

HPCC Systems ECL Builder

Narasimha Murthy G



 **#HPCCSummit**

October 12th , 2016



#HPCCSummit

ECL BUILDER



ECL BUILDER - PURPOSE

“ As **HPCC Systems continues to evolve** with significant new features, we simultaneously want to simplify the access to data so that **users can fetch data** as quickly and easily as possible **with a Very Simple and Intuitive User Interface.**”

“User needn't be a Developer or a Person with ECL Knowledge, they can be anyone (Business Analyst etc.) who need quick access to the Data”

“Provide flexibility to the User to fetch data from any Client or Touch Device from anywhere without any Limitations or Pre-Requisites”

Agenda


- Purpose
- ECL Builder - Features
- Web Technology used in ECL Builder
- Demo
- Practical use of ECL Builder
- Future enhancements
- Q&A

Current Challenges

- Users like Business Analysts(human analysts) need ECL knowledge or assistance from developers to query data and generate reports
- Non-availability of GUI based ECL clients which can construct complex/moderately complex queries and retrieve data
- Lack of provisions for ECL developers to quickly generate repetitive boiler plate code

ECL BUILDER - FEATURES

ECL Builder – Online Playground



Online playground for HPCC Systems built on web technologies with convenient and Intuitive User Interface.

ECL Builder – Connect to different Clusters

The screenshot shows a web browser window with the URL `172.23.42.36:8080/ECLBuilder/eclBuilder/home.zul`. The page title is "ECL Builder". In the top right corner, there are links for "Preferences", "SignOut", and "About". The main content area is titled "BROWSE BUILDERS" and contains a "+ New ECL Builder" button. A "Cluster Configuration" dialog box is open, displaying the following fields:

| Cluster Configuration | |
|---|---|
| IP | <input type="text" value="10.173.147.1"/> |
| Port | <input type="text" value="8010"/> |
| UserName | <input type="text"/> |
| Password | <input type="password"/> |
| Is SSL to be enabled? | <input type="radio"/> true <input checked="" type="radio"/> false |
| <input type="button" value="Cancel"/> <input type="button" value="Continue"/> | |

ECL Builder – Create New Builder

The screenshot displays the ECL Builder web application interface. The browser address bar shows the URL `172.23.42.36:8080/ECLBuilder/eclBuilder/home.zul`. The application header includes the title "ECL Builder" and navigation links for "Preferences", "SignOut", and "About". Below the header, the "BROWSE BUILDERS" section shows the selected builder "Act2016_WU1".

The main interface is divided into two panels. The left panel, titled "Datasets", shows a tree structure of datasets under the "aact201503" folder. The "fixed" folder is expanded, showing sub-datasets like "arm_groups", "authorities", "central_contacts", "conditions", "designs", and "facilities". The "facilities" dataset is selected, and its fields are listed below: "zip (string)", "country (string)", "nct_id (string)", "city (string)", "facility_id (string)", "state (string)", "facility_name (string)", and "status (string)".

The right panel is a code editor showing ECL code for the selected dataset. The code defines a record type "facilitiesrecName" and a dataset "facilities" using the "DATASET" function. It then creates a table "tablefacilities" from the "facilities" dataset, sorts it by "NCT_ID", and outputs the results to "facilities_SortedRecs".

```
1 facilitiesrecName :=RECORD
2   string facility_id;
3   string nct_id;
4   string status;
5   string facility_name;
6   string city;
7   string state;
8   string zip;
9   string country;
10 END;
11 facilities := DATASET('~aact201503::fixed::facilities', facilitiesrecName, THOR);
12
13
14 tablefacilities := TABLE(facilities,{facilities.country,facilities.nct_id,facilities.city,facilities.facility_id,facilities.state,facilities.facility_name,facilities.status});
15
16 OUTPUT(tablefacilities, NAMED('tablefacilities_Data'));
17
18 facilities_SortedRecs := SORT(facilities,NCT_ID);
19
20 OUTPUT(facilities_SortedRecs , NAMED('facilities_SortedRecs'));
```

At the bottom of the interface, there are tabs for "ECL Builder", "Outputs", and "Builder History".

