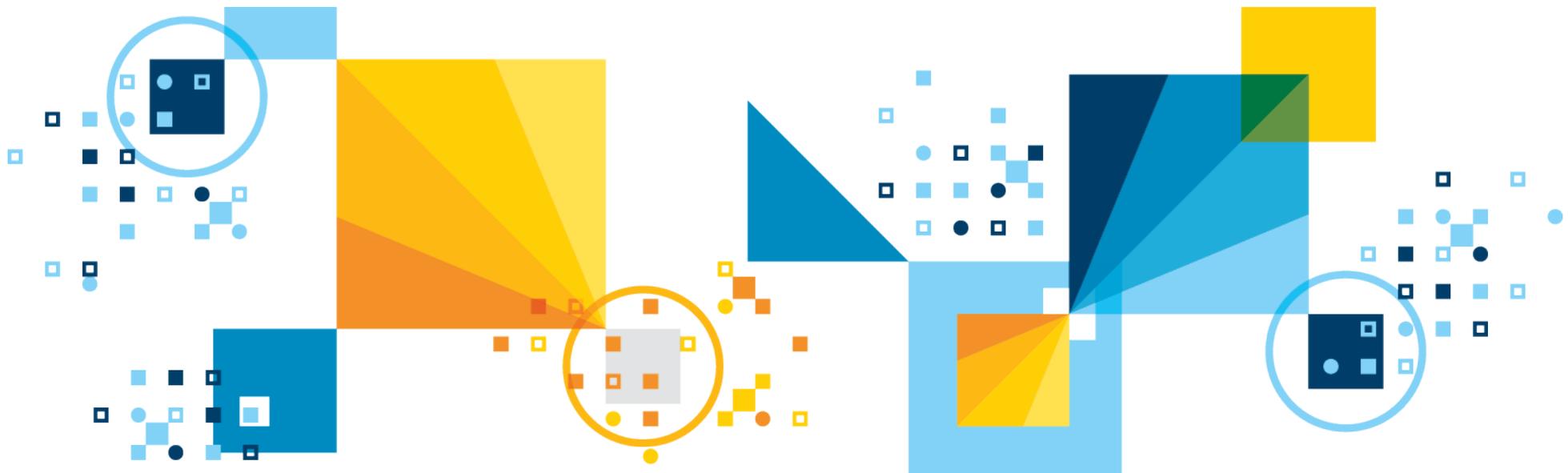


George Baklarz, IBM

DB2 New and Updated Resources for Version 11.1



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Content Free Agenda

- **Free Features included in DB2 V11.1**
- **Free DB2 Version 11.1 eBook**
 - A Review of the Contents
 - The Missing Chapter
- **Free Programs to Amuse Yourself**
 - DB2Demo Version 11
 - DB2 Static, Adaptive, and BLU Compression Estimator Version 11
 - DB2 pureScale Simulator Version 11
- **Free Highlights of the Next Fixpak (Teaser!)**
- **Free URL for these Resources**

DB2 Version 11.1 Highlights

Core Mission Critical Workloads : Extending DB2 Leadership

Comprehensive Enterprise Security



Enterprise Encryption

- Centralized Key Managers (KMIP)

Availability 2nd only to DB2 for zOS



Simple Fast Deployment

- Up and running in hours
- #### Even Greater Availability

- Zero data loss DR with HADR
- More online management

More Platforms Supported

- Power Linux (LE)
- Virtualization for RDMA (x86)

Significant Core Database Advances



Very Large Database Performance

- Higher user throughput

Simpler, Faster, More Online Upgrades

- Faster, no need for offline backup
- Streamlined HADR upgrade
- DB2 Version 9.7 direct to 11.1

Warehousing Workloads : Most Consumable, Most Scalable In-Memory Warehousing Platform

Massive Scale Warehousing at In-Memory Performance



MPP BLU Scalability

- PB scale in-memory warehousing

Next Gen In-Memory Performance, Function & Workloads



- Faster ELT/ETL performance
- More Query Workloads Optimised
- More Function supported
 - Generated Columns
 - RCAC
 - OLAP + BLU Perf

