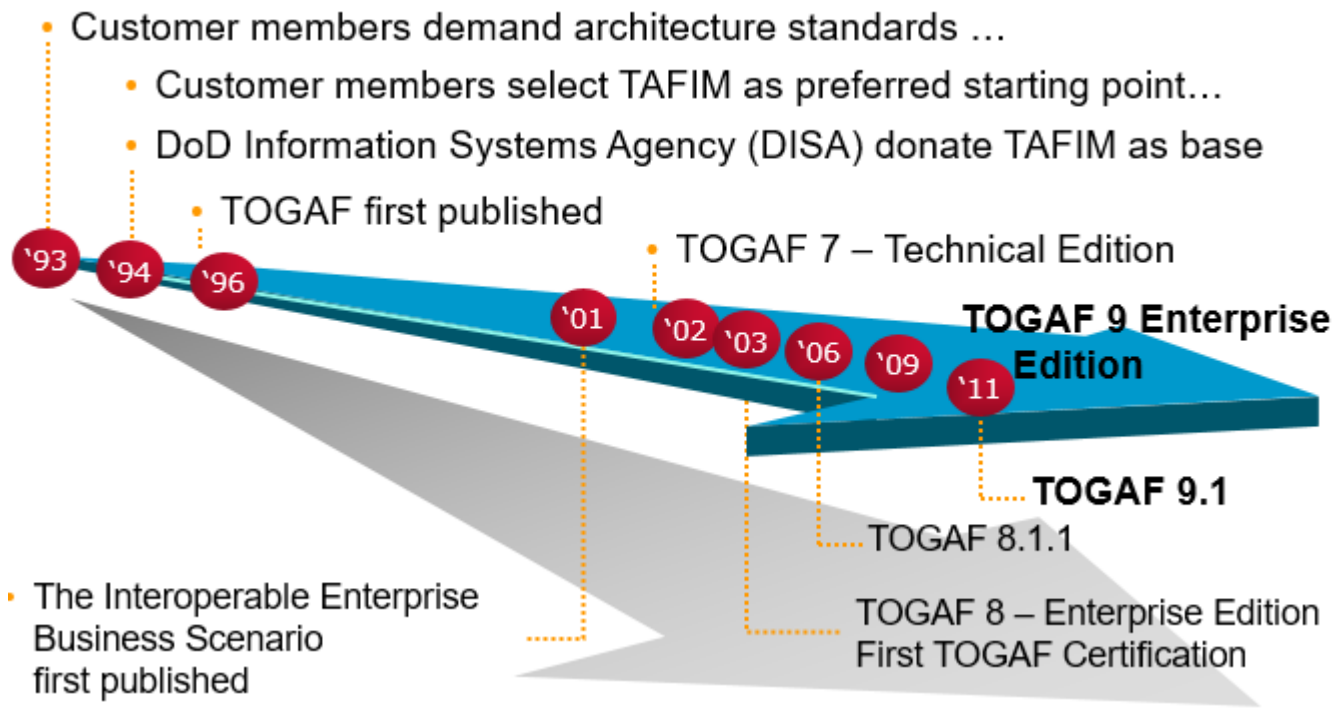

Data Strategy
Strategic Layer
Business Process Improvement Program
Tactical Layer
Enterprise Application Integration
Business Intelligence
System Rational
Operational Layer

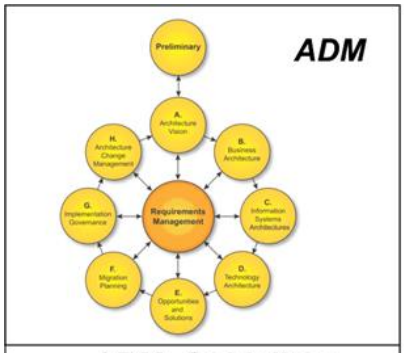

Raw Materials and Components
Warehouse
Finished Products
Shipping
Production
Quality Check

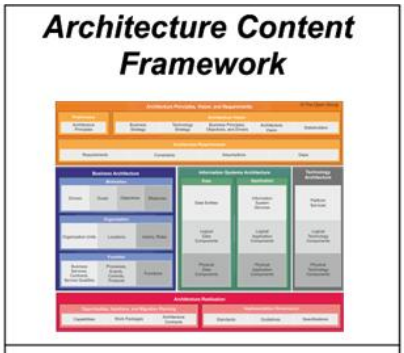

End User Layer
Presentation Layer
User Interface (UI) Components
UI Processor
Server Layer
Service Interface
Business Component
Business Entities
Business Workflow
Access Layer
Data Access Component
Service Gateway
Persist Layer
SERVICES
External Layer
API
Communication & Security Layers

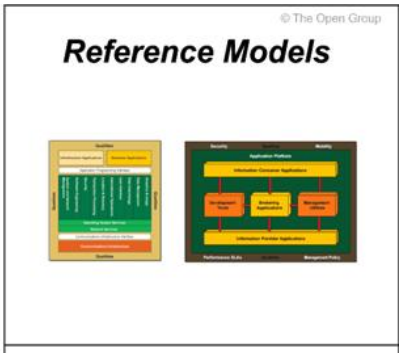


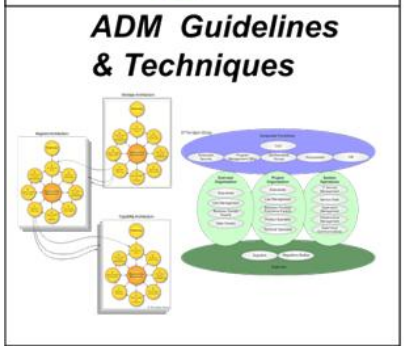
		OSI Model	Examples
Data	7	**Application Layer** Facilitates communiation between software applications like Outlook, IE	Web Application
Data	6	**Presentation Layer** Data representation and encryption	HTTP
Data	5	**Session Layer** Interhost communication	80
Segments	4	**Transport Layer** End to end connection and reliability	Transmission Control Protocol (TCP)
Packets	3	**Network Layer** Path determination and logical addressing	Internet Protocol (IP)
Frames	2	**Data Link Layer** Mac and LLC - Physical addressing	Ethernet
Bits	1	**Physical Layer** Media, signal and binary transmission	CAT5

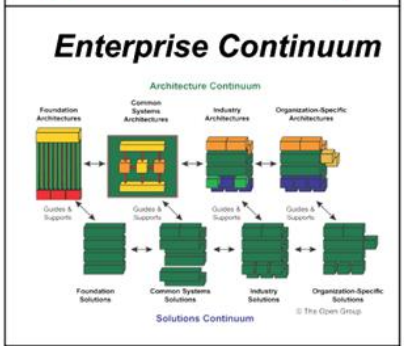

Customer members demand architecture standards …
Customer members select TAFIM as preferred starting point…
DoD Information Systems Agency (DISA) donate TAFIM as base
TOGAF first published
TOGAF 7 – Technical Edition
'93
'94
'96
'01
'02
'03
'06
'09
'11
TOGAF 9 Enterprise Edition
TOGAF 9.1
TOGAF 8.1.1
The Interoperable Enterprise Business Scenario first published
TOGAF 8 – Enterprise Edition First TOGAF Certification

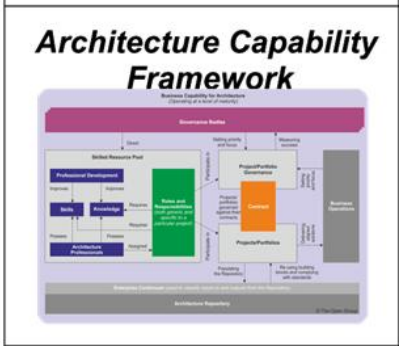


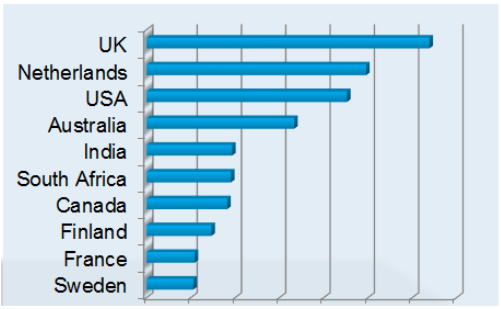


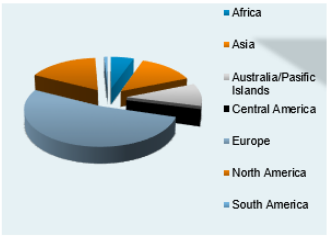




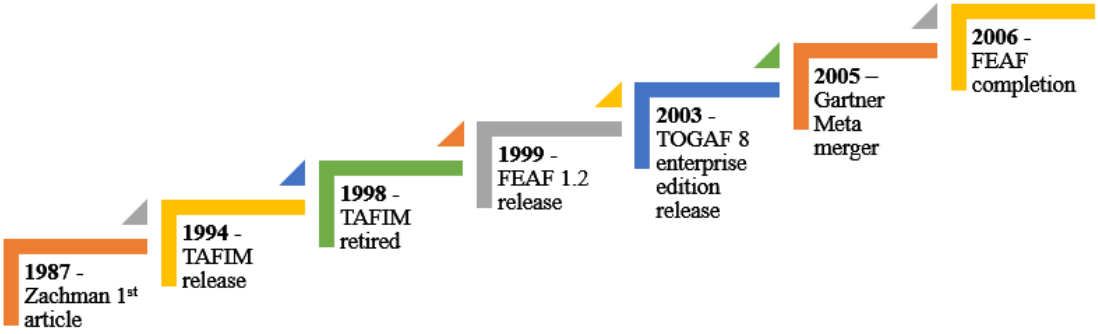


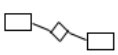
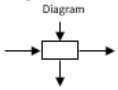
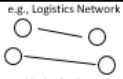
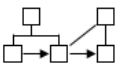
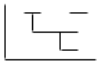
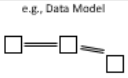
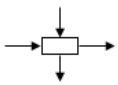
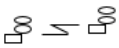
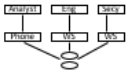
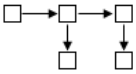
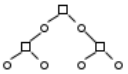
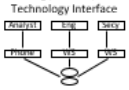
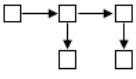




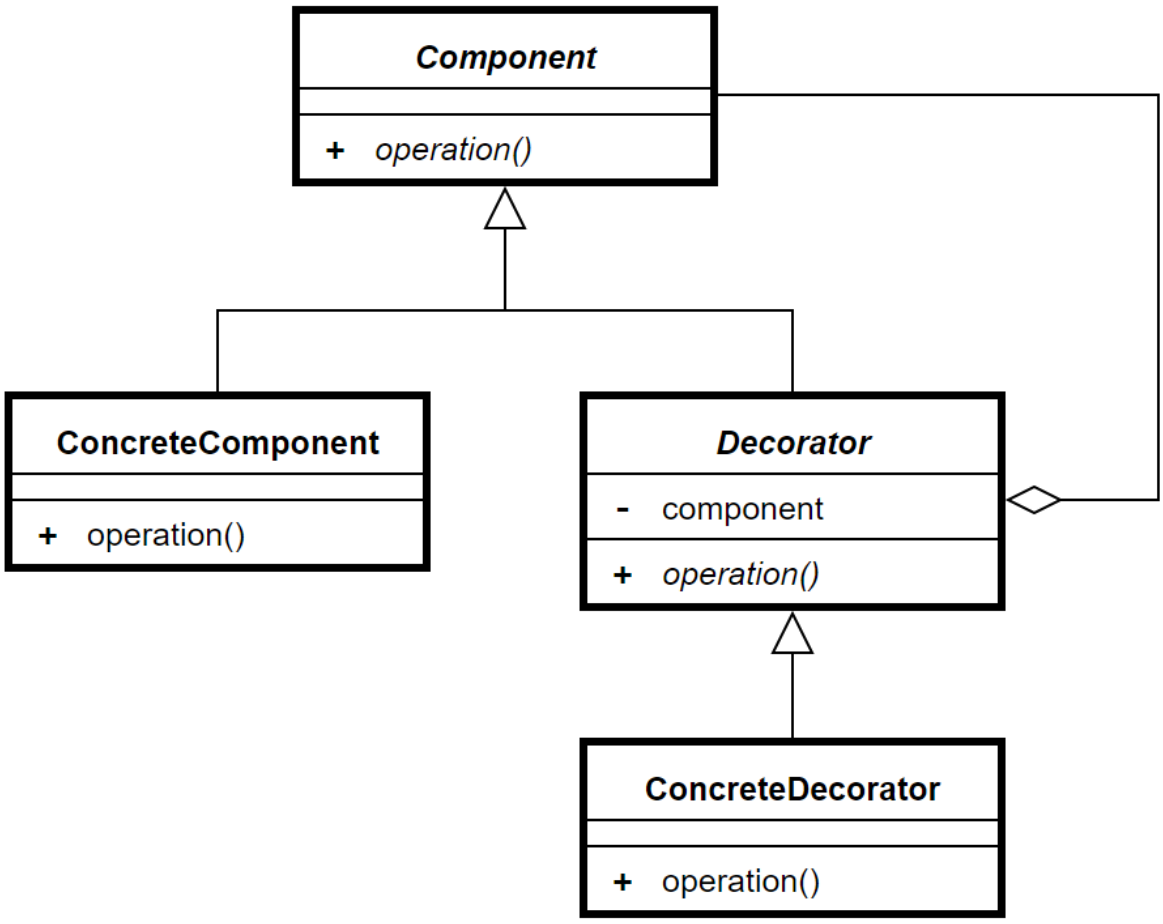


Continental wise Scorecard



		What	How	Where	Who	When	Why
		Data	Function	Network	People	Time	Motivation
REQUIREMENTS ANALYSIS	Scope	List of Things Important to Business	List of Processes the Business Performs	List of Locations Important to Business	List of Organizations Important to Business	List of Events Significant to Business	List of Business Goals/Strategies
	Investor	 Entity=Class of Business Thing	 Function=Class of Business Process	 Node=Major Business Location	 Agent=Class of Agent	 Time=Major Business Event	 End/Means=Major Business Goal
	Enterprise Model	e.g., Entity Relationship Diagram 	e.g., Function Flow Diagram 	e.g., Logistics Network 	e.g., Organization Chart 	e.g., Master Schedule 	e.g., Business Plan 
	Owner	Ent=Business Entity Rel=Business Rule	Function=Business Process	Node=Business Location Link=Business Linkage	Agent=Org Unit Work=Work Product	Time= Business Event Cycle=Business Cycle	End=Business Objectives Means=Business Strategy
DESIGN	Information System Model	e.g., Data Model 	e.g., Data Flow Diagram 	e.g., Distributed System Architecture 	e.g., Human Interface Structure 	e.g., Processing Structure 	e.g., Knowledge Architecture 
	Designer	Entity=Data Entity Relationship= Data Relationship	Funct=Appl Function Arg=User Views	Node=Info Sys Funct Link=Line Char	Agent=Role Work=Job	Time=Trigger Cycle=Component Cycle	End=Criterion Means=Option
DEVELOPMENT	Technology Model	e.g., Data Design 	e.g., Structure Chart 	e.g., System Architecture 	e.g., Human/ Technology Interface 	e.g., Control Structure 	e.g., Knowledge Organization 
	Builder	Entity=Segment/Row Relationship=Pointer/ Key	Funct=Computer Funct Arg=Screen/Device Formats	Node=Hardware/ System Software Link=Line Specification	Agent=User Work=Job	Time=Execute Cycle=Component Cycle	End=Condition Means=Action
	Components	e.g., Data Definition Description 	e.g., Program 	e.g., Network Architecture 	e.g., Security Architecture 	e.g., Timing Definition 	e.g., Knowledge Definition 
	Subcontractor	Ent=Fields Rel=Addresses	Funct=Language Stmts Arg=Control Blocks	Node=Addresses Link=Protocols	Agent=Identity Work=Transaction	Time=Interrupt Cycle=Machine Cycle	End= Means
	Functioning System	e.g., Data	e.g., Function	e.g., Network	e.g., Organization	e.g., Schedule	e.g., Strategy

Chapter 2: Principles and Patterns

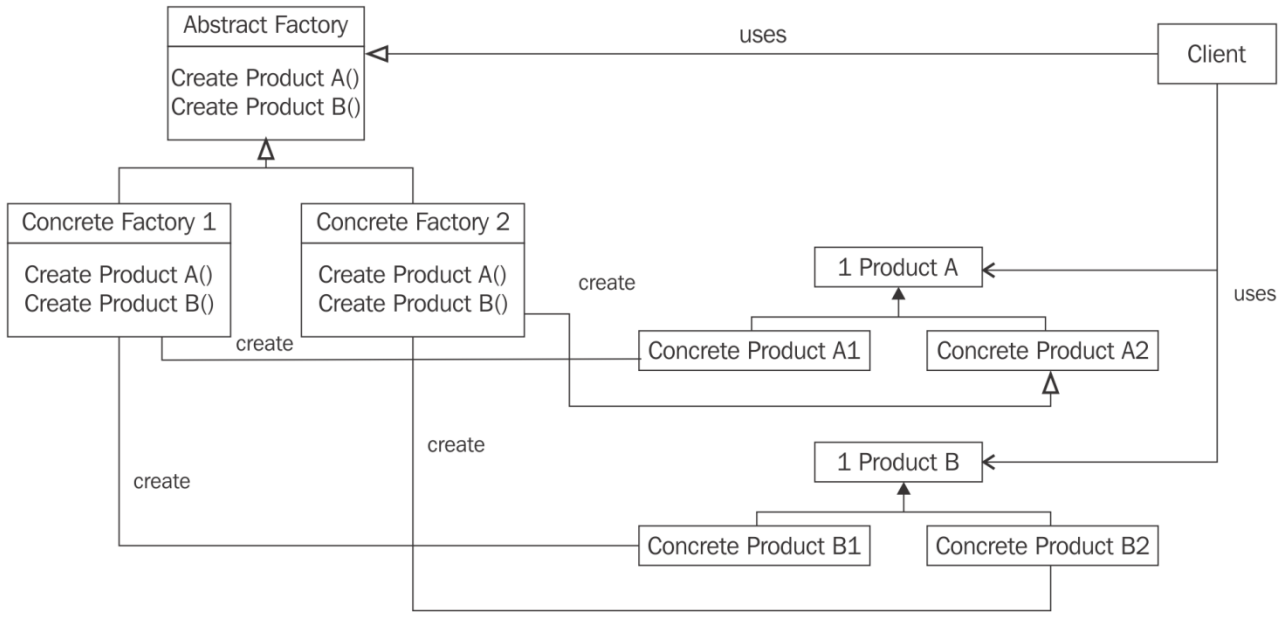


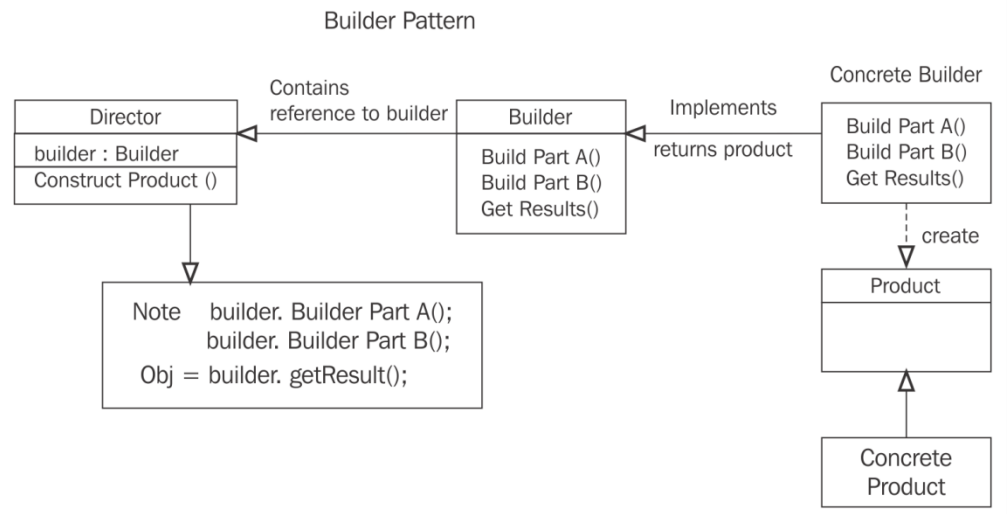
Creational patterns		
These design patterns deal with object creational mechanisms in a suitable manner under a given situation		
1	Abstract factory	Provides an interface that can create families of related classes
2	Builder	Separates complex object construction from its representation
3	Factory method	An interface used to create an object without specifying the exact class to be created
4	Prototype	Creates fully initialized objects by copying or cloning an existing object
5	Singleton	A class whose only a single instance can exist

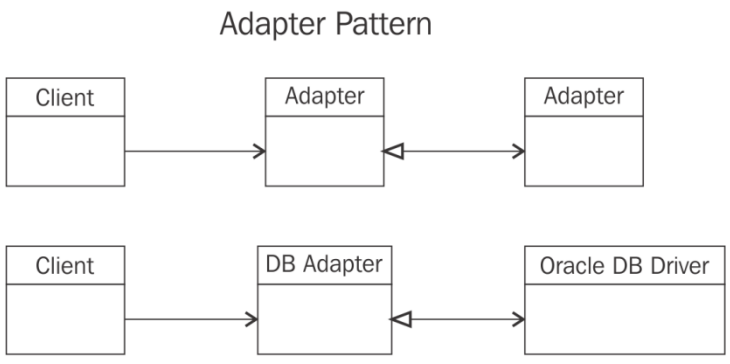
Structural Patterns		
These design patterns are the best practice used to identify a simple way to realize relationships between entitles in a given situation		
6	Adapter	Converts the interface of a class into another interface client except by wrapping it's own interface around that of an already existing class
7	Bridge	Separates an object's interface from its implementation so that the two can vary independently
8	Composite	Composes zero or more similar objects in a tree structure so that they can be manipulated as one object to represent part or whole hierarchies
9	Decorator	Dynamically adds/overrides behavior in an existing object
10	Facade	Provides a unified interface to a set of interfaces in a subsystem
11	Flyweight	Efficient sharing of a large number of similar objects
12	Proxy	An object acting as a placeholder for another object to control access to it and reduce complexity

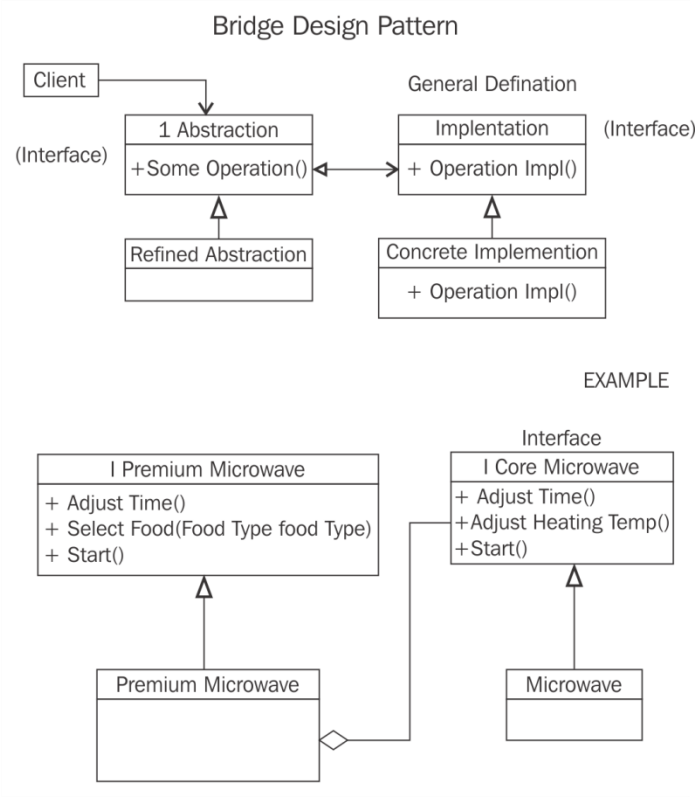
Behavioral patterns		
They identify common communication patterns between objects and increase the flexibility in carrying out the communication between them		
13	Chain of responsibility	Decouples the request sender from the request receiver by chaining more than one receiver object in a way that if one receiver object does not handle the request, it passes on to the next until the request has been handled
14	Command	Encapsulates a request/action/event along with parameter as an object
15	Interpreter	Specifies a way to interpret/evaluate sentences in a given language
16	Iterator	Sequentially accesses the elements present in an aggregate object without exposing its underlying representation/Structure
17	Mediator	Promotes loose coupling by encapsulating (and often centralizing) the communication/interaction between various objects
18	Memento	Provides the capability to snapshot the object's internal state in order to restore to this state later
19	Observer	An observable object sends events to many observing objects; sort of defines a one-to-many dependency between objects
20	State	Allows the changes in the object's behavior based on the change in its state

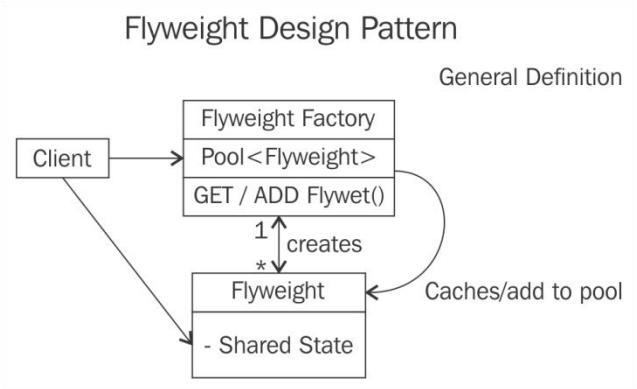
Abstract Factory Pattern

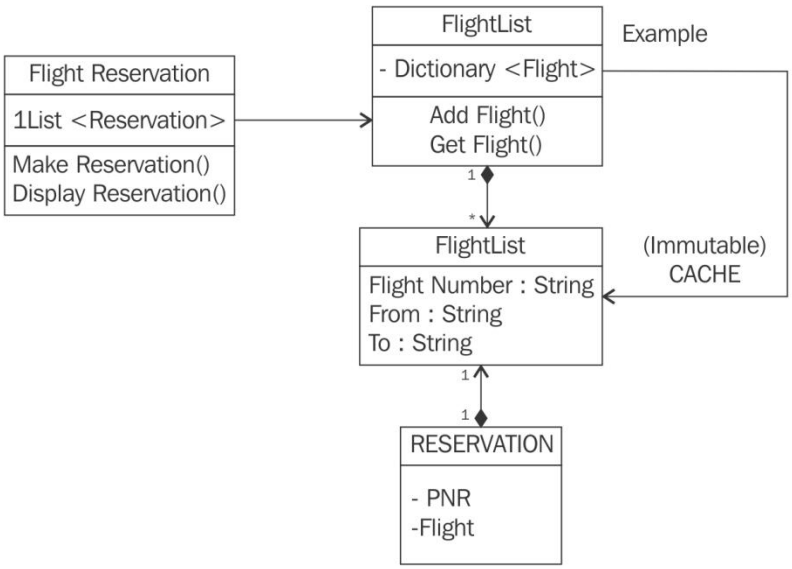


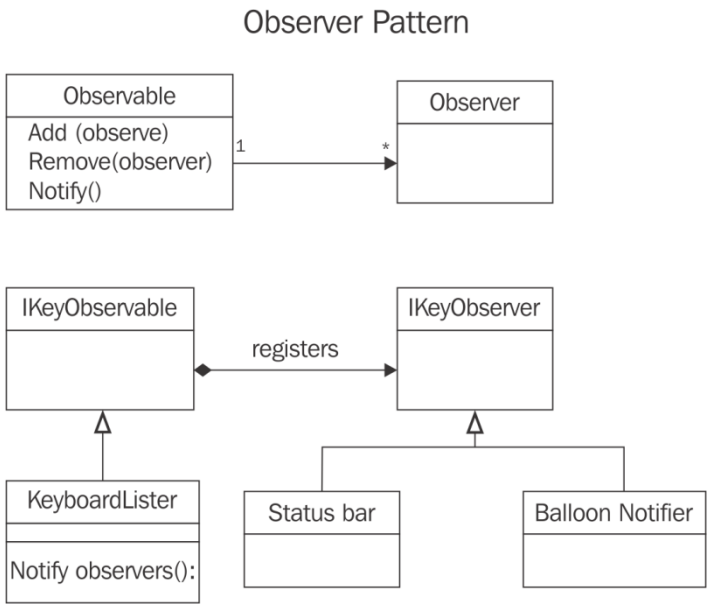

Builder Pattern
Director
builder : Builder
Construct Product ()
Contains
reference to builder
Builder
Build Part A()
Build Part B()
Get Results()
Implements
returns product
Concrete Builder
Build Part A()
Build Part B()
Get Results()
create
Product
Concrete
Product
Note builder. Builder Part A();
builder. Builder Part B();
Obj = builder. getResult();

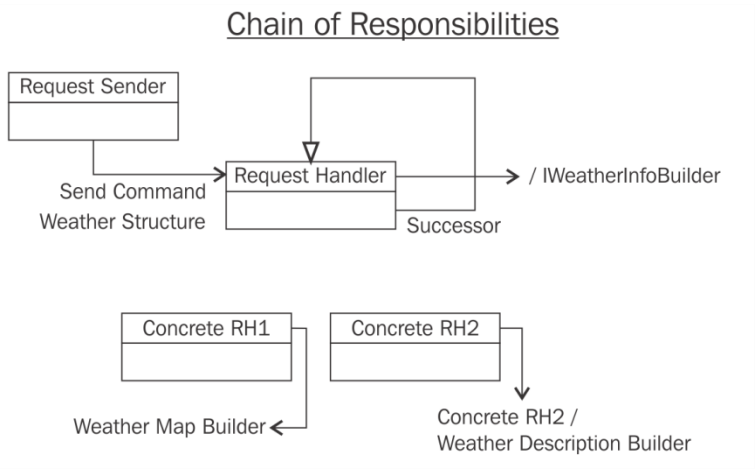

Adapter Pattern
Client
Adapter
Adapter
Client
DB Adapter
Oracle DB Driver

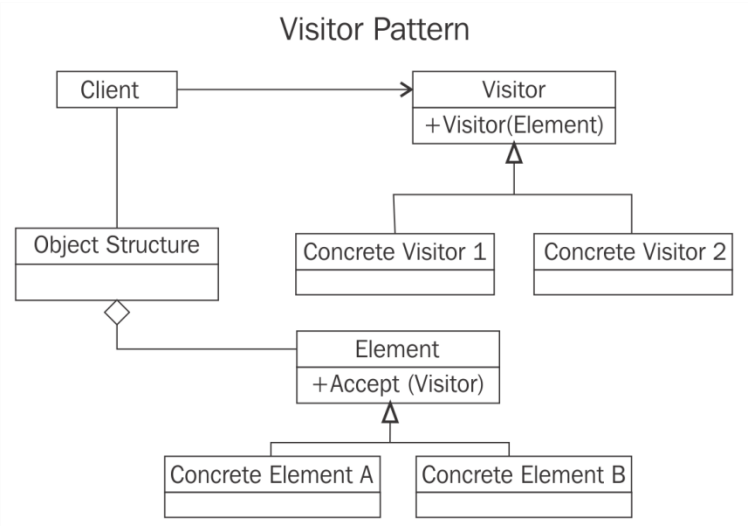

Bridge Design Pattern
Client
General Defination
1 Abstraction
(Interface)
+Some Operation()
Implentation
(Interface)
+ Operation Impl()
Refined Abstraction
Concrete Implemention
+ Operation Impl()
EXAMPLE
Interface
I Premium Microwave
+ Adjust Time()
+ Select Food(Food Type food Type)
+ Start()
I Core Microwave
+ Adjust Time()
+Adjust Heating Temp()
+Start()
Premium Microwave
Microwave

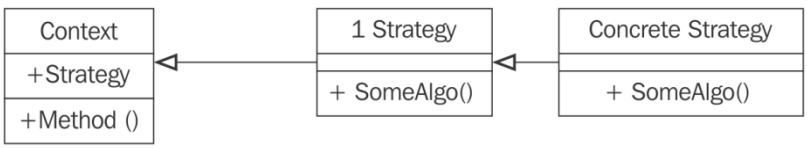

Flyweight Design Pattern
General Definition
Client
Flyweight Factory
Pool<Flyweight>
GET / ADD Flywet()
1
creates
*
Flyweight
- Shared State
Caches/add to pool

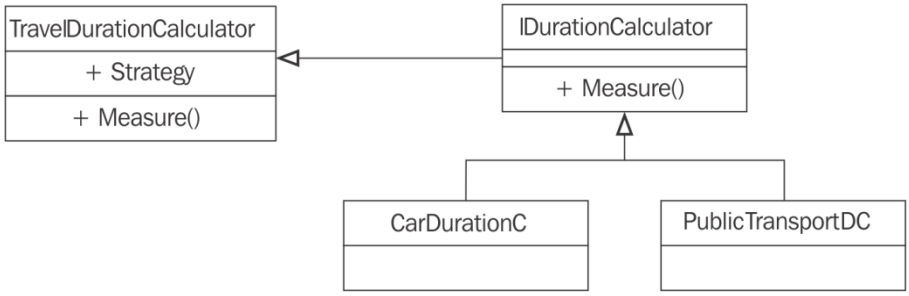

FlightList
Example
- Dictionary <Flight>
Add Flight()
Get Flight()
Flight Reservation
1List <Reservation>
Make Reservation()
Display Reservation()
1
*
FlightList
(Immutable)
CACHE
Flight Number : String
From : String
To : String
1
1
RESERVATION
- PNR
-Flight


Observer Pattern
Observable
Add (observe)
Remove(observer)
Notify()
1
*
Observer
IKeyObservable
registers
IKeyObserver
KeyboardLister
Notify observers():
Status bar
Balloon Notifier

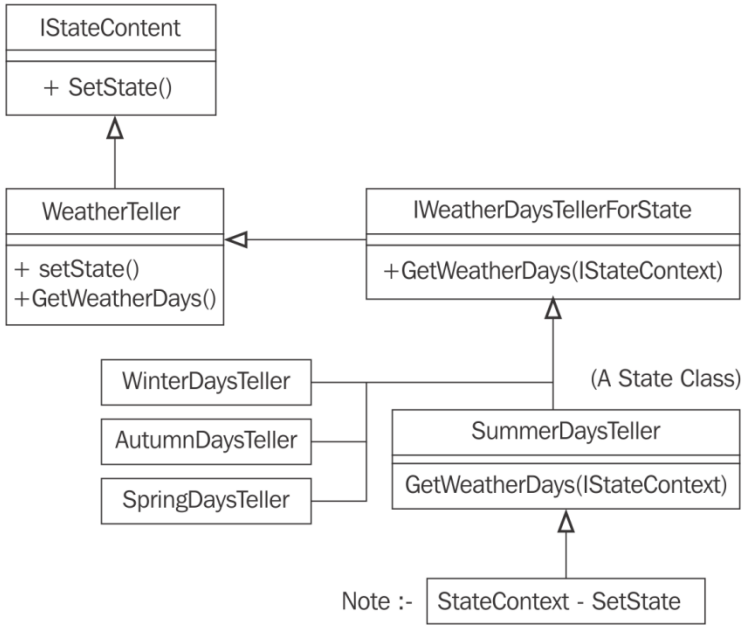

Chain of Responsibilities
Request Sender
Send Command
Weather Structure
Request Handler
/ IWeatherInfoBuilder
Successor
Concrete RH1
Concrete RH2
Weather Map Builder
Concrete RH2 /
Weather Description Builder


Visitor Pattern
Client
Visitor
+Visitor(Element)
Object Structure
Concrete Visitor 1
Concrete Visitor 2
Element
+Accept (Visitor)
Concrete Element A
Concrete Element B

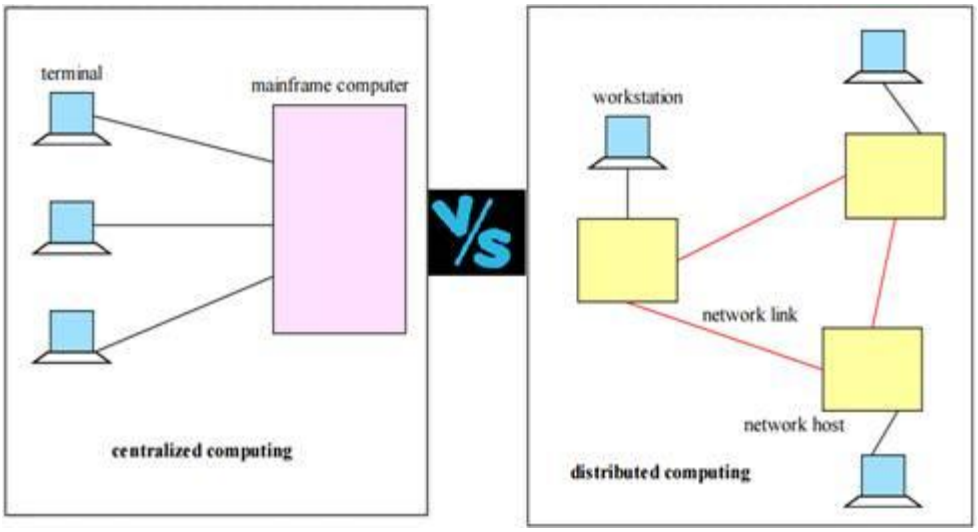

Context
+Strategy
+Method ()
1 Strategy
+ SomeAlgo()
Concrete Strategy
+ SomeAlgo()

