

Simplifying Cloud, Integration & Security:

IBM DataPower and the API Economy

Peter Brabec

IBM DataPower Gateways & API Economy

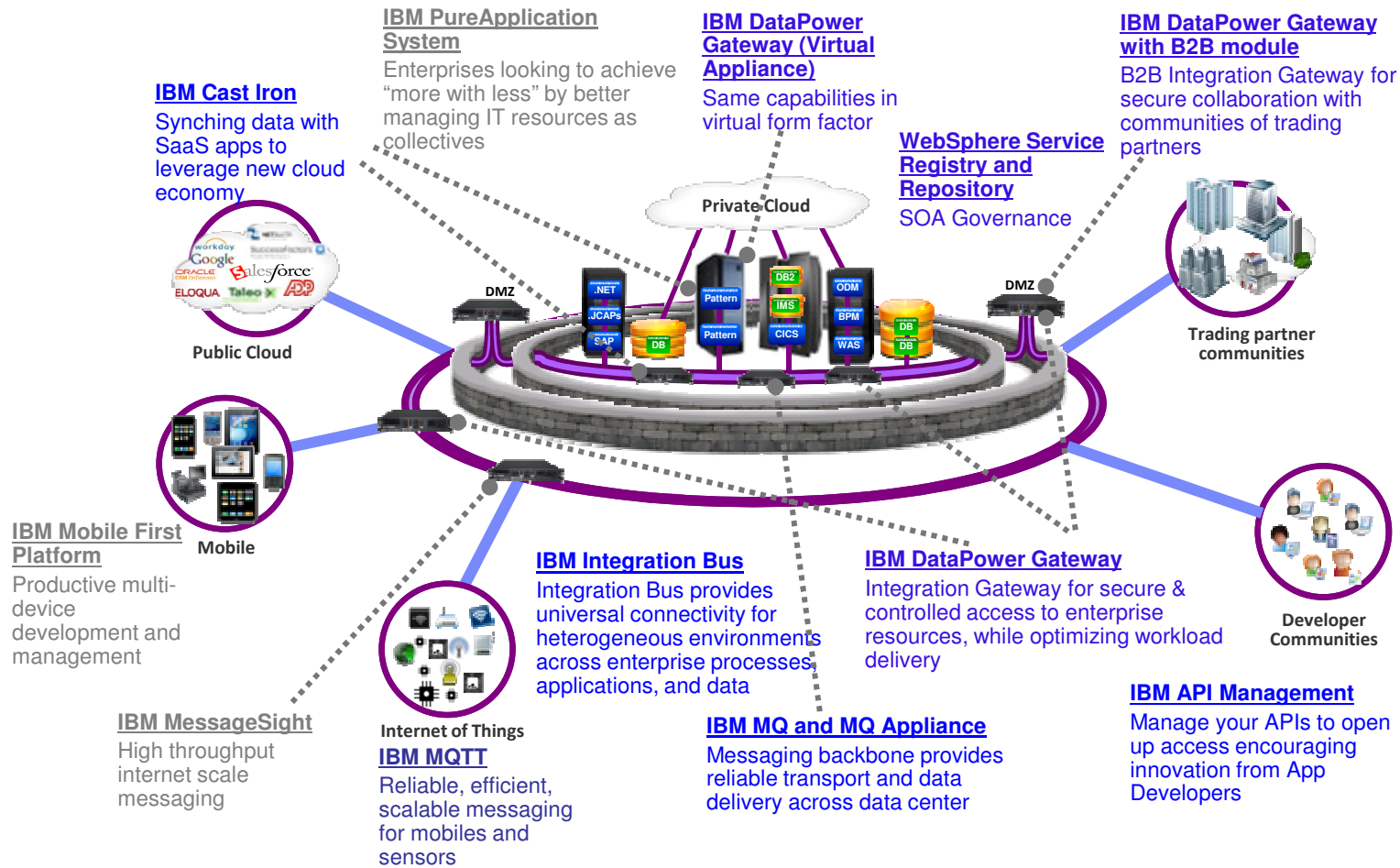
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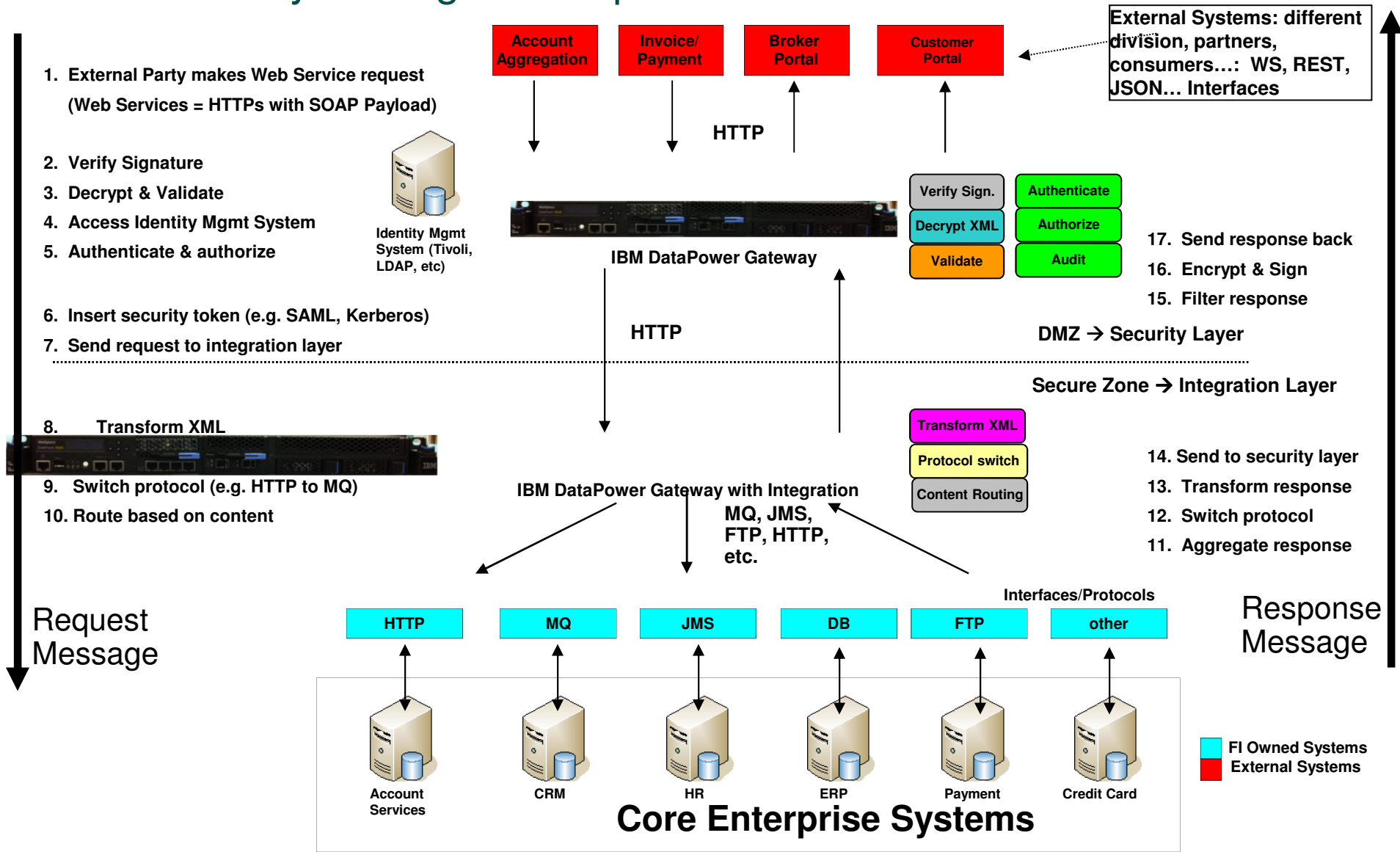
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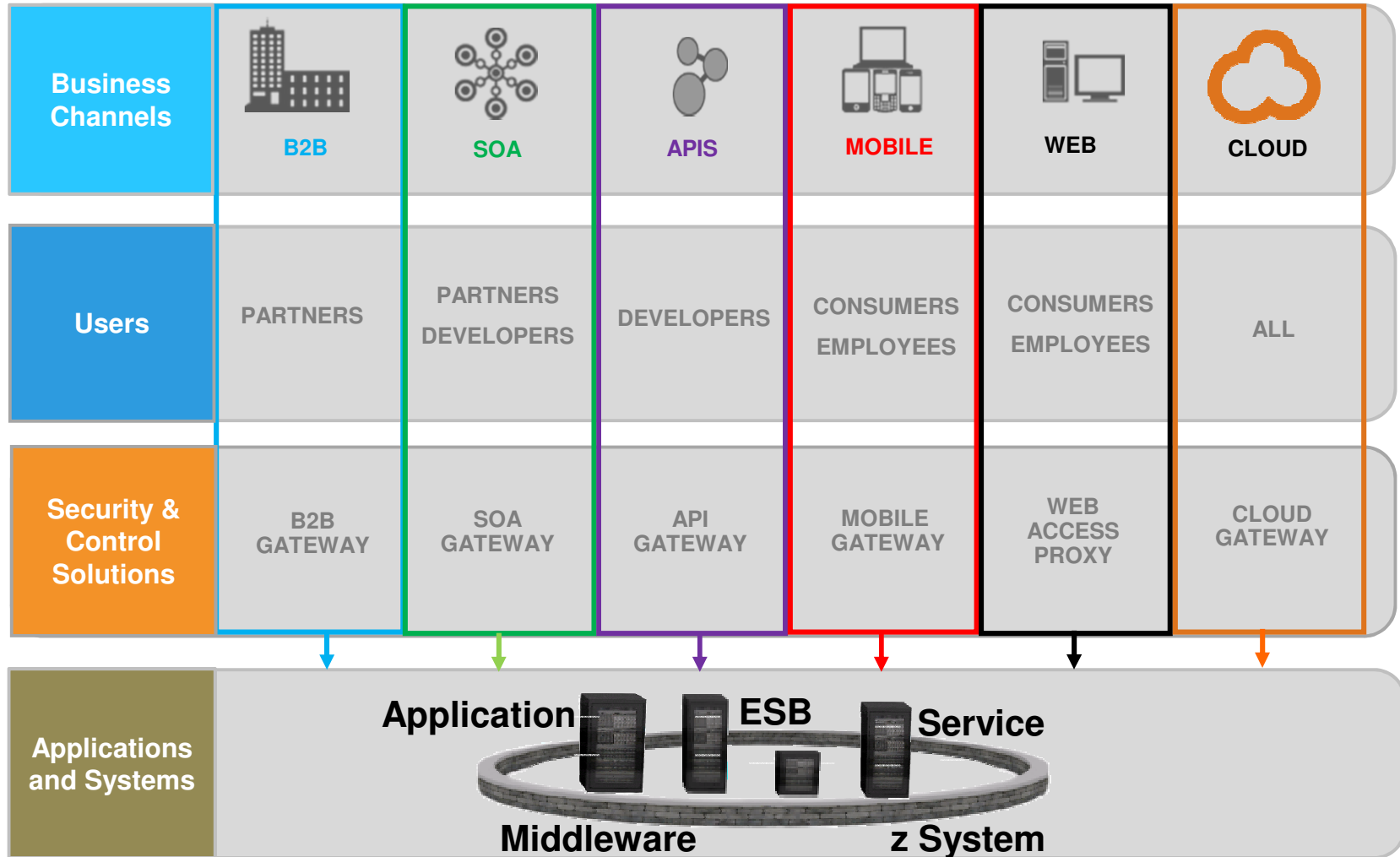
IBM Connectivity & Integration offerings



