

Perceprio DevAlert

– The Next Step in IoT Software Quality Assurance



Perceprio is an
AWS Advanced
Technology Partner.

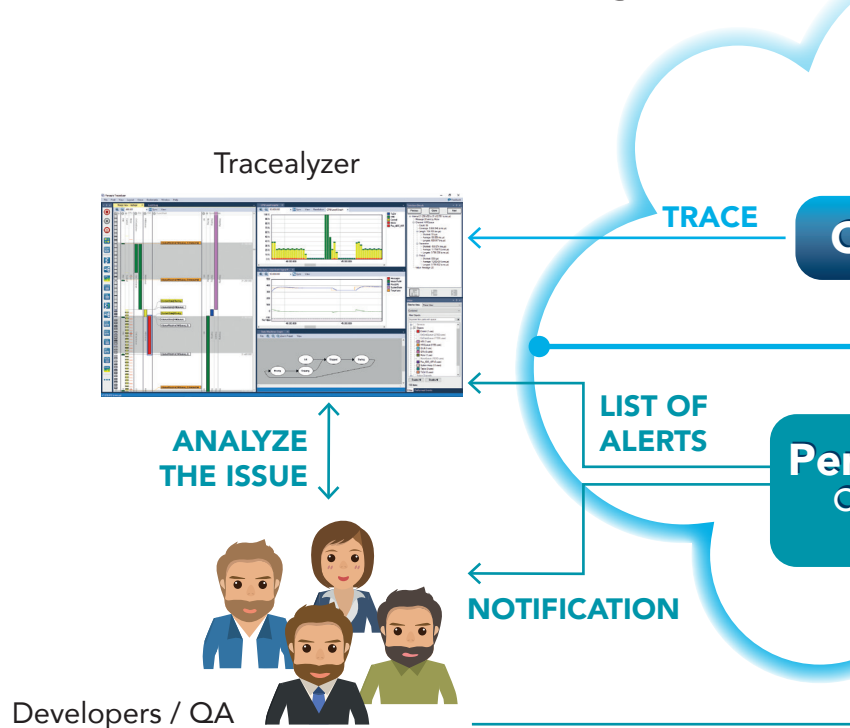
- ✓ Monitor Your Deployed IoT Firmware
- ✓ React Instantly to Firmware Errors
- ✓ Powered by Tracealyzer[®] and AWS[®]

Percepio DevAlert – The Next Step in IoT Software

Percepio DevAlert is a groundbreaking new cloud service for IoT product organizations that provides awareness of missed bugs and speeds up resolution.

DevAlert notifies the firmware developers within seconds after an error has been detected and provides diagnostic information about the issue, including a trace for Percepio Tracealyzer. This shows you what was going on in your code when the error occurred, making it far easier to understand the problem and quickly find a solution.

IoT Product Company



Devices with secure IoT connectivity enable us to think about firmware development in a new way. The traditional code – test – debug cycle remains as important as it's always been, but since we know from research and experience that some bugs almost certainly remain in deployed code, why not use the connectivity for automatic error reporting from deployed devices?

Automatic Feedback

Without automatic feedback, you rely on your end users to report any issues and provide sufficiently detailed information for you to identify and solve the problem. A vague error report like “the screen went blank” may require weeks of guesswork to find a likely cause, and even then, you don't know if you really solved the right problem. Imagine how much troubleshooting time that could be saved if you had access to detailed

diagnostic information.

Once the bug has been fixed, the updated firmware can be distributed as an over-the-air update. This creates a feedback loop that allows for fast iterative improvements. This methodology has long been standard in development of mobile and cloud applications (DevOps), and it has now become viable for embedded development as well.

Percepio DevAlert is designed to leverage existing secure solutions for cloud connectivity, storage and over-the-air updates. It relies on Amazon Web Services for infrastructure and messaging, and supports FreeRTOS- and ThreadX-based firmware. Support for additional embedded and cloud platforms is planned and can be provided on request.

