

Build "Automation Test as a Service" for large-scale e-commerce website in eBay

Bingsheng Ru (Robin Ru)

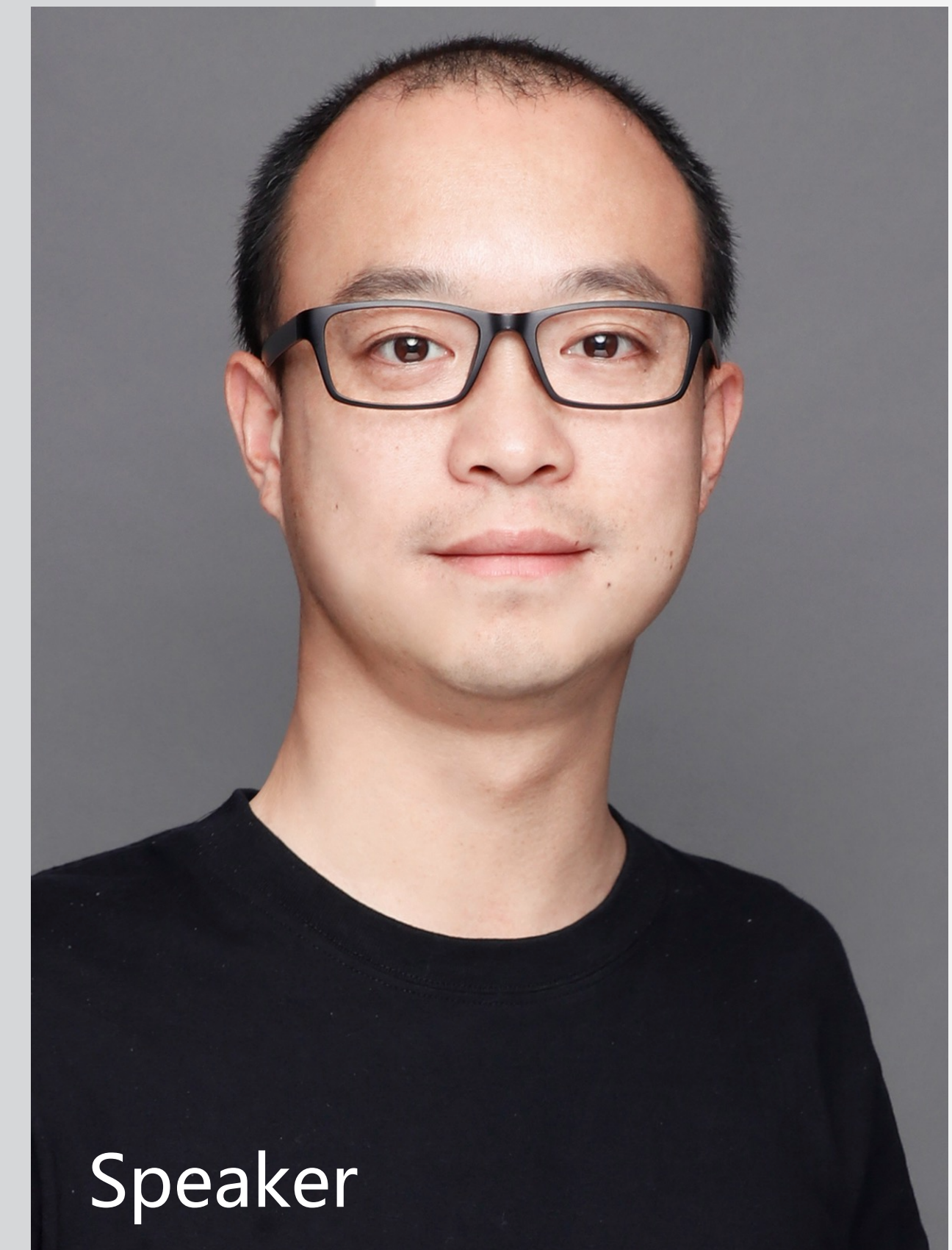
Engineering Productivity Tech Leader
eBay China Technology Center of Excellence

SPEAKER

INTRODUCTION

Bingsheng Ru (Robin)

- eBay – **Engineering Productivity Tech Leader**
- Hewlett-Packard – **Test Architect, Test Expert**
- Alcatel-Lucent – **Senior Test Leader**
- Cisco – **Senior Quality Engineer**



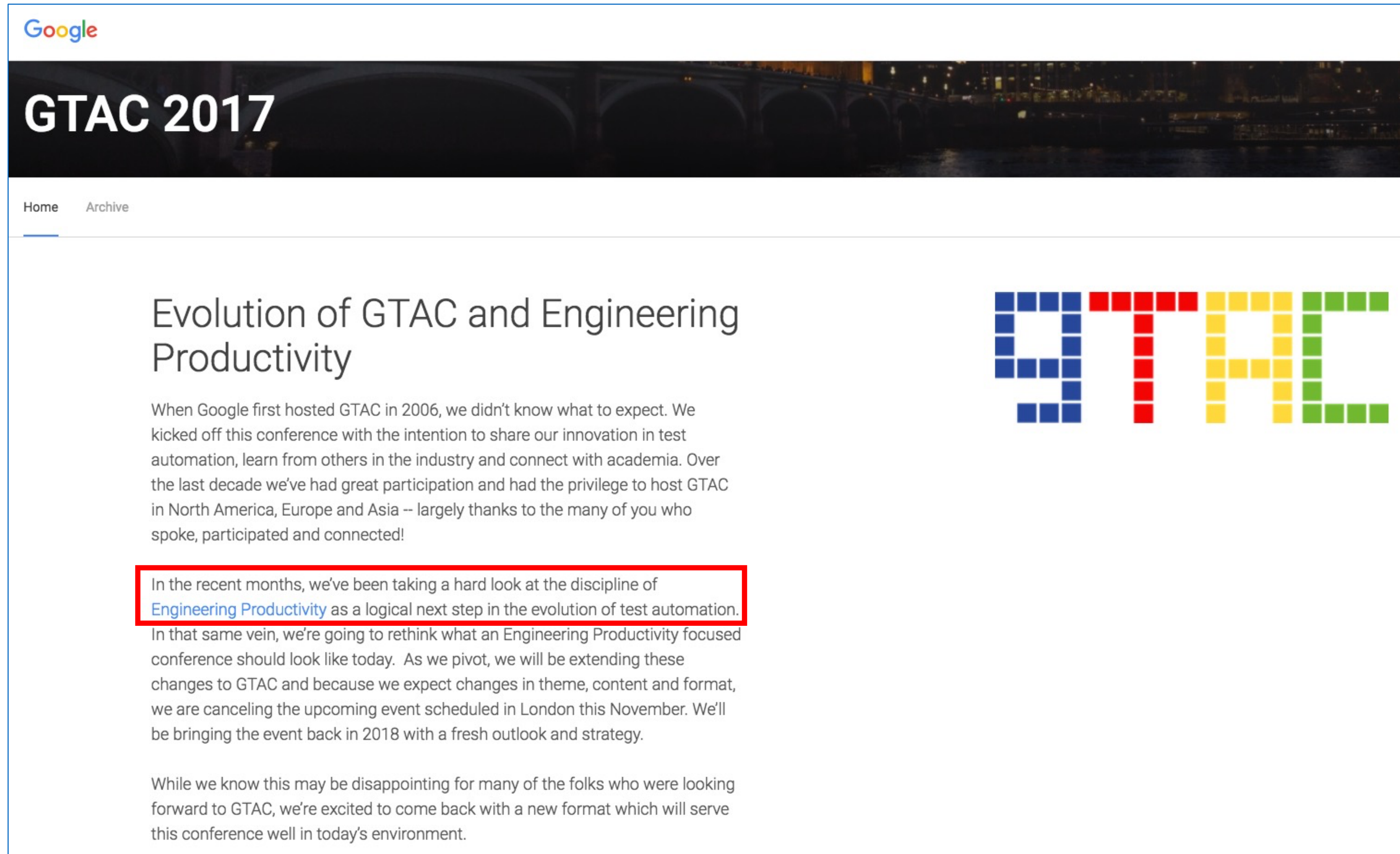
Speaker

TABLE OF **CONTENTS**

- **From Quality Engineering to Engineering Productivity**
- **Automation Test as a Service**
 - **Test Data Service**
 - **Test Execution Service**
 - **Test Bed Service**
 - **Global Registry Service**

