### **Production Environments**

# **Hardware Requirements**

There are multiple enterprise cloud deployment options available to host your Orchestrator, such as Amazon Web Services (AWS), Microsoft Azure, or Google Cloud Platform (GCP). Depending on your deployment option of choice and the size of the environment you plan to build, you need to consult different hardware requirements.

## Small to Medium Deployments

7For production environments, it is highly recommended to provide one dedicated server for each role:

* Orchestrator web application.
* SQL Server Database Engine.
* Elastic search and Kibana.

For a [Multi-Node Installation](https://docs.uipath.com/orchestrator/standalone/2022.4/installation-guide/orchestrator-the-windows-installer), in addition to the above, the following is also required:

* [High Availability add-on (HAA)](https://docs.uipath.com/orchestrator/standalone/2022.4/installation-guide/haa-hardware-and-software-requirements) for Orchestrator (3+ HAA nodes are required for true [high availability](https://docs.uipath.com/orchestrator/standalone/2022.4/installation-guide/high-availability) and 6+ HAA nodes for [geo-redundancy](https://docs.uipath.com/orchestrator/standalone/2022.4/installation-guide/disaster-recovery-two-active-data-centers).

**Note:**

Multi-node Orchestrator deployments use the RESP (REdis Serialization Protocol) for communication, and thus can be configured using any solution relying on this protocol.

HAA is the only such solution supported by UiPath

The hardware configuration for each required server depends upon the size of your deployment, as detailed below. The hardware requirements presented here were made based on tests where a Robot was defined as follows:

* messages are sent from the Robot to Orchestrator with a frequency of **1 message per second**
* within 60 seconds, the Robot sends:
  + 15 message logs
  + 2 heartbeats
  + 6 get asset requests
  + 6 add queue item requests
  + 6 get queue item requests

#### Support up to 250 Unattended Robots

##### Web Application Server

| Number of Robots | CPU Cores (min 2 GHz) | RAM (GB) | HDD (GB) |
| --- | --- | --- | --- |
| <20 | 4 | 4 | 100 |
| <50 | 4 | 4 | 100 |
| <100 | 4 | 4 | 150 |
| <200 | 4 | 4 | 200 |
| <250 | 4 | 4 | 200 |

**NOTE:**

For more than 200 Robots, increase to 500 the number of connections allowed in the pool of the SQL connection string from the UiPath.Orchestrator.dll.config file. To do this, add the Max Pool Size=500 parameter to the connection string, so that it looks similar to this example:

<add name="Default" providerName="System.Data.SqlClient" connectionString="Server=SQL4142;Integrated Security=True;Database=UiPath;Max Pool Size=500;" />

##### SQL Server

| Number of Robots | CPU Cores (min 2 GHz) | RAM (GB) | HDD (GB) |
| --- | --- | --- | --- |
| <20 | 4 | 8 | 100 |
| <50 | 4 | 8 | 200 |
| <100 | 4 | 8 | 300 |
| <200 | 8 | 8 | SSD 400 |
| <250 | 8 | 16 | SSD 400 |

Disc space requirements highly depend on:

* Whether work queues are used or not. If work queues are used, it depends on average number of transactions added daily/weekly and size (number of fields, size of each field) of each transaction.
* The retention period for successfully processed queue items (the customer should implement their own retention policy).
* Whether messages logged by the Robots are stored or not in the database. If they are stored, a filter can be applied to only store in the DB specific levels of messages (for example, store in the DB the messages with log level **Error** and **Critical**, and store in Elasticsearch messages with log level **Info**,**Warn** and **Trace**).
* Frequency of logging messages - the Robot developer uses the **Log Message** activity at will, whenever they consider a message is worth to be logged.
* The retention period for old logged messages (the customer should implement their own retention policy).
* Logging level value set up in the Robot. For example, if logging level in the robot is set to **Info**, only messages with levels **Info**,**Warn**,**Error** and **Critical** are sent to Orchestrator; messages with levels **Debug**,**Trace** and **Verbose** are ignored, they will not reach Orchestrator.

