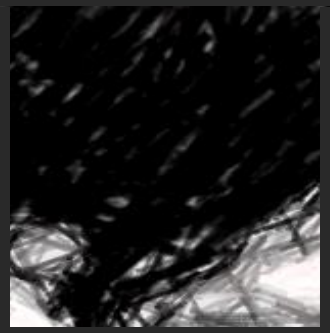
cloud strategy day

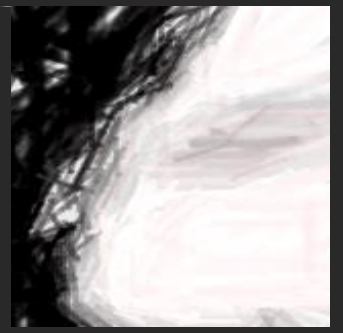
"How the Microsoft cloud enables the best App experiences across devices"

beat schwegler - director, platform strategy group, Microsoft corp.
beatsch@microsoft.com - http://cloudbeatsch.com - @cloudbeatsch

agenda

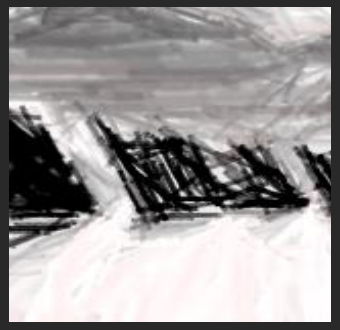
Microsoft's devices and services strategy





making money with apps

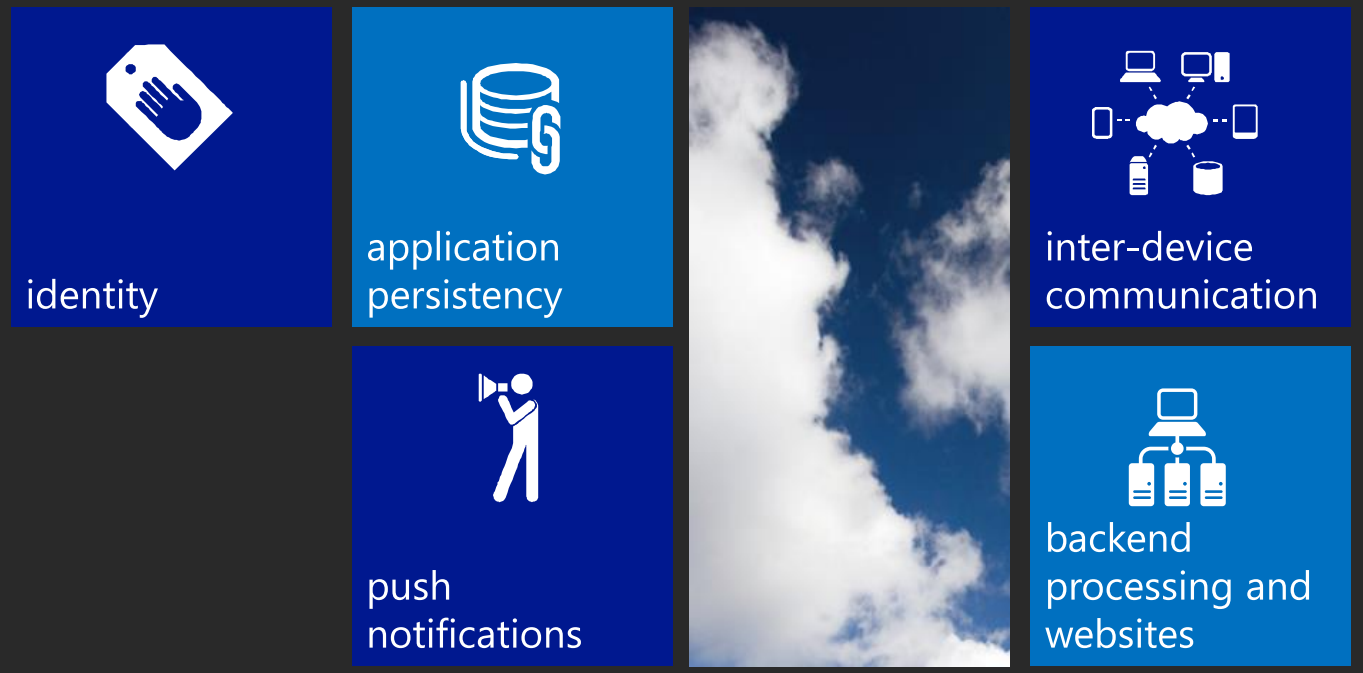
cloud enabled app scenarios with Windows Azure



