KRYON

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System Architecture & Requirements

Kryon RPA Platform v5.25.1

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Contents

Introduction

This document provides an overview of the Kryon RPA Platform: its components, architecture, deployment, and system requirements.

The Kryon RPA Platform offers a number of solutions, designed to enhance efficiency in different automation contexts:

Unattended automation (creating a virtual workforce)

Kryon Unattended Robots run on virtual machines, working 24/7 behind the scenes to automate high-volume, repetitive, time-consuming business processes. In an unattended automation context:

- Robots are assigned tasks via Kryon Console (or via the Kryon API)
- Each task invokes a wizard, which provides the robot with a precise set of instructions for completing the task
  - The wizard runs automatically in robotic mode, without the need for human intervention

Attended automation (empowering the human workforce)

Kryon Attended Robots run in the background on employee desktops, enabling employees to request guidance as needed or automate tasks on demand. There are two different methods for invoking a Kryon Attended Robot (which can be used separately or in combination):

1. When an employee needs support in completing a task, he simply brings up the robot and finds the wizard he needs in the catalog
   - A wizard can be run in **Do It** mode (in which the robot actually performs actions for the employee) or in **Guide Me** mode (in which the robot navigates the employee through the task by pointing to each location where he needs to click the mouse or enter text)

– or –

2. The robot waits silently in the Windows taskbar, using predefined sensors to detect when the employee has launched a specific application or reached a specific screen
   - When the sensor is triggered, the robot comes to life, providing context-sensitive assistance and/or data validation exactly when and where it is needed

Hybrid automation (combining the best of both worlds)

Humans and robots work efficiently together, automating business processes from end-to-end.

Unless otherwise indicated, the information in this document applies to all automation contexts. In situations for which requirements/considerations differ, the following labels appear:

Unattended/Hybrid Only

Attended/Hybrid Only

The Kryon RPA Platform

The Kryon RPA Platform consists of the following components:

- Kryon Robots (unattended/attended)
- Kryon Studio
- Kryon Console Unattended/Hybrid Only
- Kryon Application Server & Database

Kryon Robots

Unattended Robot Unattended/Hybrid Only

A client installed on a virtual machine that runs wizards (i.e., sequences of instructions) on target applications with no human intervention. For additional details, see Unattended automation (creating a virtual workforce).

Attended Robot Attended/Hybrid Only

A desktop client that runs wizards and sensors on the target applications of end-user desktops. For additional details, see Attended automation (empowering the human workforce).

Kryon Studio

Wizards and sensors are built in Kryon Studio, with a complete set of tools that make it easy for both business users and developers to create automated workflows – from the simplest to the most sophisticated. Studio includes:

- Kryon Recorder, which enables automation developers to record and edit the keystrokes and mouse movements required to perform a specific task (in a single application or across many)
- A robust toolbox of actions for editing recorded wizards or creating complete wizards from scratch. These actions can be used to retrieve data, interact directly with applications and UI elements, call up scripts, add business logic, and much more.

