HEXAWARE

Microservices with Service Fabric

Madan Sudarman

Azure Boot Camp 2018 - Hexaware, Chennai

Agenda

HEXAWARE

- Microservices Concepts
- Azure Service Fabric Overview
- Example: Customer Solution
- Getting Started

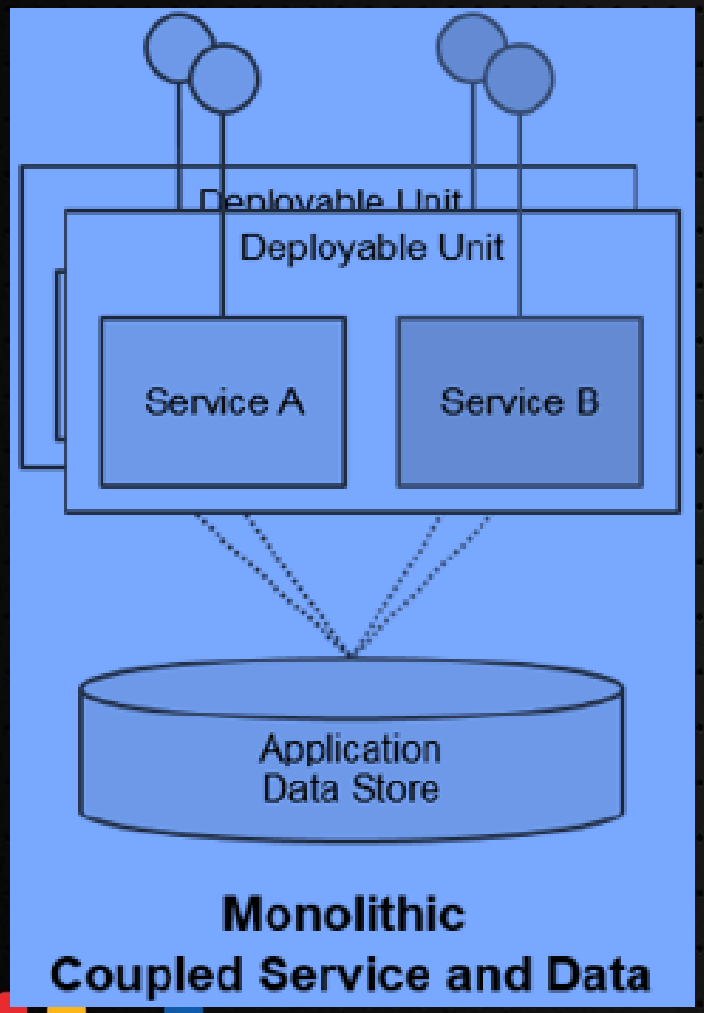
Microservices concepts

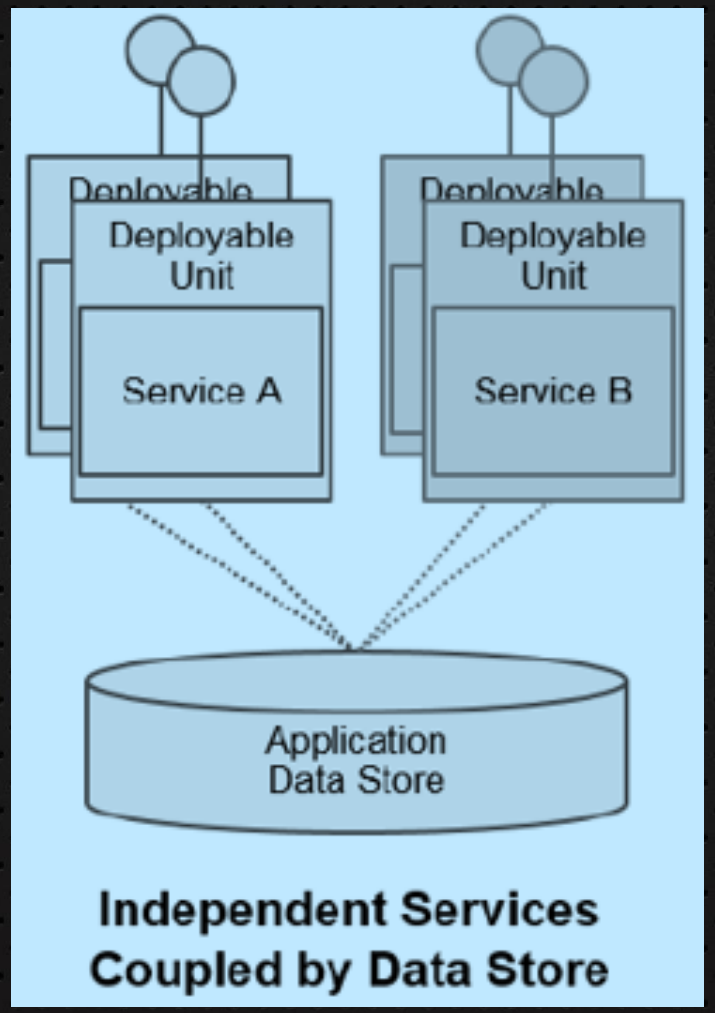
What is a Microservice?

