

BigFix Runbook AI Pre-Requisite Guide Version 6.3





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Contents

1	Pre	face	. 12
	1.1	Intended Audience	. 12
	1.2	About this Guide	. 12
	1.3	Related Documents	. 12
	1.4	Conventions	. 13
2	Pre	e-requisites for BigFix Runbook AI Component	. 14
	2.1	IIS	. 16
	2.1	.1 Installation Procedure	. 16
	2.2	Dot NET Framework- 4.8:	. 23
	2.3	Microsoft ACE OLEDB 12.0	. 23
	2.3	.1 Installation Procedure	. 23
	2.4	Python	. 24
	2.4	.1 Installation Procedure	. 24
	2.5	NLTK package	. 26
	2.5	.1 Installation Procedure	. 26
	2.6	Open SSL Package	. 26
	2.6	1 Installation Procedure	. 26
	2.7	Apache Server	. 27
	2.7	.1 Installation Procedure	. 27
	2.8	Microsoft Visual C++ 2015 Redistributable Package	. 28
	2.8	.1 Installation Procedure	. 29
	2.9	AntiWord	. 29
	2.9	.1 Installation Procedure	. 30
	2.10	Spacy	. 30

BigFix

2.10.3	.1 Installation Procedure	
2.11	NumPy	
2.11.3	.1 Installation Procedure	
2.12	Mod_wsgi	
2.12.1	.1 Installation Procedure	
2.13	En_core_web_sm	
2.13.2	.1 Installation Procedure	
2.14	Java	
2.14.1	.1 Installation Procedure	
2.15	MongoDB	
2.15 2.15.2	MongoDB	
2.15 2.15.2 2.15.2	MongoDB	
2.15 2.15.2 2.15.2 2.16	MongoDB .1 MongoDB Installation Procedure without HA mode .2 MongoDB Installation Procedure – with HA mode Apache SOLR	
2.15 2.15.2 2.15.2 2.16 2.16.2	MongoDB 1 MongoDB Installation Procedure without HA mode 2 MongoDB Installation Procedure – with HA mode Apache SOLR 1 SOLR Installation – High Availability (HA) Mode	
2.15 2.15.2 2.15.2 2.16 2.16.2 2.16.2	MongoDB	
2.15 2.15.2 2.15.2 2.16 2.16.2 2.16.2 2.17	MongoDB	
2.15 2.15.2 2.15.2 2.16 2.16.2 2.16.2 2.17 2.17.2	MongoDB	



Table of Figures

Figure 1 - IIS Installation Procedure (Cont.)17
Figure 2 - IIS Installation Procedure (Cont.)17
Figure 3 - IIS Installation Procedure (Cont.)
Figure 4 - IIS Installation Procedure (Cont.)
Figure 5 - IIS Installation Procedure (Cont.)
Figure 6 - IIS Installation Procedure (Cont.)
Figure 7 - IIS Installation Procedure (Cont.)
Figure 8 - IIS Installation Procedure (Cont.)21
Figure 9 - IIS Installation Procedure (Cont.)21
Figure 10 - IIS Installation Procedure (Cont.)22
Figure 11 - IIS Installation Procedure (Cont.)22
Figure 12 - Python Installation
Figure 13 - System Variable Screen25
Figure 14 - Python Shell
Figure 14 - Python Shell
Figure 14 - Python Shell 25 Figure 15 - Command window- Unsuccessful installation of Python 26 Figure 16 - Screenshot of the Apache service 28
Figure 14 - Python Shell 25 Figure 15 - Command window- Unsuccessful installation of Python 26 Figure 16 - Screenshot of the Apache service 28 Figure 17 - Installation of Visual C++ 29
Figure 14 - Python Shell 25 Figure 15 - Command window- Unsuccessful installation of Python 26 Figure 16 - Screenshot of the Apache service 28 Figure 17 - Installation of Visual C++ 29 Figure 18 - Environment Variable Screen 30
Figure 14 - Python Shell25Figure 15 - Command window- Unsuccessful installation of Python26Figure 16 - Screenshot of the Apache service28Figure 17 - Installation of Visual C++29Figure 18 - Environment Variable Screen30Figure 19 - Spacy Package Content31
Figure 14 - Python Shell25Figure 15 - Command window- Unsuccessful installation of Python26Figure 16 - Screenshot of the Apache service28Figure 17 - Installation of Visual C++29Figure 18 - Environment Variable Screen30Figure 19 - Spacy Package Content31Figure 20 - Uninstalling existing NumPy Package32
Figure 14 - Python Shell25Figure 15 - Command window- Unsuccessful installation of Python26Figure 16 - Screenshot of the Apache service28Figure 17 - Installation of Visual C++29Figure 18 - Environment Variable Screen30Figure 19 - Spacy Package Content31Figure 20 - Uninstalling existing NumPy Package32Figure 21 - NumPy zip folder contents32
Figure 14 - Python Shell25Figure 15 - Command window- Unsuccessful installation of Python26Figure 16 - Screenshot of the Apache service28Figure 17 - Installation of Visual C++29Figure 18 - Environment Variable Screen30Figure 19 - Spacy Package Content31Figure 20 - Uninstalling existing NumPy Package32Figure 21 - NumPy zip folder contents32Figure 22 - File Explorer35

Figure 24 - Adding JAVA_HOIVIE variable	
Figure 25 - Adding java to Path variable	
Figure 26 - Check Java Version	
Figure 27 - MongoDB Installation - Community Version (non-HA)	
Figure 28 - MongoDB Installation - Community Version (non-HA) (Cont.)	
Figure 29 - MongoDB Installation - Community Version (non-HA) (Cont.)	
Figure 30 - MongoDB Installation - Community Version (non-HA) (Cont.)	41
Figure 31 - MongoDB Installation - Community Version (non-HA) (Cont.)	
Figure 32 – Creation of MongoDB service	
Figure 33 - Creation of MongoDB service (Cont.)	
Figure 34 - Creation of MongoDB service (Cont.)	
Figure 35 – Start MongoDB Service	45
Figure 36 - Start MongoDB Service (Cont.)	
Figure 37 – Enable Authentication	46
Figure 37 – Enable Authentication Figure 38 - MongoDB Installation - Enterprise Version (non-HA) (Cont.)	46
Figure 37 – Enable Authentication Figure 38 - MongoDB Installation - Enterprise Version (non-HA) (Cont.) Figure 39 - MongoDB Installation - Enterprise Version (non-HA) (Cont.)	46 48 49
 Figure 37 – Enable Authentication Figure 38 - MongoDB Installation - Enterprise Version (non-HA) (Cont.) Figure 39 - MongoDB Installation - Enterprise Version (non-HA) (Cont.) Figure 40 - MongoDB Installation - Enterprise Version (non-HA) (Cont.) 	
 Figure 37 – Enable Authentication Figure 38 - MongoDB Installation - Enterprise Version (non-HA) (Cont.) Figure 39 - MongoDB Installation - Enterprise Version (non-HA) (Cont.) Figure 40 - MongoDB Installation - Enterprise Version (non-HA) (Cont.) Figure 41 - MongoDB Installation - Enterprise Version (non-HA) (Cont.) 	
 Figure 37 – Enable Authentication Figure 38 - MongoDB Installation - Enterprise Version (non-HA) (Cont.) Figure 39 - MongoDB Installation - Enterprise Version (non-HA) (Cont.) Figure 40 - MongoDB Installation - Enterprise Version (non-HA) (Cont.) Figure 41 - MongoDB Installation - Enterprise Version (non-HA) (Cont.) Figure 42 - MongoDB Installation - Enterprise Version (non-HA) 	
 Figure 37 – Enable Authentication Figure 38 - MongoDB Installation - Enterprise Version (non-HA) (Cont.) Figure 39 - MongoDB Installation - Enterprise Version (non-HA) (Cont.) Figure 40 - MongoDB Installation - Enterprise Version (non-HA) (Cont.) Figure 41 - MongoDB Installation - Enterprise Version (non-HA) (Cont.) Figure 42 - MongoDB Installation - Enterprise Version (non-HA) (Cont.) Figure 43 - MongoDB Installation - Enterprise Version (non-HA) (Cont.) 	
 Figure 37 – Enable Authentication Figure 38 - MongoDB Installation - Enterprise Version (non-HA) (Cont.) Figure 39 - MongoDB Installation - Enterprise Version (non-HA) (Cont.) Figure 40 - MongoDB Installation - Enterprise Version (non-HA) (Cont.) Figure 41 - MongoDB Installation - Enterprise Version (non-HA) (Cont.) Figure 42 - MongoDB Installation - Enterprise Version (non-HA) Figure 43 - MongoDB Installation - Enterprise Version (non-HA) (Cont.) Figure 44 - MongoDB Installation - Enterprise Version (non-HA) (Cont.) 	
 Figure 37 – Enable Authentication Figure 38 - MongoDB Installation - Enterprise Version (non-HA) (Cont.) Figure 39 - MongoDB Installation - Enterprise Version (non-HA) (Cont.) Figure 40 - MongoDB Installation - Enterprise Version (non-HA) (Cont.) Figure 41 - MongoDB Installation - Enterprise Version (non-HA) (Cont.) Figure 42 - MongoDB Installation - Enterprise Version (non-HA) Figure 43 - MongoDB Installation - Enterprise Version (non-HA) (Cont.) Figure 43 - MongoDB Installation - Enterprise Version (non-HA) (Cont.) Figure 44 - MongoDB Installation - Enterprise Version (non-HA) (Cont.) Figure 45 - MongoDB Installation - Enterprise Version (non-HA) (Cont.) 	
 Figure 37 – Enable Authentication Figure 38 - MongoDB Installation - Enterprise Version (non-HA) (Cont.) Figure 39 - MongoDB Installation - Enterprise Version (non-HA) (Cont.) Figure 40 - MongoDB Installation - Enterprise Version (non-HA) (Cont.) Figure 41 - MongoDB Installation - Enterprise Version (non-HA) (Cont.) Figure 42 - MongoDB Installation - Enterprise Version (non-HA) (Cont.) Figure 43 - MongoDB Installation - Enterprise Version (non-HA) (Cont.) Figure 43 - MongoDB Installation - Enterprise Version (non-HA) (Cont.) Figure 44 - MongoDB Installation - Enterprise Version (non-HA) (Cont.) Figure 45 - MongoDB Installation - Enterprise Version (non-HA) (Cont.) Figure 46 - MongoDB Installation - Start MongoDB Service (non-HA) 	
 Figure 37 – Enable Authentication Figure 38 - MongoDB Installation - Enterprise Version (non-HA) (Cont.) Figure 39 - MongoDB Installation - Enterprise Version (non-HA) (Cont.) Figure 40 - MongoDB Installation - Enterprise Version (non-HA) (Cont.) Figure 41 - MongoDB Installation - Enterprise Version (non-HA) (Cont.) Figure 42 - MongoDB Installation - Enterprise Version (non-HA) (Cont.) Figure 43 - MongoDB Installation - Enterprise Version (non-HA) (Cont.) Figure 43 - MongoDB Installation - Enterprise Version (non-HA) (Cont.) Figure 44 - MongoDB Installation - Enterprise Version (non-HA) (Cont.) Figure 45 - MongoDB Installation - Enterprise Version (non-HA) (Cont.) Figure 46 - MongoDB Installation - Enterprise Version (non-HA) (Cont.) Figure 47 - MongoDB Installation - Start MongoDB Service (non-HA) (Cont.) 	

Figure 49 - MongoDB Installation – Enable SSL Authentication (non-HA)	56
Figure 50 - Representation of MongoDB Replication set	59
Figure 51 - MongoDB Installation - Community Version (HA)	60
Figure 52 - MongoDB Installation - Community Version (HA) (cont.)	61
Figure 53 - MongoDB Installation - Community Version (HA) (cont.)	61
Figure 54 - MongoDB Installation - Community Version (HA) (cont.)	62
Figure 55 - MongoDB Installation - Community Version (HA) (cont.)	63
Figure 56 - MongoDB Installation - Community Version (HA) (cont.)	64
Figure 57 - MongoDB Installation - Community Version (HA) (cont.)	64
Figure 58 - MongoDB Installation - Community Version (HA) (cont.)	65
Figure 59 - MongoDB Installation - Community Version (HA) (cont.)	65
Figure 60 - MongoDB Installation - Community Version (HA) (cont.)	66
Figure 61 - MongoDB Installation - Community Version (HA) (cont.)	66
Figure 62 - MongoDB Installation - Community Version (HA) (cont.)	68
Figure 63 - MongoDB Installation - Enterprise Version (HA)	71
Figure 64 - MongoDB Installation - Enterprise Version (HA) (Cont.)	72
Figure 65 - MongoDB Installation - Enterprise Version (HA) (Cont.)	72
Figure 66 - MongoDB Installation - Enterprise Version (HA) (Cont.)	73
Figure 67 - MongoDB Installation - Enterprise Version (HA) (Cont.)	74
Figure 68 - MongoDB Installation - Enterprise Version (HA) (Cont.)	75
Figure 69 - MongoDB Installation - Enterprise Version (HA) (Cont.)	75
Figure 70 - MongoDB Installation - Enterprise Version (HA) (Cont.)	76
Figure 71 - MongoDB Installation - Enterprise Version (HA) (Cont.)	76
Figure 72 - MongoDB Installation - Enterprise Version (HA) (Cont.)	77
Figure 73 - MongoDB Installation - Enterprise Version (HA) (Cont.)	77

Figure 74 - MongoDB Installation - Enterprise Version (HA) (Cont.)	80
Figure 75 - MongoDB Installation - Enterprise Version (HA) (Cont.)	81
Figure 76 - Installation of Solr in HA – Architecture	85
Figure 77 - Installation of ZooKeeper	86
Figure 78 - Installation of ZooKeeper (cont.)	86
Figure 79 - Installation of Zookeeper (cont.)	87
Figure 80 - Installation of Zookeeper (cont.)	88
Figure 81 - Enabling Zookeeper as Windows Service	89
Figure 82 - Enabling Zookeeper as Windows Service (cont.)	89
Figure 83 - Enabling Zookeeper as Windows Service (cont.)	90
Figure 84 - Enabling Zookeeper as Windows Service (cont.)	90
Figure 85 - Enabling Zookeeper as Windows Service (cont.)	91
Figure 86 - Enabling Zookeeper as Windows Service (cont.)	91
Figure 87 - Installation of SOLR	92
Figure 88 - Installation of SOLR (cont.)	93
Figure 89 - Installation of SOLR (cont.)	97
Figure 90 - Enabling Solr as Windows Service	99
Figure 91 - Enabling Solr as Windows Service (cont.)	99
Figure 92 - Enabling Solr as Windows Service (cont.)	
Figure 93 - Enabling Solr as Windows Service (cont.)	
Figure 94 - Enabling Solr as Windows Service (cont.)	100
Figure 95 - Enabling Solr as Windows Service (cont.)	101
Figure 96 - Enabling Solr as Windows Service (cont.)	101
Figure 97 - Enabling Solr as Windows Service (cont.)	102

Figure 99- Installation of SOLR without HA (Cont.)	. 104
Figure 100 - Installation of SOLR (cont.)	. 108
Figure 101 - Enabling Solr as Windows Service	. 110
Figure 102 - Enabling Solr as Windows Service (cont.)	. 110
Figure 103 - Enabling Solr as Windows Service (cont.)	. 111
Figure 104 - Enabling Solr as Windows Service (cont.)	.111
Figure 105 - Enabling Solr as Windows Service (cont.)	. 111
Figure 106 - Enabling Solr as Windows Service (cont.)	. 112
Figure 107 - Enabling Solr as Windows Service (cont.)	. 112



List of Tables

Table 1 - Conventions	
Table 2 – Software Requirements	
Table 3 - Update .Net Framework 4.8	23
Table 4 - Update .Net Framework 4.8	Error! Bookmark not defined.
Table 5 – Microsoft ACE OLED 12.0 Requirements	23
Table 6 – Python Details	24
Table 7 - NLTK Requirements	26
Table 8 – SSL Package Requirements	26
Table 9 – Apache Server Requirements	27
Table 10 - Microsoft Visual C++ 2015 Redistributable Package	
Table 11 – AntiWord Requirements	29
Table 12 – Spacy Requirements	
Table 13 – NumPy Requirements	
Table 14 – Java Details	
Table 15 – MongoDB Requirements	
Table 16 – Apache SOLR Requirements	83
Table 17 – Zookeeper Requirements	
Table 18 – Certificate Requirements	
Table 19 - DLL Configuration for iRecommend multi-process	



Document Revision History

This guide is updated with each release of the product or when necessary.

This table provides the revision history of this Pre-Requisite Guide.

Version Date	Description
March, 2023	BigFix Runbook AI v6.3 Pre-Requisite Guide
July, 2023	BigFix Runbook AI v6.3 Pre-Requisite Guide



1 Preface

This section provides information about the HCL BigFix Runbook AI Pre-Requisite Guide and includes the following topics:

- Intended Audience
- About This Guide
- <u>Related Documents</u>
- <u>Conventions</u>

1.1 Intended Audience

This information is intended for administrators responsible for installing BigFix Runbook AI and infrastructure administrators responsible for provisioning infrastructure required for installation of BigFix Runbook AI.

1.2 About this Guide

This guide provides instructions to install the prerequisites required for BigFix Runbook AI. This includes the installation of MongoDB and Solr for both HA (High Availability) and non-HA modes as well as generation of certificates for authentication and authorization purposes.

1.3 Related Documents

The following documents can be referenced in addition to this guide for further information on the BigFix Runbook AI platform.

- BigFix Runbook AI Installation Guide



1.4 Conventions

The following typographic conventions are used in this document:

	Table 1 - Conventions		
Convention	Element		
Boldface	Indicates graphical user interface elements associated with an action, or terms		
Dolarace	defined in text or the glossary		
Underlined Blue Face	Indicates cross-reference and links		
Italic Indicates document titles, occasional emphasis, or glossary terms			
Courier New (Font)	Indicates commands within a paragraph, URLs, code in examples, and paths including		
	onscreen text and text input from users		
Numbered lists	Indicates steps in a procedure to be followed in a sequence		
Bulleted lists	Indicates a list of items that is not necessarily meant to be followed in a sequence		

2 Pre-requisites for BigFix Runbook AI Component

This section provides an overview of the prerequisites to run the BigFix Runbook AI installer. Once the infrastructure is ready, determine the server where the installer will be executed. Each type of server – Web Server, Application Server, Advanced AI Server and Database Server have different prerequisites depending on the components being installed. Once you have identified the required servers, components, and the deployment mode, please proceed with the installation of the pre-requisite software and utilities.

This documentation is only for Windows 2012 R2 and higher versions.

The following table describes the software requirements to install the components.

Server	Component	Sub-Components	Software Requirements
Web Server	Web Component	 Web UI Key Rotation Service 	 IIS 10.0 or above Dot Net Framework 4.8.x Microsoft ACE OLEDB 12.0
Application Server	Application Component – Microsoft Dot Net Application Component -	 Data Collector RBA Executor Generic Executor Release Generic Listener iParse iUnique 	 Dot Net Framework 4.8.x Python 3.8.10 64-bit NLTK 3.4.1 OpenSSL-Win64 Apache Server 2.4 VC++ 2015 64-bit Redistributable package AntiWord Spacy 3.1.2 Numpy 1.20.3 Mod_wsgi 4.9.0 En_core_web_sm 3.1.0
Advanced Al Server	Advanced Al Component - Python	 iKecommend iScrape iKnowledge 	 Python 3.8.10 64-bit NLTK 3.4.1 OpenSSL-Win64

Table 2 – Software Requirements



Server	Component	Sub-Components	Software Requirements
		- Advanced	- Apache Server 2.4
		Knowledge	- VC++ 2015 64-bit Redistributable package
		- Knowledge	- AntiWord
		Rating	- Spacy 3.1.2
			- Numpy 1.20.3
			- Mod_wsgi 4.9.0
			- En_core_web_sm 3.1.0
			- Google Chrome Browser
			- Oracle Distribution of Java JDK 1.8.x
			(Required only for Solr installation)
Database	Database	Transactional	MS SQL 2016 /MS SQL 2022 (+) Enterprise / Standard
Server	Database	Database	edition 64 bit
MongoDB	Document Storage	MongoDB	MongoDB 4.0
	Indexer	SOLR	- SOLR 8.5.0
			- nssm 2.24
Certificates (applicable for all tiers)		1	SSL Certificates



2.1 IIS

	Table 14 – IIS Requirements
Version	10.0 or above
Purpose	It is used as a server for website hosting
Source	Part of Windows feature sets

2.1.1Installation Procedure

- 1. Open Control Panel.
- 2. Search for 'Windows feature'. It will feature under Programs.
- 3. Click Turn Windows Features On or Off.



