Trends in Integration:

How Emerging Use Cases in Cloud, Mobile and Analytics are Changing the Game

Andrew_Humphreys@uk.ibm.com
Sr Product Manager, IBM WebSphere Integration

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2015 Predictions..

2.5 quintilion
Bytes of data will be created daily

534 billion
Dollars will be made in mobile transactions

85%
Of enterprises will use external cloud services

By 2015

Integration of data on mobile devices will represent 20% of integration spending

By 2016

Midsize to large companies will spend 33% more on integration than in 2013

By 2017

Over two-thirds of all new integration flows will extend outside the enterprise firewall

- The cost of doing application integration will increase as companies do more **B2B e-commerce, information processing, and mobile, social and cloud computing.**
- The accommodation of more mobile devices, alone, will substantially increase the amount of work — and cost — required for application integration.
- Companies will **spend more** on application integration than on new application systems.

Predicts 2013: Application Integration (Gartner Nov 2012)

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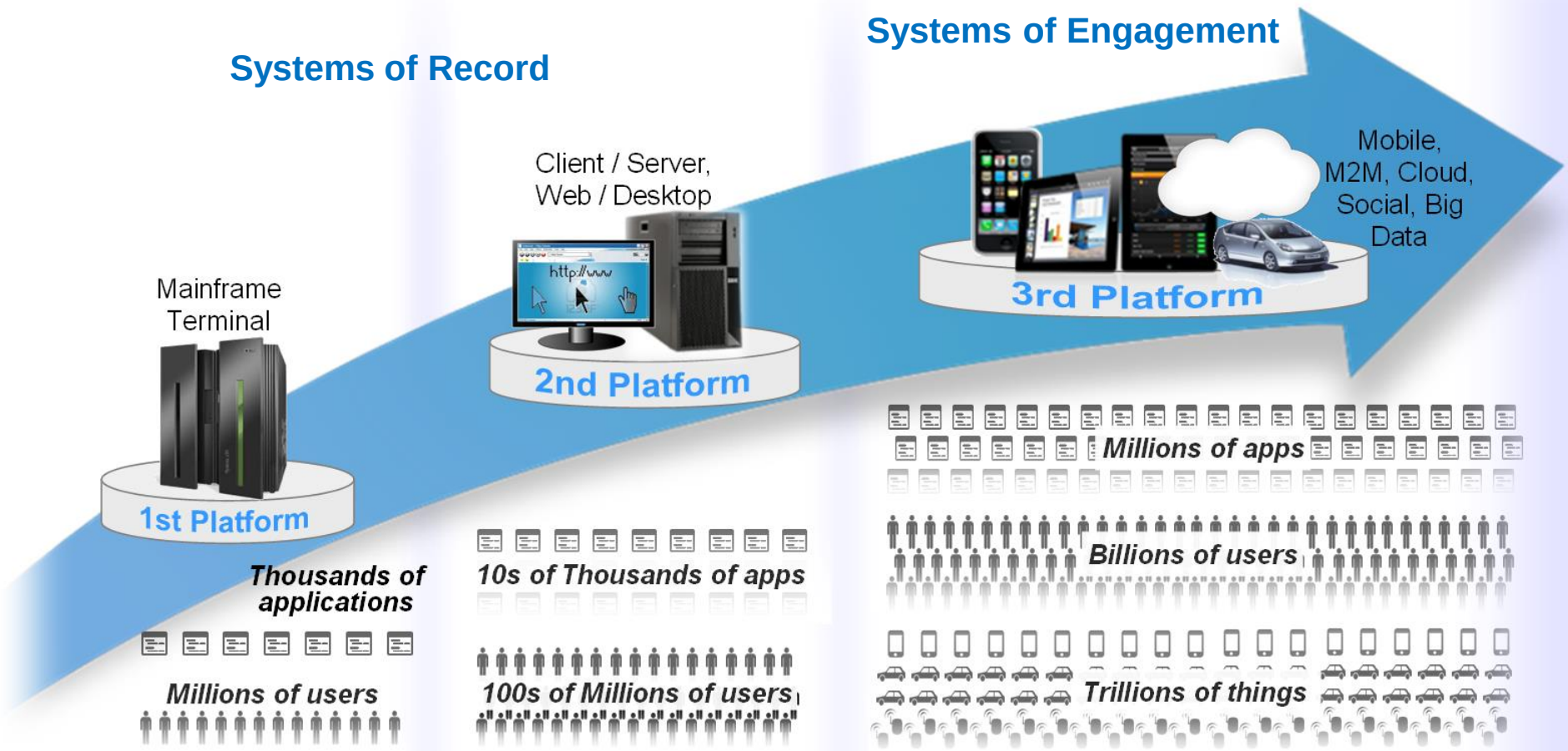
Integration needs are changing and growing…



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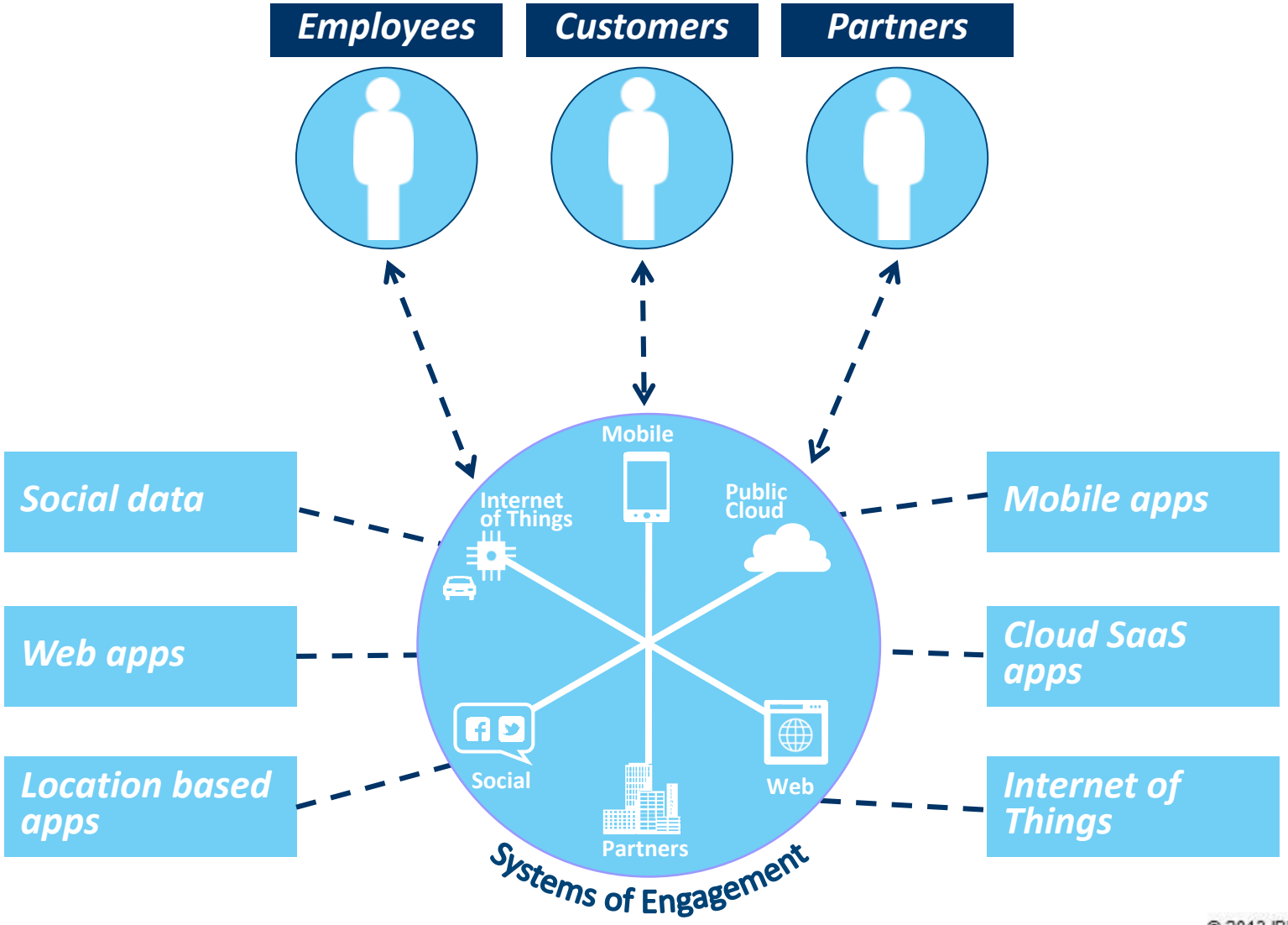
Systems of Engagement



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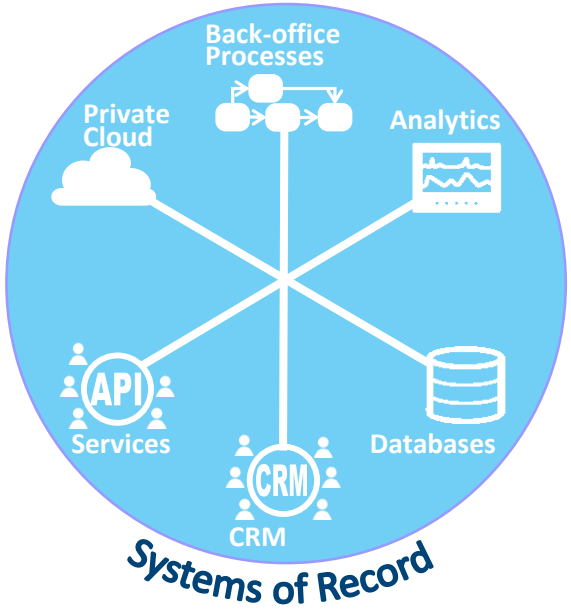
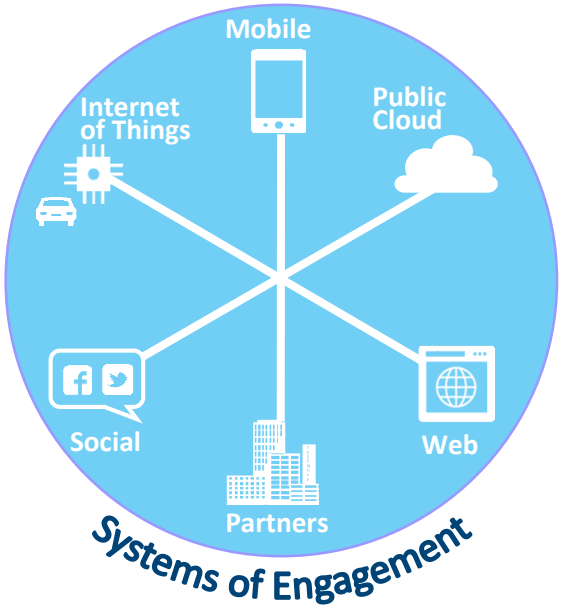
Fundamentally different types of systems





Sponsors	IT	CMO
Creators	In-house and packaged	Contractors
Value	Source of truth	Dialog and discovery
Interactions	Transactional, Asynchronous	Conversational, Synchronous
Pace of change	Ideally low	Ideally high
Lifecycle	Permanent and foundational	Transient and fluid

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Lack of integration impedes innovation

"integration with back-office systems is **biggest barrier to…systems of engagement**"

What is your most significant technical barrier to creating effective customer-facing systems? *(Systems of Engagement)*

Source: A commissioned study conducted by Forrester Consulting on behalf of IBM, Q1 2013
Systems of Engagement Demand New Integration Solutions – And a New IT, Forrester, April 2013

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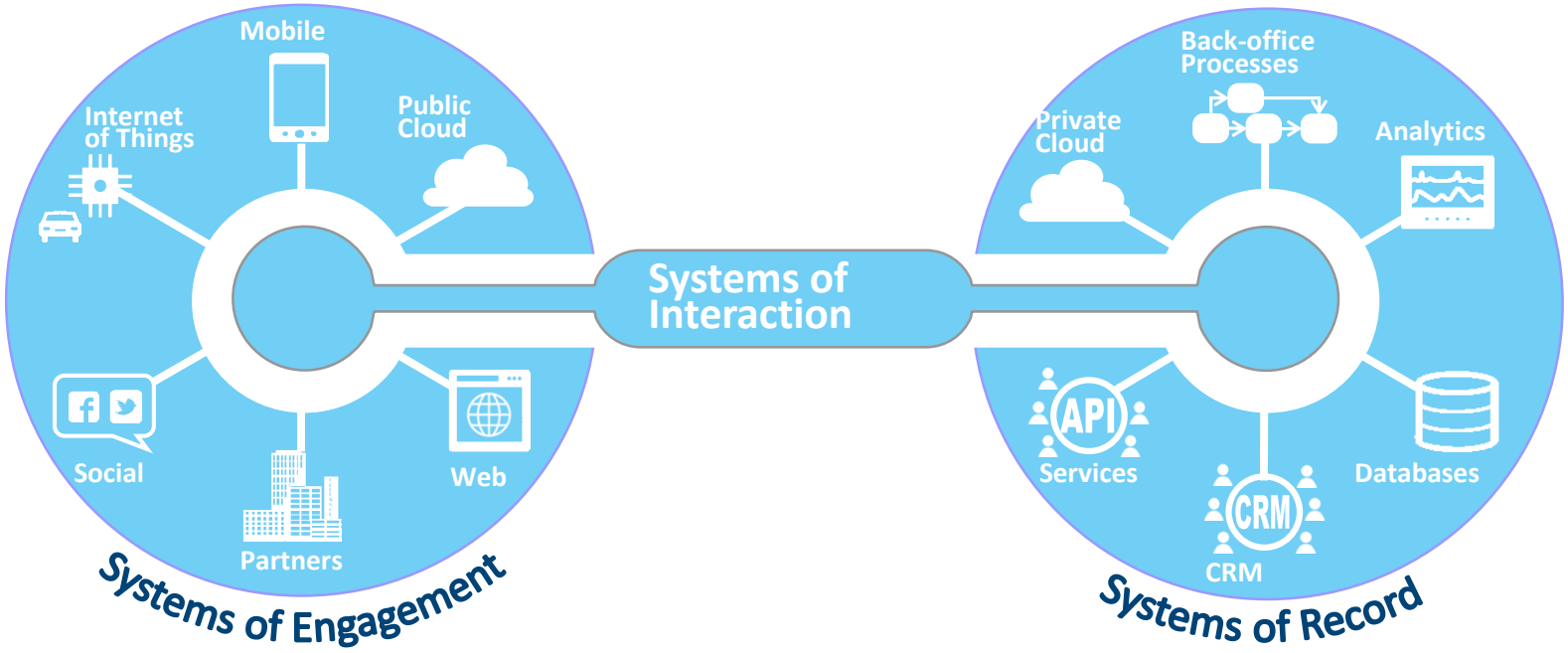
Systems of Interaction

- Bridge **tomorrow's innovations** with those powering the businesses today
- Bring together **Systems of Record** and **Systems of Engagement**
- Able to **innovate rapidly** by combining new and existing capabilities



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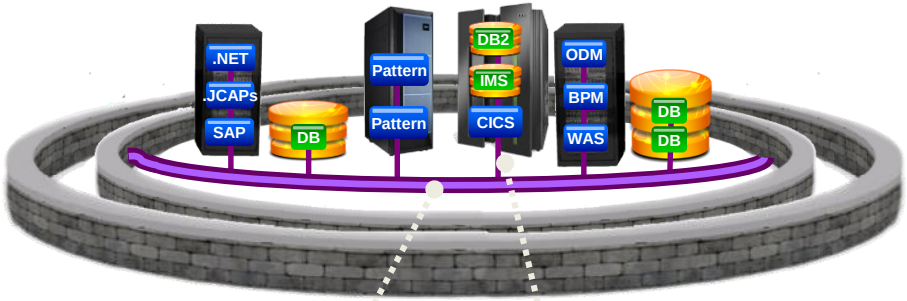
What Powers the Systems of Interaction?