ECL Builder – Persist ECL code as Projects

172.23.26.9:8080/ECLBuilder




















































172.23.26.9:8080/ECLBuilder/eclBuilder/home.zul

ECL Builder

Preferences SignOut About

BROWSE BUILDERS

+ New ECL Builder

| Name | Modified date | Actions |
|---------------------|-----------------------|---|
| Arjunas Builder | 10/03/2016 12:41:59:0 |    |
| dedupBuilder | 10/05/2016 11:06:23:0 |    |
| DemoBuilder | 10/03/2016 12:36:07:0 |    |
| DevDashboardBuilder | 09/29/2016 15:28:30:0 |    |
| FourWayBuilder1 | 10/03/2016 09:47:59:0 |    |
| narasimha1 | 10/03/2016 12:31:07:0 |    |
| NewDemoBuilder | 09/29/2016 15:20:33:0 |    |
| Raja2Builder | 09/28/2016 23:18:06:0 |    |
| RajaBuilder | 10/03/2016 13:09:06:0 |    |
| SalesData | 10/05/2016 13:48:20:0 |    |
| SalesDataPivot | 10/04/2016 16:58:29:0 |    |
| SalesPivot | 10/03/2016 15:35:49:0 |    |
| TempBuilderForTest | 09/30/2016 10:41:47:0 |    |
| TempNew | 09/28/2016 21:52:04:0 |    |
| TestAWSBuilder | 09/28/2016 21:24:22:0 |    |
| TestDemo | 09/29/2016 12:08:04:0 |    |
| TestTest1 | 10/03/2016 03:16:15:0 |    |