From Quality Engineering to Engineering Productivity

Let's start from Google



Google

GTAC 2017


Home Archive

Evolution of GTAC and Engineering Productivity

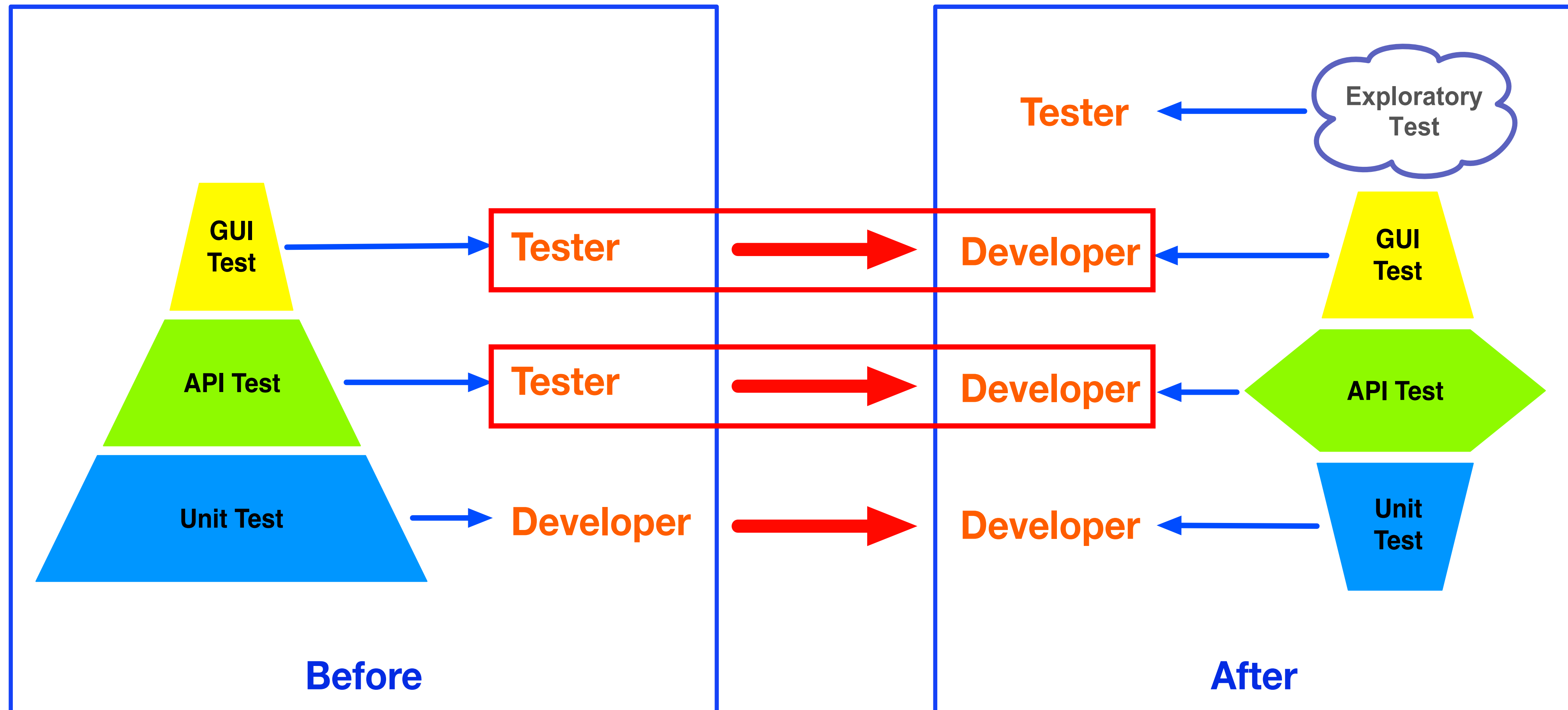
When Google first hosted GTAC in 2006, we didn't know what to expect. We kicked off this conference with the intention to share our innovation in test automation, learn from others in the industry and connect with academia. Over the last decade we've had great participation and had the privilege to host GTAC in North America, Europe and Asia -- largely thanks to the many of you who spoke, participated and connected!

In the recent months, we've been taking a hard look at the discipline of [Engineering Productivity](#) as a logical next step in the evolution of test automation. In that same vein, we're going to rethink what an Engineering Productivity focused conference should look like today. As we pivot, we will be extending these changes to GTAC and because we expect changes in theme, content and format, we are canceling the upcoming event scheduled in London this November. We'll be bringing the event back in 2018 with a fresh outlook and strategy.

While we know this may be disappointing for many of the folks who were looking forward to GTAC, we're excited to come back with a new format which will serve this conference well in today's environment.



From Quality Engineering to Engineering Productivity



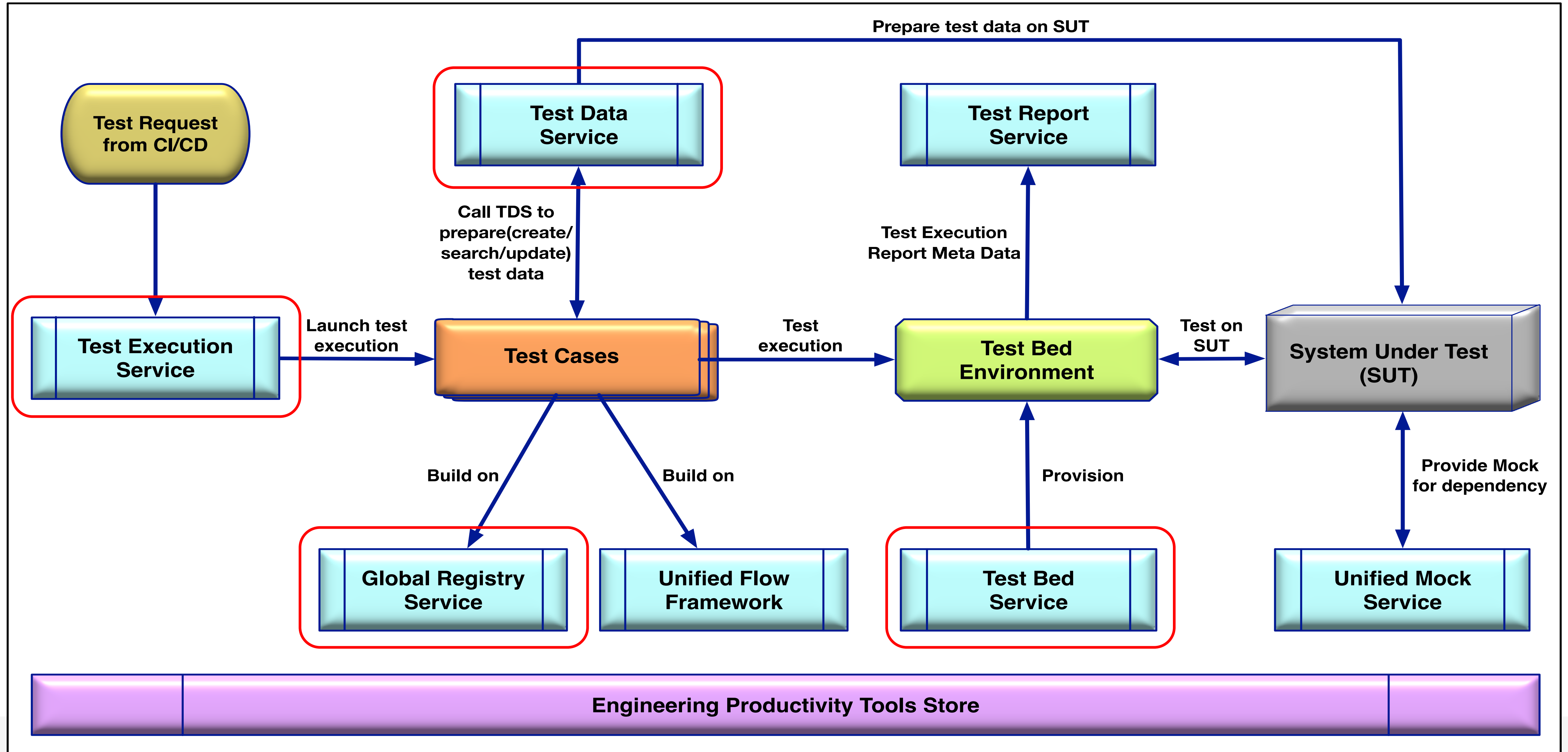
From Quality Engineering to Engineering Productivity



Strong Test Harness
=
Automation Test as a Service

Automation Test as a Service

Automation Test as a Service



Test Data Service

Test Data Service

Test Data Challenge

- Complexity for test data combination
- Time consumption for On-the-fly test data
- Dirty data for Out-of-box test data
- Time consumption for performance test data
- For Microservice arch, not enough knowledge for creating test data due to cross domain
- For Microservice arch, test data highly depend on test environment



Test Data Service

Test Data Preparation 1.0 Phase – Java-based Test Data Utility

```
145     public static User createUser(String userName, String password, Contact primaryContact,  
146         Contact paymentContact, boolean enable2FA) throws Exception {
```

```
199     public static String createListing(String eventId, boolean isGA, boolean isParking_Pass,  
200         List<Ticket> tickets, Delivery delivery,  
201         Price pricePerProduct, Price faceValue, String quantity, ListingSplit listingSplit,  
202         String inhandDate, String saleEndDate,  
203         String username, String password) {
```

Test Data Service

Test Data Preparation 2.0 Phase – Java-based Build Pattern

```
createUserImpl(A, B, C, D, E, ...);  
  
createDefaultEvent()  
{  
    init A,B,C,D,E,...  
    createUserImpl(A, B, C, D, E, ...);  
}  
  
createSellerUser(A)  
{  
    init B,C,D,E,...  
    createUserImpl(A, B, C, D, E, ...);  
}  
  
createBuyerUser(B, C)  
{  
    init A,D,E,...  
    createUserImpl(A, B, C, D, E, ...);  
}
```



```
UserBuilder.build();  
UserBuilder.withA(A).build();  
UserBuilder.withA(B).withA(C)  
                .withBuildStrategy(BuildStrategy.CREATE_ONLY)  
                .build();  
  
UserBuilder.withRecipe(XXX).build();
```

