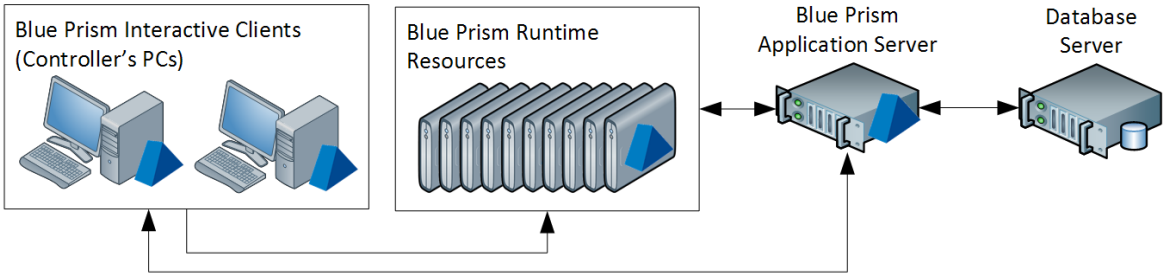
Infrastructure Overview

This data sheet provides technical guidance regarding the specification and configuration of environments for Blue Prism. It is intended as a guide for indicative sizing and configuration, however specific environments will vary depending on the profile of the Blue Prism implementation.
More detailed information can be obtained from the Blue Prism Infrastructure Reference Guide, available on request.

Implementation Profile



A Blue Prism implementation consists of a database server coupled with any number of Interactive Clients, Runtime Resources and Blue Prism Application Servers, depending on the business application.

The components perform the following functions:

- Blue Prism Interactive Client
  A physical or virtual machine with Blue Prism installed which facilitates the development, configuration and monitoring of Blue Prism processes.
- Blue Prism Runtime Resource
  A physical or virtual machine with Blue Prism installed that runs automated processes against target applications, often referred to as the robot.
- Blue Prism Application Server
  A physical or virtual machine with the Blue Prism Server service installed which shields database connection details from connected clients, implements encryption and hosts the Scheduler.
- SQL Server Database
  Blue Prism repository for processes, logs, audit and user info.

It is common for most components to be deployed into a production strength virtual infrastructure, however for pilot processes or small projects there is the option to deploy the solution on a desktop model.

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Blue Prism Interactive Client

Blue Prism Interactive Clients are used to configure and control the environment and to monitor the Blue Prism Resources as processes are executed – they can be thought of as Development or Administration machines.

Each Blue Prism Interactive Client requires the installation of Blue Prism along with the necessary software prerequisites.

In development environments the Interactive Clients are used to develop and maintain the processes - therefore access to each of the target applications and any associated pre-requisites or thick clients will also need to be deployed and configured on these devices.

These pre-requisites may include the Java Access Bridge, SAP Scripting, Adobe Acrobat Professional and certified Terminal Emulator software for mainframe automation. Local Administrator privilege is usually required in order to install these pre-requisites and the Blue Prism runtime.

Processes and objects are stored in the database server (or, for non-production use, in a local copy of SQL Express).

Minimum Requirements

- Intel Processor
- 2GB RAM
- Minimum 10GB free disk space (after install of Operating System and standard software)
- Windows 7 SP1, 8.1, 10 Anniversary Update. 32-bit or 64-bit versions.
- Windows Server 2008 R2 SP1, 2012, 2012 R2, 2016. 64-bit versions only
- .NET Framework 4.7

Interactive Clients communicate with each connected Runtime Resource in order to ascertain its' status.

Typically Interactive Clients communicate with the database via the Blue Prism Server using a .NET Remoting connection, however there is the option to configure a direct database connection as is required when a Blue Prism Server is not available.

Blue Prism Runtime Resources

Blue Prism Runtime Resources are responsible for executing the processes that are allocated to them – they are run unattended and are often referred to as Robots.

This commonly requires the process definition to be retrieved from the central repository; interact with, and automate various third-party applications via the user interface; and generate the necessary log information.

