

# Bahmni OpenMRS Platform Upgrade from 2.1 to 2.5

This is the initial analysis document for OpenMRS upgrade from **2.1.6** to **2.5.0** in the Bahmni Distribution.

Talk thread created for the upgrade discussion

<https://talk.openmrs.org/t/bahmni-openmrs-platform-upgrade-from-2-1-6-to-2-5-0/36063>

Previous OpenMRS(1.0 to 2.0) upgrade doc for reference

<https://docs.google.com/document/d/1lxcJWaUiXbzGbsY-3WjpddyUeg1h82cra7FK3FAQhYI/edit#heading=h.e19kjzv1700y>

The below table summarizes the OpenMRS platform changes for both 2.4.0 and 2.5.0. Release notes for OpenMRS platform [2.4.0](#) and [2.5.0](#) respectively.

|                  | <b>OpenMRS 2.1.6</b><br>(Current Bahmni Version) | <b>OpenMRS 2.4.0</b>                           | <b>OpenMRS 2.5.0</b>                    |
|------------------|--------------------------------------------------|------------------------------------------------|-----------------------------------------|
| <b>Spring</b>    | 3.2.7 RELEASE                                    | 5.2.9                                          | 5.2.9                                   |
| <b>Hibernate</b> | 4.3.9                                            | 5.4.21                                         | 5.4.21                                  |
| <b>Java</b>      | 8                                                | 8, 9, 10, 11, 12, 13, 14, 15                   | 8, 9, 10, 11, 12, 13, 14, 15            |
| <b>FHIR</b>      | Fhir module                                      | <b>Fhir2 module, support for fhir 4 module</b> | Fhir2 module, support for fhir 4 module |
| <b>Liquibase</b> | 2.0                                              | 3.10.2                                         | 3.10.2                                  |
| <b>Mysql</b>     | 5.6, 5.7                                         | 5.6 to the latest 8.0                          | 5.6 to the latest 8.0                   |
| <b>Postgres</b>  | No Support                                       | 8.2 up to the latest 12                        | 8.2 up to the latest 12                 |
| <b>Tomcat</b>    | 6.0.26                                           | 6.0.26                                         | 8.5+ and 9                              |
| <b>Log4j</b>     | 2.17.1                                           | 2.17.1                                         | 2.17.1                                  |
| <b>JUnit</b>     | 4.12                                             | 5                                              | 5                                       |

## Other Major Features: (Analysis)

1. Adopting OpenJDK
2. User Password - [Cannot delete user who has changed their password](#)
3. [Extending Administration through REST endpoints for OpenMRS 3.0](#)
4. [Enhancing user\\_properties to Enable storing user-specific settings for OpenMRS 3.0](#)
5. [Add "Diagnosis Attribute" to data model](#)

## Approach:

Bahmni 0.93 is on OMRS **2.1.6** version. From OMRS **2.1.6** version to **2.5.0** there are 8 intermediate releases as shown in the below screenshot.

- Platform Release Notes 2.4.2
- › Platform Release Notes 2.4.0
- Platform Release Notes 2.3.4
- Platform Release Notes 2.3.3
- Platform Release Notes 2.3.2
- Platform Release Notes 2.3.1
- › Platform Release Notes 2.3.0
- **Platform Release Notes 2.2.0**

So the approach is to upgrade one version at a time(eg: 2.1.6 to 2.2.0) in all the Bahmni modules and build the module successfully.

## Steps for upgrade (for single omod)

1. Upgrade openmrs version in a omod( eg: bahmni-core.omod)
2. Handle all the API breaking changes as per the openmrs version in the module
3. Fix all the failing unit test cases as per the OpenMRS changes.
4. Fix all the failing integration test cases as per the OpenMRS changes

**Note:** We have support for Junit 4 test cases. So this doesn't require changing the imports or test cases immediately. So we can move the test cases to Junit 5 compatible later point of time incrementally.

