


The Download: Community Tech Talks Episode 5

May 25, 2017



Welcome!

- Please share: Let others know you are here with #HPCCTechTalks 
- Ask questions! We will answer as many questions as we can following each speaker.
- Look for polls at the bottom of your screen. Exit full-screen mode or refresh your screen if you don't see them.
- We welcome your feedback - please rate us before you leave today and visit our [blog](#) for information after the event.
- Want to be one of our featured speakers? Let us know! techtalks@hpccsystems.com

Community announcements

- Welcome 2017 HPCC Systems Summer Interns!
 - 5 students in the program ranging from high school to PhD
 - Projects include machine learning, HPCC Systems integration, and extending the ECL standard library
 - Proposals for 2018 will open late September
- **Reminder:** Call for Presentations and Poster Abstracts still open for the 2017 HPCC Systems Community Day!
 - Community Day will be held in Atlanta on October 4, 2017
 - Poster Competition held on October 3
 - This year's theme is Smart Data
 - Submission deadline on **June 30**
 - Sponsorship opportunities still available. Thank you Datum Software!
 - Details at <https://hpccsystems.com/hpccsummit2017>

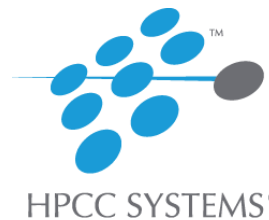


Dr. Flavio Villanustre

VP Technology

LexisNexis® Risk Solutions

Flavio.Villanustre@lexisnexisrisk.com



Today's speakers



Jeff Bradshaw

CTO

Adaptris, RBI

Jeff.Bradshaw@reedbusiness.com

Jeff Bradshaw is the founder of Adaptris and Group CTO of Adaptris/F4F/DBT within Reed Business Information. He has spent his career integrating data wherever it resides and in-flight across a number of industries including Agriculture, Airlines, Telecommunications, Healthcare, Government and Finance.

Jeff has worked with and contributed to a number of international standards bodies and continues to work with large enterprises to help them extract value from their data silos and share data seamlessly with their trading partners to achieve business benefit. For the last few years Jeff has been focusing on Big Data and how to gather that across a wide range of sources to help gain insight into the agri-food supply chain.



Jon Burger

Senior Architect

LexisNexis Risk Solutions

Jonathan.burger@lexisnexisrisk.com

Jon Burger is LexisNexis Risk's head infrastructure architect with 20+ years in information technology and over 15 years' experience with the HPCC platform. He has worked in a variety of roles within technology including Director of Technology, Director of HPCC, Engineering in Network, Linux and Microsoft.

Jon currently works out of the Boca Raton office and is the father to two teenage boys. Hive360 was created by him in an effort to aid in AWS deployments for LexisNexis Risk products.

Today's speakers



Rodrigo Pastrana

Software Architect

LexisNexis Risk Solutions

Rodrigo.Pastrana@lexisnexisrisk.com

Rodrigo is an Architect with the HPCC systems supercomputer focusing in platform integration and plug-in development. He has been a member of the HPCC core technology team for over five years and a member of the LexisNexis team for seven. Rodrigo is the principle developer of WsSQL, the HPCC JDBC connector, the HPCC Java APIs library and tools, and the Dynamic ESDL component. He has more than fifteen years of experience in design, research and development of state of the art technology including IBM's embedded text-to-speech and voice recognition products, Eclipse's device development environment. Rodrigo holds an MS and BS in Computer Engineering from the University of Florida and during his professional career has filed more than ten patent disclosures through the USPTO.



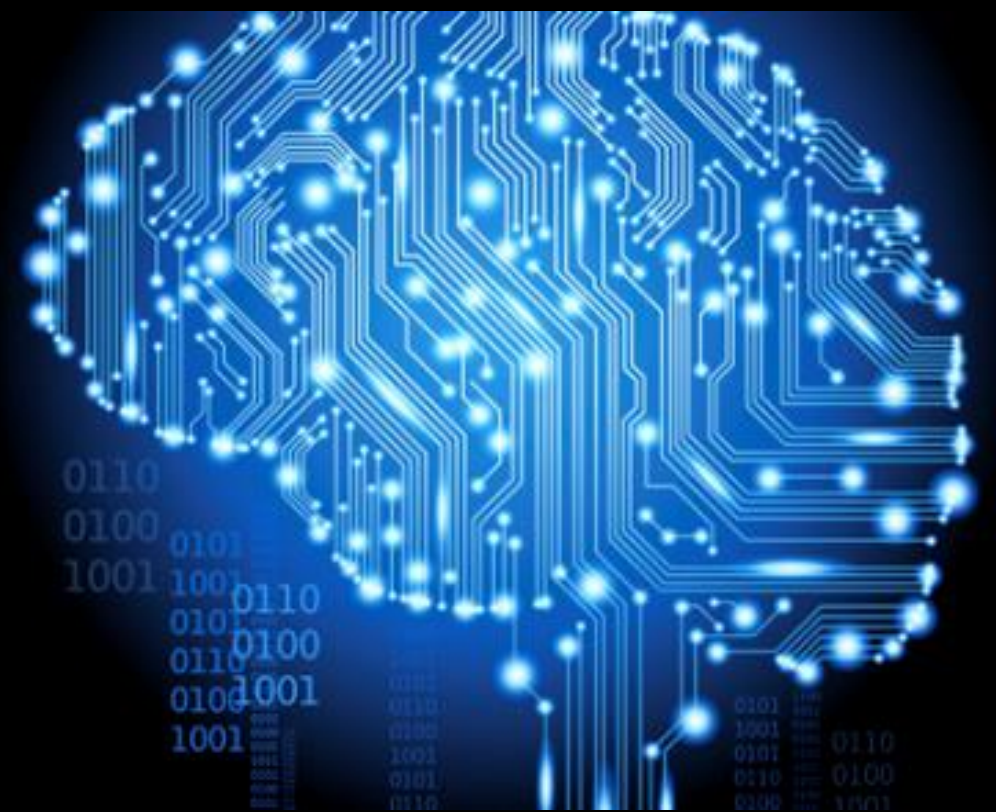
Bob Foreman

Senior Software Engineer

LexisNexis Risk Solutions

Robert.Foreman@lexisnexisrisk.com

Bob Foreman has worked with the HPCC Systems technology platform and the ECL programming language for over 5 years, and has been a technical trainer for over 25 years. He is the developer and designer of the HPCC Systems Online Training Courses, and is the Senior Instructor for all classroom and Webex/Lync based training.



Jeff Bradshaw
CTO
Adaptris, RBI

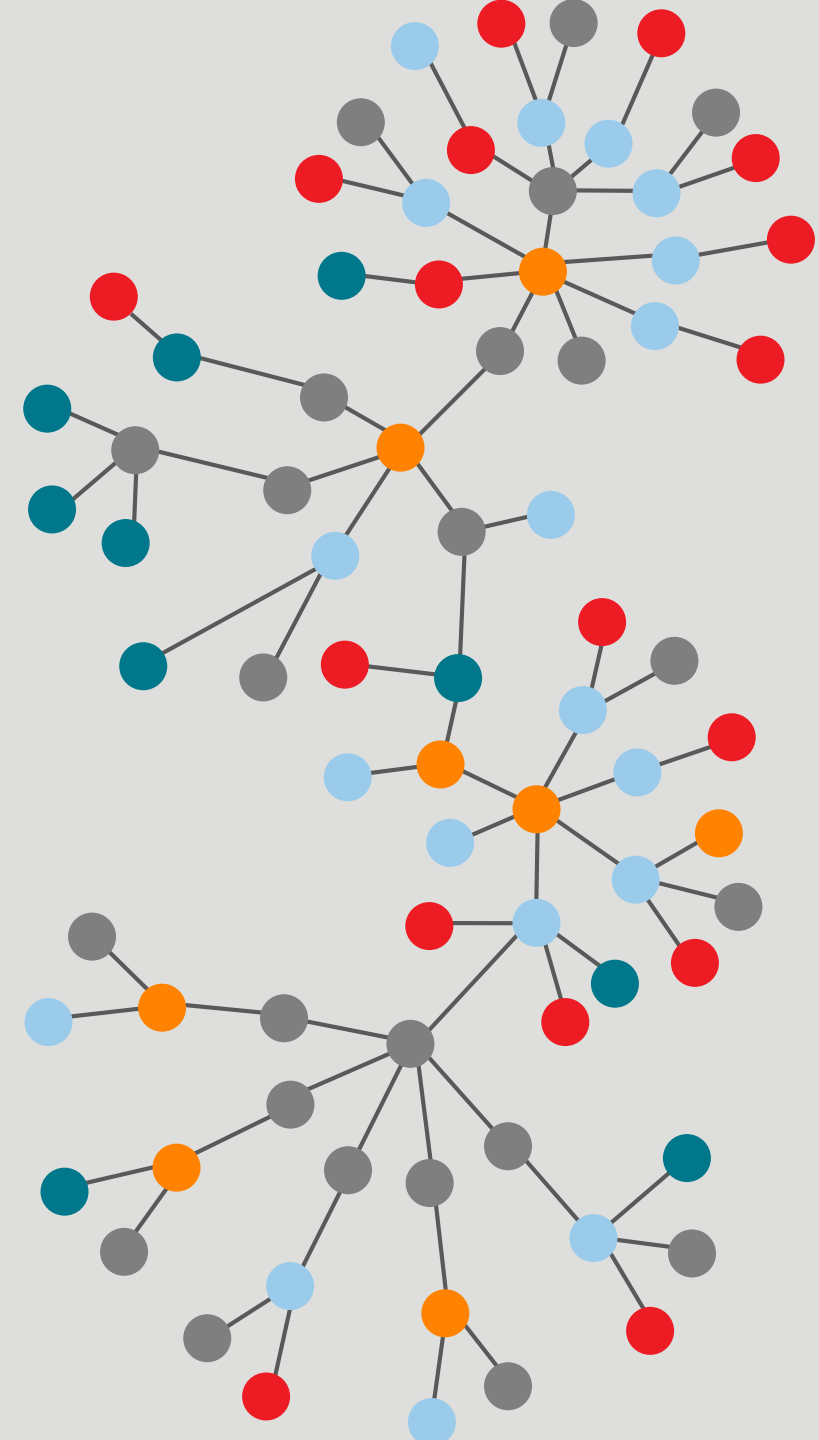


Interlok Deep Dive



Quick poll: Do you need to integrate data from legacy applications and a range of data sources?

See poll on bottom of presentation screen



Integration ^{anywhere} to feed your big data platform

Why Adaptris?

- Established in 1998 focus on Integration of data wherever it may be.
- Open Source Interlok™ Integration Framework.
- Over 300 pre-built Interlok™ Adapters.
- Commercial support, SaaS hosting, iPaaS options are available.
- Consulting to help you get up and running.

We use HPCC Systems in our ProAgrica business



We use HPCC Systems in our ProAgrica business



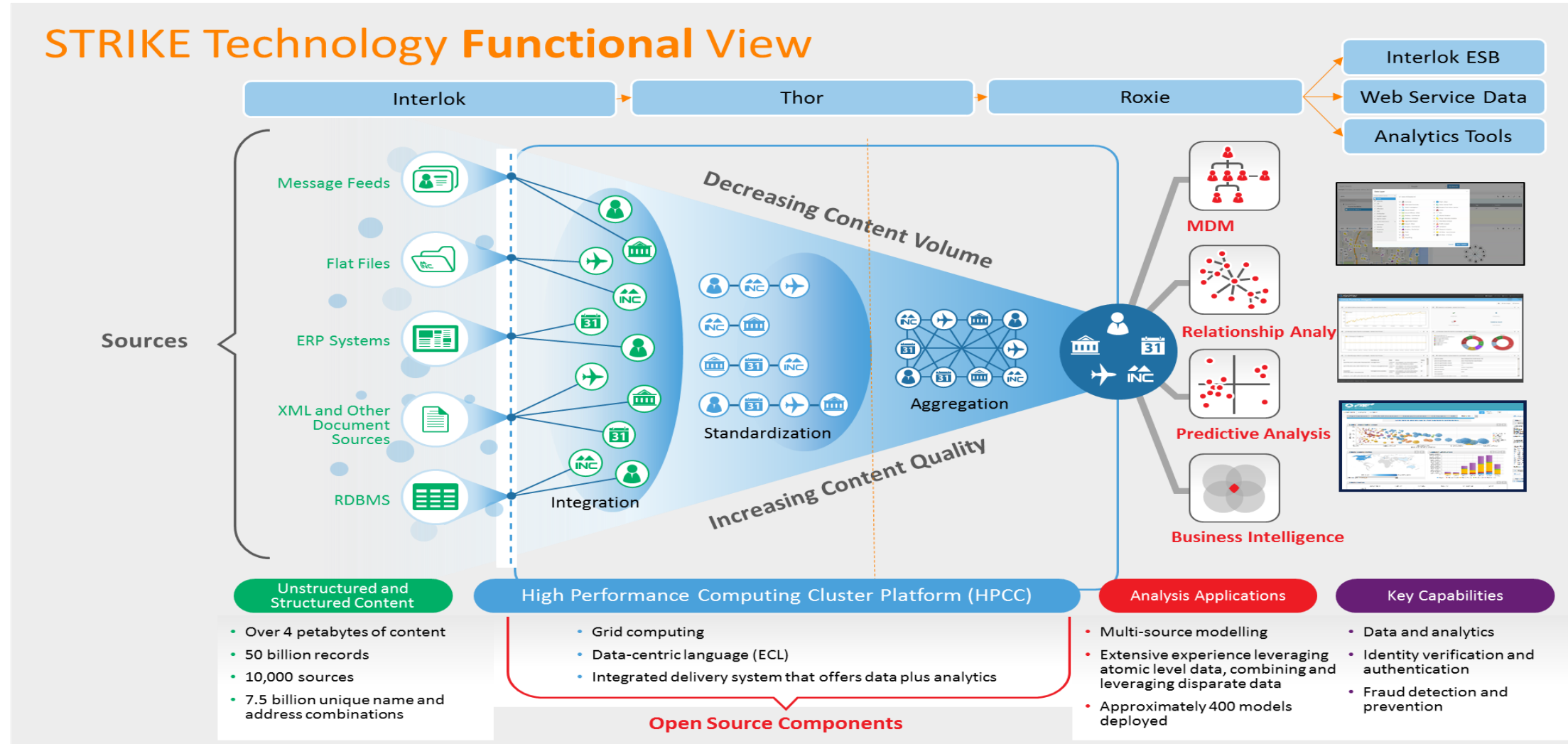
The data is DIRTY!