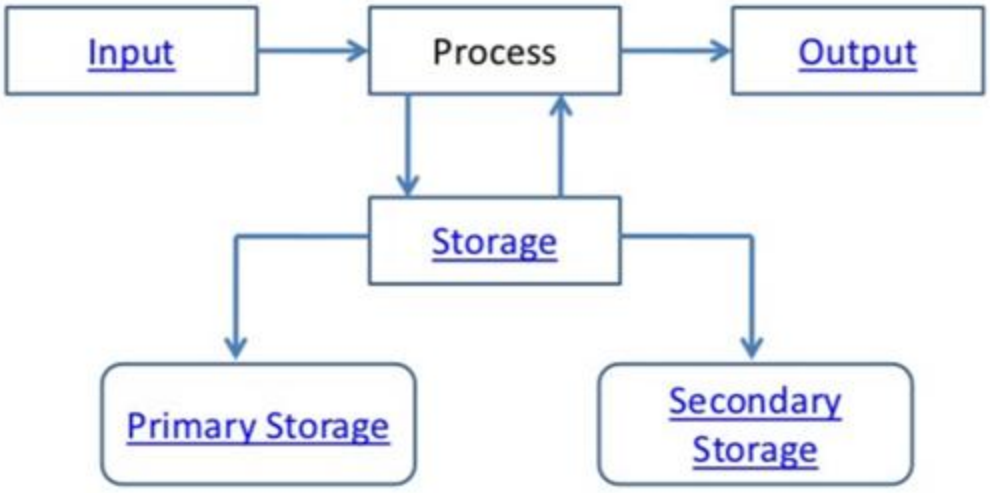


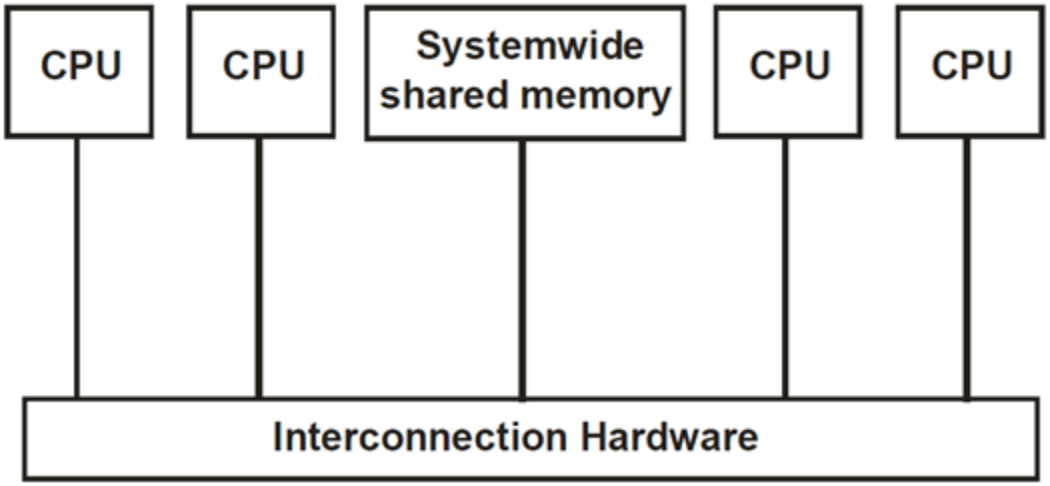
State Pattern

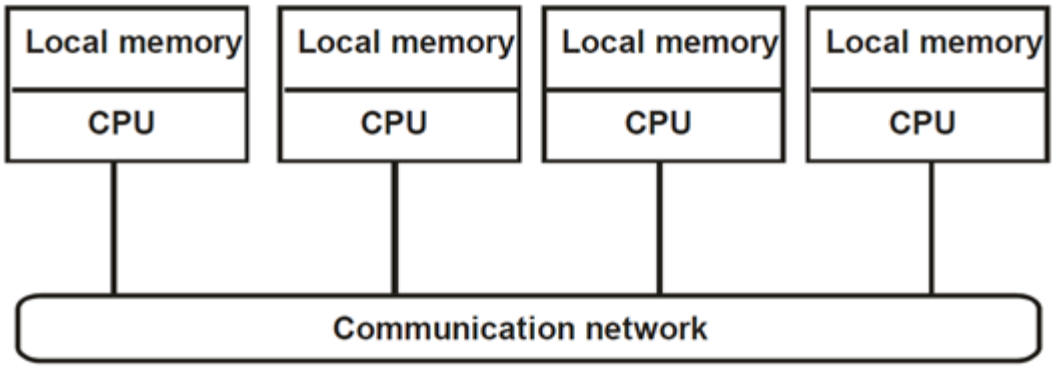


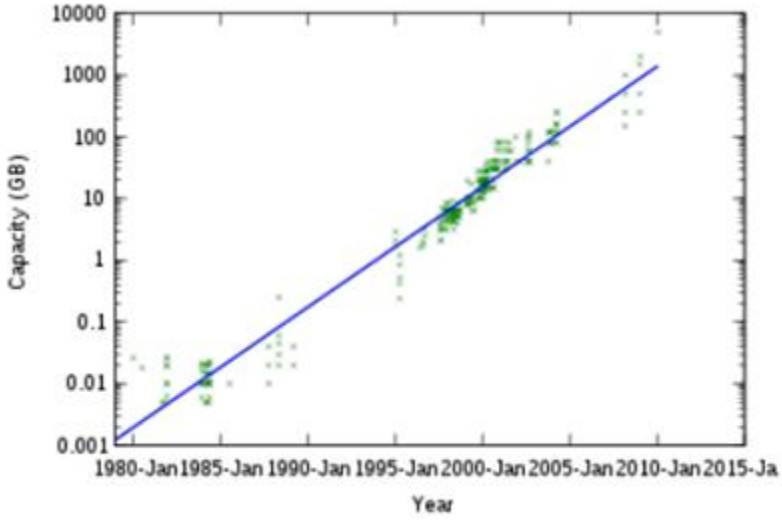
Chapter 3: Distributed Computing

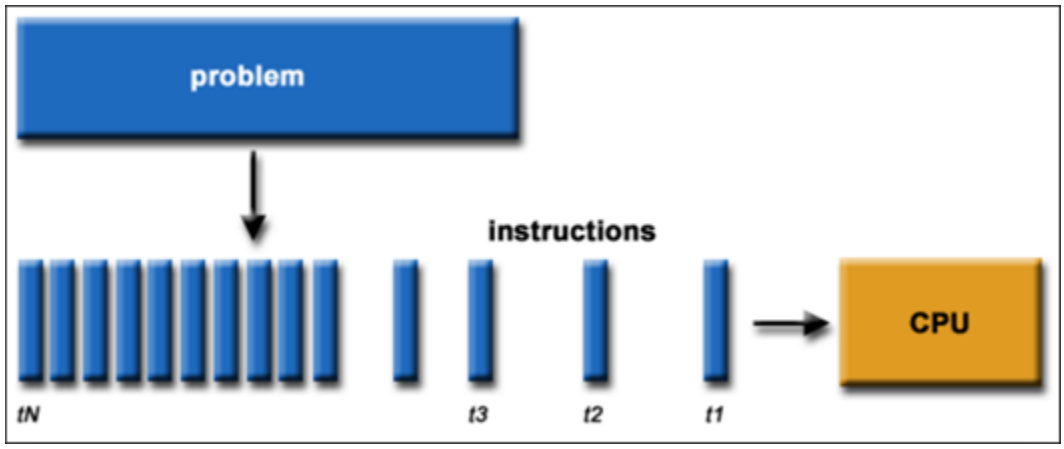


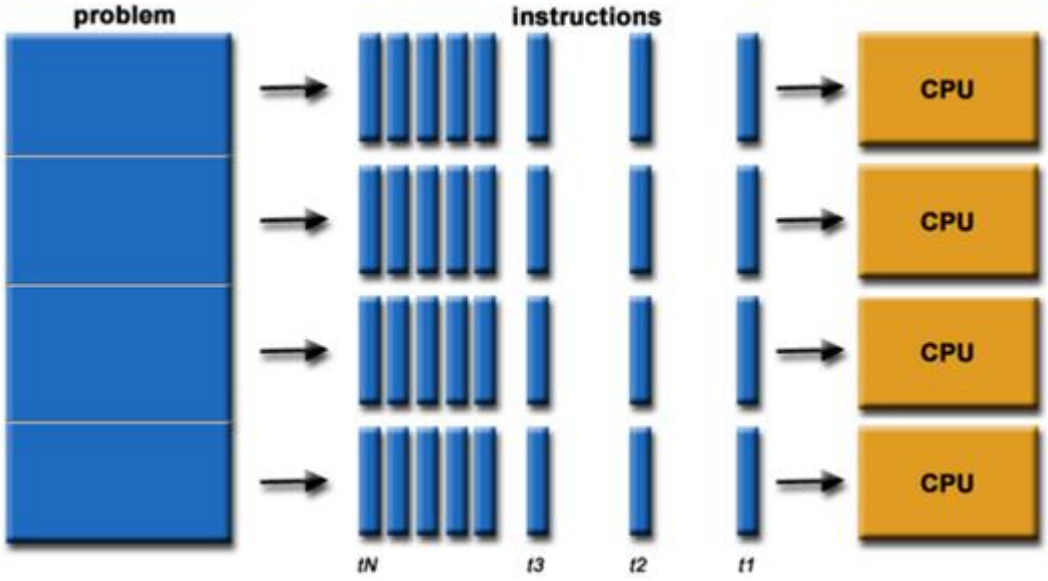


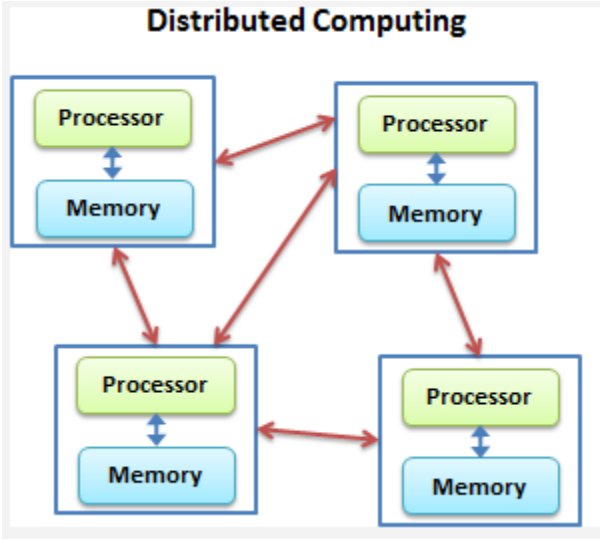

CPU
CPU
Systemwide shared memory
CPU
CPU
Interconnection Hardware


Local memory
CPU
Local memory
CPU
Local memory
CPU
Local memory
CPU
Communication network

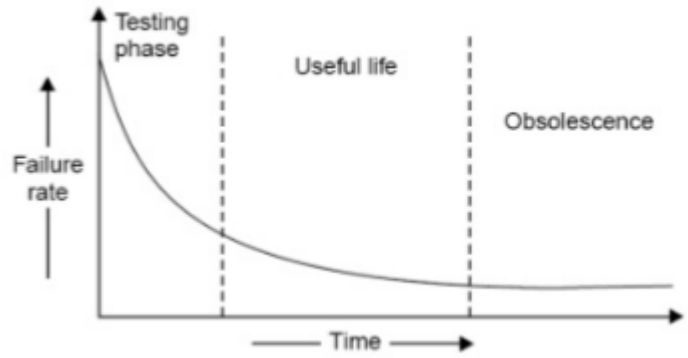

10000
1000
100
10
1
0.1
0.01
0.001
Capacity (GB)
1980-Jan
1985-Jan
1990-Jan
1995-Jan
2000-Jan
2005-Jan
2010-Jan
2015-Ja
Year

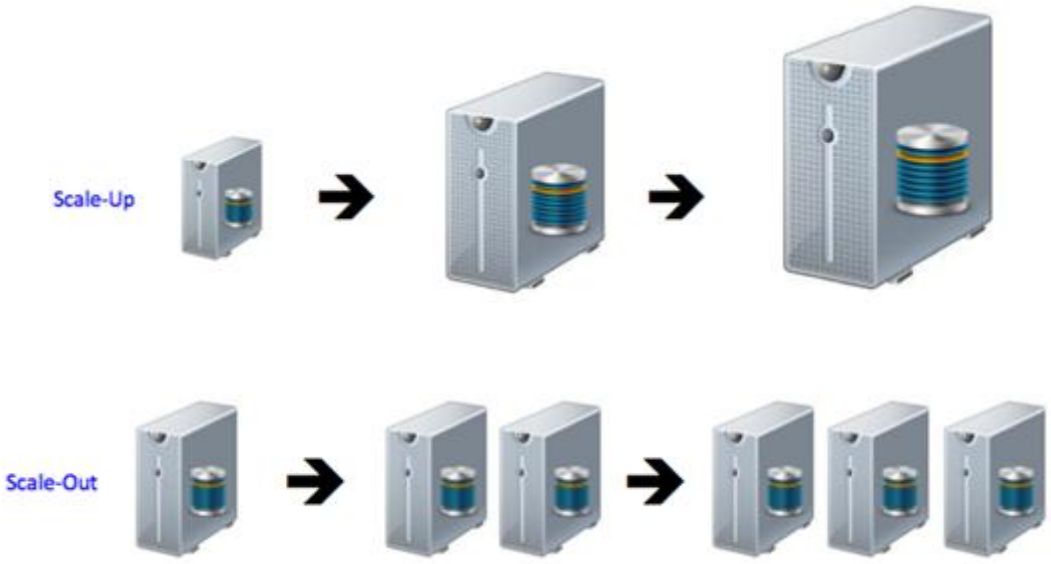

problem
instructions
CPU
tN
t3
t2
t1


problem
instructions
CPU
CPU
CPU
CPU
tN
t3
t2
t1

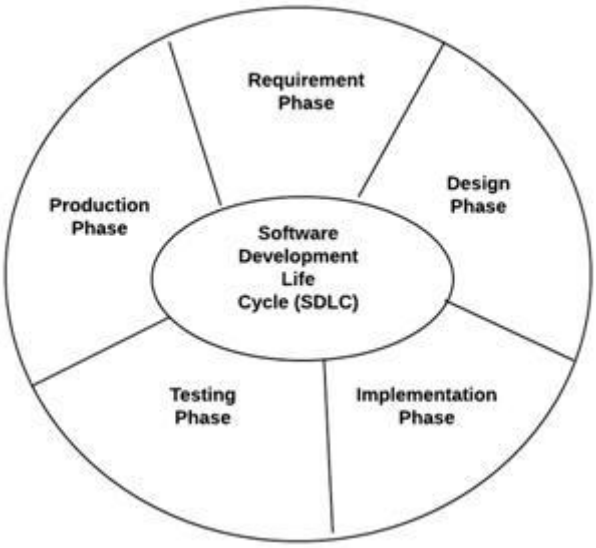


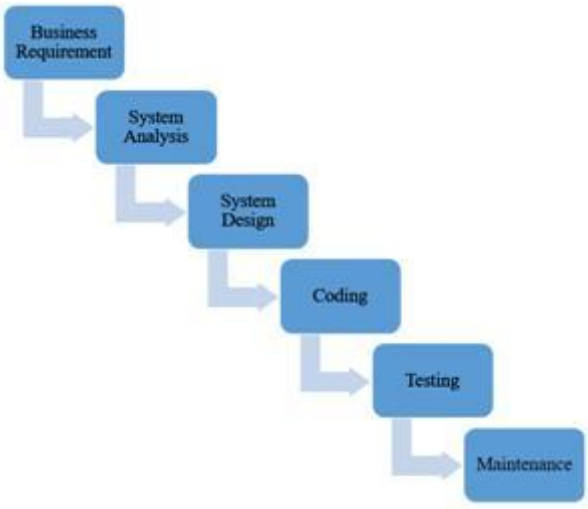
Forms of Transparency		
#	Type	Objective to hide
1	Access	difference in data representation and how resource is accessed
2	Migration	move a resource to another location
3	Location	where a resource is located
4	Replication	share a resource by several competitive users
5	Relocation	move a resource to another location, while in use
6	Concurrency	share resource by several competitive users
7	Persistance	whether a resource is in memory or on disk
8	Failure	resource's failure and recovery process

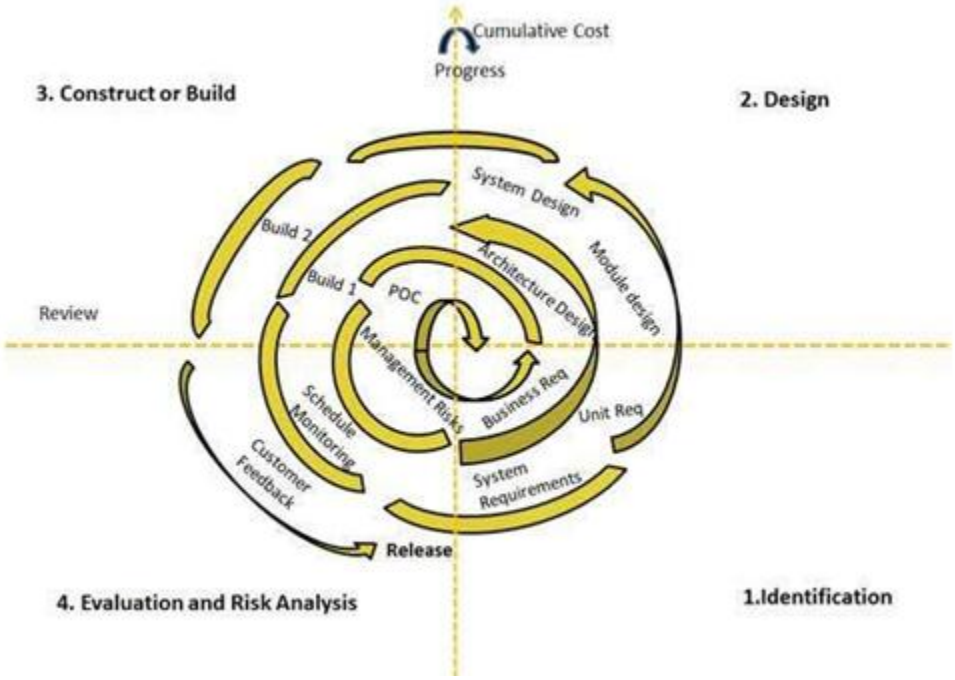


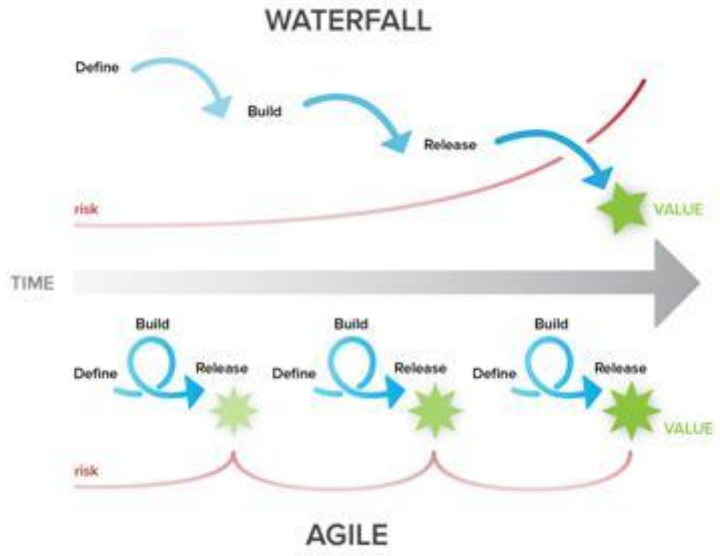

Scale-Up
Scale-Out

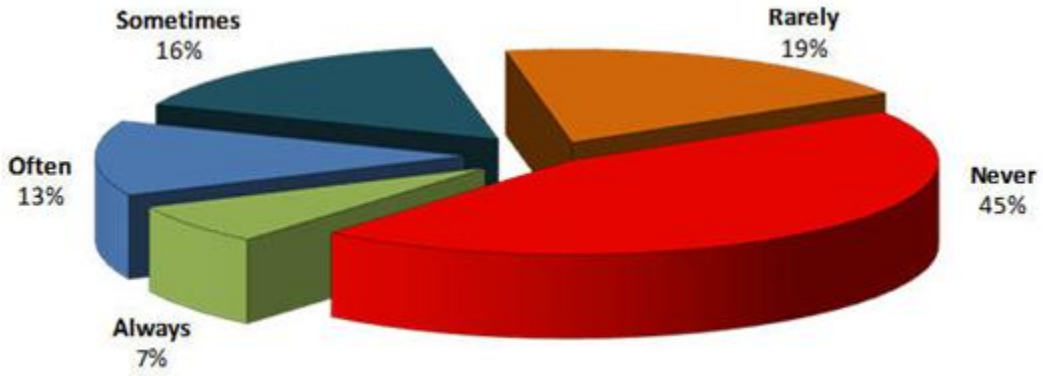
Chapter 4: Software Development Life Cycle

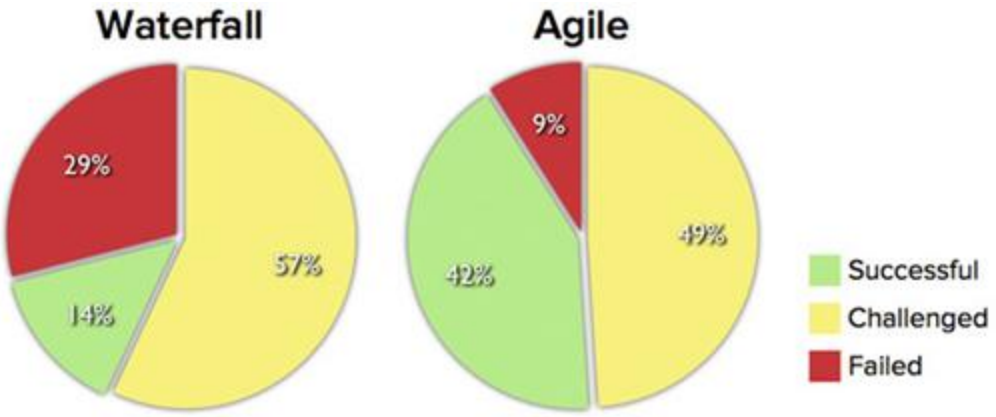




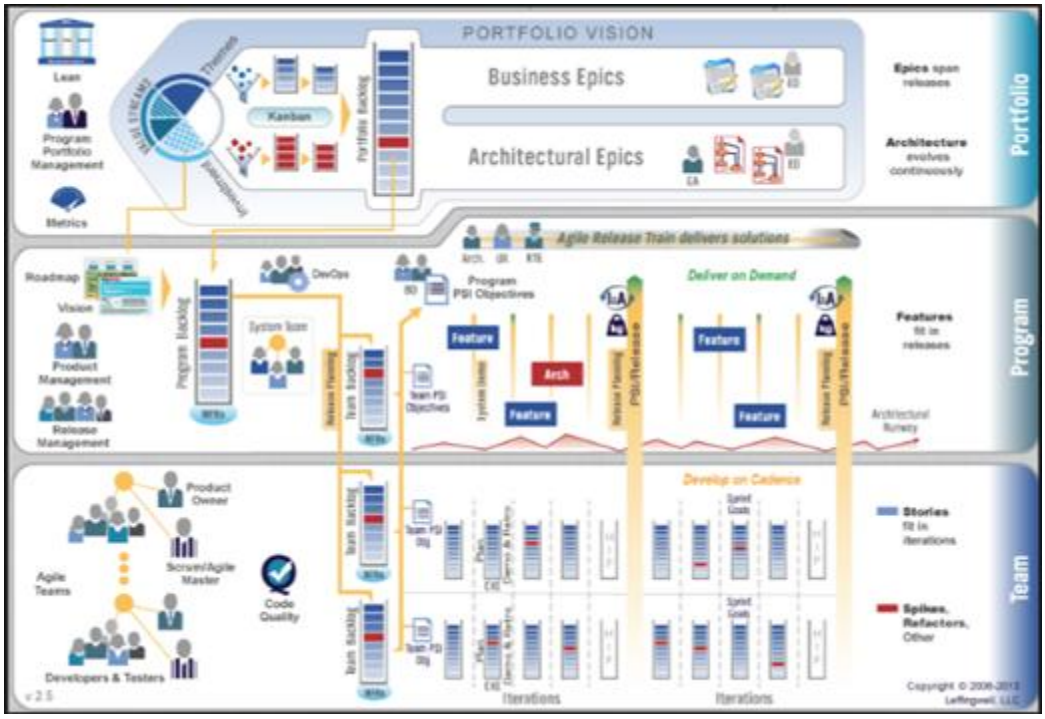

Cumulative Cost
Progress
3. Construct or Build
2. Design
Review
System Design
Architecture Design
Module design
Build 2
Build 1
POC
Management Risks
Business Req
Unit Req
Schedule Monitoring
Customer Feedback
System Requirements
Release
4. Evaluation and Risk Analysis
1.Identification

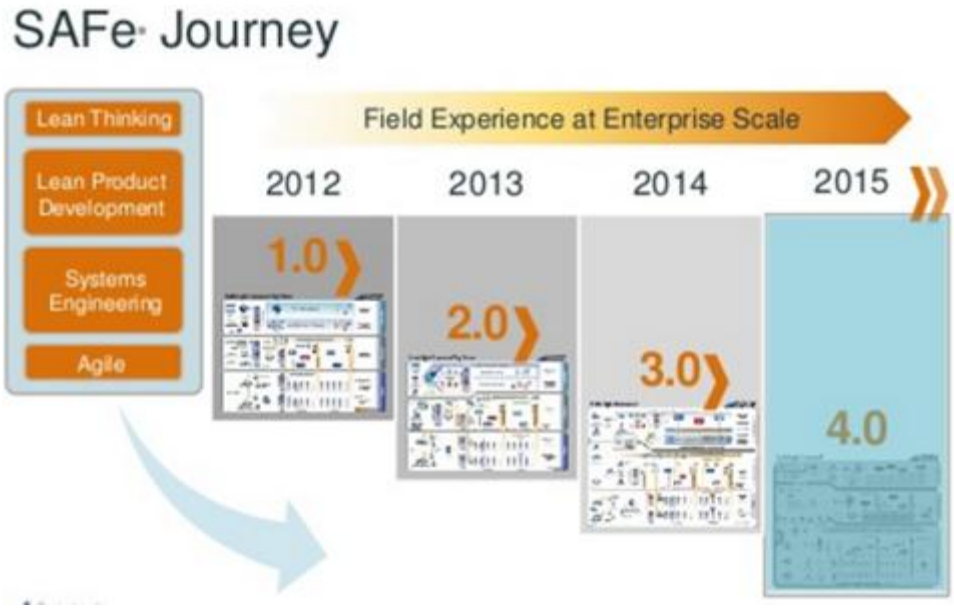

WATERFALL
Define
Build
Release
risk
VALUE
TIME
Build
Define
Release
Build
Define
Release
Build
Define
Release
VALUE
risk
AGILE

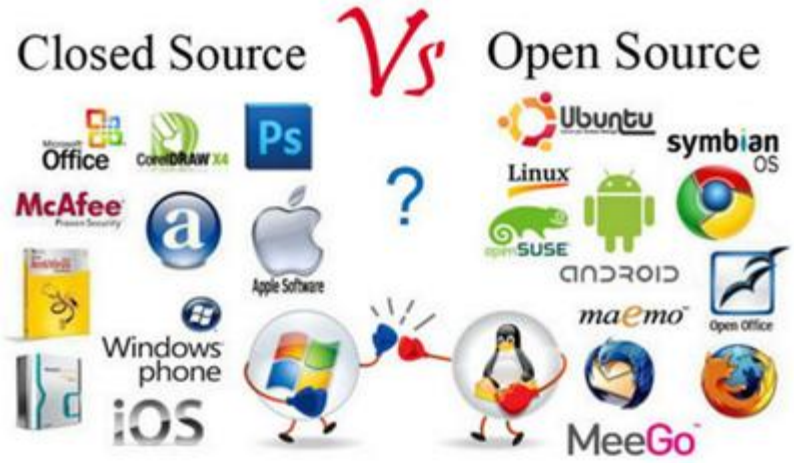


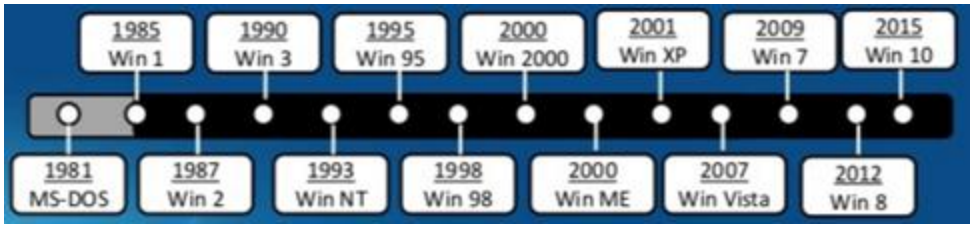


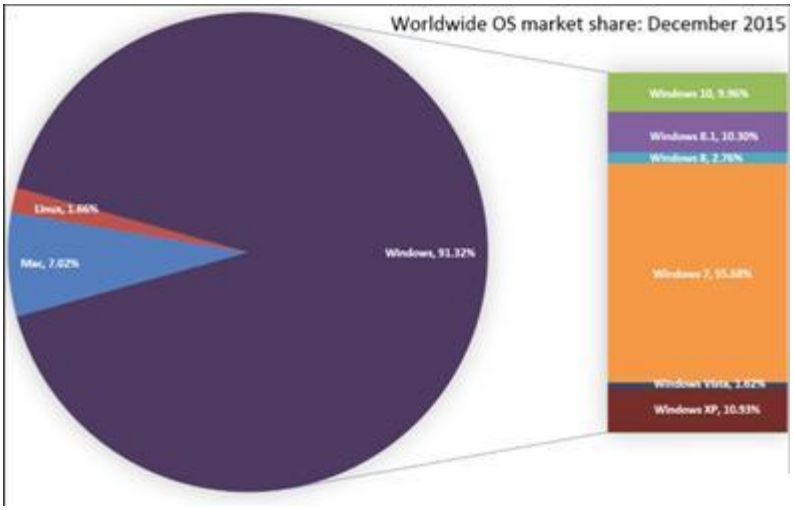
Source: The CHAOS Manifesto, The Standish Group, 2012.

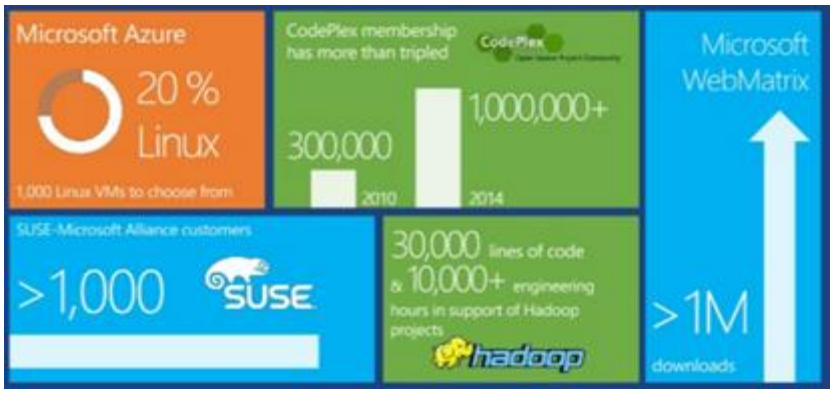

PORTFOLIO VISION
Business Epics
Architectural Epics
Kanban
Portfolio Backlog
Lean
Program Portfolio Management
Metrics
Epics span releases
Architecture evolves continuously
Portfolio
Agile Release Train delivers solutions
Roadmap
Vision
Product Management
Release Management
Program Backlog
System Team
DevOps
Program PSI Objectives
Feature
Arch
Deliver on Demand
Features fit in releases
Program
Product Owner
Scrum/Agile Master
Agile Teams
Developers & Testers
Code Quality
Develop on Cadence
Stories fit in iterations
Spikes, Refactors, Other
Iterations
Team

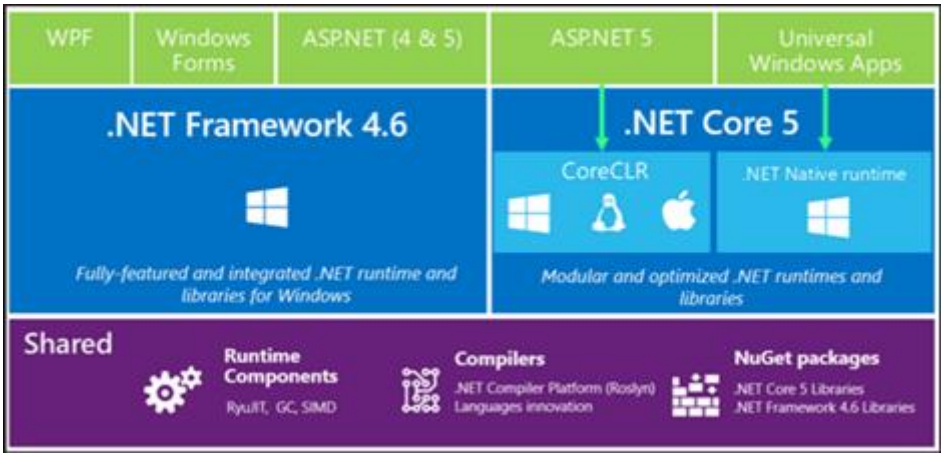

SAFe Journey
Lean Thinking
Lean Product Development
Systems Engineering
Agile
Field Experience at Enterprise Scale
2012
2013
2014
2015
1.0
2.0
3.0
4.0

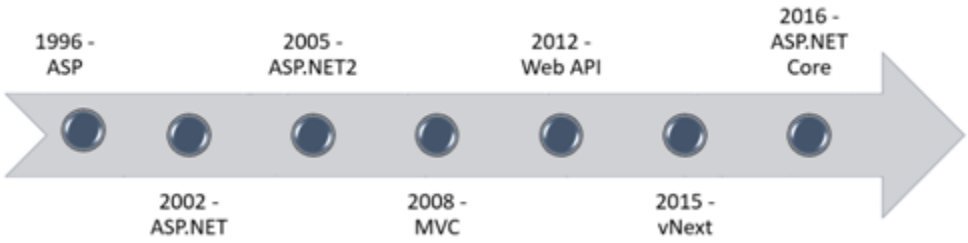

Closed Source
Vs
Open Source
Office
CorelDRAW X4
Ps
McAfee
Apple Software
Windows phone
iOS
Ubuntu
Linux
openSUSE
symbian OS
android
maemo
Open Office
MeeGo


1985 Win 1
1990 Win 3
1995 Win 95
2000 Win 2000
2001 Win XP
2009 Win 7
2015 Win 10
1981 MS-DOS
1987 Win 2
1993 Win NT
1998 Win 98
2000 Win ME
2007 Win Vista
2012 Win 8


Worldwide OS market share: December 2015
Linux, 1.66%
Mac, 7.02%
Windows, 91.32%
Windows 10, 9.96%
Windows 8.1, 10.30%
Windows 8, 2.76%
Windows 7, 55.68%
Windows XP, 10.93%

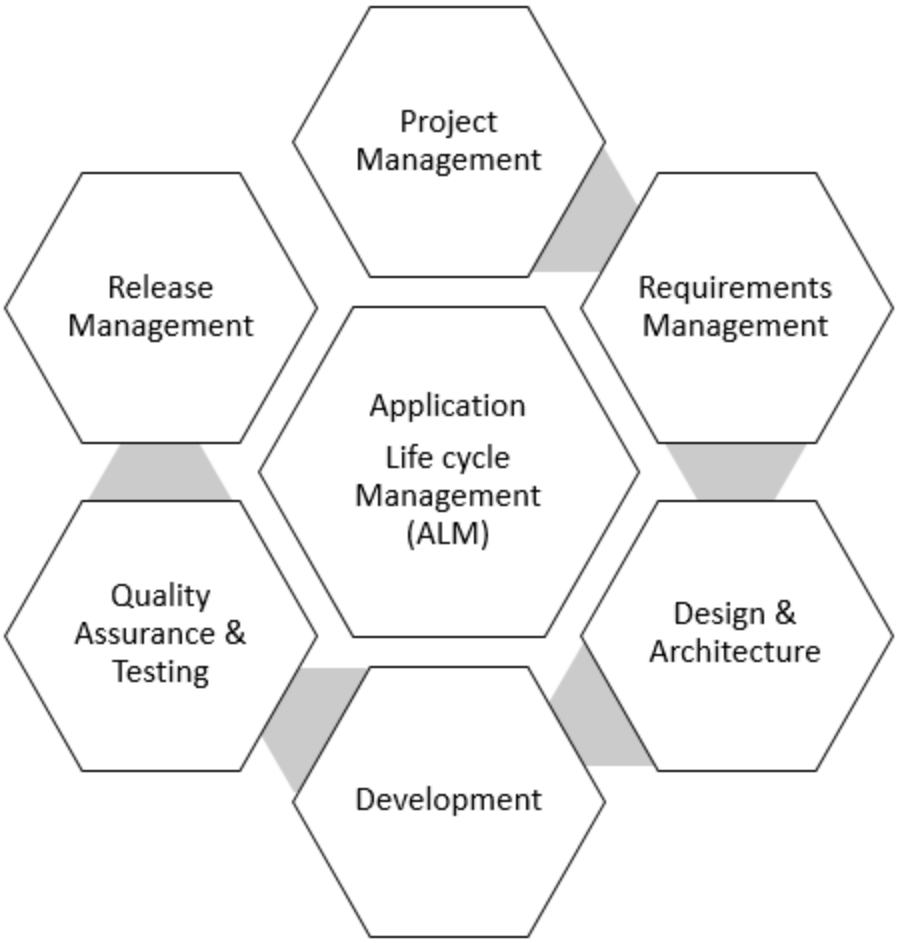

Microsoft Azure
20 %
Linux
1,000 Linux VMs to choose from
CodePlex membership has more than tripled
CodePlex
300,000
2010
1,000,000+
2014
Microsoft WebMatrix
>1M
downloads
SUSE-Microsoft Alliance customers
>1,000
SUSE
30,000 lines of code
& 10,000+ engineering hours in support of Hadoop projects
hadoop

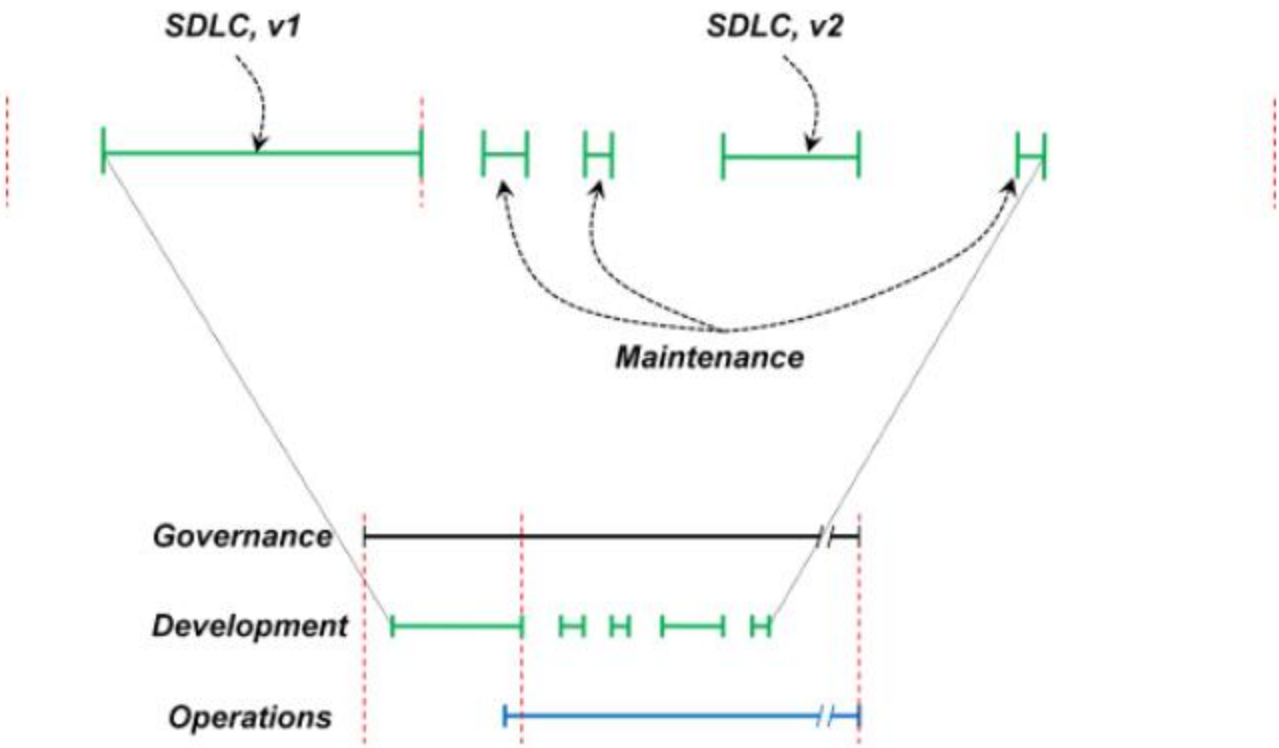

WPF
Windows Forms
ASP.NET (4 & 5)
ASP.NET 5
Universal Windows Apps
.NET Framework 4.6
Fully-featured and integrated .NET runtime and libraries for Windows
.NET Core 5
CoreCLR
.NET Native runtime
Modular and optimized .NET runtimes and libraries
Shared
Runtime Components
RyuJIT, GC, SIMD
Compilers
.NET Compiler Platform (Roslyn)
Languages innovation
NuGet packages
.NET Core 5 Libraries
.NET Framework 4.6 Libraries

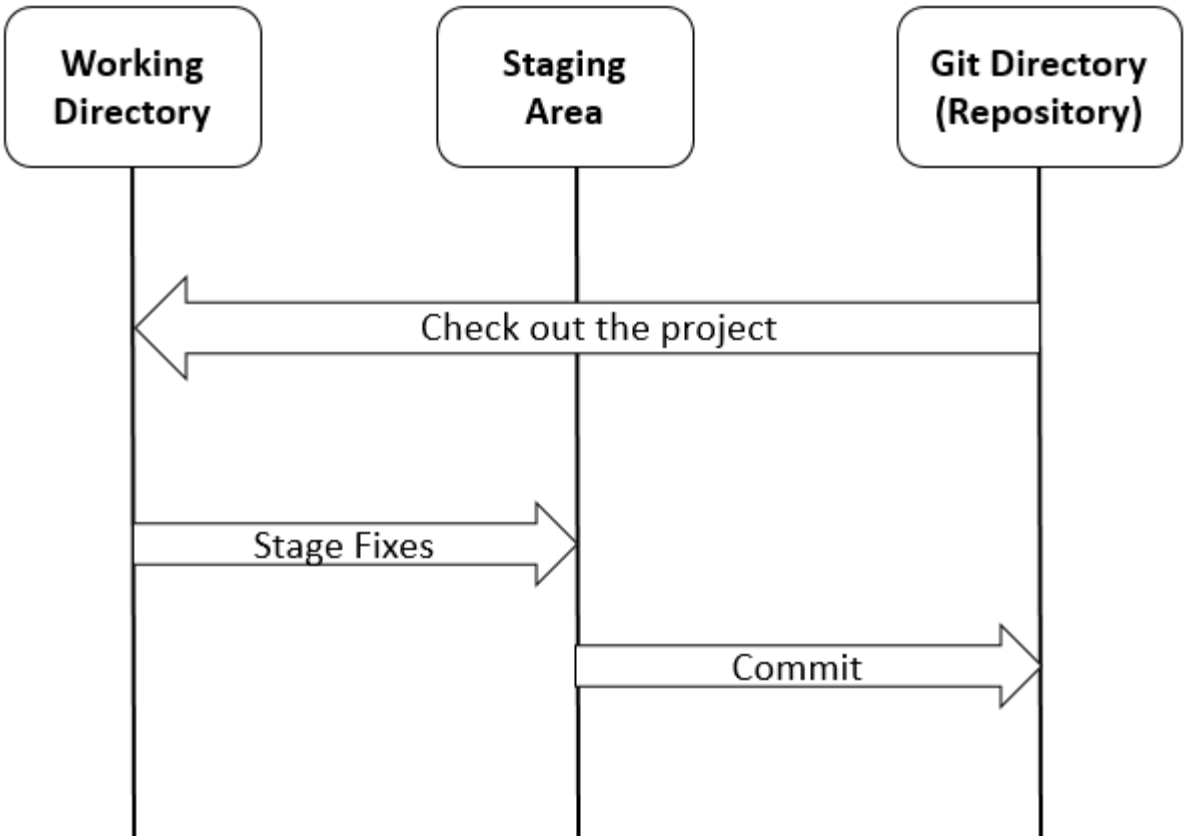

1996 - ASP
2002 - ASP.NET
2005 - ASP.NET2
2008 - MVC
2012 - Web API
2015 - vNext
2016 - ASP.NET Core