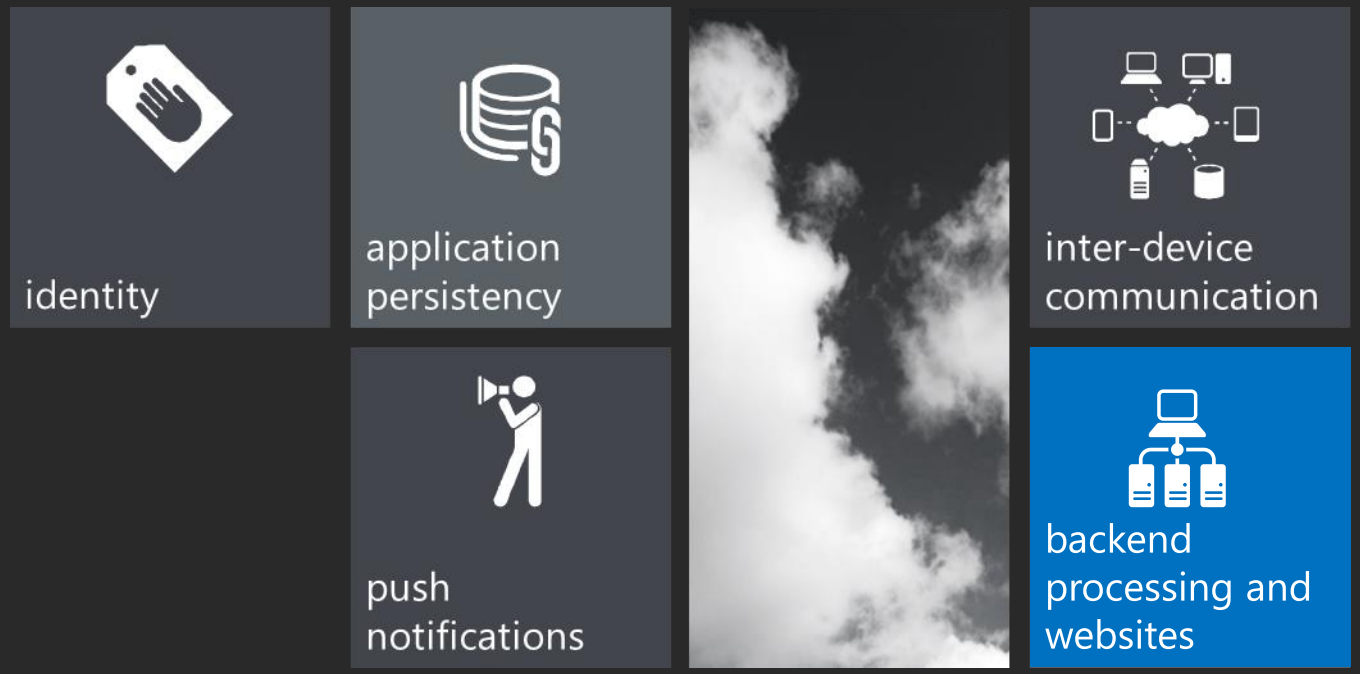
key architectural considerations

chapter III

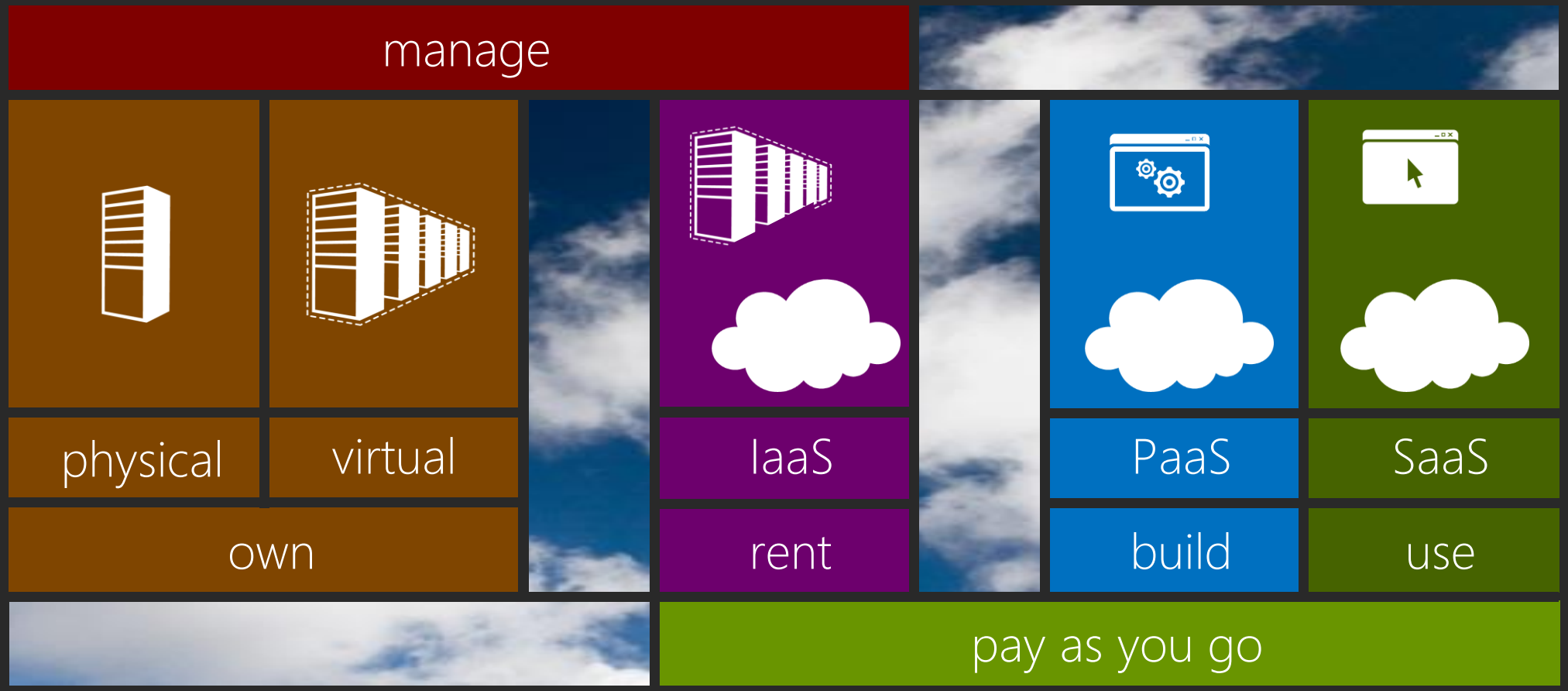
core cloud capabilities



core cloud capabilities



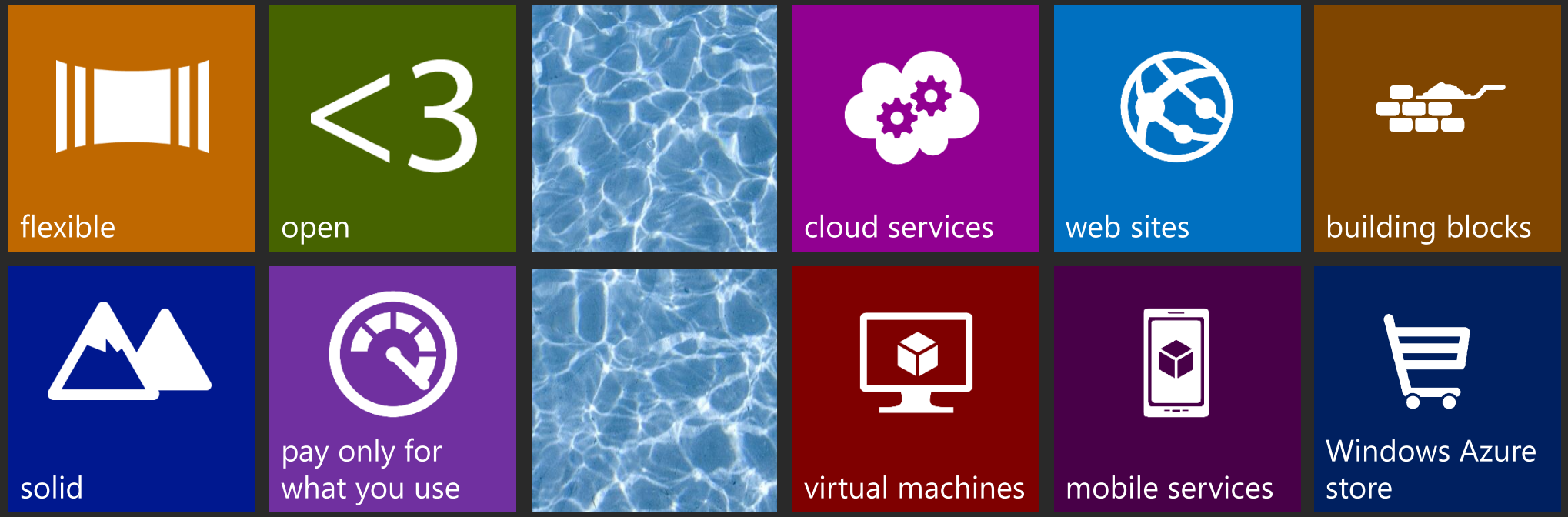
spectrum of IT services



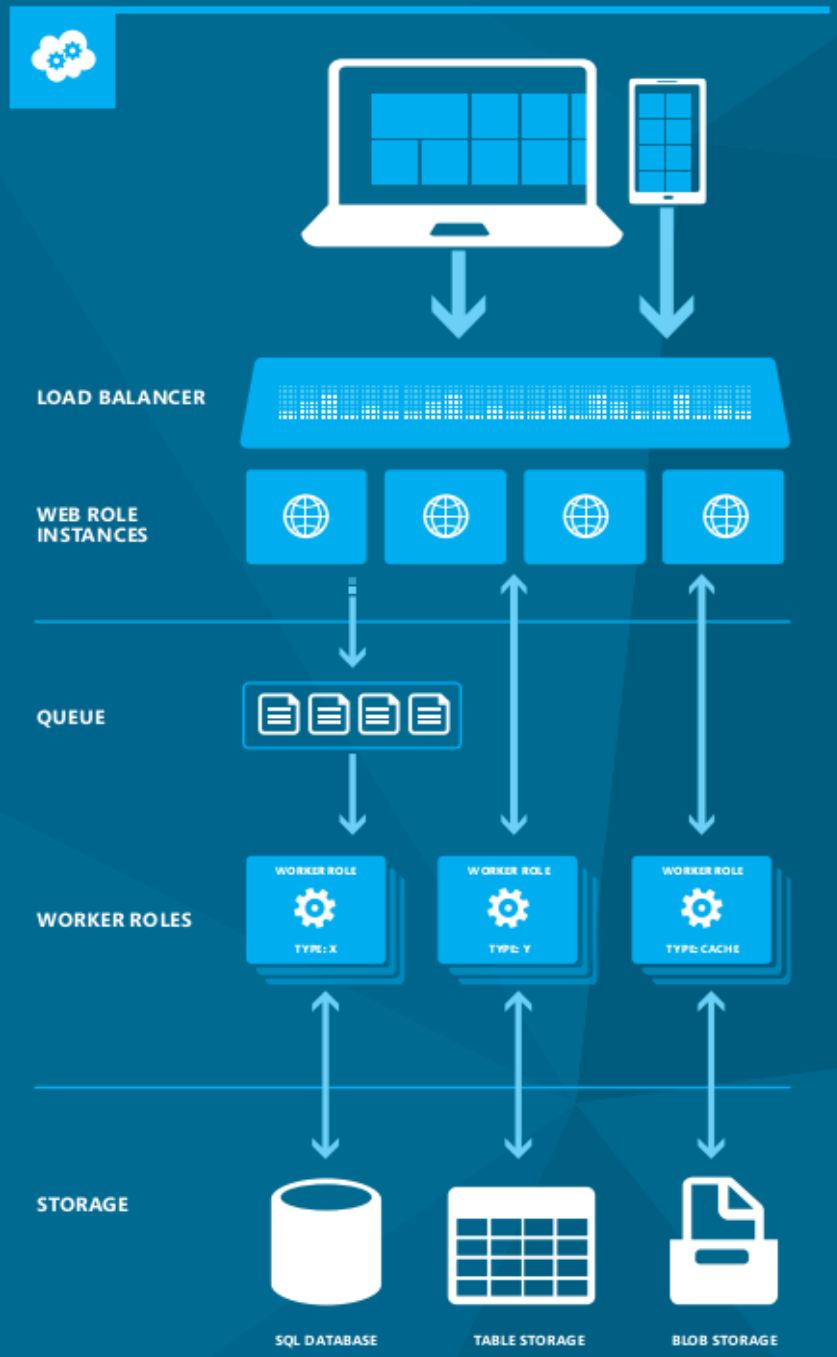
Microsoft cloud datacenters

Microsoft cloud platform

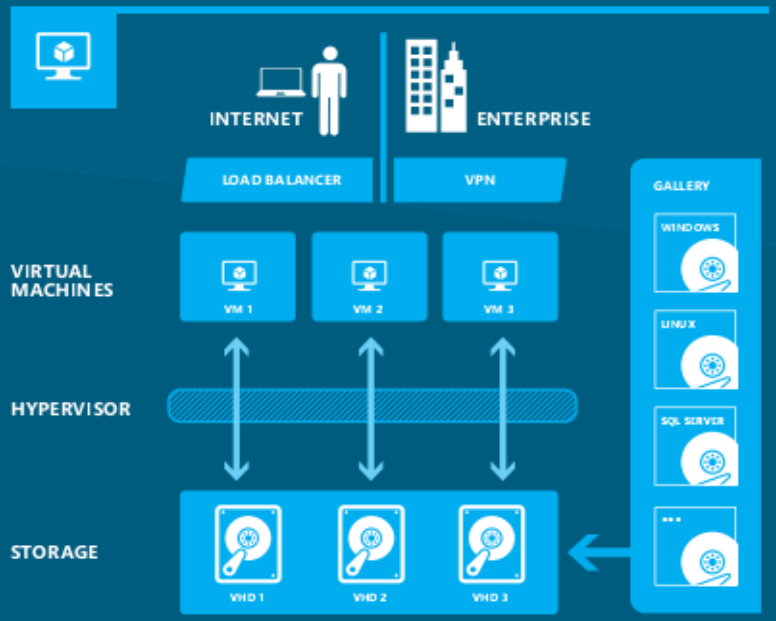
Windows Azure



CLOUD SERVICES

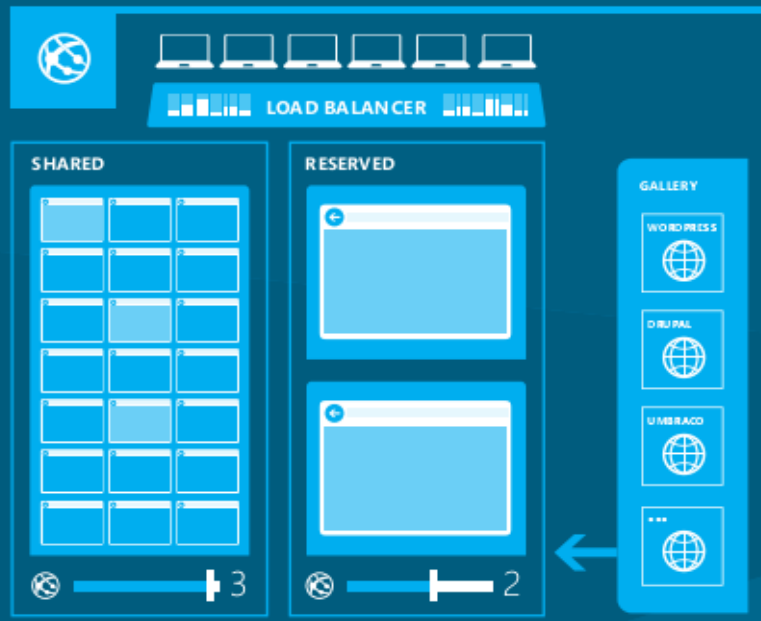


VIRTUAL MACHINES



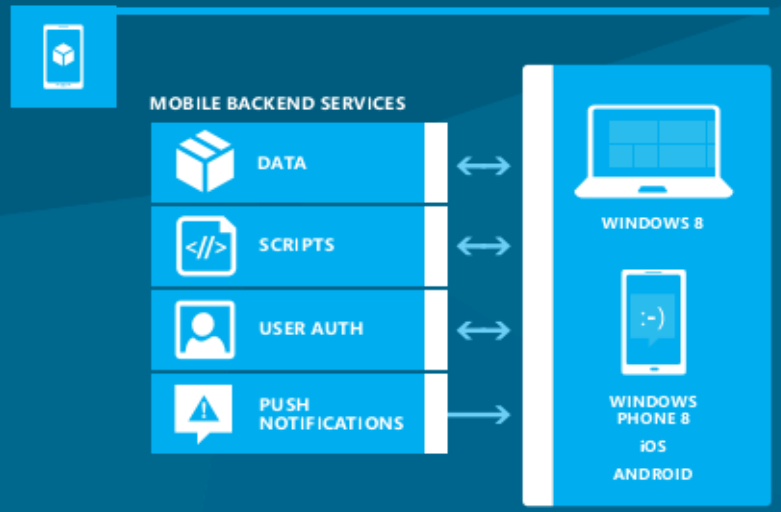