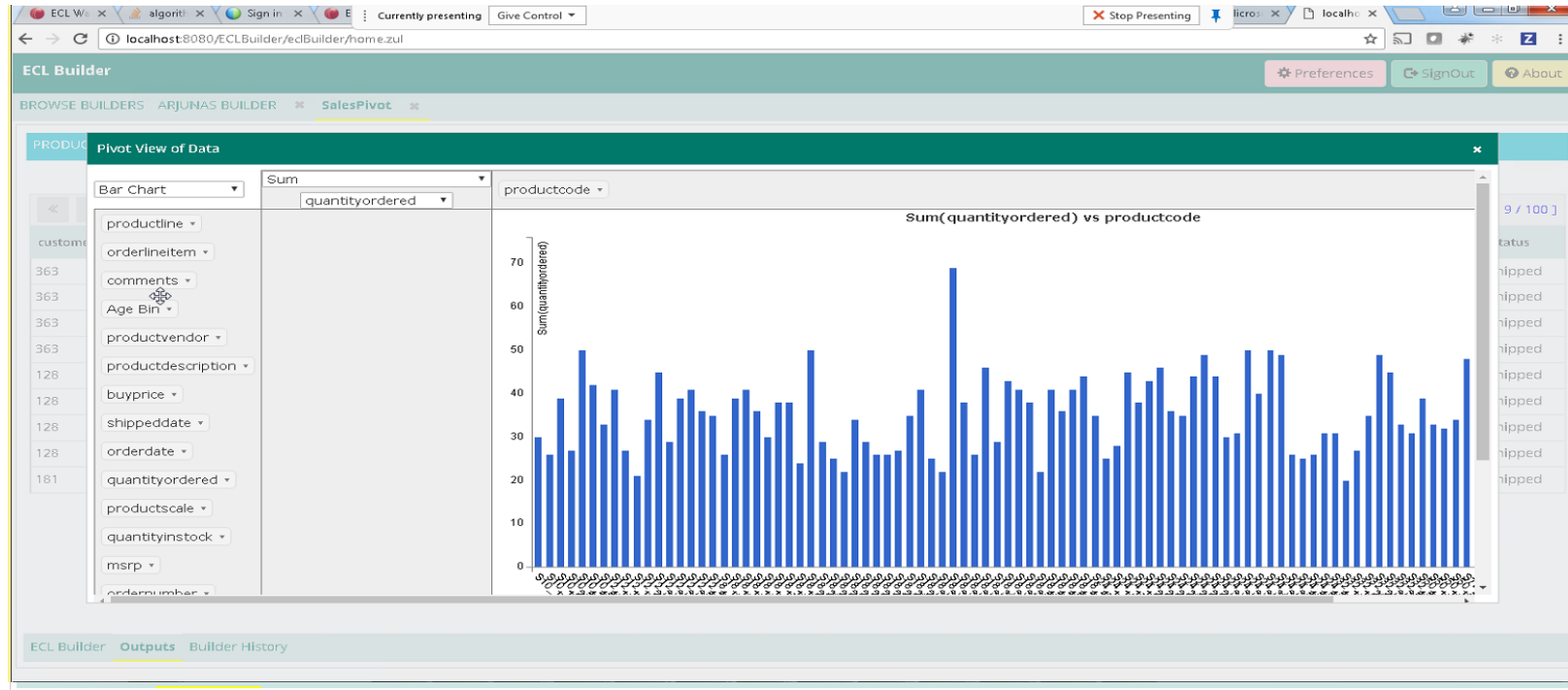
ECL Builder – Editor

The screenshot shows the ECL Builder Editor interface. The top bar includes navigation buttons like 'Import', 'Actions', and 'Run'. The left sidebar displays a project tree for 'SalesPivot'. The central pane shows ECL code for processing 'products' and 'orders' datasets. The right sidebar contains an 'Actions' menu with options like JOIN, SORT, DEDUP, DISTRIBUTE, and SAMPLING.

```

11 string msrc;
12 END;
13 products := DATASET('-birt::products', productsrecName, THOR);
14 OUTPUT(products, NAMED('products_Data'));
15
16
17 output_recName := RECORD
18   integer2 ordernumber;
19   string productcode;
20   integer8 quantityordered;
21   decimal10_3 priceeach;
22   integer1 orderlineitem;
23 END;
24 output_ := DATASET('-birt::orderdetails::output_1', output_recName, THOR);
25 OUTPUT(output_, NAMED('output_Data'));
26
27
28 ordersrecName := RECORD
29   integer2 ordernumber;
30   string orderdate;
31   string requireddate;
32   string shippeddate;
33   string status;
34   string comments;
35   integer2 customernumber;
36 END;
37 orders := DATASET('-birt::orders', ordersrecName, THOR);
38 OUTPUT(orders, NAMED('orders_Data'));
39
40
41 productorder := Join(products, output_, left.productcode = right.productcode, INNER);
42 OUTPUT(productorder, NAMED('productorder'));
43 prodOrderDtIs := Join(orders, productorder, left.ordernumber = right.ordernumber, INNER);
44 OUTPUT(prodOrderDtIs, NAMED('prodOrderDtIs'));
  
