



***Society of Cable
Telecommunications
Engineers***

**ENGINEERING COMMITTEE
Data Standards Subcommittee**

AMERICAN NATIONAL STANDARD

ANSI/SCTE 169-1 2010

**IPCablecom SMA Part 1: Architecture Framework
Technical Report**

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Abstract

This technical report describes the Security, Monitoring, and Automation (SMA) architecture, including all major system components and the network interfaces. The intended audience for this document includes developers of equipment who intend to conform to the SMA standards and network architects who need to understand the overall SMA architecture framework.

This technical report describes the SMA release. It contains the following information:

- A reference architecture;
- Description of the various functional groupings within the architecture;
- Detailed description of specific architectural components;
- Interface definitions.

The SMA standards take precedence over this technical report if the technical report contradicts any specification requirements.

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1 OVERVIEW

The SMA architecture is designed to facilitate deployments to address the following areas.

- Security - The ability to protect lives and property through professional monitoring, notifying first responders (e.g., fire, police, and medical), and providing emergency alerts to authorized individuals like home occupants. For example, fire and smoke sensors alert monitoring agencies, who can notify and provide critical information to local emergency personnel.
- Monitoring - The ability to self-monitor the status and activity in the home so that a user can be made aware of any desired state changes. For example, when motion is detected by a motion sensor, real-time alerts and associated data, such as video or photo clips, can be sent to a user.
- Automation - The ability to automate and remotely control lifestyle conveniences such as lighting, heating, cooling, and appliances. For example, a user can remotely use a web portal to verify and control conditions such as lighting or temperature in the home.

2 REFERENCES

2.1 Normative References

There are no normative references in this document.

2.2 Informative References

This technical report uses the following informative references.

- [MM-ARCH-TR] PacketCable Multimedia Architecture Framework Technical Report, PKT-TR-MM-ARCH-V02-051221, December 21, 2005, Cable Television Laboratories, Inc.
- [RFC 2616] IETF RFC 2616, Hypertext Transfer Protocol -- HTTP/1.1, June 1999.
- [RFC 2617] IETF RFC 2617, HTTP Authentication: Basic and Digest Access Authentication, June 1999.
- [RFC 2818] IETF RFC 2818, HTTP Over TLS, May 2000.
- [RFC 4566] IETF RFC 4566, SDP: Session Description Protocol, July 2006.
- [W3 XML1.0] Extensible Markup Language (XML) 1.0 (Fourth Edition), W3C Recommendation, August 16, 2006.
- [W3 XSD1.0] XML Schema Part 1: Structures, Second Edition, W3C Recommendation, October 28, 2004.

2.3 Reference Acquisition

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- Internet Engineering Task Force (IETF), Internet: <http://www.ietf.org/>
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