FIFA Gameplay Automated Testing with Jenkins

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#jenkinsconf

Improving Pre-Flight Testing with Jenkins

Measures of Success:

- Increasing test throughput
- Developing a maintainable system
- Creating an accessible system

FIFA Gameplay Pre-Flight Testing

- On demand testing of a pending change
- Runs our entire test suite:
  - Automated smoke tests (offline and online)
  - Profiling and memory metrics
  - Functional gameplay tests
- Compares results against a daily baseline
- Increases confidence in each change

Limitations of Original System

- Build Pipeline composed of scripts running on a static set of machines
- No ability to parallelize or scale
- Unable to visualize the Build Pipeline
- Email reports were created manually

Why Jenkins?

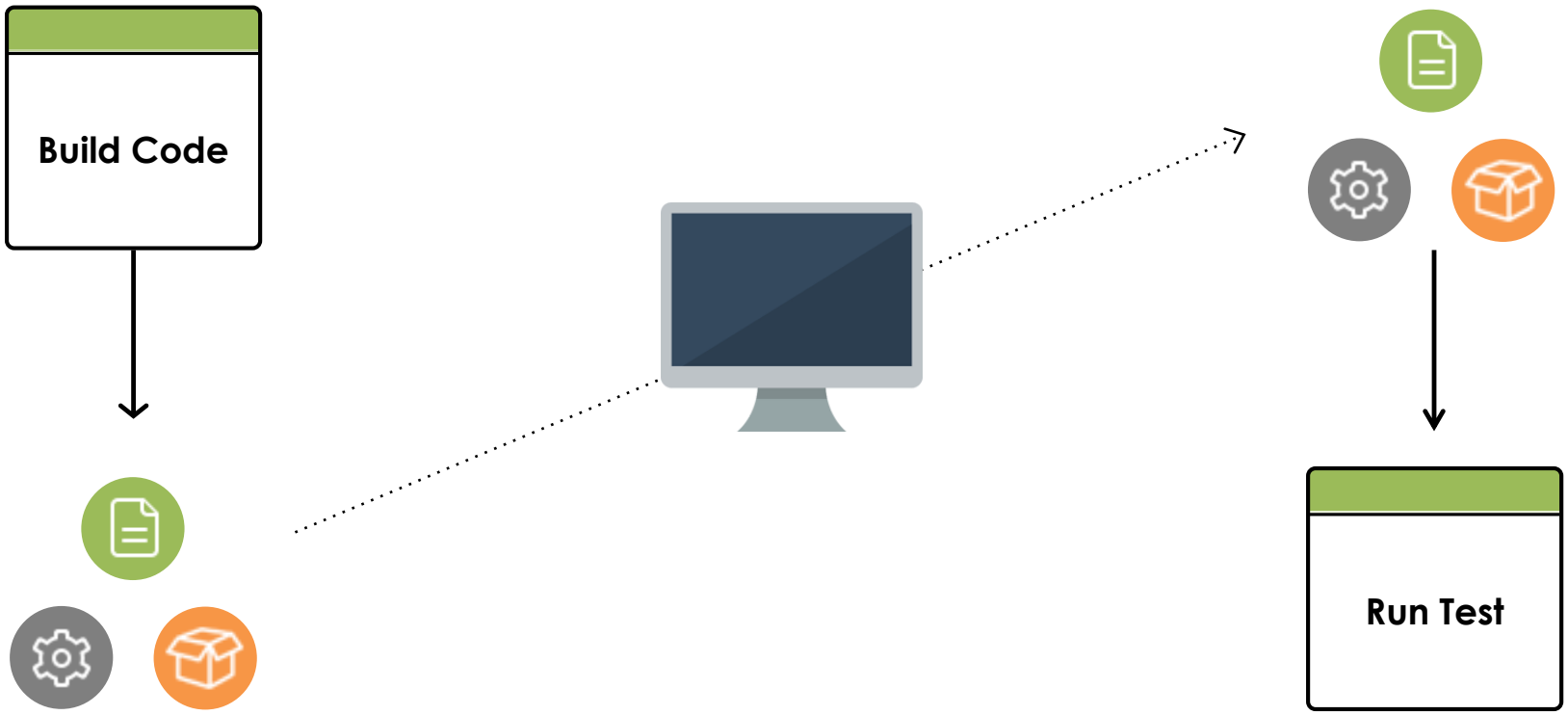
- Enables scheduling multiple tests in parallel
- Facilitates creating scalable Build Pipelines
- Provides automated reporting
- Allows Build Pipeline visualization
- Supplies accessible interface for users

Moving to Jenkins

Challenges:

- Build Archiving
- Creating Build Pipelines

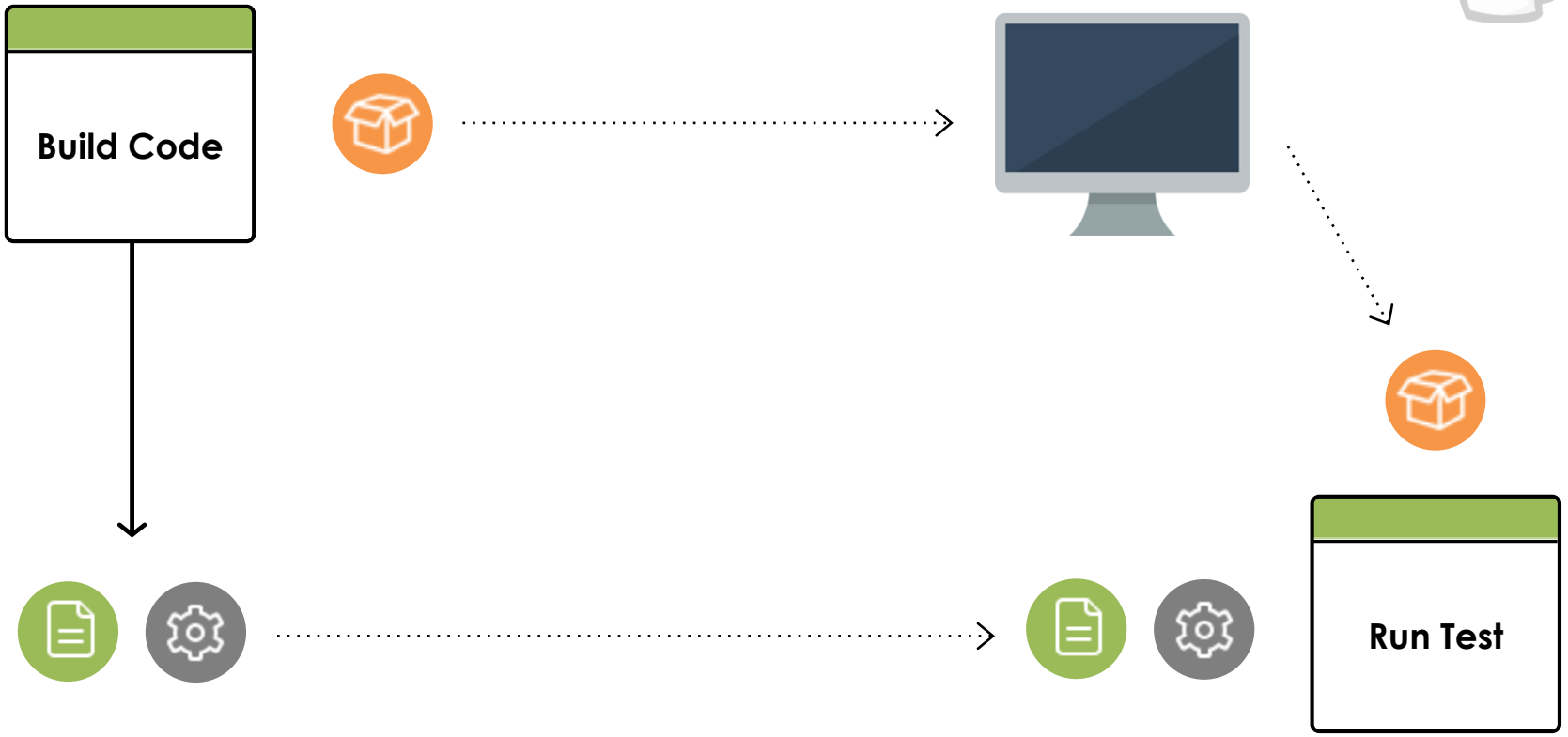
Build Archiving – Typical Pattern



Build Archiving - Challenges

- Tests run against loose builds of our game
- Build outputs include:
  - Executables, DLLs, Symbol Files, Data etc.
- Builds are on the order of 100s of GBs
- Copying all build artifacts to a central server is too expensive

