



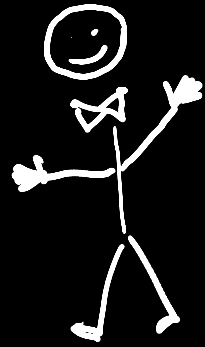
Introduktion til Windows Azure Platform

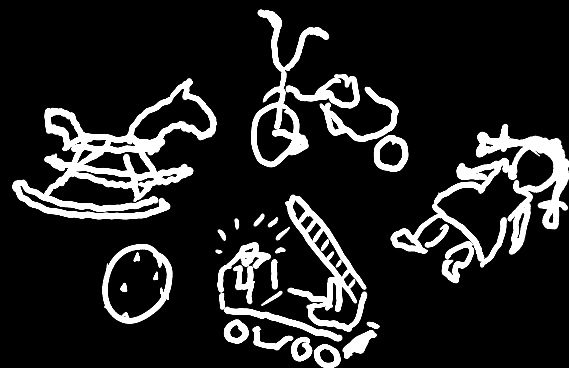
René Løhde

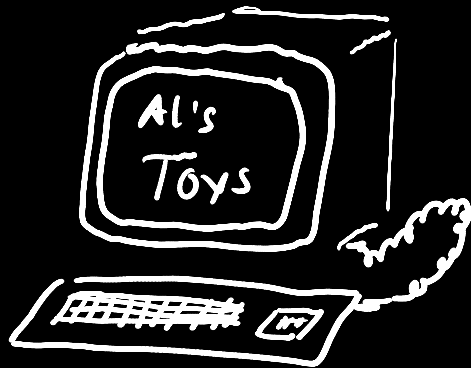
renel@microsoft.com

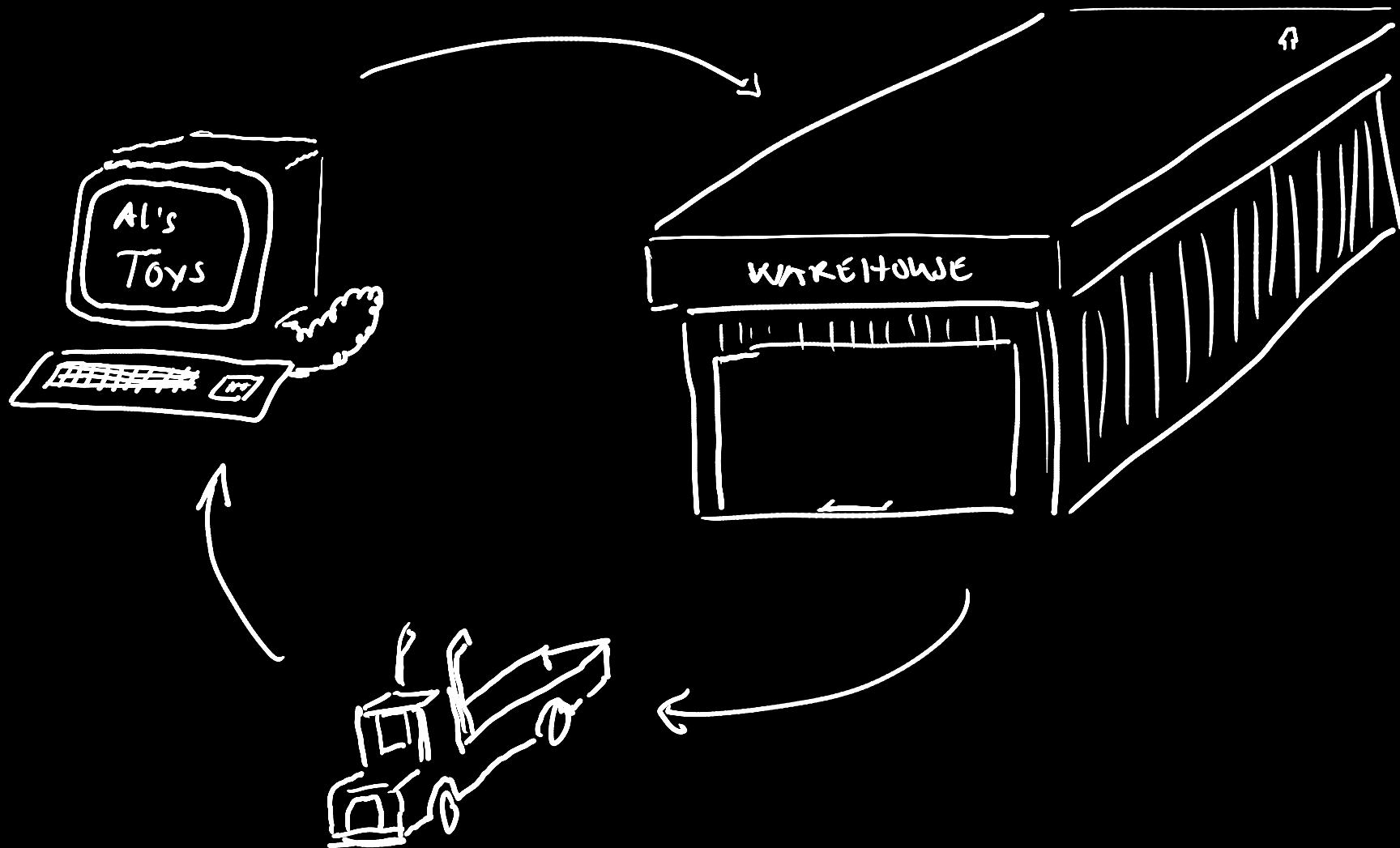
Hvad er

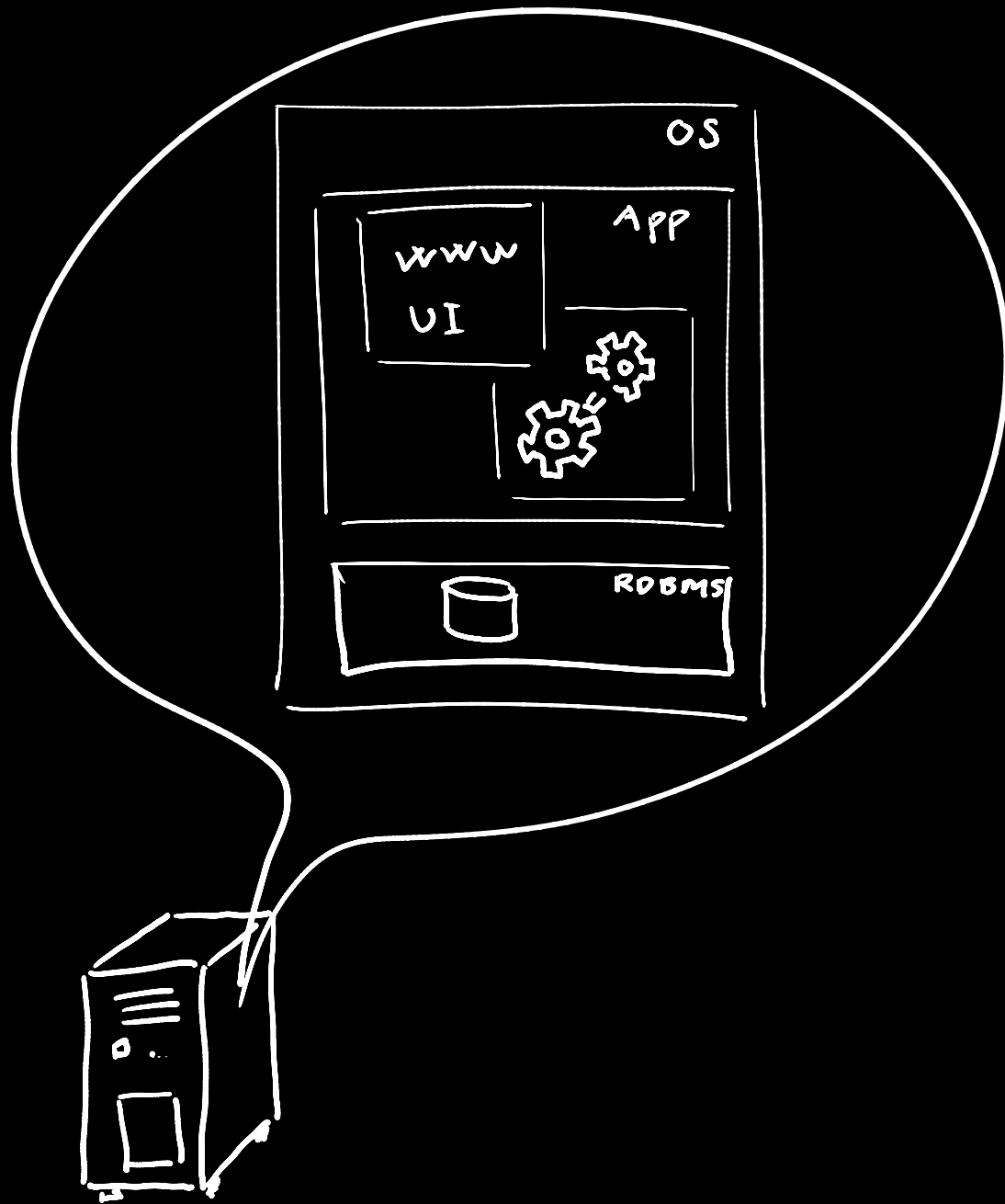
Cloud Computing?

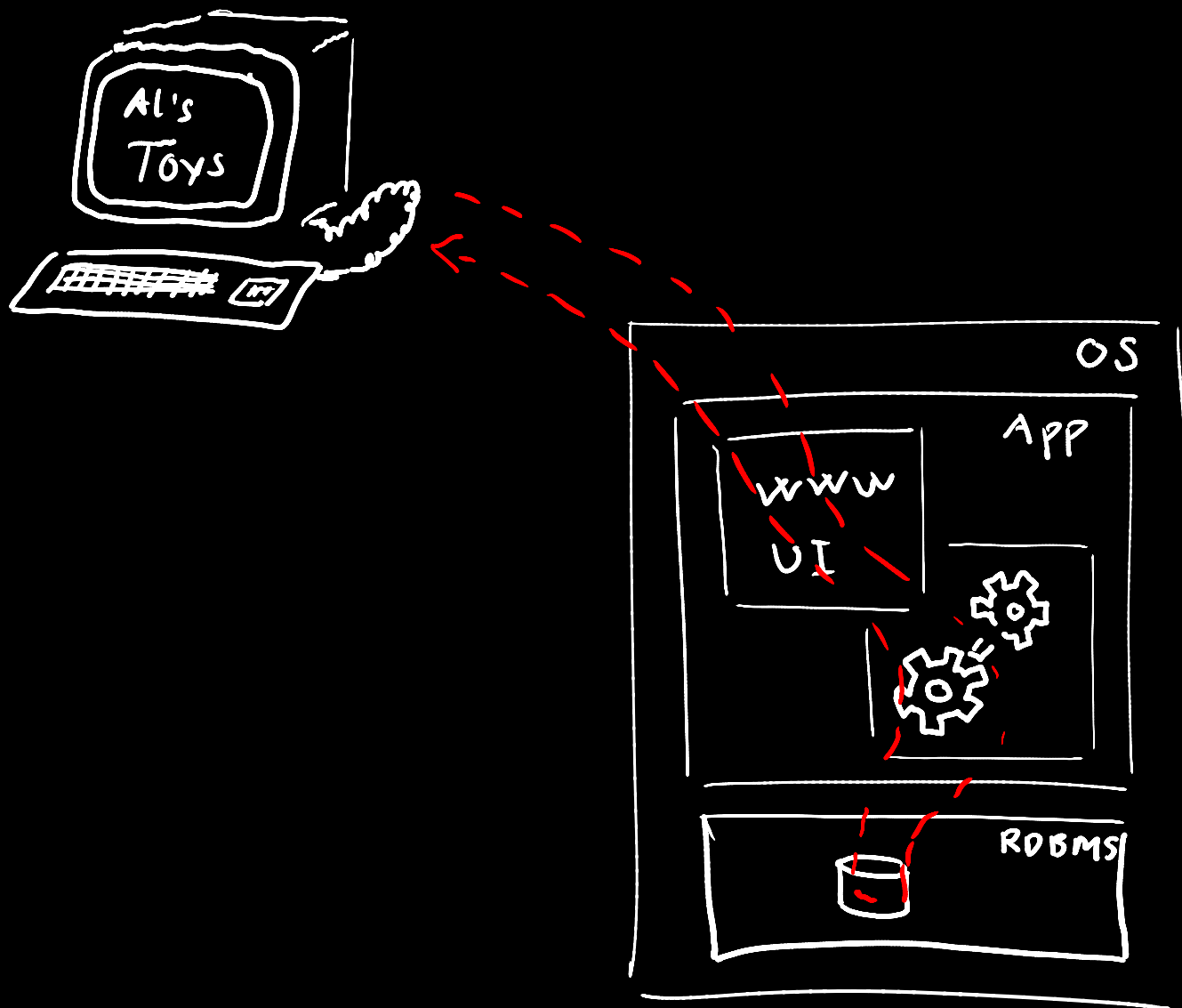


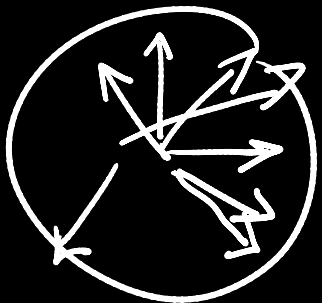
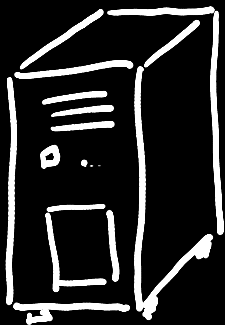


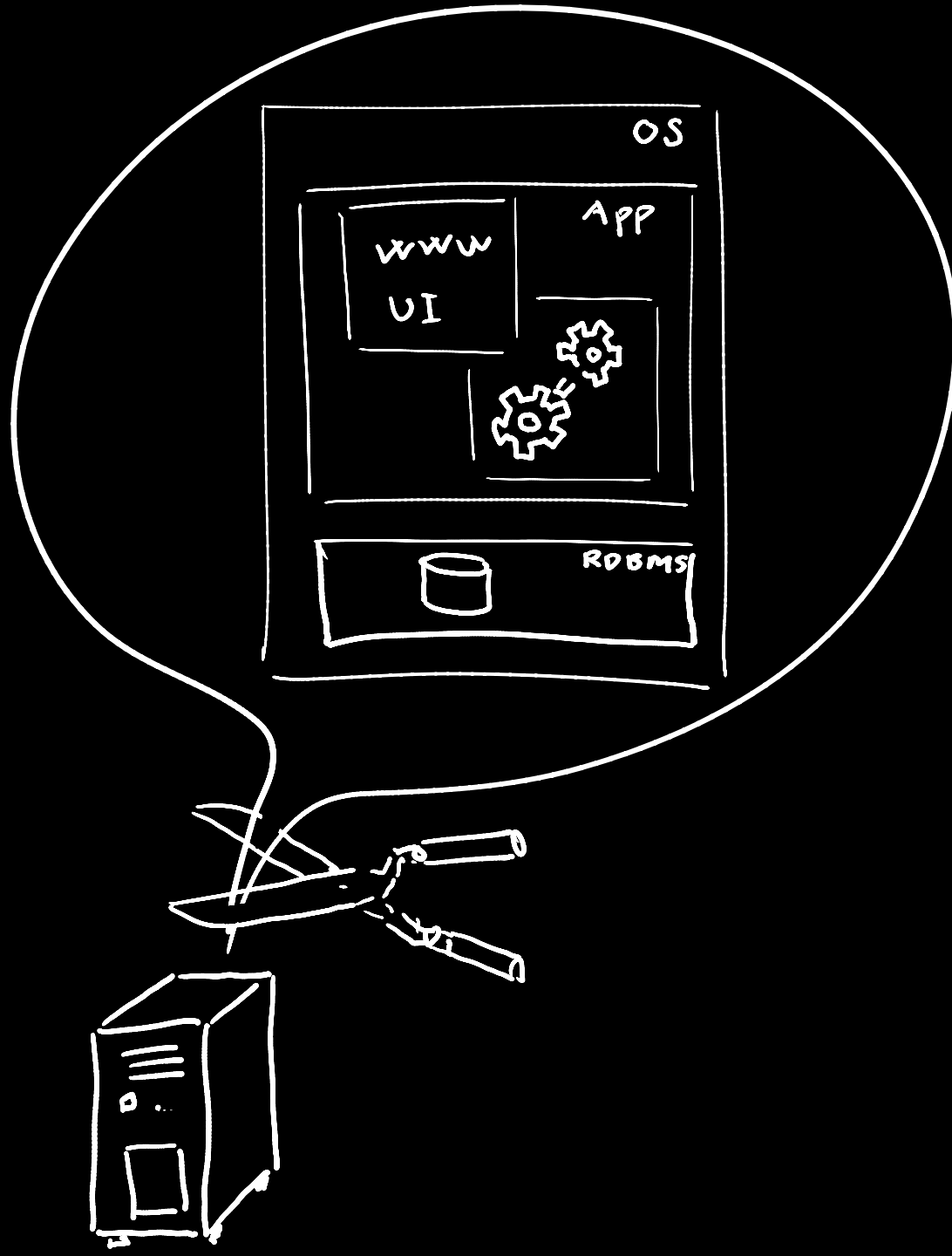


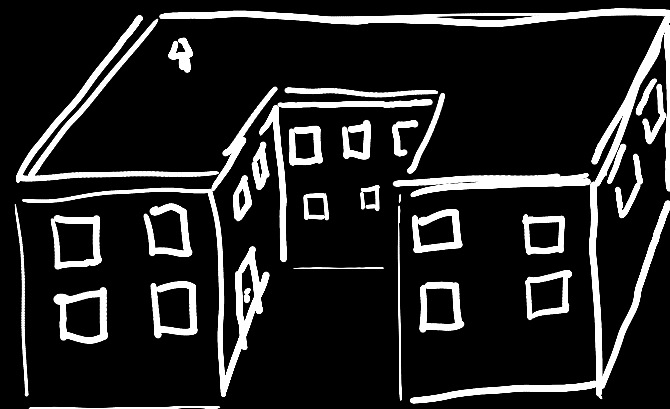
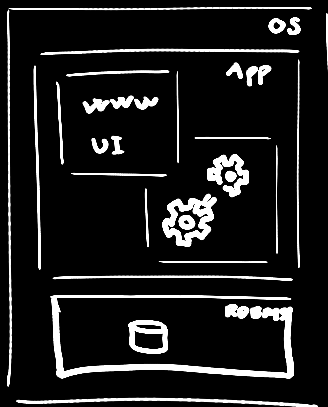