Enhanced Compatibility



Multi-Lingual SQL Advances

- PostgreSQL
- Support for European Languages
- Codepage 819

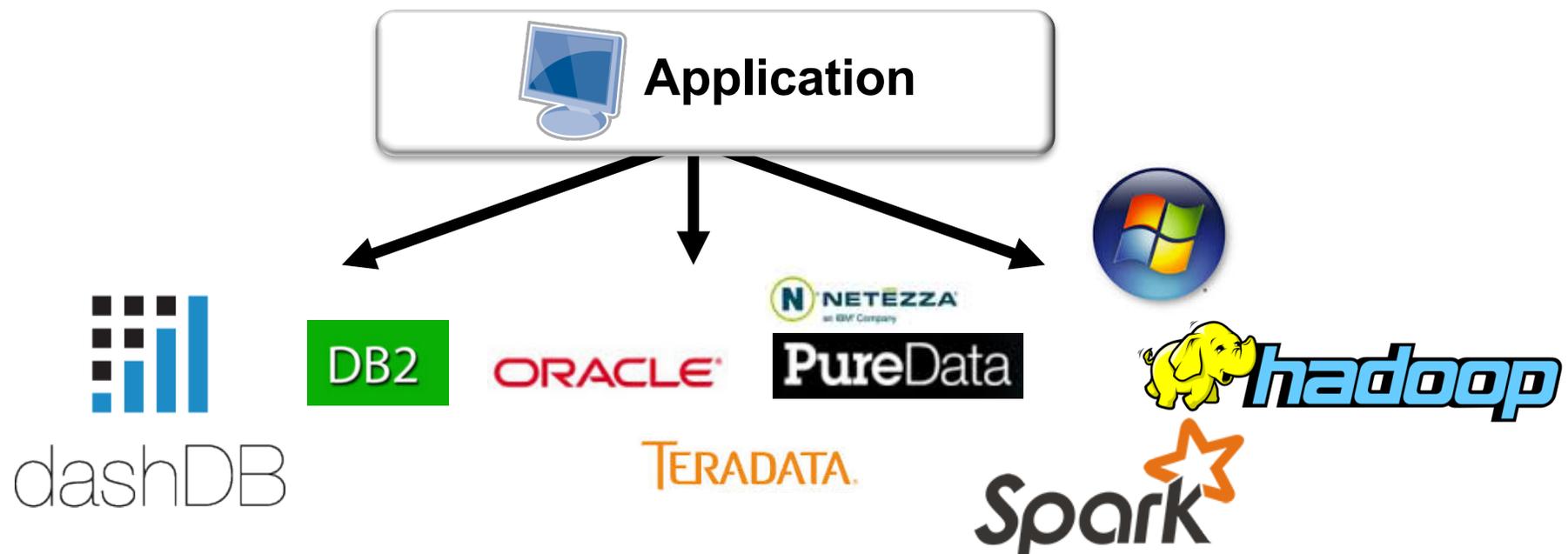
Federation Included in Packaging

▪ Integrated support for homogeneous federation

- Single install replacing any prior separate Infosphere Federation Server install
- Support for upgrading from either a DB2 database product or Infosphere Federation Server

▪ Additional Wrappers in Advanced Editions

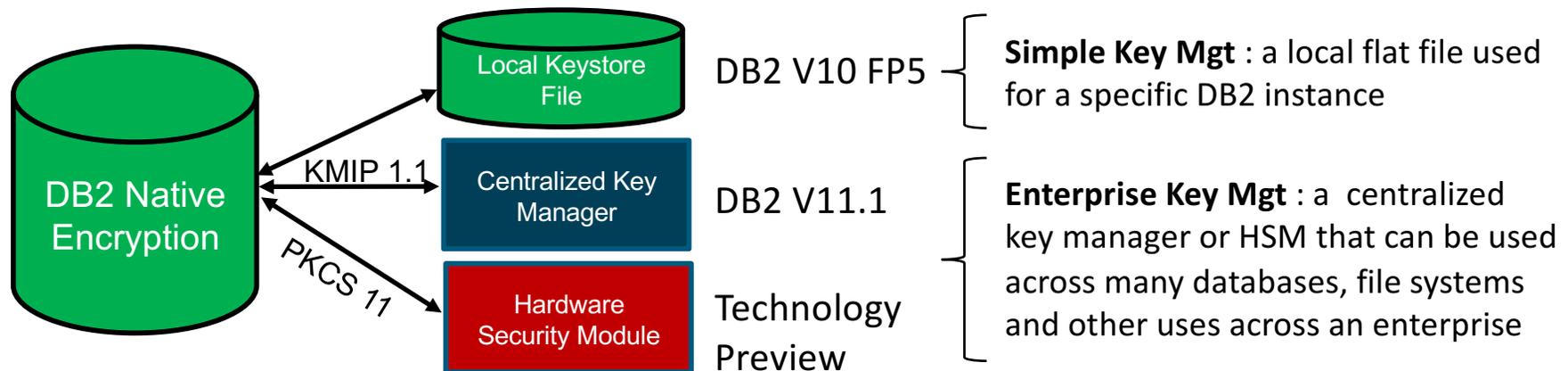
- DB2, PureData System for Analytics (PDA), Oracle, Informix, dashDB, SQLServer, BigSQL, SparkSQL, Hive, Impala, and other Big Data sources.



