blueprism®

Blue Prism

Upgrade Guide

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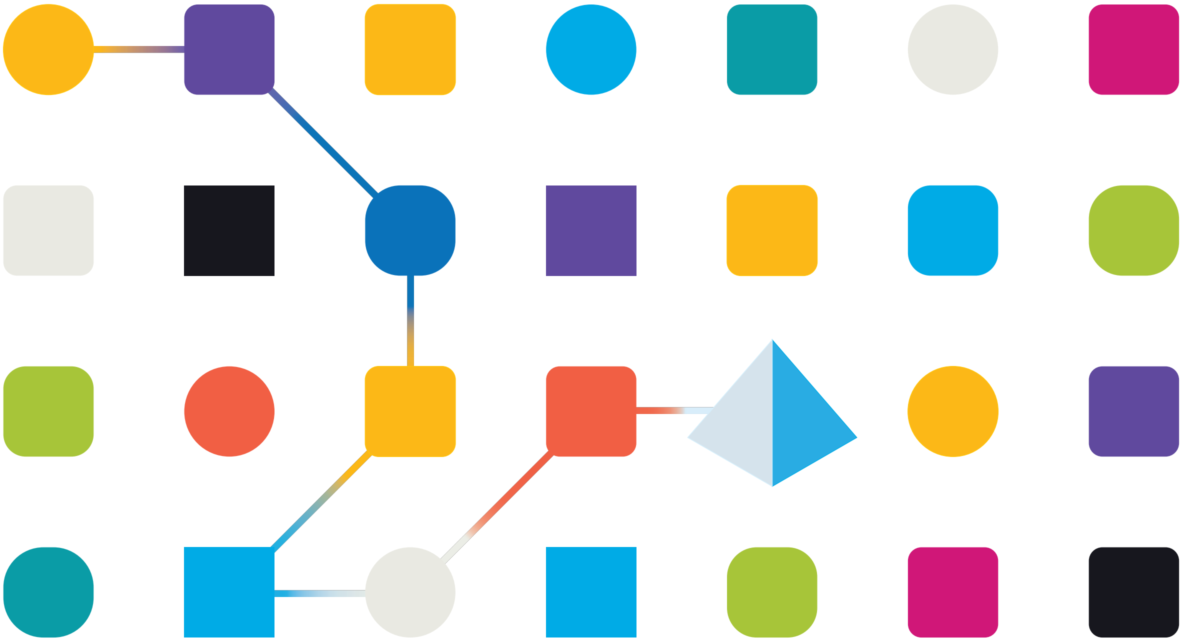

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Introduction

There is no single way to upgrade and this guide should be treated as advice on potential upgrade options and strategies, not a rigid instruction.

Users must plan their own upgrade according to their own requirements. There are many factors to weigh up, some common and some particular to the Business. The following list itemises some, but probably not all the main considerations.

- BAU solutions, the processes and their objects.
- BAU workload, the work queues and the SLAs.
- Inflight projects and the delivery schedule.
- Operational commitment to the Business.
- The current infrastructure, the different environments, the resources, clients, severs and databases.
- The Blue Prism upgrade version and all the versions released since the current version.
- The regression test environment, the infrstructure, the target applications.
- Regression test data and test scripts.
- The regression test sequence and any high priority or high risk processes.
- The rollout plan and the rollback plan.
- The upgrade participants, the PMs, SMEs, testers, developers, IT and the DBAs.

Useful resources

- Online help
- Release notes
- What's new?
- Restoring a Blue Prism Environment
- Installing Enterprise Edition

Plan an upgrade

Upgrading software in an enterprise-level production environment is not a task that should be undertaken lightly and success is almost entirely down to thorough planning. A Blue Prism upgrade involves a large number of tasks, requires collaboration between multiple stakeholders, and includes risks that need to be managed appropriately. Therefore, planning is critical and its importance cannot be overstated.