Virtual Machines can run both Windows and Linux operating systems. Create VMs from Virtual Hard Disk images stored as blobs. Create VHDs locally and upload them, choose from a stock gallery or modify a running VM and save the image to your personal gallery.

WEB SITES

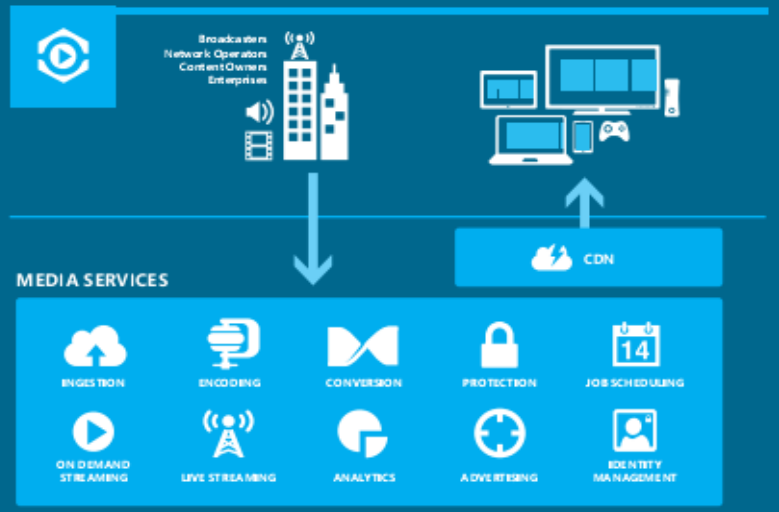


With Web Sites, you can share space in a VM or reserve an entire machine for your web site. You can create sites with both SQL Database and MySQL databases, as well as deploy popular open source software from a gallery. You can use the slider on the Windows Azure portal to scale out to more instances.