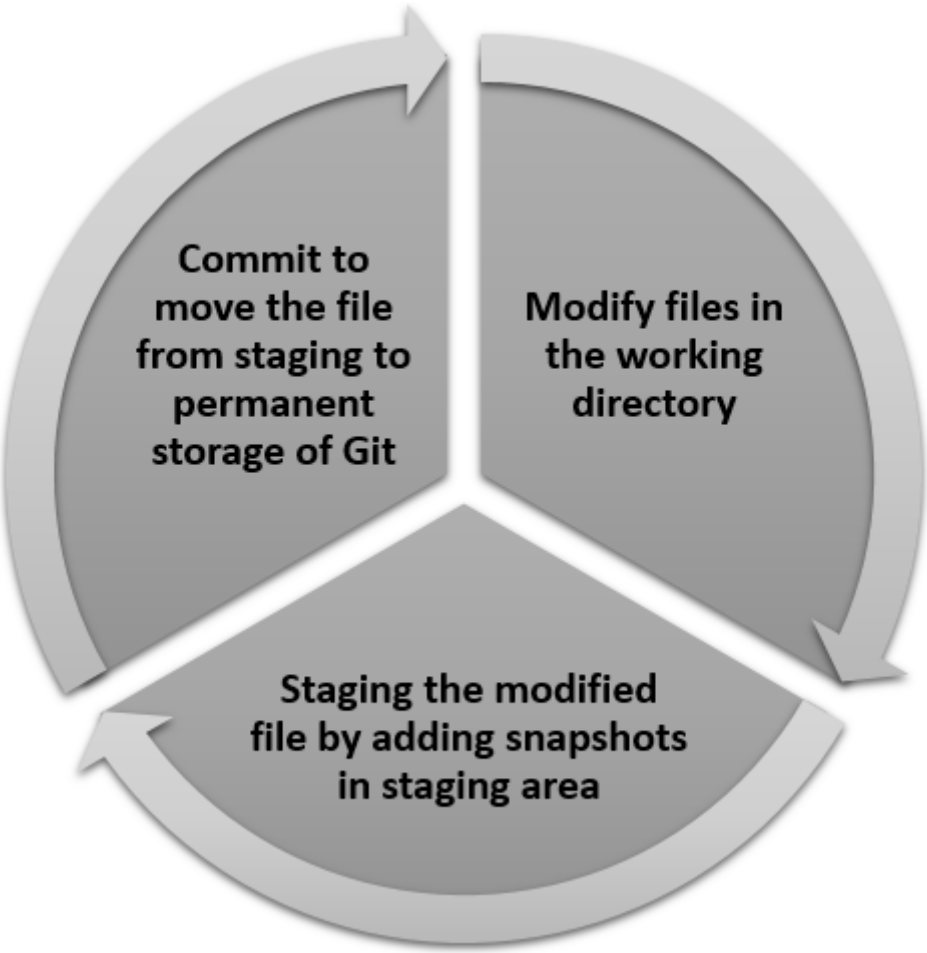

DevOps
Nagios
VAGRANT
GRUNT
gradle
Clients
Xamarin
CORDOVA
Management
CHEF
puppet labs
ANSIBLE
SALTSTACK
SCALR
Applications
Joomla!
Drupal
PaaS & DevOps
pprenda
Jelastic
App Frameworks & Tools
php
nodeJS
Java
Rails
IntelliJ IDEA
eclipse
Databases & Middleware
Hadoop
redis
cleardb
cloudera
MySQL
mongoDB
Couchbase
Infrastructure
SUSE
bitnami
ORACLE LINUX
FreeBSD
docker

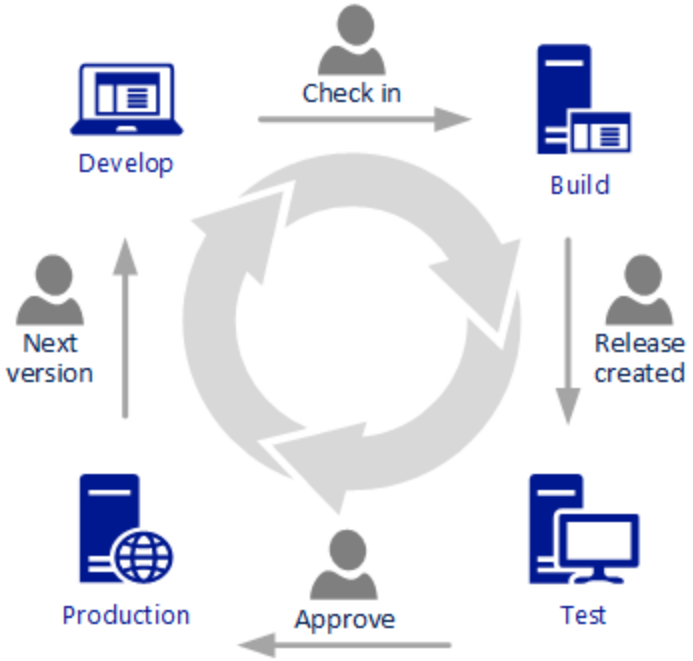
Chapter 5: Enterprise Practices in Software Development

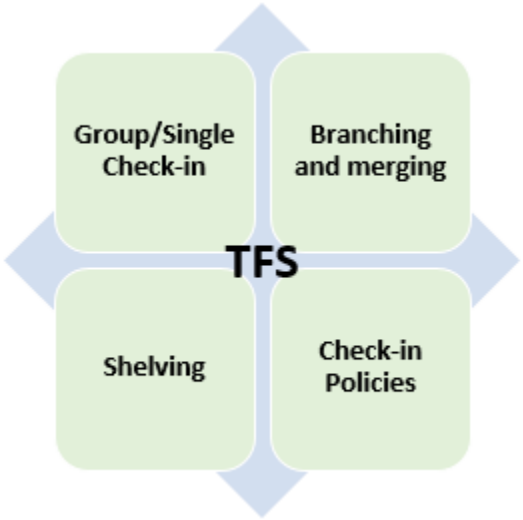

Project Management
Release Management
Requirements Management
Application Life cycle Management (ALM)
Quality Assurance & Testing
Design & Architecture
Development


SDLC, v1
SDLC, v2
Maintenance
Governance
Development
Operations


Working Directory
Staging Area
Git Directory (Repository)
Check out the project
Stage Fixes
Commit

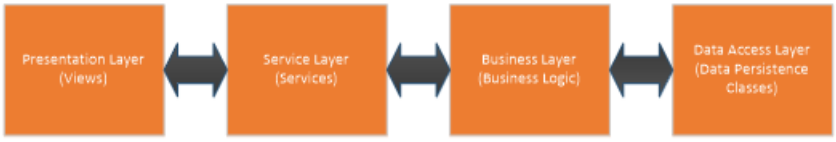

Commit to move the file from staging to permanent storage of Git
Modify files in the working directory
Staging the modified file by adding snapshots in staging area


Develop
Check in
Build
Release created
Test
Approve
Production
Next version


Group/Single Check-in
Branching and merging
TFS
Shelving
Check-in Policies

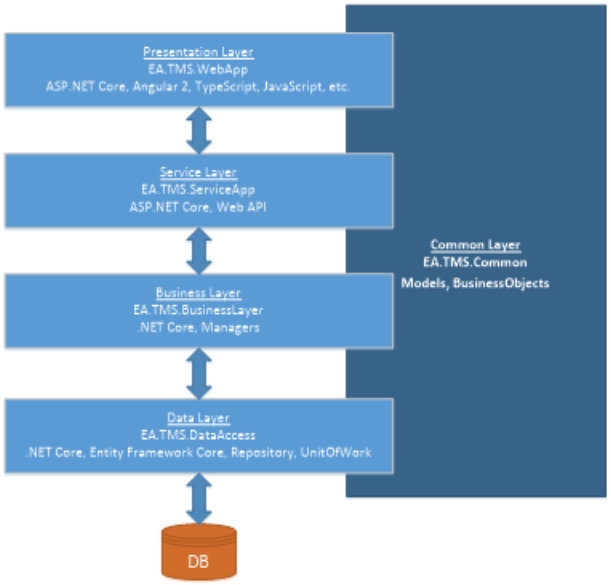
.template.config	28-Feb-2017 12:31...	File folder	
src	27-Feb-2017 7:30 ...	File folder	
EAWebApplication1.sln	27-Feb-2017 7:30 ...	Microsoft Visual St...	2 KB
global.json	27-Feb-2017 7:30 ...	JSON File	1 KB

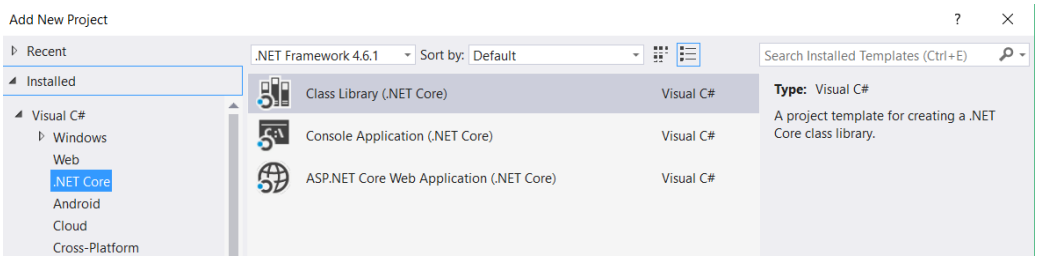
Chapter 6: Layered Approach to Solution Architecture

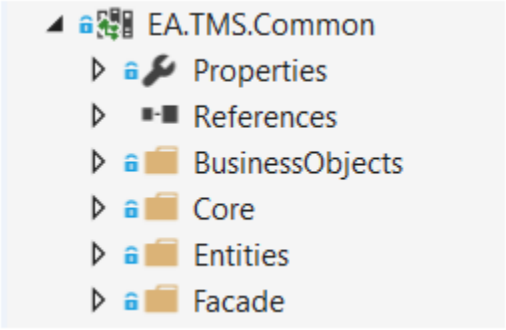


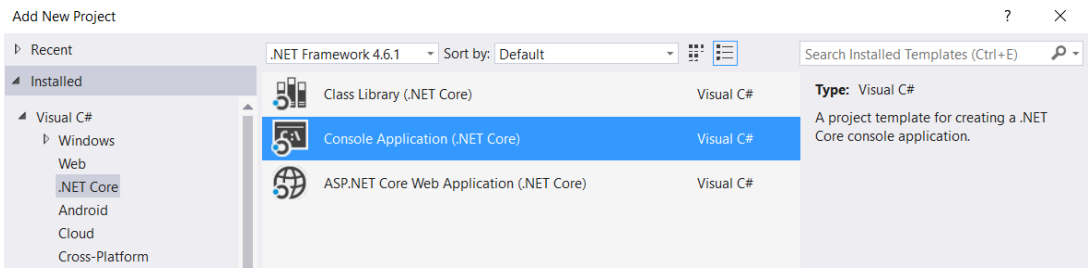
Advantages

Web service (Web API, WCF, Web Services)	**Shared library (POCOs)**
Technology agnostic – any consumer can access	No Internet connection is required
Code cannot be decompiled	No serialization overhead
Easy upgrades or bug fixes	No risk of forgery
Scalable	Higher performance as native code is called
Centralized deployments	There is no downtime of service impacting the consumer

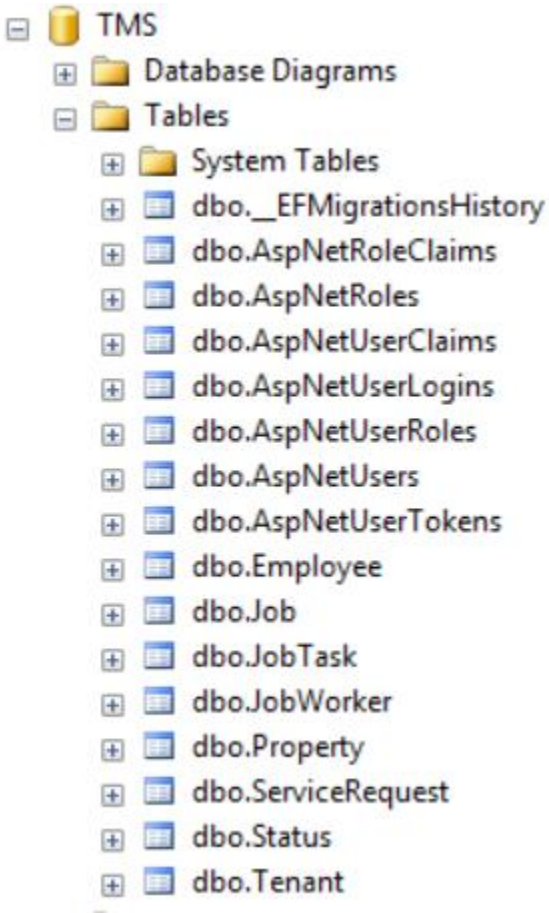

Presentation Layer
EA.TMS.WebApp
ASP.NET Core, Angular 2, TypeScript, JavaScript, etc.
Service Layer
EA.TMS.ServiceApp
ASP.NET Core, Web API
Business Layer
EA.TMS.BusinessLayer
.NET Core, Managers
Data Layer
EA.TMS.DataAccess
.NET Core, Entity Framework Core, Repository, UnitOfWork
DB
Common Layer
EA.TMS.Common
Models, BusinessObjects

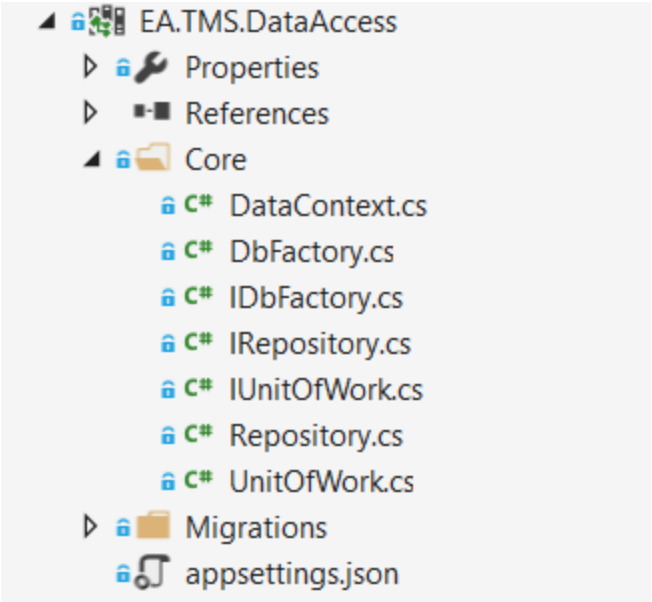

Add New Project
Recent
Installed
Visual C#
Windows
Web
.NET Core
Android
Cloud
Cross-Platform
.NET Framework 4.6.1
Sort by: Default
Search Installed Templates (Ctrl+E)
Class Library (.NET Core)
Visual C#
Console Application (.NET Core)
Visual C#
ASP.NET Core Web Application (.NET Core)
Visual C#
Type: Visual C#
A project template for creating a .NET Core class library.

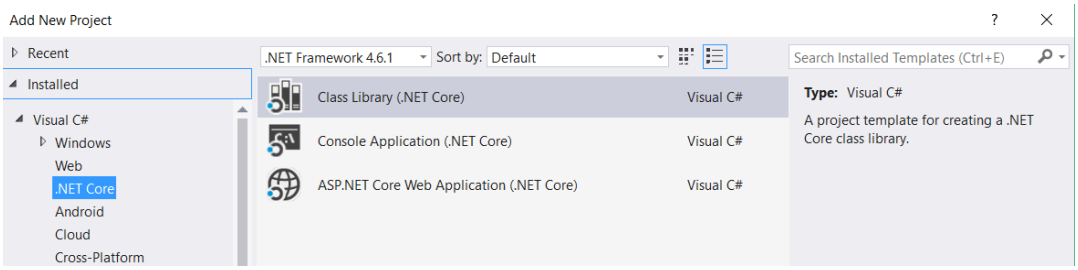

EA.TMS.Common
Properties
References
BusinessObjects
Core
Entities
Facade

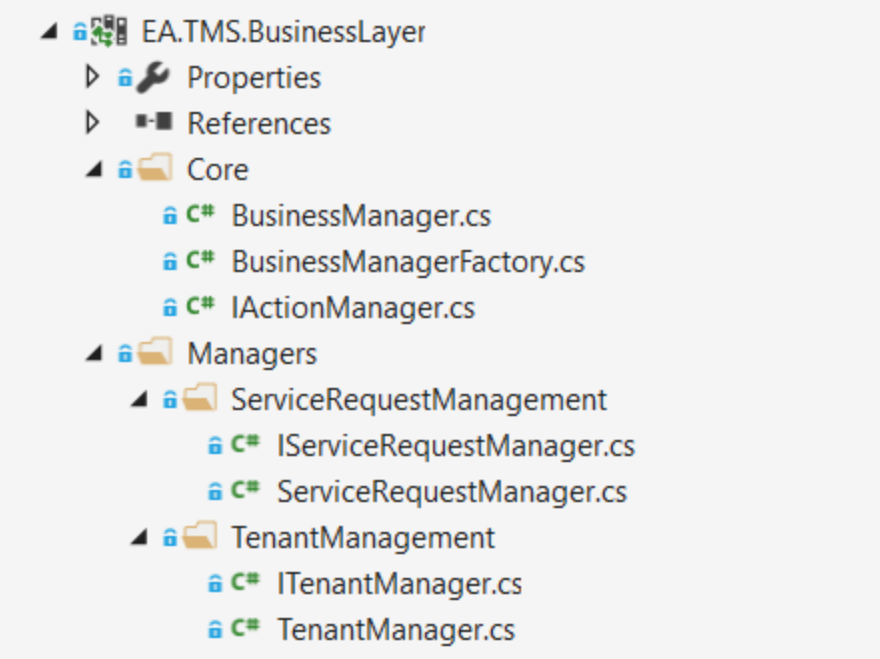

Add New Project
Recent
Installed
Visual C#
Windows
Web
.NET Core
Android
Cloud
Cross-Platform
.NET Framework 4.6.1
Sort by:
Default
Search Installed Templates (Ctrl+E)
Class Library (.NET Core)
Visual C#
Console Application (.NET Core)
Visual C#
ASP.NET Core Web Application (.NET Core)
Visual C#
Type: Visual C#
A project template for creating a .NET Core console application.

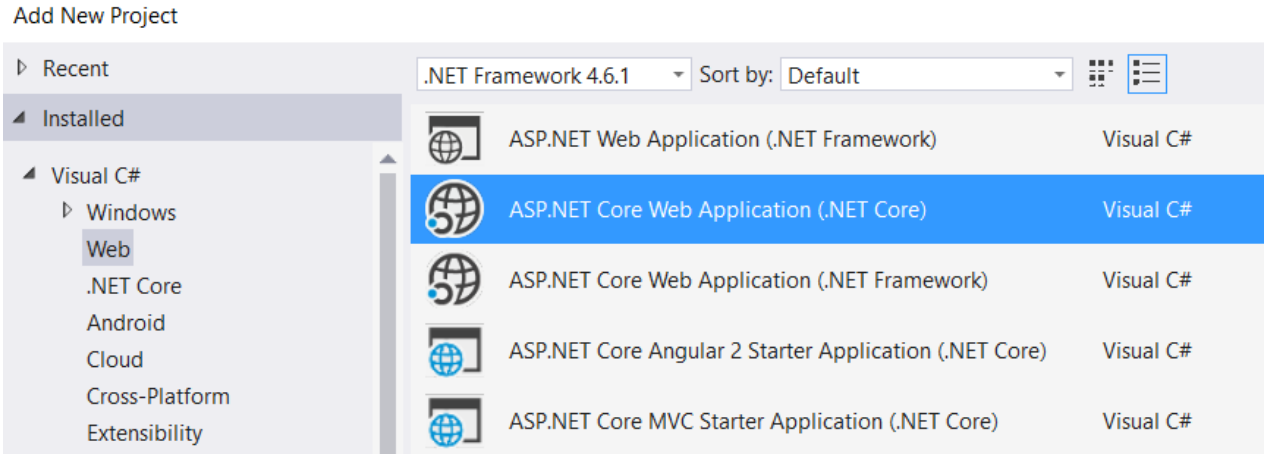

Migrations
20161117190956_Initial.cs

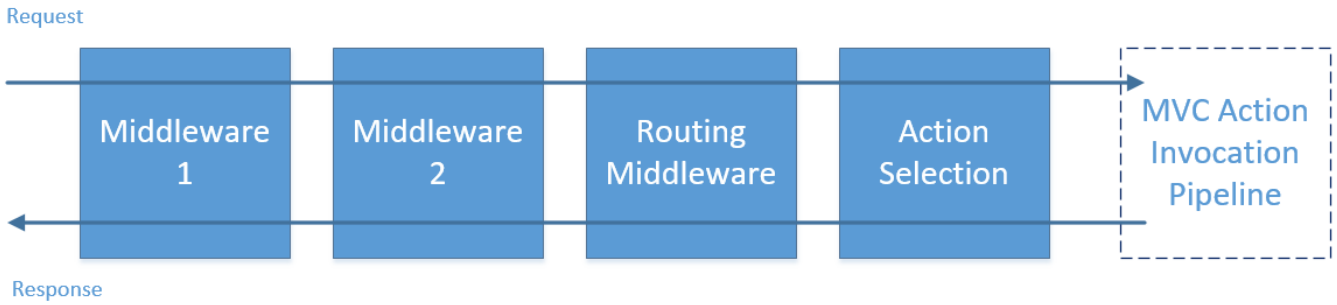

TMS
Database Diagrams
Tables
System Tables
dbo.__EFMigrationsHistory
dbo.AspNetRoleClaims
dbo.AspNetRoles
dbo.AspNetUserClaims
dbo.AspNetUserLogins
dbo.AspNetUserRoles
dbo.AspNetUsers
dbo.AspNetUserTokens
dbo.Employee
dbo.Job
dbo.JobTask
dbo.JobWorker
dbo.Property
dbo.ServiceRequest
dbo.Status
dbo.Tenant


EA.TMS.DataAccess
Properties
References
Core
DataContext.cs
DbFactory.cs
IDbFactory.cs
IRepository.cs
IUnitOfWork.cs
Repository.cs
UnitOfWork.cs
Migrations
appsettings.json

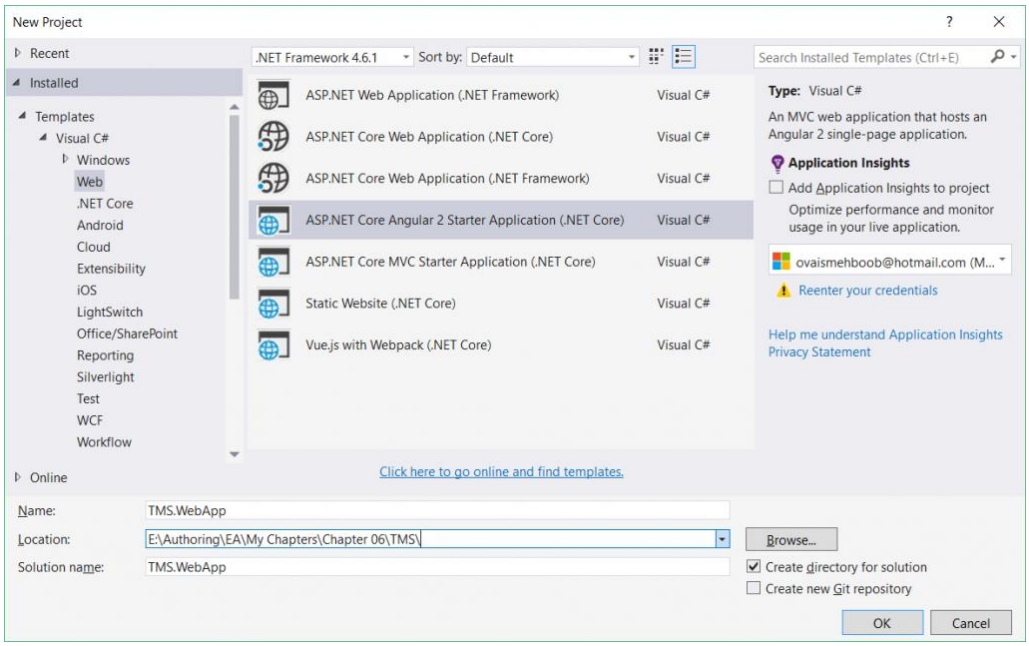

Add New Project
Recent
Installed
Visual C#
Windows
Web
.NET Core
Android
Cloud
Cross-Platform
.NET Framework 4.6.1
Sort by:
Default
Search Installed Templates (Ctrl+E)
Class Library (.NET Core)
Visual C#
Console Application (.NET Core)
Visual C#
ASP.NET Core Web Application (.NET Core)
Visual C#
Type: Visual C#
A project template for creating a .NET Core class library.

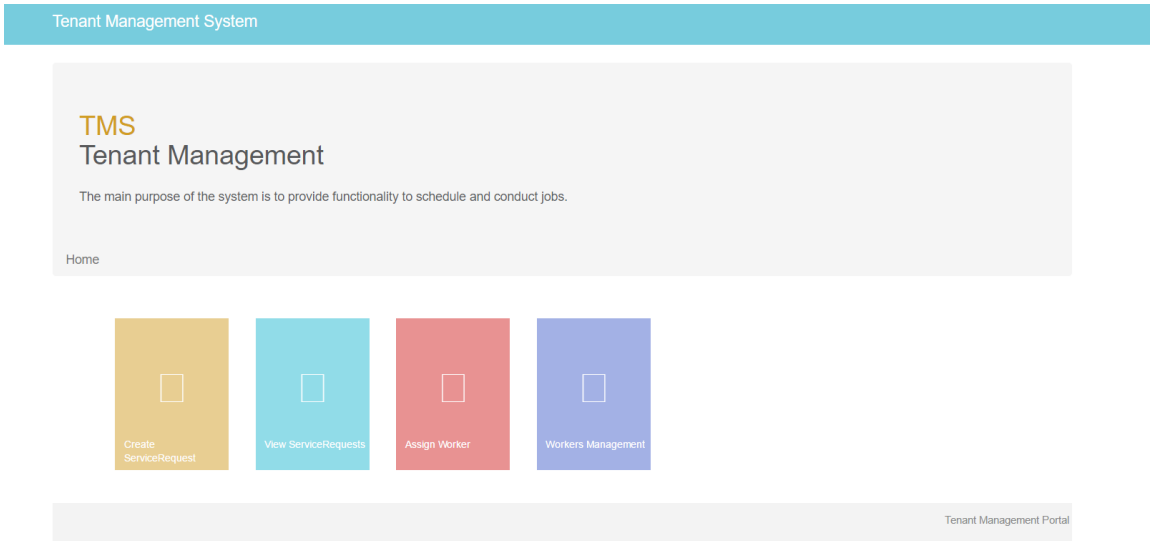

EA.TMS.BusinessLayer
Properties
References
Core
BusinessManager.cs
BusinessManagerFactory.cs
IActionManager.cs
Managers
ServiceRequestManagement
IServiceRequestManager.cs
ServiceRequestManager.cs
TenantManagement
ITenantManager.cs
TenantManager.cs


Add New Project
Recent
Installed
Visual C#
Windows
Web
.NET Core
Android
Cloud
Cross-Platform
Extensibility
.NET Framework 4.6.1
Sort by:
Default
ASP.NET Web Application (.NET Framework)
Visual C#
ASP.NET Core Web Application (.NET Core)
Visual C#
ASP.NET Core Web Application (.NET Framework)
Visual C#
ASP.NET Core Angular 2 Starter Application (.NET Core)
Visual C#
ASP.NET Core MVC Starter Application (.NET Core)
Visual C#

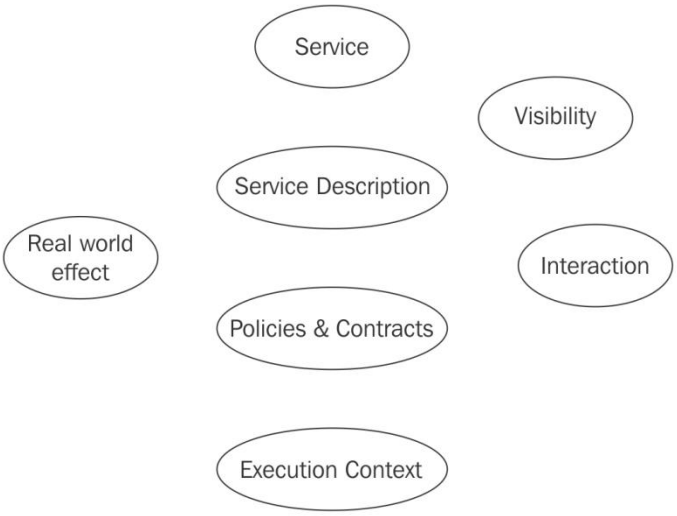

Request
Middleware 1
Middleware 2
Routing Middleware
Action Selection
MVC Action Invocation Pipeline
Response

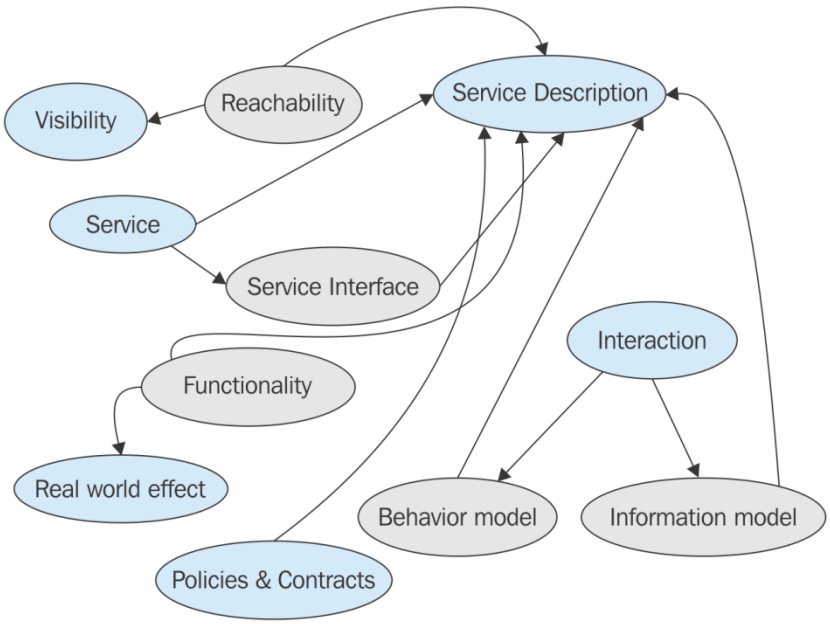

Client
Server
Request
returns HTML
AJAX call
returns JSON

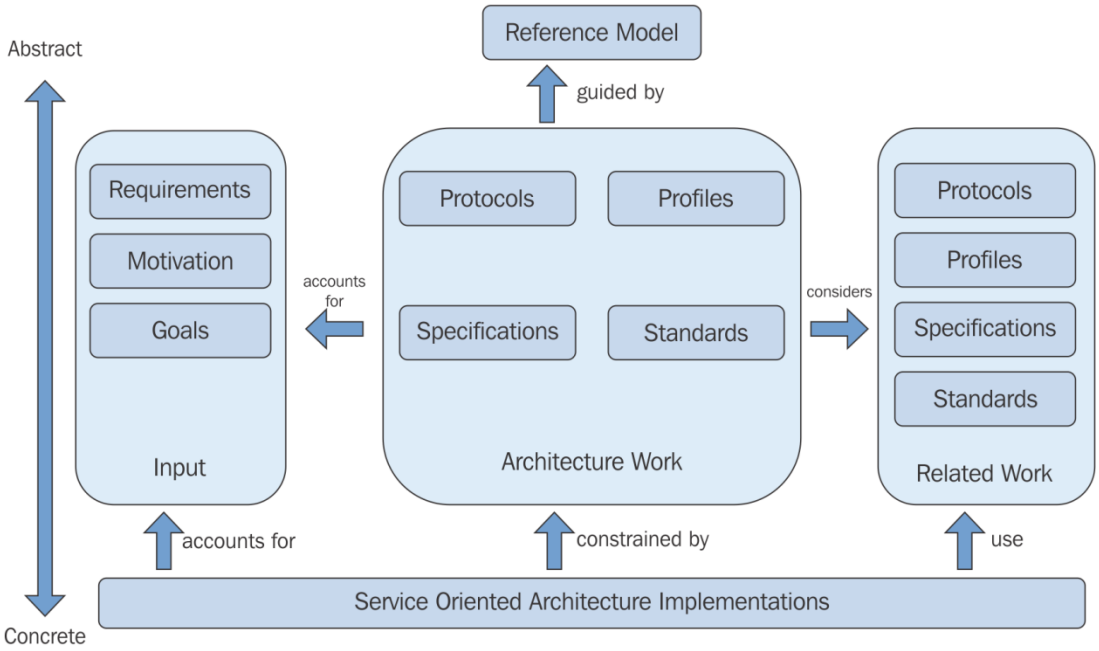

New Project
Recent
Installed
Templates
Visual C#
Windows
Web
.NET Core
Android
Cloud
Extensibility
iOS
LightSwitch
Office/SharePoint
Reporting
Silverlight
Test
WCF
Workflow
Online
.NET Framework 4.6.1
Sort by: Default
Search Installed Templates (Ctrl+E)
ASP.NET Web Application (.NET Framework) Visual C#
ASP.NET Core Web Application (.NET Core) Visual C#
ASP.NET Core Web Application (.NET Framework) Visual C#
ASP.NET Core Angular 2 Starter Application (.NET Core) Visual C#
ASP.NET Core MVC Starter Application (.NET Core) Visual C#
Static Website (.NET Core) Visual C#
Vue.js with Webpack (.NET Core) Visual C#
Type: Visual C#
An MVC web application that hosts an Angular 2 single-page application.
Application Insights
Add Application Insights to project
Optimize performance and monitor usage in your live application.
ovaismehboob@hotmail.com (M...
Reenter your credentials
Help me understand Application Insights
Privacy Statement
Click here to go online and find templates.
Name: TMS.WebApp
Location: E:\Authoring\EA\My Chapters\Chapter 06\TMS\
Solution name: TMS.WebApp
Browse...
Create directory for solution
Create new Git repository
OK
Cancel

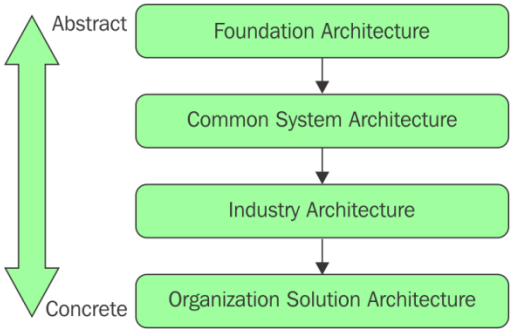

Tenant Management System
TMS
Tenant Management
The main purpose of the system is to provide functionality to schedule and conduct jobs.
Home
Create ServiceRequest
View ServiceRequests
Assign Worker
Workers Management
Tenant Management Portal

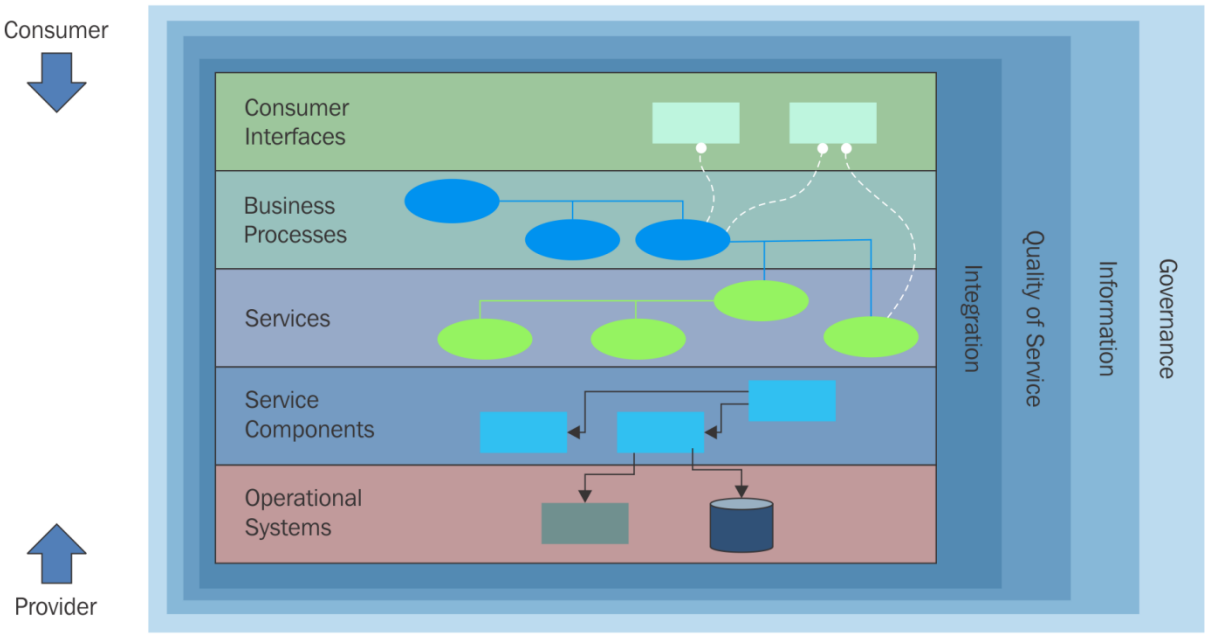
Chapter 7: SOA Implementation with .NET Core

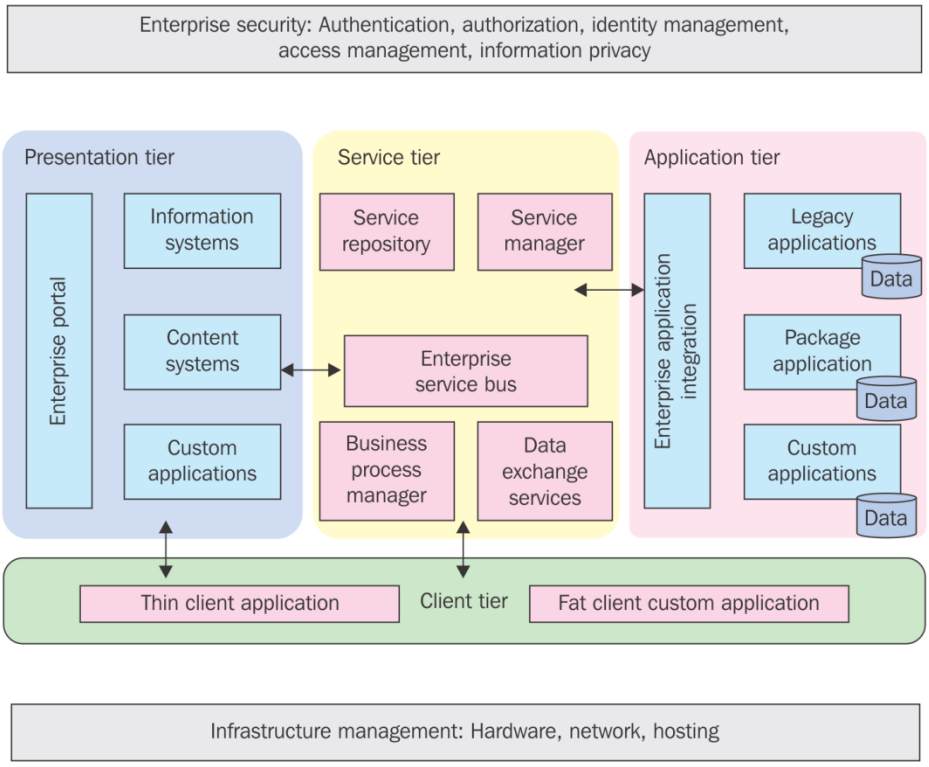


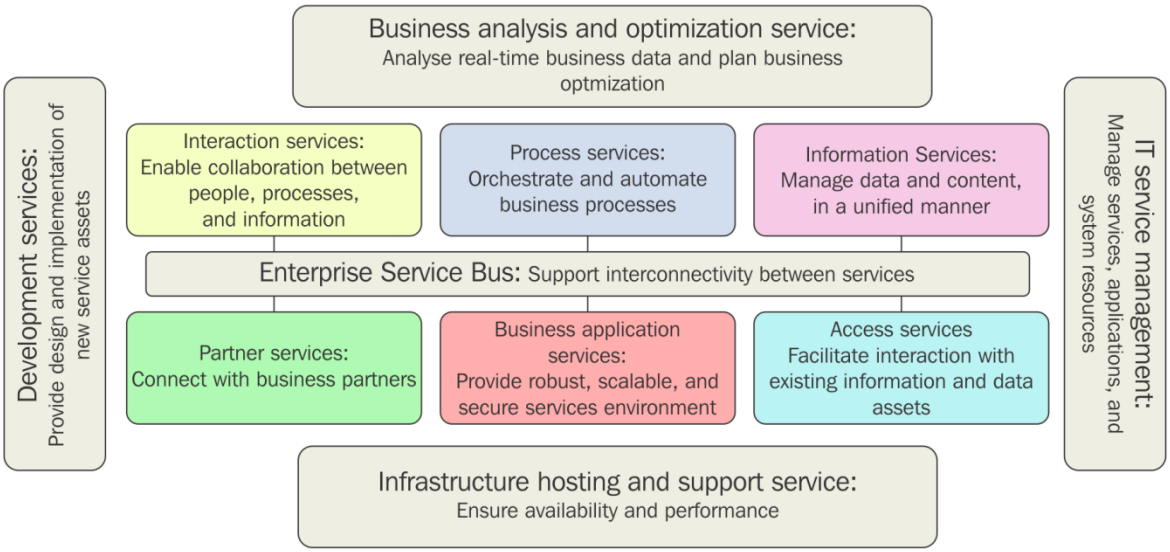


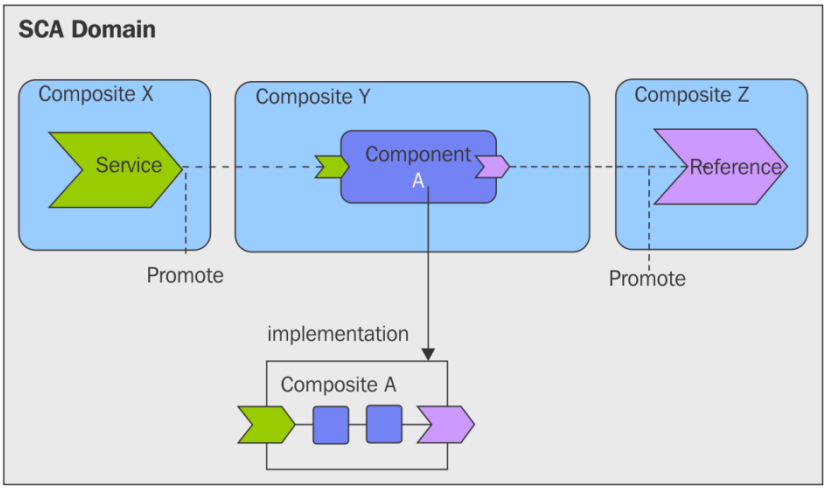

Abstract
Reference Model
guided by
Requirements
Motivation
Goals
Input
accounts for
Protocols
Profiles
Specifications
Standards
Architecture Work
considers
Protocols
Profiles
Specifications
Standards
Related Work
accounts for
constrained by
use
Service Oriented Architecture Implementations
Concrete