Each Blue Prism Runtime Resource requires the installation of Blue Prism along with the necessary software prerequisites. In addition, each will need to be configured with access to each of the target applications and any associated pre-requisites. Relevant thick clients will also need to be deployed.

Minimum Requirements

- Intel Processor
- 2GB RAM
- Minimum 10GB free disk space (after install of Operating System and standard software)
- Windows 7 SP1, 8.1, 10 Anniversary Update. 32-bit or 64-bit versions
- Windows Server 2008 R2 SP1, 2012, 2012 R2, 2016. 64-bit versions only
- .NET Framework 4.7

Typically Runtime Resources communicate with the database via the Blue Prism Server using a Windows Communication Framework (WCF) connection, however there is the option to configure a direct database connection as is required when a Blue Prism Server is not available.

The specification of the **Interactive Clients** (used for development) and the **Runtime Resources** must meet the collective recommendations of the in-scope target applications. (E.g. SAP, Office, Kana etc.)

A useful indicator is to base the specification on an equivalent PC used by an end-user to automate those same applications.

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Blue Prism Application Server

The Blue Prism Server is an optional but important component that marshals database connections and removes the need to configure direct connections between the various Blue Prism components and the database.

When implemented, all Blue Prism components (Interactive Clients and Runtime Resources) connect to the Blue Prism Server service.

Additional Blue Prism Servers can be added to an environment to provide increased scale and capacity. Typically Blue Prism Servers are deployed to dedicated, virtual servers however there are options to co-host Blue Prism Servers that service different environments on the same devices. (E.g. a single virtual server could host Blue Prism Servers for the Dev and Test environment).

Minimum Requirements

- Intel Xeon Processor
- 2GB RAM
- 20GB free disk space after install of OS and standard software
- Windows Server 2008 R2 SP1, 2012, 2012 R2, 2016. 64-bit versions only.
- .NET Framework 4.7

The Blue Prism Server is responsible for the key used by encrypted work queues and credentials, and also manages the execution and allocation of scheduled processes.

Where multiple Blue Prism servers are deployed for the same environment, all of them must be configured with the same encryption scheme information, and those which have the scheduler enabled must be configured to use the same time zone.

Database Server

Underpinning the Blue Prism platform is a Microsoft SQL Server database which holds not only the process and object repository, but also user credentials, audit information and production process log data – a transaction log of each production process running in the environment.

Communication between the Blue Prism Runtime Resources, Application Servers and Database is typically moderate to high in volume, and transactional in nature as records are frequently inserted into the session log, along with look-ups and updates being performed within workflow tables.

Consideration should be given to the proximity of the Database Server to the Blue Prism Application Server and Runtime Resources, particularly when implemented across large or multi-site networks. Where network latency is an issue, it will be made more prominent by the frequency of the queries performed.

Commonly the Blue Prism database will receive direct connections only from each Blue Prism Application Server within a given environment.

Minimum Requirements

- Intel Quad Xeon Processor
- 4GB RAM
- SQL Server 2012, 2012 R2, 2014, 2016. 32-bit or 64-bit versions.
- Case insensitive, 1252 code page SQL Collation
- Non-clustered or clustered architecture (includes support for AlwaysOn Availability Groups)
- Allocate 10GB Data File per connected Runtime Resource (min 100GB)
- Allocate 5GB Data Log File per connected Runtime Resource (min 50GB)
- High performance disk array

In some circumstances, such as where Application Servers are not deployed, any Blue Prism component can be configured to establish a direct database connection. This will be subject to the application of appropriate routing, authorization and access settings.

The number of connections that will be established by each directly connecting device is managed by the .NET Framework through use of SQL connection pools.

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As with many database applications, Blue Prism can occupy shared space in a data center should suitable database servers already be available. Likewise where there are multiple segregated Blue Prism environments such as for Dev, Test, Production, or for different parts of the business (HR, Finance, Operations), each will have its own dedicated database. If required, these schemas can co-exist within the same SQL Server instance and the Blue Prism Application Server is then responsible for directing the communications to the relevant database.

See also the specific data sheets available for Provisioning and Maintaining a Blue Prism Database Server.