The benefit of upgrading must be carefully weighed against the implementation effort: perhaps the performance of existing processes will be improved by a new version of Blue Prism; maybe new functionality is required to successfully deliver a new project; or more simply, the current version is nearing end-of-life and will soon become unsupported. It is important to note that upgrading the Blue Prism version is unlikely to resolve issues with the platform or individual processes if these issues are a result of poor design or implementation.

A Blue Prism environment is comprised of more than just the Blue Prism software and care must be taken to plan the upgrade carefully to make the execution goes as smoothly as possible. Planning can be broken down into the following stages:

- Upgrade Scale
- Upgrade Strategy
- Release Notes
- Operational Impact
- New Functionality
- Other Changes

Upgrade Scale

It is vital to understand the scale of the estate when planning an upgrade. A detailed understanding of the Blue Prism solutions and the Blue Prism infrastructure is necessary to plan the upgrade project effectively. Below are some key considerations. However, it should be noted that this is by no means a definitive list and there are many other factors which must be considered:

- How many processes are there? How many business objects are there?
- What applications do the processes use? Are they accessed via single-sign-on? How many credentials are there?
- Do the resource machines log into Windows via Login Agent? How many Windows accounts are used?
- Which processes are mission-critical or high-risk?
- How many users are there? What roles do they have? What permissions do they have?
- How many work queues are there? Do any processes use more than one?

The number of infrastructure assets across the estate also needs to be understood in detail.

- How many resource machines are there? How many clients? How many application servers? How many database servers?
- Which ones are for Production and which are for Dev and Test?
- Are any machines multi-purpose? For example, are multiple BP Server services running on the same application server? Or are there clients that can connect to both Dev and Test?
- Are any machines currently redundant? Are there resources registered in databases that are in fact no longer used?

- Will any machines become redundant after the upgrade?
- Will any new machines be required for the upgrade?

Upgrade Strategy

A strategy for setting up an environment, executing the upgrade, regression testing the processes and maintaining operational service should be meticulously planned.

1 **Infrastructure**

Consideration should be given to the infrastructure intended to support the new version of Blue Prism and whether any infrastructure upgrades are also required. For example, is the operating system compatible, is the correct .Net Framework installed and do the machine specifications meet the requirements of the new version?

2 **Regression test environment**

Although it is extremely unlikely that a new version of Blue Prism will introduce major problems to existing processes, regression testing should be carried out nevertheless, and where the testing will take place requires thought. Different options are explored in more detail in Process regression testing.

3 **Upgrade sequence**

Knowing your estate it crucial to identifying high priority processes and planning the testing sequence accordingly. Quite how much time is to be spent testing each process is dependent on its criticality to the business, its complexity, the appetite for risk and the size of the 'version leap', i.e. the number of versions between the current version of Blue Prism and the upgrade version.

4 **Back-up and rollback**

It is important to plan for what will happen in the event of an unsuccessful upgrade. Consideration should be given to ensuring backups exist for key data including the Blue Prism database, config files, encryption keys, passwords, machine images etc.

Remember that, once upgraded, the Blue Prism database cannot be reverted to an older version. Additionally, Once the authentication mechanism is implemented, it cannot be changed.
Backwards compatibility of processes cannot be assumed if importing from newer to older version.

5 **Release notes**

Reading the release notes of every version of Blue Prism from the currently installed version and up to the upgrade version will not only provide an overview of new functionality but vitally, will highlight any additional actions relating to the planned upgrade path. Some versions of Blue Prism require additional upgrade actions (such as an upgrade to Login Agent) and it is essential to be aware of any such steps in versions between the current version and the upgrade version. Particular attention should be paid to the upgrade notices.

6 Operational impact

The impact of an upgrade on the business should be defined and documented. Below are some key considerations. However, it should be noted that this is by no means a definitive list and there are many other factors which must be considered:

- Which processes are (most) business critical? Are any deemed high risk and require special attention?
- What will the BAU workload be during the upgrade? Are any peaks in demand imminent or likely?
- Can the business tolerate downtime during the upgrade? Which processes could survive some 'loss of service' and which must remain operational?
- Does the upgrade need to be performed during any particular time-window?