```

ECL Builder – Output



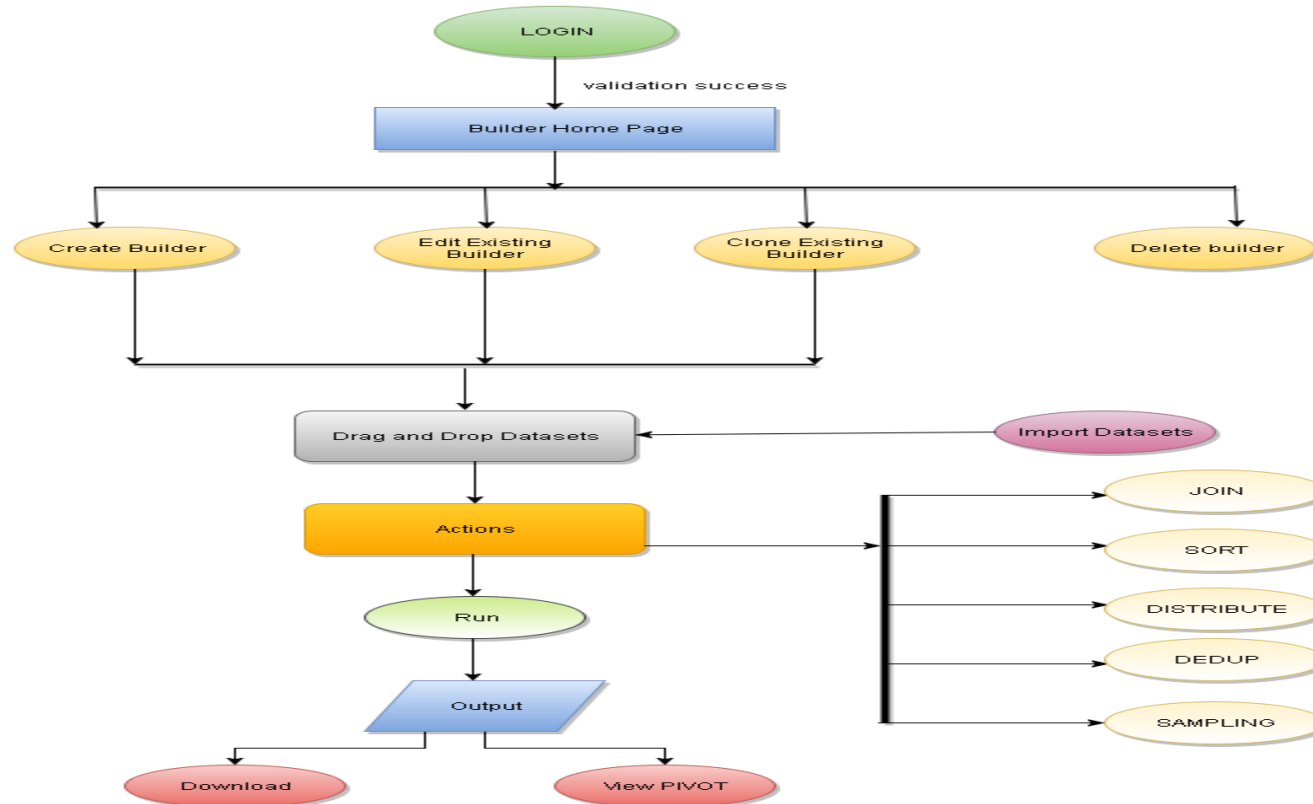
ECL Builder – Features Summary

- Online playground for HPCC Systems built on web technologies
- Provides a convenient and Intuitive Interface
- Preference setting to connect to any cluster
- Upload files into the landing zone and spray them
- Create new Builders/Projects, Clone Existing and Delete
- Provides the ability to segregate and persist ECL code as separate projects
- Easily browse and select logical files
- Clear [iconic] overview of the Names & types of the attributes of the datasets available under the logical Files of the Cluster