Database Collation

The collation of the Blue Prism database must be one that is case-insensitive and that supports the 1252 codepage. The case-insensitive feature is typically denoted by the presence of CI within the collation name e.g.:

- Latin1_General_CI_AS
- SQL_Latin1_General_CP1_CI_AS

Database Disk Space Requirements

Best-practise should be followed in relation to the performance and allocation of disk arrays and their use by both Microsoft SQL Server and the underlying operating system.

The amount of disk space that is required by Blue Prism in the database is largely dependent on the number of connected Runtime Resources, although it will also be dependent on the data retention policy. For production environments the amount of space required is:

- Minimum 10GB data file per connected Runtime Resource
- Minimum 5GB log file per connected Runtime Resource
  (50% of the value allocated to the data file)

In addition to the above metrics, the minimum amount of disk space allocated to the database data file for a production environment should be no less than 100GB (+ 50GB for logs). For Dev/Test environments this minimum should be no less than 50GB (+25GB for logs)

Regular archiving of the Blue Prism logs, as well as frequent database server maintenance and housekeeping can be used to control the amount of space used overtime.

High Availability and Redundancy

The platform can be connected to SQL databases which are configured for SQL high-availability or redundancy. This includes those that are configured for clustering or mirroring and those hosted by SQL Availability Groups.

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Deploying Blue Prism to a Virtualized or Cloud Environment

For some smaller implementations where there is less demand for scalability or where virtualization is not feasible, Blue Prism can be deployed to a wholly physical environment and can largely make use of existing desktops - albeit in a secured environment.

Virtualization however, is commonly the recommend approach as it more easily provides benefits which include physical security and scalability. Many virtualization technologies also simplify the rollout of software updates and the implementation of disaster recover capabilities.

The core Blue Prism components can be deployed to persistent virtualized Windows devices and there are two main approaches:

- Use of an existing virtualization technology
  Where organizations already have access to virtualization technologies such as VMWare or Citrix XenDesktop, there may be the capability to utilize these to provide the virtual machines which will host the required Blue Prism components. Further details on Virtualization patterns are provided within the Virtualization Guide (available on request).
- Provision a dedicated virtualization host
  Virtualization can be provided by provisioning a new dedicated server (or set of servers) on which new virtual machines are configured and used to host the required Blue Prism components. These typically use technologies such as Microsoft Hyper-V or VMware ESX although others are available.

  When deploying to this type of host machine it is important to ensure that the specification of the host machine is sufficient to not only cater for the underlying operating system, but also provide the appropriate resources and performance for each of the virtual machines that will be configured.

Dedicated Virtual Host (Example)

10-15 Blue Prism Runtime Resources

- Dual Socket Virtualization hosts:
- Quad Intel Xeon Quad Core Processors
- 32GB RAM (minimum)
- 450GB available space after applying RAID to arrayed disks
- 2 physical 1000Mbit NIC
- Operating System appropriate to technology (e.g. Hyper-V, ESX)

- Cloud-based deployment patterns
  Blue Prism may be deployed on a cloud environment such as Microsoft Azure or Amazon AWS. This may be appropriate if the organization has an existing cloud strategy. Further details may be found in:
  Blue Prism Data Sheet – Cloud Deployments
  Blue Prism Data Sheet – Azure Reference Architecture
  Blue Prism Data Sheet – AWS Reference Architecture

Deployment Options

The following examples provide sample architectures based on the scale, or key features of the environment. Factors such as security, resilience, scalability and failover should also be considered. The example deployment options below include:

- Proof of Concept / Pilot / Pre-Production : Up to 5 runtime resources using physical runtime resources
- Up to 100 runtime resources using virtualized runtime resources
- Provision of development, test and production environments using some shared hardware
- Provision of three production environments using some shared hardware
- Up to 300 runtime resources with multiple Blue Prism Application Servers.
- Multi-site deployment