IBM Integration Bus

Integration Bus provides ESB for heterogeneous connectivity across enterprise processes, applications, and data

IBM MQ messaging

Messaging backbone provides reliable transport and data delivery across data centre

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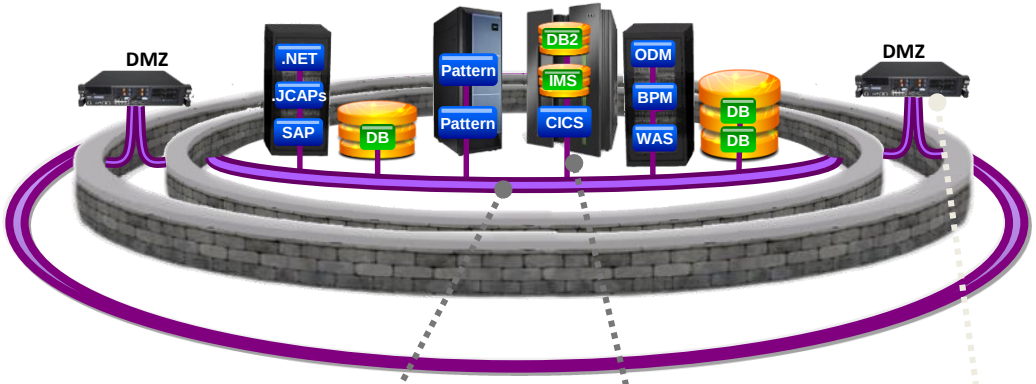
What Powers the Systems of Interaction?



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Integration Bus provides ESB for heterogeneous connectivity across enterprise processes, applications, and data

IBM DataPower

Integration Gateway provides access beyond enterprise and protects perimeter

IBM MQ messaging

Messaging backbone provides reliable transport and data delivery across data centre

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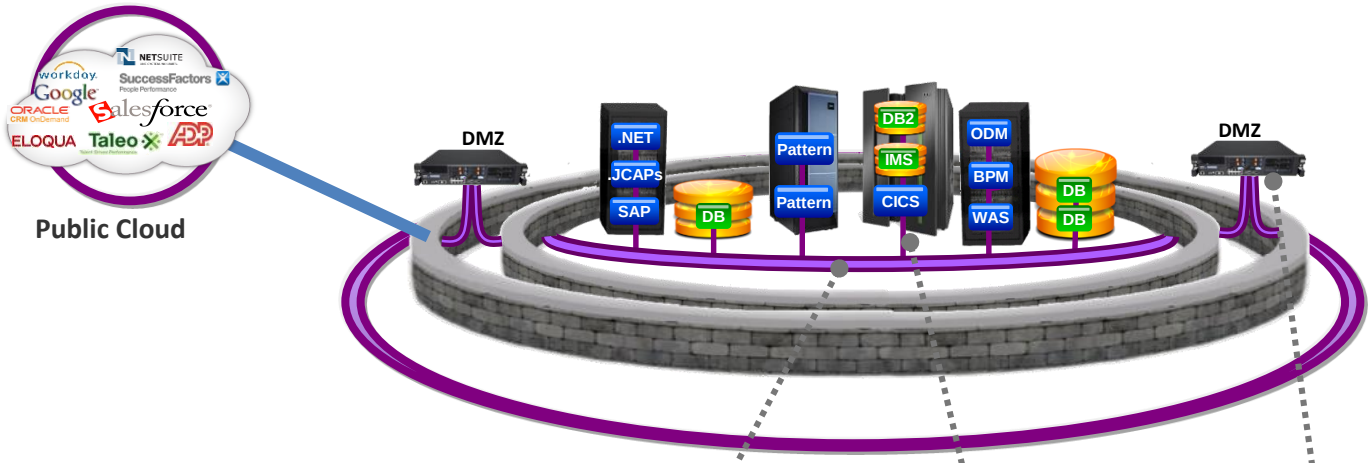
What Powers the Systems of Interaction?

IBM Cast Iron

Synching data with SaaS apps to leverage new cloud economy



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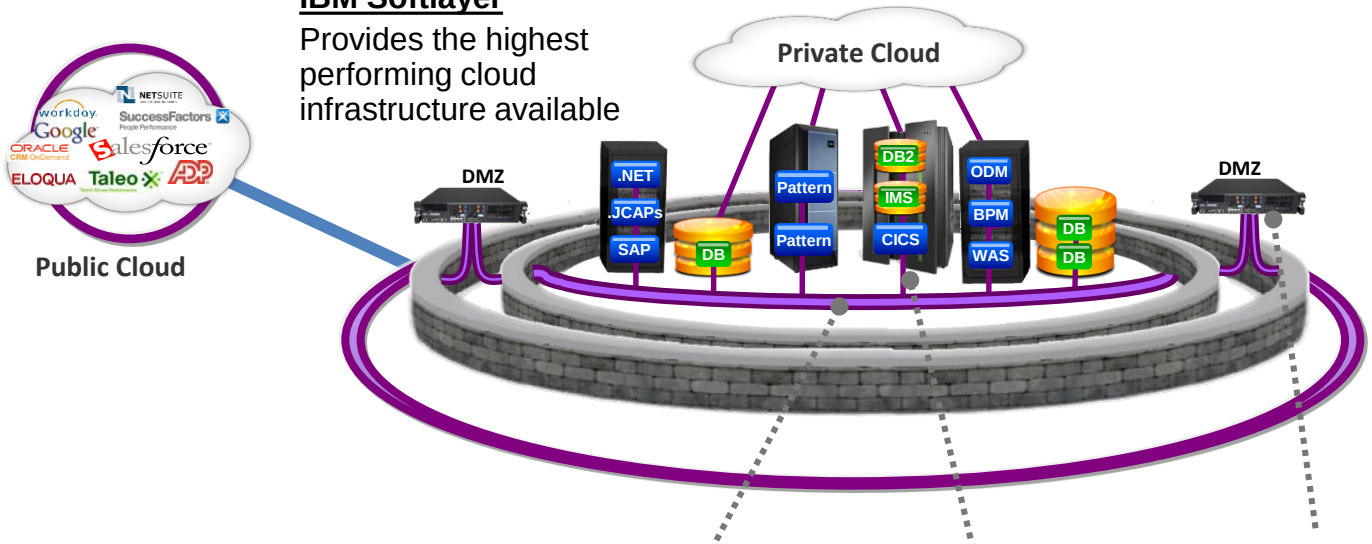
IBM PureApplication System

Enterprises looking to achieve "more with less" by better managing IT resources as collectives

IBM Softlayer

Provides the highest performing cloud infrastructure available



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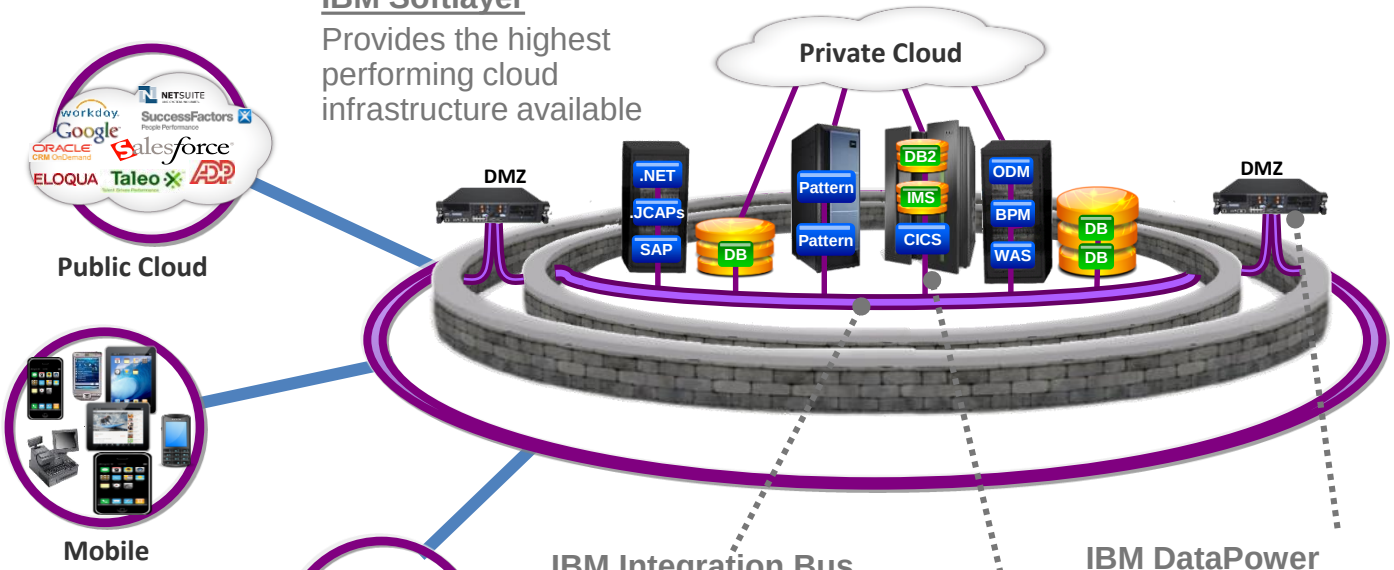

IBM Worklight

Productive multi-device development

IBM Integration Bus

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IBM DataPower

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Messaging backbone provides reliable transport and data delivery across data centre

IBM IoT

Reliable, efficient messaging for mobiles and sensors

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What Powers the Systems of Interaction?

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Synching data with SaaS apps to leverage new cloud economy

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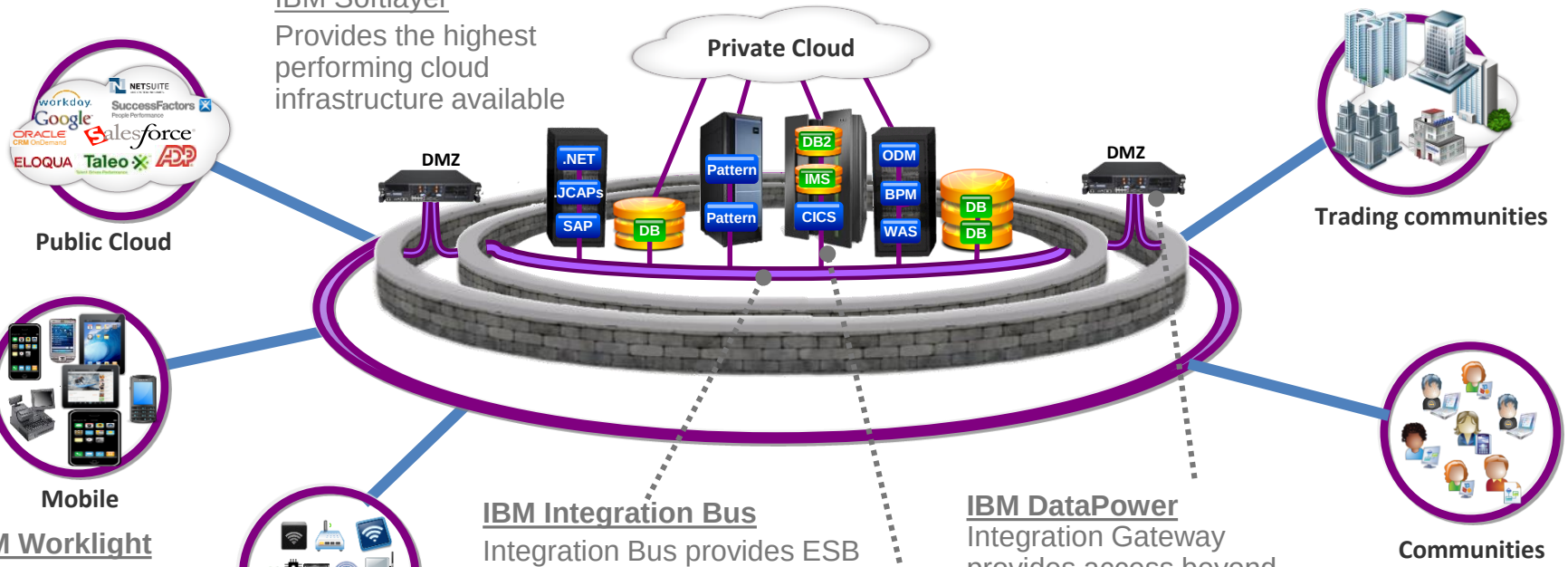
Enterprises looking to achieve "more with less" by better managing IT resources as collectives

IBM Sterling B2Bi
Managing B2B communities of trading partners

IBM Softlayer
Provides the highest performing cloud infrastructure available



IBM Worklight
Productive multi-device development

IBM IoT
Reliable, efficient messaging for mobiles and sensors

IBM Integration Bus
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IBM MQ messaging
Messaging backbone provides reliable transport and data delivery across data centre

IBM DataPower
Integration Gateway provides access beyond enterprise and protects perimeter

IBM API Management
Open up access to encourage innovation from App Developers

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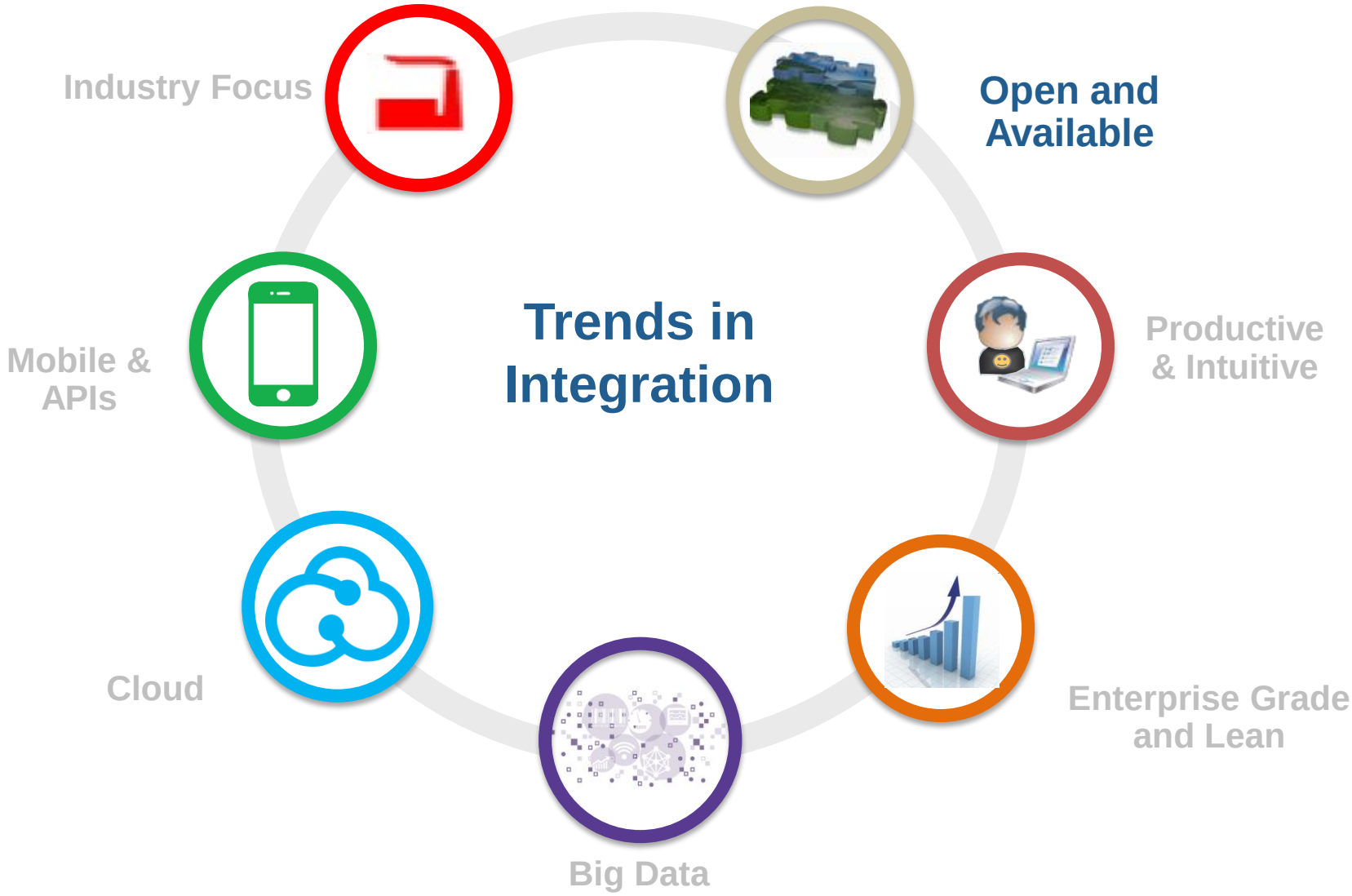

