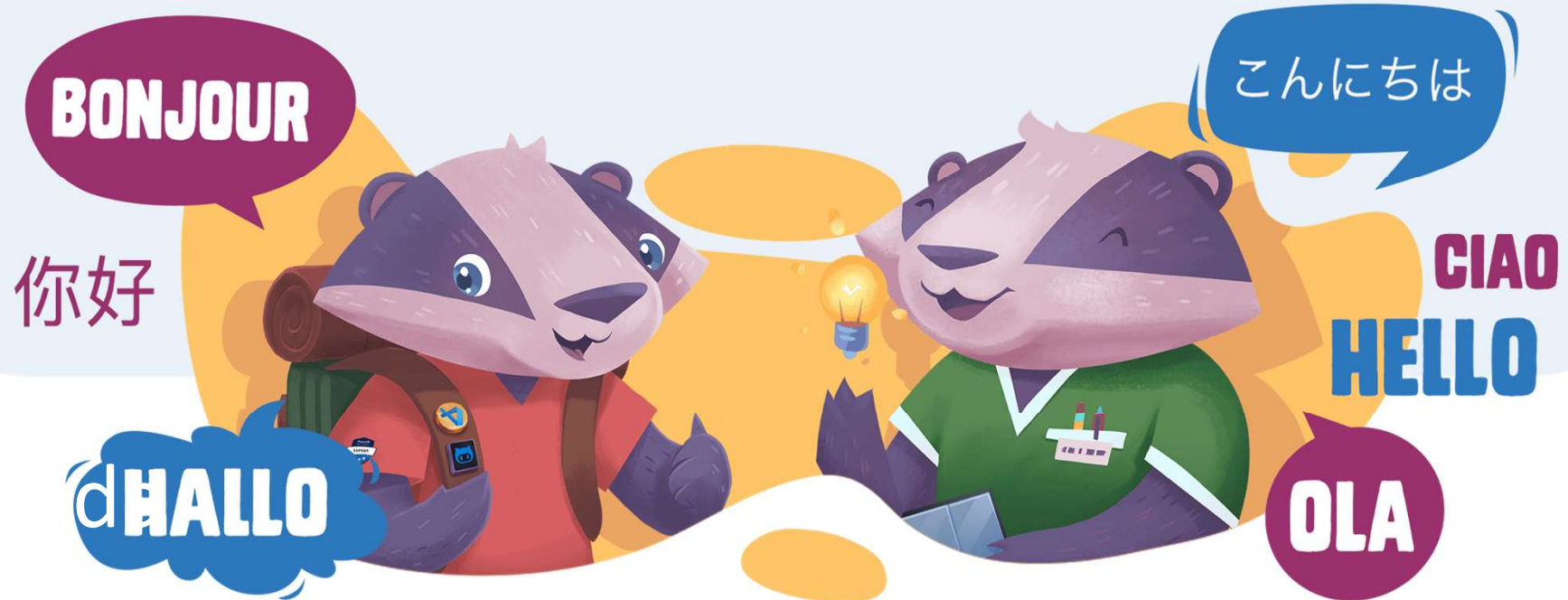




From Monolith to Serverless
On Azure

Vitor Paulino | @vmpaulino

Software Engineer @ Siemens TechHub



- The use case
- Monolithic
- Services
- Micro Services
- Serverless

Lenses and Cameras by



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Once upon a time ...



Mylt Backoffice

Mylt Backoffice gives you a powerful, patterns-based way to execute your work enables a clean separation of concerns and gives you full control over markup for enjoyable, agile development.

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Business Management

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Monolithic



Drive the change

- Fast Developments
- Easy deployments
- Small Infrastructure
- Traceability
- Operability

- Maintainability
- Testability
- Reliability
- Availability
- Portability
- Scalability
- Reusability
- Efficiency
- Durability
- Fault tolerance



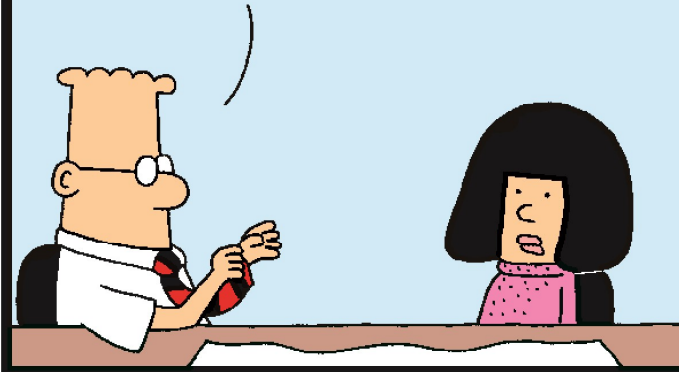
EXTREME PROGRAMMING

I CAN'T GIVE YOU
ALL OF THESE
FEATURES IN THE
FIRST VERSION.



www.dilbert.com scottadams@aol.com

AND EACH FEATURE
NEEDS TO HAVE
WHAT WE CALL A
"USER STORY."

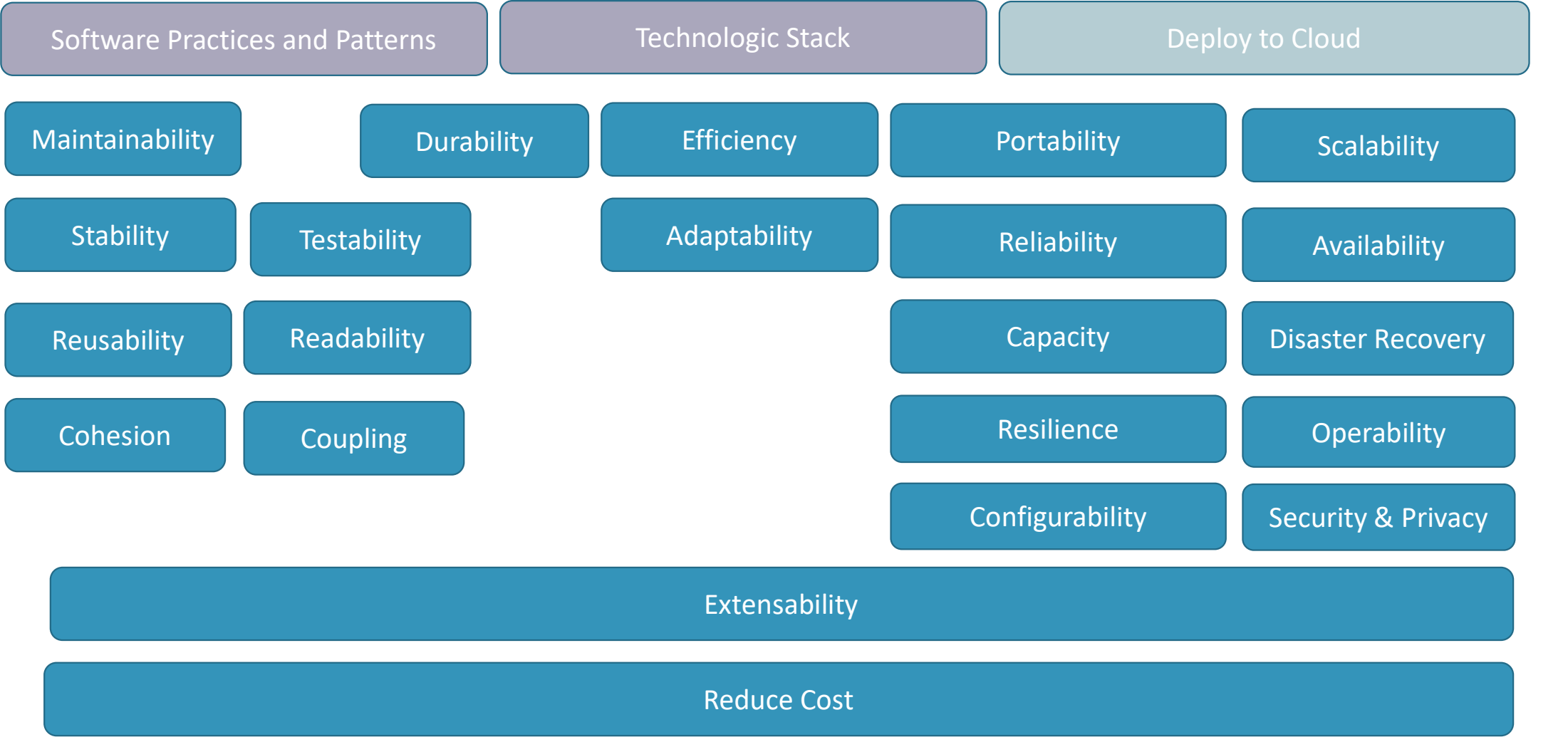


1/10/03 © 2002 United Feature Syndicate, Inc.