Encryption Included in Packaging



- **V11.1 adds support for KMIP 1.1 compliant centralized key managers**
 - Validated on IBM's Security Key Lifecycle Manager (ISKLM)



- **Direct support for Hardware Security Modules (HSMs) (Preview)**
 - Support to include SafeNet Luna & Thales nShield Connect+

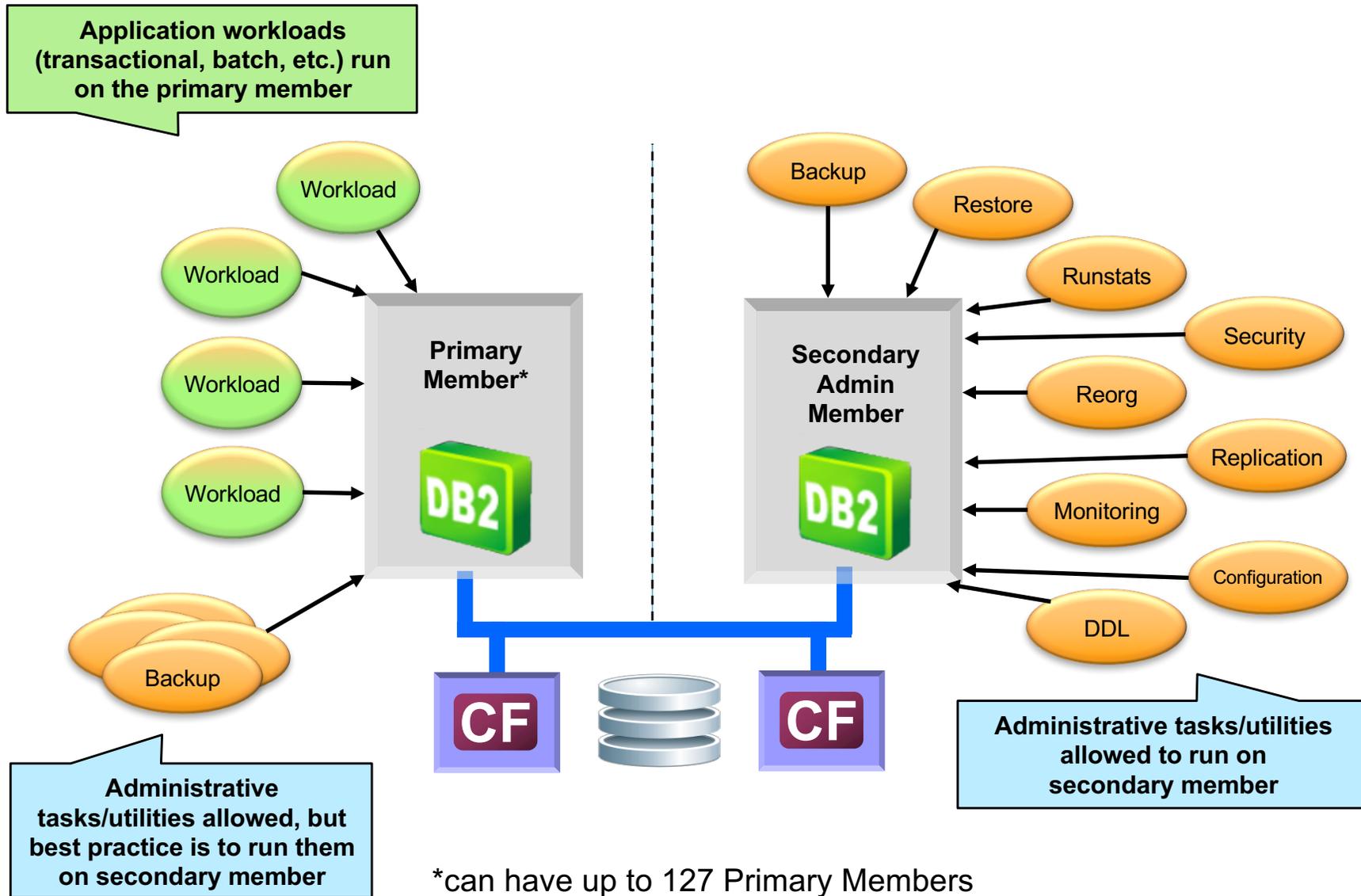
DB2 pureScale Included in Packaging

- **DB2 pureScale available in DB2 Advanced Editions, including new Direct Advanced Edition**

