Achilles Test Software from GE Digital
Test security capabilities early in the product development lifecycle

Robustness testing for secure and reliable products

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 they deploy in these environments.

Achilles Test Software from GE Digital is an important tool for development teams of mission-critical infrastructure manufacturers who want to ensure products are not vulnerable to cyber attacks. Achilles Test Software is the industry’s most comprehensive robustness testing tool that allows development teams to discover security vulnerabilities. Delivering capabilities similar to GE Digital’s Achilles Test Platform in a more economical form factor, the software runs as a VM on a variety of platforms allowing more widespread use of the test capabilities. By making this important test tool available to developers, security capabilities can be tested much earlier in the product development lifecycle, saving both time and money.

"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

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 throughout the development cycle with robustness testing, manufacturers reduce the cost of fixing bugs at the QA or validation stage. Fixing vulnerabilities before product release reduces the requirement for patch distribution, customer service, and increases customer retention by avoiding quality problems.

03 Reduce time-to-market and revenue
Compressing the development lifecycle by identifying vulnerabilities early on allows for a faster time-to-market. Faster time-to-market can increase market share and allow 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 Communications Certification and the ISA Secure EDSA Communications Robustness Testing Component.
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Achilles Test Software differentiation

01 Comprehensive testing of industrial control specific protocols

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

02 Perform testing outside of the QA Lab

Provide design teams and engineers testing software earlier in development. Test candidate hardware and software platforms before submitting to final approval and lab testing. Engineering teams can reproduce and resolve problems found in final QA. Simplify bug fixes by exporting test results from the Achilles Test Platform and importing them into Achilles Test Software.

03 Extensive summary and detailed reporting

Get an overall view of test results from the master report per product, outlining all vulnerabilities. Identify and drill down on specific faults using detailed fault reporting. Easily share information across the organization—reproduce faults through packet capture and reports, and export a regression test suite for use by other users of Achilles Test Software. Reports can be exported into csv, xml, and pdf files.

Cost benefits of early vulnerability detection

“Ethernet-enabled industrial networks and control systems are increasingly exposed to new cyber risks that can jeopardize process integrity and result in unnecessary downtime. Achilles has proven to be the most effective tool in the market at identifying and mitigating potential weaknesses and helps our development teams continuously improve product robustness and meet the cyber security expectations of our customers.”

– Emerson

Automated testing
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Use cases

- Early lifecycle testing
  - The cost of correcting a vulnerability in the field is 65 times greater than if it is found and corrected during development
  - Reduce the cost of mitigation and allow for faster, more efficient implementation of secure interfaces
- Reproduce and isolate vulnerabilities across development teams
  - Allows teams to perform regression tests of new versions
  - Tests (or re-tests) devices remotely, with no need to ship Achilles Test Platform to different sites

Development process cycle

The Achilles Test Software is utilized in the realization stage of the product development cycle. It can be utilized within numerous groups—such as engineering groups—for development and design.

Utilization of the Achilles Test Software during development will significantly reduce the time-to-market and costs associated with bug fixes, by ensuring devices are robust and secure earlier in the development process.

When to use the Achilles Test Platform

The Achilles Test Software provides a more cost-effective test tool for developers who do not have the same requirements as the QA team. The Achilles Test Software does not support monitoring of the DUT outputs, and if the specific test cases being analyzed by the developers require output monitoring, they should use the Achilles Test Platform for those tests.

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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Hardware requirements

- CPU
  - Dual core 1.8GHz processor (quad core 2.4–3 GHz CPU recommended)
  - 64-bit CPU required for VMWare Workstation 8.0
  - CPU speed will affect network storm packet rates
  - Achilles Test Software has been successfully tested on Windows XP 32-bit, Windows 7 32- and 64-bit

- RAM
  - 2 GB (4 GB recommended)

- Network interface
  - Network interface for Achilles Test Software Port 1 (must be wired to connect to the DUT)

- Disk space
  - New VM disk requires approx. 4 GB
  - VM disk can grow up to 250 GB

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

Hardware requirements are representative and may vary by customer deployment. Please consult the product documentation for more details.

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.

About GE
GE (NYSE: GE) is the world’s Digital Industrial Company, transforming industry with software-defined machines and solutions that are connected, responsive and predictive. GE is organized around a global exchange of knowledge, the “GE Store,” through which each business shares and accesses the same technology, markets, structure and intellect. Each invention further fuels innovation and application across our industrial sectors. With people, services, technology and scale, GE delivers better outcomes for customers by speaking the language of industry.

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