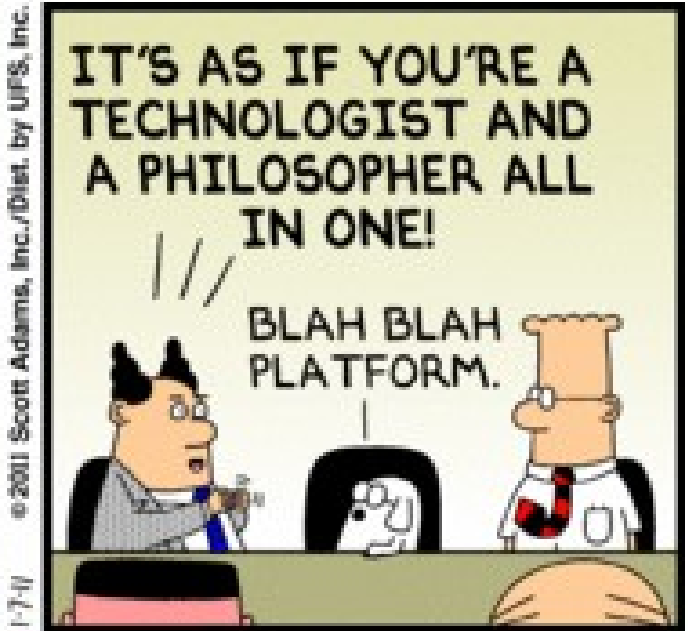
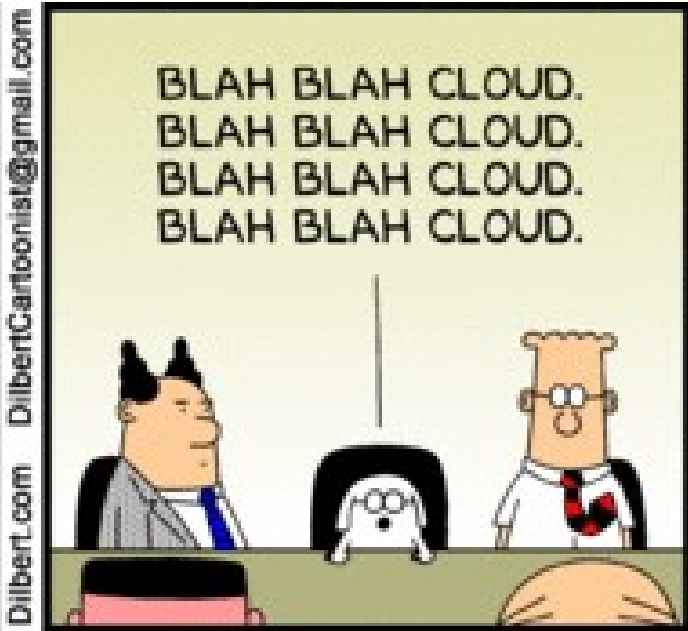
OKAY, HERE'S A
STORY: YOU GIVE
ME ALL OF MY
FEATURES OR I'LL
RUIN YOUR LIFE.



Drive the change



The path to change



The path to change

From monolithic to serverless

IaaS


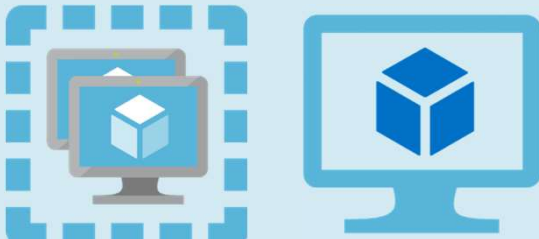


Diagram illustrating Infrastructure as a Service (IaaS). It shows a stack of monitors with a cube on the top one, and a single monitor with a cube on its screen. Below the monitors are the Windows logo, the Microsoft .NET logo, and the Linux penguin logo.

PaaS

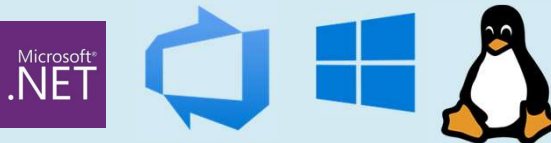
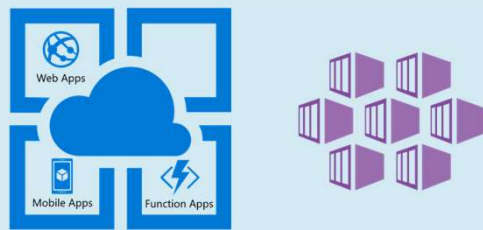


Diagram illustrating Platform as a Service (PaaS). It shows a cloud icon with 'Web Apps', 'Mobile Apps', and 'Function Apps' labels, and a stack of purple cubes. Below the cloud are the Microsoft .NET logo, the Azure logo, the Windows logo, and the Linux penguin logo.

