



Mbarx Secure IoT

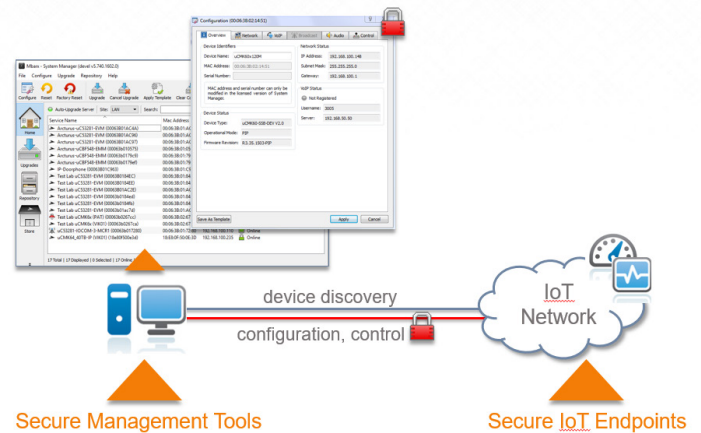
➤ Endpoints and Tools

overview

Mbarx simplifies the development of secure, end-to-end IoT systems. It consists of endpoints, tools and gateways that work together to form a chain-of-trust architecture. The Mbarx ecosystem is built around endpoints that range in complexity from simple MCUs to multi-process Linux systems. Mbarx endpoint solutions are intended to provide underpinning security, connectivity and management services without defining the core function of the endpoint itself.

Mbarx endpoints provide location and service information to other applications, tools or gateways. This information is used at a system-level to understand the capabilities of the endpoint and securely connect, configure or control it. Mbarx endpoints are built around a security architecture that includes industry standard TLS cryptography with certificate based authentication.

Mbarx tools interact with endpoints. Mbarx System Manager provides administrative workflow at a site-wide level allowing for the configuration and management of many devices concurrently, using simple click-through workflow. When combined with Mbarx gateways, System Manager capability is extended to support remote IoT sites. System Manager is qualified to support hundreds of concurrent firmware upgrades using a conventional PC and is available for Windows® or Mac®.



Endpoint solutions and tools for secure IoT systems.

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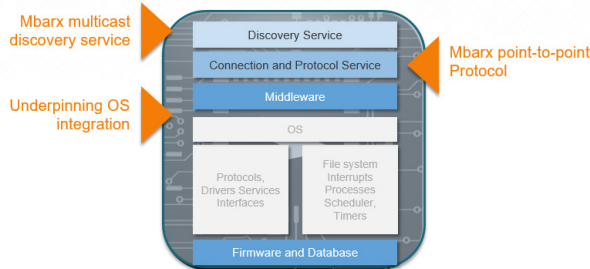
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endpoints

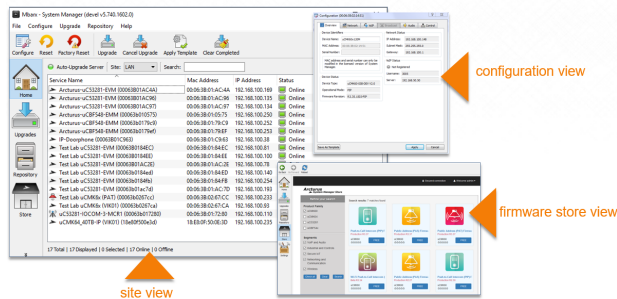
The Mbarx endpoint stack consists of two components, a multicast discovery announcement and a point-to-point connection. The discovery announcement advertises basic information using a multicast protocol. The point-to-point connection is established by securely connecting to a TCP/IP socket or local UART connection. This connection provides a simple request/response protocol service that can be used for both configuration management and operational control.



tools

Mbarx System Manager

Mbarx System Manager is a PC tool that supports concurrent configuration and firmware management of many devices, using click-through workflow. System Manager supports an auto-firmware upgrade service, bulk templates, system resets and the configuration of endpoint or gateway parameters. It has both a local firmware repository and a remote firmware store interface to allow the secure acquisition of up-to-date firmware directly from a trusted source. System Manager works with Mbarx gateways, extending capability beyond a LAN to support the remote management of IoT sites, from one central location.



availability

Arcturus offers several levels of software, customization, solutions and support.

Development Kits and Evaluation

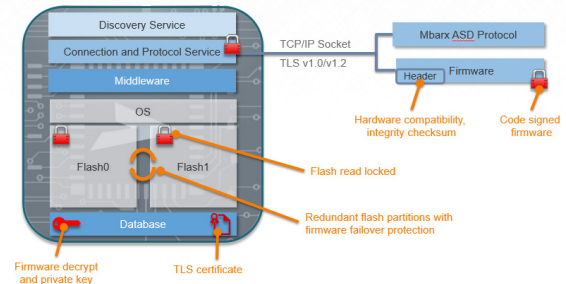
IoT development kits are available for endpoints including the uCMK64-IoT module. Tools are provided with the purchase of the development kit. Please refer to the Arcturus website for online ordering information and details.

