Application of Microservice Architecture to B2B Processes

(IBM Watson Customer Engagement)

by

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Introduction

The International Business Machines Corporation (IBM) is an American multinational technology company headquartered in Armonk, New York, United States, with operations in over 170 countries. IBM manufactures and markets computer hardware, middleware and software, and provides hosting and consulting services in areas ranging from mainframe computers to nanotechnology.

IBM has a large and diverse portfolio of products and services. As of 2016, these offerings fall into the categories of cloud computing, cognitive Computing, commerce, data and analytics, Internet of Things (IoT), IT infrastructure, mobile, and security. IBM aims to bring Businesses closer and smarter than ever with the help of their state of the art enterprise software product called B2B Sterling Integrator.

IBM B2B Integrator helps companies integrate complex B2B (Business to Business) / EDI (Electronic Data Exchange) processes with their partner communities. It provides a single, flexible B2B platform that supports most communication protocols, helps secure your B2B network and data and achieve high availability operations. The offering enables companies to reduce costs by consolidating on a single B2B platform and helps automate B2B processes across enterprises while providing governance and visibility over those processes.

IBM Sterling B2B Integrator

It is a B2B integration software to help synchronize the business partner communities. Today's empowered customers expect more from the companies they do business with.

IBM Sterling B2B Integrator software helps companies execute a smarter commerce strategy by synchronizing virtually every part of the value chain. It addresses complex integration challenges, enabling you to connect your systems to those of your business partners.

- IBM Sterling B2B Integrator is a transaction engine and set of components designed to run processes you define and manage according to your business needs.
- It supports high-volume electronic message exchange, complex routing, translation, and flexible interaction with multiple internal systems and external business partners.
- Has robust security infrastructure, visual management tools for easy configuration of and visibility into work flows, system and trading partner activities.
- Integrates applications, processes, data and people, both within and outside an organization.

Report on the Present Investigation and Progress
(Progress during this 15-days Period)

### Laptop Setup and Software Installation

The computing machine provided to me is a Lenovo ThinkPad business Ultrabook. For all the IBM employees, its necessary to setup the machine with proper credentials and IBM Authentication services. After the Laptop setup, the following necessary software and services were being installed.

