



A LAND GRAB

FOR IOT-ENABLING BUILDINGS

Power Over Ethernet (PoE) Rising in the Digital Frontier

The great convergence is here. From voice over IP (VoIP) to lighting, everything is on the network. Nearly all building devices support native IP connectivity or will soon. The vastness, diversity and density of the internet of things (IoT) provides enormous opportunities to ICT

providers who resell, install and provide value-added services to customers. Specifically, an IoT-centric power-over-Ethernet (PoE) platform dramatically aligns ICT providers with their customers.

With the ubiquity of the Ethernet cable, PoE lighting has taken off and is

approaching a tipping-point. Thanks to the accessibility of the Ethernet cable it has mass market appeal in the business world. Additionally, it provides further reassurance to those concerned about connecting devices to a wireless system. Even in the best wireless environments, wireless connections can prove fickle and do not provide the same robust capabilities as PoE systems with the Ethernet cord. Yes, devices that were once static can now be smart even though they are cabled into their environment.

In the lighting industry, PoE technology increases the density of devices on the IoT by an order of magnitude. Customers gain the ability to fully analyze and adapt IoT-enabled environments. As lighting is increasingly adopted as an element of an intelligent building, customers show an increasing willingness to consider more robust IoT solutions for their buildings. IoT service providers are in the position to continuously reaffirm their customers' desired business outcomes, provide quantifiable collaboration, offer outcome-driven solutions, and protect against cyber threats. ICT providers already perform these functions for various solutions and are best positioned to evolve into IoT building service providers.

BICSI members can provide their customers a path to the future. This is a journey for customers and requires detailed direction in this latest digital frontier. You can be the one to help customers adapt their

businesses to market dynamics, and employ best-fit technologies and processes as they become available.

ICT providers who start enabling buildings for the future using the latest IoT technology now will dominate the next decade's service revenues, solution sales and market leadership. This article will review IoT adoption benefits and risks to customers, highlight BICSI members' opportunities and discuss selecting an enterprise IoT platform.

CUSTOMER BENEFITS AND RISKS

IoT Empowers Customers with Agile Business Practices

Every company is facing increasingly volatile market dynamics. There is a glaring need to embrace cultures of continuous low-risk, low-cost, no-fear experimentation. With a comprehensive IoT-centric PoE platform, buildings transform from fixed assets to agile plug-and-play adaptive architectures.

An IoT-enabled building built on a PoE platform gives building owners enhanced control and flexibility. Once a device is installed it can be grouped, managed and controlled using an application. PoE allows for low-voltage installations, decreasing hazards of typical electrical work. Operating costs to the building owner are lower over time, and the smart analytics that accompany most PoE platforms allow for increased long-term cost savings associated with operating and powering connected devices.

Advance Changing Customer-Defined Outcomes with IoT

An IoT-centric PoE platform helps companies reduce operating costs and remain technologically flexible, but it also allows companies to reach their unique strategic goals. With extensive comprehensive monitoring, automation and machine learning, today's top platforms go beyond the basics to analyze and adapt. As this is a flexible platform, the analytics can be directed toward desired business outcomes, and support continuous improvements to those outcomes.

Every vertical market and customer have unique desired business outcomes. An example would be the senior living industry with more than 22,000 residential care communities, 15,700 nursing homes and 3,700 registered hospice facilities. Availability is at an all-time low as they face increasing demand among an aging population. One may not consider caring for America's seniors a place ripe for advanced technology, but the industry is uniquely positioned to adopt IoT platforms. Increased regulations to prevent injuries, expectations of resident comfort, and tech-savvy children helping their aging parents find a home is driving the industry toward IoT technology.

In Alabama, Cottage Senior Living (The Cottages) faced challenges to meet business outcomes common among senior care facilities: ensuring resident safety and improving their quality

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of life. They chose PoE technology for its ability to connect numerous lights, sensors, IoT devices, apps, and deploy new solutions throughout the building's lifecycle.

Like many new to IoT technology, The Cottages chose to test PoE lighting in a smaller part of their campus before a larger rollout. They selected their corporate offices as a pilot. The installation caused little disruption to their office operation and was installed by their local telecom technician. The software went live immediately, creating a simple plug-and-play situation with each connected device. The Cottages immediately received positive employee feedback due to the lighting customization abilities of the platform.