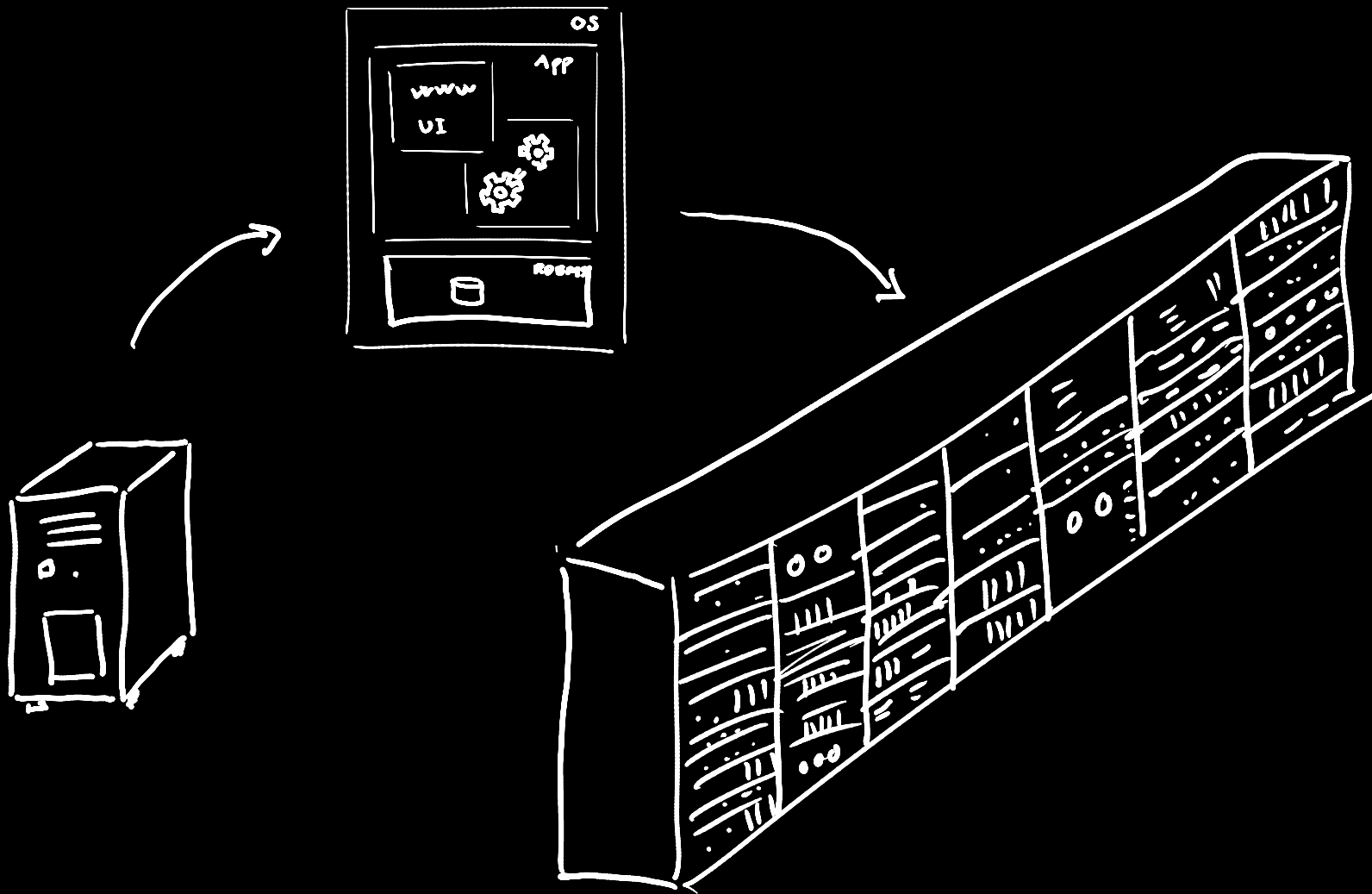


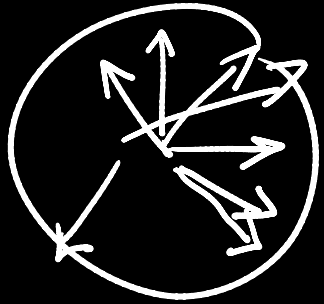




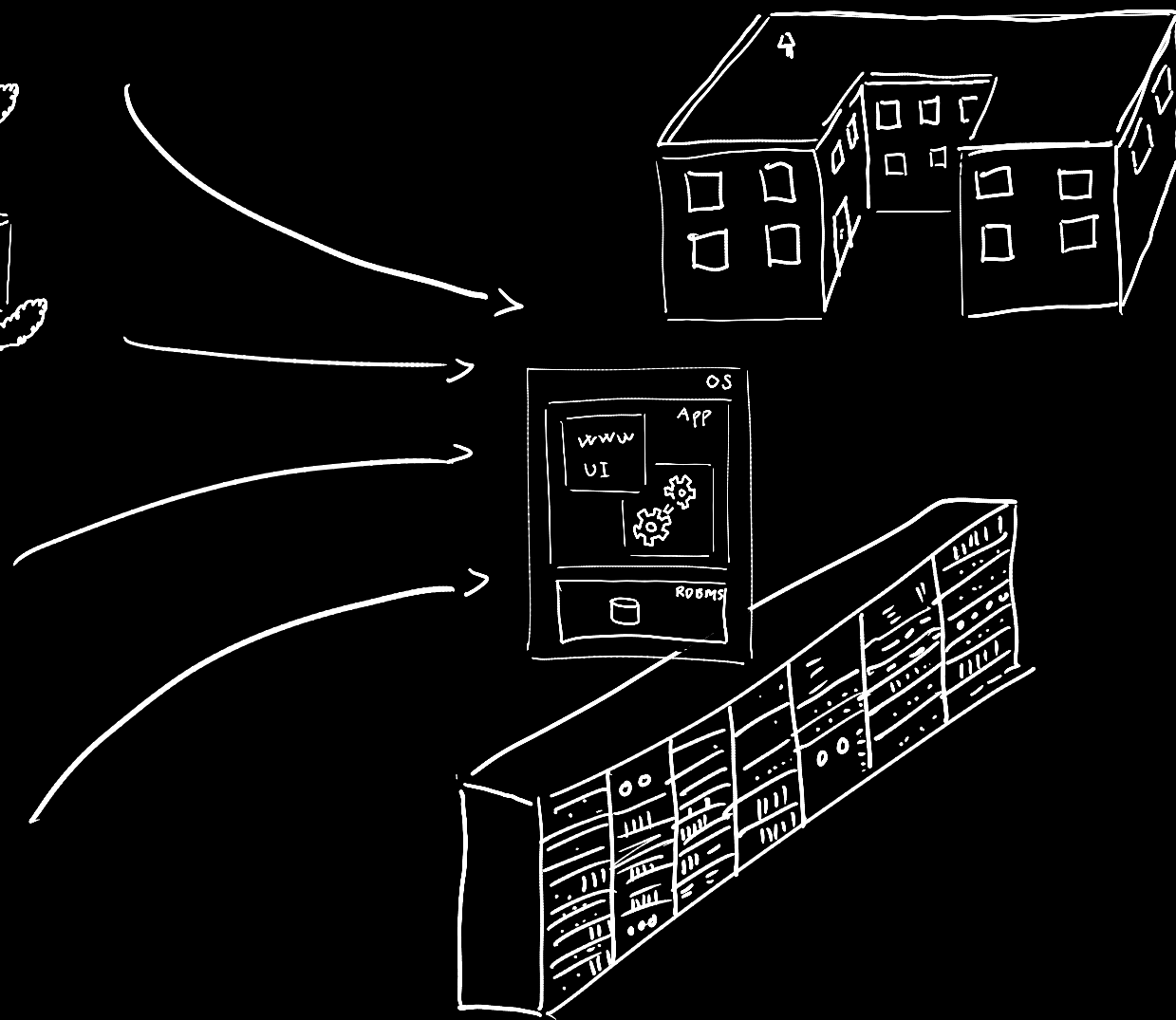
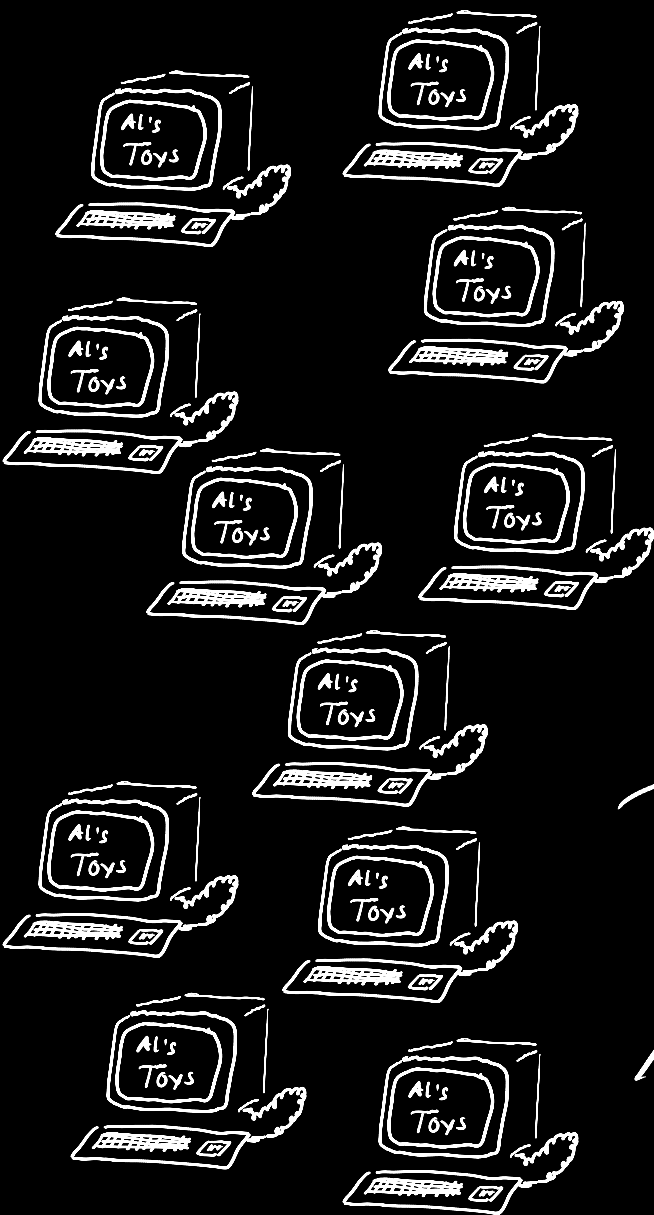


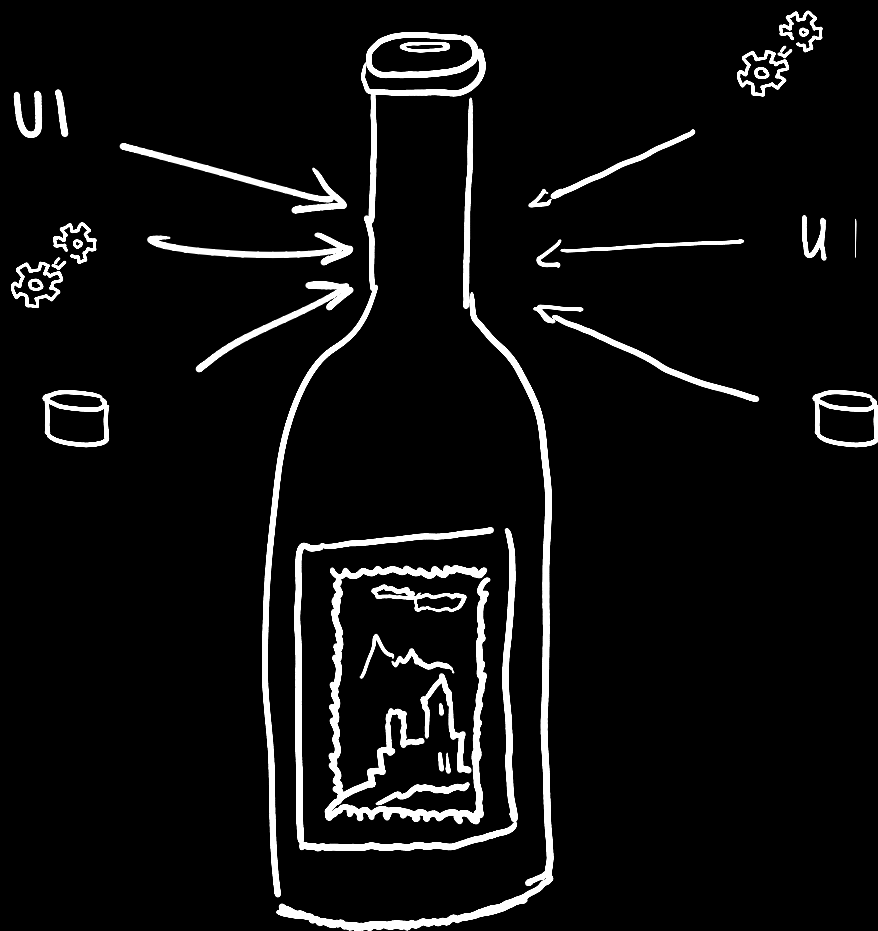


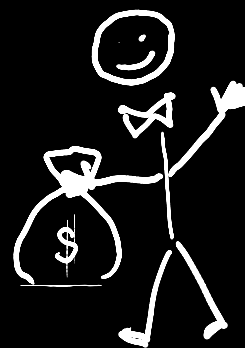
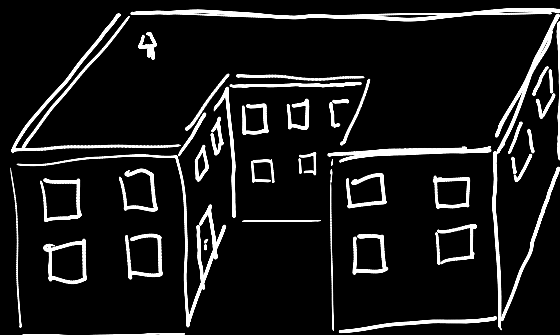


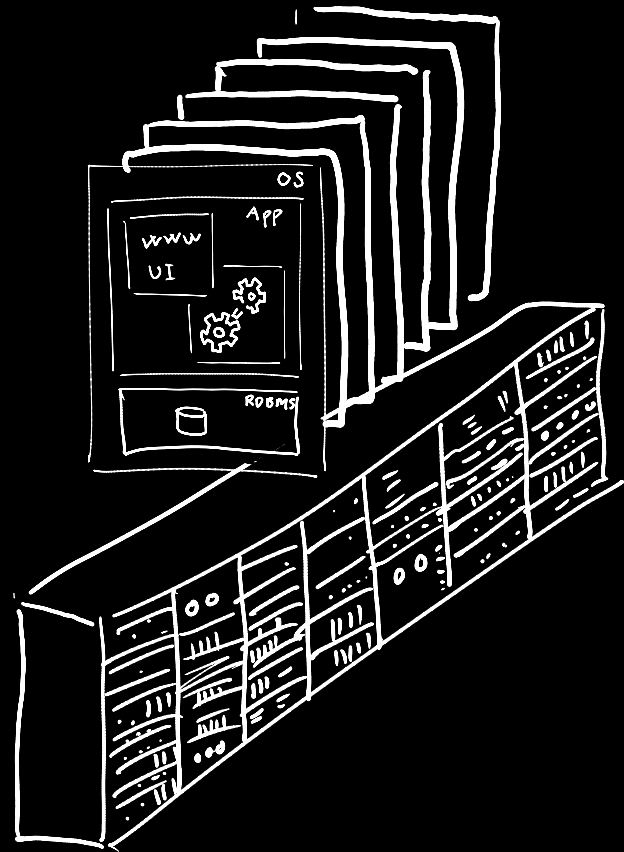
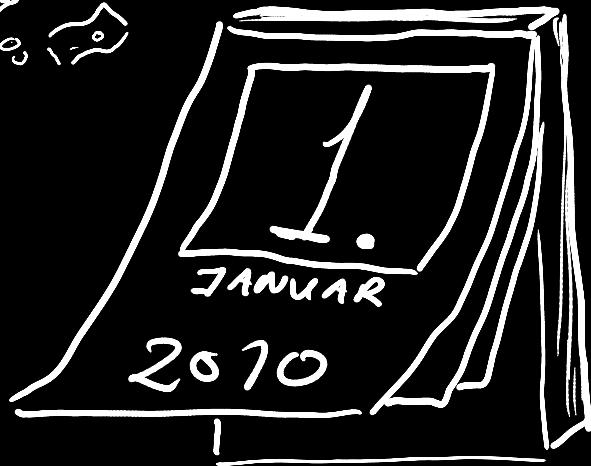
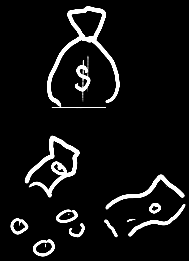
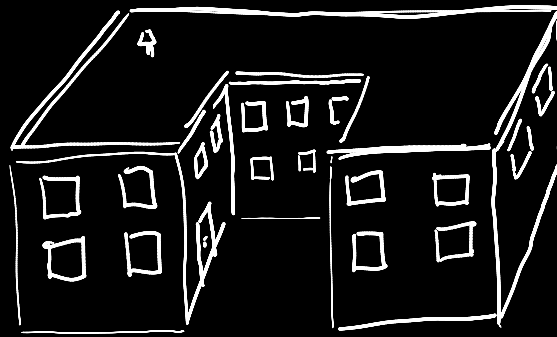