Information Flow

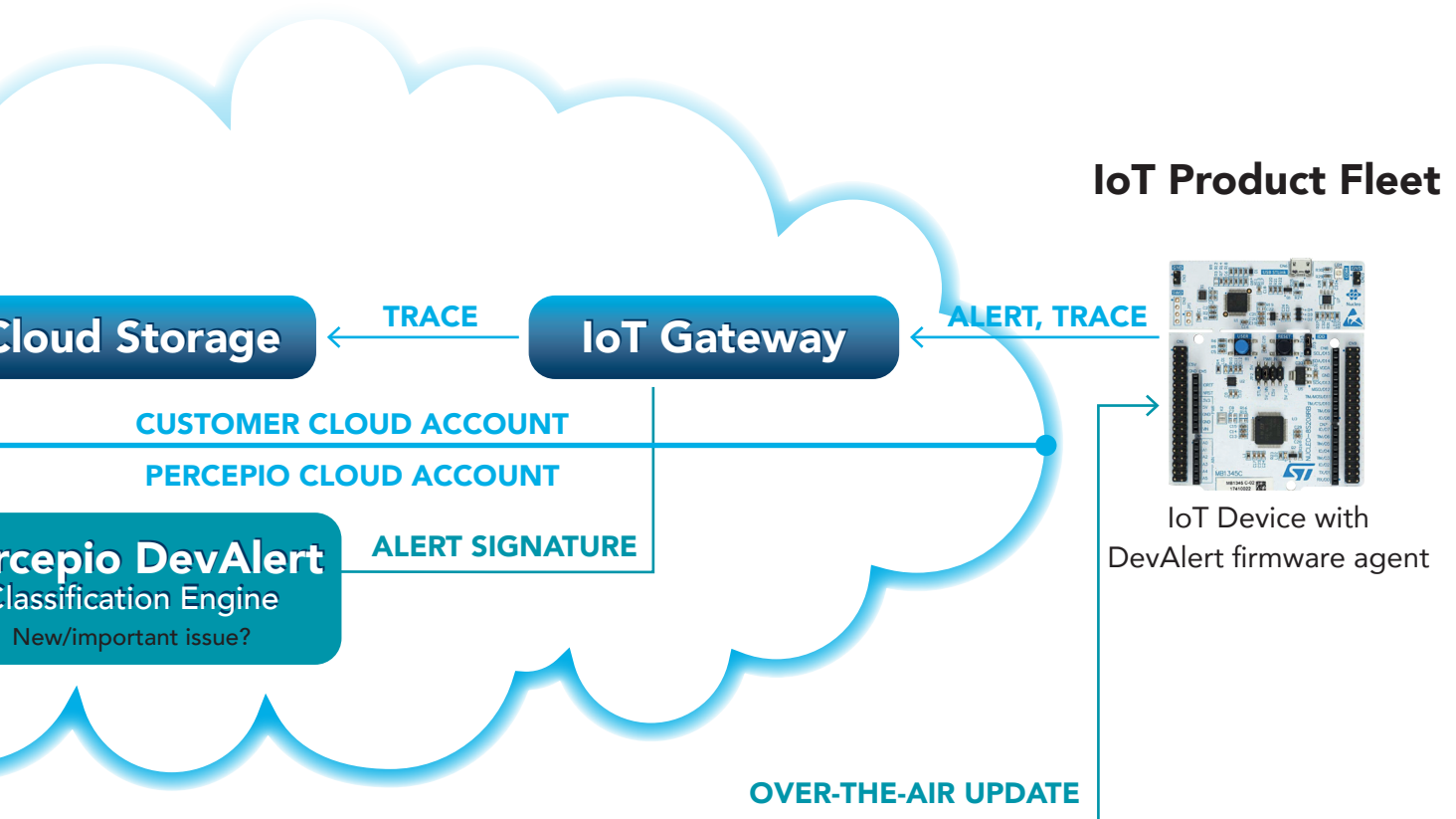
The information flow starts in the error handling code of the IoT

device, such as existing sanity checks and fault exception handlers. By calling the DevAlert firmware agent from these locations, firmware issues are uploaded as alerts to the customer's cloud account. An alert may include an error message and any other information relevant to the specific issue, such as software state variables and hardware registers. Depending on the severity of the issue, the alert is either uploaded directly or after a device restart, once the cloud connection has been restored.

DevAlert provides visual trace diagnostics for remote diagnostics, using Percepio Tracealyzer. Every alert includes a trace of the most recent software events prior to the error, which is recorded automatically by the agent. The trace provides both the details of the error and the context, making it easier to identify the bug.

This tracing technology builds

Software Quality Assurance



on 15 years of experience in RTOS tracing and is 4-8x more memory efficient than traditional RTOS tracers – only 4 KB is needed to store a trace with up to 1000 software events. The efficient trace encoding is important for three reasons – it allows us to collect traces of sufficient length from memory-constrained IoT systems, it reduces the upload time to a fraction of a second and it minimizes the cloud-side operational costs of DevAlert messaging and storage.