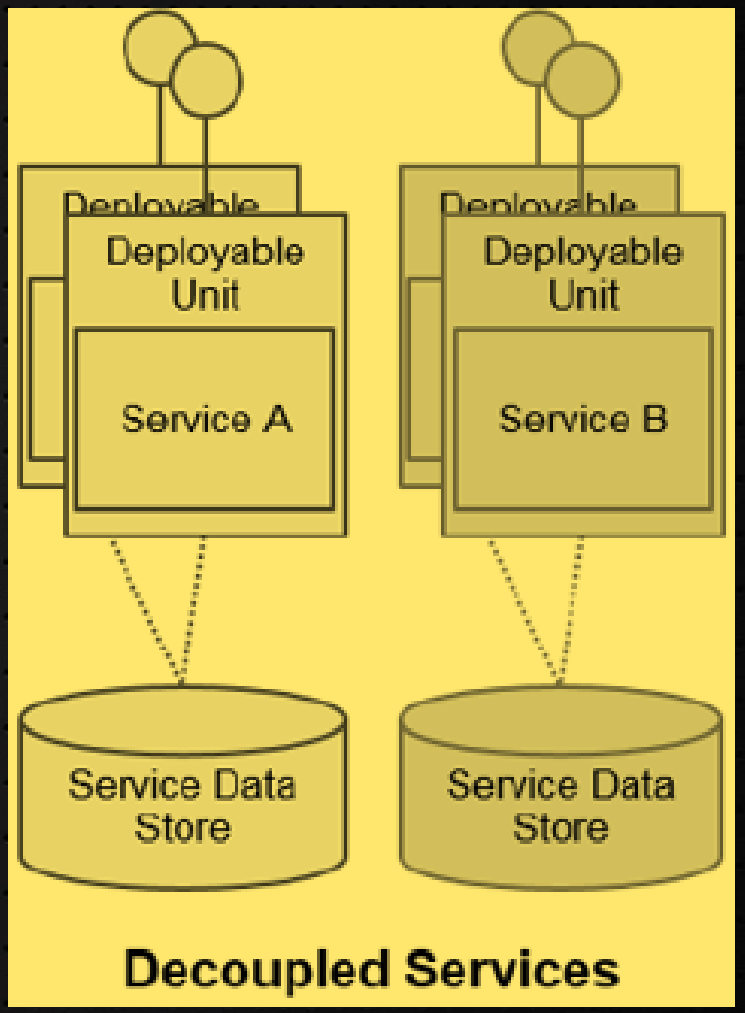
HEXAWARE

- Encapsulates a scenario
  - Single responsibility
  - Bounded context
- Contain code plus state that is independently versioned, deployed, and scaled
- Can be written in any language and framework
- Interact with other Microservices over well defined interfaces and protocols such as http (have a unique name - URL that can be resolved)
- Remains consistent and available in the presence of failures

Evolution







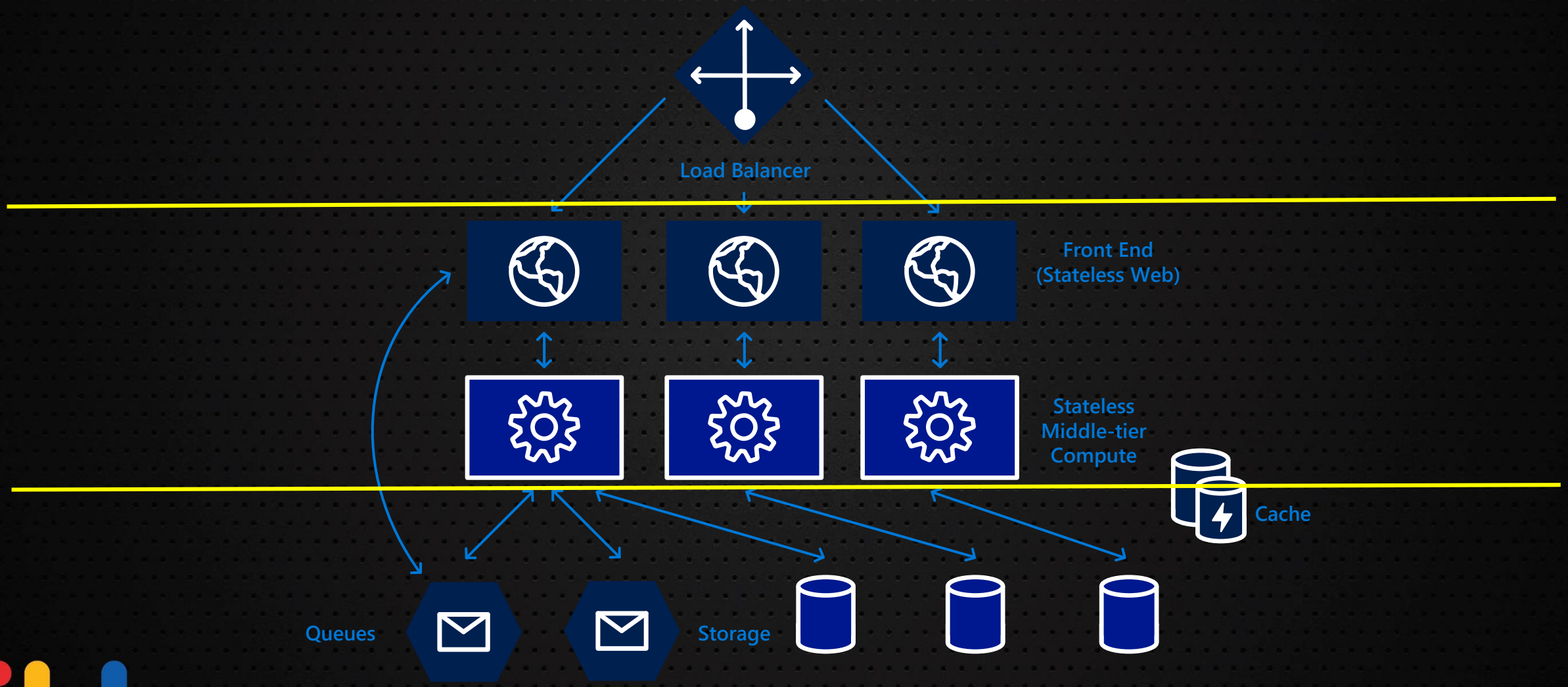
Credits: Gartner

Types of Microservices - Service Fabric perspective

HEXAWARE

- Stateless microservice
  - Has either no state or it can be retrieved from an external store
  - There can be N instances
  - e.g. web frontends, protocol gateways, Azure Cloud Services etc.
- Stateful microservice
  - Maintain hard, authoritative state
  - N consistent copies achieved through replication and local persistence
  - e.g. database, documents, workflow, user profile, shopping cart etc.

Stateless microservices pattern



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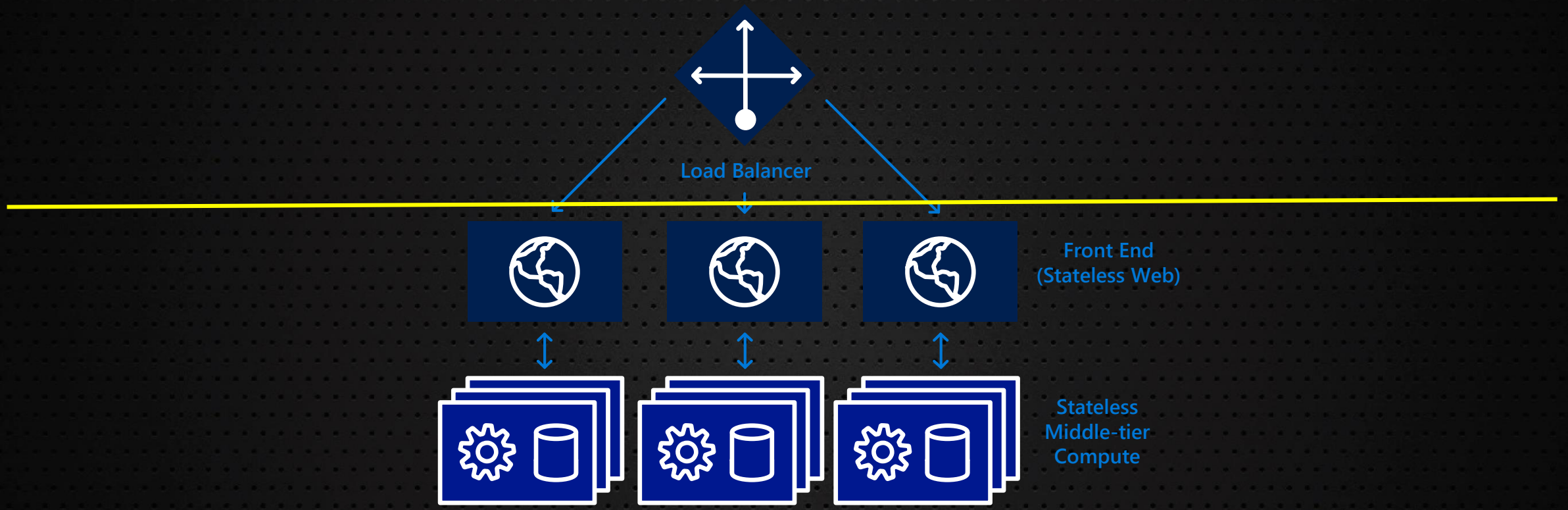
Stateful microservices pattern