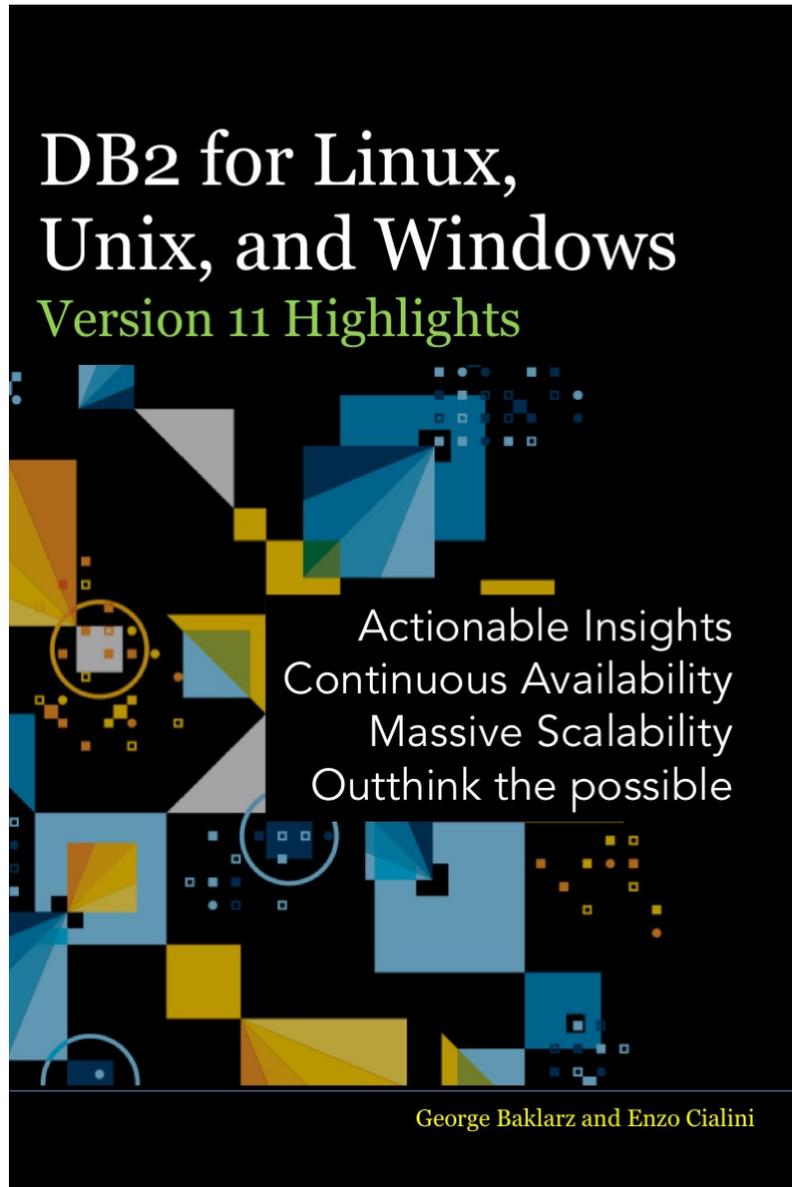
- **Low cost active/passive licensing** where one DB2 member has minimal licensing and the other DB2 member(s) fully licensed
 - All application workloads are directed to the primary active member(s)
 - Sometimes referred to as the “primary” member
 - Utilities and admin tasks allowed on the secondary admin member
 - Admin member licensed as warm standby (e.g. 100 PVUs or 1 VPC)
 - Great for off-loading backups from primary members



Licensing - DB2 pureScale Active/Passive Model



DB2 11.1 eBook



DB2 for Linux, Unix, and Windows Version 11 Highlights

George Baklarz and Enzo Cialini

The DB2 11.1 release delivers a number of significant enhancements including Database Partitioning Feature (DPF) for BLU columnar technology, improved pureScale performance and High Availability Disaster Recovery (HADR) support, and numerous SQL features.

This book was written to highlight many of the new features and functions that are now available in this release, without you having to search through various forums, blogs, and online manuals. We hope that this book gives you more insight into what you can now accomplish with DB2 11.1, and include it on your shortlist of databases to deploy, whether it is on premise, in the cloud, or in virtualized environment.

Coverage Includes:

- An overview of the new packaging changes in DB2 11.1, along with pre-requisites for installing the product
- Enhancements to DB2 BLU, including support for BLU columnar tables in a DPF (Data Partitioning Feature) environment
- pureScale capabilities that provide continuous availability in a production environment, along with all of the enhancements that have been made to simplify installation and management of a cluster
- Numerous SQL and compatibility enhancements

George Baklarz, B. Math, M. Sc., Ph.D. Eng., has spent 31 years at IBM working on various aspects of database technology. George has written 10 books on DB2 and other database technologies. George is currently part of the Worldwide Core Database Technical Sales Team.

