IBM DATA VIRTUALIZATION MANAGER FOR z/OS

Any Data to Any App

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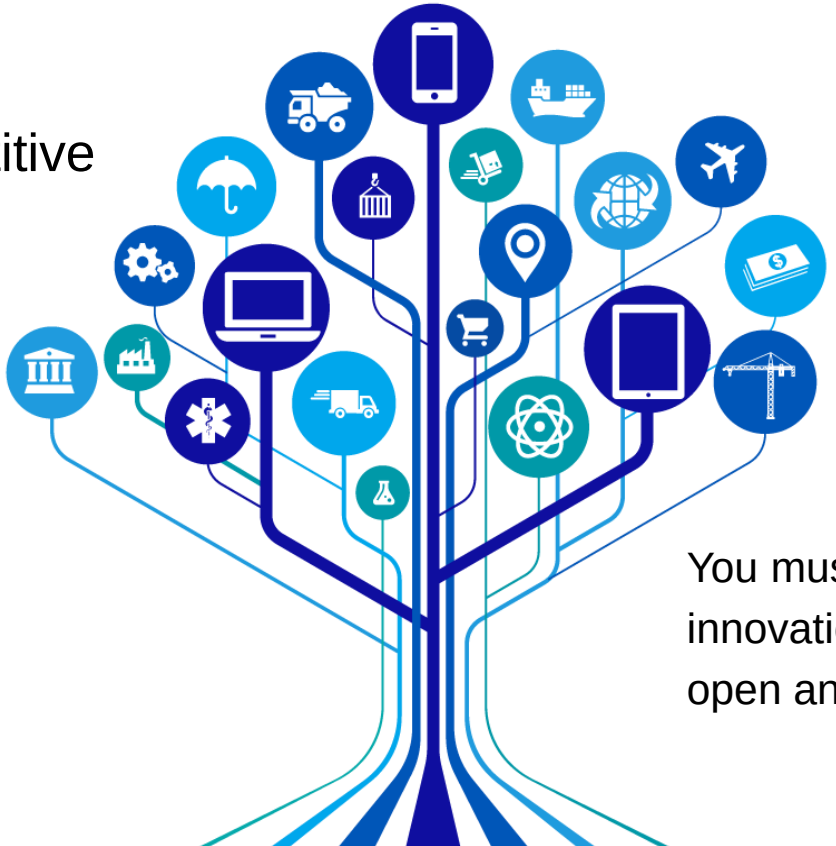
IBM | IBM z Analytics

A New Era of Digital Business

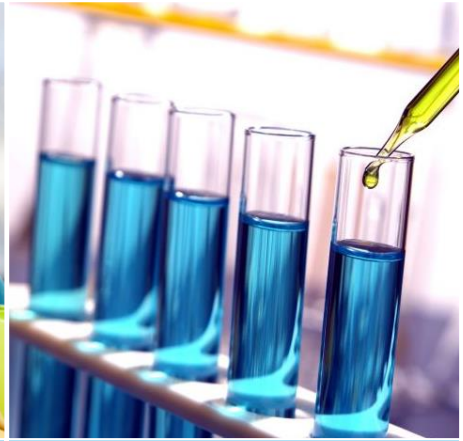
To Remain Competitive



You must deliver new digital innovations at speed - in a secure, open and connected manner