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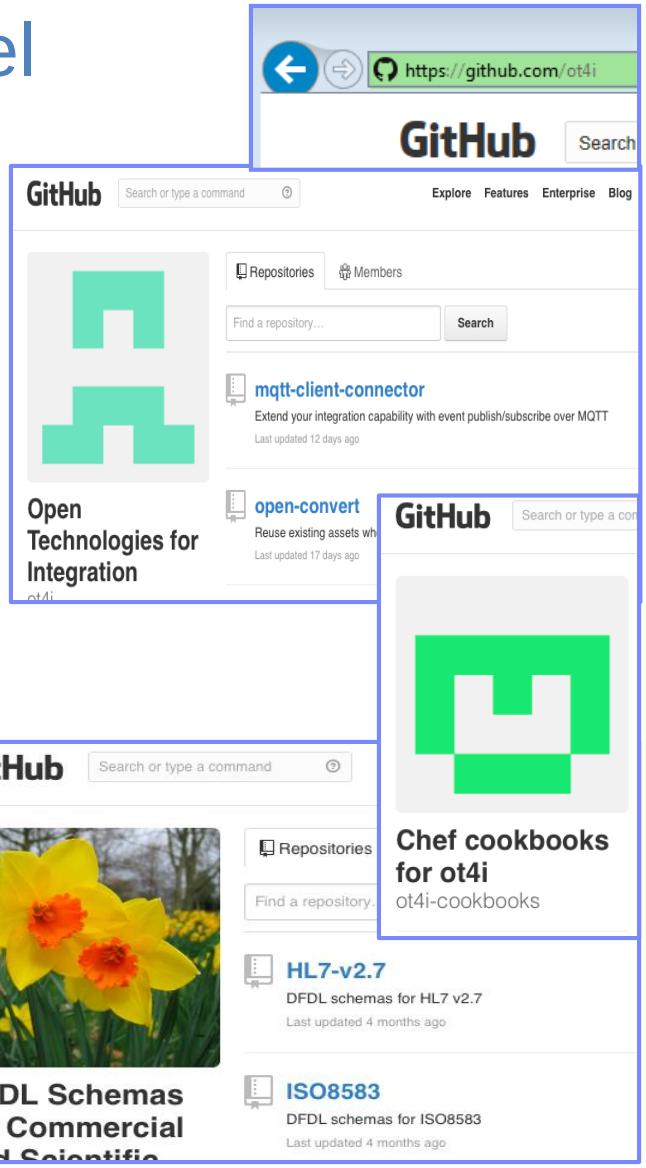
IBM Integration: supporting standards, skills and an open contribution model

- **No single standard** for integration software

- **Extensive standards support** in IBM Integration for various aspects of integration including:
  - Protocols: SOAP, HTTP/S, TCP/IP, REST, S(FTP), SMTP, MQTT, JMS and SOAP/JMS…
  - Web services: WS-I, WS-Trust, WS-Security, WS-RM…
  - Data formats: XML, XSD, DFDL, JSON, COBOL, CORBA…
  - Industry formats: ACORD AL3, CSV, EDIFACT, FIX, HL7, SWIFT, TLOG, X12, ISO8583…

- **Exploit and contribute to open source** integration components
  - Focus on transferable and embeddable assets
  - Source freely available on popular Github website under flexible Eclipse Public License
  - Enables both IBM and Community contributions and modifications



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Free Developer Editions and Trial Versions

- IBM Integration Bus and MQ Developer Editions **freely downloadable** from ibm.com
- Available for anyone to download, install and evaluate the latest capabilities without needing to purchase licenses
- Full product install with usage stipulations
  - Full function, Limits performance
- …**No timebombs!**
- CastIron Live
  - 30 day free trial

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Open Betas

IBM Integration Bus 10.0.0 Beta > Welcome

MQ Light
Open Beta

IBM Integration Bus Version 10.0 Open Beta

Welcome to the product documentation for IBM® Integration Bus Version 10.0 Open Beta, where you can find detailed instructions about how to complete the tasks to establish and maintain your integration environment. This information also describes concepts to help you understand the product, and the ways in which you can use it to solve your business problems.

- Watch a video: http://ibm.biz/iibopenbetavideo
- Download it: http://ibm.biz/iibopenbeta
- Discuss it: http://ibm.biz/iibopenbetaforum

IBM Integration Bus V10 Open Beta Program Forum

- **Overview**
- Recent Updates
- Status Updates
- Members
- Forums

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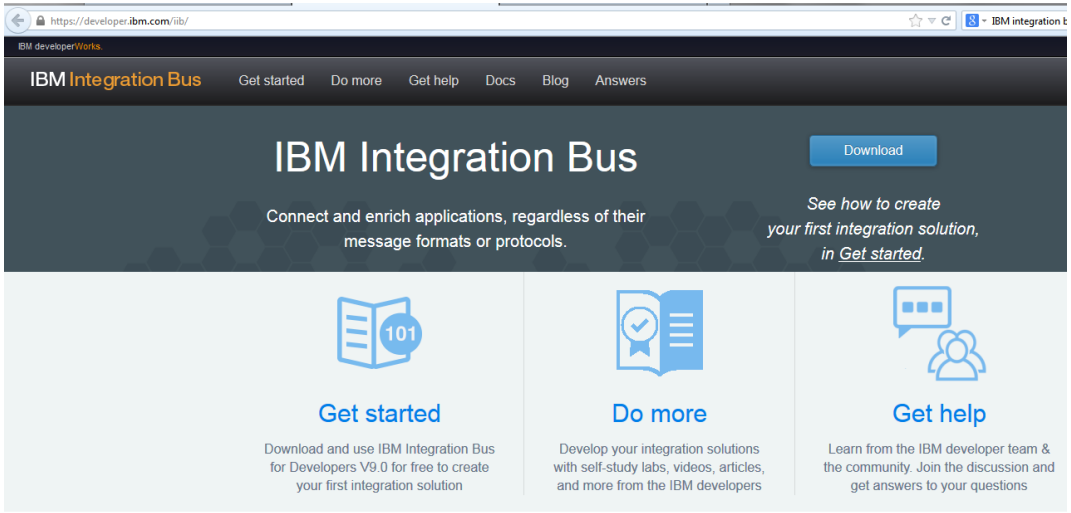
IBM Developer Outreach



developerWorks

Developer sites
https://developer.ibm.com/iib/

MQdev community

IBM Developer Works Forums
https://developer.ibm.com/answers

The IBM Integration Bus development team is actively moderating your questions on dW answers. Join the discussion!

Get help on dWAnswers

Social Media

- Twitter @IBMintegration
- LinkedIn IBM Integration Bus group

IBM Integration Community

BLOG DOWNLOAD LEARN PARTICIPATE

Integration Community site

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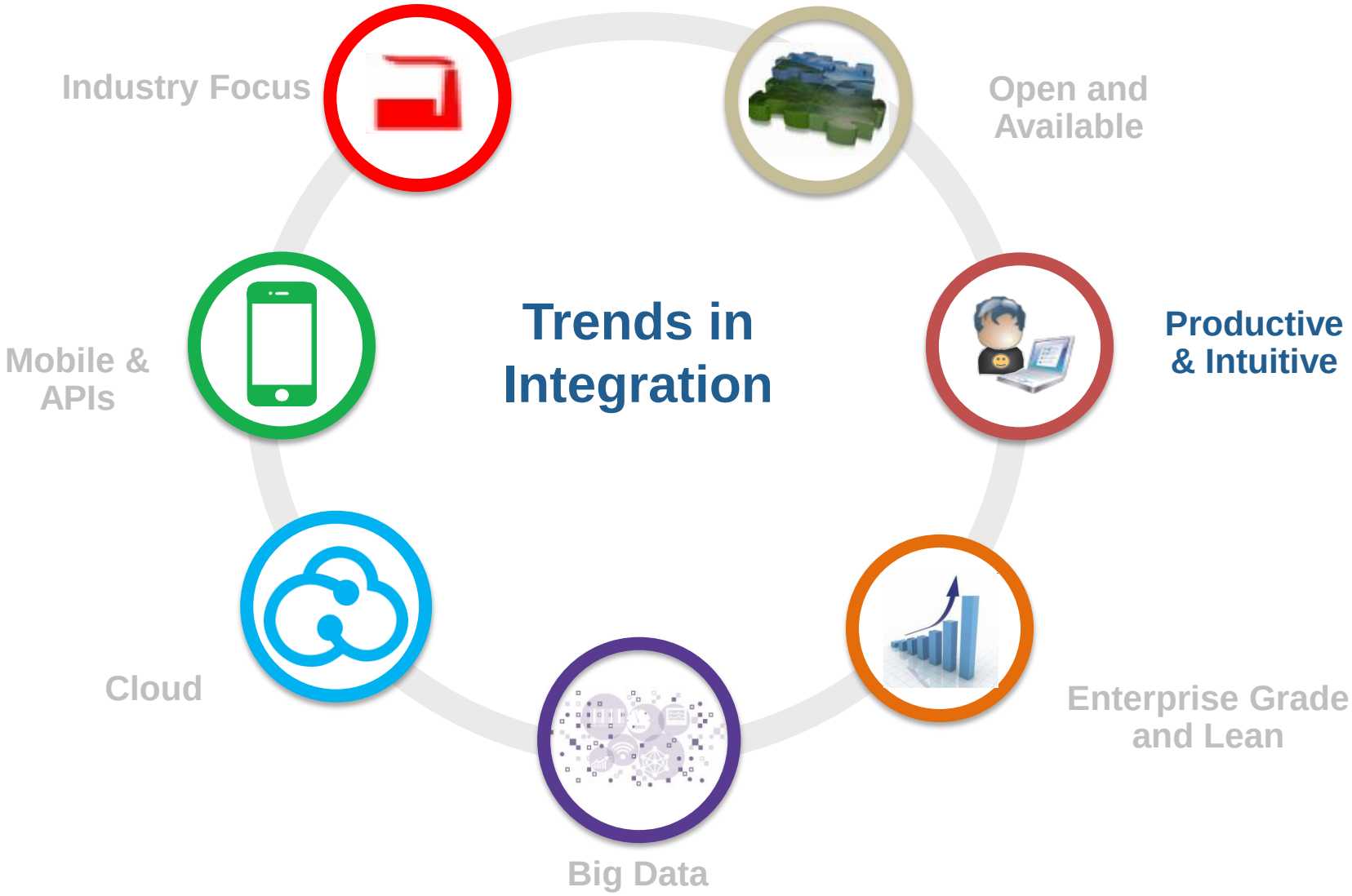

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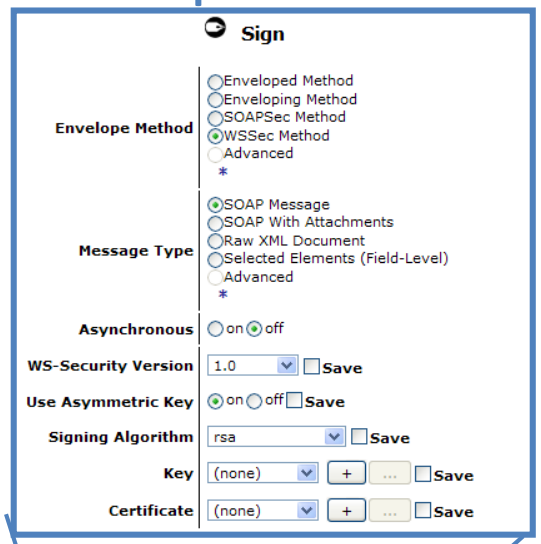
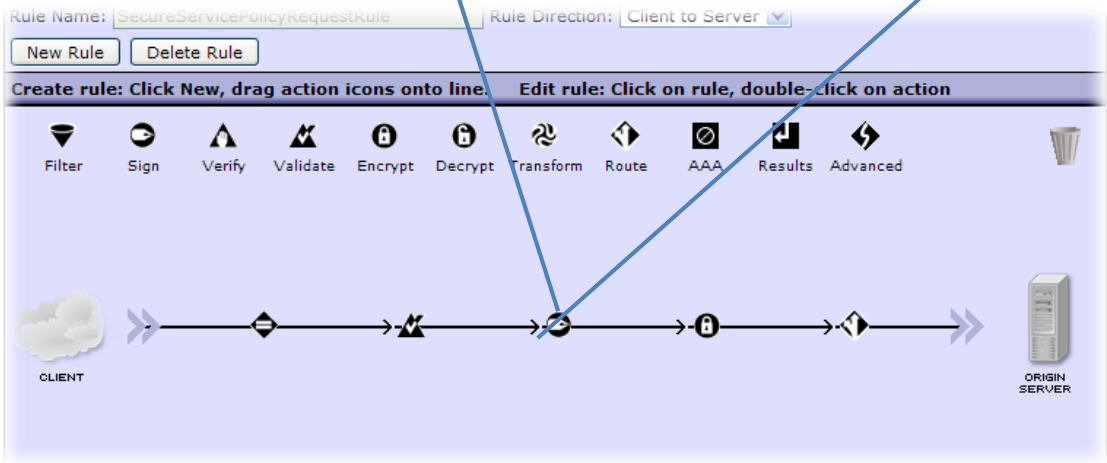
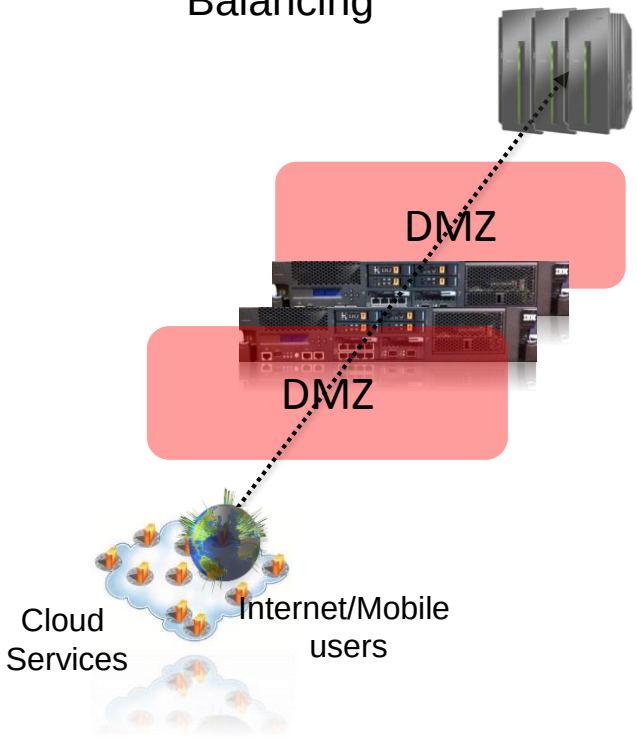
DataPower's configuration-driven approach speeds time to market

- Enforce security standards with **zero coding**
- Uses intuitive pipeline message processing
- **Import/export** configurations between environments
- Plug and Play Service Level Management & Load Balancing







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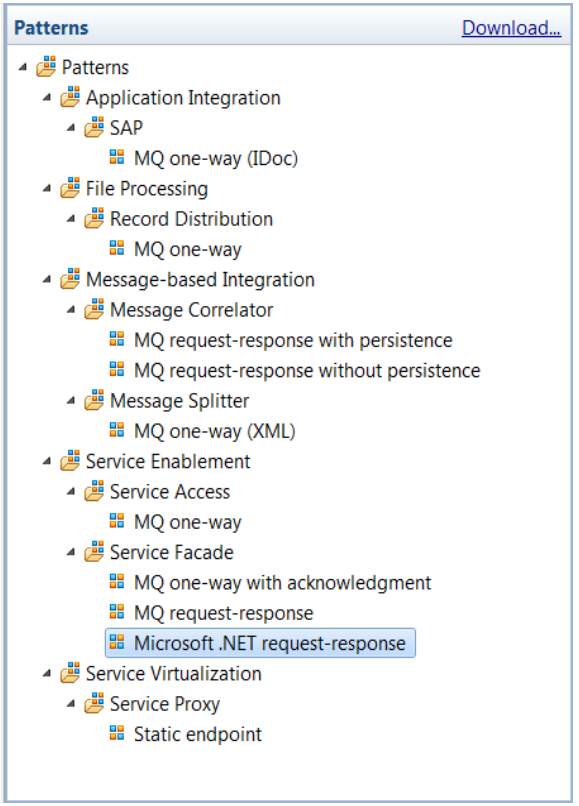
IBM Integration Bus - Productive and Intuitive

- **Patterns Based Development**
  - Quickly create best practice solutions from pre-built templates
    - e.g. Web Service façades, Message processing, File to queue…
  - IBM pre-supplied & User Defined Patterns
    - Create & share user patterns, including community downloads