PaaS

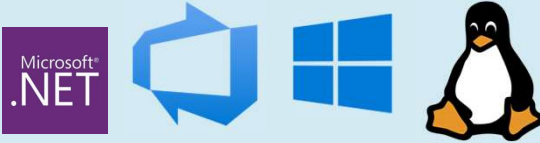
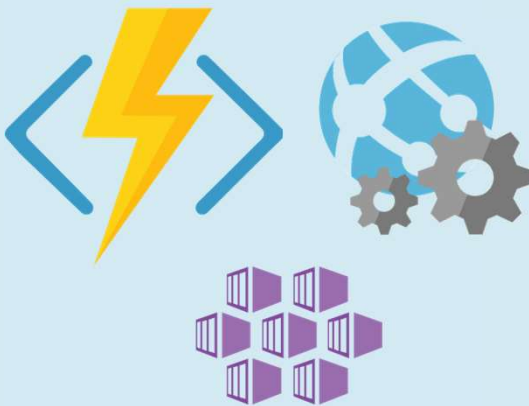
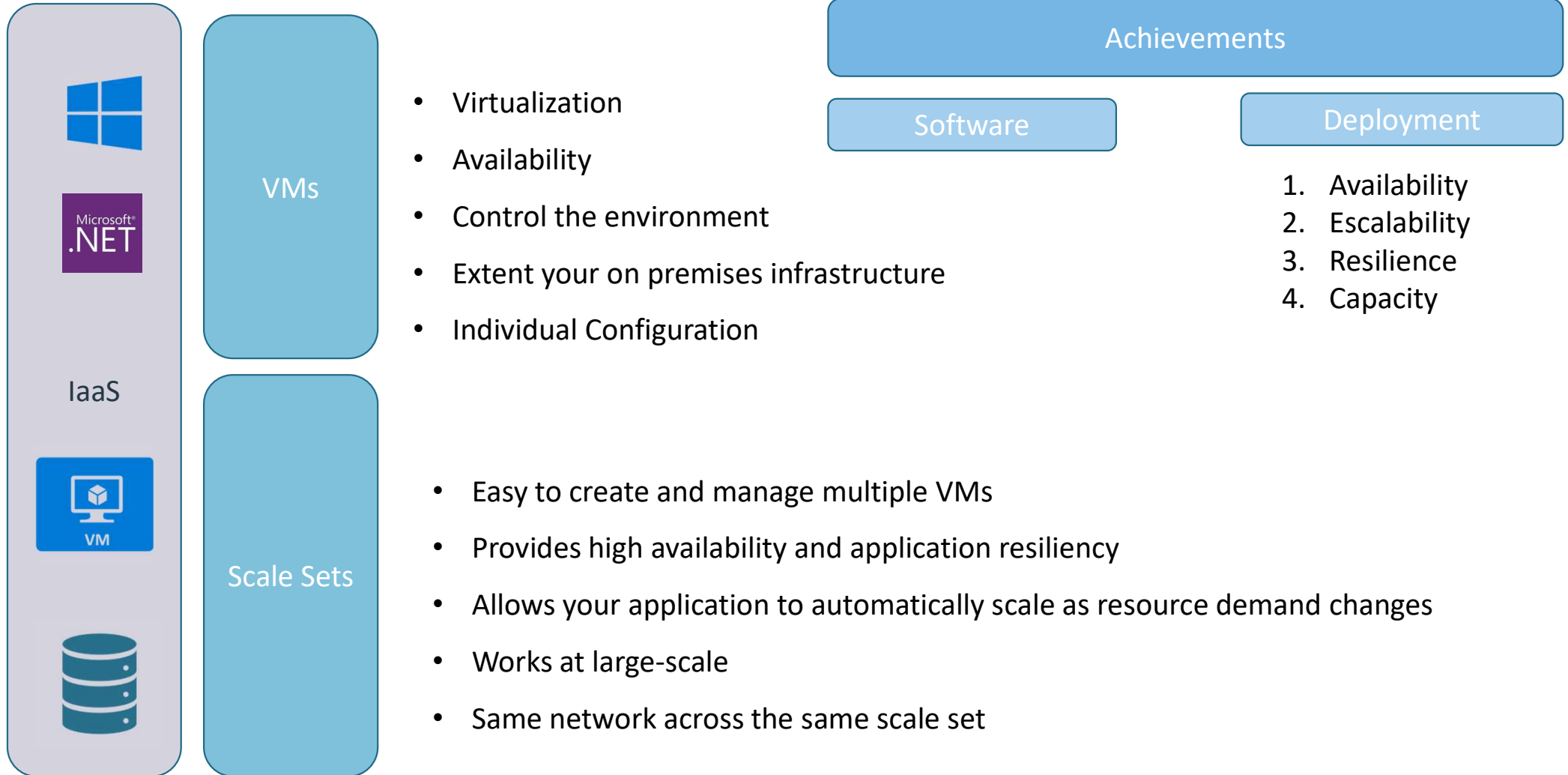
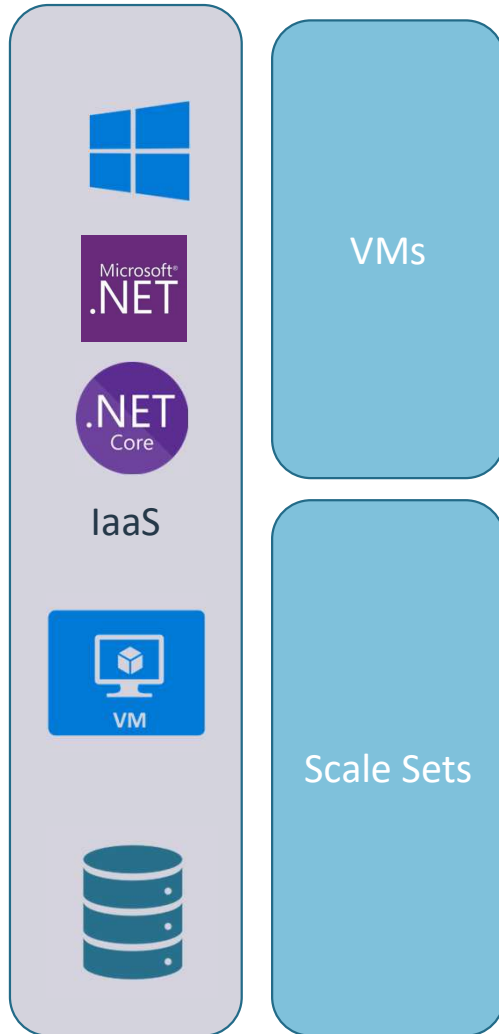


Diagram illustrating Platform as a Service (PaaS). It shows a lightning bolt icon, a globe with gears, and a stack of purple cubes. Below the lightning bolt are the Microsoft .NET logo, the Azure logo, the Windows logo, and the Linux penguin logo.





1. Create and Start VM (+ .Net framework)
2. Install IIS
3. Install Web Management Service
4. Install WebDeploy > 3.5
 1. turn off the Internet Enhances Security
5. Creating an inbound rules for VM in Azure portal
 1. Set public static IP to enable deploy
6. Publish

Custom Script Extension definition

1. Use Azure Cloud Shell
 1. *Install with Set-AzureVMExtension*
 2. Scripts on storage or github to run on VMs
 3. New-AzVmss
 4. Add-AzVmssExtension
 5. Update-AzVmss
2. Or use templates
 1. Json file describes the template
 2. Create a new deployment *az group deployment create*

Deploy Monolith to Azure
ReHost



Achievements

Software

Deployment

1. Traceability & Monitoring

- 1. Availability
- 2. Escalability
- 3. Resilience
- 4. Capacity

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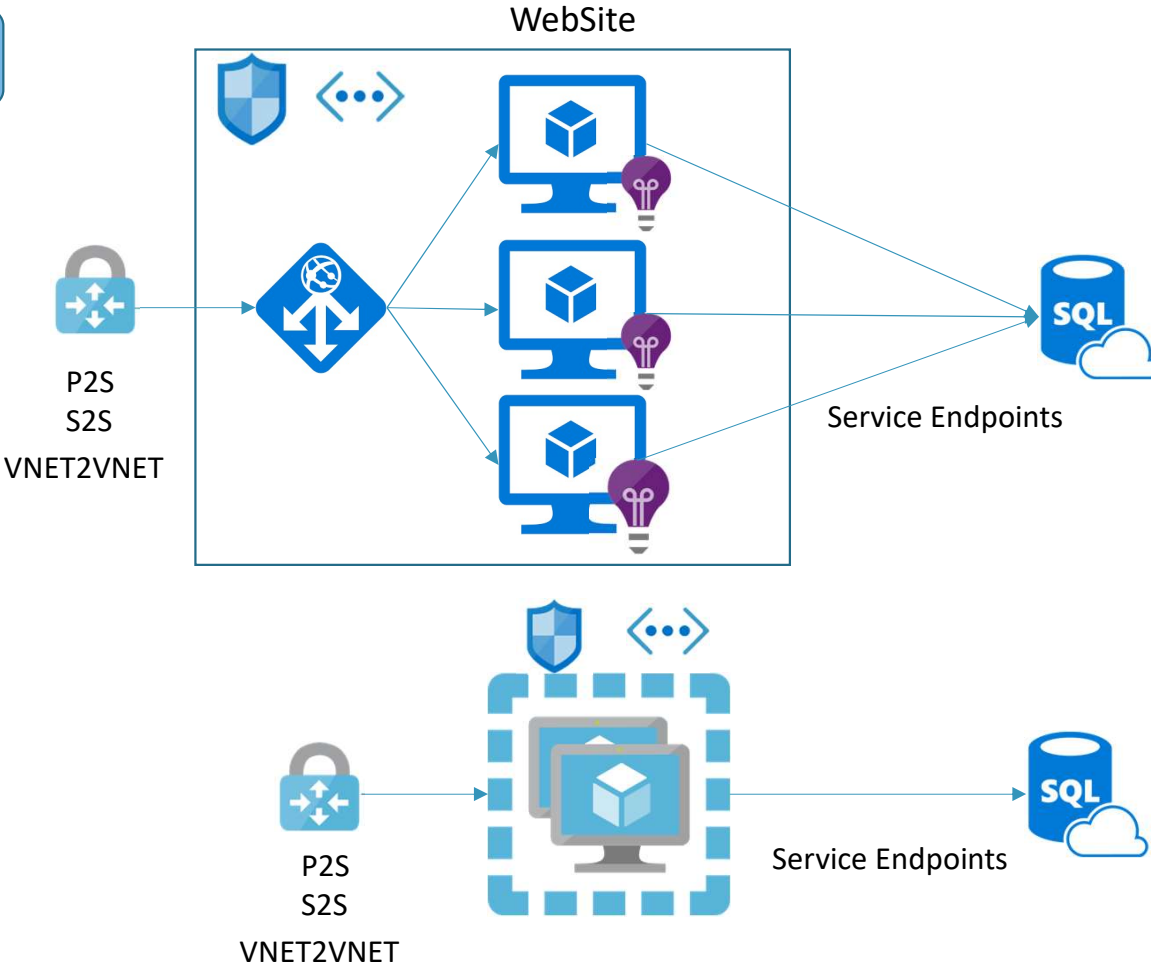
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Take the next step





