



Azure Architect: Design Business Continuity

Aligned with Microsoft Certification Exam AZ-304

ine.com

<https://t.me/learningnets>

Course Topics

Business Continuity
Azure Data Protection
Auto-scaling

AZ-304 Objective Domains

- Design monitoring (10-15%)
- Design identity and security (25-30%)
- Design data storage (15-20%)
- **Design business continuity (10-15%)**
- Design infrastructure (25-30%)

Exam AZ-304: Microsoft Azure Architect Design

- Design a solution for backup and recovery
 - + recommend a recovery solution for Azure hybrid and on-premises workloads that meets
- recovery objectives (RTO, RLO, RPO)
 - + design and Azure Site Recovery solution
 - + recommend a solution for recovery in different regions
 - + recommend a solution for Azure Backup management
 - + design a solution for data archiving and retention
- Design for high availability
 - + recommend a solution for application and workload redundancy, including compute, database, and storage
 - + recommend a solution for autoscaling
 - + identify resources that require high availability
 - + identify storage types for high availability
 - + recommend a solution for geo-redundancy of workloads

Pre-requisites

- **Azure Administrator Associate**



Prepare Azure Resources for ASR

Prepare Azure Resources for ASR

- Resource Requirements
- Demonstration: Prepare Azure Resources for ASR

Resource Requirements

- Recovery Vault
- Network(s)
- Storage Account
- Administrative Account

Demonstration: Prepare Azure Resources for ASR



Prepare Hyper-V Resources for ASR

Prepare Hyper-V Resources for ASR

- Components
- Resource Requirements
- Demonstration: Prepare a Hyper-V Server for ASR

Hyper-V ASR Components

Resource Requirements

- Hyper-V
 - + Networking
 - + NIC teaming only at the host level
 - + Guest IPv6 (not in SCVMM)
 - + Static IP – Windows only
 - + Guest OS storage
 - + No shared cluster disks, encrypted disks, or SMB 3.0 shares
- System Center Virtual Machine Manager (SCVMM)
 - + Host and SCVMM versions should match
 - + At least one cloud with at least one host group
 - + Prepare VMM for network mapping
- Virtual machines
 - + Gen 1 OS disk up to 2TB
 - + Gen 2 OS disk up to 300GB
 - + Data disk up to 4TB

Demonstration: Prepare a Hyper-V Server for ASR



Prepare VMWare Resources for ASR

Prepare VMWare Resources for ASR

- VMWare Components
- Resource Requirements
- Demonstration: Prepare VMWare Resources for ASR

VMWare/Physical ASR Components

Resource Requirements

- VMWare / On-prem
 - + On-premises servers
 - + Configuration
 - + Process
 - + Failback
 - + vCenter or vSphere 5.5 or later
 - + Service accounts
 - + VMWare – custom role with Datastore, Network, Resource, Task, and VM rights
 - + Hosts – account with permission to install mobility client (agent)
- Virtual machines
 - + Azure compatible OS
 - + OS disk must be basic, up to 2TB
 - + Data disk – up to 8TB when replicating to managed disk
 - + OS specific requirements

ASR Resource Preparation Take-aways

- On-premises
 - + VMWare
 - + Hyper-V
 - + SCVMM
 - + Physical
- Azure
 - + Site recovery vault
 - + Networking

Demonstration: Prepare VMWare Resources for ASR



Configure ASR Replication

Configure ASR Replication

- Demonstration



Site Recovery Failover and Failback

Site Recovery Failover and Failback

- **Failover Options**
- **Failover Checklist**
- **Demonstration: Failover**

Azure Site Recovery Failover Options

- Automatic failover is not supported
- Data Center to Azure
- Data Center to Data Center – vCenter 5.5+ and SC-VMM
- Azure to Azure
- Recovery plans
- Failover drills
- Failback – supported for VMWare and SC-VMM

Azure Site Recovery Failover Checklist

- **Pre-failover**
 - + Configure network connectivity
 - + Site-to-site, ExpressRoute
 - + Vnet-to-Vnet, peering
 - + Test failover
 - + Create and test recovery plans
- **Post failover**
 - + Update IP addressing links as necessary (DNS)
 - + Test connectivity
 - + Server to server
 - + Client to server
 - + Test applications
 - + Implement SOPs with recovered servers
 - + Ensure protection of recovered servers