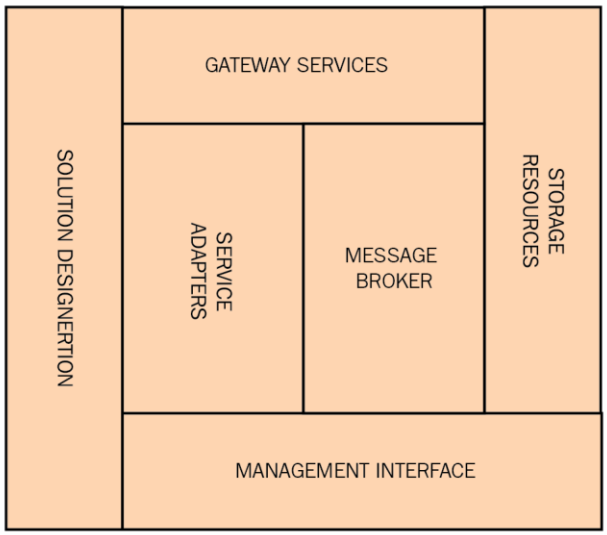

Abstract
Foundation Architecture
Common System Architecture
Industry Architecture
Organization Solution Architecture
Concrete

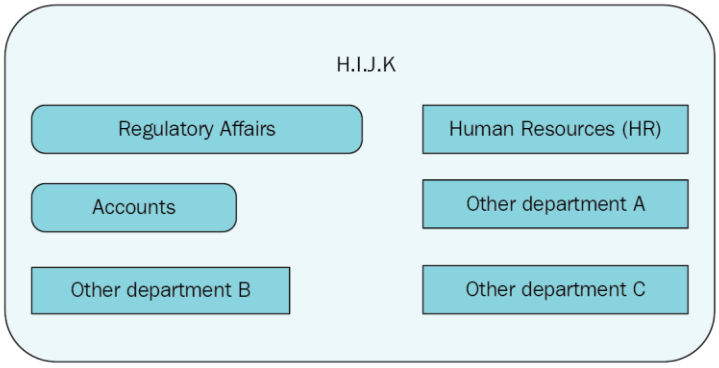

Consumer
Consumer Interfaces
Business Processes
Services
Service Components
Operational Systems
Integration
Quality of Service
Information
Governance
Provider

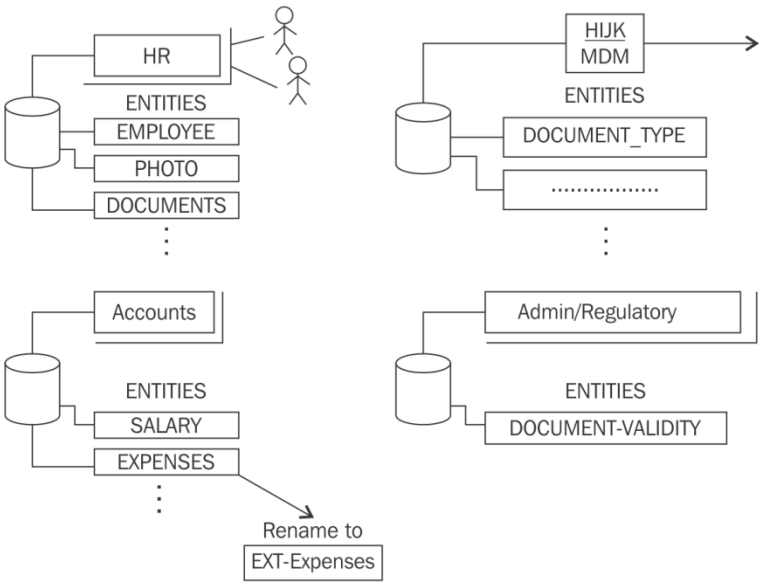

Enterprise security: Authentication, authorization, identity management, access management, information privacy
Presentation tier
Enterprise portal
Information systems
Content systems
Custom applications
Service tier
Service repository
Service manager
Enterprise service bus
Business process manager
Data exchange services
Application tier
Enterprise application integration
Legacy applications
Data
Package application
Data
Custom applications
Data
Thin client application
Client tier
Fat client custom application
Infrastructure management: Hardware, network, hosting

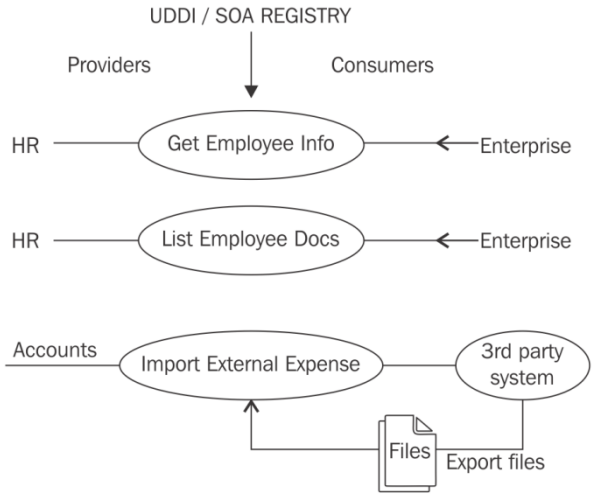

Business analysis and optimization service:
Analyse real-time business data and plan business optmization
Development services:
Provide design and implementation of new service assets
Interaction services:
Enable collaboration between people, processes, and information
Process services:
Orchestrate and automate business processes
Information Services:
Manage data and content, in a unified manner
IT service management:
Manage services, applications, and system resources
Enterprise Service Bus: Support interconnectivity between services
Partner services:
Connect with business partners
Business application services:
Provide robust, scalable, and secure services environment
Access services
Facilitate interaction with existing information and data assets
Infrastructure hosting and support service:
Ensure availability and performance

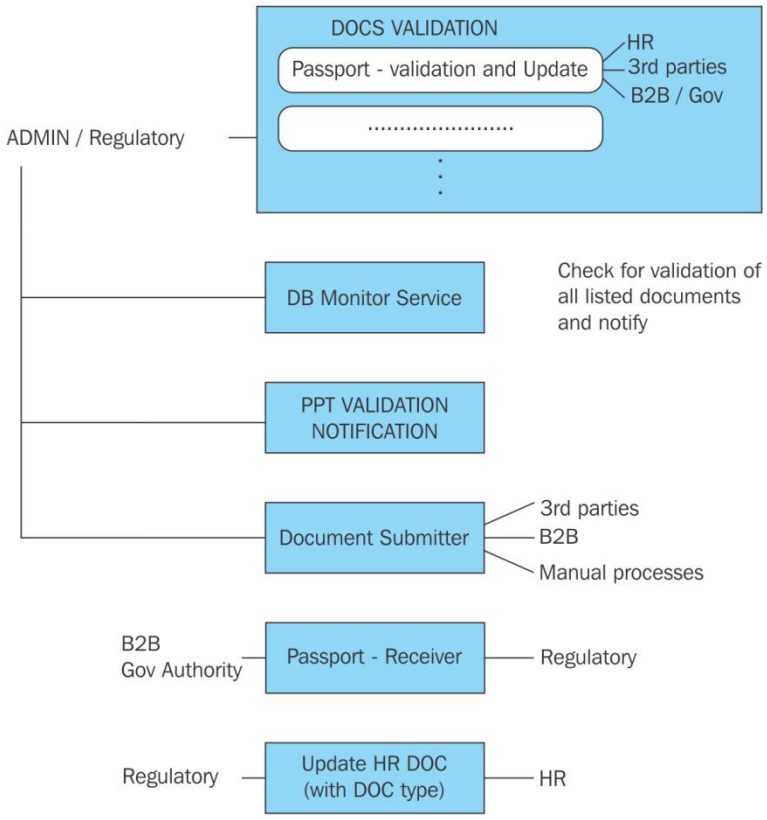

SCA Domain
Composite X
Service
Promote
Composite Y
Component A
implementation
Composite A
Composite Z
Reference
Promote

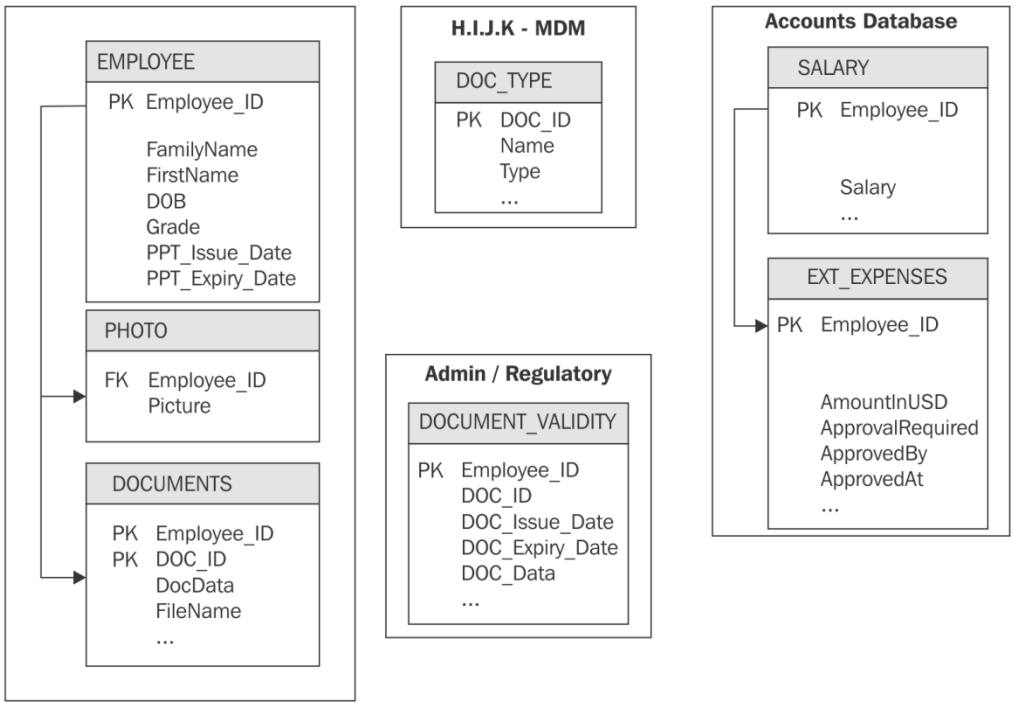

GATEWAY SERVICES
SOLUTION DESIGNERTION
SERVICE ADAPTERS
MESSAGE BROKER
STORAGE RESOURCES
MANAGEMENT INTERFACE

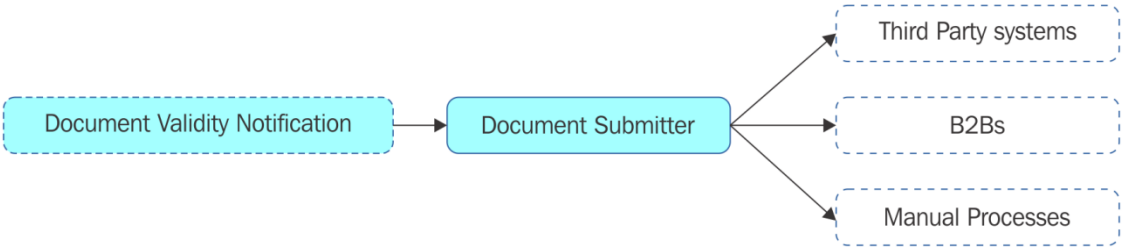

H.I.J.K
Regulatory Affairs
Human Resources (HR)
Accounts
Other department A
Other department B
Other department C

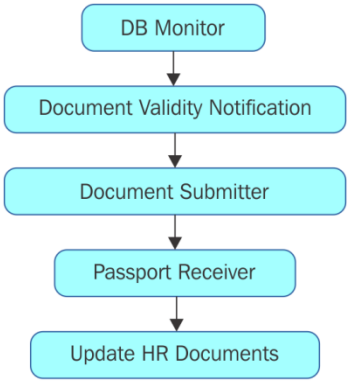

HR
ENTITIES
EMPLOYEE
PHOTO
DOCUMENTS
HIJK
MDM
ENTITIES
DOCUMENT_TYPE
.....
Accounts
ENTITIES
SALARY
EXPENSES
Rename to
EXT-Expenses
Admin/Regulatory
ENTITIES
DOCUMENT-VALIDITY


UDDI / SOA REGISTRY
Providers
Consumers
HR
Get Employee Info
Enterprise
HR
List Employee Docs
Enterprise
Accounts
Import External Expense
3rd party system
Files
Export files

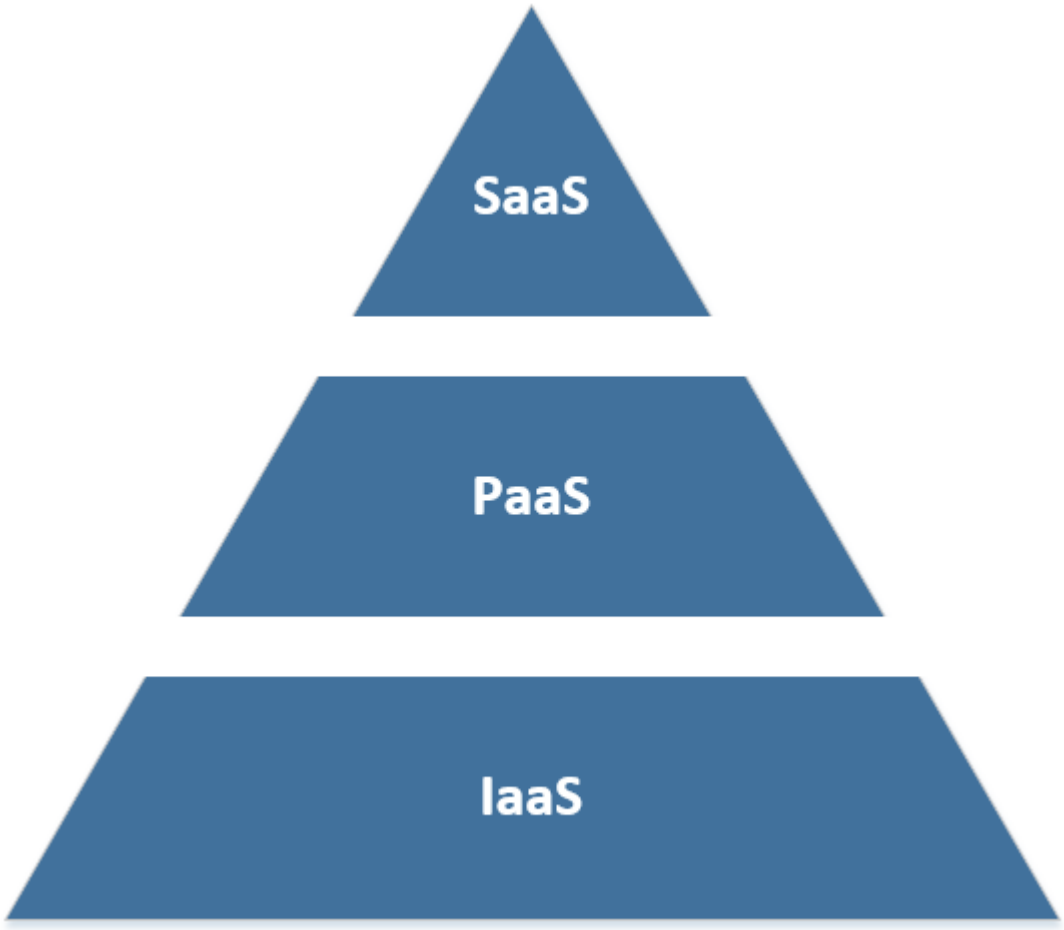

DOCS VALIDATION
Passport - validation and Update
HR
3rd parties
B2B / Gov
.....
ADMIN / Regulatory
DB Monitor Service
Check for validation of all listed documents and notify
PPT VALIDATION NOTIFICATION
Document Submitter
3rd parties
B2B
Manual processes
B2B
Gov Authority
Passport - Receiver
Regulatory
Regulatory
Update HR DOC (with DOC type)
HR


EMPLOYEE
PK Employee_ID
FamilyName
FirstName
DOB
Grade
PPT_Issue_Date
PPT_Expiry_Date
PHOTO
FK Employee_ID
Picture
DOCUMENTS
PK Employee_ID
PK DOC_ID
DocData
FileName
...
H.I.J.K - MDM
DOC_TYPE
PK DOC_ID
Name
Type
...
Admin / Regulatory
DOCUMENT_VALIDITY
PK Employee_ID
DOC_ID
DOC_Issue_Date
DOC_Expiry_Date
DOC_Data
...
Accounts Database
SALARY
PK Employee_ID
Salary
...
EXT_EXPENSES
PK Employee_ID
AmountInUSD
ApprovalRequired
ApprovedBy
ApprovedAt
...

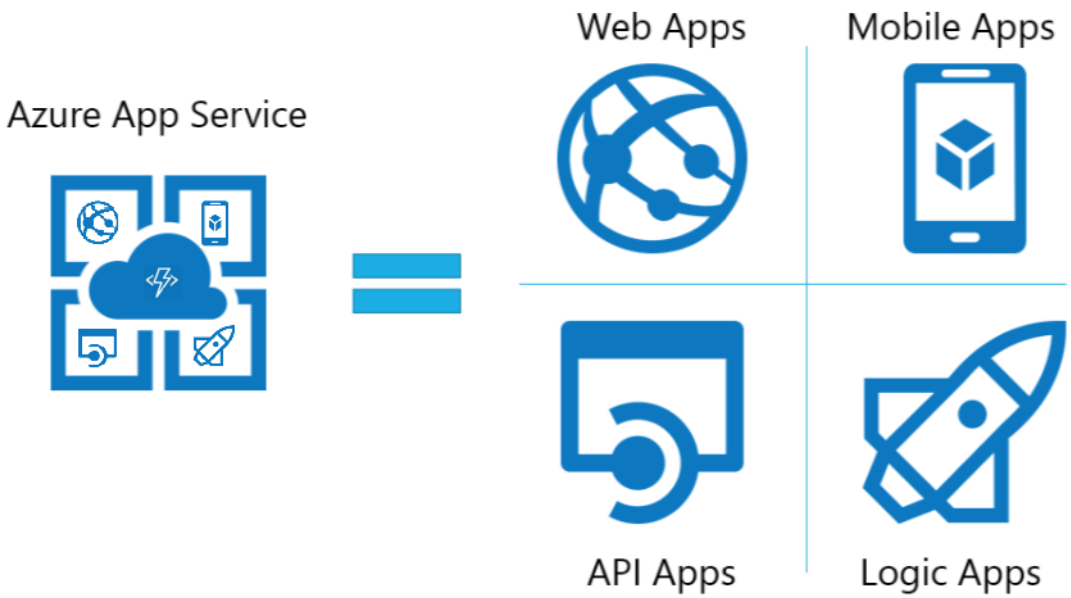

Document Validity Notification
Document Submitter
Third Party systems
B2Bs
Manual Processes

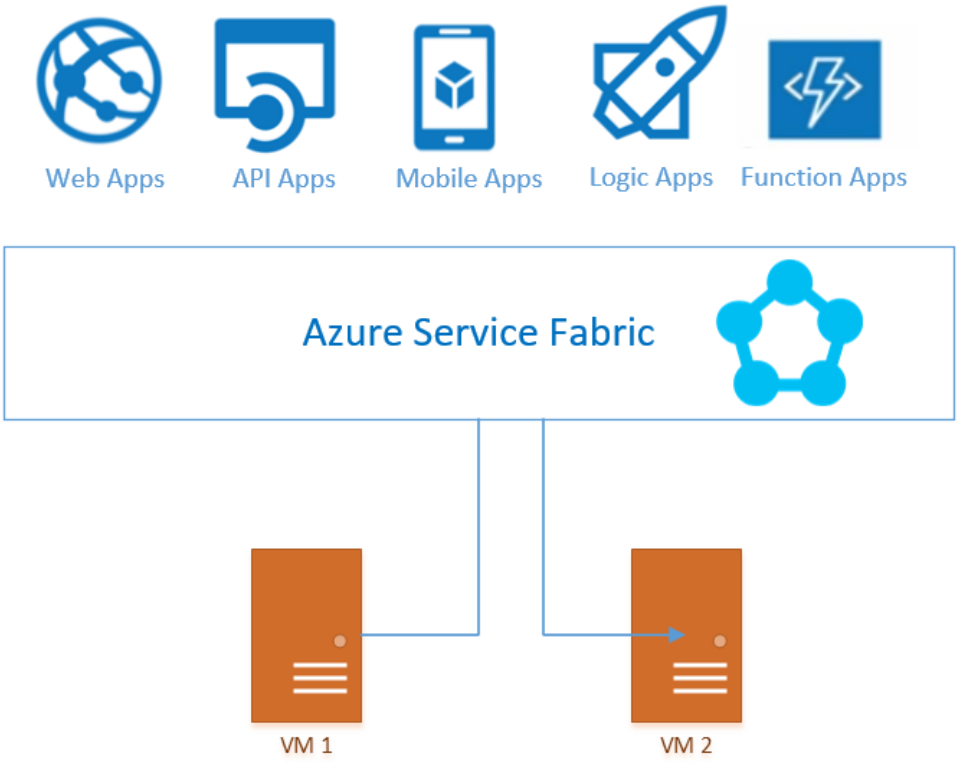

DB Monitor
Document Validity Notification
Document Submitter
Passport Receiver
Update HR Documents

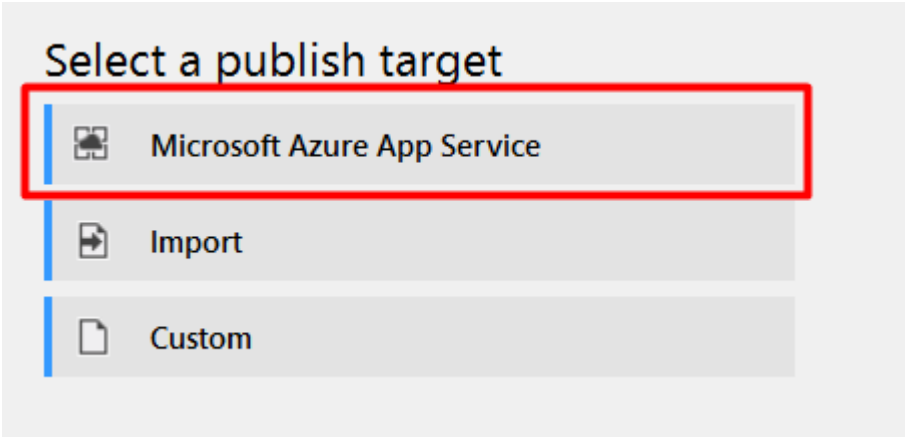
Chapter 8: Cloud-Based Architecture and Integration with .NET Core

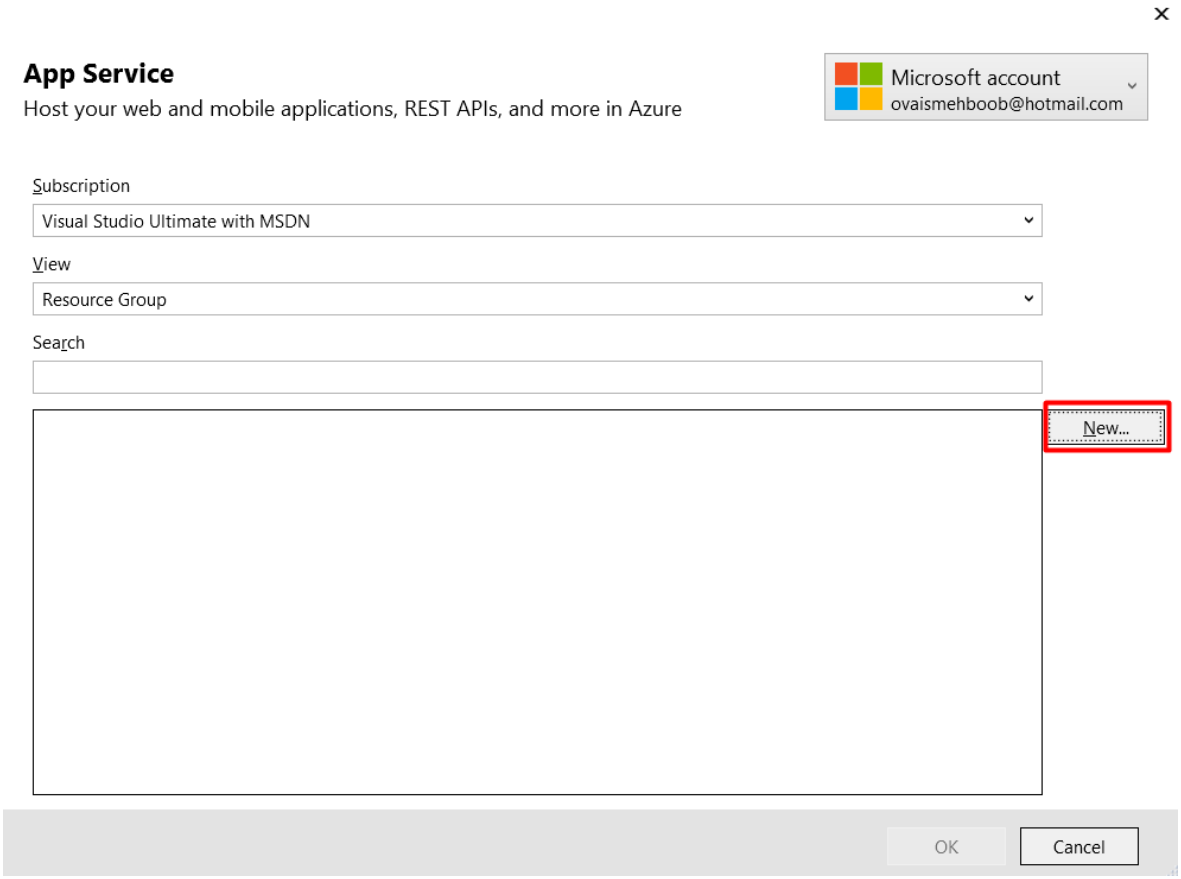


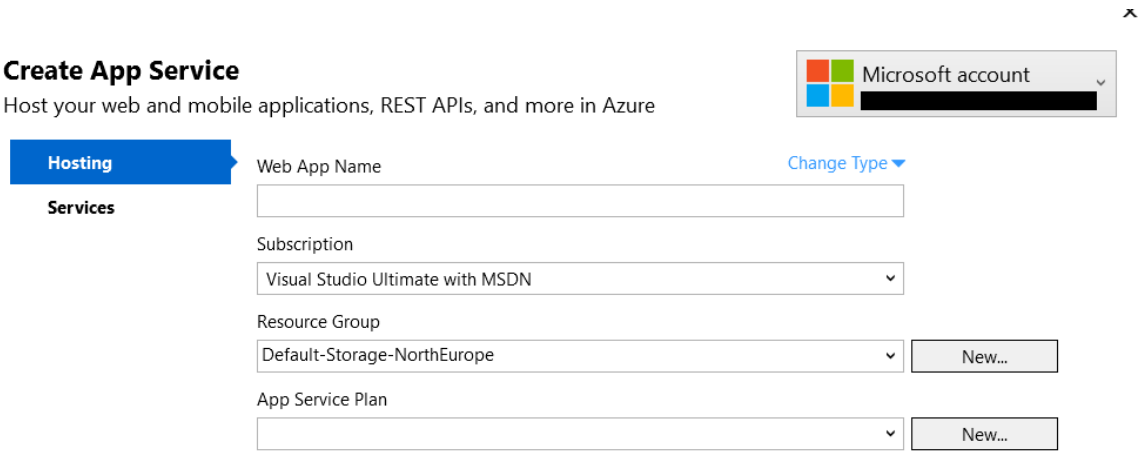
Features	Virtual machines	Cloud services	Azure App Services	Service Fabric
Azure managed OS		✓	✓	✓
Quick deployment			✓	✓
Shared storage, which enables easy scaling			✓	✓
Deployment slots to keep multiple environments		✓	✓	✓
Operating system and patches updated by Azure		✓	✓	✓
Deploy code from Git	✓		✓	
Deploy code from TFS	✓	✓		✓
Access to Azure storage services	✓	✓	✓	✓
Support for different languages like ASP.NET, Node.js, PHP, and Python	✓	✓	✓	✓
SSL support	✓	✓	✓	✓
Remote Access to servers	✓	✓		✓
Integrated Monitoring support	✓	✓	✓	




Web Apps
API Apps
Mobile Apps
Logic Apps
Function Apps
Azure Service Fabric
VM 1
VM 2


Select a publish target
Microsoft Azure App Service
Import
Custom


App Service
Host your web and mobile applications, REST APIs, and more in Azure
Microsoft account
ovaismehboob@hotmail.com
Subscription
Visual Studio Ultimate with MSDN
View
Resource Group
Search
New...
OK
Cancel


Create App Service
Host your web and mobile applications, REST APIs, and more in Azure
Microsoft account
Hosting
Services
Web App Name
Change Type
Subscription
Visual Studio Ultimate with MSDN
Resource Group
Default-Storage-NorthEurope
New...
App Service Plan
New...

Configure App Service Plan

An App Service plan is the container for your app. The App Service plan settings will determine the location, features, cost and...

App Service Plan

HelloWorld20161231081245Plan

Location

South Central US

Size

S3 (4 cores, 7 GB RAM)

HelloCloudChapterWebApp - Web Deploy

Publish method: Web Deploy

Server: hellocloudchapterwebapp.scm.azurewebsites.net:443

Site name: HelloCloudChapterWebApp

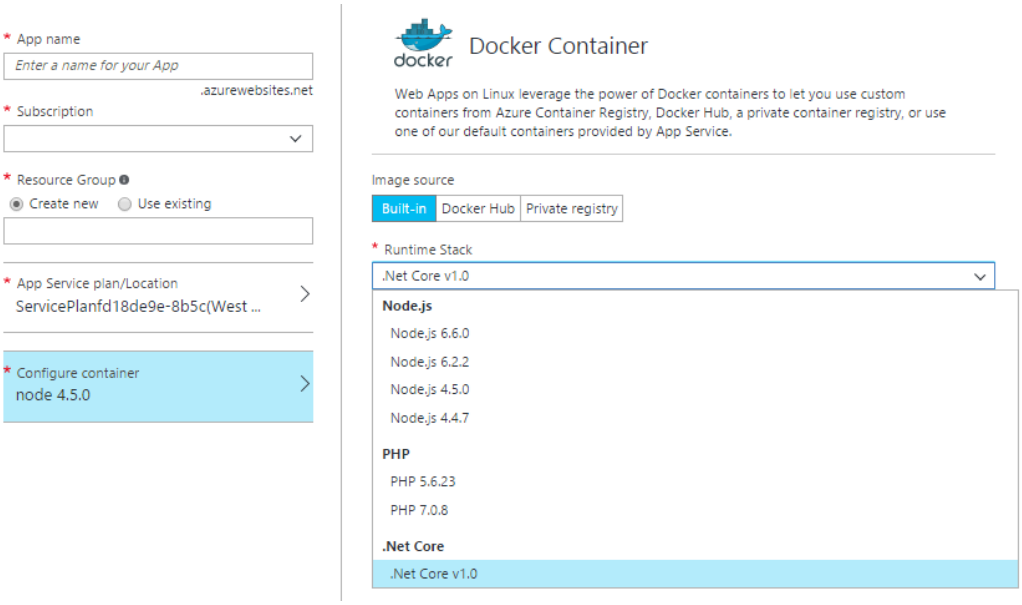
User name: $HelloCloudChapterWebApp

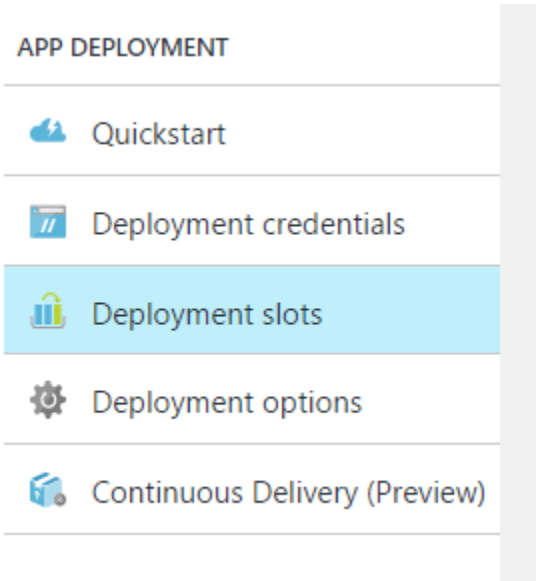
Password: ••

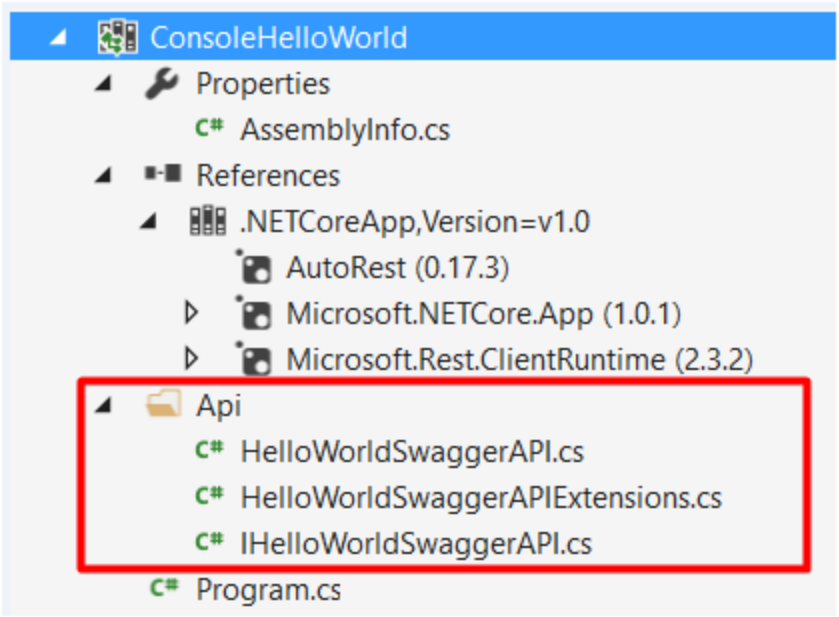
☑ Save password

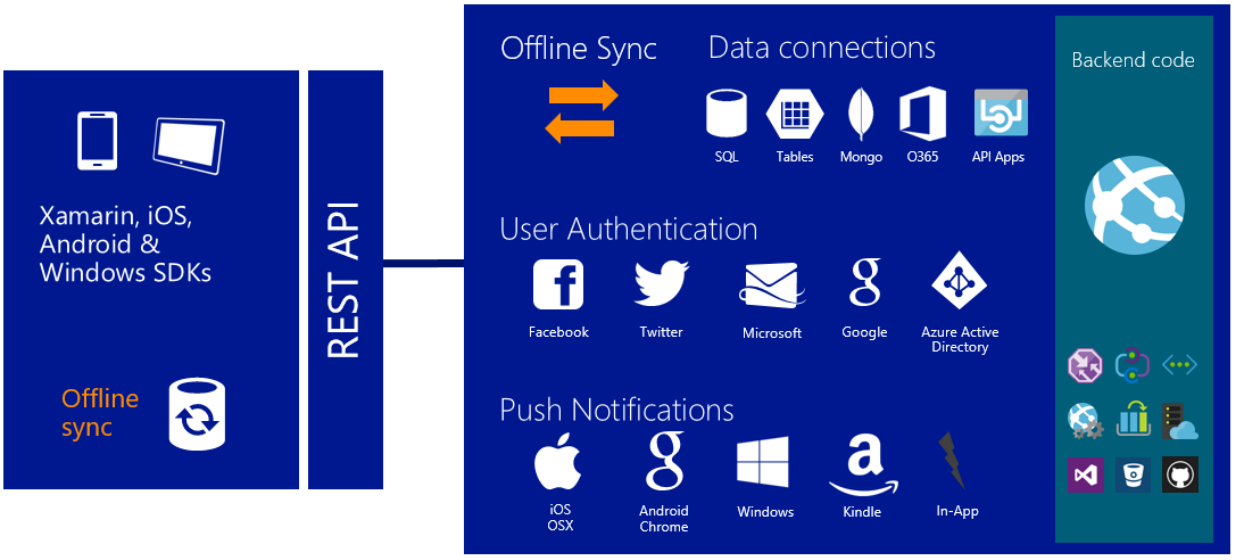
Destination URL: http://hellocloudchapterwebapp.azurewebsites.net

Validate Connection

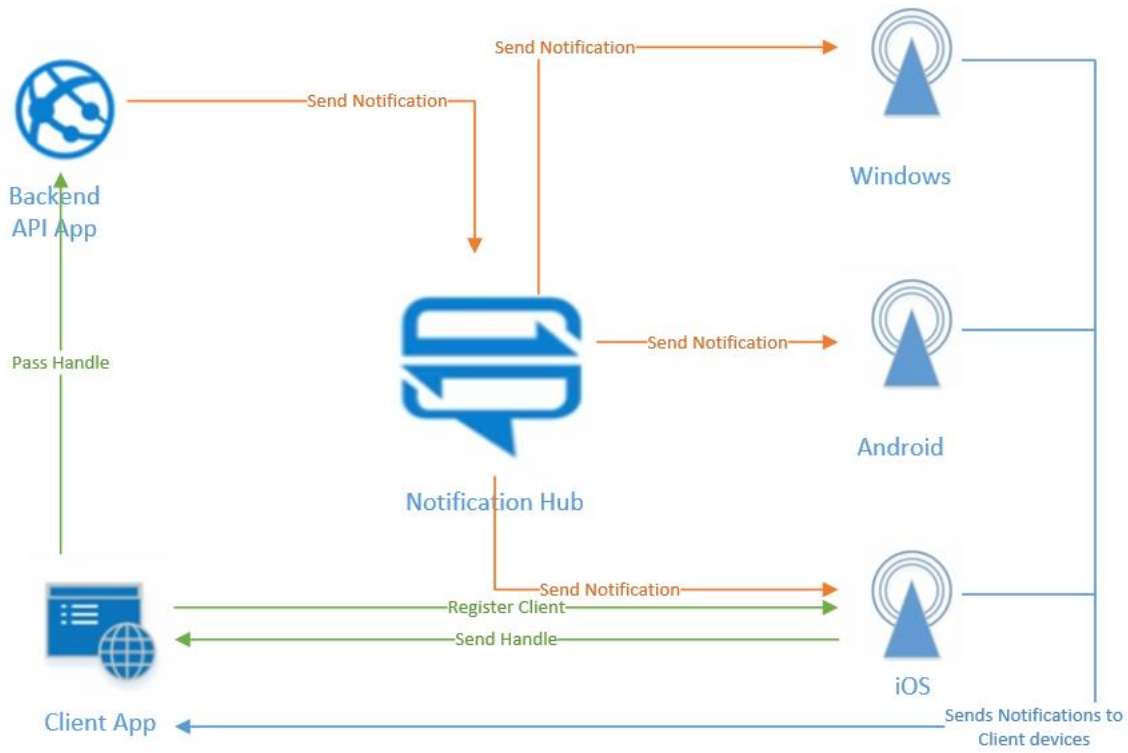

* App name
Enter a name for your App
.azurewebsites.net
* Subscription
* Resource Group
Create new
Use existing
* App Service plan/Location
ServicePlanfd18de9e-8b5c(West ...
* Configure container
node 4.5.0
Docker Container
Web Apps on Linux leverage the power of Docker containers to let you use custom containers from Azure Container Registry, Docker Hub, a private container registry, or use one of our default containers provided by App Service.
Image source
Built-in
Docker Hub
Private registry
* Runtime Stack
.Net Core v1.0
Node.js
Node.js 6.6.0
Node.js 6.2.2
Node.js 4.5.0
Node.js 4.4.7
PHP
PHP 5.6.23
PHP 7.0.8
.Net Core
.Net Core v1.0