PaaS



Web Apps

Azure
Services



Blob Storage



File Storage



Table Storage



Queue Storage



Achievements

Software

- 1. Cohesion
- 2. Decoupling
- 3. Maintainability
- 4. Stability
- 5. Reusability
- 6. Traceability & Monitoring

Deployment

- 1. Availability
- 2. Operability
- 3. Escalability
- 4. Resilience
- 5. Configurability
- 6. Capacity
- 7. Disaster Recovery
- 8. Reduce Cost
- 9. Disaster Recovery
- 10. Security & privacy
- 11. CI/CD

“Any organization that designs a system (defined more broadly here than just information systems) will inevitably produce a design whose structure is a copy of the organization's communication structure”

Stages of Design

1. Understanding of the boundaries, both on the design activity and on the system to be designed, placed by the sponsor and by the world's realities.
2. Achievement of a preliminary notion of the system's organization so that design task groups can be meaningfully assigned.



Achievements

Software

- 1. Cohesion
- 2. Decoupling
- 3. Maintanability
- 4. Escalability
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- 6. Tracelability & Monitoring

Deployment

- 1. Availability
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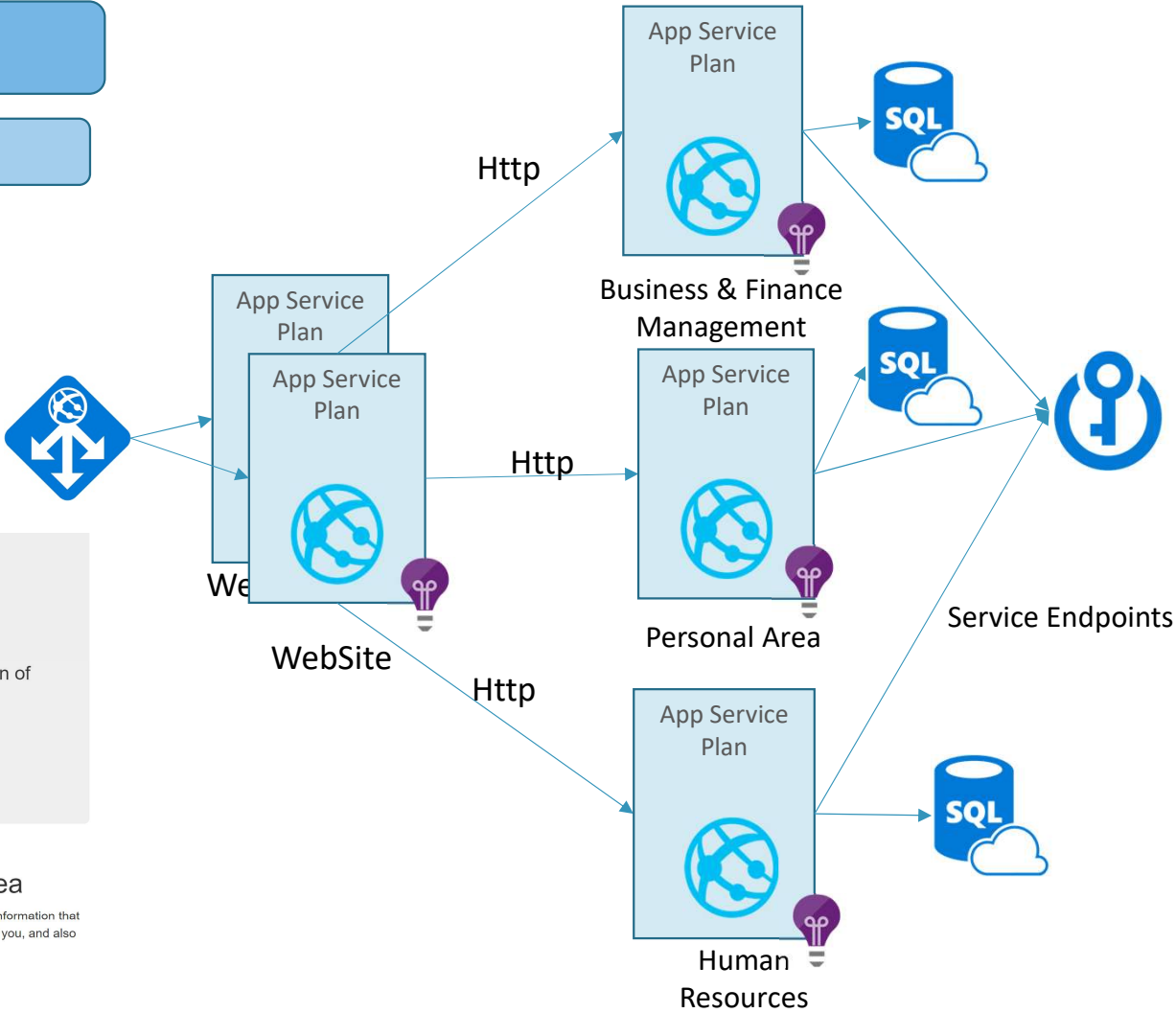
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Personal Area

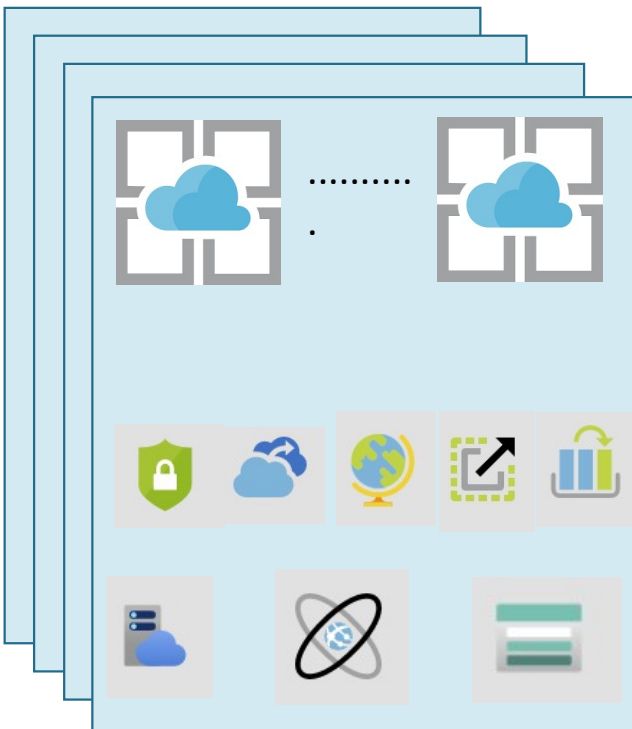
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Resource Group