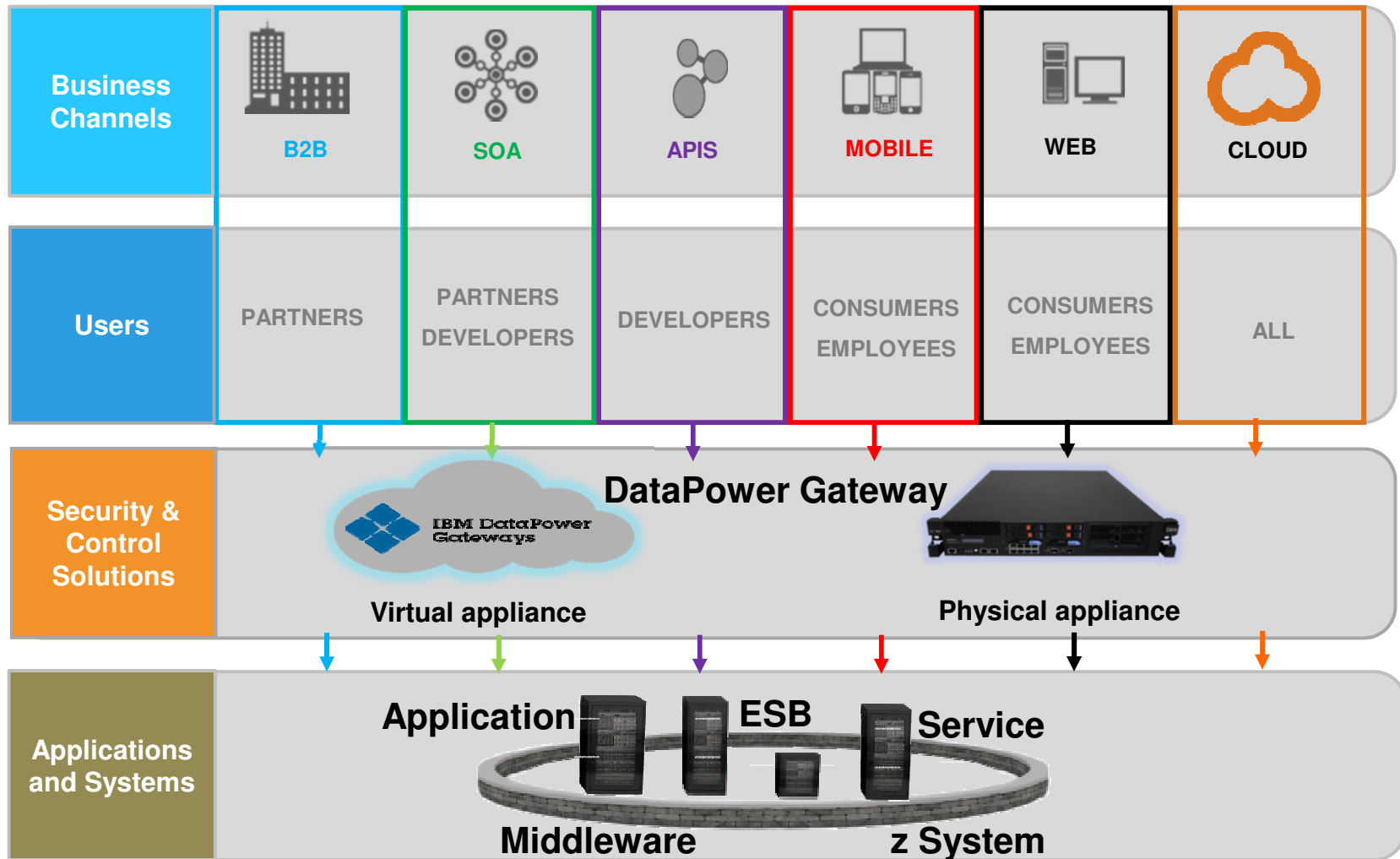
SOA Security & Integration Operational Scenario



Silos of security & control are impeding business agility



Reduce cost + improve security & control with a single gateway



Rapidly deliver secure integration & optimized access for a full range of workloads

Secure



- **Secure & protect** your back-end systems from harmful workloads and unauthorized users & apps

Integrate



- **Convert** payloads, bridge transports and **connect** to existing services at wire-speed

Control



- **Limit & shape** traffic based on service level agreements, and **route** based on message content

Optimize

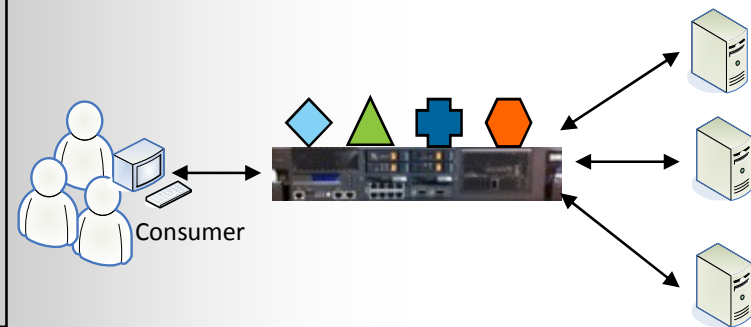
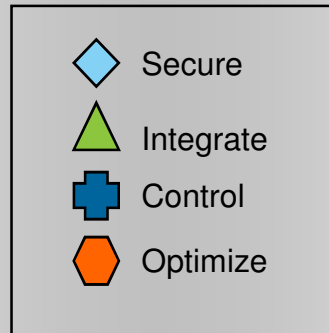
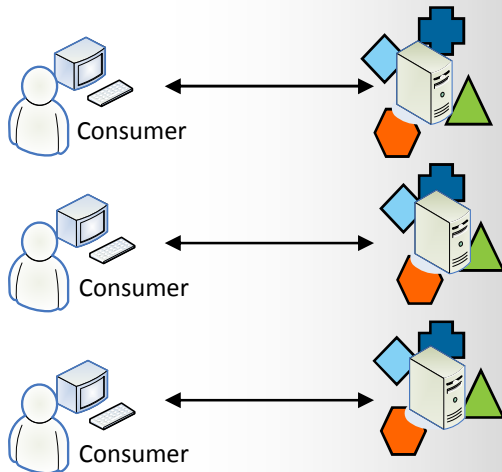


- **Improve** response times, **reduce** load on backend systems and intelligently **distribute** load

