

The business benefits of automated infrastructure management in connected and efficient buildings

Automated, real-time visibility and documentation of the connected environment also eliminate the need for manual network audits, which are time-consuming and have the potential for human error. Typically, enterprise IT departments spend an average of six hours per month manually auditing network assets like PCs and printers. AIM software reclaims those wasted hours, automatically uploading changes to the connectivity database as they occur.

Growing adoption of AIM drives industry standard

The need for accurate and automated infrastructure management combined with the scope and capabilities of today's AIM systems has accelerated the adoption of AIM technology within the connected and efficient building. This has led to the inclusion of AIM references in various standards covering infrastructure administration such as TIA-606 and ISO/IEC 14763-2. In 2013 the Joint Technical Committee (JTC) of ISO and IEC began work to develop a comprehensive standard to define the functional elements and requirements for AIM systems. Drafted under the title, "Automated infrastructure management (AIM) systems—Requirements, data exchange and applications", the ISO/IEC 18598 standard defines AIM's functional requirements, its intrinsic and extrinsic benefits, and establishes the definition of an open data exchange framework. The technical standardization work is now complete, and the final draft of the ISO/IEC 18598 AIM standard is expected to be approved in the third quarter of 2016, with publication in early 2017.

The development of the ISO/IEC 18598 AIM standard acknowledges the critical role AIM systems play in the development, administration, and growth of enterprise networks and helps inform and guide those responsible for specifying an AIM solution. Additionally, the inclusion of an open data exchange framework that enables integration with external applications and systems is expected to further accelerate adoption of AIM systems globally.



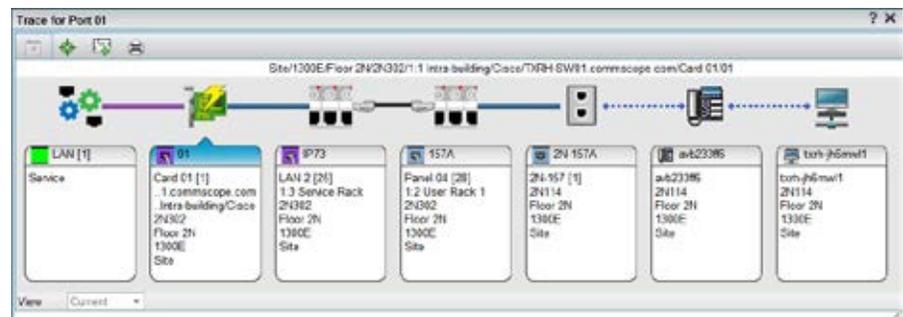
Publication of the ISO/IEC 18598 standard is expected in early 2017

Intrinsic benefits of an AIM system

The intrinsic capabilities of AIM provide real-time monitoring and automated management of the building's structured cabling infrastructure and networked devices. The ISO/IEC 18598 standard sub-divides these intrinsic benefits into the following areas:

Accurate documentation

Accurate documentation refers to the system's ability to detect and document connections within the infrastructure and automatically update its database as changes are made. This includes the ability to automatically document a device's entire connectivity trace from end to end, map the physical location of all connected elements and display their location on building plans and layouts. The automated documentation capabilities of an AIM system can virtually eliminate the expected error rate associated with manually managed infrastructure systems.



A detailed end-to-end trace from CommScope's imVision® AIM solution

Asset management

In addition to documenting the cabling infrastructure, the AIM system also provides detailed information on all network switches and end devices. According to ISO/IEC 18598 this includes identifying the physical location of every networked asset—room, rack, server, port—as well as device properties like host name, MAC address, WWN and IP address. Among the obvious benefits of this granular capability are a faster mean time to repair (MTTR) and significant time savings during network audits—both of which have significant positive impact on operating expenditure. Additionally, it makes it easier to support and enforce the facility's Bring Your Own Device (BYOD) policies, enabling IT personnel to quickly identify and locate unauthorized devices.

Capacity management

Within the connected and efficient building, capacity management requires the ability to optimize the use of connectivity assets such as switch ports. By monitoring the real-time utilization and status of all ports, patch panels, shelves and work area outlets, AIM systems identify inactive switch ports, find available rack space and locate unused panel ports. Armed with this information, IT personnel are able to maximize existing resources and defer costly capacity upgrades.



A capacity management dashboard from CommScope's imVision® AIM solution

Change management

Facilities and IT managers today are keenly aware of the dynamic nature of the workplace, as many employees and their connected devices are constantly on the move. An important section of the ISO/IEC AIM standards outlines the system's ability to handle the moves, adds and changes of connected assets within the network. The standards specify the need for accurate and real-time connectivity information, technical guidance to minimize human errors, and the ability to support electronic work orders and track work order history. In addition, the standard encourages users to look for systems with intelligent service and circuit provisioning, which would eliminate the need to manually select connectivity paths and/or elements when adding devices.