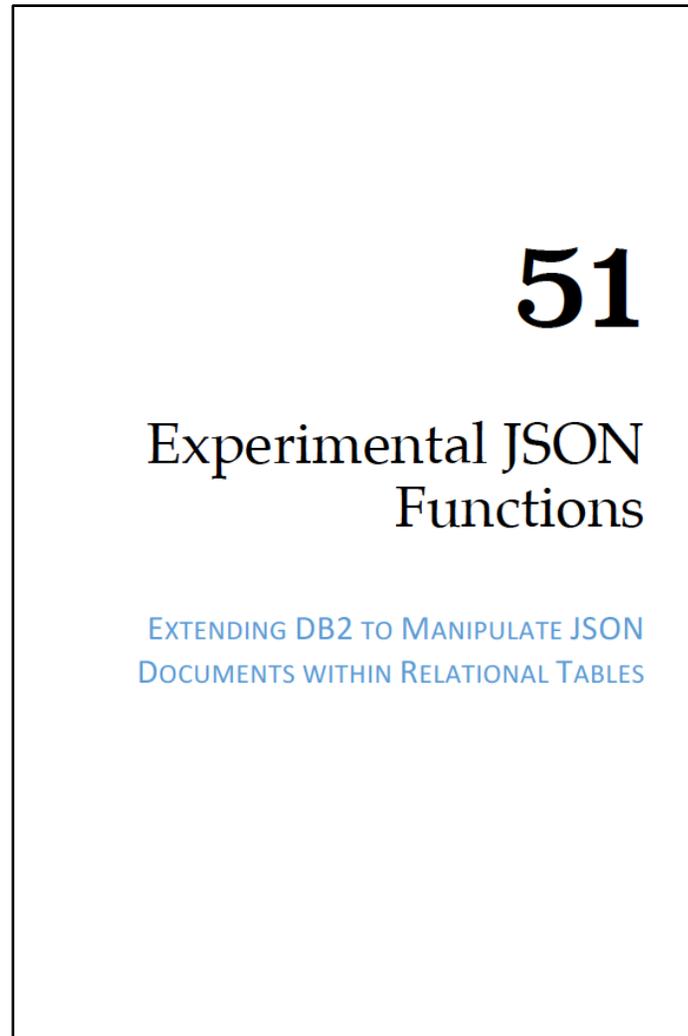
Enzo Cialini, B.Sc., is a Senior Technical Staff Member and Master Inventor in the Worldwide Core Database Technical Sales Team and formerly the Chief Quality Assurance Architect for DB2 & PureData in the IBM Toronto DB2 Development Team. He is also a published book author and written various papers on DB2. Enzo has 25 years of experience in database technology, software development, testing, support, competitive analysis and production deployments.



DB2 eBook Contents

<p>1</p> <p>Packaging, Installation, and Administration</p> <p>ENHANCED LICENSING AND DEPLOYMENT OPTIONS FOR DB2</p>	<p>2</p> <p>DB2 BLU Enhancements</p> <p>EXTENDING THE POWER OF IN-MEMORY COMPUTING</p>	<p>3</p> <p>pureScale Continuous Availability</p> <p>EXTREME SCALABILITY AND AVAILABILITY</p>	<p>4</p> <p>Compatibility Features</p> <p>MAKING IT EASIER TO MOVE FROM ONE DATABASE SYSTEM TO ANOTHER</p>	<p>5</p> <p>Netezza Compatibility</p> <p>SUPPORT FOR NETEZZA SQL SYNTAX AND STORED PROCEDURES</p>	<p>6</p> <p>SQL Extensions</p> <p>EXTENDING SQL SYNTAX WITH MORE POWERFUL FEATURES</p>
<p>7</p> <p>Date Functions</p> <p>MORE WAYS TO EXTRACT AND MANIPULATE DATE FIELDS</p>	<p>8</p> <p>Binary Manipulation</p> <p>NEW BINARY AND HEXADECIMAL OPERATORS</p>	<p>9</p> <p>Regular Expressions</p> <p>EXTENSIVE REGULAR EXPRESSION SUPPORT FOR SEARCHING AND DATA VALIDATION</p>	<p>10</p> <p>Statistical Functions</p> <p>NEW AND UPDATED STATISTICAL FUNCTIONS FOR COMPLEX DATA ANALYSIS</p>	<p>11</p> <p>Hashing Functions</p> <p>HASHING FUNCTIONS FOR GENERATING UNIQUE VALUES FOR CHARACTER STRINGS</p>	<p>A</p> <p>Appendix</p> <p>ADDITIONAL RESOURCES FOR DB2</p>

DB2 11.1 eBook – The Missing Chapter



Current DB2 JSON Support

▪ DB2 JSON Features

- Administer and interactively query JSON data using a command line shell
- Programmatically store and query data from Java programs using an IBM provided Java driver for JSON
 - Users to connect to their JSON data through the same JDBC driver used for SQL access
- Use any driver that implements portions of the MongoDB protocol
 - Wire listener
 - Access DB2 JSON store from a variety of modern languages, including node.js, PHP, Python, and Ruby, as well as more traditional languages such as C, C++, and Perl

▪ No Ability to Manipulate JSON with DB2 SQL

JSON Data in DB2

▪ JSON Data is Stored in a BLOB Column

- The JSON data is stored in a binary-encoded format called BSON (Binary JSON)
- BSON is designed to be lightweight, easily traversed and very efficiently encoded and decoded
- Must use DB2 routines to create BSON objects since there are extensions used by DB2

▪ Best Practices

- Create the BLOB object as INLINE as possible to avoid additional BLOB overhead
- BSON is usually smaller than original CLOB object, but can be substantially larger if there are many small numeric values

Note: These functions are not officially supported so you are using them entirely at your own risk!