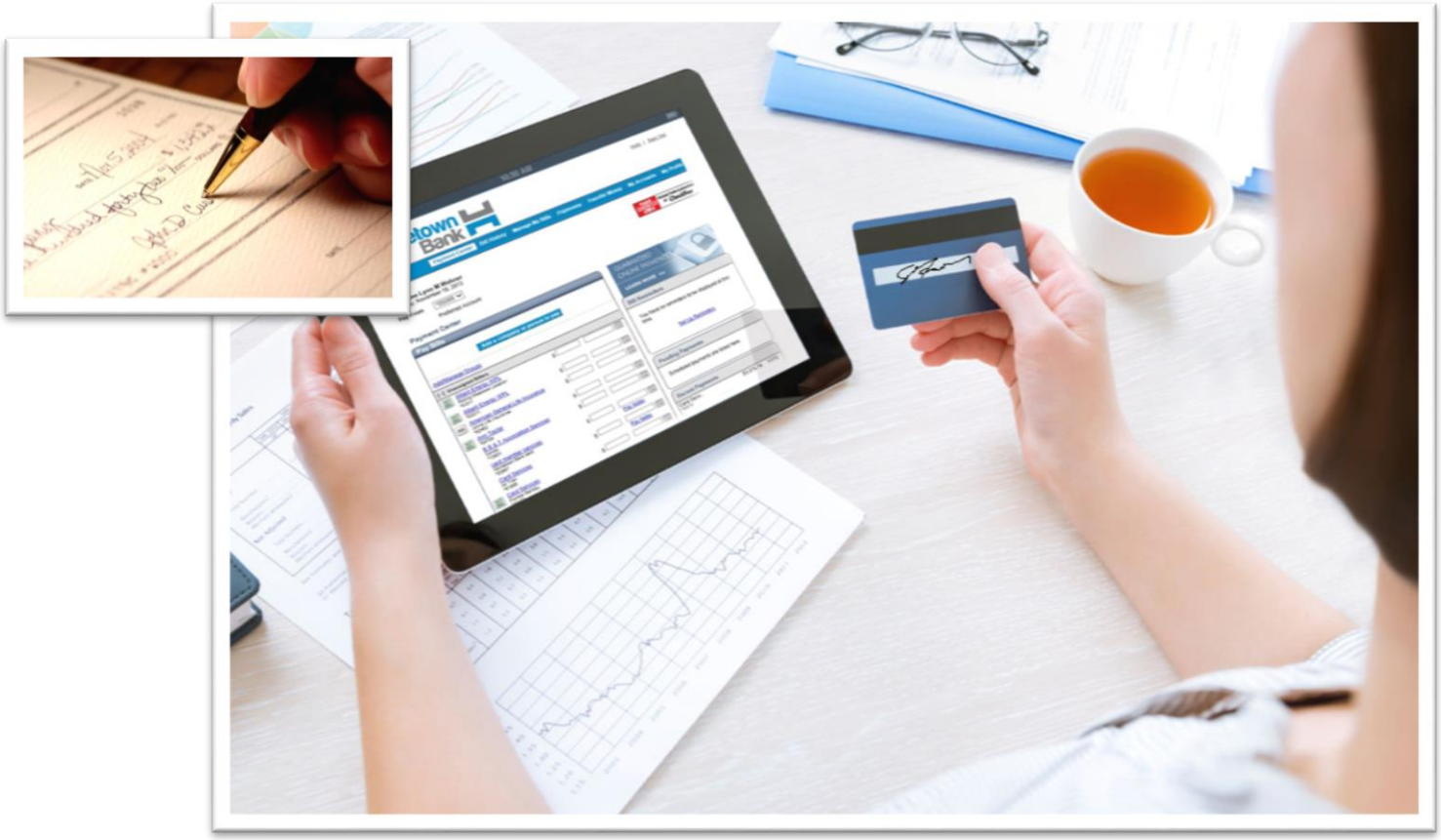
What's Driving Digital Transformation

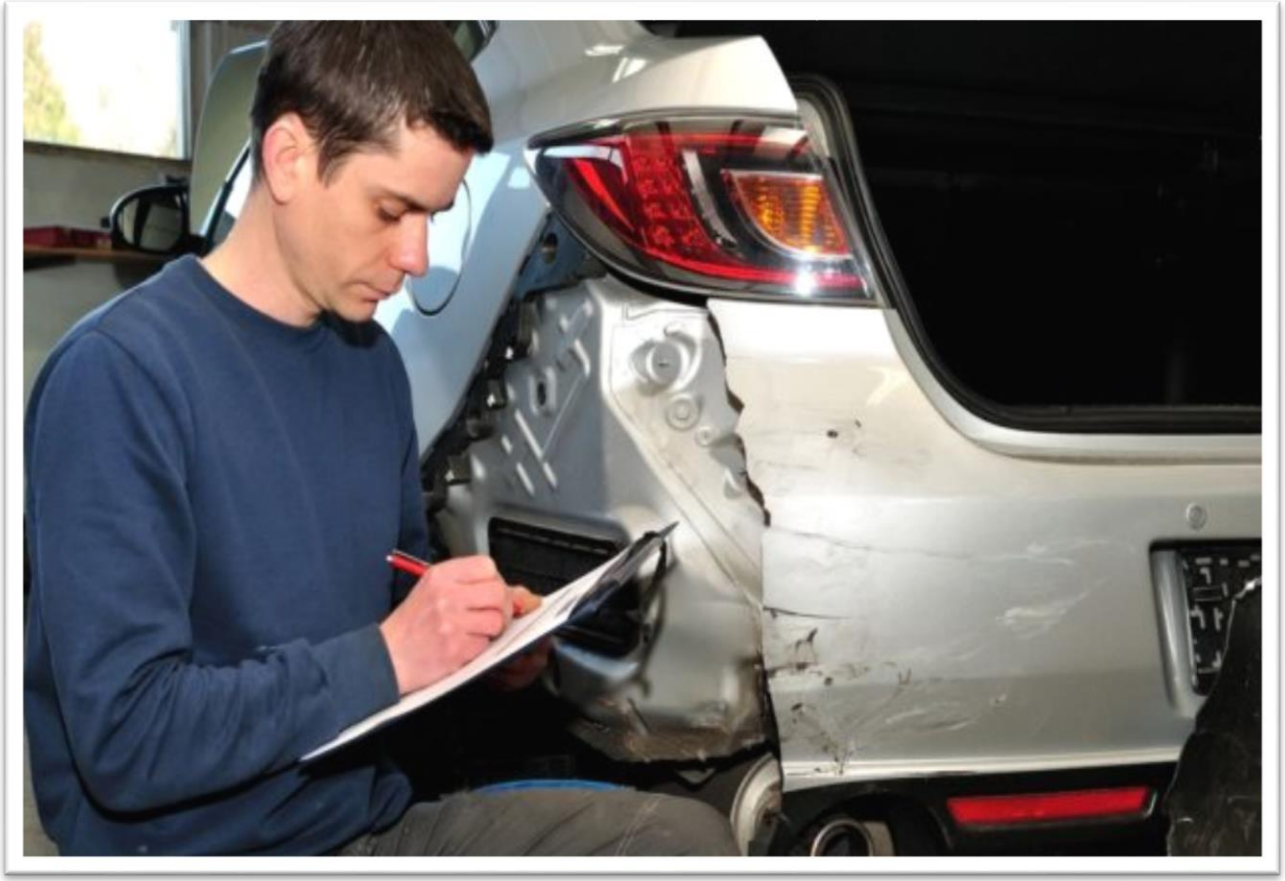
Deliver more personalized customer experiences



