# Run-Time elements:

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **Technology**  **(version)** | **Purpose Summary** | **Standard** | **Waiver/OSS/JIG** | **Toolchain Position** | **How Used** |
| **Red Hat Linux**  **(RedHat Enterprise Linux Server release 6.7 (Santiago))** | Enterprise Linux operating system for system servers. | **Standard** ESATS: PI 32394, - Enterprise |  | Dev/Operation | Runs on the eCFD server that hosts the eCFD application. Interactions to HPC will be performed through this server in secure shell mode |
| **WSSO**  **(5.0.0)-**  **10.1.4.3.0.13-IP02 BP 13-IP02** | Web Single Sign On for web authentication. | **Standard** ESATS: PI 4124, - Enterprise |  | Operation | Supports web authentication of eCFD users |
| **Wildfly [aka JBoss]**  **(8.x) 8.2.0**   |  |  |  | | --- | --- | --- | | HAL version: | 2.4.9.Final |  | | Core version: | 2.4.9.Final |  | | Product name: | Tweek |  | | Product version: | 8.2.0.Final |  | | Profile: | COMMUNITY |  | | Application Server for JavaEE application server. | **Restricted** ESATS: PI 4124, - Enterprise | Boeing Java Interest Group | Operation | JBOSS serves as the Application server that hosts the runtime environment for the BPM engine. Configuration files (UI templates, workflow configuration, python scripts) will persist on the eCFD server. JBOSS includes Drools rules engine and JBPM business process management. Currently using the free Wildfly product. Possible migration to JBoss Enterprise if require a more robust implemtation. |
| **LDAP Proxy**  **(1.12.4-47)**  **Open LDAP 2.4.40-7** | Lightweight Directory Access Protocol Proxy | **Standard** ESATS: PI 17056, - Enterprise |  | Operation | This will be used to facilitate secure communications for eCFD user login verification and validation. |
| **Java JDK**  **(**1.8.0\_66)  1.8.0\_60 | Java programming language ; class-based and object-oriented. | **Standard** ESATS: PI 48571, - Enterprise |  | Dev/Operation | eCFD conductor development |
| **Python**  **(**2.6.6)  (2.7.9) | Python scripting language for solver and service layer wrappers. | **Standard** ESATS: PI 30118, - Enterprise |  | Dev/Operation | Used as a scripting language to create wrappers for eCFD solver scripts and build service layers enabling the interaction between workflows and Boeing application/tools. A Dispatcher written in python will consume the JSON and eCFD elements to interact with the external applications and tools. Includes PyMongo library. |
| **JSON**  **(No Version)** | JSON (JavaScript Object Notation) is a lightweight data-interchange format. | **Standard** ESATS: 18341, Enterprise |  |  | Data exchange format for data exchange from the front-end presentation layers to the BPM layer and the backend database |
| **Jquery JavaScript**  **(1.3)** | JavaScript Library for rapid web development. | **Standard** ESATS: PI 19202, - Enterprise |  | Dev/Operation | The user interface is built using this technology to provide a responsive UI that can run across multiple channels – desktop, mobile, iPad etc. |
| **JBPM**  **(**6.2.0) | Open-source, Java Business Process Manager. | **Non-Standard** ESATS: 21058, OSS Tool Kit | ESATS Waiver #63604 | Dev/Operation | Used to support the execution of workflows in the eCFD system |
| **MongoDB**  **(**2.6.6) | Open-source, No SQL database for document-oriented storage. | **Non-Standard** ESATS: 21058, OSS Tool Kit | ESATS Waiver #63772 | Operation | Mongo DB is the core DB used to store and manage user data. Also stores transaction data. |
| **PostgreSQL**  **(9.3.5)** | Open-source SQL database that seamlessly works with JBPM. | **Non-Standard** ESATS: PI 21058, OSS Tool Kit | ESATS Waiver #65309 | Operation | The JBPM framework used by the eCFD project provides out-of-the-box support for PostgreSQL with no tailoring required. JBPM is necessary for use on BDS closed programs because the other option IBM BPM is too expensive for smaller programs. |
| **Apache**  Server version: Apache/2.2.15 (Unix)  Server's Module Magic Number: 20051115:25 | Open-source web & scripting language for deployment/hosting web services. | **Non-Standard** ESATS: PI 14576 | Boeing Java Interest Group | Operation | Used to deploy/host python web services. |
| **Bottle**  **(**0.12.8) | WSGI micro web framework for Python | **Non-Standard** ESATS: PI 47754 |  | Operation | Bottle web service is used to expose Python services and solver wrappers for components such as Connectors, Security Services, Post & Pre processing. Also BPM communicates with Integration Service via Bottle. |
| **Spring Framework**  **(**4.1.7**)** | The Spring Framework is a Java platform used to create high performing, easily testable, reusable code. | **Standard** ESATS: 8767, - Enterprise | Boeing Java Interest Group | Operation | The UI makes calls to the Spring Model-View-Controller. The Spring REST Template is also used. |
| **CKEditor**  **(4.4.8)??** | Web text editor | **Non-Standard** ESATS: PI 16101, OSS Tool Kit |  | Dev/Operation | Used for in app for authoring context sensitive help for Conductor and Processes. |
| **Hopscotch**  **(0.2.5)** | Framework for devs to add product tours to their pages. Accepts a tour JSON object as input. | **Non-Standard** | ESATS Waiver # 78336 | Dev/Operation | Used to provide guided tour style help for application pages. |
| **Firefox**  **(45.5.0)** | Open-source web browser | **Standard** ESATS: 13665, - Enterprise |  | Operation | Browser compatible with HTML5 |
| **Cloudera Hadoop**  **(5.2)**  **HDO1 is Hortonworks 2.5.0**  **HDO2 is Hortonworks 2.3.2**  **Note: HD02 will be updated to 2.5.0 well before the end of this year.** | Distributed file system and big data management capabilities. | **Non-Standard** | ESATS Waiver #67826 | Operation | Big Data storage and analysis for and of CFD, Wind Tunnel, and Flight Test data. |
| **Anaconda**  **(2.2.5)** |  |  |  |  |  |