MOBILE SERVICES

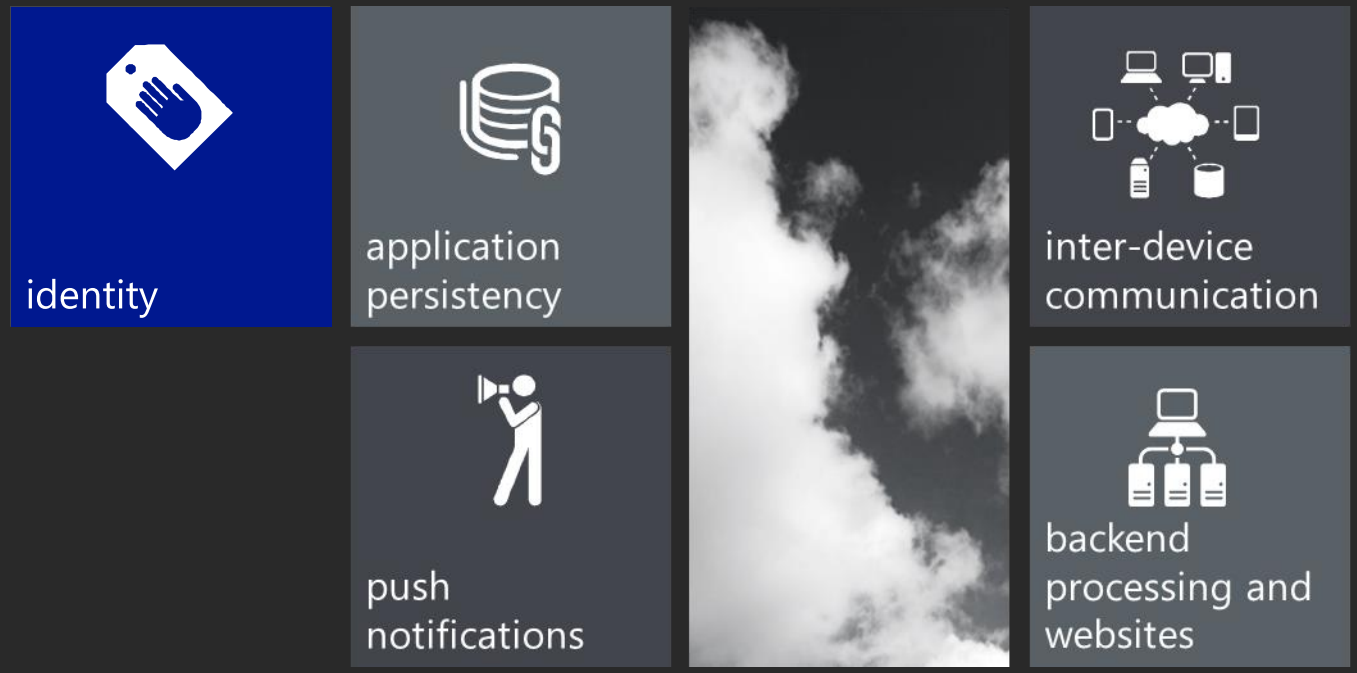


MEDIA SERVICES

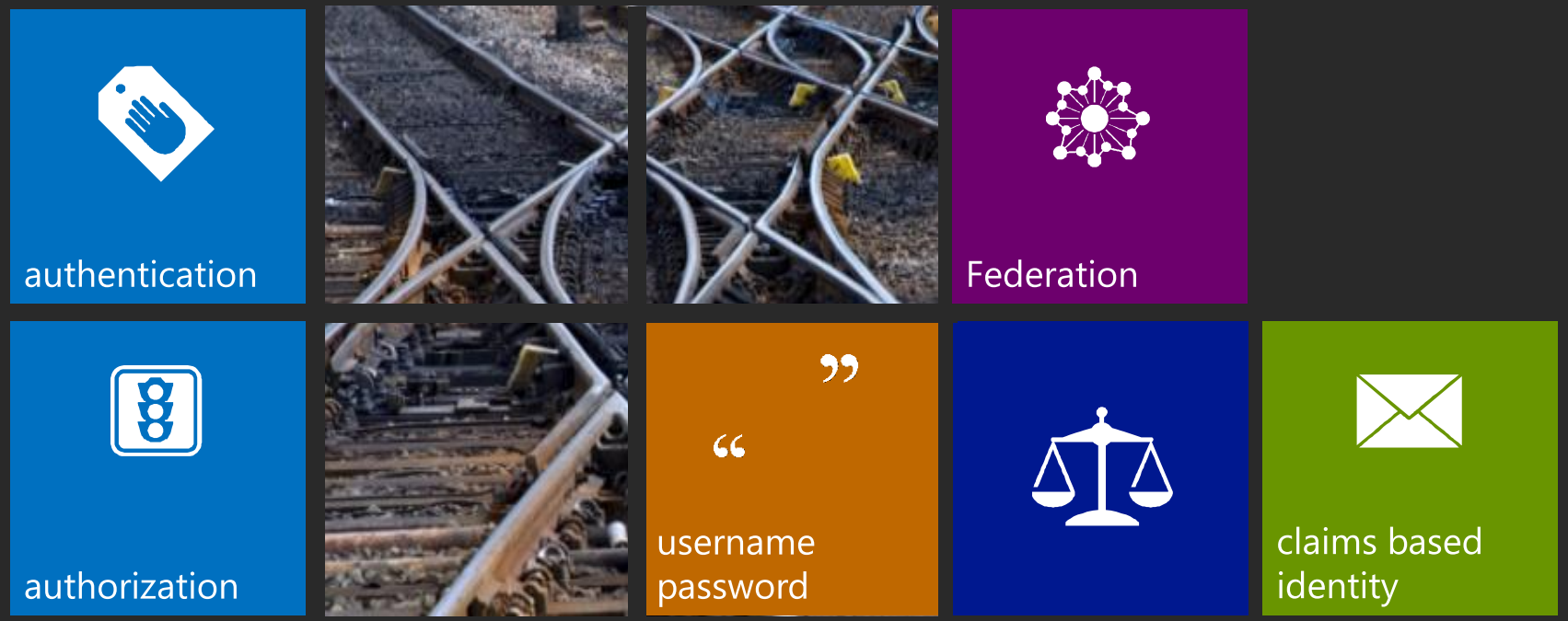


demo:
Windows Azure

core cloud capabilities

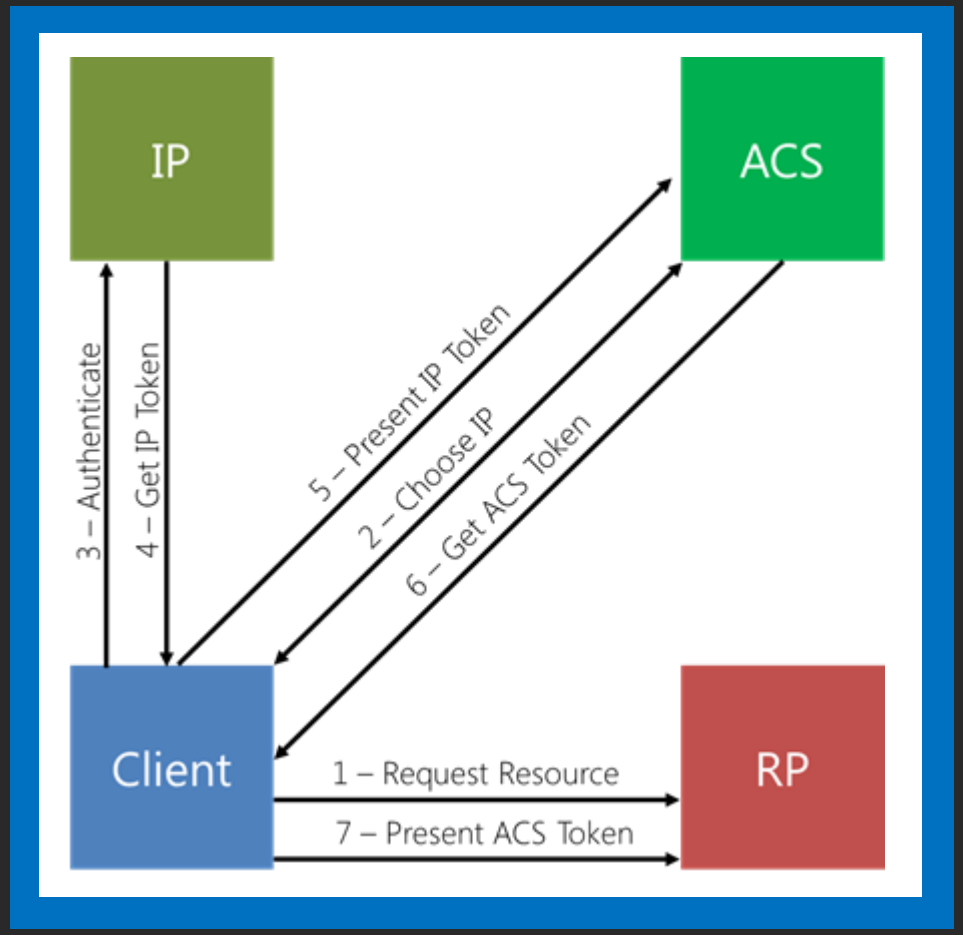


identity


authentication
Federation
authorization
username
password
claims based
identity

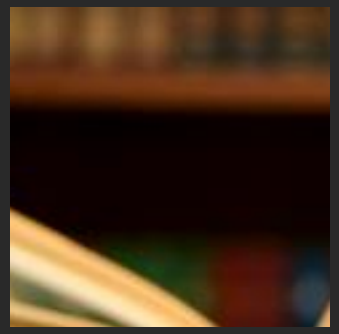
demo:
Access Control
Service in
MargieTravel

Access Control Service (ACS)