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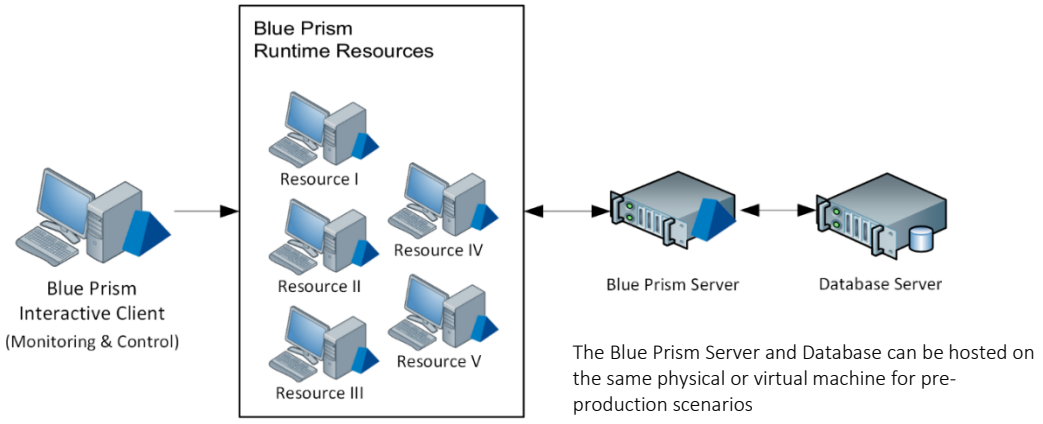
Deployment Example 1: Proof of Concept / Pilot / Pre-Production Up to 5 Resources

For deployments with up to 5 Blue Prism Runtime Resources, a configuration using physical machines can be used. The machines should be appropriately secured and can be used either with or without the Blue Prism Server component (depending on requirements for scheduling and encryption).

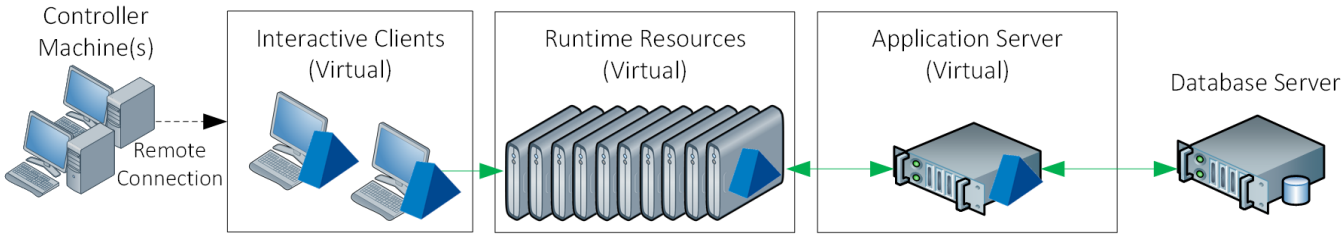


The Blue Prism Server and Database can be hosted on the same physical or virtual machine for pre-production scenarios

Deployment Example 2: Up to 100 Resources

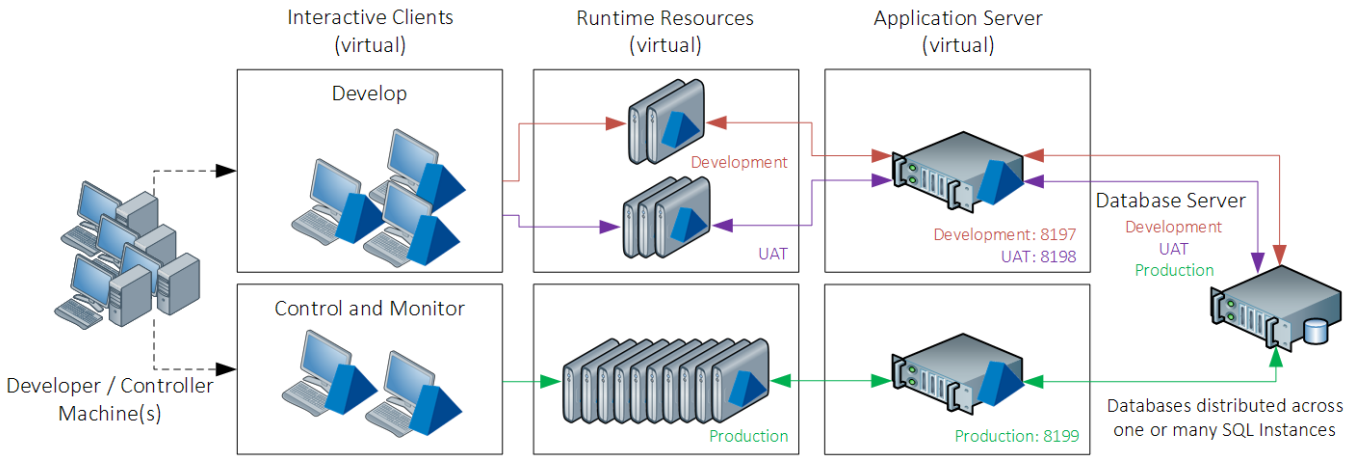
For deployments above 5 physical Runtime Resources, Blue Prism recommends installing on Windows desktops provided by a virtualized environment such as VMWare ESX or Citrix XenDesktop.