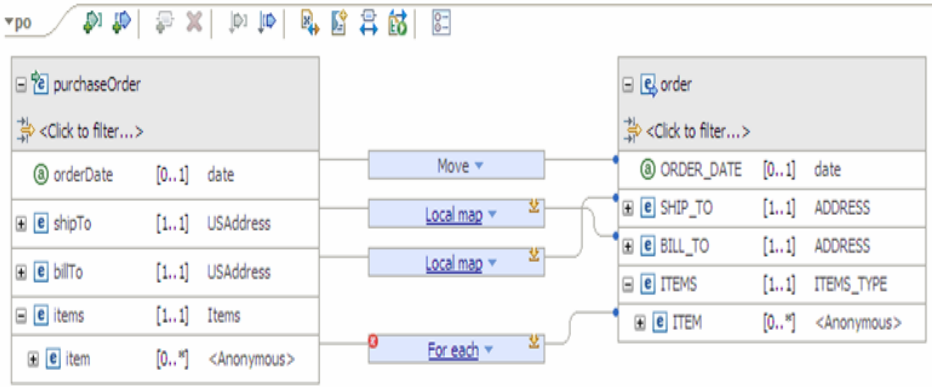


- **Capture your artifacts as an exemplar for a custom pattern**

- **Broadest range of platform support**
  - From Cloud platforms to Unix/Linux, Windows, and Mainframe

- **Do the work with the skills that fit your shop**
  - Transform natively in Graphical. Java, .NET, PHP, XSLT and more

- **Do the click test!**
  - Common tasks faster and in fewer clicks than others



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Groundbreaking Productivity

Reuse an existing asset	4 clicks
Deploy & test a simple integration	4 clicks
Diagnose and resolve a problem	4 clicks
Customize a java integration	10 clicks
Redeploy on a new platform	drag & drop
Enable a service to be monitored	2 minutes

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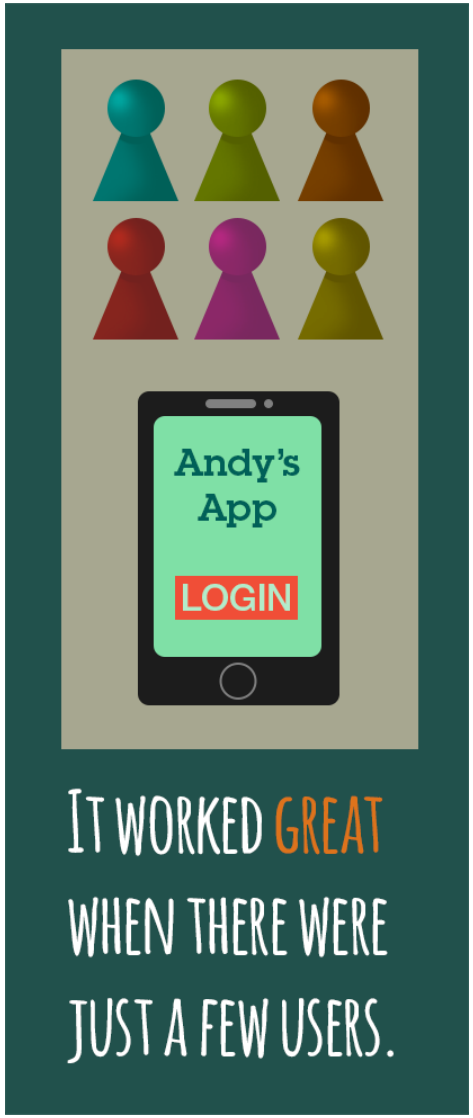
MQ Light



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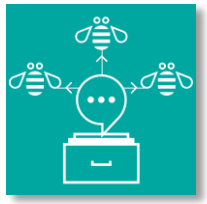
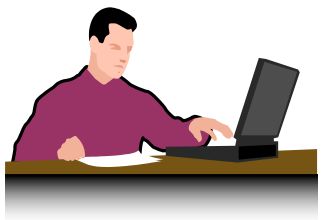
MQ Light

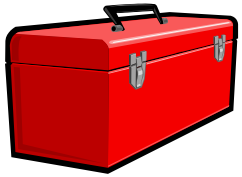
Designed for application developers writing apps that need to scale

- Exceptionally easy for developers to get started with
- APIs that feel native in each language
- Tooling that assists development
- Simple download and unzip – zero install
- Simple admin, no need to be an infrastructure specialist





Develop Application
node, ruby, python, etc



Develop using
MQ Light

"MQ Light"

WebSphere MQ
[Statement of Direction]

MQ Light for Bluemix

www.ibmdw.net/messaging/mq-light/

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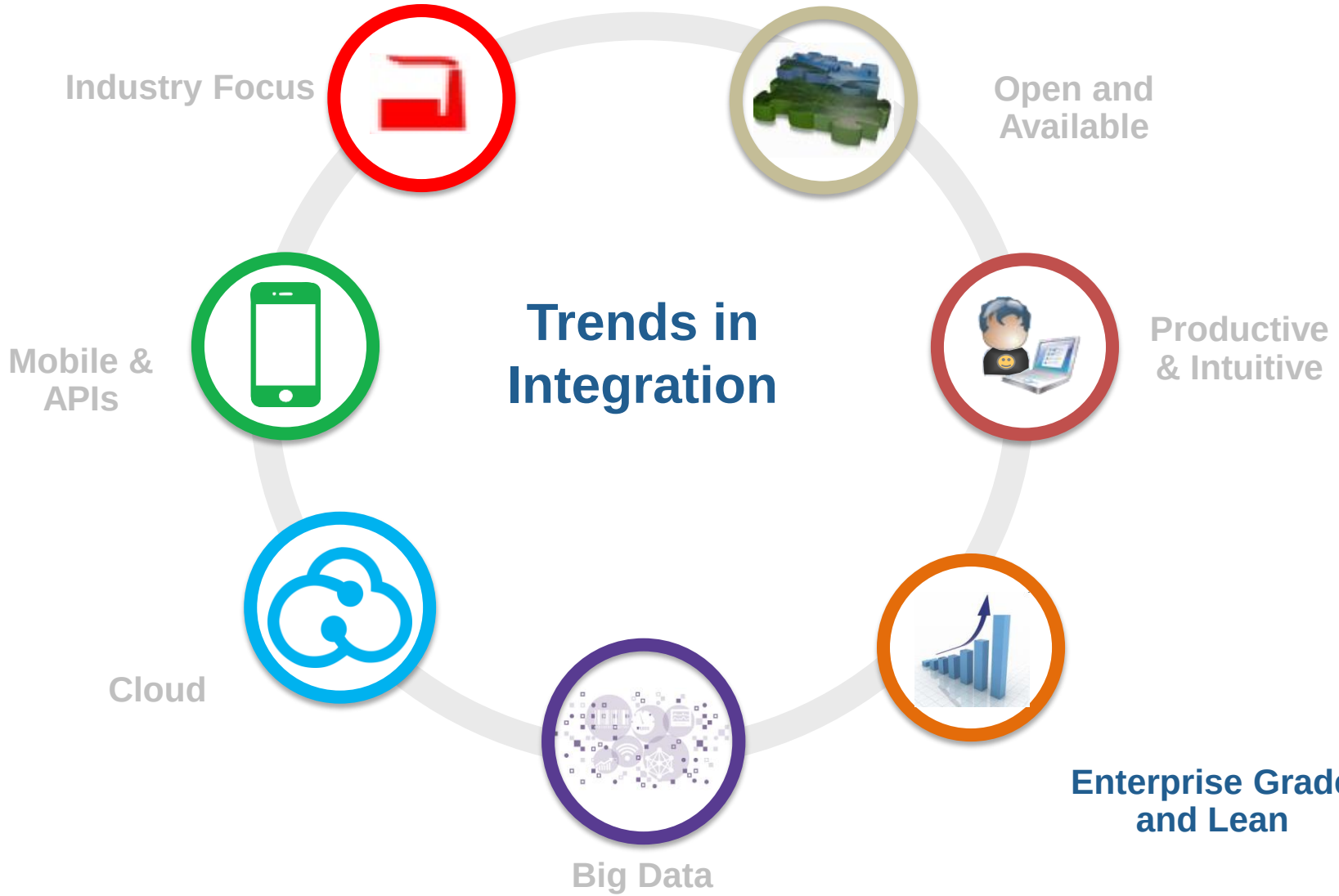

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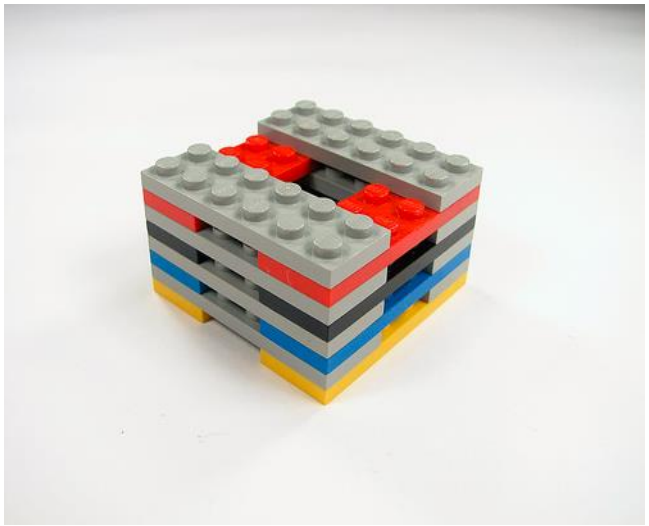
Lean Footprint

Zero trade off between Lean and Capability

Typical integration Tool

- Multiple Pre-reqs
  - Application Server
  - DataBase
- Limited platforms
- OS specific development, customisation



IBM Integration Tools

- Zero pre-reqs
- Run anywhere
  - Widest range of supported platforms encompassing cloud, virtual, distributed, and mainframe.
- Unrivaled scaling and throughput.

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Available now!

IBM MQ V8.0 and IBM MQ V8.0 for z/OS

Scalable, secure, comprehensive connectivity using reliable messaging everywhere you need it

Platforms & Standards	*Security*	*Scalability*	*System z exploitation*
64-bit for all platforms	Userid authentication via OS & LDAP	Multiplexed client performance	64-bit buffer pools in MQ for z/OS means less paging, more performance
Multiple Cluster Transmit Queue on all platforms	User-based authorisation for Unix	Queue manager vertical scaling	Performance and capacity
Support for JMS 2.0	AMS for IBM i & z/OS	Publish/Subscribe improvements	Performance enhancements for IBM Information Replicator (QRep)
Improved support for .Net and WCF	DNS Hostnames in CHLAUTH records	Routed publish/subscribe	Exploit zEDC compression accelerator
SHA-2 for z, i & NSS	Multiple certificates per queue manager		SMF and shared queue enhancements

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Available now!

DataPower Firmware v7.0

- **Patterns based development and deployment**
- **GatewayScript**: A **JavaScript-based** gateway runtime which simplifies configuration for developers and provides an easier development paradigm for **Mobile, Web, & API**
- New **Virtual Edition for Developers** provides a low cost (per user pricing) and easy to use **gateway for developers**
- Support for Citrix **XenServer** provides additional deployment flexibility for Virtual Edition deployment **on-premise & in SoftLayer**
- **WebSocket Proxy** support enables full-duplex, bi-directional, & low-latency communication for **Web & Mobile applications**
- Network redundancy & increased throughput with support for **Link Aggregation**
- **Improved security & traffic control** functionality in support of **API Management** offering

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Early 2015

Key Initiatives

Business Insight

Analytics
Management Dashboards
Business Transaction Monitoring

Develop to Deploy

Developer Tools Platforms
Developing for Deployment
Single Package Install

IBM Integration Bus v10

Cloud

Industry

Industry Integration
Healthcare
Retail
Manufacturing

Platforms

MQ Flexibility
Platform Support
Pure Systems

Integration for Developers

Data Formats & DFDL
Graphical Data Mapping

Connectors & Discovery

New & Updated Common Connectors
Discovering Endpoints
Applying Policy

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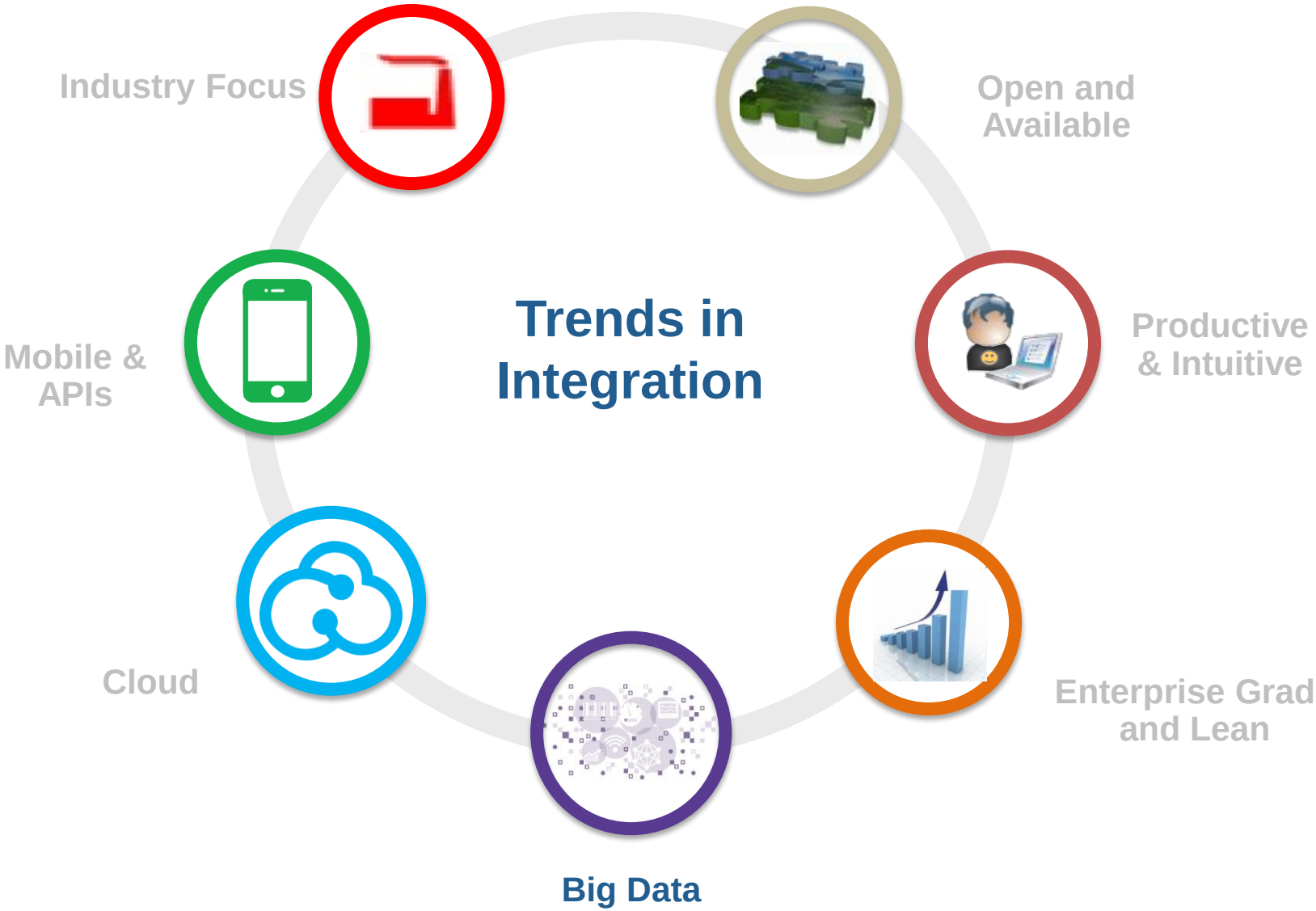

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How big is Big Data?