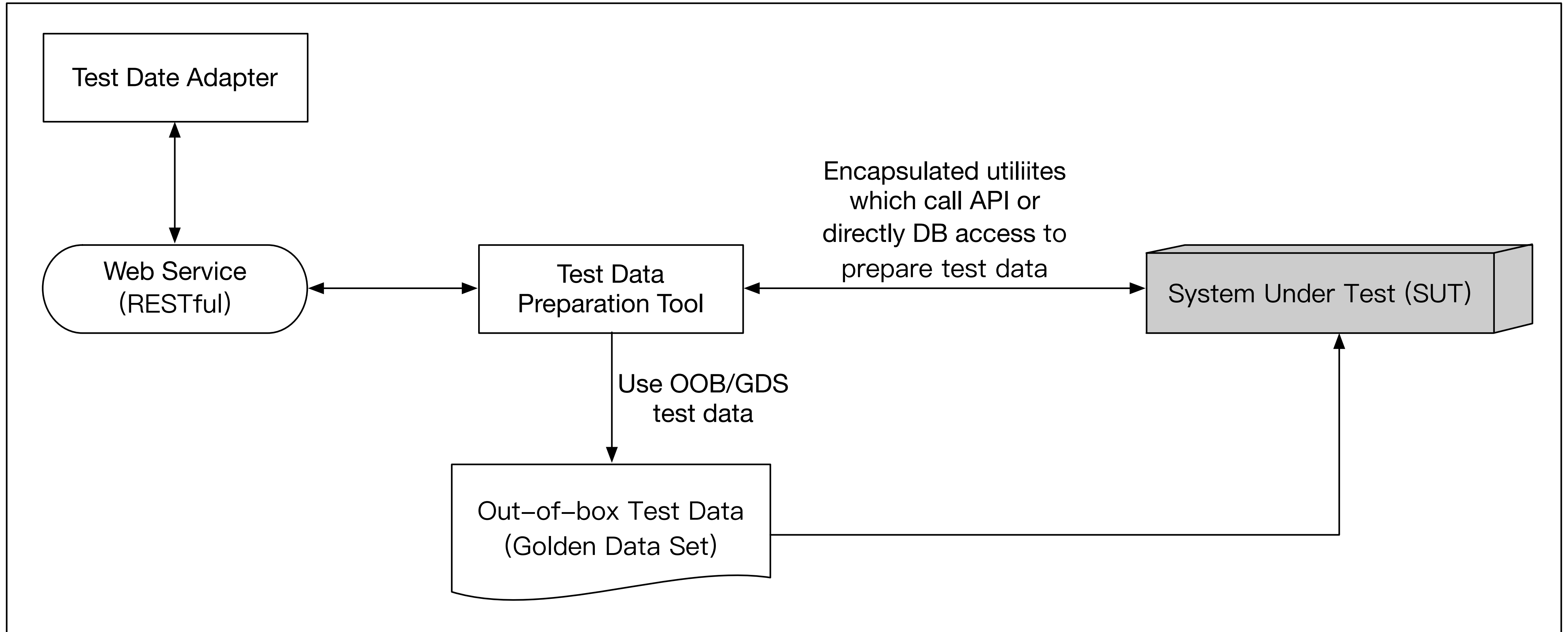
```
BuildStrategy.CREATE_ONLY  
BuildStrategy.SEARCH_ONLY  
BuildStrategy.SMART  
BuildStrategy.GOLDENT_DATA_ONLY
```

```
User seller = GlobalUserBuilder.newBuilder().withSellerType(SellerType.valueOf(sellerType))  
                .withCreditCard().withCountry(CountryUtil.getCountry(sellerCountryCode)).build();
```

Test Data Service

Test Data Preparation 3.0 Phase – Test Data Service

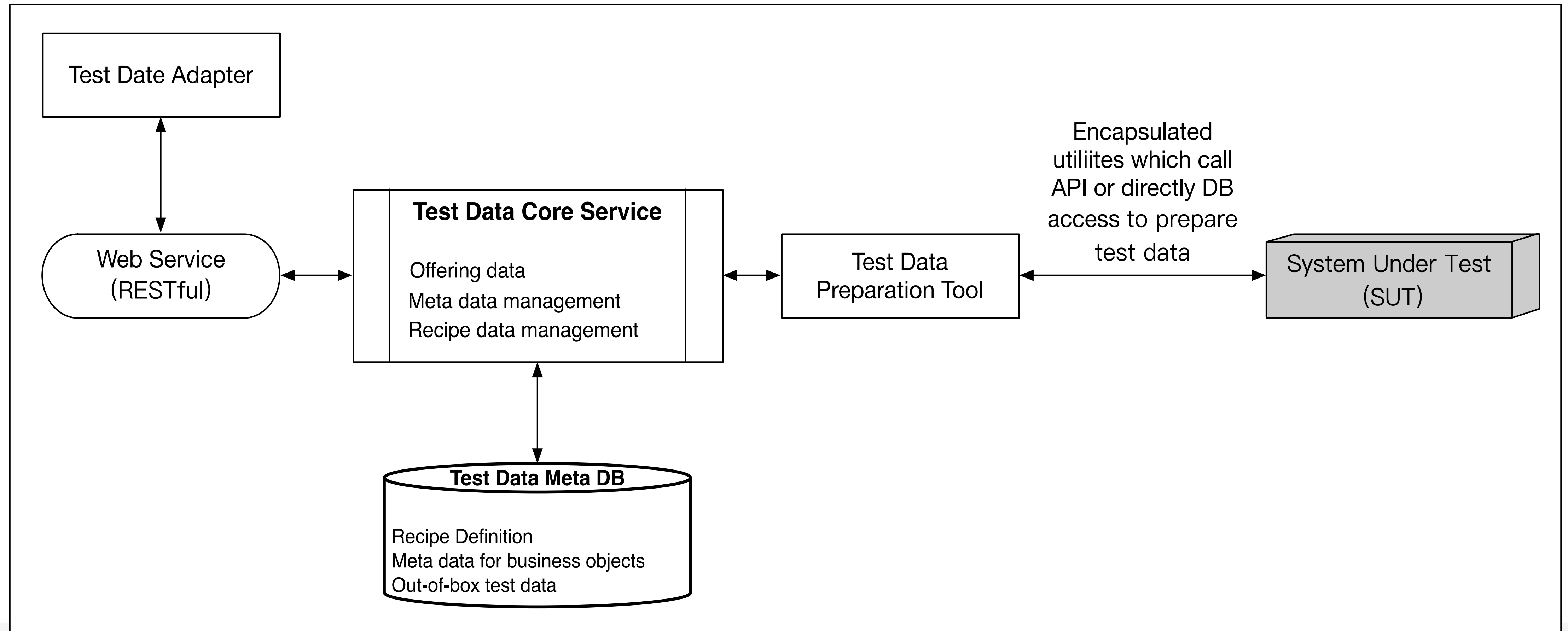
Test Data Service Rudiment



Test Data Service

Test Data Preparation 3.0 Phase – Test Data Service

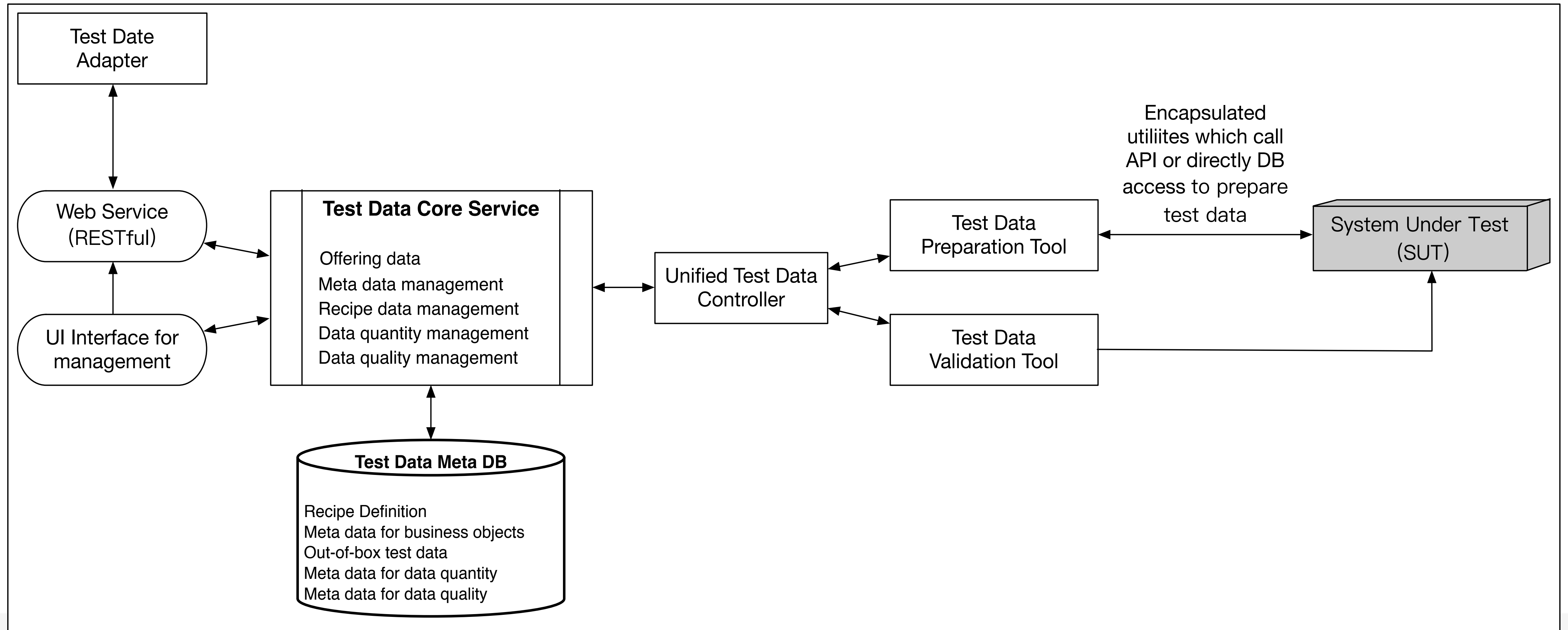
Introduce Test Data Core Service and Internal Database