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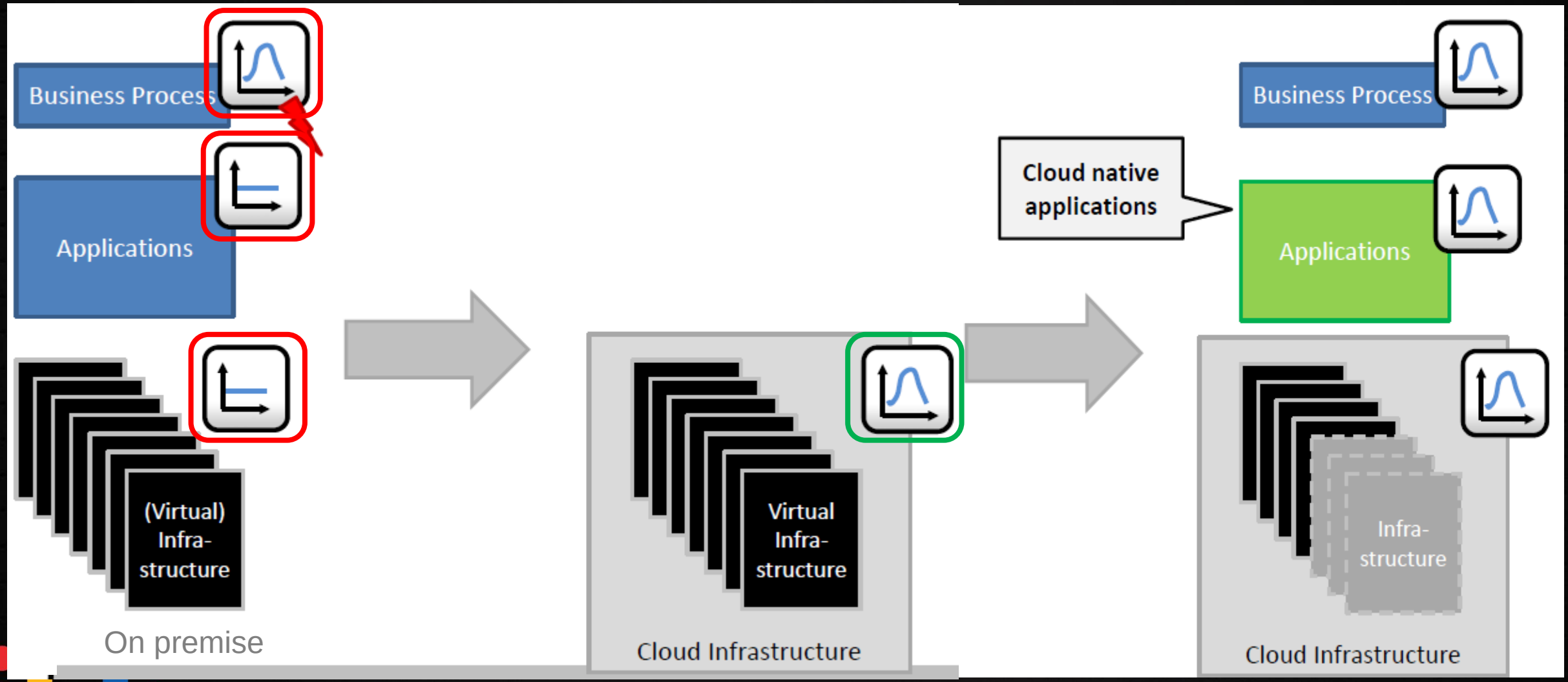
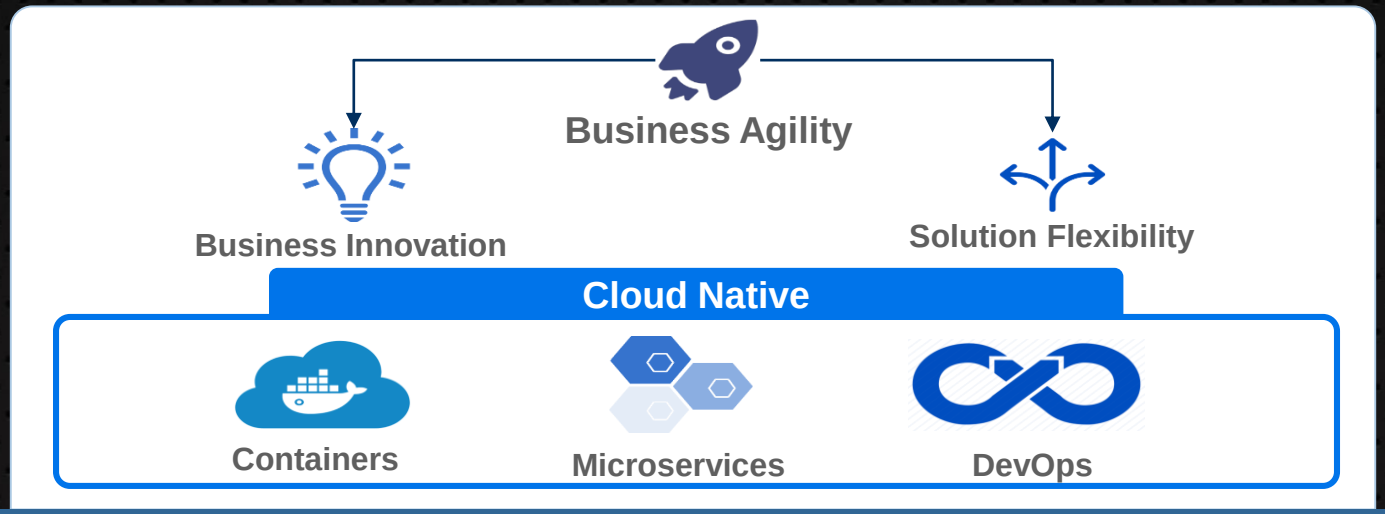
When to consider Microservices