Blue Prism is installed on each virtual instance and becomes more easily secured and scaled up according to the size and capacity of the host server(s).



Deployment Example 3: Environments for Development, Test and Production

When deploying a number of environments such as for Dev, Test and Production purposes, each environment will require a dedicated database, however it is possible for some of the Blue Prism components to be shared. In the example below a single virtual server is used to host the Blue Prism Server service for the separate Dev and Test environments. Likewise a single Interactive Client can be configured to access any number of environments.



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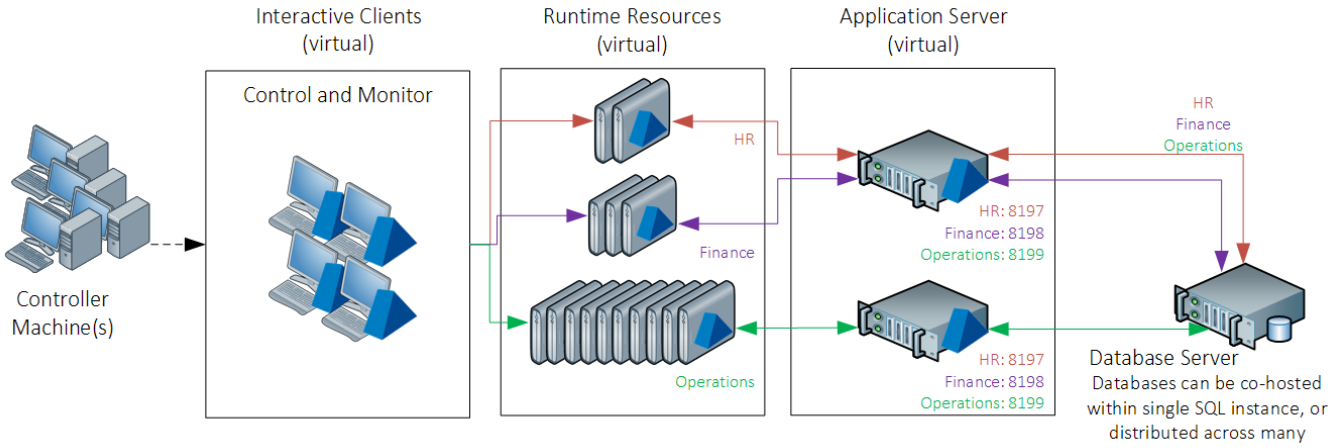
Deployment Example 4: Environments for Independent Business Areas