We use HPCC Systems in our ProAgrica business

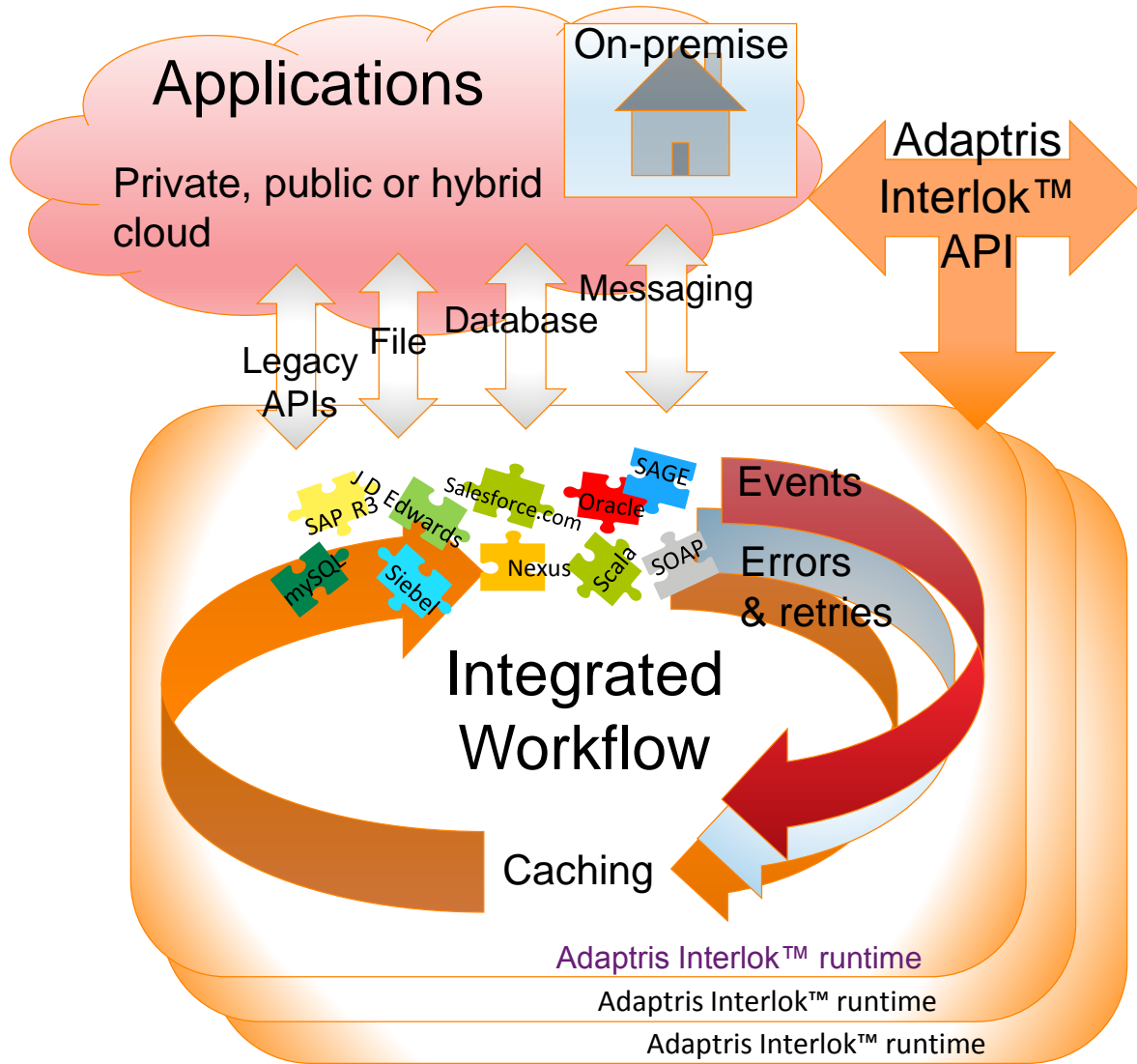


We use HPCC Systems in our ProAgrica business

STRIKE Technology Functional View



Putting the “I” in STRIKE!

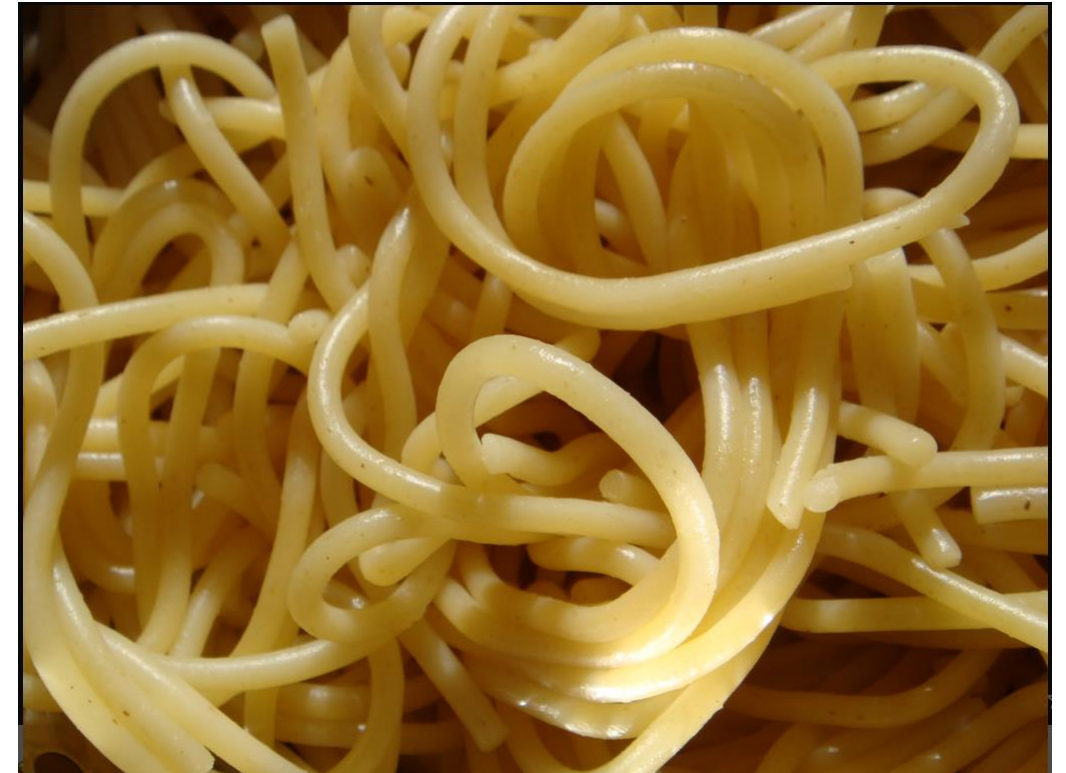


- Federated run-time / Centralised configuration
- Cross-platform consistency
- Linear scaling
- Configuration not coding
- Exposed API

But we have API's

- API based integration is great*.
- Interlok™ works with APIs, and allows you to combine them to do more interesting things.
- Interlok™ lets us call API's and orchestrate them, it also lets us cache results when they are slow.
- Interlok™ enables us to expose legacy databases, applications etc as API's
- Interlok™ helps us pull all of this data into HPCC to let Thor loose on it.....

* So is spaghetti.... It is similar to unpick when it goes wrong.....



How about IoT?

- You can run Interlok™ on a RaspberryPi close to the source of the data.
- Interlok™ speaks MQTT to allow data to be consumed from IoT devices.
- We can also bring in other types of data such as :-
 - Flat-Files
 - CSV Files
 - EDI Files
 - HL7 Files
 - Relational database
 - PDF's

How easy is it to work with HPCC Systems?

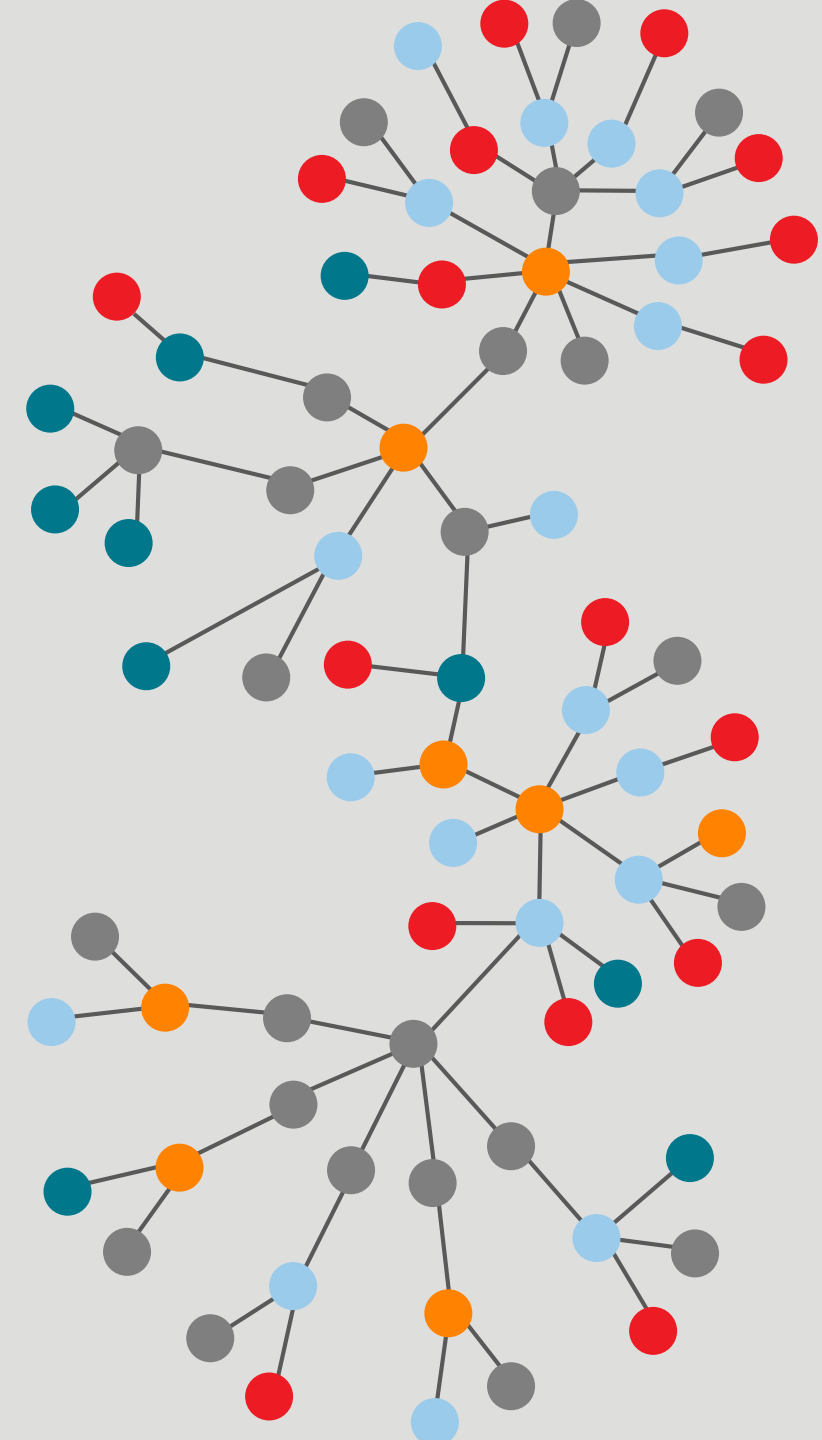
- We have pre-built connections for HPCC Systems out of the box
- You can spray data directly in to THOR
- You can de-spray data from THOR
- You can do both of these as you like in a single workflow and expose it as an API!

Now for a quick demo.....



Quick poll: Would you like to be able to integrate data from cloud system providers?

See poll on bottom of presentation screen



Questions?