4. Click Next.



5. Click Next

Before You Begin	Select the installation type. You can install roles and features on a running physical computer or virtual machine or on an offline virtual bard disk (VHD)
Installation Type	
Server Selection	Configure a single server by adding roles, role services, and features.
	Remote Desiston Services installation
	Install required role services for Virtual Desktop Infrastructure (VDI) to create a virtual machine-based
	or session-based desktop deployment.
	< Previous Next > Install Cancel

6. Click Next.

tallation Type	 Select a server fr Select a virtual h 	Select a server from the server pool Select a virtual hard disk		
ver Belection	Server Pool	Server Pool		
i tures nfirmation	Filter:			
	Name	IP Address	Operating System	
	iAutomateApSrv1		Microsoft Windows Server 2016 Datacenter	
	1 Computer(s) foun This page shows ser and that have been newly-added server	d vers that are running Wir added by using the Add s from which data collect	ndows Server 2012 or a newer release of Windows Server, Servers command in Server Manager. Offline servers and ion is still incomplete are not shown.	

7. Select Web Server (IIS) and click Next.

Belore You Begin	Select one or more roles to install on the selected server.
Installation Type	Roles
Server Selection	Active Directory Lightweight Directory Services
Server Roles	Active Directory Rights Management Services
Features	Device Health Attestation
Web Server Role (IIS)	DNS Server
Role Services	↓ Fax Server ▶ ■ File and Storage Services (1 of 12 installed)
Confirmation	Host Guardian Service
Results	 ☐ Hyper-V ☐ MultiPoint Services ☐ Network Controller ☐ Network Policy and Access Services ☐ Print and Document Services ☐ Remote Access ☐ Remote Desktop Services ☐ Volume Activation Services ☑ Windows Deployment Services ☐ Windows Server Essentials Experience ☐ Windows Server Update Services

Figure 4 - IIS Installation Procedure (Cont.)

8. Select .NET framework 3.5 Features.



9. Click **Next** for installing IIS.

ew i	installation progress
Ð	Feature installation
	Installation started on iAutomateApSrv1
NE	T Framework 3.5 Features
	.NET Framework 3.5 (includes .NET 2.0 and 3.0)
	HTTP Activation
NE	T Framework 4.6 Features
	ASP.NET 4.6
Ve	b Server (IIS)
	Management Tools
	IIS Management Console
	Web Server
	Application Development
	.NET Extensibility 3.5
1 bor	You can close this wizard without interrupting running tasks. View task progress or open this page again by clicking Notifications in the command bar, and then Task Details. t configuration settings
	< Previous Next > Close Cancel
	Figure 6 US Installation Procedure (Cent.)

10. Open Control Panel and search for 'Windows feature'. It will feature under Programs.

11. Click Turn Windows Features on or off.



12. Click Next and expand the Web Server (IIS).



13. Expand Application Development and select features as shows in the image below.



14. Click **Next** to proceed with installation.

	Installation started on iAutomateApSrv1
Neb	Server (IIS)
	Management Tools
	IIS 6 Management Compatibility
	IIS 6 Metabase Compatibility
	Web Server
	Application Development
	ASP
	ASP.NET 3.5
	ASP.NET 4.6
	CGI
	Server Side Includes
1	You can close this wizard without interrupting running tasks. View task progress or open page again by clicking Notifications in the command bar, and then Task Details.
ort	configuration settings

- 15. To validate successful installation of IIS, type Run in Windows Search Bar and Press Enter.
- 16. Type '**inetmgr'** and click **Enter**. Once the installation is successful, the following screen pops up to confirm the installation of IIS.

ons		omo		Actions
		ome		Manage Server
(H	Filter: • 77 <u>G</u> o	Show All Group by: Area	• 🗊 •	S Restart
	ASP.NET		*	Start
		NET NET Trust Application	Connection Machine Key, Range and Drunder, Service State SMTR E-mail	View Application Pools
	Authorizat Compilation Pages	Globalization Levels Settings	Strings Controls	Change .NET Framework Version
	2 🔏 🖷	CGI	🔉 省 🗊 🗟 🖑 💦	• Get New Web Platform Components
	ASP Authentic Authorizat Rules	CGI Default Directory Document Browsing	Error Pages FastCGI Handler HTTP HTTP IP Address Settings Mappings Redirect Respon and Doma	😧 Help
	🌇 🍑 🍺	at 🖗 😂		
	ISAPI and ISAPI Filters MIME Type CGI Restri	es Modules Output Request Caching Filtering	Server Worker Certificates Processes	
	Management	F	A	
	Centralized Configurat Feature Certificates Editor Delegation	Shared n Configurat		

Figure 11 - IIS Installation Procedure (Cont.)

For any issue follow below link for window 2016 <u>https://www.rootusers.com/how-to-install-iis-in-windows-server-2016/</u> For any issue follow below link for window 2019 <u>https://www.rootusers.com/how-to-install-iis-in-windows-server-2019/</u>



https://learn.microsoft.com/en-us/iis/application-frameworks/scenario-build-an-aspnetwebsite-on-iis/configuring-step-1-install-iis-and-asp-net-modules

2.2 Dot NET Framework- 4.8:

Table 3 - Update .Net Framework 4.8

Version	.NET Framework 4.8
	Available as part of BigFix Runbook AI installer package.
Source	Package Name →.NETFRAMEWORK4.8.zip
	Available as part of BigFix Runbook AI installer package

Use the links below in case of any help require to install and error fixing: <u>https://help.salesforce.com/s/articleView?id=sf.cg_modeler_ibe_install_dotnet.htm&ty_pe=5</u>

https://learn.microsoft.com/en-us/dotnet/framework/install/

2.3 Microsoft ACE OLEDB 12.0

Table 4 – Microsoft ACE OLED 12.0 Requirements

Version	12.0
Purpose	It is used to download the runbook metadata format
	Available as part of iAutomate installer package
	Follow the below path for 32 bit machine:
Source	 Pre-Requisite Software AccessDatabaseEngine.exe
	Follow the below path for 64 bit machine:
	 Pre-Requisite Software AccessDatabaseEngine_X64.exe

2.3.1Installation Procedure

1. Refer the file from the source field mentioned in the table above and run the exe.



2.4 Python

	Table 5 – Python Details
Version	Python 3.8.10
Purpose	All AI components of BigFix Runbook AI requires python as pre-requisite.
Source	Available as part of BigFix Runbook AI installer package. Follow the below path:
	Pre-Requisite Software \rightarrow python-3.8.10-amd64.exe

2.4.1Installation Procedure

- Download the file python-3.8.10-amd64.exe from the Path mentioned in the source field of <u>Table</u>
 <u>5 Python Details</u>. For installation, double click on python-3.8.10-amd64.exe file.
- 2. Create new folder Python38 with path "C:\Python38" if not already existing.
- 3. During the installation, browse for the location i.e., C:\Python38 and then click Next.
- 4. Select option Install Python for all users.

Python 3.8.10 (64-bit) Setup		_		×
	Advanced Options			
	☑ Install for all users			
	Associate files with Python (requires the py launcher)			
	Create shortcuts for installed applications			
	Add Python to environment variables			
	Precompile standard library			
	Download debugging symbols			
-	Download debug binaries (requires VS 2015 or later)			
	Customize install location			
outhon	C:\Python38		Brows	e
for				
windows	Back Install		Cance	el

Figure 12 - Python Installation

- 5. The system environment variable **PYTHON_HOME** needs to be set with the path **C:\Python38**.
- 6. Add below paths to system variable Path:



- C:\Python38
- C:\Python38\Scripts

C:\Python38\Scripts\	New
C:\Python38\	
	Edit
	Browse
· · · · · · · · · · · · · · · · · · ·	
· · · · · · · · · · · · · · · · · · ·	Delete

Figure 13 - System Variable Screen

Please ensure the path added to PYTHON_PATH and Path variable don't have '\' appended at the end.

- 7. To validate successful installation of Python, perform the below steps:
 - a. Open the Command Prompt as Administrator, type python and press Enter.



b. If Python installation is successful, the Python Version will be displayed. If Python installation was not successful, then the below screen is displayed.





Figure 15 - Command window- Unsuccessful installation of Python

2.5 NLTK package

Table 6 - NLTK Requirements

Version	3.4.1
Purpose	This package is used by BigFix Runbook AI for Natural Language Processing tasks.
Course	Available as part of BigFix Runbook AI installer package. Follow the below path:
Source	Pre-Requisite Software \rightarrow nltk_data.zip

2.5.1Installation Procedure

- 1. Download the file **nltk_data.zip** from the Path mentioned in the source field of <u>Table 6 NLTK</u> <u>Requirements.</u>
- 2. Extract the contents of the zip file in the given path: C:\nltk_data.

2.6 Open SSL Package

Table 7 – SSL Package Requirements

	It is required for the creation of certificates. Please note that certificates generated by these steps
Purpose	are self-signed certificates only. If you are looking for CA signed certificates, then contact the
	concerned stakeholders from customer.
Course	Available as part of BigFix Runbook AI installer package. Follow the below path:
Source	Pre-Requisite Software \rightarrow OpenSSL-Win64.zip

2.6.1Installation Procedure

- Download the file OpenSSL-Win64.zip from the Path mentioned in the source field of <u>Table 7 SSL</u> <u>Package Requirements.</u>
- 2. Extract the contents of the zip file in the path C:\OpenSSL-Win64.
- 3. Set the system environment variable with name **OPENSSL_CONF** with the path as:

C:\OpenSSL-Win64\bin\openssl.cfg



4. In the system environment variable name as "Path", add the following:

C:\OpenSSL-Win64\bin

2.7 Apache Server

Table 8 – Apache Server Requirements

Version	2.4
Purnose	Apache Server is used to release features of AI components as REST APIs. This also creates
	window service for all python components.
	Available as part of BigFix Runbook AI installer package. Follow the below path:
	Pre-Requisite Software → Apache24.zip
	Certificate Path - Available as part of BigFix Runbook AI installer package.
Source	Follow the below path:
	Pre-Requisite Software → Python certificate.zip
	Follow the below path for DLL
	 Pre-Requisite Software → HCL.iAutomate.EncryptDecrypt.dll
	 Pre-Requisite Software → Newtonsoft.Json.dll

2.7.1Installation Procedure

- Download the file Apache24.zip from the Path mentioned in source field of <u>Table 8 Apache</u> <u>Server.</u>
- 2. Extract the contents of zip file. It should be placed in the given path: C:\Apache24.
- 3. Add the system environment variable ANT_HOME with the path *C:\Apache24*
- 4. To the system environment Variable Path, add the below paths:
 - C:\Apache24\bin
 - C:\Apache24
- Before starting any of the services, make sure the following DLL files are present in the path C:\Apache24\bin.
 - HCL.iAutomate.EncryptDecrypt.dll
 - Newtonsoft.Json.dll



DLL will be updated as soon as any change occurs.

- Download the certificates from the Path mentioned in <u>Table 8 Apache Server</u>. After unzipping the certificates, copy them to C:/Program Files/certificate folder.
- 7. Open the **Command Prompt** as **Administrator** and run the following command to install the Apache

Service:

httpd -k install

 Go to Run (Windows + R) and type services.msc and start the apache service if the status is not already Running.

Apache2.4	Name	Description	Status	Startup Type	Log On As
	ActiveX Installer (AxInstSV)	Provides Us		Manual	Local Syste
Stop the service	🥋 Adobe Flash Player Update	This service		Manual	Local Syste
Restart the service	🍓 AllJoyn Router Service	Routes AllJo		Manual (Trig	Local Service
	Apache2.4	Apache/2.4	Running	Automatic	Local Syste
Description:	App Readiness	Gets apps re		Manual	Local Syste
Apache/2.4.23 (Win64)	🌼 Application Host Helper Ser	Provides ad	Running	Automatic	Local Syste
open332/1.0.211	Application Identity	Determines		Manual (Trig	Local Service
	🎑 Application Information	Facilitates t	Running	Manual (Trig	Local Syste
	🆏 Application Layer Gateway	Provides su		Manual	Local Service
	Application Management	Processes in	Running	Manual	Local Syste
	🆏 AppX Deployment Service (Provides inf		Manual	Local Syste
	ASP.NET State Service	Provides su		Manual	Network S
	🥋 AssignedAccessManager Se	AssignedAc		Manual	Local Syste
	🆏 Auto Time Zone Updater	Automatica		Disabled	Local Service
	🧠 Background Intelligent Tran	Transfers fil		Manual	Local Syste
	🆏 Background Tasks Infrastru	Windows in	Running	Automatic	Local Syste
	🆏 Base Filtering Engine	The Base Fil	Running	Automatic	Local Service
	🍓 BES Client	Facilitates u	Running	Automatic (D	Local Syste
	🍓 BitLocker Drive Encryption	BDESVC hos	Running	Manual (Trig	Local Syste
	🎑 BitLocker Management Clie	BitLocker M	Running	Automatic (D	Local Syste
	🎑 Block Level Backup Engine	The WBENG		Manual	Local Syste
	🧠 Blue Coat Unified Agent	Provides W	Running	Automatic	Local Syste
	🌼 Bluetooth Handsfree Service	Enables wir		Manual (Trig	Local Service
	🌼 Bluetooth Support Service	The Bluetoo	Running	Manual (Trig	Local Service
	🍓 BranchCache	This service		Manual	Network S
	🌼 Capability Access Manager	Provides fac		Manual	Local Syste
	Certificate Propagation	Copies user	Running	Automatic	Local Syste
	Cisco AnyConnect Network	Establishes	Running	Automatic	Local Syste
	Cisco AnyConnect Network	Provides Sin	Running	Automatic	Local Syste

Figure 16 - Screenshot of the Apache service

2.8 Microsoft Visual C++ 2015 Redistributable Package

Table 9 - Microsoft Visual C++ 2015 Redistributable Package

Version	2015
Purpose	It is required for installation of Python packages
Sourco	Available as part of BigFix Runbook AI installer package. Follow the below path:
300102	Pre-Requisite Software → vc_redist.x64.exe

2.8.1Installation Procedure

- Download the file vc_redist.x64.exe from the Path mentioned in source field of <u>Table 9 Microsoft</u> <u>Visual C++ 2015 Redistributable Package</u>.
- Install by double clicking on the file named vc_redist.x64. Accept the terms and conditions and click Install to complete the setup.



Figure 17 - Installation of Visual C++

2.9 AntiWord

Table 10 – AntiWord Requirements

Version	NA
Purpose	It is used for document crawling
Source	Available as part of BigFix Runbook AI installer package. Follow the below path:
	Pre-Requisite Software → antiword.zip

2.9.1Installation Procedure

BigFix

- Download the file antiword.zip from the Path mentioned in the source field of <u>Table 10 AntiWord</u> <u>Requirements.</u>
- 2. Extract the contents of zip file to the given path: C:\antiword.
- 3. System environment variable ANTIWORDHOME needs to be set with path C:\antiword.

ew System Variable			×
ariable name:	ANTIWORDHOME		
ariable value:	C:\antiword		
Browse Directory	Browse File	ОК	Cancel
_			.:
	Figure 18 - Environme	nt Variable Screen	

2.10Spacy

Table 11 – Spacy Requirements

Version	3.1.2
Purpose	Spacy package of python needs to be present before starting any of the services
Source	Available as part of BigFix Runbook AI installer package. Follow the below path:
	Pre-Requisite Software \rightarrow Spacy_PreReq.zip

2.10.1Installation Procedure

 Download the file Spacy_PreReq.zip from the Path mentioned in the source field of <u>Table 11</u> – <u>Spacy Requirements</u>. The extracted contents from the zip file named as Spacy_PreReq should be placed in the path.

```
C:\Python38\Lib\site-packages
```

Please ensure to copy the files inside the folder **Spacy_PreReq** to path **C:\Python38\Lib\site-packages**.

Name	Date modified	Туре
	JJJ1/2022 4.21 111	
📙 numpy	3/31/2022 4:28 PM	File folder
numpy-1.21.2.dist-info	3/31/2022 4:29 PM	File folder
packaging	3/31/2022 4:29 PM	File folder
packaging-21.0.dist-info	3/31/2022 4:29 PM	File folder
📕 pathy	3/31/2022 4:29 PM	File folder
pathy-0.6.0.dist-info	3/31/2022 4:29 PM	File folder
preshed	3/31/2022 4:29 PM	File folder
preshed-3.0.5.dist-info	3/31/2022 4:29 PM	File folder
📙 pydantic	3/31/2022 4:29 PM	File folder
📕 pydantic-1.8.2.dist-info	3/31/2022 4:29 PM	File folder
pyparsing-2.4.7.dist-info	3/31/2022 4:29 PM	File folder
E requests	3/31/2022 4:29 PM	File folder
requests-2.26.0.dist-info	3/31/2022 4:29 PM	File folder
smart_open	3/31/2022 4:29 PM	File folder
smart_open-5.2.1.dist-info	3/31/2022 4:29 PM	File folder
spacy	3/31/2022 4:31 PM	File folder
spacy_legacy	3/31/2022 4:31 PM	File folder
spacy_legacy-3.0.8.dist-info	3/31/2022 4:31 PM	File folder
spacy-3.1.2.dist-info	3/31/2022 4:31 PM	File folder
📕 srsly	3/31/2022 4:31 PM	File folder
srsly-2.4.1.dist-info	3/31/2022 4:31 PM	File folder

Figure 19 - Spacy Package Content

2.11NumPy

	Table 12 – Numpy Requirements
Version	1.20.3
Purpose	NumPy package of python needs to be present before starting any of the services
Source	Available as part of BigFix Runbook AI installer package. Follow the below path:
	Pre-Requisite Software → numpy.zip

2.11.1Installation Procedure

1. Before installing NumPy, the previous version of NumPy needs to be removed, if already installed.

Open a new command prompt and execute the below command to uninstall the existing version.

pip uninstall numpy



Figure 20 – Uninstalling existing NumPy Package

2. Download the file **numpy.zip** from the Path mentioned in the source field of <u>Table 12 – NumPy</u>

<u>Requirements.</u> The extracted contents from the zip file consists of two folders as depicted in the figure below. Place these two folders in the python site-packages path.

C:\Python38\Lib\site-packages

Please ensure to copy the two folders inside NumPy folder to path C:\Python38\Lib\site-packages.



2.12Mod_wsgi

Table 12 – Mod_wsgi Requirements

Version	4.9.0
Purpose	Mod_wsgi package of python needs to be present before starting any of the services
Source	Available as part of BigFix Runbook AI installer package. Follow the below path:
	Pre-Requisite Software → mod_wsgi.zip



2.12.1Installation Procedure

 Download the file mod_wsgi.zip from the Path mentioned in the source field of <u>Table 12 – NumPy</u> <u>Requirements</u>. The extracted contents from the zip file consists of two folders as depicted in the figure below. Place these two folders in the python site-packages path.