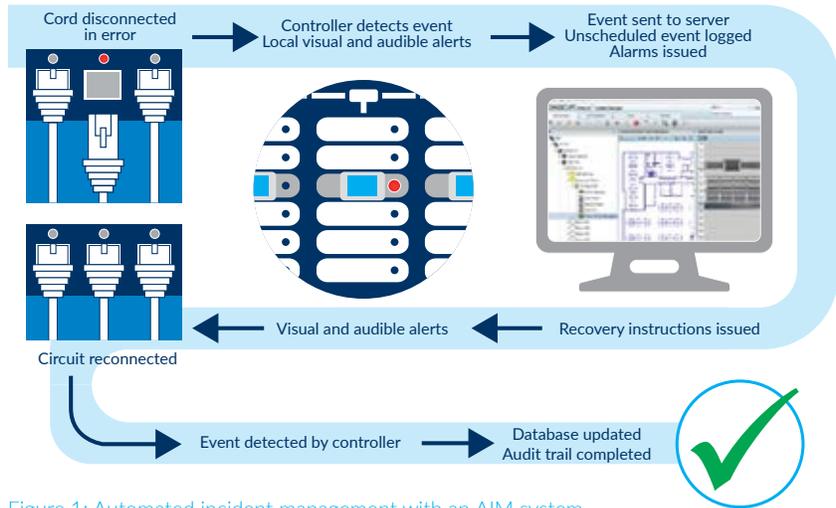


Figure 1: Automated incident management with an AIM system

Incident management

Within the IT infrastructure an “incident” is typically defined as any unscheduled or unauthorized change in connectivity status. According to the ISO/IEC 18598 standard, AIM systems must be able to detect all incidents and create an audit trail that documents them as well as the corrective actions taken. This requires a sophisticated set of automated steps that must be completed across various components of the infrastructure and in real time. An example of the automated incident management capabilities of AIM is shown in Figure 1.

Extrinsic benefits of an AIM system

The extrinsic benefits of an AIM system are the result of its ability to communicate seamlessly with a wide range of external applications and systems. The data exchange framework, defined in the ISO/IEC 18598 standard, is responsible for facilitating interoperability between AIM systems and other third-party applications.

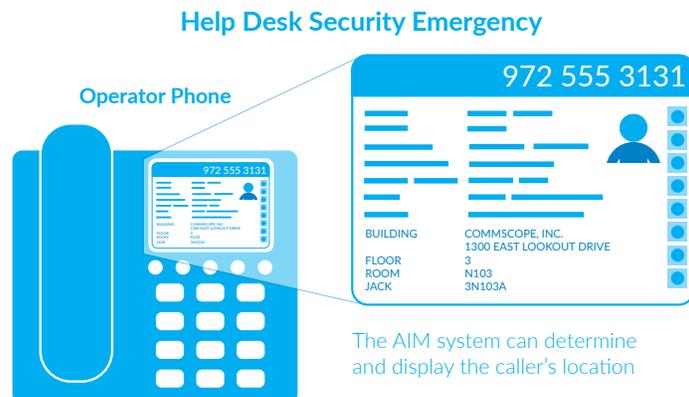
The standard divides the extrinsic benefits into several areas, including IT-related systems, building management systems, and configuration management database (CMDB) support.

IT-related systems

IT-related systems include IP telephony management as well as the management of other network systems, like helpdesk applications and information security systems.

IP telephony management

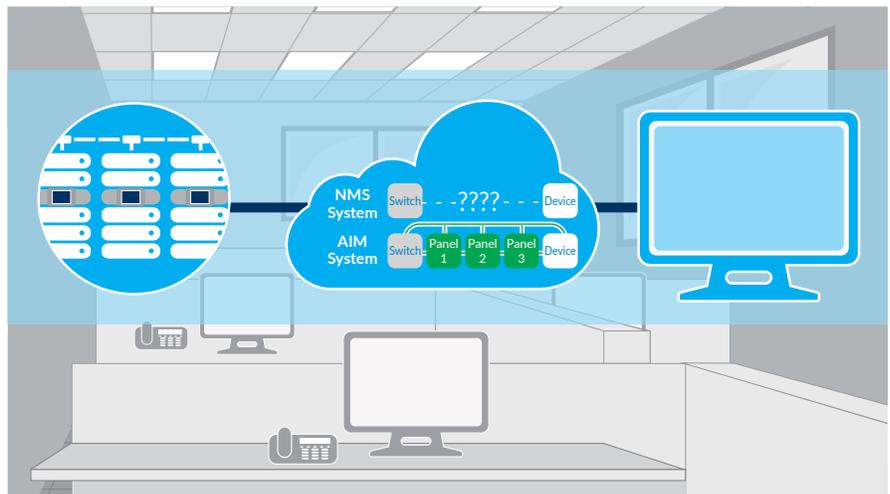
In an intelligent building, the IP-based phone system uses the facility’s common cabling infrastructure and has access to the connectivity information within the AIM system. This information includes the exact physical location of all end devices, like VoIP phones, that are connected to the cabling infrastructure. In an emergency, the VoIP system is able to retrieve the location of a specific VoIP caller and reduce critical response time.