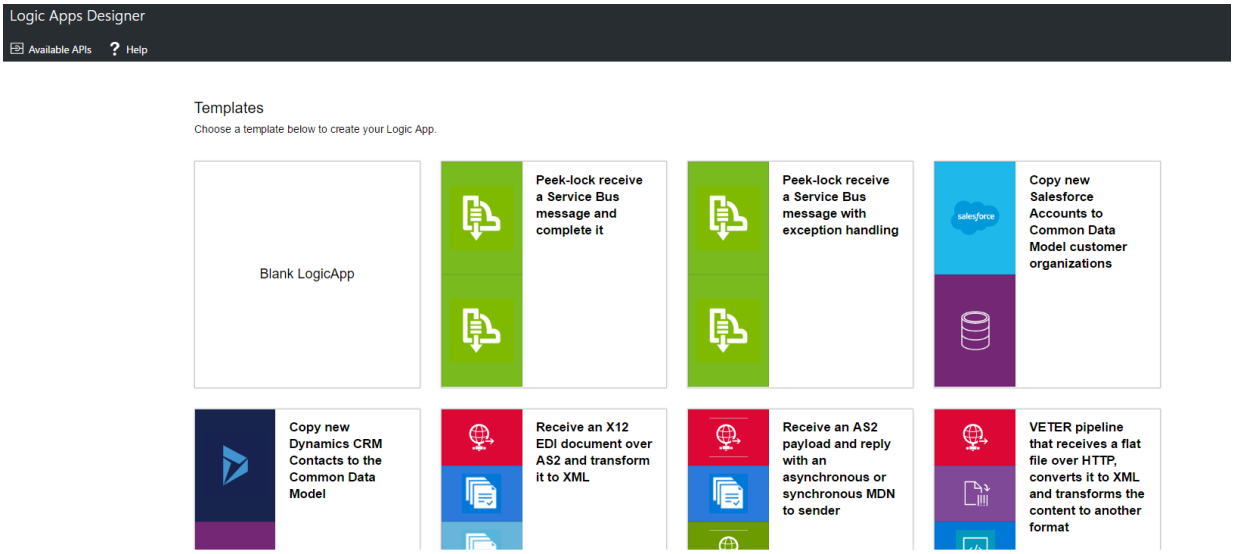

APP DEPLOYMENT
Quickstart
Deployment credentials
Deployment slots
Deployment options
Continuous Delivery (Preview)

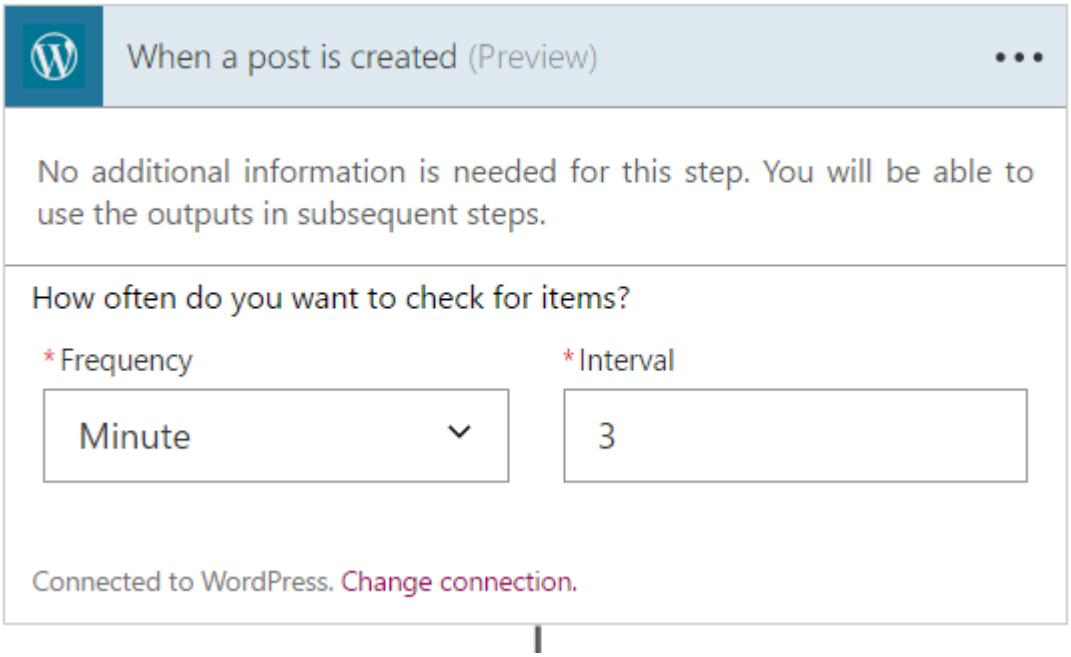

ConsoleHelloWorld
Properties
AssemblyInfo.cs
References
.NETCoreApp,Version=v1.0
AutoRest (0.17.3)
Microsoft.NETCore.App (1.0.1)
Microsoft.Rest.ClientRuntime (2.3.2)
Api
HelloWorldSwaggerAPI.cs
HelloWorldSwaggerAPIExtensions.cs
IHelloWorldSwaggerAPI.cs
Program.cs

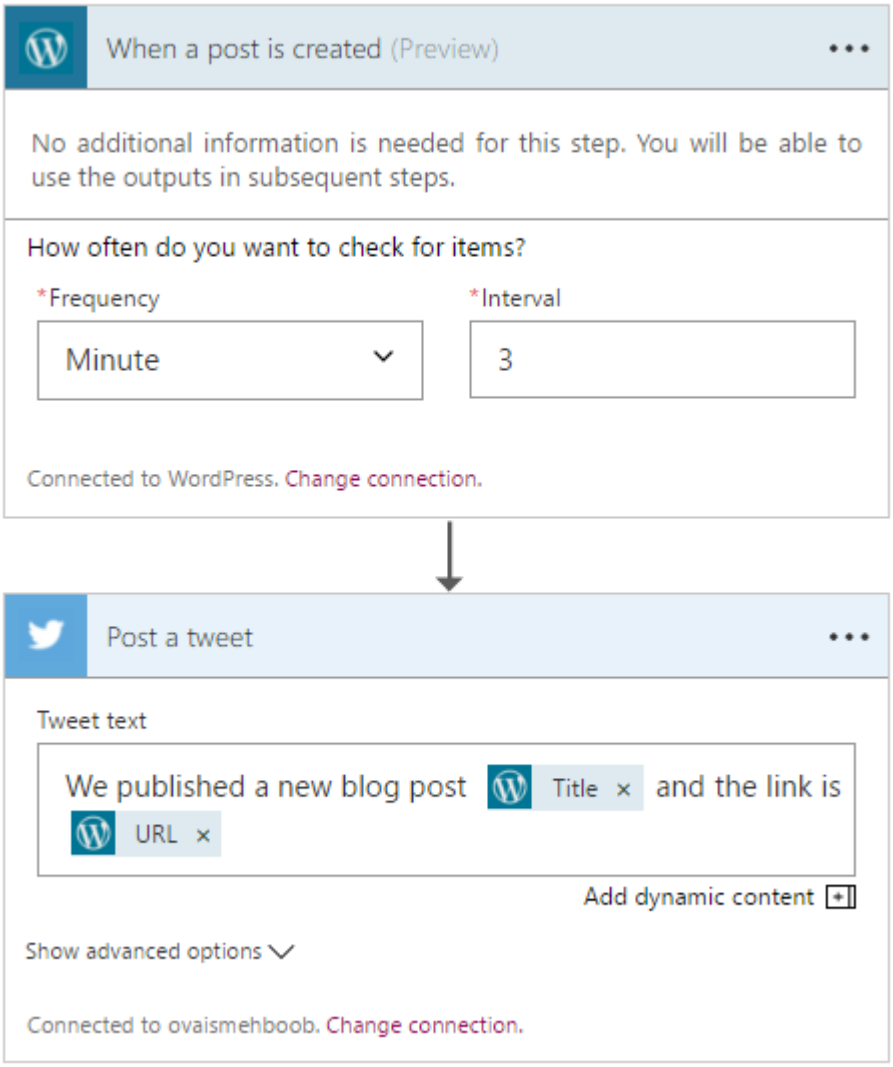

Xamarin, iOS, Android & Windows SDKs
Offline sync
REST API
Offline Sync
Data connections
SQL
Tables
Mongo
O365
API Apps
User Authentication
Facebook
Twitter
Microsoft
Google
Azure Active Directory
Push Notifications
iOS OSX
Android Chrome
Windows
Kindle
In-App
Backend code

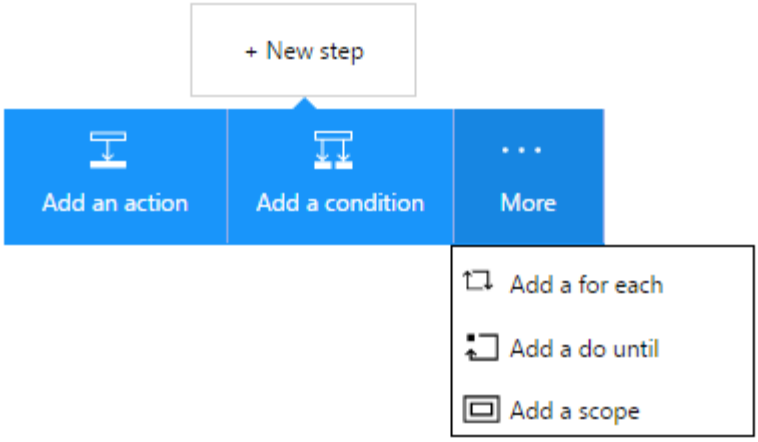
NAME	PUBLISHER	CATEGORY
Mobile App	Microsoft	Web + Mobile
Mobile Apps Quickstart	Microsoft	

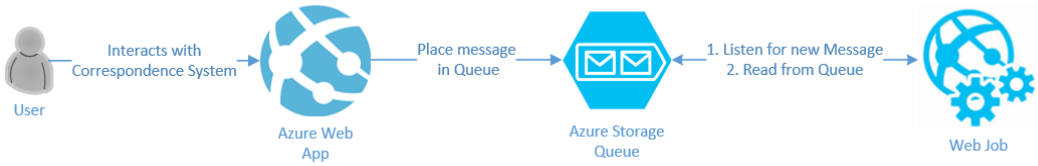


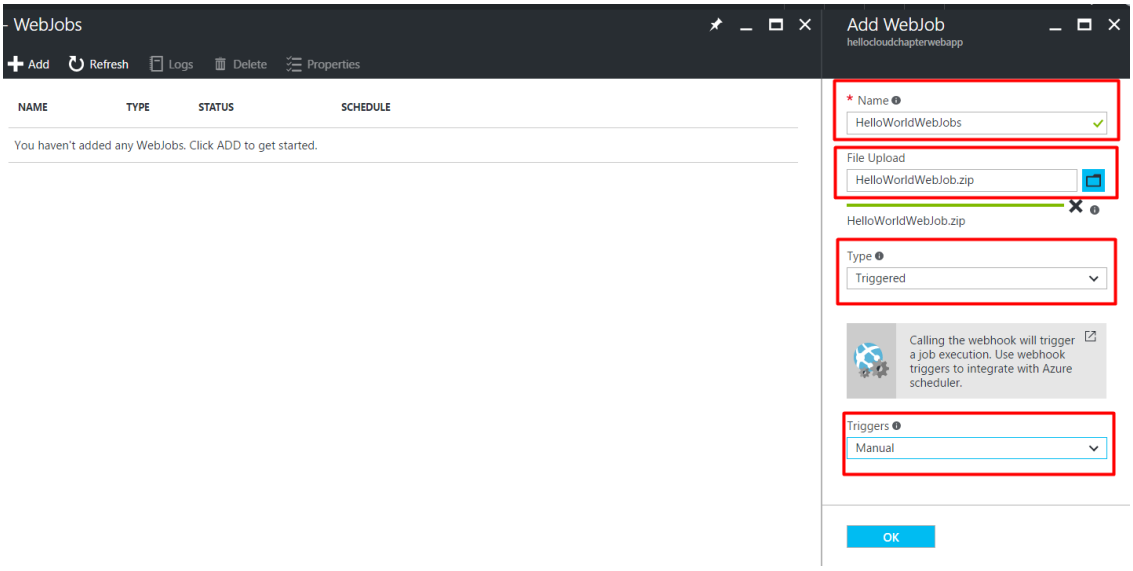

Logic Apps Designer
Available APIs
Help
Templates
Choose a template below to create your Logic App.
Blank LogicApp
Peek-lock receive a Service Bus message and complete it
Peek-lock receive a Service Bus message with exception handling
Copy new Salesforce Accounts to Common Data Model customer organizations
Copy new Dynamics CRM Contacts to the Common Data Model
Receive an X12 EDI document over AS2 and transform it to XML
Receive an AS2 payload and reply with an asynchronous or synchronous MDN to sender
VETER pipeline that receives a flat file over HTTP, converts it to XML and transforms the content to another format

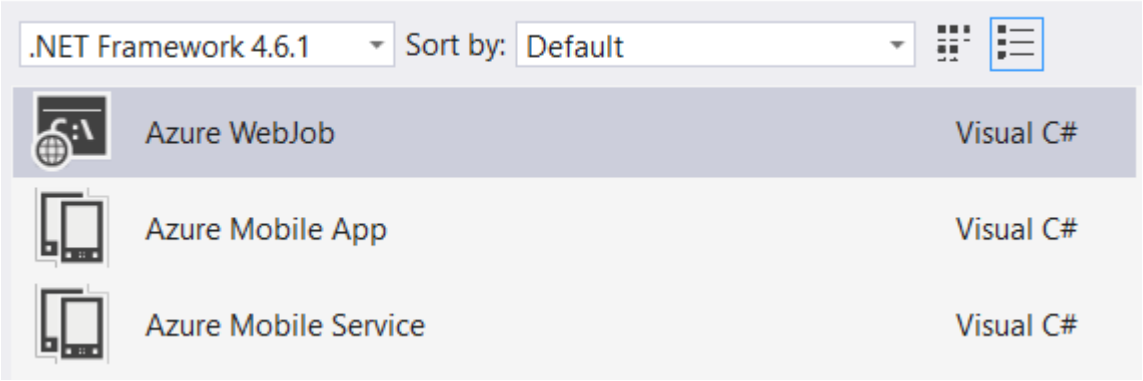

When a post is created (Preview)
No additional information is needed for this step. You will be able to use the outputs in subsequent steps.
How often do you want to check for items?
* Frequency
Minute
* Interval
3
Connected to WordPress. Change connection.

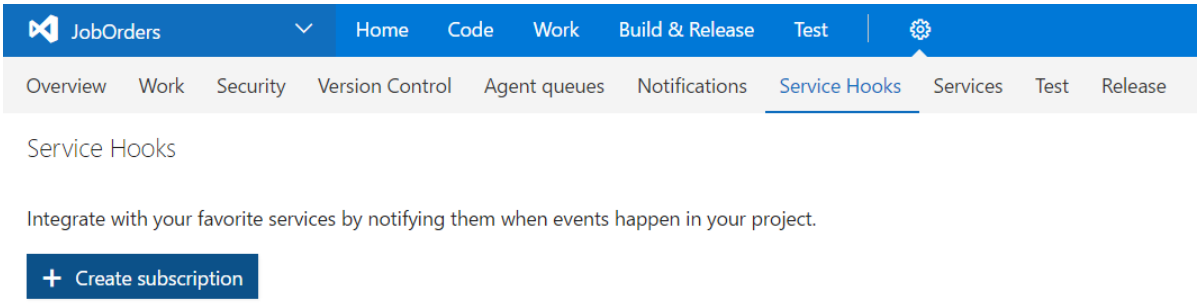

When a post is created (Preview)
No additional information is needed for this step. You will be able to use the outputs in subsequent steps.
How often do you want to check for items?
*Frequency
Minute
*Interval
3
Connected to WordPress. Change connection.
Post a tweet
Tweet text
We published a new blog post
Title
and the link is
URL
Add dynamic content
Show advanced options
Connected to ovaismehboob. Change connection.

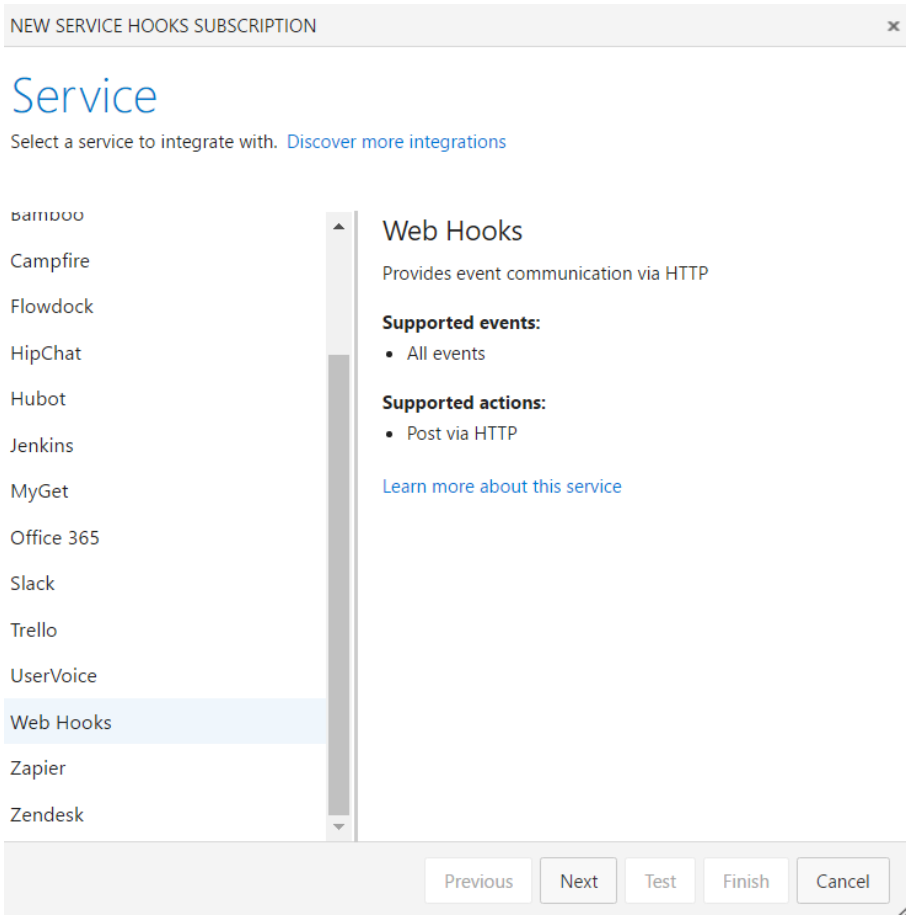

+ New step
Add an action
Add a condition
More
Add a for each
Add a do until
Add a scope

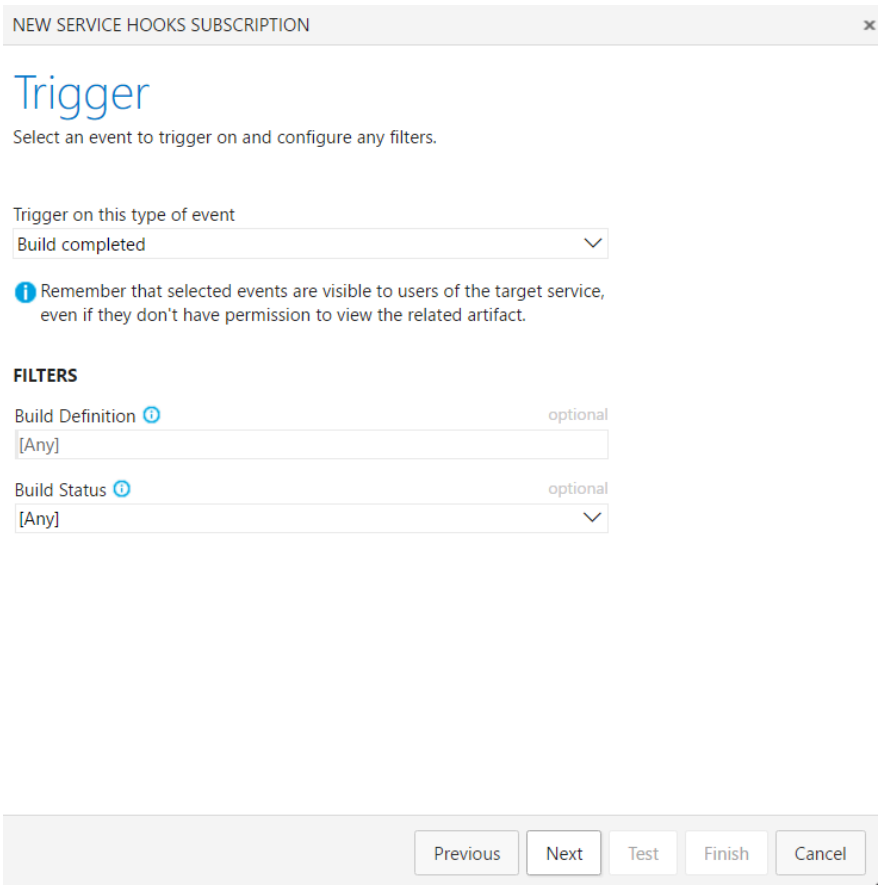

User
Interacts with Correspondence System
Azure Web App
Place message in Queue
Azure Storage Queue
1. Listen for new Message
2. Read from Queue
Web Job

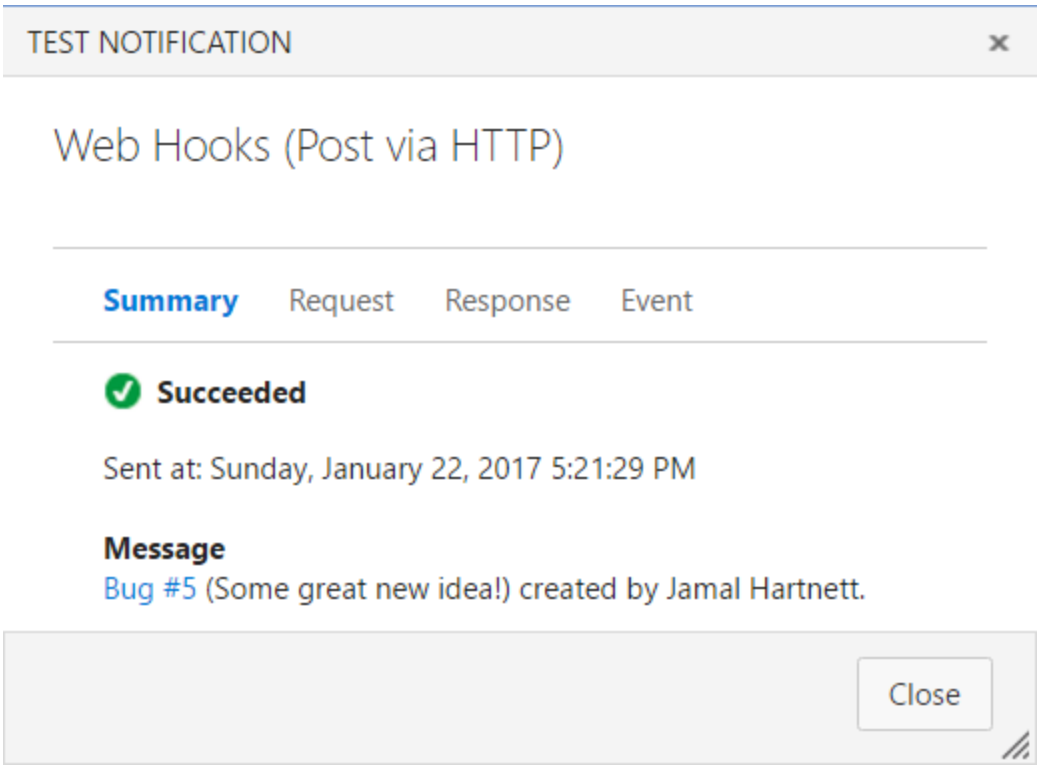

WebJobs
Add
Refresh
Logs
Delete
Properties
NAME
TYPE
STATUS
SCHEDULE
You haven't added any WebJobs. Click ADD to get started.
Add WebJob
hellocloudchapterwebapp
Name
HelloWorldWebJobs
File Upload
HelloWorldWebJob.zip
HelloWorldWebJob.zip
Type
Triggered
Calling the webhook will trigger a job execution. Use webhook triggers to integrate with Azure scheduler.
Triggers
Manual
OK

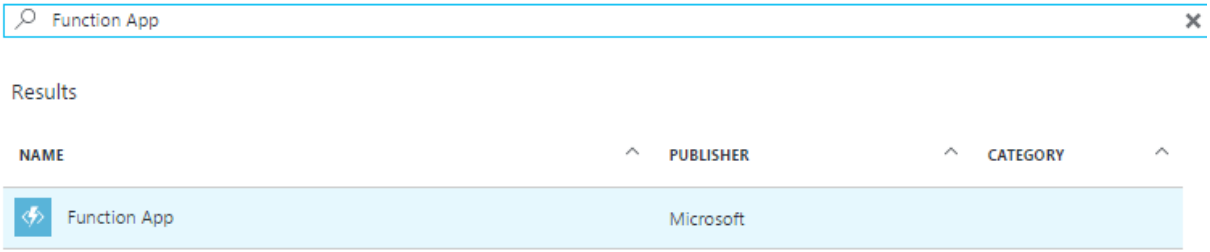

.NET Framework 4.6.1
Sort by:
Default
Azure WebJob
Visual C#
Azure Mobile App
Visual C#
Azure Mobile Service
Visual C#

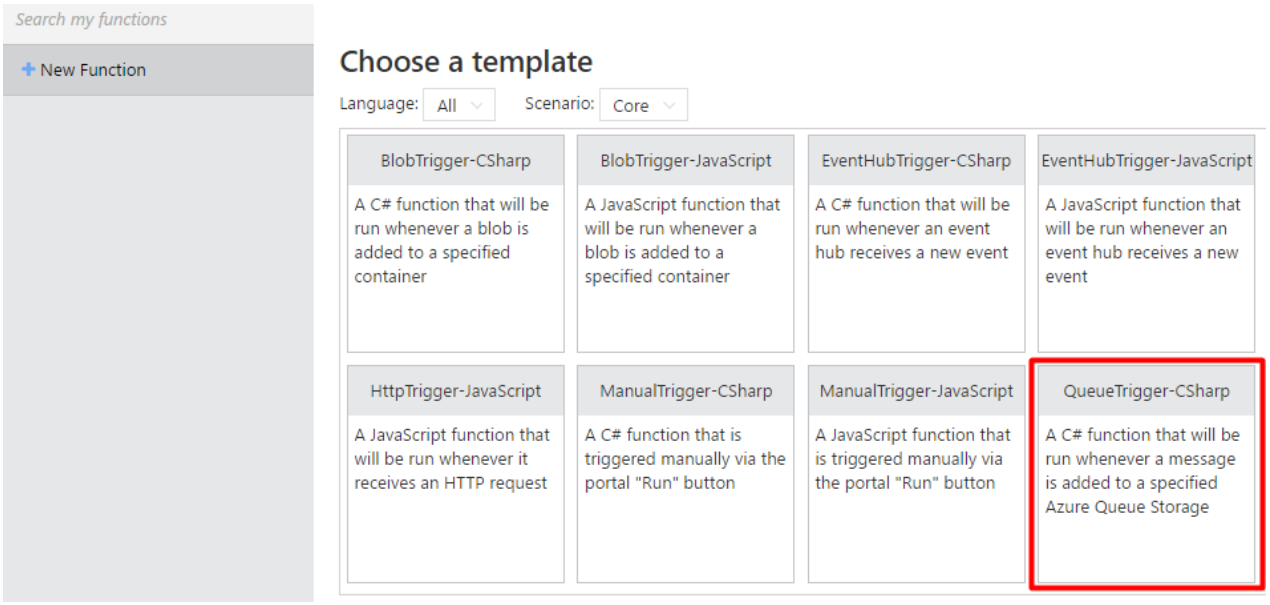

JobOrders
Home
Code
Work
Build & Release
Test
Overview
Work
Security
Version Control
Agent queues
Notifications
Service Hooks
Services
Test
Release
Service Hooks
Integrate with your favorite services by notifying them when events happen in your project.
+ Create subscription

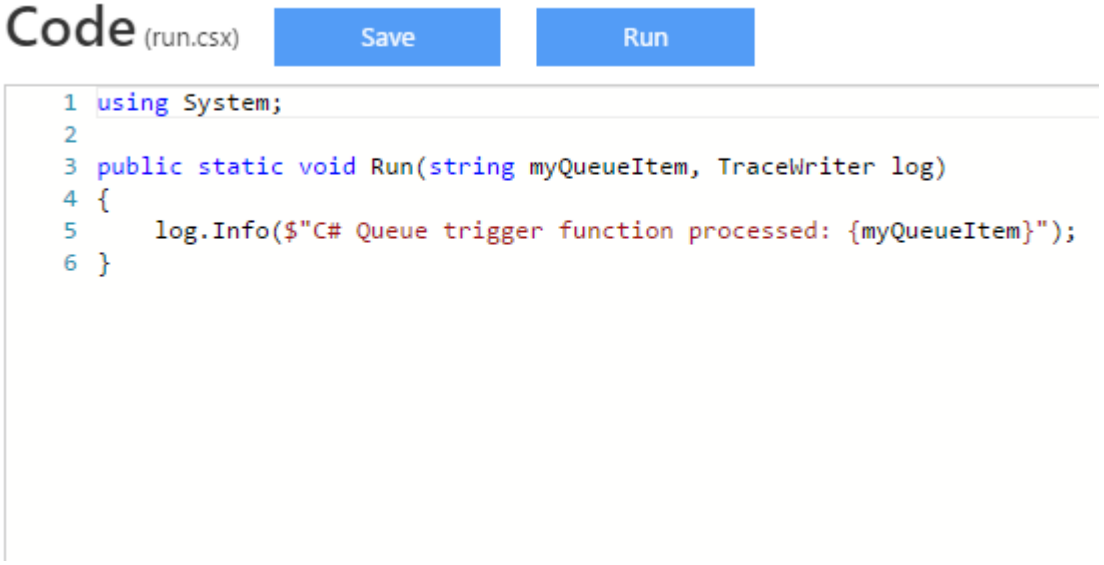

NEW SERVICE HOOKS SUBSCRIPTION
Service
Select a service to integrate with. Discover more integrations
Bamboo
Campfire
Flowdock
HipChat
Hubot
Jenkins
MyGet
Office 365
Slack
Trello
UserVoice
Web Hooks
Zapier
Zendesk
Web Hooks
Provides event communication via HTTP
Supported events:
All events
Supported actions:
Post via HTTP
Learn more about this service
Previous
Next
Test
Finish
Cancel

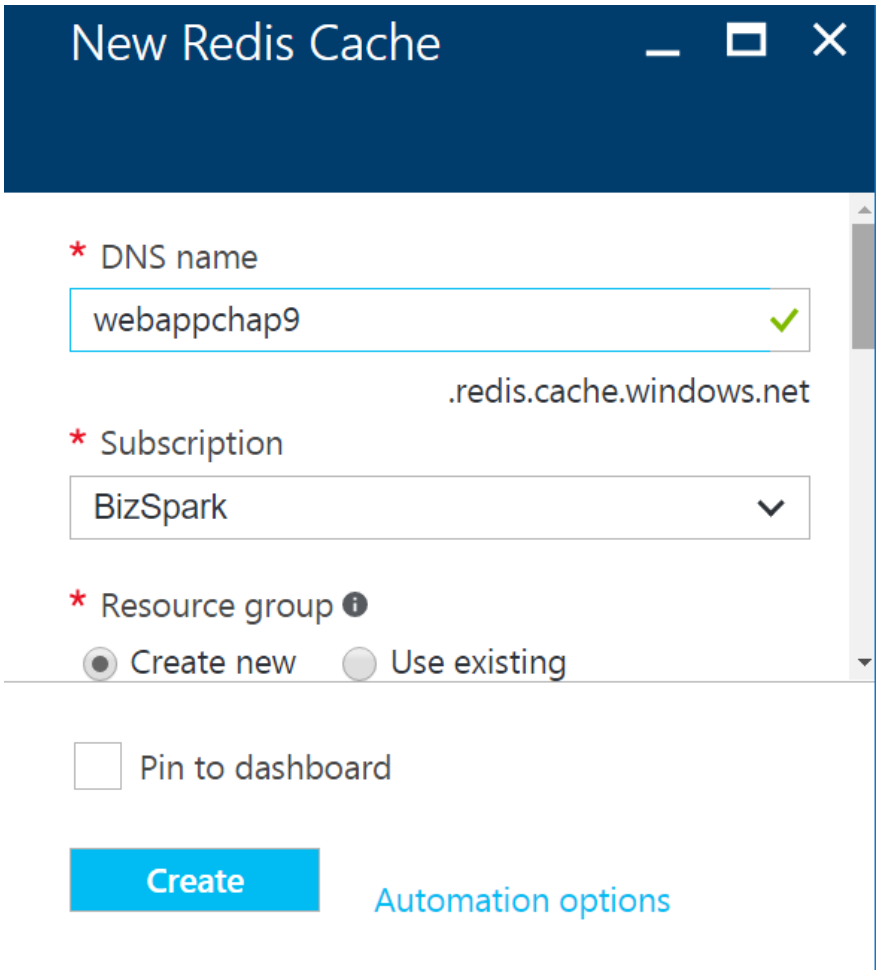

NEW SERVICE HOOKS SUBSCRIPTION
Trigger
Select an event to trigger on and configure any filters.
Trigger on this type of event
Build completed
Remember that selected events are visible to users of the target service, even if they don't have permission to view the related artifact.
FILTERS
Build Definition
optional
[Any]
Build Status
optional
[Any]
Previous
Next
Test
Finish
Cancel

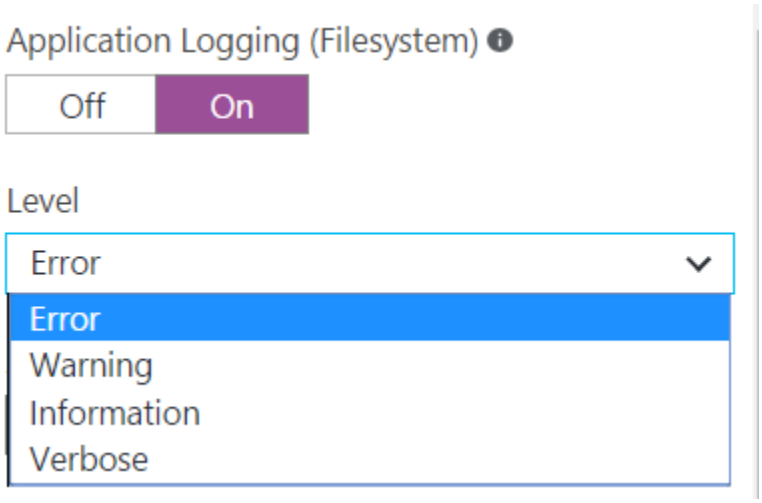

TEST NOTIFICATION
Web Hooks (Post via HTTP)
Summary
Request
Response
Event
Succeeded
Sent at: Sunday, January 22, 2017 5:21:29 PM
Message
Bug #5 (Some great new idea!) created by Jamal Hartnett.
Close

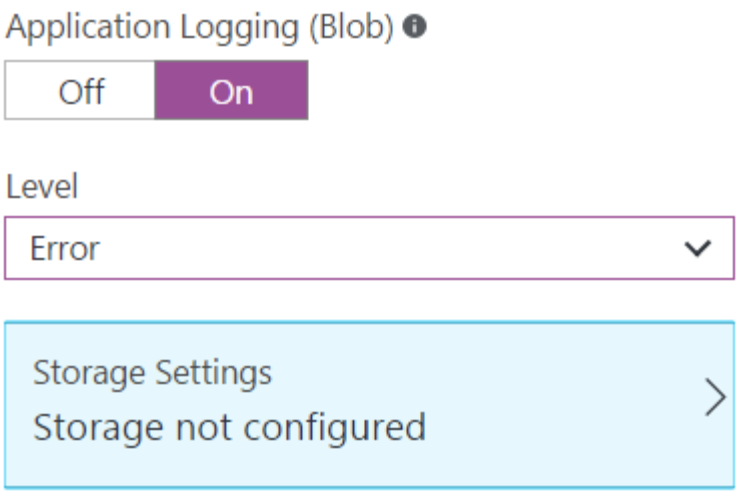

Function App
Results
NAME
PUBLISHER
CATEGORY
Function App
Microsoft

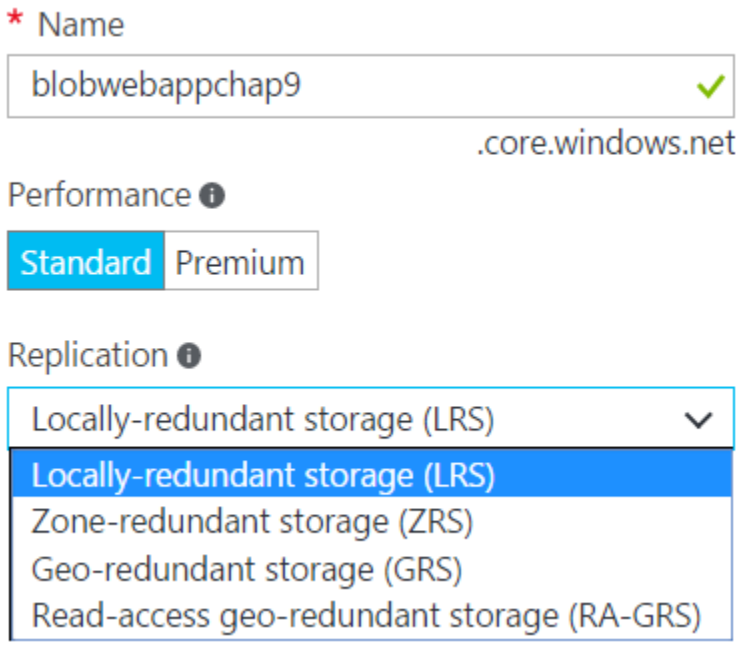

Search my functions
New Function
Choose a template
Language: All
Scenario: Core
BlobTrigger-CSharp
A C# function that will be run whenever a blob is added to a specified container
BlobTrigger-JavaScript
A JavaScript function that will be run whenever a blob is added to a specified container
EventHubTrigger-CSharp
A C# function that will be run whenever an event hub receives a new event
EventHubTrigger-JavaScript
A JavaScript function that will be run whenever an event hub receives a new event
HttpTrigger-JavaScript
A JavaScript function that will be run whenever it receives an HTTP request
ManualTrigger-CSharp
A C# function that is triggered manually via the portal "Run" button
ManualTrigger-JavaScript
A JavaScript function that is triggered manually via the portal "Run" button
QueueTrigger-CSharp
A C# function that will be run whenever a message is added to a specified Azure Queue Storage


Code (run.csx)
Save
Run
1 using System;
2
3 public static void Run(string myQueueItem, TraceWriter log)
4 {
5 log.Info($"C# Queue trigger function processed: {myQueueItem}");
6 }

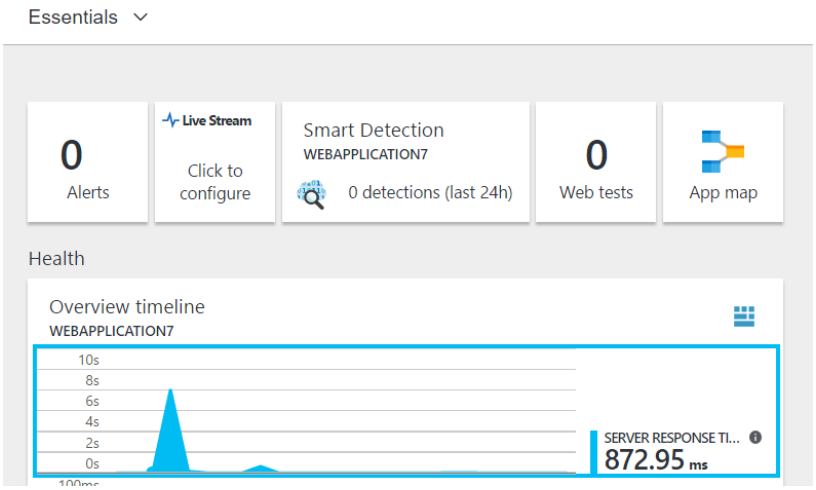

New Redis Cache
* DNS name
webappchap9
.redis.cache.windows.net
* Subscription
BizSpark
* Resource group
Create new
Use existing
Pin to dashboard
Create
Automation options


Application Logging (Filesystem)
Off
On
Level
Error
Error
Warning
Information
Verbose