Enable faster time to market for new, innovative offerings

Simplify and streamline ability to partner






3.8%
financing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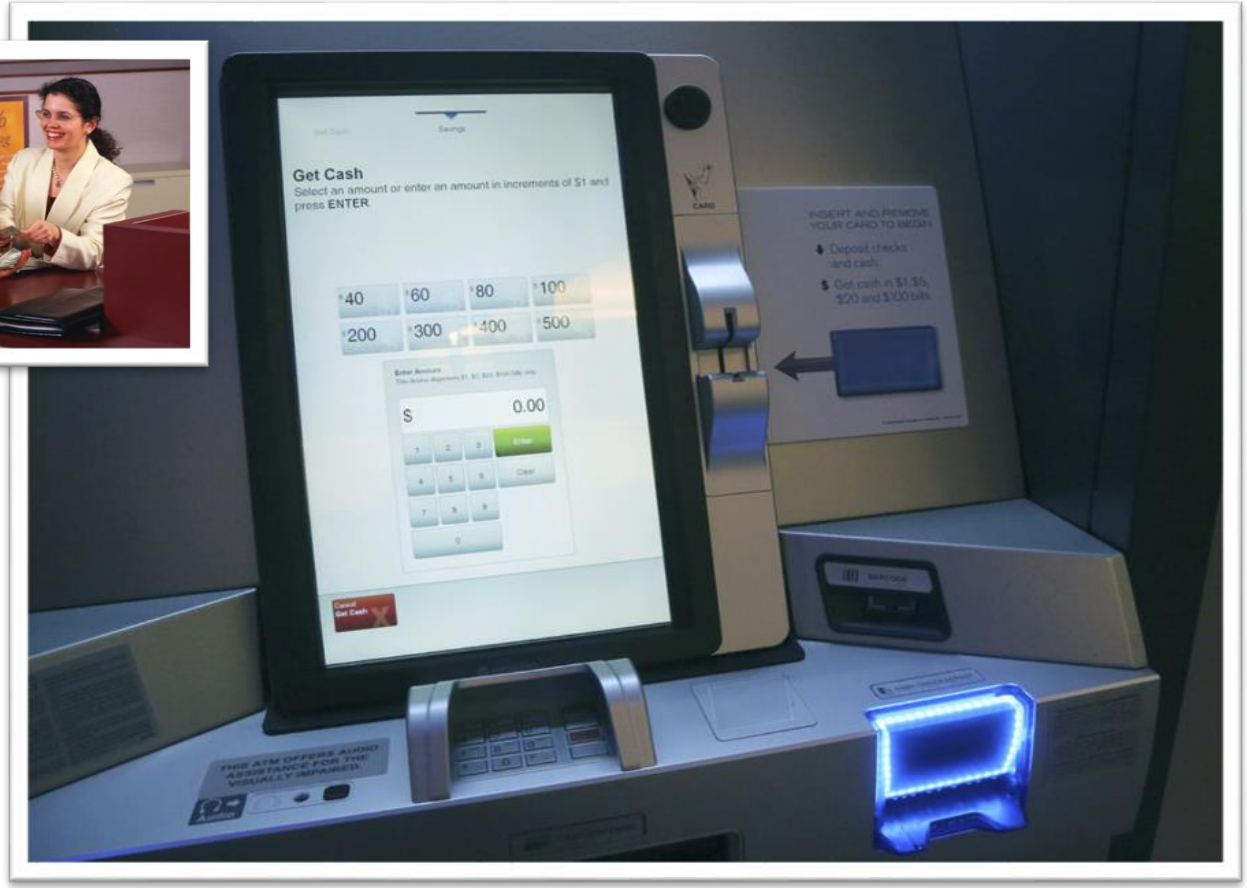
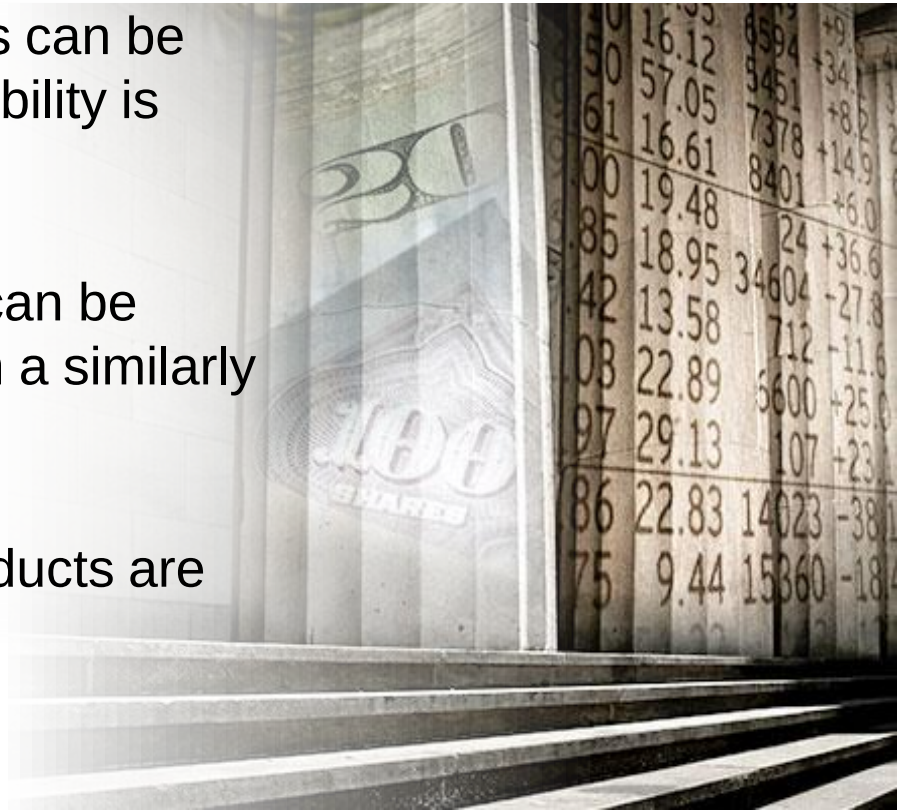
financing


Get Cash
Select an amount or enter an amount in increments of $1 and press ENTER.
40
60
80
100
200
300
400
500
$
0.00
INSERT AND REMOVE YOUR CARD TO BEGIN
Deposit checks and cash
Get cash in $1, $5, $20 and $100 bills
THIS ATM OFFERS AUDIO ASSISTANCE FOR THE VISUALLY IMPAIRED.

Digital Transformation Still in Progress

- Only 1 in 4 business banking products can be applied for online, and mobile accessibility is even lower.
- Only 9% of small business accounts can be opened from a mobile device, up from a similarly modest 7% in 2016.
- Only 41% of wealth management products are accessible online.



Forbes: The State Of Digital Transformation In Banking And Financial Services, 2017

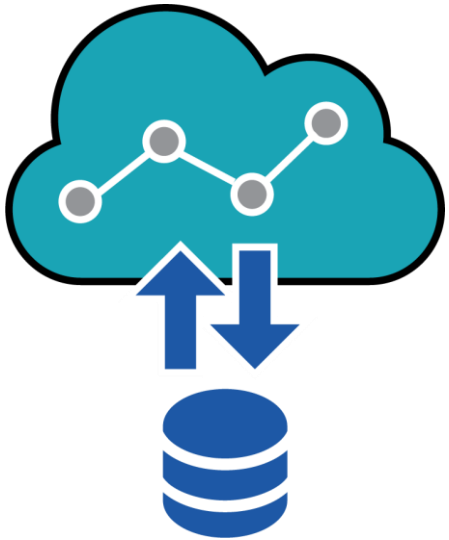
Making Interoperability Easier with APIs