Before DataPower Gateway

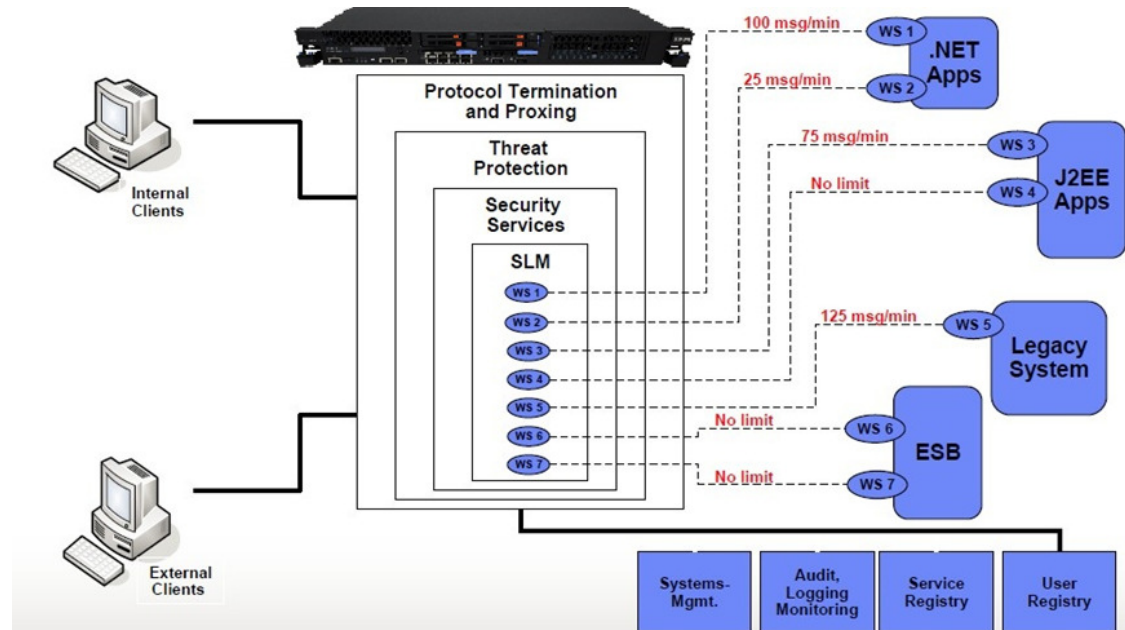


After DataPower Gateway



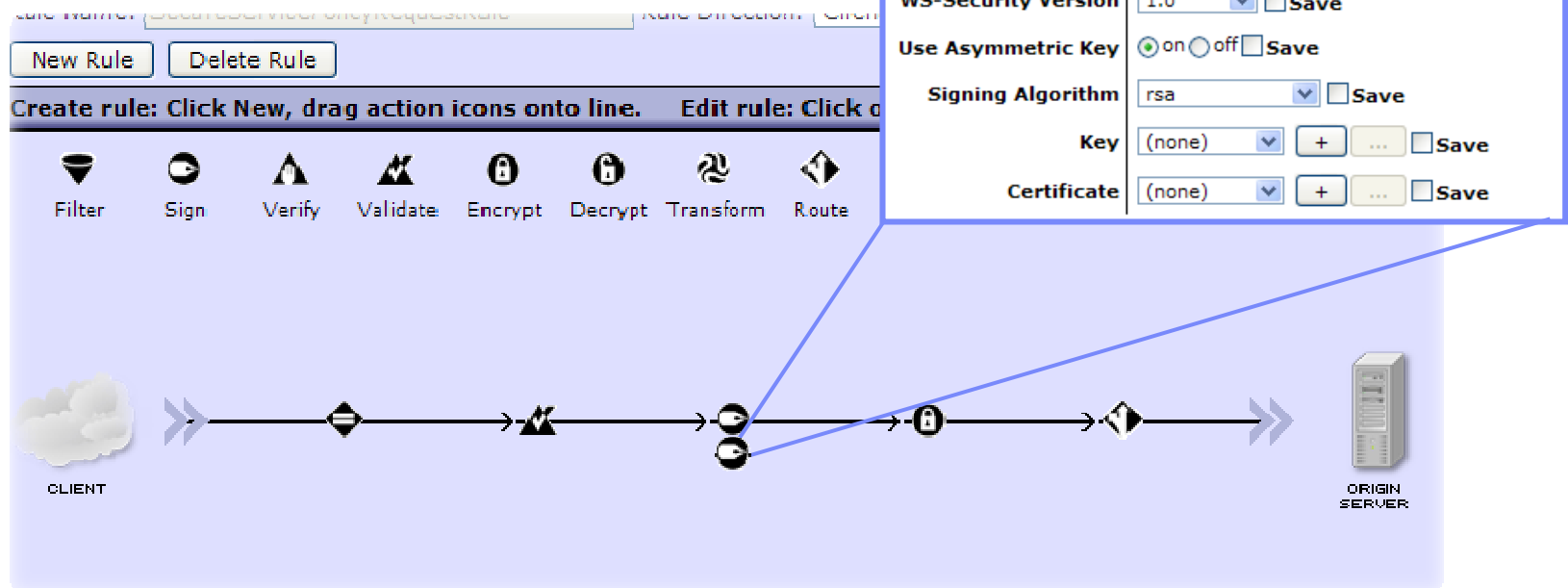
Centralized Service Gateway

- Security Services
- Integration Services
- Service Level Monitoring (SLM) to protect your services and applications from over-utilization and enforce quota
 - Traffic Control
 - Frequency based on concurrency OR based on messages per time period
 - Take action when exceeding a custom threshold: notify, log, shape, delay, throttle or reject



Configuration-driven approach speeds time to market

- Enforce security standards with **zero coding**
- Uses intuitive pipeline message processing
- **Import/export** configurations between environments
- Transaction probe shows message content between actions for debugging



IBM DataPower Gateway: New HW and Module Approach

Single Security & Integration gateway platform to provide security, integration, control & optimized access to a full range of Mobile, API, Web, SOA, B2B, & Cloud workloads

- IBM DataPower Gateway is the new name of a consolidated, extensible & modular platform
 - Converges three existing products, XG45 / XI52 / XB62, into a single modular offering
 - Available in physical and virtual form factor
- Physical Appliance
 - 2U rack mount appliance using latest generation hardware platform
 - Two base editions: Non-HSM and HSM (FIPS 140-2 Level 3 certified)
 - Each software module is licensed separately
- Virtual Edition
 - Three flavors: Developer, Non-Production, Production
 - Developer includes all software modules, except TIBCO EMS
 - Non-Production includes all software modules, except TIBCO EMS & ISAM Proxy
 - Production: Each software module is licensed separately

Supports V7.1
& above

ISAM
Proxy
Module

Integration
Module

B2B
Module

AO
Module

TIBCO
EMS
Module

All software modules are
field upgradeable



(2U Physical, Virtual Edition, Cloud Edition)

Single, modular & extensible platform

B2B Module

- B2B DMZ gateway
- EDIINT AS1,AS2,AS3,ebXML
- Partner profile management
- B2B transaction viewer
- Any-to-Any message transformation
- Database connectivity

TIBCO EMS Module

- Integrate with TIBCO EMS messaging middleware
- Support for queues & topics
- Load balancing & fault-tolerance

ISAM Proxy Module

- User access control, session management, web SSO enforcement
- Advanced mobile security: mobile SSO, context-based access, one-time password, multi-factor authn
- Integration with ISAM for Mobile

Application Optimization Module

- Frontend self-balancing
- Backend intelligent load distribution
- Session affinity
- z Sysplex Distributor integration

Integration Module

- Any-to-Any message transformation
- Database connectivity
- Mainframe IMS connectivity

IBM DataPower Gateway (Base)			
<p>Secure</p> <ul style="list-style-type: none"> ▪ Authentication, authorization ▪ Security token translation ▪ Service / API virtualization ▪ Threat protection ▪ Message validation ▪ Message filtering ▪ Message digital signature ▪ Message encryption ▪ AV scanning integration 	<p>Integrate</p> <ul style="list-style-type: none"> ▪ Transport protocol bridging ▪ Message enrichment ▪ Message transformation & processing using JavaScript, JSONiq, XQuery, XSLT ▪ Mainframe integration & enablement ▪ Flexible pipeline message processing engine 	<p>Control & Manage</p> <ul style="list-style-type: none"> ▪ Service level management ▪ Quota & rate enforcement ▪ Content-based routing ▪ Message accounting ▪ Integration w/ management & visibility platforms including IBM API Management & WSRR for policy enforcement 	<p>Optimize & Offload</p> <ul style="list-style-type: none"> ▪ SSL / TLS offload ▪ Hardware accelerated crypto* ▪ JSON, XML offload ▪ JavaScript, JSONiq, XSLT, XQuery acceleration ▪ Local response caching ▪ Distributed caching with WXS or XC10 ▪ Backend load balancing



Physical, Virtual or Cloud Edition*)

*) Coming with 7.2 on Softlayer & Amazon EC2

DataPower Gateways



Government

- Agencies and ministries
- Defense and security organizations
- Crown corporations



Banking

- Majority of the big US and European banks
- All of the big 5 Canadian banks
- Numerous regional banks and credit unions



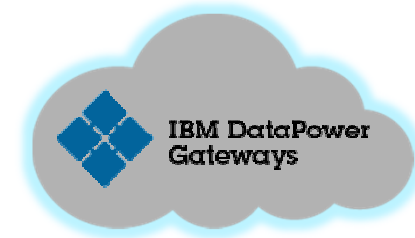
Insurance

- Used by 95% of top global insurance firms
- SaaS providers, ASPs, regulators, etc.