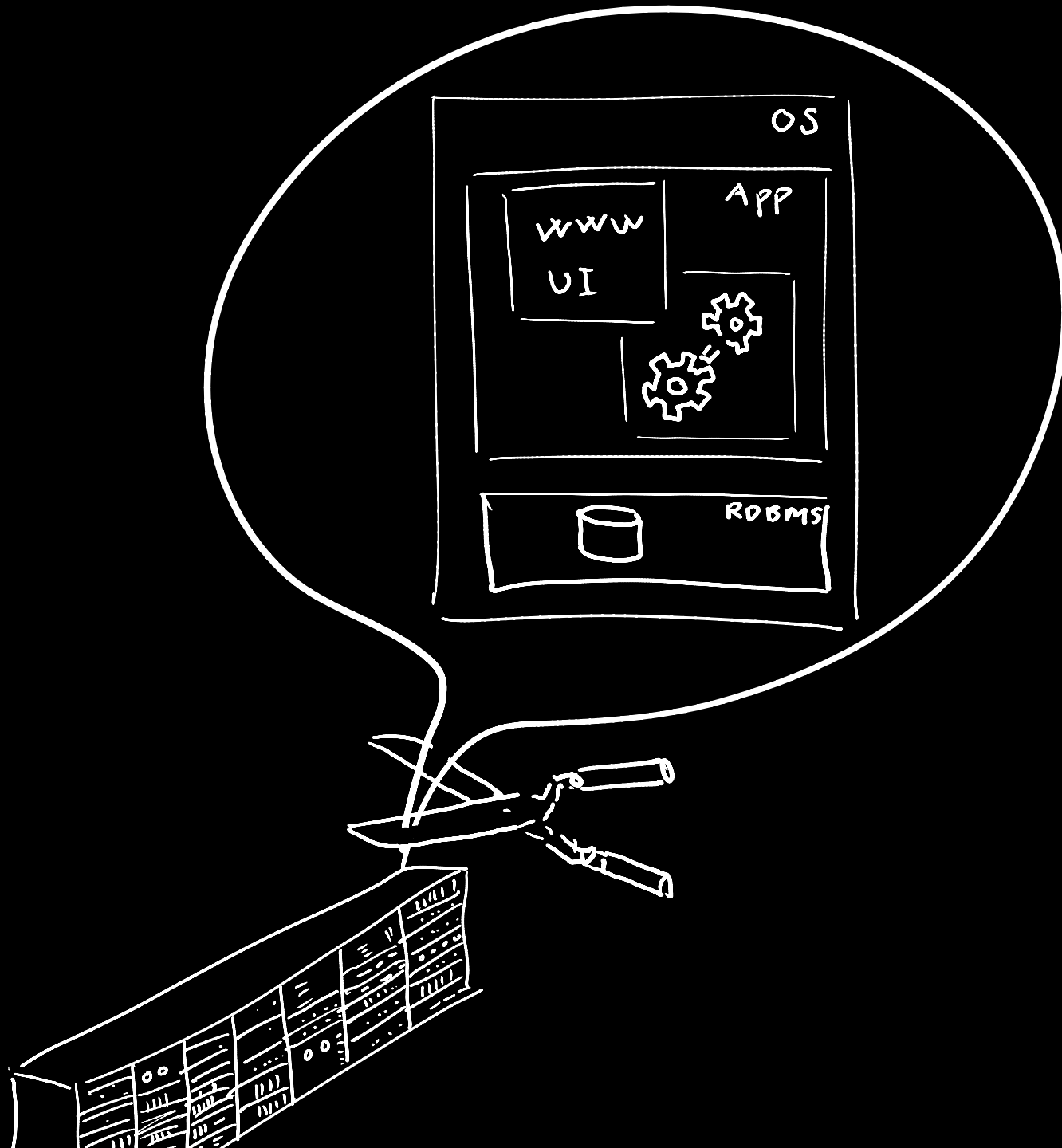


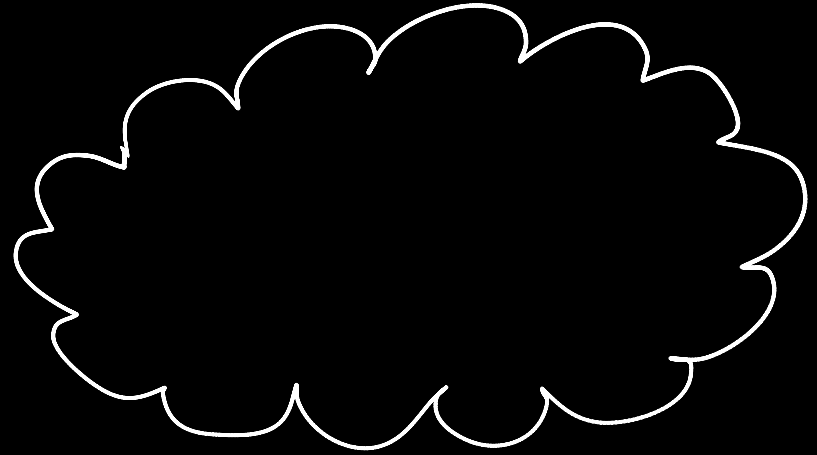
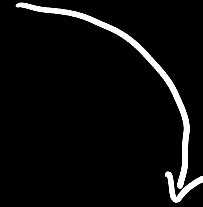
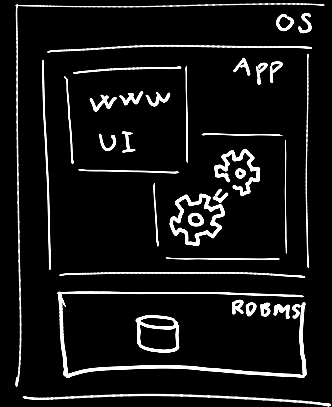
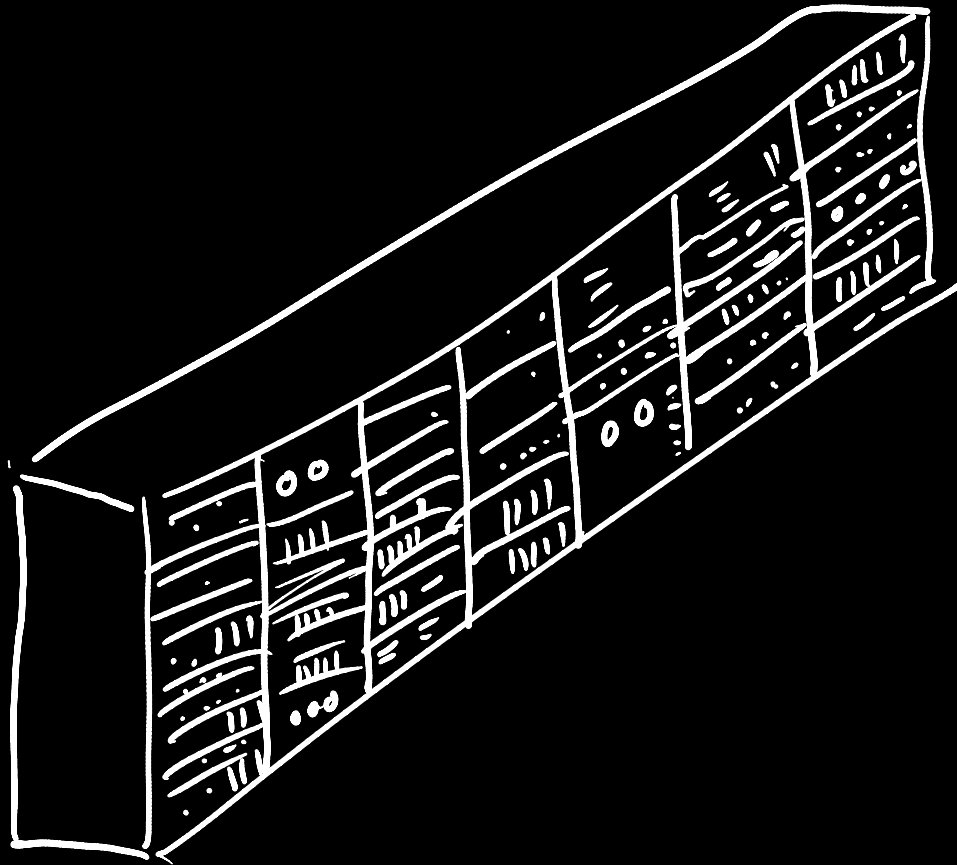


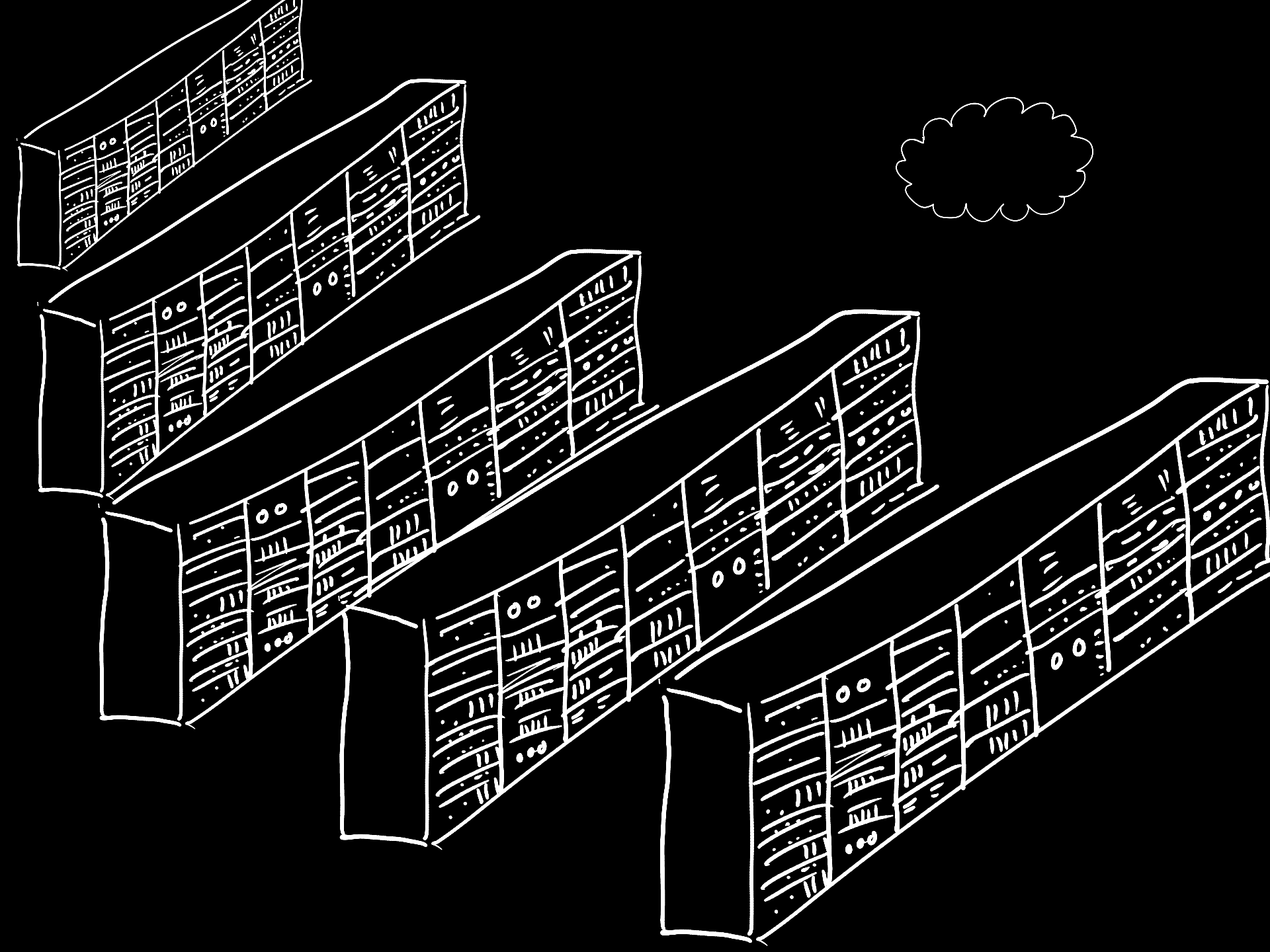






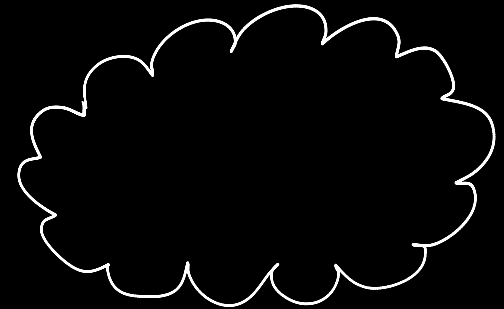
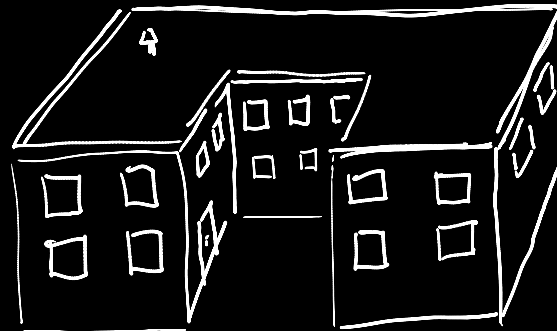
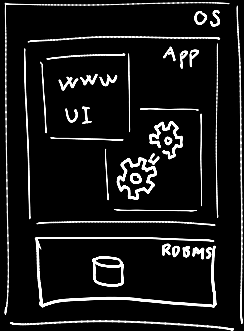


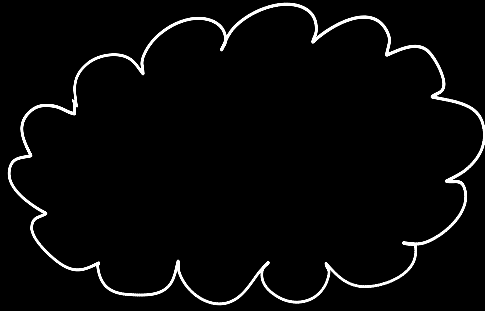
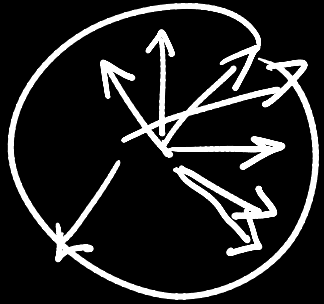




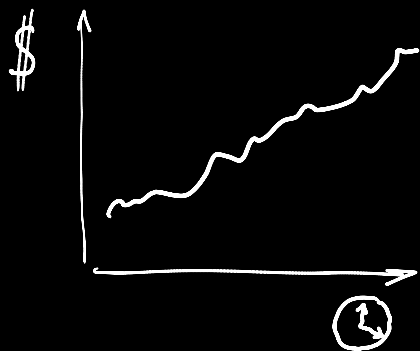
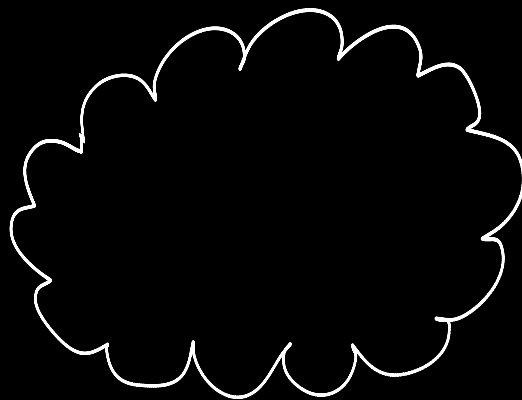
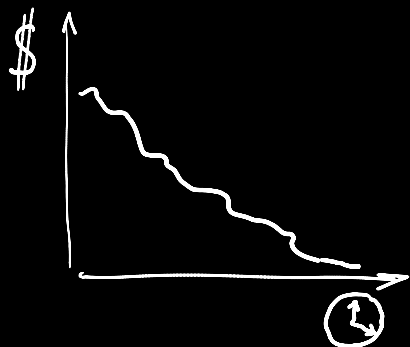
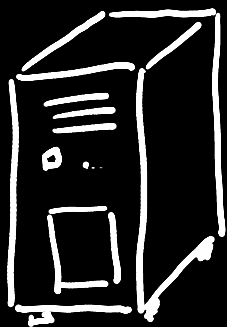
Infrastructure as a Service

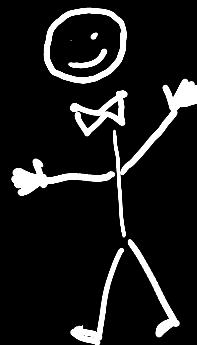
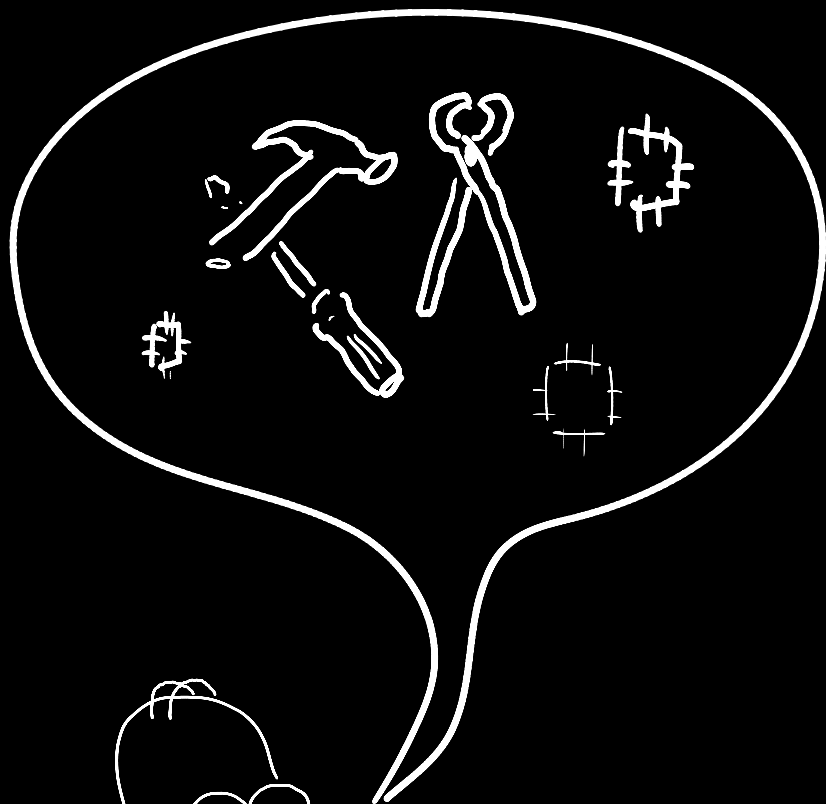
IaaS

