

Hands on Lab 3282

Integrating IBM Watson IoT Platform and IBM Blockchain

Leucir Marin Junior
Senior Software Architect
IBM Watson Internet of Things
lmarij@us.ibm.com

Rahul Gupta
Senior Software Architect
IBM Watson Internet of Things
rahul.gupta@us.ibm.com

**World of
Watson
2016**

IBM

Abstract

In this hands-on lab, you will deploy smart contracts for IoT in IBM Blockchain, and connect MQTT devices to send IoT data to the blockchain using the IBM Watson IoT Platform. In an IoT context, data comes from "things" to private blockchain ledgers for inclusion in shared transactions with tamper-resistant records. Attend this lab and start creating a more efficient business network with the IBM Watson IoT Platform and IBM Blockchain.

Agenda

- Blockchain Basics
- IoT and Blockchain
- Lab Scenario

The Business Value of Blockchain

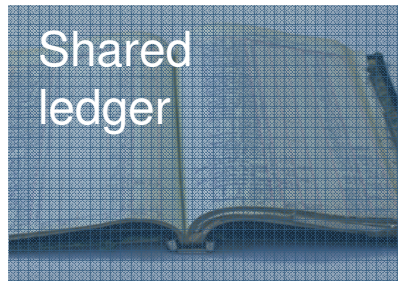
Blockchain is a shared ledger technology allowing any participant in the business network to see
THE system of record (ledger)



Blockchain for business ...

Append-only
distributed system of
record shared across
business network

Shared
ledger



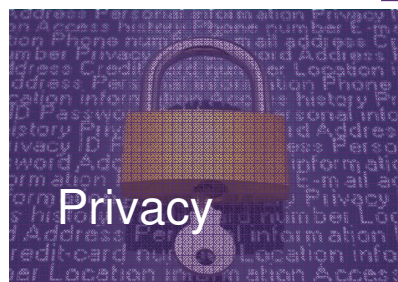
Smart
contract



Business terms
embedded in
transaction database
& executed with
transactions

Ensuring appropriate
visibility; transactions are
secure, authenticated
& verifiable