##### Elastic search Server

| Number of Robots | CPU Cores (min 2 GHz) | RAM (GB) | HDD (GB) |
| --- | --- | --- | --- |
| <20 | 4 | 4 | 100 |
| <50 | 4 | 4 | 100 |
| <100 | 4 | 8 | 150 |
| <200 | 4 | 12 | 200 |
| <250 | 4 | 12 | 300 |

Disc space requirements depend on:

* The retention period (the customer should implement their own retention policy).
* Frequency of logging messages - the Robot developer uses the **Log Message** activity at will, whenever they consider a message is worth to be logged.
* Logging level value set up in the Robot. For example, if logging level in the Robot is set to **Info**, only messages with levels **Info**,**Warn**, “Error” and “Critical” are sent to Orchestrator; messages with levels “Debug”, “Trace” and “Verbose” are ignored, they will not reach Orchestrator.

**NOTE:** For more than 50 Robots you need to instruct the Java Virtual Machine used by Elasticsearch to use 50% of the available RAM, by setting both the -Xms and -Xmx arguments to half of the total amount of memory. This is done either through the ES\_JAVA\_OPTS environment variable or by editing the jvm.options file.

# **Software Requirements**

## **Server OS**

| Software | Compatible Versions |
| --- | --- |
| Windows Server | * 2012 R2 * 2016 * 2019 * 2022 |

## **Databases**

| Software | Compatible Versions |
| --- | --- |
| SQL Server | * 2012 Standard or Enterprise Edition * 2014 Standard or Enterprise Edition * 2016 Standard or Enterprise Edition * 2017 Standard or Enterprise Edition * 2019 Standard or Enterprise Edition * Azure SQL Database * Amazon RDS for SQL Server * Google Cloud SQL for SQL Server   **NOTE:** If you are considering installing [Insights](https://docs.uipath.com/insights/standalone/2022.4/user-guide/overview), make sure that your database supports both columnstore indexes and JSON functions. |
| UiPath High Availability Add-on | * All Versions   **NOTE:** Required only for supported HA installations. |

## Logging & Visualization

**NOTE:** The below software is not explicitly required, but is recommended for logging & visualization purposes.

| Software | Compatible Versions |
| --- | --- |
| Elasticsearch | * 7.16.3 - 8.x   Check the official Elasticsearch [End-of-Life dates](https://www.elastic.co/support/eol) and [support matrix](https://www.elastic.co/support/matrix).  Starting with version 7.16.2, Elasticsearch [no longer provides](https://www.elastic.co/guide/en/elasticsearch/reference/7.16/windows.html) Windows MSI installer packages. Any later versions must be installed via .zip package. |
| Kibana | * 7.16.3 - 8.x |

## Browsers

| Software | Compatible Versions |
| --- | --- |
| Google Chrome | * 50+ |
| Firefox | * 69.0.1+   Not supported in Private Browsing mode |
| Microsoft Edge | * 20+ |

## IMPORTANT: Internet Explorer is not supported.

## Deployment

| Software | Compatible Versions |
| --- | --- |
| WebDeploy | * 3.5+   64bit version  Please note that this is required only for PowerShell script installations, such as the [Azure one](https://docs.uipath.com/orchestrator/standalone/2022.4/installation-guide/the-azure-app-service-installation-script). |

## Software Frameworks

| Software | Compatible Versions |
| --- | --- |
| .NET Framework | * 4.7.2+ |
| ASP.NET Core Module | * 3.1.x * 6.0.x |

## Web Servers

| Software | Compatible Versions |
| --- | --- |
| IIS | * 8+ |
| * IIS Modules - URL Rewrite | * 2.1+ |

## Virtualization Platforms

**NOTE:** Any platform that can create a Windows Virtual Machine can be used as well.

| Software | Compatible Versions |
| --- | --- |
| Citrix XenDesktop | * 7.6+ |
| Oracle VirtualBox | * 5.0+ |
| Microsoft Hyper-V | N/A |
| VMWare | N/A |

## Credential Stores

**NOTE:** The below items are not required for use of Orchestrator, but optional integrations.

| Software | Compatible Versions | Dependencies |
| --- | --- | --- |
| CyberArk® | * Central Provider 11.1 | * Digital Vault 9.6 and later * Application Password SDK 9.7 and later. |
| Azure Key Vault |  |  |
| HashiCorp Vault | * Open Source 1.5.0 and later * Enterprise 1.5.0 and later * Cloud (HCP Vault) |  |
| BeyondTrust | * 21.3+ |  |