Web app service plans



- Service Tiers
- Multiple languages and frameworks
- DevOps optimization
- Global scale with high availability
- Connections to SaaS platforms and on-premises data
- Application templates
- Security and compliance
- Visual Studio integration
- API and mobile features
- Serverless code

Resource Group

Sql Server as a Service (DSaaS)



- Language features - Control of flow language keywords, Cursors, Data types, DML statements, Predicates, Sequence numbers, Stored procedures, and Variables.
- Database features - Automatic tuning (plan forcing), Change tracking, Database collation, Contained databases, Contained users, Data compression, Database configuration settings, Online index operations, Partitioning, and Temporal tables (see getting started guide).
- Security features - Application roles, Dynamic data masking (see getting started guide), Row Level Security, and Threat detection - see getting started guides for single database and elastic pools and managed instance.
- Multi-model capabilities - Graph processing, JSON data (see getting started guide), OPENXML, Spatial, OPENJSON, and XML indexes.

From:

<https://docs.microsoft.com/en-us/azure/sql-database/sql-database-features>

Resource Group

Application Insights



- Request rates, response times, and failure rates
- Dependency rates, response times, and failure rates
- Exceptions
- Page views and load performance
- AJAX calls
- User and session counts.
- Performance counters
- Host diagnostics
- Diagnostic trace logs
- Custom events and metrics

Traffic Manager (DNS level)



1. DNS-based traffic load balancer
2. monitors the health of service endpoints.
3. Redirect Traffic based on Routing methods

Application Gateways (Layer 7)



1. Multiple-site hosting
2. routing decisions based on http requests
3. static VIP
4. Web application firewall
5. Ingress Controller

Load Balancing (Layer 4)



1. distributing load or incoming network traffic
2. outbound connections to Vnets
3. Support TCP and UDP

VPN Gateways (VPN Level)



1. VPN or Express Route
2. VMs that are deployed to a specific subnet
3. Support S2S connection
4. Support VNET 2 VNET connection
5. Support Point to Site Connection



Dilbert.com @ScottAdamsSays



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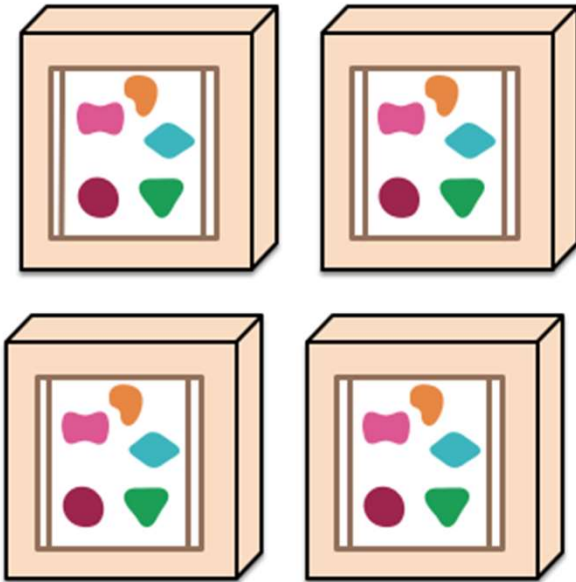


Microservices

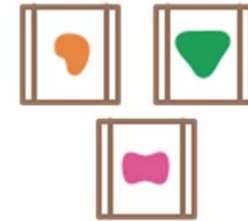
A monolithic application puts all its functionality into a single process...



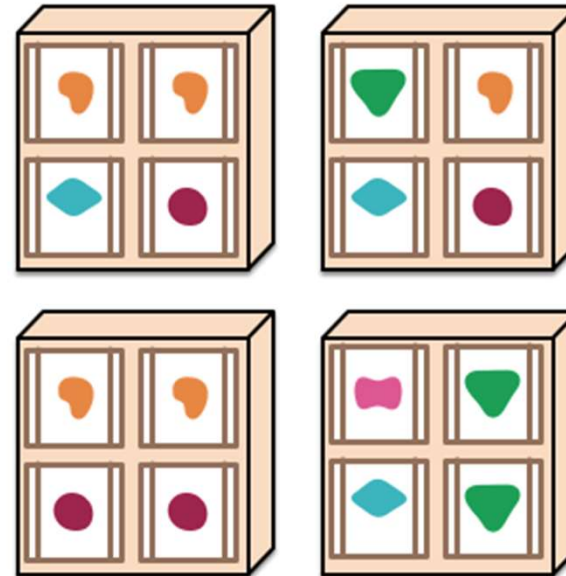
... and scales by replicating the monolith on multiple servers



A microservices architecture puts each element of functionality into a separate service...



... and scales by distributing these services across servers, replicating as needed.





Employee Area

This area is personalized for you. here you can find information that is only related to you

Learn more »

Management Area

This management area is the place to manage clients, projects and sales

Learn more »

Personal Info

Check here all the announcements that the company has for you

Enter here

Announcements

Check here all the announcements that the company has for you

Enter here

Activities

Check here all the activities and partnership that the company as available for you

Enter here

Timesheet

Manage your time in the projects that you participate. This will enable the company to better track our income

Enter here

Clients

Clients are the reason we exist. Our focus is to create and maintain our relationship with all clients daily.

Enter here

Projects

Our presence in the clients is made with projects. In this area you will be able to create and list all your projects that you create and access them to edit them

Enter here

Sales

Manage all your sales in this section. Its important to maintain a good relationship with your clients to keep seeing more projects

Learn more »

Financial Area

This Financial area is the place to manage the company incomes, expenses, Sales and Salaries

Learn more »

Generate All Reports



Ubiquitous Language



The Domain

Income

Press here to manage all your company income and to generate reports

Enter here

Generate Monthly Report

Expenses

Press here to view what are the company expenses and to generate reports

Enter here

Generate Monthly Report

Sales

Manage all your sales in this section. Its important to maintain a good relationship with your clients to keep seeing more projects

Enter here

Generate Monthly Report

Salaries

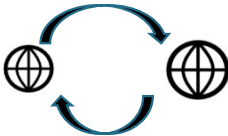
Manage all your company salaries in this section. Here we ca manage the diferent salary offers and deductions associated