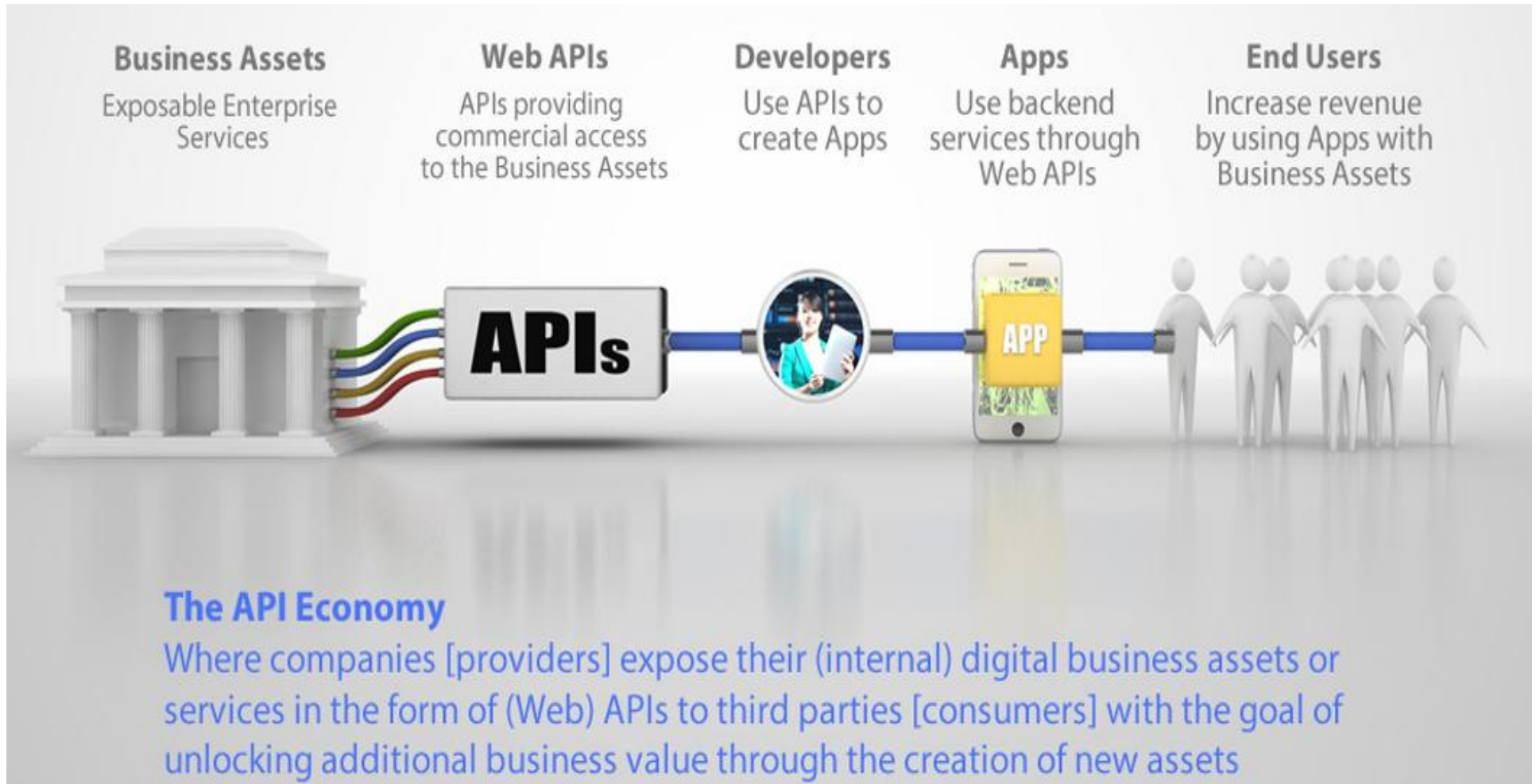
Many, many, more

- Healthcare
- Retailers
- Utilities, Power, Oil and Gas
- Telecom
- Airlines
- Others



Over 14 years of innovation & over **2,000** global installations

API Economy Value Chain



Differences and Value of API and SOA

- SOA
 - Mostly internal
 - Integration and exposing current Services
 - Integration of Backend Data & Applications
 - Increase the Agility and effectiveness of delivery

- API
 - Mostly external
 - Increasing Revenue
 - Extending customer Reach & Value
 - Supporting Sales & Marketing Activities
 - Stimulating Business & Technical Innovation

API Economy

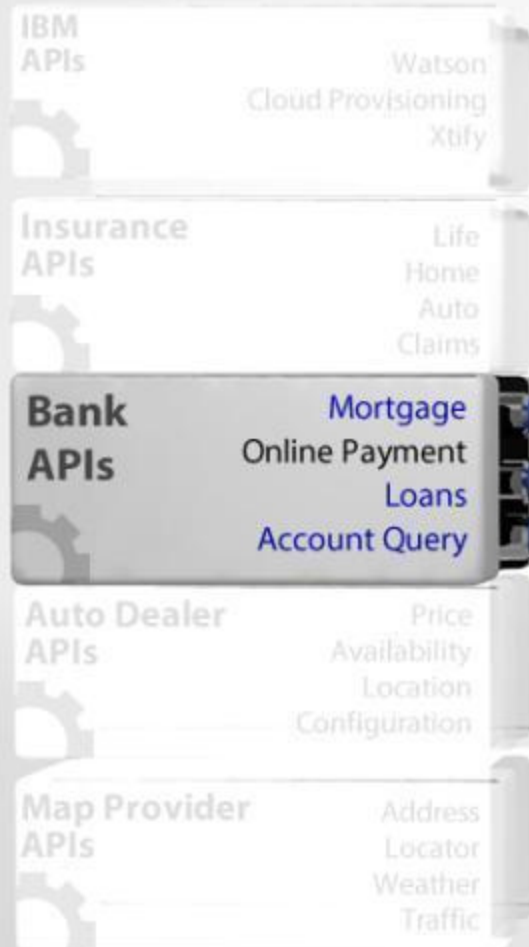
Mobile App Assembly



API Economy

Provider Perspective

Mobile App Assemblers Developers & Partners



New Customers



Providers

Consumers

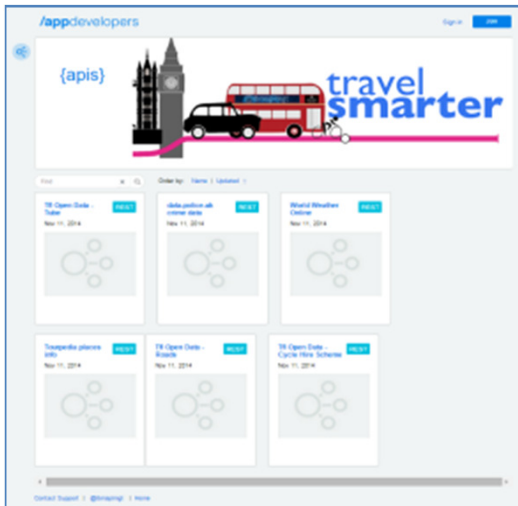
IBM API Management: One Integrated Platform

Design, secure, control, publish, monitor & manage APIs

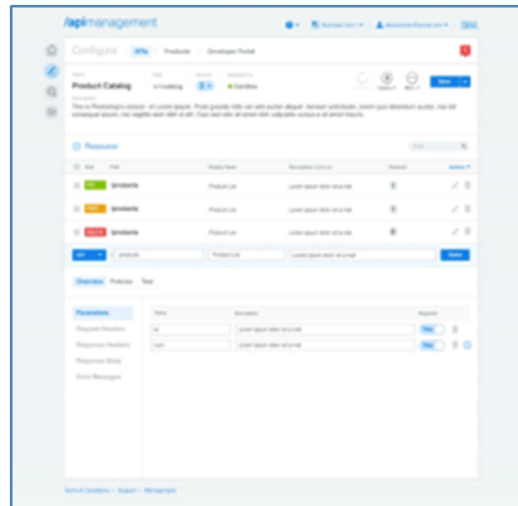
Developer Portal

API Manager

Management Console



- Explore API documentation
- Provision application keys
- Self-service experience



- Define and manage APIs
- Explore API usage with analytics
- Manage API user communities



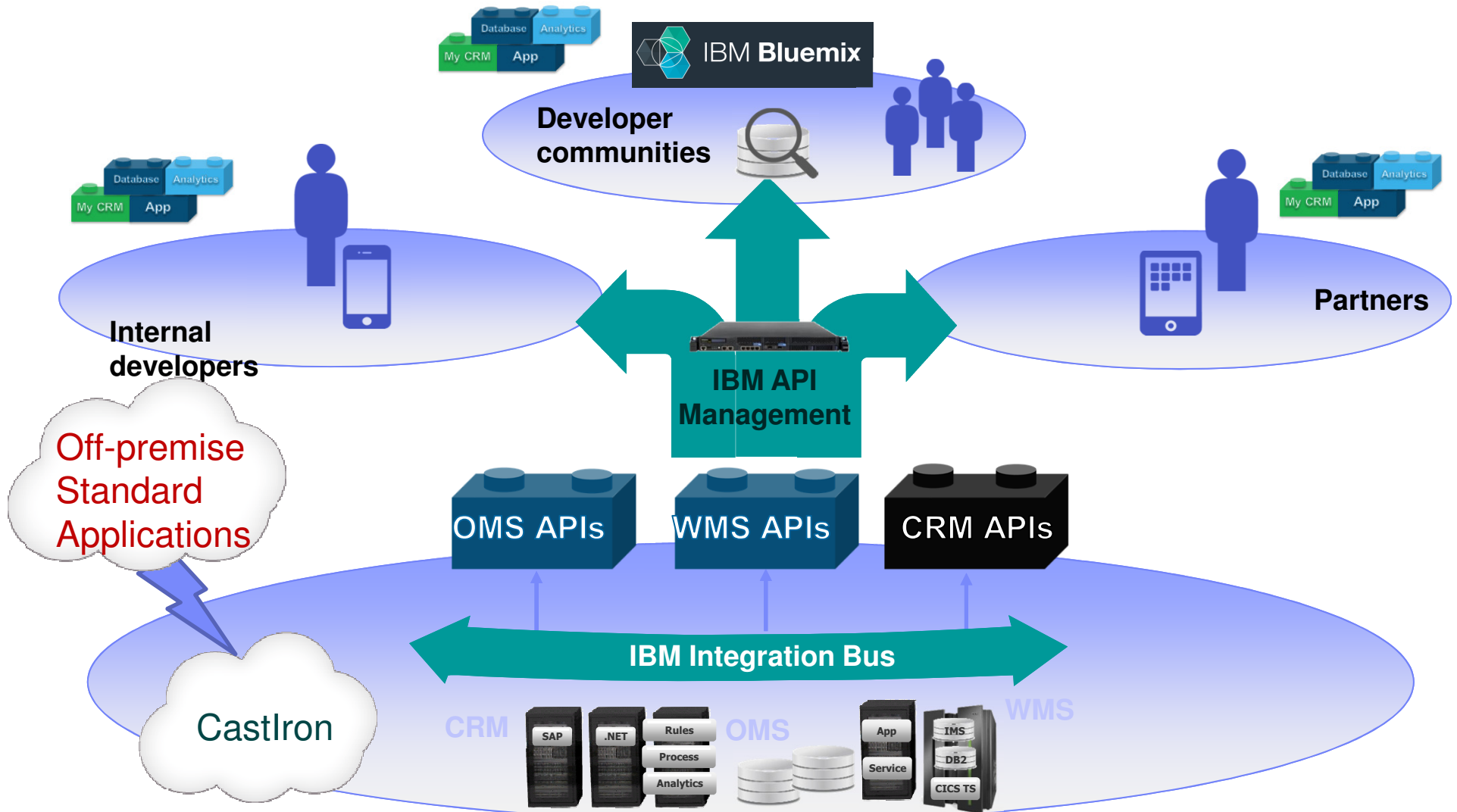
- Provision system resources
- Monitor runtime health
- Scale the environment