Demonstration: Failover

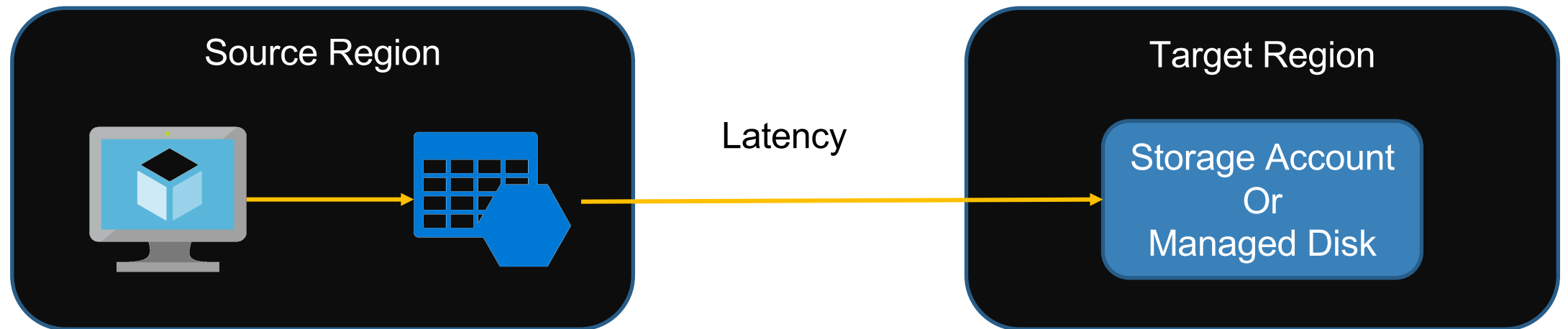


Site Recovery Geographic Considerations

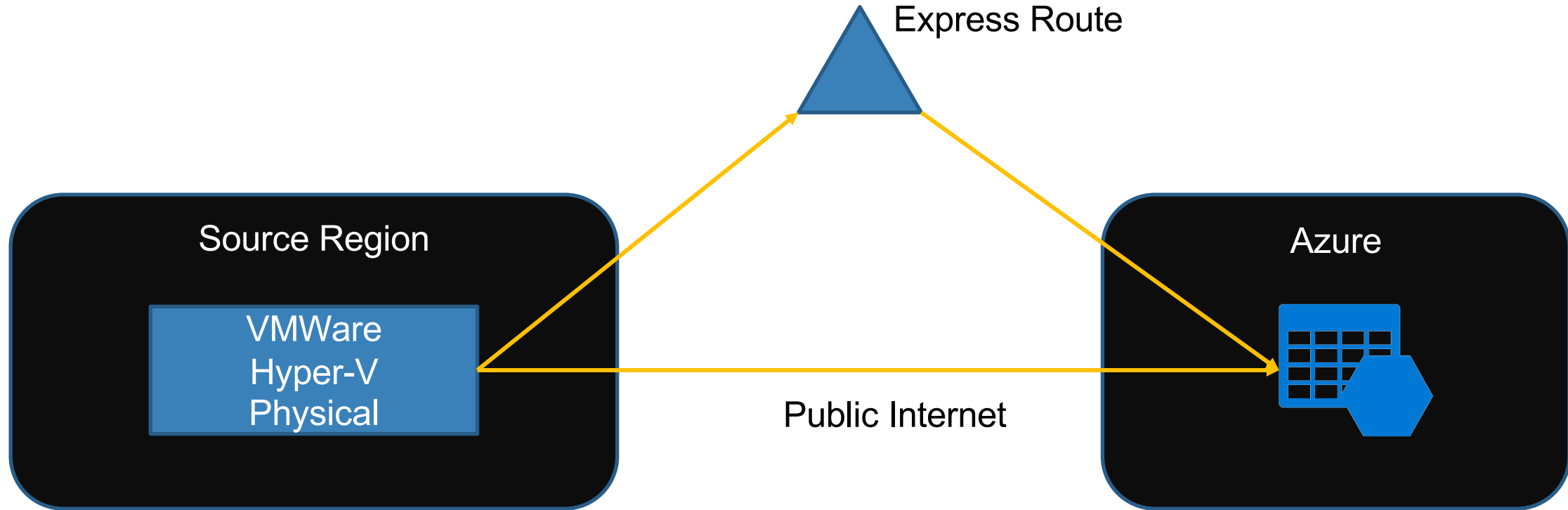
Site Recovery Geographic Considerations

- **Azure VM Protection**
- **Data Center Protection**

Geographic Considerations for Azure Virtual Machines with Site Recovery



Geographic Considerations for Data Center Protection with Site Recovery





Long Term Data Retention

Long Term Data Retention

- + Long Term Data Retention in Azure
- + **Demonstration:** Configure Long Term Retention for Azure Services

Long Term Data Retention in Azure

- + Azure SQL Database Backups
- + Azure Recovery Services Vault Back-up Retention
- + Storage Account Archive Tier



Data Archiving SLAs

Data Archiving SLAs

- **SQL Server Long Term Retention**
- **Storage Account SLAs**

SQL Server Long Term Retention Azure Storage SLAs

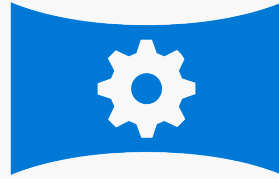
- + Availability – 99.9%
+ Configure daily, weekly, monthly, and yearly
- + Durability
+ Up to 10 years
- + LRS – 11.9s
+ Stored in Azure Storage Account
+ ZRS – 12.9s
- + Not currently available for managed instance
+ GRS – 16.9s



Geographic Data Storage in Azure

Data Geo-storage

- SQL Server
- Cosmos DB
- Storage Account



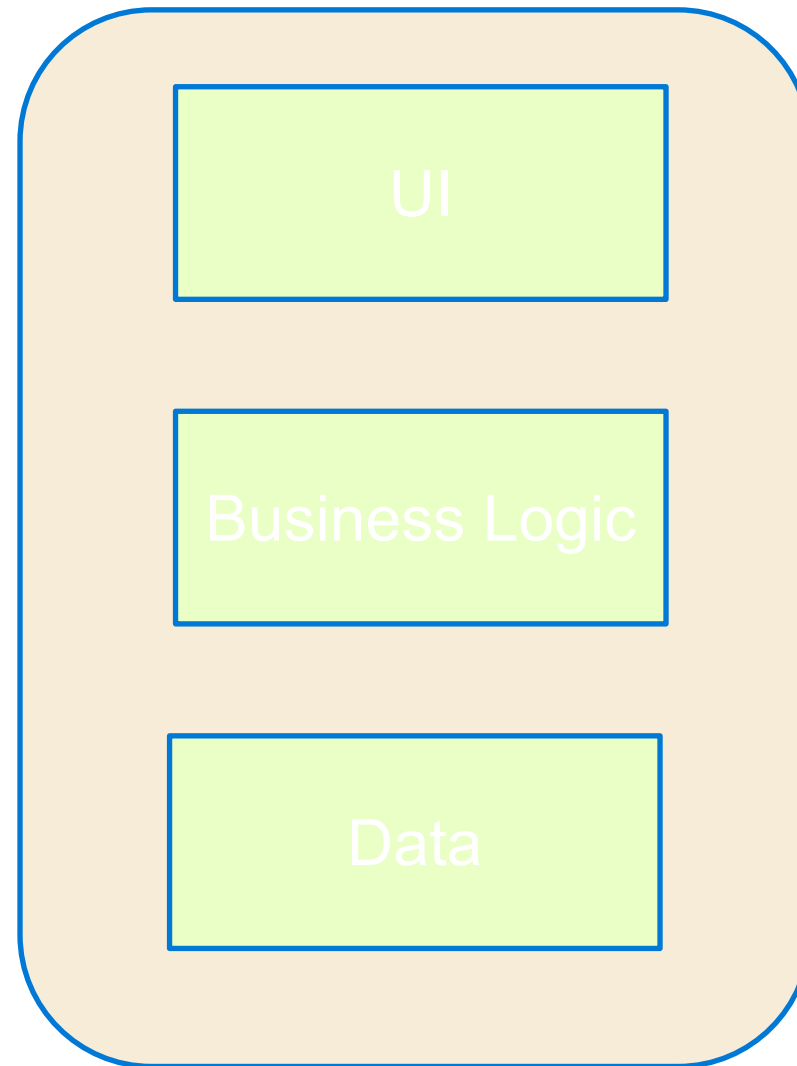
Application Architecture: Scalable Design