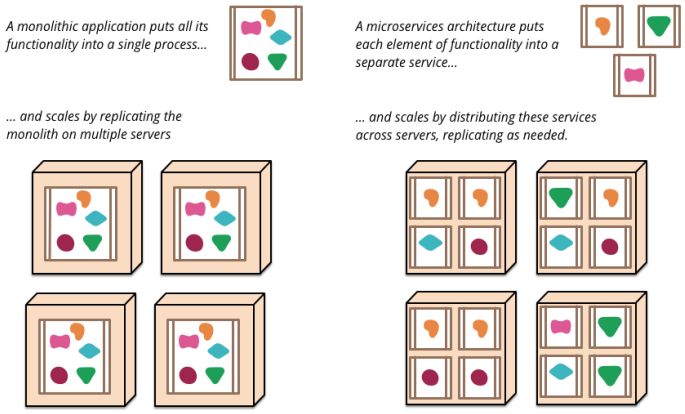


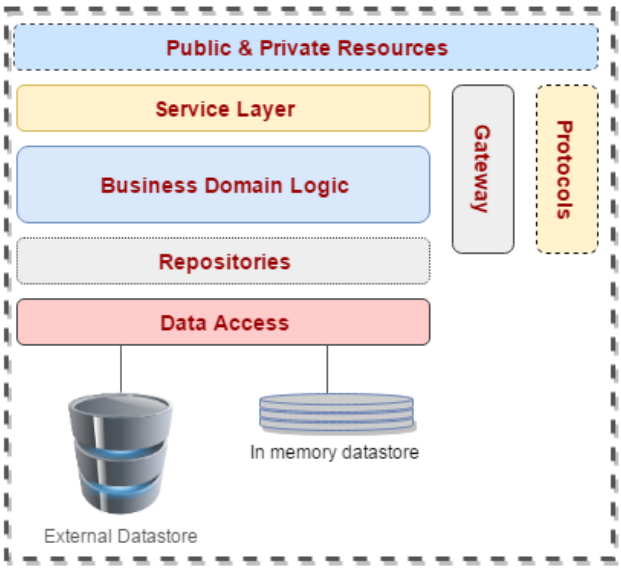


NAME	PUBLISHER	CATEGORY
Application Insights	Microsoft	Web + Mobile

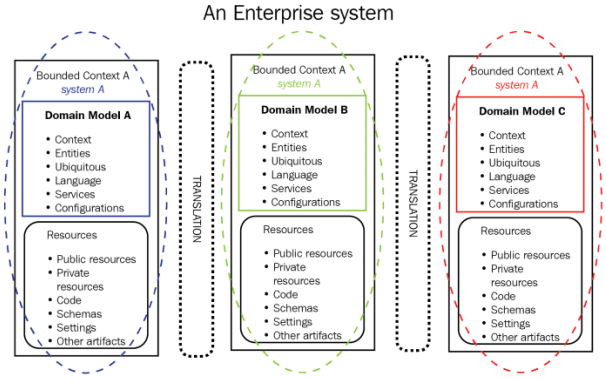

Essentials
0
Alerts
Live Stream
Click to configure
Smart Detection
WEBAPPLICATION7
0 detections (last 24h)
0
Web tests
App map
Health
Overview timeline
WEBAPPLICATION7
10s
8s
6s
4s
2s
0s
SERVER RESPONSE TI...
872.95 ms

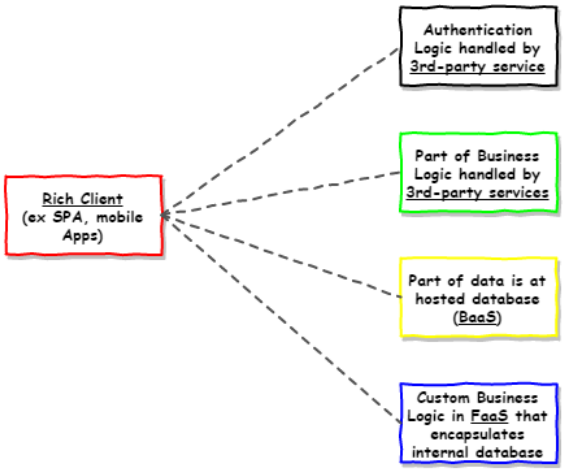
Chapter 9: Microservices Architecture



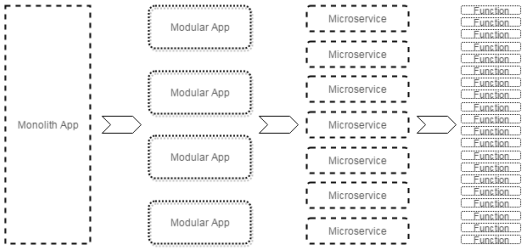


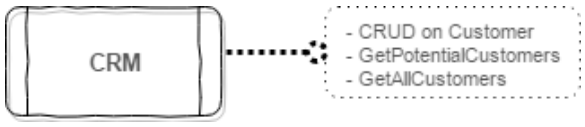
Typical Microservice Architecture

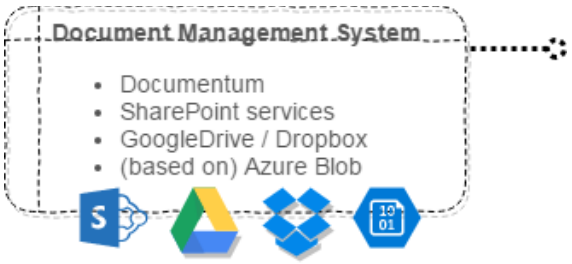


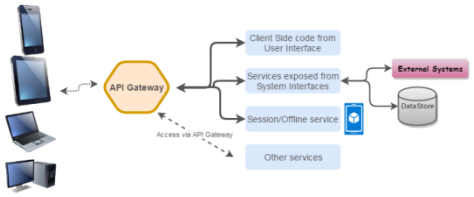


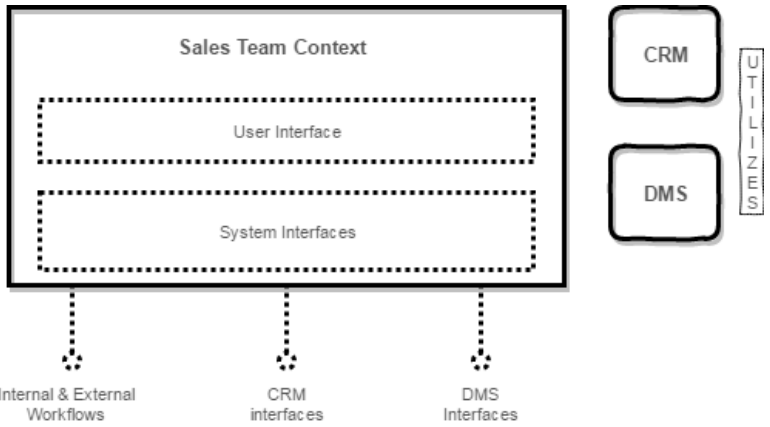
Typical Serverless Architecture

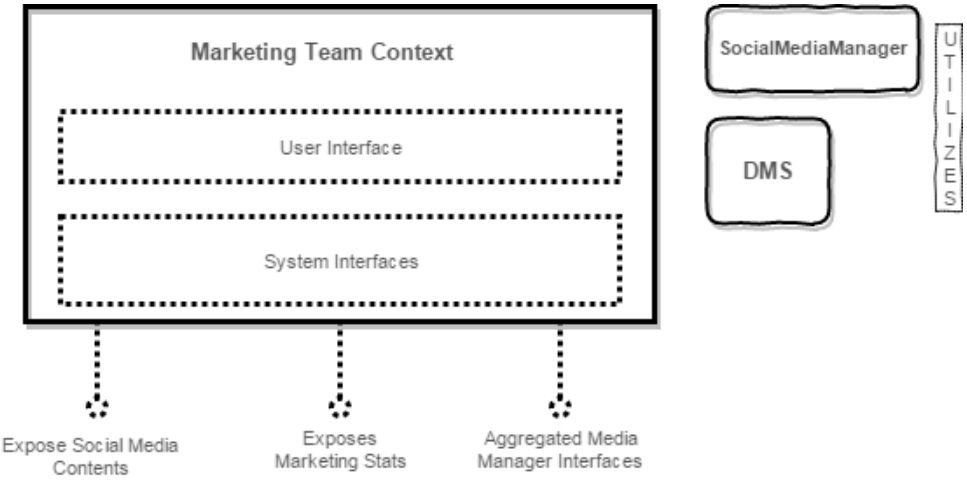


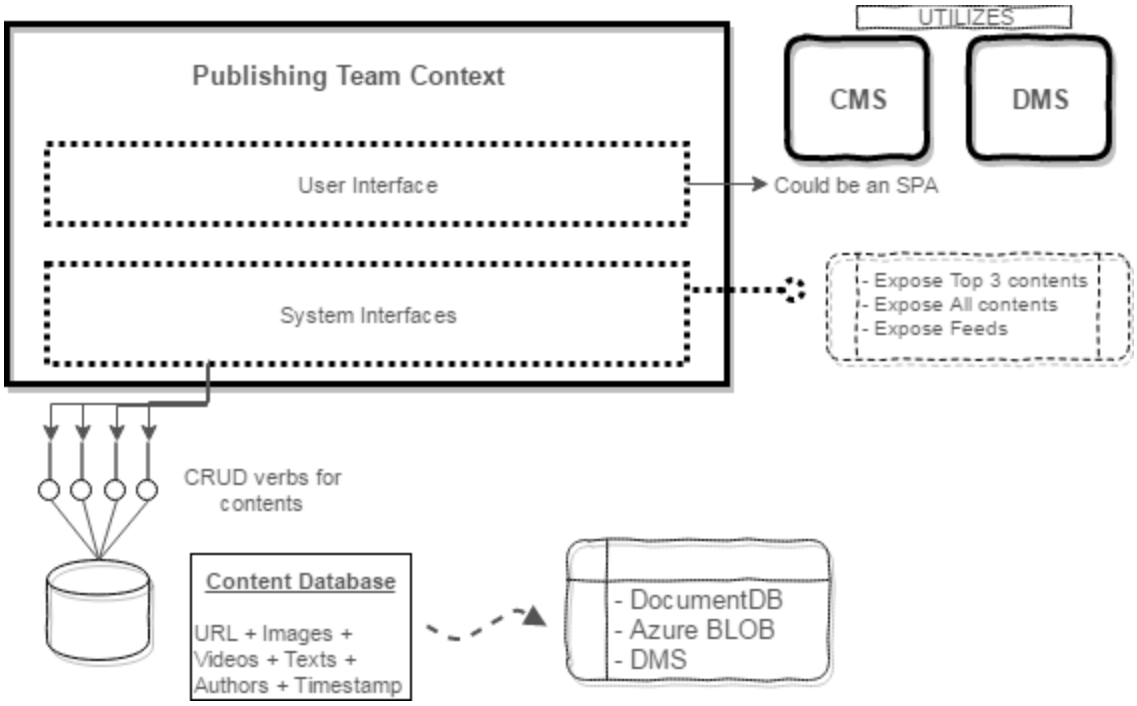


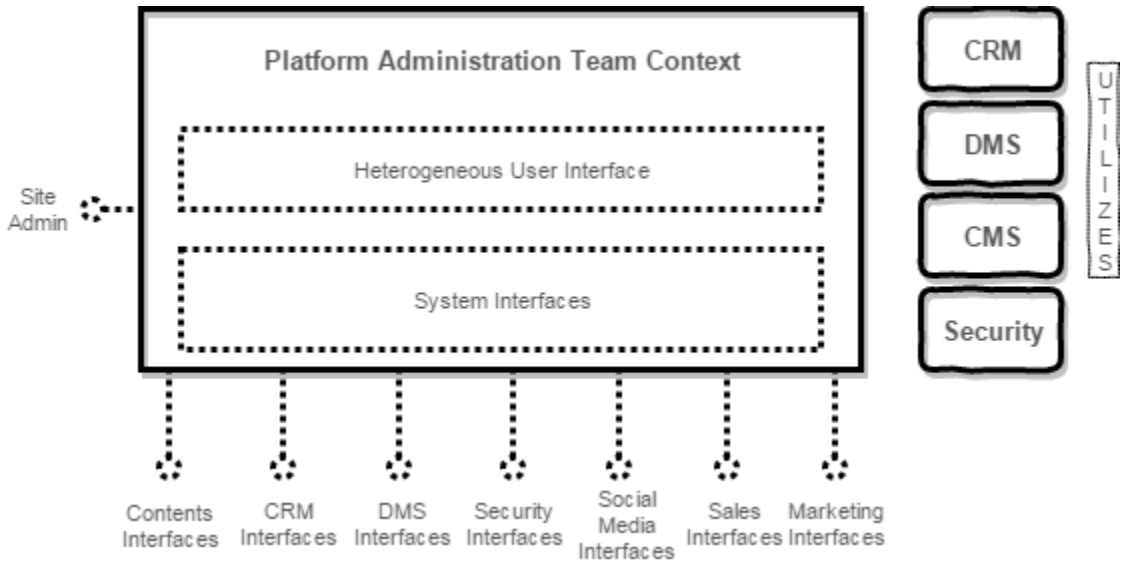


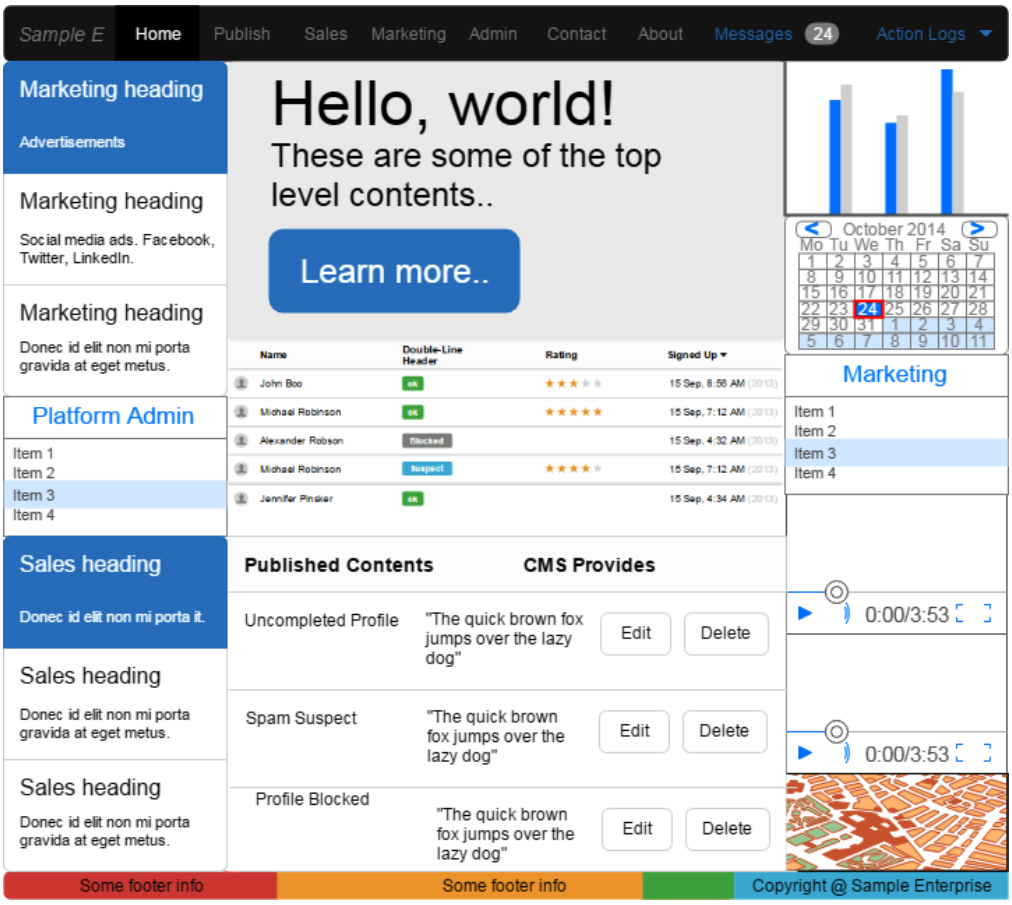

API Gateway
Client Side code from User Interface
Services exposed from System Interfaces
Session/Offline service
Other services
Access via API Gateway
External Systems
DataStore

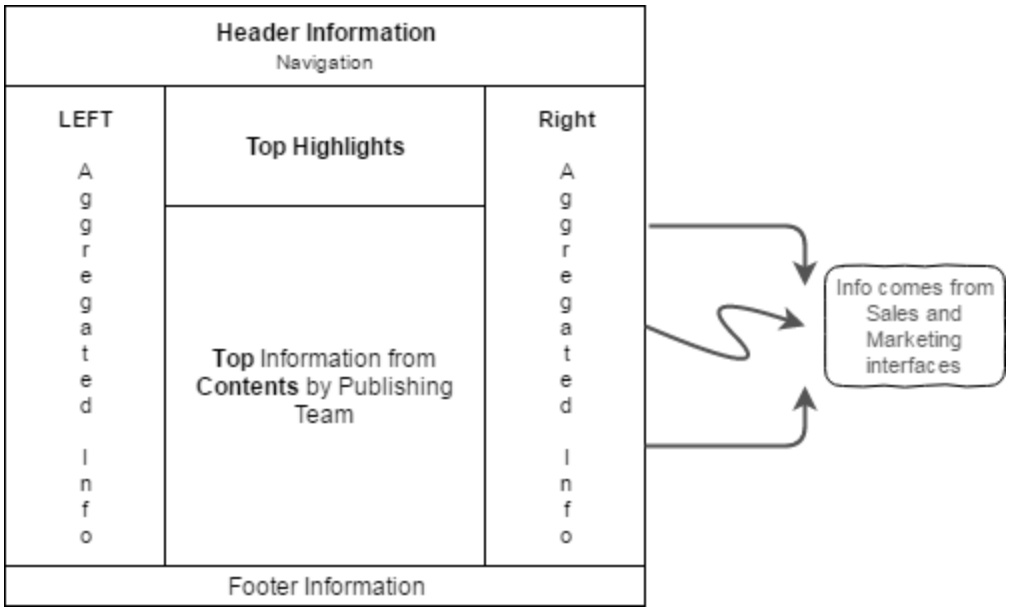

Sales Team Context
User Interface
System Interfaces
CRM
DMS
UTILIZES
Internal & External Workflows
CRM interfaces
DMS Interfaces

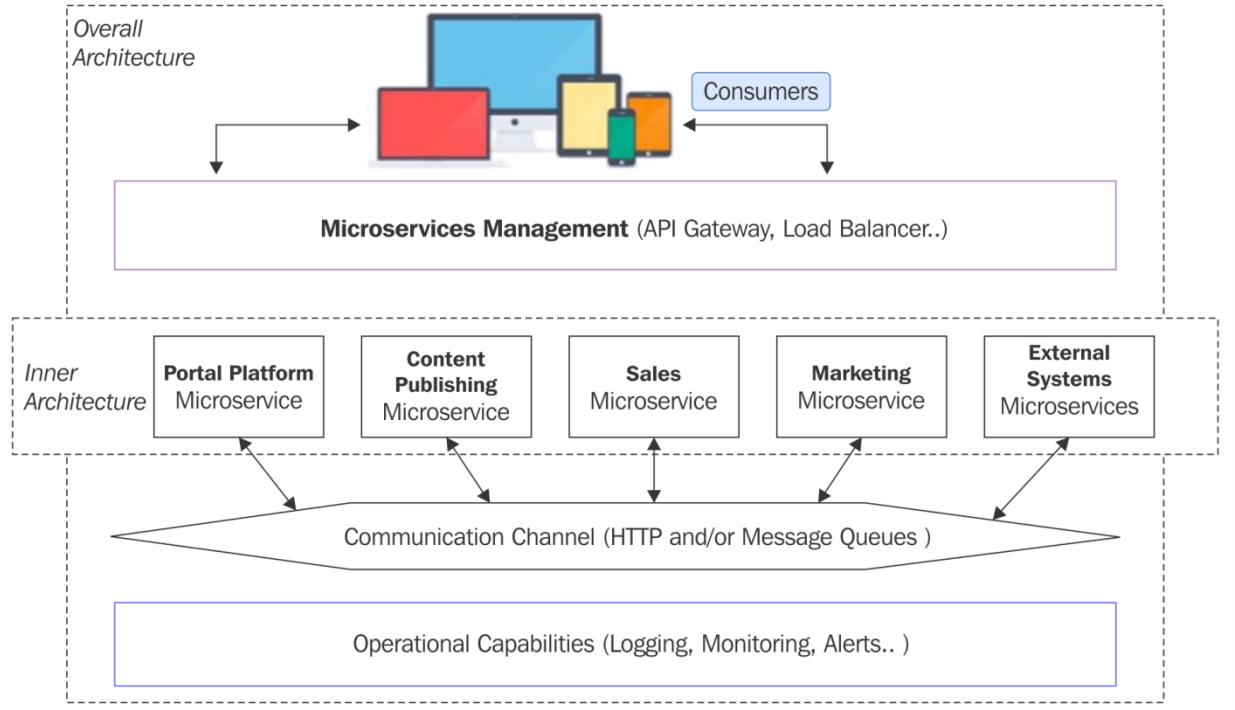

Marketing Team Context
User Interface
System Interfaces
SocialMediaManager
DMS
UTILIZES
Expose Social Media Contents
Exposes Marketing Stats
Aggregated Media Manager Interfaces

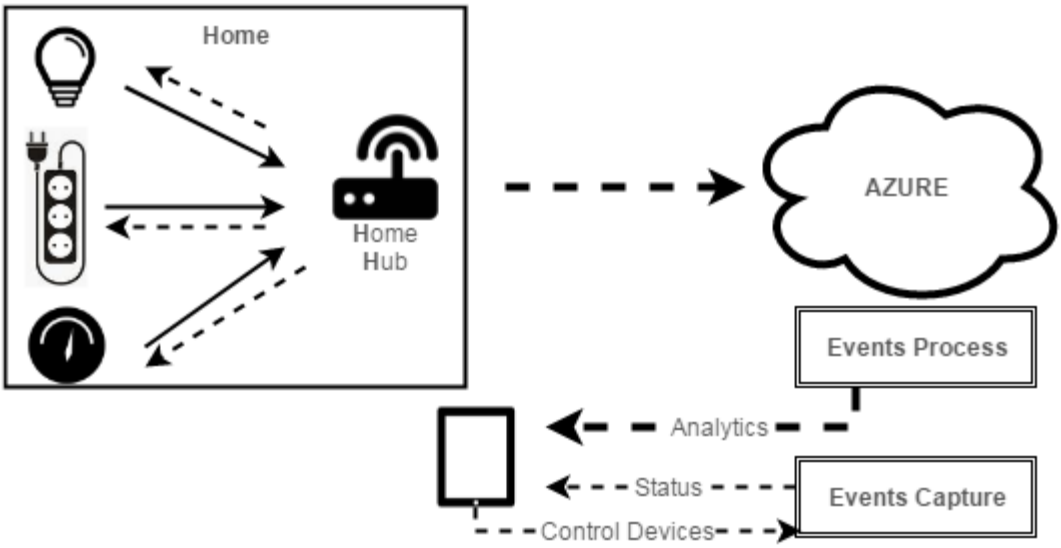

Publishing Team Context
User Interface
System Interfaces
UTILIZES
CMS
DMS
Could be an SPA
- Expose Top 3 contents
- Expose All contents
- Expose Feeds
CRUD verbs for contents
Content Database
URL + Images + Videos + Texts + Authors + Timestamp
- DocumentDB
- Azure BLOB
- DMS

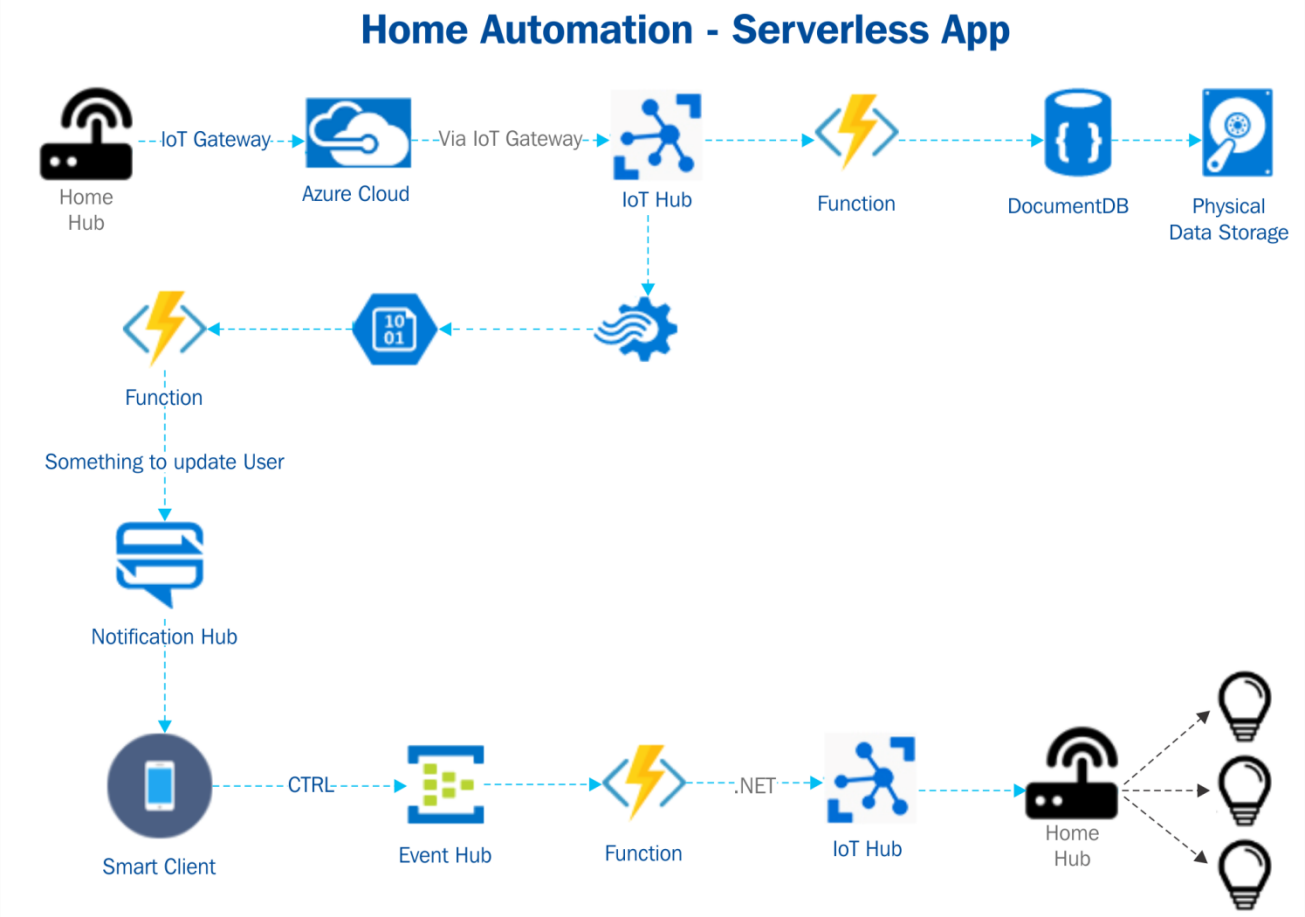

Platform Administration Team Context
Heterogeneous User Interface
System Interfaces
Site Admin
CRM
DMS
CMS
Security
UTILIZES
Contents Interfaces
CRM Interfaces
DMS Interfaces
Security Interfaces
Social Media Interfaces
Sales Interfaces
Marketing Interfaces


Sample E
Home
Publish
Sales
Marketing
Admin
Contact
About
Messages 24
Action Logs
Marketing heading
Advertisements
Marketing heading
Social media ads. Facebook, Twitter, LinkedIn.
Marketing heading
Donec id elit non mi porta gravida at eget metus.
Platform Admin
Item 1
Item 2
Item 3
Item 4
Sales heading
Donec id elit non mi porta it.
Sales heading
Donec id elit non mi porta gravida at eget metus.
Sales heading
Donec id elit non mi porta gravida at eget metus.
Hello, world!
These are some of the top level contents..
Learn more..
Name
Double-Line Header
Rating
Signed Up
John Boo
Michael Robinson
Alexander Robson
Michael Robinson
Jennifer Pinker
Published Contents
CMS Provides
Uncompleted Profile
"The quick brown fox jumps over the lazy dog"
Edit
Delete
Spam Suspect
"The quick brown fox jumps over the lazy dog"
Edit
Delete
Profile Blocked
"The quick brown fox jumps over the lazy dog"
Edit
Delete
October 2014
Mo Tu We Th Fr Sa Su
Marketing
Item 1
Item 2
Item 3
Item 4
0:00/3:53
0:00/3:53
Some footer info
Some footer info
Copyright @ Sample Enterprise

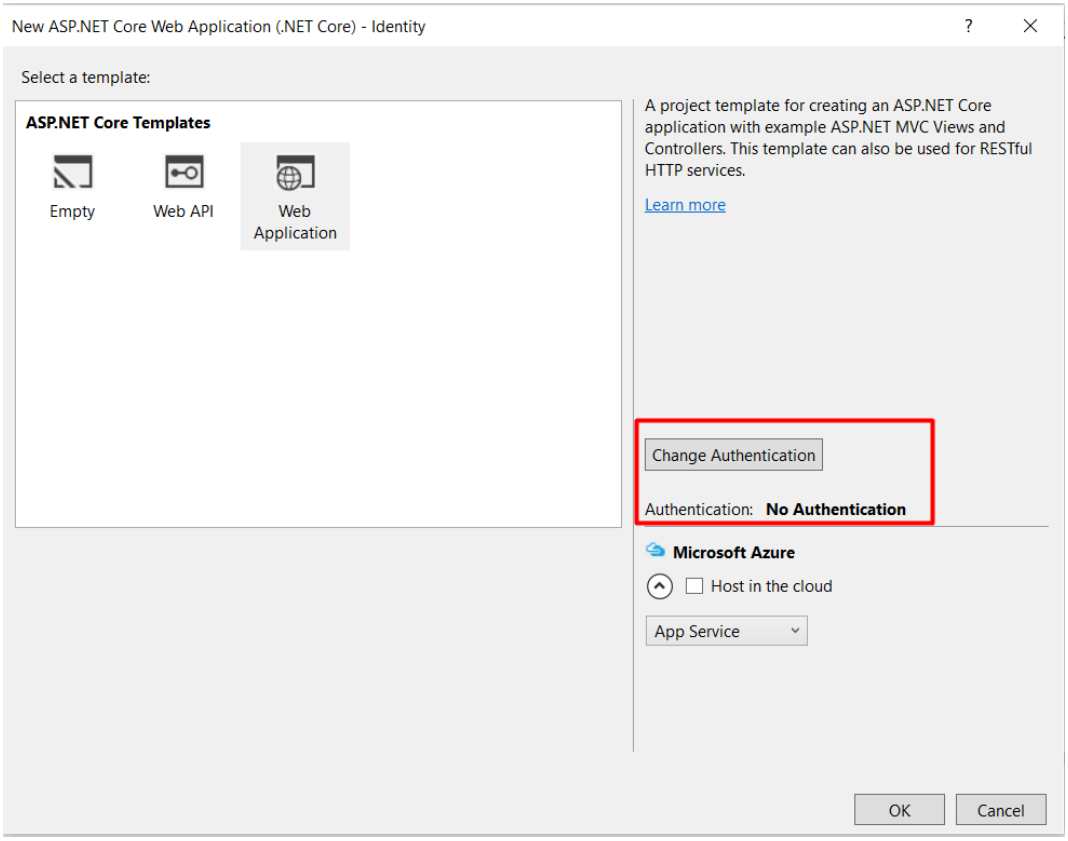

Header Information
Navigation
LEFT
Aggregated Info
Top Highlights
Top Information from Contents by Publishing Team
Right
Aggregated Info
Info comes from Sales and Marketing interfaces
Footer Information

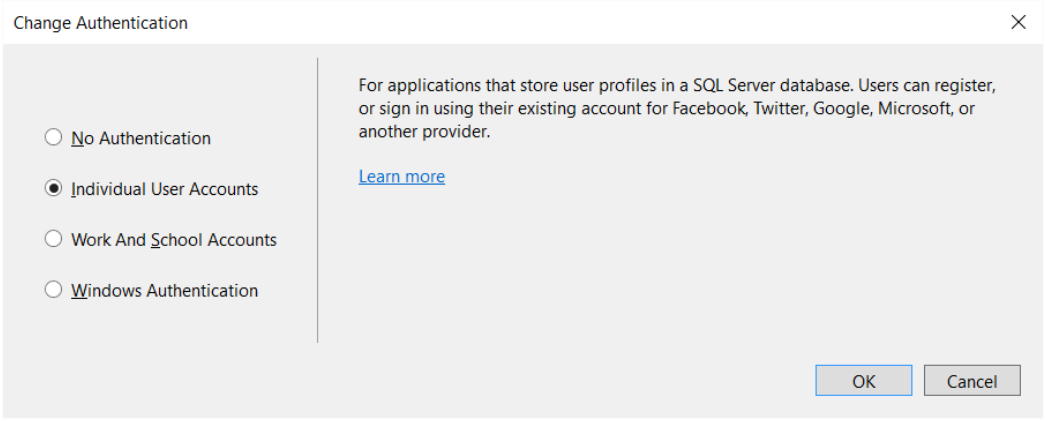

Overall Architecture
Consumers
Microservices Management (API Gateway, Load Balancer..)
Inner Architecture
Portal Platform Microservice
Content Publishing Microservice
Sales Microservice
Marketing Microservice
External Systems Microservices
Communication Channel (HTTP and/or Message Queues)
Operational Capabilities (Logging, Monitoring, Alerts..)


Home
Home
Hub
AZURE
Events Process
Analytics
Status
Events Capture
Control Devices

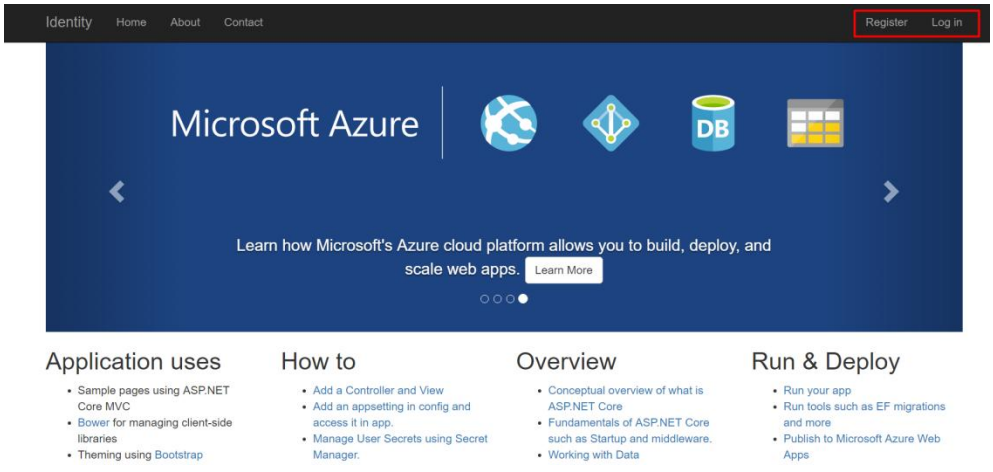

Home Automation - Serverless App
Home Hub
IoT Gateway
Azure Cloud
Via IoT Gateway
IoT Hub
Function
DocumentDB
Physical Data Storage
Function
Something to update User
Notification Hub
Smart Client
CTRL
Event Hub
Function
.NET
IoT Hub
Home Hub

Chapter 10: Security Practices with .NET Core





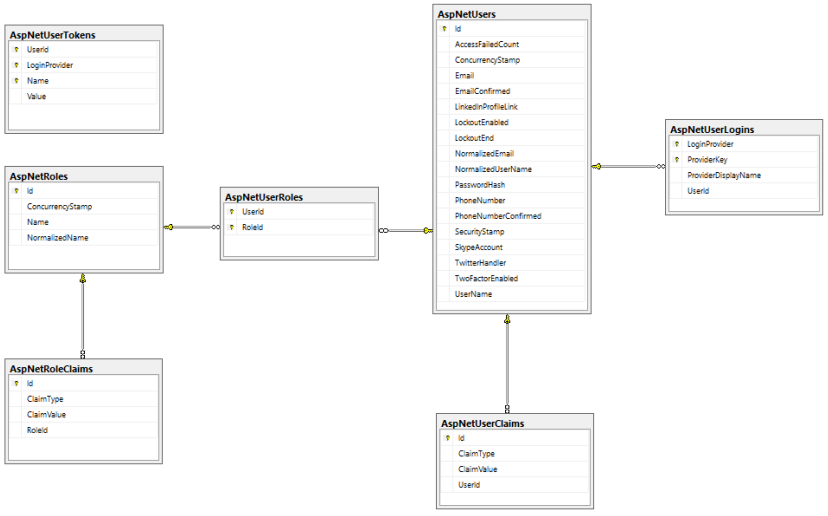
```
{
  "ConnectionStrings": {
    "DefaultConnection": "Server=(localdb)\\mssqllocaldb;Database=aspnet-Identity-5e118a64-89bb-47a4-ab69-4c9e872c4205;Trusted_Connection=True;MultipleActiveResultSets=true"
  },
  "Logging": {
    "IncludeScopes": false,
    "LogLevel": {
      "Default": "Debug",
      "System": "Information",
      "Microsoft": "Information"
    }
  }
}
```

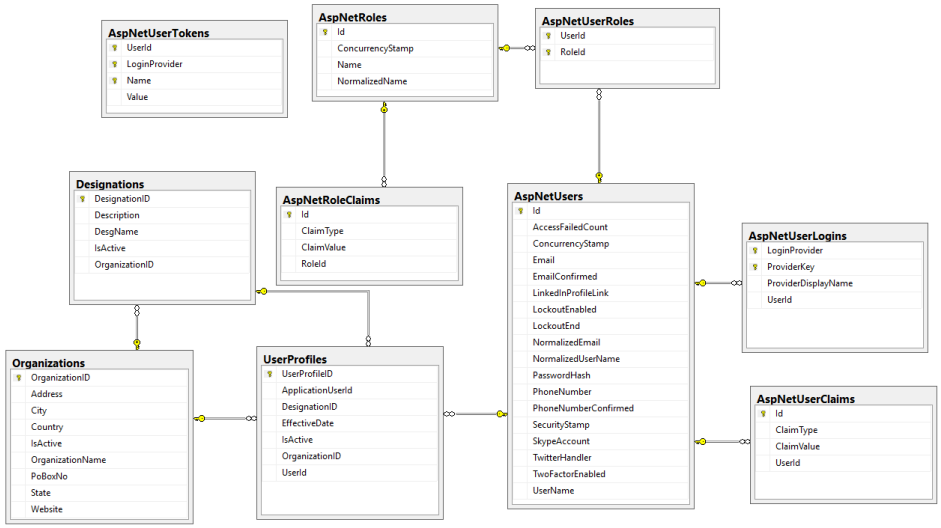



```
namespace Microsoft.AspNetCore.Identity.EntityFrameworkCore
{
    public abstract class IdentityDbContext<TUser, TRole, TKey, TUserClaim, TUserRole, TUserLogin, TRoleClaim, TUserToken> : DbContext
        where TUser : IdentityUser<TKey, TUserClaim, TUserRole, TUserLogin>
        where TRole : IdentityRole<TKey, TUserRole, TRoleClaim>
        where TKey : IEquatable<TKey>
        where TUserClaim : IdentityUserClaim<TKey>
        where TUserRole : IdentityUserRole<TKey>
        where TUserLogin : IdentityUserLogin<TKey>
        where TRoleClaim : IdentityRoleClaim<TKey>
        where TUserToken : IdentityUserToken<TKey>
    {
        public IdentityDbContext(DbContextOptions options);
        protected IdentityDbContext();

        public DbSet<TRoleClaim> RoleClaims { get; set; }
        public DbSet<TRole> Roles { get; set; }
        public DbSet<TUserClaim> UserClaims { get; set; }
        public DbSet<TUserLogin> UserLogins { get; set; }
        public DbSet<TUserRole> UserRoles { get; set; }
        public DbSet<TUser> Users { get; set; }
        public DbSet<TUserToken> UserTokens { get; set; }

        protected override void OnModelCreating(ModelBuilder builder);
    }
}
```





Tell us about your website

Site URL

https://testsiteEA.com

Next

App ID

[redacted]

App Secret

[redacted] Reset

Display Name

EA

Namespace

App Domains

Contact Email

ovaismehboob@yahoo.com

Privacy Policy URL

Privacy policy for Login dialog and App Details

Terms of Service URL

Terms of Service for Login dialog and App Details

App Icon

1024 x 1024

Category

Apps for Pages

Log in.

Use a local account to log in.

Email

Password

Remember me?

Log in

Register as a new user?

Forgot your password?

Use another service to log in.

Facebook

Register.

Associate your Facebook account.

Association Form

You've successfully authenticated with **Facebook**. Please enter an email address for this site below and click the Register button to finish logging in.

Email ovaismehboob@hotmail.com

Register

Manage your account.