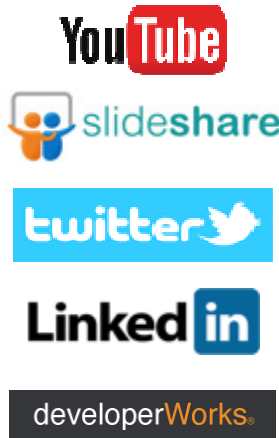
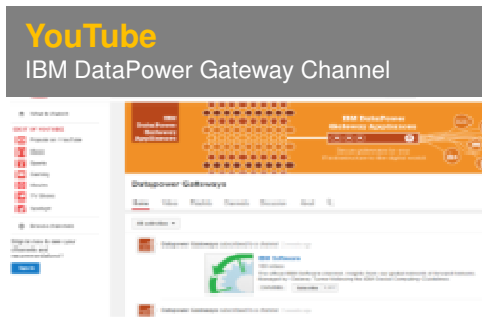
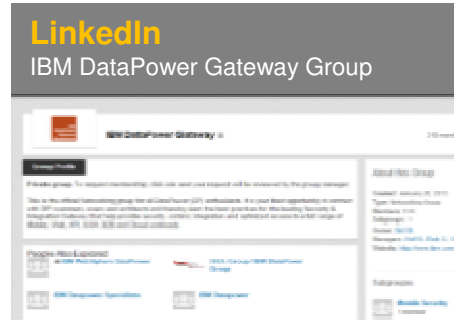
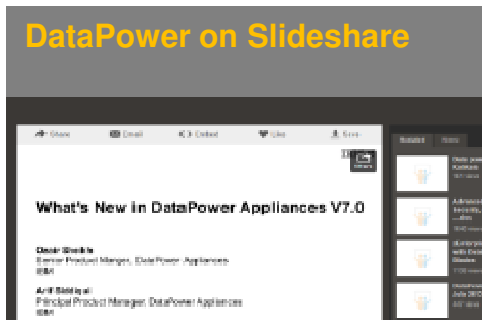
API Gateway (IBM DataPower)

Enforce runtime policies to control API traffic

SUMMARY: IBM API Management exposes APIs everywhere to any community of developers



Getting Social with IBM DataPower Gateways



- **YouTube Channel:** [IBM DataPower Gateways](#)
- **Slideshare:** [IBM DataPower Gateway](#)
- **Twitter:** [@IBMGateways](#)
- **LinkedIn Group:** [IBM DataPower Gateway](#)
- **developerWorks blog:** [IBM DataPower Gateway](#)
- **GitHub:** [IBM DataPower Gateway](#)
- [Online User Forum](#)
- [Product page on ibm.com](#)
- [Product documentation](#)



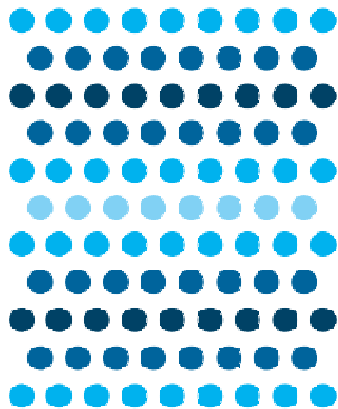
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Backup Slides
API Successes & technical
information



**IBM DataPower
Gateways**



Gateways to secure, control
& connect you Digital World





Large Airline in North America provides authorized access to flight services



Business Challenge

- ❑ External business partners retrieve flight information by scraping the company's website
- ❑ Unauthorized access to full flight information , with no usage analytics
- ❑ Delays in updating website – difficult for authorized partner to test changes



Business Value

- ✓ Enable secure exposure of APIs to External Business Partners, saving the implementation cost of building a developer support infrastructure with access management
- ✓ Easily and securely connect company Website to new APIs
- ✓ Enable secure Mobile app integration with Enterprise APIs



Leading Global Commercial Bank provides easy & secure access to key financial services



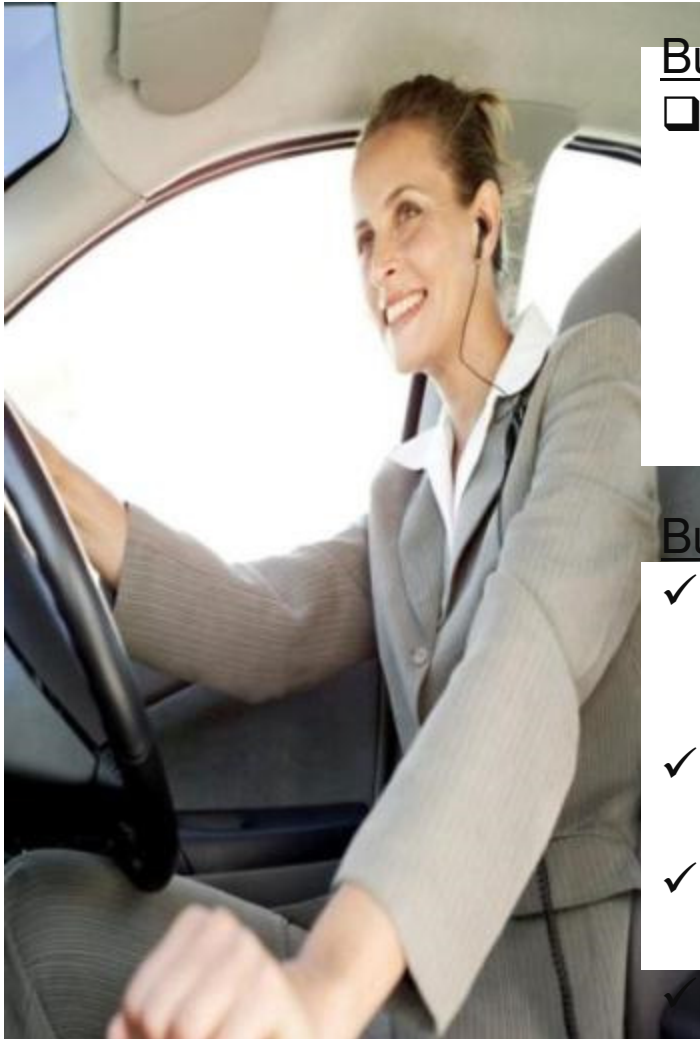
Business Challenge

- ❑ Difficult for internal partners and developers to discover & access key financial services
- ❑ Lacked a standard ecosystem to manage internal partners including global credit card companies and merchants
- ❑ No visibility on Service consumption or ability to chargeback for LoB use of Services

Business Value

- ✓ Offers 3rd party merchants secure standards-based access to key business services as APIs, with a self-service experience
- ✓ Provides an internal ecosystem for partners and a central repository with usage analytics
- ✓ Drives innovation for Mobile application development

Leading European Auto Manufacturer provides innovative vehicle connectivity with IBM API Management



Business Challenge

- ❑ Offer innovative connectivity services to customers, improve the driver experience, improve safety, and create new revenue sources
 - ❑ Improve driving conditions with driver profiling, eco-driving, fleet management, reduce accident risk
 - ❑ Collect data to monetize them for partners

Business Value

- ✓ “Always connected” low-latency reliable communications with the car systems/apps and customer mobile apps
- ✓ Vehicle data APIs published on secure developer portal
- ✓ Internal & external developers use vehicle data to develop mobile applications
- ✓ Drives innovation for Mobile application development

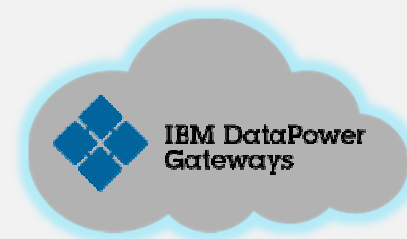
Deployment options

Physical



- Purpose-built, DMZ-ready appliances provide physical security
- High density 2U rack-mount design
- 8 x 1 and 2 x 10 GbE ports
- Cryptographic acceleration card
- Trusted platform module
- Customized intrusion detection
- Optional HSM (FIPS 140-2 Level 3 certified)

Virtual

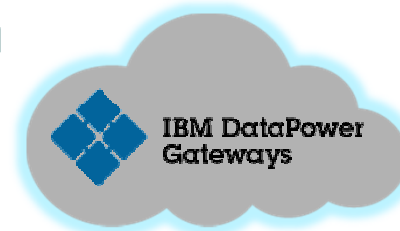
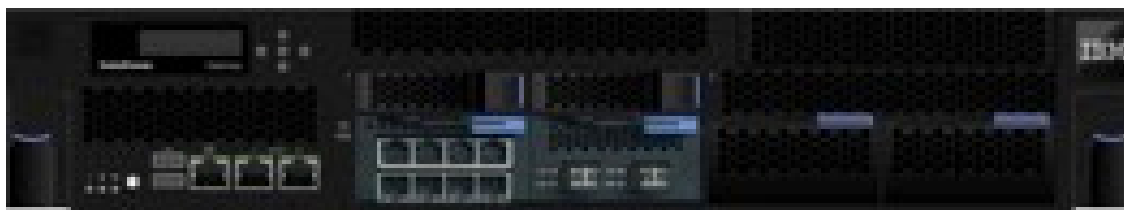


- Virtual appliances provide deployment flexibility
- Support multiple hypervisors and cloud environments
 - VMware
 - Citrix XenServer
 - IBM PureApplication System (x86 nodes)
 - IBM PureApplication Service on SoftLayer (x86 nodes)
 - IBM SoftLayer bare metal instances using supported hypervisors

Enterprise grade security requires a secure platform

■ **Purpose-built hardware** provides physical security

- Sealed, tamper-evident case
- No usable USB, VGA, other ports
- Intrusion detection switch
- Trusted Platform Module
- Encrypted flash drive
- FIPS 140-2 level 3 Hardware Security Module (option) for secure storage of private keys



■ **Hardened firmware** provides platform security for physical & virtual gateways

- Single signed and encrypted firmware by IBM
- No arbitrary software
- Optimized, embedded operating system
- High assurance, “locked-down” configuration
- Key materials are not exportable from the appliance *