Network management and helpdesk support systems

A standards-compliant AIM system can help improve the scope and effectiveness of network management systems (NMS) used to track and control connected devices, as well as the helpdesk applications needed to keep them operational.

While the NMS tracks the logical connection between switch and device, the AIM system provides the physical layer trace in order to monitor and manage complete end-to-end physical connectivity, including cabling segments and connecting points. For example, when AIM-generated alerts about changes in the cabling infrastructure are sent to the NMS, they are consolidated with NMS-based alerts to provide a deeper understanding of how the IT environment may be impacted.



The AIM system can provide detailed end-to-end physical connectivity information to a network management system

In much the same way, the AIM system's connectivity information can be accessed and used by helpdesk support systems in facilitating workflows. For example, when the helpdesk system generates a trouble ticket for a connected device, it can automatically access the AIM database to determine the location and connectivity path of the device to help reduce the mean time to repair (MTTR). The AIM system can also augment the functionality of the helpdesk system with its own internal workflow management capabilities. The more information, assistance and automation the AIM system can provide, the greater its value.

Information security

As with IP-based phone traffic, security systems that monitor telecommunication rooms and server racks have easy access to AIM-based connectivity information. AIM systems provide alerts to information security systems, warning of potential threats at critical patching locations. An alert of a suspicious or unscheduled event can automatically trigger the appropriate IP cameras to display real-time video of what is happening at the site. The pre- and post-event video can then be automatically uploaded to a storage server.





Building management systems

In defining the 18598 standard for AIM, the ISO/IEC standards body outlined some key building management applications in which AIM systems can play a role: energy management, lighting management, building security and access control.

Energy and lighting management systems

Increasingly, Power over Ethernet (PoE) technologies are being used to power a wide range of devices in connected and efficient buildings, including VoIP phones, wireless access points, HVAC controllers, sensors, badge readers and lighting systems. The AIM system can greatly simplify and automate the assignment of PoE-based energy management profiles to specified locations. Using its comprehensive knowledge of the connected infrastructure environment, the AIM system can assign an energy management policy to the correct switch port, based on real-time location and connectivity information. The entire process can be automated and fully documented.

Configuration management database (CMDB) support

The configuration management database (CMDB) contains all relevant information about the components used by an organization's IT services and the relationships between those components. Components can include software, hardware, documentation and personnel—or any combination of these. AIM provides real-time data regarding the location and status of networked assets such as VoIP phones and printers, automatically populating the CMDB with location information. The result is a more complete and accurate record of the entire IT environment.

Conclusion

IT infrastructure is a fundamental element of an intelligent building. IT and facility personnel are finding it increasingly difficult to manually manage the growing number of connections and growing device diversity within the infrastructure. As a result, AIM systems are becoming more important. This is underscored by the development of the ISO/IEC 18598 standard, soon to be ratified. This standard provides an industry-accepted framework for the intrinsic and extrinsic benefits of AIM technology, enabling IT and facility managers to vet and select a best-fit solution.

Looking ahead, the role of AIM in the connected and efficient building will continue to evolve beyond monitoring and managing the infrastructure. The technology is set to become an enabler of wider capabilities. The development of a standardized API framework, as described in ISO/IEC 18598, opens the door for future integrations with a variety of external applications and systems not yet described in the standard, such as building information modeling (BIM) and Internet of Things applications.

Irrespective of how intelligent buildings evolve, there will always be a need to efficiently leverage the network infrastructure's connectivity information. The business benefits of a standards-compliant AIM solution make a compelling case for the selection of an AIM system as the primary tool for managing a key element of connected and efficient buildings.



Want to know more?

- 1 Automated Infrastructure Management; Pipeline Magazine, Feb. 2016
- 2 Striving to Achieve 100% Data Accuracy: The Challenge for Next Generation Asset Management, Watson & Fulton, 2009
- 3 Global Enterprise Survey Report; CommScope, Inc.; March 2013



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