

DASH Technical Note

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DASH Delivers Multi-Vendor Management for Desktop and Mobile Systems

Introduction

In today's multi-vendor, distributed enterprise environments, desktop and mobile systems management is a critical challenge. Administrators must master a disparate set of tools and applications as they attempt to manage the multitudes of networked desktop and mobile client systems. In many cases, the tools are specialized, and adapted to each individual environment.

As a result, there is a lack of interoperability and consistency in approach when managing desktop and mobile systems in the hardware management solution space, particularly in out-of-band and out-of service situations. In addition, the resulting out-of-band and out-

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of-service management solutions differ from the operating system's representation and management of the system.

To address these challenges, the DMTF has unveiled the Desktop and mobile Architecture for System Hardware (DASH) Management Initiative – a suite of specifications that takes full advantage of the DMTF's Web Services for Management (WS-Management) standard and Common Information Model (CIM) to deliver standards-based, Web Services-based platform management for desktop and mobile* client systems. DASH, one of several DMTF Management Initiatives, is a comprehensive framework that delivers the syntax and semantics necessary to manage desktop and mobile computer systems.

DMTF's DASH

Since the DMTF's Desktop and Mobile Working Group (DMWG) was announced, the group has attracted more than 180 members from over 35 different companies, demonstrating a strong commitment by vendors and users across the industry to collaborate on this effort and deliver vendor-independent, platform-neutral desktop and mobile management. The result is DASH, which includes architectural semantics, industry standard protocols and a set of profiles to standardize the management of desktop and mobile systems independent of machine state, operating platform or vendor.

The first goal of DASH is to enable the same tools, syntax, semantics and interfaces to work across a full range of products – traditional desktop systems, mobile and laptop computers, bladed PCs, as well as "thin clients." Another goal is to allow the same

*"Mobile" refers to wireless laptop computers and "thin clients." It is within the scope of the DASH efforts to address handhelds in the future.

management interfaces to be used, independent of system state. DASH addresses these goals, containing the models, mechanisms and semantics necessary to manage mobile and desktop computers independent of service state. This includes the architectural, service and operations models, which covers boot and firmware updates, inventory management, service discovery, as well as a number of other features.

Extra emphasis has been placed in the development of DASH to enable lightweight implementations which are architecturally consistent. This includes software-only solutions and small footprint firmware solutions. Emphasis has been placed on ensuring that these implementations will be interoperable, independent of implementation, CPU architecture, chipset solutions, vendor or operating environment.

Working in concert with the DMTF's widely implemented Common Information Model (CIM), DASH enables a full spectrum of implementations that can be easily incorporated into existing management environments.

In addition, by using existing industry standard protocols, DASH facilitates interoperability over the network. DASH will enable a more integrated approach, and administrators will see this increased simplicity and functionality in the management solutions for the heterogeneous enterprise.

DASH's transport and management protocols allow implementers to determine the communication requirements for compliant systems. It describes the discovery and security requirements, helping users understand their aspects in relation to the profiles and protocols. And the DASH use cases, included in the DASH White Paper [see link below], help implementers understand the communications that take place in certain circumstances.

Web Services-Based

DASH utilizes WS-Management as its management protocol for supporting the transport of messages for performing CIM operations on the CIM objects represented by the DASH CIM profiles. The WS-Management specification promotes interoperability between management applications and managed resources by identifying a core set of Web service specifications and usage requirements to expose a common set of operations that are central to all systems management. This includes the abilities to:

- DISCOVER the presence of management resources and navigate between them
- GET, PUT, CREATE, and DELETE individual management resources, such as settings and dynamic values
- ENUMERATE the contents of containers and collections, such as large tables and logs
- SUBSCRIBE to and DELIVER events emitted by managed resources
- EXECUTE specific management methods with strongly typed input and output parameters

The WS-Management protocol stack for DASH is shown in Figure 1.