Kryon Console Unattended/Hybrid Only

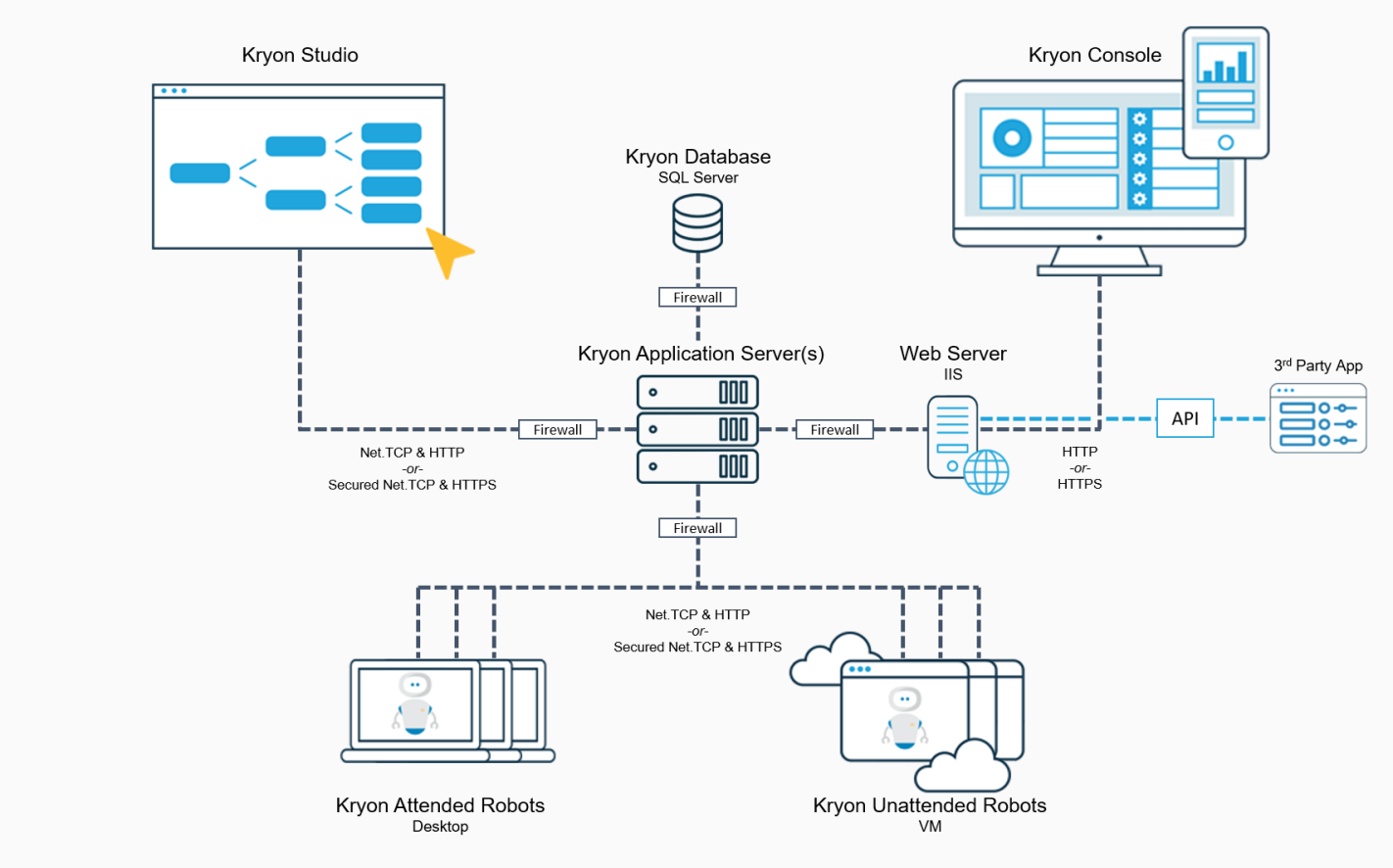
The "command and control" center in the unattended automation context, Kryon Console is a browser-based application that provides automation managers the tools to setup, manage, and monitor the virtual workforce (i.e., unattended robots). Kryon Console includes sophisticated, yet easy-to-use, modules for:

- setting up and managing the unattended automation environment (robots and robot groups, robot credentials, system notifications, etc.)
- scheduling and triggering tasks and assigning them to robots/groups
- monitoring and analyzing robot/task performance with Smart Analytics

Kryon Application Server & Database

The central repository that stores all wizards (including automatic backups and version history), collects usage statistics, and manages licenses and permissions. The client-server architecture of the Kryon RPA Platform provides a truly collaborative, enterprise-ready, and multi-tenant enabled solution – easily scalable across organizations of all sizes.

System Architecture



Supported protocols: Net.TCP & HTTP (with TLS/SSL: Secured Net.TCP, HTTPS & HTTP)

Ports: Configurable (by default, Net.TCP = 443 & HTTP = 80)

Network Considerations

Protocols

By default, the Kryon RPA Platform utilizes the Net.TCP and HTTP protocols. The platform includes the option to secure communications using TLS/SSL, in which case the primary protocols are Secured Net.TCP and HTTPS.

- When deployed with TLS/SSL, one of Kryon's Windows services utilizes the HTTP protocol. The communication for this service uses a secured channel, with security implemented at the message level rather than at the transport level.

NOTES

When installing with TLS/SSL, the customer must provide the required certificate.

Note that encrypting communications at the transport level may influence communication speed between the Kryon Server and clients.

Ports

Kryon's default port configuration is as follows. Server-side ports are fully and easily configurable.

Protocol	Server-side inbound port (configurable)	Client-side outbound port
HTTP	80	dynamic
Net.TCP	443	dynamic
HTTPS (if deployed with TLS/SSL)	8080	dynamic

Unattended/Hybrid Only The following additional ports are required in an unattended automation context:

- A customer-selected port to be used by Kryon Console
- A customer-selected port to be used by the Kryon Web Service API (if the API will be used as a method of managing unattended robot tasks)
- Port 8090 if installing more than one Kryon Application Server or if the Kryon Application Server and the Web Server (IIS) for Kryon Console will be installed on different machines

Traffic

Downloading wizards from the Kryon Server to robots has minimal impact on overall network traffic.

