Build and Release Management

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Q1. What is the difference between Build Management and Versioning Control?

Version control is a system that records changes to a file or set of files over time so that you can recall specific versions later. If you are a graphic or web designer and want to keep every version of an image or layout (which you would most certainly want to), a Version Control System (VCS) is a very wise thing to use. It allows you to revert selected files back to a previous state, revert the entire project back to a previous state, compare changes over time, see who last modified something that might be causing a problem, who introduced an issue and when, and more. Using a VCS also generally means that if you screw things up or lose files, you can easily recover. In addition, you get all this for very little overhead.

While Build management is the process of managing, planning, scheduling and controlling a software build through out its life cycle. The build process is described below:

- Fetching source code from a central repository
- Compile the source code and check/download the dependencies
- Run automated unit/smoke tests to verify the integrity of the build
- Once build is successful, store the artifacts and send notifications of the build

Q2. Write a short note on following:

a) Smoke Testing

In simple terms, we verify whether the important features are working and there are no showstoppers in the build that is under testing.
It is a mini and rapid regression test of major functionality. It is a simple test that shows the product is ready for testing. This helps determine if the build is flawed as to make any further testing a waste of time and resources.
Smoke Testing is done whenever the new functionalities of software are developed and integrated with existing build that is deployed in QA/staging environment. It ensures that all critical functionalities are working correctly or not.

In this testing method, the development team deploys the build in QA. The subsets of test cases are taken, and then testers run test cases on the build. The QA team test the application against the critical functionalities. These series of test cases are designed to expose errors that are in build. If these tests are passed, QA team continues with Functional testing.
Any failure indicates a need to handle the system back to the development team. Whenever there is a change in the build, we perform Smoke Testing to ensure the stability.
For an example,New registration button is added in the login window and build is deployed with the new code. We perform smoke testing on a new build.
This type of testing is done by QA engineers.

b) Regression Testing

This testing is done to make sure that new code changes should not have side effects on the existing functionalities. It ensures that the old code still works once the latest code changes are done.
Regression Testing is nothing but a full or partial selection of already executed test cases which are re-executed to ensure existing functionalities work fine.

We use selenium for this testing.