Windows Azure Active Directory

REST based service in the cloud

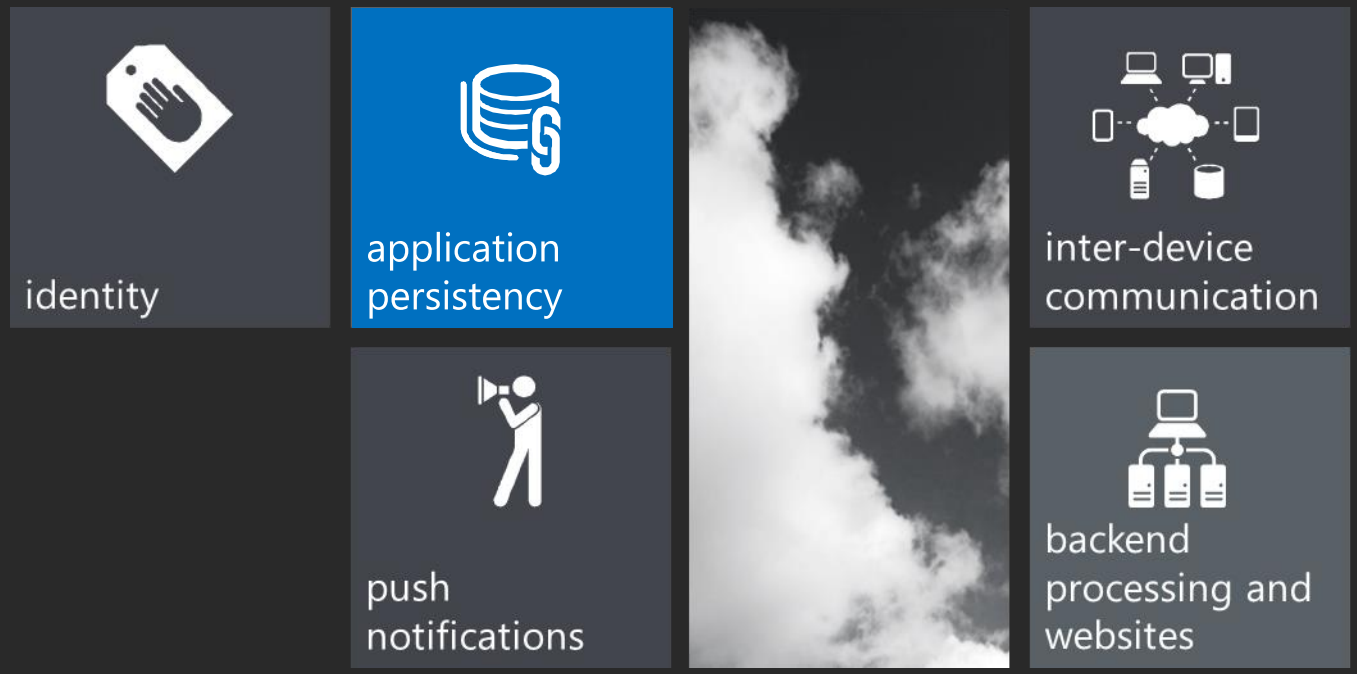


Microsoft Office 365, Dynamics CRM Online, Windows Intune…

single sign on across cloud applications

cross company social connections

core cloud capabilities



storage options

tables

non-relational structured storage
massive scale-out

blobs

big files

queues

persistent async messaging
enqueue, dequeue

SQL
database

relational database
highly available
managed for you as a service

Windows Azure mobile services

easily build cloud back-ends

data, identity management, push notifications

Windows 8, Windows Phone, iOS

demo:
Windows Azure
Mobile Services

big data

what is big?

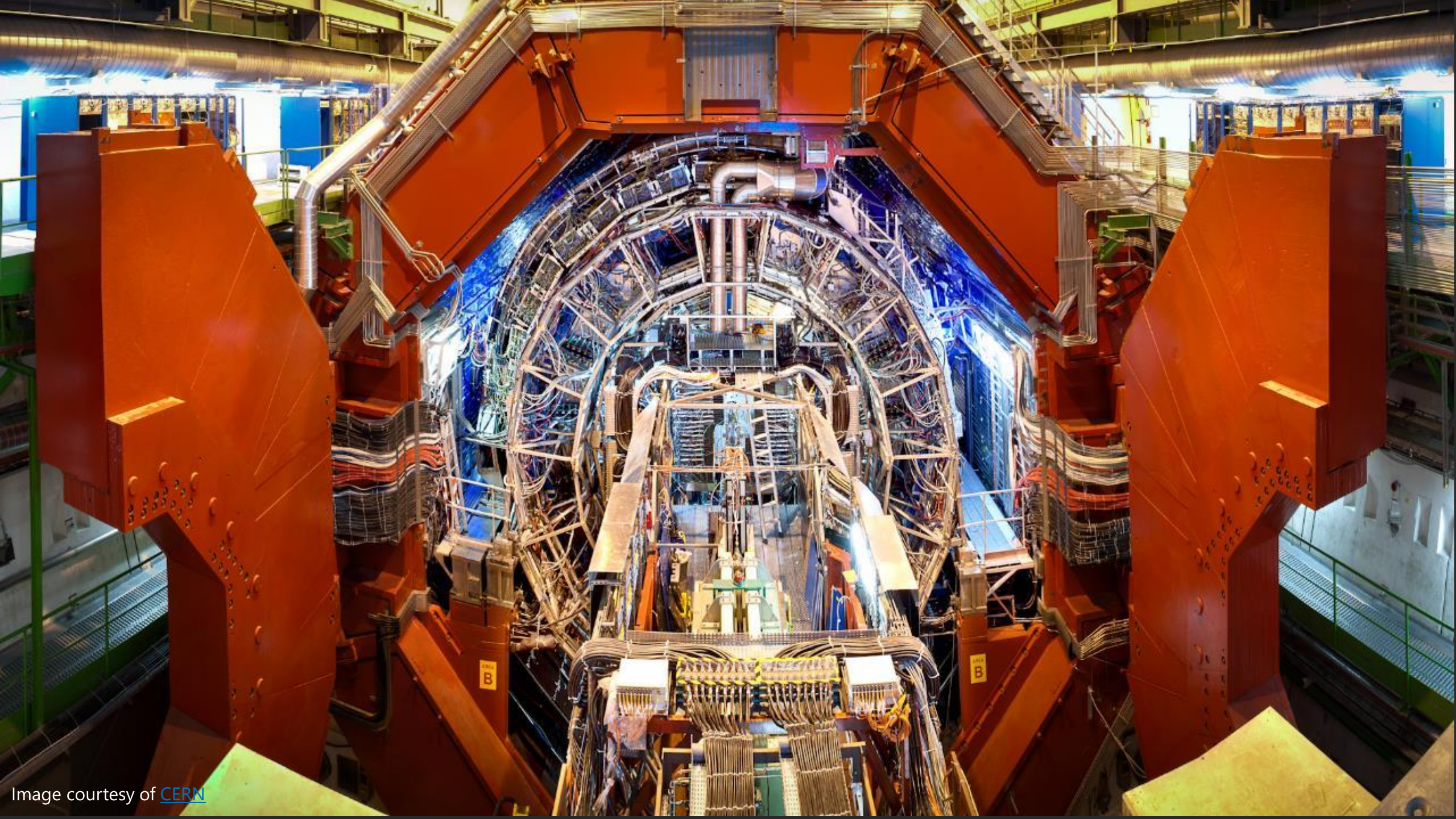
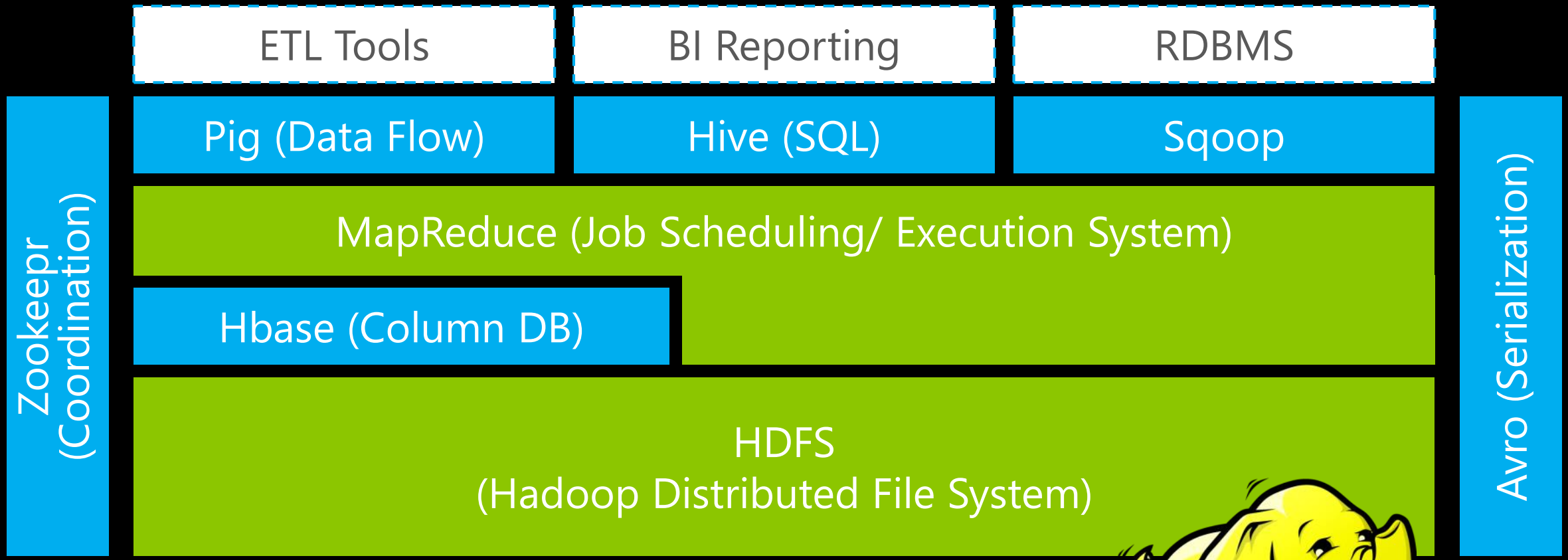