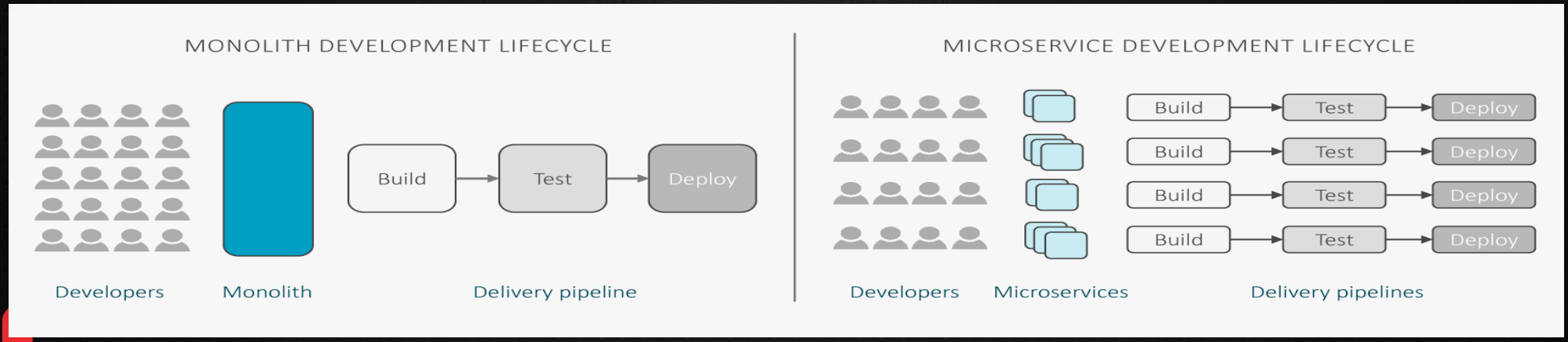
Credits: cloudcomputingpatterns.org

Cloud Native for Business Agility



Microservices architecture helps to continuously innovate by providing flexibility

Easier development & Testing | **Easy to upgrade** | **Agility & Continuous Delivery**



Azure Service Fabric - Overview

Cloud application development challenge

Balancing the needs of Business

- **Developer productivity** is essential for **business agility**
- Yet, keeping data and **apps stable**; and **cost optimal** is critical
- While you continue to **perform** to deliver value to your customers
- And **digitally transform** your business to **innovate**

Credits: Microsoft Azure

Azure Service Fabric

Build, deploy, and operate applications, using any OS, at any scale, on any cloud

Build

Build new or transform existing applications

Deploy

Deploy any code at any scale using tools you know

Operate

Run and secure services reliably at any scale

Credits: Microsoft Azure

To build, deploy, and operate…

…containers or microservices on any OS on any cloud

Programming Models

Dev & Ops Tooling

Orchestration

Lifecycle Management

Health & Monitoring

Always On Availability

Auto Scaling

Dev machine

Azure

On-premises infrastructure

Other clouds

Credits: Microsoft Azure

Build: data-aware microservices

Programming Models

Dev & Ops Tooling

Orchestration

Lifecycle Management

Health & Monitoring

Always On Availability

Auto Scaling

Reliable Actors

Use familiar tools: Visual Studio + Team Services for .NET or Jenkins + Yeomen for Java

Reliable Services

Manage state reliability without a database, lowering latency

Guest Executables

Run existing code and orchestrate life cycle using service fabric

Containers

Orchestrate your Windows Server or Linux containers reliably at scale

.NET or Java ...

Built-in ASP.NET core integration; work with VS and VSTS or Eclipse and Jenkins

Credits: Microsoft Azure

Deploy: any code on any OS

Programming Models

Dev & Ops Tooling

Orchestration

Lifecycle Management

Health & Monitoring

Always On Availability

Auto Scaling

CI/CD

Maximize uptime and scalability with isolated compute threads running concurrently

Docker Compose

Orchestrate existing container applications natively

Automate

Deploy or remove applications using PowerShell, CLI, Visual Studio, and other APIs

Rolling upgrades

Upgrade non-disruptively and roll-back in case of failures, automate with PowerShell

Monitor and diagnose

Generate, aggregate, and analyze events with built-in tooling and integration with Azure services

Credits: Microsoft Azure

Operate: on any cloud at any scale

Programming Models

Dev & Ops Tooling

Orchestration

Lifecycle Management

Health & Monitoring

Always On Availability

Auto Scaling

Use familiar tools

Such as Splunk, OMS, ELK, or AppInsights to gain deep insights or monitor application health

Use controlled chaos

Test graceful and ungraceful failure scenarios

Recover gracefully

Recover from node or service failure gracefully; replicate data automatically

Secure at scale

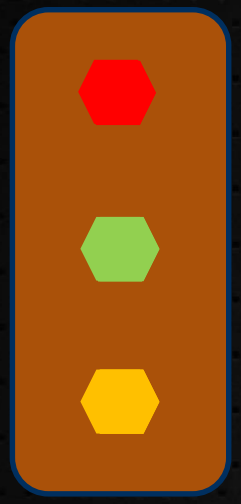
Secure node-to-node communication and user access using built-in capabilities

Scale programmatically

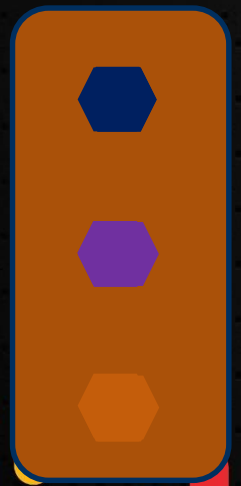
Use PowerShell, CLI, or APIs to scale programmatically achieving very high densities