Inserting and Validating JSON Data in DB2

▪ Inserting and Retrieving Entire JSON Objects

- JSON2BSON – Convert JSON strings into a BSON document format
`JSON2BSON (JSON-document)`
- BSON2JSON – Convert BSON formatted document into JSON strings
`BSON2JSON (BSON-document)`

▪ Validating a BSON Object

- BSON_VALIDATE – Checks to make sure that a BSON field in a BLOB object is in a correct format
`BSON_VALIDATE (BSON-document)`

Note: These functions are not officially supported so you are using them entirely at your own risk!

Retrieving an Individual Field

▪ Retrieving Individual Fields

- JSON_VAL – Extracts data from a JSON document into SQL data types

```
value = JSON_VAL(BSON-document, field, type)
```

- Field is specified as either the name, structure location, or array

- "empno"
- "phone.0"
- "pay.salary"

▪ Determining the JSON Data Type

- JSON_TYPE – Returns the data type of a specific field within a JSON document

```
type = JSON_TYPE(BSON-document, field, 2048)
```

Note: These functions are not officially supported so you are using them entirely at your own risk!

Manipulating JSON Arrays

▪ Retrieve Array Values as a Table

- JSON_TABLE – Returns a table of values for a document that has array types in it

`JSON_TABLE(document, field, type)`

- Returns a table with two columns containing the TYPE, and the VALUE(s) in the array

▪ Determine the Number of Elements in an Array

- JSON_LEN – Returns the count of elements in an array type inside a document

`JSON_LEN(document, field)`

▪ Find an Element in an Array

- JSON_GET_POS_ARR_INDEX – Find a value within an array

`JSON_TABLE(document, BSON-field-specification)`

Note: These functions are not officially supported so you are using them entirely at your own risk!

Updating JSON Values

▪ Update the Entire Value with a SET statement

- Use standard UPDATE clause

```
UPDATE <table> SET FIELD = BSON2JSON(JSON)
```

▪ Update an Individual Field using \$SET syntax

- JSON_UPDATE – Update a field or document using set syntax

```
UPDATE <table> SET FIELD =  
JSON_UPDATE('$set: {field:value}')
```

Note: These functions are not officially supported so you are using them entirely at your own risk!