Image courtesy of CERN

the large hadron collider produces
1 PB/sec

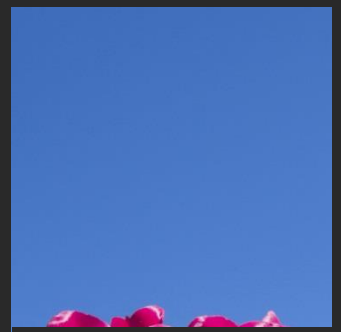
big data basics
move compute to data

the hadoop ecosystem



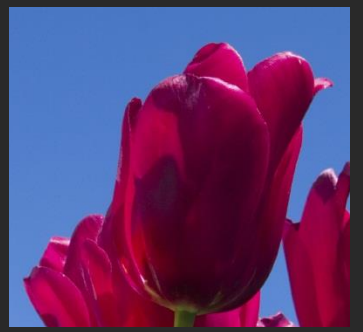
Reference: Tom White's Hadoop: The Definitive Guide

MapReduce

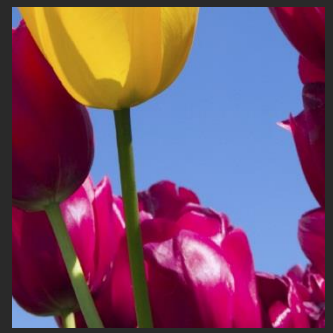


framework schedules map tasks to process input and generate key/value pairs

```
var map = function (key, value, context) {
    var words = value.split(/[^a-zA-Z]/);
    for (var i = 0; i < words.length; i++) {
        if (words[i] !== "") {
            context.write(words[i].toLowerCase(), 1);
        }
    }
};
```



framework splits data into independent datasets for parallel execution



framework sorts map output and schedules reduce tasks which emit key/value pairs

```
var reduce = function (key, values, context) {
    var sum = 0;
    while (values.hasNext()) {
        sum += parseInt(values.next());
    }
    context.write(key, sum);
};
```

MapReduce

functionally

Map f(k1,v1) ➔ list(k2,v2)

Reduce f(k2, list(v2)) ➔ (k2, v3)

in code

```
var map = function (key, value, context) {
    var words = value.split(/[^a-zA-Z]/);
    for (var i = 0; i < words.length; i++) {
        if (words[i] !== "") {
            context.write(words[i].toLowerCase(), 1);
        }
    }
};

var reduce = function (key, values, context) {
    var sum = 0;
    while (values.hasNext()) {
        sum += parseInt(values.next());
    }
    context.write(key, sum);
};
```

in practice, WordCount

The quick brown fox jumps over the lazy dog

Map

(the,1) (quick,1), (brown,1), (fox,1), (jumps,1) (over,1), (the,1),(lazy,1),(dog,1)

Shuffle

(the,(1,1)) (quick,1), (brown,1), (fox,1),(jumps,1) (over,1),(lazy,1),(dog,1)

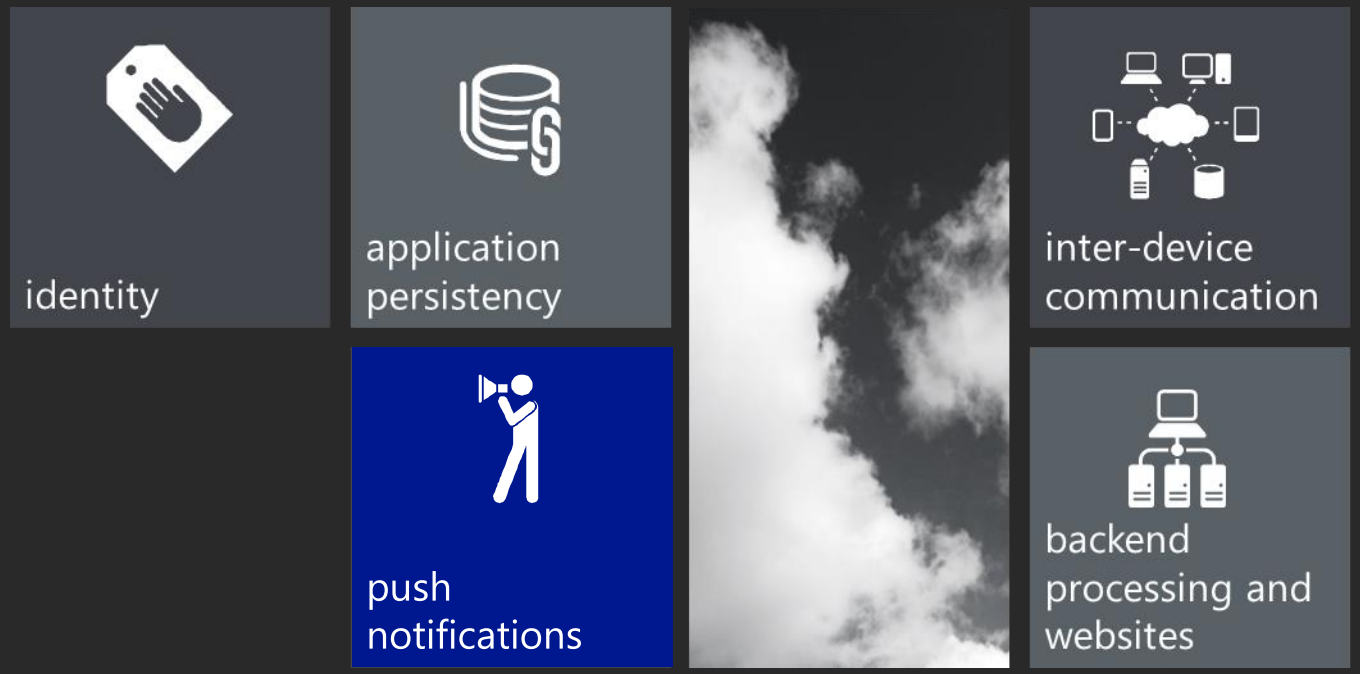
Reduce

(the,2) (quick,1), (brown,1), (fox,1), (jumps,1),(over,1), (lazy,1),(dog,1)