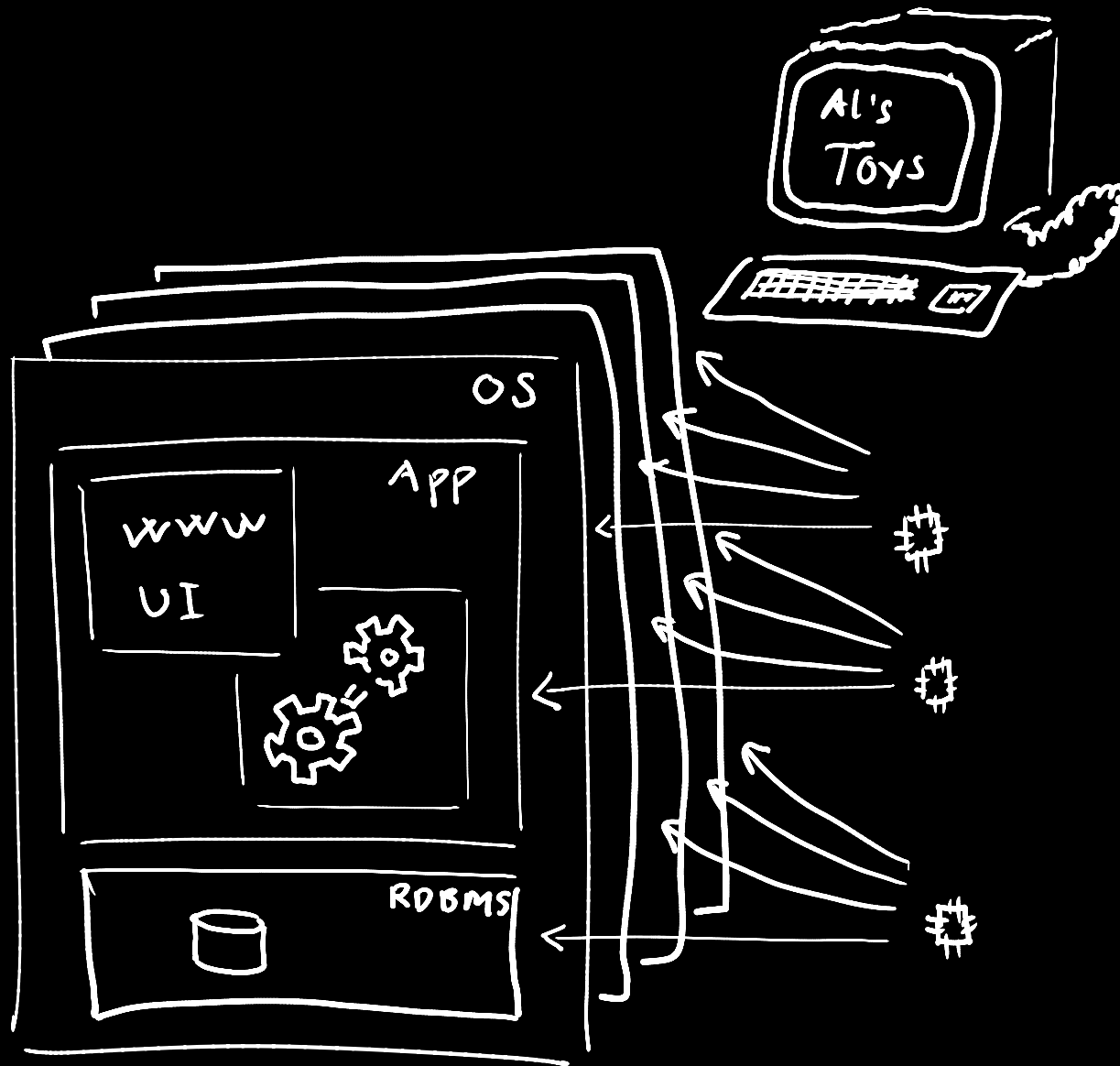


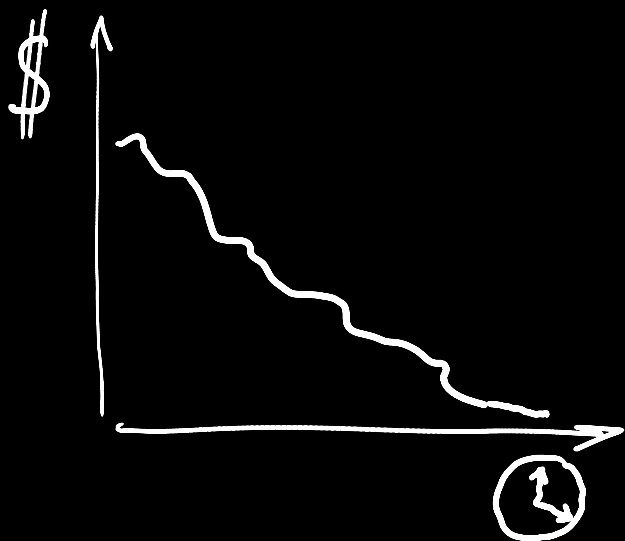


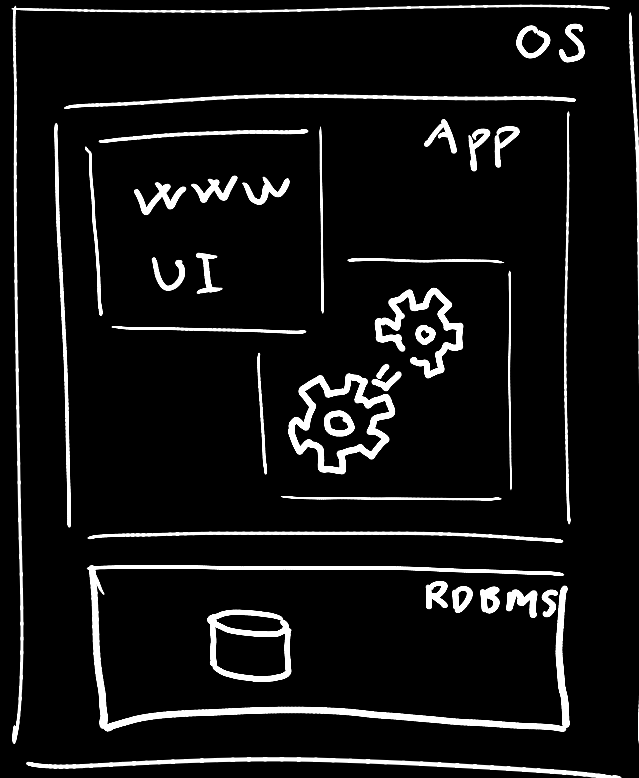
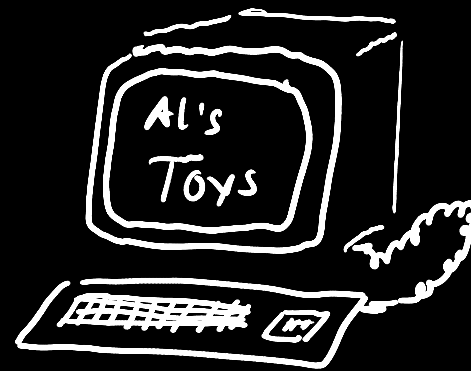


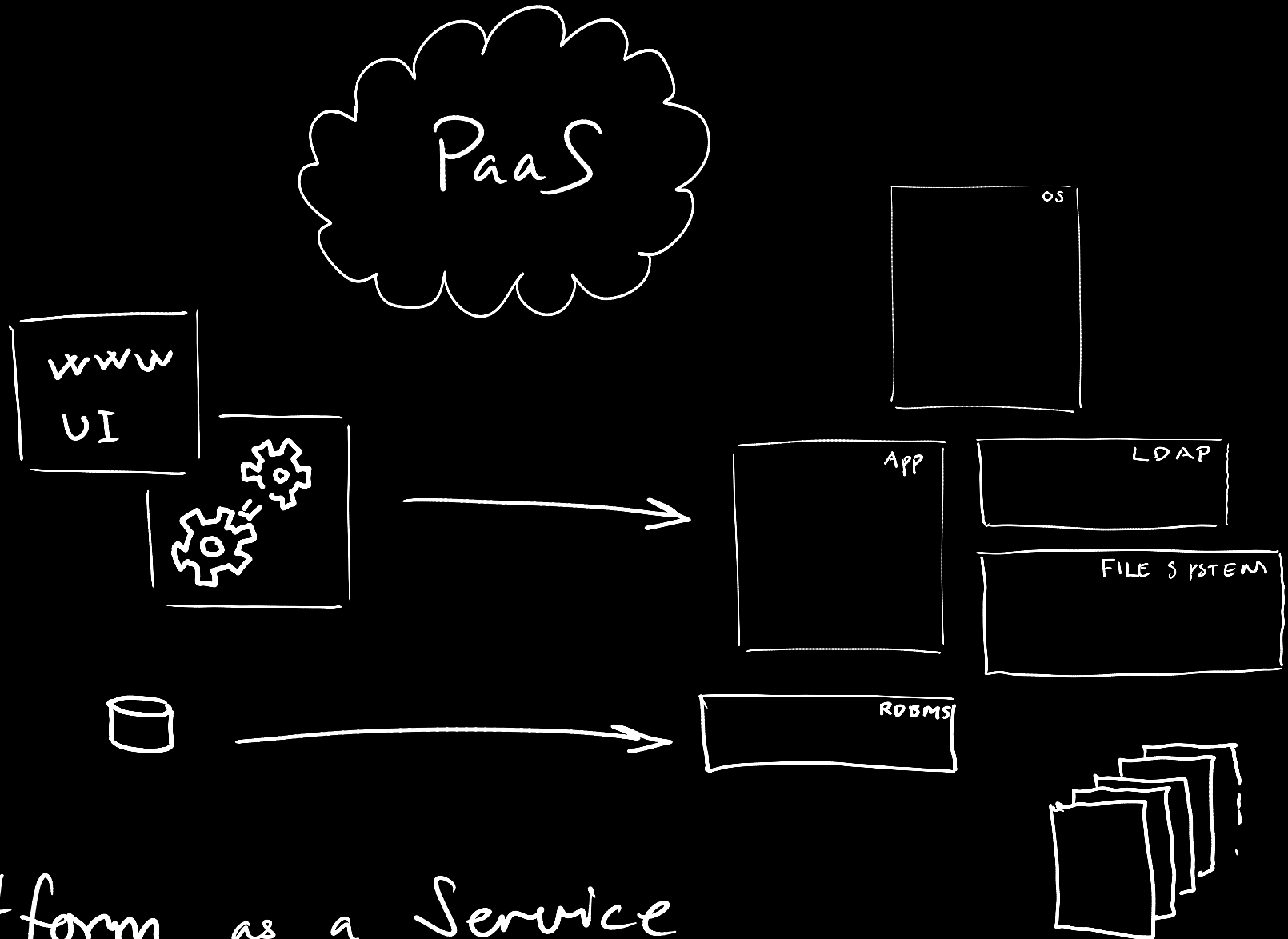




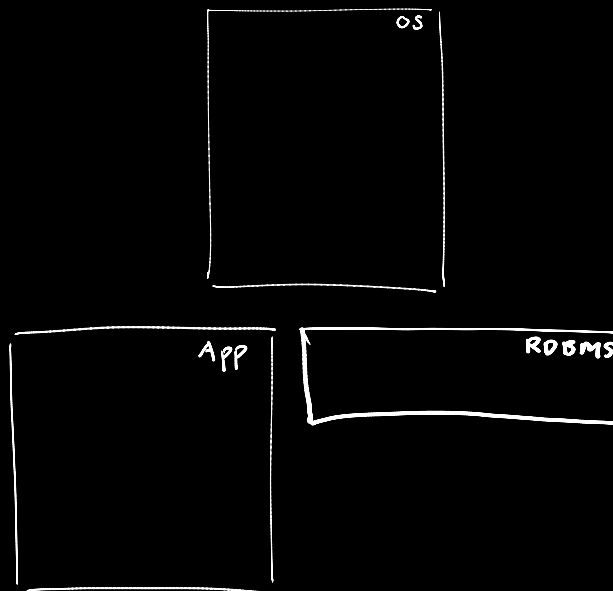
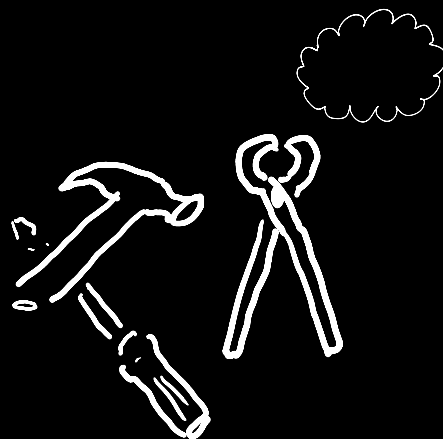
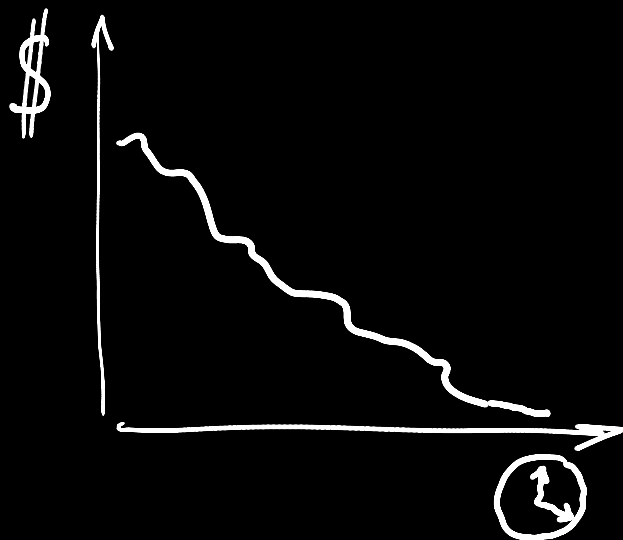


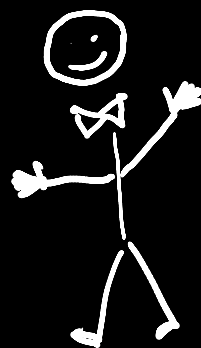
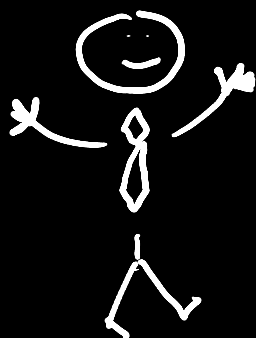




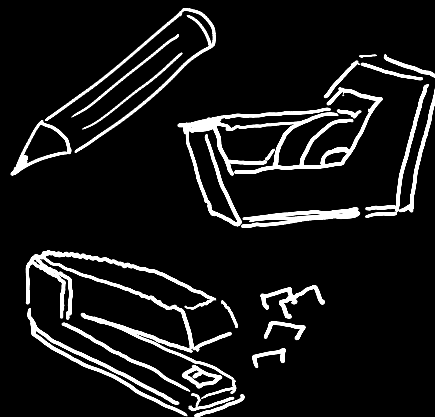
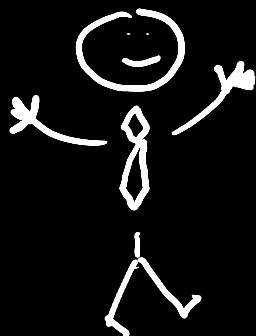


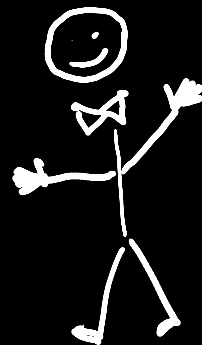
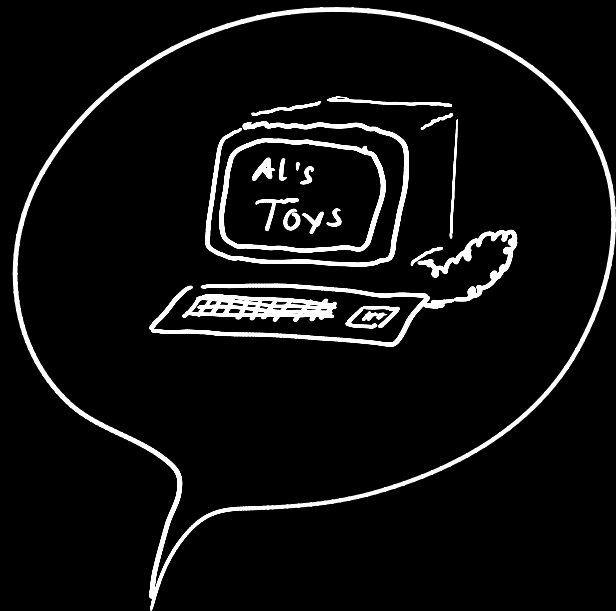
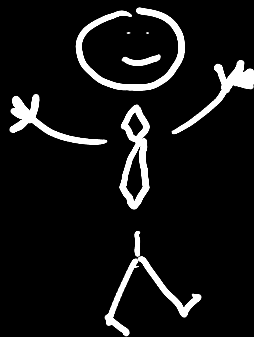
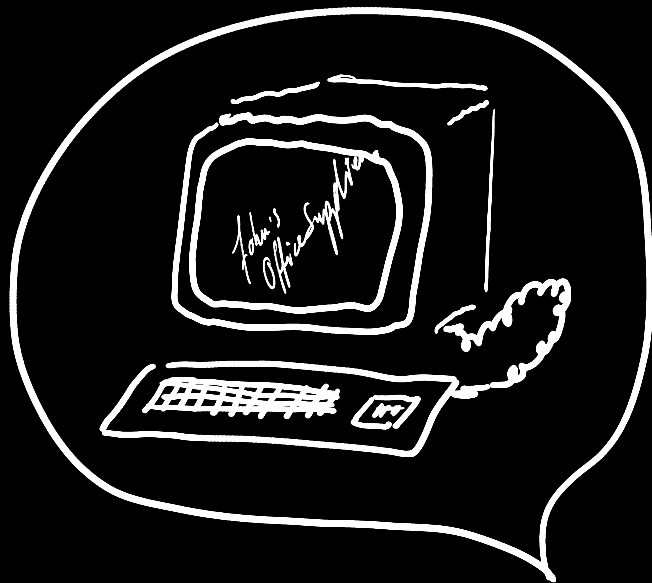
Platform as a Service