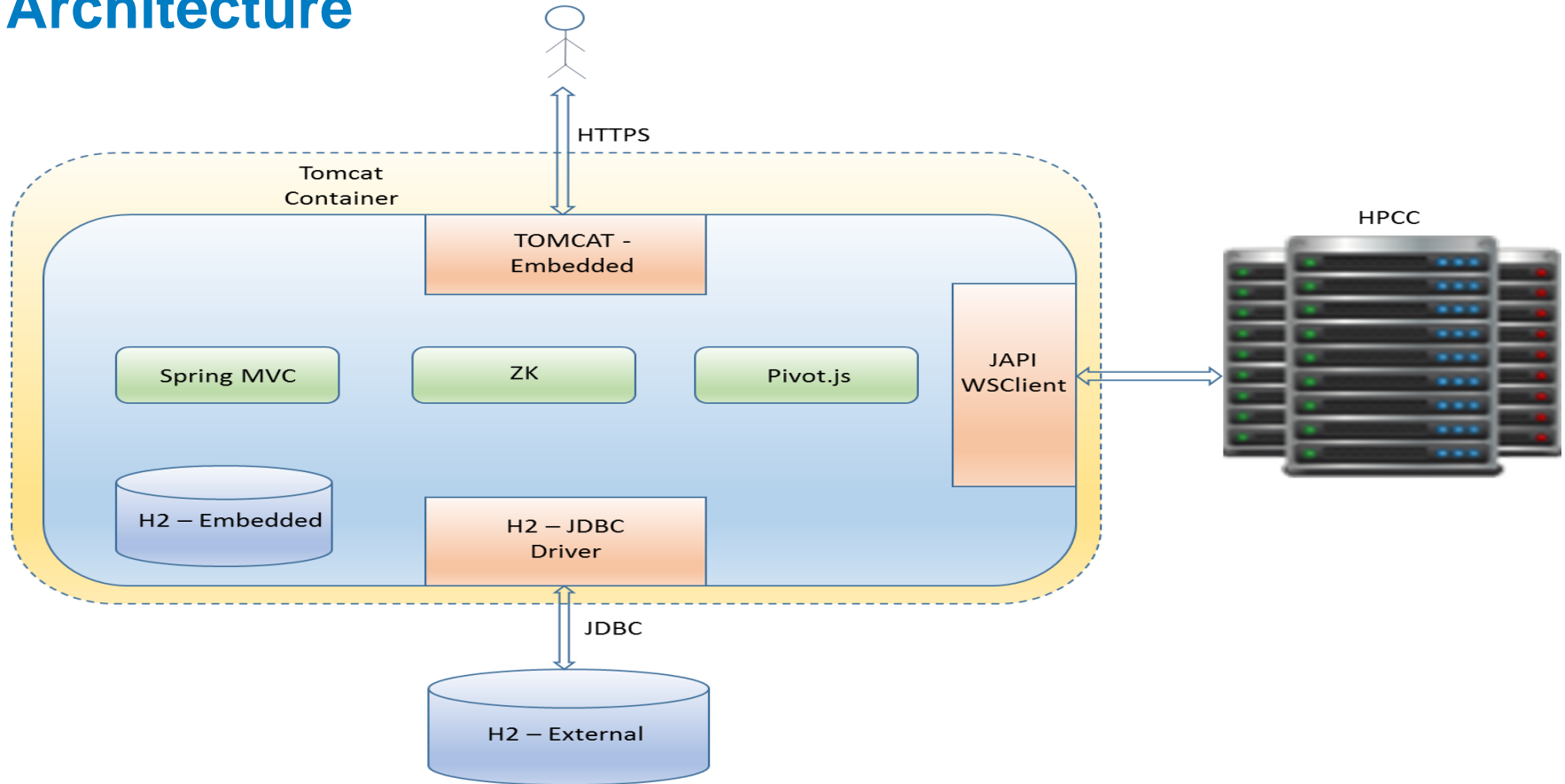
ECL Builder – Features Summary –Cont..

- Vertical Filtering of dataset can be done in easy way (within drag & drop of Logical file to the Editor)
- Drag & Drop logical files to run ECL Actions(reading datasets, performing joins, running cross tab reports, sorts)
- Syntax Highlighting
- Save and view Build History
- Download Output
- Provides enhanced interface to generate output visualization and output post-processing (e.g. generating pivot tables)