7 New functionality

An upgrade can be viewed as an ideal opportunity to incorporate new functionality into the current processes; indeed, this may be the main reason for the upgrade. By contrast, such changes may be viewed as a risk best avoided during the upgrade, and instead the normal Change Request path should be followed after the upgrade is complete.

8 Other changes

It is recommended that the amount of change introduced during a Blue Prism upgrade is kept to a minimum. Therefore, updates to Windows versions or application versions are not recommended at the same time as the Blue Prism version is being updated.

Apply an upgrade

Executing the upgrade is a relatively simple procedure and is described in the Release Notes of every version of Blue Prism. At a very high level, the steps are as follows.

1. Stop all activity.
2. Back up the database.
3. Stop BP Servers, Resource PCs and Clients.
4. Run the database upgrade script.
5. Apply the software update.
6. Restart BP Servers, Resource PCs and Clients.

Obviously if a completely new environment is to be created for the new version of Blue Prism, then the standard installation is followed, together with additional steps to migrate existing assets (connection details, credential keys, release packages etc) and replicate the system settings in the new environment.

If a hybrid approach is used, where an old database is migrated to a new infrastructure (new servers, clients and resources) then additional steps will be required to update any references to the old infrastructure. For example, unless they have been marked as retired, a database will not ‘know’ that it’s list of old resources PCs and clients are no longer part of the new environment. Similarly, maybe there are credentials named after old machines that need to be renamed.

High-level upgrade strategies

There are three general approaches to upgrading Blue Prism, each with advantages and disadvantages. No strategy is the best and the client must decide on the most appropriate choice. Regardless of the approach taken, there are steps common to each.

General procedure

1. Create a detailed plan that as well as activity sequence, priority and dependency, also consider:
   - Communication
   - Workload and business continuity
   - Process priority
   - Process dependency (e.g. shared objects)
   - Inflight delivery projects
   - Assistance from outside of the RPA delivery team (e.g. business SMEs, IT, security etc)
   - Rollback and DR
2. Obtain support and approval for the plan from stakeholders and participants
3. Execute the upgrade according to the chosen strategy – See specific strategy sections below
4. Regression test processes
   - Ideally start from the 'pre-Acceptance' test phase
   - Reuse existing test scripts
   - Focus on the object layer

In-place strategy

An in-place upgrade is where the new software simply replaces the old version. No changes are made to the environment, apart from any required by the new version of Blue Prism, for example an upgrade to the .Net framework. Essentially the idea is to simply upgrade Blue Prism and keep everything else.

The advantage of this approach is that infrastructure changes will be minimal, and the new version can be applied across an environment in one go. No data can be lost because the same database is being reused.

The main drawback is that such an 'all or nothing' approach carries risk: if there are issues during or after the upgrade then they must be fixed within the planned timeframe; a full rollback plan will be required in the event of serious problems.

Specific procedure

In addition to the common steps above, the following is a very high-level view of the in-place upgrade procedure:

1. Bring the environment to a complete stop
2. Back up the database and configuration files
3. Make any necessary infrastructure upgrades
4. Install the new version of Blue Prism and upgrade the database
5. Restart the environment
6. Test and confirm upgrade success (or execute roll back)

Obviously meticulous planning is key to avoiding problems and of course the Development, Test and Production (and maybe DR) environments don't have to be upgraded simultaneously. The plan can and should determine an advantageous, lowest-risk approach, perhaps by upgrading Development first, or maybe by creating a temporary sandbox environment in which to test the upgrade.

Migration strategy

The migration strategy is where a new environment is prepared with the upgrade version and releases are imported into it from the old environment.

The advantage of this approach is that the existing environment can remain active while the upgrade is taking place, and if there are any problems, a rollback is not urgent. The risk of a big-bang approach is not essential, and the migration into the new environment can be done progressively, so that the old environment is gradually wound down, process by process.