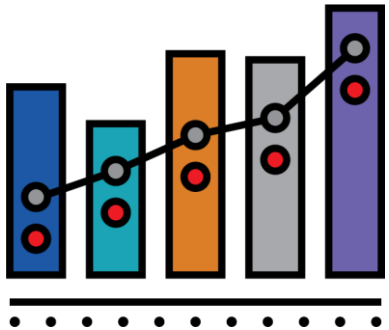
APIs are the digital glue that links services, applications and systems

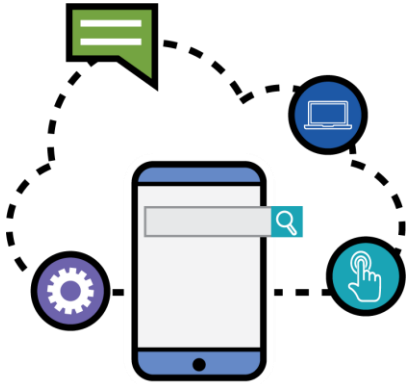
Making Interoperability Easier with APIs

…to exploit data to create more compelling customer experiences

The Rules Have Changed for Data Integration

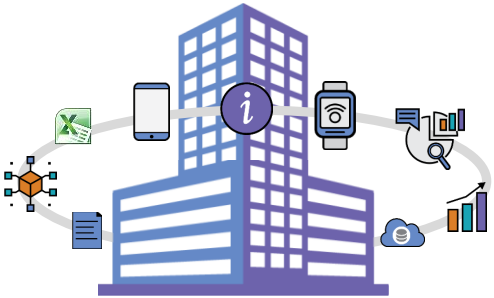






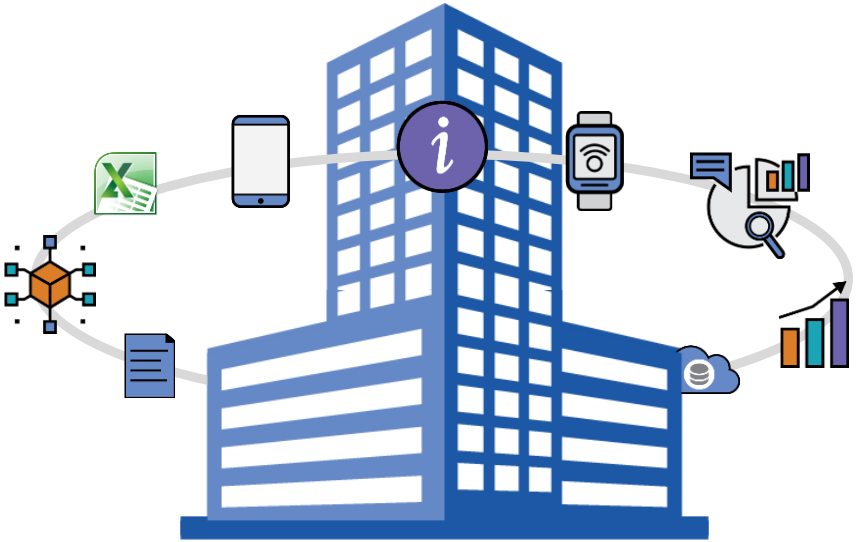
The Rules Have Changed for Data Integration

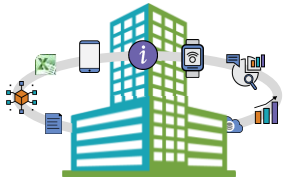
Limited View of Data Across the Enterprise



Older architectures can't handle data volume, velocity or variety

Data is typically segregated by business unit, format or platform



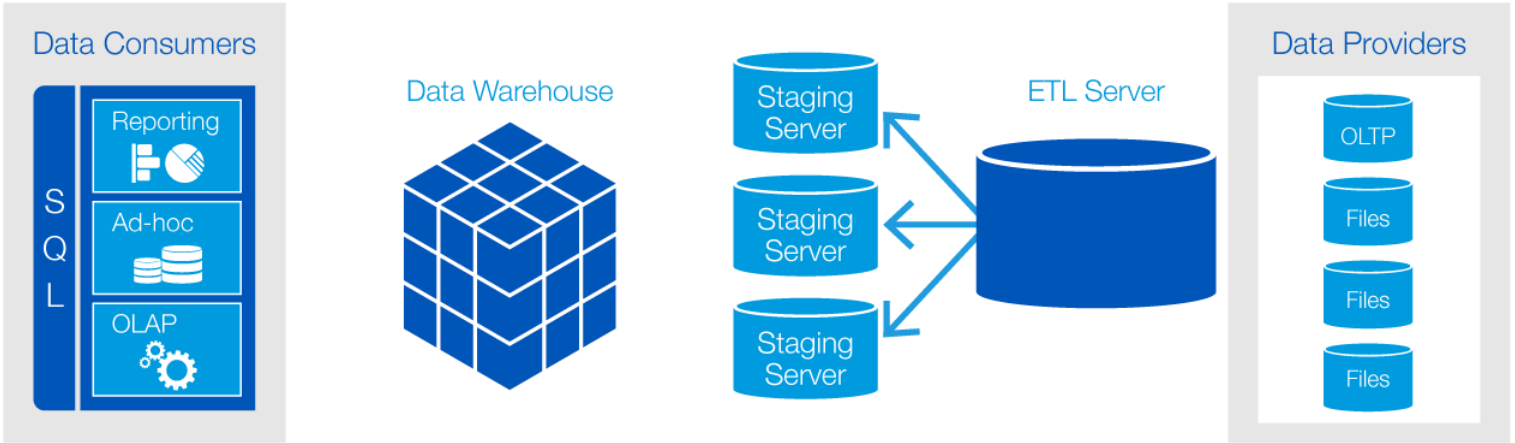


Valuable business data in secure, transactional systems

Traditional Data Integration Inadequate

No longer Viable to Move Data
(using extract, transform, load ETL)

- Risk to data security
- Data inconsistency
- Rigid, limits business agility
- High cost and latency