C:\Python38\Lib\site-packages

Please ensure to copy the two folders inside NumPy folder to path C:\Python38\Lib\site-packages.

nod_wsgi mod_wsgi-4.9.0-py3.8.egg-info

9/20/2021	1:01 PM	File folder
9/20/2021	1:01 PM	File folder

Figure 16 -mod_wsgi zip folder contents

2.13En_core_web_sm

Table 13 – En_core_web_sm Requirements

Version	3.1.0
Purpose	En_core_web_sm package of python needs to be present before starting any of the services
Source	Available as part of BigFix Runbook AI installer package. Follow the below path:
	Pre-Requisite Software → en_core_web_sm.zip

2.13.1Installation Procedure

 Download the file en_core_web_sm.zip from the Path mentioned in the source field of <u>Table 12</u> – <u>NumPy Requirements</u>. The extracted contents from the zip file consists of two folders as depicted in the figure below. Place these two folders in the python site-packages path.

C:\Python38\Lib\site-packages

Please ensure to copy the two folders inside NumPy folder to path C:\Python38\Lib\site-packages.



📙 en_core_web_sm	9/20/2021 8:24 PM	File folder
📙 en_core_web_sm-3.1.0.dist-info	9/20/2021 8:24 PM	File folder

Figure 17 -en_core_web_sm zip folder contents

2.14Java

	Table 13 – Java Detalls
Version	Open Jdk distribution of Java version 1.8.0_282
Purpose	Advanced AI component of BigFix Runbook AI requires Apache Solr for which Java is a prerequisite.
Source	Available as part of BigFix Runbook AI installer package. Follow the below path:
	Pre-Requisite Software \rightarrow java-1.8.0-openjdk.zip
Note	It needs to be installed on the server where Apache Solr will be installed

2.14.1Installation Procedure

- Download the folder java-1.8.0-openjdk.zip from the path mentioned in the source field of <u>Table 13</u>
 <u>– Java Details.</u>
- Create a folder with the name 'Java' in the path C:\Program Files and extract zip file inside Java Folder. It should contain the extracted content only.
- 3. Please perform the following steps to set environment variable for Java:
 - a. Open File Explorer, go to This PC, right-click and select Properties.

Quick acce	55	∨ Folders (7)	
Documer	its 🖈		3D Objects
Downloa	ds 🖈		F
Pictures	*		Downloads
6.0.5			
Data (C:)			
Desktop			Videos
excel ppt			n.
DneDrive -	HCL Technologies Ltd	✓ Devices and	d drives (1)
his PC			Data (C:)
3D C	Collapse	-	371 GB free of 471 GB
Desk	Manage		
Doci	Pin to Start		
Dow	Map network drive		
Musi	Open in new window		
Pictu	Pin to Quick access		
Vide	Disconnect network drive		
Data	Add a network location		
letwc	Delete		
LP-5	Rename		
	Droportion		
	Auick acces Documer Download Pictures 6.0.5 Data (C:) Desktop excel ppt MeDrive - his PC 3D C Dock Dock Dock Dock Dock Musi Pictu Vide Data Letwc IP-5	tuick access Documents Downloads Downloads Pictures A.C. Data (C:) Desktop excel ppt Desktop excel ppt Desk Manage Doc Pin to Start Dow Map network drive Dow Mus Open in new window Pictu Pin to Quick access Disconnect network drive Data Add a network location Letwc Delete Letwc Rename	tuick access Uncomments Downloads Pictures Collapse Desk Manage Doc Pin to Start Dow Map network drive Dow Map network drive Disconnect network drive Data Add a network location Letwc Delete Letwc Rename Visite

Figure 22 – File Explorer

b. Click on Advanced tab in System Properties window.

omputer Name	Hardware	Advanced	Remote			
You must be le	ogged on as	an Adminis	trator to	make mos	st of these chang	Ies.
Performance						
Visual effects	s, processor s	scheduling,	memory	usage, ar	nd virtual memory	
					Settings	ı İ.
-User Profiles-						
Desktop sett	ings related t	o your sign	-in			
					Cottingo	
					Settings	
Startup and R	ecovery					
System start	up, system fa	illure, and c	lebuggin	g informat	ion	
					Settings	
				Enviro	onment Variables	
		Ok	<	Cance	el Appl	у
	_					



- c. Click Environment Variables.
- d. Click New under System Variables section.
- e. Enter 'JAVA_HOME' in the Variable name section and 'C:\Program Files\Java' in Variable value section.
- f. Click **OK** to close the box.

New System Variable			×
Variable name: Variable value:	JAVA_HOME C:\Program Files\Java		3
Browse Directory	Browse File	OK Can	icel
_	Figure 24 - Adding JA	VA_HOME variable	

g. Under **System variables** section, find the variable named **Path**, select that variable and click the **Edit** button.

%SystemRoot%\system32	New
%SystemRoot%	
%SystemRoot%\System32\Wbem	Edit
%SYSTEMROOT%\System32\WindowsPowerShell\v1.0\	
%SYSTEMROOT%\System32\OpenSSH\	Proviso
C:\Windows\CCM	browse
C:\Python36\Scripts\	
C:\Python36\	Delete
%JAVA_HOME%	
%JAVA_HOME%\bin	
	Move Up

- h. If the last character of **Variable value** box is not a semi-colon (;) then add semi-colon at the end.
- i. Add %JAVA_HOME%; at the end of the Variable value.
- j. Further add **%JAVA_HOME%\bin;** at the end of the **Variable value**.
- k. Click **OK** to close the dialog box.
- To validate successful installation of Java, open Command Prompt as Administrator, and type java

 -version and press Enter on the keyboard.


On successful Java installation, Java Version will be displayed.



2.15MongoDB

	Table 14 – MongoDB Requirements
Version	4.0
Purpose	It is a NoSQL database and used for storing documents' content.
	This is available as part of BigFix Runbook AI installer package.
	For Community Version: Follow the below path:
Source	Pre-Requisite Software → mongodb-win32-x86_64-2008plus-ssl-4.0.25-signed.msi. For Enterprise Version: Follow the below path:
	Pre-Requisite Software → mongodb-win32-x86_64-enterprise-windows-64-4.0.25-
	signed.msi.

MongoDB is an open-source NoSQL document database. MongoDB stores information in the form of documents. It is used in BigFix Runbook AI to store meta-data information of Knowledge articles, SOPs etc. and various NLP models used in iKnowledge module.

This document describes steps for installation and configuration of MongoDB version 4.0 for Community and Enterprise edition in High Availability (HA) and non-High Availability (non-HA) mode.

Before proceeding with the installation, a user should already have identified various configurational parameters mentioned below:

- Encryption Required: At Rest or In-Transit

High Availability: Required / Not Required
Version: Enterprise or Community
If encryption is required, proceed with MongoDB Enterprise version.

2.15.1MongoDB Installation Procedure without HA mode

2.15.1.1Community Version:

This section describes the procedure for installation of MongoDB with authentication and authorization configured for Community Edition.

Important note:

- Please ensure the ports that are to be used for MongoDB service is open for communication with the help of a windows administrator.
- During the installation procedure, whenever the MongoDB service is restarted, open the new command prompt to run further commands.

2.15.1.1.1Installation steps

- 1. Download the file **mongodb-win32-x86_64-2008plus-ssl-4.0.25-signed.mse** from the Path mentioned in the source field of Table 14 MongoDB Requirements for Community Version.
- 2. Double-click on mongodb-win32-x86_64-2008plus-ssl-4.0.25-signed.mse file and select installation option as Complete and click Next.

Choose	DB 4.0.11 2008R2PI	us 55L (04 bit) Setup	-	-	×
Choos	se the setup type tha	t best suits yo	ur needs			I
[Complete	res will be inst	alled. Dequires t	ne most disk so		
	Recommended fo	r most users.	alicu, requires u	ie most dist sp	ace.	
	Allows users to d they will be instal	hoose which pr led. Recommer	ogram features nded for advance	will be installed ed users.	and wher	e
			Back	Next		Cancel

3. The option Install MongoDB as service would be checked by default.

Install MongoD as	a Service
Run service as	Network Service user
ORun service as	a local or domain user:
Account Doma	ain: ,
Account Name	E: MongoDB
Account Pass	word:
Service Name:	MongoDB
Data Directory:	C:\Program Files\MongoDB\Server\4.0\data\
Log Directory:	C:\Program Files\MongoDB\Server\4.0\/og\

4. Uncheck Install MongoDB as Service and click Next.

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Install MongoD as a	Servic	e
Run service as I	Network	k Service user
O Run service as a	a local o	or domain user:
Account Doma	in:	
Account Name	:	MongoDB
Account Passv	vord:	
Service Name:	Mon	IgoDB
Data Directory;	C:\F	Program Files\MongoDB\Server\4.0\data\
Log Directory:	C:\F	Program Files\MongoDB\Server\4.0\/og\
		< Back Next > Cancel

5. Wait till the MongoDB installation is complete.

2.15.1.1.2Add MongoDB to the Path:

To add MongoDB to the PATH, please perform the below steps:

- 1. Go to the location where MongoDB was installed. For e.g., C:\Program Files\MongoDB.
- 2. Inside MongoDB, go to *folder\Server\4.0\bin*.
- 3. Go to **Control Panel** → **System and Security**→**System**.
- Select Advanced System Settings and click Environment Variables.
 This will open a new dialog box.
- Select the variable path in System Variables and add path of MongoDB. For e.g. C:\Program Files\MongoDB\Server\4.0\bin.

:\Python36\Scripts	_	
:\Program Files\MongoDB\Server\3.2\bin		Edit
:\Users\		
:\Program Files\Git\cmd		Browse
:\Program Files\PuTTY\		
2:\antiword		Delete
6SOLR_HOME%\bin		
:\Program Files\Java\jdk1.8.0_201\bin		
:\Program Files\nssm-2.24\win64		Move Up
:\Program Files (x86)\Windows Kits\8.1\Windows Performance To		
:\Apache24\bin		Move Down
2:\antiword		
:\ironpython2\net45		
NOnenSSL-Win64\bin		Edit text
:\Program Files\MongoDB\Server\4.0\bin		
:\Program Files (x86)\Microsoft SQL Server\Client SDK\ODBC\130.		
:\Program Files (x86)\Microsoft SQL Server\130\Tools\Binn\		
:\Program Files (x86)\Microsoft SQL Server\130\DTS\Binn\	_	
:\Program Files (x86)\Microsoft SQL Server\130\Tools\Binn\Mana.	I	

2.15.1.1.3Creation of Directory Structure:

- 1. Create a folder named **mongo**. It should not be in the same location where MongoDB is installed.
- Inside the folder mongo, create a folder named data and then create three folders named as config, database and log as shown in Figure 32.

ame	Date modified	Туре	Size	
config	7/25/2019 11:00 AM	File folder		
database	7/26/2019 3:07 PM	File folder		
log	7/25/2019 11:11 AM	File folder		

2.15.1.1.4Creation of MongoDB Service

- Go to the location where MongoDB is installed. Refer to the Path set in the PATH environment variable. For e.g., C:\Program Files\MongoDB.
- 2. Go to bin folder. for e.g., C:\Program Files\MongoDB\Server\4.0\bin.
- 3. Locate the file named **mongod.cfg** and copy the file.

Name	Date modified	Туре	Size
📧 bsondump.exe	7/25/2019 4:52 AM	Application	17,822 KB
📄 ca.pem	6/3/2019 6:08 PM	PEM File	4 KB
client.pem	6/3/2019 6:10 PM	PEM File	3 KB
📄 InstallCompass.ps1	7/25/2019 5:16 AM	Windows PowerS	2 KB
🖄 libeay32.dll	7/3/2019 10:45 PM	Application extens	2,414 KB
mongo eve	7/25/2019 5·15 ΔM	Application	18.041 KB
📗 mongod.cfg	7/25/2019 4:50 AM	CFG File	1 KB
mongod.exe	7/25/2019 5:18 AM	Application	32,009 KB
mongod.pdb	7/25/2019 5:18 AM	PDB File	353,348 KB
📧 mongodump.exe	7/25/2019 4:57 AM	Application	18,898 KB
📧 mongoexport.exe	7/25/2019 4:55 AM	Application	18,401 KB
📧 mongofiles.exe	7/25/2019 4:54 AM	Application	18,246 KB
📧 mongoimport.exe	7/25/2019 4:55 AM	Application	18,584 KB
📧 mongorestore.exe	7/25/2019 4:56 AM	Application	18,965 KB
mongos.exe	7/25/2019 5:08 AM	Application	16,537 KB
mongos.pdb	7/25/2019 5:08 AM	PDB File	184,828 KB
📧 mongostat.exe	7/25/2019 4:53 AM	Application	18,488 KB
📧 mongotop.exe	7/25/2019 4:58 AM	Application	18,085 KB
ssleav32.dll	7/3/2019 10:45 PM	Application extens	350 KB



Figure 32 – Creation of MongoDB service

 Go to the mongo folder that was custom created earlier. Inside the directory data, go to the config folder. Paste the mongod.cfg file here.

Name	^	Date modified	Туре	Size
🗋 mo	ngod.cfg	7/25/2019 11:36 AM	CFG File	1 KE

Figure 33 - Creation of MongoDB service (Cont.)

5. Open the file **mongod.cfg** (preferably in Notepad++ or Sublime) and follow the below steps:

While editing the file, maintaining indentation in the file is very important.

- a. In the **storage** header, change the following field:
 - **dbPath**: Add path till mongo\data\database.
- b. In the systemLog, change the following field:
 - **Path**: Add path of mongo\data\log\mongod.log.

Folder mongo\data\log doesn't have Mongod.log. This will be created automatically when mongoDB service is created.

- c. In the **net**, change the following fields:
 - **Port**: Enter the port for the installation of MongoDB.
 - **bindIpAll**: true.

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for documentation of all	options, see:	
http://docs.mongodb.or	g/manual/reference/configuration-options/	
Where and how to store d	ata.	
torage:		
dbPath: C:\mongo\data\da	tabase	
journal:		
enabled: true		
engine:		
mmapv1:		
wiredTiger:		
where to write logging d	ata.	
/stemLog:		
destination: file		
logAppend: true		
path: C:\mongo\data\log	\mongod.log	
network interfaces		
et:		
port: 27017		
bindIpAll: true		

Figure 34 - Creation of MongoDB service (Cont.)

- d. Save the changes made in the file mongod.cfg.
- e. Open the Command Prompt as Administrator and run the following command:

Please make sure to provide correct path for config.

```
mongod -config "<path of the mongoDB folder you
created\mongo\data\config\mongod.cfg>" --install --serviceName
"MongoDB"
For e.g. mongod --config "C:\mongo\data\config\mongod.cfg" --
install --serviceName "MongoDB"
```

f. MongoDB service with the name MongoDB will be created.

2.15.1.1.5Start MongoDB Service

1. Press Windows+R, and type services.msc and press Enter.

Open: services.msc	~
OK Cancel <u>B</u> rowse	

2. Search for MongoDB service, then click on MongoDB service and click Start the service on the Left

pane.

MongoDB	Name	Description	Status	Startup Type	Log On As
	MessagingService_13ab08	Service sup		Automatic (T	Local Syste
<u>Start</u> the service	Microsoft (R) Diagnostics Hub Standard Collector Service	Diagnostics		Manual	Local Syste
	Microsoft Account Sign-in Assistant	Enables use	Running	Manual (Trig	Local Syste
Description:	Microsoft App-V Client	Manages A		Disabled	Local Syste
Apache/2.4.23 (Win64)	Microsoft iSCSI Initiator Service	Manages In		Manual	Local Syste
	🖏 Microsoft Passport	Provides pr		Manual (Trig	Local Syste
	🖏 Microsoft Passport Container	Manages Io	Running	Manual (Trig	Local Service
	🖏 Microsoft Policy Platform Local Authority			Manual	Local Syste
	🖏 Microsoft Policy Platform Processor			Manual	Local Syste
	🌼 Microsoft Software Shadow Copy Provider	Manages so		Manual	Local Syste
	🖏 Microsoft Storage Spaces SMP	Host service		Manual	Network S
	🖏 Microsoft Windows SMS Router Service.	Routes mes	Running	Automatic (D	Local Syste
	🖏 Mobile Broadband HL Service	Provide serv	Running	Automatic	Local Syste
	😳 MongoDB	Apache/2.4		Automatic	Local Syste
	🌼 Mozilla Maintenance Service	The Mozilla		Manual	Local Syste
	SUPSrv SUPSrv	MSUPSrv	Running	Automatic (D	Local Syste
	🖏 Natural Authentication	Signal aggr		Manual (Trig	Local Syste
	🖏 Net.Msmq Listener Adapter	Receives act		Disabled	Network S
	🖏 Net.Pipe Listener Adapter	Receives act	Running	Automatic	Local Service
	🖏 Net.Tcp Listener Adapter	Receives act	Running	Automatic	Local Service

Figure 36 - Start MongoDB Service (Cont.)

3. Go to the server that has MongoDB service installed. Open the Command Prompt as Administrator

and execute the below commands by changing the respective IP and port of server.



4. If the service is running successfully, the connection will be established without any error message.

2.15.1.1.6Enable Authentication

To enable the authentication, perform the following steps:

 Go to the server where MongoDB service has been installed. Open the Command Prompt as Administrator and execute the below command.

mongo --host x.x.xx.x1 --port 27017

2. Execute the below command.

MongoDB> use admin

- 3. Make the following changes in the values before execution:
 - user:<user-name >
 - pwd :<password>

(choose any password for the corresponding user for MongoDB authentication.)

```
MongoDB>> db.createUser(
    {
        user: "admin",
        pwd: "comnet123",
        roles: [ { role: "userAdminAnyDatabase", db: "admin" }, {
        role: "root", db: "admin" }, "readWriteAnyDatabase" ]
        }
)
```

4. Make the following changes in mongod.cfg. Refer the screenshot below:

ecurity:		
authorization:	"enabled"	
operationProfil	ing:	

Figure 37 – Enable Authentication

- 5. Restart the **MongoDB service** in the server.
- 6. Re-open the **Command Prompt as Administrator** and open the MongoDB terminal using the following command:

```
mongo --host <IP> --port <Port> -u <username> -p <password> --
authenticationDatabase "admin"
For e.g. - mongo --host x.x.xx.x --port 27017 -u admin -p
comnet123 --authenticationDatabase "admin"
```

7. Connection with MongoDB should be successfully established.



2.15.1.1.7Test the Connection

To test the connection, perform the following steps:

Python 3.6 should be present. You should also have the BigFix Runbook AI installer package as it contains some resources to be used in subsequent steps.

1. Open the **Command Prompt as Administrator** and execute the following command to install pymongo:

pip install pymongo

- a. Copy the file named "mongo_connection_community_Non-HA.py" present in the installer package under iAutomateInstaller → Resources → Resources.zip folder to any folder.
- Open the file in Notepad and change the value of Server IP and Port where MongoDB service is running.

c. Open the Command Prompt as Administrator mode. Change the current working

directory to the folder that has code using the following command:

cd <folder path>

d. Execute the code by using the following command.

python <file_name.py>

e. If file executes without any error, then connection is successful.



2.15.1.2Enterprise Version

BigFix

This section describes the procedure for installation of MongoDB with authentication and authorization configured for Enterprise Edition.

- Please ensure the ports that are to be used for MongoDB service is open for communication with the help of windows administrator.
- During the installation procedure whenever the MongoDB service is restarted, open the new command prompt window to run the further commands.

2.15.1.2.1Installation steps:

- 1. Download the file **mongodb-win32-x86_64-enterprise-windows-64-4.0.25-signed.mse** from the Path mentioned in the source field of Table 14 MongoDB Requirements for Enterprise Version.
- Double-click on mongodb-win32-x86_64-enterprise-windows-64-4.0.25-signed.mse file and select installation option as Complete and click Next.

