

# MUSIC Certification

**Certification Level:**  
MUSIC 2009-1 Foundation Level

**Device Certified:**  
Tofino Security Appliance

**Certification Date:**  
01May-2009

**Certificate Identifier:**  
MUSIC-Foundation-May09-1

**Certification Tests Conducted By:**  
Byers Security, Inc.

**Certifying Entity:**  
Mu Dynamics, Inc.

## Executive Summary

MUSIC is the certification program for Industrial Control offered by Mu Dynamics, Inc. The program is based on a regimen of vendor testing with independent verification and certification. The Foundation-level certification requires the use of the Mu-4000 Security Analyzer to test the supported protocols from the following list: ARP, DHCP, ICMPv4, IEEE 802.1p/Q, IPv4, TCP, TFTP and UDP. The Tofino Security Appliance was tested at Byers Security Inc.'s facilities in British Columbia, Canada with the independent verification being provided by Mu Dynamics.

The Tofino Security Appliance was tested using a Mu-4000 for security and robustness issues using the complete suite of Foundation-level protocols supported by the Tofino Security Appliance. No faults were detected during the running of the analysis. The Tofino Security Appliance controller was tested without a firewall.

The analyses were run using the attacks available for each protocol on the Mu-4000 Security Analyzer. Byers Security carried out the certification testing and the results were independently verified and certified by Mu Dynamics, Inc.

## Analysis Details

- **Device tested:** Tofino Security Appliance - Software Release 1.3.0
- **Test location:** British Columbia, Canada
- **Analysis completion date:** 24th March 2009
- **Tests conducted by:** Byers Security, Inc.
- **Tests verified by:** Mu Dynamics, Inc.
- **Certification specification:** MUSIC-Foundation 2009-1
- **Filters used in Mu-4000 Attack Vector Set:** None. All attack vectors were run during the testing.
- **Mu-4000 Analysis Mode:** Mutation Analysis (Endpoint-mode)
- **Testbed Description:** The Mu-4000 analyzer was directly connected to the Tofino Security Appliance using an Ethernet connection. All attacks were transported using IP version 4.



## Protocols Tested

In Mu terminology, attacks are hierarchically divided into Protocols, Suites and Variants. A Variant is the lowest level in the hierarchy, and is a collection of attacks using a common method of attack. A Suite is a collection of Variants that generally involves a single message or transaction type. A Protocol consists of a collection of Suites. An Analysis can consist of one or more Protocols.

The following protocols were tested during this analysis:

Protocol	Suites Run	Mu Protocol Version
ARP	All	2.3.0.r2492
DHCP	None*	n/a
ICMPv4	All	2.3.0.r2492
IEEE 802.1p/Q	None*	n/a
IPv4	All	2.3.0.r2492
TCP	All	2.3.0.r2492
TFTP	None*	n/a
UDP	None*	n/a

\*Not supported by the Tofino Security Appliance

## About the MUSIC Certification Program

The MUSIC certification is based on the philosophy of vendor-driven testing (either at their own facility or using an approved Mu partner lab) with independent verification, an approach that already works well in many industries. Mu Dynamics provides negative tests designed to expose implementation flaws in implementations of all protocols that are part of the certification. Mu Dynamics's customers who own or rent the Mu-4000 and the relevant protocols that comprise the MUSIC test package may run through the certification tests as part of their development and quality assurance processes and submit authenticated Mu-4000-generated reports to Mu Dynamics or MUSIC consulting partners for verification. They may also engage Mu Dynamics or its consulting partners to perform the testing and verification. The tests themselves are accessible to anyone with access to a Mu-4000 Security Analyzer. Mu Dynamics or its partner labs will archive all analyses in such a manner that they can be reproduced at any time if the certified device is available.

MUSIC Certification consists of a Foundation Level and an Advanced Level. Protocols available for testing and certification at the Foundation Level include ARP, DHCP, ICMPv4, IEEE 802.1p/Q, IPv4, TCP, TFTP and UDP. Customers will need to test all applicable supported protocols on the device under test for the target certification level. Protocols available for testing at the Advanced Level include DNP3, FTP, HTTP, MMS, MODBUS/TCP, Telnet and SNMP. Customers may choose to certify individual protocols for the Advanced Level certifications.

Certification details are posted under the Mu Secure Critical Infrastructure solution page at <http://www.mudynamics.com/solutions/customers/endusers.html#critical> and will include:

- Product Name
- Product Version tested
- Protocols tested
- Unique Test identifier
- Test location
- Date of testing
- Expiration date of certification

Mu Dynamics fully supports the work of ISA SP99 and IEC 61508 in their efforts to define and promulgate security standards within the industrial control systems markets (DCS, MES, SCADA, etc.) and commits to shipping automated test suites corresponding to these evolving security standards as soon as (or before, if possible) they become available, in addition to the MUSIC test suites available today. Complete details on the MUSIC program may be obtained from <http://www.mudynamics.com/music>.

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Analysis performed using Mu Dynamics' analyzer product is consistent with current industry best practices. Vulnerabilities may exist in products in spite of such testing. Mu Dynamics, Inc. and its partner laboratories cannot guarantee that certified products are free of all vulnerabilities. Mu Dynamics and/or its partners also cannot guarantee that testing was carried out on the specific device and version listed unless Mu or the partner lab is the entity listed as carrying out the actual testing. In cases where Mu or a partner lab did not carry out the actual testing, vendors of the products being certified provided a signed affidavit that the testing was actually performed on the device(s) and software version that were submitted for certification. This MUSIC Certification is not an endorsement or warranty of the certified device. Mu Dynamics does not warrant the operation, performance or functionality of the certified device or that the certified device will be suitable for the end user's application or will satisfy the end user's requirements.

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