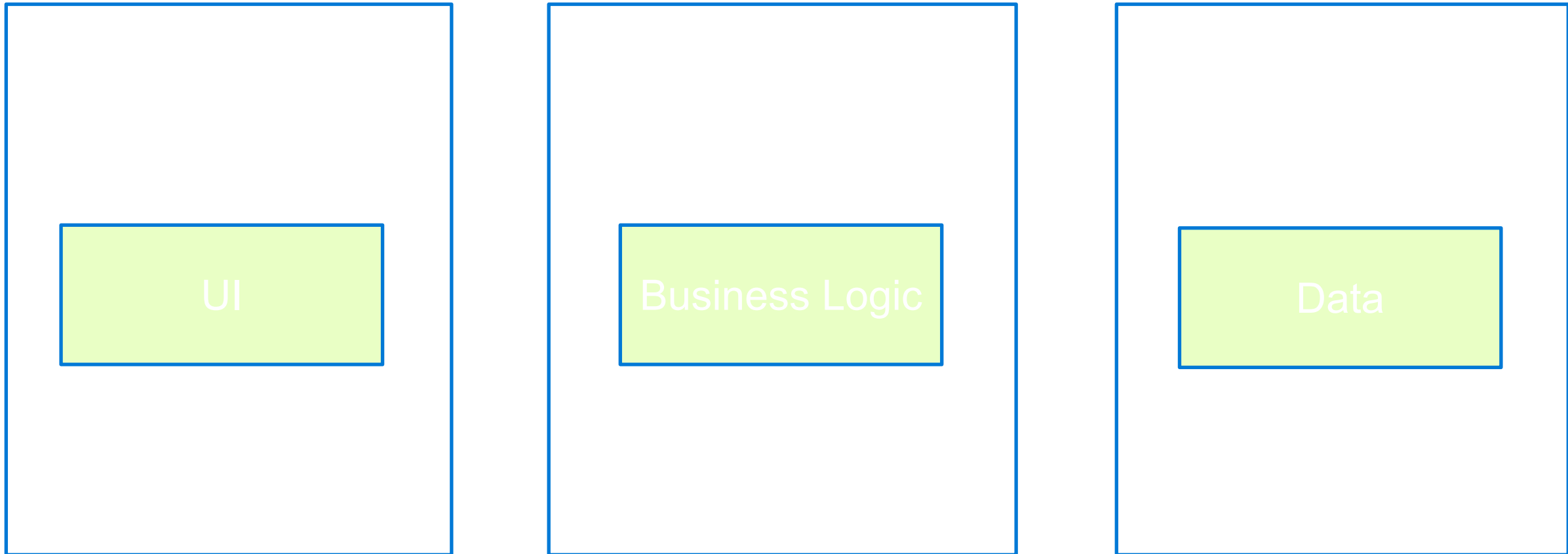
Application Architecture: Scalable Design