Change your account settings

Password:	[Change]
External Logins:	0 [Manage]
Phone Number:	Phone Numbers can used as a second factor of verification in two-factor authentication. See this article for details on setting up this ASP.NET application to support two-factor authentication using SMS.
	None [Add]
Two-Factor Authentic…	There are no two-factor authentication providers configured. See this article for setting up this application to support two-factor authentication.
	[Enable] Disabled

Verify Phone Number.

Add a phone number.

Code

Submit

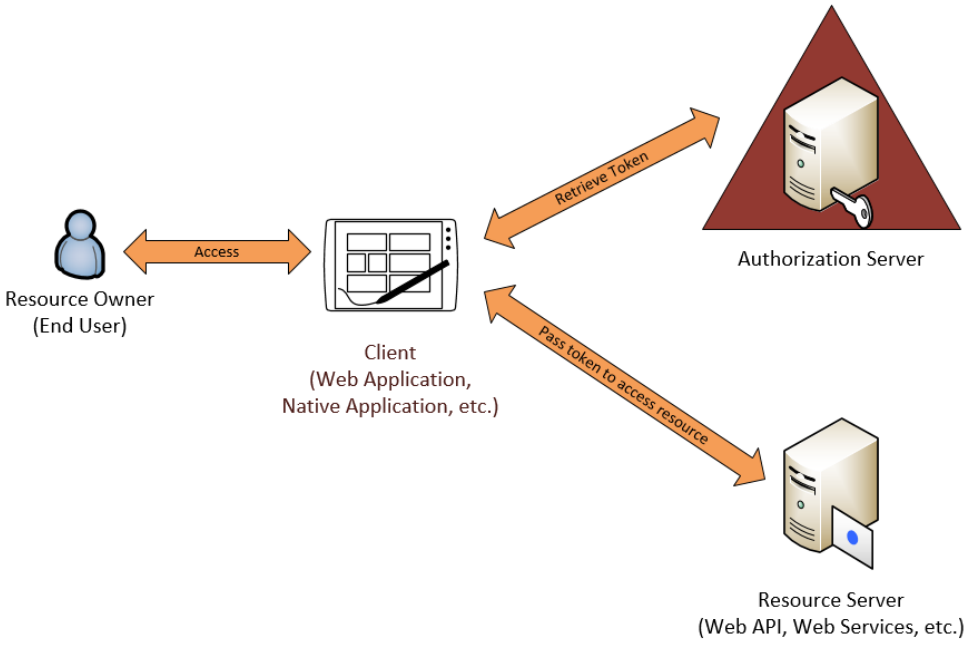
Manage your account.

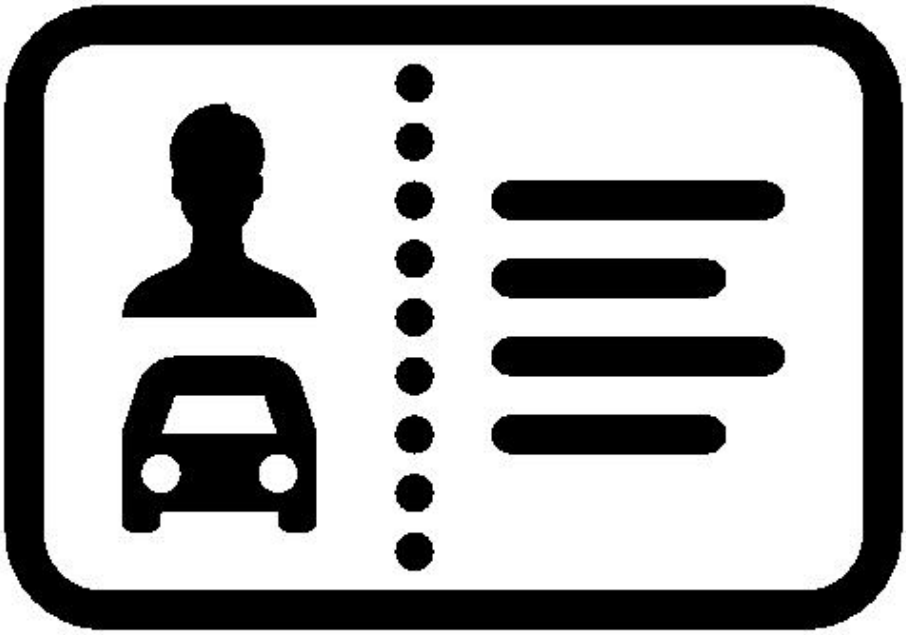
Your phone number was added.

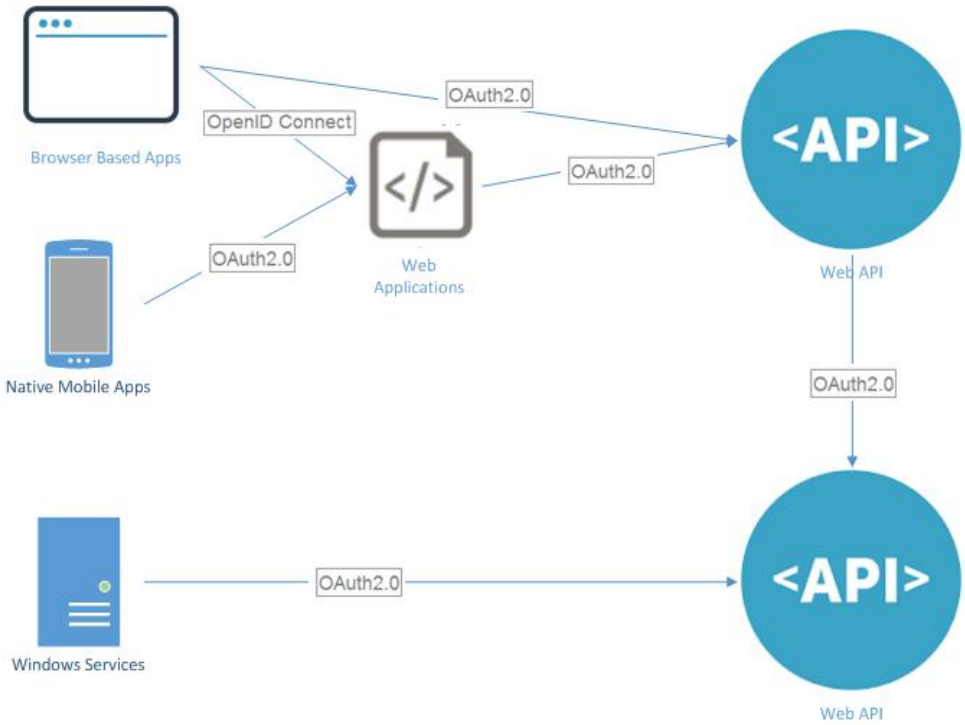
Change your account settings

Password:	[Change]
External Logins:	0 [Manage]
Phone Number:	Phone Numbers can used as a second factor of verification in two-factor authentication. See this article for details on setting up this ASP.NET application to support two-factor authentication using SMS.
	[redacted]
	[Change]
	[Remove]
Two-Factor Authentic…	There are no two-factor authentication providers configured. See this article for setting up this application to support two-factor authentication.
	Enabled [Disable]


THIS SIDE UP - INSERT AND REMOVE
room
ACCESS


Retrieve Token
Authorization Server
Access
Resource Owner
(End User)
Client
(Web Application,
Native Application, etc.)
Pass token to access resource
Resource Server
(Web API, Web Services, etc.)



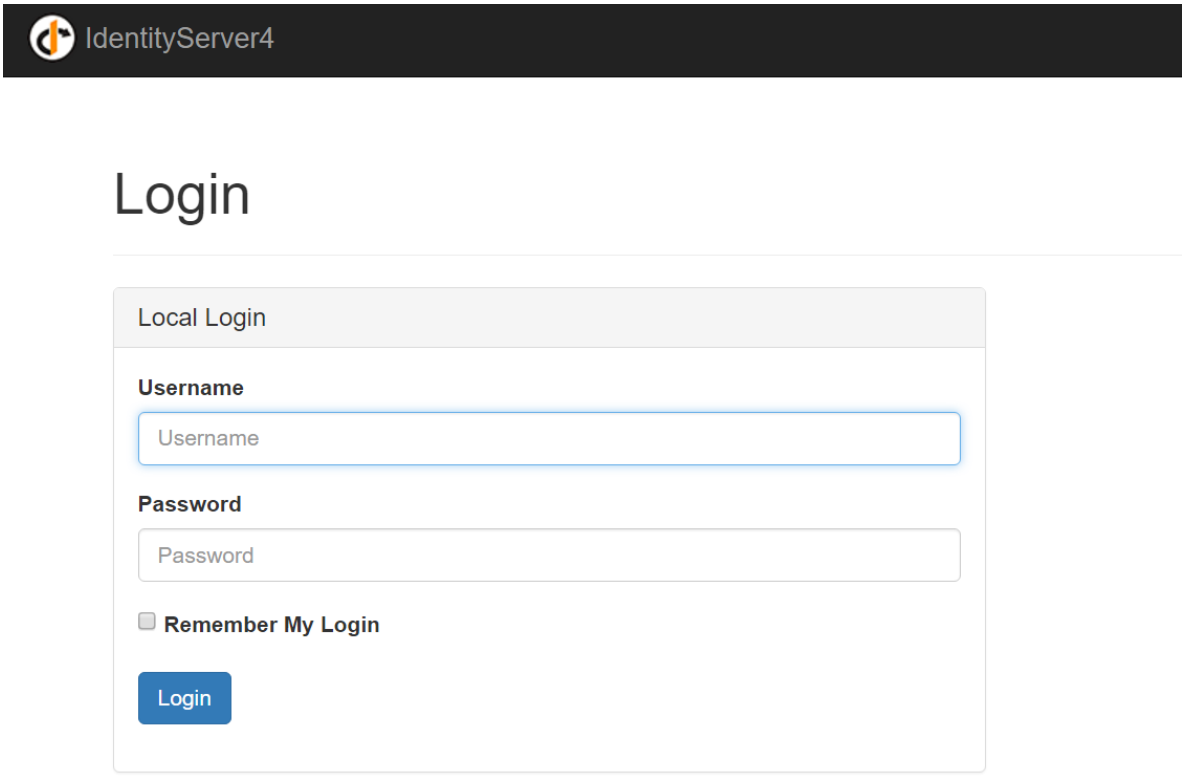

Browser Based Apps
OAuth2.0
OpenID Connect
OAuth2.0
<API>
Web API
Web Applications
OAuth2.0
Native Mobile Apps
OAuth2.0
Windows Services
OAuth2.0
<API>
Web API

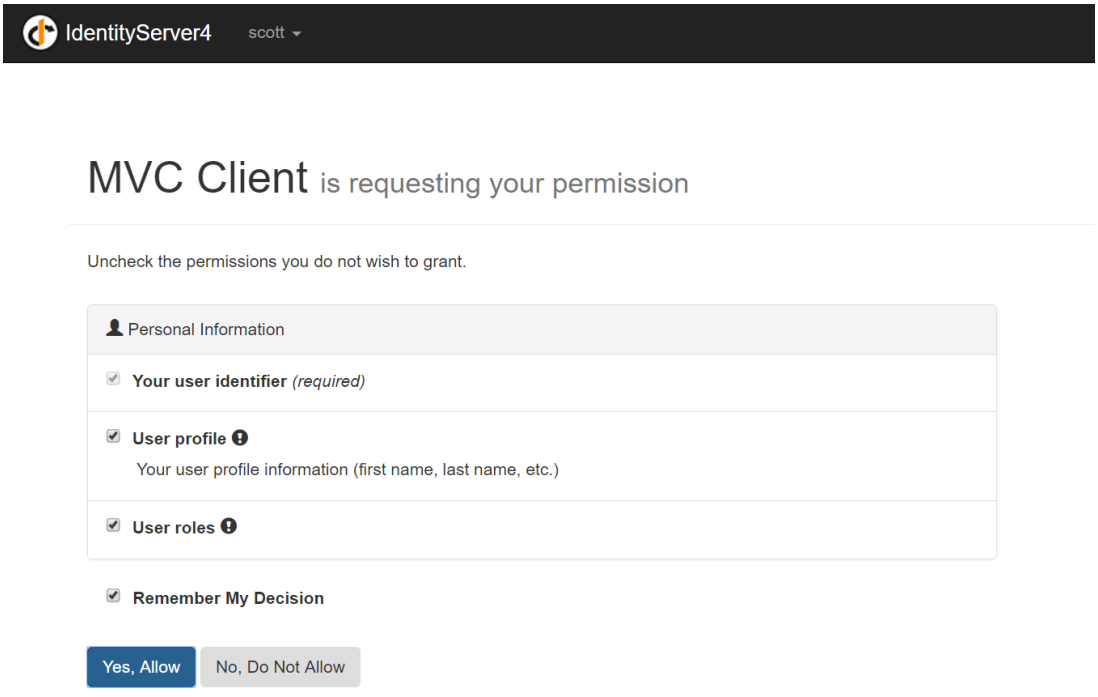
IdentityServer4

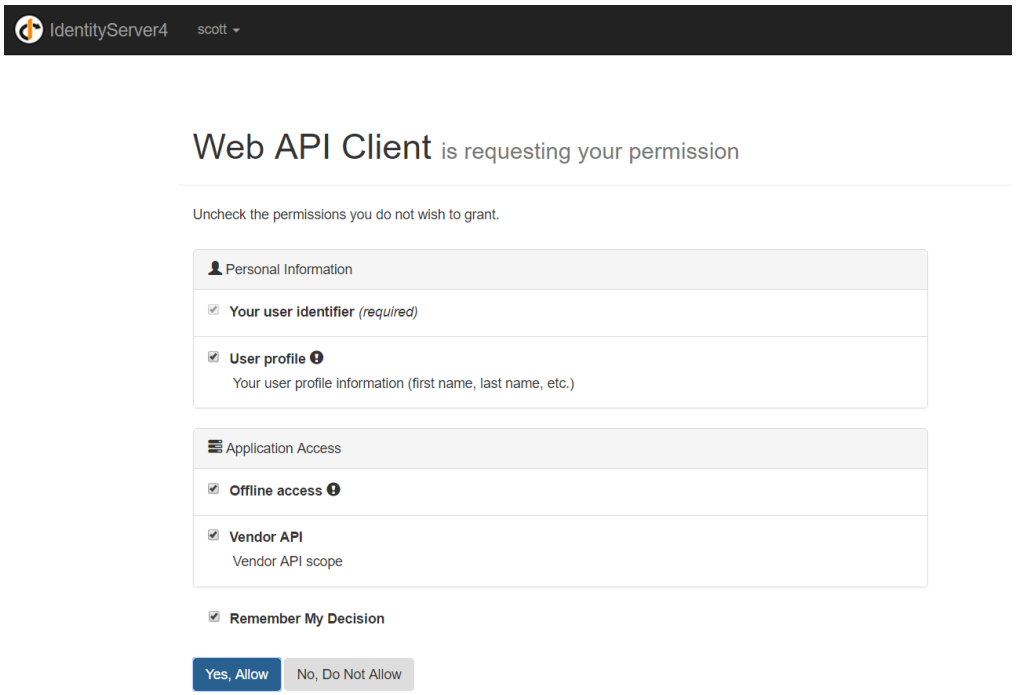
Welcome to IdentityServer4

IdentityServer publishes a discovery document where you can find metadata and links to all the endpoints, key material, etc.

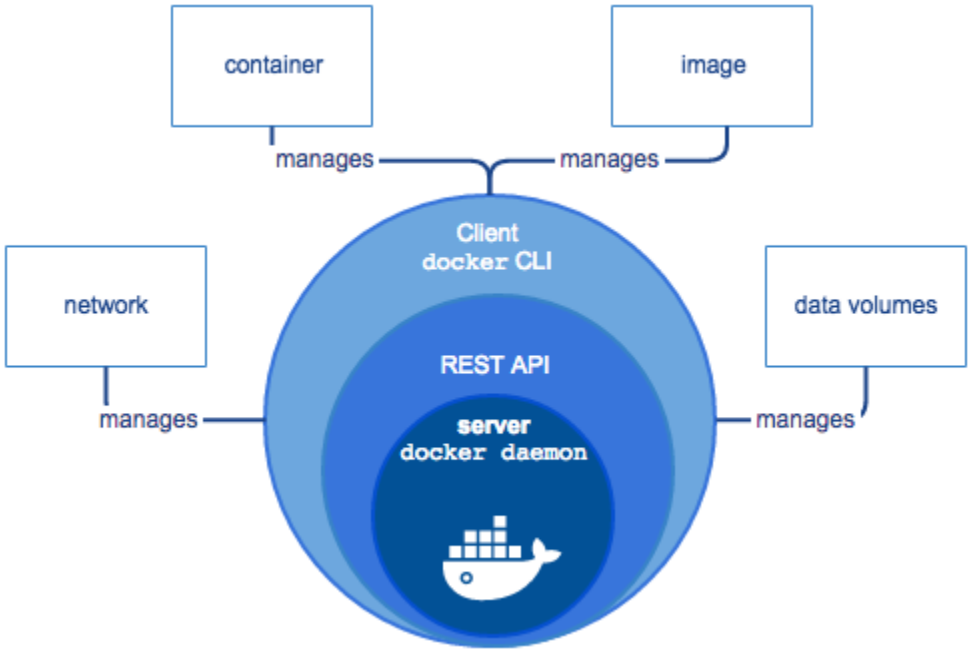
Here are links to the source code repository, and ready to use samples.

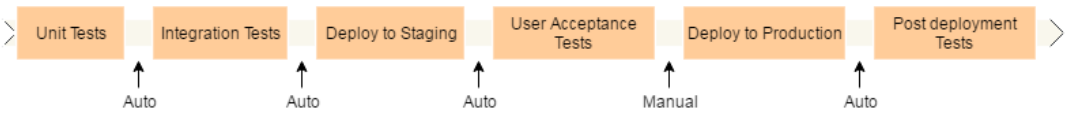

IdentityServer4
Login
Local Login
Username
Username
Password
Password
Remember My Login
Login

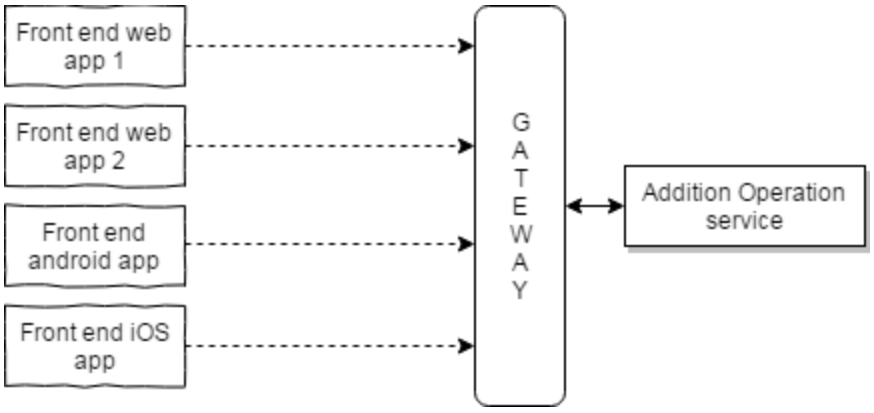

IdentityServer4
scott
MVC Client is requesting your permission
Uncheck the permissions you do not wish to grant.
Personal Information
Your user identifier (required)
User profile
Your user profile information (first name, last name, etc.)
User roles
Remember My Decision
Yes, Allow
No, Do Not Allow

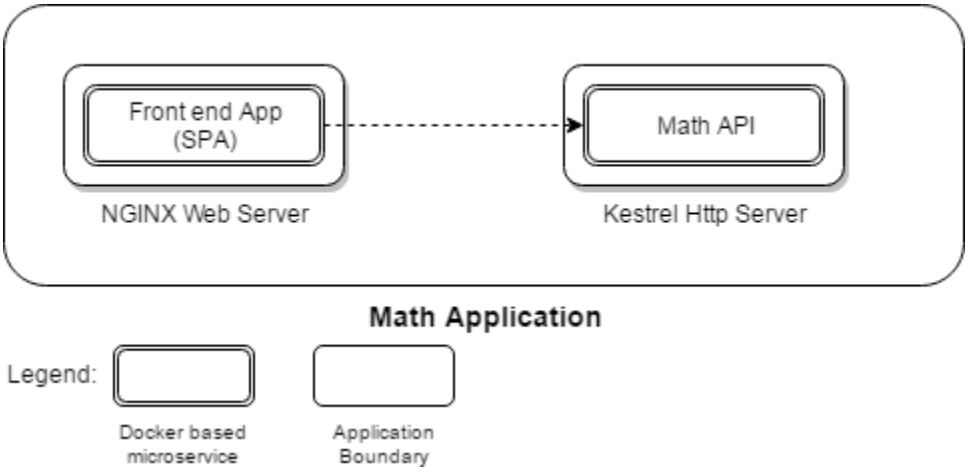

IdentityServer4
scott
Web API Client is requesting your permission
Uncheck the permissions you do not wish to grant.
Personal Information
Your user identifier (required)
User profile
Your user profile information (first name, last name, etc.)
Application Access
Offline access
Vendor API
Vendor API scope
Remember My Decision
Yes, Allow
No, Do Not Allow

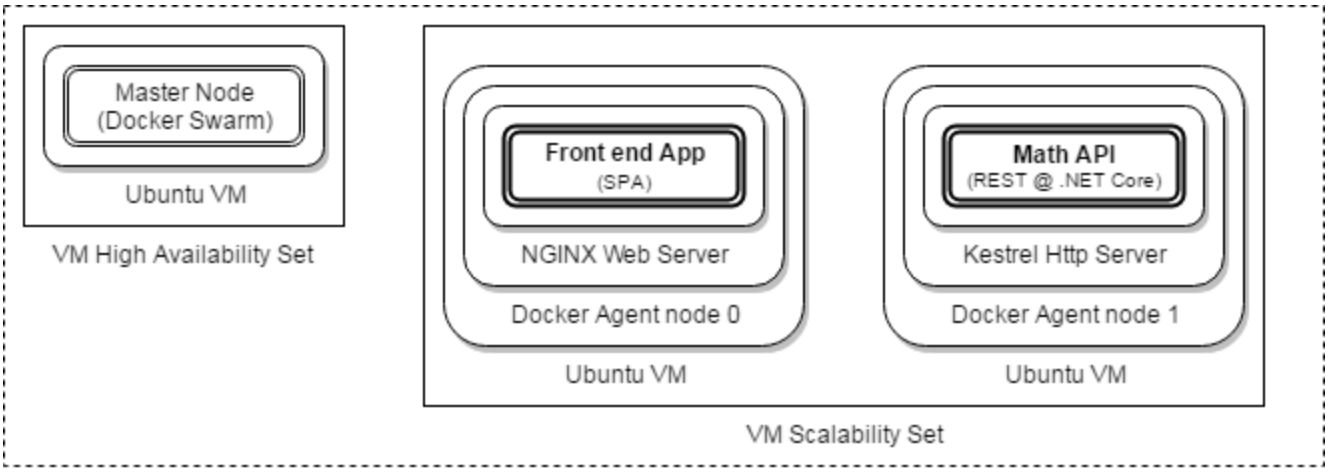
Chapter 11: Modern AI Offerings by Microsoft





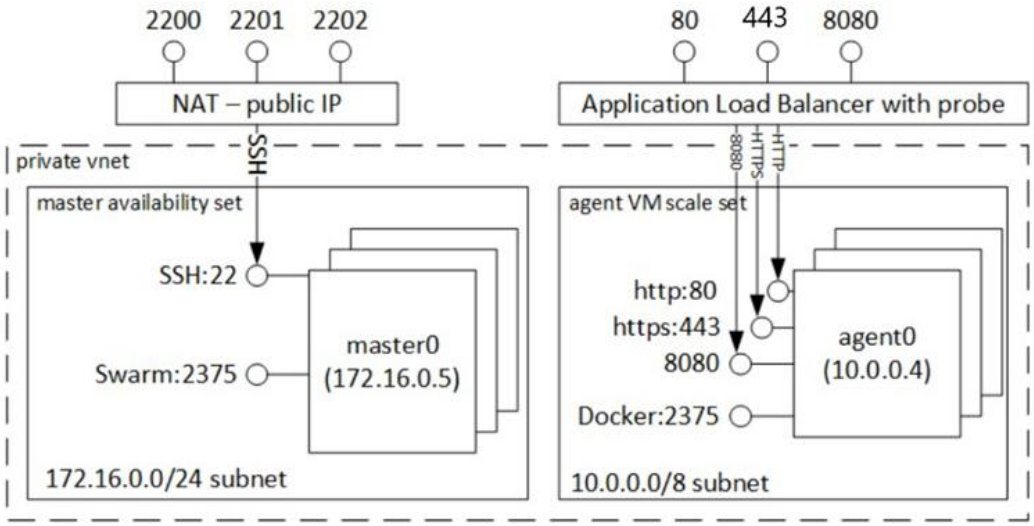

Front end web app 1
Front end web app 2
Front end android app
Front end iOS app
GATEWAY
Addition Operation service

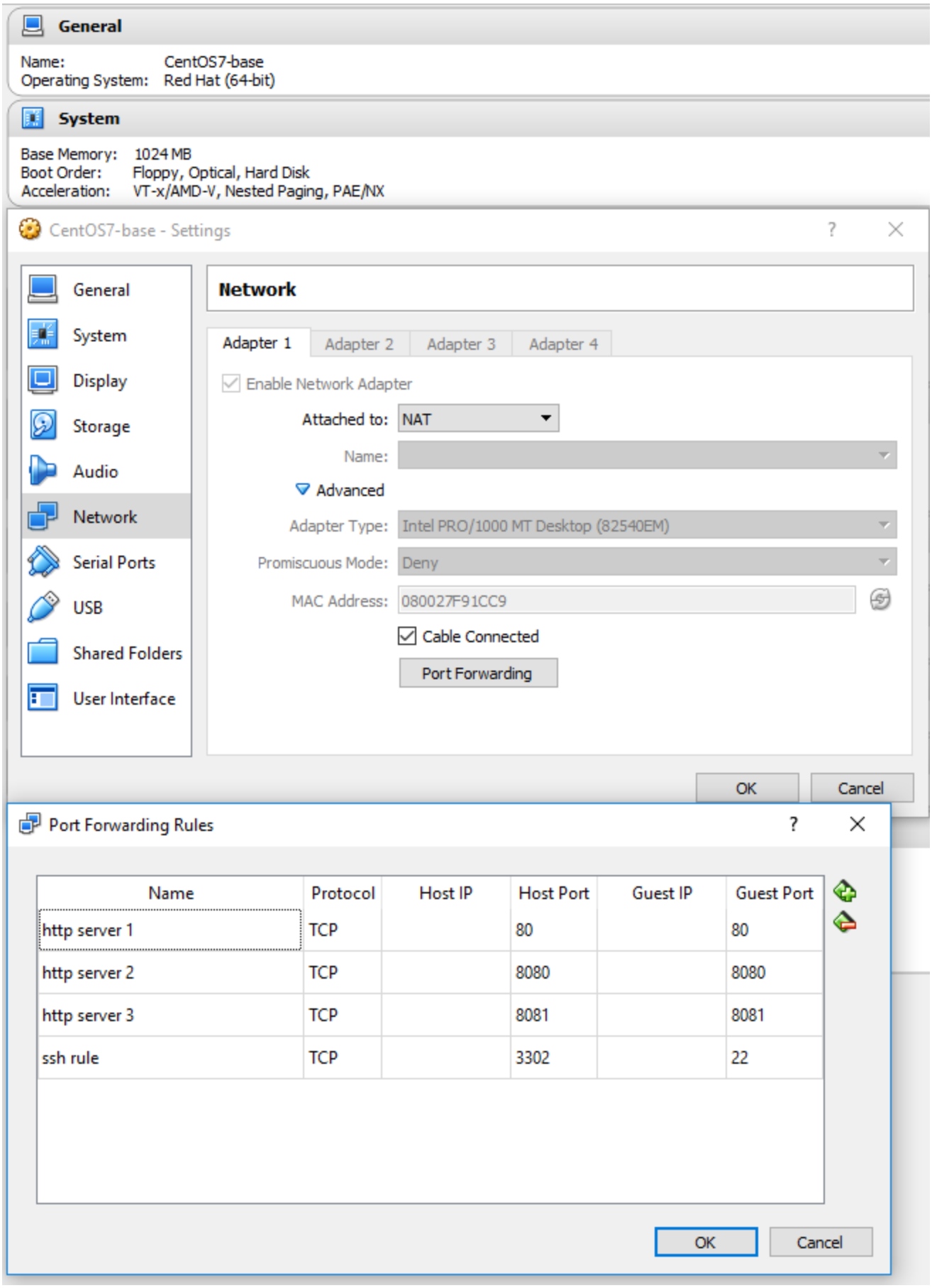

Front end App (SPA)
NGINX Web Server
Math API
Kestrel Http Server
Math Application
Legend:
Docker based microservice
Application Boundary

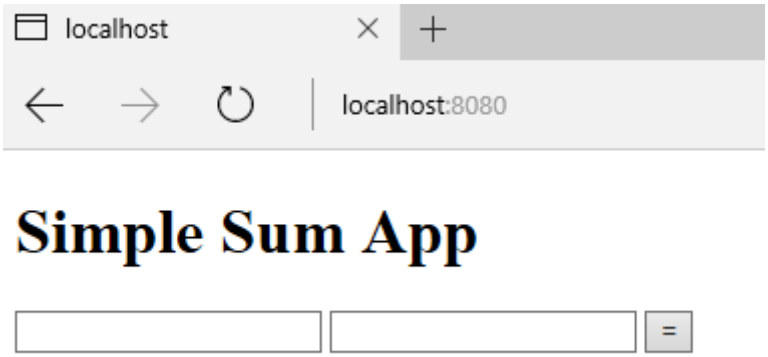


Math Application (in a private virtual network)

ACS with Swarm



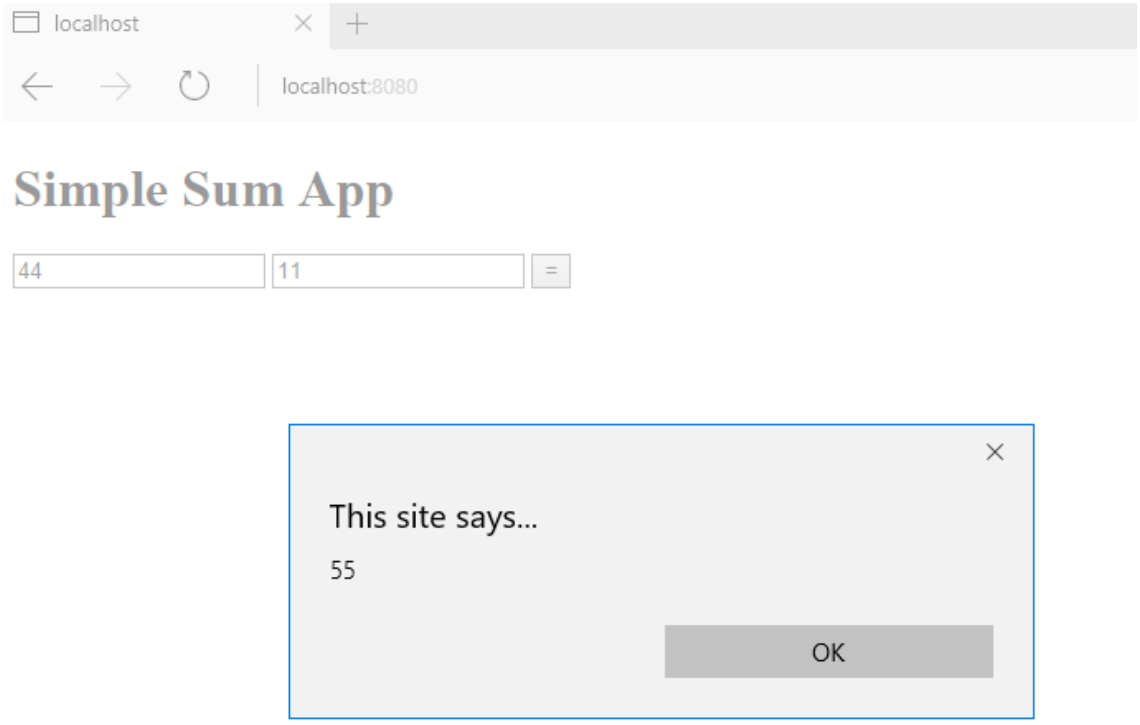

General
Name: CentOS7-base
Operating System: Red Hat (64-bit)
System
Base Memory: 1024 MB
Boot Order: Floppy, Optical, Hard Disk
Acceleration: VT-x/AMD-V, Nested Paging, PAE/NX
CentOS7-base - Settings
General
System
Display
Storage
Audio
Network
Serial Ports
USB
Shared Folders
User Interface
Network
Adapter 1
Adapter 2
Adapter 3
Adapter 4
Enable Network Adapter
Attached to: NAT
Name:
Advanced
Adapter Type: Intel PRO/1000 MT Desktop (82540EM)
Promiscuous Mode: Deny
MAC Address: 080027F91CC9
Cable Connected
Port Forwarding
OK
Cancel
Port Forwarding Rules
Name Protocol Host IP Host Port Guest IP Guest Port
http server 1 TCP 80 80
http server 2 TCP 8080 8080
http server 3 TCP 8081 8081
ssh rule TCP 3302 22
OK
Cancel

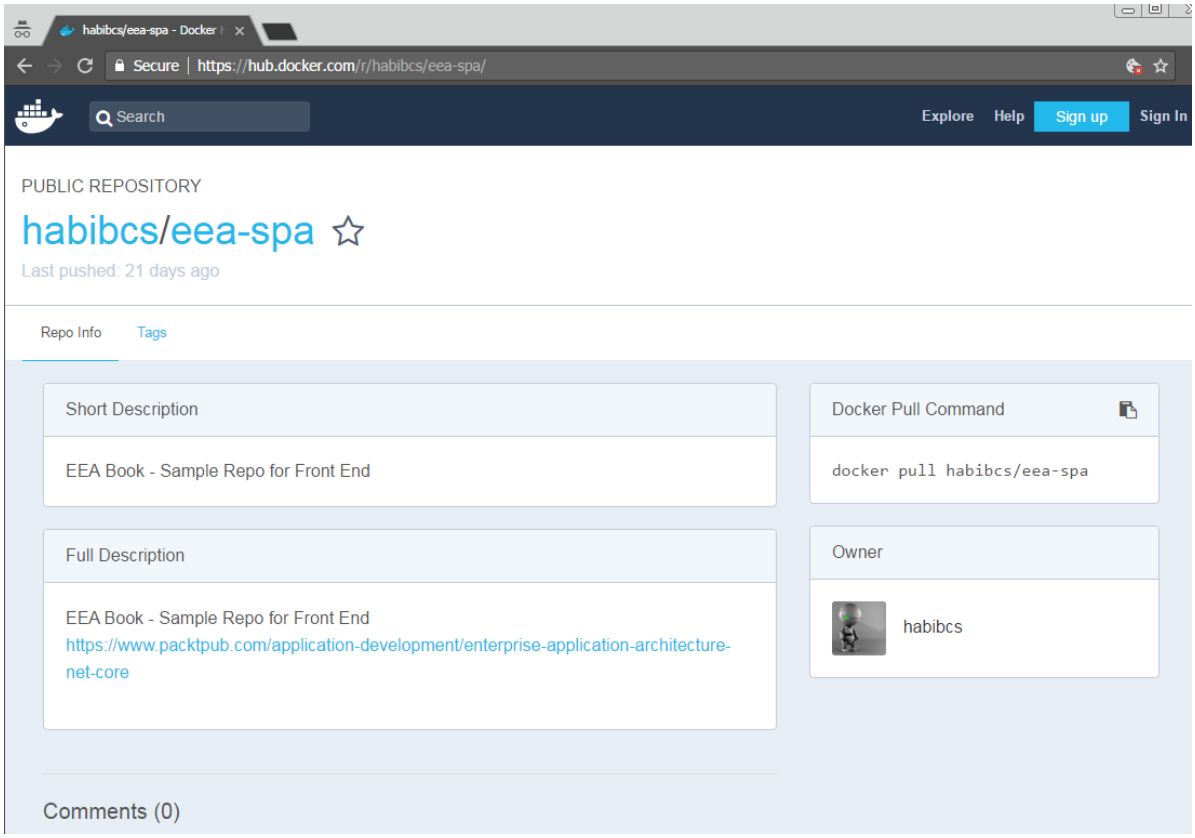



```
centos@localhost:~/containerization/app/dynamic
[centos@localhost ~]$ cd containerization/app/dynamic/
[centos@localhost dynamic]$ ls
mathwebapi_publish  mathwebapi_publish.zip
[centos@localhost dynamic]$ rm -rf mathwebapi_publish.zip
[centos@localhost dynamic]$ ls
mathwebapi_publish
[centos@localhost dynamic]$ clear
[centos@localhost dynamic]$ docker images
REPOSITORY          TAG                 IMAGE ID            CREATED             SIZE
hello-world         latest              48b5124b2768        4 weeks ago         1.84 kB
[centos@localhost dynamic]$ docker ps
CONTAINER ID        IMAGE               COMMAND             CREATED             STATUS              PORTS               NAMES
[centos@localhost dynamic]$ pwd
/home/centos/containerization/app/dynamic
[centos@localhost dynamic]$ ls
mathwebapi_publish
[centos@localhost dynamic]$ docker build mathwebapi_publish -t mathwebapi
Sending build context to Docker daemon 7.576 MB
Step 1/6 : FROM microsoft/aspnetcore:1.0.1
1.0.1: Pulling from microsoft/aspnetcore
386a066cd84a: Pull complete
```

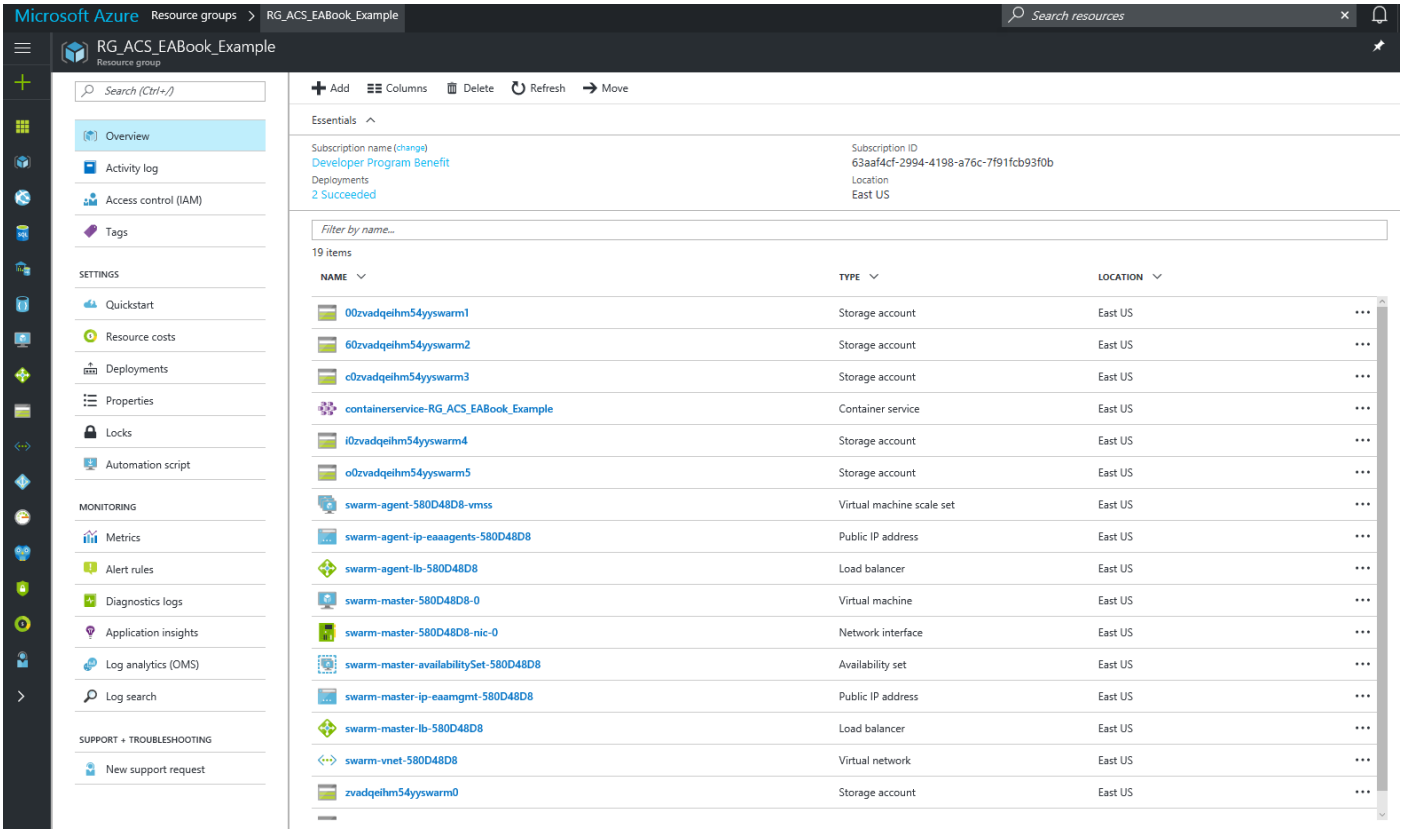
```
[centos@localhost dynamic]$ docker images
REPOSITORY              TAG                 IMAGE ID            CREATED             SIZE
mathwebapi              latest              1786f7451938        3 minutes ago       274 MB
hello-world             latest              48b5124b2768        4 weeks ago         1.84 kB
microsoft/aspnetcore    1.0.1               2c7bbc508bb2        8 weeks ago         267 MB
[centos@localhost dynamic]$
```