Test Data Service

Test Data Preparation 3.0 Phase – Test Data Service

Introduce Data Quantity / Quality management



Test Data Service

Test Data Service GUI Screenshot

The screenshot shows a web browser window with the URL `slcd000tlk001.stubcorp.com:5000/event`. The browser tabs include Origin, Stubhub/qe-infrastructure, Index of /dist/maven/maver, Sublime Text: The text edit, The Docker Platform, Docker Community Edition, and Release v1.1.0-beta.2. The application interface has a dark sidebar with navigation items: Origin, Dashboard, Test Data, Event (highlighted), User, Listing, and Order. The main content area is titled "GoldenEvents" and "SearchEvents". It features several search filters: Fulfillment (UPS), Environment (slce002), Country (DE), Locale (de_DE), Currency (EUR), Date Range (UTC) (2017-06-16 ~ 2018-06-30), Status (ACTIVE), Date TBD (off), GA (off), Time TBD (off), and With Listing (checked). A "Basic Search" button and a "Search" button are present. Below the filters, the "Event id: 9655307" is displayed, followed by a JSON response:

```
{
  "id": "9655307",
  "name": "Manowar Tickets",
  "status": "active",
  "locale": "de_DE",
  "expiredInd": "false",
  "currencyCode": "EUR",
  "eventDateUTC": "2017-12-12 19:30:00 ",
  "eventDateLocal": "2017-12-12 20:30:00+01:00",
  "timezone": "Europe/Copenhagen",
  "categories": [
    {
      "id": "1",
      "name": "Concert tickets",
      "locale": "en_US"
    }
  ]
}
```

Test Data Service

Test Data Service GUI Screenshot

The screenshot displays a web browser window with multiple tabs. The active tab is 'Origin' at the URL 'slcd000tlk001.stubcorp.com:5000/event'. The page features a dark sidebar on the left with navigation options: Origin, Dashboard, Test Data (expanded), Event (selected), User, Listing, and Order. The main content area has two tabs: 'GoldenEvents' (active) and 'SearchEvents'. Below the tabs is a search bar labeled 'Full Text Search...'. The primary data is presented in a table with the following columns: ID, Status, Locale, Currency, Country, Fulfillment, GA, Environment, Date(UTC), Name, and Actions. The table lists several events, all with a status of 'active' and locale 'en_US'. The 'Actions' column for each row contains an information icon (i) and a link icon.

ID	Status	Locale	Currency	Country	Fulfillment	GA	Environment	Date(UTC)	Name	Actions
9647349	active	en_US	USD	US	LMS_PreDelivery,LMS,PDF,PDF_Pre Delivery,UPS	false	common	2017-07-13 23:00:00	V - The Ultimate Variety Show Las Vegas Tickets	i link
9669904	active	en_US	USD	US	LMS_PreDelivery,LMS,PDF,PDF_Pre Delivery,UPS	false	common	2017-07-20 00:00:00	Hello, Dolly! New York Tickets	i link
9721174	active	en_US	USD	US	LMS_PreDelivery,LMS	false	common	2017-09-28 00:00:00	Hamilton New York Tickets	i link
9795454	active	en_US	USD	US	LMS_PreDelivery,LMS,PDF,PDF_Pre Delivery,UPS	false	common	2017-09-27 23:30:00	DC United at New York Red Bulls Tickets	i link
9795453	active	en_US	USD	US	LMS_PreDelivery,LMS,PDF,PDF_Pre Delivery,UPS	false	common	2017-09-17 17:00:00	Philadelphia Union at New York Red Bulls Tickets	i link
9795456	active	en_US	USD	US	LMS_PreDelivery,LMS,PDF,PDF_Pre Delivery,UPS	false	common	2017-10-07 21:00:00	Vancouver Whitecaps FC at New York Red Bulls Tickets	i link
9705286	active	en_US	USD	US	Barcode_PreDelivery_NonSTH,Barcode,Barcode_PreDelivery_STH	false	common	2017-08-22 02:15:00	Milwaukee Brewers at San Francisco Giants Tickets	i link
.....	.....	.....	.....	.....	Barcode_PreDelivery_NonSTH,Barco	.....	.....	.....	Milwaukee Brewers at New	i link

At the bottom of the page, there is a pagination control showing page 2 of 10, with a 'Goto 1' button.

Test Execution Service and Test Bed Service

Test Execution Service and Test Bed Service

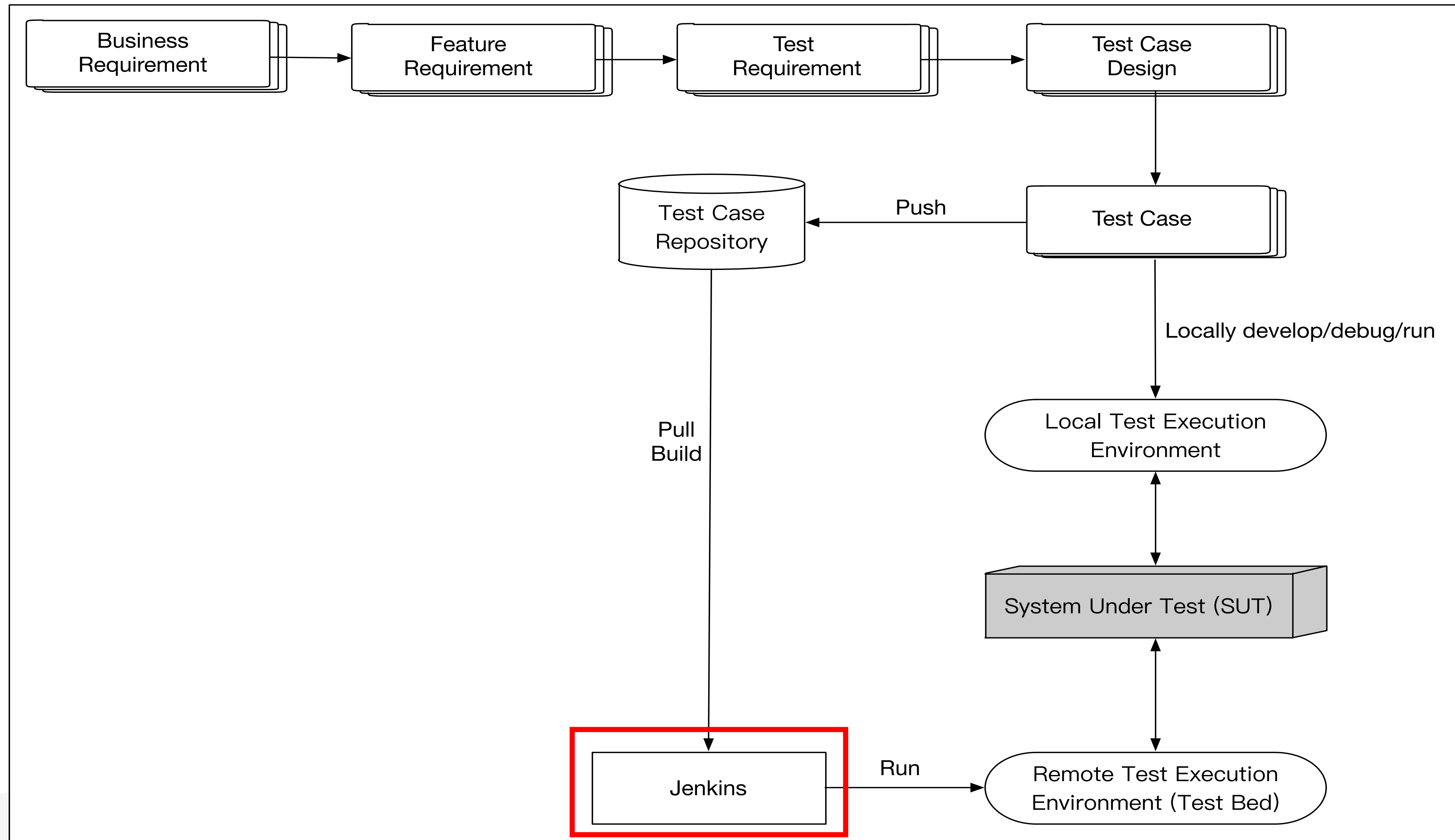
What is the ideal Test Execution Platform