Enter here

Generate Monthly Report

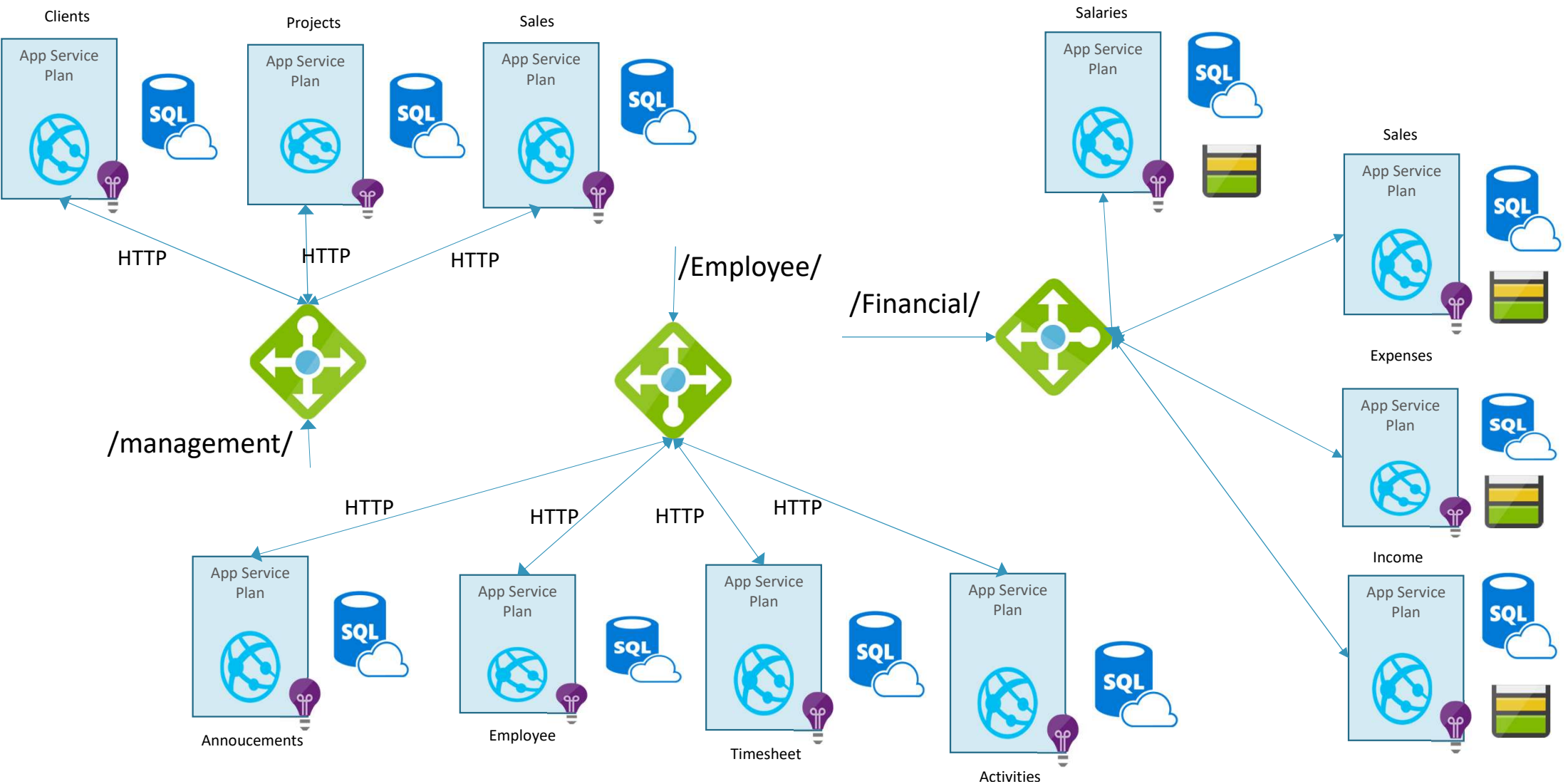


Bounded Context



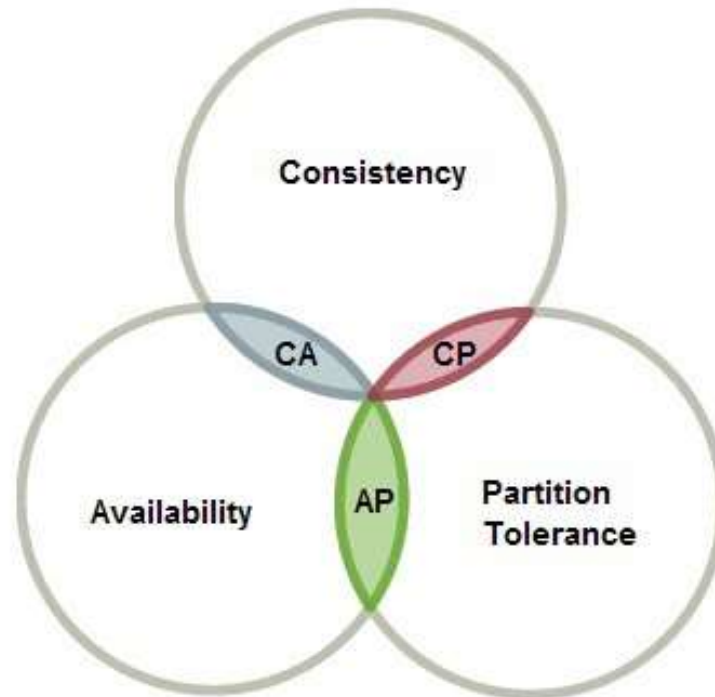
Eventual Consistency

Microservices
Domain Driven Design Approach



Every read receives the most recent write or an error

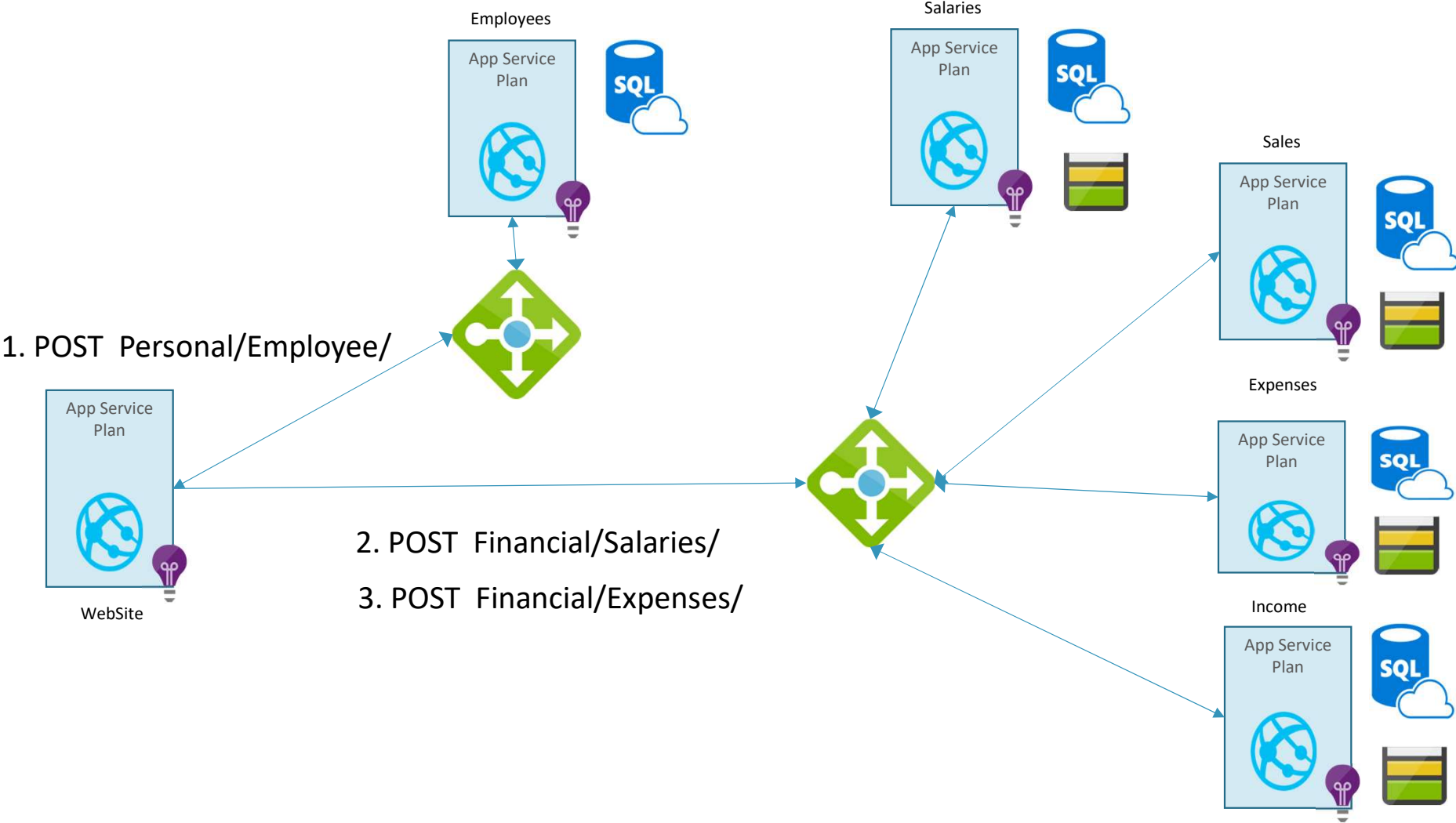
Every request receives a (non-error) response, without the guarantee that it contains the most recent write