Choose Choose	e Setup Type e the setup type that	best suits yo	ur needs			Ø
	Complete All program feature Recommended for Custom Allows users to che they will be installe	es will be inst most users. pose which pr rd. Recommer	alled. Requires th ogram features w nded for advance	e most disk spa vill be installed a d users.	ce. nd where	
			Back	Next	Can	el

Figure 38 - MongoDB Installation - Enterprise Version (non-HA) (Cont.)

Please ensure to note the location of the installation directory of MongoDB.

3. The option Install MongoDB as service would be checked by default.

🛃 MongoDB 4.0.10 2	008R2Plus Enterprise (64 bit) Service Custo — 🛛 🛛 🛛
Service Configurat Specify optional se	t ion ttings to configure MongoDB as a service.
🗸 Install MongoD as a	Service
Run service as N	letwork Service user
O Run service as a	local or domain user:
Account Domai	n: .
Account Name	MongoDB
Account Passw	vord:
Service Name:	MongoDB
Data Directory:	C:\Program Files\MongoDB\Server\4.0\data\
Log Directory:	C:\Program Files\MongoDB\Server\4.0\Jog\
	< Back Next > Cancel

Figure 39 - MongoDB Installation - Enterprise Version (non-HA) (Cont.)

4. Uncheck Install MongoDB as service and click Next.

nstall MongoD as a	Service	e				
Run service as l	Vetwork	Service user				
Run service as	a local o	r domain user:				
Account Doma	in:					
Account Name	:	MongoDB				
Account Pass	vord:					
Service Name:	Mon	goDB				
Data Directory;	C:\P	Program Files∖Mon	goDB\Serve	r\4.0\data	\	
Log Directory:	C:\P	Program Files (Mon	goDB\Serve	r\4.0\log\		

5. Wait till the MongoDB installation is complete.



2.15.1.2.2Add MongoDB to the Path

To add MongoDB to the PATH, please perform the below steps:

- 1. Go to the location where MongoDB was installed. For e.g., C:\Program Files\MongoDB.
- 2. Inside MongoDB, go to *folder\Server\4.0\bin*.
- 3. Go to **Control Panel→System and Security→Security**.
- 4. Select Advanced System Settings, click Environment Variables. This will open up a new dialog box.
- Select the Variable Path in System Variables and add path of MongoDB. For e.g. C:\Program Files\MongoDB\Server\4.0\bin.

C:\Python36	New
C:\Python36\Scripts	
C:\Program Files\MongoDB\Server\3.2\bin	Edit
C:\Users\ADesktop\pkg\components	
C:\Program Files\Git\cmd	Browse
C:\Program Files\PuTTY\	
C:\antiword	Delete
%SOLR_HOME%\bin	
C:\Program Files\Java\jdk1.8.0_201\bin	
C:\Program Files\nssm-2.24\win64	Move Up
C:\Program Files (x86)\Windows Kits\8.1\Windows Performance To	
C:\Apache24\bin	Move Down
C:\antiword	
C:\ironpython2\net45	
C\OpenSSL-Win64\bin	Edit text
C:\Program Files\MongoDB\Server\4.0\bin	
C:\Program Files (x86)\Microsoft SQL Server\Client SDK\ODBC\130	
C:\Program Files (x86)\Microsoft SQL Server\130\Tools\Binn\	
C:\Program Files (x86)\Microsoft SQL Server\130\DTS\Binn\	
C:\Program Files (x86)\Microsoft SQL Server\130\Tools\Binn\Mana 🗸	
]
OK	Canad
OK .	Cancel

Figure 41 - MongoDB Installation - Enterprise Version (non-HA) (Cont.)

2.15.1.2.3 Creation of Directory Structure

- 1. Create a folder named **mongo**. It should not be in the same location where MongoDB is installed.
- 2. Inside the folder **mongo**, create a folder named **data**.



3. Inside the folder data, create three folders named as config, database, and log.

lame	Date modified	Туре	Size	
config	7/25/2019 11:00 AM	File folder		
database	7/26/2019 3:07 PM	File folder		
	7/25/2019 11:11 AM	File folder		
	1, 20, 2010 1111 1111	incronaci		

2.15.1.2.4Creation of MongoDB Service

- Go to the location where MongoDB is installed. Refer to the Path set in the PATH environment variable. For e.g., C:\Program Files\MongoDB.
- 2. Go to bin folder. for e.g., C:\Program Files\MongoDB\Server\4.0\bin.
- 3. Locate the file named **mongod.cfg** and copy the file.

,			
Name	Date modified	Туре	Size
📧 bsondump.exe	7/25/2019 4:52 AM	Application	17,822 KB
ca.pem	6/3/2019 6:08 PM	PEM File	4 KB
📄 client.pem	6/3/2019 6:10 PM	PEM File	3 KB
InstallCompass.ps1	7/25/2019 5:16 AM	Windows PowerS	2 KB
🗟 libeay32.dll	7/3/2019 10:45 PM	Application extens	2,414 KB
mongo eve	7/25/2019 5·15 ΔM	Application	18.041 KB
🗐 mongod.cfg	7/25/2019 4:50 AM	CFG File	1 KB
mongod.exe	7/25/2019 5:18 AM	Application	32,009 KB
📄 mongod.pdb	7/25/2019 5:18 AM	PDB File	353,348 KB
📧 mongodump.exe	7/25/2019 4:57 AM	Application	18,898 KB
mongoexport.exe	7/25/2019 4:55 AM	Application	18,401 KB
📧 mongofiles.exe	7/25/2019 4:54 AM	Application	18,246 KB
📧 mongoimport.exe	7/25/2019 4:55 AM	Application	18,584 KB
📧 mongorestore.exe	7/25/2019 4:56 AM	Application	18,965 KB
mongos.exe	7/25/2019 5:08 AM	Application	16,537 KB
📄 mongos.pdb	7/25/2019 5:08 AM	PDB File	184,828 KB
📧 mongostat.exe	7/25/2019 4:53 AM	Application	18,488 KB
📧 mongotop.exe	7/25/2019 4:58 AM	Application	18,085 KB
ssleay32.dll	7/3/2019 10:45 PM	Application extens	350 KB

```
Figure 43 - MongoDB Installation - Enterprise Version (non-HA) (Cont.)
```

4. Go to the **mongo** folder that was created earlier. Inside the directory data, go to the **config** folder and paste the mongod.cfg file here.

mongod.cfg 7/25/2	019 11:36 AM CFG File	1 KB

Figure 44 - MongoDB Installation - Enterprise Version (non-HA) (Cont.)

5. Open the file mongod.cfg (preferably in Notepad++ or Sublime) and follow the below steps:

While editing the file, maintaining indentation in the file is very important.

- a. In the storage header, change the following fields:
 - **DBPATH**: Add path till mongo\data\database
- b. In the **systemLog**, change the following fields:
 - **PATH**: Add path of mongo\data\log\mongod.log

Folder mongo\data\log doesn't have Mongod.log. This will be created automatically when mongo service is created.

c. In the **net**, change the following fields:



- o port: Enter the port you want to install MongoDB
- o **bindIpAll**: true

mongod.conf	
for documentation of all options, see:	
http://docs.mongodb.org/manual/reference/configuration-options/	
Where and how to store data.	
torage:	
dbPath: C:\mongo\data\database	
journal:	
enabled: true	
engine:	
mmapvl:	
wiredTiger:	
where to write logging data.	
ystemLog:	
destination: file	
logAppend: true	
path: C:\mongo\data\log\mongod.log	
network interfaces	
et:	
port: 27017	
bindIpAll: true	

Figure 45 - MongoDB Installation - Enterprise Version (non-HA) (Cont.)

- 6. Save the changes made in the file mongod.cfg.
- 7. Open the Command Prompt as Administrator and run the following command.

Please ensure to enter correct path of config).

```
mongod -config "<path of the mongoDB folder you
created\mongo\data\config\mongod.cfg>" --install --serviceName
"MongoDB"
For e.g. mongod --config "C:\mongo\data\config\mongod.cfg" --
install --serviceName "MongoDB"
```

8. MongoDB service with the name MongoDB will be created.

2.15.1.2.5Start MongoDB Service

1. Press Windows+R, type services.msc and press Enter.

٨	Type the name of a program, folder, document, or Internet resource, and Windows will open it for you.
<u>O</u> pen:	services.msc ~
	OK Cancel <u>B</u> rowse

- 2. Search for MongoDB service.
- 3. Click **MongoDB service** and click **Start the service** on the Left pane.

MongoDB	Name	Description 9	Status	Startup Type	Log On As
	MessagingService_13ab08	Service sup		Automatic (T	Local Syste
Start the service	Microsoft (R) Diagnostics Hub Standard Collector Service	Diagnostics		Manual	Local Syste
	🖏 Microsoft Account Sign-in Assistant	Enables use	Running	Manual (Trig	Local Syste
Description:	🖏 Microsoft App-V Client	Manages A		Disabled	Local Syste
Apache/2.4.23 (Win64)	A Microsoft iSCSI Initiator Service	Manages In		Manual	Local Syste
	Microsoft Passport	Provides pr		Manual (Trig	Local Syste
	🖏 Microsoft Passport Container	Manages Io	Running	Manual (Trig	Local Service
	🌼 Microsoft Policy Platform Local Authority			Manual	Local Syste
	🖏 Microsoft Policy Platform Processor			Manual	Local Syste
	🌼 Microsoft Software Shadow Copy Provider	Manages so		Manual	Local Syste
	🖏 Microsoft Storage Spaces SMP	Host service		Manual	Network S
	🖏 Microsoft Windows SMS Router Service.	Routes mes	Running	Automatic (D	Local Syste
	🌼 Mobile Broadband HL Service	Provide serv	Running	Automatic	Local Syste
	🙀 MongoDB	Apache/2.4		Automatic	Local Syste
	🏟 Mozilla Maintenance Service	The Mozilla		Manual	Local Syste
	🖏 MSUPSrv	MSUPSrv F	Running	Automatic (D	Local Syste
	🖏 Natural Authentication	Signal aggr		Manual (Trig	Local Syste
	🖏 Net.Msmq Listener Adapter	Receives act		Disabled	Network S
	🖏 Net.Pipe Listener Adapter	Receives act	Running	Automatic	Local Service
	Net.Tcp Listener Adapter	Receives act	Running	Automatic	Local Service

- (Cont.)
- 4. Go to the server that has MongoDB service installed.
- 5. Open the **Command Prompt** as **Administrator** and execute the below command by changing respective IP and port of server.

```
mongo --host <IP> --port <port on which mongoDB service is
running(mentioned in config file)>
for e.g. - mongo --host 10.1.1xx.x1 --port 27017
```

6. If the service is running successfully, then connection will be established. If not, then follow the above steps again.



2.15.1.2.6Enable Authentication

BigFix

To enable the authentication, perform the following steps:

- 1. Go to the server where MongoDB service has been installed.
- 2. Open the Command Prompt as Administrator and execute the below command:

```
mongo --host x.x.xx.x1 --port 27017
```

3. Execute the below command:

MongoDB Enterprise> use admin

- 4. Make the following changes in the values before execution:
 - user:<user-name >
 - pwd :<password>

(choose any password for the corresponding user for MongoDB authentication.)

```
MongoDB Enterprise> db.createUser(
    {
    user: "admin",
    pwd: "comnet123",
    roles: [ { role: "userAdminAnyDatabase", db: "admin" }, { role:
    "root", db: "admin" }, "readWriteAnyDatabase" ]
  }
)
```

5. Make the following changes in mongod.cfg and refer to the screenshot below.

<pre>#processManagement:</pre>	
security:	
authorization: "enabled"	
#operationProfiling:	
ure 48 - Mongous Installation – Start Mo	ngodb Service (non-HA)
(Cont.)	

- 6. Restart the MongoDB service in the server.
- 7. Re-open the **Command Prompt** as **Administrator** and open the MongoDB terminal using the following command:

```
mongo --host <IP> --port <Port> -u <username> -p <password> --
authenticationDatabase "admin"
```

BigFix

```
For e.g. - mongo --host x.x.xx.x --port 27017 -u admin -p
comnet123 -- authenticationDatabase "admin"
```

8. Connection with MongoDB should be successfully established.

2.15.1.2.7Fnable SSI Authentication

To enable SSL authentication, perform the following steps:

Please ensure that only one ca.pem should be generated. From the same ca.pem, server.pem for each server should be generated. From the same ca.pem, client.pem should be generated.

- 1. Generate the ca.pem, server.pem and client.pem by referring to the Generate ca.pem and server.pem and Generate client.pem.
- 2. After the ca.pem, client.pem and server.pem are generated, copy these files and paste them in the

following path:

```
<MongoDB installed path>/MongoDB/Server/4.0/bin
For e.g. - C:\Program Files\MongoDB\Server\4.0\bin
```

3. Go to folder **mongo/data/config**, open the file **mongod.cfg** and make the following changes:

Please preserve the space and indentations as shown below. Ensure that editing is done in notepad++.

a. In the **net** header, enter the following values:

```
ssl:
     mode: allowSSL
      PEMKeyFile: C:\Program
Files\MongoDB\Server\4.0\bin\server.pem
      CAFile: C:\Program Files\MongoDB\Server\4.0\bin\ca.pem
```

,	
. # 1	network interfaces
net	5:
1	port: 27017
k	pindIpAll: true
2	ssl:
	mode: allowSSL
	PEMKeyFile: C:\Program Files\MongoDB\Server\4.0\bin\server.pem
	CAFile: C:\Program Files\MongoDB\Server\4.0\bin\ca.pem
#pi	rocessManagement:

Figure 49 - MongoDB Installation – Enable SSL Authentication (non-HA)

b. Save the file for changes to be reflected.

4. Open the **Command Prompt** as **Administrator** on the server and execute the below command:

```
mongo --ssl --host <IP> --port <port> -u <username> -p <password>
--authenticationDatabase "admin" --sslCAFile "<path of ca.pem>" --
sslPEMKeyFile "<path of client.pem>"
for e.g. -
mongo --ssl --host x.x.x.x1 --port 27017 -u admin -p comnet123 --
authenticationDatabase "admin" --sslCAFile "C:\Program
Files\MongoDB\Server\4.0\bin\ca.pem" --sslPEMKeyFile "C:\Program
Files\MongoDB\Server\4.0\bin\client.pem"
```

- 5. This will establish the connection with MongoDB.
- 6. Execute the below commands:

```
MongoDB Enterprise>db.adminCommand( { setParameter: 1, sslMode:
"preferSSL" } )
MongoDB Enterprise> db.adminCommand( { setParameter: 1, sslMode:
"requireSSL" } )
```

7. Restart the **MongoDB** service on the server.

2.15.1.2.8Test the Connection

To test the connection, perform the following steps:

Python 3.6 should be present. You should also have the BigFix Runbook AI installer package as it contains some resources to be used in subsequent steps.

1. Open the Command Prompt as Administrator and execute the following command:

pip install pymongo

- Copy the file named "mongo_connection_enterprise_Non-HA.py", present in the installer package under iAutomateInstaller → Resources → Resources.zip folder to any folder.
- 3. Open the file in Notepad and change the value of **IP**, **port**, **username**, **password**, **path of pem files** where **MongoDB** service is running.



```
ssl=True,
ssl_certfile="<path of
client.pem file>",
file>",
ssl_cert_reqs=ssl.CERT_REQUIRED)
db = client['DRYiCE_db']
db_collection = db['DRYiCE_Collection']
db_collection.insert({"name":"xyz"})
print("Connection to Mongo Database successful")
```

4. Open the **Command Prompt** as **Administrator**. Change the current working directory to the folder that has code using the following command:

cd <folder path>

5. Execute the code by using the following command:

python <file_name.py>

6. If the file executes without any error, the connection is successful.

2.15.2MongoDB Installation Procedure – with HA mode

High Availability in MongoDB is enabled using concept of replica set where at least three MongoDB instances are used to configure clusters. For BigFix Runbook AI, we will have three MongoDB instances where one instance will be Primary and rest of them will be Secondary. HA in MongoDB works as per below guidelines.

- 1. If primary node is down, then one of secondary node will be promoted to become primary node.
- 2. If secondary is down, then system will work as it is.

Replication amongst nodes is handled by MongoDB itself.

Replication provides redundancy and increases <u>data availability</u>. With multiple copies of data on different database servers, replication provides a level of fault tolerance against the loss of a single database server.





For MongoDB in HA, at least three servers are required. If more than three servers are to be configured, ensure that they are odd in number. Please make sure the ports that are going to be used for MongoDB are open for communication.

2.15.2.1Community Version:

This section describes the procedure for installation of MongoDB with authentication and authorization configured for Community Edition in HA mode.

Important note:

- Please ensure the ports that are to be used for MongoDB service is open for communication with the help of Windows administrator.
- During the installation procedure whenever the MongoDB service is restarted, open the new command prompt to run the further commands.

2.15.2.1.1Installation steps:

- 1. Download the file **mongodb-win32-x86_64-2008plus-ssl-4.0.25-signed.mse** from the Path mentioned in the source field of <u>Table 14 MongoDB Requirements</u> for Community Version.
- 2. Double-click on mongodb-win32-x86_64-2008plus-ssl-4.0.25-signed.mse file, then select installation option as Complete and click Next.

oDB 4.0.11 2008R2Plus SSL (64 bit) Setup —			Х
e Setup Type se the setup type that best suits your needs			Ø
Complete All program features will be installed. Requires the most disk spa Recommended for most users. Custom	ace.		
Allows users to choose which program features will be installed they will be installed. Recommended for advanced users.	and wh	nere	
Back Next		Cano	el
	oDB 4.0.11 2008R2Plus SSL (64 bit) Setup e Setup Type se the setup type that best suits your needs Complete All program features will be installed. Requires the most disk spaceommended for most users. Custom Allows users to choose which program features will be installed they will be installed. Recommended for advanced users. Back Next	oDB 4.0.11 2008R2Plus SSL (64 bit) Setup — e Setup Type se the setup type that best suits your needs Complete All program features will be installed. Requires the most disk space. Recommended for most users. Custom Allows users to choose which program features will be installed and whethey will be installed. Recommended for advanced users. Back Next	oDB 4.0.11 2008R2Plus SSL (64 bit) Setup — e Setup Type se the setup type that best suits your needs Complete All program features will be installed. Requires the most disk space. Recommended for most users. Custom Allows users to choose which program features will be installed and where they will be installed. Recommended for advanced users. Back Next

Figure 51 - MongoDB Installation - Community Version (HA)

3. The option Install MongoDB as service would be checked by default.

🛃 MongoDB 4.0.11 2	2008R2Plus SSL (64 bit) Service Customization — 🛛 🛛 🛛
Service Configura Specify optional se	tion ettings to configure MongoDB as a service.
☑ Install MongoD as a	a Service
Run service as I	Network Service user
O Run service as a	a local or domain user:
Account Doma	in:
Account Name	MongoDB
Account Pass	vord:
Service Name:	MongoDB
Data Directory:	C:\Program Files\MongoDB\Server\4.0\data\
Log Directory:	C:\Program Files\MongoDB\Server\4.0\log\
	< Back Next > Cancel

Figure 52 - MongoDB Installation - Community Version (HA) (cont.)

4. Uncheck Install MongoDB as service and click Next.

Install MongoD as a	a Service
Run service as N	Network Service user
Run service as a	a local or domain user:
Account Doma	in:
Account Name	MongoDB
Account Passv	vord:
Service Name:	MongoDB
Data Directory;	C:\Program Files\MongoDB\Server\4.0\data\
Log Directory:	C:\Program Files\MongoDB\Server\4.0\Jog\

5. Wait till the MongoDB installation is complete.



2.15.2.1.2Add MongoDB to the Path:

To add MongoDB to the PATH, please perform the below steps:

- 1. Go to location where MongoDB was installed. For e.g., C:\Program Files\MongoDB.
- 2. Inside MongoDB, go to *folder\Server\4.0\bin*.
- 3. Go to **Control Panel** → **System and Security** → **Security**.
- Select Advanced System Settings and click Environment Variables. This will open up a new dialog box.
- Select the variable Path in System Variables and add path of MongoDB. For e.g. C:\Program Files\MongoDB\Server\4.0\bin.