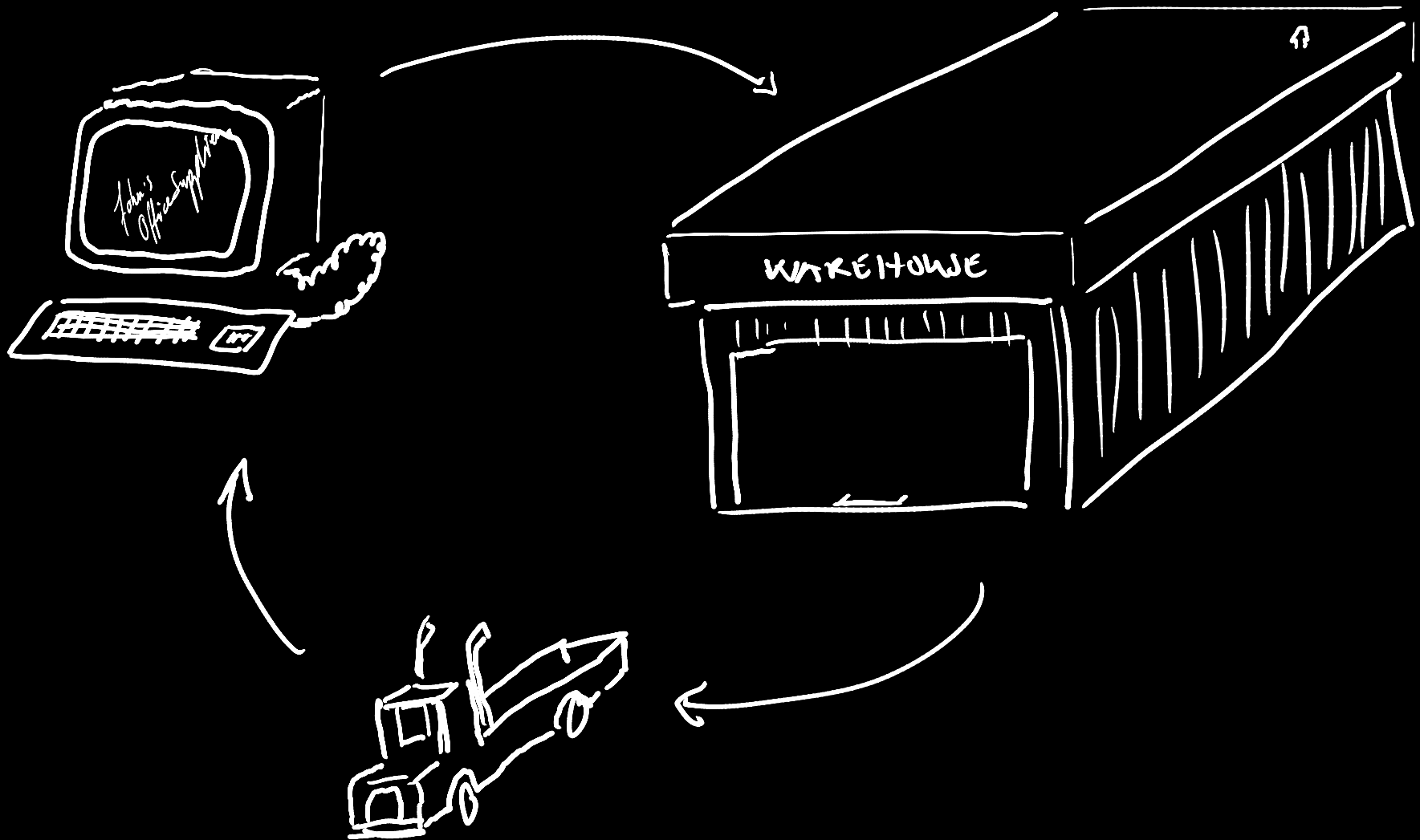


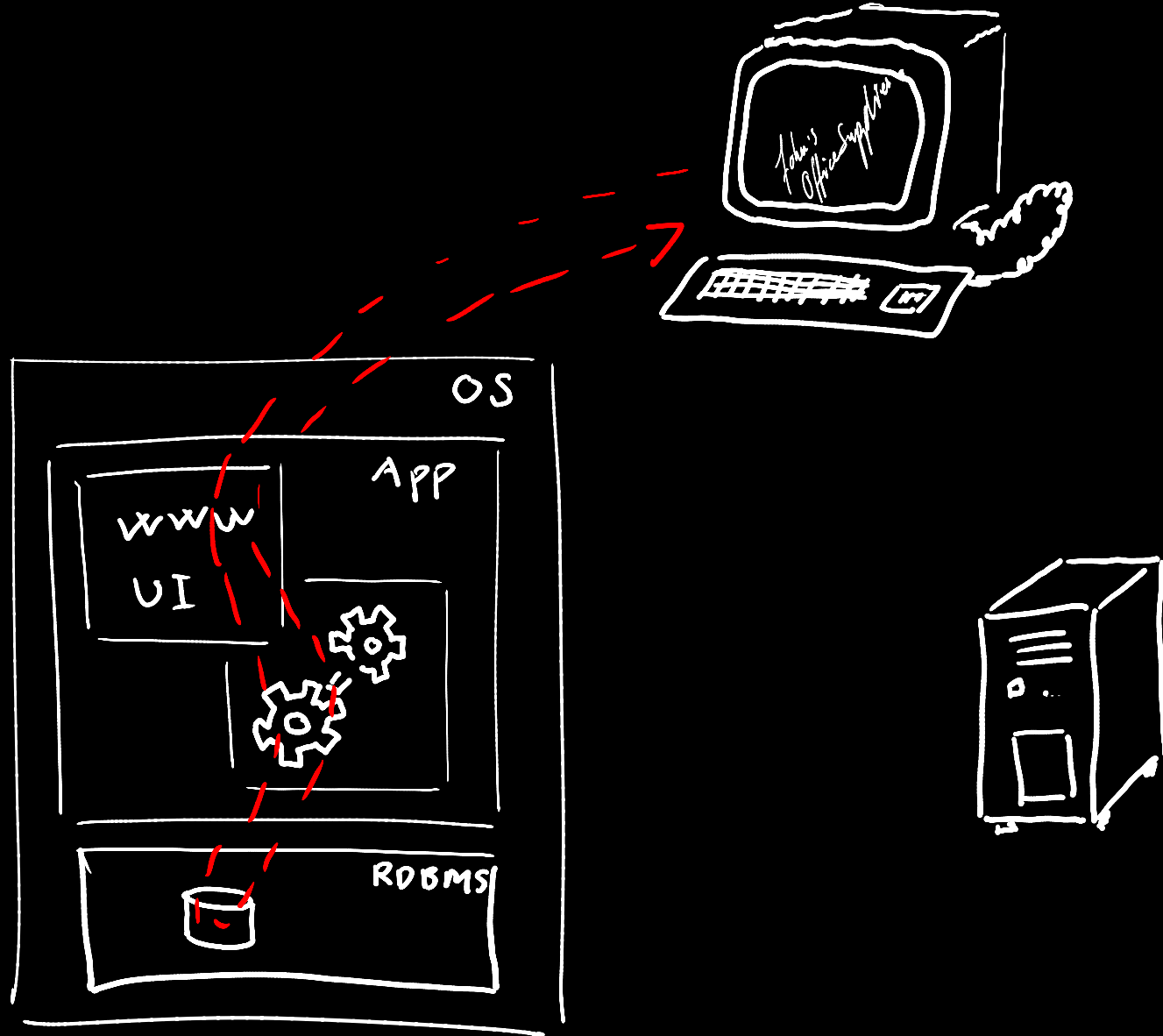


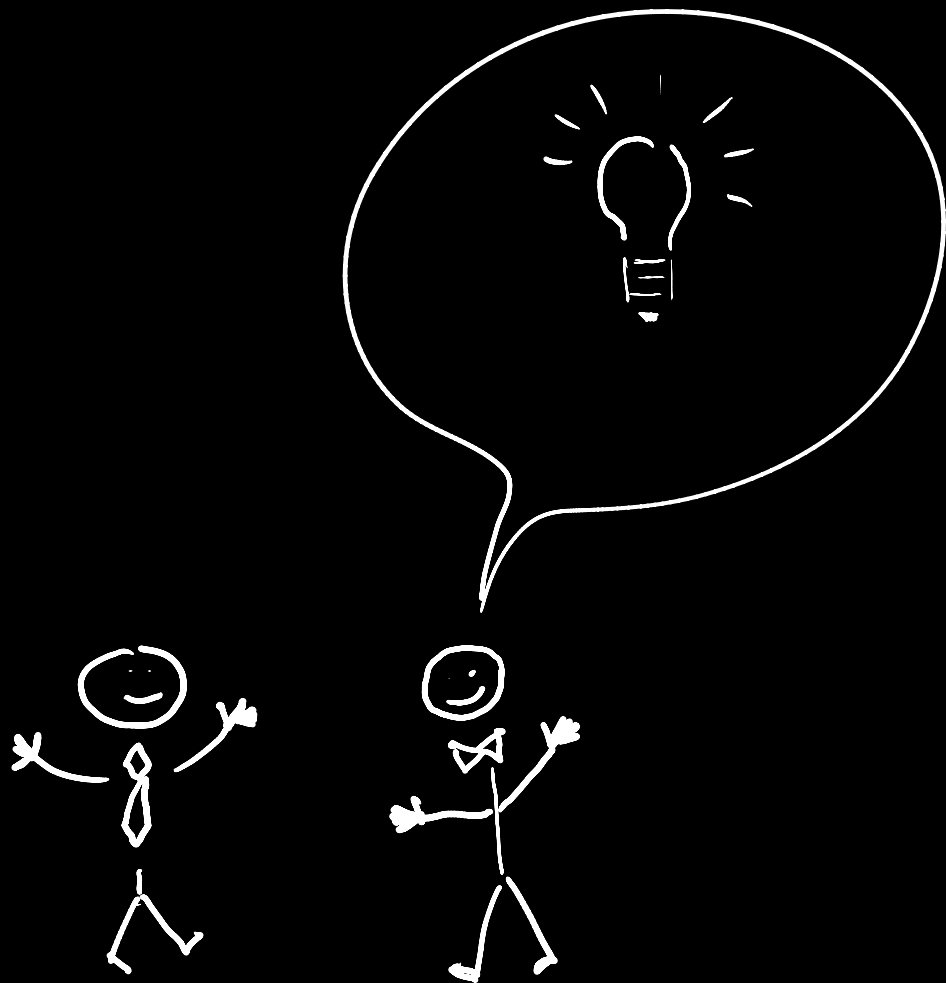
John's
Office Supplies



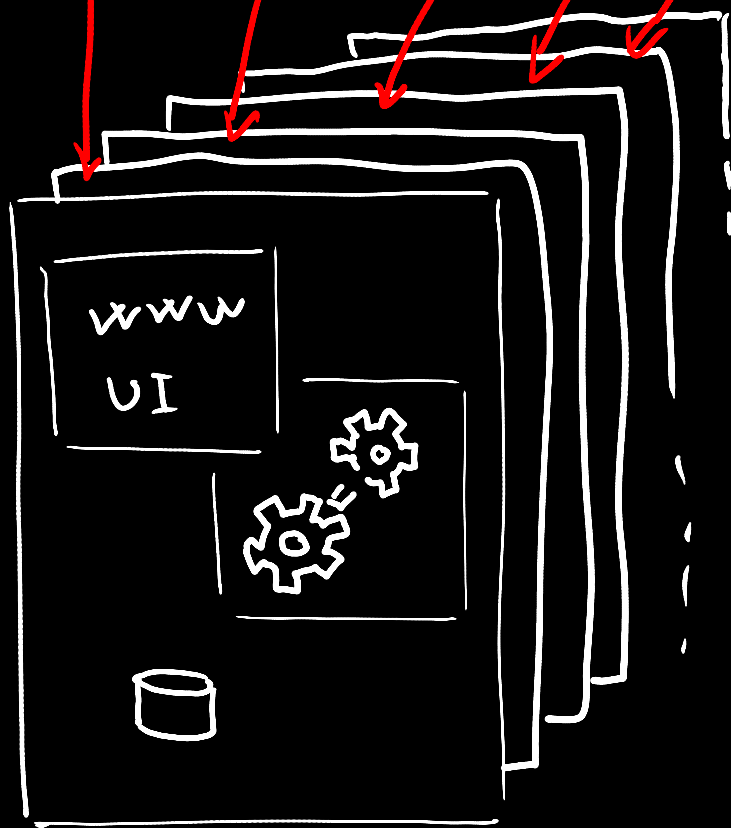
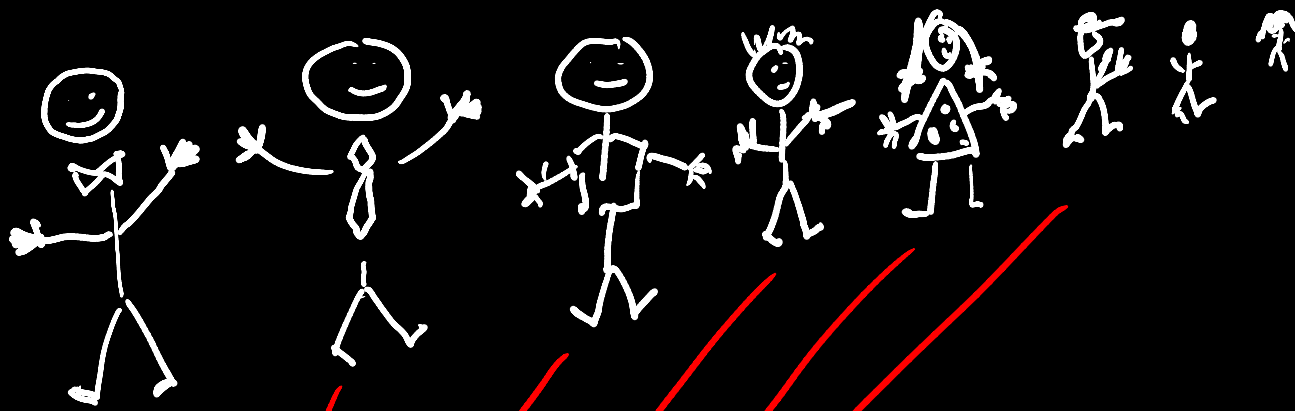








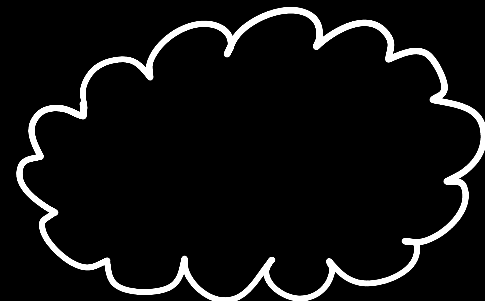
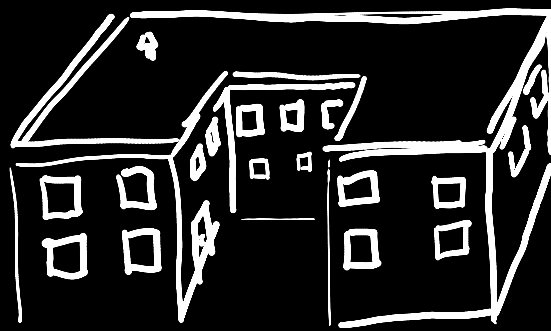
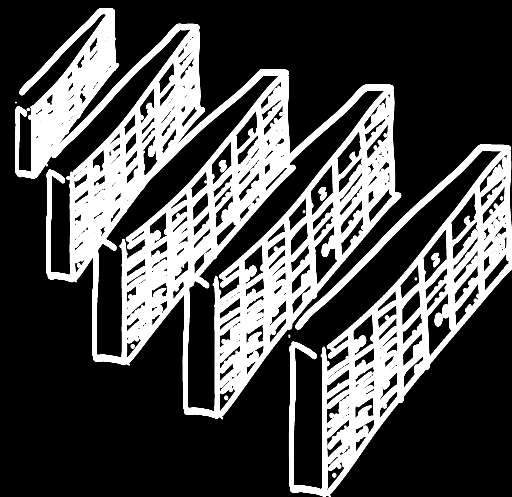
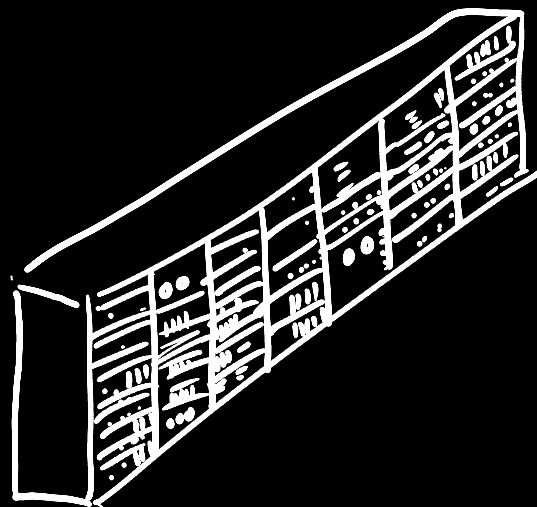
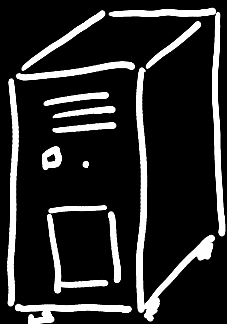
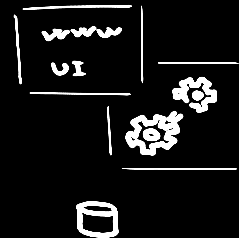
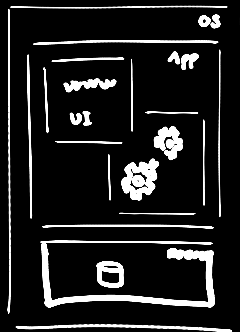
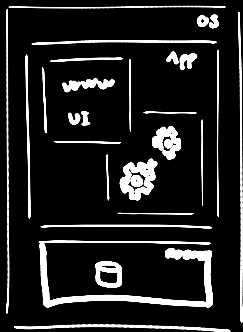


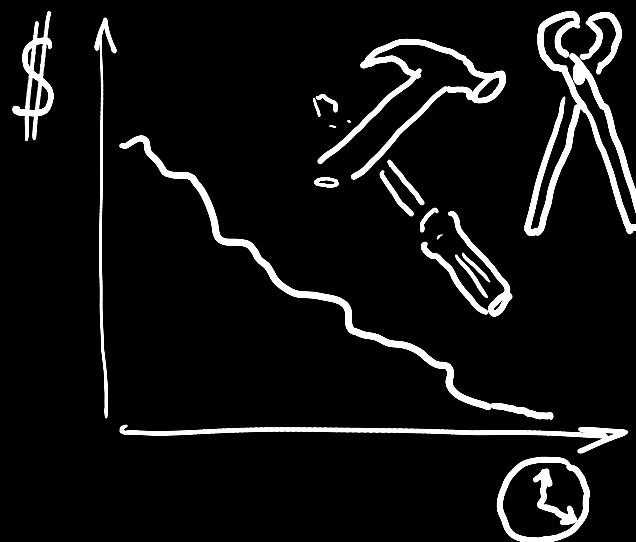
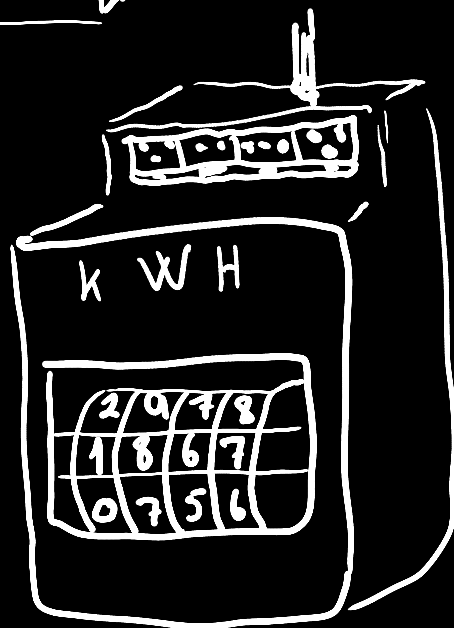
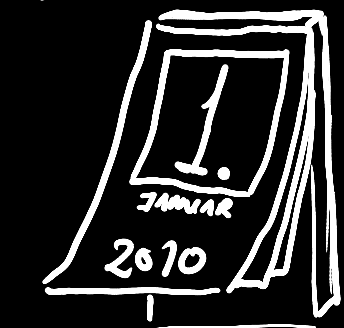


