Achilles Test Platform from GE Digital

Comprehensive test platform for monitoring network and operational parameters

Achilles tested. Achilles certified.

As technology continues to drive towards more open and connected networks, mission-critical systems—including those in the oil, gas, utility, waste water, chemical and critical manufacturing industries—are becoming increasingly vulnerable to cyber attacks. This has led to greater awareness from system operators around the security and robustness of the devices deployed in these environments.

The Achilles Test Platform from GE Digital is an important tool for manufacturers of mission-critical infrastructure who need to ensure that their products are not vulnerable to cyber attacks. The Achilles Test Platform is the only communications robustness test platform that can monitor both network and operational parameters, allowing vulnerabilities to be discovered, faults to be reproduced, isolated, identified, and resolved before products are introduced to the market.

Robustness testing benefits

01 Increase productivity and effectiveness

Achilles test automation dramatically improves test efficiency and offers more thorough testing, which provides customers with secure, reliable, and robust products.

02 Minimize the cost associated with escaped bugs

Identifying vulnerabilities early in the lifecycle can reduce the risk of experiencing an issue in the field, which can be costly. The test platform can also minimize the need for patch distribution and customer service, as well as improve customer retention by avoiding quality problems.

03 Reduce time-to-market

Compressing the development lifecycle by identifying vulnerabilities early on allows for a faster time-to-market. This leads to creating high market share, more time for product sales, and quicker revenue recognition.

04 Prepare, align, and conform with industry standards and requirements

Get ahead of compliance mandates, meet customer procurement requirements, and become a product differentiator with Achilles certifications. The certifications provide the exact tests used in industry-recognized standards, such as the Achilles Communcations Certification and the ISA Secure EDSA Communications Robustness Testing Component.

> "Achilles Test Platform provides a powerful platform from which we can automate and expand our security testing procedures, which in turn helps us identify issues early in the development lifecycle."
>
> **– Invensys**
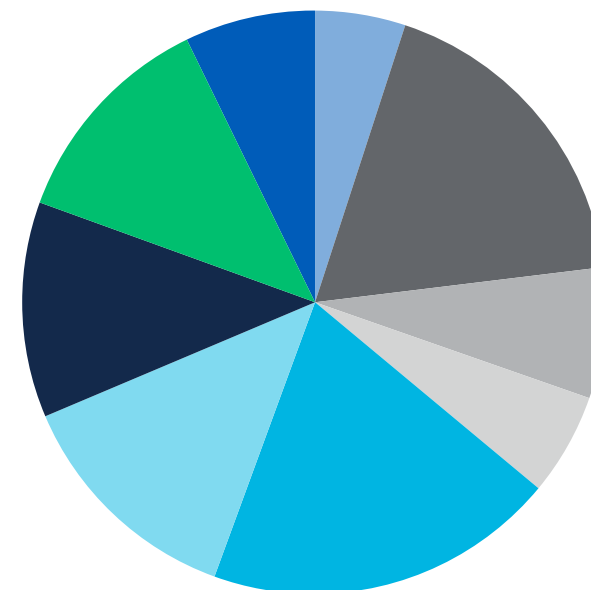
The total cost of an attack for device manufacturers is more than just finding and resolving the vulnerability.

- Finding and resolving the vulnerability
- Field implementation of the resolution
- Potential product recall
- Liability costs
- Crisis management costs
- Lost cycles of sales team
- Lost cycles of management team
- Ongoing increased marketing costs
- Ongoing increased insurance costs
- Ongoing impacts to reputation and brand equity

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Achilles Test Platform differentiation

01 Real-world test environment monitoring

The patented test framework is specifically designed to allow you to test and monitor your device's capability under real-world conditions—allowing you to accurately verfiy and validate performance. The monitoring techniques also provide unparalleled visibility into your device's core functionality and monitor all key operating parameters during testing.

02 Comprehensive testing of industrial control specific protocols

Achilles has the most extensive set of control protocol coverage, with tests designed specifically for devices found in critical infrastructure. Our experience with manufacturers and operators has allowed for tests that specifically address real-life scenarios in the field.