Then, scale to TB/PB of data over 10's, 100's or 1000's of nodes

demo:
Windows Azure
big data

core cloud capabilities

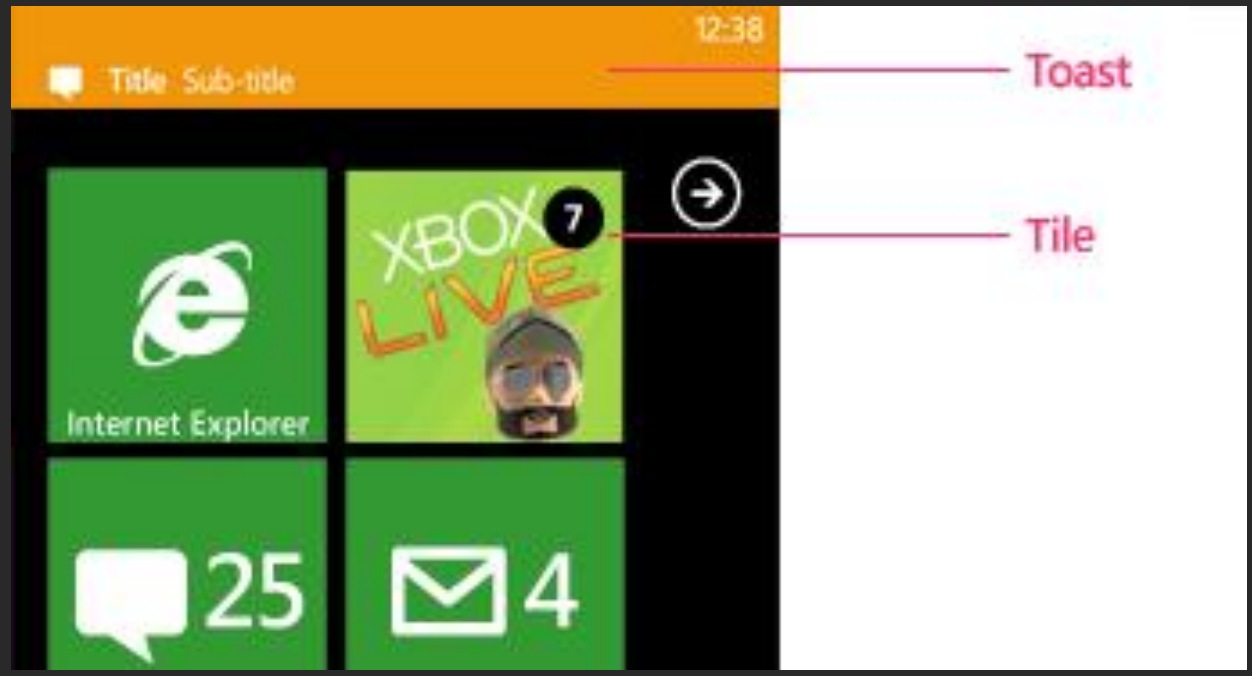


push notifications

single connecting between the device and the notification service

bandwidth- and battery-friendly

no guarantee of delivery



different platforms – different services

Windows 8

Windows Push Notification Service (WNS)

Windows Phone

Microsoft Push Notification Service (MPNS)

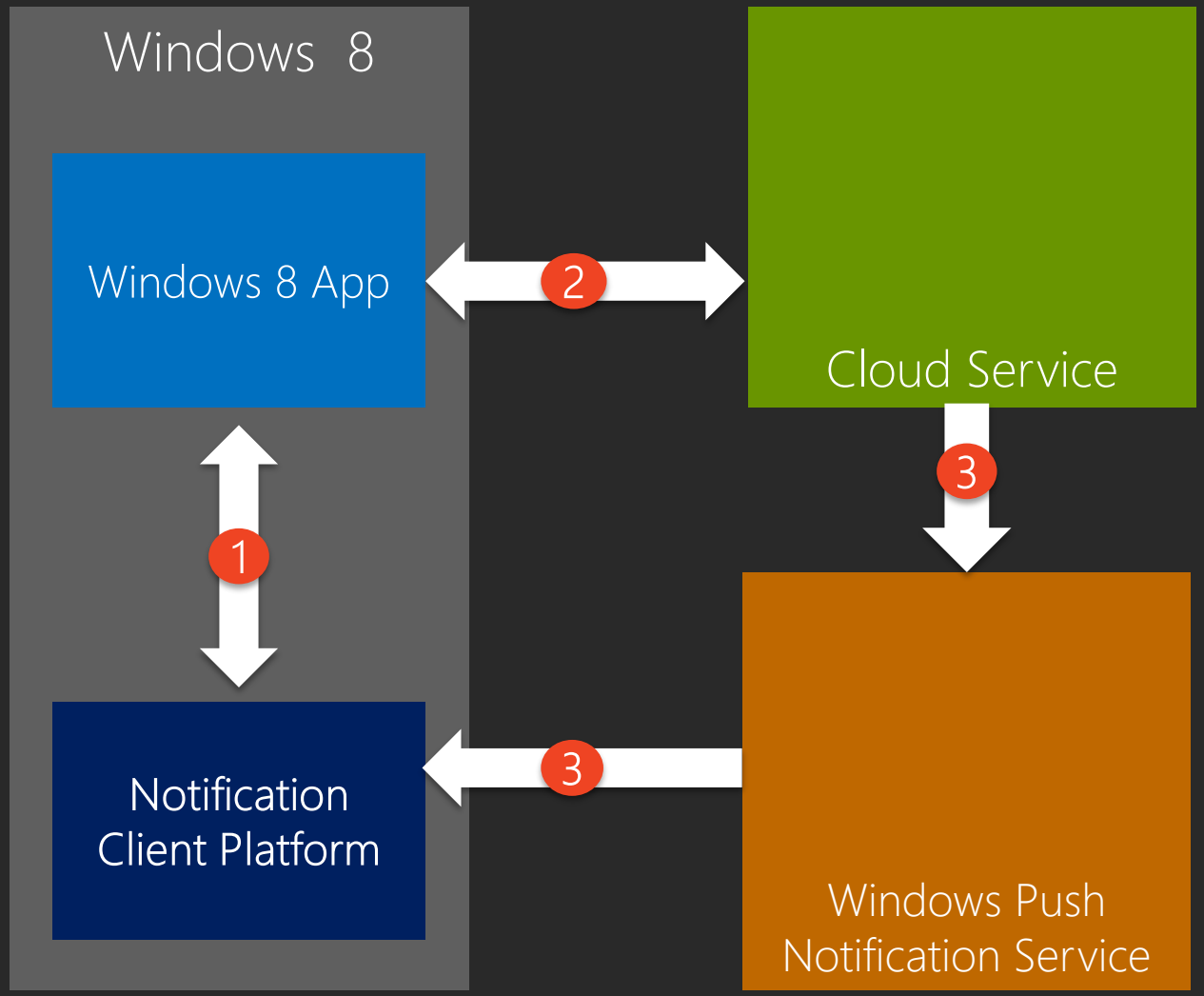
iOS

Apple Push Notification Service (APNS)

Android

Cloud To Device Messaging (C2DM)