1. Eclipse IDE
2. Putty
3. FileZilla
4. IBM Cloud CLI

5. Dockers
6. IBM Bluemix Account creation
7. Node.js
8. Postman Rest API extension

Access request to Company Servers / B2B Service

In order to work on the B2B Sterling Integrator product, access to the servers of IBM on which the product is currently deployed and is running live is to be acquired. The access to the servers and the B2B project team was requested and was granted within a week.
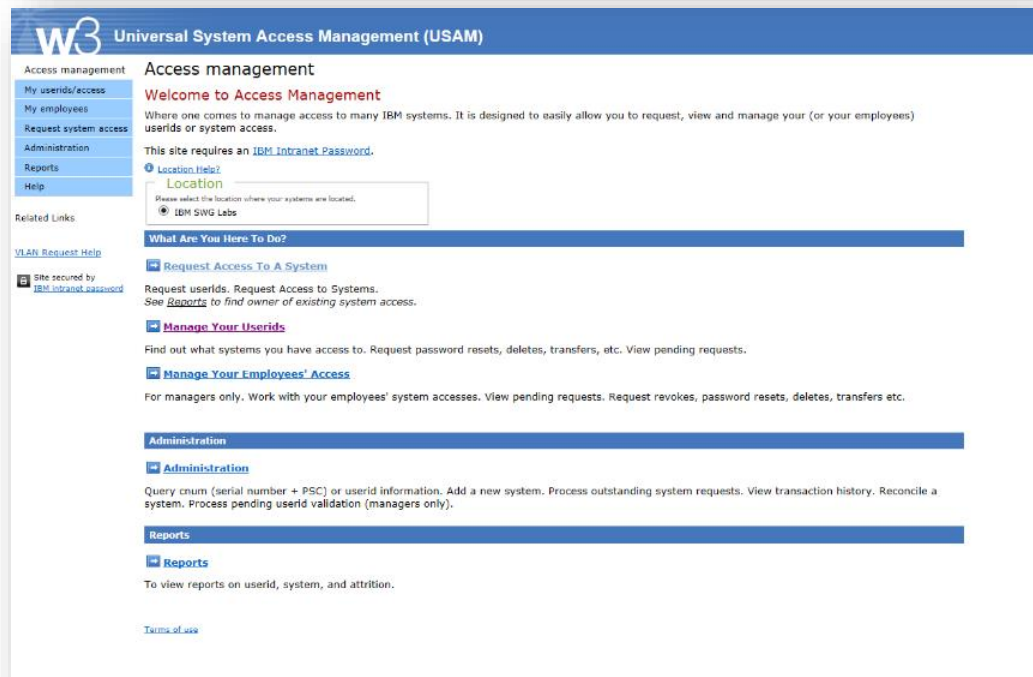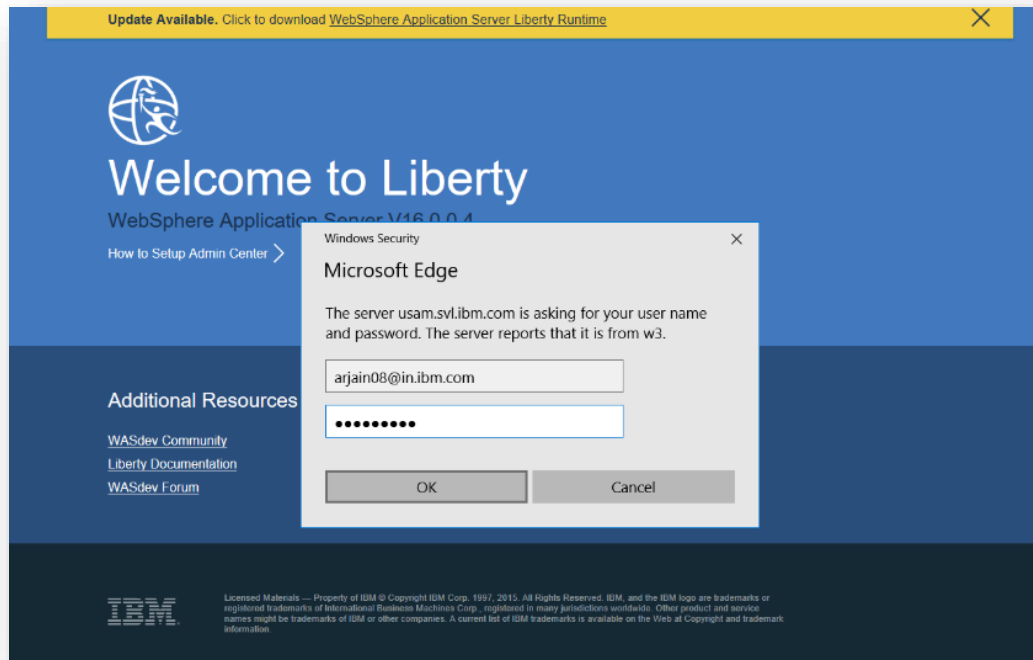
Universal System Access Management (USAM)

Request system access
Location: IBM SWG Labs

ⓘ Help?

Owner: Jain Mr, Arpit (Arpit) *VENDOR*

If the owner listed above is correct, then continue to 'System Search' below.
Search BluePages to change new System Access Owner.
To search BluePages again, enter new search criteria and press the GO button. Do not use the Browser Back button.

Search On: [Name (Last, First) ▾]   **Search For:** [_____] [GO]

System Search

- Search below by name or related key words, for all services for which you wish to request access.
  (This is usually not a host name. Try searching by Site name, or Product).
- Check desired systems and press SUBMIT. You will be prompted for additional information on the next page.
- Subsequent searches will append to the table of already checked systems.

Search for: [Networks/Columbus/NAD/] [Search]

System Search Results:

ⓘ Help?

SYSTEM_NAME	DESCRIPTION
☑ Networks/Columbus/NAD/Dev Center	Development Center NAD, Columbus, Ohio (Include server IP address in justification)

[Submit]

Terms of use

Universal System Access Management (USAM)

My userids/access
Location: IBM SWG Labs

Current system access | **Pending requests** | **Historic system access** | **Approval authority delegation**

Jain Mr, Arpit (Arpit) *VENDOR* - ACTIVE

Current System Access (If an * appears next to a link, a new window external to Access Management will open)