Normal system communications (bridged)

Test traffic

Network monitors

Device under test

Operational parameter monitoring

Execute an entire set of tests from a simple user interface

03 Fast, efficient, and easy automated testing methodology

Achilles manages the sending and monitoring of multiple tests and test sequences, resulting in the fast execution of a comprehensive suite of tests. It can complete a full set of tests for Achilles Communications Certification Level 1 in just 2 hours.

04 Extensive summary and detailed reporting

Detailed fault reporting allows you to identify and drill down on specific faults as well as easily share information across your organization. Through packet capture and reports, you can quickly reproduce faults and export a regression test suite for other platform users to utilize. These reports can be exported into cxv, xml, and pdf files.

"Achilles testing provides welcome reassurance to the industrial automation community that the products they purchase are highly secure and reliable, conforming to a comprehensive set of requirements, in order to achieve their globally recognized certification"

– ICS Triplex

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Use cases

- Automated QA testing
  - The cost of correcting a vulnerability in the field is 65 times greater than if it is found and corrected during development
  - Using the Achilles Test Platform reduces the risk of vulnerabilities entering the field, minimizing the potential for manufacturers to face financial and brand equity consequences

- Prepare products for certification
  - Test products in advance to ensure they will conform with industry recognized standards and certifications
  - Achilles Test Platform performs the exact test suites utilized in ACC Level 1, ACC Level 2, and ISASecure Robustness Testing Certifications
  - GE Digital can perform Certification remotely via the ATP on your device throughout the Development Process

Development process cycle

CONCEPTION   DEFINITION   REALIZATION   VALIDATION   RAMP-UP

REQUIREMENT SPECIFICATION → DEVELOPMENT SPECIFICATION → ARCHITECTURE & DESIGN → IMPLEMENTATION → UNIT TEST → INTEGRATION TEST → ACCEPTANCE TEST → SYSTEM TEST → DELIVERY TEST → MARKET INTRODUCTION

Achilles
TEST PLATFORM

Testing throughout the development process

- The Achilles Test Platform is utilized in the validation and ramp-up stage of the product development cycle. It can be utilized within numerous groups such as product groups for validation, QA, and release testing.

- Utilization of the Achilles Test Platform during development will significantly reduce the time-to-market and costs associated with bug fixes that are required in the field, by ensuring devices are robust and secure before deploymentface financial and brand equity consequences.

Technical specs

Achilles Grammars

Achilles Grammars test for protocol boundary conditions in the device communications. It systematically iterates over each field and combinations of fields to produce repeatable, quantifiable tests of the common types of implementation errors.

Achilles Grammars send invalid, malformed, or unexpected packets to the Device Under Test (DUT) to test for vulnerabilities in specific layers of the protocol stack.
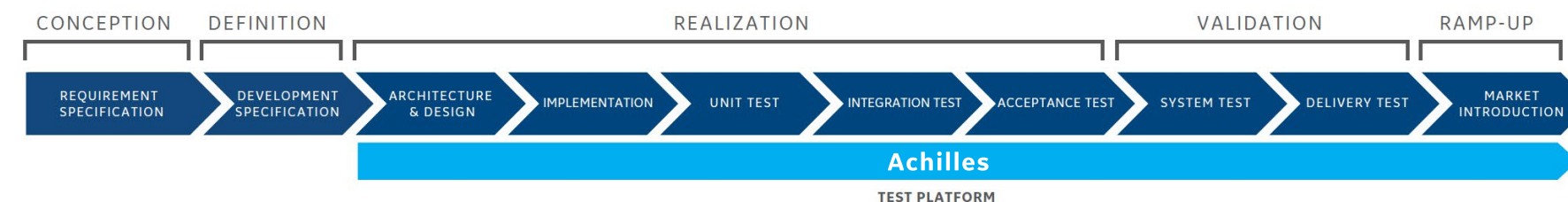
Achilles Storms

Achilles Storms generate packets at a high rate in order to examine the DUT's ability to handle high traffic rates for different protocols. The Achilles Test Platform also includes the ability to search for the denial-of-service threshold for a given type of storm traffic—the storm rate at which the device is no longer able to respond to other normal requests.