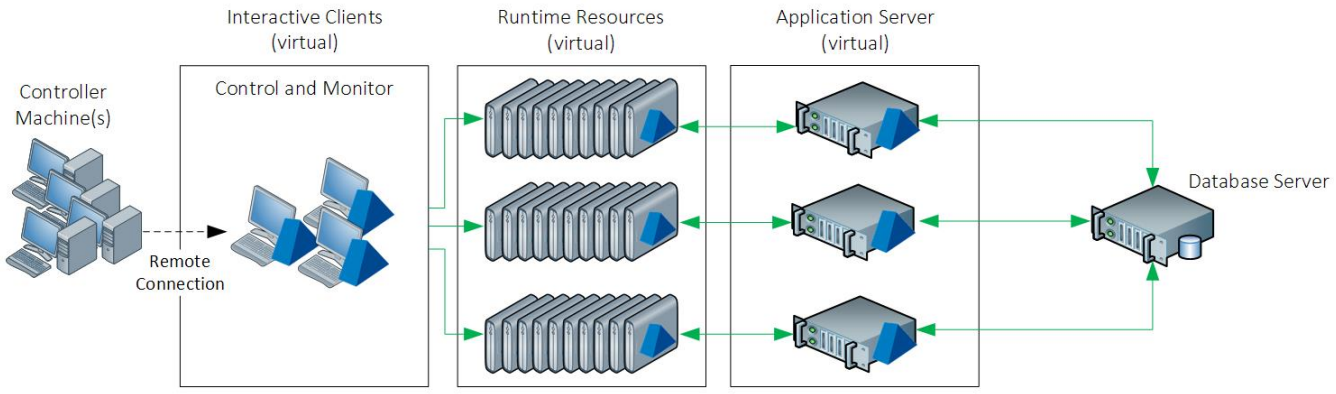
In larger or more complex scenarios it is possible to configure separate environments, such as for purposes of data or process segregation, whilst still sharing certain central features.

The example below demonstrates how three environments, each specifically purposed for supporting a defined business area can be configured. In this example, each business area has a series of dedicated runtime resources, and has a dedicated Blue Prism Server service, but the Server services are co-hosted on shared hardware.



Deployment Example 5: Up to 300 Resources

For larger scale environments, the Blue Prism Runtime Resources are replicated and scaled, and each is paired with a dedicated application server for database communication. For failover and DR the hosts can be co-located at different physical sites. It is possible to deploy large numbers of runtime resources by following this approach.



In the above example, each Application Server can marshal the connectivity for up to 100 Blue Prism Runtime Resources.