Privacy



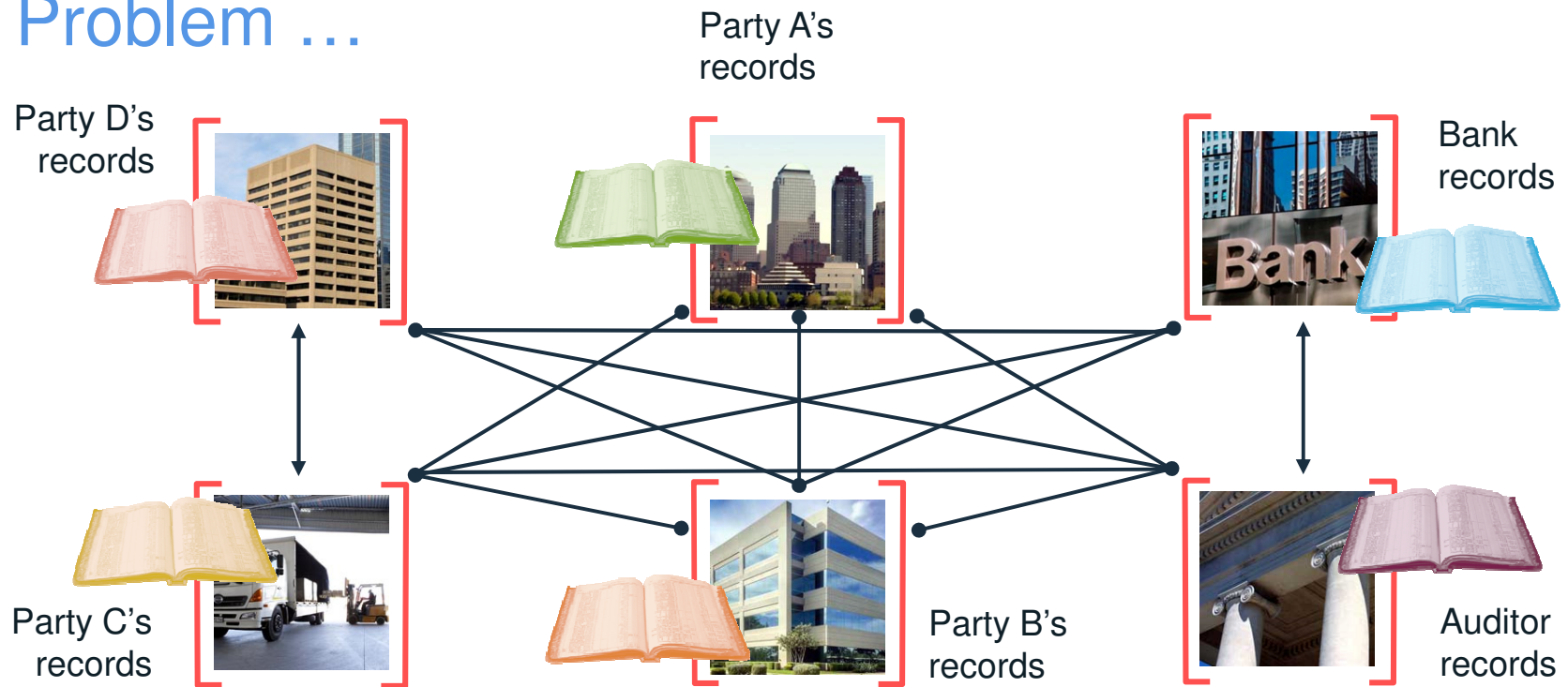
Consensus



All parties agree
to network verified
transaction

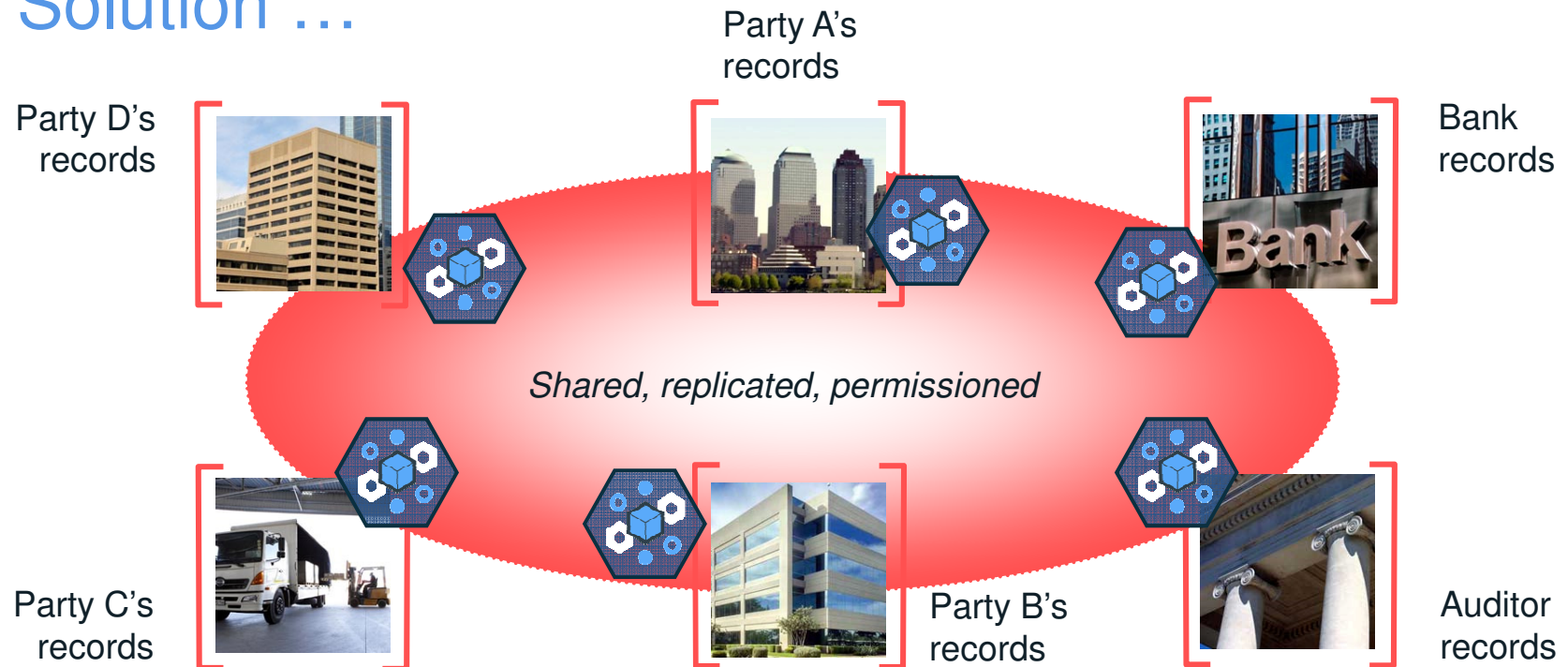
... Broader participation, lower cost, increased efficiency

Problem ...