DataPower Gateway: Latest Generation Hardware Platform

- Purpose-built, high density 2U rack mount design
- Increased capacity
 - Higher performance CPU & memory
 - Faster cryptographic acceleration card
 - New RAID controller w/ large write cache
- 192 GB memory
- Two 1.2 TB high speed hard drives
- Three management traffic ports
 - 1 RJ45 serial port
 - 2 x 1 GbE ports
- Ten application traffic ports
 - 8 x 1 GbE ports
 - 2 x 10 GbE ports
- Trusted Platform Module
- Customized intrusion detection
- Cryptographic Acceleration Card
- Optional Hardware Security Module (FIPS 140-2 Level 3 certified)
- Runtime Hardware Diagnostic
- Intelligent Platform Management Interface
- Super capacitor Powered Flash-backed RAID Cache
- Multiple Replaceable Units
 - Customer Replaceable Units (CRU)
 - Fan, Power Supply, HDD, Network Module
 - Field Replaceable Units (FRU)
 - Appliance, CPU, Memory, Flash Drive, Coin Battery, Super capacitor for RAID
 - Cryptographic Acceleration Card, HSM Card, RAID Card



Virtual Edition Benefits

- **Deployment flexibility and elasticity** – “Right size” the deployment, quickly deploy where needed, & rapidly scale
- **Workload isolation** - Projects can use their own instances
- **Unbounded memory scalability** - Memory can be added to instances without additional licensing
- **Low cost for Dev & Test environments** - Developers & Non-Production versions include add-on software modules at no additional charge
- **Free disaster recovery** - Warm or cold backup without additional licenses when licensed for Production
- **Flexible licensing and entitlement**
 - Sub-capacity licensing
 - **Monthly licensing** option
 - **Entitlement to future product versions** at no additional charge with active maintenance (S&S)

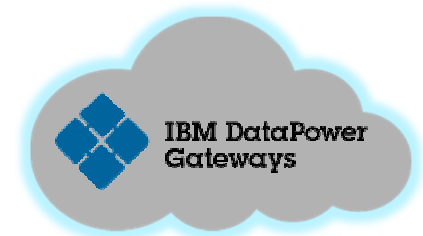


SOFTLAYER[®]
an IBM Company

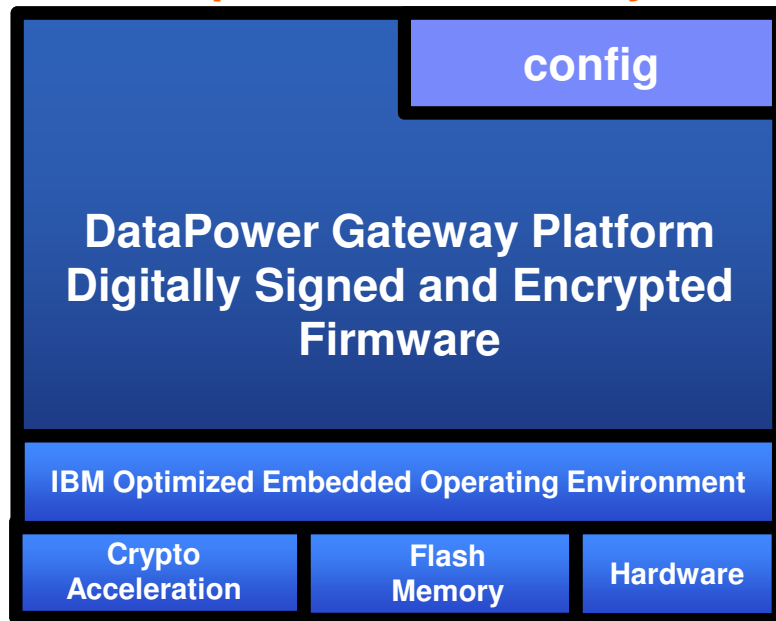
Delivers purpose-built, highly consumable **Security & Integration Gateway** functionality in virtual appliance form factor for cloud deployments

Simple and Secure Architecture

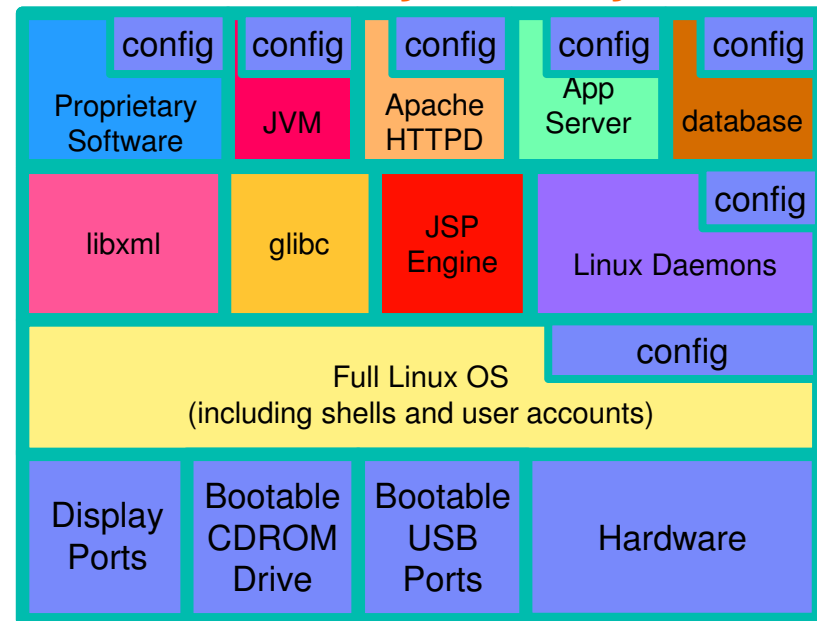
- Simple Architecture: Purpose-built firmware + hardware
 - Complete gateway platform delivered as firmware
- Guiding philosophy is to centralize common security, integration, control, traffic management, acceleration functions and optimize them in a security-hardened gateway appliance



Purpose-built Gateways



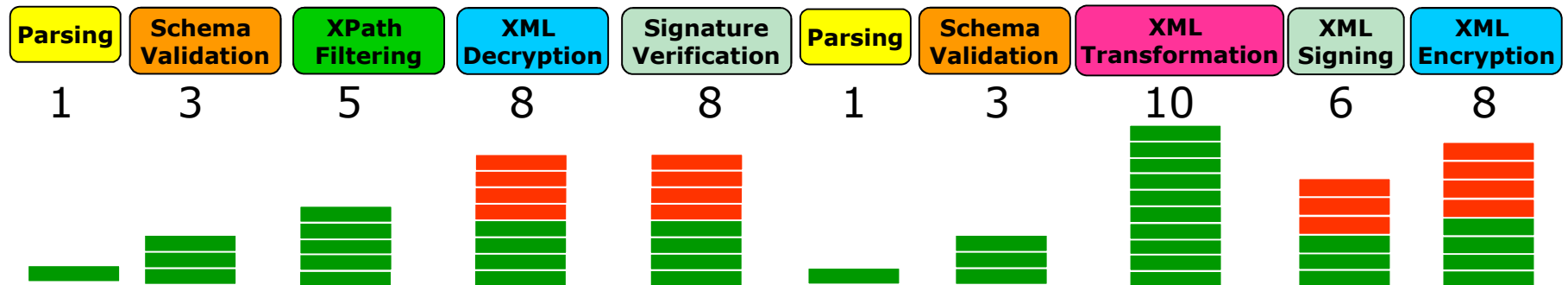
Commodity Gateways



Performance Cost of XML Policy Processing

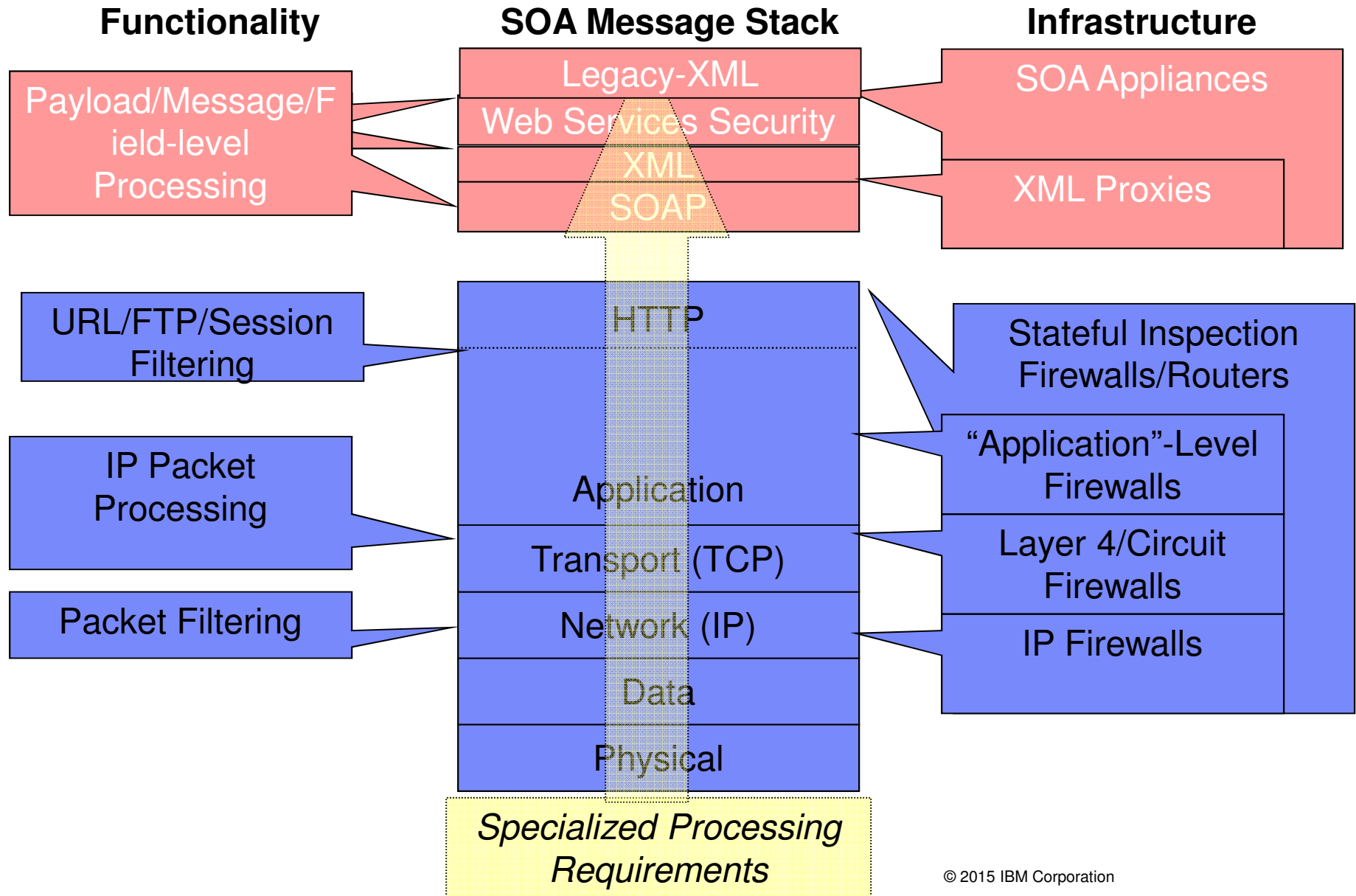
- Performance is key to security & mediation
 - Each security function requires XML processing
 - Must implement all services without any compromise
 - Need ability to scale as content and user base grows