overview push notification Windows 8

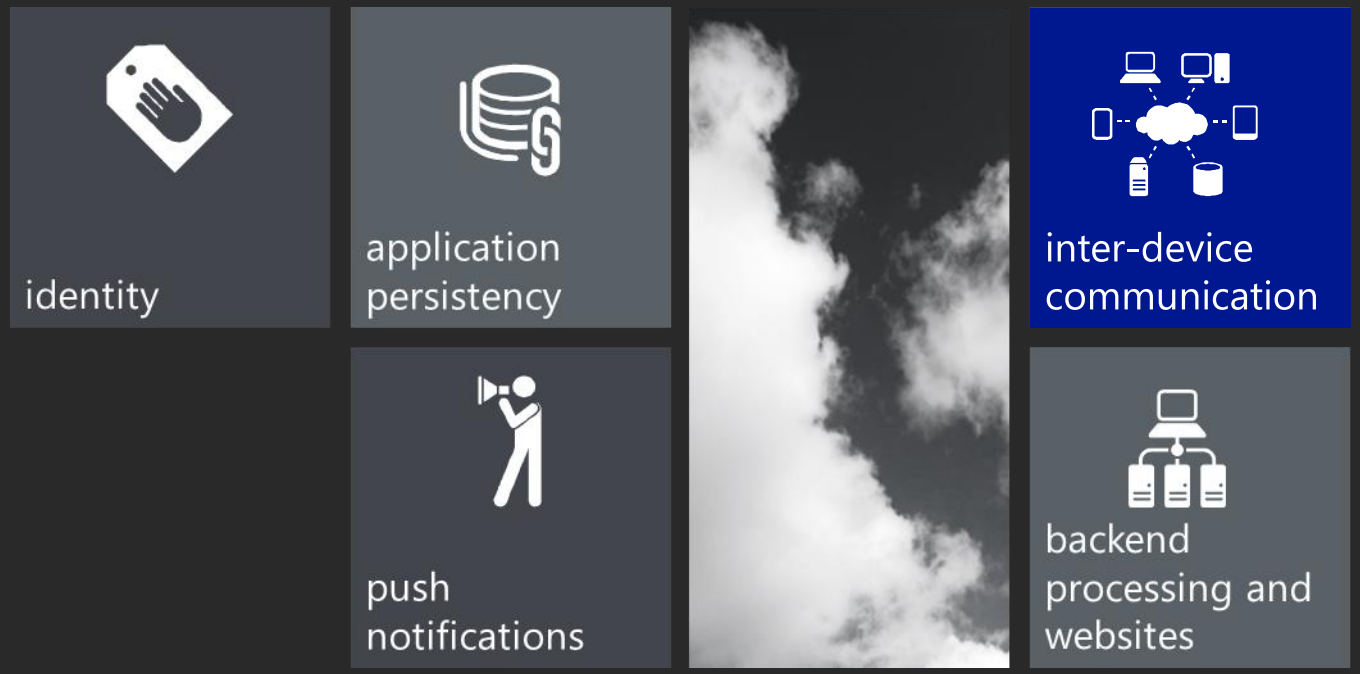


(1) request channel URI

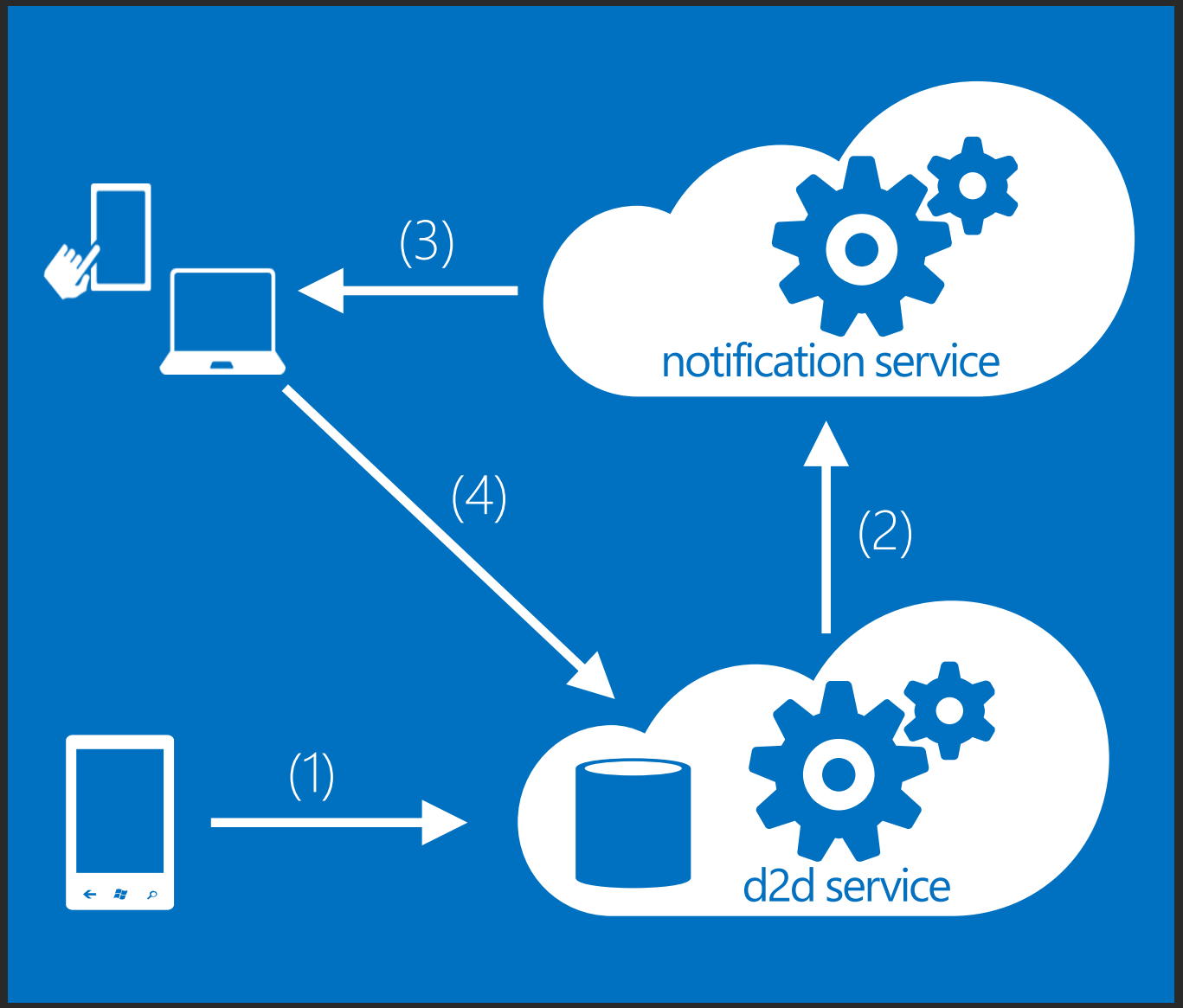
(2) register with service

(3) authenticate & push notification

core cloud capabilities



device to device communication



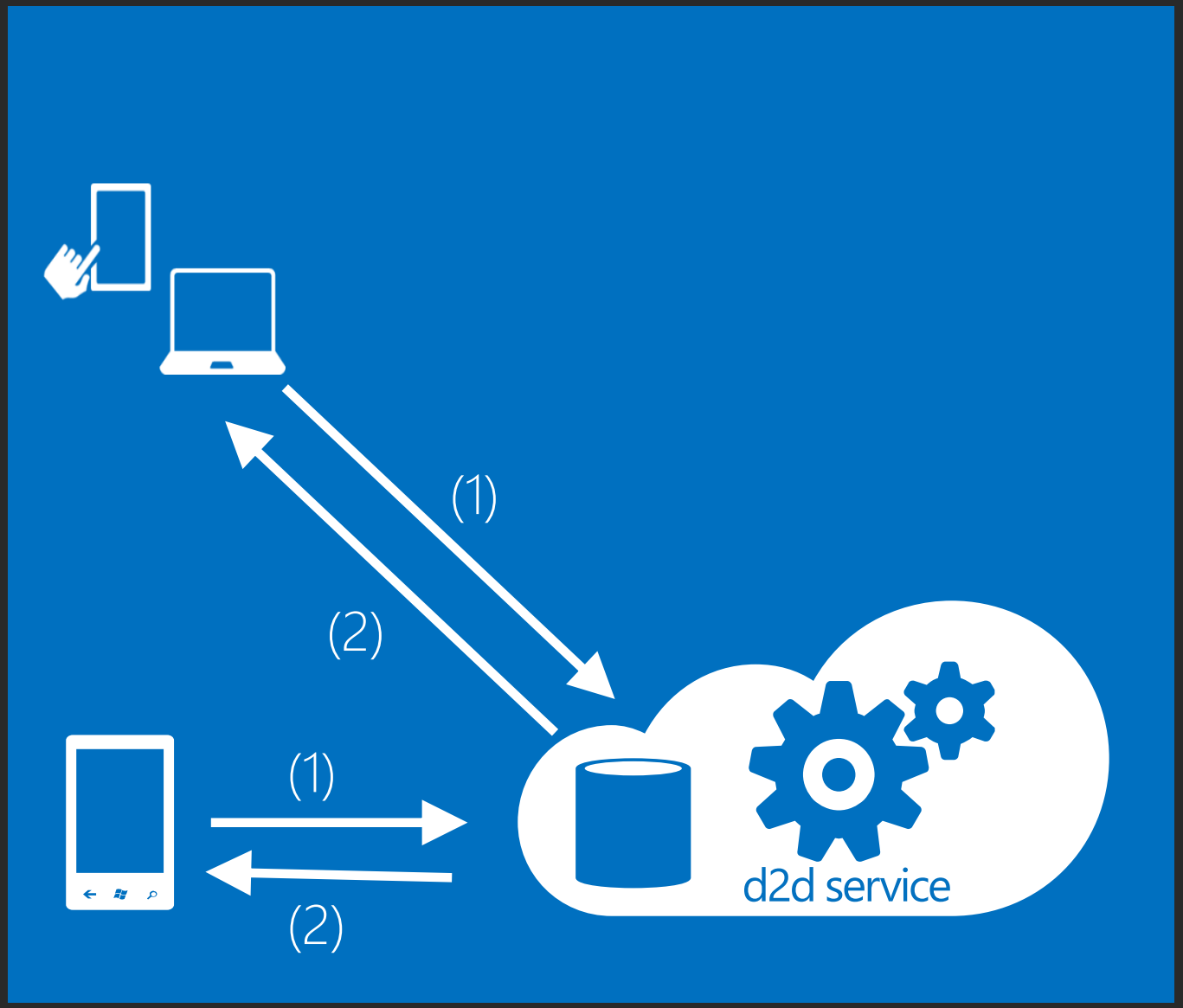
(1) device initiates data share

(2) d2d services stores data and requests push notification for target device(s)

(3) *NS notifies device(s)

(4) device retrieves data from d2d service

device to device communication



(1) Establish duplex communication channel (WebSocket/SignalR)

(2) server pushes data to client

conclusion

the cloud enables core App capabilities

Windows Azure is Microsoft's cloud platform

it provides 1st class PaaS & IaaS

and is open