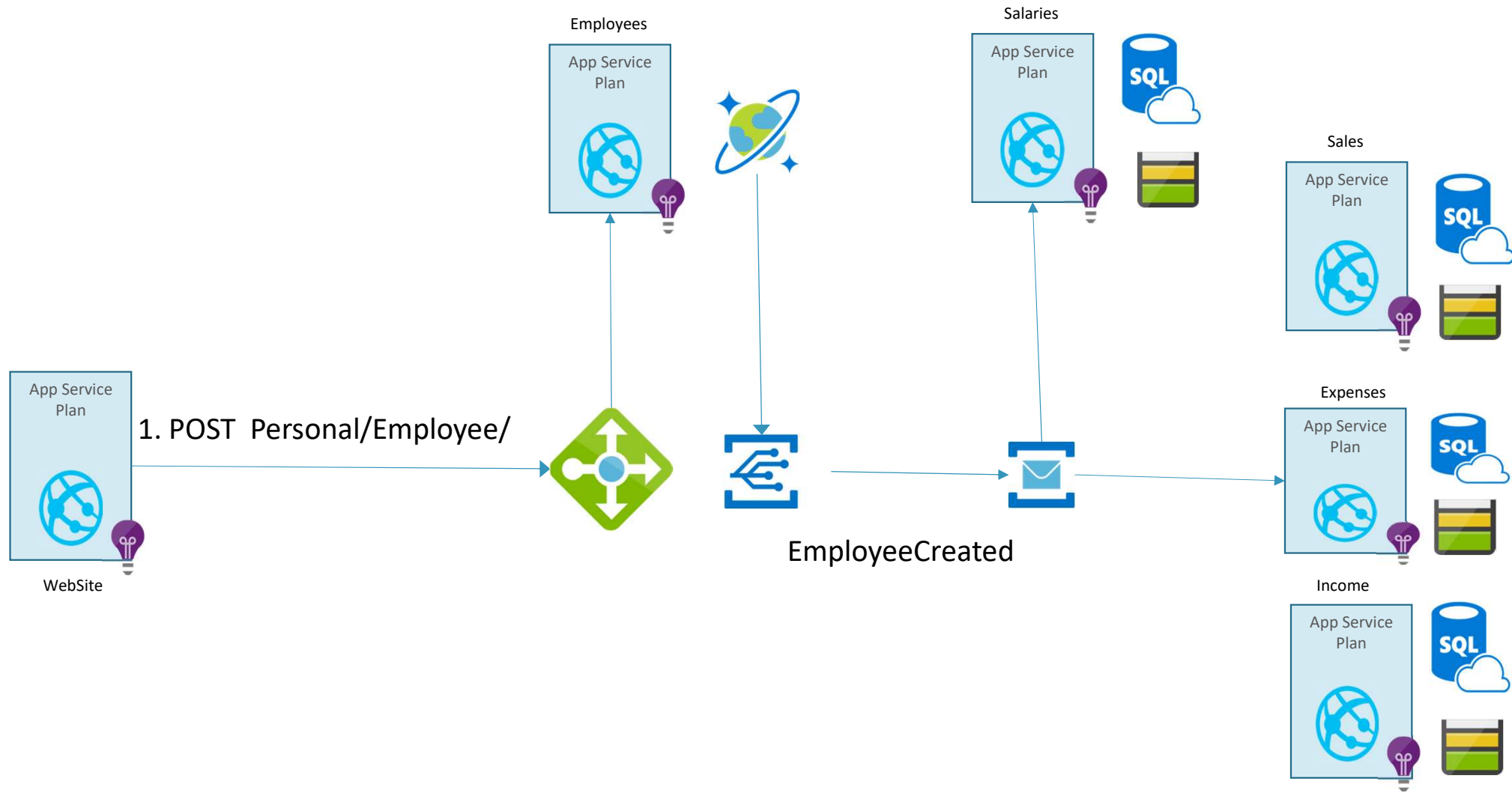


The system continues to operate despite an arbitrary number of messages being dropped (or delayed) by the network between nodes

We cannot have the three at the same time

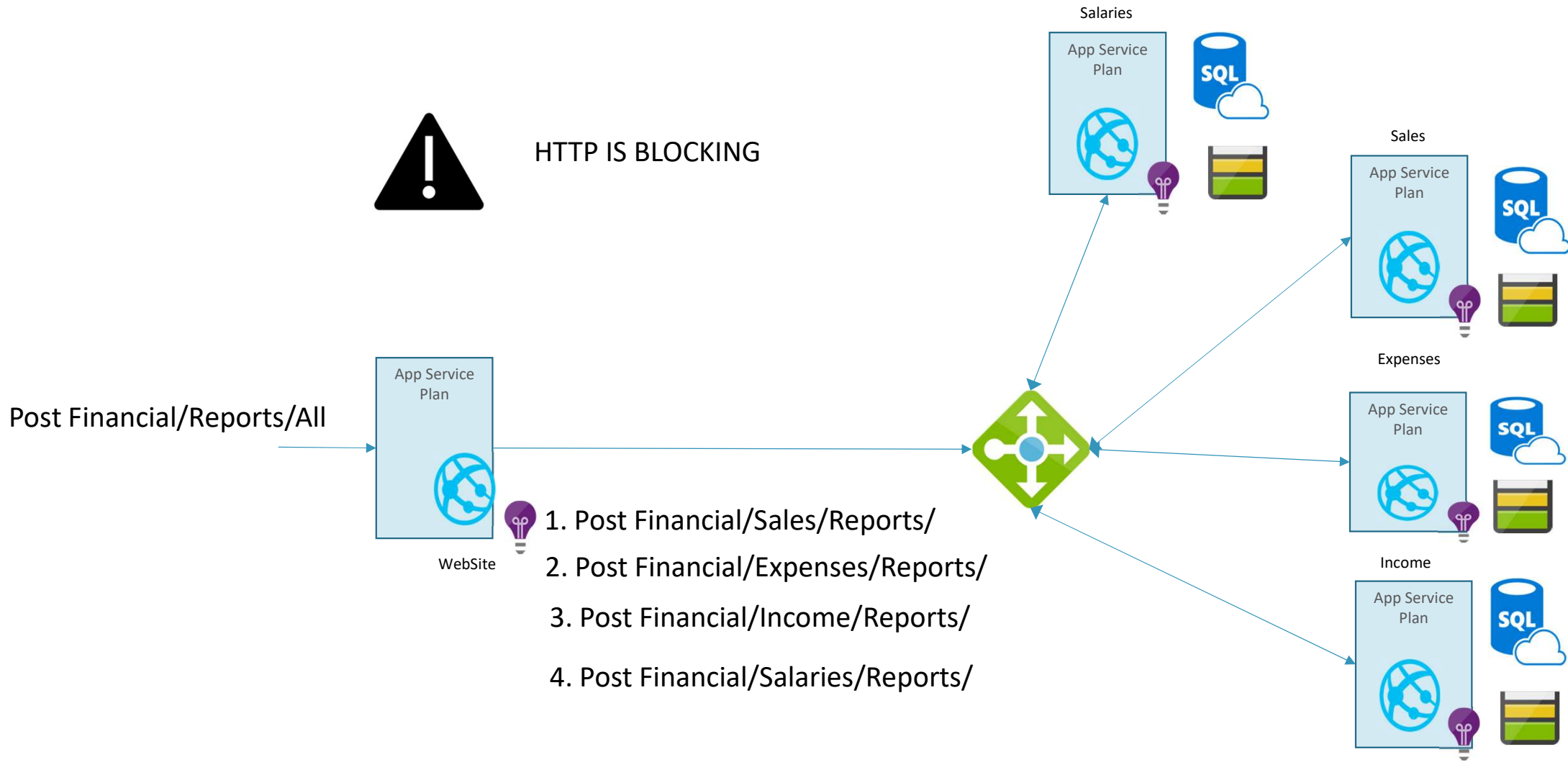
(<https://www.infoq.com/articles/cap-twelve-years-later-how-the-rules-have-changed/>)