- ▶ From Monolithic to Micro-Services
- ▶ Scalable Application Considerations

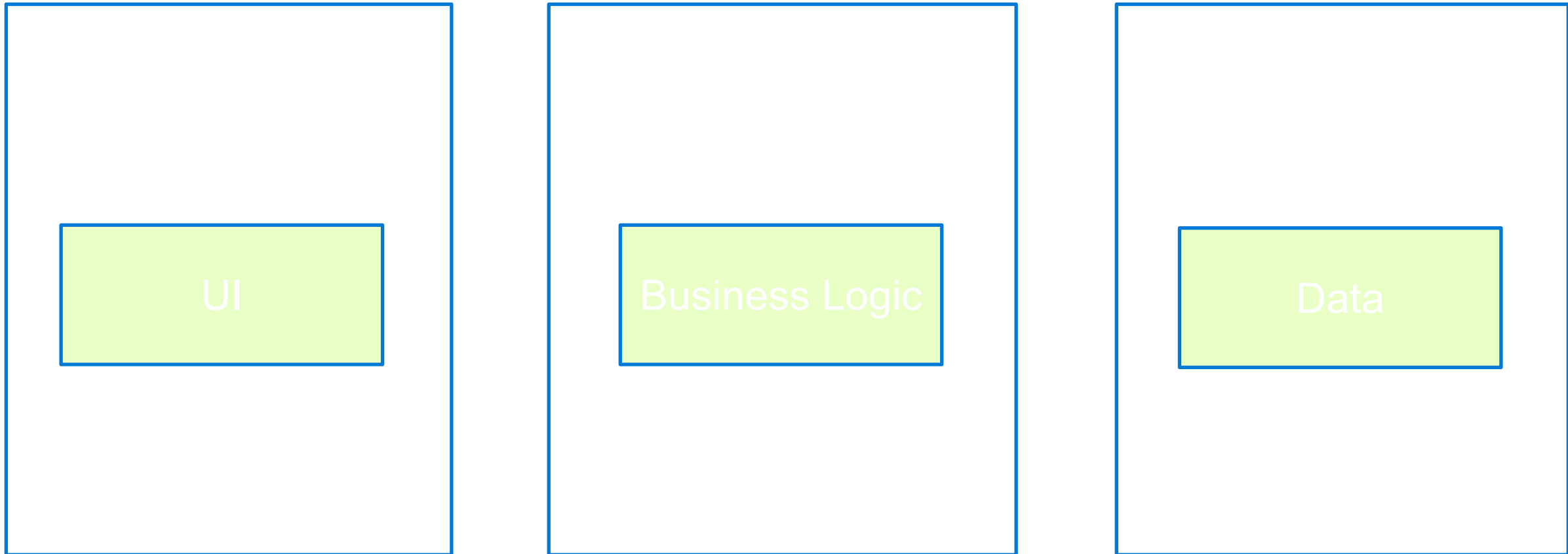
From Monolithic to Micro-Services



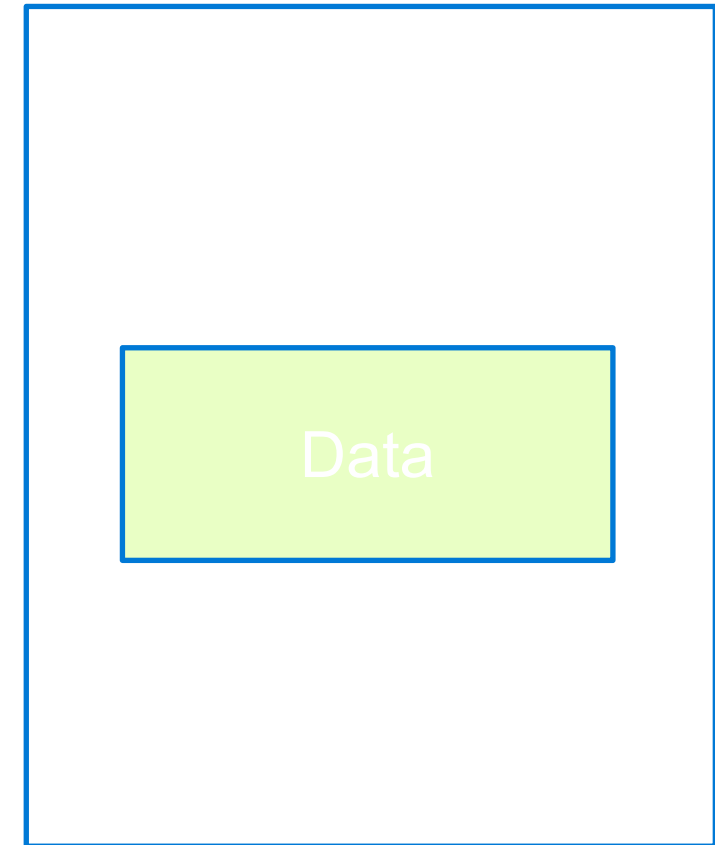
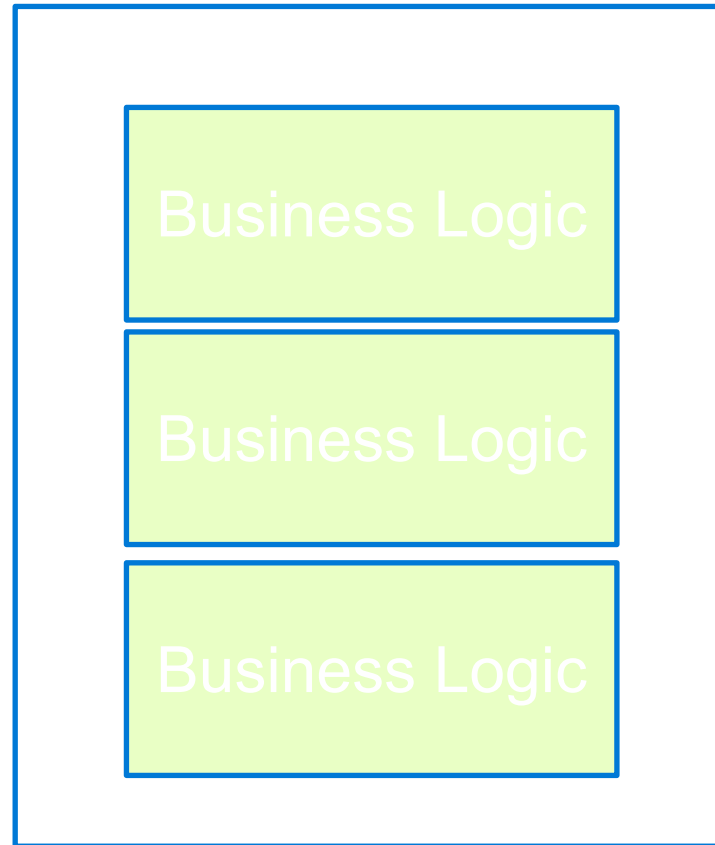
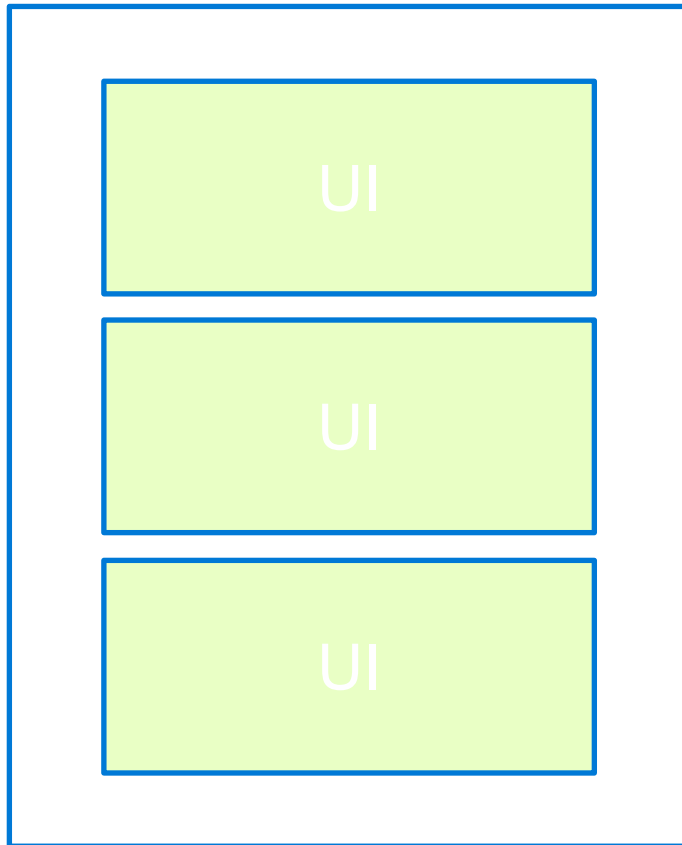
From Monolithic to Micro-Services