c) Acceptance Testing

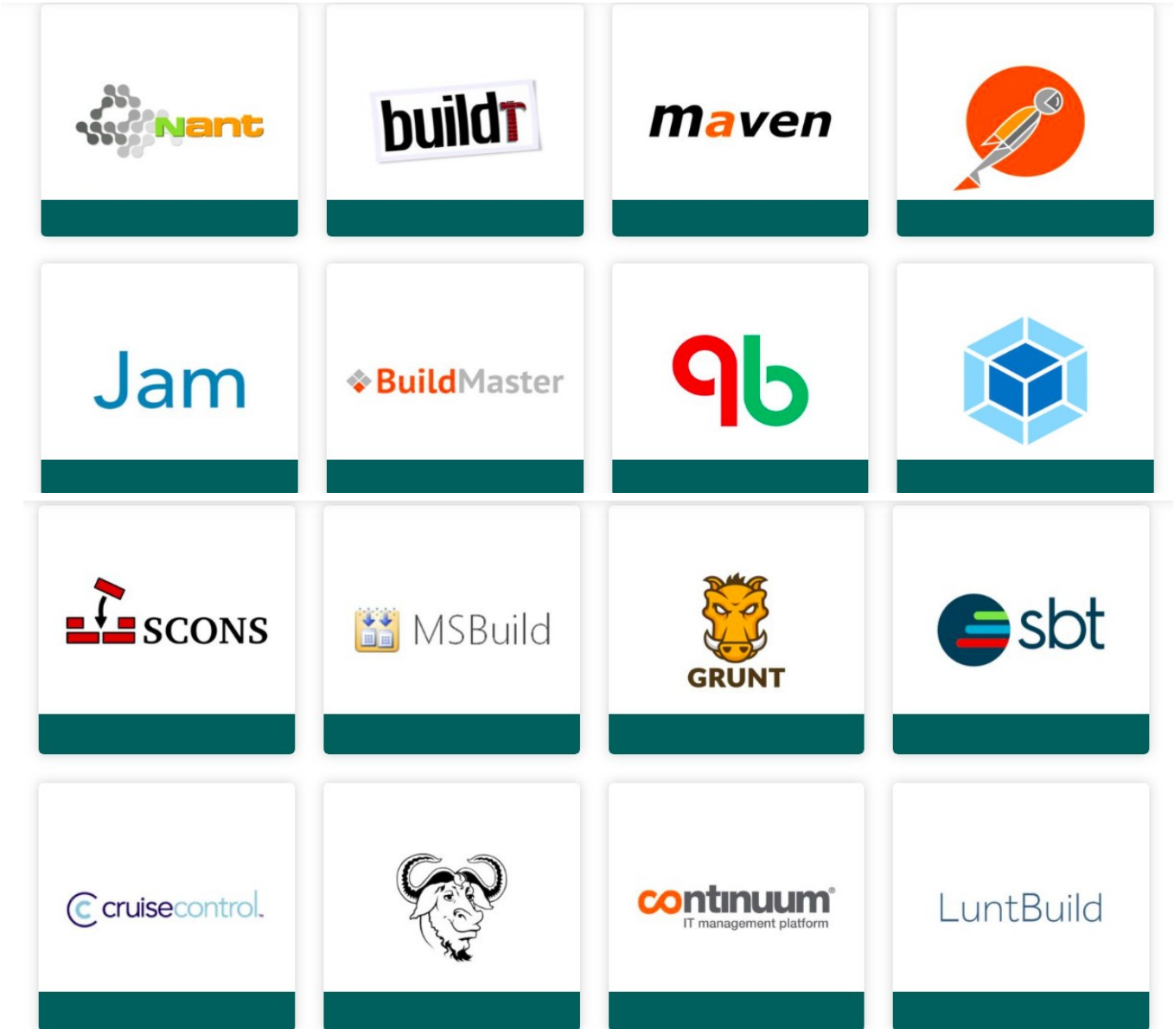
The main purpose of UAT is to validate the end to end business flow. It does NOT focus on Cosmetic errors, Spelling mistakes or System testing. User Acceptance Testing is carried out in a separate testing environment with production-like data setup. It is a kind of black box testing where two or more end-users will be involved.

