HCLTech | Supercharging Progress™

Accelerating time to market for a multinational air conditioning manufacturer

HCLTech's RAPID Embedded DevOps (RED) framework bolsters shift left testing

A Japan-based, multinational company that manufactures home appliances and specializes in air conditioning and cooling technology needed to release new features in its HVAC products faster. As an engineering partner to this customer, HCLTech DevOps consultants analyzed their current development processes and tools, identified gaps and recommended the tools, processes and pipelines that would help accelerate release of new features in the product.

The RED framework brings ready-to-use solutions and defines processes that together abstract the complexity of implementing complex steps such as remotely connecting to devices/semiconductor chips, remotely interfacing with microcontrollers and accessories like USB ports, embedded storage, file transfer, on-chip emulation, and validation and verification with Automated Test Equipment (ATE)

The Challenge:
Keeping pace with rising customer expectations

With ever-increasing competition and expectations of their customers to see new features and enhancements in the product, the customer wanted to reduce the release cycle with automated testing for firmware development of their HVAC system. The lack of continuous deployment and flash deployment was a major blocker to accelerating the test process.

The Objective:
Automating firmware development

Firmware development has its unique common software development environment compromising specialized tools and processes. The customer wanted to speed up firmware development by implementing an end-to-end automated continuous integration (CI), continuous delivery (CD) and continuous testing (CT) pipeline.
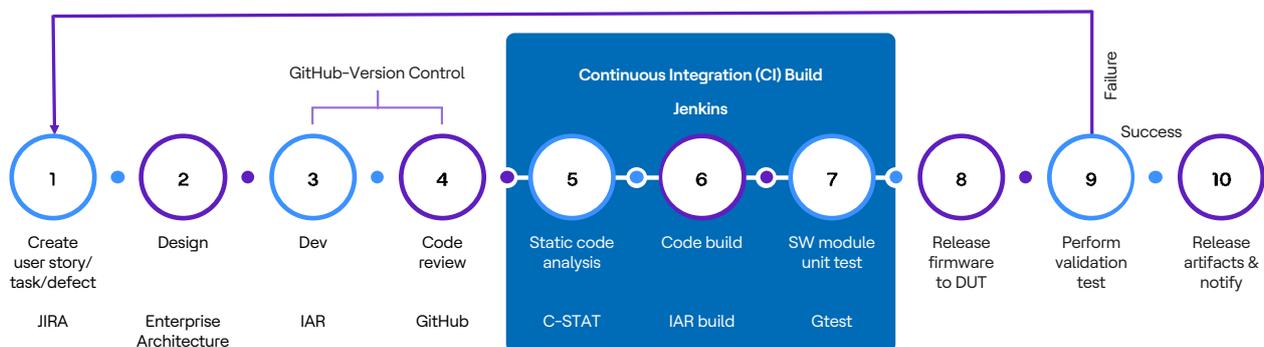
The Solution:
Accelerating firmware development with DevOps

HCLTech helped the customer to create a CI-CD-CT platform for faster development of firmware for an advanced HVAC system they were building. It leveraged its specialized RAPID Embedded DevOps (RED) Framework, which brings ready-to-use solutions and defines processes that together abstract the complexity of implementing complex steps involved in any firmware development (including remotely connecting to devices/semiconductor chips, remotely interfacing with microcontrollers (MCU) and accessories like USB ports, embedded storage, file transfer, on-chip emulation, and validation and verification with automated test equipment).

SMEs from HCLTech DevOps CoE along with application architects from embedded software development began with a due diligence exercise. This enabled them to recommend the right tools for version control, build automation, static code analysis, automation testing and remote connectivity to boards/MCU. These tools were integrated into a toolchain, in which individual tools were installed and configured by HCLTech engineers. Finally, the pipelines were written to automate code build, code quality checks, code deployment, test scripts deployment and trigger tests.

GitHub-Version Control		Continuous Integration (CI) Build — Jenkins			Failure / Success	
1 Create user story/ task/defect — JIRA	**2** Design — Enterprise Architecture	**3** Dev — IAR	**4** Code review — GitHub	**5** Static code analysis — C-STAT	**6** Code build — IAR build	**7** SW module unit test — Gtest	**8** Release firmware to DUT	**9** Perform validation test	**10** Release artifacts & notify

The Impact:
Embedded software reaches new levels of excellence

HCLTech deployed RED Framework for the customer delivering significant efficiencies for DevOps.

Now the customer can complete DevOps setup in 30 percent lesser implementation time than before.

Automation helps the customer save 16 hours per week spent in deploying new builds compared to the manual process.

By reusing components from HCLTech RED Framework, they save 15 percent in cost.

The use of agile and DevOps-centric development processes has significantly reduced release cycle time from three months to one month.

HCLTech

hcltech.com