System Solutions

System Solutions are engineering-level engagements that combine Arcturus hardware, software and expertise to form turn-key project collaborations. System Solutions provide a low-cost barrier to entry to

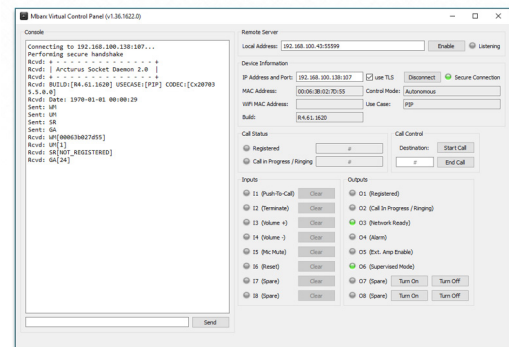
Security Architecture

The Mbarx security architecture is built on a foundation of industry standard TLS authentication and encryption, then enhanced to support payload integrity, authenticity and compatibility for system critical functions such as firmware upgrades. This additional protection helps to minimize threat vectors and improve system reliability. Device specific implementations can further enhance this performance with redundant firmware storage, image failover, flash read lockout and tamper detection.



Mbarx Virtual Control Panel

The Mbarx Virtual Control Panel is a tool to help developers become familiar with the Mbarx ASD protocol. It contains a console interface and various controls to help with workflow experimentation and debug. The Virtual Control Panel is built using Python and QT and is available as a source package for developers that may want to use it as a starting point. The Virtual Control Panel is available for Windows or Mac.

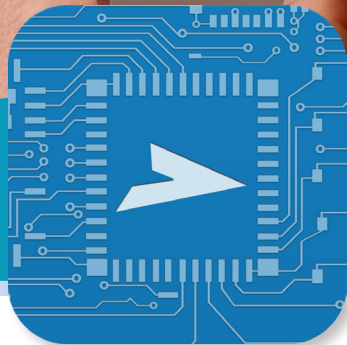


get projects moving forward and packages are tailored to specific project needs. System Solutions leverage extensive experience developing connected products for healthcare, transportation and building system markets.

Online Lab

Access to an online lab provides the opportunity to evaluate the capabilities of Mbarx gateways. The lab provides access to standard Mbarx endpoints by securely connecting to the lab's Site Controller. Connectivity to the demo lab is built into System Manager, allowing existing users to remotely evaluate the capabilities of a Mbarx gateway in a real-world environment.

- SECURE ENDPOINT STACK
- SYSTEM-WIDE MANAGEMENT TOOLS
- CHAIN-OF-TRUST ARCHITECTURE
- INDUSTRY STANDARD TLS SECURITY
- ACCESS, SERVICES AND WORKFLOW GATEWAYS



Mbarx Secure IoT

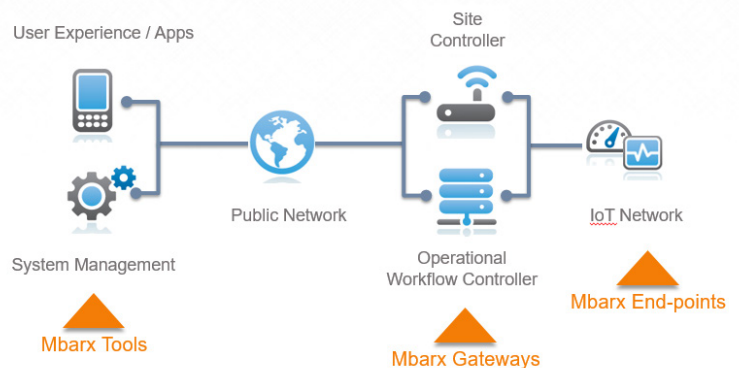
➤ Gateway Solutions

overview

Mbarx simplifies the development of secure, end-to-end IoT systems. It consists of end-points, tools and gateways that work together to form a chain-of-trust architecture. Mbarx gateways reside at the edge, or inside an IoT network and provide various services including security, access and interactive workflow. Gateway hardware is available from Arcturus to support the Mbarx Site Controller and Operations Controller gateway solutions.

Mbarx Site Controller is used to extend secure connectivity and management beyond the local area network, to support remote sites. Site Controllers work seamlessly with System Manager enabling central management of remote IoT sites using the same click-through workflow. Site Controllers offer various services to the IoT site including secure access, connectivity, firmware management and network services.