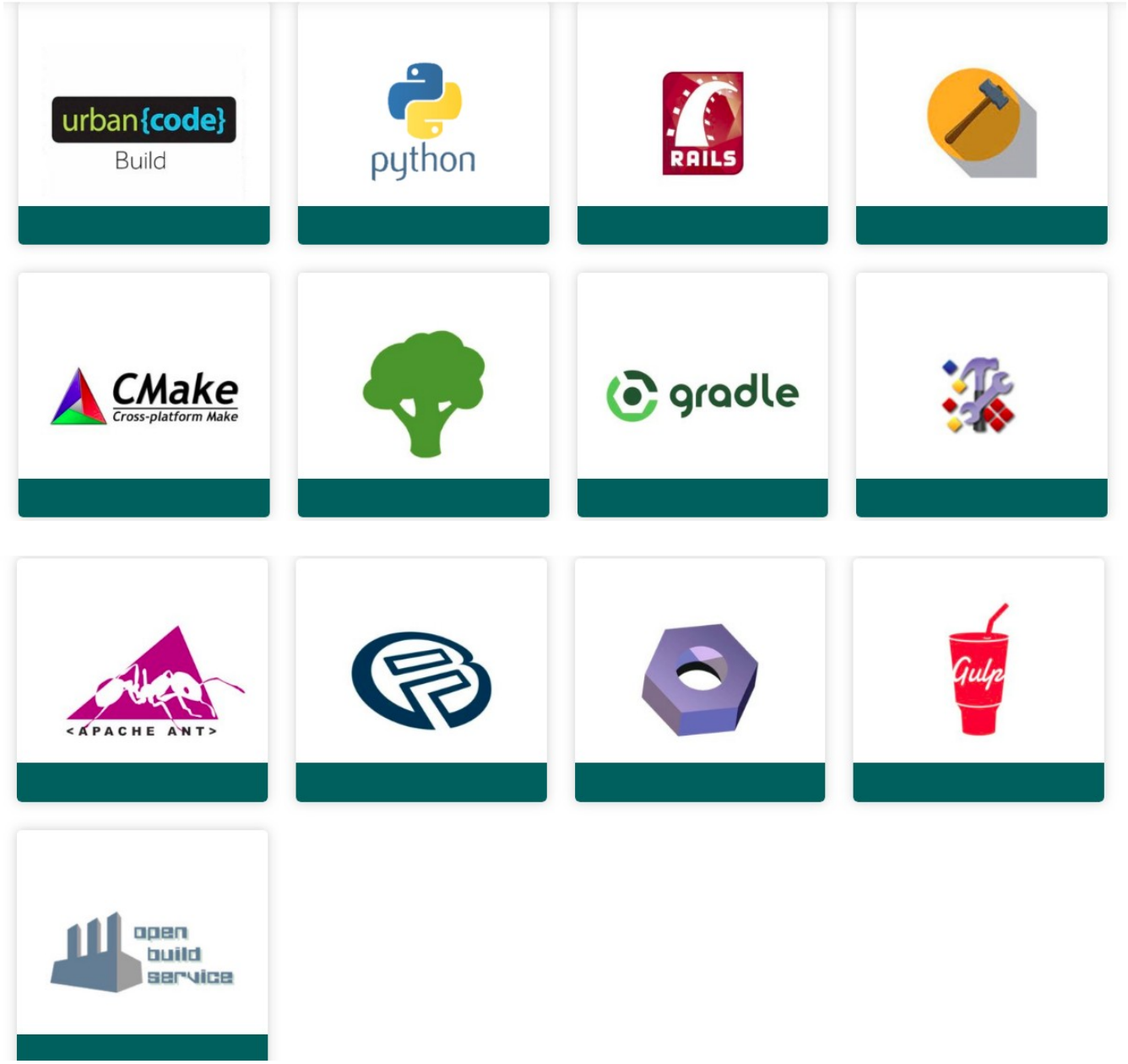
The Full Form of UAT is User Acceptance Testing.

It is done by the client and end users.

Q3. Write any Three majorly used open source tools for Build and Release Management. Design a comparison Table between them.

There are many popular build tools in the market like:





We would in detail about Ant, Maven and Gradle.

At first we need to highlight that there are two type of build tools and the type of build tool is necessary to decide which one is required for which type.

Build tools can be categorized as:

Task-oriented – Ant

Tasks are the units of your build script that actually execute the build operations for your project. Some of the tasks are mkdir, copy, delete, javac, Javadoc and jar

Configuration Oriented – Gradle and Maven

Configuration such as compiling the source code, generating generate-sources etc.

	Ant	***Maven***	***Gradle***
1.	Open source build tool from Apache tomcat project	Part of the Apache software foundation project	Gradle is an open source tool release with the Apache license
2.	Ant is used to automate repetitive tasks	Maven depends on POM (Project Object Model)	Gradle uses flexible conventions
3.	Created in early 2000	2002	2007
4.	Can build Java,C,C++ applications	Maven can be used with programming languages like Java, Ruby and C#	Flexible to build any type of software
5.	It uses XML file format to describe the build process and its dependencies.	POM is in xml file format	Gradle scripts are written in Groovy or Kotlin DSL instead of xml
6.	Less preferred	More preferred comparatively	Significant preferation
7.	Ant do not have a life cycle	It has lifecycle	Gradle uses Directed Acyclic Graph(DAG) to decide the order of tasks to be executed
8.	The ant scripts are not reusable.	Reusable plugins	Reuses output from previous executions
9.	Created by James Duncan Davidson	Jason van Zyl	Hans Dockter, Adam Murdoch, Szczepan Faber, Peter Niederwieser, Luke Daley, Rene Gröschke, Daz DeBoer