Cost and effort are the disadvantages to migrating: new infrastructure needs to be procured and set up; applications need to be installed and configured; parallel environments need to be managed, albeit temporarily; processes need to be moved. A migration needs additional planning to maintain service commitments made to the Business, and care is required not to lose or duplicate workload between the old and new environments.

Having a new, empty database is a great opportunity for a fresh start, provided the effort to replicate the configuration of the new Blue Prism instance to match the old one is accepted and planned for. In contrast, restarting with a new database presents the risk of leaving data behind in the old database and losing important information. The fact that historical data (such as audit trail, logs and queue results) and operational settings (such as credentials and multi-team environment folder restrictions) that cannot be transported between databases via release files may make the migration strategy less desirable.

Specific procedure

In addition to the common steps above, the following is a very high-level view of the migration upgrade procedure.

1. **Prepare the new environment**
   - Follow the same steps for a new installation.
   - Replicate original environmental and system settings.
   - Verify functionality of BP components, target applications, user access, networking, security etc.
2. **Migrate the first process**
   - Import the release file.
   - Manage the transition of workload between old and new environments.
3. **Regression test the first process**
   - Ideally start from the 'pre-Acceptance' test phase.
   - Reuse existing test scripts.
   - Focus on the object layer.
4. **Complete for all processes**
   - Repeat for all processes according to the planned sequence.

Special attention is needed to prepare and validate the packages that define the release contents. It's not uncommon for package definition and quality to have lapsed, and migration planning should factor in the effort to assess and maybe correct packages prior to export. Similarly, the influence dependencies of shared assets like business objects may have on the plan should be evaluated.

Migration can be viewed as a larger than normal change management exercise, so procedures need to be well defined and accurately followed. If the current approach to project implementation and change management is too casual, then it will almost certainly be inadequate for a successful upgrade.

Cloning strategy

Upgrading through cloning is where the current database is copied into a new environment and then upgraded with the new version of Blue Prism.

As with the in-place strategy, this approach has the advantage of not having to migrate and potentially miss or duplicate something - the whole database is copied, and nothing can be lost. That said, aged and possibly unwanted data is cloned too, and perhaps additional effort to archive and clean such data will be required.

Like the migration approach, the cloning strategy requires cost and effort to prepare a new environment, but this brings the same advantage of being able to keep the original environment operational during the upgrade. Controlling the transition of workload and maybe the progress of inflight projects between the Blue Prism versions is an additional overhead, but the as with migrating, it means the overall upgrade project can be done gradually, with the fallback of the old environment.

Specific procedure

1	**Deactivate the old environment** • Retire schedules and resources
2	**Prepare the new environment** • Follow the same steps for a new installation • Copy the database into the new environment • Verify functionality of BP components, target applications, user access, networking, security etc
3	**Reactivate the old environment** • Unretire schedules and resources
4	**Regression test first process** • Ideally start from the 'pre-Acceptance' test phase • Reuse existing test scripts • Focus on the object layer
5	**Complete for all processes** • Repeat for all processes according to the planned sequence.

The deactivation step above is to ensure that when the cloned database is brought online, the new application server(s) does not try to run schedules or contact resource PCs that don't exist in the new environment. This is particularly true if resources PCs are to be reused – care should be taken to ensure the old application server(s) does not try to contact resource PCs that have been connected to the new environment.

Strategy comparison

As mentioned above, no strategy is better than the others and all require careful planning, not just for execution but also for business continuity and communication, and for a possible roll back. The table below presents some of the key features of the three general strategies. Note however that some characteristics can be seen both as a positive or a negative, depending on your viewpoint.