## Outcome Of Analysis

Once we are able to build one module successfully with all the upgrade steps mentioned above, we **can use this approach/pointers to make the similar changes in other phase1 modules** and bring up the bahmni instance. And do one round of functional testing for the changes that are part of the upgrade.

And this has to be repeated for every OMRS version upgrade.

**Note:** As we don't have log4j2 changes abc ported to 2.2/2.3 OMRS versions, we can't go ahead with functional testing on these versions. We can only take up the functional testing on 2.4 OMRS version.

## Other things to ponder:

1. [Possible RISK] Do we have the latest version of OMODs (e.g. bed-management, endtb OMOD etc..) compatible with 2.5.0? Are there any breaking openmrs api that needs to be fixed across various other OMODs which will increase our scope? (2.5.0)
2. Document the upgrade steps clearly for implementation teams to upgrade their custom OMODs accordingly.

## Out of the scope (Till Bahmni is stable with 2.5.0 openmrs platform)

Lets not plan

1. Java version upgrade, as 2.5.0 works with Java 8.
2. Mysql version upgrade, as Mysql 5.6 is supported with OpenMRS 2.5.0
3. Postgres openmrs database setup.

## List of OMODS in Bahmni Distro Requires Upgrade

Below is the list of modules where we have to update the OpenMRS version to 2.5.0. Most modules marked as "OpenMRS" in the last column are packaged in OpenMRS already, so we will take them as-is. The others are the ones we will need to upgrade.

| Module Name         | OpenMRS 2.1.6<br>(Current Bahmni<br>Version) | OpenMRS 2.5.0 | OpenMRS/Bahmni<br>Module which<br>requires upgrade work |
|---------------------|----------------------------------------------|---------------|---------------------------------------------------------|
| Bacteriology Module | 1.2.0                                        |               | <b>Bahmni - Yes</b>                                     |
| Reporting           | 1.16.0                                       | <b>1.23.0</b> | OpenMRS                                                 |
| Metadata Sharing    | 1.2.2                                        | <b>1.8.0</b>  | OpenMRS                                                 |
| ID Generation       | 4.4.1                                        | <b>4.7.0</b>  | OpenMRS                                                 |

|                               |               |               |                                         |
|-------------------------------|---------------|---------------|-----------------------------------------|
| AtomFeed Module               | 2.5.6         |               | ICT4H - Yes                             |
| Operation Theater             | 1.3.0         |               | OpenMRS - Yes                           |
| EMR API Module                | 1.24.8        | <b>1.32.0</b> | OpenMRS - Yes                           |
| Rules Engine Module           | 0.94-SNAPSHOT |               | Bahmni - Yes                            |
| Reporting REST                | 1.10.0        | <b>1.12.0</b> | OpenMRS                                 |
| Metadata Mapping              | 1.3.1         | <b>1.4.0</b>  | OpenMRS                                 |
| OpenMRS UI Framework          | 3.8           | <b>3.22.0</b> | OpenMRS                                 |
| Bed Management Module         | 5.11.0        |               | OpenMRS - Yes                           |
| HTML Widgets                  | 1.8.0         | <b>1.10.0</b> | OpenMRS                                 |
| Serialization Xstream         | 0.2.12        | <b>0.2.15</b> | OpenMRS                                 |
| Address Hierarchy             | 2.9           | <b>2.14.2</b> | OpenMRS                                 |
| Event Module                  | 2.8.0         | <b>2.10.0</b> | OpenMRS                                 |
| Provider Management Module    | 2.5.0         | <b>2.13.0</b> | OpenMRS                                 |
| Calculation                   | 1.2           | <b>1.3.0</b>  | OpenMRS                                 |
| Episodes of Care OMOD         | 1.0-SNAPSHOT  |               | Bahmni - Yes                            |
| Open Web Apps Module          | 1.9.0         | <b>1.13.0</b> | OpenMRS                                 |
| UI Commons Module             | 2.0           | <b>2.19.0</b> | OpenMRS                                 |
| Rest Web Services OMOD        | 2.32.0.68810c | 2.32.0.68810c | OpenMRS                                 |
| Legacy UI Module              | 1.3.3         | <b>1.8.4</b>  | OpenMRS                                 |
| UI Library Module             | 2.0.5         | <b>2.0.7</b>  | OpenMRS( <b>deprecated by OpenMRS</b> ) |
| Bahmni Appointment Scheduling | 1.3.0         |               | Bahmni - Yes                            |
| Bahmni.ie.apps Module         | 1.2.0         |               | Bahmni - Yes                            |