Known vulnerabilities

Known vulnerability test cases generate exploit traffic for vulnerabilities that have a high probability of existing in control devices.

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Physical specifications*

Specifications	Ports
9.5 cm H x 43.5cm W x 27.5 cm D; fits standard 2U	11 commands
(8.7cm H x 43.5cm W) with feet removed, mounting brackets included	6 x Ethernet (RJ45)
Weight: 6.4 kg	1 x Serial (DB9)
Operating Environment: 5C to 30C	2 x USB (2.0)
Power Requirements: 120-240 VAC, 50/60Hz, 6.0A	4 x Digital Input (12V to 24V Logic)
90 Day Warranty	2 x Digital Output (34V, 0.16A max)
	2 x Switchable AC Power Output (IEC C13, 2.0A max)

Footnote example: OpShield is fluent in these protocols to the command level.
 OpShield recognizes over 20 additional protocols, including Siemens S7, OPC UA and EtherNet/IP-CIP

Supported communication protocols

Protocol Tests

- Process
  - EtherNet/IP (CIP)
  - Foundation Fieldbus (FF-HSE)
  - MMS
  - Modbus TCP/IP
  - OPC UA
  - PROFINET IO
- Utility
  - DNP3
  - MMS (IEC 61850/ICCP)
  - Modbus TCP/IP
  - SES-92
  - ZigBee SE (802.15.4)

Monitoring Coverage

- Low Layer Communications
  - ICMP
  - ARP
  - Link State
- High-Layer Communications
  - OPC (via VCS)
  - Heartbeat: watch DUT-VCS traffic
  - TCP and UDP Ports
  - Windows/Linux Performance
- Control
  - Discrete (level signal or square wave)
  - Analog

GE Digital helps you harden your security posture and prepare to succeed in the new digital industrial landscape.

LEARN MORE

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Services

In the world of Industrial Internet of Things (IIoT), organizations are able to optimize productivity, reduce costs, and achieve Operational Excellence. While this is an exciting time for opportunity and growth, it can also bring on new challenges, questions, and uncertainty. No matter where you are on your IIoT journey, GE Digital has the right services offering for you.

Advisory Services We can help you plan and start your IIoT journey in a way that aligns to your specific business outcomes.

Managed Services We can help you maintain your critical machines from one of our remote locations around the world using model-based predictive-analytic technology.

Implementation Services Our team will help develop a collaborative, multi-generational plan that will marry your existing investments to the right process enhancements and technology.

Education Services We specialize in education services to ensure that you're leveraging our solutions to the fullest extent with our training and certificate programs.

GlobalCare Support Services Let us help by ensuring that your business continues to operate at its highest efficiency, all while mitigating risks to your investments.

Cyber Security Services Our solutions provide industrial-grade security for a wide range of OT network and application topologies.

Related products

GE Digital's OT cyber security suite helps protect industrial and healthcare companies against misconfigured devices and unplanned downtime due to cyber incidents. We can help you test, certify, and secure industrial connected devices, applications, and processes.

OpShield →

Designed to help protect critical infrastructure and controls network by defending the processes, communications, and assets that underpin your control strategy.

Predix →

Innovate and transform your business with the cloud-based operating system for the Industrial Internet, purpose-built for industry.

Continue your IIoT journey

Transforming your business requires innovative foundational solutions that lay the groundwork for optimized performance.
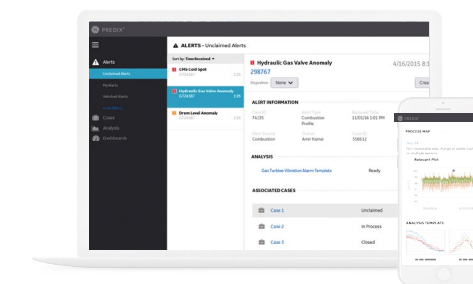
Historian →

Optimize asset and plant performance through time-series industrial data collection and aggregation, leveraging Predix IIoT connectivity.

iFIX →

Gain visibility into your operations and secure agility for smarter decision making that drives results.

Asset Performance Management →

Move from reactive to proactive maintenance to reduce unplanned downtime, minimize maintenance costs, improve efficiency and extend asset life.

Contact

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