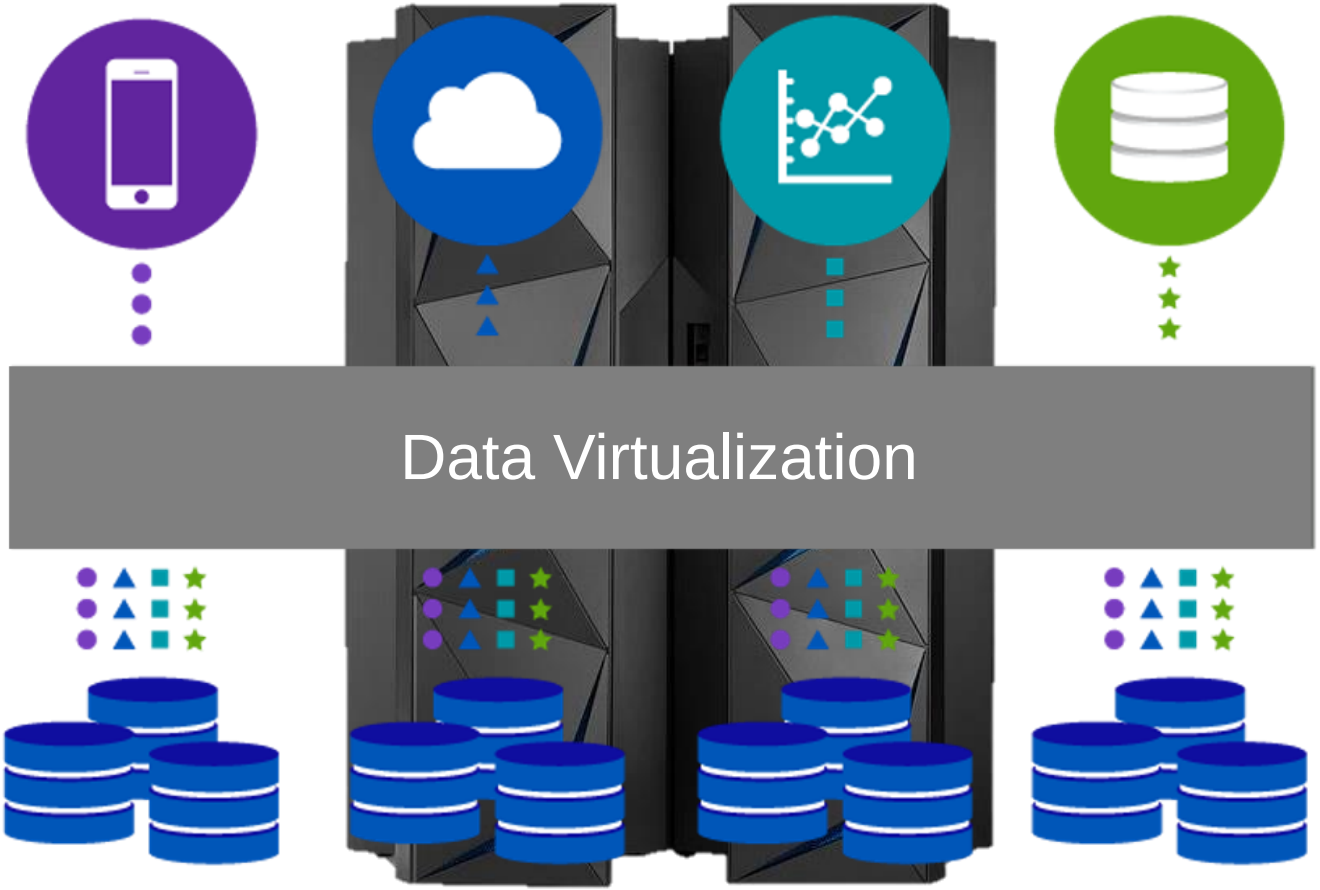


A New Approach is Needed – Data Virtualization

Unlike traditional data integration…

data virtualization creates virtualized and integrated views of disparate data in-memory for immediate read/write access rather than waiting on moving the data and holding the integrated views in an EDW

- a data services layer that integrates data and content on demand from disparate sources in real time
- provides a layer of abstraction that shields developers from unique data implementation
- provides a metadata catalog to keeps track of data, location, availability, and state
- supports transactions that write back to the original data sources regardless of location
- doesn't mandate a API or schema - supports "many to many"


Data Virtualization

IBM Data Virtualization Manager for z/OS

Virtualize z/OS data with other enterprise data sources in real-time without data movement to provide comprehensive information that is readily consumable by analytics, cloud and cognitive applications

- ensures data is **secure** and **in-place** with **real-time** data virtualization
- supports **Hybrid** architectures (on-premises, Cloud, Hadoop and MF)
- broad **API** support via SQL, NoSQL, SOAP, and REST via z/OS Connect EE
- **z/OS resident optimization** for improved performance and TCO
- abstraction layer for improved **productivity** and business **agility**

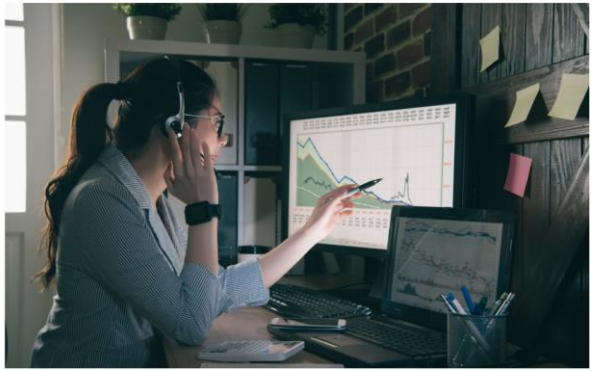
Take action now!

- ✓ accelerate mainframe modernization initiatives involving Big Data
- ✓ gain real-time business insights across z/OS and enterprise data
- ✓ eliminate coding of complex z/OS apps via built-in APIs and interfaces

The industry's only Z-resident data virtualization solution!

How Are Customer Using Data Virtualization?