C:\Python36	^ N	lew
C:\Python36\Scripts		
C:\Program Files\MongoDB\Server\3.2\bin	E	Edit
C:\Users\ADesktop\pkg\components		
C:\Program Files\Git\cmd	Bro	wse
C:\Program Files\PuTTY\		
C:\antiword	De	elete
%SOLR_HOME%\bin		
C:\Program Files\Java\jdk1.8.0_201\bin		
C:\Program Files\nssm-2.24\win64	Mo	ve Up
C:\Program Files (x86)\Windows Kits\8.1\Windows Performance To		
C:\Apache24\bin	Mov	e Down
C:\antiword		
C:\ironpython2\net45		
C\OnenSSL-Win64\bin	Edit	text
C:\Program Files\MongoDB\Server\4.0\bin		
C:\Program Files (x86)\Microsoft SQL Server\Client SDK\ODBC\130		
C:\Program Files (x86)\Microsoft SQL Server\130\Tools\Binn\		
C:\Program Files (x86)\Microsoft SQL Server\130\DTS\Binn\		
C:\Program Files (x86)\Microsoft SQL Server\130\Tools\Binn\Mana	v	
OK	C.	ancel
UK CK		incer
		_

- 2.15.2.1.3Creation of Directory Structure:
 - 1. Create a folder named **mongo**. It should not be in the same location where MongoDB is installed.



- 2. Inside the folder mongo, create a folder named data.
- 3. Inside the folder data, create three folders named as config, database, and log.

Name	Date modified	Туре	Size	
config	7/25/2019 11:00 AM	File folder		
database	7/26/2019 3:07 PM	File folder		
log	7/25/2019 11:11 AM	File folder		

2.15.2.1.4Creation of MongoDB Service

- Go to the location where MongoDB is installed. Refer to the **Path set** in the PATH environment variable. For e.g., *C:\Program Files\MongoDB*.
- 2. Go to bin folder. for e.g., C:\Program Files\MongoDB\Server\4.0\bin.
- 3. Locate the file named mongod.cfg and copy the file.

Name	Date modified	Туре	Size
📧 bsondump.exe	7/25/2019 4:52 AM	Application	17,822 KB
📄 ca.pem	6/3/2019 6:08 PM	PEM File	4 KB
📄 client.pem	6/3/2019 6:10 PM	PEM File	3 KB
InstallCompass.ps1	7/25/2019 5:16 AM	Windows PowerS	2 KB
🖄 libeay32.dll	7/3/2019 10:45 PM	Application extens	2,414 KB
🕴 mongo exe	7/25/2019 5·15 ΔM	Application	18.041 KB
mongod.cfg	7/25/2019 4:50 AM	CFG File	1 KB
mongod.exe	7/25/2019 5:18 AM	Application	32,009 KB
mongod.pdb	7/25/2019 5:18 AM	PDB File	353,348 KB
📧 mongodump.exe	7/25/2019 4:57 AM	Application	18,898 KB
📧 mongoexport.exe	7/25/2019 4:55 AM	Application	18,401 KB
📧 mongofiles.exe	7/25/2019 4:54 AM	Application	18,246 KB
📧 mongoimport.exe	7/25/2019 4:55 AM	Application	18,584 KB
📧 mongorestore.exe	7/25/2019 4:56 AM	Application	18,965 KB
mongos.exe	7/25/2019 5:08 AM	Application	16,537 KB
mongos.pdb	7/25/2019 5:08 AM	PDB File	184,828 KB
📧 mongostat.exe	7/25/2019 4:53 AM	Application	18,488 KB
📧 mongotop.exe	7/25/2019 4:58 AM	Application	18,085 KB
ssleay32.dll	7/3/2019 10:45 PM	Application extens	350 KB

Figure 56 - MongoDB Installation - Community Version (HA) (cont.)

 Go to the mongo folder that was created earlier. Inside the directory data, go to the config folder and paste the mongod.cfg file here.

- turne	Date modified	lype	Size
mongod.cfg	7/25/2019 11:36 AM	CFG File	1 KE
	.,,		

Figure 57 - MongoDB Installation - Community Version (HA) (cont.)

5. Open the file mongod.cfg (preferably in Notepad++ or Sublime) and follow the below steps:

While editing the file, maintaining indentation is very important.

- a. In the storage header, change the following fields:
 - **dbPath**: Add path till mongo\data\database
- b. In the systemLog, change the following fields:
 - **path**: Add path of mongo\data\log\mongod.log

Folder mongo\data\log doesn't have Mongod.log. This will be created automatically when mongo service is created.

- c. In the net, change the following fields:
 - o **port**: Enter the port you want to install MongoDB



o **bindlpAll**: true

Please do not user Port Number 27017 as it's the default port.

- d. In the replication, change the following fields:
 - **replSetName**: Enter the name of replica set

<pre># mongod.conf</pre>	
t for documentation of all options and	
* for documentation of all options, see:	
http://docs.mongodb.org/manual/reference/configuration-options/	
# Where and how to store data.	
etorage:	
dDPath: C: mongo(data/database	
Journal:	
enabled: true	
<pre># engine:</pre>	
<pre># mmapv1:</pre>	
<pre># wiredTiger:</pre>	
# where to write logging data.	
systemLog:	
destination: file	
logannend: true	
Destruction of the second seco	
path: C: (mongo(data/10g(mongod.10g	
t network interfaces	
The second secon	
net:	
port: 27017	
bindIpAll: true	

Figure 58 - MongoDB Installation - Community Version (HA) (cont.)

eplication:	
replSetName:"DRYiCEReplicaSet"	
Sharurny.	•
	plication: replSetName:"DRYiCEReplicaSet"

Figure 59 - MongoDB Installation - Community Version (HA) (cont.)

- 6. Save the changes made in the file mongod.cfg.
- 7. Open **Command Prompt as Administrator** and run the following command.

Please ensure to enter the correct path of config file.

```
mongod -config "<path of the mongoDB folder you
created\mongo\data\config\mongod.cfg>" --install --serviceName
"MongoDB"
For e.g. mongod --config "C:\mongo\data\config\mongod.cfg" --
install --serviceName "MongoDB"
```

8. MongoDB service with the name MongoDB will be created.



2.15.2.1.5Start MongoDB Service

1. Press Windows+R, then type services.msc and press Enter.



Figure 60 - MongoDB Installation - Community Version (HA) (cont.)

- 2. Search for the MongoDB service and click MongoDB service.
- 3. Click Start the service on the Left pane.

/longoDB	Name	Description	Status	Startup Type	Log On As
	MessagingService_13ab08	Service sup		Automatic (T	Local Syste
<u>Start</u> the service	🌼 Microsoft (R) Diagnostics Hub Standard Collector Service	Diagnostics		Manual	Local Syste
	🖏 Microsoft Account Sign-in Assistant	Enables use	Running	Manual (Trig	Local Syste
Description:	🖏 Microsoft App-V Client	Manages A		Disabled	Local Syste
Apache/2.4.23 (Win64)	Microsoft iSCSI Initiator Service	Manages In		Manual	Local Syste
	Microsoft Passport	Provides pr		Manual (Trig	Local Syste
	Microsoft Passport Container	Manages Io F	Running	Manual (Trig	Local Service
	🆏 Microsoft Policy Platform Local Authority			Manual	Local Syste
	Microsoft Policy Platform Processor			Manual	Local Syste
	🏟 Microsoft Software Shadow Copy Provider	Manages so		Manual	Local Syste
	🏟 Microsoft Storage Spaces SMP	Host service		Manual	Network S
	Microsoft Windows SMS Router Service.	Routes mes F	Running	Automatic (D	Local Syste
	🏟 Mobile Broadband HL Service	Provide serv F	Running	Automatic	Local Syste
	🖏 MongoDB	Apache/2.4		Automatic	Local Syste
	🏟 Mozilla Maintenance Service	The Mozilla		Manual	Local Syste
	🖏 MSUPSrv	MSUPSrv F	Running	Automatic (D	Local Syste
	🍓 Natural Authentication	Signal aggr		Manual (Trig	Local Syste
	🍓 Net.Msmq Listener Adapter	Receives act		Disabled	Network S
	🏟 Net.Pipe Listener Adapter	Receives act	Running	Automatic	Local Service
	🖏 Net.Tcp Listener Adapter	Receives act	Running	Automatic	Local Service

Figure 61 - MongoDB Installation - Community Version (HA) (cont.)

These steps must be performed on all the servers which are part of the replica set.

- 4. Go to all the servers that have MongoDB service installed.
- 5. Open Command Prompt as Administrator and execute the below command by changing respective

IP and port of server.

```
mongo --host <IP> --port <port on which mongoDB service is running
(mentioned in config file)>
for e.g.
server 1: mongo --host x.x.xx.x1 --port 27017
server 2: mongo --host x.x.x.x2 --port 27017
server 3: mongo --host x.x.x.x3 --port 27017
```



 If the service is running successfully, then connection will be established without any error message.

2.15.2.1.6Configure Replica Set

Once the MongoDB service is up and running, perform the below steps to configure the replica set for MongoDB.

- 1. Go to one of the servers that is a part of the replica set.
- 2. Open the **Command Prompt** as **Administrator** and execute the below command to open the terminal.

```
mongo --host <IP> --port <in which MongoDB service is running. The
one written in config >
for e.g. - mongo --host x.x.xx.x1 --port 27017
```

3. In the same terminal, execute the below commands:

```
MongoDB > rs.initiate( {
    _id : "DRYiCEReplicaSet",
    members: [
    { _id: 0, host: "<IP>:<PORT>" },
    { _id: 1, host: "<IP>:<PORT>" },
    { _id: 2, host: "<IP>:<PORT>" }
    ]
})
```

4. Here, add the hosts that are part of the replica set and mention the respective host IP and port on

which MongoDB service is running. Ensure that the ports are open for communication.

```
MongoDB > rs.initiate( {
    _id : "DRYiCEReplicaSet",
    members: [
    { _id: 0, host: "10.1.1xx.x1:27017" },
    { _id: 1, host: "10.1.1xx.x21:27017" },
    { _id: 2, host: "10.1.1xx.x3:27017" }
]
})
```

5. Enter the below command to identify the Primary and Secondary server:

MongoDB >rs.status()

6. Execute the below command on the Secondary servers:

MongoDB >rs.slaveOk()

2.15.2.1.7Enable Authentication

BigFix

Authentication needs to be enabled only on the Primary server. All the secondary replica server will automatically be updated with the same.

To enable the authentication, perform the following steps:

- 1. Go to the **Primary server** in the replica set.
- 2. Open the **Command Prompt** as **Administrator** and execute the below command:

```
mongo --host x.x.xx.x1 --port 27017
```

3. Execute the below command:

MongoDB replicaTest:PRIMARY>use admin

- 4. Execute the below command. Make the following changes in the values before execution:
 - user:<user-name >
 - pwd :<password>

(choose any password for the corresponding user for MongoDB authentication.)

```
MongoDB replicaTest:PRIMARY> db.createUser(
    {
    user: "admin",
    pwd: "comnet123",
    roles: [ { role: "userAdminAnyDatabase", db: "admin" }, { role:
    "root", db: "admin" }, "readWriteAnyDatabase" ]
  }
)
```

5. After this is successfully executed in the primary server of replica set, make the following changes

in mongod.cfg of all the servers that are part of replica set. Refer the screenshot below:

security: authorization: "enabled" #operationProfiling:	
igure 62 - MongoDB Installation - Commun	ty Version (HA) (cont.

6. Close the terminal and restart the MongoDB service of all servers in the replica set.

7. Re-open the Command Prompt as Administrator on all the servers in the replica set and connect

to MongoDB using the below command:

```
mongo --host <IP> --port <Port>-u <username> -p <password> --
authenticationDatabase "admin"
For e.g. -
mongo --host x.x.xx.x1 --port 27017 -u admin -p comnet123 --
authenticationDatabase "admin"
mongo --host x.x.xx.x2 --port 27017 -u admin -p comnet123 --
authenticationDatabase "admin"
mongo --host x.x.xx.x3 --port 27017 -u admin -p comnet123 --
authenticationDatabase "admin"
```

8. Connection with MongoDB should be successfully established on both Primary and Secondary servers.

2.15.2.1.8Test the Connection

To test the connection, perform the following steps:

Python 3.6 should be present. You should also have the BigFix Runbook AI installer package as it contains some resources to be used in subsequent steps.

1. Open the **Command Prompt** as **Administrator** and execute the following command to install pymongo.

pip install pymongo

- Copy the file named "mongo_connection_community_HA.py", present in the installer package under iAutomateInstaller → Resources → Resources.zip folder, to any folder.
- 3. Open the file in **Notepad** and change the respective **IP**, **port**, **username**, **password** where MongoDB service is running.

Please preserve spaces and indentation.

ssl=False)

```
db = client['DRYiCE_db']
db_collection = db['DRYiCE_Collection']
```

```
db_collection.insert({"name":"xyz"})
print("Connection to Mongo Database successful")
```

4. Open the **Command Prompt** as **Administrator** mode and change the current working directory to the folder that has code using the following command:

the folder that has code using the follow

cd <folder path>

5. Execute the code by executing the following command:

python <file_name.py>

6. If file executes without any error, then connection is successful.

2.15.2.2Enterprise Version

This section describes the procedure for installation of MongoDB with authentication and authorization configured for Enterprise Edition in HA mode.

Important note:

- Please ensure the ports that are to be used for MongoDB service is open for communication with the help of Windows administrator.
- During the installation procedure whenever the MongoDB service is restarted, open the new command prompt to run the further commands.

2.15.2.2.1Installation steps:

- Download the file mongodb-win32-x86_64-enterprise-windows-64-4.0.25-signed.mse from the Path mentioned in the source field of <u>Table 14 – MongoDB Requirements</u> for Enterprise Version.
- 2. Double-click on mongodb-win32-x86_64-enterprise-windows-64-4.0.25-signed.mse file, select installation option as Complete and click Next.

🕼 MongoDB 4.0.10 2008R2Plus Enterprise (64 bit) Setup 🧼 —		×
Choose Setup Type		
Choose the setup type that best suits your needs		Y
Complete		- 1
All program features will be installed. Requires the most disk space. Recommended for most users.		_
Custom		- 1
Allows users to choose which program features will be installed and they will be installed. Recommended for advanced users.	where	- 1
		- 1
		- 1
		- 1
Back Next	Cano	el
1.000	-	_

Figure 63 - MongoDB Installation - Enterprise Version (HA)

- 3. Please ensure to note the location of the installation directory of MongoDB.
- 4. The option Install MongoDB as service would be checked by default.

Install MongoD as a S	ervice
Run service as Net	twork Service user
O Run service as a lo	ocal or domain user:
Account Domain:	
Account Name:	MongoDB
Account Passwor	rd:
Service Name:	MongoDB
Data Directory:	C:\Program Files\MongoDB\Server\4.0\data\
Log Directory:	C:\Program Files\MongoDB\Server\4.0\Jog\



Figure 64 - MongoDB Installation - Enterprise Version (HA) (Cont.)

5. Uncheck Install MongoDB as service and click Next.

nstall MongoD as a Se	rvice
Run service as Netv	vork Service user
Run service as a loc	al or domain user:
Account Domain:	
Account Name:	MongoDB
Account Password	l:
-	۲
Service Name:	MongoDB
Data Directory:	C:\Program Files\MongoDB\Server\4.0\data\
Log Directory D	
Log Directory,	C: \Program Files \MongoDB \Server \4.0 \Jog \
	< Back Next > Cancel

6. Wait till the MongoDB installation is complete.

2.15.2.2.2Add MongoDB to the Path:

To add MongoDB to the PATH, please perform the below steps:

- 1. Go to location where MongoDB was installed. For e.g., C:\Program Files\MongoDB.
- 2. Inside MongoDB, go to *folder \Server\4.0\bin*.
- 3. Go to Control Panel \rightarrow System and Security \rightarrow Security.
- 4. Select Advanced System Settings, click Environment Variables. This will open a new dialog box.
- Select the variable path in System Variables and add path of MongoDB. For e.g. C:\Program Files\MongoDB\Server\4.0\bin.
| C:\Python36 | New |
|---|-----------|
| C:\Python36\Scripts | |
| C:\Program Files\MongoDB\Server\3.2\bin | Edit |
| C:\Users\veena-m\Desktop\pkg\components | |
| C:\Program Files\Git\cmd | Browse |
| C:\Program Files\PuTTY\ | |
| C:\antiword | Delete |
| %SOLR_HOME%\bin | |
| C:\Program Files\Java\jdk1.8.0_201\bin | |
| C:\Program Files\nssm-2.24\win64 | Move Up |
| C:\Program Files (x86)\Windows Kits\8.1\Windows Performance To | |
| C:\Apache24\bin | Move Down |
| C:\antiword | |
| C:\ironpython2\net45 | |
| C\OpenSSI -Win64\bin | Edit text |
| C:\Program Files\MongoDB\Server\4.0\bin | |
| C:\Program Files (x86)\Microsoft SQL Server\Client SDK\ODBC\130 | |
| C:\Program Files (x86)\Microsoft SQL Server\130\Tools\Binn\ | |
| C:\Program Files (x86)\Microsoft SQL Server\130\DTS\Binn\ | |
| C:\Program Files (x86)\Microsoft SQL Server\130\Tools\Binn\Mana | |
| | |
| OK | Cancel |
| - OK | Currect |
| | .: |

2.15.2.2.3Creation of Directory Structure:

- 1. Create a folder named **mongo**. It should not be in the same location where MongoDB is installed.
- 2. Inside the folder **mongo**, create a folder named **data**.
- 3. Inside the folder data, create three folders named as config, database, and log.

Manaa	Data was differed	Turne	Cine.	
Name	Date modified	туре	Size	
config	7/25/2019 11:00 AM	File folder		
database	7/26/2019 3:07 PM	File folder		
log	7/25/2019 11:11 AM	File folder		

2.15.2.2.4Creation of MongoDB Service

- Go to the location where MongoDB is installed. Refer to the Path set in the PATH environment variable. For e.g., C:\Program Files\MongoDB.
- 2. Go to bin folder. For e.g., C:\Program Files\MongoDB\Server\4.0\bin.
- 3. Locate the file named **mongod.cfg** and copy the file.

Name	Date modified	Туре	Size
📧 bsondump.exe	7/25/2019 4:52 AM	Application	17,822 KB
📄 ca.pem	6/3/2019 6:08 PM	PEM File	4 KB
client.pem	6/3/2019 6:10 PM	PEM File	3 KB
InstallCompass.ps1	7/25/2019 5:16 AM	Windows PowerS	2 KB
🗟 libeay32.dll	7/3/2019 10:45 PM	Application extens	2,414 KB
🖡 mongo eve	7/25/2019 5·15 ΔM	Application	18.041 KR
🥘 mongod.cfg	7/25/2019 4:50 AM	CFG File	1 KB
mongod.exe	7/25/2019 5:18 AM	Application	32,009 KB
📄 mongod.pdb	7/25/2019 5:18 AM	PDB File	353,348 KB
📧 mongodump.exe	7/25/2019 4:57 AM	Application	18,898 KB
📧 mongoexport.exe	7/25/2019 4:55 AM	Application	18,401 KB
📧 mongofiles.exe	7/25/2019 4:54 AM	Application	18,246 KB
📧 mongoimport.exe	7/25/2019 4:55 AM	Application	18,584 KB
📧 mongorestore.exe	7/25/2019 4:56 AM	Application	18,965 KB
mongos.exe	7/25/2019 5:08 AM	Application	16,537 KB
mongos.pdb	7/25/2019 5:08 AM	PDB File	184,828 KB
📧 mongostat.exe	7/25/2019 4:53 AM	Application	18,488 KB
📧 mongotop.exe	7/25/2019 4:58 AM	Application	18,085 KB
🚳 ssleay32.dll	7/3/2019 10:45 PM	Application extens	350 KB

4. Go to the **mongo** folder that was custom created earlier. Inside the directory **data**, go to the **config** folder. Paste the mongod.cfg file here.