Mbarx Operations Controller provides a framework for interactive workflow systems. It provides a hierarchical grouping and association database, a notification system and an html5 interactive presentation layer. The Operations Controller is ideal for applications where user supervised workflow is required, including building security and access control, nurse call, patient care or mass transit management systems.



Gateways solutions for security, access and interactive workflow systems.

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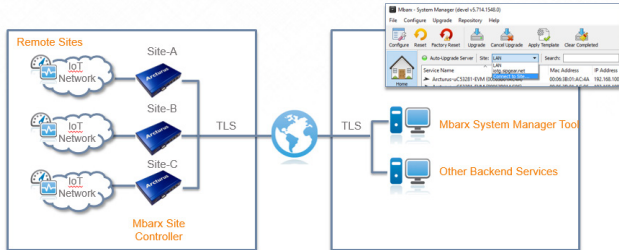
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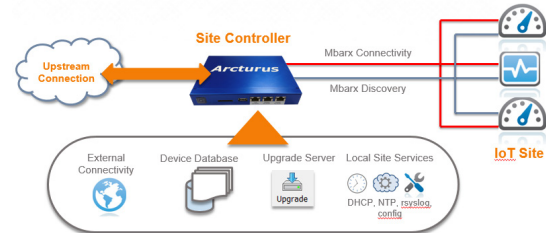
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site controller

The Mbarx Site Controller is a gateway solution for secure connectivity and IoT site services. The Site Controller resides at the edge or inside a remote IoT network and provides secure access to the site and its end-points. Site Controllers are fully compatible with the Mbarx System Manager tool allowing remote management of many IoT sites, securely from a central location. Site Controllers can be deployed in networks where multiple subnets or NATs make reliable remote connectivity difficult and can be added easily as deployments change or grow.

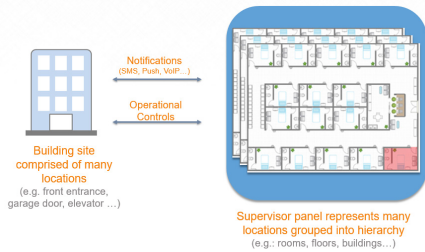


In addition to connectivity, Site Controllers can provide various IoT site services, including the ability to host automated site-wide firmware upgrades. Hosting firmware on the gateway eliminates the need for many devices to egress their home network, thus reducing bandwidth, vulnerability and improving update reliability. The Site Controller performance is qualified to handle up to 300 concurrent updates using Arcturus IoT Gateway hardware. Site Controllers can also provide network services, such as DHCP, NTP and rsyslog or specialized services, such as voice/PBX, network bridging/bonding, failover or 3G/LTE redundancy.

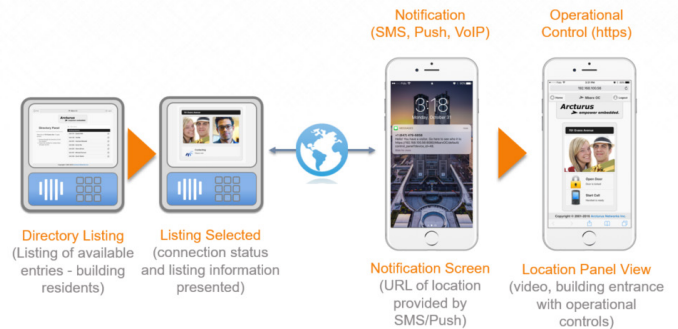


operations controller

The Mbarx Operations Controller gateway solution is intended for developing secure interactive workflow systems. It is suitable for various types of applications where user supervised workflow is required, including security and access control, nurse call, patient care or mass transit management systems. The core is built around a hierarchical grouping and notification system. Devices are associated to a location; locations are then grouped hierarchically to form a continuum, e.g. rooms, floors, buildings etc. The notification system is tied to events that are fed from devices, these events are routed to subscribed users through the Operations Controller framework or externally via push notification, SMS, VoIP, Twitter, or other method.



A mobile responsive html5 front-end provides the workflow interface. This allows users to jump seamlessly from notification to operational control regardless of where they are in the world or type of device they are using. The user interface provides the ability to tie in other html objects such as live video, historical information, location, account data etc. The system is multi-user and highly configurable.



availability

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Development Kits and Evaluation

Mbarx Site Controller and Operations Controller solutions are available for Arcturus Gateway hardware. Demonstrations of the capabilities may be provided with the purchase of a development kit to qualified customers. Contact Arcturus for more details.

System Solutions

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- INTERACTIVE WORKFLOW SYSTEMS
- ACCESS AND SERVICES GATEWAYS
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