Processing Steps*

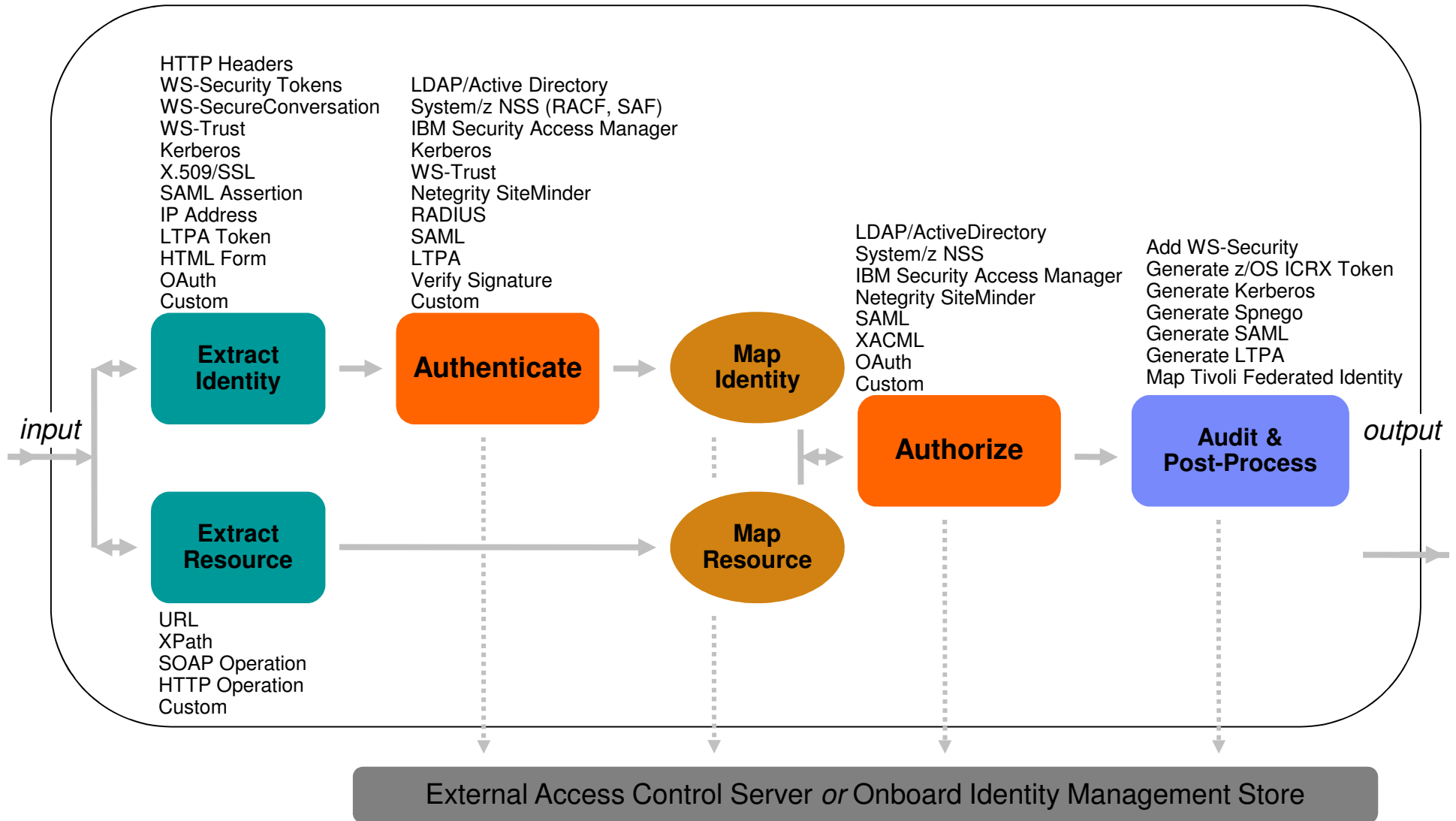


* Representative of software-based systems.
For demonstration only. Actual processing
time varies depending on application.

Application Firewall (XML, WebService, WAF...)



AAA : Authentication Authorization Auditing



Highlights of IBM DataPower Gateway & Firmware V7.1

- **IBM DataPower Gateway** is the new name of a consolidated, extensible & modular platform
 - Converges **three existing products**, XG45 / XI52 / XB62, into a **single modular offering**
 - Available in 2U rack mount physical & virtual form factors
- IBM DataPower Gateway physical appliance uses **latest generation hardware platform** to provide increased performance & scalability to meet the needs of mission-critical applications
- **Single multi-channel gateway** platform to secure & optimize delivery of mobile, API, web, SOA, B2B, cloud apps, and integrate with IBM **MobileFirst & WebSphere** platforms
 - Integrates industry-proven access enforcement capabilities of **IBM Security Access Manager** into the DataPower platform, available as a software module called **ISAM Proxy Module** on physical & virtual form factors
- Easy-to-use & secure B2B integration capabilities, formerly available on XB62 appliances only, available as a software module called **B2B Module** on physical & virtual form factors
- Enable authentication from internet consumers & Non-Microsoft consumers to Microsoft systems with **Kerberos S4U2Self** support



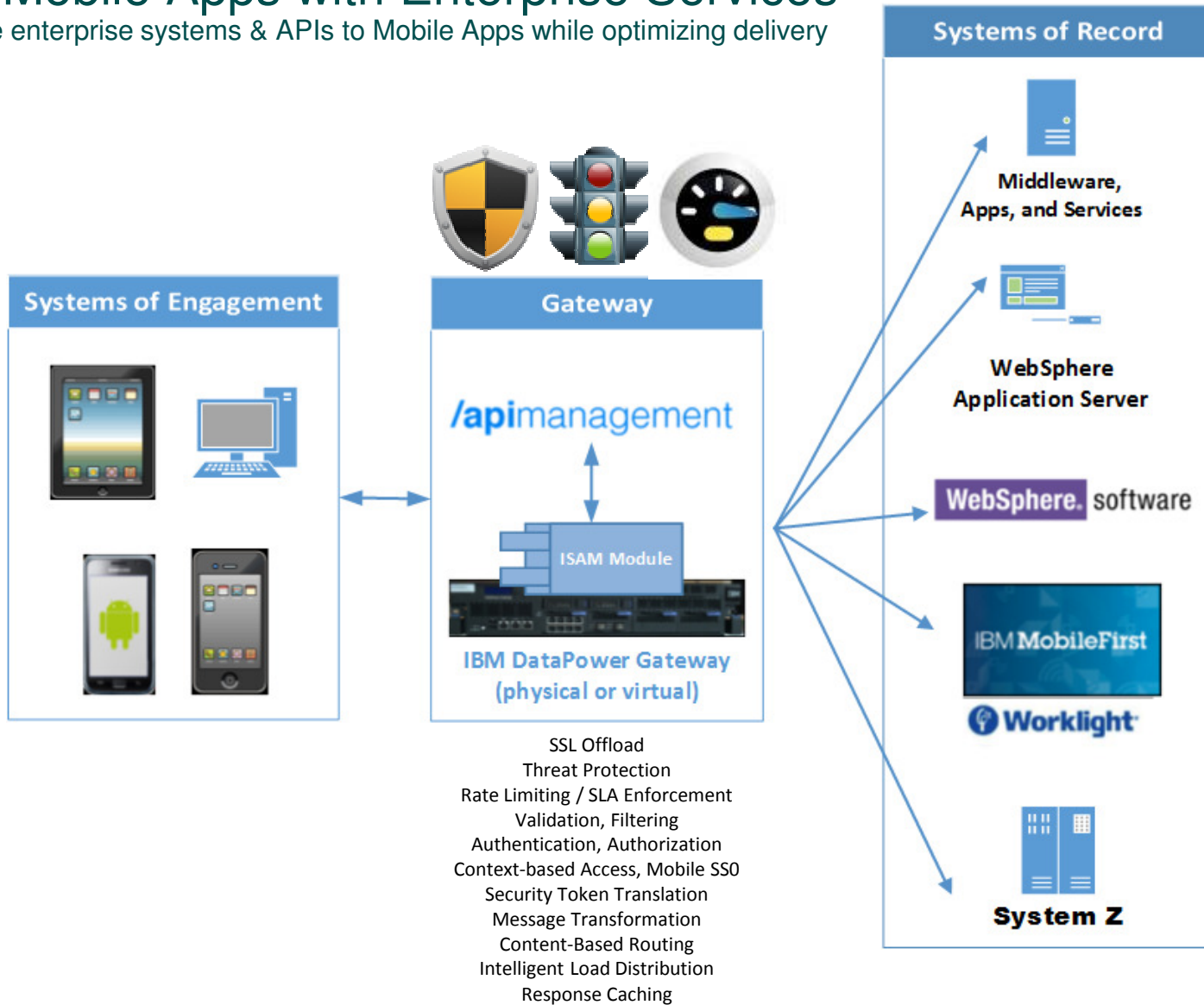
IBM DataPower Gateway provides market leading security and integration gateway capabilities for Mobile, Web, API, B2B, SOA, & Cloud workloads; reducing infrastructure complexity & lowering TCO