- Transparency to user (DEV, CI/CD pipeline)
- Ease maintenance to Maintainer
- Scalability to test case execution



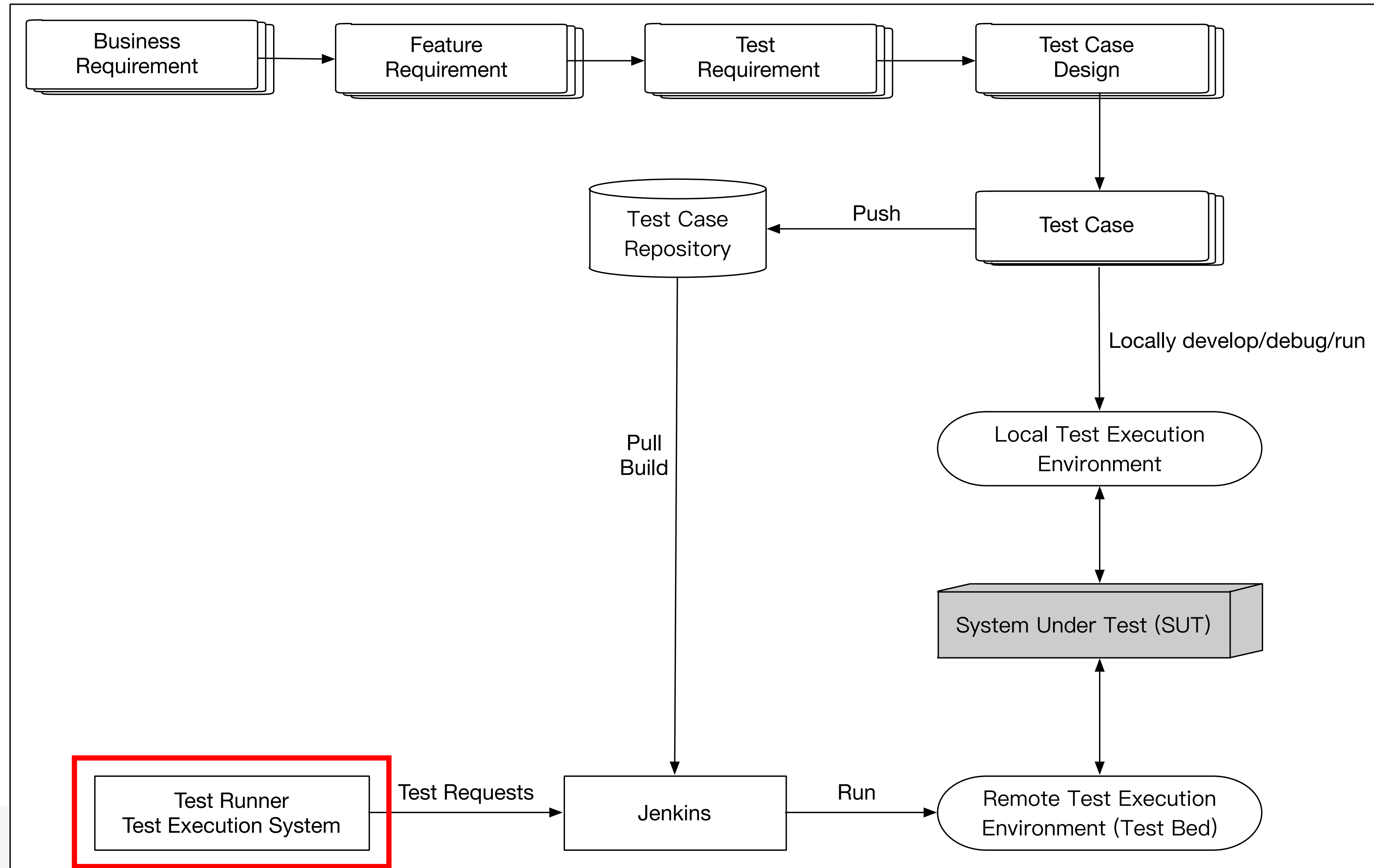
Test Execution Service and Test Bed Service

Use Jenkins to trigger test execution



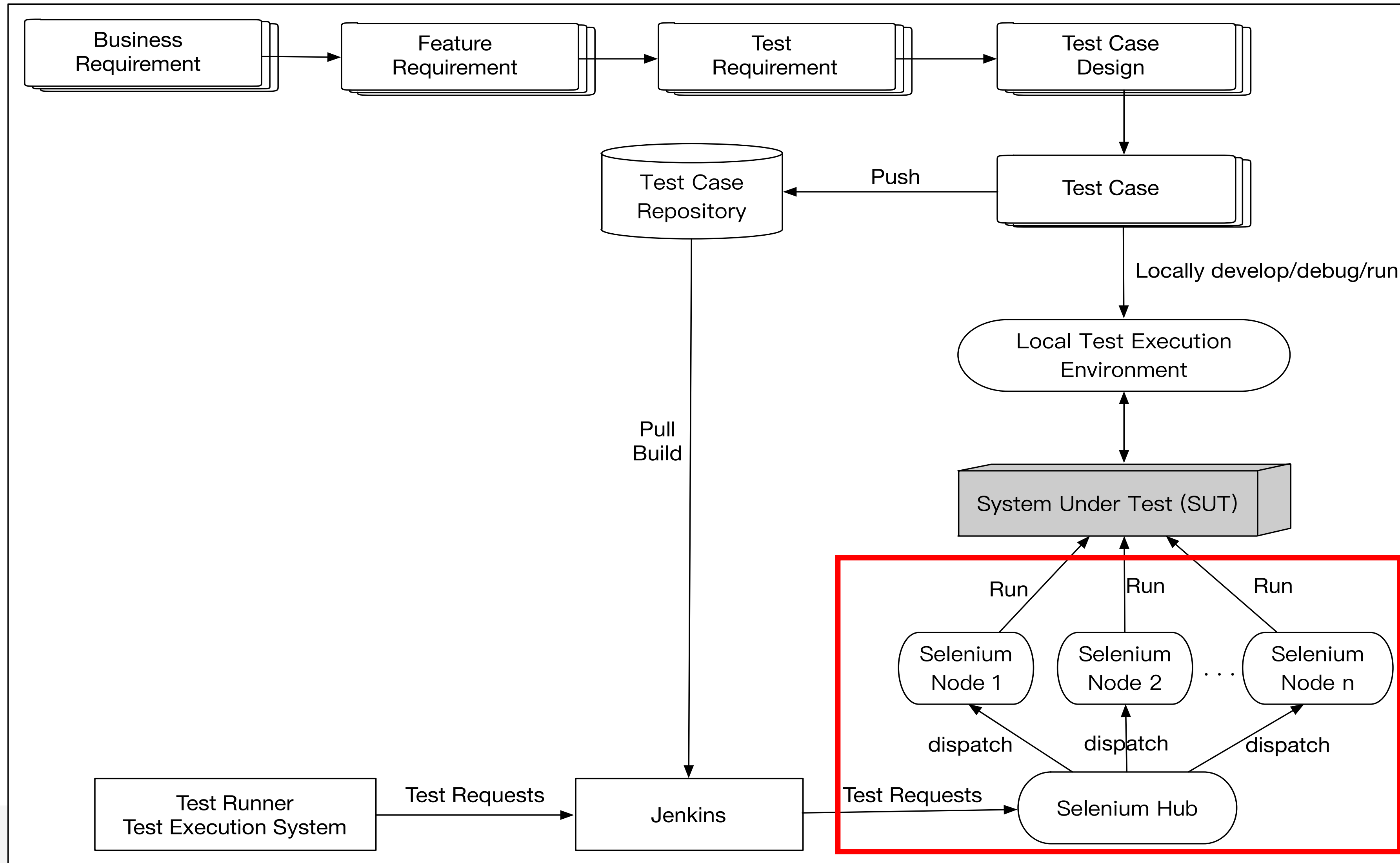
Test Execution Service and Test Bed Service