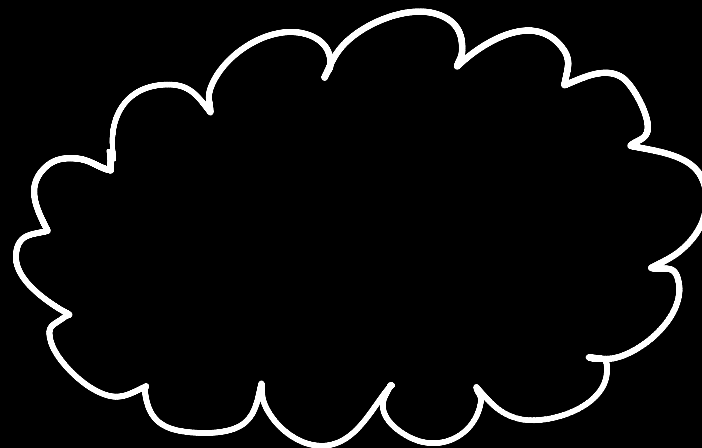
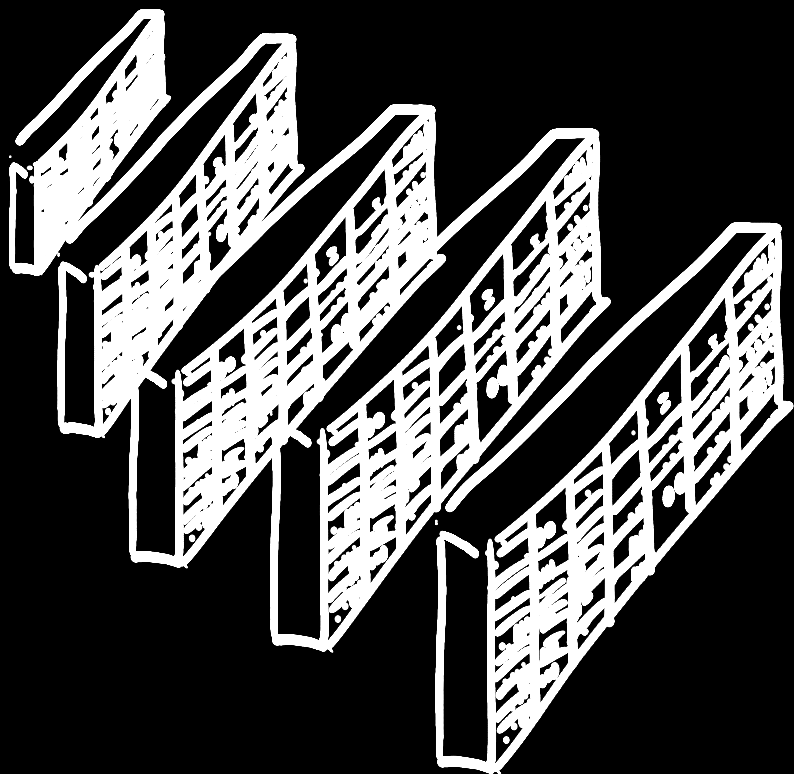
SaaS

Software as a
Service

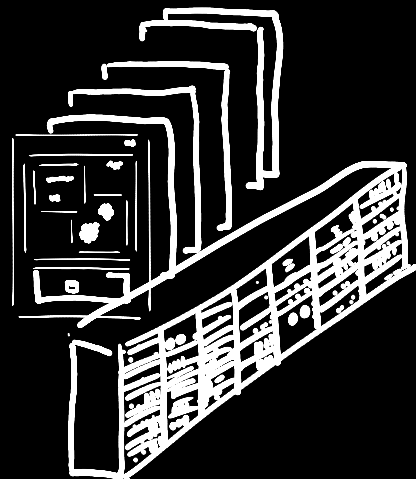
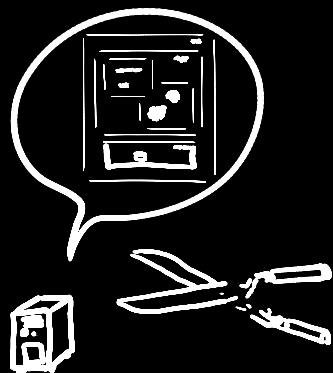
Opsumming



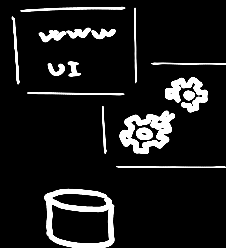
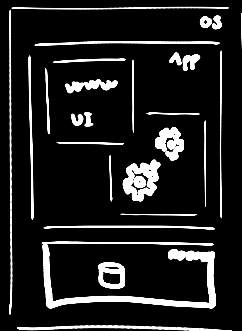




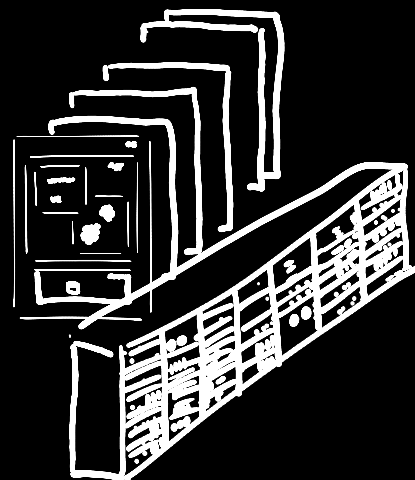
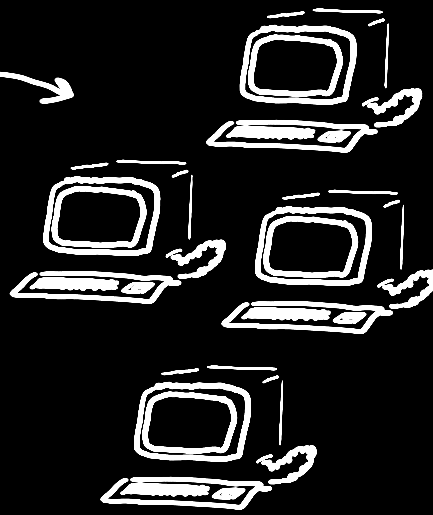
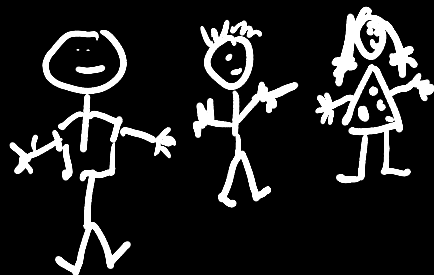
IaaS:



PaaS:



SaaS:





Tak!

Topics

- Cloud Computing Introduction
- Windows Azure Platform components
 - Windows Azure
 - SQL Azure
 - AppFabric (f.k.a. .Net Services)
- Price, Support and SLA

Objective

- Windows Azure in Cloud Computing
- Windows Azure Platform components
- Familiar developer and management tools

Microsoft Data Centers



SaaS

Applications

Microsoft®
SharePoint® Online

 Microsoft
Dynamics® CRM Online

 Microsoft®
Exchange Online

 Microsoft®
Office Live

 Windows Live™



Windows Azure Platform



AppFabric



Windows Server 2008 R2
Hyper-V™



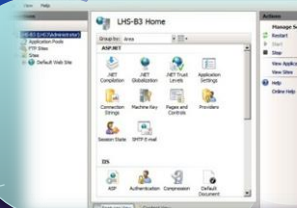
Windows® Azure™

Compute

Storage

Management

IIS7
internet information services





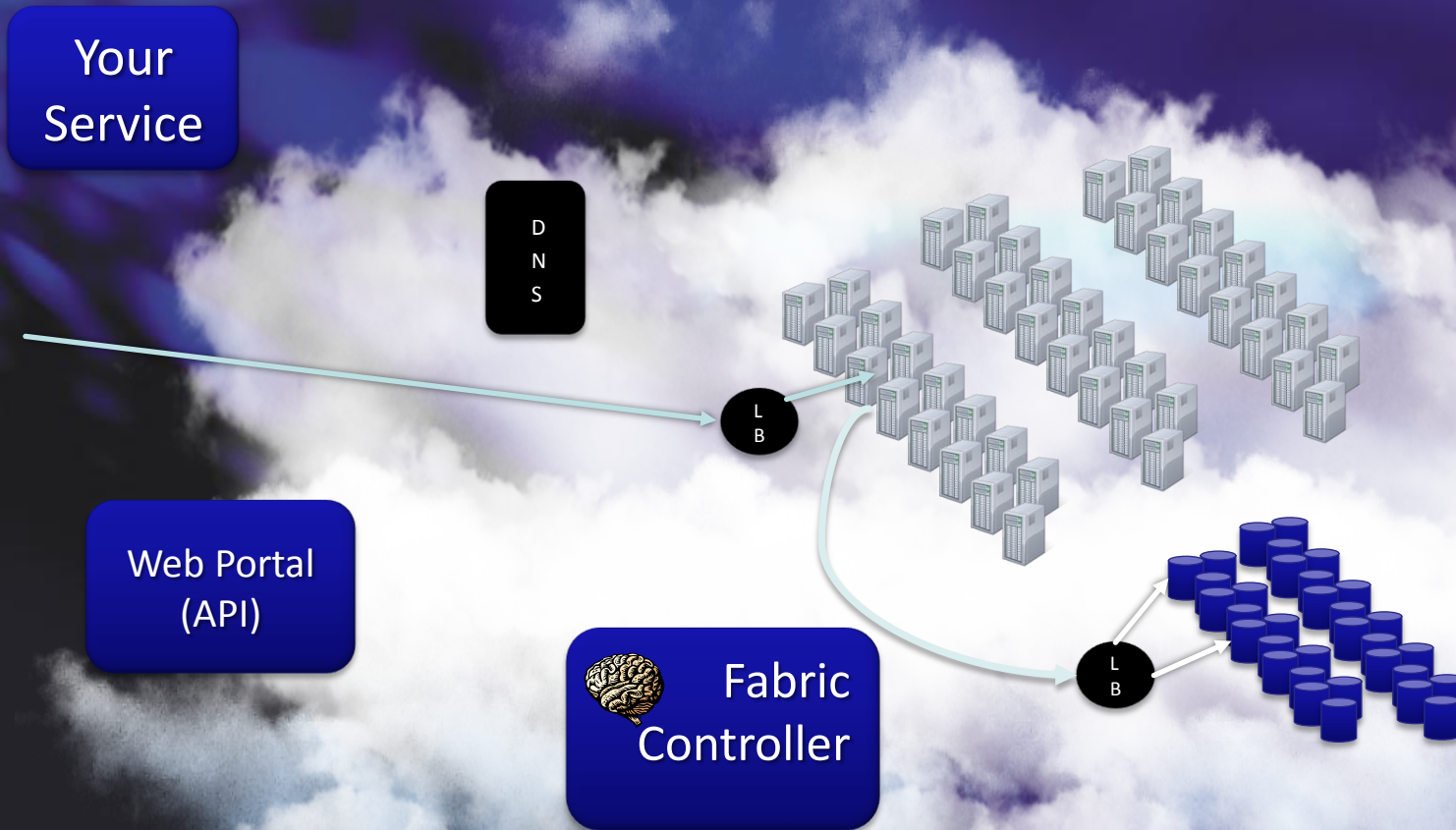
Windows® Azure™

Compute

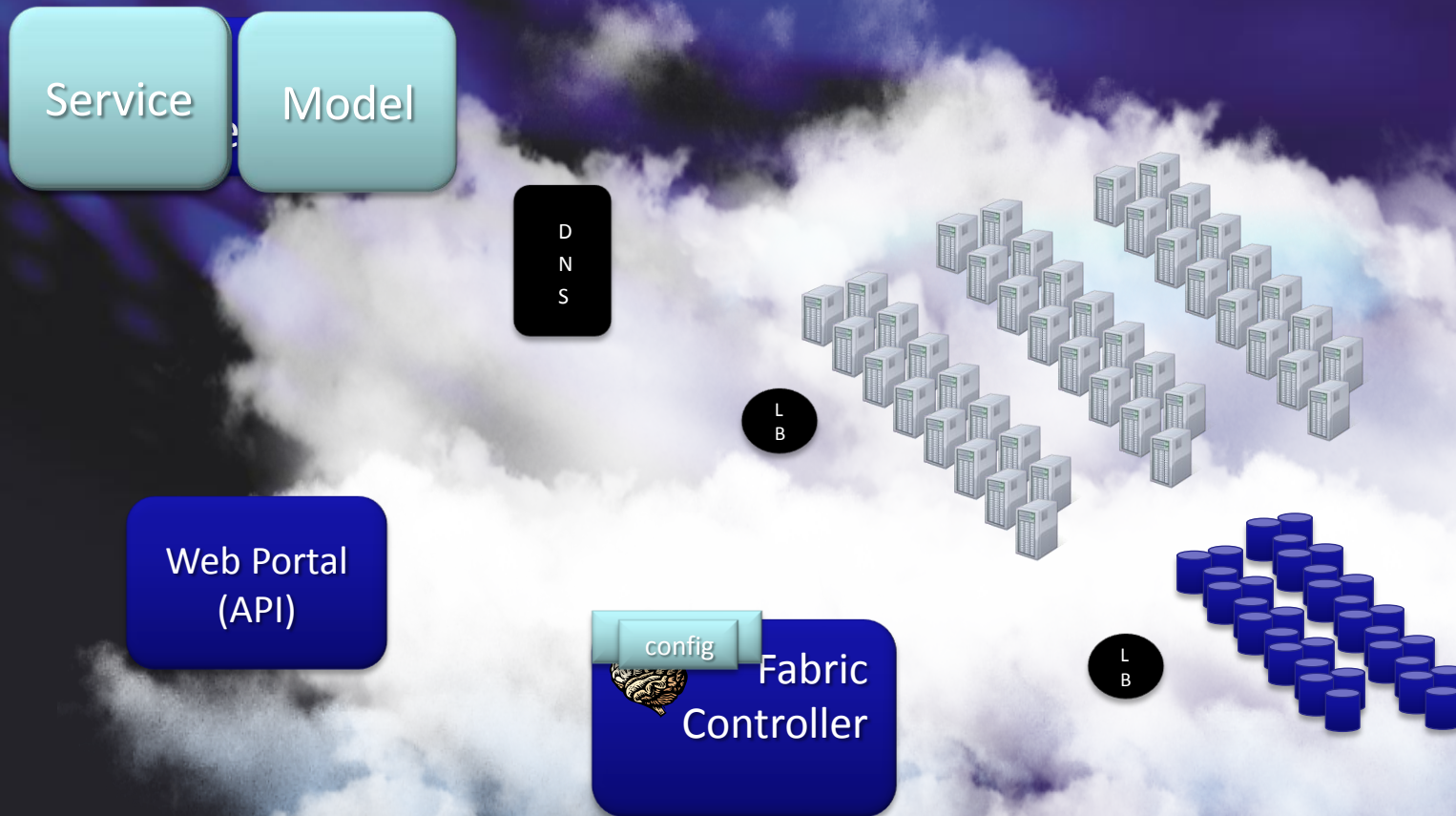
Storage

Management

Windows Azure



Service deployment



Compute come in two flavors

Web Role

- ▶ Windows Server 2008 x64
- ▶ IIS 7
- ▶ ASP.NET 3.5 SP1
- ▶ FastCGI – PHP
- ▶ Native Code
- ▶ Full Trust

Worker Role

- ▶ Windows Server 2008 x64
- ▶ Native Code
- ▶ Full Trust
- ▶ New - Anything goes...



Compute

Storage

Management

Windows Azure Storage

- Blobs, Tables, Queues
- (New) Drives
 - Use standard file system APIs
- Designed for the cloud
 - For easy access, from anywhere
 - For durability
 - For massive scale

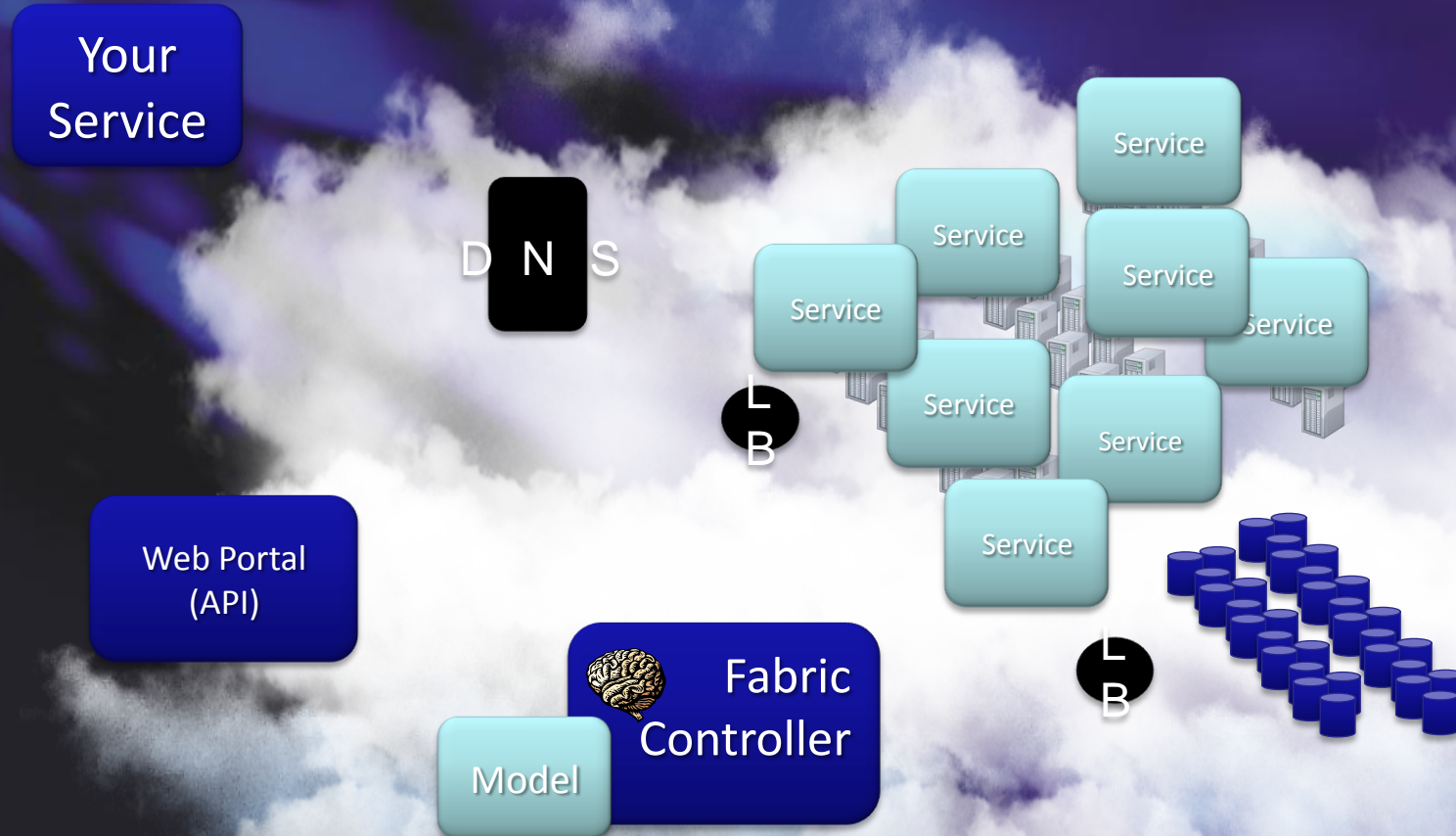


Compute

Storage

Management

Service Scale



Service Monitoring & Recovery

Your
Service

D
N
S

Service

L
B

Service

Service

Web Portal
(API)