Microservices & Serverless

Generate Reports



Azure Functions



1. flexible scaling based on your workload volume
2. short-lived and stateless
3. programming model based on triggers and bindings
4. End-to-end development experience



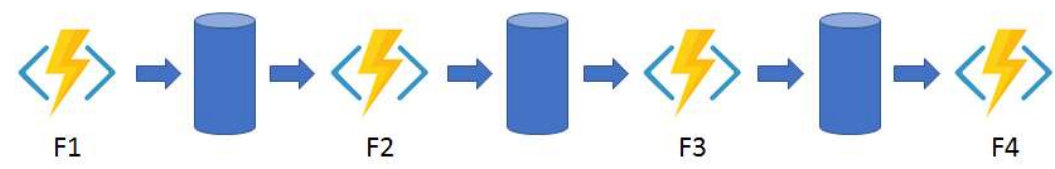
1. Automate workflows
2. Connect business with services
3. Integrate on-premises
4. No code experience

Web App WebJobs

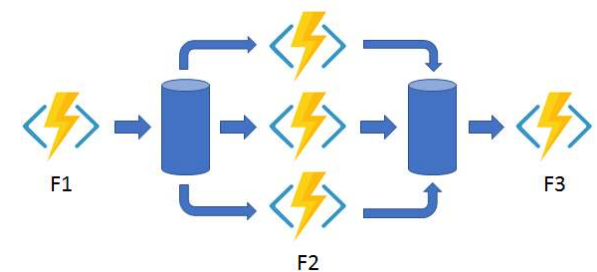


1. Run Background tasks in Web App Service
2. Support continuous or trigger mode

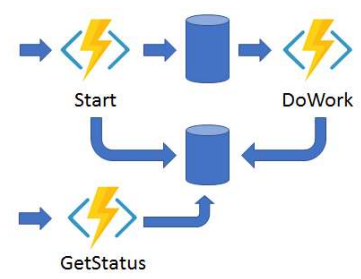
Function Chaining



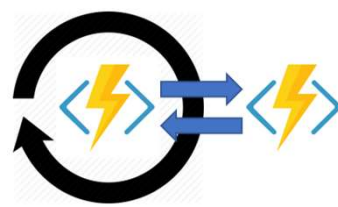
Fan out/fan in



Async HTTP APIs



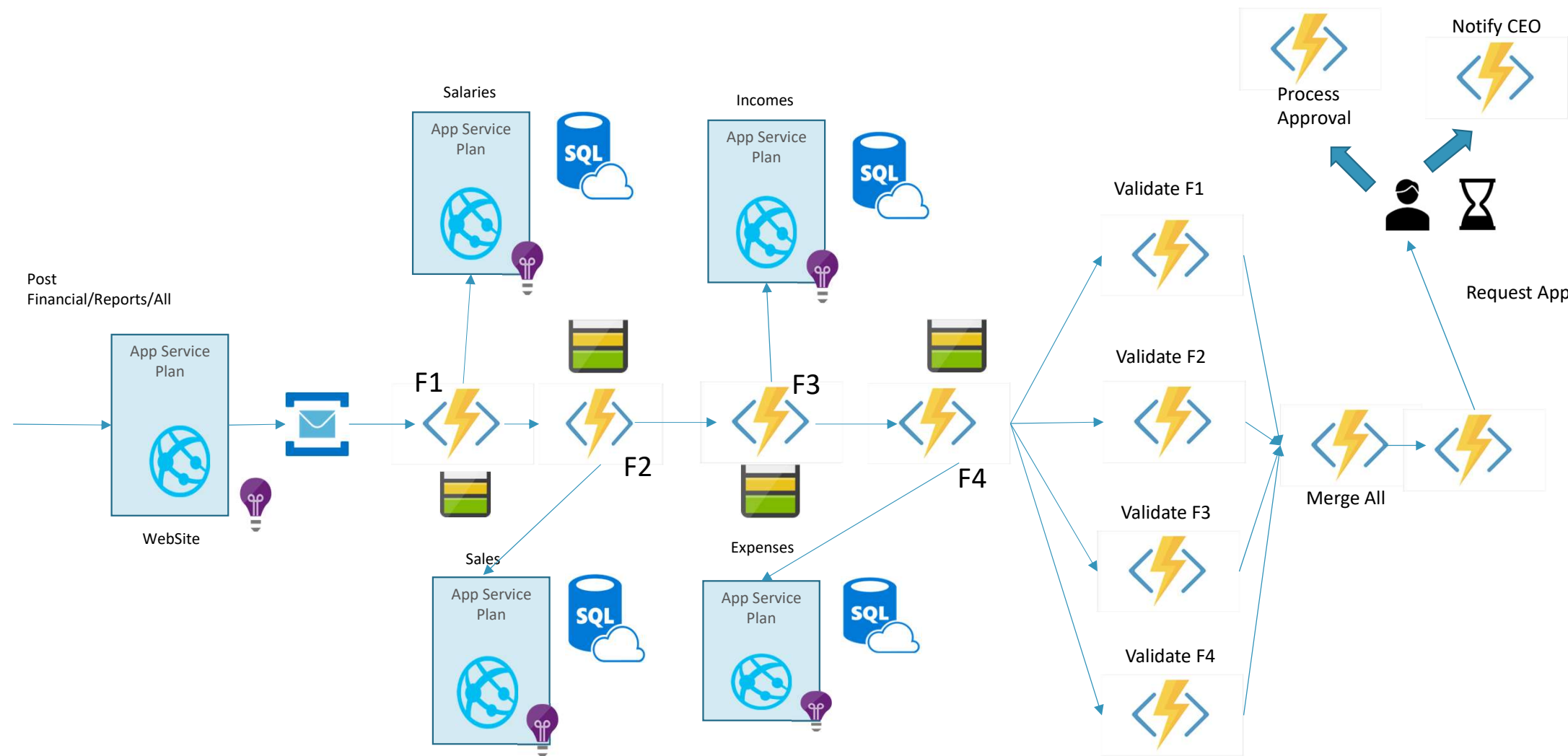
Monitor



Human interaction



Microservices & Serverless
Employee Evaluations





PaaS



Micro
services

Azure
Services






Blob Storage

File Storage

Table Storage

Queue Storage

Achievements

Software

Deployment

1. Cohesion
2. Decoupling
3. Maintainability
4. Stability
5. Reusability
6. Traceability & Monitoring

1. Availability
2. Operability
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7. Disaster Recovery
8. Reduce Cost
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Q&A