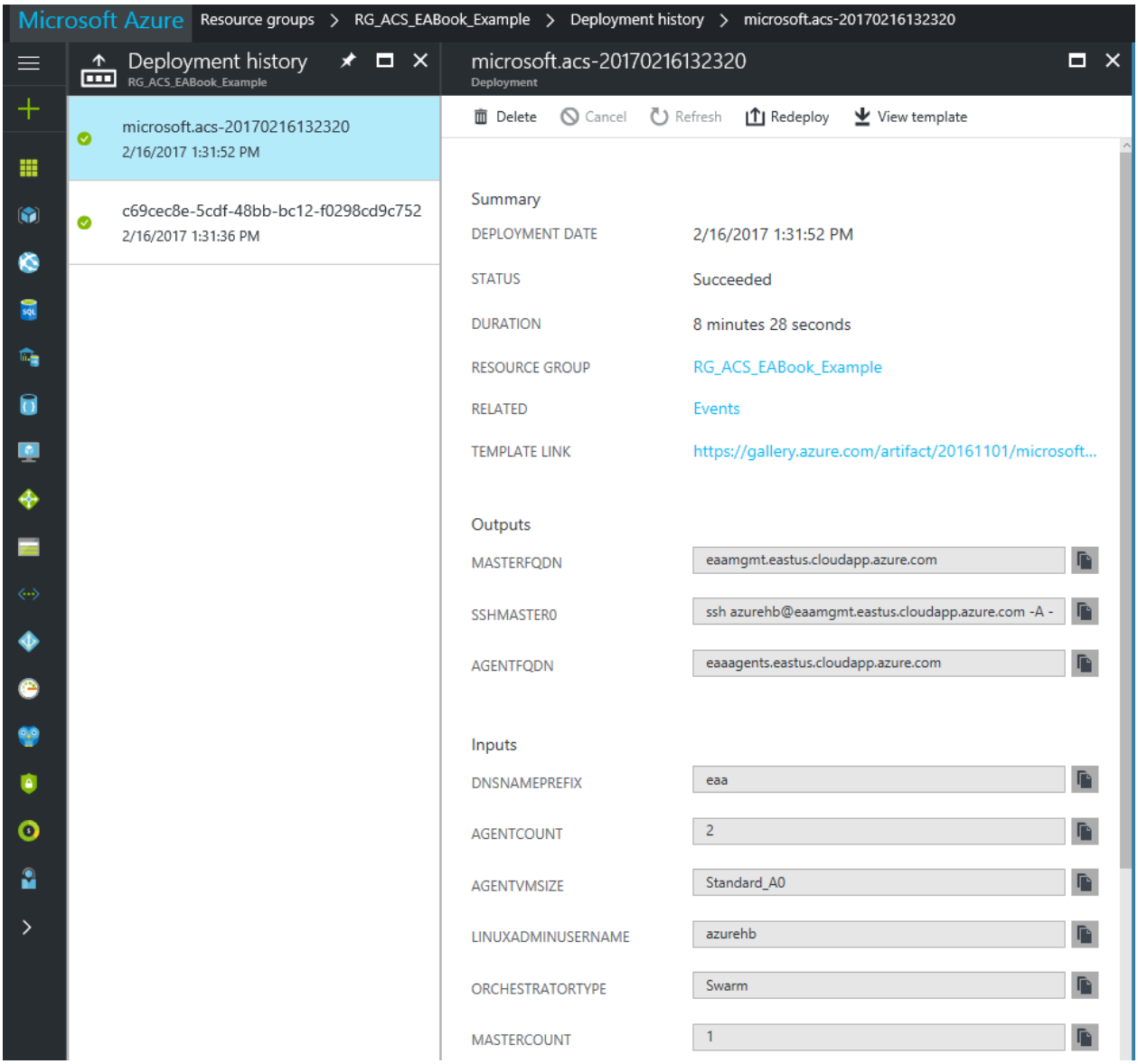
```
[centos@localhost dynamic]$ docker run -it -d -p 8080:80 mathwebapi
8c22f2bcb2d1b16c92a70b20d2c47d3cb39aba02c6bd1c131201e83f1f89a260
[centos@localhost dynamic]$ docker ps
CONTAINER ID        IMAGE               COMMAND                  CREATED             STATUS              PORTS                   NAMES
8c22f2bcb2d1        mathwebapi          "dotnet MathWebAPI..."   6 seconds ago       Up 4 seconds        0.0.0.0:8080->80/tcp    pedantic_albatt
```





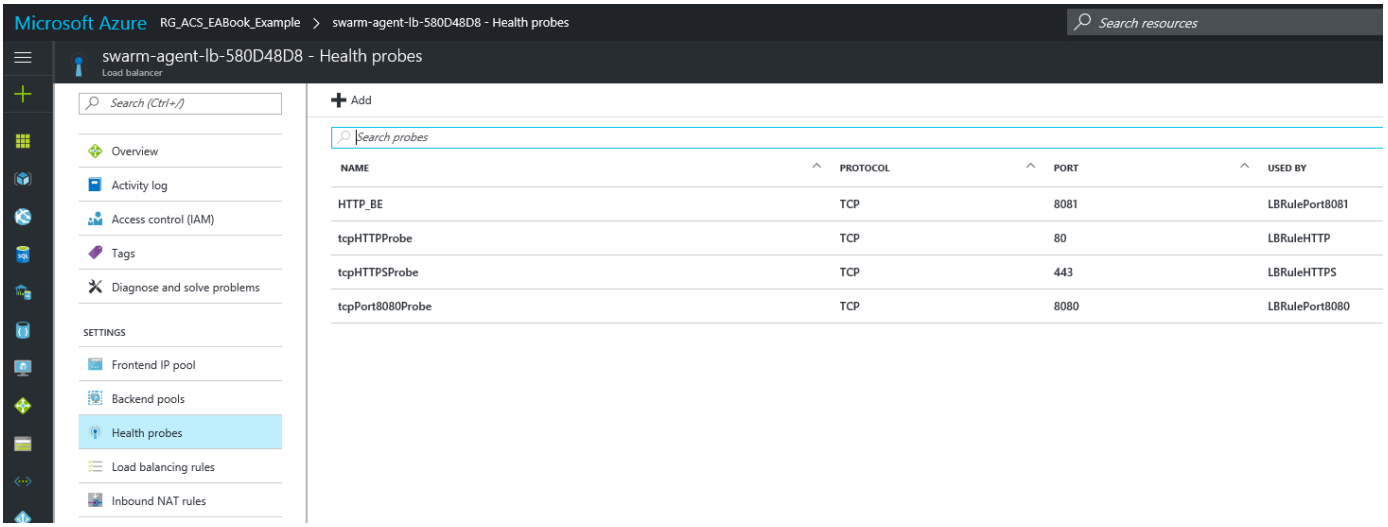

```
[centos@localhost static]$ docker images
REPOSITORY                  TAG                 IMAGE ID            CREATED             SIZE
mathappfe                   latest              8e4917865c26        About an hour ago   182 MB
mathwebapi                  latest              80a458cc5a04        About an hour ago   274 MB
```

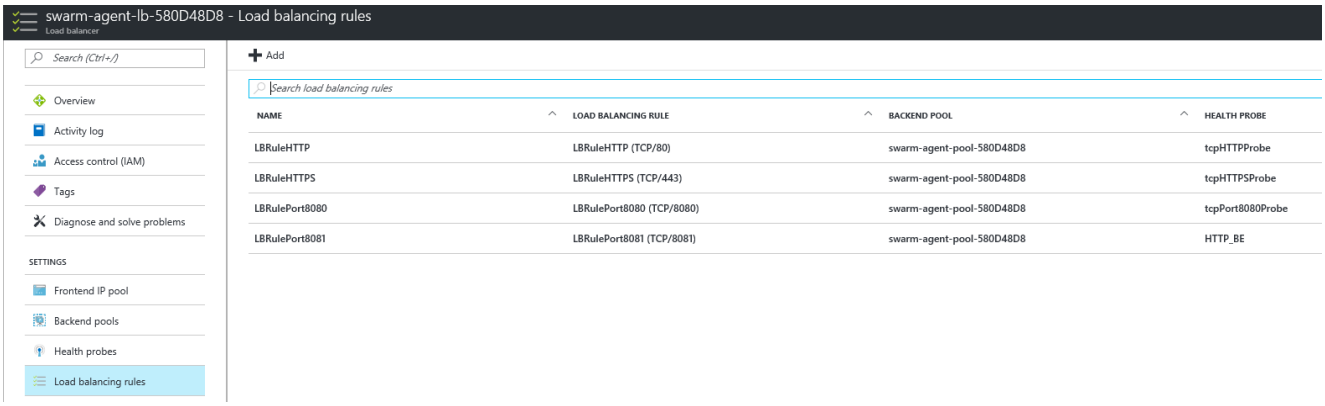

Microsoft Azure
Resource groups
RG_ACS_EABook_Example
Search resources
RG_ACS_EABook_Example
Resource group
Search (Ctrl+/)
Overview
Activity log
Access control (IAM)
Tags
SETTINGS
Quickstart
Resource costs
Deployments
Properties
Locks
Automation script
MONITORING
Metrics
Alert rules
Diagnostics logs
Application insights
Log analytics (OMS)
Log search
SUPPORT + TROUBLESHOOTING
New support request
Add
Columns
Delete
Refresh
Move
Essentials
Subscription name (change)
Developer Program Benefit
Deployments
2 Succeeded
Subscription ID
63aaf4cf-2994-4198-a76c-7f91fcb93f0b
Location
East US
Filter by name...
19 items
NAME
TYPE
LOCATION
00zvadqeihm54yyswarm1 Storage account East US
60zvadqeihm54yyswarm2 Storage account East US
c0zvadqeihm54yyswarm3 Storage account East US
containerservice-RG_ACS_EABook_Example Container service East US
i0zvadqeihm54yyswarm4 Storage account East US
o0zvadqeihm54yyswarm5 Storage account East US
swarm-agent-580D48D8-vmss Virtual machine scale set East US
swarm-agent-ip-eaaagents-580D48D8 Public IP address East US
swarm-agent-lb-580D48D8 Load balancer East US
swarm-master-580D48D8-0 Virtual machine East US
swarm-master-580D48D8-nic-0 Network interface East US
swarm-master-availabilitySet-580D48D8 Availability set East US
swarm-master-ip-eaamgmt-580D48D8 Public IP address East US
swarm-master-lb-580D48D8 Load balancer East US
swarm-vnet-580D48D8 Virtual network East US
zvadqeihm54yyswarm0 Storage account East US

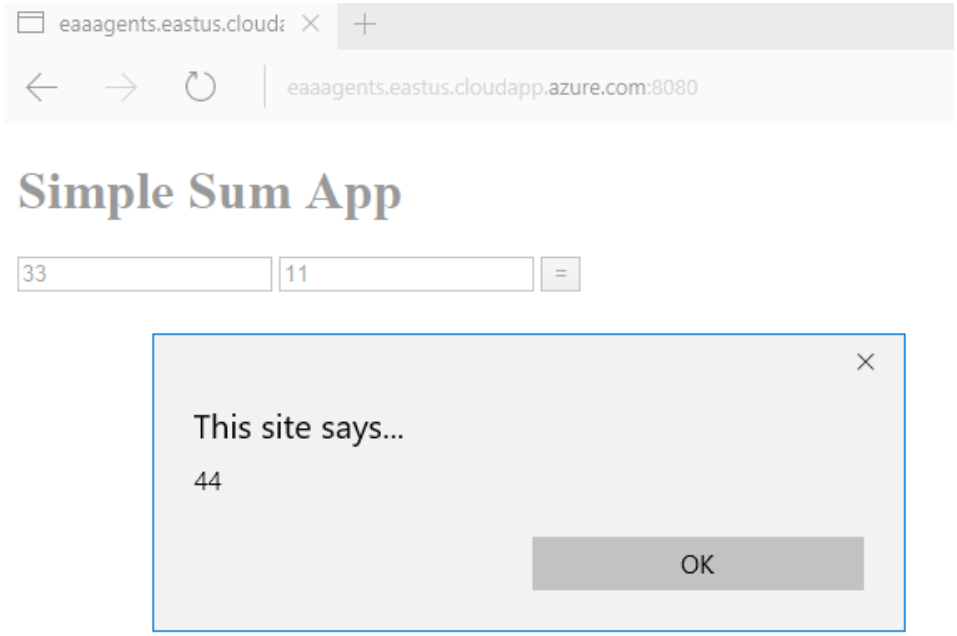

Microsoft Azure
Resource groups
RG_ACS_EABook_Example
Deployment history
microsoft.acs-20170216132320
Deployment history
RG_ACS_EABook_Example
microsoft.acs-20170216132320
2/16/2017 1:31:52 PM
c69cec8e-5cdf-48bb-bc12-f0298cd9c752
2/16/2017 1:31:36 PM
microsoft.acs-20170216132320
Deployment
Delete
Cancel
Refresh
Redeploy
View template
Summary
DEPLOYMENT DATE
2/16/2017 1:31:52 PM
STATUS
Succeeded
DURATION
8 minutes 28 seconds
RESOURCE GROUP
RG_ACS_EABook_Example
RELATED
Events
TEMPLATE LINK
https://gallery.azure.com/artifact/20161101/microsoft...
Outputs
MASTERFQDN
eaamgmt.eastus.cloudapp.azure.com
SSHMASTER0
ssh azurehb@eaamgmt.eastus.cloudapp.azure.com -A -
AGENTFQDN
eaaagents.eastus.cloudapp.azure.com
Inputs
DNSNAMEPREFIX
eaa
AGENTCOUNT
2
AGENTVMSIZE
Standard_A0
LINUXADMINUSERNAME
azurehb
ORCHESTRATORTYPE
Swarm
MASTERCOUNT
1

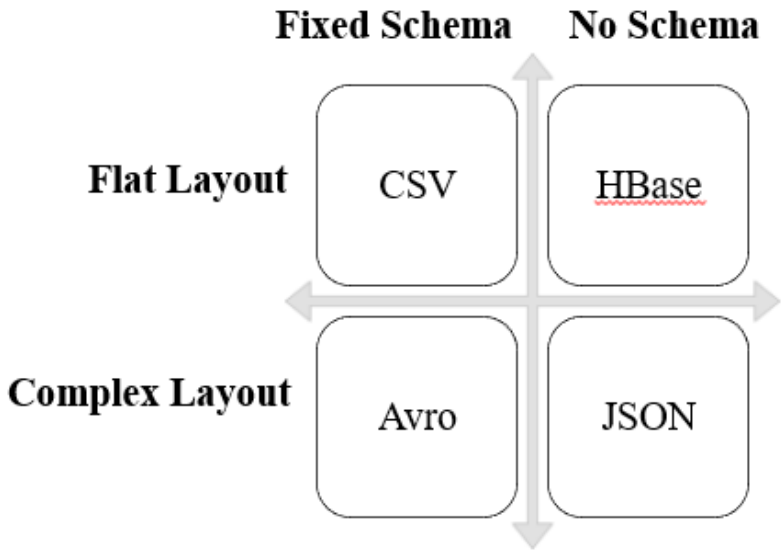
```
azurehb@swarm-master-580D48D8-0:~$ docker info
Containers: 2
 Running: 2
 Paused: 0
 Stopped: 0
Images: 2
Server Version: 1.13.1
Storage Driver: aufs
 Root Dir: /var/lib/docker/aufs
 Backing Filesystem: extfs
 Dirs: 25
 Dirperm1 Supported: true
Logging Driver: json-file
Cgroup Driver: cgroupfs
Plugins:
 Volume: local
 Network: bridge host macvlan null overlay
Swarm: inactive
Runtimes: runc
Default Runtime: runc
Init Binary: docker-init
containerd version: aa8187dbd3b7ad67d8e5e3a15115d3eef43a7ed1
runc version: 9df8b306d01f59d3a8029be411de015b7304dd8f
init version: 949e6fa
Security Options:
 apparmor
Kernel Version: 3.19.0-65-generic
Operating System: Ubuntu 14.04.4 LTS
OSType: linux
Architecture: x86_64
CPUs: 2
Total Memory: 6.805 GiB
Name: swarm-master-580D48D8-0
ID: ZVNF:TMRA:IHVY:SHSF:BVHM:45BJ:4YJM:TYLU:ALCI:BICM:J7EW:77LM
Docker Root Dir: /var/lib/docker
Debug Mode (client): false
Debug Mode (server): false
Registry: https://index.docker.io/v1/
WARNING: No swap limit support
Experimental: false
Insecure Registries:
 127.0.0.0/8
Live Restore Enabled: false
```

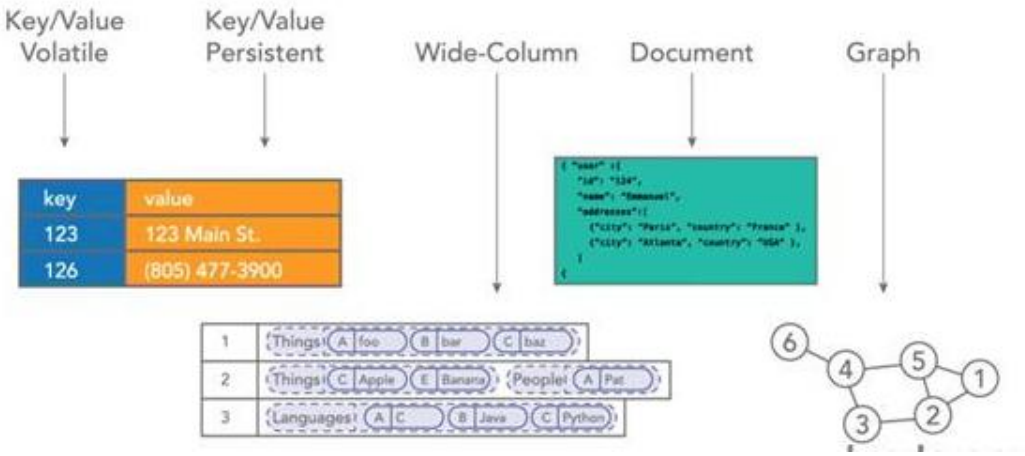
```
azurehb@swarm-master-580D48D8-0:~$ export DOCKER_HOST=tcp://127.0.0.1:2375
azurehb@swarm-master-580D48D8-0:~$ docker info
Containers: 2
 Running: 0
 Paused: 0
 Stopped: 2
Images: 4
Role: primary
Strategy: spread
Filters: health, port, dependency, affinity, constraint
Nodes: 2
 swarm-agent-580D48D8000000: 10.0.0.4:2375
  └ Status: Healthy
  └ Containers: 1
  └ Reserved CPUs: 0 / 1
  └ Reserved Memory: 0 B / 702 MiB
  └ Labels: executiondriver=<not supported>, kernelversion=3.19.0-65-generic, operatingsystem=Ubuntu 14.04.4 LTS, storagedriver=aufs
  └ Error: (none)
  └ UpdatedAt: 2017-03-12T16:25:07Z
 swarm-agent-580D48D8000002: 10.0.0.6:2375
  └ Status: Healthy
  └ Containers: 1
  └ Reserved CPUs: 0 / 1
  └ Reserved Memory: 0 B / 702 MiB
  └ Labels: executiondriver=<not supported>, kernelversion=3.19.0-65-generic, operatingsystem=Ubuntu 14.04.4 LTS, storagedriver=aufs
  └ Error: (none)
  └ UpdatedAt: 2017-03-12T16:24:55Z
Plugins:
 Volume:
 Network:
Swarm:
 NodeID:
 Is Manager: false
 Node Address:
Kernel Version: 3.19.0-65-generic
Operating System: linux
Architecture: amd64
CPUs: 2
Total Memory: 1.371 GiB
Name: 9d951f333a17
Docker Root Dir:
Debug Mode (client): false
Debug Mode (server): false
WARNING: No kernel memory limit support
Experimental: false
Live Restore Enabled: false
```

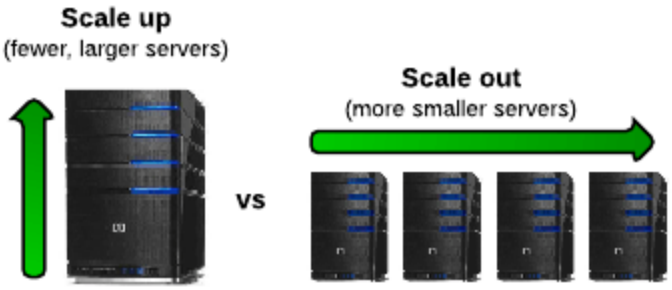


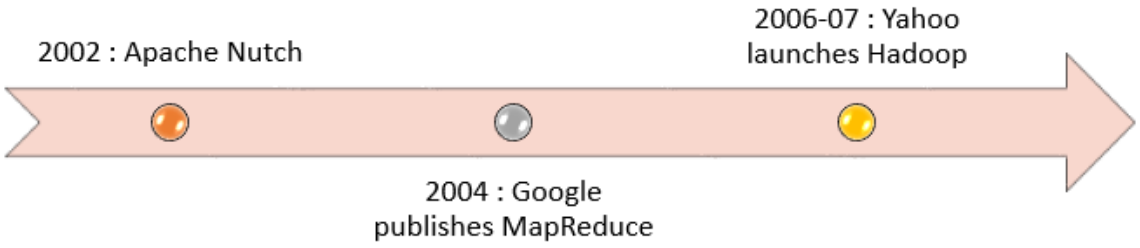

swarm-agent-lb-580D48D8 - Load balancing rules
Load balancer
Search (Ctrl+/)
Overview
Activity log
Access control (IAM)
Tags
Diagnose and solve problems
SETTINGS
Frontend IP pool
Backend pools
Health probes
Load balancing rules
Add
Search load balancing rules
NAME
LOAD BALANCING RULE
BACKEND POOL
HEALTH PROBE
LBRuleHTTP
LBRuleHTTP (TCP/80)
swarm-agent-pool-580D48D8
tcpHTTPProbe
LBRuleHTTPS
LBRuleHTTPS (TCP/443)
swarm-agent-pool-580D48D8
tcpHTTPSProbe
LBRulePort8080
LBRulePort8080 (TCP/8080)
swarm-agent-pool-580D48D8
tcpPort8080Probe
LBRulePort8081
LBRulePort8081 (TCP/8081)
swarm-agent-pool-580D48D8
HTTP_BE

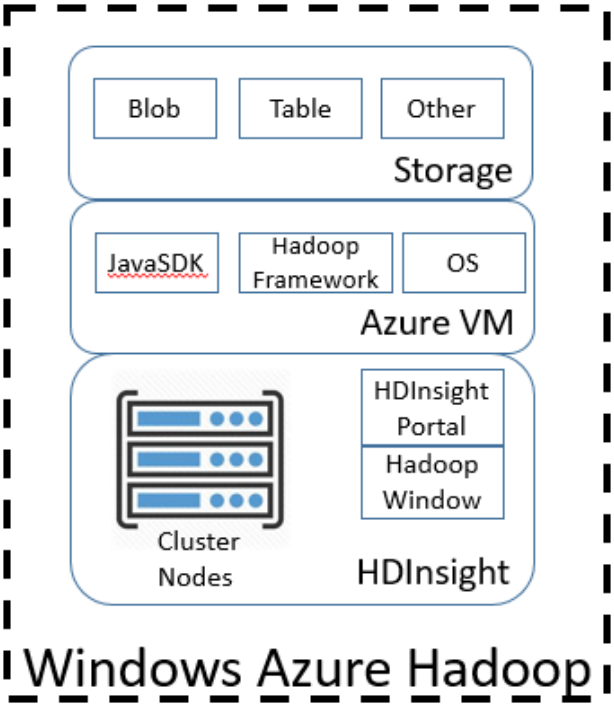

eaaagents.eastus.cloud
eaaagents.eastus.cloudapp.azure.com:8080
Simple Sum App
33
11
=
This site says...
44
OK

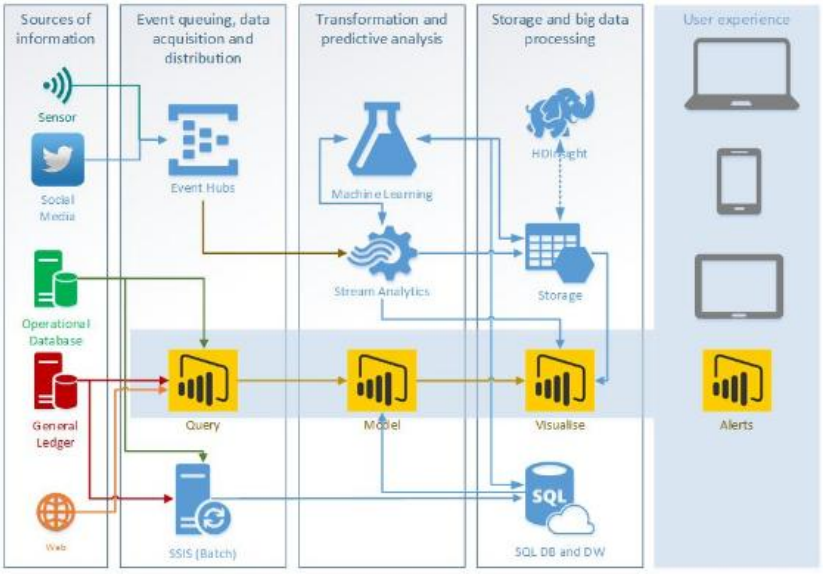

Fixed Schema
No Schema
Flat Layout
CSV
HBase
Complex Layout
Avro
JSON

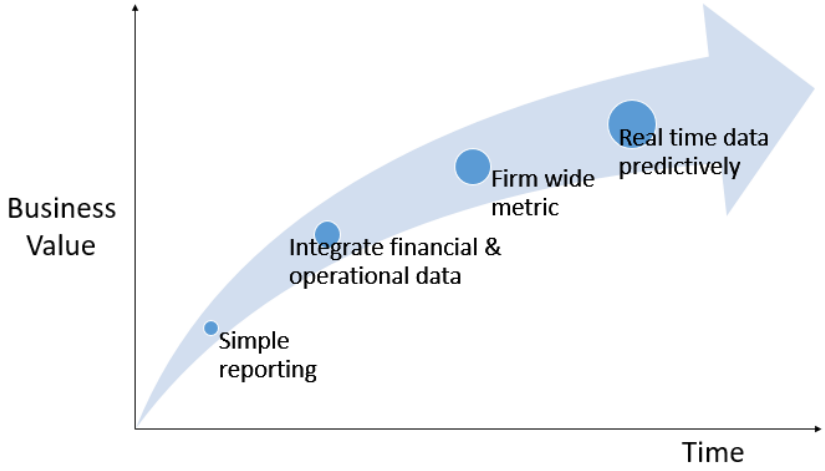

Key/Value Volatile
Key/Value Persistent
Wide-Column
Document
Graph
key
value
123
123 Main St.
126
(805) 477-3900
1
Things
A
foo
B
bar
C
baz
2
Things
C
Apple
E
Banana
People
A
Pat
3
Languages
A
C
B
Java
C
Python
6
4
5
1
3
2


Scale up
(fewer, larger servers)
vs
Scale out
(more smaller servers)

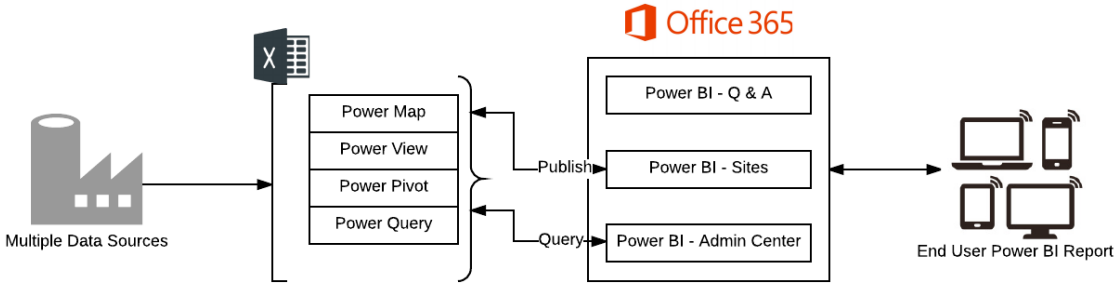

2002 : Apache Nutch
2004 : Google
publishes MapReduce
2006-07 : Yahoo
launches Hadoop


Blob
Table
Other
Storage
JavaSDK
Hadoop Framework
OS
Azure VM
HDInsight Portal
Hadoop Window
Cluster Nodes
HDInsight
Windows Azure Hadoop

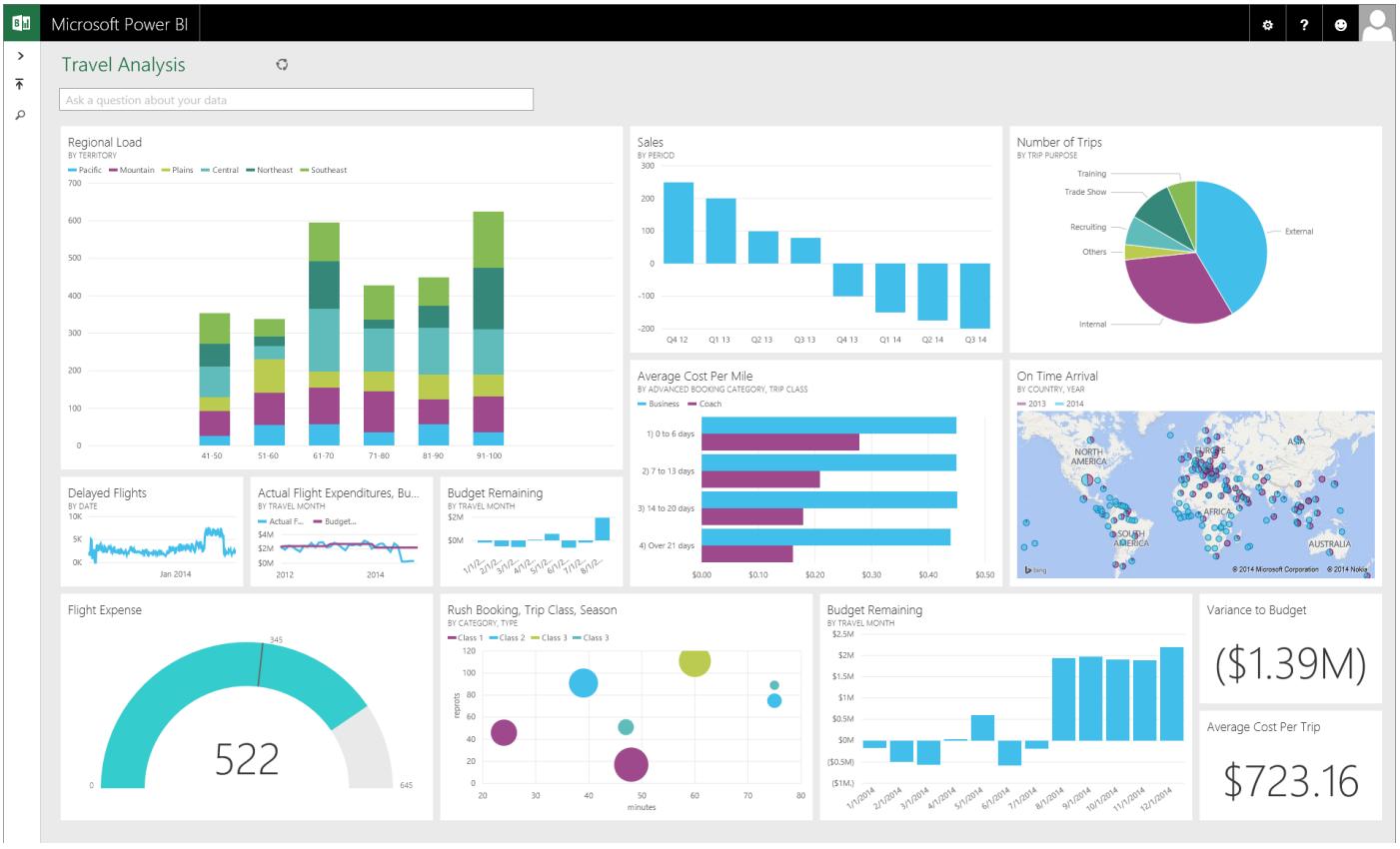

Sources of information
Event queuing, data acquisition and distribution
Transformation and predictive analysis
Storage and big data processing
User experience
Sensor
Social Media
Operational Database
General Ledger
Web
Event Hubs
Machine Learning
Stream Analytics
HDInsight
Storage
Query
Model
Visualise
Alerts
SSIS (Batch)
SQL
SQL DB and DW

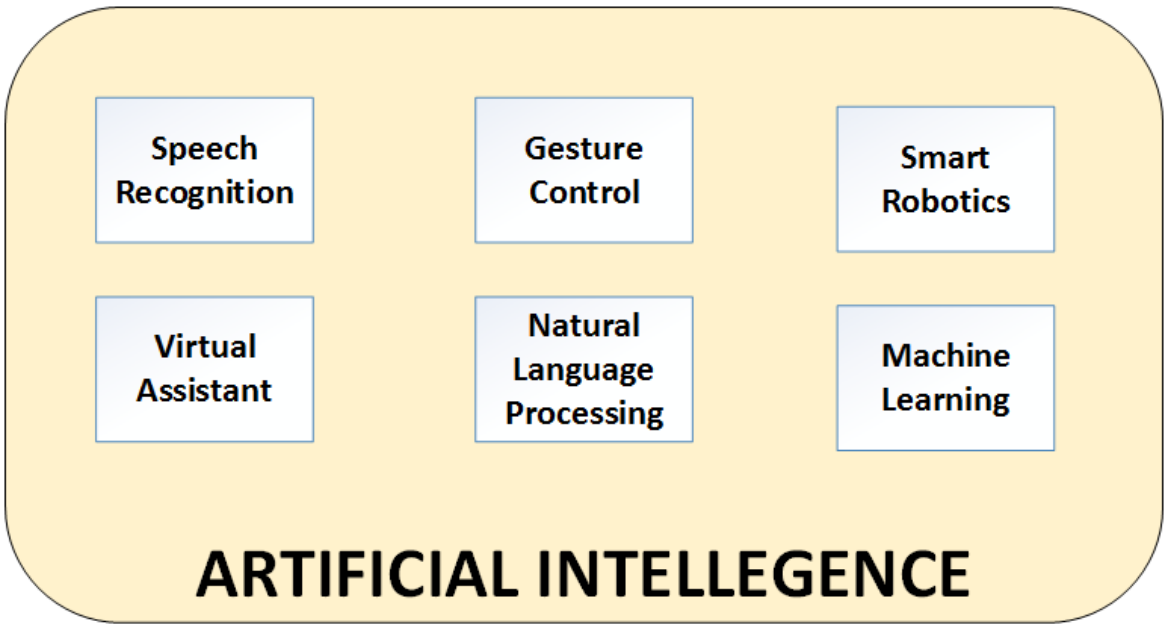

Business Value
Time
Simple reporting
Integrate financial & operational data
Firm wide metric
Real time data predictively

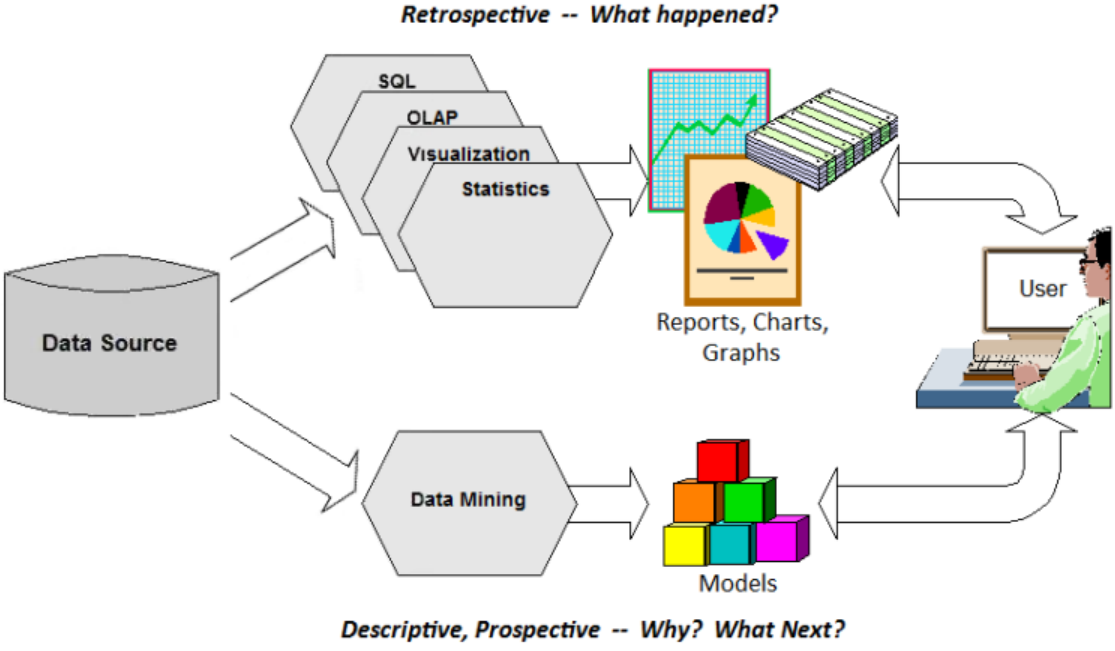

Current State
Future State
Roadmap

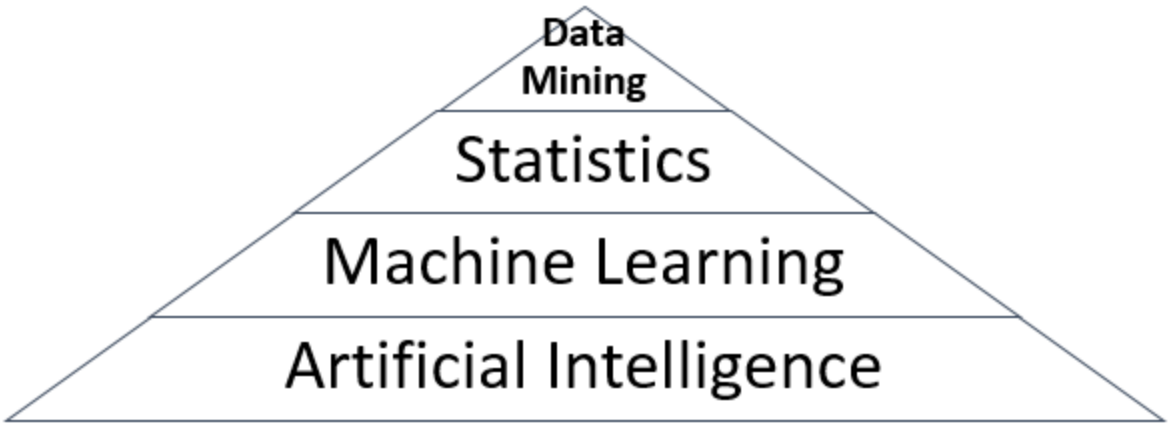

Office 365
Multiple Data Sources
Power Map
Power View
Power Pivot
Power Query
Publish
Query
Power BI - Q & A
Power BI - Sites
Power BI - Admin Center
End User Power BI Report


Power BI Service
Power BI Desktop
End User Power BI Report


Microsoft Power BI
Travel Analysis
Ask a question about your data
Regional Load
BY TERRITORY
Pacific
Mountain
Plains
Central
Northeast
Southeast
41-50
51-60
61-70
71-80
81-90
91-100
Sales
BY PERIOD
Q4 12
Q1 13
Q2 13
Q3 13
Q4 13
Q1 14
Q2 14
Q3 14
Number of Trips
BY TRIP PURPOSE
Training
Trade Show
Recruiting
Others
External
Internal
Average Cost Per Mile
BY ADVANCED BOOKING CATEGORY, TRIP CLASS
Business
Coach
1) 0 to 6 days
2) 7 to 13 days
3) 14 to 20 days
4) Over 21 days
On Time Arrival
BY COUNTRY, YEAR
2013
2014
NORTH AMERICA
EUROPE
ASIA
AFRICA
SOUTH AMERICA
AUSTRALIA
Delayed Flights
BY DATE
Jan 2014
Actual Flight Expenditures, Bu...
BY TRAVEL MONTH
Budget Remaining
BY TRAVEL MONTH
Flight Expense
522
Rush Booking, Trip Class, Season
BY CATEGORY, TYPE
Class 1
Class 2
Class 3
Class 3
minutes
Budget Remaining
BY TRAVEL MONTH
Variance to Budget
($1.39M)
Average Cost Per Trip
$723.16


Speech Recognition
Gesture Control
Smart Robotics
Virtual Assistant
Natural Language Processing
Machine Learning
ARTIFICIAL INTELLEGENCE


Retrospective -- What happened?
SQL
OLAP
Visualization
Statistics
Data Source
Reports, Charts, Graphs
User
Data Mining
Models
Descriptive, Prospective -- Why? What Next?


Data
Mining
Statistics
Machine Learning
Artificial Intelligence