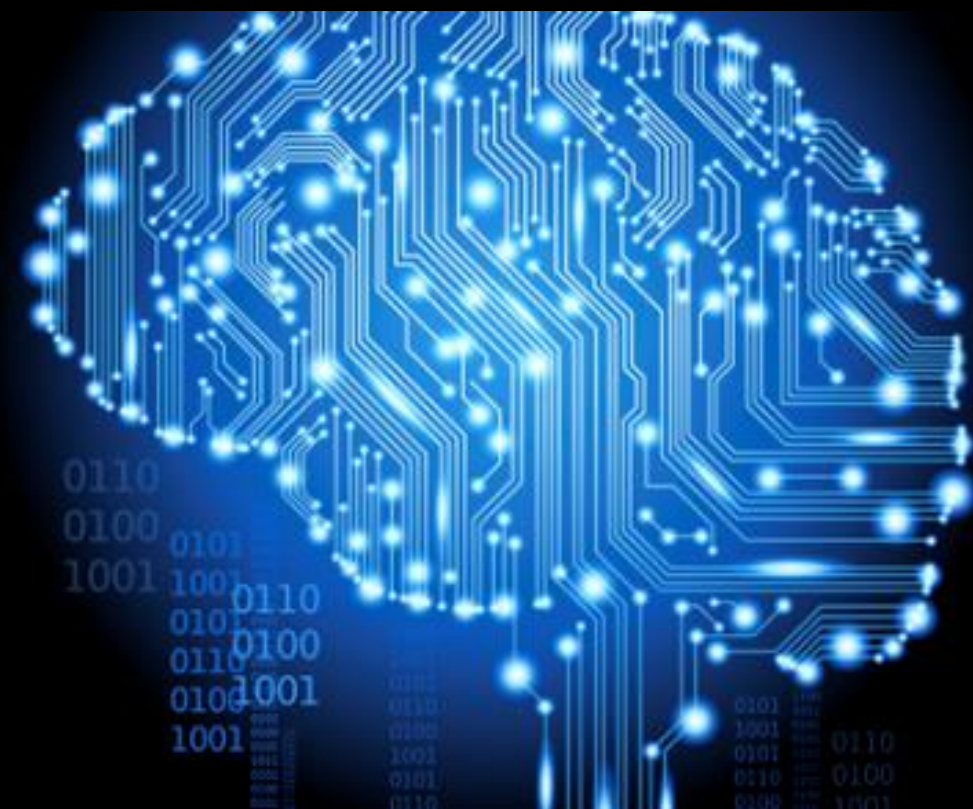


Jeff Bradshaw

CTO

Adaptris, RBI

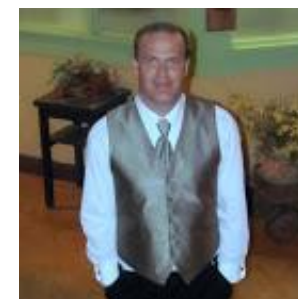
Jeff.Bradshaw@reedbusiness.com



Hive360, Cloud Ported HPCC Systems Platform

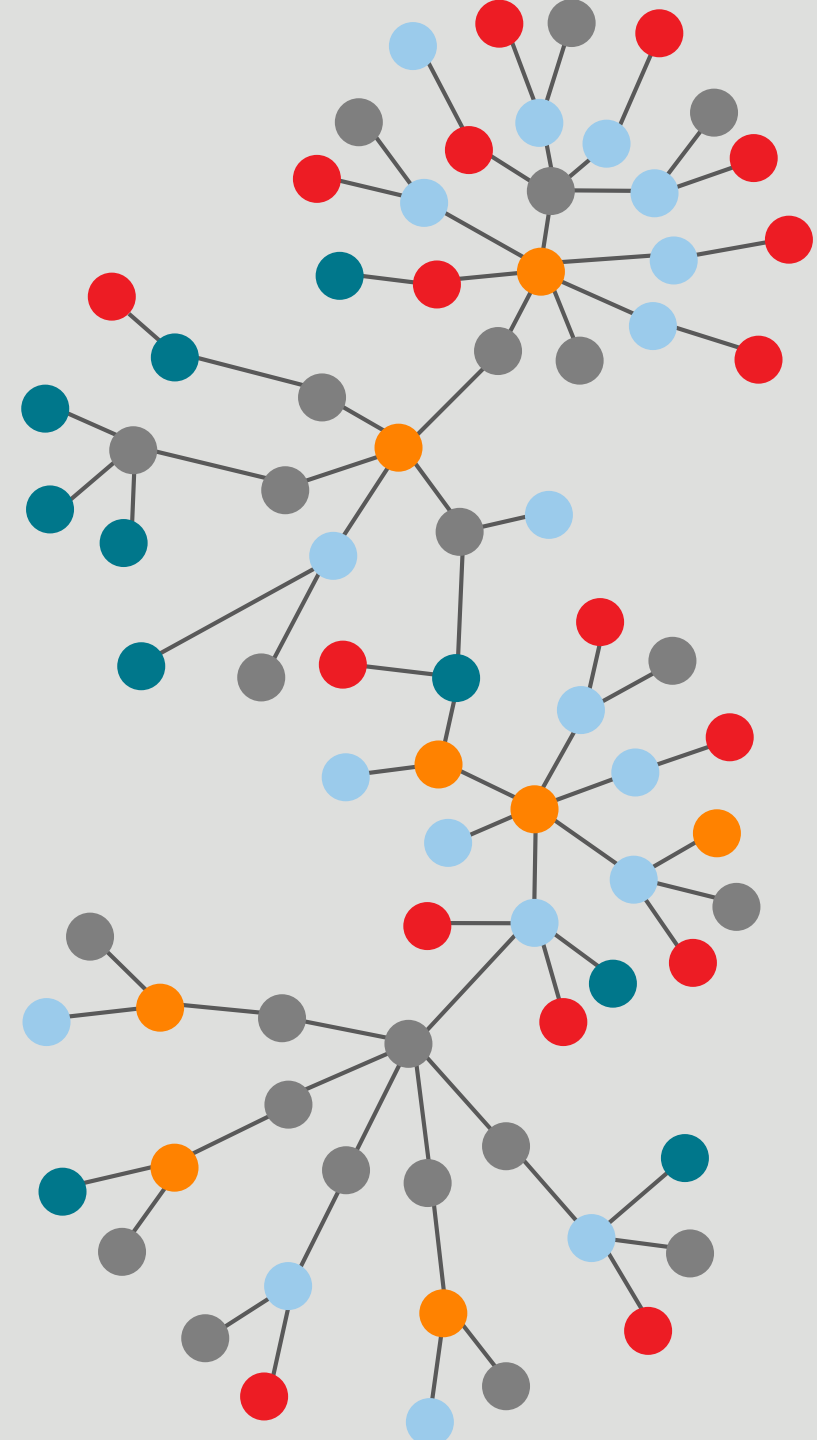


Jon Burger
Senior Architect
LexisNexis Risk Solutions

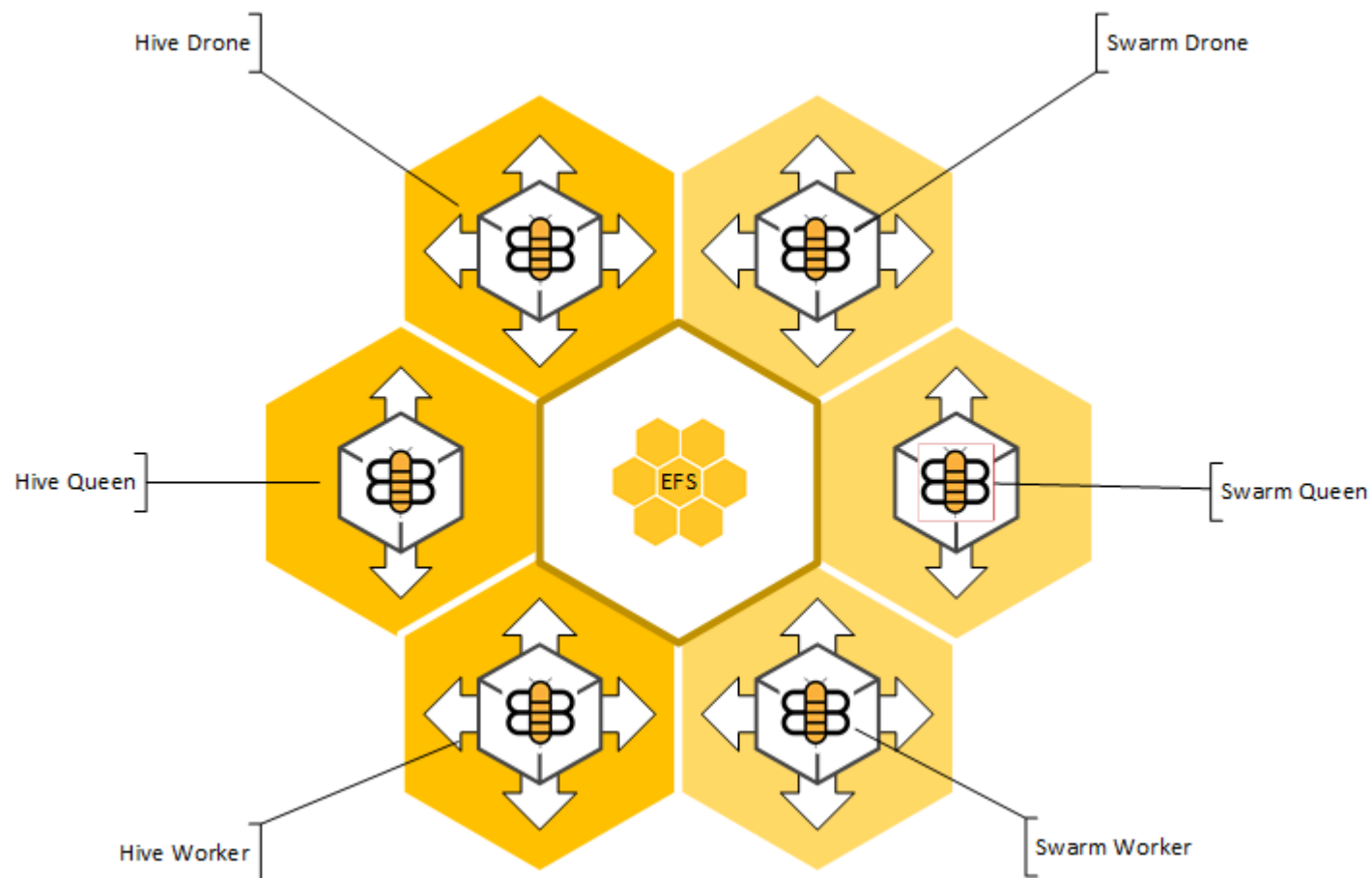


Quick poll: Do you have a need for a low cost, turn-key, push button scalable big data platform within AWS that doesn't require a team of engineers to support?

See poll on bottom of presentation screen



Introducing Hive360 – A Cloud Way To HPCC Systems

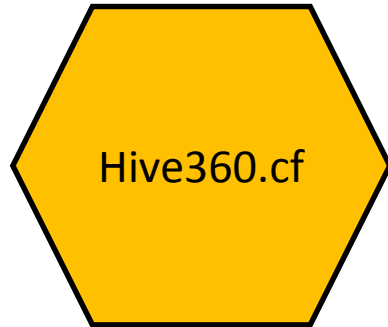


The reason for it's creation

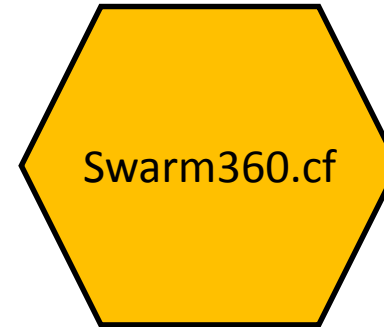
- **To leverage the on-demand benefits of IaaS cloud technology**
 - Data Driven Workflows
 - Dynamic Scalability
 - Self-healing Application & Infrastructure
 - Push Button Deployments
 - Lower Infrastructure Costs
 - Lower Operational Costs

What is it exactly?

- Quite simply it consists of two AWS cloud formation scripts



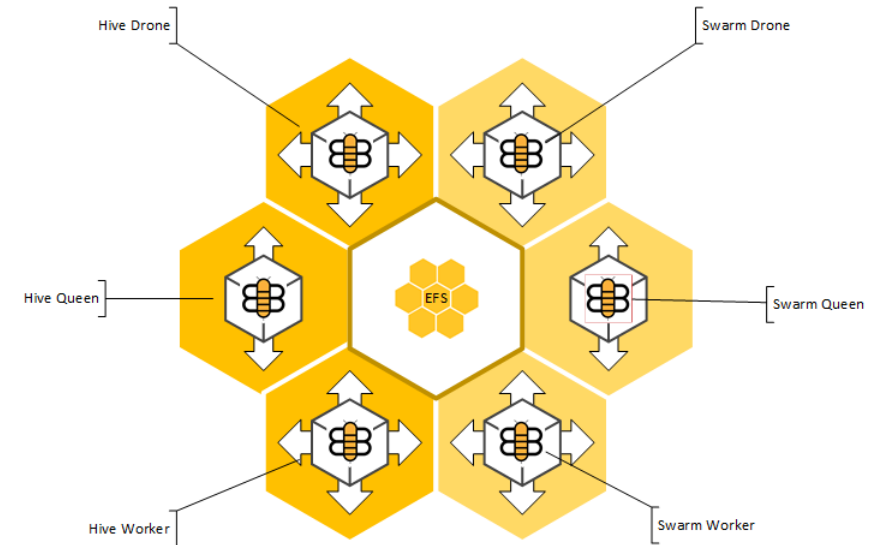
Creates the initial Hive360 HPCC Platform



Designed to clone an existing Hive

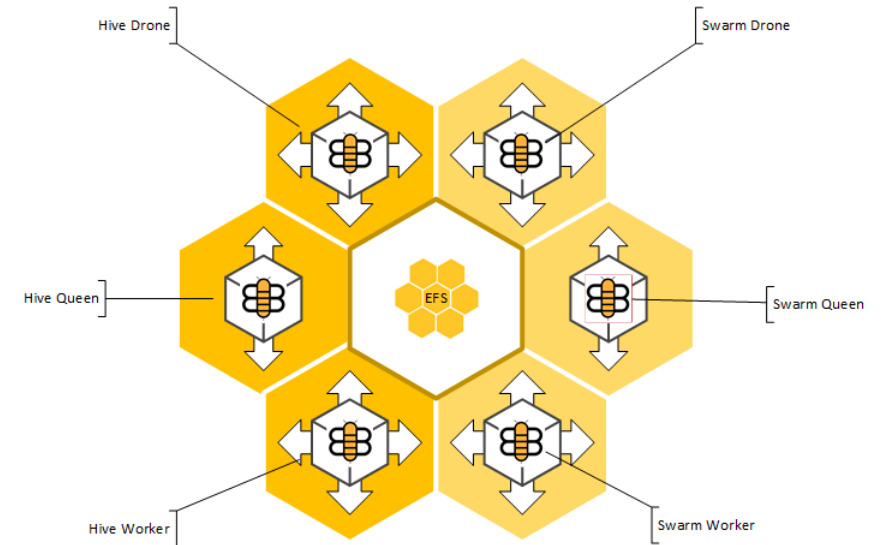
What do these scripts do for me?

- **They create a HPCC built to fully leverage cloud technology**
 - Dynamic Creation & Resizing (Horizontal & Vertical)
 - Robust Self-Healing
 - Auto Scaling Roxie Infrastructure
 - Instant Data Release Between Thor & Roxie
 - Automated Platform Updates
 - Ability to Clone Environments For Dev & QA
 - Low Operational Overhead
 - Low Cost Overhead



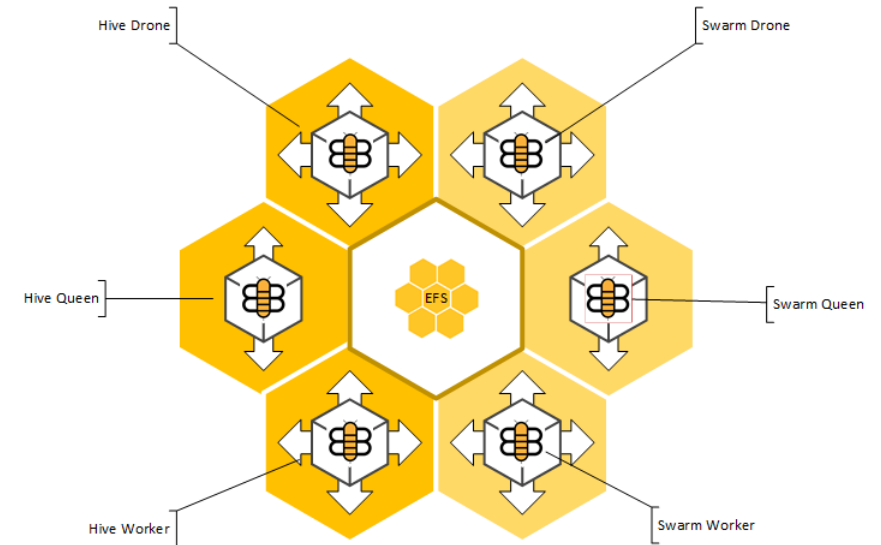
What's the catch?