Highlights of DataPower V7.2

- ✓ **Amazon EC2** and **Softlayer CCI** support for increased deployment flexibility on public **cloud** environments
- ✓ Enhanced **hybrid cloud integration** using **Secure Gateway** service to securely connect between **IBM Bluemix** applications and on-premise services secured using DataPower Gateways
- ✓ Stronger **cloud and on-premise security** with support for **Elliptic Curve Cryptography (ECC)**, **Server Name Indication (SNI)**, and **Perfect Forward Secrecy (PFC)** to protect against malicious protocol attacks
- ✓ **Mobile security** enhancements for securing access to REST services using **JSON Web Encryption (JWE)**, **JSON Web Signature (JWS)**, **JSON Web Key (JWK)** and **JSON Web Token (JWT)**
- ✓ Easier integration between **Systems of Engagement** and **System of Record** solutions with **XML support** using *GatewayScript*, JavaScript-based runtime.
- ✓ New management API based on a **REST** architecture for managing DataPower configuration, enabling easier **DevOps**.
- ✓ Increased **transactional reliability** with enhanced **IMS** database support
- ✓ **Distributed caching** support with **IBM WebSphere eXtreme Scale 8.6+**

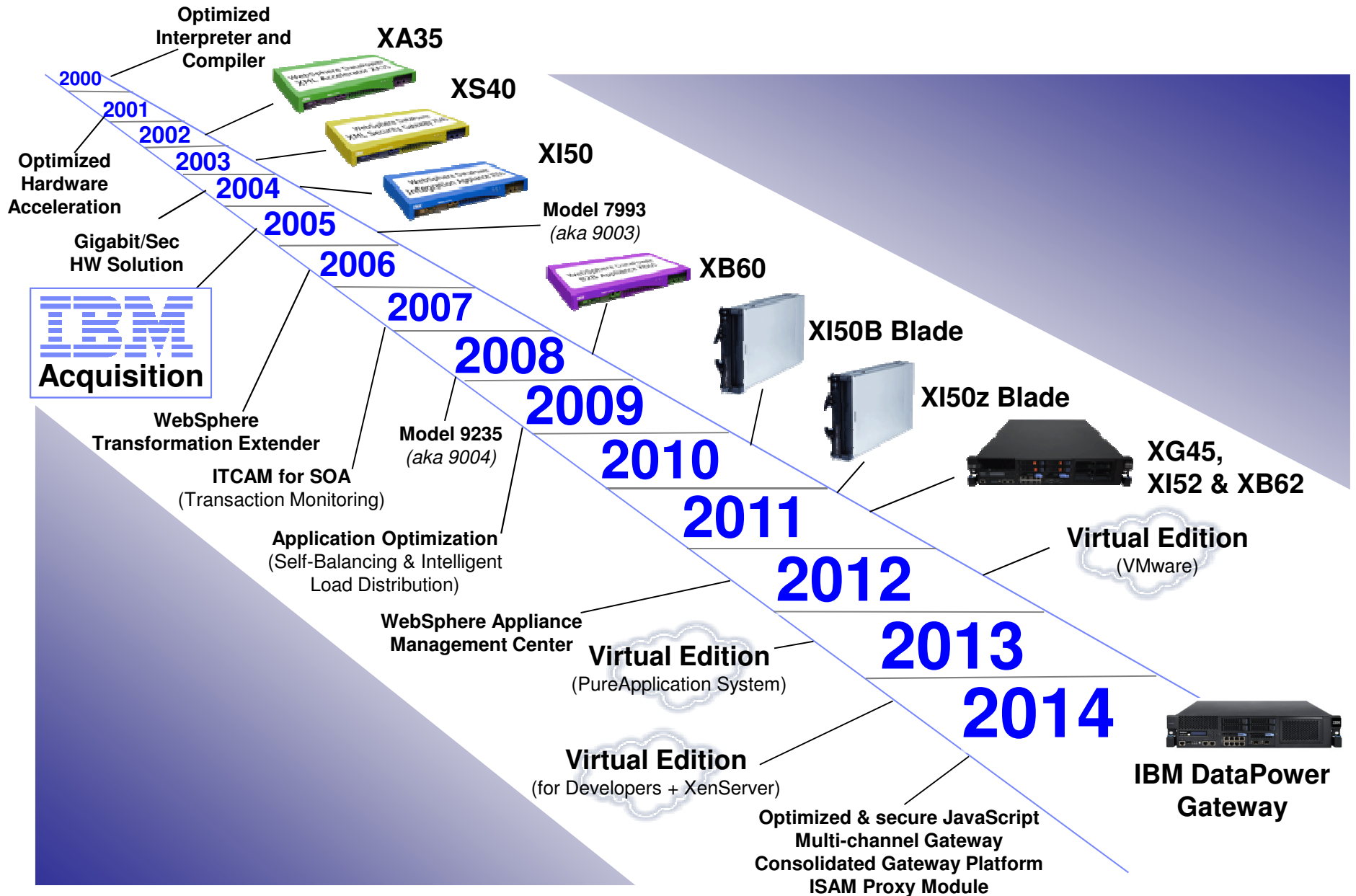
Connect Mobile Apps with Enterprise Services

Securely expose enterprise systems & APIs to Mobile Apps while optimizing delivery



- **Data format & language**
 - [JavaScript](#)
 - JSON
 - JSON Schema
 - JSONiq
 - REST
 - SOAP 1.1, 1.2
 - WSDL 1.1
 - XML 1.0
 - XML Schema 1.0
 - XPath 1.0
 - XPath 2.0 (XQuery only)
 - XSLT 1.0
 - XQuery 1.0
- **Security policy enforcement**
 - [OAuth 2.0](#)
 - SAML 1.0, 1.1 and 2.0, SAML Token Profile, SAML queries
 - XACML 2.0
 - Kerberos (including [S4U2Self](#), S4U2Proxy)
 - SPNEGO
 - RADIUS
 - RSA SecurID OTP using RADIUS
 - LDAP versions 2 and 3
 - Lightweight Third-Party Authentication
 - Microsoft Active Directory
 - FIPS 140-2 Level 3 (w/ optional HSM)
 - FIPS 140-2 Level 1 (w/ certified crypto module)
 - SAF & IBM RACF® integration with z/OS
 - Internet Content Adaptation Protocol
 - W3C XML Encryption
 - W3C XML Signature
 - S/MIME encryption and digital signature
 - WS-Security 1.0, 1.1
 - WS-I Basic Security Profile 1.0, 1.1
 - WS-SecurityPolicy
 - WS-SecureConversation 1.3
- **Transport & connectivity**
 - HTTP, HTTPS, [WebSocket Proxy](#)
 - FTP, FTPS, SFTP
 - WebSphere MQ
 - WebSphere MQ File Transfer Edition
 - TIBCO EMS
 - WebSphere Java Message Service
 - IBM IMS Connect, & IMS Callout
 - NFS
 - AS1, AS2, AS3, ebMS 2.0, CPPA 2.0, POP, SMTP (XB62)
 - DB2, Microsoft SQL Server, Oracle, Sybase, IMS
- **Transport Layer Security**
 - TLS versions 1.0, 1.1, and 1.2
 - SSL versions 2 and 3
- **Public key infrastructure (PKI)**
 - RSA, 3DES, DES, AES, SHA, X.509, CRLs, OCSP
 - PKCS#1, PKCS#5, PKCS#7, PKCS#8, PKCS#10, PKCS#12
 - XKMS for integration with Tivoli Security Policy Manager (TSPM)
- **Management**
 - Simple Network Management Protocol
 - SYSLOG
 - IPv4, IPv6
- **Open File Formats**
 - Distributed Management Task Force (DMTF) Open Virtualization Format (OVF)
 - Virtual Machine Disk Format (VMDK)
 - Virtual Hard Disk (VHD)
- **Web services**
 - WS-I Basic Profile 1.0, 1.1
 - WS-I Simple SOAP Basic Profile
 - WS-Policy Framework
 - WS-Policy 1.2, 1.5
 - WS-Trust 1.3
 - WS-Addressing
 - WS-Enumeration
 - WS-Eventing
 - WS-Notification
 - Web Services Distributed Management
 - WS-Management
 - WS-I Attachments Profile
 - SOAP Attachment Feature 1.2
 - SOAP with Attachments (SwA)
 - Direct Internet Message Encapsulation
 - Multipurpose Internet Mail Extensions
 - XML-binary Optimized Packaging (XOP)
 - Message Transmission Optimization Mechanism (MTOM)
 - WS-MediationPolicy (IBM standard)
 - Universal Description, Discovery, and Integration (UDDI versions 2 and 3), UDDI version 3 subscription
 - WebSphere Service Registry and Repository (WSRR)

[Link to Product Documentation](#)



- Known as the ‘bible’ of DataPower planning, implementation, and usage.
- New content to cover previous six years of new products/features, including 9006/7.1!
- Volume 1 consists of *Chap 1 DataPower Intro*, *Chap 2 Setup Guide*, new *Preface* and two invaluable new appendices for physical and virtual appliances.



Volume 2: DataPower Networking

This volume concentrates on DataPower networking, and features chapters on beginning and advanced networking, as well as common topologies and network deployment.

Volume 3: DataPower Development

This volume focuses on all aspects of developing code for DataPower using both XSLT and Gateway Script methods.

Volume 4: DataPower B2B

This volume focuses on all aspects of B2B gateway functions including security, partner profile management, B2B messaging protocols like AS1, AS2 and AS3 and B2B process integration using ebXML.

Available in softcover and e-book formats

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