Big Data

90%
of data is less than two years old

80%
of the world's data is unstructured

2.5
quintillion bytes created daily

168
million emails sent each minute

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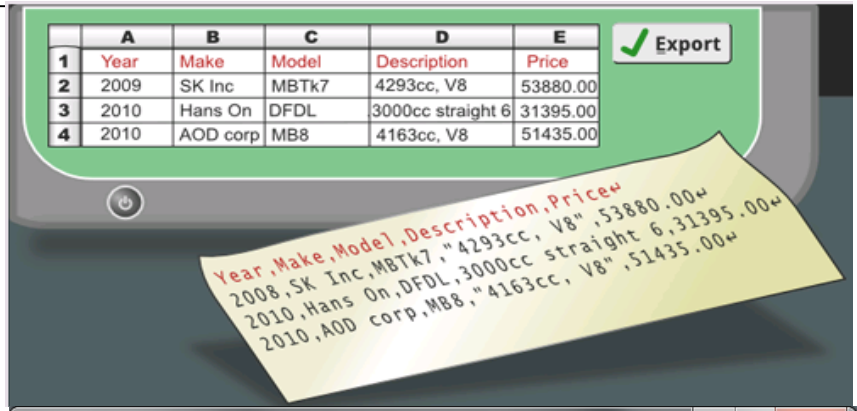
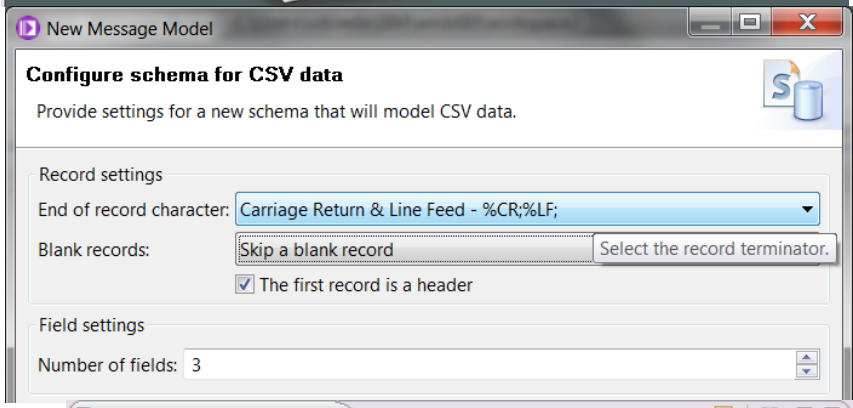
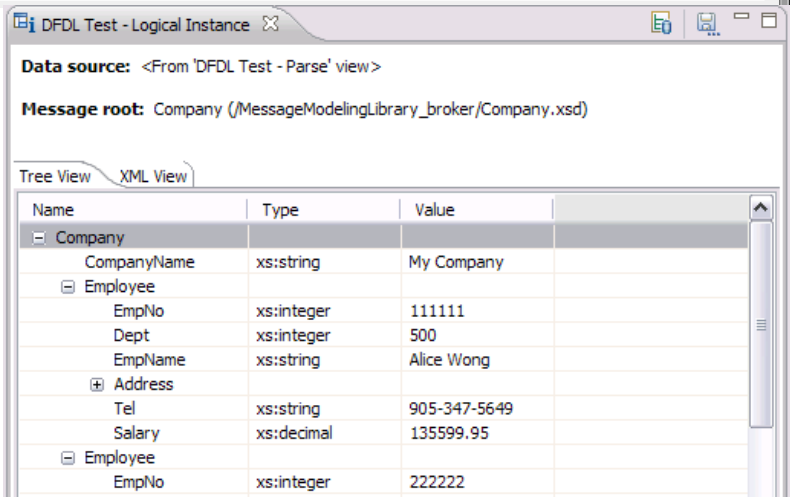
Easily Handle Unstructured Data from new Data Sources

- **DFDL—Data Format Description Language**
  - Simple & powerful standard for data modelling
  - Standard for binary, text & industry data formats
    - forge.gridforum.org/projects/dfdl-wg
  - In place parsing check and test data generation
  - Very high performance (JIT, streaming, partial parsing, etc.)
- **Graphical Mapper now supports schema-less mapping**
- **No parse option and no internal canonical means high throughput pass-through**



	A	B	C	D	E
1	Year	Make	Model	Description	Price
2	2009	SK Inc	MBTk7	4293cc, V8	53880.00
3	2010	Hans On	DFDL	3000cc straight 6	31395.00
4	2010	AOD corp	MB8	4163cc, V8	51435.00





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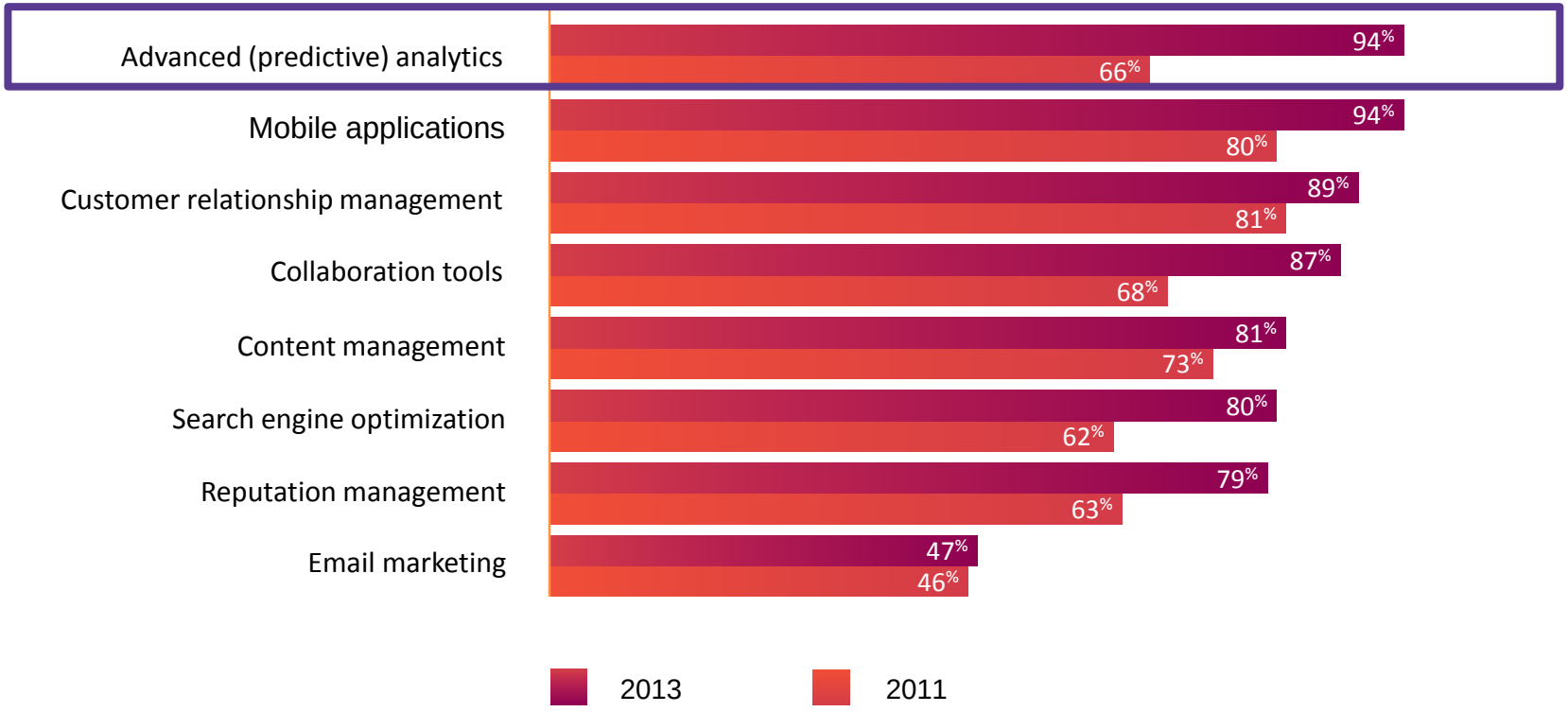
Predictive Analytics: Using Realtime for Competitive Advantage

CMO intended use of digital technologies (3 to 5 years)



Source: Question CMO7–What is your plan around the usage of the following technologies over the next 3 to 5 years?

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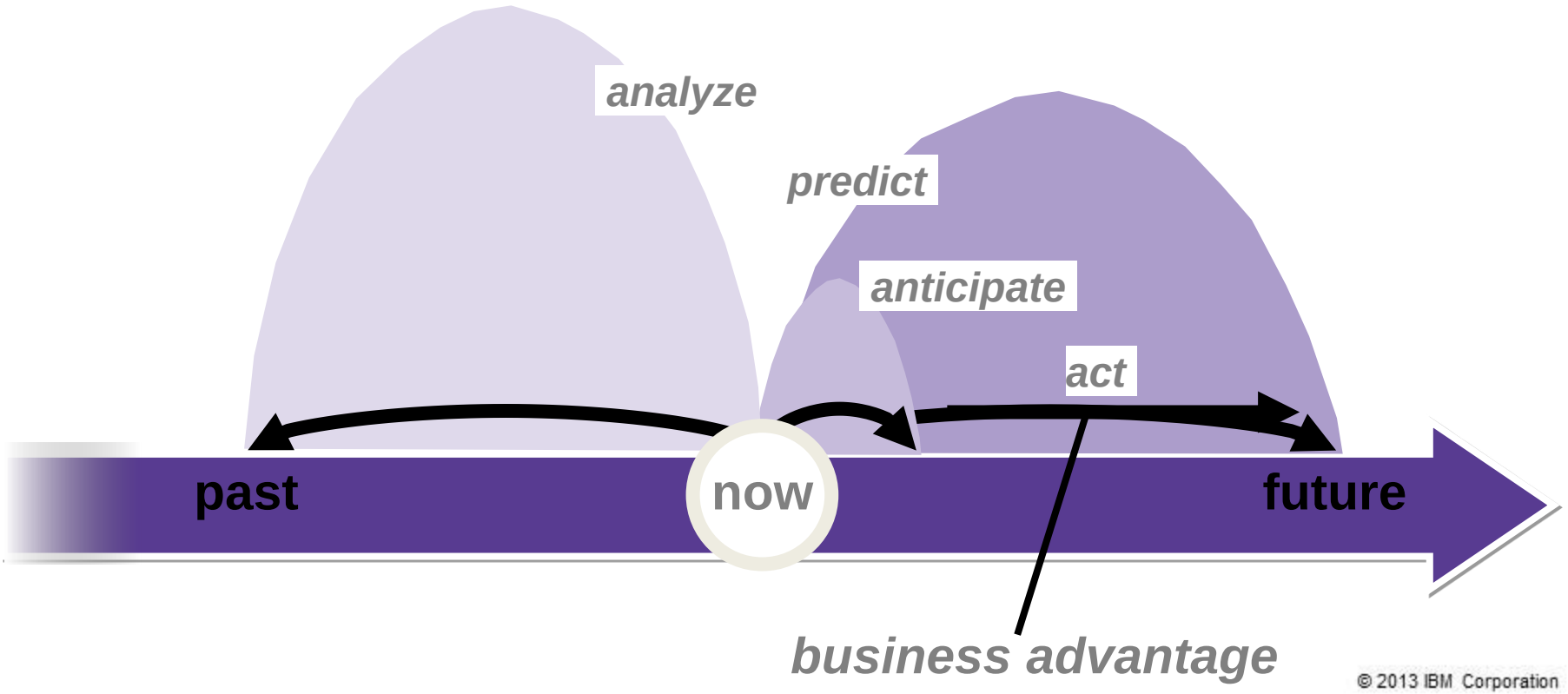
Predictive Analytics in a Nutshell

- Comparing **what is happening right now** with **past experience** to **predict the future**
- **Anticipate** the changes needed to **proactively optimize** the business



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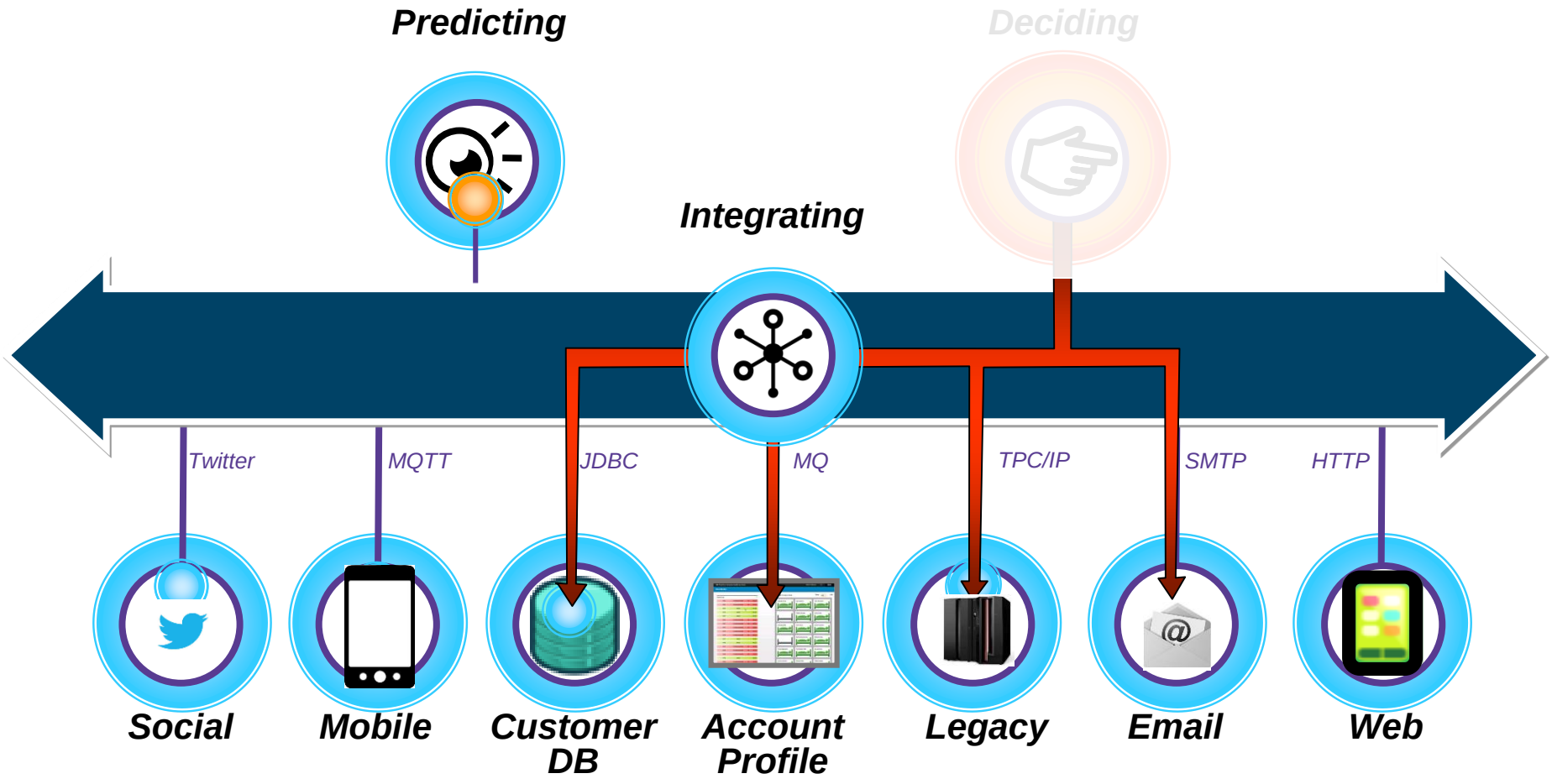
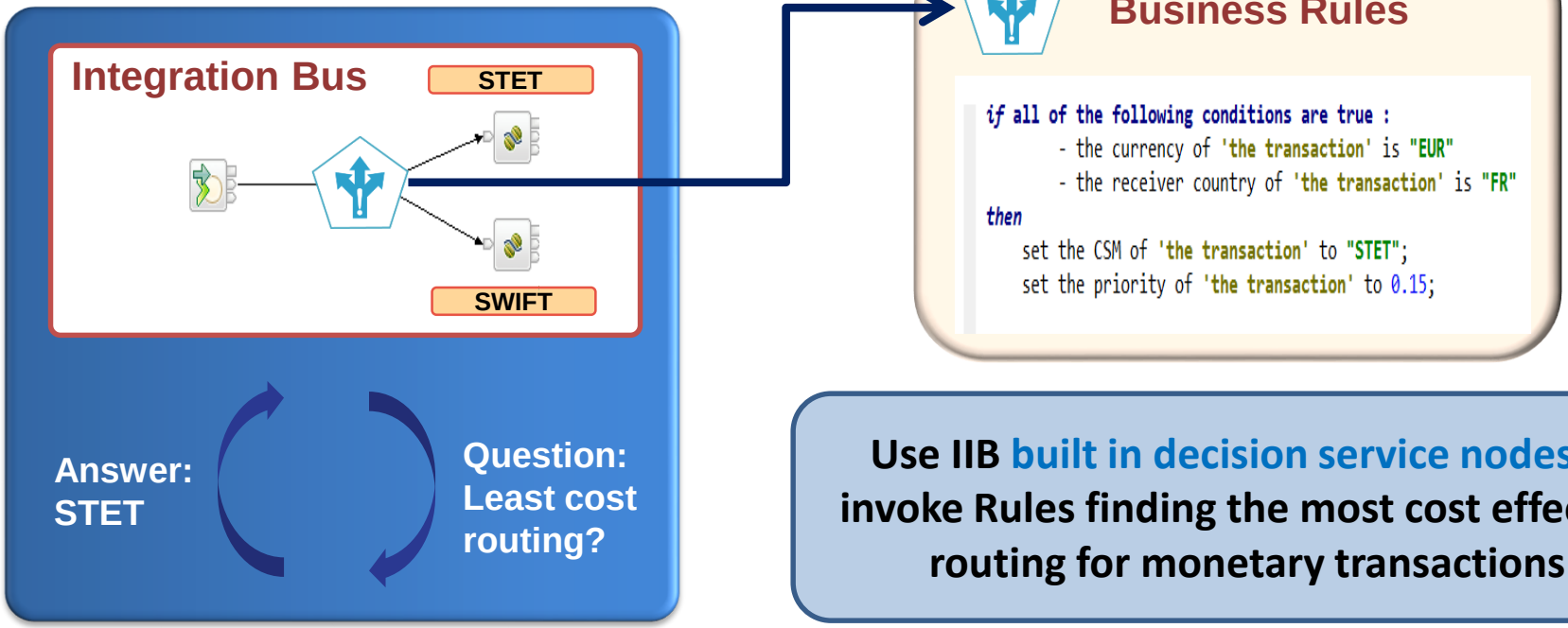
Putting it together: Predictive Analytics in Action