Sequence Diagram

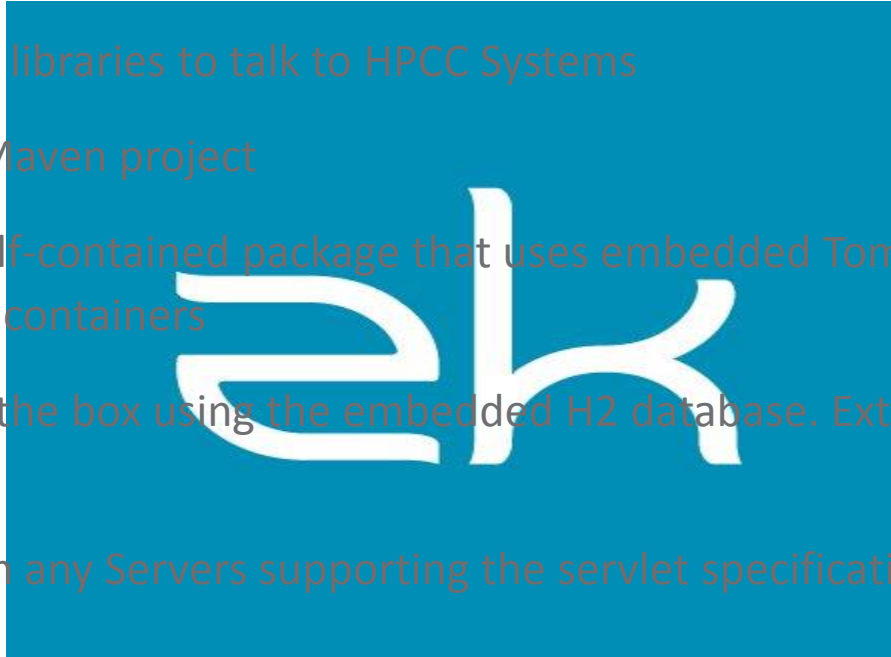


Architecture



Technology

- Built on the ZK framework, an open-source Ajax Web application framework
- Uses the WSClients libraries to talk to HPCC Systems
- Can be built as a Maven project
- Is available as a self-contained package that uses embedded Tomcat Server and does not need any external containers
- Can be run out of the box using the embedded H2 database. External database instance not mandatory.
- Can be installed on any Servers supporting the servlet specifications



DEMO

COLLABORATE

Git: <https://github.com/infosys-hpcc/eclbuilder>

- The ECLBuilder code base
- A pre-built packaged version of the ECLBuilder that can be run out of the box
- A readme file that provides instructions on
 - Running on building, installing and running both versions of the application i.e. the enterprise deployment as well as the local deployment.
 - Steps to set up the pre-requisites including installation of the database, the servlet containers etc.
- Instructions/guidelines on contributing to the project

ECL BUILDER IN USE

- The ECL Builder is currently being used on the “FDA – Clinical trials Analysis”
- ECL Builder can be used a Teaching Tool
- ECL Builder can be used to generate repetitive boiler plate code

Upcoming Enhancements

- Migrate to a more flexible and interactive front end based on Angular 2.0 and Spring MVC based web services
- Adding support for additional ECL constructs like Normalize, Denormalize, Iterate, generating functions and macros etc.
- Providing support for additional optional parameters for various constructs like JOIN, SORT etc.
- Adding ability to generate and publish Roxie web services
- Adding support for consuming and reusing Roxie queries
- Adding support for leveraging Machine Learning (HPCC-ML) functions
- Making the ECL builder Gradle compatible
- Adding the ability to embed visualizations

Q & A

Point of Contact & Contributors

- Narasimha Gopal (Narasimhamurthy_G@Infosys.com)
- Raja Sundarrajan (Raja_Sundarrajan@infosys.com)
- Ashoka Parameshwara Kadambalithaya (Ashoka_K@infosys.com)
- Bhuvaneswari L
- Senthil Kumar Ramachandiran
- Angurbala Panda
- Saravana Pandian

Thank You



© 2016 Infosys Limited, Bangalore, India. All Rights Reserved. Infosys believes the information in this document is accurate as of its publication date; such information is subject to change without notice. Infosys acknowledges the proprietary rights of other companies to the trademarks, product names and such other intellectual property rights mentioned in this document. Except as expressly permitted, neither this documentation nor any part of it may be reproduced, stored in a retrieval system, or transmitted in any form or by any means, electronic, mechanical, printing, photocopying, recording or otherwise, without the prior permission of Infosys Limited and/ or any named intellectual property rights holders under this document.

Infosys®