- There are a few current restrictions limiting its use
 - AWS only
 - VPC Spanning Multiple AWS AZs
 - Elastic File System (EFS)
 - Minimum Running Workers (Thor Nodes) is 5
 - Maximum Storage 8000 PB
 - Maximum Swarms is 175
 - HPCC released AMI's



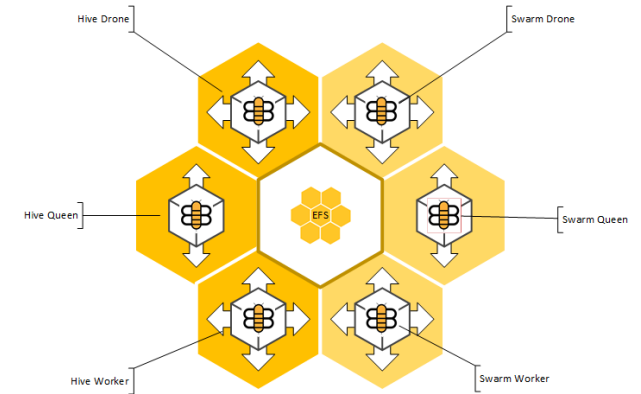
Who is this for?

- **Anyone requiring a dynamic and lower cost big data processing platform**
 - Groups looking to integrate HPCC into a workflow
 - Solution stacks with an unpredictable data growth
 - Groups with minimal technology support resources
 - Groups with lower frequency big data needs
 - DevOps driven environments
 - Groups looking to evaluate HPCC
 - Production quality HPCC deployments



How would I use it?

- Download Hive360.cf and Swarm36.cf from Github
- Decide how many, if any, workers and drones you want
- Upload the Hive360.cf script to Cloud Formation in your VPC
- Set configuration values & vertical and horizontal sizing
- Create the Hive
- Use HPCC as normal
- When complete, modify your stack to lower worker and drone counts to 0
- Next time you want to use it, modify stack to set new worker & drone counts
- If you need to test or develop, swarm your hive for a COW clone that operates independently of the hive. It can even run a different build.
- If you want to integrate into a workflow, simply use the aws tools and hpcc command line tools to drive it in a complete devops driven workflow.



Demo time

QUICK DEMO

Demo screenshots

Hive360 Stack Creation Screenshot

Parameters

General Configuration

AMI

Enter the AMI Id of the source image

Password

Password for the default ecl-user account

Cloud Configuration

VPC

Search by ID, or Name tag value

▼

Choose the VPC where the hive will live

PrivateSubnetA

Search by ID, or Name tag value

▼

Choose the first private subnet where the hive will live

PrivateSubnetB

Search by ID, or Name tag value

▼

Choose the second private subnet where the hive will live

KeyName

Search

▼

Choose the keypair you want to associate with the hive

Hive360 Configuration

QueenSize

m4.xlarge

▼

Choose the size of the queen

WorkerSize

m4.xlarge

▼

Choose the size of worker instances

DroneSize

m4.xlarge

▼

Choose the size of the drone instances

WorkerCount

5

▼

Choose the count of workers to create

DroneCount

2

▼

Minimum number of drones in autoscaling group

Swarm360 Stack Creation Screenshot

Parameters

General Configuration

AMI

Enter the AMI Id of the source image

Password

Password for the default ecl-user account

Cloud Configuration

ReferenceStackName

Enter the stack name of the Hive360 you want to swarm.

KeyName

Search

▼

Choose the keypair you want to associate with the hive

Swarm360 Configuration

QueenSize

m4.large

▼

Choose the size of the queen

WorkerSize

m4.large

▼

Choose the size of worker instances

DroneSize

m4.large

▼

Choose the size of the drone instances

WorkerCount

5

▼

Choose the count of workers to create

DroneCount

2

▼

Minimum number of drones in autoscaling group

Demo screenshots

Example Hive360 Creation Events CloudFormation Screenshot

Overview	Outputs	Resources	Events	Template	Parameters	Tags	Stack Policy	Change Sets
2017-05-17		Status	Type	Logical ID		Status reason		
▶ 13:52:33 UTC-0400	UPDATE_COMPLETE	AWS::CloudFormation::Stack	hive360-insurance					
▶ 13:52:31 UTC-0400	UPDATE_COMPLETE_CLEANUP_IN_PROGRESS	AWS::CloudFormation::Stack	hive360-insurance					
▶ 13:52:28 UTC-0400	CREATE_COMPLETE	AWS::AutoScaling::AutoScalingGroup	workers					
▶ 13:48:40 UTC-0400	CREATE_COMPLETE	AWS::CloudWatch::Alarm	DroneCpuLow					
▶ 13:48:40 UTC-0400	CREATE_IN_PROGRESS	AWS::CloudWatch::Alarm	DroneCpuLow	Resource creation Initiated				
13:48:39 UTC-0400	CREATE_IN_PROGRESS	AWS::CloudWatch::Alarm	DroneCpuLow					
▶ 13:48:37 UTC-0400	CREATE_COMPLETE	AWS::CloudWatch::Alarm	DroneCpuHigh					
▶ 13:48:36 UTC-0400	CREATE_COMPLETE	AWS::AutoScaling::ScalingPolicy	DroneScaleDownPolicy					
▶ 13:48:36 UTC-0400	CREATE_IN_PROGRESS	AWS::CloudWatch::Alarm	DroneCpuHigh	Resource creation Initiated				
▶ 13:48:36 UTC-0400	CREATE_IN_PROGRESS	AWS::AutoScaling::ScalingPolicy	DroneScaleDownPolicy	Resource creation Initiated				
13:48:36 UTC-0400	CREATE_IN_PROGRESS	AWS::CloudWatch::Alarm	DroneCpuHigh					
13:48:35 UTC-0400	CREATE_IN_PROGRESS	AWS::AutoScaling::ScalingPolicy	DroneScaleDownPolicy					
▶ 13:48:33 UTC-0400	CREATE_COMPLETE	AWS::AutoScaling::ScalingPolicy	DroneScaleUpPolicy					
▶ 13:48:33 UTC-0400	CREATE_IN_PROGRESS	AWS::AutoScaling::ScalingPolicy	DroneScaleUpPolicy	Resource creation Initiated				
13:48:32 UTC-0400	CREATE_IN_PROGRESS	AWS::AutoScaling::ScalingPolicy	DroneScaleUpPolicy					
▶ 13:48:30 UTC-0400	CREATE_COMPLETE	AWS::AutoScaling::AutoScalingGroup	drones					
▶ 13:47:36 UTC-0400	CREATE_IN_PROGRESS	AWS::AutoScaling::AutoScalingGroup	drones	Resource creation Initiated				
13:47:35 UTC-0400	CREATE_IN_PROGRESS	AWS::AutoScaling::AutoScalingGroup	drones					
▶ 13:47:32 UTC-0400	CREATE_IN_PROGRESS	AWS::AutoScaling::AutoScalingGroup	workers	Resource creation Initiated				
13:47:31 UTC-0400	CREATE_IN_PROGRESS	AWS::AutoScaling::AutoScalingGroup	workers					
▶ 13:47:29 UTC-0400	CREATE_COMPLETE	AWS::ElasticLoadBalancing::LoadBalancer	DroneElb					
▶ 13:47:29 UTC-0400	CREATE_IN_PROGRESS	AWS::ElasticLoadBalancing::LoadBalancer	DroneElb	Resource creation Initiated				

Demo screenshots

Example Hive360 Outputs Cloud Formation Screenshot

- ECLWatch URL
- Grafana URL
- ROXIE DNS Name / Port

Overview	Outputs	Resources	Events	Template	Parameters	Tags	Stack Policy	Change Sets
Key		Value		Description		Export Name		
RoxieDNS		internal-hive360-insurance-drone-elb-1434754092.us-west-2.elb.amazonaws.com:9876		The roxie DNS name:port				
EfsExport		fs-3ca56e95				hive360-insurance:FileSystem		
ECLWatchURL		http://internal-hive360-insurance-queen-elb-1191863672.us-west-2.elb.amazonaws.com:8010		The URL for ECLWatch Page				
PrivateSubnetBExport		subnet-86e4afe2				hive360-insurance:PrivateSubnetB		
VpcExport		vpc-25e2c741				hive360-insurance:VPC		
DefaultSG		sg-acaf85d4				hive360-insurance:DefaultSecurityGroup		
PrivateSubnetAExport		subnet-2a8cef5c				hive360-insurance:PrivateSubnetA		
BeekeeperGrafanaURL		http://internal-hive360-insurance-queen-elb-1191863672.us-west-2.elb.amazonaws.com:3000		The URL for the Beekeeper Grafana Page				

Demo screenshots

Example ECLWatch Home Page

internal-hive360-insurance-queen-elb-1191863672.us-west-2.elb.amazonaws.com:8010/#/stub/Main

Apps Tools and Sites Troubleshooting Cloud Links Project Links FOCUS Blackboard Connect College Email K12PaymentCenter Imagine Schools Web MEETINGS CALENDAR Other bookmarks

ECL Watch

Wuid, User, (ecl:*, file:*, dfu:*, LOGGED IN AS: ecl-user

Activity Event Scheduler Search Results

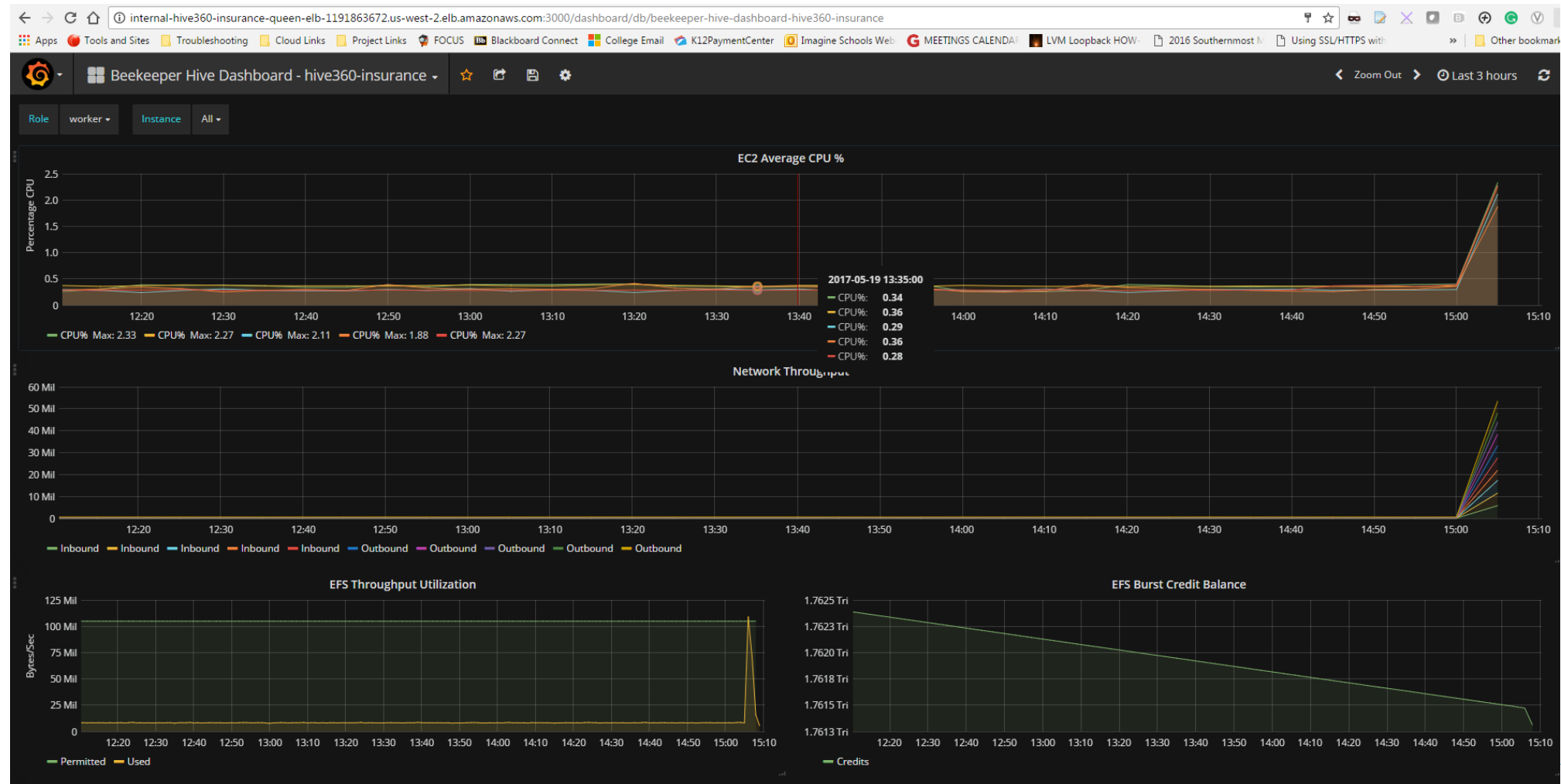
Activity

Refresh | Pause Resume Clear | Open Pause Pause Now Resume Abort | High Normal Low | Top Up Down Bottom

<input type="checkbox"/>	Target/Wuid	Graph	State	Owner	Job Name
<input type="checkbox"/>	hthor				
<input type="checkbox"/>	thor				
<input type="checkbox"/>	roxie				
<input type="checkbox"/>	hthor.eclserver,thor.eclserver,roxi...				
<input type="checkbox"/>	dfuserver_queue				

Demo screenshots

Example Grafana Metric Page



Demo screenshots

Example Hive360 Cloudwatch Logs

CloudWatch > Log Groups > Streams for hive360-insurance-hpcclogs-...