Analytics Web Portal



Need immediate insight into your customer or business

Difficult access to data (SMF, non-relational, MQ)

Mobile & Web Apps

Faster, easier delivery of digital systems of engagement

Real-time Z Data is a needed via multiple APIs

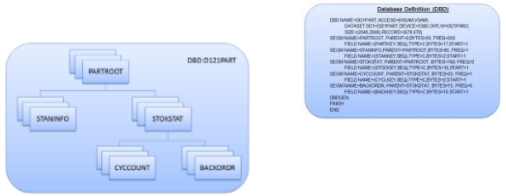
Optimized Data Access

Improve efficiency/performance for any application needing Z data

Too costly and time-consuming for applications to get Z Data

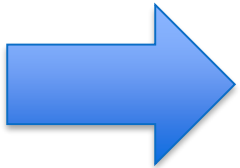
APIs to Non-Relational Data

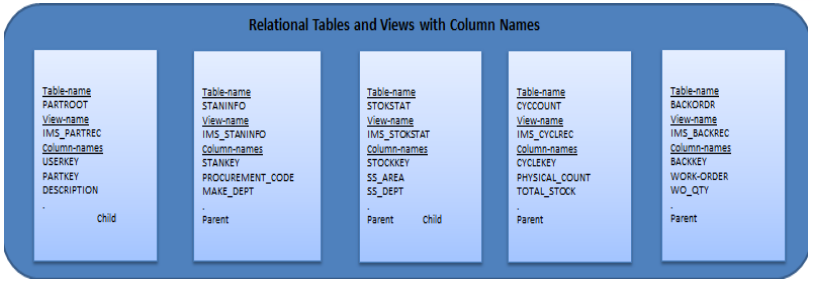
- Multiple APIs to Adabas, IMS, IDMS, VSAM, SMF….
  - SQL, NoSQL, Services (SOAP or REST)
  - Secure, read/write access to non-relational data



Program Specification Block (PSB)

```
DBPCB01  PCB   TYPE=DB,DBDNAME=DI21PART,PROCOPT=GOT,KEYLEN=43
SENSEG NAME=PARTROOT
SENSEG NAME=STANINFO,PARENT=PARTROOT
SENSEG NAME=STOKSTAT,PARENT=PARTROOT
SENSEG NAME=CYCCOUNT,PARENT=STOKSTAT
SENSEG NAME=BACKORDR,PARENT=STOKSTAT
PSBGEN LANG=COBOL,PSBNAME=DFSSAM07
END
```

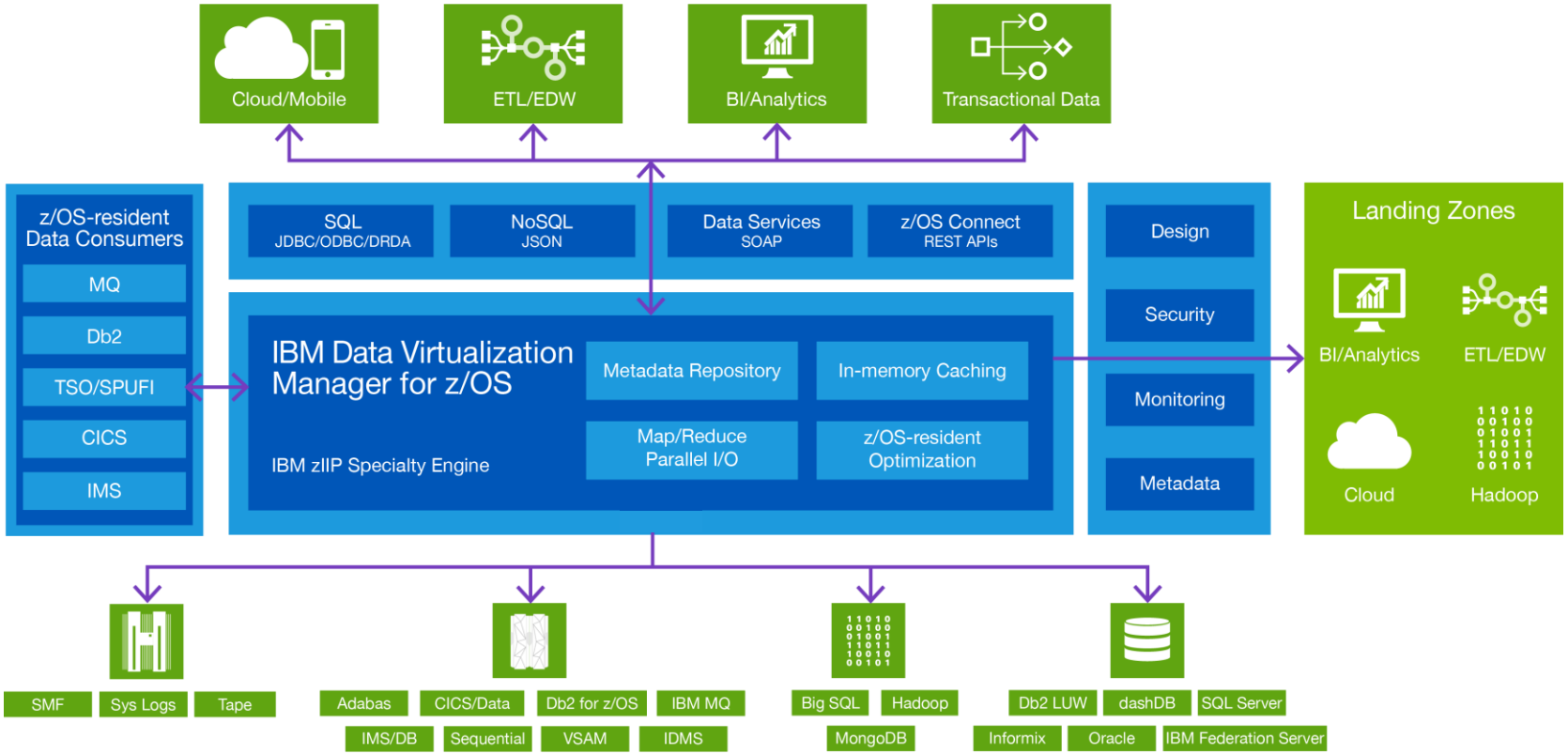




Mainframe non-relational data structure

Transformed into relational format

IBM Data Virtualization Manager for z/OS



How does IBM Data Virtualization Manager perform?