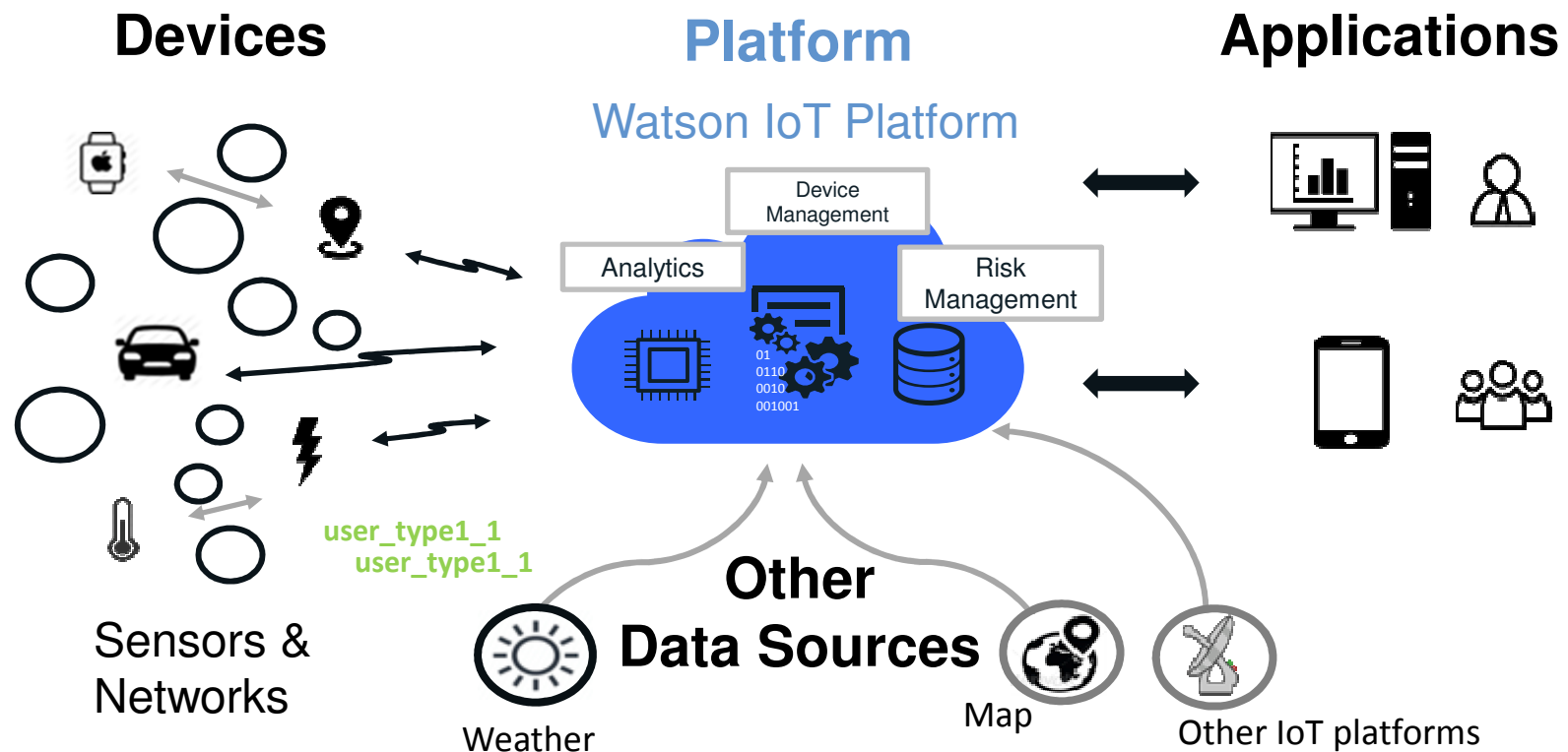
... Inefficient, expensive, vulnerable

Solution ...



