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Wind River Studio's Unified Development Speeds Aptiv Software Rollouts

Automotive software development is increasingly challenging, but time to market is more important than ever. Complex, continually evolving applications and requirements have led to long development and update cycles. Developers depend on internal teams and partners distributed around the world, who struggle to collaborate. They need a faster, more unified way to build and update code.

URGENCY CLASHES WITH COMPLEXITY

Aptiv faces these challenges in creating high-quality software quickly for major OEMs. For increasingly connected software-defined vehicles, even minor functional enhancements can become vast global projects when they need to address cybersecurity, functional safety, communications and other requirements. An average software project at Aptiv involves a team of 100 to 150 people — and can include as many as 500 — often dispersed across a minimum of two or three locations and time zones.

Typically, fragmented workflows have prevented smooth, efficient collaboration. Each team had to accumulate its own tools, artifacts, pipelines, CI/CD (continuous integration/continuous deployment) toolchains and other assets. Code developed by one team would not work for another because the teams had been working in different environments or at different stages of the V-model, which describes the development and testing phases of the project. As software moved between teams, it could take hours to ramp up the same development environment, with its unique dependencies, just to reproduce a bug.

Development across disjointed workflows, such as when developing according to the V-model, was often a manual process. At each gate in the process, the entire stack might need to be recertified and recompiled. Each testing team would have to track down the right test methods and physical or virtual testbeds, and test results would then be stored in different locations and software management platforms, without standardized use of a common methodology. As a result, some development teams completed new releases only once per quarter, on a longer than necessary timeline to roll out updates and bug fixes.

Challenge
- Reduce time to release software updates
- Improve collaboration among software engineers dispersed across regions
- Eliminate duplication of efforts

Solution
- Adopted Wind River Studio Developer to standardize development and delivery workflows
- Shared common tools and test benches across global teams of developers
- Automated time-consuming tasks while optimizing existing tool investments

Results
- Increased developer productivity by as much as 25%
- Increased utilization of development and test hardware by up to 40%
- Achieved 68% faster scans and 20% faster builds

GETTING ON THE SAME PAGE

To increase developer productivity and shorten time to market, Aptiv is adopting Wind River Studio Developer, an end-to-end integrated DevSecOps (development, security and operations) platform. Studio lets developers view and share a consistent set of software tools on demand in the cloud through a single pane of glass that is common throughout the organization. Engineers at multiple sites can operate as true teams: building, testing and deploying code in common environments and workspaces instead of continually reconciling and redoing one another's work.

Studio comes with a standard set of high-performance development tools and standardized methodologies. Teams can also add their own internal and third-party tools from Wind River Studio Gallery. Out of the box, Gallery includes more than 30 tools specifically curated for intelligent systems and embedded use cases. The platform maintains all tools and other assets, including updated pipelines, build environments and workflows, for internal and external teams subject to built-in access controls.

This level of deep integration across the platform accelerates speed to market in several ways. Built-in tools let developers automate previously time-consuming tasks. The platform includes automated traceability to find the code written for specific requirements and verify its functionality, even long after its release. Continuous certification removes the hurdle of manually recertifying code at each stage in development, even for minor steps such as changing the name of a variable.

Studio simplifies testing by making all physical and virtual test platforms, and all previous test results, visible and accessible via the dashboard. It also includes tools for creating feedback loops to test features in the field. Combined with automation, this accelerates the pace of testing and, with it, the frequency of releases and updates.

STANDARDIZATION PAYS OFF

Aptiv is currently using Studio in 20 projects, growing to about 60 by the end of 2024, and the platform is already delivering significant benefits.

Developer productivity has increased as much as 25 percent on teams using Studio's Pipeline Manager for workflow automation. By improving access to test infrastructure, Studio has also increased utilization of development and test hardware by up to 40 percent.

Faster build-and-scan tools available with Studio are also accelerating projects. One team saw 68 percent faster scans and 20 percent faster builds compared with its existing high-performance build toolchains. Another team, using integrated third-party build-and-scan tools from Wind River Studio Gallery, achieved 25 percent build-and-scan improvement over its existing Jenkins toolchain.

GATEWAY TO NEXT-GENERATION DEVELOPMENT

Aptiv's experience with Studio demonstrates its potential to accelerate development by unifying teams around a common, consistent set of software assets in the cloud. It can bring the full benefits of DevSecOps to automotive OEMs facing growing demands for rapid innovation.

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