Introduce Test Execution System



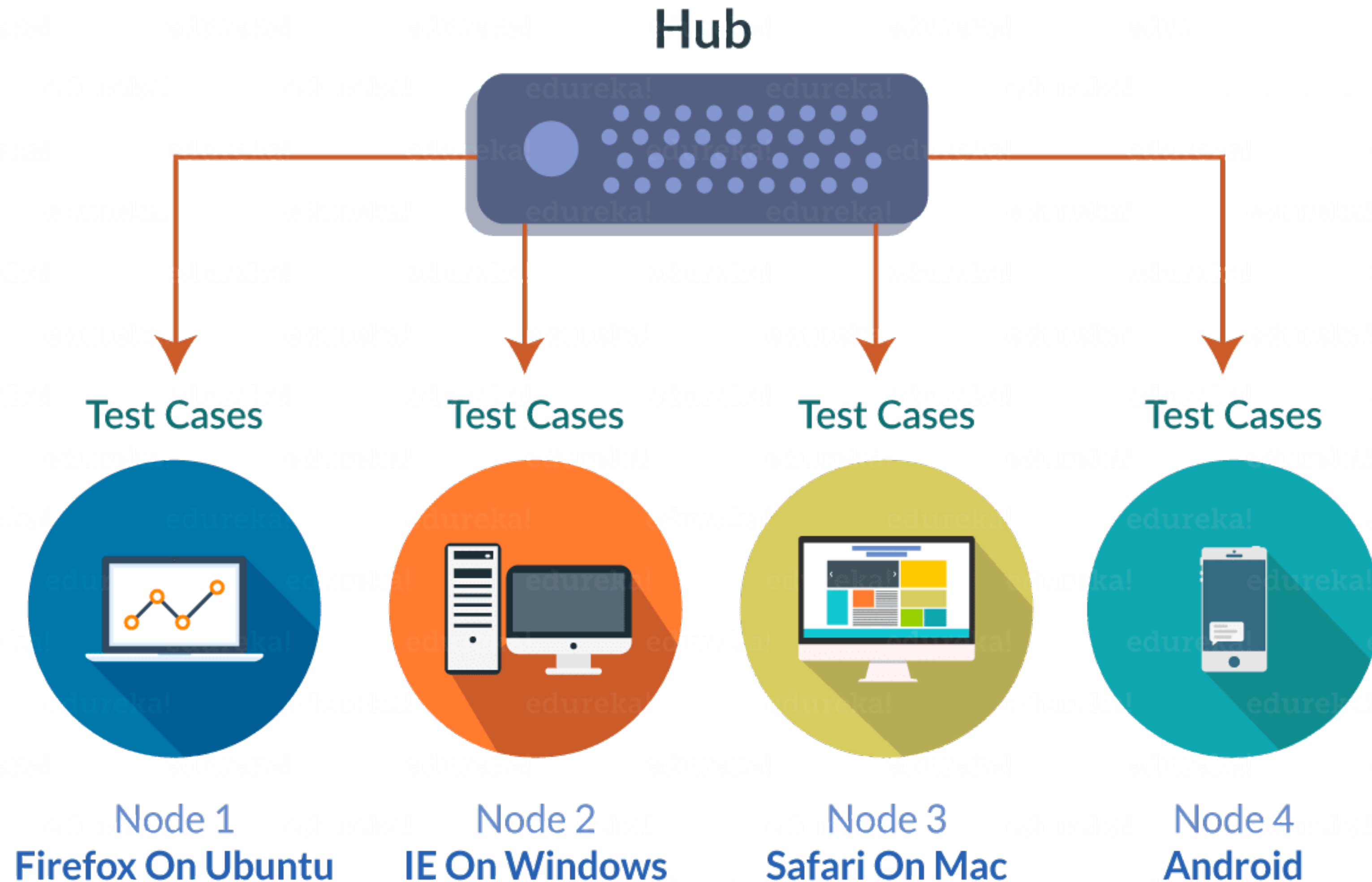
Test Execution Service and Test Bed Service

Introduce Selenium Grid



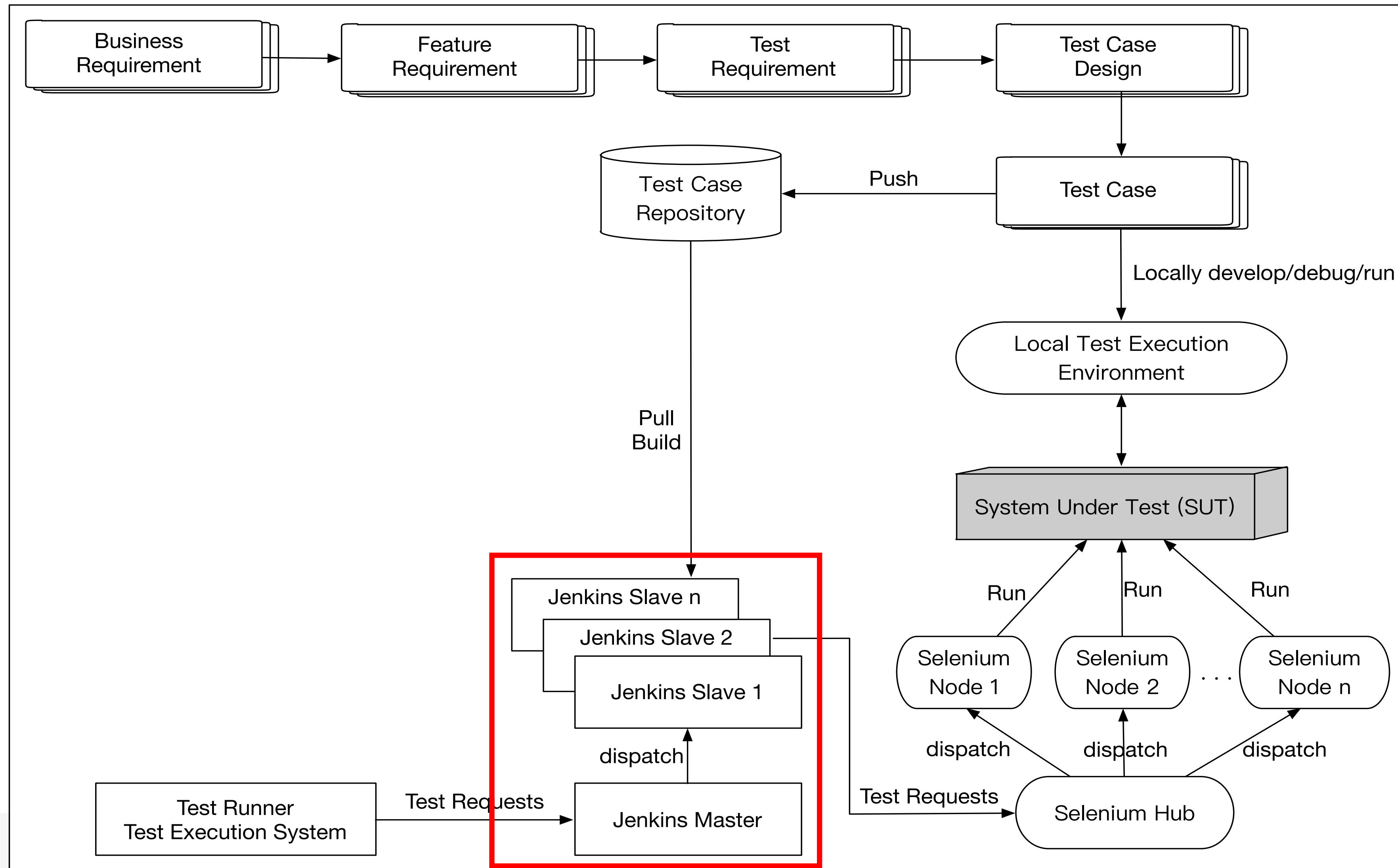
Test Execution Service and Test Bed Service

Selenium Grid



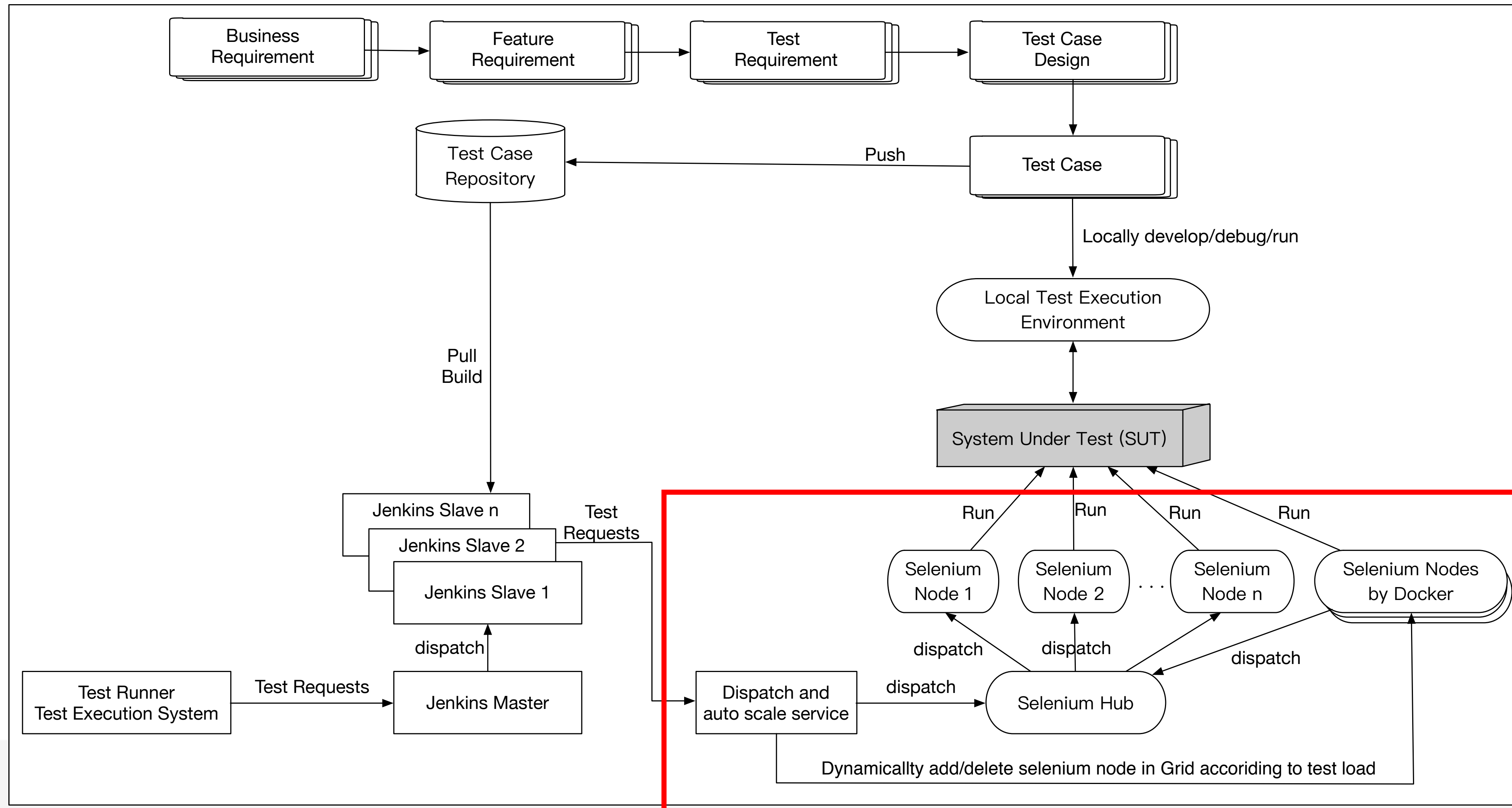
Test Execution Service and Test Bed Service