Search Log Group Create Log Stream Delete Log Stream

Filter: Log Stream Name Prefix x

Log Streams	Last Event Time
roxie-i-0883c42f5449ee597	2017-05-19 15:10 UTC-4
daaditi-01d2bd9a0ef9dca0f	2017-05-19 15:09 UTC-4
thorslave-i-095d6aad8b1b17356	2017-05-19 15:07 UTC-4
sasha-i-01d2bd9a0ef9dca0f	2017-05-19 15:07 UTC-4
thormaster-i-01d2bd9a0ef9dca0f	2017-05-19 15:07 UTC-4
roxie-i-0404263ee9042790c	2017-05-19 15:07 UTC-4
dfilesrv-i-0934e752117bc5d1c	2017-05-19 15:06 UTC-4
hpccinit-i-01d2bd9a0ef9dca0f	2017-05-19 15:06 UTC-4
dfilesrv-i-05e027be303e8b215	2017-05-19 15:05 UTC-4
dfilesrv-i-01d2bd9a0ef9dca0f	2017-05-19 15:02 UTC-4
dfilesrv-i-0404263ee9042790c	2017-05-19 15:01 UTC-4
dfilesrv-i-095d6aad8b1b17356	2017-05-19 15:01 UTC-4
dfilesrv-i-0e6686837d1d6f0db	2017-05-19 15:01 UTC-4
roxie-i-0934e752117bc5d1c	2017-05-19 15:00 UTC-4
esp-i-01d2bd9a0ef9dca0f	2017-05-19 14:56 UTC-4
roxie-i-002d3266888f9ce87	2017-05-19 14:55 UTC-4
dfilesrv-i-002d3266888f9ce87	2017-05-19 14:51 UTC-4
dfilesrv-i-0d2e58e00ed09afb2	2017-05-19 14:51 UTC-4
dfilesrv-i-0bcfbcab017a8f0e4	2017-05-19 14:46 UTC-4
dfilesrv-i-0883c42f5449ee597	2017-05-19 14:44 UTC-4
dali-i-01d2bd9a0ef9dca0f	2017-05-19 14:37 UTC-4
thorslave-i-0bcfbcab017a8f0e4	2017-05-17 17:03 UTC-4
thorslave-i-05e027be303e8b215	2017-05-17 17:03 UTC-4

When and where will it be available?

- Scripts will be available in HPCCSysytems GitHub
- AMI's will be available in the AWS marketplace (for free)
- Targeting Limited Release in Q2

Quick poll: What do you find the most challenging aspect around HPCC Platform adoption?

See poll on bottom of presentation screen



Questions?

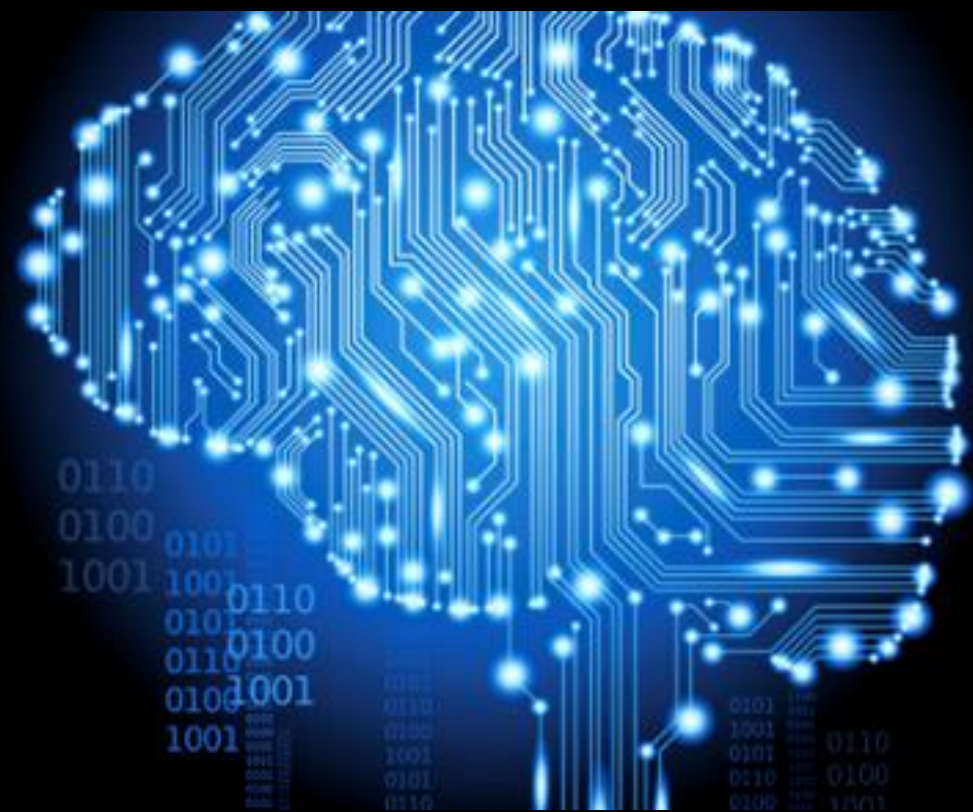


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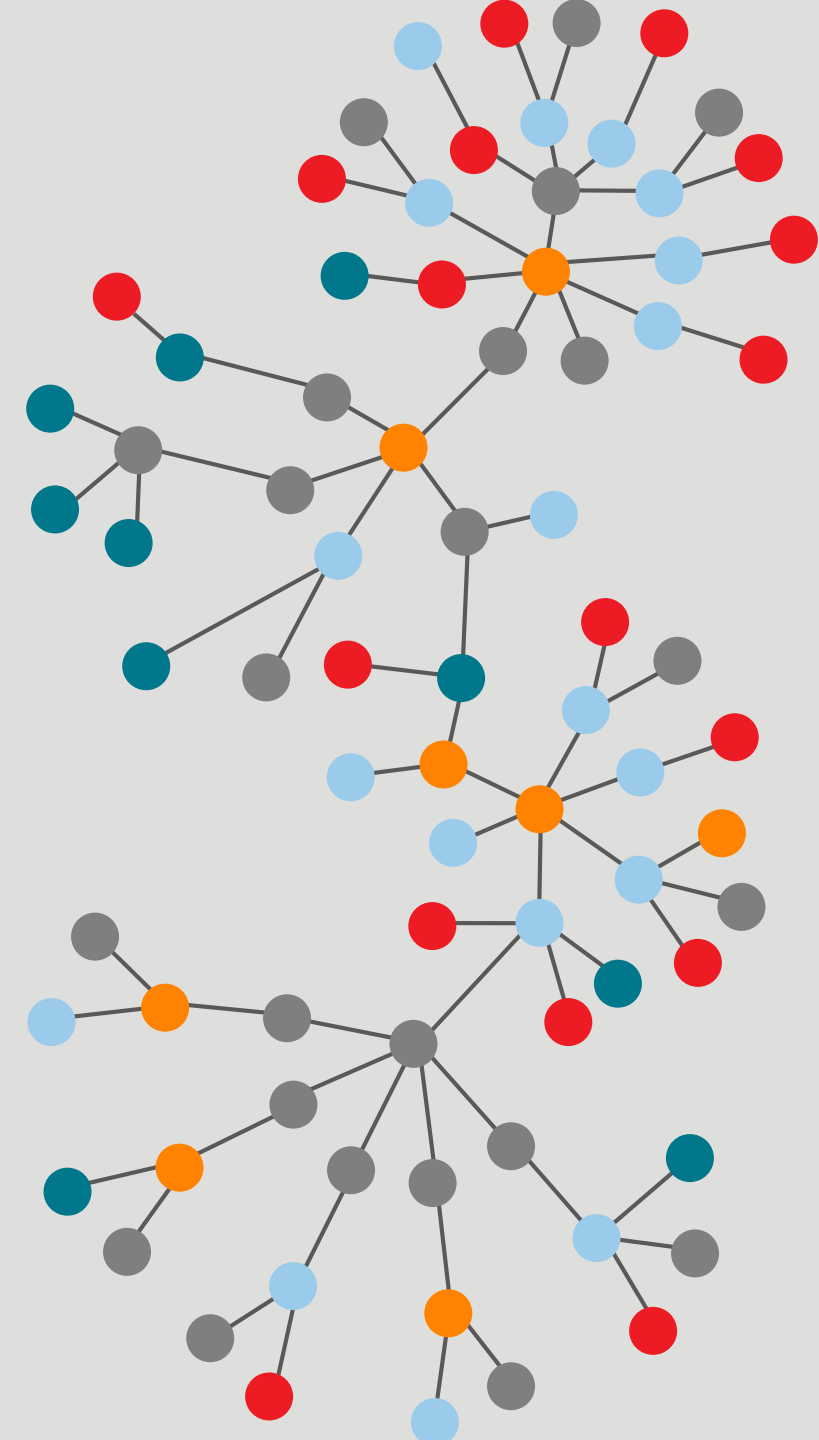
SQL on HPCC Systems

Rodrigo Pastrana
Software Architect
LexisNexis® Risk Solutions



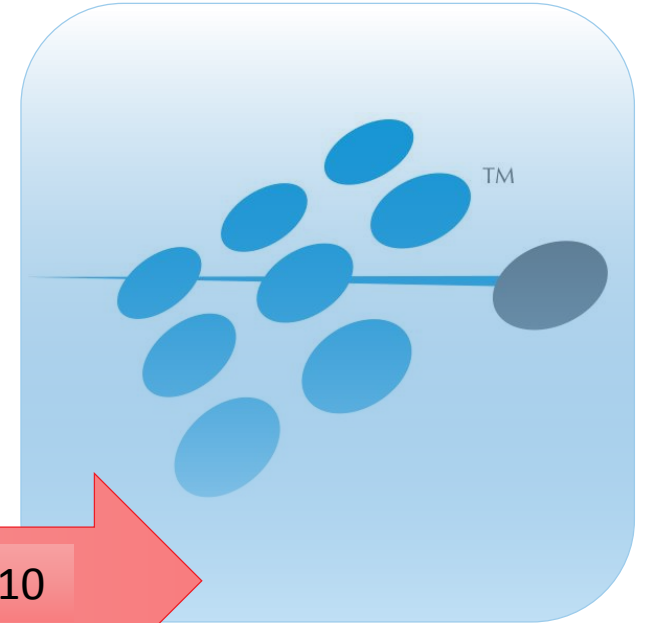
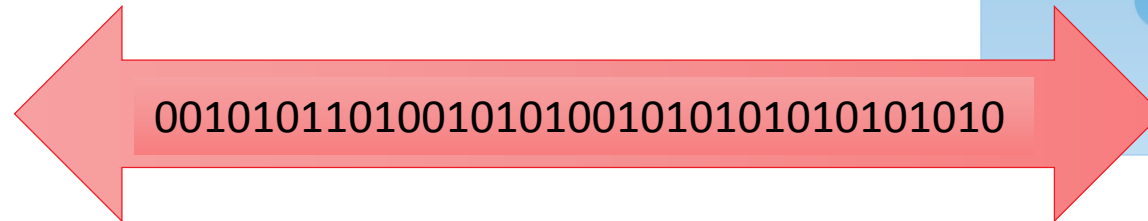
Quick poll: Do you (or your team)
possess SQL skills?

See poll on bottom of presentation screen



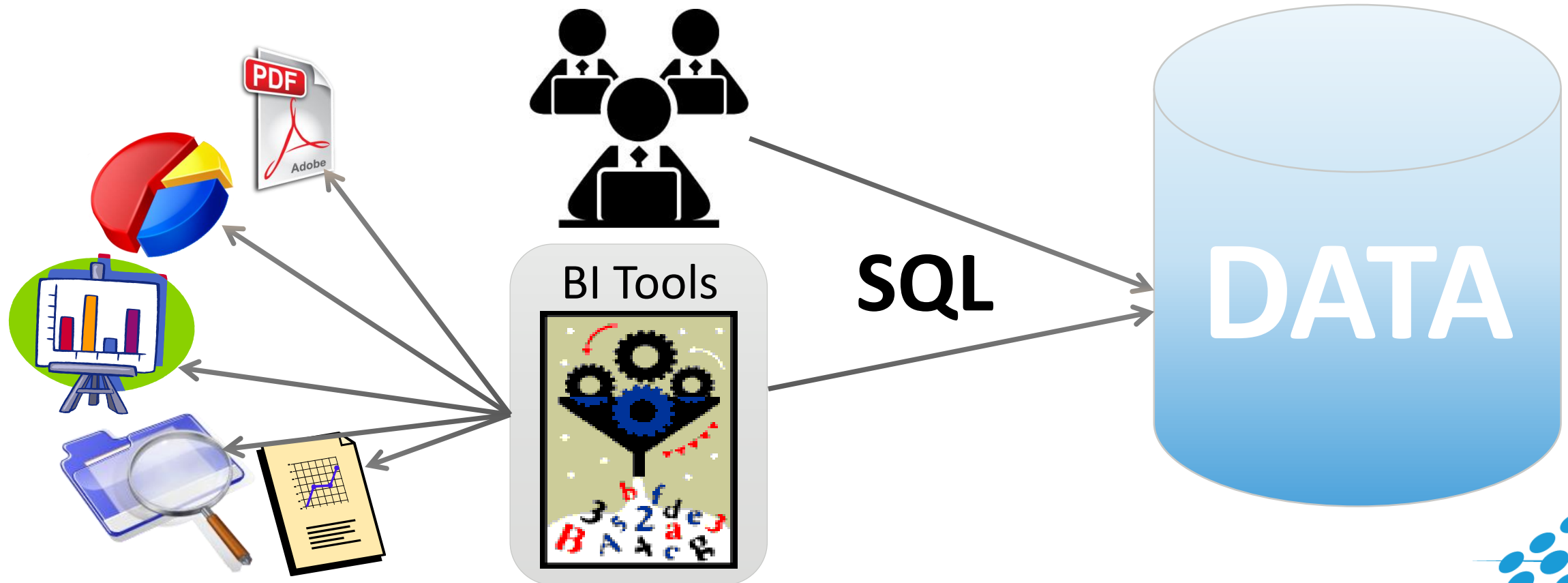
SQL on HPCC Systems via WsSQL and JDBC Driver

Select * from table;