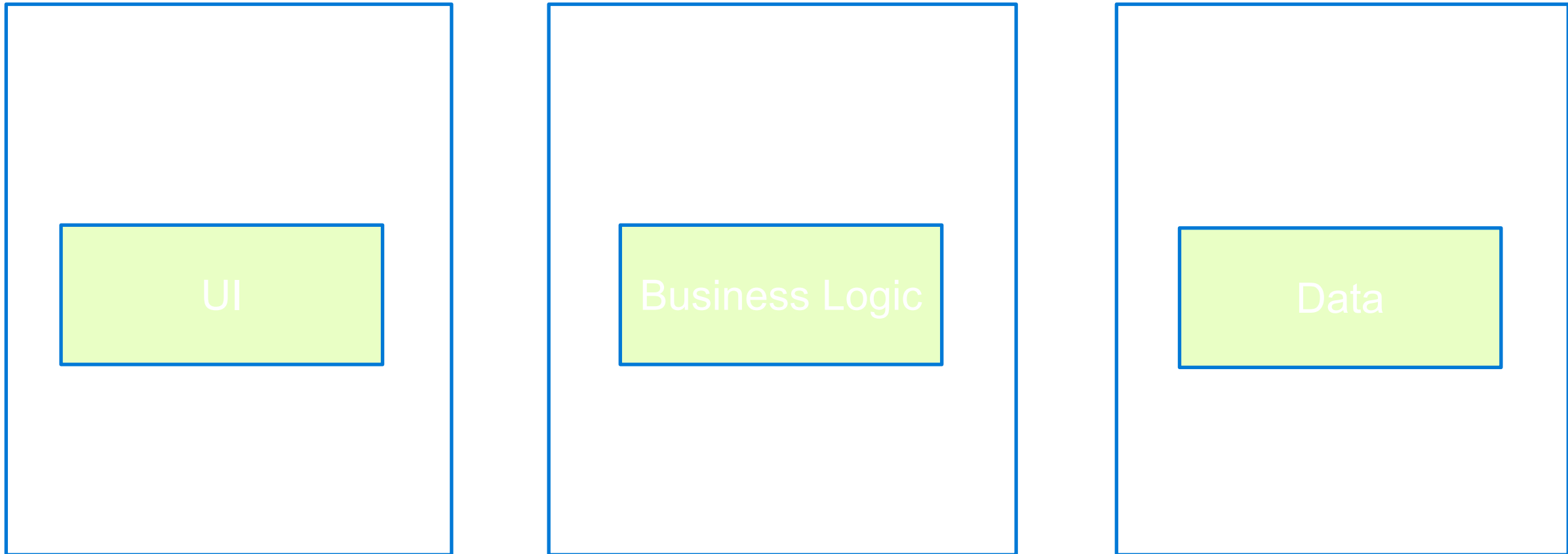
From Monolithic to Micro-Services



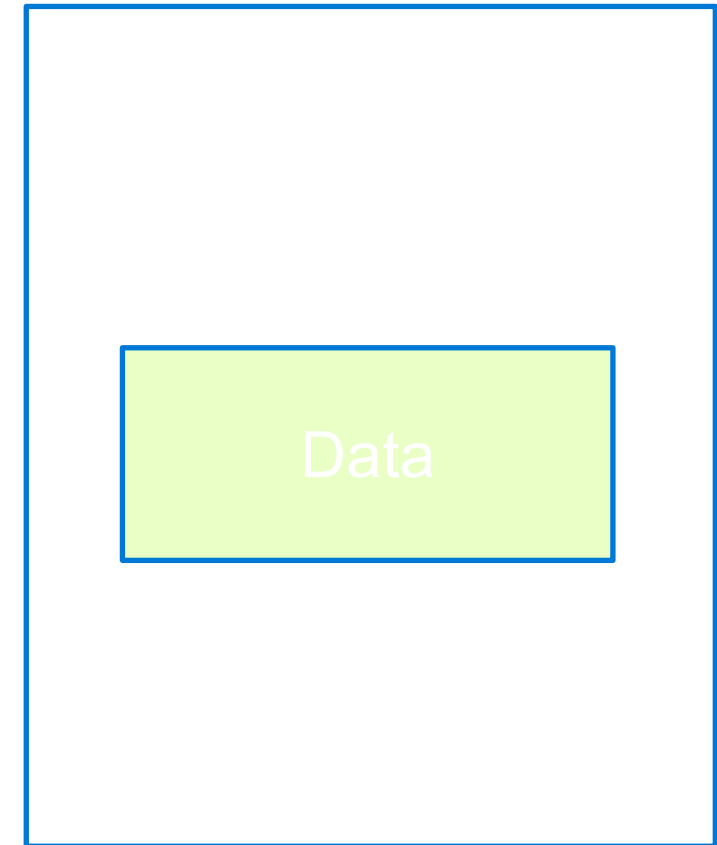
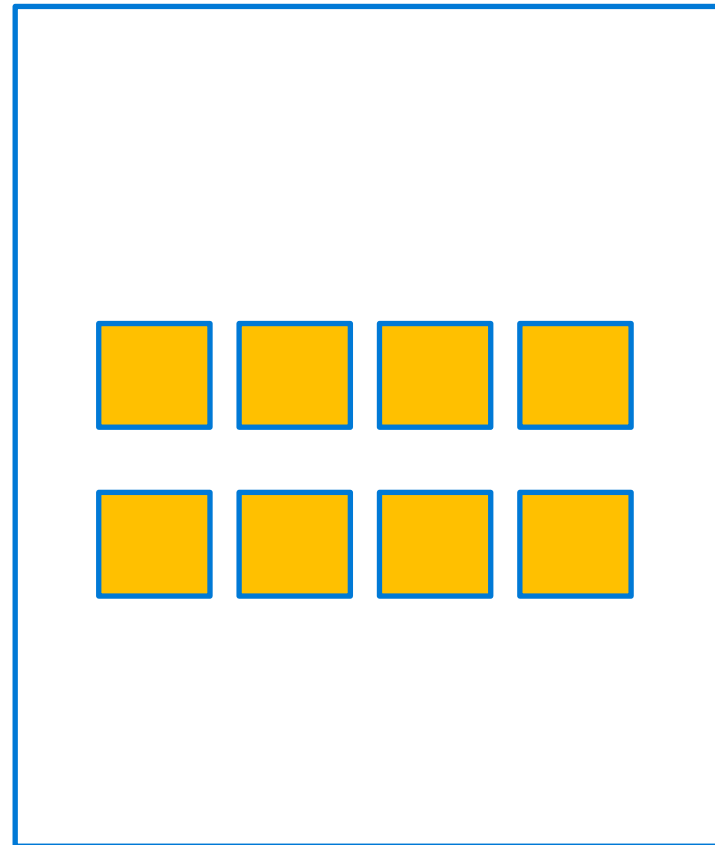
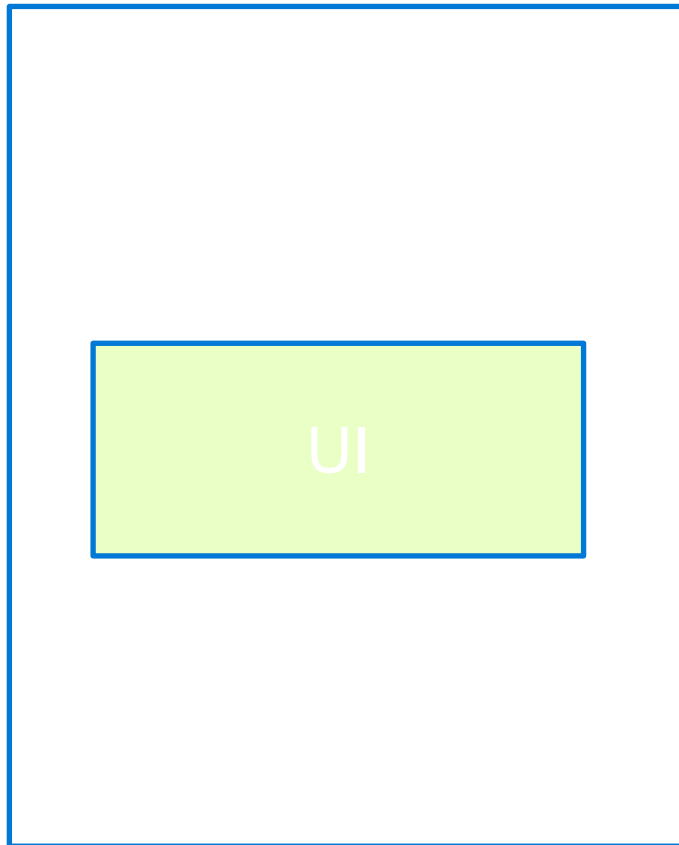
From Monolithic to Micro-Services