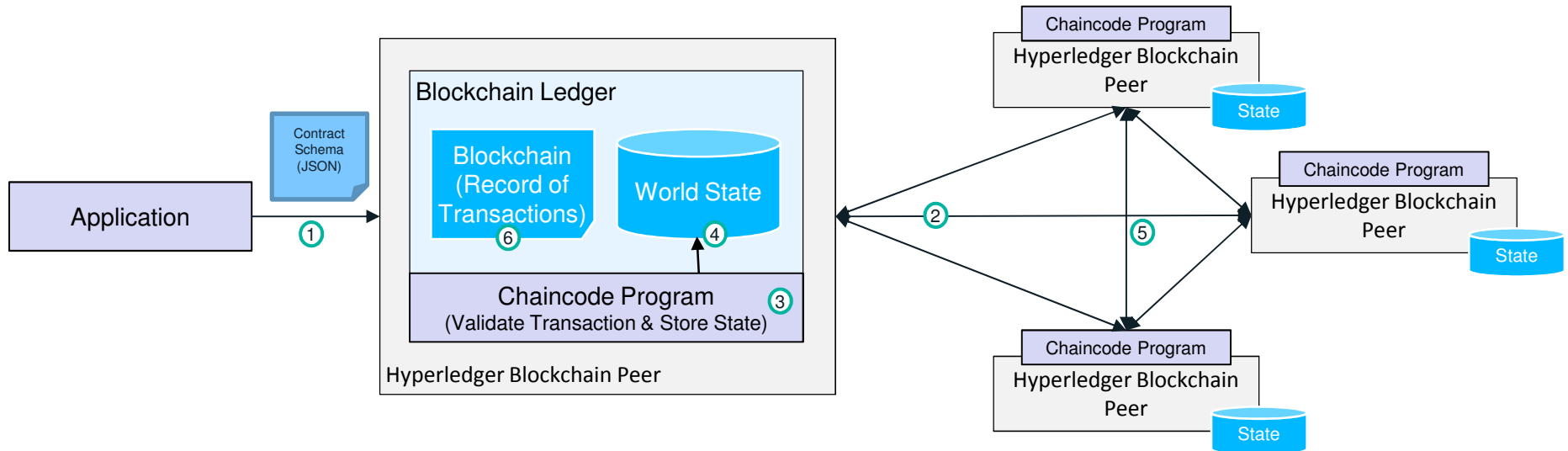
... Consensus, provenance, immutability, finality

What is an IoT Platform?