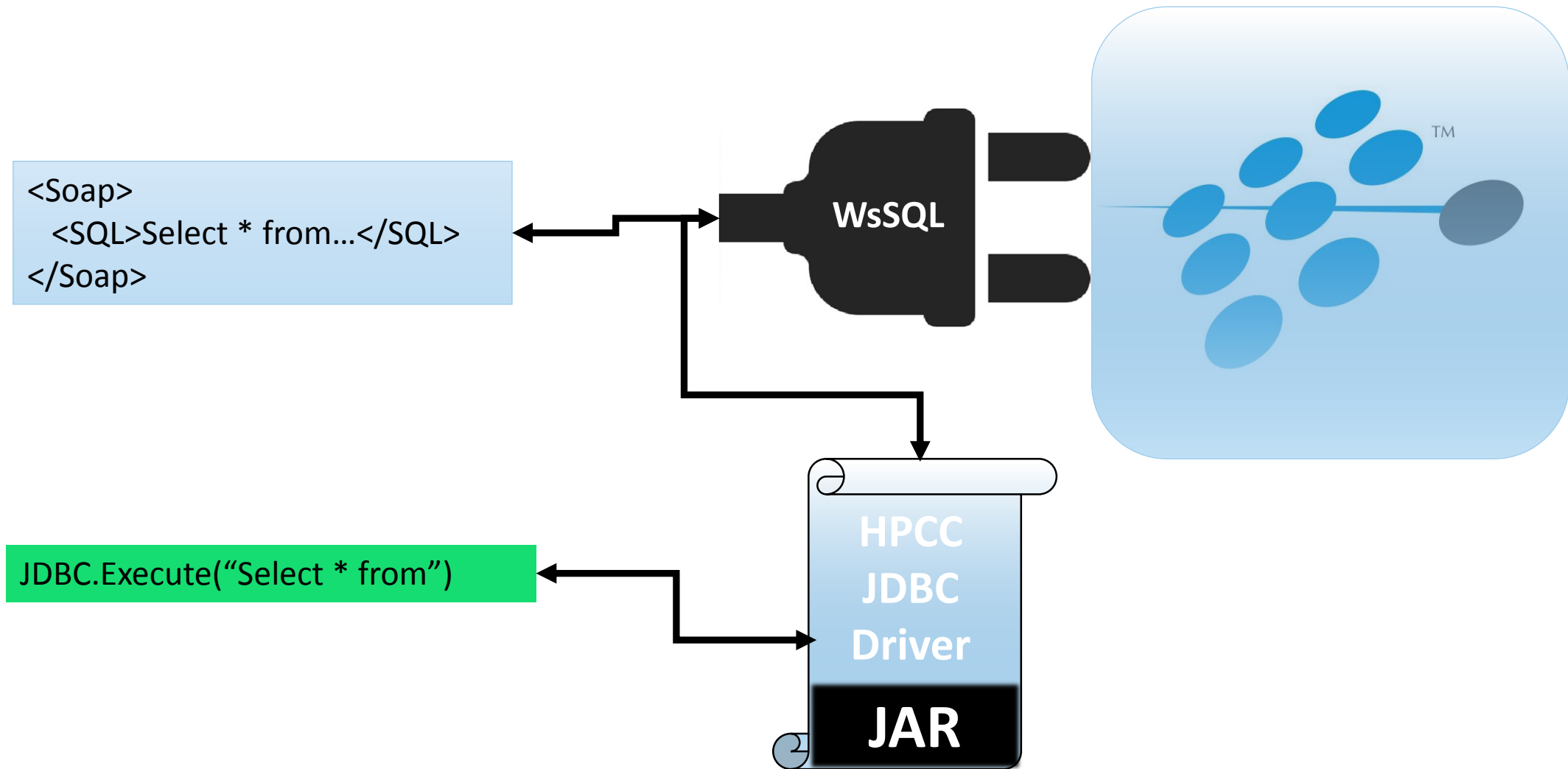


We have ECL, so why??

- Not as powerful as ECL, but has a long standing legacy, is widely used
- Many feature-rich data related tools are based on SQL
- Data sources almost expected to provide SQL interface



High-level overview



What can WsSQL do?

- Creates logical mapping of HPCC cluster to DB System
 - HPCC data files -> DB tables
 - HPCC published queries -> Stored Procedures
- Supports subset of SQL using MySQL-like syntax
 - SELECT
 - CREATE TABLE and LOAD DATA
 - CALL
 - PREPARE*
 - EXECUTE (PREPARED)*
- Provides support information
 - GetDBSystemInfo
 - GetDBMetaData
 - GetResults (ASYNCHRONOUS)
 - GetRelatedIndexes
- Supports programmatic and interactive interaction
 - Data owners can explore their data by directly issuing free hand SQL commands
 - Or indirectly via JDBC clients, BI tools, custom applications
- Translates SQL to ECL

Setup

- HPCC VM Image – No setup needed, WsSQL is pre-configured
 - Great for evaluation purposes
- Install WsSQL on Target HPCC
 - Install package available from **HPCCSystems.com** portal, or build from github source
 - Use YUM, DPKG, APT-GET, etc to install
- Configure WsSQL as an ESP web service
 - Automatic if new configuration file is generated
 - 2 step process to add to pre-existing configuration file
 - Create new ESP service of type ws_sql
 - Add new ESP Service binding based on newly created ws_sql ESP service
- JDBC Connection – if desired
 - Packaged as executable JAR file
 - Available from HPCCSystems.org, MAVEN repositories, and can be built from github source
 - Make JAR visible to your JDBC client (CLASSPATH)
 - Provide connection string/properties
 - “JDBC:HPCC;ServerAddress=10.0.0.1”

As seen from JDBC client

The screenshot shows a JDBC client window titled "4 - myLocalHPCC (hthor)". The interface is divided into three main sections: a left-hand tree view, a top toolbar, and a right-hand details pane.

Left-hand tree view: Shows a hierarchy of objects under "myLocalHPCC". The "TABLE" section is expanded, listing various tables such as "xdbc.sample", "certification::full_test_distributed", "lotto::winning::numbers::date", "progguide::exampledata::accounts", "tutorial::rp::originalperson", "tutorial::rp::peoplebyzipindex", "tutorial::rp::peoplebyzipindex2", "tutorial::rp::peoplebyzipindex3", "tutorial::rp::tutorialperson", and "tutorial::rp::tutorialperson2". The "PROCEDURE" section is also expanded, showing "myroxie::fetchpeoplebyzipservice".

Top toolbar: Contains various icons for database operations like connect, disconnect, refresh, and search.

Right-hand details pane: Displays metadata for the selected table. It has tabs for "Keys", "Imported Keys", "Indexes", "Privileges", "Column Privileges", "Row IDs", and "Versions". The "Content" tab is active, showing a table with two columns: "Property Name" and "Value".

Annotations:

- An orange box with the text "HPCC File Metadata is available" has an arrow pointing to the "Content" tab in the details pane.
- An orange box with the text "HPCC Data files listed as tables" has an arrow pointing to the "tutorial::rp::peoplebyzipindex" table in the left-hand tree view.
- An orange box with the text "HPCC published queries listed as stored procedures" has an arrow pointing to the "myroxie::fetchpeoplebyzipservice" procedure in the left-hand tree view.

Property Name	Value
catalogName	mythor
childTables	<null>
exportedKeys	<null>
importedKeys	<null>
qualifiedName	tutorial::rp::tutorialperson
remarks	XDBC:RelIndexes=[tutorial::rp::peoplebyzipindex,tutorial::rp::p...
schemaName	tutorial::rp::tutorialperson
simpleName	tutorial::rp::tutorialperson
type	TABLE

As seen from JDBC client

The screenshot shows a JDBC client window with a toolbar at the top. The 'SQL' tab is active, displaying a SQL query: `select state, city, zip, COUNT(zip) from tutorial::rp::tutorialperson where zip > '33440' and zip < '33449' or zip = '90210' group by zip`. An orange callout box labeled 'Freehand SQL input' points to this query. Below the query, the 'Results' tab is active, showing a table with columns 'Column' and 'Data'. The table has four rows: 'state' with values 'CA' and 'FL'; 'city' with values 'BEVERLY HILLS ...' and 'DEERFIELD BEACH - DELRAY BEACH'; 'zip' with values '33441 - 33448' and '90210'; and 'COUNT' with values '32' and '49 - 53'. An orange callout box labeled '“Overview” for Quick result analysis layout' points to the table. A mouse cursor is hovering over the 'DEERFIELD BEACH - DELRAY BEACH' cell, which has triggered a 'fly-over' tooltip. This tooltip, highlighted by an orange callout box labeled 'Result statistics displayed in “fly-over”', contains the following text: 'row count = 8; percentage = 88.8888888888889%', 'first value = DEERFIELD BEACH', 'last value = DELRAY BEACH', 'first index = 1; last index = 8', 'data interval =]BT88WUJI+3 (!.= , DELRAY BEACH]', and 'complete row count = 9'.

Freehand SQL input

“Overview” for Quick result analysis layout

Result statistics displayed in “fly-over”

Column	Data
state	CA FL
city	BEVERLY HILLS ... DEERFIELD BEACH - DELRAY BEACH
zip	33441 - 33448 90210
COUNT	32 37 - 39 49 - 53

row count = 8; percentage = 88.8888888888889%
first value = DEERFIELD BEACH
last value = DELRAY BEACH
first index = 1; last index = 8
data interval =]BT88WUJI+3 (!.= , DELRAY BEACH]
complete row count = 9

Querying HPCC data via JAVA

```
Properties info = new Properties();
```

```
try
```

```
{
```

```
    Driver hpccdriver = DriverManager.getDriver("jdbc:hpcc");
```

```
    HPCCConnection hpccconnection =
```

```
        (HPCCConnection) hpccdriver.connect("jdbc:hpcc;ServerAddress=192.168.1.1;", info);
```

```
    PreparedStatement prepstm = hpccconnection.prepareStatement("select * from myTable");
```

```
    ResultSet qrs = (( HPCCPreparedStatement) prepstm).executeQuery();
```

```
    ResultSetMetaData meta = qrs.getMetaData();
```

↑ Execute Query

↑ Create SQL

```
    while (qrs.next())
```

```
    {
```

```
        for (int i = 1; i <= meta.getColumnCount(); i++)
```

```
        {
```

```
            System.out.print("[ " + qrs.getObject(i) + " ]");
```

```
        }
```

```
        System.out.println();
```

```
    }
```

```
}
```

```
catch (Exception e) { System.out.println("Error"); }
```

← Instantiate Driver

← Connect

To HPCC

Manual walkthrough

1. Let's create an HPCC file and load it
2. Let's verify file is created, and view metadata
3. Perform various simple queries on that file
4. Create a prepared query
5. Execute prepared query
6. Fetch paged results

Create and load HPCC file – DEMO SLIDE

<SOAP>

```
CREATE TABLE created::personstable (  
  personid INT(3) UNSIGNED,  
  firstname VARCHAR(15),  
  lastname VARCHAR(25),  
  middleinitial VARCHAR(1),  
  gender VARCHAR(1),  
  street VARCHAR(42),  
  city VARCHAR(20),  
  state VARCHAR(2),  
  zip VARCHAR(5)  
);
```

```
LOAD DATA INFILE 'people' CONNECTION='10.0.2.15'  
DIRECTORY='/var/lib/HPCCSystems/mydropzone'  
INTO TABLE created::personstable;
```

</SOAP>



```
<Dataset name='WsSQLResult'>  
  <Row>  
    <Result>true</Result>  
  </Row>  
</Dataset>  
<Dataset name='WsSQLCount'>  
  <Row>  
    <ResultCount>1000000</ResultCount>  
  </Row>  
</Dataset>
```

Create and load HPCC file, let's verify. – DEMO SLIDE

<SOAP>

```
<GetDBMetaDataRequest>  
  <IncludeTables>1</IncludeTables>  
</GetDBMetaDataRequest>
```



```
<Tables>  
  <Table>  
    <Name>created::personstable</Name>  
    <Columns>  
      <Column>  
        <Name>personid</Name>  
        <Type>unsigned3</Type>  
      </Column>  
      <Column>  
        <Name>firstname</Name>  
        <Type>string15</Type>  
      </Column>  
      <Column>  
        <Name>state</Name>  
        <Type>string2</Type>  
      </Column>  
    </Columns>  
    <Format>FLAT</Format>  
  </Table>  
</Tables>
```

</SOAP>

Simple select queries. – DEMO SLIDE

<SOAP>



```
<ExecuteSQLRequest>  
  <SqlText>select * from created::personstable;</SqlText>  
  <TargetCluster>thor</TargetCluster>  
</ExecuteSQLRequest>
```

```
<ExecuteSQLResponse>  
  <ParentWuld/>  
  <Result>  
    <Dataset name='WsSQLResult'>  
      <Row>  
        <personid>1</personid><firstname>TIMTOHY  
        </firstname><lastname>BIALES  
        </lastname><middleinitial>T</middleinitial><gender>  
        M</gender><street>524 BEATTIE RD  
        </street><city>BIRCH RUN  
        </city><state>MI</state><zip>48415</zip></Row>  
      <Row><personid>2</personid><firstname>TIMTOHY  
        </firstname><lastname>COOLING  
        </lastname>  
      </Row>  
    </Dataset>  
  </Result>  
</ExecuteSQLResponse>
```

</SOAP>

Simple select queries. – DEMO SLIDE

<SOAP>

```
<ExecuteSQLRequest>  
  <SqlText>  
select city FROM created::personstable  
where state = 'FL' group by city;  
</SqlText>  
<TargetCluster>thor</TargetCluster>  
</ExecuteSQLRequest>
```



```
<ExecuteSQLResponse>  
  <ParentWuld/>  
  <Result>  
    <Dataset name='WsSQLResult'>  
      <Row>  
<personid>1</personid><firstname>TIMTOHY  
</firstname><lastname>BIALES  
</lastname><middleinitial>T</middleinitial><gender>  
M</gender><street>524 BEATTIE RD  
</street><city>BIRCH RUN  
</city><state>MI</state><zip>48415</zip></Row>  
      <Row><personid>2</personid><firstname>TIMTOHY  
</firstname><lastname>COOLING  
</lastname>  
      </Row>  
    </Dataset>  
  </Result>  
</ExecuteSQLResponse>
```