This smart building platform is being expanded to the residential area. Using their PoE platform, The Cottages can achieve various objectives such as promoting resident physical activity with indoor positioning, keeping residents safely inside designated areas with specialized lighting and sensors, fighting dementia with light therapy, personalized lighting control and color, fall mitigation and detection with novel sensors, and family engagement with reporting and access control. Achieving quality

of life and wellness improvements for their residents was a primary reason for deploying IoT technology.

This is a benefit of IoT building systems: building owners can completely customize their objectives. A great platform will also provide granular energy and sensor analytics with actionable intelligence, delivering clear cost-saving optimizations. As The Cottages' PoE platform is flexible with an open application program interface (API), new apps and technologies can connect immediately, further allowing The Cottages to stay on top of technological advancements. Key to the client's ongoing success, their ICT provider works with them every step of the way, from recommending or choosing an IoT platform to designing the requirements, deploying the technology and supporting the client on an ongoing basis as a partner and advisor.

Cyber Threats Can Be Managed

Technology risks and cyber threats exist in every industry and organization. Most organizations already have systems in place to manage these threats. However, moving devices such as lighting and heating, ventilation and air-conditioning onto the IoT can raise security and operational reliability

concerns among customers that results in the delayed adoption of new technologies. These are the same hurdles ICT providers continually face each time a new solution transitions to the IP network. As trusted customer advocates, ICT providers are uniquely positioned to evaluate platform flexibility, cyber threat resiliency, and serviceability.

Rather than avoid these ICT risks, it is necessary to embrace them. IoT platforms provide an opportunity to consolidate as many proprietary and disconnected systems onto ICT networks as possible, so the ICT industry's best practices, ongoing skills training and numerous tools can be broadly applied with single brush strokes. This drives operating budget focus that all leverage this common platform investment, reduces resource slack and improves productivity.

When evaluating a platform to bring devices into the IoT, ICT providers need to help their customers recognize the characteristics of a strong security system. For example, an IoT-centric PoE platform should, at the minimum, meet these recommended security thresholds:

- Continuous software updates to patch bugs and address known vulnerabilities.

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- Protect and monitor the IoT network and isolate external threat entry points as a firewall would.
- API access compartmentalization using keys and tokens.
- Secure network communications using standards.
- Secure inter-application authentication.
- Eliminate multicast or broadcast messaging over the IP network.
- Ensure regular security vulnerability scans on the IoT software.

BIGSI MEMBERS UNIQUELY POSITIONED

You Don't Sell Commodities

Most components of a building are sold as commodities. Lighting—one of the most promising areas for IoT adoption—is sold as a commodity, whereby architects and lighting designers specify products to be installed, and distributors and electrical contractors install the product. End customers typically have no relationship with these providers during this process. Upon completed construction, there is no post-install relationship among any of the parties.

ICT providers give customers trusted guidance and value-added offerings. With a direct customer

relationship, ICT providers can fully appreciate and anticipate their customers' pain points and goals. With this focus, ICT providers are well positioned to deliver valuable customer outcomes using IoT.

You Invest in Customer Relationships

The currency of the new economy is trust. IoT-centric PoE platforms build trust by continuously delivering data and providing shared transparency between customers and providers that continuously powers customer outcomes. This feedback loop only benefits customers who engage their senior stakeholders directly with IoT service providers.

Installing IoT is a beginning, not an end. IoT building service providers listen to customers, advise, plan, deploy, test and scale new IoT ecosystem offerings. ICT providers are uniquely positioned to leverage their existing roles as critical domain experts, trusted advisors, and consistent engagement with customer stakeholders.

A CASE FOR AN IoT PLATFORM

A Solid Foundation

A solid platform foundation makes everything possible.

Without a platform, every solution requires its own end-to-end effort. Devices and systems connect to one another directly with no oversight or traceability. Situational awareness is limited to simple network traffic monitoring, rather than IoT process-centric contextual analysis. As IoT peers are added to a network, management complexity grows exponentially, quickly reaching intolerable levels.

Choosing the wrong platform plagues operations, overruns budgets, and pigeonholes your options. The wrong platform can put up walls among systems and create very frustrated users.

A successful IoT platform provides a single brushstroke covering all common IoT directives. The ideal platform also scales effectively from one to millions of IoT devices, from one site to many locations globally, and allows sharing IoT access between customers, vendors, users and systems. It would create, effectively, an IoT social network.

CHOOSING A PLATFORM

The IoT platform should assume the responsibilities common among most IoT participants (e.g., devices, apps, integrations). Simplifying these IoT participants allows IoT developers to focus on

delivering their unique value and avoid needing to understand all the complexities of IoT network design. IoT is a rapidly evolving field and it is impractical for all IoT participants to stay current and support all IoT network requirements.