Use Jenkins cluster to improve test case distribution capacity



Test Execution Service and Test Bed Service

Enable auto-scale capacity for Selenium Grid to dynamically meet test load by using Docker



Test Execution Service and Test Bed Service

Challenge in Mobile Test Platform

- Android Fragmentation
- Different Device Coverage
- Test Execution Time



Test Execution Service and Test Bed Service

Build Mobile Test Execution Platform in Private Cloud



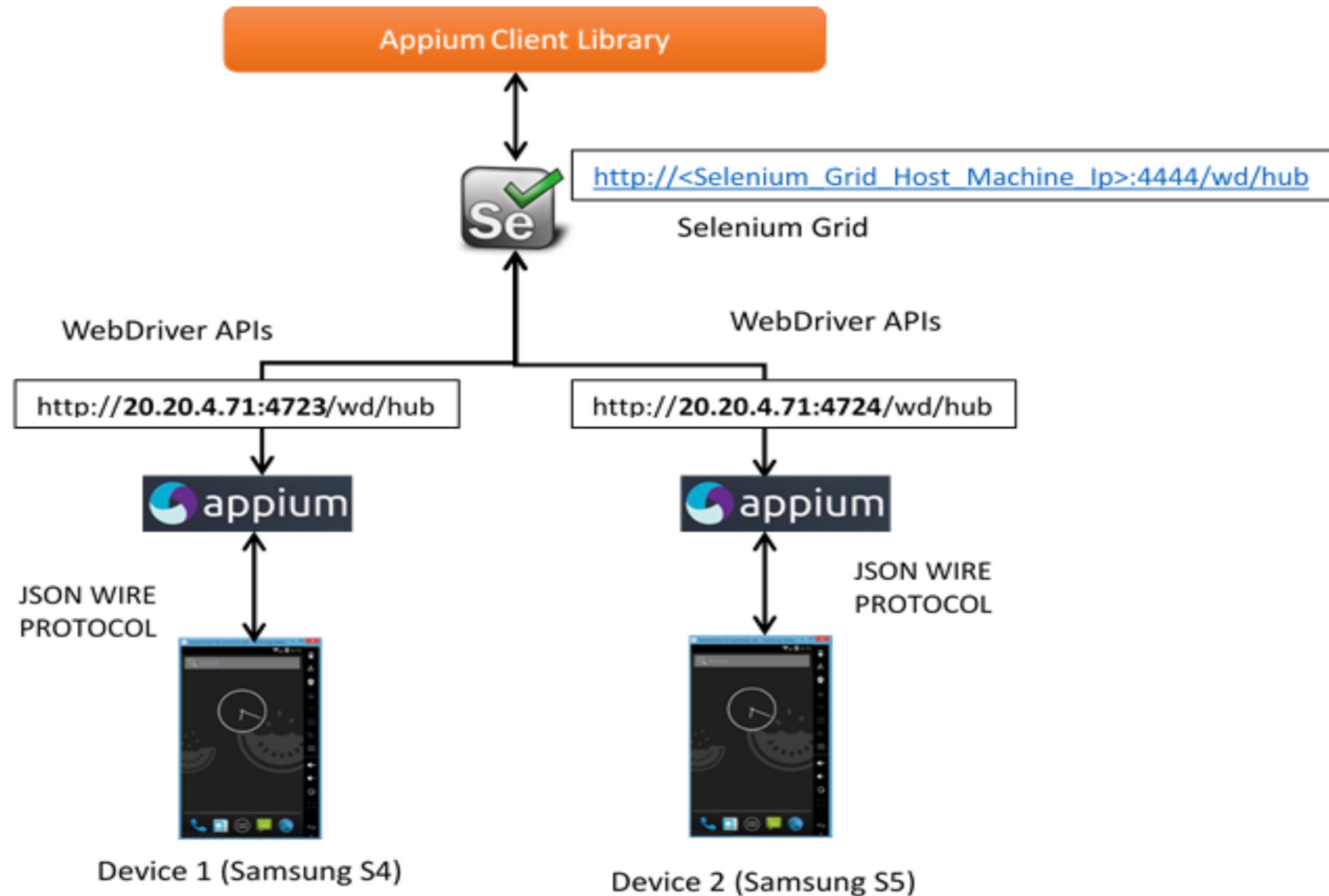
Automation for Apps

Appium is an open source test automation framework for use with native, hybrid and mobile web apps. It drives iOS, Android, and Windows apps using the WebDriver protocol.



Test Execution Service and Test Bed Service

Base on Appium, build Mobile Test Execution Platform in Private Cloud



Test Execution Service and Test Bed Service

DEMO: Build Mobile Test Execution Platform in Private Cloud

TES Regression x Mobile Automation Test as x qe-stream-mvt/testng_app x

ebay.com:8080/tesng/regression/regression.html#/unit/suite?unitId=5714360687c42be8befb801f&unitName=mobile%20auto...

Apps Github Stubhub Jenkins Wiki QE Riesling TES Regression JIRA 在线翻译_在线词典_金 QE Jenkins Grid Console NEW TOOLS LINK FO Other Bookmarks

Riesling Test Execution

Mobile Automation Dashboard Suite Test Case

Services

- Ios Native App
iOS Native App test suite
TEST GID: com.stubhub.qe.stream.mvt
TEST AID: com.stubhub.qe.stream.mvt.uitest
WAR GID:
WAR AID:
- Android Native App
android Native App test suite
- Android Web Test
android web test suite
- Ios Web Test
ios web test suite

Ios Native App

- Search - iOS App - Real Device
Iris Li
com/stubhub/qe/stream/mvt/uitest/base/testng_app_ios_search.xml
History Edit
- Search - iOS App - Simulator
Iris Li
com/stubhub/qe/stream/mvt/uitest/base/testng_app_ios_search.xml
History Edit

Test Execution Service and Test Bed Service

DEMO: Build Mobile Test Execution Platform in Private Cloud

The screenshot displays a web browser window with several tabs open, including 'TES Regression', 'd-shc-15008219.corp.eba', 'Mobile Automation Test as', and 'qe-stream-mvt/testng_app'. The address bar shows a URL: 'com:8080/tesng/regression/regression.html#/unit/suite?unitId=5714360687c42be8befb801f&unitName=mobile%20auto...'. The browser's bookmark bar contains various links like 'Apps', 'Github Stubhub', 'Jenkins', 'Wiki QE', 'Riesling', 'TES Regression', 'JIRA', '在线翻译_在线词典_金', 'QE Jenkins', 'Grid Console', and 'NEW TOOLS LINK FO'. The main content area is titled 'Riesling Test Execution' and features a navigation menu with 'Mobile Automation', 'Dashboard', 'Suite', and 'Test Case'. A 'Services' section lists 'ios Native App', 'Android Native App', 'Android Web Test', and 'ios Web Test'. A modal dialog titled 'Search - iOS App - Real Device' is open, showing configuration options for a test suite. The dialog includes a 'Context (com.stubhub.qe.stream.mvt.uitest)' section with dropdowns for 'Pool' (stubhub), 'Site' (US), and 'Version' (1.16.6-SNAPSHOT). Below these are two red text annotations: 'Run Mobile Test on production environment' and 'Same Versioning Control mechanism'. The 'Parameters' section lists 'DISTRIBUTING_URL' as 'd-shc-15008219.corp.ebay.StubHub.app' and 'udid' as '74518daaccce220d92af4d'. At the bottom of the dialog are 'CANCEL' and 'START' buttons.

Test Execution Service and Test Bed Service

DEMO: Build Mobile Test Execution Platform in Private Cloud

The screenshot displays the Riesling Test Execution web interface. The browser address bar shows the URL: `ebay.com:8080/tesng/regression/regression.html#/unit/suite?unitId=5714360687c42be8befb801f&unitName=mobile%20auto...`. The page title is "Riesling Test Execution". The navigation menu includes "Mobile Automation", "Dashboard", "Suite", and "Test Case".