STATUS	USERID	SYSTEM	PRIV/GRP ACCESS	ACTIONS
ACTIVE	arjain08@in.ibm.com	HURSLEY/RTC/jazzc01.hursley.ibm.com:9443/B2B-SFG[ccm]	[[Team Member]]	[Delete] [Manage_Groups/Privileges] [Email Admin]
ACTIVE	arjain08	IS Dublin OH/System/Unix-Linux - Dublin	[[dublr021vm.devlab.ibm.com][users][100]] [[dublr022vm.devlab.ibm.com][users][100]] [[dublr023vm.devlab.ibm.com][users][100]] [[dublr024vm.devlab.ibm.com][users][100]]	[Delete] [Manage_Groups/Privileges] [Transfer] [Email Admin]
ACTIVE	arjain08@in.ibm.com	Networks/Columbus/NAD/Dev Center		[Delete] [Email Admin]

Terms of use

IBM® Sterling B2B Integrator

[Admin Console] [Operator] [Advanced File Transfer]   Manage Layout

Administration Menu

- Business Processes
- Trading Partner
- Deployment
- eInvoicing
- EBICS
- Operations
- Accounts
- Standards Processing Engine

Admin Console Home

System Alerts 06/11/2018 6:26:14 AM
⚠ No alerts to report

System News
📄 No news items to report

Tools
Run Graphical Process Modeler   [Go!]

Tips

Getting Started
The Graphical Process Modeler enables you to easily build XPath expressions that represent complex rules within a business process, for example, a rule to locate a specific node or source content within an XML document.

Links
▸ XML Standard
▸ What is BPML?
▸ Product Documentation

(Product Interface)

Research Work

After installation of the software and acquiring access to the B2B Sterling Servers, I was all set to work on and test the functionality of B2B sterling Integrator product.
IBM's aim is to convert **IBM B2B Integrator** (Extremely Large Software Product) which is a Monolithic Product into Microservice Architecture. I need to know the basic concepts of Microservices and Microservice Architecture.

Primary question is how to decompose Monolithic application (Like B2B Integrator) into microservices and how to deploy microservices on Cloud taking care of the inter-communication between them using Language neutral interfaces (Like REST API).

My final task of this duration was to research and study about these topics and give a presentation meeting to the entire B2B Team regarding my study and findings. Following is the link to the presentation I delivered.
[LINK]

Apart from this I also need to understand BPML or Business Process Modelling Language during the next 15 days phase. The complete B2B Sterling Integrator product is based on the business processes and its essential for the complete understanding of the product to understand the modelling of business processes.

Also, in order to work and understand the internal functioning of the B2B Sterling product, a request for the access of the GitHub repository of the product is applied. The request will be granted most probably in the next week team meeting.

Results and Discussions

After researching on microservice architecture of software development, it was found that it is an effective practice to decompose a large complex monolithic application into small microservices for better and optimized handling of software components.

Advantages of microservices Architecture:

- Frequent Releases can be handled easily.
- Enables continuous integration and delivery of software components.
- Better fault isolation; if one microservice fails, the others will continue to work and the entire system will continue to function rather than crashing down.
- Codes can be written in many languages and frameworks. Each microservice can be written in a different manner irrespective of other microservices.
- Each microservice has its own database eliminating the discrepancies of updating a common database from several simultaneous calls.

Microservice Architecture has some disadvantages too. It is very complex to design and an expensive process because it uses more resources. If we don't want to further expand your application then don't go for it but if you need frequent releases and want to maintain each module independently, then it is an amazing alternative to consider.

IBM aims to transform the B2B Sterling product into Microservice architecture. The application is extremely large and monolithic. The making of the product is in process since the last 8 years and is still growing. Primary aim of my entire Six-month PBI period is to convert 2-3 components of B2B Sterling Integrator into microservices and connect with the main application.

Conclusions

During these 15 days, I completed the setup of prerequisites on my Company Work Machine. Then, I Acquired the access to the Servers and product I am going to work upon. I Experimented and performed a certain set of test cases on the Product Interface. Lastly, I conducted a study about the Microservice architecture and why its useful for Developing Large Applications. Under my research, I referred to several Blogs (Esp. Martin Fowler) and Video tutorials. I completed the Microservice course on Coursera [LINK] for in-depth knowledge. At the end, I gave the presentation [LINK] on Microservice Architecture to my Product team.

Next Target
My target for the next 15 days is to make a demo application leveraging the microservice architecture and deploy it on the Cloud. Apart from it I am going to make communication channel between the microservices to interact using language neutral interface.