An IoT platform handles IoT network logistics, continuously and relentlessly ensures operational excellence and fosters a frictionless IoT ecosystem.

IOT NETWORK LOGISTICS

For IoT networks to scale beyond a few participants, a platform must facilitate IoT logistics using intuitive, manageable policy-based mechanisms. IoT participants compete and conflict. Effective IoT network logistics require deliberate selection of IoT participants, authorization of trusts between participants and prioritization of commands. For example, a user pressing a wall control button will turn on a light, but a schedule may turn it off immediately afterward. These competing systems create user frustration that can be easily avoided using platform policies that limit and prioritize behaviors between IoT participants.

OPERATIONAL EXCELLENCE

Most buildings are never operating well. There is either too little or too much data. Typical building automation systems throw thousands of alerts on

facility managers every day. It is incredibly challenging to quantify, prioritize, locate, identify and solve problems. Disparate IoT participants were not specifically designed to interact with one another. It is incumbent upon the platform to provide simple actionable insights and recommendations via best-of-breed technologies such as machine learning. The platform is uniquely positioned to understand what is expected of all these participants, and verify they are behaving as intended. With this awareness, misbehaving IoT participants can be quarantined, throttled or trust-curtailed.

Beyond detecting a lack of expected behavior, a platform can offer detection of unexpected behaviors. This elevates cyber threat vigilance. For example, an IoT platform deployed at the Central Iowa Power Cooperative (CIPCO) detected abnormal and unexpected behaviors among IoT participants, identified bad actors within the network and alerted IT of the threat. Ironically, the incident was invoked by CIPCO's IT department running a cyber threat analysis on their network.

Transparency at every level of interaction makes identifying and solving complex network problems possible. IoT networks are comprised of numerous links, where the simplest IoT interactions regularly travel through dozens or hundreds of links between cause and effect scenarios. With so many links, it

can easily become daunting to know what is going on, who is doing what and manage any of it. However, IoT links are typically small, singularly-focused and well-defined. When paired with thorough data logging and intelligent automation, these complex networks are actually easier to understand and maintain than much smaller proprietary systems.

IoT networks are comprised of many IP devices, and existing IT policies can be enforced between participants. Choose an IoT platform that offers implementation flexibly, so existing corporate IT security policies do not require compromises.

All platform users benefit from the accumulated wisdom of shared data pattern symptoms, prognoses and suggested solutions.

Ultimately, with this robust foundation, machine learning services will support the ecosystem with autopilot optimizations, self-healing and cyber threat protections.

FRICITIONLESS IOT ECOSYSTEM

A good IoT platform simplifies, secures and optimizes the environment for all IoT participants. Those participants may be devices, systems, apps or integrations. A successful platform strategy removes complexity, frees resources and focuses organizations on deploying value-driven apps via an open API.

The importance of APIs cannot be overstated. A robust API-centric IoT platform provides a solid foundation for a third

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party ecosystem. Apps can only do what the platform exposes. As an example, a scalable platform is comprised of many local platform services and cloud services. Each platform service has a specific purpose wrapped with APIs. Services communicate with each other's APIs via compartmentalized secure access. These APIs are core to the proper functioning of the system, are constantly exercised and provide access to every platform function. Users can also navigate, explore and even invoke API methods via a web interface. Look for APIs providing secure real-time interaction through access keys, event webhooks, subscriptions and analytics.

Additionally, remote deployment of local third party services can further empower customers to quickly experiment and scale out solutions, and allow developers to easily market and monetize their work.

A NEW ERA

The next era promises simple IoT-driven outcomes. IoT-centric platforms are accumulating the data to generate the wisdom required to build autonomous optimization, self-healing and cyber threat resiliency.

PoE is the catalyst. PoE enables most building components to attach directly to the IP network. PoE puts IT stakeholders in full control of power and data connectivity. PoE transitions the built environment from a static edifice to a dynamic plug-and-play data-defined environment.

Businesses gain a competitive advantage when empowered with an IoT PoE platform connected to PoE lighting, sensors and controls. BICSI members can lead the way. The expansiveness of IoT and PoE represents the largest opportunity for BICSI members since IP networks rolled out en masse. As history has foretold, those who grab land early get the best views, the most fertile soil, most strategic positions, gain early wisdom from the experience, and ultimately become power brokers who consolidate their peers. There is no better time to IoT-empower your customers. ■

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