The main content area is titled "Ios Native App" and shows a list of test suites. The selected suite is "Search - iOS App - Real Device" by Iris Li, with the test file `com/stubhub/qe/stream/mvt/uitest/base/testng_app_ios_search.xml`. The suite details are as follows:

Timestamp	Environment	Version	Pass	Fail	Block	Actions
4/18/2016, 9:50:08 AM	stubhub	1.16.6-SNAPSHOT	1 (100%)	0 (0%)	0 (0%)	DETAIL, REPORT, CONSOLE
app : StubHub.app site : US pool : stubhub DISTRIBUTING_URL : d-shc-15008219.corp.ebay.com:8080 udid : 74518daaccce220d92af4d44c7149ee78056a16d version : 1.16.6-SNAPSHOT						
4/18/2016, 9:35:43 AM	stubhub	1.16.6-SNAPSHOT	0 (0%)	0 (0%)	0 (0%)	DETAIL, REPORT, CONSOLE
app : StubHub.app site : US pool : stubhub DISTRIBUTING_URL : d-shc-15008219.corp.ebay.com:8080 udid : 74518daaccce220d92af4d44c7149ee78056a16d version : 1.16.6-SNAPSHOT						

Below the "Real Device" section, there is a section for "Search - iOS App - Simulator" by Iris Li, with the same test file. This section is currently empty.

Test Execution Service and Test Bed Service

DEMO: Build Mobile Test Execution Platform in Private Cloud

[Back to QA-TES-JAR-001](#)

mauireport

[Zip](#)



Test Report

Generate at Apr 18, 2016 9:52:14 AM

Instances: 1

1

Test Search

Duration: 125s

N/A

testSearch site : US browser : iPhone pool : stubhub
com.stubhub.qe.stream.mvt.uitest.base.MobileAppTestPlan

124s

LOGS

CONTEXT

Show Debug Logs

- 1 [2016-04-17 18:50:43] WebDriver is running on node 10.249.74.14, iPhone, session a2be2af1-7dc9-4958-b2af-2b681a392ecb
- 2 [2016-04-17 18:50:49] wait for edittext Search, by={By.xpath: //UIApplication[1]/UIWindow[1]/UINavigationBar[1]/UISearchBar[1]/UISearchBar[1]} to be visible.
- 3 [2016-04-17 18:51:29] HomeView
- 4 [2016-04-17 18:51:45] clear value on edittext **Search** locator=**By.xpath: //UIApplication[1]/UIWindow[1]/UINavigationBar[1]/UISearchBar[1]**
- 5 [2016-04-17 18:51:49] sendKeys "Z mobile" on edittext **Search** locator=**By.xpath: //UIApplication[1]/UIWindow[1]/UINavigationBar[1]/UISearchBar[1]**
- 6 [2016-04-17 18:51:57] enter
- 7 [2016-04-17 18:51:57] wait for uitable Search result table, by={By.xpath: //UIApplication[1]/UIWindow[1]/UITableView[1]} to present.
- 8 [2016-04-17 18:52:02] SearchResultView
- 9 [2016-04-17 18:52:08] testSearch on
- 10 [2016-04-17 18:52:13] Search Z mobile event succesfully

Global Registry Service

Global Registry Service



USA

The screenshot shows the StubHub website for the USA. The header includes the StubHub logo and navigation links like 'Find events', 'Sell tickets', and 'Log in'. A search bar is present with the placeholder text 'Event, artist or team'. Below the search bar, the location is set to 'San Jose, CA' and the date is 'When'. The main content area features a section titled 'See what's out there' with four category buttons: 'All events', 'Sports', 'Concerts', and 'Theater & Comedy'. Below this is a 'View popular events' section with three event cards: 'Game of Thrones' (Sep 2018), 'Weezer' (Aug 2018), and 'San Jose Earthquakes' (Mar 2018). The bottom right corner shows a price of 10,241.2.53.



France

The screenshot shows the StubHub website for France. The header includes the StubHub logo and navigation links like 'Rechercher des événements', 'Vendre des billets', 'Mes billets', and 'Se connecter'. A search bar is present with the placeholder text 'Événement, artiste ou équipe'. Below the search bar, the location is set to 'Paris, France' and the date is 'Dates'. The main content area features a large banner with the text 'Réinventez votre quotidien.' and a background image of a concert. Below the banner is a 'Restez informé' section with four category buttons: 'Tous les événements', 'Sports', 'Concerts', and 'Spectacles et humour'. The bottom right corner shows a price of 10,241.2.53.



Germany

The screenshot shows the StubHub website for Germany. The header includes the StubHub logo and navigation links like 'Veranstaltung auswählen', 'Tickets verkaufen', 'Meine Tickets', and 'Einloggen'. A search bar is present with the placeholder text 'Veranstaltung, Künstler oder Team'. Below the search bar, the location is set to 'Berlin, Deutschland' and the date is 'Wann'. The main content area features a section titled 'Finden Sie heraus, was als Nächstes ansteht' with four category buttons: 'Alle Veranstaltungen', 'Sport', 'Konzerte', and 'Theater & Comedy'. Below this is a 'Beliebte Veranstaltungen ansehen' section with three event cards: 'LA PEGATINA', 'SASCHA GRAMMEL', and 'DIE TOTEN HOSEN'. The bottom right corner shows a price of 10,241.2.53.



Mexico

The screenshot shows the StubHub website for Mexico. The header includes the StubHub logo and navigation links like 'Encontrar eventos', 'Vender boletos', 'Mis boletos', and 'Iniciar sesión'. A search bar is present with the placeholder text 'Buscar por eventos, artistas, equipos o recintos'. Below the search bar, the location is set to 'Ciudad de México,' and the date is 'Dónde'. The main content area features a section titled 'StubHub es el mejor lugar del mundo para compradores y revendedores de entradas. Los precios pueden ser mayores o menores que el valor nominal.' Below this is a grid of event cards for 'MALUMA', 'CHRIS YOUNG', and 'ALICIA VILLARREAL'. The bottom right corner shows a price of 10,241.2.53.

Global Registry Service

Before

```
public static String getCurrencyCode() {  
    String currencyCode = "USD";  
    if (Environment.isDESite() || Environment.isFRSite()) {  
        currencyCode = "EUR";  
    } else if (Environment.isUKSite()) {  
        currencyCode = "GBP";  
    } else if (Environment.isUSSite() || Environment.isMXSite()) {  
        currencyCode = "USD";  
    } else {  
        throw new IllegalArgumentException("Site is not supported : " + Environment.getSite());  
    }  
    return currencyCode;  
}
```

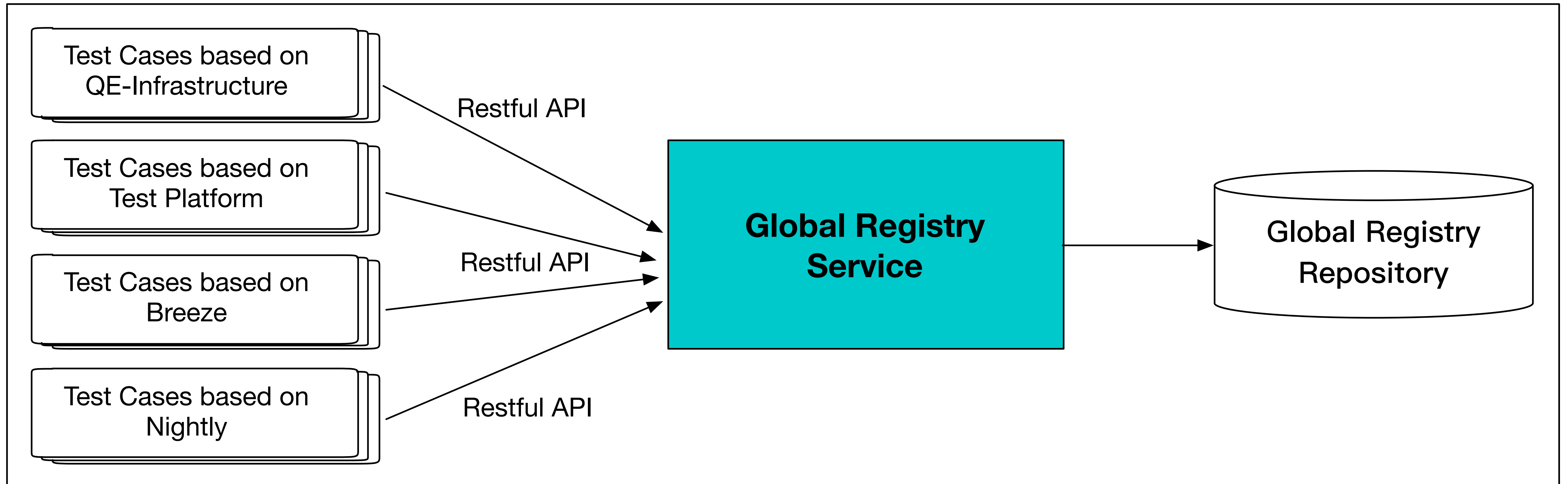
Global Registry Repository

```
shstoreId=1  
defaultLocale=en-US  
defaultCurrency=USD  
supportedLocales=en-US,es-MX  
supportedCurrencies=USD  
defaultWebTLD=com
```

After

```
public static String getCurrencyCode() {  
    return GlobalRegistry.byCountry(GlobalEnvironment.getCountry()).getDefaultCurrency();  
}
```

Global Registry Service





My column in
Software Testing



My WeChat

