# Vorne XL - IT Brief (v2.12)

## Overview

Vorne XL is a comprehensive production monitoring platform that includes:

- **XL Productivity Appliance™:** IoT devices that each monitor one manufacturing process. XL devices are unique in that they work equally well as networked devices in your internal network or as edge computing devices connected to XL Enterprise.
- **XL Enterprise:** A cloud-based application developed by Vorne that provides services that extend the XL platform. These services include alerts (real-time email alerts), reports (automatically delivered end-of-shift reports) and updates (software updates delivered to XL devices).

## Architecture

XL devices are highly integrated embedded systems with a TI Sitara™ ARM processor and 4 GB of eMMC Flash (storing approximately one year's worth of historical production data). The OS is a Yocto-based Linux distribution designed for embedded and IoT devices. The application software includes an integrated database and web server. No software needs to be installed in your existing infrastructure. Every XL device uses the same data model and software, and from an IT perspective is managed the same way.

XL Enterprise is a cloud-based application hosted on Amazon Web Services using data centers located in the USA. XL Enterprise temporarily stores production data – no historical production data is stored.

XL supports IE 11, Edge, Chrome, and Firefox browsers. Chrome is recommended for best performance.

## Software Updates

Software updates are regularly released for XL devices. Each update includes one or more of the following:

| Software Update | Purpose |
|---|---|
| **Features** | Provides new functionality. We regularly add new features and functionality to the XL platform. |
| **Defect Fixes** | Provides fixes as well as usability and performance improvements. |
| **Security Patches** | Provides updates to the operating system and other software packages. Security updates are based on the National Vulnerability Database (NVD), which is maintained by the United States National Institute of Standards and Technology. Vorne has a formal process and automated tools for reviewing the NVD to identify security patches that may be relevant to XL devices. |

Software updates for XL devices are digitally signed and hosted on XL Enterprise (they are also available from our technical support team). If enabled, XL devices automatically check for updates once per day. When a new update is available, the XL device automatically downloads it – ready for the administrator to install at a time of their choosing.

You can review our software versions at www.vorne.com/new, and you can also sign up for our email list to receive notifications of new versions.

XL Enterprise software updates are managed by Vorne and are transparent to users.

# Network Considerations

## XL Productivity Appliance

XL devices are designed and intended for use solely in a secure, private network environment. If access to the XL device is required from outside the LAN, we recommend using your corporate VPN.

**Protocols:** XL devices utilize the following protocols: DHCP, DNS, ICMP Echo, and SNTP.

**Network Settings:** XL devices are shipped in DHCP mode. We recommend providing either a reserved DHCP address or a static IP address. Additional network settings include the subnet mask, default gateway, preferred DNS server, and an optional alternate DNS server. Network settings can be easily configured at www.vorne.com/set-ip.

**Network Traffic:** The following are examples of typical network traffic loads for an XL device:

| Scenario | Network Traffic |
|---|---|
| **Browser Application** | XL has a sophisticated single-page browser application that is cached by the browser. When the application is first opened, approximately 2 MB is cached in the browser. Subsequent opens of the interface update the cache, with 120 KB being a typical update size. |
| **Browser Data** | XL has many dynamic and self-updating report pages:<br>▪ When viewing data for 1 asset, typical network traffic is 20 KB to 200 KB per minute.<br>▪ When viewing data for 15 assets, typical network traffic is 60 KB to 600 KB per minute. |
| **XL Enterprise** | XL devices can optionally communicate with XL Enterprise. This typically creates network traffic of approximately 4 KB per minute. |

## XL Enterprise

XL devices use token authentication for initial connection to XL Enterprise. All communication with XL Enterprise is via HTTPS (this includes XL devices and browsers).

## Ports and Permissions

Opening ports and whitelisting domains as shown below will enable you to take advantage of services that extend XL. None of these services are required. XL devices can fully function without them.

Open the following ports for XL devices to enable them to use the associated features:

| Port | Feature |
|---|---|
| **Port 53** | Enable XL devices to use an external DNS to resolve addresses (if an internal DNS server is not available). |
| **Port 123** | Enable XL devices to set their time with an external time authority (if an internal NTP or SNTP server is not available). |
| **Port 443** | Enable XL devices to communicate via HTTPS (if you are using any XL Enterprise services). |

Whitelist the following domains for XL devices to enable them to use the associated features:

| Domain | Feature |
|---|---|
| **xl-enterprise.com**<br>**updates.xl-enterprise.com** | Enable XL devices to communicate with XL Enterprise for software updates. |
| **xl.vorne.com** | Enable XL devices to communicate with XL Enterprise to provide data for alerts and reports. |
| ***.vornexl.pool.ntp.org** | Enable XL devices to set their time from a Vorne NTP server pool. |

# XL Integration Tools

The XL platform can operate entirely as a standalone system or it can be integrated with your other systems and applications using a broad range of integration tools. We recommend an incremental approach as it ensures that your integrations are soundly based on real-world experience. When you are ready, there are three types of integrations:

| Integration | Explanation |
|---|---|
| **Built-In** | Built-in integrations enable XL to use information from your existing systems with minimal investment of time or money. For example, XL can be configured to respond to your existing part and job barcodes, and you can import parts and jobs using simple spreadsheets.<br><br>Built-in integrations are particularly useful for smaller companies with limited IT resources. |
| **XL API** | The XL API is a REST-based interface that enables you to directly integrate XL devices with other systems and applications (e.g., ERP applications). The **XL API** guide provides detailed information.<br><br>The XL API is particularly useful for larger companies with well-staffed IT departments that have the resources to create and maintain custom integrations. |
| **Third-Party** | Third-party tools are products and services offered by partner companies. Examples include PLC integration, ERP integration, and local SQL databases to integrate to your enterprise reporting platform.<br><br>This is a great choice for any company that wants to leverage standard products to accelerate progress and avoid custom IT projects. Learn more about third-party tools at www.vorne.com/tools. |

# Data Access

Each XL device stores the production data it collects in its own embedded database. This means that there is no requirement for you to install a dedicated server or SQL database. One of the paramount XL design goals is to always make the underlying data easily accessible and immediately available. Here are five ways that you can access the data in the XL device:

| Access Method | Description |
|---|---|
| **Reports** | XL includes a sophisticated reporting engine, which runs in the browser and aggregates data across multiple devices. |
| **Dashboards** | It is easy to create custom reports using point-and-click tools included in every XL device. |
| **Export Templates** | Create any number of Excel export file templates (another dashboards feature). Each export template includes metrics and dimensions organized as tabular data – ready to export as an Excel file. |
| **XL API** | Use the REST API to programmatically access information from XL devices. You can access raw "table" data as well as business-ready "channel" data. Please note that the XL API is subject to change as we continue to add to and improve the XL platform. |
| **Backup** | You can instantly create a backup of your production data with a single click from the XL browser interface (Settings > Backup and Restore). |

If you would like to create a centralized database that contains production data from all your XL devices you can accomplish this using the XL API (free) or third-party integration tools (fast and easy).