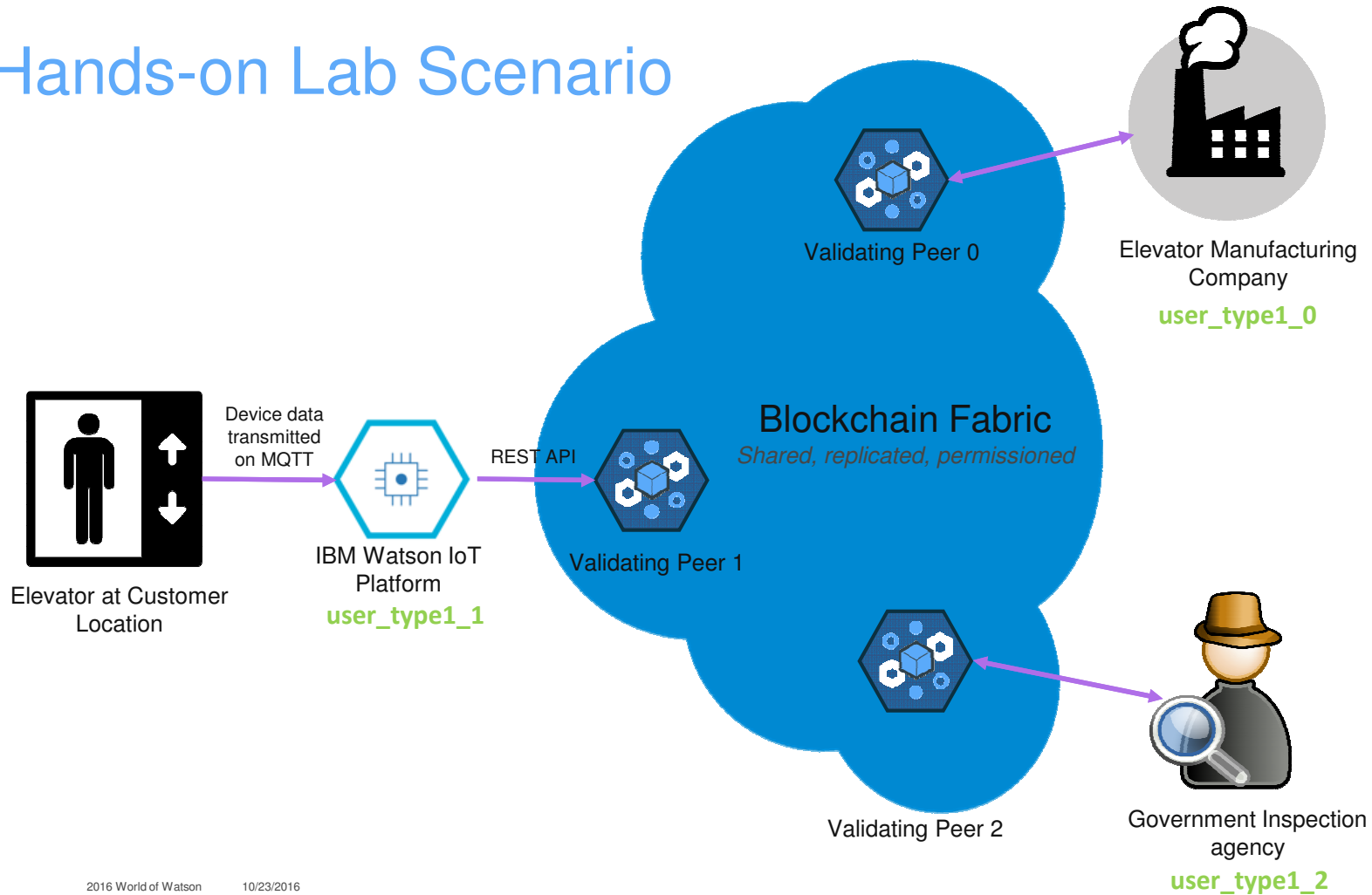
Invoking a Blockchain Transaction

Peer	Individual nodes in a fabric.
Fabric	Collection of nodes



①	Application invokes a transaction and passes data
②	Transaction data is replicated to the validating peers in the blockchain fabric
③	Peers pass transaction data to local chaincode program and run it. Chaincode programs are currently written in the language Go. Currently writing chaincode is very custom.
④	Peer can store state information in the World State local database.
⑤	Consensus algorithm runs and compares results across the peers. If > 50% of the peers agree, the changes to the world state database will be committed.
⑥	Data passed to the Transaction is "locked" into a new block in the chain. Transactions are gathered into time windows for writing to the blockchain (default is 1 second).

Hands-on Lab Scenario



Lab Guide Download

<https://ibm.biz/wowiotlob>

Surveys/uGifting

We're all ears! How was your IBM World of Watson 2016 experience?

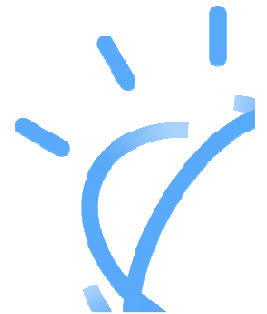
Let us know how we did! Complete your session surveys daily, as well as the overall conference survey, available on the IBM Events mobile app beginning Wednesday at 8:00am.

Each session survey earns you WoWBUCK\$ bringing you closer to winning an Apple TV, sponsored by Cvent. 1000 points gets you into the drawing.*

After completing the overall conference survey, Clients and IBM Business Partners* will be provided a \$20 e-voucher that can be applied toward the purchase of an item of your choice at the IBM Logo Store or the IBM Bookstore, or you can choose to donate those funds to charity.

Clients and IBM Business Partners, visit the "Redeem your gift" page in your IBM Events mobile app for full details and restrictions.

* Clients and IBM Business Partners only. Public sector employees are not eligible.
Full rules at ibmevents.tumblr.com. Vouchers not valid on prior purchases.



