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CASE STUDY

### HW & SW Co-Verification

432% Validation speed up



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True understanding of the clients' needs, and business specifics is essential. Focusing on clients' challenges, expectations, business, and industry specifics enable us to provide the most relevant solution for the client and support their growth.

As a top-notch semiconductor provider of cuttingedge solutions that serves customers in automotive, aerospace, security, storage, networking, power and many other markets, our client was in high demand of a stable and trustworthy service partner.



#### **Comprehend the Client**

Unsatisfied with process speed and level of resources usability.



#### Goal

Ensure that the product line is reliable and bug free, while speeding up the process and increasing resources usability to the maximum.



#### Solution

Develop test environment, improve processes and upgrade overall test flow.



#### Results

Performance analysis indicating the process improvements.



#### **Comprehend Client**

The client required empowerment in area of architecture, design, development, execution and reporting.



Our client provides a wide range of trusted advanced storage solutions for storing and managing any kind of digital content and sensitive data.

In communication with the client, we have identified several areas which required improvements, support or empowerment in order to reach the desired process flow and pace by the clients' specification.

Specifically, the client encountered issues in area of:

- o process speed;
- o level of resources utilization;
- o product line validation and testing.



#### **Comprehend Client**

The client required empowerment in area of architecture, design, development, execution and reporting.



Empowerment

Scope of activities we have been working on:

- Co-Verification of SATA/SAS controllers used in various devices from entertainment to high-end data centers;
- High complexity HW & FW;
- Continuous regression as even a small change in HW and/or FW could have a huge impact on other functionalities;
- Use of existing and/or develop new test validation methods;
- Usage of bug tracking and result reporting tools.





Goal Achieve product line reliability, improve process speed and resources utilization

### **Quality and validation**

Within product lines

It was necessary to develop and maintain the **test environment**. Since a huge number of cases had to be tested, high level of automation was mandatory. In order to speed up the result processing, automated validators had to be developed as well.

Furthermore, it was mandatory to clearly specify and carefully plan the test to reach the highest level of coverage possible and have the best utilization of **Protium** and **Palladium emulation platforms**.

To ensure quality test environment and secure reliable automated test validation, in the beginning there was a need for:

- Manual logs, results review;
- Manual analysis of captured waves and traces.

Once we had a lot of data collected, we proceeded to development of a fully automated validation system.



Solution Develop test environment, execute tests, report bugs and issues.

### **Proprietary HW & SW**

Test framework in several programing languages

TEST FRAMEWORK has been a collection of **Python**, **Bash**, **Perl**, **TCL** scripts and other in-house and 3rd party tools.

TEST LAB with **Protium, Palladium emulation systems**, different protocol jammers/ analysers, various type of storage devices.

TEST DEVELOPMENT, testing and debugging is performed on Protium and Palladium emulation systems. Tests with all configuration values are defined on **TestRail**.



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Solution Develop test environment, execute tests, report bugs and issues.

### **Proprietary HW & SW**

Fully automated testing environment

Test case and script development required understanding of what must be tested. Understanding how the test environment works is a precondition for the development of **a fully automated testing environment**.

In order to achieve **high test coverage** and **shorten the time** of result analysis, various **in-house** helper scripts, analysers, validators have been developed.

Those in-house developed tools helped us in discovering/ debugging new issues during testing.





**Results** Performance analysis indicating the process improvements.

### ~10% of testing time reduction

Once the flow was fully debugged and completely functional, code and test execution optimization took place.

The following coding optimizations led up to ~10% of testing time reduction:

- Dead Code Elimination;
- Common Sub-Expression Elimination;
- Code Movement;
- Wait period reduction.

In the segments where static delays were replaced with conditional based time delay **speed up that** section by 3 times.



**Results** Performance analysis indicating the process improvements.

### 432% Validation speed up

**Performance analysis** 

**Results Overview** 

- ~10% of overall testing time reduction
- Increasing the speed of FW download by 3 times
- Bugs Issues:
  - 315 reported
  - 315 resolved
- Developed validation tool for Automated test result checking
- Decrease validation time frame from 3 days of manual to 10 minutes automated

### LET'S CONNECT!

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in Connect with us

Where passion leads to excellence



## ABOUT US

### **AVISTO Eastern Europe**

AVISTO Eastern Europe is a service provider that focuses on empowering Industrial automation and Semiconductor projects by offering tailored made solutions in areas of Embedded Systems, Test Automation, Application Software and DevOps.

Established in 2007, AVISTO currently operates three design centers in Serbia and boasts a strong network of experienced engineers empowered by high level of technical adaptability to meet the specific requirements and demands of clients' projects.

As a French company and a member of the Advans Group, which comprises over 1000 engineers, AVISTO can deliver comprehensive product-based development support to clients at the enterprise level. ~\|?568 hD?u (t=b(ls))

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