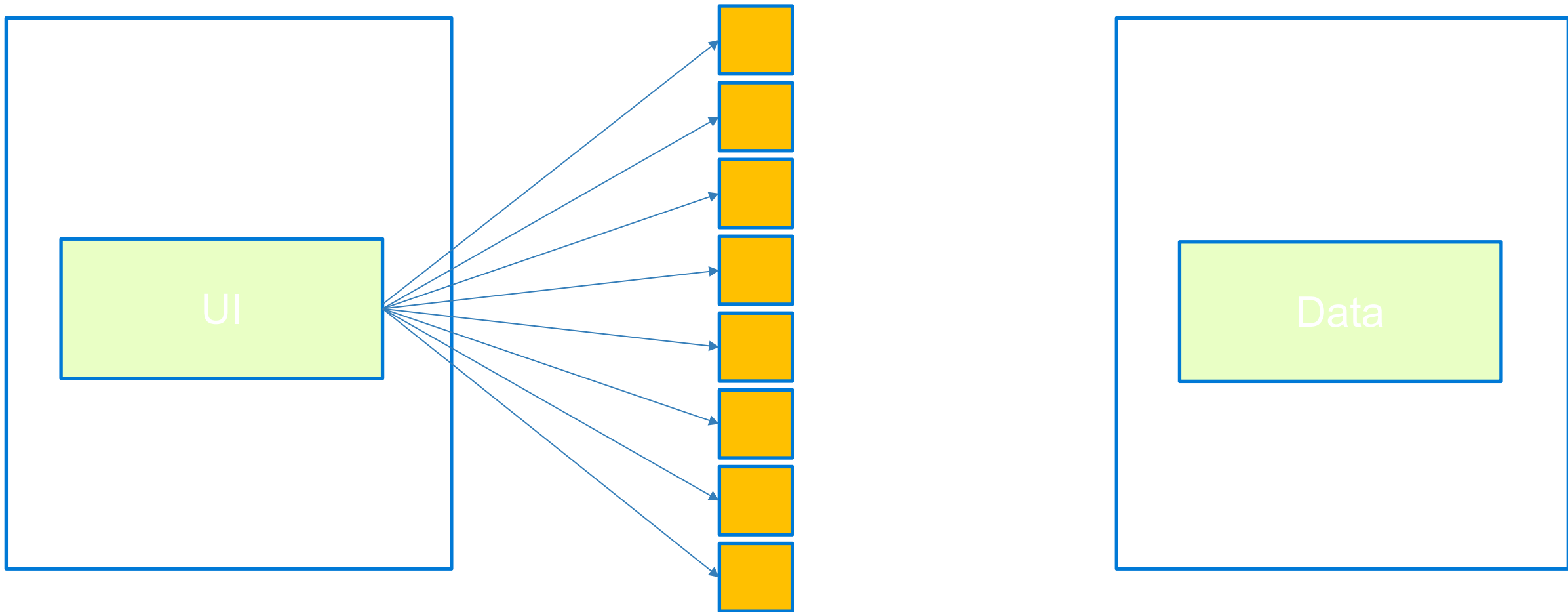
From Monolithic to Micro-Services



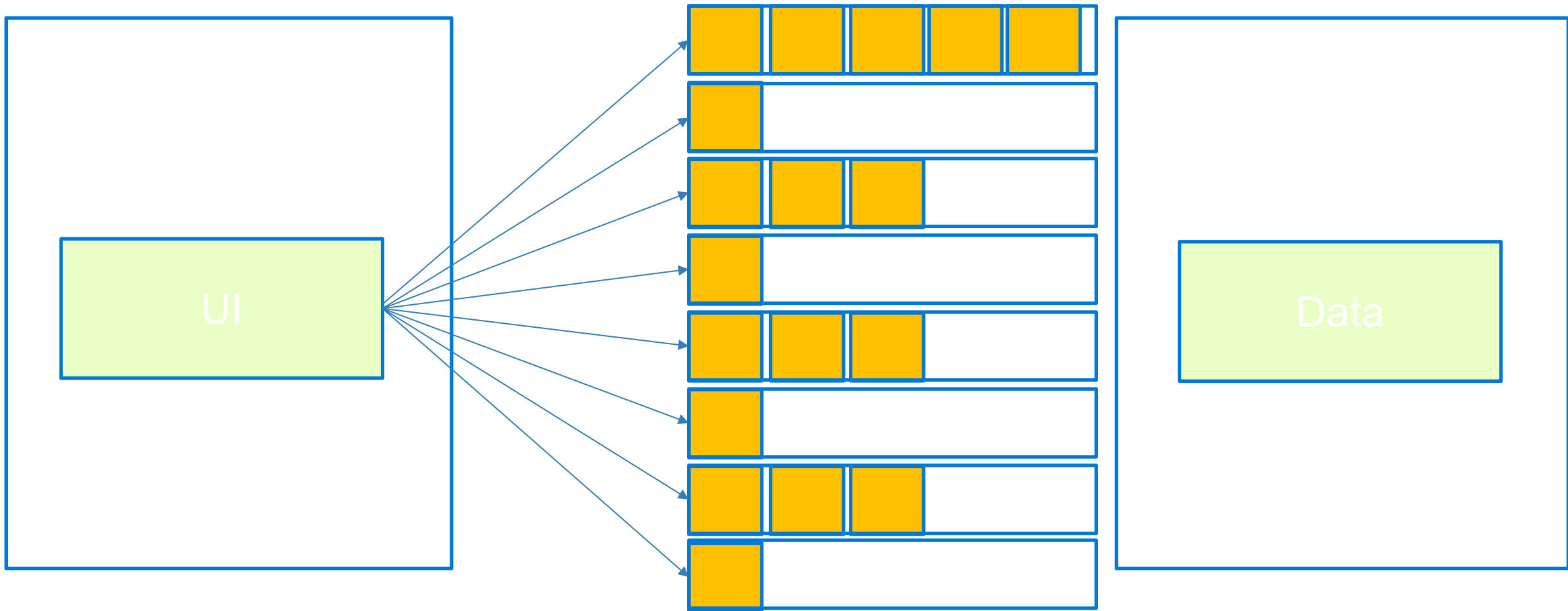
From Monolithic to Micro-Services



From Monolithic to Micro-Services

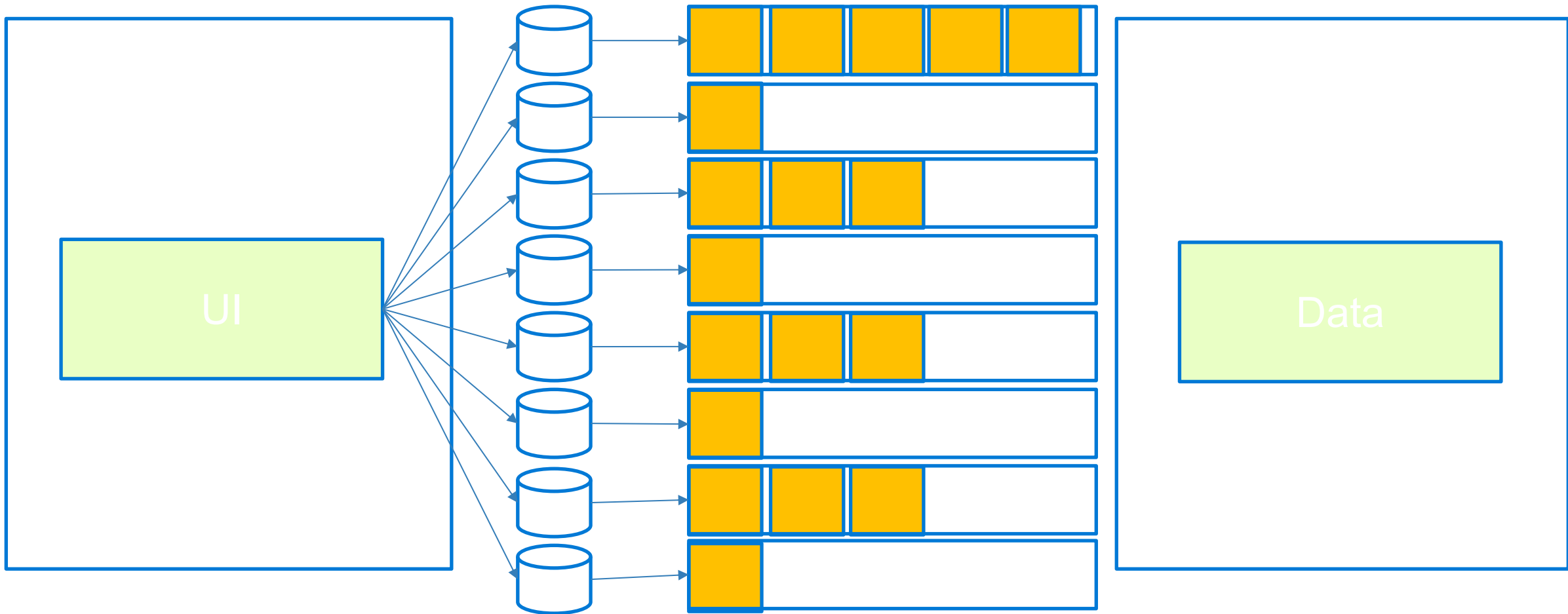


From Monolithic to Micro-Services



Azure Function Apps

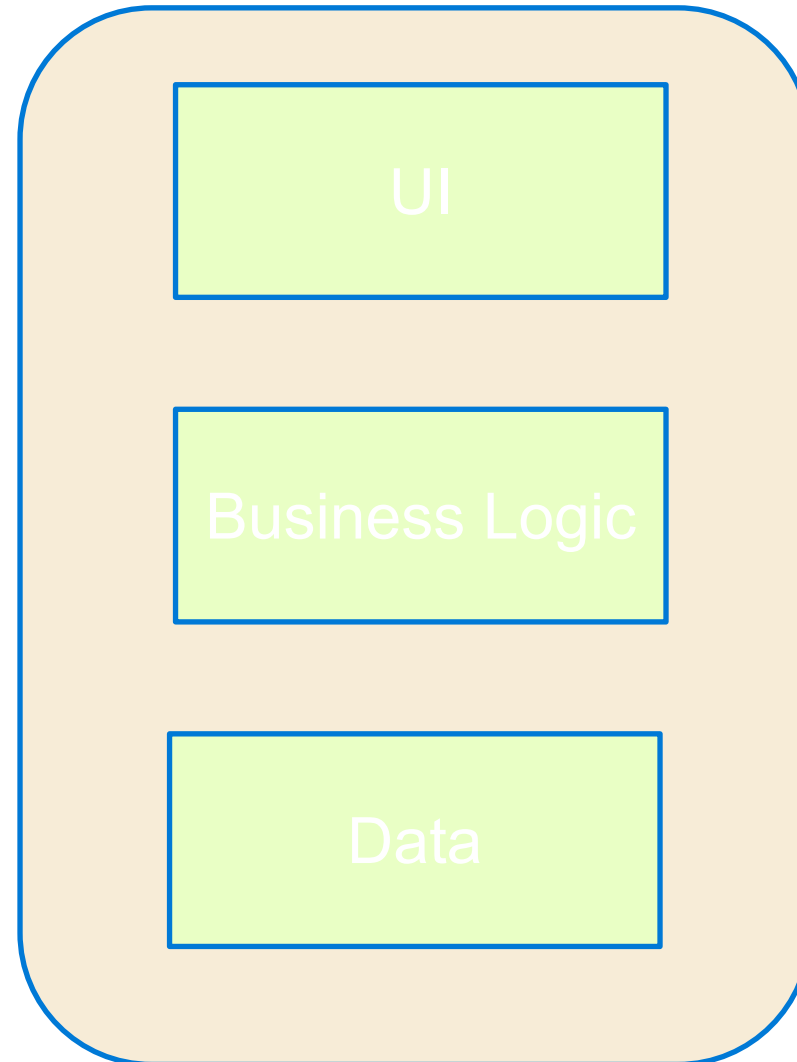
From Monolithic to Micro-Services



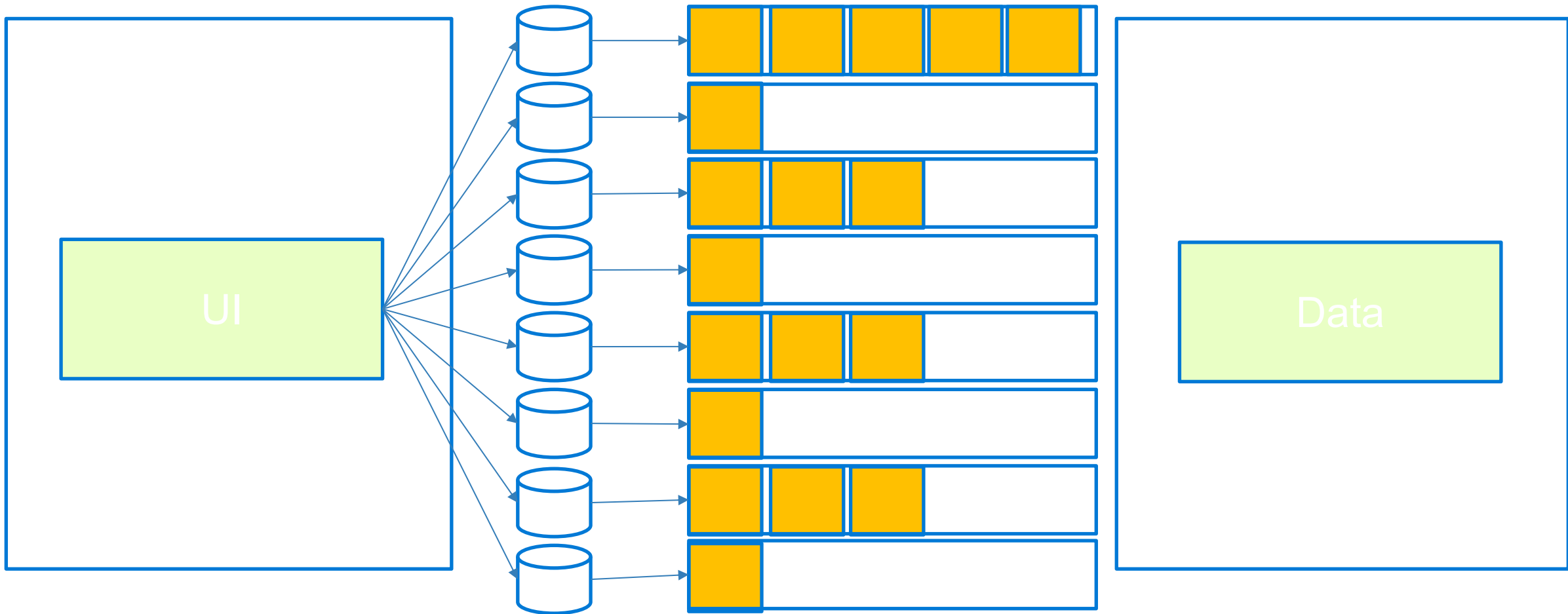
Scalable Application Considerations

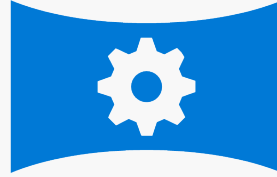
- ▶ Abstract the work engine and the host environment
 - ▶ Dependency injection
 - ▶ Test driven development
 - ▶ Maximum flexibility
- ▶ Microservices
 - ▶ Deployment
 - ▶ Performance and scale
- ▶ Design considerations