Classification Engine

Alerts from the firmware agent are uploaded to the customer's cloud service, which is configured to store the alerts and to also notify the DevAlert Classification Engine. This is the core of DevAlert, and a fully managed service hosted in Percepio's AWS account. It is responsible for classification, statistics and sending of notifications to the developers. It also offers configuration

options, e.g. under what conditions notifications should be sent and to whom.

When developers receive notification about a new issue, they can access alerts and traces directly from Percepio Tracealyzer. The DevAlert Dashboard in Tracealyzer shows recent alerts and allows for high-level analysis, e.g. if a certain issue was fixed by your latest firmware version. Moreover, the traces can be opened directly from the Dashboard, thanks to Tracealyzer's built-in cloud service integrations and customization possibilities.

Your Information Is Secure

The software trace never needs to leave the customer's cloud account. Only an anonymized signature of the alert is required by the Classification Engine and this information is completely transparent, configurable, and meaningless on its own. Furthermore, both communication and storage are protected using

best practices for authentication and encryption.

An Invaluable Feedback Loop

Testing in the lab often just isn't enough due to the complexity of today's embedded IoT systems. Percepio DevAlert is an extremely valuable service that is easy for development teams to integrate into their design flow. It allows device developers to gather critical information about problems occurring in the field, directly affecting their customers. Combined with the over-the-air update capability present in AWS IoT Core, it closes the feedback loop and enables IoT device developers to leverage the DevOps methodology to achieve continuous improvement and a better user experience.

Welcome to Tracealyzer

Percepio Tracealyzer is a powerful tool for tracing and visualization of RTOS-based embedded software systems. More than 25 views offers amazing insight into the real-time behavior, speeding up debugging, validation and performance optimization.

To enable tracing in your target system, follow the step-by-step guide provided in the [User Manual](#).

-  [Getting Started](#)
 [How to Purchase](#)
 [User Manual](#)

Percepio DevAlert

My Product

Revision	Issue	Alert Count	Latest Update	Latest Trace	Trace Size	Device
0.9.2	Malloc Failed	4	Just now	00978AC2_26217F3B/2	7.9 KB	DFM_CYPRESS_DEMO_TEST
0.9.2	Swipe Left	2	3 minutes ago	00978AC2_26217F3B/1	7.9 KB	DFM_CYPRESS_DEMO_TEST
0.9.2	Assert Failed	1	5 minutes ago	00978AC2_26217F3B/0	7.9 KB	DFM_CYPRESS_DEMO_TEST
N/A	Hard Fault	1	20 hours ago	00B11102_26878E2C/2	7.9 KB	DFM_CYPRESS_DEMO_TEST
N/A	Assert Failed	1	20 hours ago	00B11102_26878E2C/0	7.9 KB	DFM_CYPRESS_DEMO_TEST

Integrated with Tracealyzer

When you launch a DevAlert-enabled Tracealyzer, recent issues are shown in the DevAlert Dashboard. For each type of issue, you can see the firmware version, the reported symptoms, and how many times it has occurred. This makes it easy to spot new issues after deploying a firmware update. You can also see if issues reported from earlier firmware versions have been solved, or still appear in the latest firmware version.

“The world has been waiting for a solution like DevAlert. DevAlert will revolutionize product quality and it’s a must-have for any embedded or IoT project.”

Jacob Beningo, President and principal consultant at Beningo Embedded Group

“As good as the STM32 family of 32-bit Arm® Cortex®-M MCUs is, and as powerful as the STM32 development ecosystem is, the underlying application code invariably contains bugs that can be difficult to find and fix. Unobtrusively running a powerful trace diagnostic program such as Percepio DevAlert can help developers catch and squash bugs to minimize customer disruption.”

Laurent Hanus, Ecosystem Marketing Manager, STMicroelectronics

“Utilizing DevAlert, Percepio’s remote debugging tool, device manufacturers can now quickly identify and fix software in field-deployed IoT products. Cypress’ IoT platforms, including ultra-low power PSoC 6 micro-controllers and industry-leading Wi-Fi and Bluetooth connectivity, work seamlessly with Percepio’s powerful DevAlert and Tracealyzer tools.”

Gary Sugita, director of marketing, IoT Compute and Wireless Business at Cypress