# Other Elements (not part of end-user’s runtime environment):

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **GitLab**  **(8.6.1)** | Open-source source code version control | **Non-Standard** ESATS: PI 21058, OSS Tool Kit | Boeing OSS Tool Kit | Dev | Used for eCFD source code control supporting highly-parallel branching support and distributed version control capabilities. |
| **Jenkins**  **(**[**1.597**](http://jenkins-ci.org/)**)**  **2.7.4** | Open-source continuous integration server (CI). | **Standard** ESATS: PI 22988, - Enterprise |  | Dev | Jenkins is used as a continuous integration tool for running unit tests and build deployments. It works with GIT and does script-driven automatic provisioning of the builds. |
| **Selenium**  **(**2.53.0**)** | Software testing tool for automating testing web applications | **Standard** ESATS: PI 10257 , - Enterprise |  | Dev | Using selenium based automation scripts to perform regression testing for the application. |
| **Eclipse**  **(Luna)** | Open-source, application development (IDE). | **Standard** ESATS: PI 19092, - Enterprise |  | Dev |  |
| **TFS** | Agile Project Management | **Standard** ESATS: 21309, Enterprise |  | Plan | TFS agile lifecycle management tool. Used for agile project management and tracking of tasks. |
| **ARIS-BPM** | Business Process Modeling Software | **Standard** ESATS: 17908, - Enterprise |  | Dev | ARIS (Architecture for Integrated Information Systems) is a set of web-based enterprise, integrated software products that help enterprises to develop, analyze, deploy and monitor for continuous improvement of their business processes. This tool will be used to model the processes, sub processes and workflow for the eCFD process. |
| **VISIO** | Design and Documentation | **Standard** ESATS: 9467, - Enterprise |  | Plan/Dev | Microsoft Visio delivers powerful, automated design and documentation tools for IT professionals who develop and maintain networks, databases, software applications, and web sites. Visio will be used for creating architecture artifacts. |
| **Microsoft Project** | Project Management Gantt charting and Precedence diagramming application. | Boeing Software Express |  | Plan | Used for project planning and scheduling |
| **Microsoft Office** | Office productivity | Boeing Software Express / Standard PC load |  | Plan/Dev | Word processing, spreadsheet analysis, presentation generation, and e-mail facilitation |