Tests performed at the IBM Systems Benchmark Center, Poughkeepsie, NY in Nov. 2017 running on IBM z13 using 800GB of financial data - flat files, with a multitude of fields

zIIP exploitation

- 99% of data virtualization runs on zIIP

Parallelism

- Test Case 4 and 2 have same configuration
- With degree of parallelism at 8 elapsed time is reduced from 98.68 minutes to 17 minutes
- Furthermore, by adding 3 zIIPs, test case 8 shows even greater improvement bringing the elapsed time down to 13.83 minutes.
- With enough zIIPs it will not unusual for us to see 1000% improvement for elapsed times

zIIP engine exploitation

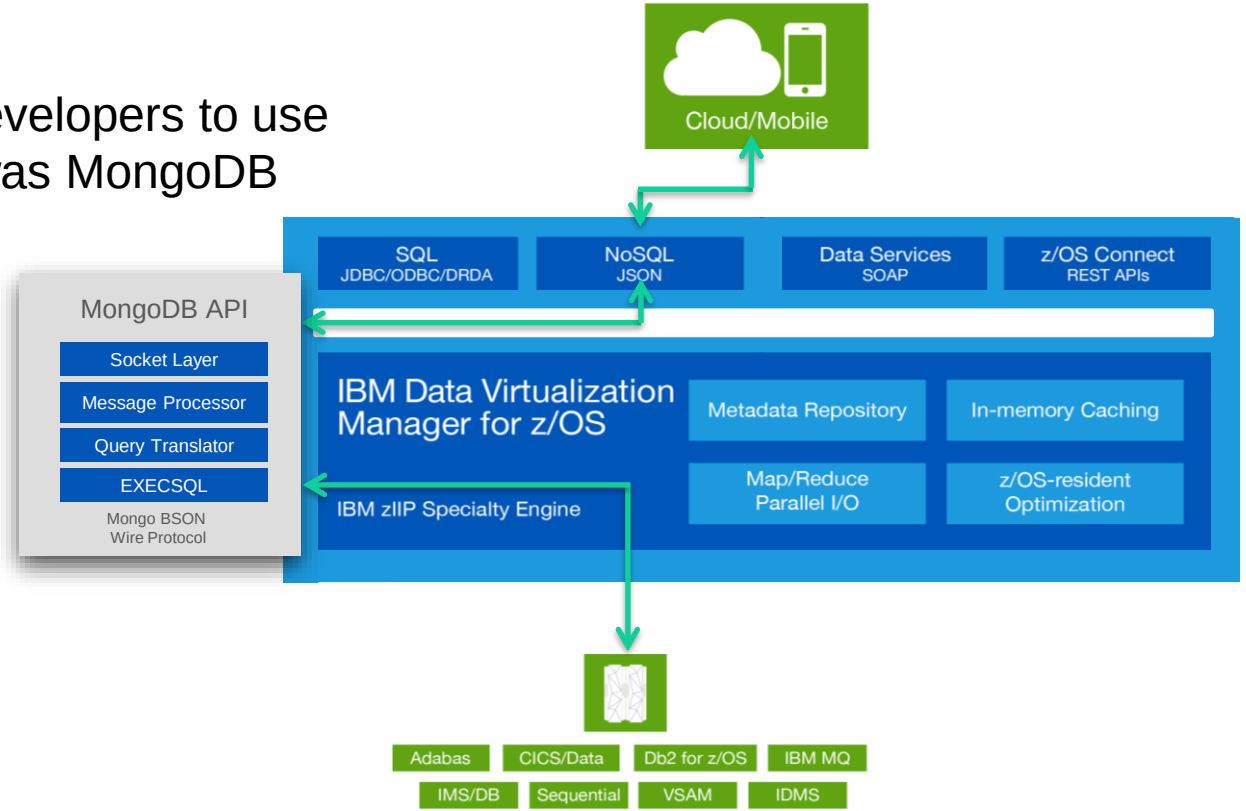
	Sum of CPU Time	Sum of zIIP Time	Sum of IIPCP Time	Sum of zIIP NTime	%zIIP eligible
DVM	7099.03	5609.55	1389.58	5609.55	98.59%

Parallelism impact on elapsed time

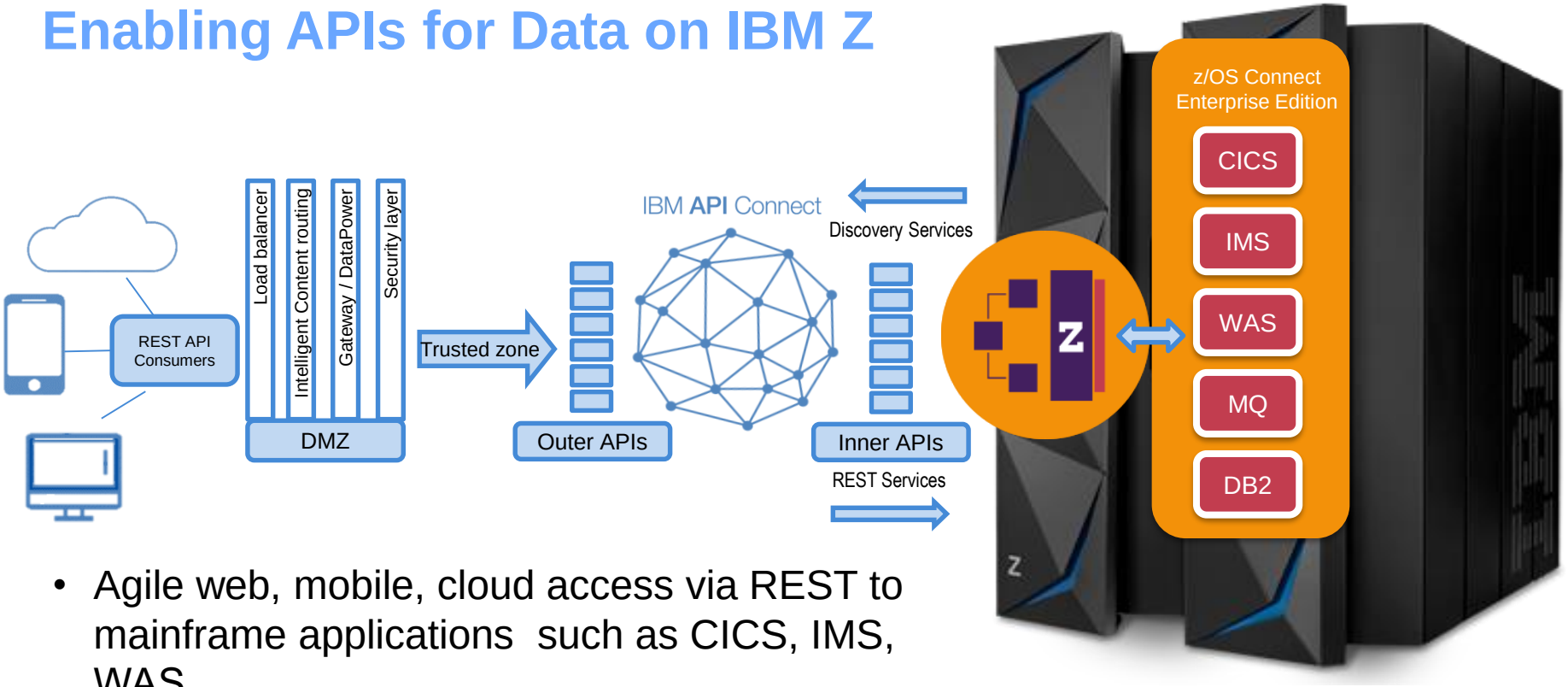
Test Case	GPP's	Number of zIIP engines	Degree of parallelism	Elapse time in minutes	SMT
1	8	0	0	118.96	1
2	8	5	0	98.68	1
3	8	5	4	27.05	1
4	8	5	8	17.14	1
5	8	5	8	20.84	2
6	8	5	10	17.00	2
7	8	5	16	15.73	2
8	8	8	8	13.83	1
9	8	8	8	17.62	2
10	8	8	16	11.72	2