Credits: Microsoft Azure

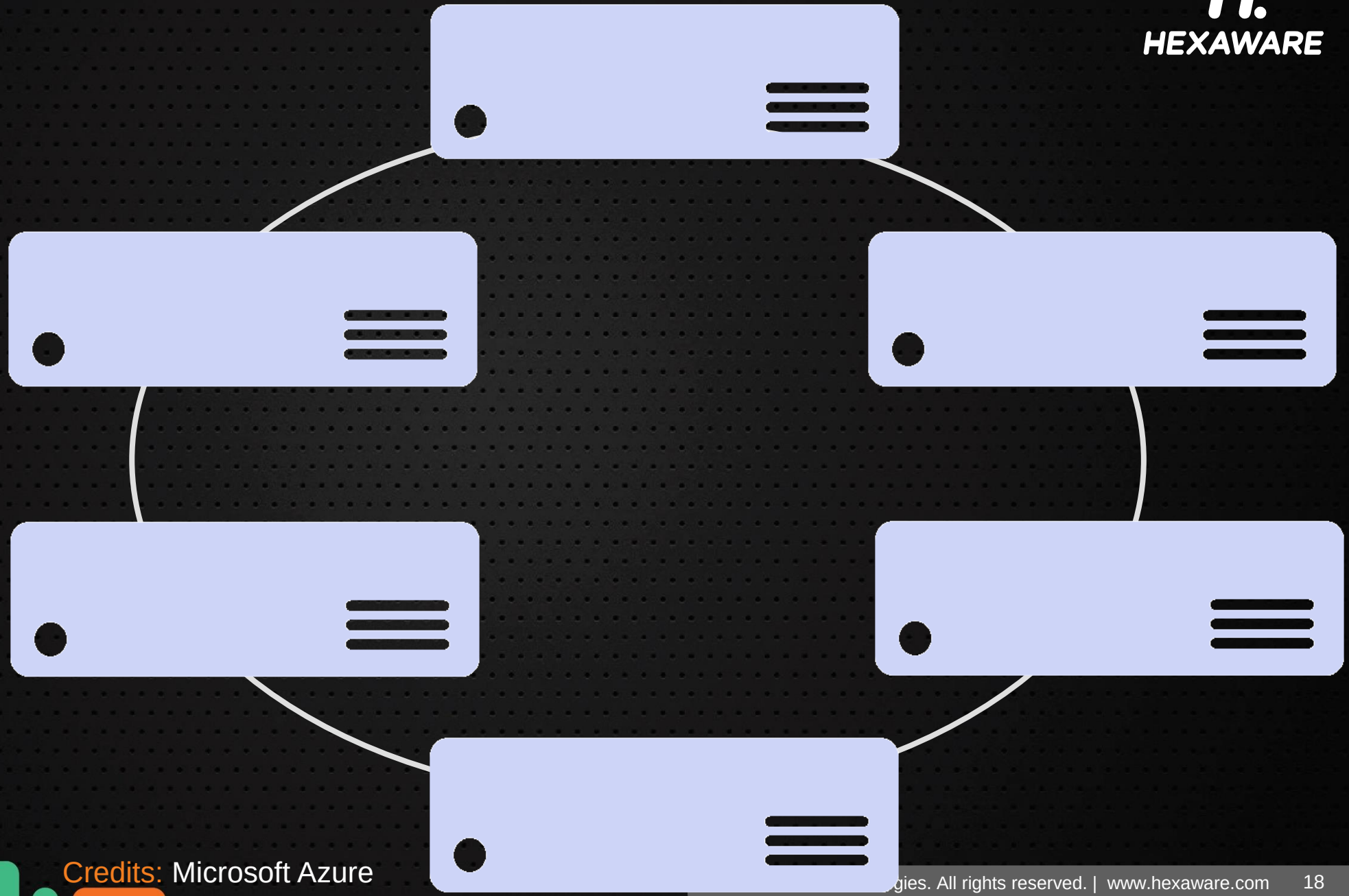
Service Fabric cluster with microservices



App1

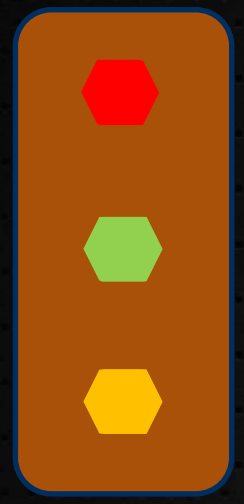


App2



Credits: Microsoft Azure

Handling machine failures



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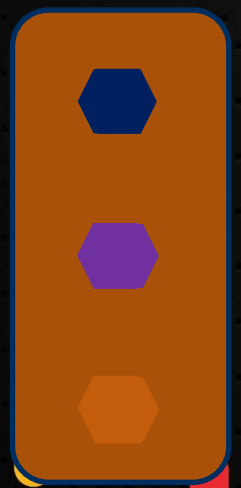
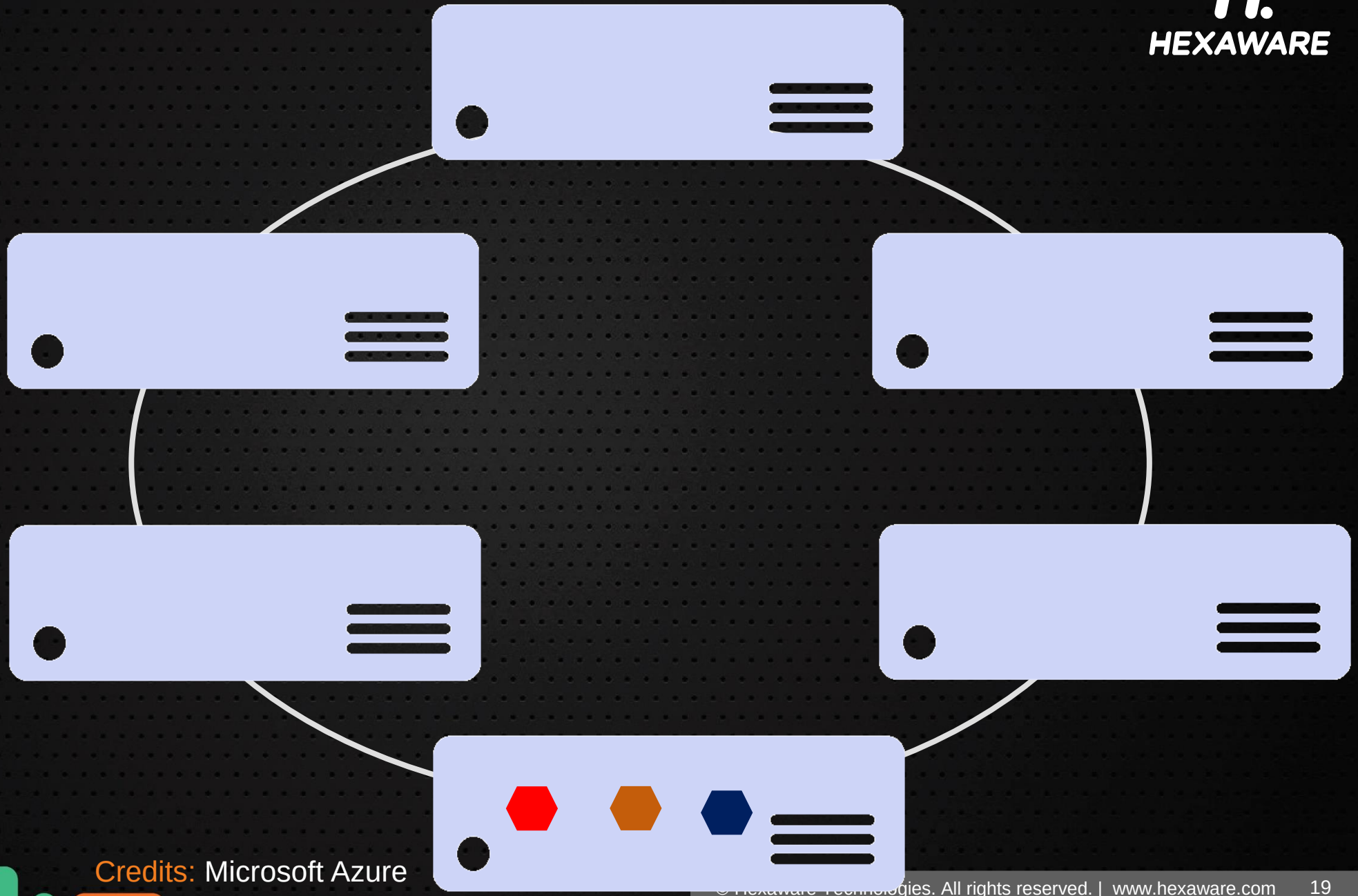