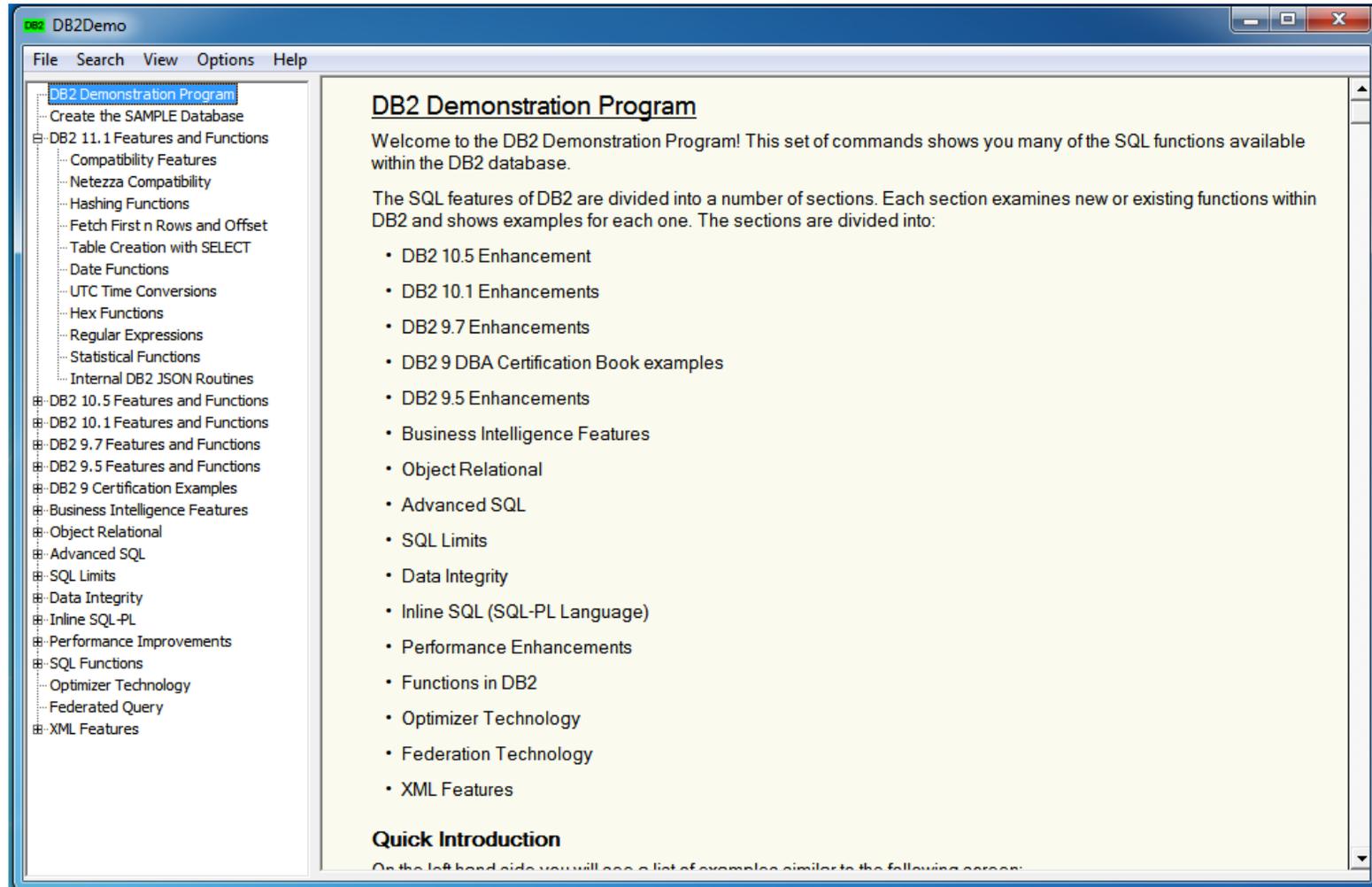
JSON Resources

- **Examples of JSON usage available in DB2DEMO**

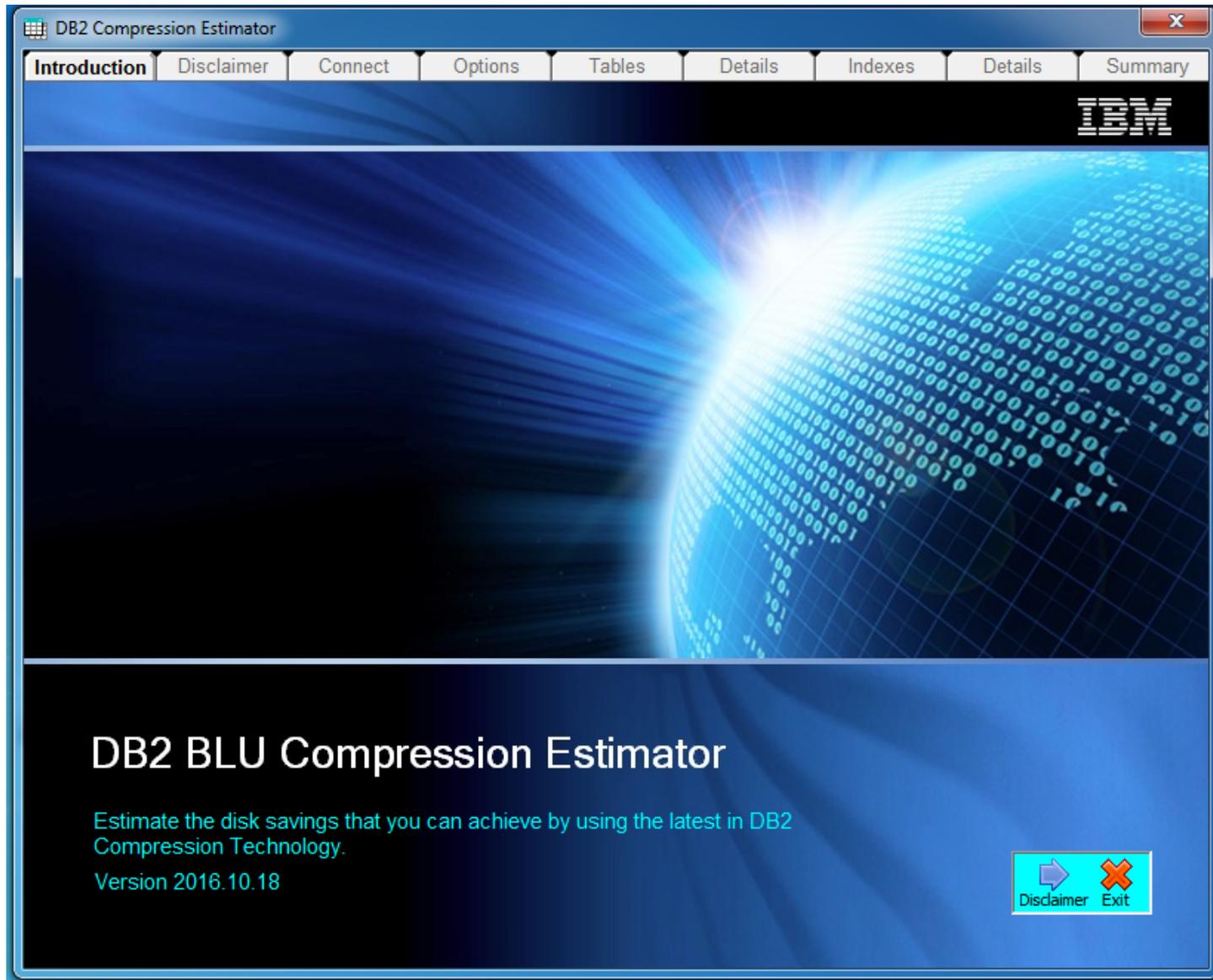
- **Script DB2-V11-JSON-Examples.SQL**
 - Available with DB2 eBook
 - Contains all of the JSON examples found in the JSON chapter
 - Includes commands that will register the JSON functions