MongoDB API for Mainframe Data

- Enables cloud/mobile developers to use mainframe data as if it was MongoDB
- MongoDB API for accessing:
  - Adabas, Db2, IMS, IDMS, VSAM, Physical Sequential, IBM MQ….
- Accelerates time to value for mainframe participation in digital initiatives

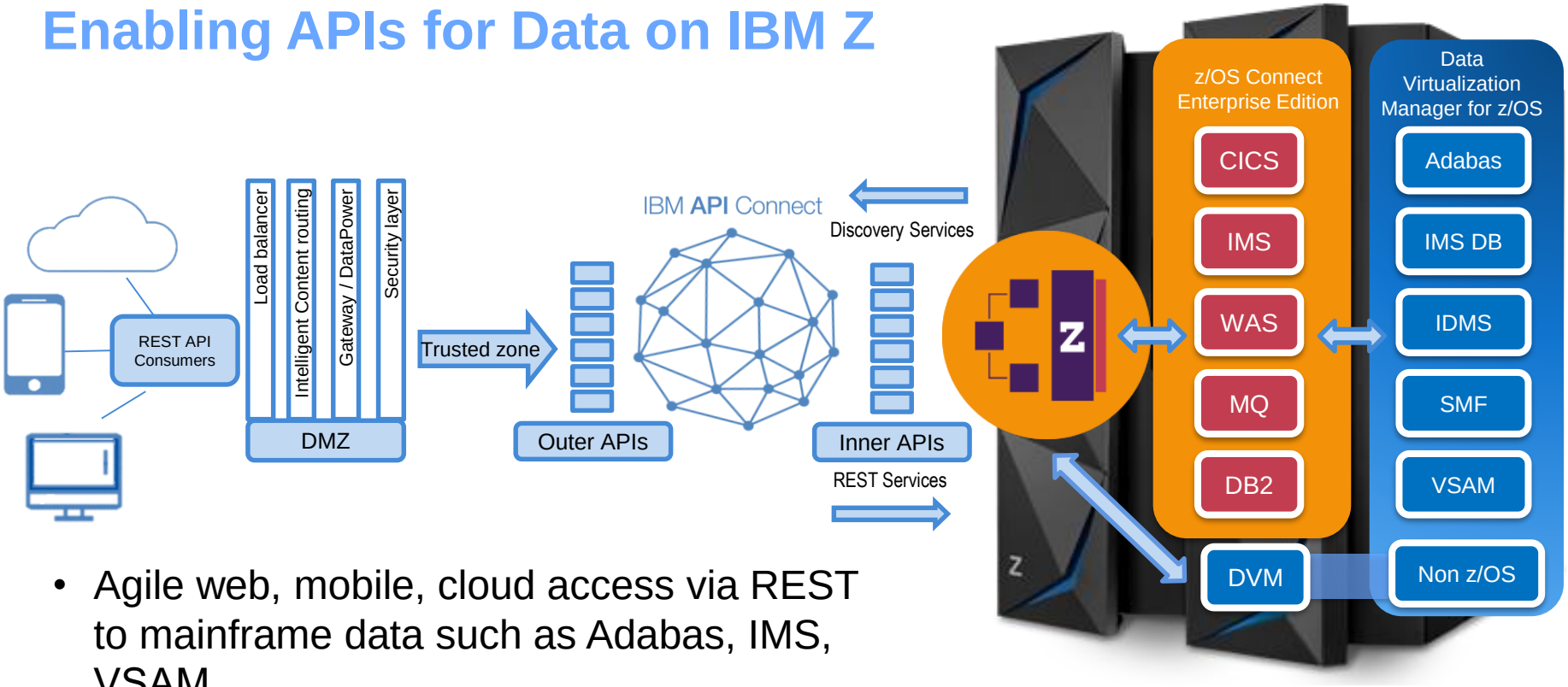


Enabling APIs for Data on IBM Z



- Agile web, mobile, cloud access via REST to mainframe applications such as CICS, IMS, WAS…

Enabling APIs for Data on IBM Z



- Agile web, mobile, cloud access via REST to mainframe data such as Adabas, IMS, VSAM…

Simple 3 Step Process – Create Mainframe Data API

Step 1	Step 2	Step 3
Installation of DVM Service Provider https://goo.gl/DuVUxB	Create DVM Server Instance https://goo.gl/jCzYxa	Create WOLA Connection Install DVM Server https://goo.gl/bxphsP
Create API		
Create RESTful API to Mainframe Data IBM Data Virtualization Manager and z/OS Connect https://goo.gl/DuVUxB		

ANY Data for ANY Application

Simple
Get transactional access, no data movement

Open to all Apps
Modern APIs enable access

Secure
Avoid risk by reducing moving data off Z Systems

Fast
Exploits Z architecture, including parallelism and in-memory processing

Cost Effective
Keeps Z costs down with up to 99% zIIP offload

Information Sources

IBM DVM Marketplace
https://www.ibm.com/us-en/marketplace/data-virtualization-manager-for-zos

YouTube "IBM Data Virtualization Manager for z/OS" channel
https://www.youtube.com/channel/UCtbd_4oHoH-uKDYgSSRL7SA

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