Positives and negatives

+/-	Description	In-place	Migration	Cloning
+	**Advantage of a gradual transition to the new version**	No	Yes	Yes
+	**The original environment can remain operational during the upgrade**	No	Yes	Yes
+	**Advantage of a clean start**	No	Yes	No
+	**All data is preserved**	Yes	No	Yes
+	**Data such as audit trail and queue history available in upgraded environment**	Yes	No	Yes
-	**‘All or nothing’ or ‘big bang’ approach**	Yes	No	No
-	**Very high dependency on rollback and business continuity planning**	Yes	No	No
-	**Cost and effort to create new environment**	No	Yes	Yes
-	**Risk of failing to replicate original BP system settings**	No	Yes	No
-	**Risk that applications in new environment will not perform as expected**	No	Yes	Yes
-	**Risk of working cases twice or losing cases between environments**	No	Yes	Yes
-	**Effort required to verify packages and prepare release files**	No	Yes	No
-	**Downtime is required to perform the upgrade**	Yes	No	Yes

Blue Prism server upgrade considerations

The high-level strategies discussed above deliberately make no mention of an application server and how Blue Prism clients and resource PCs should connect to a sandbox database. This is because running an upgraded version of BP Server requires a new application server, as different versions of BP Server cannot co-exist on the same machine.

It is possible that the same application server is currently running multiple instances of BP Sever in parallel, perhaps Dev and Test together, or even Dev, Test and Prod instances. In these situations, the upgrade cannot be partially applied to individual instances, all instances will be affected by an upgrade.

If an existing DR environment is to be used as a temporary sandbox, then the infrastructure already exists, and the DR application server can be upgraded. Similarly, if another application server is available, then it could be used to run the upgraded version of BP Server.

However, if an additional application server is not available, then a decision must be made on how to connect the sandbox clients and resource machines to the sandbox database. There are two options: firstly, to make one of the resource machines multi-purpose, have it run an instance of BP Server and connect all other sandbox machines through it; or secondly, to connect all machines directly to the sandbox database. Note that BP Server runs the scheduling, so when all machines use a direct database connection, the scheduler will not function.

Process regression testing

Regression testing is not so much the testing of process logic but rather the interaction with target systems and services, ensuring that the data and process flows are preserved.

The testing of production processes should follow the existing test approach, starting from the pre-acceptance phase, in attended mode and ideally using live data. The test scripts originally used to deliver the processes into production should be used as templates for regression testing scripts.

> Any inflight projects currently in the acceptance phase for the current version of Blue Prism should, in the new version, revert to the previous attended test phase.

1 What is the effort required?

The following factors should be considered:

- How many processes/objects are there in production?
- Is there test documentation or test scripts from the delivery projects for these processes that can reused? Where they exist, it is recommended to make use of these tests.
- What are the success criteria? Does this need to be altered for upgrade?
- Following a comprehensive testing methodology typically used during a delivery project is probably excessive. Can an upgrade-relevant approach and success criteria be defined? Reduced effort can be achieved by shortening phases spent with attended and unattended testing.
- What changes are being introduced that will impact the volume and thoroughness of the required testing? Such as:
  - Will the target applications be different?
  - Will the operating system change?
  - Will a different web browser be used?

2 What are the environment (as opposed to process-specific) functions to be tested?

It might be suitable to create a test package made up of a pre-determined selection of processes/objects with the aim of verifying the environment operates as it did pre-upgrade, building confidence that accelerated testing/deployment of the remaining processes can happen.

This package should contain a subset of processes/objects that touch all of the required systems and perform most/all the common interactions such as:

- Different spying methods, for example: Java, HTML, UIA, Win32, Mainframe, Modern Browser.
- Accessing shared drives.
- API calls.
- Web services.
- Utility objects.
- Credential calls.
- Launching and attaching to all target systems.
- Resolution checks/surface automation image comparisons.