Model

Fabric
Controller

L
B



Demo

- > Windows Azure Developer and Deployment Experience 101

Summary : Windows Azure Architecture





Microsoft®
SQL Azure™

Reporting

Business
Analytics

Data Sync



Database

Database

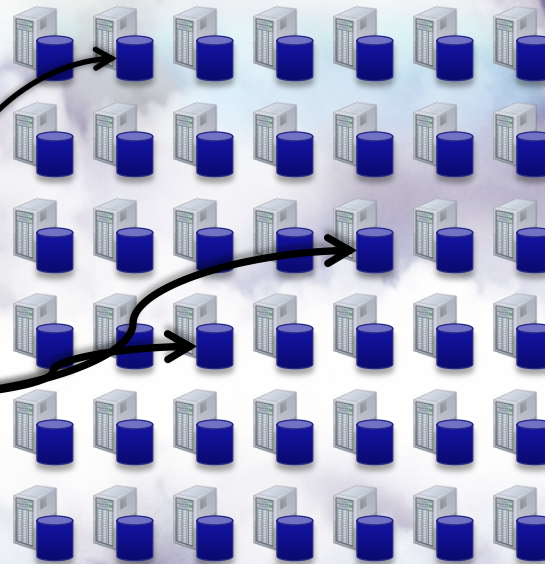
- Relational database, provided as a service
 - Highly symmetrical development and tooling experience (use TDS protocol and T-SQL)
 - Highly scaled out, on commodity hardware
 - Built on the SQL Server technology foundation
- Beyond “hosted database”
 - High availability, DB provisioning, and DB management are provided by the service
 - Pay for what you use

SQL Azure Deployment

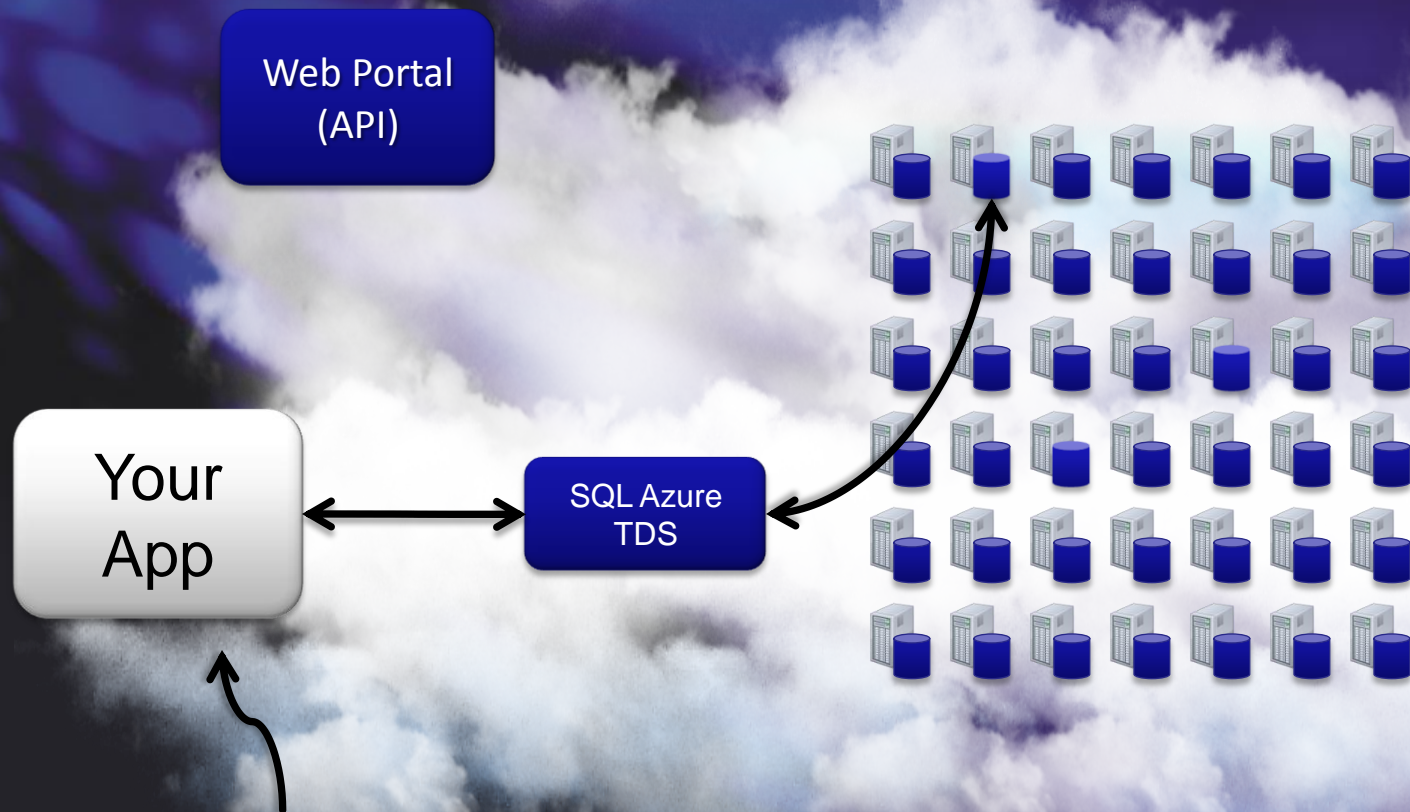
Web Portal
(API)

DB
Script

SQL Azure
TDS



SQL Azure DB access



Change Connection String

Demo

- > SQL Azure – Sign Up and create database

The screenshot displays the Microsoft SQL Azure portal interface. The top navigation bar includes links for Windows Azure, SQL Azure, and .NET Services, along with a user profile for 'Rene' (reneloehde@hotmail.com) with options for Billing and sign out. The left sidebar contains a navigation menu with 'Windows Azure', 'SQL Azure', and '.NET Services' sections. The main content area is titled 'Server Administration' and shows details for a server named 'mv7icmdtvi'. The 'Server Information' section lists the Server Name, Administrator Username (reneloehde), and Server Location (South Central US). Below this, the ADO.NET and ODBC connection strings are provided, both pointing to the 'MySQLAzure' database. The ADO.NET string is 'Server=tcp:mv7icmdtvi.database.windows.net;Database=MySQLAzure;User ID=reneloehde;Password=myPassword;Trusted_Connection=False;' and the ODBC string is 'Driver={SQL Server Native Client 10.0};Server=tcp:mv7icmdtvi.database.windows.net;Database=MySQLAzure;Uid=reneloehde@mv7icmdtvi;Pwd=myPassword;'. Both strings have 'Copy to clipboard' links. At the bottom of the page, there are buttons for 'Connection Strings', 'Test Connectivity', 'Create Database', and 'Drop Database'.

Demo

- > SQL Azure – Familiar SQL Server tooling

Summary SQL Azure

- TDS and SQL supported Cloud RDBMS
- Two sizes 1 GB and 10 GB
- >10 GB ?



Windows® Azure™ platform

AppFabric

Service
Bus

Access
Control

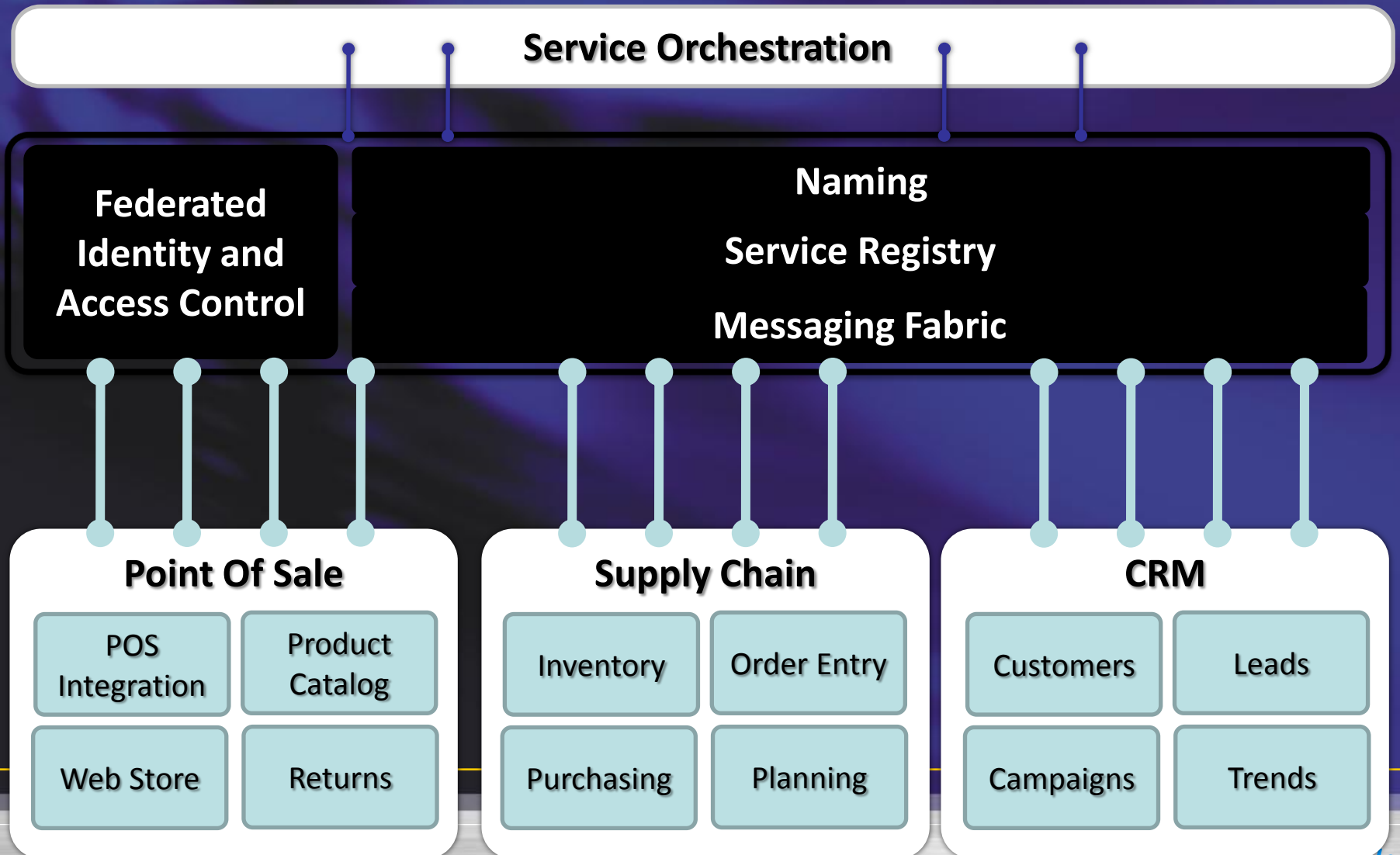


Windows® Azure™ platform

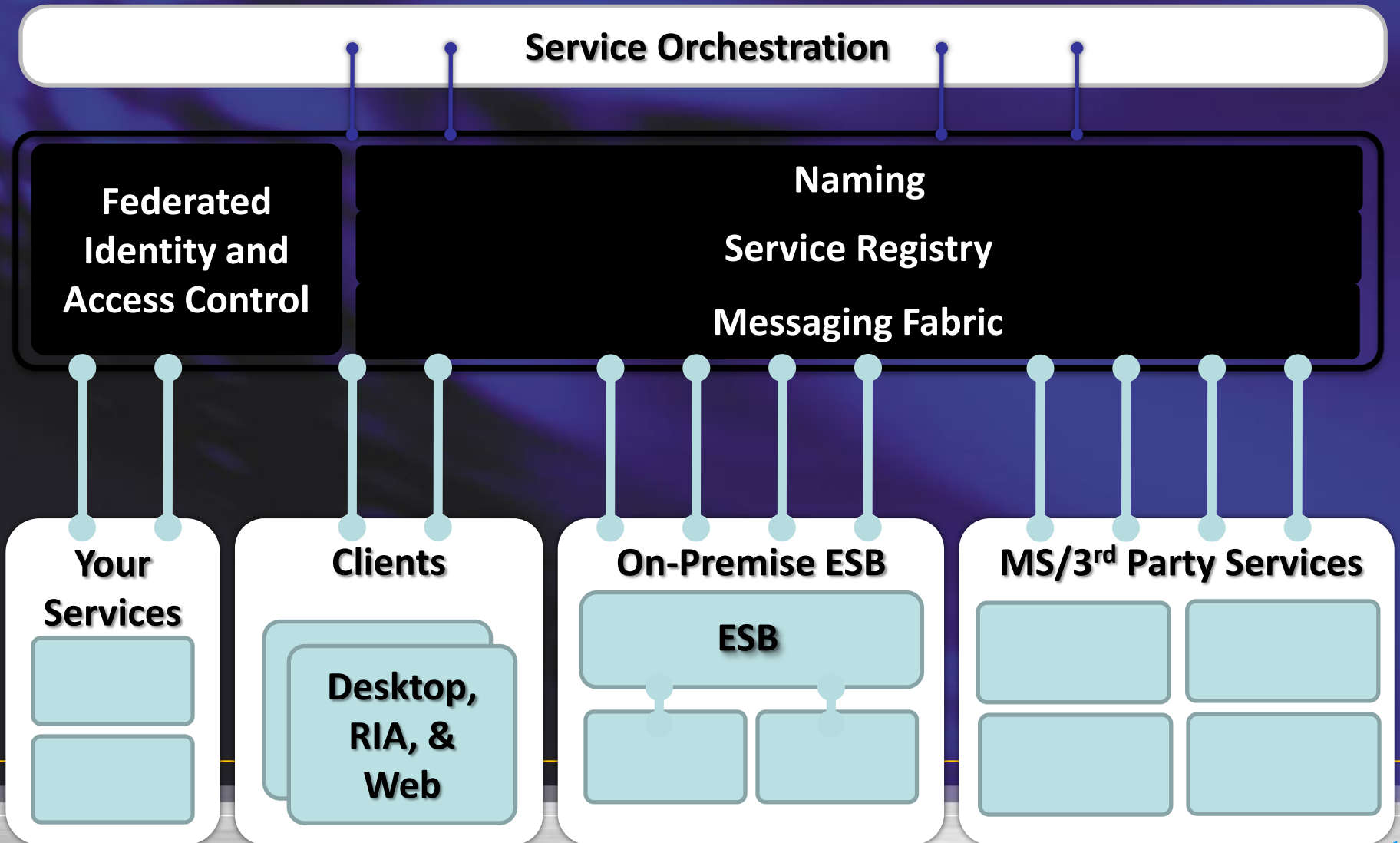
AppFabric

Service
Bus

Enterprise Service Bus



Internet Service Bus



Service Bus

- Securely connect applications
 - Over the internet
 - Across any network topology
 - Across organizational boundaries
- Primary application patterns
 - Eventing:
 - Notify applications and/or devices
 - Service Remoting:
 - Securely project on-premises services out to the cloud
 - Tunneling:
 - App-to-app communication with NAT/Firewall traversal

Service Bus programming model

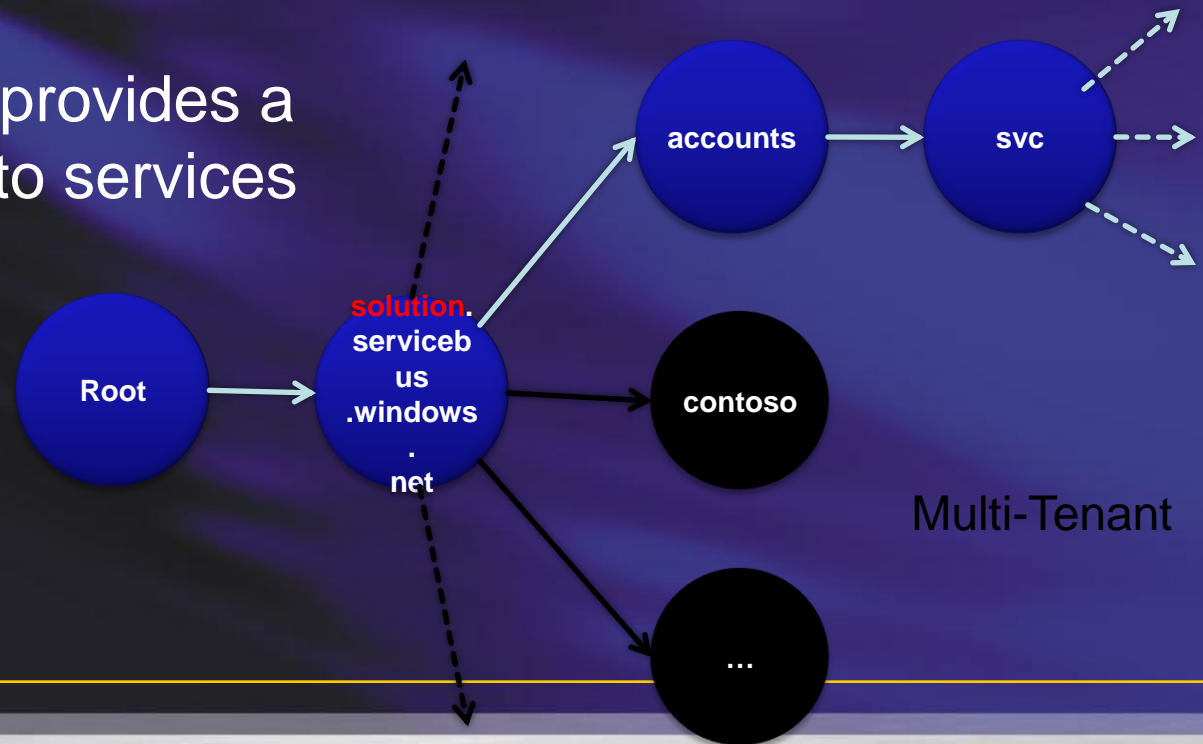
- Primary programming model: WCF
- Windows Communication Foundation like bindings

Service Registry

[http|sb]://**solution**.servicebus.windows.net/accounts/svc/...