|                        |               |               |                     |
|------------------------|---------------|---------------|---------------------|
| Offline Sync Module    | 0.92-SNAPSHOT |               | <b>Bahmni - Yes</b> |
| OWA Module             |               |               | OpenMRS             |
| AppFramework           | 2.10.0        | <b>2.16.0</b> | OpenMRS             |
| Idgen webservices rest |               |               | Bahmni              |
|                        |               |               |                     |

## Order of Bahmni Modules which requires OpenMRS version upgrade

The upgrade of OMODS can be done in phases as mentioned below. Once we are done with Phase 1, we can deploy the changes onto a QA env and do the regression testing. And the same can be repeated for Phase 2 OMODS.

### Phase 1:

1. Bacteriology OMOD - <https://github.com/openmrs/bacteriology>
2. Bedmanagement OMOD - <https://github.com/openmrs/openmrs-module-bedmanagement>
3. Emrapi OMOD - <https://github.com/openmrs/openmrs-module-emrapi>
4. Openmrs-atomfeed OMOD - <https://github.com/ICT4H/openmrs-atomfeed>
5. Atomfeed OMOD - <https://github.com/ICT4H/atomfeed>
6. Episodes OMOD - <https://github.com/Bahmni/openmrs-module-episodes>
7. Rules Engine OMOD - <https://github.com/Bahmni/openmrs-module-rulesengine>

### Phase 2:

1. Appointments OMOD - <https://github.com/Bahmni/openmrs-module-appointments>
2. OT OMOD - <https://github.com/openmrs/openmrs-module-operationtheater>
3. Bahmni.ie.apps OMOD - <https://github.com/Bahmni/openmrs-module-bahmni.ie.apps>
4. Bahmni Offline Sync OMOD - <https://github.com/Bahmni/bahmni-offline-sync>
5. **Bahmni Event log Service**
6. **Bahmni Reports Service**
7. **pacsQuery OMOD**
8. **OpenERP Atomfeed service**

### Optional Modules(check this really require OpenMRS upgrade for Bahmni on cloud)

1. Endtb OMOD - <https://github.com/endtb/openmrs-module-bahmniendtb>
2. Data Integrity OMOD - <https://github.com/openmrs/openmrs-module-dataintegrity>
3. Any Custom Modules for Bahmni (TeleConsultation, any ABDM Modules)

4. *<Any custom module that we want to bundle as part of the openmrs upgrade(this may/may not require upgrade)>*

## **Build and Deployment Approach**

1. Build changes need to be made in GHA for Dockerization
2. Build changes need to be made in Bahmni Installer.
- 3.

### **<Changes in Bahmni-package and Bahmni-playbooks>**

<Bundle any new modules from OpenMRS Ref App ? OCL Module ?>

<QA Checklist>

<Any new Integration tests/API test cases are required, mention here>

<Benefits with OpenMRS platform upgrade>

<Create a JIRA card to track the documentation on below topics>

1. Omod upgrade with latest openmrs version
2. Schema changes done for entire upgrade
3. Diagnosis and Conditions schema, functional and technical changes
4. Deprecated classes from openmrs repositories
- 5.

## **Reference links**

1. Junit migration - <https://wiki.openmrs.org/display/docs/How+to+migrate+to+JUnit+5>
2. Dependency Injection analysis of modules in Bahmni - <https://docs.google.com/document/d/1jOHR2IUU95dm9Dp-RtCHntOp3hMjq7dVnuHlzVz1vnU/edit#heading=h.l8s1qq7obwxh>