System Requirements

Server-Side Components

	Test Server	Production Environment (minimum)	Production Environment (recommended)	
	Single Server	Single Server	Application Servers	Database Server
Machine role	Application Server + Database + Console	Application Server + Database + Console	Application Server + Console	Database
# of servers	1 physical or VM server	1 physical or VM server	2	According to organization policy – redundant or cluster
CPU	4 cores	4 cores + 1 core for each 1,000 concurrent attended or 50 unattended robots	4 cores + 1 core for each 1,000 concurrent attended or 50 unattended robots	4 cores
Memory	4 GB	8 GB	8 GB	8 GB

	Test Server	Production Environment (minimum)	Production Environment (recommended)	
	Single Server	Single Server	Application Servers	Database Server
Robot capacity		**According to number of CPU cores –** *With 4 cores (minimum architecture)*: Max # of concurrent attended robots = 1,000 - or - Max # of concurrent unattended robots = 100 *With 4 additional cores*: Max # of concurrent attended robots = 5,000 - or - Max # of concurrent unattended robots = 300	**According to number of CPU cores –** *With 4 cores (minimum architecture)*: Max # of concurrent attended robots = 1,000 - or - Max # of concurrent unattended robots = 100 *With 8 additional cores*: Max # of concurrent attended robots = 9,000 - or - Max # of concurrent unattended robots = 500	
Disk	250 GB	250 GB	500 GB	500 GB

	Test Server	Production Environment (minimum)	Production Environment (recommended)	
	Single Server	**Single Server**	**Application Servers**	**Database Server**
Network	2 MB in/out	2 MB in/out	2 MB (in/out) per 5,000 concurrent attended or 300 concurrent unattended robots	
OS	Windows Server 2012/2016	Windows Server 2012/2016	Windows Server 2012/2016	

Windows components	**.NET Framework 4.7.1 or higher, including these features –**
	• TCP Port Sharing
	--- 	
	Unattended/Hybrid Only
	Web Server (IIS) Server Role, including these features –
	• Common HTTP Features:
	  ◦ Default Document
	  ◦ Directory Browsing
	  ◦ HTTP Errors
	  ◦ Static Content
	  ◦ HTTP Redirection
		.NET Framework 4.7.1 or higher, including these features –
		• TCP Port Sharing
		--- 	
		Unattended/Hybrid Only
		Web Server (IIS) Server Role, including these features –
		• Common HTTP Features:
		  ◦ Default Document
		  ◦ Directory Browsing
		  ◦ HTTP Errors
		  ◦ Static Content
		  ◦ HTTP Redirection
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			Unattended/Hybrid Only
			Web Server (IIS) Server Role, including these features –
			• Common HTTP Features:
			  ◦ Default Document
			  ◦ Directory Browsing
			  ◦ HTTP Errors
			  ◦ Static Content
			  ◦ HTTP Redirection	

	Test Server	Production Environment (minimum)	Production Environment (recommended)	
	Single Server	**Single Server**	**Application Servers**	**Database Server**
	• Health and Diagnostics: ∘ HTTP Logging ∘ Custom Logging ∘ Logging Tools ∘ Request Monitor • Performance • Security: ∘ Request Filtering ∘ Basic Authentication ∘ Client Certificate Mapping Authentication ∘ Digest Authentication ∘ IIS Client Certificate Mapping Authentication ∘ IP and Domain Restrictions	• Health and Diagnostics: ∘ HTTP Logging ∘ Custom Logging ∘ Logging Tools ∘ Request Monitor • Performance • Security: ∘ Request Filtering ∘ Basic Authentication ∘ Client Certificate Mapping Authentication ∘ Digest Authentication ∘ IIS Client Certificate Mapping Authentication ∘ IP and Domain Restrictions	• Health and Diagnostics: ∘ HTTP Logging ∘ Custom Logging ∘ Logging Tools ∘ Request Monitor • Performance • Security: ∘ Request Filtering ∘ Basic Authentication ∘ Client Certificate Mapping Authentication ∘ Digest Authentication ∘ IIS Client Certificate Mapping Authentication ∘ IP and Domain Restrictions	

	Test Server	Production Environment (minimum)	Production Environment (recommended)	
	Single Server	Single Server	Application Servers	Database Server
	◦ URL Authorization ◦ Windows Authentication • Application Development: ◦ .NET Extensibility 4.5 (or above) ◦ ASP.NET 4.5 (or above) ◦ ISAPI Extensions ◦ ISAPI Filters • Management Tools: ◦ IIS Management Console ◦ IIS Management Scripts and Tools ◦ Management Service	◦ URL Authorization ◦ Windows Authentication • Application Development: ◦ .NET Extensibility 4.5 (or above) ◦ ASP.NET 4.5 (or above) ◦ ISAPI Extensions ◦ ISAPI Filters • Management Tools: ◦ IIS Management Console ◦ IIS Management Scripts and Tools ◦ Management Service	◦ URL Authorization ◦ Windows Authentication • Application Development: ◦ .NET Extensibility 4.5 (or above) ◦ ASP.NET 4.5 (or above) ◦ ISAPI Extensions ◦ ISAPI Filters • Management Tools: ◦ IIS Management Console ◦ IIS Management Scripts and Tools ◦ Management Service	