Name		Date modified	Туре	Size
mongod.cfg)	7/25/2019 11:36 AM	CFG File	1 KE
mongod.cfg)	7/25/2019 11:36 AM	CFG File	

Figure 69 - MongoDB Installation - Enterprise Version (HA) (Cont.)

5. Open the file mongod.cfg (preferably in Notepad++ or Sublime) and follow the below steps:

While editing the file, maintaining indentation in the file is very important.

- a. In the storage header, change the following fields:
 - **dbPath**: Add path till mongo\data\database.
- b. In the systemLog, change the following fields:
 - **path**: Add path of mongo\data\log\mongod.log.

Folder mongo\data\log doesn't have Mongod.log. This will be created automatically when mongo service is created.



- c. In the net, change the following fields:
 - **port**: Enter the port you want to install MongoDB.
 - **bindIpAll**: True.
- d. In the replication, change the following fields:
 - **replSetName**: Enter the name of the replica set.

t mongod conf	
* mongod.com	
<pre>for documentation of all options, see:</pre>	- 10
<pre>http://docs.mongodb.org/manual/reference/configuration-options/</pre>	
	- 8
# Where and how to store data.	- 8
storage:	
dbPath: C:\mongo\data\database	
journal:	
enabled: true	
<pre># engine:</pre>	
<pre># mmapv1:</pre>	
<pre># wiredTiger:</pre>	
# where to write logging data.	
systemLog:	_
destination: file	
logAppend: true	- 8
path: C:\mongo\data\log\mongod.log	
	_
<pre># network interfaces</pre>	
net:	
port: 27017	
bindIpAll: true	

Figure 70 - MongoDB Installation - Enterprise Version (HA) (Cont.)

<pre>#operationProfiling:</pre>	
replication: replSetName:"DRYiCEReplicaSet"	
†onaraing.	

Figure 71 - MongoDB Installation - Enterprise Version (HA) (Cont.)

- 6. Save the changes made in the file mongod.cfg.
- 7. Open the **Command Prompt** as **Administrator** and run the following command.

```
mongod -config "<path of the mongoDB folder you
created\mongo\data\config\mongod.cfg>" --install --serviceName
"MongoDB"
For e.g. mongod --config "C:\mongo\data\config\mongod.cfg" --
install --serviceName "MongoDB"
```

Ensure to enter the correct path of config file.



8. MongoDB service with the name MongoDB will be created.

2.15.2.2.5Start MongoDB Service

1. Press Windows+R, type services.msc and press Enter.

	lype the name resource, and	e of a progran Windows will	n, folder, docum open it for you.	ient, or Internet
<u>O</u> pen:	services.msc			~
		ОК	Cancel	<u>B</u> rowse

Figure 72 - MongoDB Installation - Enterprise Version (HA) (Cont.)

2. Search for **MongoDB service**, then click on it and click **Start the service** on the Left pane.

MongoDB	Name	Description	Status	Startup Type	Log On As
	MessagingService_13ab08	Service sup		Automatic (T	Local Syste
<u>Start</u> the service	Microsoft (R) Diagnostics Hub Standard Collector Service	Diagnostics		Manual	Local Syste
	🖏 Microsoft Account Sign-in Assistant	Enables use	Running	Manual (Trig	Local Syste
Description:	Microsoft App-V Client	Manages A		Disabled	Local Syste
Apache/2.4.23 (Win64)	A Microsoft iSCSI Initiator Service	Manages In		Manual	Local Syste
	🖏 Microsoft Passport	Provides pr		Manual (Trig	Local Syste
	🖏 Microsoft Passport Container	Manages Io	Running	Manual (Trig	Local Service
	🍓 Microsoft Policy Platform Local Authority			Manual	Local Syste
	🍓 Microsoft Policy Platform Processor			Manual	Local Syste
	🍓 Microsoft Software Shadow Copy Provider	Manages so		Manual	Local Syste
	🍓 Microsoft Storage Spaces SMP	Host service		Manual	Network S
	🍓 Microsoft Windows SMS Router Service.	Routes mes	Running	Automatic (D	Local Syste
	🍓 Mobile Broadband HL Service	Provide serv	Running	Automatic	Local Syste
	🖏 MongoDB	Apache/2.4		Automatic	Local Syste
	🍓 Mozilla Maintenance Service	The Mozilla		Manual	Local Syste
	🖏 MSUPSrv	MSUPSrv	Running	Automatic (D	Local Syste
	🆏 Natural Authentication	Signal aggr		Manual (Trig	Local Syste
	🆏 Net.Msmq Listener Adapter	Receives act		Disabled	Network S
	🆏 Net.Pipe Listener Adapter	Receives act	Running	Automatic	Local Service
	🖏 Net.Tcp Listener Adapter	Receives act	Running	Automatic	Local Service

Figure 73 - MongoDB Installation - Enterprise Version (HA) (Cont.)

These steps must be performed on all the servers that are part of the replica set.

- 3. Go to all the servers that have MongoDB service installed.
- Open the Command Prompt as Administrator and execute the below command by changing respective IP and port of server.

Ensure that the port on which MongoDB service is running is open for communication.

```
mongo --host <IP> --port <port on which mongoDB service is
running(mentioned in config file)>
```

for e.g.



```
server1: mongo --host x.x.x.x1 --port 27017
server2: mongo --host x.x.x.x2 --port 27017
server3: mongo --host x.x.x.x3 --port 27017
```

5. If the service is running successfully, then connection will be established without any error message.

2.15.2.2.6Configure Replica Set

Once the MongoDB service is up and running, perform the below steps to configure the replica set for MongoDB.

- 1. Go to one of the servers that is a part of the replica set.
- 2. Open the **Command Prompt** as **Administrator** and execute the below command to open the terminal.

```
mongo --host <IP> --port <in which MongoDB service is running. The
one written in config >
```

- for e.g. mongo --host x.x.xx.x1 --port 27017
- 3. In the same terminal, execute the below commands:

```
MongoDB > rs.initiate( {
id : "DRYiCEReplicaSet",
members: [
{ id: 0, host: "<IP>:<PORT>" },
{ id: 1, host: "<IP>:<PORT>" },
{ id: 2, host: "<IP>:<PORT>" }
1
})
For eq.,
MongoDB > rs.initiate( {
   id : "DRYiCEReplicaSet",
   members: [
      { id: 0, host: "10.1.1xx.x1:27017" },
      { id: 1, host: "10.1.1xx.x21:27017" },
      { id: 2, host: "10.1.1xx.x3:27017" }
     1
  })
```

- 4. Here, add the hosts that are part of the replica set. Also mention the respective host IP and port on which MongoDB service is running. Ensure that the ports are open for communication.
- 5. Enter the below command to identify the **Primary** and **Secondary** server.



MongoDB >rs.status()

6. Execute the below command on the Secondary servers.

MongoDB >rs.slaveOk()

2.15.2.2.7Enable Authentication

Authentication needs to be enabled only on the Primary server. The Secondary servers are automatically updated as they are part of the replica set.

To enable the authentication, perform the following steps:

- 1. Go to the primary server in the replica set.
- 2. Open the **Command Prompt** as **Administrator** and execute the below command:

```
mongo --host x.x.xx.x1 --port 27017
```

3. Execute the below command:

```
MongoDB Enterprise replicaTest:PRIMARY>use admin
```

- 4. Execute the below command. Make the following changes in the values before execution:
 - user:<user-name >
 - pwd :<password>

(choose any password for the corresponding user for MongoDB authentication.)

```
MongoDB Enterprise replicaTest:PRIMARY>db.createUser(
{
   user: "admin",
   pwd: "comnet123",
   roles: [ { role: "userAdminAnyDatabase", db: "admin" }, { role:
   "root", db: "admin" }, "readWriteAnyDatabase" ]
  }
)
```

After this is successfully executed in the primary server of replica set, make the following changes in mongod.cfg of all the servers that are part of replica set. Refer the screenshot below:

security:				
authorizat	ion:	"enabled"		
<pre>#operationPre</pre>	ofili	ng:		_

- 5. Close the terminal and restart the MongoDB service of all the servers in the replica set.
- 6. On all the server's part of the replica set, open the Command Prompt as Administrator and open

the MongoDB terminal using the following command:

```
mongo --host <IP> --port <Port> -u <username> -p <password> --
authenticationDatabase "admin"
For e.g.
mongo --host x.x.xx.x1 --port 27017 -u admin -p comnet123 --
authenticationDatabase "admin"
mongo --host x.x.xx.x2 --port 27017 -u admin -p comnet123 --
authenticationDatabase "admin"
mongo --host x.x.xx.x3 --port 27017 -u admin -p comnet123 --
authenticationDatabase "admin"
```

 Connection with MongoDB should be successfully established on both primary and secondary servers.

2.15.2.2.8 Enable SSL Authentication

To enable SSL authentication, perform the following steps:

Please ensure that only one **ca.pem** should be generated. From the same **ca.pem**, **server.pem** for each server should be generated. From the same **ca.pem**, **client.pem** should be generated.

If this is not done properly, it may result in failure of SSL Authentication and replica set server may become unreachable.

- 1. Generate the ca.pem, server.pem and client.pem by referring to the Generate ca.pem and server.pem and Generate client.pem.
- After the ca.pem, client.pem and server.pem are generated, copy these files, and paste them in the path below:

<MongoDB installed path>/MongoDB/Server/4.0/bin





For e.g. - C:\Program Files\MongoDB\Server\4.0\bin

server.pem generated for the respective servers should be placed in the same server.

3. Go to folder mongo/data/config, then open the file mongod.cfg and make the following changes.

Please preserve the space and indentations as shown in the screen shot below. Ensure that editing is done in notepad++.

a. In the **net header**, edit the following:

```
ssl:
    mode: allowSSL
    PEMKeyFile: C:\Program
Files\MongoDB\Server\4.0\bin\server.pem
    CAFile: C:\Program Files\MongoDB\Server\4.0\bin\ca.pem
```



Figure 75 - MongoDB Installation - Enterprise Version (HA) (Cont.)

- 4. Save the file for changes to be reflected.
- After making the changes in all the servers of the replica set, Restart the MongoDB services on all the servers.
- 6. Open Command Prompt as Administrator on all the servers and execute the below command:

```
mongo --ssl --host <IP> --port <port> -u <username> -p <password>
--authenticationDatabase "admin" --sslCAFile "<path of ca.pem>" --
sslPEMKeyFile "<path of client.pem>"
```

7. Add the respective IP, port, path of the pem file in all the servers.

```
for e.g. -
mongo --ssl --host 10.x.x.x1 --port 27017 -u admin -p comnet123 --
authenticationDatabase "admin" --sslCAFile "C:\Program
Files\MongoDB\Server\4.0\bin\ca.pem" --sslPEMKeyFile "C:\Program
Files\MongoDB\Server\4.0\bin\client.pem"
```

This will help in establishing the connection with MongoDB.

8. Execute the below commands in all the servers of the replica sets.



```
MongoDB Enterprise replicaTest:PRIMARY>db.adminCommand( {
  setParameter: 1, sslMode: "preferSSL" } )
    MongoDB Enterprise replicaTest:PRIMARY>db.adminCommand( {
   setParameter: 1, sslMode: "requireSSL" } )
```

9. Restart the MongoDB service on all the servers in the replica set.

2.15.2.2.9Test the Connection

To test the connection, perform the following steps:

Python 3.6 should be present. You should also have the BigFix Runbook AI installer package as it contains some resources to be used in subsequent steps.

1. Open Command Prompt as Administrator and execute the following command:

pip install pymongo

- Copy the file named "mongo_connection_enterprise_HA.py", present in the installer package under iAutomateInstaller → Resources → Resources.zip folder, to any folder.
- 3. Open the file in **Notepad** and change the value of **IP**, **port**, **username**, **password**, **certificate path** where **MongoDB** service is running.

4. Open Command Prompt as Administrator and change the current working directory to the folder

that has code using the following command:



cd <folder path>

5. Execute the code by using the following command:

python <file_name.py>

6. If file executes without any error, then connection is successful.

2.16Apache SOLR

	Table 15 – Apache SOLR Requirements
Version	Solr 8.5.0
Purpose	It is used an indexer for searching information from documents. It is also used for maintaining pre-downloaded repository document mappings.
Prerequisites	Installation of Java
	This is available as part of BigFix Runbook AI installer package. For Solr: Follow the below path:
Source	Pre-Requisite Software → solr-8.5.0.zip For NSSM : Follow the below path: Pre-Requisite Software → nssm-2.24.zip
Config	Available as part of BigFix Runbook AI installer package. Follow the below path: Pre-Requisite Software \rightarrow Solr_8.5_Prereq.zip

Apache Solr is an open-source enterprise search platform. It is being used as indexer in BigFix Runbook AI to search for relevant document based on context. In BigFix Runbook AI, it is used to provide the relevant knowledge articles based on the ticket descriptions. Users can also search for the knowledge articles proactively.

Apache Solr can be configured in two modes i.e., HA or non-HA mode. In non-HA mode, user will need to configure only one instance of Solr in Cloud mode where zookeeper will be in-built provided by Solr.

However, in HA mode user will need to configure separate zookeeper cluster. Zookeeper cluster should have at least 3 servers and if user wants to further increase the same then it should be odd in numbers.



Please ensure that the user has at least two Solr instances which are connected via load balancer. In HA mode, all instances of Apache Solr have point in-time data replication i.e., all Solr instances are in read and write mode.

2.16.1SOLR Installation – High Availability (HA) Mode

This section describes the procedure for installation of Solr in HA mode which is integrated with Zookeeper. This is applicable only for Windows Sever.

For **Apache Solr in H.A**, configure **Zookeeper on at least three different servers** because for ZooKeeper cluster to be active, there must be a majority of non-failing machines that can communicate with each other. For this reason, ZooKeeper cluster is usually made up of an odd number of machines. It runs as an ensemble of ZooKeeper servers i.e., Zookeeper cluster. User must integrate Zookeeper cluster with **two Solr node running on different servers** that are connected with Load Balancer.

Minimum configuration for each of the servers are explained below:

- Windows Server 2016 with 64-bit Processor
- 2 GB of RAM, and 80GB HDD hard drives
- 2 Cores





Figure 76 - Installation of Solr in HA – Architecture

2.16.1.1Installation of Zookeeper

 Table 16 – Zookeeper Requirements

 Table 16 – Zookeeper Requirements

 Available as part of BigFix Runbook Al installer package. Follow the below path:

 Source

 Pre-Requisite Software → zookeeper-3.6.3.zip

This section describes the procedure for installation of Zookeeper. Please perform the below steps:

- Download zookeeper-3.6.3.zip file from the path mentioned in the source field of Table 16 Zookeeper Requirements on all three servers.
- 2. Copy the zookeeper.zip folder in the desired location and extract it.

e.g. - D:\zookeeper

Ensure that Java version 1.8 or higher is configured in the system and JAVA_HOME variable is set.
 To check the same, open the Command Prompt and type the below command:

Java -version



Figure 77 - Installation of ZooKeeper

- 4. Proceed with the installation if the Java version is displayed. If not, please install Java as mentioned in section Java.
- 5. Go to the zookeeper installation directory where zookeeper was extracted.
- 6. Go to <zookeeper_install_dir>/conf folder, rename the zoo_sample.cfg file to zoo.cfg.
- 7. Create a folder inside zookeeper directory with name dataDir. For doing this, go inside the zookeeper installation directory, open the **Command Prompt** as **Administrator** and type:

mkdir dataDir

 Go to <zookeeper_install_dir>/conf folder and open zoo.cfg file. Change the below parameters and add details of three zookeeper servers. Here you need to select three distinct zookeeper ids for three distinct servers. (Keep it numeric).



Figure 78 - Installation of ZooKeeper (cont.)

9. Enter the same parameter details in **zoo.cfg** file.

🧾 zoo.cfg - Notepad	—		×
File Edit Format View Help			
# synchronization phase can take			^
initLimit=5			
# The number of ticks that can pass between			
# sending a request and getting an acknowledgement			- 199
syncLimit=2			
# the directory where the snapshot is stored.			
# do not use /tmp for storage, /tmp here is just			
# example sakes.			
dataUir=C:/Zookeeper/dataUir			
# the port at which the clients will connect			
# the maximum number of client connections			
# increase this if you need to handle more clients			
<pre>#maxClientCnxns=60</pre>			
#			
# Be sure to read the maintenance section of the			
# administrator guide before turning on autopurge.			
#			
<pre># http://zookeeper.apache.org/doc/current/zookeeperAdmin.html#s</pre>	c_main	tenance	e
#			
# The number of snapshots to retain in dataDir			
#autopurge.snapRetainCount=3			
# Purge task interval in hours			
# Set to "0" to disable auto purge feature			
#autopurge.purgeInterval=1			
Server.1=XXX.XXX.XXX.XXX.2000:0000			
Server.2-XXX.XXX.XXX.2003.3003			
Ser ver . 3-AAA. AAA. AAA. 2030. 3030			
			~
Figure 79 - Installation of Zookeeper (con	t.)		

For Reference, zookeeper will use these ports (2888, 2889,....) to connect the individual follower nodes to the leader nodes. The other ports (3888, 3889,....) are used for leader election in the ensemble. Make sure all these ports must be different from each other.

10. Go to <*zookeeper_install_dir*> and open **Command Prompt as Administrator** and type the below command:

(echo<Zookeeper Server ID>)>dataDir/myid

e.g. – (echo 1)>dataDir/myid

This command will create a file inside dataDir folder with name **myid** and add the server ID. The server ID is a number between 1-255, and it must be unique. Also it must correspond with server.\${id} in the zoo.cfg files.

bin	version-2	7/29/2019 11:40 AM E	ile folder	
dataDir	myid	7/24/2019 4:03 PM F	ile	1 KB
logs				
This PC				
Deskton				
Documents				
in potentia				

Figure 80 - Installation of Zookeeper (cont.)

- 11. In above example followed, there are 3 server IDs 1, 2 and 3. So, for the respective server, it's **zoo.cfg** should contain its respective id.
- 12. Go to the **bin** folder and open the **Command Prompt** as **Administrator** inside <zookeeper install dir>.
- 13. Start **Zookeeper** by executing the following command:

zkServer.cmd

- 14. Now Zookeper is running at <*IP_address>:<port>* (User can change the port in the zoo.cfg file with field name i.e., client Port).
- 15. User may see some error in the terminal, if other two zookeepers were not started. Ignore this error for now, until all three Zookeeper starts.
- 16. Configuration is ready for the first Zookeeper node.

2.16.1.2 Enabling Zookeeper as Windows Service

This section describes the procedure for enabling Zookeeper as a Windows service. Please perform the below steps:

- Download nssm-2.24.zip file from the path mentioned in the source field of Table 15 Apache SOLR Requirements and unzip it.
- 2. Copy nssm.exe from nssm-2.24\win64 to <zookeeper_install_dir >\bin.
- Go to the bin folder i.e., < zookeeper_install_dir >\bin and open the Command Prompt as Administrator.
- 4. Execute the below command:

nssm install zookeeper

5. The below window will be displayed.

plication D	etails Log on Dependencies Process Shutdown Exit 💶
Application	
Path:	
Startup direc	tory:
Arguments:	
/ice name:	Zookeeper Install service Lance

Figure 81 - Enabling Zookeeper as Windows Service

6. Click **Application** tab and enter the information as mentioned below:

```
Path: <zookeeper_install_dir> \bin\zkServer.cmd
Startup Directory: <zookeeper_install_dir> \bin
```

- Applicatio]
Path:	C:\zookeeper\bin\zkServer.cmd
Startup di	ectory: C:\zookeeper\bin
Argument	
	1
vice name:	zookeeper Install service Cance

7. Click **Details** tab and enter the information as displayed in the image below:

Application Details	Log on Dependencies Process Shutdown Exit
Details	
Display name:	
Description:	Zookeeper Service
Startup type:	Automatic
ervice name: 200	keeper
ervice name. 200	

- 8. Click Install Service.
- 9. Upon successful installation, following message will appear.