- **Value your feedback on what JSON Support you would like to see being delivered in DB2**

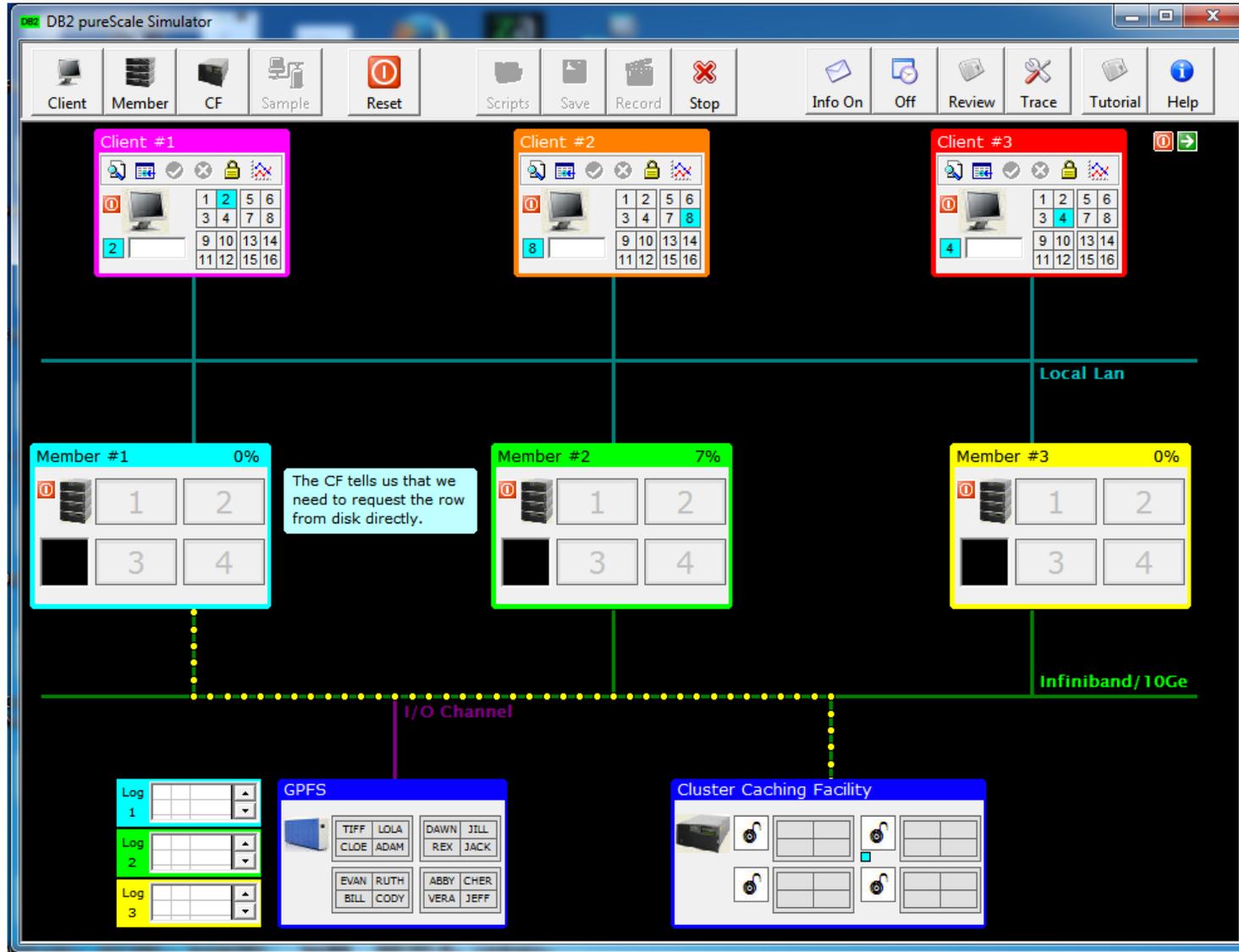
DB2Demo Version 11.1



DB2 11.1 Compression Estimator



DB2 pureScale Simulator



DB2 11.1 eBook and Resources

- URL for all DB2 Resources including the eBook
 - <https://ibm.ent.box.com/v/DB2v11eBook>
- Use a QR-code scanner on your Phone or Tablet get the eBook



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DB2 New and Updated Resources for Version 11.1