	Test Server	Production Environment (minimum)	Production Environment (recommended)	
	Single Server	Single Server	Application Servers	Database Server

Additional software	• Microsoft Visual C++ 2005 Redistributable (x64)
	• Microsoft Visual C++ 2013 Redistributable (x64)
	• Microsoft Visual C++ 2015 Redistributable (x64)
	• SQL Server Express 2012/2014/2016 ***(NO license required)***, including these components:
	  ◦ Database Engine Services
	  ◦ Basic Management Tools
		• Microsoft Visual C++ 2005 Redistributable (x64)
		• Microsoft Visual C++ 2013 Redistributable (x64)
		• Microsoft Visual C++ 2015 Redistributable (x64)
		• SQL Server 2012/2014/2016 (Standard edition and higher, ***license required***), including these components:
		  ◦ Database Engine Services
		  ◦ Basic Management Tools
			• Microsoft Visual C++ 2005 Redistributable (x64)
			• Microsoft Visual C++ 2013 Redistributable (x64)
			• Microsoft Visual C++ 2015 Redistributable (x64)
				SQL Server 2012/2014/2016 (Standard edition and higher, ***license required***), including these components:
				• Database Engine Services
				• Basic Management Tools

Kryon Clients

	Unattended Robot		Attended Robot		Kryon Studio	
	minimum	recommended	minimum	recommended	minimum	recommended
Machine type	physical or virtual		physical or virtual		physical or virtual	
CPU	Intel® Core Duo 2 GHz (or similar)	Intel® i3/i5/i7 (or similar)	Intel® Core Duo 2 GHz (or similar) * Intel® i3/i5/i7 (or similar) – if using Kryon's sensor/push technology	Intel® i3/i5/i7 (or similar)	Intel® i3/i5/i7 (or similar)	
RAM	2 GB	4 GB	2 GB * 4 GB – if using Kryon's sensor/push technology	4 GB	4 GB	8 GB
Free memory	200-300 MB (or higher)		200-300 MB (or higher)		200-300 MB (or higher)	
Minimum disk space	200 MB		200 MB		200 MB	

	Unattended Robot		Attended Robot		Kryon Studio	
	minimum	recommended	minimum	recommended	minimum	recommended
OS	Windows 7 SP1/8.1/10 (most recent update – 64 bit Windows Server 2008 R2 SP1/2012/2016 – 64 bit ** The Kryon platform does not directly support robots installed on terminal servers. Contact Kryon for additional information and possible solutions if your organization requires terminal server support.*		Windows 7 SP1/8.1/10 (most recent update) – 32/64 bit Windows Server 2008 R2 SP1/2012/2016 – 64 bit		Windows 7 SP1/8.1/10 (most recent update) – 64 bit Windows Server 2008 R2 SP1/2012/2016 – 64 bit ** Best practice is for the Studio machine's OS to match as closely as possible the OS of the robot machine(s) on which the automation workflows will run.*	
Other requirements	.NET Framework 4.7.1 or higher Microsoft Visual C++ 2005 Redistributable (x64) Microsoft Visual C++ 2013 Redistributable (x64) Microsoft Visual C++ 2015 Redistributable (x64)		.NET Framework 4.7.1 or higher Microsoft Visual C++ 2005 Redistributable (x64) Microsoft Visual C++ 2013 Redistributable (x64) Microsoft Visual C++ 2015 Redistributable (x64)		.NET Framework 4.7.1 or higher Microsoft Visual C++ 2005 Redistributable (x64) Microsoft Visual C++ 2013 Redistributable (x64) Microsoft Visual C++ 2015 Redistributable (x64)	

NOTE

Consider the apps!

Remember that Kryon Unattended and Attended Robots work directly on their machines' applications. Therefore, robot machines' specifications must also meet the minimum requirements for the applications themselves.

Additional Information

Kryon Robot Performance & Resource Consumption

- Kryon robots (both unattended and attended) are designed to consume minimum system resources when idle: 0 CPU time and approximately 2-3 MB of memory
- When a wizard is running, a robot consumes CPU resources as required, and memory consumption could increase to 250-300 MB
    - Sufficient resources to run the target application(s) are also required
- Resources are automatically released when the robot returns to idle (i.e., the wizard has completed)

Installation Considerations

Kryon clients (unattended/attended robots and Studio) must be installed on machines that have direct access to the target applications on which the wizards will run.

- Local applications → Kryon clients should be installed on the same machine on which the applications are installed
- Web applications → Kryon clients should be installed on a machine with access to the Internet and the website(s) used by the applications

Supported Browsers for Web Applications

The following browsers are supported for wizards running on web applications:

- Internet Explorer 11 and above
- Google Chrome 66 and above
- Mozilla Firefox 53 and above