10. Press Win+R, type services.msc and press OK.

🖅 Run	×
۸	Type the name of a program, folder, document, or Internet resource, and Windows will open it for you.
<u>O</u> pen:	services.msc 🗸
	OK Cancel <u>B</u> rowse



Figure 85 - Enabling Zookeeper as Windows Service (cont.)

- 11. Search for **zookeeper** service and click on **zookeeper** service.
- 12. Click **Start the service** on the left panel to start the service.

🎑 Windows Management Inst	Provides a c	Running	Automatic	Lo
🥋 Windows Mobile Hotspot S	Provides th		Manual (Trig	Lo
🏟 Windows Modules Installer	Enables inst		Manual	Lo
🥋 Windows Presentation Fou	Optimizes p		Manual	Lo
🔍 Windows Push Notification	This service	Running	Automatic	Lo
🔍 Windows Push Notification	This service		Manual	Lo
🔍 Windows Push Notification	This service		Manual	Lo
🔍 Windows Remote Manage	Windows R	Running	Automatic	Ne
🖏 Windows Search	Provides co		Disabled	Lo
🔍 Windows Time	Maintains d	Running	Automatic (T	Lo
🖏 Windows Update	Enables the		Manual (Trig	Lo
🖏 WinHTTP Web Proxy Auto	WinHTTP i	Running	Manual	Lo
🎑 Wired AutoConfig	The Wired		Manual	Lo
🌼 WMI Performance Adapter	Provides pe		Manual	Lo
Workstation	Creates and	Running	Automatic	Ne
🎇 Xbox Live Auth Manager	Provides au		Manual	Lo
🎑 Xbox Live Game Save	This service		Manual (Trig	Lo
zookeeper	Zookeeper		Automatic	Lo

Figure 86 - Enabling Zookeeper as Windows Service (cont.)

2.16.1.3Installation of SOLR

This section describes the procedure for installation of Solr. As per the best practices, Solr instances (preferably two or more in number) should be configured on different servers, different from the servers where ZooKeeper cluster has been set up.

Please follow the below steps for each of the Solr instances:

- Download the folder solr-8.5.0 .zip file from the Path mentioned in source field of <u>Table 14 –</u> <u>Apache SOLR Requirements.</u>
- 2. Extract zip file to desired location.

e.g.: **D:\solr**

Ensure that Java version 1.8 or higher is configured in the system. And JAVA_HOME variable is set.
 To check the same, open the Command Prompt and type the below command:



java -version

- 4. Proceed with the installation if the Java version is displayed. If not, please install Java as mentioned in Java.
- 5. Set **SOLR_HOME** environment variable and add to **PATH** environment variable. Follow the below steps to set the **SOLR_HOME** and **PATH**.
 - a. Go to Control Panel \rightarrow System and Security \rightarrow Advanced System Settings.
 - b. Click Environment Variables. A new dialog box appears.

Edit System Variable				×
Variable name: Variable value:	SOLR_HOME			
Browse Directory	Browse File		ОК	Cancel

Figure 87 - Installation of SOLR

- c. Select **Path** in **System Variables** and add the respective path of Solr mentioned above.
- d. Set the environment variable as depicted in the image above.
- e. Add **%SOLR_HOME%\bin** to **PATH** environment variable.

BigFix

dit environment variable	×
%USERPROFILE%\AppData\Local\Microsoft\WindowsApps	New
C:\Program Files\Python37	
C:\Program Files\Python37\Scripts	Edit
C:\Program Files\Java\jdk1.8.0_181 \bin	
%SOLR_HOME%\bin	Browse
	Delete
	Move Up
	more op
	Move Down
	Edit text
[
ОК	Cancel

- Figure 88 Installation of SOLR (cont.)
- 6. Navigate to SOLR_HOME\bin. Open the Command Prompt as Administrator and execute the

below command:

```
solr start -cloud -s <SOLR HOME\server\solr> -p <PORT> -z
<ZOOKEEPER IP 1>:<ZOOKEEPER PORT 1>,
<ZOOKEEPER IP 2>:<ZOOKEEPER PORT 2>,<ZOOKEEPER IP 3>:<ZOOKEEPER PO</pre>
RT 3>
```

7. Enter the **IP address** and the **Port** as shown in below example in the respective fields:

```
e.q. -
solr start -cloud -s "C:\solr\solr-8.5.0\server\solr" -p 8983 -z
"1x.xx.xx.x1:2181,1x.xx.1xx.x2:2181,1x.xx.x3:2181"
Here,
-p for port, you can choose another port
-h for hostname/IP
-s for path where solr.xml and zoo.cfg is present
-SOLR HOME is solr path till /solr-8.5.0
-z List of comma separated: Zookeeper IP with port
```

8. Create a folder named **iAutomateSolr** in the directory path SOLR HOME\server\solr\configsets.

- This step requires the two conf folders (that contains schema.xml and solrconfig.xml) from path mentioned in <u>Table 14 – Apache SOLR Requirements</u>. Please reach out to <u>iAuto-Product-Supp@hcl.com</u> to get access to the folder.
- 10. Copy the two conf folder received to the 'iAutomateSolr' folder created in previous steps.
- 11. Navigate to *SOLR_HOME\server\scripts\cloud-scripts*. Open the Command Prompt as Administrator and execute the below command for all three Zookeeper servers, for each of the two conf folders with different schema names, respectively.

```
zkcli.bat -zkhost <ZOOKEEPER_IP>:<ZOOKEEPER_PORT> -cmd upconfig -
confname <SCHEMA_NAME> -confdir
SOLR HOME\server\solr\configsets\iAutomateSolr\<CONF FOLDER NAME>
```

• For iScrape and iKnowledge: Enter the Solr IP and ZooKeeper Port that has been configured earlier. Set Schema Name as 'ticketschema' for Basic Knowledge and iScrape conf folder

named as 'conf_iscrape_knowledge'.

```
e.g. for iScrape and iKnowledge -
zkcli.bat -zkhost 1x.xx.xx.x1:2181 -cmd upconfig -confname
ticketschema -confdir C:\solr\solr-
8.5.0\server\solr\configsets\iAutomateSolr\conf_iscrape_knowledge
zkcli.bat -zkhost 1x.xx.xx.x2:2181 -cmd upconfig -confname
ticketschema -confdir C:\solr\solr-
8.5.0\server\solr\configsets\iAutomateSolr\ conf_iscrape_knowledge
zkcli.bat -zkhost 1x.xx.xx.x3:2181 -cmd upconfig -confname
ticketschema -confdir C:\solr\solr-
8.5.0\server\solr\configsets\iAutomateSolr\ conf_iscrape_knowledge
```

• For Indexer: Enter the Solr IP and ZooKeeper Port that has been configured earlier. Set

Schema Name as 'documentschema' for Advance iKnowledge conf folder named as

'conf_indexer'.

```
e.g. for Indexer -
zkcli.bat -zkhost 1x.xx.xx.x1:2181 -cmd upconfig -confname
documentschema -confdir C:\solr\solr-
8.5.0\server\solr\configsets\iAutomateSolr\conf_indexer
zkcli.bat -zkhost 1x.xx.xx.x2:2181 -cmd upconfig -confname
documentschema -confdir C:\solr\solr-
8.5.0\server\solr\configsets\iAutomateSolr\conf_indexer
```

```
zkcli.bat -zkhost 1x.xx.xx.3:2181 -cmd upconfig -confname
documentschema -confdir C:\solr\solr-
8.5.0\server\solr\configsets\iAutomateSolr\conf indexer
```

2.16.1.3.1Authentication

 Create security.json file with the content mentioned in the file named security.json, present in the installer package under iAutomateInstaller → Resources →Resources.zip folder and store in system.

e.g., D:\solr\solr-8.5.0\security.json.

 Upload the security.json file to each of the ZooKeeper instances. Open the Command Prompt as Administrator and execute the below commands to upload configuration file to each of ZooKeeper

instances:

```
solr zk cp <Security JSON PATH> zk:/security.json -z
<IP>:<ZooKeeper Port>
e.g. -
solr zk cp file:C:\solr\solr-8.5.0\security.json zk:/security.json
-z 1x.xx.xx.x1:2181
solr zk cp file:C:\solr\solr-8.5.0\security.json zk:/security.json
-z 1x.xx.xx.x2:2181
solr zk cp file:C:\solr\solr-8.5.0\security.json zk:/security.json
-z 1x.xx.xx.x3:2181
```

This will create one user with name **Solr** and password as **SolrRocks**.

3. Execute the below command in browser to ensure that Solr is running with authentication and authorization enabled.

```
http://<IP>:<SOLRPORT>/solr/admin/authentication
http://<IP>:<SOLRPORT>/solr/admin/authorization
```

4. Enter the username '**solr'** and password '**SolrRocks'** when prompted for authentication.

If the message **"authorization.enabled":true** is displayed, it confirms that authorization has been enabled successfully.

```
{
"responseHeader":{
"status":0,
"QTime":0},
"authorization.enabled":true,
"authorization":{
"class":"solr.RuleBasedAuthorizationPlugin",
"user-role":{"solr":"admin"},
```

```
"permissions":[{
  "name":"security-edit",
  "role":"admin"}]}}
```

5. If the message "authentication.enabled":true is displayed, it confirms that authorization has been

enabled successfully.

```
{
    "responseHeader":{
    "status":0,
    "QTime":3},
    "authentication.enabled":true,
    "authentication":{
    "class":"solr.BasicAuthPlugin",
    "credentials":{"solr":"IV0EHq1OnNrj6gvRCwvFwTrZ1+z1oBbnQdiVC3otuq0
    = Ndd7LKvVBAaZIF0QAVi1ekCfAJXr1GGfLtRUXhgrF8c="}}
```

Execute the below command as POST request on any of rest clients such as *Postman* or *Curl*. Select
 Basic Authentication and provide Username and Password as created in above steps under
 authorization tab. This creates a new user with UserName to be further used as <user_name> in
 credentials.

URL: Error! Hyperlink reference not valid.

In Basic Authentication use the below credentials.

- Username: solr
- Password: SolrRocks
- In the **Body** tab, select input as **Raw JSON** (application/json) and provide the below input.

```
{
"set-user": {"<user-name>" : "<password>" }
}
e.g. -
This will create user with username: solradmin and password:
Admin098
{
    "set-user": {"solradmin" : "Admin098" }
}
```

Now, a Solr user has been created with UserName as 'solradmin' and Password as 'Admin098'.

POST • http://ionianame/solr/a	dmin/authorization		Send 🔹	Save *
Params Authorization Headers (2)	Body Pre-request Script Tests		Cookies Code	
TYPE Basic Auth 💌	Heads up! These parameters hold s environment, we recommend using	rensitive data. To keep this data secure while working in 5 variables. Learn more about variables	a collaborative	×
The authorization header will be automatically generated when you send the request. Learn more about authorization Preview Request	Username Password	solr SolrRocks Show Password		
dy Cookies Headers (2) Test Results		Status: 200 OK Time: 80 r	ns Size: 141 B	Download
Pretty Raw Preview JSON *	Ð			n q
1 - (2 - "responseHeader": { 3 "status": 0, 4 "QTime": 8 5) 6 }				

```
Figure 89 - Installation of SOLR (cont.)
```

 This step provides admin rights to user which is mentioned in <username> tab and sets the user role using Post request with the URL specified below:

Execute the below command as **POST** request in any of rest client such as *Postman* or *Curl* In Basic Authentication use the below credentials.

- URL: <u>http://<IP>:<SOLRPORT>/solr/admin/authorization</u>
- Username: solr
- **Password**: SolrRocks
- In the **Body** tab, select input as **Raw JSON** (application/json) and provide the below input.

```
{ "set-user-role": {"<user-name>":["admin"]}}
e.g. -
This will provide admin rights to solradmin
```

```
{ "set-user-role": {"solradmin":["admin"]}}
```

8. This step grants all permissions to the admin role as is mentioned below:

Execute the below command as **POST** request in any of rest client such as *Postman* or *Curl*.

Select Basic Authentication with Username as solr and Password as SolrRocks and this step will set the user permission.

9. Enter the respective **IP** and **Solr Port**.

{

}

Error! Hyperlink reference not valid.

10.In the Body tab, select input as Raw JSON (application/json) and provide the below input.

"set-permission": { "name":"all","role": "admin"}

This grants all permissions to the users with admin role.

11. Open the Command Prompt as Administrator and run the below command:

solr stop -p <port of solr>

12. Go to path where Solr is installed < SOLR_HOME >\bin.

e.g. - C:\solr\solr-8.5.0\bin.

13. Open solr.in in Edit mode. Uncomment the two lines mentioned below and edit <user-name> and

<password> as mentioned in below example:

```
REM set SOLR_AUTH_TYPE=basic
REM set SOLR_AUTHENTICATION_OPTS="-Dbasicauth=<user-
name>:<password>"
e.g. -
set SOLR_AUTH_TYPE=basic
set SOLR_AUTH_TYPE=basic
set SOLR_AUTHENTICATION_OPTS="-Dbasicauth=solradmin:Admin098"
```

2.16.1.4SOLR as a Service

This section describes the procedure for enabling Solr as a service.

Please follow the below steps:

- Download nssm-2.24.zip file from the path mentioned in the source field of <u>Table 15 Apache SOLR</u> <u>Requirements</u> and unzip it.
- 2. Copy nssm.exe from nssm-2.24\win64 to SOLR_HOME\bin.
- 3. Open the Command Prompt as Administrator and Navigate to SOLR_HOME\bin.
- 4. Execute the below command:

nssm install solrservice

The following window appears:

, ibbiioc	Log on Decais Log on Dependencies I nocess I shadowin Lake	1 1 1
- App Path	lication	
Star Argu	uments:	
Service r	name: solrservice Can	cel

Figure 90 - Enabling Solr as Windows Service

- 5. Click **Application** tab and enter the information as mentioned below:
 - Path: C:\solr\solr-8.5.0\bin\solr.cmd
 - Startup directory: C:\solr-8.5.0\bin
 - Arguments: <As mentioned below>

```
start -cloud -s <SOLR_HOME\server\solr> -h <SOLR_IP> -f -p
<SOLR_PORT> -z <ZOOKEEPER_IP>:<ZOOKEEPER_PORT>
E.g.
start -cloud -s "C:\solr\solr-8.5.0\server\solr" -h 1x.xx.xx.x1 -f
-p 8983 -z "1x.xx.xx.x2:2181,1x.xx.xx.3:2181,1x.xx.xx.x4:2181"
```

Application	
Path:	C:\solr\solr-8.5.0\bin\solr.cmd
Startup directory:	C:\solr\solr-8.5.0\bin
Arguments:	start -m 2g -cloud -h localhost -f -p 8983 -s C:\solr\solr-8.5

- Figure 91 Enabling Solr as Windows Service (cont.)
- 6. Click **Details** tab and enter the below information:

A	pplication Details	Log on Dependencies Process Shutdown Exit	
1	Details		
	Display name:	solr server	
	Description:	service to start and stop the solr	
	Startup type:	Automatic	
Ser	rvice name: solr	service Install service Cancel	
	_		

- 7. Click Install Service.
- 8. Upon successful installation, following message will appear.



Figure 93 - Enabling Solr as Windows Service (cont.)

9. Press Win+R, type services.msc and press Enter.

	Type the name of a program, folder, document, or Internet resource, and Windows will open it for you.
<u>O</u> pen:	services.msc 🗸
	OK Cancel <u>B</u> rowse

10. Search for Solr Server service.



11. Click on **Solr Server** service and then click **Start the service** on the left panel to start the service.

Solr Server	Name	Description	Status	Startup Type	Log On As
	🆏 Shared PC Account Manager	Manages pr		Disabled	Local Syste
Stop the service	🆏 Shell Hardware Detection	Provides no	Running	Automatic	Local Syste
Restart the service	🆏 Smart Card	Manages ac	Running	Automatic (T	Local Service
	🤹 Smart Card Device Enumera	Creates soft		Manual (Trig	Local Syste
Description:	🆏 Smart Card Removal Policy	Allows the s		Manual	Local Syste
	🆏 SMS Agent Host	Provides ch	Running	Automatic (D	Local Syste
service to start of stop son	🎑 SNMP Trap	Receives tra		Manual	Local Service
	Software Protection	Enables the		Automatic (D	Network S
	🆏 Solr Server	service to st	Running	Automatic	Local Syste
	🆏 Solr Server 2	start and st	Running	Automatic	Local Syste
	🏟 solr_8aug		Running	Automatic	Local Syste
	🎑 Spatial Data Service	This service		Manual	Local Service
	🏟 Spot Verifier	Verifies pote		Manual (Trig	Local Syste
	🎑 SQL Server (MSSQLSERVER)	Provides sto	Running	Automatic	NT Service
	🧠 SQL Server Agent (MSSQLS	Executes jo		Manual	NT Service
	🆏 SQL Server Browser	Provides SQ		Disabled	Local Service

12. Check the below mentioned URL in browser:

http://<SOLR IP>:<SOLRPORT>/solr

13. Enter username as "solradmin" and password as "Admin098" on Solr Portal Login Page.

Figure 95 - Enabling Solr as Windows Service (cont.)

	Instance		题 System	G
	④ Start	about an hour ago	Physical Memory 47.6%	
gout solradmin	😤 Versions			
shboard	@ cols coos	9.5.0	7.62 GB	
aging	- solr-spec	0.5.0 7ac400hf7h07h61740h10fa3ac0dc46a74h9dc42 ramcayaaak 2020.02 .	Curren Canada - an an	16.00 GB
ud	W lucene-snec	8.5.0	Swap Space SU.4%	
	lucene-impl	8.5.0 7ac489bf7b97b61749b19fa2ee0dc46e74b8dc42 - romsevneek - 2020-03-		
lections	locono impr	and selection by berry serial condition in balling reading and the	9.26 GB	
a Properties				18.37 GB
ead Dump	MVC 💿		JVM-Memory 10.5%	
gestions			,	
	a Runtime	Uracle Corporation Java HotSpot(IM) 64-Bit Server VM 1.8.0_181 25.181-D13		_
collections	Processors			
ilable	M Args	-DSTOP.KET=SUITORS	215.50 MB	
and create one		-Dhost=10.1.150.86		2.00 GB
		-Djava.io.tmpdir=C:\solr\solr8.5\solr-8.5.0\server\tmp		2.00 GB
cores available		-Djetty.home=C:\solr\solr8.5\solr-8.5.0\server		
and create one		-Djetty.host=0.0.0.0		
		-Djetty.port=8985		
		-Dlog4j.configurationFile=C:\solr\solr8.5\solr-8.5.0\server\resources\log4j2.xml		
		-Dsolr.default.confdir=C:\solr\solr8.5\solr-8.5.0\server\solr\configsets_default\		

Figure 96 - Enabling Solr as Windows Service (cont.)