Business Rules Service: Applying insight to in-flight data

- Empower business users to design, manage and improve rule decisions with **Rule authoring tools and an embedded Rules engine**
- Invoke Rules with built in decision service nodes to inform routing, validation and transformation within integration solutions

Example:
Smart Routing for Finance Payments



Use IIB built in decision service nodes to invoke Rules finding the most cost effective routing for monetary transactions

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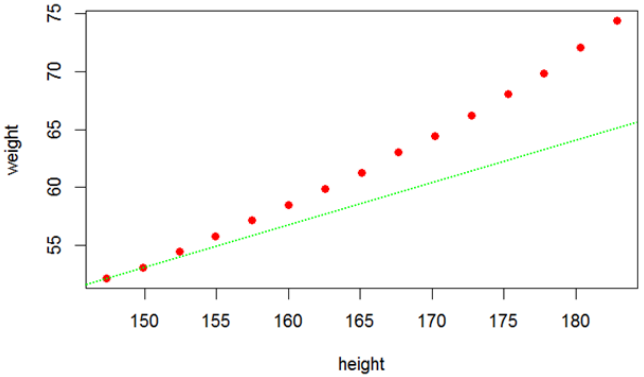
Analytics Node

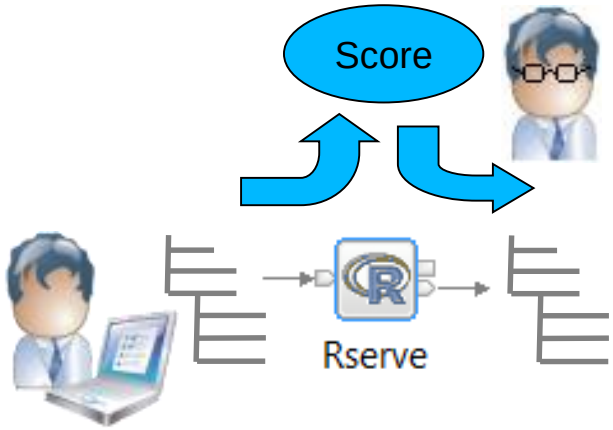
- Demand is growing for analytics to be a real-time activity
- As data flows through the enterprise, IIB has visibility to score it against a predictive model



- Data Scientist Role
  - Prepares a model based on an analytics engine.
  - For example R, SPSS, SAS

- Integration Developer Role
  - Formats a data stream and applies it to a model

- Analytics node for model based decision making
  - Find & express patterns in data with analytics models
  - Analytics equivalent to Business Decision node
    - Pluggable engine for e.g. R, SPSS, SAS…



GitHub

Open Technologies for Integration

http://ot4i.github.io

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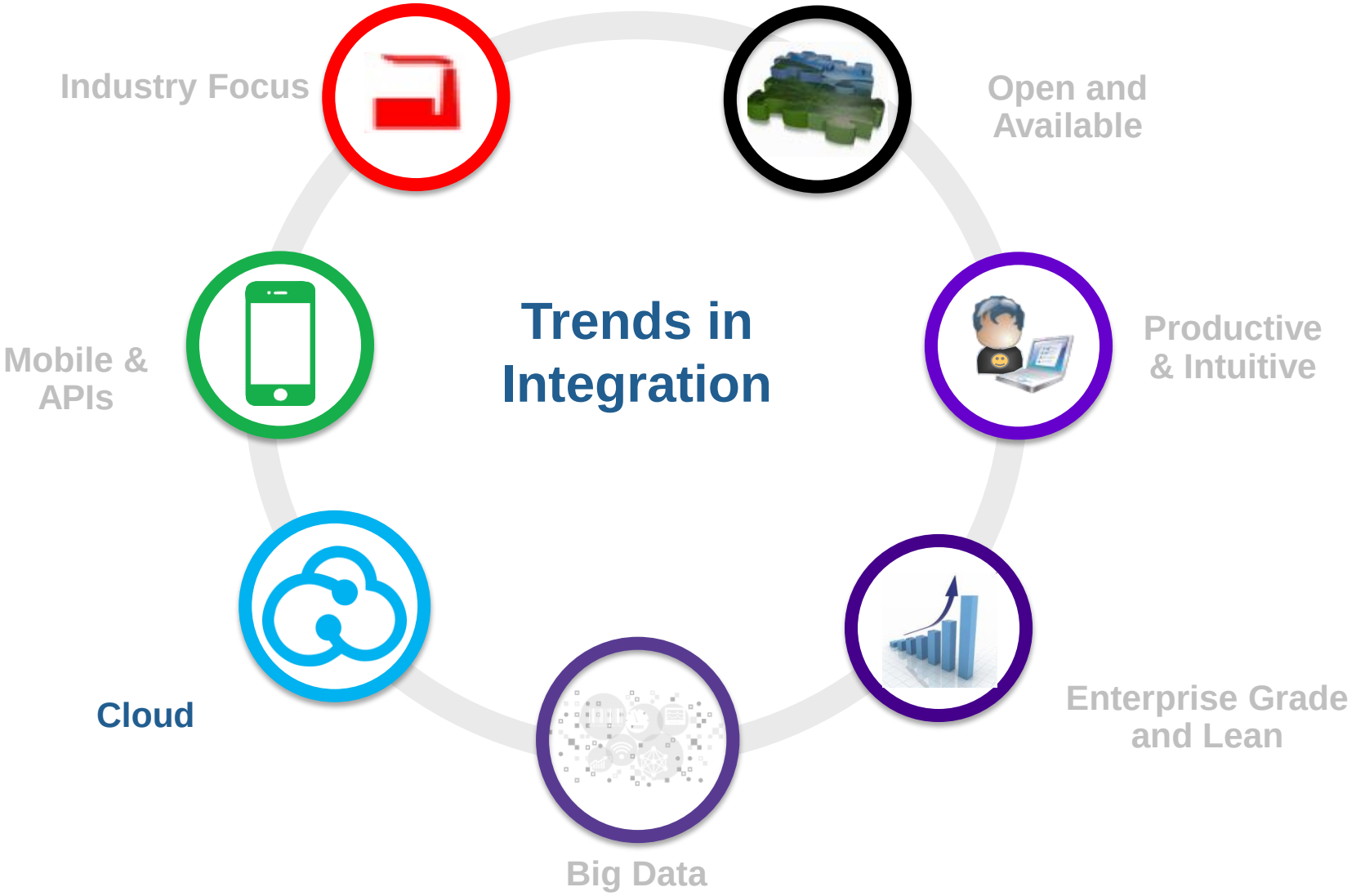
Industry Focus
Open and Available
Mobile & APIs
Trends in Integration
Productive & Intuitive
Cloud
Enterprise Grade and Lean
Big Data

Cloud is changing the game

Cloud

62%
of total workloads in the cloud by 2016

75%
of users act on location-based offers

85%
Of businesses use at least one external SaaS application

545
Average number of cloud services in use

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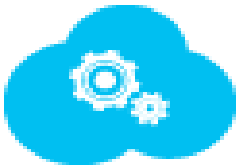
What Do We Mean by Cloud Computing?

- **Infrastructure as a Service (IaaS)**
  - The most basic layer. Equivalent to logical hardware layer.
  - Access to compute, storage, network resources
  - Charging generally by (virtual) machine capacity
  - Examples: VMWare, KVM, EC2, OpenStack, Rackspace, TerraMark,…
  - Many organizations have some experience with these technologies
  - Total flexibility: can build and deploy VM to run any application

IaaS

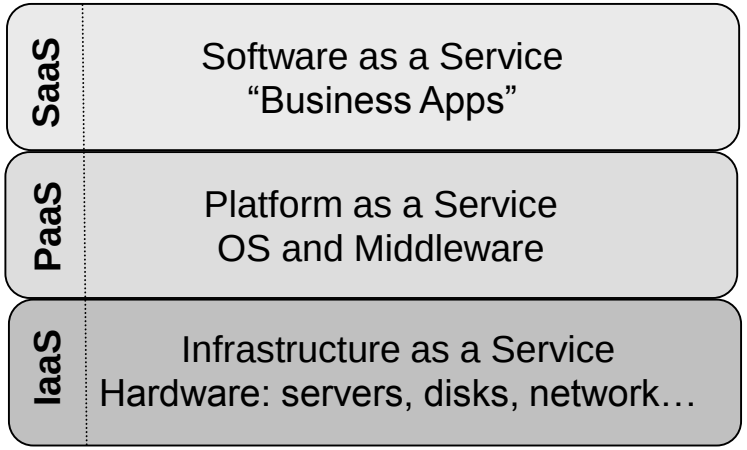
- **Platform as a Service (PaaS)**
  - Application Centric view. Equivalent to operating system for Cloud.
  - Application deployed into this environment hosted in the cloud
  - Simplifies application dependency & provisioning, e.g. databases, messaging
  - Often charged by licensed capacity or by usage
  - Examples: Cloud Foundry, Heroku, OpenShift, Force.com…
  - Developers are trying out these platforms today, adoption growing



PaaS

SaaS

- **Software as a Service (SaaS)**
  - Provides access to hosted applications or services
  - Trades off flexibility in favour of ease of use for users with less middleware experience
  - Usage based charging, per hour or per ‘transaction’
  - Examples Salesforce, Office 365, GoogleApps…
  - Particular applications are very popular



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IaaS: Install/Configuration automation

- Full IBM support on popular public IaaS options such as Softlayer and Amazon

SOFTLAYER® an IBM Company

- Subscription / Rental pricing
- Chef
  - Open Source technology focussing on managing middleware install/config
  - Bring your own hardware or Cloud provider such as SoftLayer
  - Chef Cookbook for IBM Integration Bus v9 published on github
  - Installs IIB and MQ, creates queue managers and integration nodes
  - Recipes follow best practices including performance tuning

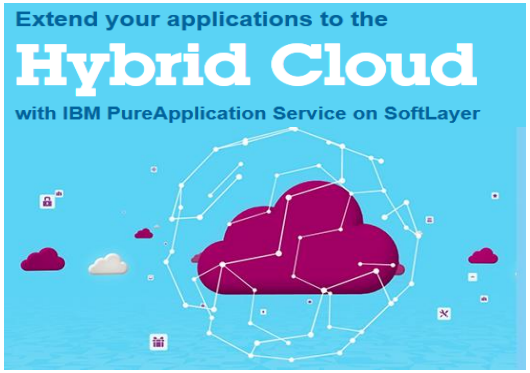
CHEF™

- IBM UrbanCode Deploy plugins
  - Orchestrates and automates the deployment of applications, middleware configurations, and database changes into development, test, and production environments

urban{code}
An IBM company

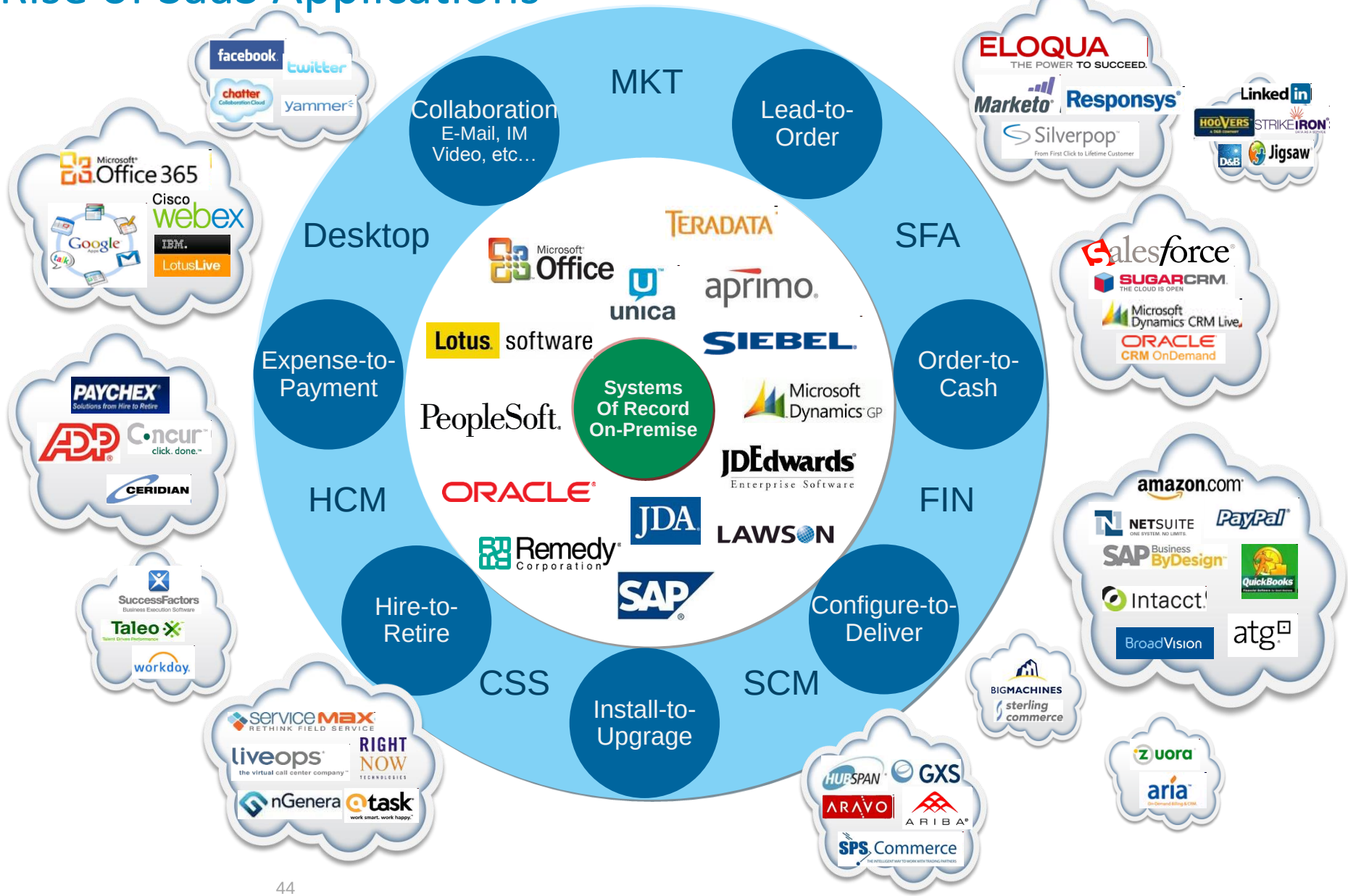
PaaS: IBM Hosted Environments

- IBM PureApplication Service on Softlayer
  - Fully integrated, managed hardware platform, hosted on **IBM SoftLayer**
  - Subscription / Rental Pricing
  - Automated provisioning of machines as well as deployment of middleware via IBM Patterns
  - **IIB & MQ Patterns** for PureApplication Service available on IBM Cloud Marketplace

