



CDRouter Storage Whitepaper

Testing Residential NAS Devices

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Introduction

CDRouter™ Storage is a unique approach to testing storage functionality in residential NAS devices. While existing storage test tools are either geared for performance testing or test storage protocols in isolation, CDRouter Storage fills the testing gap by offering comprehensive functional testing of residential NAS functionality.

CDRouter is already known as the leading test solution for functional testing of CPE routers covering a wide array of protocols. The CDRouter product family includes add-on modules that cover specific technologies such as IPv6 and the Broadband Forum's TR-069. CDRouter Storage is the latest add-on from QA Cafe that brings CDRouter's proven test methodology and automation to residential NAS devices. This whitepaper talks about some of the short comings of existing test tools and the clear benefits of CDRouter Storage.

Why Existing Test Tools Are Lacking in the Residential NAS Space

Storage performance test tools typically target the enterprise and cloud data center. These types of tools are generally too expensive and complex for the residential NAS testing space. Storage performance test tools usually have high speed interfaces such as 10GE that clearly target the enterprise network, not the residential network. At the same time, they may lack interfaces such as 802.11 wireless that play a large role residential networks.

Other protocol only test tools approach protocol testing without regard for interactions with all the protocols involved in a residential network. This singular approach is not able

to detect functional problems that are specific to residential NAS devices. For example, a NAS device whose access is dependent on the WAN interface may work fine from the LAN using a single protocol. However, when tested with CDRouter, it quickly becomes obvious that the residential NAS functionality does not work when the WAN connection is down. CDRouter's complete test environment provides the realistic behaviors needed for complete functional testing.

IPv6 Support is a Must Have

Residential IPv6 has become a standard feature on today's CPE devices. CDRouter Storage supports both IPv4 and IPv6 testing allowing verification of NAS protocols over both IPv4 and IPv6 at the same time. Since CDRouter Storage handles the creation of NAS clients automatically, verification of IPv6 is straight forward. While some NAS devices claim support for IPv6, deep functional testing with CDRouter Storage quickly reveals that only some of the NAS protocols support IPv6.

The CDRouter Storage Approach

The CDRouter Storage approach is unique because it combines storage protocol testing with router testing to make sure the entire system works as expected. This approach supports devices that contain integrated NAS storage as well as standalone NAS devices that target the residential environment. Both devices need to be tested with all the protocols involved in a CPE network. In a residential environment, storage protocols have interactions with firewalls, NAT, UPnP, DNS, and NetBIOS. These protocols may need testing from both the LAN and WAN sides of the network. Combining these options with IPv6, IPv4, wired, and wireless interfaces produces a high number of testing scenarios very quickly.

CDRouter Storage offers several test modules that target specific NAS protocols such as SMB, FTP, or FTPS. Within each test module, individual test cases verify functional behaviors specific to the protocol. These storage test modules can be combined with other router specific test cases to build interesting and realistic test runs.

Example Problems

Throughout the development process, QA Cafe categorized the functional NAS protocol

issues revealed by CDRouter Storage. Some of these are highlighted below.

- Unexpected delays during user authentication
- NAS functionality unavailable when the WAN interface is down
- Protocol bugs from open source implementations
- Service failure after long term usage
- Unexpected access where ReadOnly clients granted ReadWrite access
- Web-based admin interfaces creating invalid configurations
- File system incompatibilities
- Lack of IPv6 support
- Inability to locate NAS services for IPv6

Conclusion

If you are involved in testing residential NAS functionality, CDRouter Storage will jump start your NAS testing with CDRouter's proven test methodology. CDRouter Storage ensures that your storage solution works in both IPv4 and IPv6 environments with wired and wireless interfaces. By combining targeted functional storage testing with an easy to use automation framework, CDRouter Storage quickly provides quick feedback on the functionality of your NAS device.

More Information/References

CDRouter Storage	http://www.qacafe.com/show/storage
CDRouter	http://www.qacafe.com/show/cdrouter

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