Notices and disclaimers

Copyright © 2016 by International Business Machines Corporation (IBM). No part of this document may be reproduced or transmitted in any form without written permission from IBM.

U.S. Government Users Restricted Rights - Use, duplication or disclosure restricted by GSA ADP Schedule Contract with IBM.

Information in these presentations (including information relating to products that have not yet been announced by IBM) has been reviewed for accuracy as of the date of initial publication and could include unintentional technical or typographical errors. IBM shall have no responsibility to update this information. THIS DOCUMENT IS DISTRIBUTED "AS IS" WITHOUT ANY WARRANTY, EITHER EXPRESS OR IMPLIED. IN NO EVENT SHALL IBM BE LIABLE FOR ANY DAMAGE ARISING FROM THE USE OF THIS INFORMATION, INCLUDING BUT NOT LIMITED TO, LOSS OF DATA, BUSINESS INTERRUPTION, LOSS OF PROFIT OR LOSS OF OPPORTUNITY. IBM products and services are warranted according to the terms and conditions of the agreements under which they are provided.

IBM products are manufactured from new parts or new and used parts. In some cases, a product may not be new and may have been previously installed. Regardless, our warranty terms apply."

Any statements regarding IBM's future direction, intent or product plans are subject to change or withdrawal without notice.

Performance data contained herein was generally obtained in a controlled, isolated environments. Customer examples are presented as illustrations of how those customers have used IBM products and the results they may have achieved. Actual performance, cost, savings or other results in other operating environments may vary.

References in this document to IBM products, programs, or services does not imply that IBM intends to make such products, programs or services available in all countries in which IBM operates or does business.

Workshops, sessions and associated materials may have been prepared by independent session speakers, and do not necessarily reflect the views of IBM. All materials and discussions are provided for informational purposes only, and are neither intended to, nor shall constitute legal or other guidance or advice to any individual participant or their specific situation.

It is the customer's responsibility to insure its own compliance with legal requirements and to obtain advice of competent legal counsel as to the identification and interpretation of any relevant laws and regulatory requirements that may affect the customer's business and any actions the customer may need to take to comply with such laws. IBM does not provide legal advice or represent or warrant that its services or products will ensure that the customer is in compliance with any law.

Notices and disclaimers continued

Information concerning non-IBM products was obtained from the suppliers of those products, their published announcements or other publicly available sources. IBM has not tested those products in connection with this publication and cannot confirm the accuracy of performance, compatibility or any other claims related to non-IBM products. Questions on the capabilities of non-IBM products should be addressed to the suppliers of those products. IBM does not warrant the quality of any third-party products, or the ability of any such third-party products to interoperate with IBM's products. IBM EXPRESSLY DISCLAIMS ALL WARRANTIES, EXPRESSED OR IMPLIED, INCLUDING BUT NOT LIMITED TO, THE IMPLIED WARRANTIES OF MERCHANTABILITY AND FITNESS FOR A PARTICULAR PURPOSE.

The provision of the information contained herein is not intended to, and does not, grant any right or license under any IBM patents, copyrights, trademarks or other intellectual property right.

IBM, the IBM logo, ibm.com, Aspera®, Bluemix, Blueworks Live, CICS, Clearcase, Cognos®, DOORS®, Emptoris®, Enterprise Document Management System™, FASP®, FileNet®, Global Business Services®, Global Technology Services®, IBM ExperienceOne™, IBM SmartCloud®, IBM Social Business®, Information on Demand, ILOG, Maximo®, MQIntegrator®, MQSeries®, Netcool®, OMEGAMON, OpenPower, PureAnalytics™, PureApplication®, pureCluster™, PureCoverage®, PureData®, PureExperience®, PureFlex®, pureQuery®, pureScale®, PureSystems®, QRadar®, Rational®, Rhapsody®, Smarter Commerce®, SoDA, SPSS, Sterling Commerce®, StoredIQ, Tealeaf®, Tivoli®, Trusteer®, Unica®, urban{code}®, Watson, WebSphere®, Worklight®, X-Force® and System z® Z/OS, are trademarks of International Business Machines Corporation, registered in many jurisdictions worldwide. Other product and service names might be trademarks of IBM or other companies. A current list of IBM trademarks is available on the Web at "Copyright and trademark information" at: www.ibm.com/legal/copytrade.shtml.

Thank You

**World of
Watson
2016**

IBM