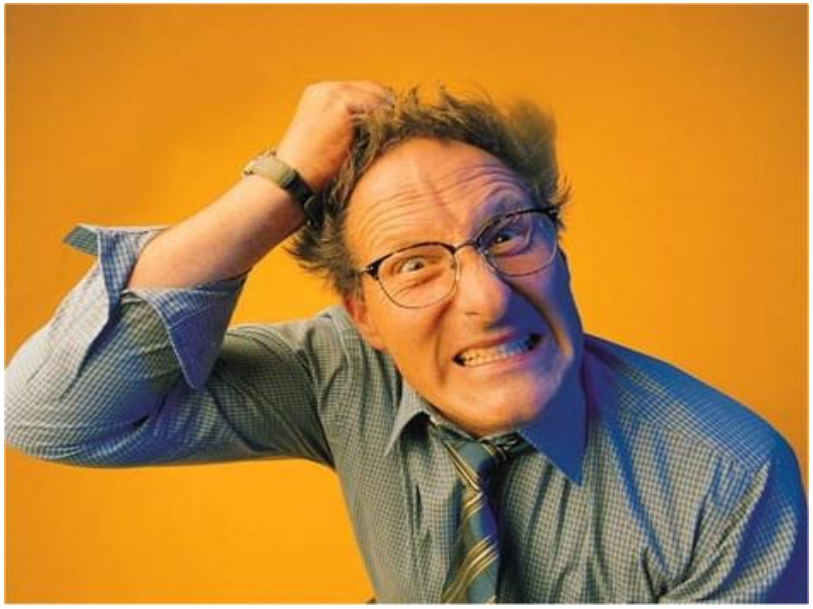


- IBM CastIron Live
  - Multi-tenant, cloud-based platform for integrating cloud and on-premise applications and enterprise systems in a hybrid environment.
  - Rapidly connects your cloud applications without writing a single line of code

Rise of SaaS Applications



SaaS App Integration Introduces New Requirements

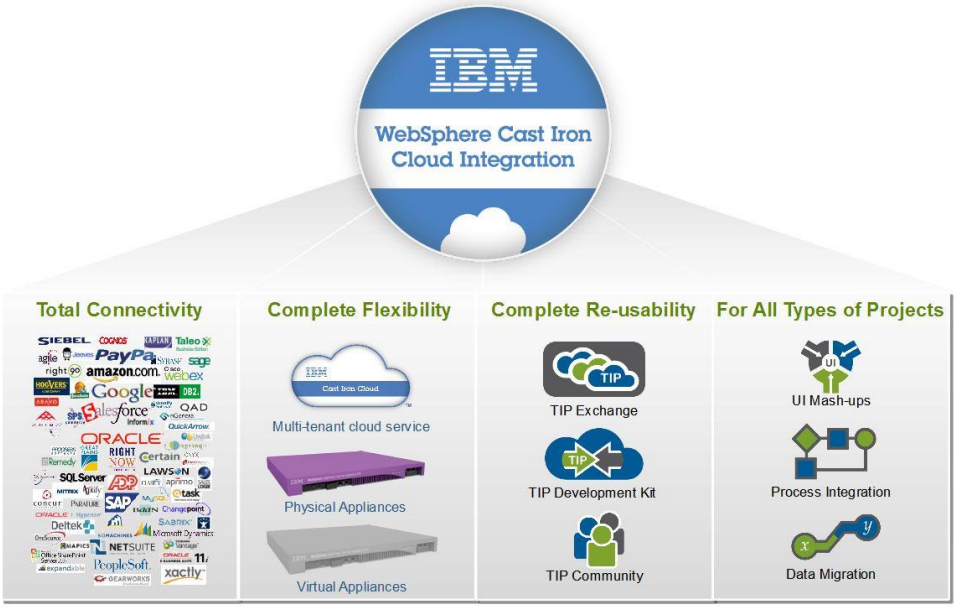


- Enabling data load and data synch of SaaS applications
- Session Management
- Masking sensitive data passed to cloud end points
- Security
- Managing data quality from cloud end points
- Exposing enterprise assets as API's for use by application developers

Available now!

Rapid Integration with the Cloud

- IBM WebSphere Cast Iron V7.0 provides an approach to integrating applications that does not require any programming knowledge.
- Integration flows are built in Cast Iron Studio (a graphical development environment that is installed to a PC).
- There are two main ways Cast Iron can be implemented:
  - An appliance model where the appliance can be either physical hardware or a virtual machine, and where the Integration Appliance is installed on-premise, behind the firewall.
  - As a **PaaS** model (Cast Iron Live)
- Both implementations (form factors) allow for cloud-to-cloud, cloud-to-on premise, and on premise-to-on premise integration.



Highlight: Currently, $1 of every $3 of companies' IT spending goes toward integration projects. Cast Iron's configuration-based approach can help companies **reduce integration costs by up to 80%** compared to the costs of customer code writing.

Highlight: With hundreds of reusable templates and prepackaged integration processes, the need to build custom-coded integrations from scratch is eliminated, reducing time for data integration and migration **from months to days**.

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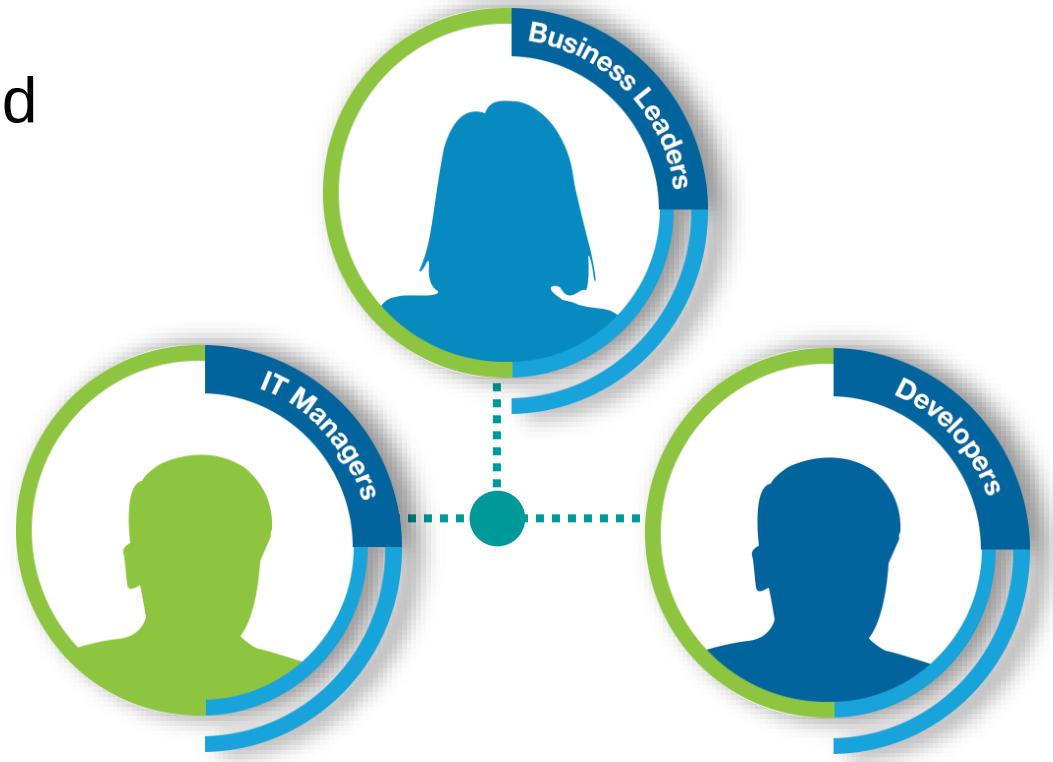
The Future is a Composable Business

- Restless reinvention and process innovation
- Better decision making from actionable insight
- Speed to market



Available now!

Manage your APIs in the Cloud
IBM API Management Service (SaaS)

- All capabilities of on-prem offered as SaaS
- Self service, Try & Buy, credit card payment
- Monthly billing, Annual subscription
- Pricing based on number of API calls & developer accounts, and optional logging of API payload
- Assisted selling for large customers & volume buyers
- Hosted on IBM SoftLayer Cloud

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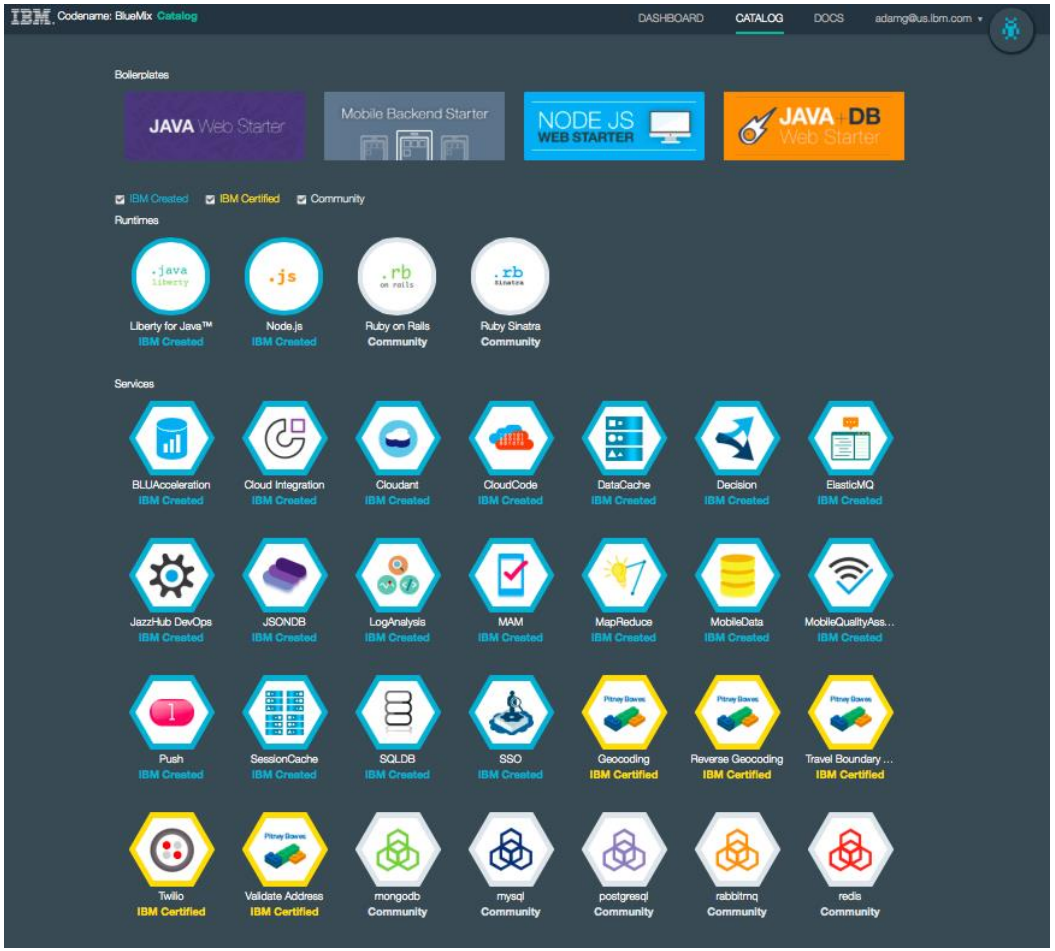
Available Now!

Introducing IBM BlueMix

Delivering a Composable Services development environment



Run Your Apps

The developer can chose any language runtime or bring their own. Just upload your code and go.

DevOps

Development, monitoring, deployment and logging tools allow the developer to run the entire application

APIs and Services

A catalog of open source, IBM and third party APIs services allow a developer to stitch together an application in minutes.

Cloud Integration

Build hybrid environments. Connect to on-premises systems of record plus other public and private clouds. Expose your own APIs to your developers.

Built on IBM SoftLayer

Runs automatically on top of IBM's leading infrastructure as a service. No need to worry about provisioning or managing infrastructure.

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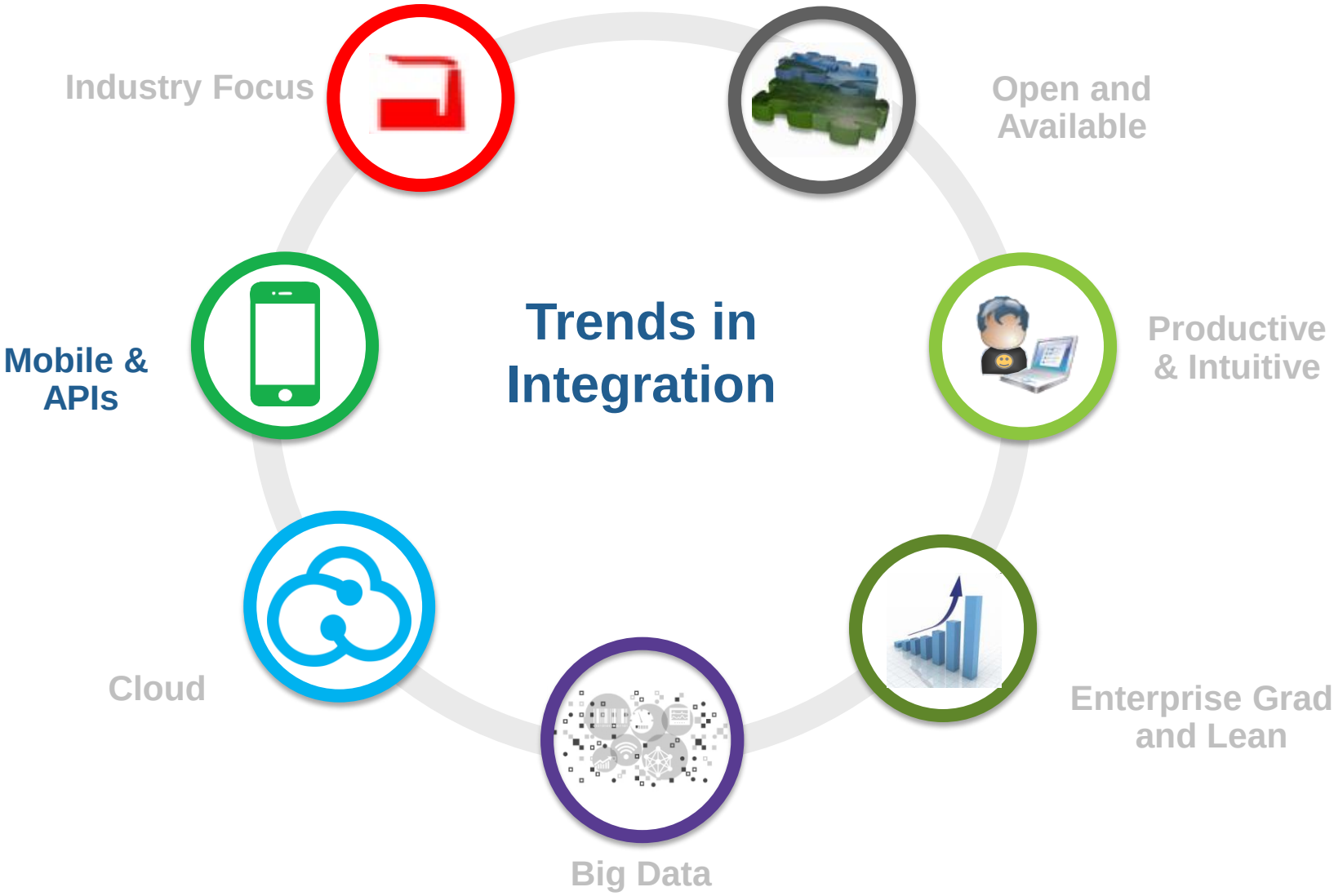

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Why enterprises are putting Mobile First

Mobile

1B
Smartphone users by 2016

75%
of users act on location-based offers

91%
always keep mobile at arms reach

11,000
APIs on the Programmable Web

$534b
Mobile transactions by 2015

95%
of Mobile traffic is data by 2015

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Or just consider the 2 recent Papal inaugurations…

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IBM Worklight accelerates web, native and Hybrid development

Integrated Development Environment or Command line tools (BYO Tool)