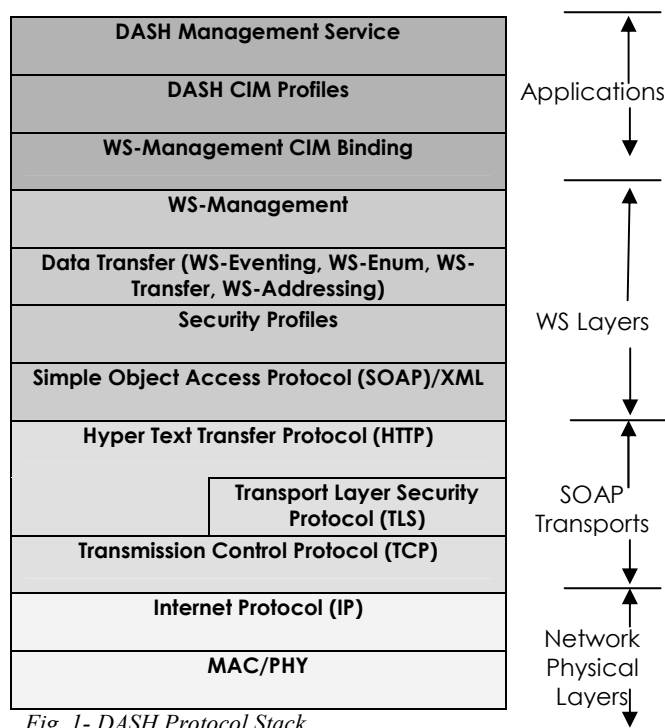


Fig. 1- DASH Protocol Stack

As seen in the diagram, the network and physical layers are at the bottom of this stack. The transport layers that carry SOAP messages are next, followed by SOAP/XML message handling. Above the SOAP/XML layer is the data transfer layer, which is based on multiple Web Services specifications, including WS-Transfer, WS-Enumeration, and WS-Eventing, for transferring the management information. The top three layers represent the WS-Management applications. The DASH profiles are mapped over the WS-Management protocol stack using the DMTF's WS-Management CIM Binding.

DASH Security

A key benefit of the DASH Initiative is that it delivers more secure desktop and mobile management. DASH embraces industry standard network and transport layer encryption, authentication, and authorization mechanisms, and establishes standard profiles for roles, authorization, and account management.

An important aspect of DASH's secure management is its access control for the managed resources and management operations. The authorization and access control is based on the roles assigned, and privileges associated with, the user accounts. Operational roles include "Read only User," which allows a user to only perform query and read operations on the managed elements; "Operator," which permits a user to perform read, write, and execute operations on the managed elements; and "Administrator," which adds to the operator role capabilities to perform user account management.

DASH's transport-level security provides machine-level authentication and encryption of payloads contained within the transport messages. The user level authentication and authorization mechanisms provide the second level of authentication and authorizations for operations allowed for the specific roles.

Additional DASH Capabilities

Another key feature of the DASH Initiative is its use of Profiles from the DMTF, which contain the required classes, instances, properties and methods necessary to manage desktop and mobile systems. The DASH Implementation Requirements Specification identifies

how these Profiles should be used in a DASH solution.

In an additional advancement, DASH defines a set of standardized event message content in the DMTF Message Registry Schema, fostering greater interoperability between different implementations of management instrumentation and the applications that subscribe for, and receive, events.

Closing Remarks

DASH builds on the power of WS-Management and CIM to deliver advanced desktop and mobile management features, including:

- Power Control
- Boot Control
- WS-Eventing Push Indications
- Correlatable System ID
- Firmware version information
- Hardware information (including Chassis model/serial, CPU, Memory, Fan, Power Supply, and Sensor)
- Login and UserID credentials, as well as Roles and Privileges

Products and solutions that utilize DASH will provide new levels of interoperability in desktop and mobile systems management, greatly simplifying one of the key challenges in distributed management today.

Recommended Reading

DASH White Paper

(http://www.dmtf.org/standards/published_documents/DSP_2014.pdf)

DASH Initiative

(<http://www.dmtf.org/standards/mgmt/dash>)

DMTF Management Initiatives

(<http://www.dmtf.org/standards/mgmt/>)

DMTF's WS-Management

(<http://www.dmtf.org/standards/wbem/wsman>)

DMTF (<http://www.dmtf.org>)

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