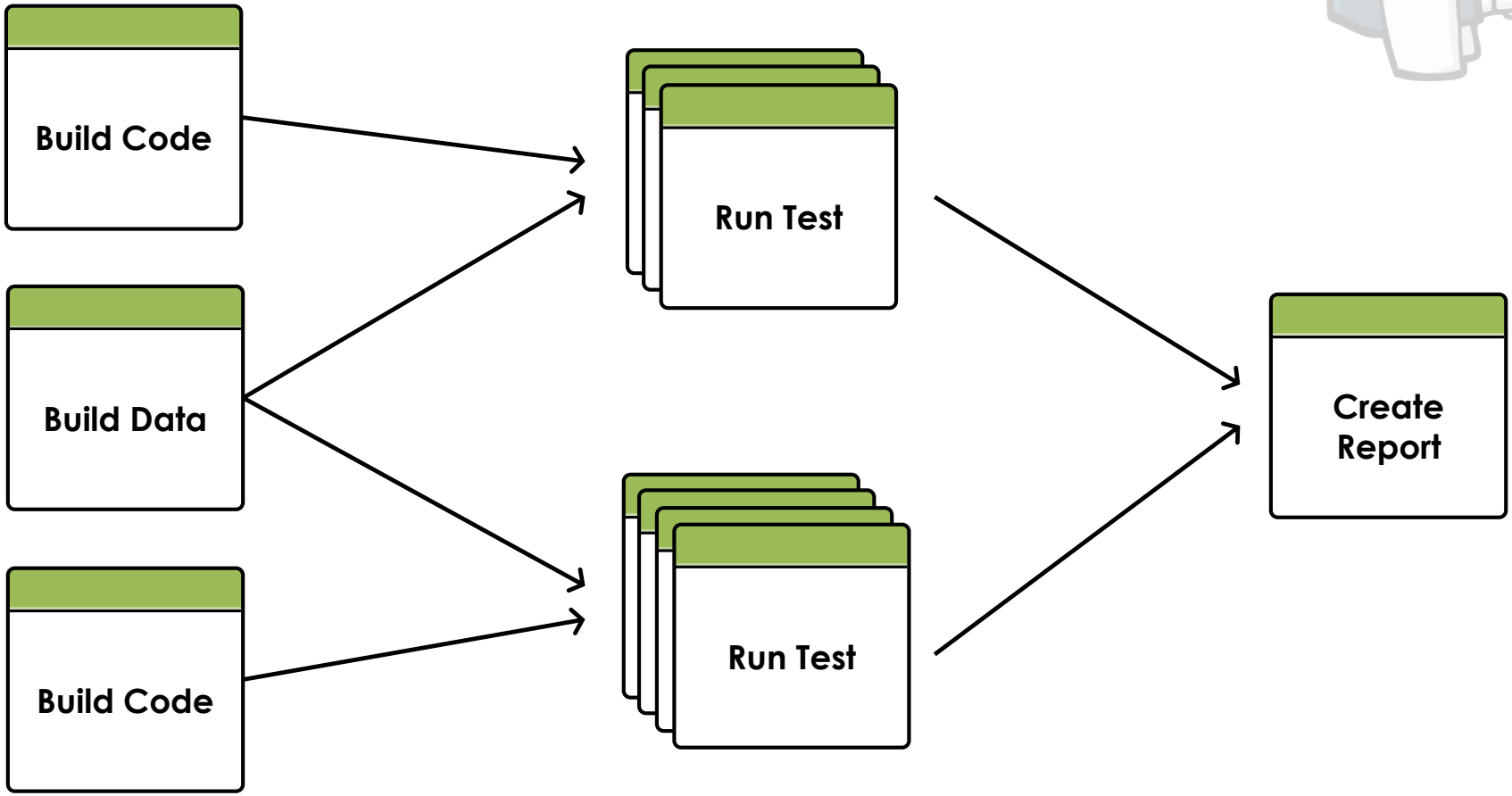
Build Archiving - Solution



Build Archiving - Solution

- Build machines each own a local build share
- Builds are copied to the shared directory
  - Only keep last n builds for each configuration
- Only small property files are copied as artifacts
  - Includes build information
- Test jobs copy small artifacts from the master
- Test scripts retrieve actual builds from the network

Build Pipelines - Design



Build Pipelines - Implementation

- Build Pipelines are defined in Build Flow projects
- Collections of closures represent Pipeline Phases
- Jobs in Phases are fundamental build steps:
  - Build code, build data, run test, submit change, etc.
- Jobs are identified by unique keys
  - Allows subsequent phases to find jobs from earlier phases
- Build Pipelines are serialized into JSON
- Reports parse JSON for Build Pipeline information

Build Pipelines - Implementation


```
// build phase
args.buildConfigs.each { config ->
    buildClosureMap[getBuildKey(config)] = generateBuildClosure(config);
}
buildJoin = parallel(buildClosureMap);

// test phase
args.testTypes.each { test ->
    args.testsConfigs[test].each { config ->
        build = buildJoin[getBuildKey(config)];
        testKey = getTestKey(config, test);
        testClosureMap[testKey] = generateTestClosure(config, test, build);
    }
}
testJoin = parallel(testClosureMap);

// report phase
reportClosure = generateReportClosure(buildJoin, testJoin, args);
build(reportClosure);
```

Project Outcomes

- Evaluated approximately 500 changes during FIFA 15 Final vs 200 changes for FIFA 14
  - Approximately 10% of changes had issues needing investigation
- More than 15,000 code builds to date
- Over 12,000 tests ran so far
- Saved 8 hours per week by automating integration tasks
- Established permanent pre-flight testing farm for engineers

Next Steps

- Move testing farm to VMs
- Improve development kit management
- Standardize process for other teams

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