 - ▶ Complexity
 - ▶ Communication
 - ▶ CI/CD pipeline

From Monolithic to Micro-Services



From Monolithic to Micro-Services





Develop for Autoscaling



Develop for Autoscaling

- ▶ State Data
- ▶ Session Affinity
- ▶ Autoscale Rules

Develop for Autoscaling

- ▶ State Data
- ▶ Session Affinity

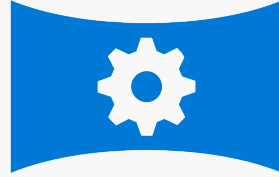
Autoscale Rules

▷ Scale triggers

- ▶ Performance
- ▶ External
- ▶ Scheduled

▷ Scale timing

- ▶ Autoscale is not instant
- ▶ Different hosting platforms provide different scale latency
 - ▶ VMSS
 - ▶ Web App
 - ▶ Azure Kubernetes Service



Application Architecture: Scaling a Web App



Application Architecture: Scaling a Web App

▶ Demonstration: Scale a Web App



Application Architecture: Scalable Services



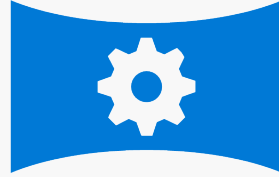
Application Architecture: Scalable Services

- ▶ Competing Consumer Pattern
- ▶ Function Apps
- ▶ Demonstration: Implement a Function App

Competing Consumer Pattern

Function Apps

- ▷ Azure serverless compute
 - ▶ Consumption-based pricing
 - ▶ Scaled by Azure
- ▷ Simple singleton programming paradigm
 - ▶ Trigger
 - ▶ Inputs
 - ▶ Outputs
- ▷ Robust SDK
- ▷ Based on WebJob framework



Application Architecture: Transient State



Application Architecture: Transient State

- ▶ Transient Errors in Distributed Applications
- ▶ Demonstration: Handling Transient State in an Application

Applications