Versatile Application development using native and/or familiar web technologies

Support wide range of operating system and devices

With the simplicity of a single, shared code base

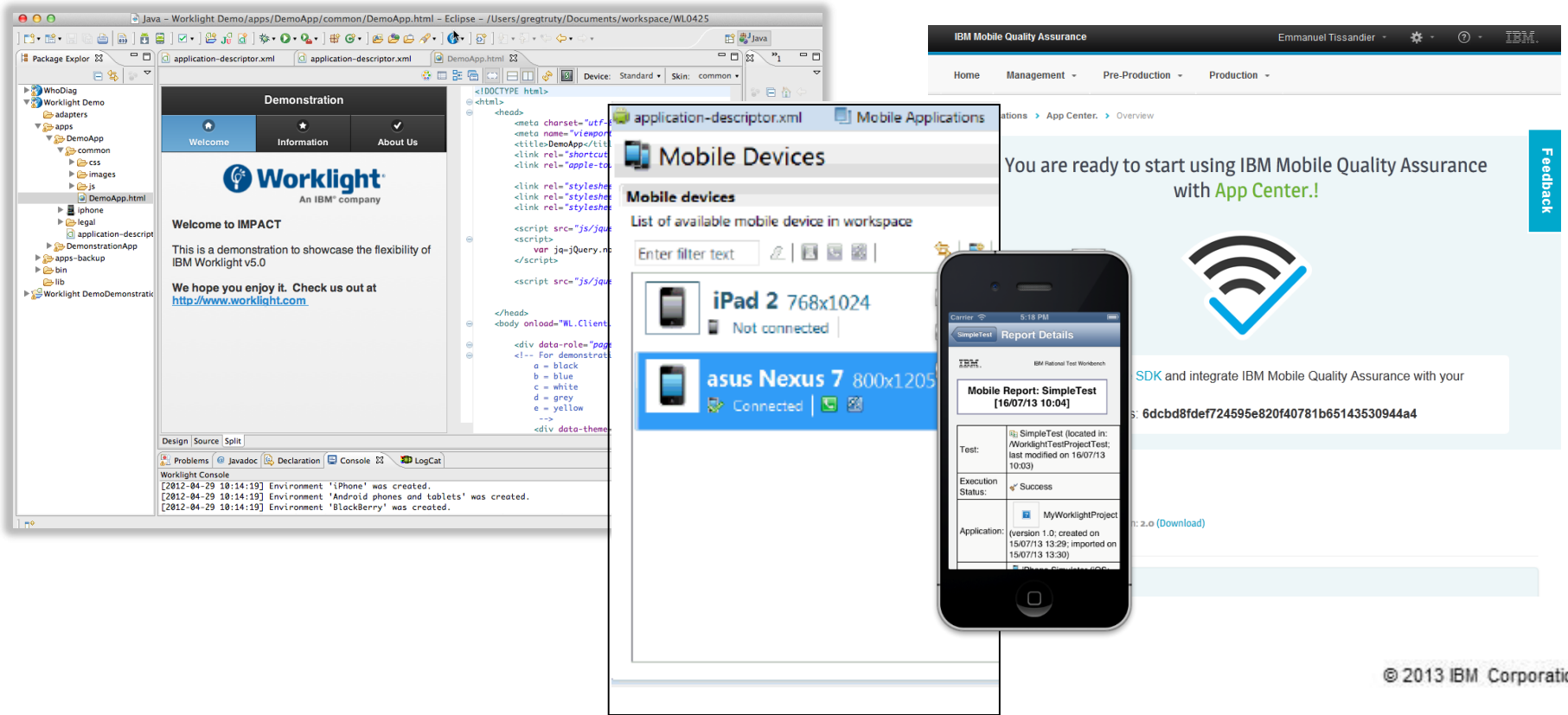
Simulate apps on a variety of form factors

Create, run and automate functional tests

Mobile Quality Assurance

In-App bug reporting

Crash reporting



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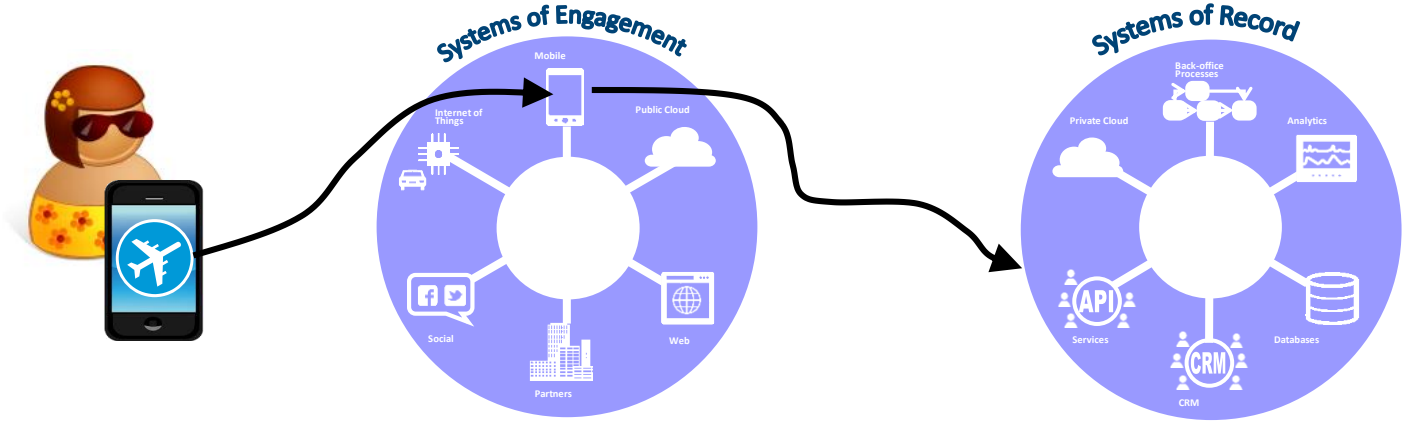
Un-integrated Mobile apps are not Engaging

Example: Customer uses Mobile app to interact with Airline



- ✓ **Can** see my ticket
- ✓ **Can** find my seat
- ✓ **Can** see upgrade option
- ✓ **Can** check flight status
- ✓ **Can** see in-flight meal

- × **Can't** change my ticket
- × **Can't** move my seat
- × **Can't** buy upgrade
- × **Can't** change flight
- × **Can't** buy my choice of food

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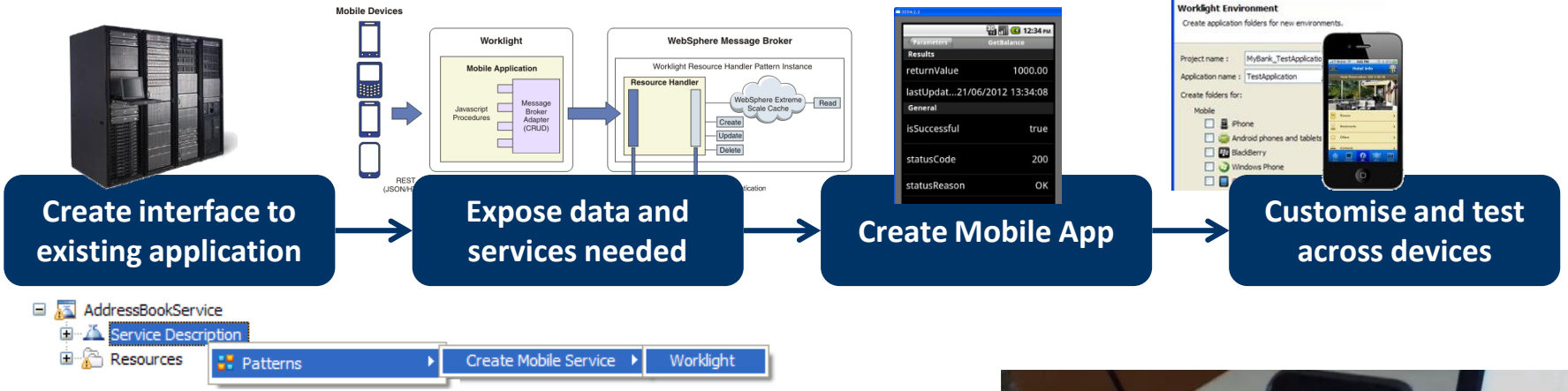
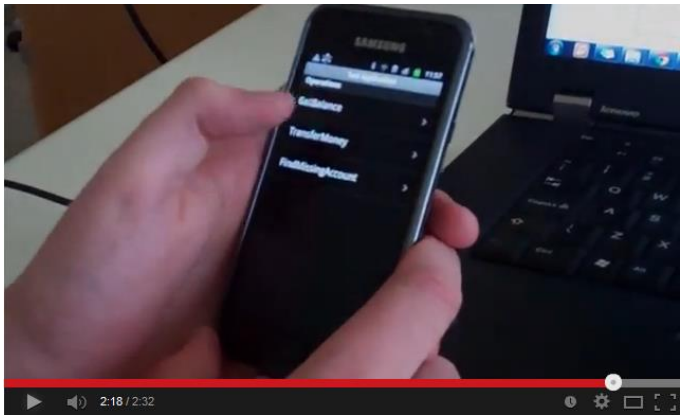
Mobile in 10 minutes

Integrated engaging Mobile apps



- **Easy**
  - Drag and drop application and enter Worklight adapter details
- **Rapid**
  - Pattern does all the hard work in less than a minute
  - Generates Web service exposing desired operations
- **Easy to test**
  - Generates sample mobile application
  - Optimised for small screen mobile devices
  - Easy to add extra environments for iOS, Android and many more!
- **Ready to run**
  - Generates adapter ready for deployment to Worklight Server



http://youtu.be/xE3EcDdA-RE

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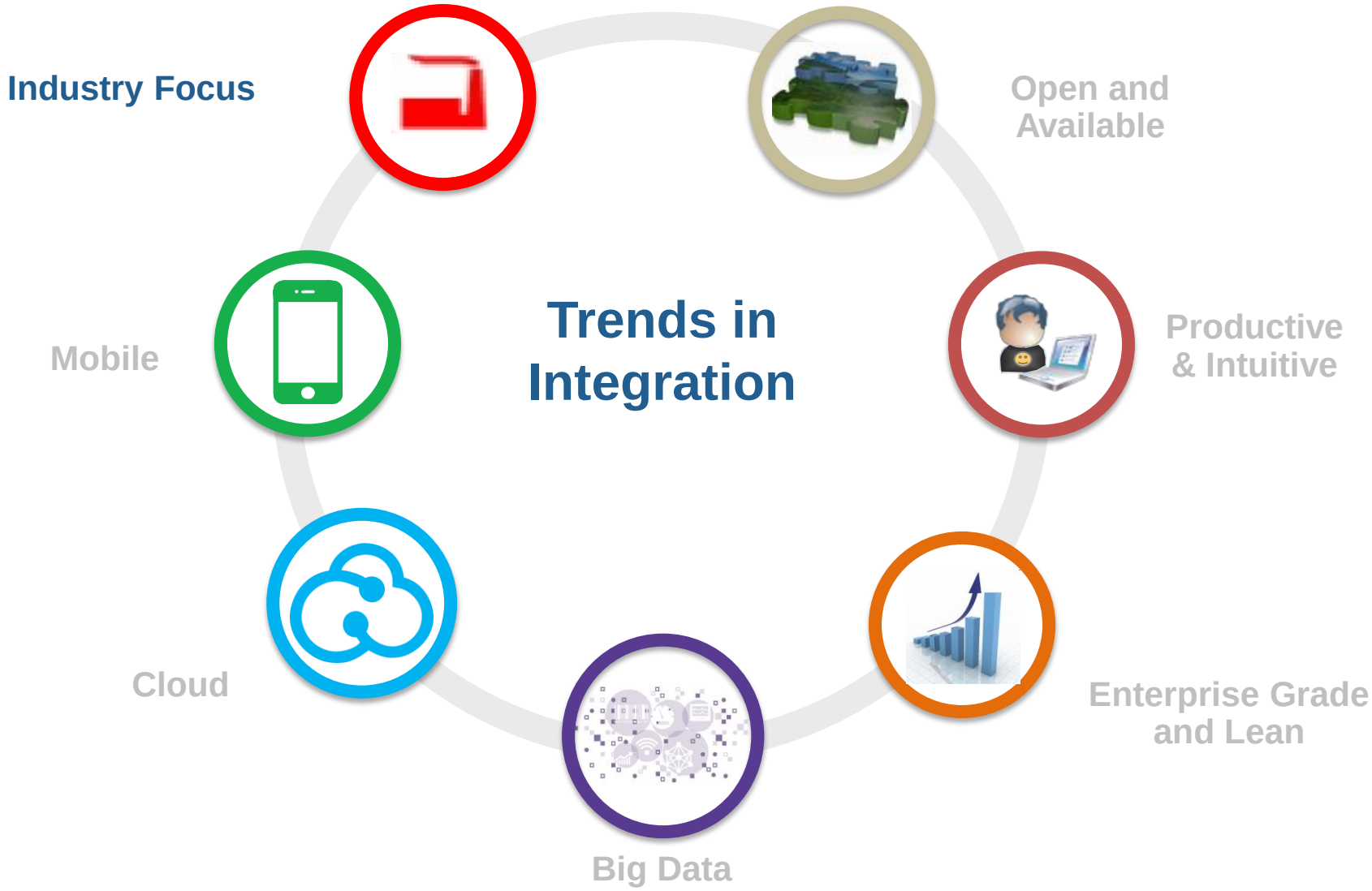

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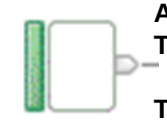
What are IBM Integration Industry Packs?

- Each pack is a separately purchased, fully supported software product, built on IBM Integration Bus
- Provide industry-specific development accelerators for common industry integration problems
- Help users to deploy working integration solutions in *literally* a few clicks of the mouse.
- Provide industry specific pricing e.g store, factory and hospital per bed deployments
- IIB Industry Pack content is structured around three delivery pillars:

Industry Connectors & data formats



Association for Retail Technology Standards (ARTS)

TLOG (PoS Transactions)

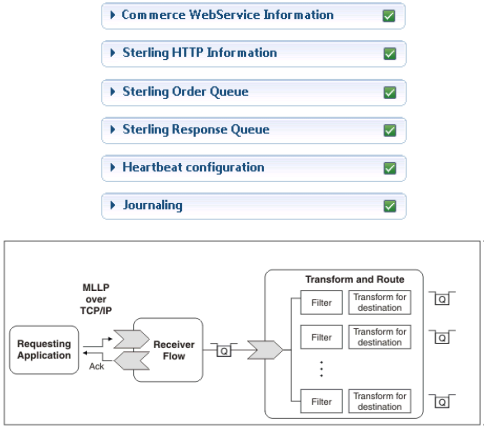
Proprietary Medical Devices

OPC (industrial & Manufacturing)

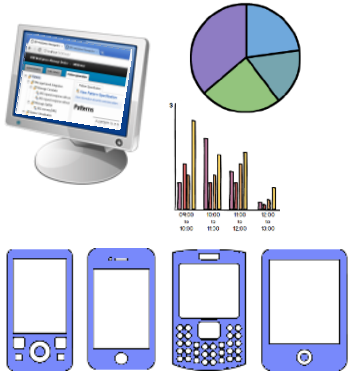
Health Level 7

Digital Imaging and Communication in Medicine (DICOM)

Integration Patterns



Domain specific Operational Views



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Industry packs for Healthcare, Retail and Manufacturing

Healthcare Pack v3.0

- Support for Continua based remote patient monitoring solutions
- Integrates HL7 v2.x based clinical repositories & applications
- Integrates DICOM based PACS & modalities
- Processes CDA/CCD documents
- Direct connectivity to medical equipment - monitors, infusion pumps

Retail Pack v1.0

- Integrates PoS terminals
- Processes Point of sale transaction data in TLOG and PoSLog formats.
- Integrates WebSphere Commerce eCommerce engine and Sterling DOMS Order Management
- Provides Web based view of point of sales transaction data

Manufacturing Pack v1.0

SoD – April 22 2014 (Impact)
Announce – 5 May 2014

- Connects and integrates plant floor and industrial machinery utilizing OPC (classic) industry standard
- Direct support for vendor specific implementation of OISSoft PI Server
- Integrates plant and enterprise applications which support OPC UA standards
- Web-based interface to provide operational views of data published from plant and machinery

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Thank You

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