3	**What can be chosen as success criteria?** • Create a baseline which constitutes an inventory of current exception/terminations rates to confirm upgrade is performing as it did before. • Terminations and exceptions probably happen pre-upgrade, if so, how often? This will need to be compared with post-upgrade to do a fair comparison.
4	**Have subject matter experts (SMEs) been identified to help facilitate the testing?** SMEs need to confirm things such as (this will vary from process to process): • Exceptions/referrals are communicated via the same/acceptable method. • Timings/frequencies of interactions with the robots remains the same/acceptable. • Are SLAs still being met?
5	**What areas in the object layer should be tested?** From a hands-on developer perspective, focus should generally be on the objects rather than processes since these are the parts that touch the target applications. Business process logic is likely going to be the same post-upgrade so focus should be on: • Launching and attaching to the target applications. • Highlighting application elements. • Interactions such as Global Mouse Click and Global Send Keys. • Any surface automation involving image-based regions/image searches – colors/resolutions may differ. • Timings on wait stages – these may need to be adjusted to suit new environments. • Process/object errors – these could indicate items like environment variables, credentials or utility objects have not been imported. • Ensure the correct versions of utility objects are being used. Besides the Internal objects, objects are not automatically upgraded as part of a Blue Prism upgrade – the new utility objects need to be imported if these are required. It is recommended to continue using/testing with the previously used objects and treat using newer versions as a separate process change.
6	**Have the developers & testers been identified?** • Ideally the developer will have prior knowledge of the process/objects. This will facilitate smoother testing. • Does design documentation exist? This can aid testing with a better understanding of the size and workings of the solution. • A Business Object Library is useful to help understand the depth of the objects to see which objects and actions. Dependencies can also be checked to help here.
7	**How will fixes be implemented?** It is necessary to define a procedure to be followed if an issue is found: • Will a fix on fail approach be used, or should the process/object be demoted to a lower environment to replicate the issue and make a change? • Will solutions need to be pointed to production systems to perform testing or can test systems be used?

8	**Has anything else besides the version of Blue Prism been changed as part of the upgrade project?** It is recommended to avoid making changes to the configuration or version of business applications in the scope of the upgrade project. These should stay constant if possible: • Business applications versions • OS version • Browser version If any of these things have changed special consideration should be made during upgrade regression testing planning.
9	**Are standard VBOs used?** • Remember that new versions of Blue Prism contain new versions of the utility objects in the VBO folder. • It is recommended that the same ones currently used continue to be used - using the new VBOs counts as a change.
10	**For each process, is it known what the correct result is for the given input data?** It's important to ensure the correct result is known in order to determine the result of the testing. If not, it may be necessary to execute the tests twice. (The project schedule may have to be adjusted to accommodate this): • First, with no modification to the current environment to obtain the golden output result. • Then, a second time on the upgraded environment. The output result is to be compared to the first output result to ensure that the Blue Prism version upgrade had not caused any regression.

Encryption and upgrades

Encryption keys are used to secure data such as credentials, and the same keys must be used across all environments to allow encryption and decryption to function in the same way in each environment. The same is true for an upgrade – keys must be replicated in the upgraded environment, otherwise all data will need to be re-encrypted. For example, with credentials this is likely to mean manually entering all passwords again.

FIPS Compliance

As of v6.6 and above, Blue Prism can be deployed on devices that enforce Federal Information Processing Standards (FIPS) compliant algorithms. Changes were made to ensure that Blue Prism adheres to the required standards for FIPS, and these changes should be considered when upgrading to v6.6 or later. Details can be found on the Blue Prism portal and in the product release notes.

Upgrade contingency and rollback

Unforeseen issues may arise during a product upgrade that necessitate a rollback or ‘back out’ scenario. For this reason, a detailed rollback plan should be produced during any upgrade project to accompany the upgrade plan.

Operational contingency planning should also form part of an upgrade, to consider how the business will cope during any unexpected downtime. The criticality of processes should be assessed and factored into contingency plans together with any manual failover actions.

Longer-term contingency planning and how any issues encountered post-upgrade will be resolved must also be considered. If for example, exception rates for a process have inexplicably increased after the upgrade, a decision must be made on how to progress. Will issues be ‘fixed on fail’, or will the process be taken offline and manual intervention requested from the business? Can the workload be temporarily diverted back to the old environment instead? The procedure to address such situations must be considered, documented and agreed as part of the overall upgrade plan.