App2



Credits: Microsoft Azure

Example:
Customer Solution

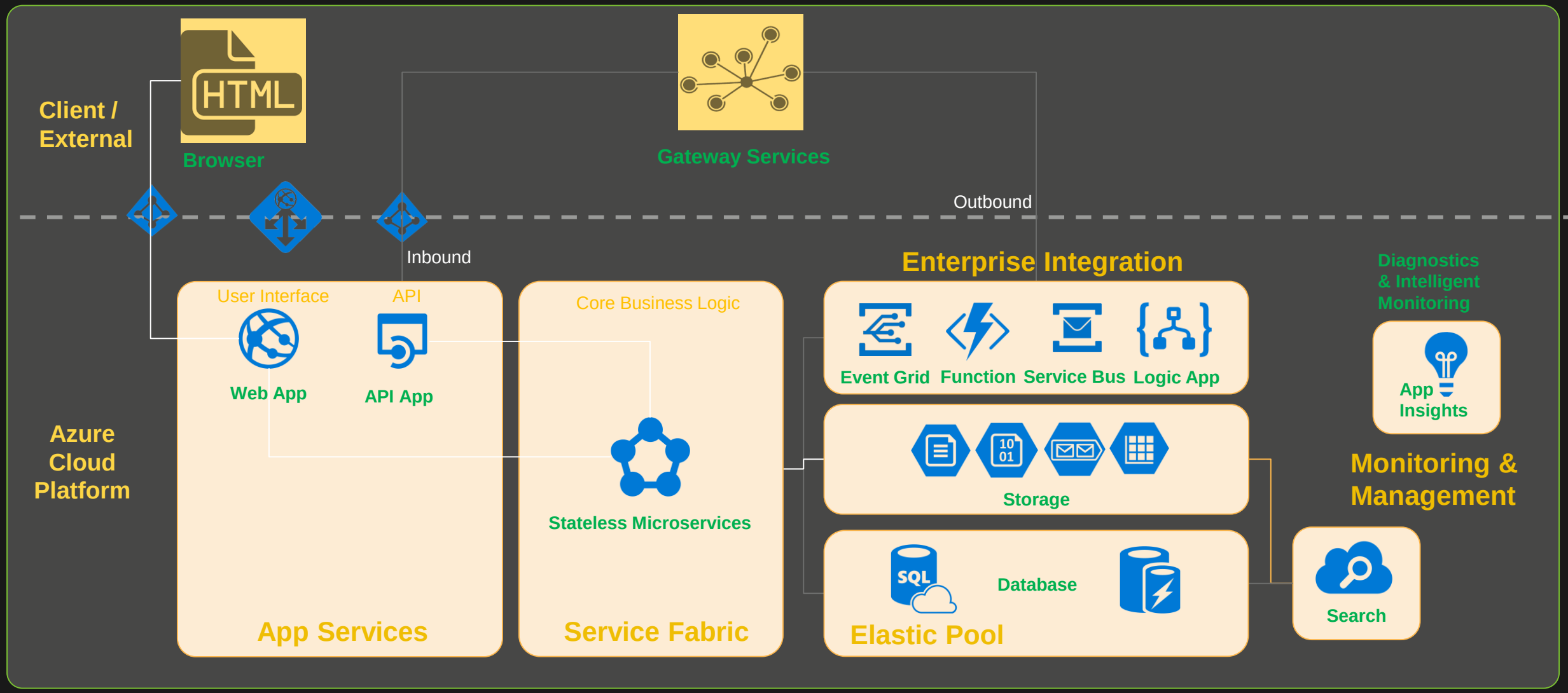
Proposed Solution & Key Design Principles

Proposed Solution

*fully developed, custom solution hosted in **Azure** leveraging **Service Fabric** as **Cloud Native Platform***

- Agile and robust delivery using Microservices
- Loosely coupled independent subsystems with clear purpose and scope
- Minimal technical diversity for ease of development & support (Microsoft Technology Stack)
- Data protection by Design By Default