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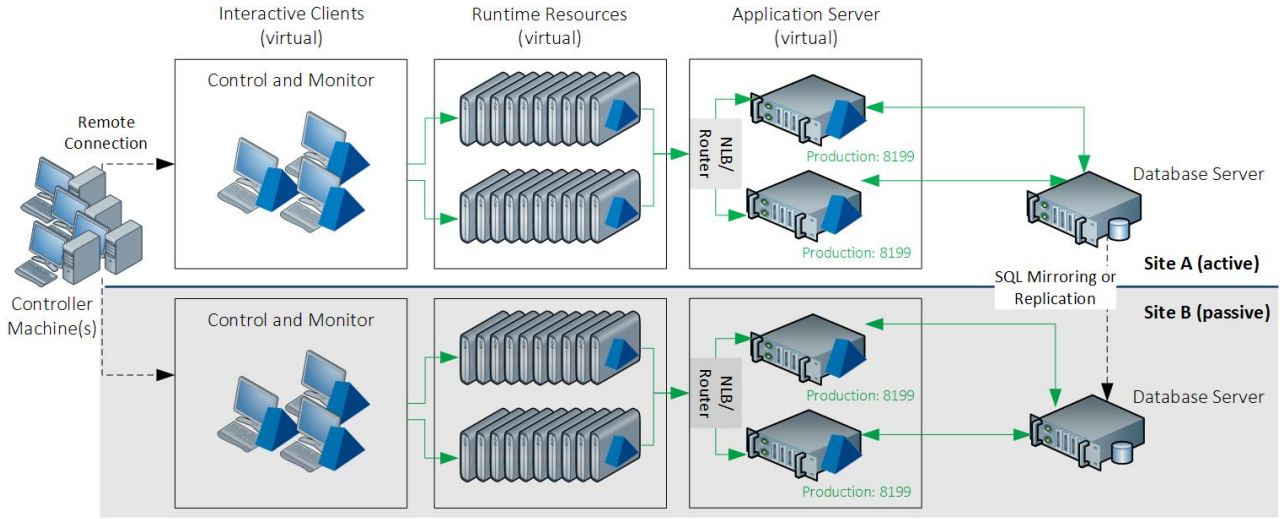
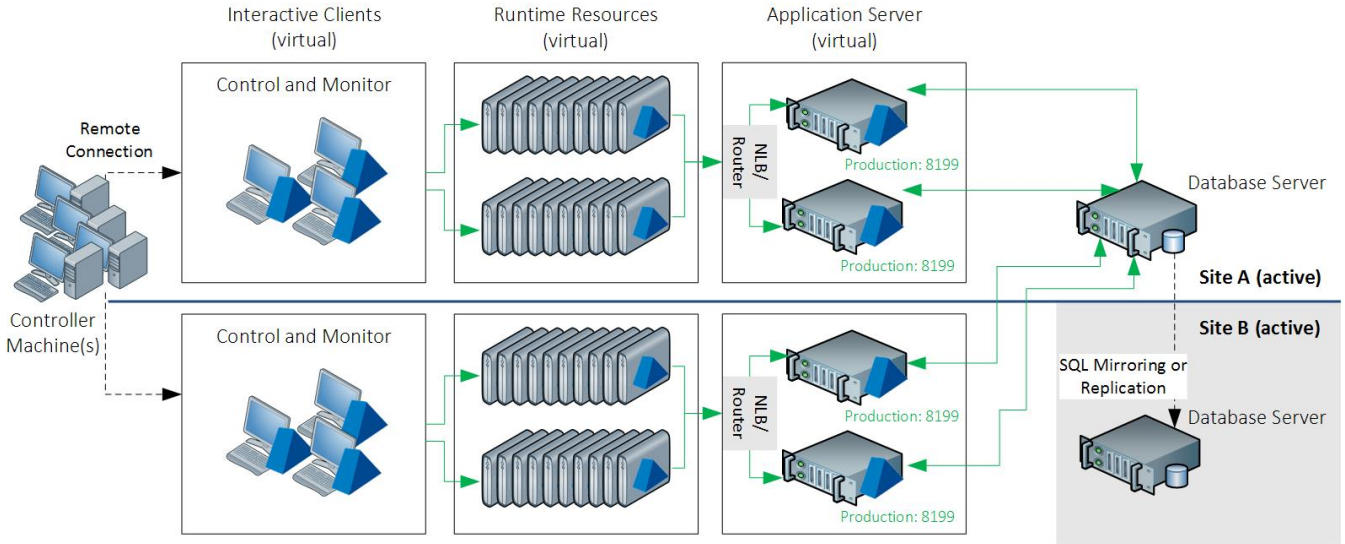
Deployment Example 6: Multi-site – Active/Active or Active Passive

Where there is a requirement to deploy across multiple sites, Blue Prism can accommodate either an Active/Passive or Active/Active scenario depending on considerations such as network performance and security.