</SOAP>

Simple select queries. – DEMO SLIDE

wssql

CreateTableAndLoad

Echo

ExecutePreparedSQL

ExecuteSQL

GetDBMetaData

GetDBSystemInfo

GetRelatedIndexes

GetResults

PrepareSQL

SetRelatedIndexes

SOAP Test

wssql / ExecuteSQL

Destination: ExecuteSQL?ver_=3.05

Request:

Response:

Remove Empty

Remove Zeros

✓

```
<?xml version="1.0" encoding="utf-8"?>
<soap:Envelope xmlns:soap="http://schemas.xmlsoap.org/soap/envelope/" xmlns:SOAP-ENC="http://schemas.xmlsoap.org/soap/encoding/" xmlns:urn:hpccsystems:ws:wssql">
  <soap:Body>
    <ExecuteSQLRequest>
      <SqlText>select city FROM created::personstable where state = 'FL' group by city</SqlText>
      <UserName/>
      <TargetCluster>thor</TargetCluster>
      <SuppressXmlSchema>1</SuppressXmlSchema>
    </ExecuteSQLRequest>
  </soap:Body>
</soap:Envelope>
```

```
<?xml version="1.0" encoding="utf-8"?>
<soap:Envelope xmlns:xsi="http://www.w3.org/2001/XMLSchema-instance" xmlns:xsd="http://www.w3.org/2001/XMLSchema" xmlns:soap="http://schemas.xmlsoap.org/soap/envelope/" xmlns:wsse="http://schemas.xmlsoap.org/ws/2002/04/secext">
  <soap:Body>
    <ExecuteSQLResponse xmlns="urn:hpccsystems:ws:wssql">
      <ParentWuid>W20170518-164646</ParentWuid>
      <Result>&lt;Dataset name='WsSQLResult'&gt;
        &lt;Row&gt;&lt;city&gt;ALACHUA&lt;/city&gt;&lt;/Row&gt;
        &lt;Row&gt;&lt;city&gt;ALFORD&lt;/city&gt;&lt;/Row&gt;
        &lt;Row&gt;&lt;city&gt;ALTAMONTE SPRING&lt;/city&gt;&lt;/Row&gt;
        &lt;Row&gt;&lt;city&gt;APALACHICOLA&lt;/city&gt;&lt;/Row&gt;
        &lt;Row&gt;&lt;city&gt;APOLLO BEACH&lt;/city&gt;&lt;/Row&gt;
        &lt;Row&gt;&lt;city&gt;APOPKA&lt;/city&gt;&lt;/Row&gt;
        &lt;Row&gt;&lt;city&gt;ARCHER&lt;/city&gt;&lt;/Row&gt;
        &lt;Row&gt;&lt;city&gt;AVON PARK&lt;/city&gt;&lt;/Row&gt;
        &lt;Row&gt;&lt;city&gt;BABSON PARK&lt;/city&gt;&lt;/Row&gt;
        &lt;Row&gt;&lt;city&gt;BAKER&lt;/city&gt;&lt;/Row&gt;
        &lt;Row&gt;&lt;city&gt;BARTOW&lt;/city&gt;&lt;/Row&gt;
        &lt;Row&gt;&lt;city&gt;BASCOM&lt;/city&gt;&lt;/Row&gt;
        &lt;Row&gt;&lt;city&gt;BAY PINES&lt;/city&gt;&lt;/Row&gt;
        &lt;Row&gt;&lt;city&gt;BELLE GLADE&lt;/city&gt;&lt;/Row&gt;
        &lt;Row&gt;&lt;city&gt;BELLEAIR&lt;/city&gt;&lt;/Row&gt;
        &lt;Row&gt;&lt;city&gt;BELLEAIR BEACH&lt;/city&gt;&lt;/Row&gt;
        &lt;Row&gt;&lt;city&gt;BELLEVUE&lt;/city&gt;&lt;/Row&gt;
        &lt;Row&gt;&lt;city&gt;BIG PINE KEY&lt;/city&gt;&lt;/Row&gt;
        &lt;Row&gt;&lt;city&gt;BOCA GRANDE&lt;/city&gt;&lt;/Row&gt;
        &lt;Row&gt;&lt;city&gt;BOCA RATON&lt;/city&gt;&lt;/Row&gt;
        &lt;Row&gt;&lt;city&gt;BONIFAY&lt;/city&gt;&lt;/Row&gt;
        &lt;Row&gt;&lt;city&gt;BONITA SPRINGS&lt;/city&gt;&lt;/Row&gt;
        &lt;Row&gt;&lt;city&gt;BOYNTON BEACH&lt;/city&gt;&lt;/Row&gt;
```

Create prepared query. – DEMO SLIDE

Request:

```
<?xml version="1.0" encoding="utf-8"?>
<soap:Envelope xmlns:soap="http://schemas.xmlsoap.org/soap/envelope/" xmlns:SOAP-
ENC="http://schemas.xmlsoap.org/soap/encoding/" xmlns="urn:hpccsystems.ws:wsql">
  <soap:Body>
    <PrepareSQLRequest>
      <SqlText>select city FROM created::personstable where state = ? group by city</SqlText>
      <TargetCluster>author</TargetCluster>
    </PrepareSQLRequest>
  </soap:Body>
</soap:Envelope>
```

Response:

```
<?xml version="1.0" encoding="utf-8"?>  
<soap:Envelope xmlns:xsi="http://www.w3.org/2001/XMLSchema-instance" xmlns:xsd="http://www.w3.org/  
/2001/XMLSchema" xmlns:soap="http://schemas.xmlsoap.org/soap/envelope/"  
xmlns:wssse="http://schemas.xmlsoap.org/ws/2002/04/seccxt">  
  <soap:Body>  
    <PrepareSQLResponse xmlns="urn:hpcsystems:ws:wssql">  
      <Workunit>  
        <Wuid>W20170518-175725</Wuid>  
        <Owner/>  
        <Cluster>Thor</Cluster>  
        <Jobname/>  
        <StateID>1</StateID>  
        <State>compiled</State>  
        <Protected>0</Protected>  
        <Snapshot/>  
        <IsPausing>0</IsPausing>  
        <ThorLCR>0</ThorLCR>  
        <EventSchedule>0</EventSchedule>  
        <Query/>  
        <ErrorCount>0</ErrorCount>  
        <WarningCount>0</WarningCount>  
        <InfoCount>0</InfoCount>  
        <AlertCount>0</AlertCount>  
      </Workunit>  
      <Results>&lt;XmlSchema name=&quot;WsSQLResultSchema&quot;&gt;&lt;x:schema xmlns:xs=&  
quot:http://www.w3.org/2001/XMLSchema&quot; xmlns:hpscc=&quot;urn:hpcsystems:xsd:appinfo&quot;  
elementFormDefault=&quot;qualified&quot; attributeFormDefault=&quot;unqualified&quot;&gt;&lt;  
&lt;x:s:element name=&quot;Dataset&quot;&gt;&lt;x:complexType&gt;&lt;x:sequence minOccurs=&  
quot;0&quot; maxOccurs=&quot;unbounded&quot;&gt;&lt;  
&lt;x:s:element name=&quot;Row&quot;&gt;&lt;x:complexType&gt;&lt;x:sequence&gt;  
&lt;x:s:element name=&quot;city&quot; type=&quot;string20&quot;/&gt;&lt;  
&lt;/x:s:sequence&gt;&lt;x:s:complexType&gt;&lt;x:s:element&gt;  
&lt;/x:s:sequence&gt;&lt;x:s:complexType&gt;&lt;x:s:element&gt;  
&lt;x:s:simpleType name=&quot;string20&quot;&gt;&lt;x:s:restriction base=&quot;x:string&quot;  
xs:maxLength value=&quot;20&quot;/&gt;&lt;/x:s:restriction&gt;&lt;x:s:simpleType&gt;  
&lt;/x:s:schema&gt;&lt;/Xm
```

Execute that prepared query – DEMO SLIDE

```
<?xml version="1.0" encoding="utf-8"?>
<soap:Envelope xmlns:soap="http://schemas.xmlsoap.org/soap/envelope/" xmlns:SOAP-ENC="http://schemas.xmlsoap.org/soap/encoding/" xmlns="urn:hpccsystems:ws:wssql">
  <soap:Body>
    <ExecutePreparedSQLRequest>
      <Wuid>W20170518-175725</Wuid>
      <SuppressResults>1</SuppressResults>
      <Variables>
        <NamedValue>
          <Name>state</Name>
          <Value>WY</Value>
        </NamedValue>
      </Variables>
    </ExecutePreparedSQLRequest>
  </soap:Body>
</soap:Envelope>
```

```
<?xml version="1.0" encoding="utf-8"?>
<soap:Envelope xmlns:xsi="http://www.w3.org/2001/XMLSchema-instance" xmlns:xsd="/2001/XMLSchema" xmlns:soap="http://schemas.xmlsoap.org/soap/envelope/" xmlns:wssse="http://schemas.xmlsoap.org/ws/2002/04/secext">
  <soap:Body>
    <ExecutePreparedSQLResponse xmlns="urn:hpccsystems:ws:wssql">
      <ParentWuid>W20170518-175725</ParentWuid>
      <Result/>
      <ResultWindowStart>0</ResultWindowStart>
      <ResultWindowCount>0</ResultWindowCount>
      <Workunit>
        <Wuid>W20170518-180154</Wuid>
        <Owner/>
        <Cluster>thor</Cluster>
        <Jobname/>
        <StateID>3</StateID>
        <State>completed</State>
        <Protected>0</Protected>
        <Snapshot/>
        <IsPausing>0</IsPausing>
        <ThorLCR>0</ThorLCR>
        <EventSchedule>0</EventSchedule>
        <TotalClusterTime>0.825</TotalClusterTime>
      </Workunit>
      <Query/>
      <Variables>
        <ECLResult>
          <Name>param1</Name>
        </ECLResult>
      </Variables>
    </ExecutePreparedSQLResponse>
  </soap:Body>
</soap:Envelope>
```

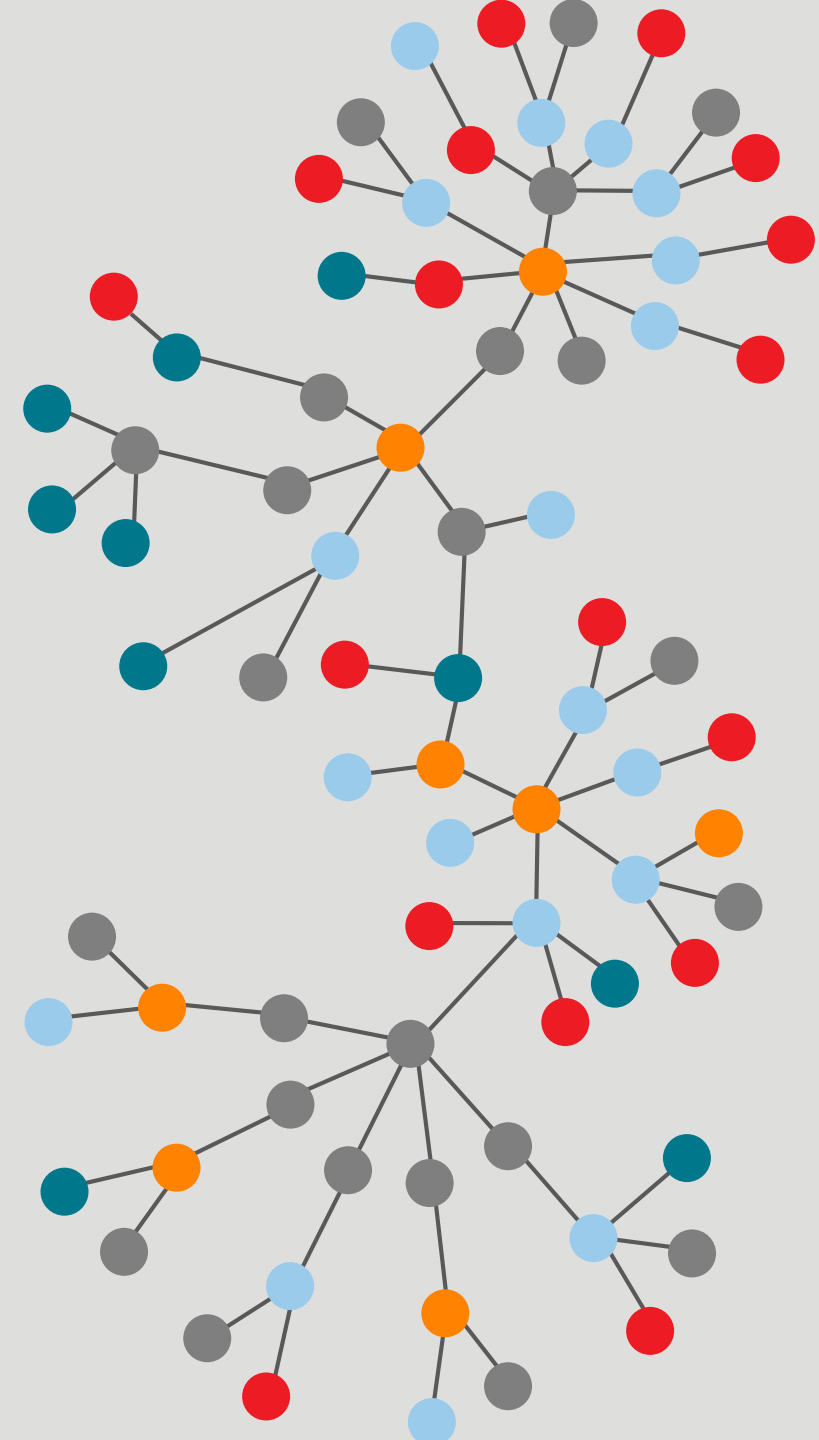
Fetch your results in pages, or bulk – DEMO SLIDE

```
<?xml version="1.0" encoding="utf-8"?>
<soap:Envelope xmlns:soap="http://schemas.xmlsoap.org/soap/envelope/" xmlns:SOAP-ENC="http://schemas.xmlsoap.org/soap/encoding/" xmlns:urn:hpcsystems:ws:wssql">
  <soap:Body>
    <GetResultsRequest>
      <Wuid>W20170518-180154</Wuid>
      <SuppressXmlSchema>1</SuppressXmlSchema>
      <ResultWindowStart>5</ResultWindowStart>
      <ResultWindowCount>10</ResultWindowCount>
    </GetResultsRequest>
  </soap:Body>
</soap:Envelope>
```

```
<?xml version="1.0" encoding="utf-8"?>
<soap:Envelope xmlns:xsi="http://www.w3.org/2001/XMLSchema-instance" xmlns:xsd="http://www.w3.org/2001/XMLSchema" xmlns:soap="http://schemas.xmlsoap.org/soap/envelope/" xmlns:wssse="http://schemas.xmlsoap.org/ws/2002/04/secext">
  <soap:Body>
    <GetResultsResponse xmlns="urn:hpcsystems:ws:wssql">
      <Result>&lt;Dataset name='WsSQLResult'&gt;
        &lt;Row&gt;&lt;city&gt;CORA&lt;/city&gt;&lt;/Row&gt;
        &lt;Row&gt;&lt;city&gt;FE WARREN AFB&lt;/city&gt;&lt;/Row&gt;
        &lt;Row&gt;&lt;city&gt;FORT LARAMIE&lt;/city&gt;&lt;/Row&gt;
        &lt;Row&gt;&lt;city&gt;GREEN RIVER&lt;/city&gt;&lt;/Row&gt;
        &lt;Row&gt;&lt;city&gt;KEMMERER&lt;/city&gt;&lt;/Row&gt;
        &lt;Row&gt;&lt;city&gt;LANDER&lt;/city&gt;&lt;/Row&gt;
        &lt;Row&gt;&lt;city&gt;LARAMIE&lt;/city&gt;&lt;/Row&gt;
        &lt;Row&gt;&lt;city&gt;LOVELL&lt;/city&gt;&lt;/Row&gt;
        &lt;Row&gt;&lt;city&gt;LUSK&lt;/city&gt;&lt;/Row&gt;
        &lt;Row&gt;&lt;city&gt;MILLS&lt;/city&gt;&lt;/Row&gt;
        &lt;/Dataset&gt;
      </Result>
      <ResultWindowStart>5</ResultWindowStart>
      <ResultWindowCount>10</ResultWindowCount>
      <Workunit>
        <Wuid>W20170518-180154</Wuid>
        <Owner/>
        <Cluster>thor</Cluster>
        <Jobname/>
        <StatID>2</StatID>
      </Workunit>
    </GetResultsResponse>
  </soap:Body>
</soap:Envelope>
```