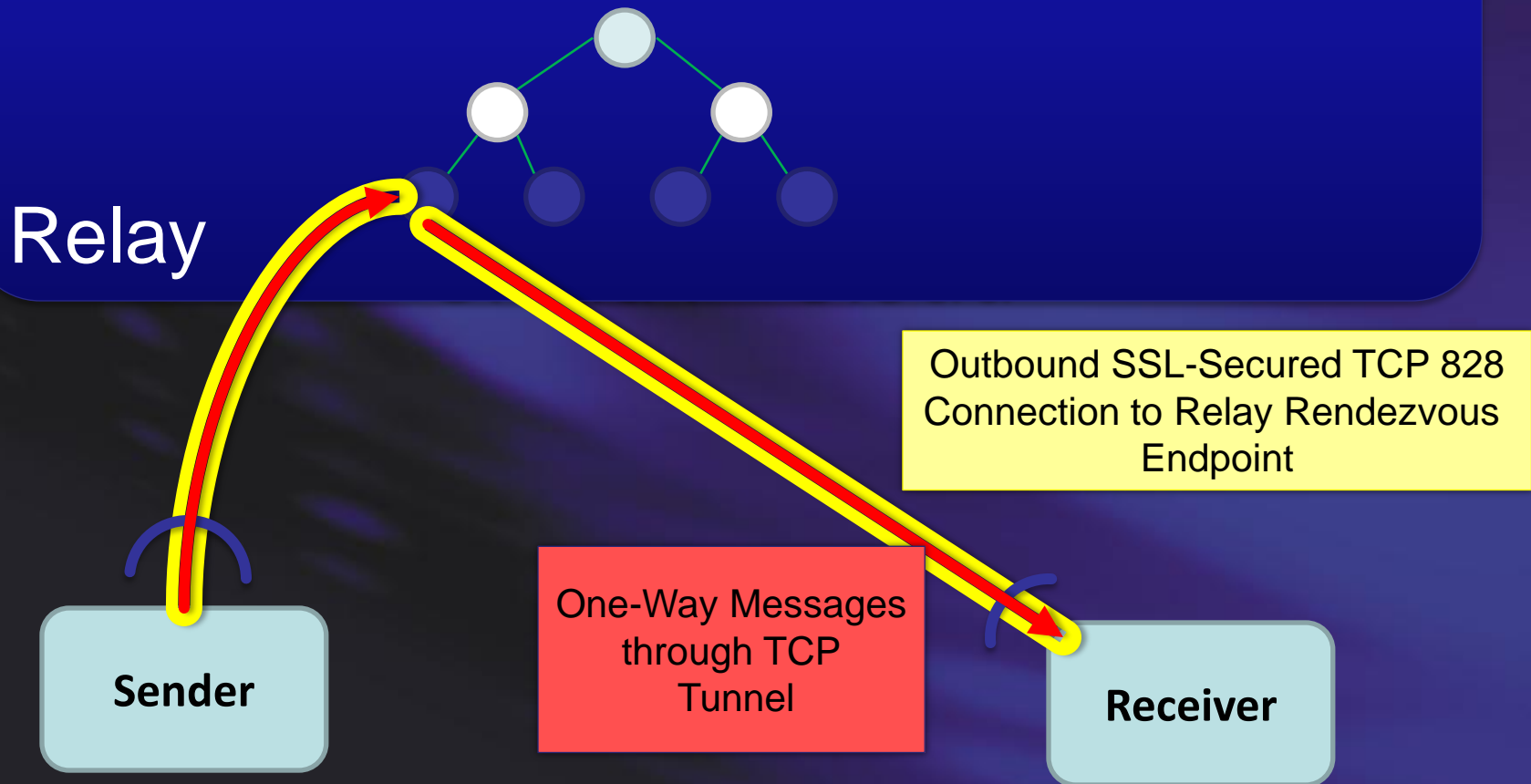
Service Registry Root

The service registry provides a mapping from URIs to services



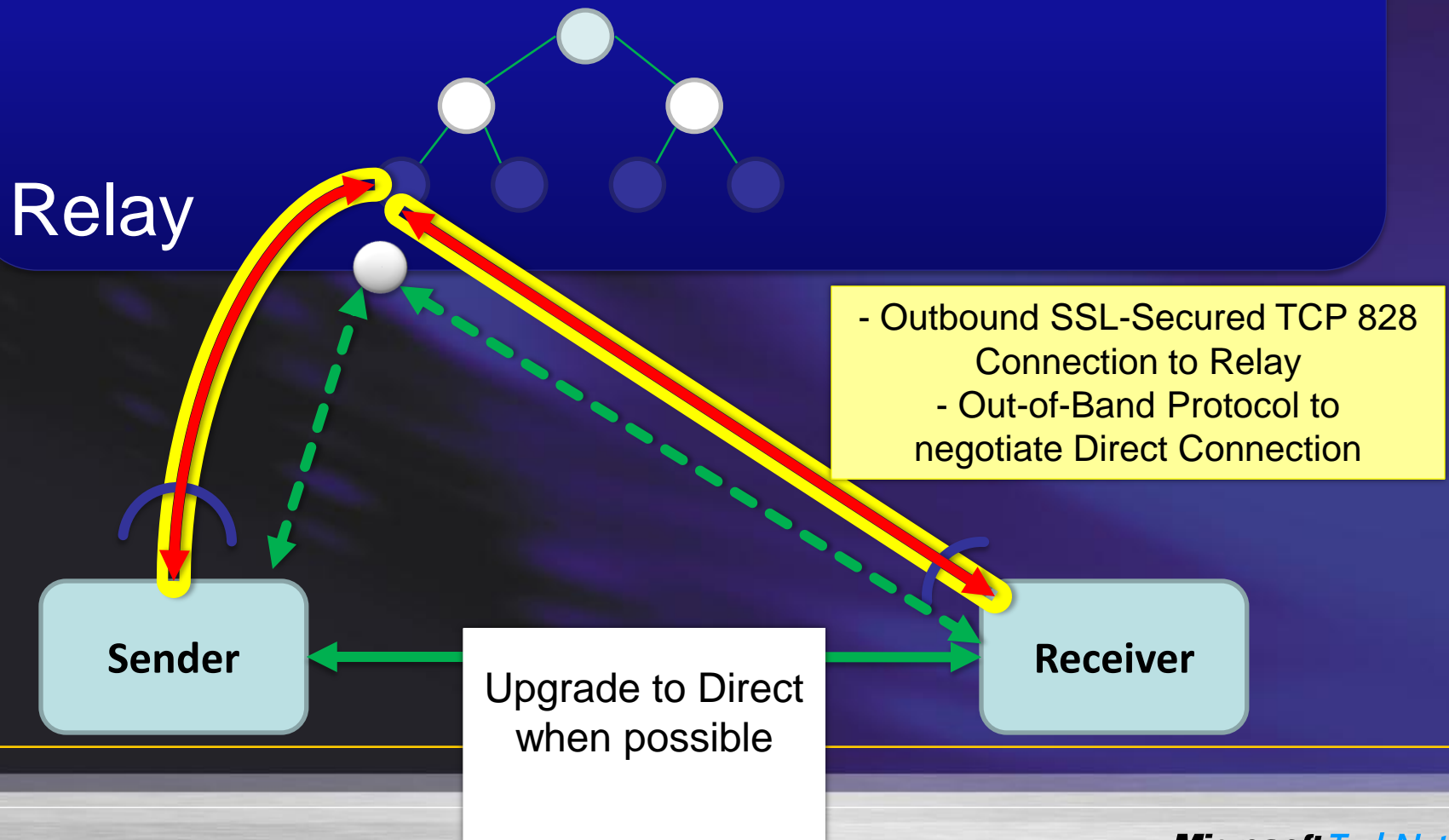
Message pattern ex: One Way

sb://solution.servicebus.windows.net/service/endpoint



Message pattern ex: Direct Connection

sb://solution.servicebus.windows.net/service/endpoint



Other message pattern examples

- Pub/Sub
- Multicast
- ... PortBridge (protocol shifting agent)

Demo

- > Service Bus – one way relay and directed

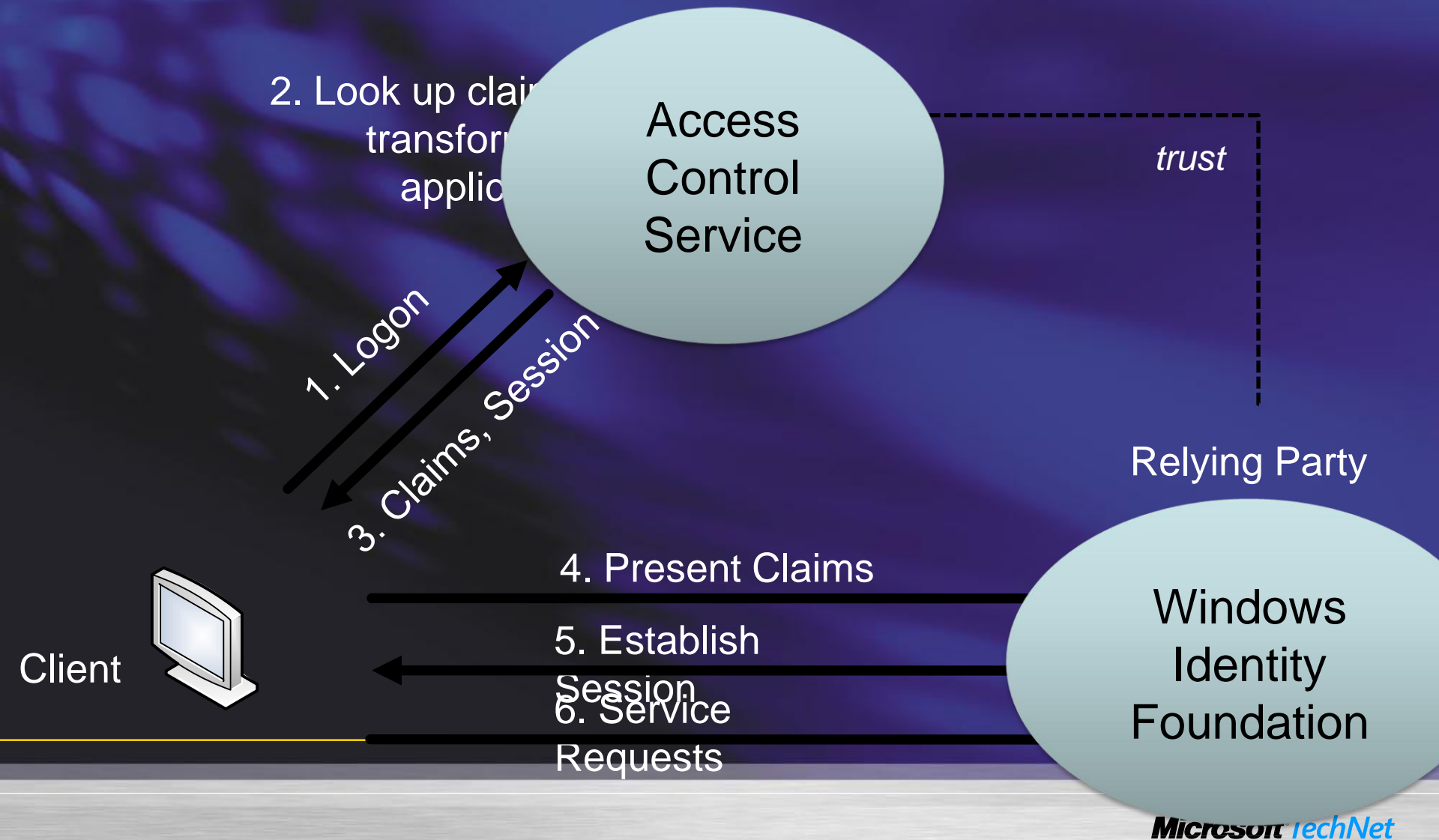


Windows® Azure™ platform

AppFabric

Access
Control

Externalizing Authentication



Access Control Service

- Provides outsourcing of claims-based access control for REST web services
- Key capabilities:
 - Usable from any platform
 - Low friction way to onboard new clients
 - Integrates with AD FS v2
 - Supports WRAP / SWT
 - Enables simple delegation
- Used today by Service Bus and “Dallas”



Windows® Azure™ Platform

Windows Azure Platform



Windows Azure Platform Purchasing Models



Consumption

“Pay as you go and grow”

Available Jan 2010

- Low barrier to entry & flexibility
- Optimized for cloud elasticity



Subscription

“Value for a commitment”

Select offers available Jan 2010

- Discounts for commitment
- Plans for payment predictability



Additional Licensing

“Coordinated purchasing”

Planned for post PDC

- Centralized purchasing experience
- Introduction to volume discounts

Promotional
Offers

Development
Pricing

Partner
Discount

Integration with
Programs

Windows Azure Platform Consumption Prices

Pay as you go and grow for only what you use when you use it



Elastic, scalable, secure, & highly available
automated service platform



Highly available, scalable, and self
managed distributed database service

Compute

Per service hour

\$0.12/hour
+ Variable Instance Sizes

Storage

Per GB stored & transactions

\$0.15 GB/month
\$0.01/10K transactions

Web Edition

Per database/month

\$9.99/month
(up to 1 GB DB/month)

Business Edition

Per database/month

\$99.99/month
(up to 10 GB DB/month)

Windows Azure platform AppFabric Service Bus & Access Control

Scalable, automated, highly available services for secure connectivity

Access Control

Per Message Operation

\$0.015/10k Message Operations

Service Bus

Per Message Operation

\$0.015/10k Message Operations

Windows Azure Instance Sizes

Variable instance sizes to handle complex workloads of any size

Small

\$0.12

Per service hour

Medium

\$0.24

Per service hour

Large

\$0.48

Per service hour

X Large

\$0.96

Per service hour

Unit of Compute Defined

Equivalent compute capacity of a 1.6Ghz processor (on 64bit platform)

Small

1 x 1.6Ghz
(moderate IO)

1.75 GB memory
250 GB storage
(instance storage)

Medium

2 x 1.6Ghz
(high IO)

3.5 GB memory
500 GB storage
(instance storage)

Large

4 x 1.6Ghz
(high IO)

7.0 GB memory
1000 GB storage
(instance storage)

X-Large

8 x 1.6Ghz
(high IO)

14 GB memory
2000 GB
(instance storage)

Windows Azure Platform Data Transfer

Priced per GB transferred/month (prices shown in USD)

North America Region

\$0.10 GB Ingress

\$0.15 GB Egress

N. Central – US
Sub-region



S. Central - US
Sub-region



Europe Region

\$0.10 GB Ingress

\$0.15 GB Egress

N. Europe
Sub-region



W. Europe
Sub-region



Asia Pacific Region

\$0.30 GB Ingress

\$0.45 GB Egress

E. Asia
Sub-region



S.E. Asia
Sub-region



No Charge For Off Peak Ingress Promotion (ends 6/30/10)

On-board to Windows Azure platform at no charge

Off peak times defined as: 10pm-6am Mon-Fri & from 10pm-Fri to 6am-Mon for weekends in each designated regional time zones below

North America
PST = UTC-8

Europe
WET = UTC

Asia Pacific
SST = UTC+8

Monthly Service Level Agreement

Compute connectivity

- Your service is connected & reachable via web
- Internet facing roles will have external connectivity

>99.95%

Instance monitoring & restart

- All running roles will be continuously monitored
- If role is unhealthy we will detect & initiate corrective state

>99.9%

Storage availability

- Storage service will be available/ reachable (connectivity)
- Your storage requests will be processed successfully

>99.9%

Database availability

- Database is connected to the internet gateway
- All databases will be continuously monitored

>99.9%

Service bus & Access control availability

- Service bus & access control endpoints will have external connectivity
- Message operation requests processed successfully

>99.9%

Support For Customers & Partners

Online Self Help

Assisted Support

Windows Azure Platform Portal
(<http://azure.com>)

Customer Care
(no charge 24/7 phone access)

Service Dashboard
(available to all users)

Developer Support
(paid developer support)

Public Forums
(available to all users)

Premier Windows Azure Platform
(now fully integrated)

Microsoft Developer Network (MSDN) & Microsoft Partner Network (MPN) Benefits

Managed forums w/ response SLA, incident support, advanced technical guidance, & training

Summary

- Windows Azure Platform is PaaS
- Windows Azure Platform components
 - Windows Azure
 - SQL Azure
 - AppFabric
- Developer/ Management Experience is/ to be “as you know it”
- Pricing and SLA known

PDC Ressources



Windows® Azure™ Platform

Windows Azure

- [Lap Around the Windows Azure Platform](#)
- [Bridging the Gap from On-Premises to the Cloud](#)
- [Developing PHP and MySQL Applications with Windows Azure](#)
- [Windows Azure Tables and Queues Deep Dive](#)
- [Windows Azure Blob and Drive Deep Dive](#)
- [Patterns for Building Scalable and Reliable Applications with Windows Azure](#)
- [Windows Azure Monitoring, Logging, and Management APIs](#)
- [Using the Microsoft Sync Framework to Connect Apps to the Cloud](#)
- [Windows Azure Present and Future](#)
- [Building Java Applications with Windows Azure](#)
- [The Business of Windows Azure: What you should know about Windows Azure Platform pricing and SLAs](#)
- [Tips and Tricks for Using Visual Studio 2010 to Build Applications that Run on Windows Azure](#)
- [Introduction to Building Applications with Windows Azure](#)
- [Developing Advanced Applications with Windows Azure](#)
- [Automating the Application Lifecycle with Windows Azure](#)

SQL Azure

- [SQL Azure Database: Present and Future](#)
- [The Future of Database Development with SQL Azure](#)
- [Development Best Practices and Patterns for Using Microsoft SQL Azure Databases](#)
- [Enrich your Applications with Data from Microsoft Project Code Name "Dallas"](#)
- [Scaling out Web Applications with Microsoft SQL Azure Databases](#)
- [Microsoft SQL Azure Database: Under the Hood](#)

Service Bus

- [Windows Identity Foundation Overview](#)
- [REST Services Security Using the Access Control Service](#)
- [Enabling Single Sign-On to Windows Azure Applications](#)
- [Building Hybrid Cloud Applications with Windows Azure and the Service Bus](#)

Customer / Partner Discussions

- [Lessons Learned: Migrating Applications to the Windows Azure Platform](#)
- [Lessons Learned: Building On-Premises and Cloud Applications with the Service Bus and Windows Azure](#)
- [Lessons Learned: Building Multi-Tenant Applications with the Windows Azure Platform](#)
- [Lessons Learned: Building Scalable Applications with the Windows Azure Platform](#)
- [Coming Together in the Cloud](#)

Other

- [Software + Services Identity Roadmap Update](#)
- [Software in the Energy Economy](#)
- [Petabytes for Peanuts! Making Sense out of "Ambient" Data](#)
- [Data Programming and Modeling for the Microsoft .NET Developer](#)
- [Developing REST Applications with the .NET Framework](#)
- [Microsoft Perspectives on the Future of Programming](#)



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