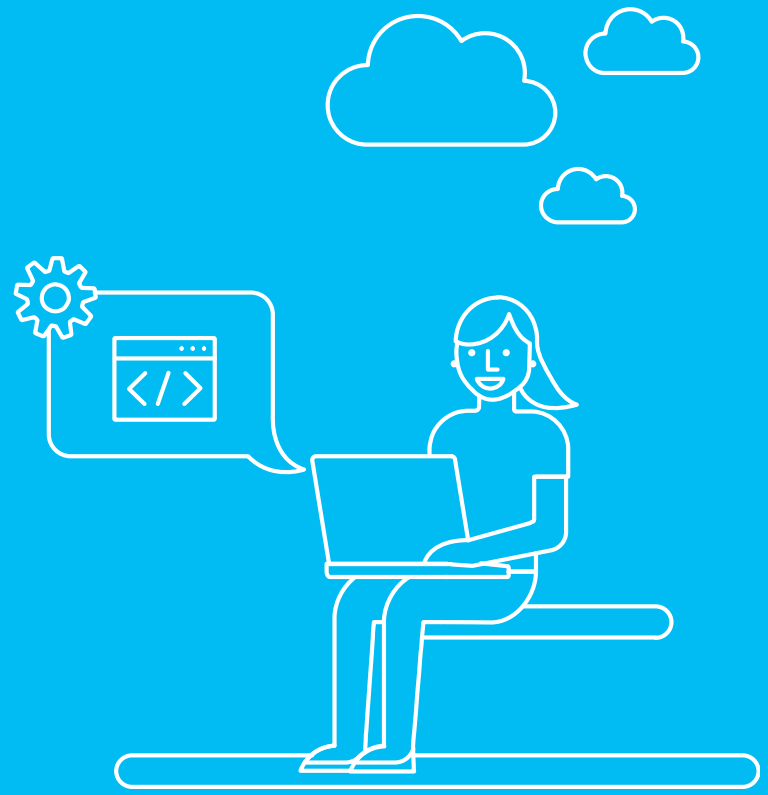
Solution Overview



Getting Started

Awesome for developers

- Use .NET, Java or more
  - Stateless and Stateful services
  - ASP.NET core integration
- Open source programming models
  - Reliable services and actor programming model
- Visual studio integration
  - Use single node cluster for dev/test purposes
- Consistent experience across environments
  - Run the same environment on dev box as in production