Quick poll: Have you used Business Intelligence tools (such as Pentaho, BIRT, etc) to analyze data or generate reports and visualizations?

See poll on bottom of presentation screen



Questions?

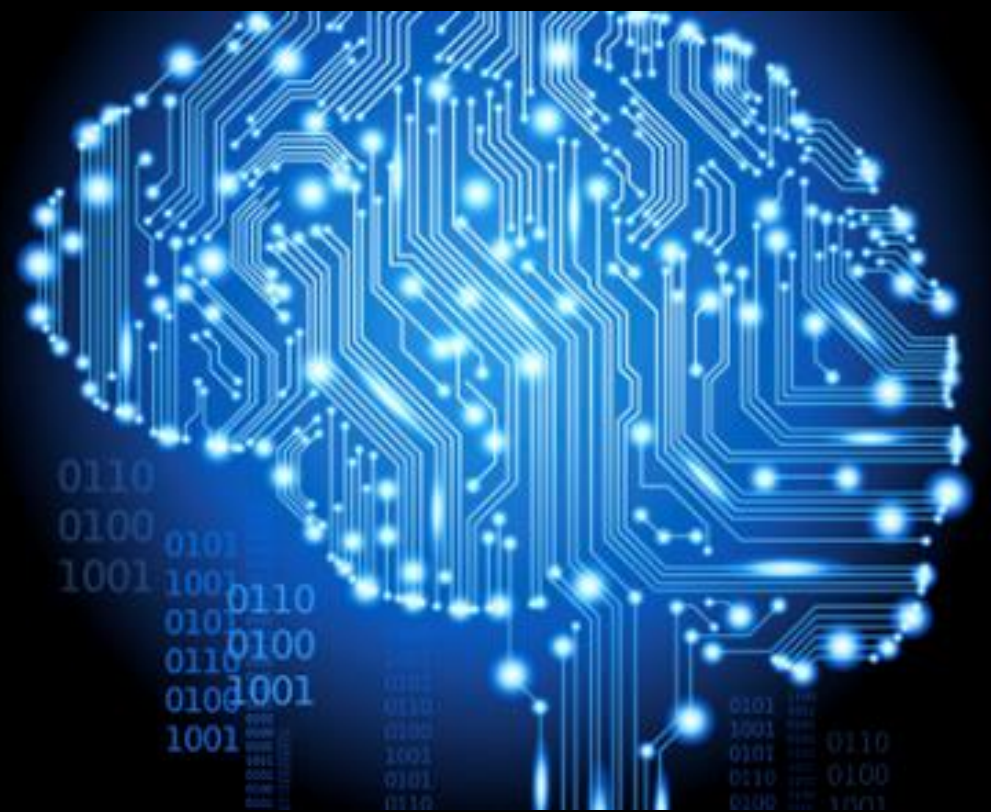


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Software Architect

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Bob Foreman
Senior Software Engineer
LexisNexis Risk Solutions

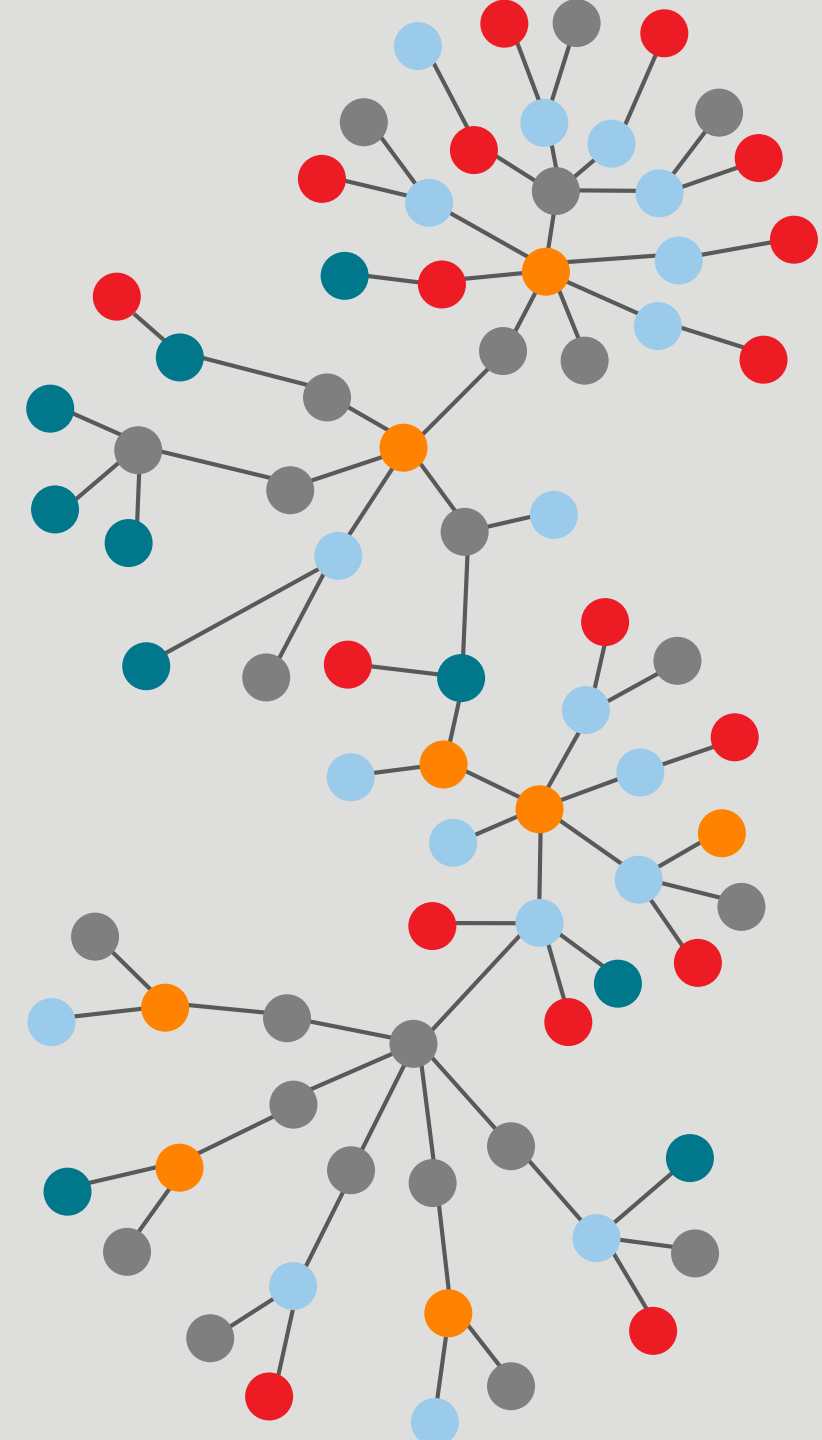


ECL Tip of the Month



Quick poll: Are you actively using the HPCC Systems Support Forums for issues, tips, or announcements?

See poll on bottom of presentation screen



Tip of the Month – Comes from our HPCC Systems Support Forum

A May two-for-one special!

1. The secret Date/Time Functions of the Standard Library Reference



2. Fear no STRING – how to read and parse just about anything.

Code examples:

BWR_StringToDate
BWR_StringToDateTime
BWR_StringReplaceV1
BWR_StringReplaceV2
BWR_StringReplaceParse

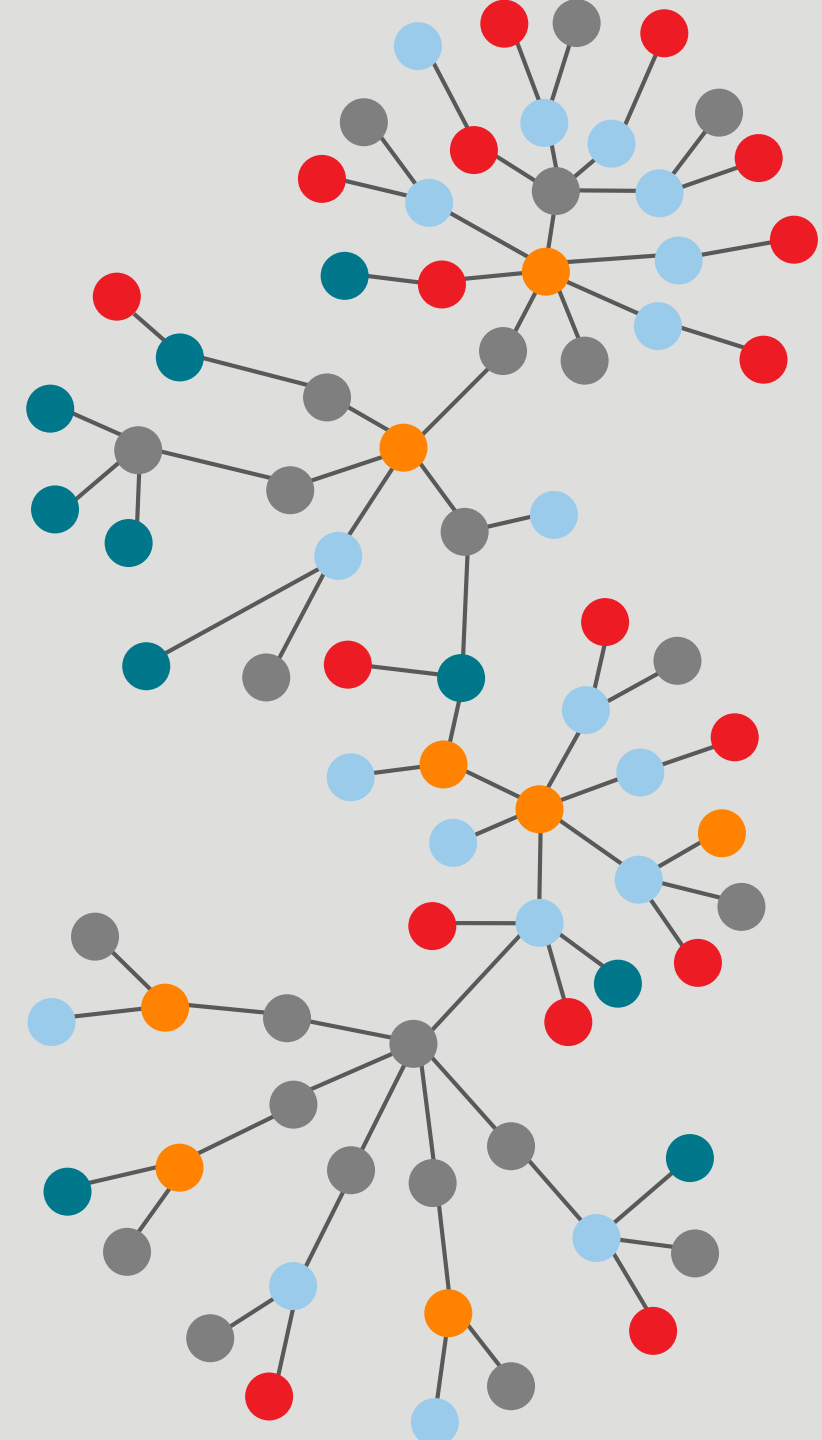


Download them here:

<https://hpccsystems.com/techtalk5-ecl>

Quick poll: Will you be needing
classroom or remote ECL training
within the next 6 months?

See poll on bottom of presentation screen



Questions?



Bob Foreman

Senior Software Engineer

LexisNexis Risk Solutions

Robert.Foreman@lexisnexisrisk.com

Submit a talk for an upcoming episode!

- Have a new success story to share?
- Want to pitch a new use case?
- Have a new HPCC Systems application you want to demo?
- Want to share some helpful ECL tips and sample code?
- Have a new suggestion for the roadmap?
- Be a featured speaker for an upcoming episode! Email your idea to Techtalks@hpccsystems.com

The Tech Talk Series will return late Summer. Stay tuned for details!

Visit The Download Tech Talks wiki for more information:

<https://wiki.hpccsystems.com/display/hpcc/HPCC+Systems+Tech+Talks>

Thank You!



 **RELX** Group

A copy of this presentation will be made available soon on our blog:
hpccsystems.com/blog