Active / Passive

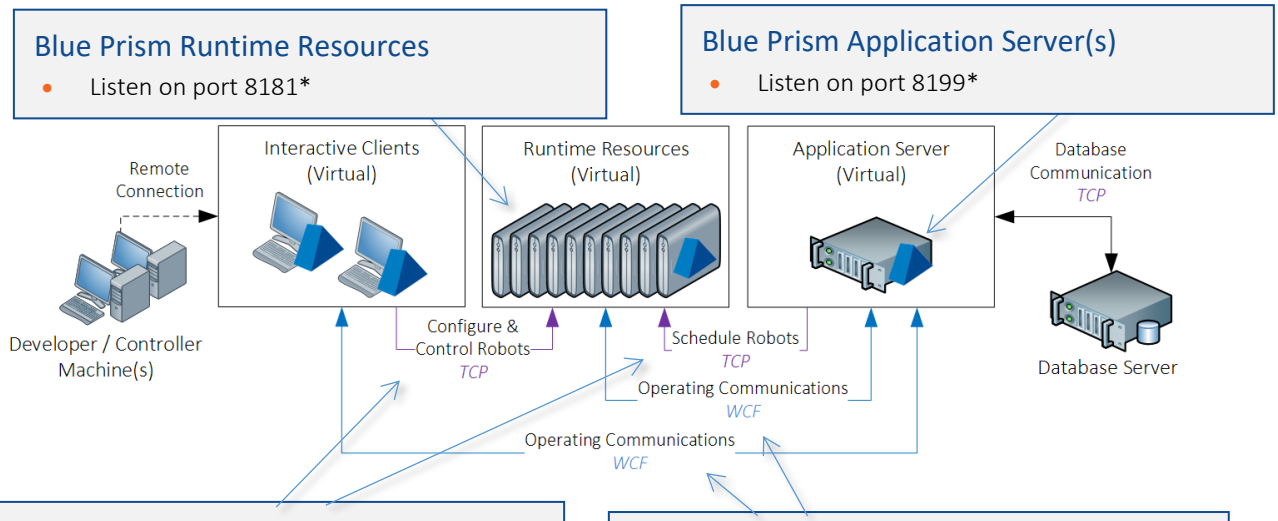


Active / Active



Blue Prism Communication Summary

The following information highlights the Blue Prism inter-component communication and the security that can be configured for each channel.



TCP Connectivity

- The devices initiating these connections must be able to resolve the IP address of each Blue Prism Runtime Resource by using its name.
- The Runtime Resource start-up procedure can be configured to reference a deployed certificate that will be used to encrypt data received.

Windows Communication Foundation (WCF)

- The communications with the Blue Prism Server are initiated by the Runtime Resources/Interactive Clients.
- This is primary channel for operational data such as process definitions.

*ports are configurable

Legacy support of .NET Remoting for Operating Communications

In addition to the select of WCF modes that are available, it is possible to configure the Operating Communications channel to use .NET Remoting.

While it is not recommended to use this legacy technology, the following should be considered where it is used:

- **Network Address Translation (NAT)**
  Microsoft's .NET Remoting does not support Network Address Translation (NAT) and therefore NAT is not supported for the inter-component communication that uses this protocol.
- **Callback Port**
  Unless disabled, the Blue Prism Application Server will callback to the connecting device (Runtime Resource or Interactive Client) on the port configured on the connection. It is necessary to ensure that the connecting device can be contacted on this port.

TCP Connectivity - Name Resolution

By default, the inter-component communication takes place over TCP uses the short-name of the target machine (e.g. using robot001, not robot001.mydomain.local) and requires DNS to be configured appropriately.

System Administrators can optionally change in this setting if appropriate for deployments utilizing v4.2.57 or above:

- Register and communicate using machine (short) name – **historical default**
- Register using machine (short) name, communicate using FQDN
- Register and communicate using FQDN

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User Profile Settings

The following settings will need to be configured on each of the **Blue Prism Interactive Clients** used for developing processes and each **Blue Prism Runtime Resource**. Explicitly the settings will need to be applied for user accounts that will be used to develop and configure processes; and for the accounts used by the Runtime Resources to access the network and authenticate with third-party applications.

- **Power saver options**. To reduce the required complexity of the processes, screen-locking and screensavers should be disabled.
- **Prerequisites for the target applications.** Connectivity and prerequisites for each of the target applications that will be automated need to be configured. (e.g. network connectivity, thick-clients, client-side technologies etc.).
- **Screen Resolutions**. The screen resolution settings should be consistently applied across the Runtime Resources and the Interactive Clients used for development.
- **Font-smoothing**. Where target applications are presented using thin-client technology such as Citrix, font-smoothing will need to be disabled for the users.
- **Aero/Glass Themes**. The display theme should be set to not use transparent or opaque window borders.
- **Default Login Settings (Security Policy)**. Where Blue Prism Login Agent will be used it is necessary to disable the requirement for CTRL + ALT + DEL to be pressed prior to interactively logging on. Also logon messages such as Usage Access Policies will need to be disabled.
- **SAP GUI Scripting.** This setting should be enabled for the appropriate users if automating SAP via the GUI.

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