14. Create collection named as 'ScriptKnowledgeData' in Solr for Basic Knowledge and iScrape using

the URL below:

```
http://<SOLR_IP>:<SOLR_PORT>/solr/admin/collections?action=CREATE&
name=ScriptKnowledgeData&router.name=implicit&shards=iScrape,Knowl
edge&replicationFactor=1&maxShardsPerNode=4&collection.configName=
ticketschema&router.field=shardType.
```



15. On successful creation of the collection following response is received.

```
{
   "responseHeader":{
    "status":0,
    "QTime":3373},
   "success":{
    "<SOLR_IP>:<SOLR_PORT>_solr":{
        "responseHeader":{
            "status":0,
            "QTime":2464},
        "core":"ScriptKnowledgeData_iScrape_replica_n1"},
   "<IP>:<PORT>_solr":{
            "responseHeader":{
            "status":0,
            "QTime":2737},
            "core":"ScriptKnowledgeData_Knowledge replica_n2"}}}
```

16. To check the Successful creation of collection in Solr. Navigate to Solr Home Page as mentioned in Figure 96. On Left Pane Select "Collections" tab and verify "ScriptKnowledgeData" collection is present.

	ScriptKnowled	Collection: Scriptl	KnowledgeDat	a	Shard: iScrape			×
Logout solradmin Dashboard Logging Cloud Collections Java Properties Thread Dump Suggestions	Zreate Alias	Shard count: configName: replicationFactor: maxShardsPerNode: router: autoAddReplicas:	2 ticketschema 1 4 implicit false		🗟 Shard: Knowled	ige		×
Select an Option *				Documentation	Issue Tracker	4 IRC Channel	Scommunity forum	Solr Query Syntax

2.16.2Solr Installation – Non-High Availability (non-HA) mode

This section describes the procedure for installation of Solr without High Availability.



Please follow the below steps:

- Download the folder solr-8.5.0 .zip file from the Path mentioned in source field of <u>Table 15 –</u> <u>Apache SOLR Requirements</u>.
- 2. Extract zip file to desired location.

e.g.: **D:\solr**

Ensure that Java version 1.8 or higher is configured in the system and JAVA_HOME variable is set.
 To check the same, open the Command Prompt as Administrator and type the below command:

java -version

- 4. Proceed with the installation if the Java version is displayed. If not, please install Java as mentioned in Java.
- 5. Set **SOLR_HOME** environment variable and add to **PATH** environment variable. Follow the below steps to set the **SOLR_HOME** and **PATH**.
 - a. Go to Control Panel \rightarrow System and Security \rightarrow Advanced System Settings.
 - b. Click Environment Variables. A new dialog box appears.
 - c. Select Path in the System Variables and add the respective path of Solr mentioned above.

:\solr-8.5.0		
Browse File	ОК	Cancel
	:\solr-8.5.0 Browse File	C:\solr-8.5.0 Browse File

- d. Set the environment variable as depicted in the image above.
- e. Add **%SOLR_HOME%\bin** to **PATH** environment variable.



%USERPROFILE%\AppData\Local\Microsoft\WindowsApps	New
C:\Program Files\Python37	
C:\Program Files\Python3/\Scripts	Edit
L:\Program Files\Java\Jdk1.8.0_181 \bin	Province
%SOEK_HOME %\BIN	Browse
	Delete
	Move Up
	Move Down
	Edit text
ок	Cancel

Figure 99- Installation of SOLR without HA (Cont.)

6. Navigate to **SOLR_HOME\bin.** Open the **Command Prompt** in **Administrator** mode and execute the below command:

below command:

```
solr start -m 2g -cloud -h <SOLR_IP> -p <SOLR_PORT> -s
SOLR HOME\server\solr
```

7. Enter the IP address and the Port as the example below states in the respective fields.

```
e.g. -
solr start -m 2g -cloud -h localhost -p 8983 -s D:\solr-
8.5.0\server\solr
Here,
-p for port, you can choose another port
-h for hostname/IP
-m for memory
-s for path where solr.xml and zoo.cfg is present
SOLR_HOME is solr path till /solr-8.5.0
```

8. Create a folder named iAutomateSolr in the directory path SOLR_HOME\server\solr\configsets.

- This step requires the two conf folders (that contains schema.xml and solrconfig.xml) from path mentioned in source field of <u>Table 15 – Apache SOLR Requirements</u>. Please reach out to <u>iAuto-Product-Supp@hcl.com</u> to get access to the folder.
- 10. Copy the two conf folders received to the 'iAutomateSolr' folder created in previous steps.
- 11. Navigate to SOLR_HOME\server\scripts\cloud-scripts. Open the Command Prompt as Administrator mode and execute the below command for the zookeeper server, for each of the two conf folders with different schema names, respectively; to upload the config for Solr as mentioned in the following two steps:

```
zkcli.bat -zkhost <SOLR_IP>:<ZOOKEEPERPORT> -cmd upconfig -
confname <SCHEMA_NAME> -confdir
SOLR_HOME\server\solr\configsets\iAutomateSolr\<CONF FOLDER NAME>
```

• For Indexer: Enter the ZooKeeper IP and ZooKeeper Port where ZooKeeper IP is the IP address of the solr installation server and ZooKeeper Port is SolrPort+1000. Set the schema name as

'documentschema' for Advance iKnowledge conf folder named as 'conf_indexer'.

```
e.g. For Indexer-
zkcli.bat -zkhost localhost:9983 -cmd upconfig -confname
documentschema -confdir D:\solr-
8.5.0\server\solr\configsets\iAutomateSolr\conf_indexer
Here,
- zookeeperPort is (solrport+1000)
- documentschema is name of config file maintain by zookeeper
- confdir is directory where your schema.xml(edited) for Advance
iKnowledge is present
```

• For **iScrape**: Enter the **ZooKeeper IP** and **ZooKeeper Port** where ZooKeeper IP is the IP address of the solr installation server and ZooKeeper Port is SolrPort+1000. Set the **schema name** as

'ticketschema' for BasicKnowledge and iScrape conf folder named as

'conf_iscrape_knowledge'.

```
e.g. For iScrape: -
zkcli.bat -zkhost localhost:9983 -cmd upconfig -confname
ticketschema -confdir D:\solr-
8.5.0\server\solr\configsets\iAutomateSolr\conf_iscrape_knowledge
Here,
- zookeeperPort is (solrport+1000)
- ticketschema is name of config file maintain by zookeeper
- confdir is directory where your schema.xml(edited) is present
```

BigFix

2.16.2.1Authentication

1. Create security.json file with the content mentioned in the file named security.json, present in the installer package under iAutomateInstaller \rightarrow Resources \rightarrow Resources.zip folder and store in system.

```
e.g. D:\solr\solr-8.5.0\security.json
```

Upload the security.json file to the ZooKeeper instance. Open Command Prompt as Administrator and execute the below command to upload configuration file to ZooKeeper:

```
solr zk cp <Security JSON PATH> zk:/security.json -z
<IP>:<ZooKeeper Port>
e.g. -
solr zk cp D:\solr-8.5.0\security.json zk:/security.json -z
1x.xx.xx.x1:9983
```

This will create one User with name solr and Password as SolrRocks

- 3. Execute the below command in browser to ensure that Solr is running with authentication and authorization enabled.
 - http://<IP>:<SOLRPORT>/solr/admin/authentication
 - http://<IP>:<SOLRPORT>/solr/admin/authorization
- 4. Enter the username "solr" and password "SolrRocks" when prompted on browser. If the message "authorization.enabled":true is displayed, it confirms that authorization has been enabled successfully.

```
{
"responseHeader":{
"status":0,
"QTime":0},
"authorization.enabled":true,
"authorization":{
"class":"solr.RuleBasedAuthorizationPlugin",
"user-role":{"solr":"admin"},
"permissions":[{
"name":"security-edit",
"role":"admin"}]}}
```

If the message "authentication.enabled":true is displayed, it confirms that authorization has been

enable successfully.

```
"responseHeader":{
"status":0,
"QTime":3},
```

bigFix

```
"authentication.enabled":true,
"authentication":{
"class":"solr.BasicAuthPlugin",
"credentials":{"solr":"IV0EHq1OnNrj6gvRCwvFwTrZ1+z1oBbnQdiVC3otuq0
= Ndd7LKvVBAaZIF0QAVi1ekCfAJXr1GGfLtRUXhqrF8c="}}
```

Execute the below command as POST request on any of rest clients such as *Postman* or *Curl*. Select
Basic Authentication and provide Username and Password as created in above steps under
Authorization tab. This creates a new user with UserName to be further used as <user_name> in
aredontials

credentials.

• http://<IP>:<SOLRPORT>/solr/admin/authentication

In basic authentication, use below credentials:

- Username: solr
- Password: SolrRocks
- In Body tab, select input as Raw JSON (application/json) and provide the below input

POST v http://1000000001/a	dmin/authorization		Send • Save •
arams Authorization • Headers (2)	Body Pre-request Script	Tests	Cookies Code Comments (0)
Basic Auth	Heads up! These parameter environment, we recommend	ers hold sensitive data. To keep this data secure while end using variables. Learn more about variables	e working in a collaborative X
The authorization header will be sutomatically generated when you send the request. Learn more about authorization Preview Request	Username Password	solr SolrRocks Show Password	
dy Cookies Headers (2) Test Results		Status: 200 OK	Time: 80 ms Size: 141 B Download
Pretty Raw Preview JSON -	E C		a Q
1 * { 2 * "responseHeader": { 3 "status": 0, 4 "QTime": 8 5 } 6 }			

Figure 100 - Installation of SOLR (cont.)

6. Execute the below command as POST request in any of rest client such as *Postman* or *Curl* and Select **Basic Authentication** with **Username** as **solr** and **Password** as **SolrRocks** under **Authorization tab** and set the user role using Post request with the URL specified below:

This step will provide admin rights to user which will is mentioned in <username> tab.

- http://<IP>:<SOLRPORT>/solr/admin/authorization
- 7. Enter the respective IP and Solr Port.
- 8. In the Body tab, select input as raw JSON (application/json) and provide the below input.

```
{ "set-user-role": {"<user-name>":["admin"]}}
```

e.g. – This will provide admin rights to solradmin

```
{ "set-user-role": {"solradmin":["admin"]}}
```

- Execute the below command as POST request in any of rest client such as *Postman* or *Curl* and Select **Basic Authentication** with **Username** as **solr** and **Password** as **SolrRocks** and set the user permission.
 - http://<IP>:<SOLRPORT>/solr/admin/authorization

Now, a Solr user has been created with UserName as 'solradmin' and Password as 'Admin098'.

```
"set-permission": { "name":"all","role": "admin"}
```

10. Open the **Command Prompt** as **Administrator** and run the below command:

{


solr stop -p <port of solr>

- 11. Go to path where Solr is installed < SOLR_HOME >\bin
 - e.g. C:\solr\solr-8.5.0\bin
- 12. Open **solr.in** in **Edit** mode. Uncomment the two lines mentioned below and edit them:

```
set SOLR_AUTH_TYPE=basic
set SOLR_AUTHENTICATION_OPTS="-Dbasicauth=<user-name>:<password>"
e.g. -
set SOLR_AUTH_TYPE=basic
set SOLR_AUTH_TYPE=basic
set SOLR_AUTHENTICATION_OPTS="-Dbasicauth=solradmin:Admin098"
```

2.16.2.2SOLR as a Service

This section describes the procedure for enabling Solr as a service.

Please follow the below steps:

- Download nssm-2.24.zip file from the path mentioned in the source field of <u>Table 15 Apache SOLR</u> <u>Requirements</u> and unzip it.
- 2. Copy nssm.exe from nssm-2.24\win64 to SOLR_HOME\bin.
- 3. Go to the **SOLR_HOME\bin**. Open the Command Prompt as Administrator.
- 4. Execute the below command:

nssm install solrservice

5. The window shown in below image appears.

b BigFix

N NSSN	A service installer	×
Applic App Pat Sta Arg	ation Details Log on Dependencies Process Shutdown Exit	
Service	name: solrservice Install service Cance	Ū.
	Figure 101 - Enabling Solr as Windows Service	

- 6. Click **Application** tab and enter the information as mentioned below:
 - Path: C:\solr\solr-8.5.0\bin\solr.cmd
 - Startup Directory: C:\solr-8.5.0\bin
 - Arguments: <Enter values as mentioned below>

start	-m 2	2g	-cloud	-h	<solr_< th=""><th>_ID></th><th>-f</th><th>-p</th><th><solf< th=""><th>L_PC</th><th>)RT></th><th>-s</th><th></th></solf<></th></solr_<>	_ID>	-f	-p	<solf< th=""><th>L_PC</th><th>)RT></th><th>-s</th><th></th></solf<>	L_PC)RT>	-s	
<solr_< td=""><td>HOM</td><td>E∖s</td><td>erver\s</td><td>solı</td><td>:></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td></solr_<>	HOM	E∖s	erver\s	solı	:>								
e.g.													
start	-m 2	2g	-cloud	-h	localh	nost	-f	-p	8983	-s	$C: \s$	solr\:	solr-
8.5.0	ser	ver	\solr										

	NSSM service installer X Application Details Log on Dependencies Process Shutdown Exit Image: Closed content of the service of the servi
Service name: solrservice Install service Cancel	ervice name: solrservice Cancel

- 7. Click the **Details** tab and enter the information as displayed in the below image:

b BigFix

Application	Details Log on Dependencies Process Shutdown	Exit
– Details – Display r Descripti	n: service to start and stop the solr	
Startup t	be: Automatic solrservice Install service	Cancel
F	gure 103 - Enabling Solr as Windows Service (con	

- 8. Click Install service.
- 9. Upon successful installation, the following message will appear.



Figure 104 - Enabling Solr as Windows Service (cont.)

10. Press Win+R, type services.msc and press Enter.

	Type the name of a program, folder, document, or Internet resource, and Windows will open it for you.
<u>O</u> pen:	services.msc 🗸
	OK Cancel <u>B</u> rowse

11. Search for Solr Server service and click on it.



12. Click **Start the service** on the left panel to start the service.

Solr Server	Name	Description	Status	Startup Type	Log On As
	🌼 Shared PC Account Manager	Manages pr		Disabled	Local Syste
Stop the service	🌼 Shell Hardware Detection	Provides no	Running	Automatic	Local Syste
lestart the service	🆏 Smart Card	Manages ac	Running	Automatic (T	Local Service
	🌼 Smart Card Device Enumera	Creates soft		Manual (Trig	Local Syste
	🎑 Smart Card Removal Policy	Allows the s		Manual	Local Syste
Jescription: envice to start or stop solr	🥋 SMS Agent Host	Provides ch	Running	Automatic (D	Local Syste
ervice to start or stop son	🖏 SNMP Trap	Receives tra		Manual	Local Service
	🆏 Software Protection	Enables the		Automatic (D	Network S
	🎇 Solr Server	service to st	Running	Automatic	Local Syste
	Solr Server 2	start and st	Running	Automatic	Local Syste
	🥋 solr_8aug		Running	Automatic	Local Syste
	🆏 Spatial Data Service	This service		Manual	Local Service
	🥋 Spot Verifier	Verifies pote		Manual (Trig	Local Syste
	🆏 SQL Server (MSSQLSERVER)	Provides sto	Running	Automatic	NT Service
	🥋 SQL Server Agent (MSSQLS	Executes jo		Manual	NT Service
	SQL Server Browser	Provides SQ		Disabled	Local Service

Figure 106 - Enabling Solr as Windows Service (cont.)

13. Check in browser, if Solr is properly configured.

	Instance		system	C
	Start	about an hour ago	Physical Memory 47.6%	
out solradmin	Versions			
hboard			7.62 GB	
aina	soir-spec	8.5.0		16.00 GB
	soir-impi	8.5.0 /ac489bf/b9/b61/49b19fa2eeudc46e/4b8dc42 - romseygeek - 2020-03-:	Swap Space 50.4%	
10	Iucene-spec	8.5.0		
ections	lucene-impl	8.5.0 7ac489bt7b97b61749b19ta2ee0dc46e74b8dc42 - romseygeek - 2020-03-:	9.26 GB	
a Properties				18.37 GB
ead Dump	11/M		WM-Memory 10.5%	
gestions			and Seri Metholy 10.5%	
	Runtime	Oracle Corporation Java HotSpot(TM) 64-Bit Server VM 1.8.0_181 25.181-b13		
collections	Processors	4		
lable	Args	-DSTOP.KEY=solrrocks	215.50 MB	
and create one		-D510P.POR1 = 7965		2.00 GB
		-Diava.io.tmpdir=C:\solr\solr8.5\solr-8.5.0\server\tmp		2.00 GB
cores available		-Djetty.home=C:\solr\solr8.5\solr-8.5.0\server		
and create one		-Djetty.host=0.0.0.0		
		-Djetty.port=8985		
		-Dlog4j.configurationFile=C:\solr\solr8.5\solr-8.5.0\server\resources\log4j2.xml		
		-Dlog4j.configurationFile=C:\solr\solr8.5\solr-8.5.0\server\resources\log4j2.xml		

Figure 107 - Enabling Solr as Windows Service (cont.)

14. Create collection named as 'ScriptKnowledgeData' in Solr for Basic Knowledge and iScrape using

the below url:

```
http://<SOLR_IP>:<SOLR_PORT>/solr/admin/collections?action=CREATE&
name=ScriptKnowledgeData&router.name=implicit&shards=iScrape,Knowl
edge&replicationFactor=1&maxShardsPerNode=4&collection.configName=
ticketschema&router.field=shardType
```

15. On successful creation of the collection, the following response is received:



```
"responseHeader":{
   "status":0,
   "QTime":3373},
"success":{
   "<SOLR_IP>:<SOLR_PORT>_solr":{
    "responseHeader":{
        "status":0,
        "QTime":2464},
        "core":"ScriptKnowledgeData_iScrape_replica_n1"},
   "<IP>:<PORT>_solr":{
        "responseHeader":{
        "status":0,
        "gTime":2737},
        "core":"ScriptKnowledgeData_Knowledge_replica_n2"}}}
```

2.17Certificates

	Table 17 – Certificate Requirements
Purpose	Install certificate for communication
Source	Available as a part of iAutomate installer package. Follow the path below: Pre-requisite \rightarrow Python certificate.zip

2.17.1Installation Process

1. Download the file Python certificate.zip from the Path mentioned in the above section. Copy the extracted contents from the zip file and copy it to "*C*: *Programfiles**certificate*" folder.

Create folder if not available.

2.18DLL Configuration for IRecommend:

Table 18 - DLL Configuration for iRecommend multi-process

Version	As per DLL versions released by BigFix Runbook AI team.
Purpose	This configuration is required to run iRecommend module in multi-process mode.
	DLLs are available as part of BigFix Runbook AI installer package.
Source	Pre-Requisite Software → Newtonsoft.Json.Dll
	Pre-Requisite Software → HCL.iAutomate.EncryptDecrypt.Dll

- 1. Make sure to add downloaded DLLs files in the path <pythonpath>\Lib\site-packages.
 - HCL.iAutomate.EncryptDecrypt.dll
 - Newtonsoft.Json.dll

BigFix

ime	Date modified	Type	Size
ј апросовт пласке рузласуд	0/27/2012 501110	LOOTING	24 100
aniso8601-1.3.0-py3.6.egg	6/27/2019 4:31 PM	EGG File	26 KB
bz2file	6/20/2019 6:44 PM	Python File	18 KB
clr	6/12/2019 7:01 PM	Python Extension	6 KB
configparser	6/20/2019 6:40 PM	Python File	2 KB
decorator	6/20/2019 6:42 PM	Python File	16 KB
easy_install	6/20/2019 6:43 PM	Python File	1 KB
easy-install.pth	6/27/2019 4:32 PM	PTH File	1 KB
flask_classful	6/20/2019 6:42 PM	Python File	18 KB
HCL.iAutomate.EncryptDecrypt.dll	6/16/2021 5:39 PM	Application extens	14 KB
ipaddress	6/20/2019 6:44 PM	Python File	78 KB
its dangerous	6/20/2019 6:40 PM	Python File	32 KB
Newtonsoft.Json.dll	6/16/2021 5:39 PM	Application extens	660 KB

Figure 117 - Screenshot of the DLL Configuration

2. Now Start/Restart iRecommend service as per the steps defined earlier.