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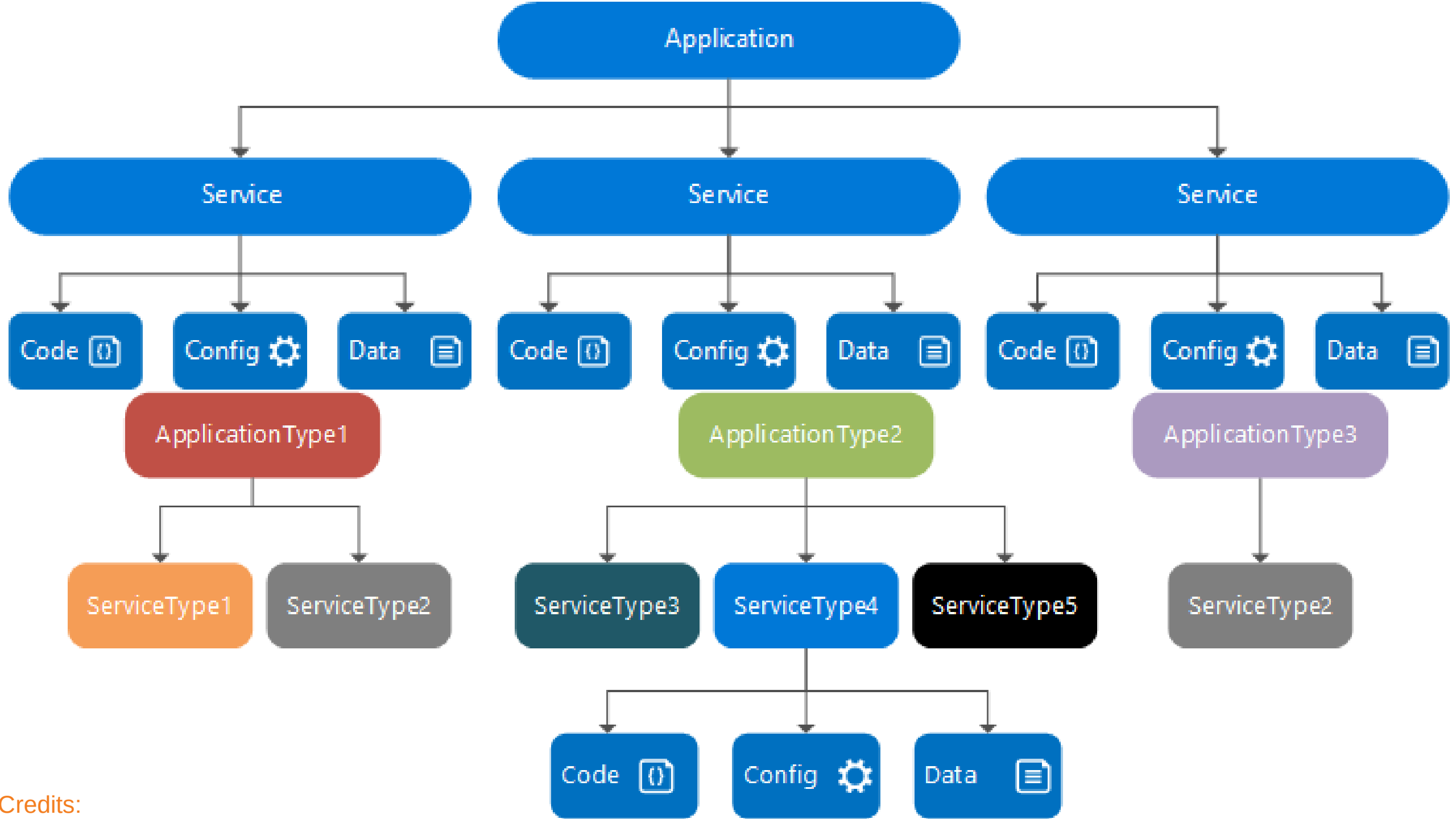
Demo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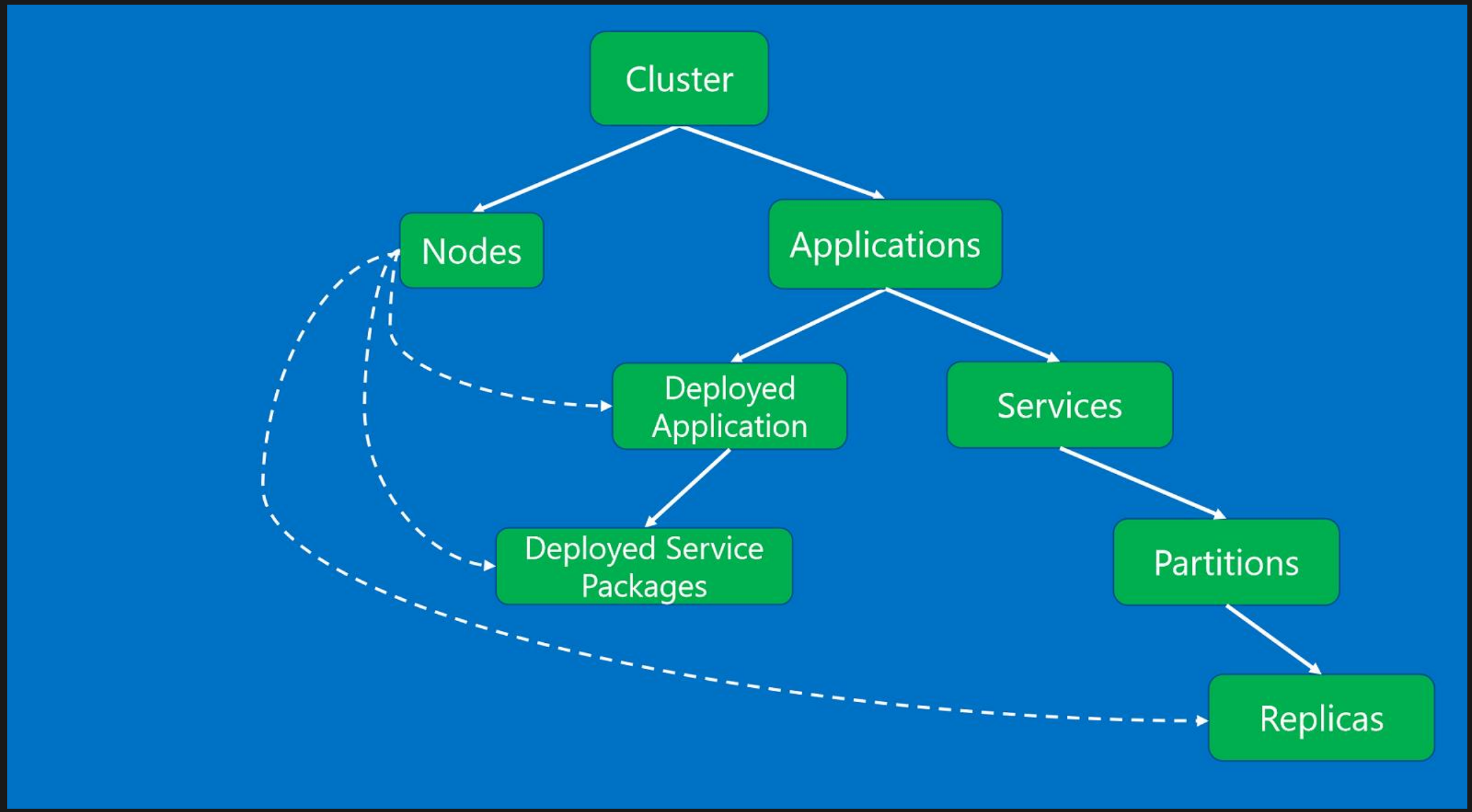
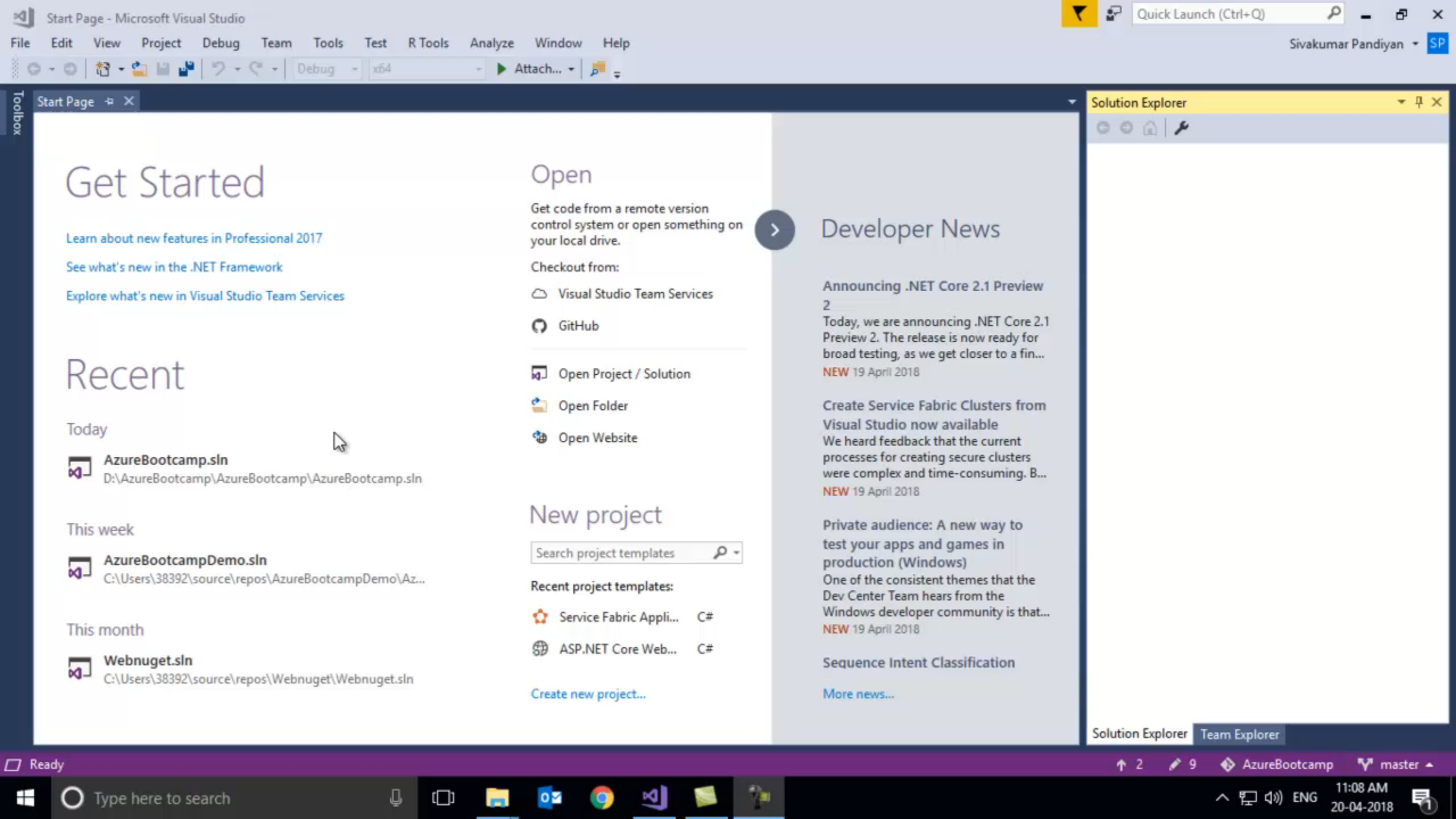


Credits: Microsoft Azure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Key Takeaway

Key Takeaways

- Microservices are key for scalable and evolving applications
- Service Fabric is a platform for building applications with a microservices design approach

https://docs.microsoft.com/en-us/azure/service-fabric/service-fabric-get-started

Q & A

Thank you