




Automation in environment management: A wellspring of efficiency



Abstract

Agility is the key for the IT function in an organization to be able to respond quickly to changing business conditions. With IT infrastructure becoming ever more complex, it is increasingly difficult to manage given the complex dependencies involved and manual intervention required. In this challenging scenario, managing non-production environments (NPE) has always been secondary for most organizations. There are several reasons for this including the lack of specialized skills in test environment management, Agile-based delivery, multiple vendors to manage such environments, complexity in architecture, and the sheer volume and variety of demands.

It should come as no surprise that the unorganized and ad-hoc management of NPEs invariably increases operational costs for organizations. Efficient and effective management of non-production environments driven by structured automation can deliver significant benefits along with substantial cost savings. It also increases availability of applications while speeding up the response to business and IT needs.



Non-production environments

Organizations with complex mission critical applications face multiple challenges in managing computing environments. With the rise of agile development methods, it is critical to build and test computing environments quickly in order to support rapid delivery timelines and maintain quality.

A non-production environment (NPE) is one that is created to functionally mirror production or future production environments. Typically, this sub-set covers development (Dev), system integration testing (SIT), and Pre-production or Staging environments.

NPEs are inherently different from production environments due to their usage and relevance. These environments need to be set up to accommodate back-up, non-functional criteria and restore procedures, and should be able to manage multiple versions of test data sets. Additionally, NPEs must accommodate uptrends and downtrends linked with test data sets, testing tools, stubs, drivers, and data generation tools.

With the applications and infrastructure landscape becoming more complex, the challenges of managing computing environments including planning, provisioning, configuration, deployment, and testing have multiplied. Despite the efficiency gains that QA teams achieve through improvement initiatives like automation and centralization, IT still tends to lose around 20% of productive testing time due to inefficient environment management.

Maintaining the infrastructure for the highly complex and rapidly changing configuration requirements of NPEs – in contrast with the stable and consistent production environments – requires considerable effort. Even minor changes to device drivers or a new patch update for an application require extensive testing. Even so, managing configuration changes between development, test and production systems can introduce unforeseen problems. Provisioning environments (which includes configuring) can take several weeks and sometimes months, causing delays in the release of new functionalities for business. Controlling the impact of environment defects has become a major concern for QA teams. For IT departments the key challenges lie in curtailing infrastructure expenses and managing inventory in complex computing environments.

So, how do organizations address these challenges?

NPE optimization can be achieved through various initiatives like Process & Governance, Technology & Infrastructure Rationalization, and Demand Management. The focus of this white paper is on enhancement through automation.

Automation in NPEs

With diverse and ever-changing business requirements, the IT function is fast moving from the traditional software development lifecycle (SDLC) to agile methodology that demands continuous releases and deployments with stable NPEs.

Deployment of a new application or releasing new services requires a rigorous process to be followed before the actual release.

Typically, the release management process is complex and time-consuming. It can take weeks or even months to move applications through the process from initial integration and testing to production. Even if applications can be provisioned using specific templates, infrastructure is usually provisioned manually.

This kind of manual intervention in managing the environment lifecycle is no longer sustainable, given the complexity of the overall IT environment and the pressure to release services to meet business needs and avoid market delays. Leveraging automation can empower IT to drastically reduce the time to release new services while ensuring compliance and standardization.

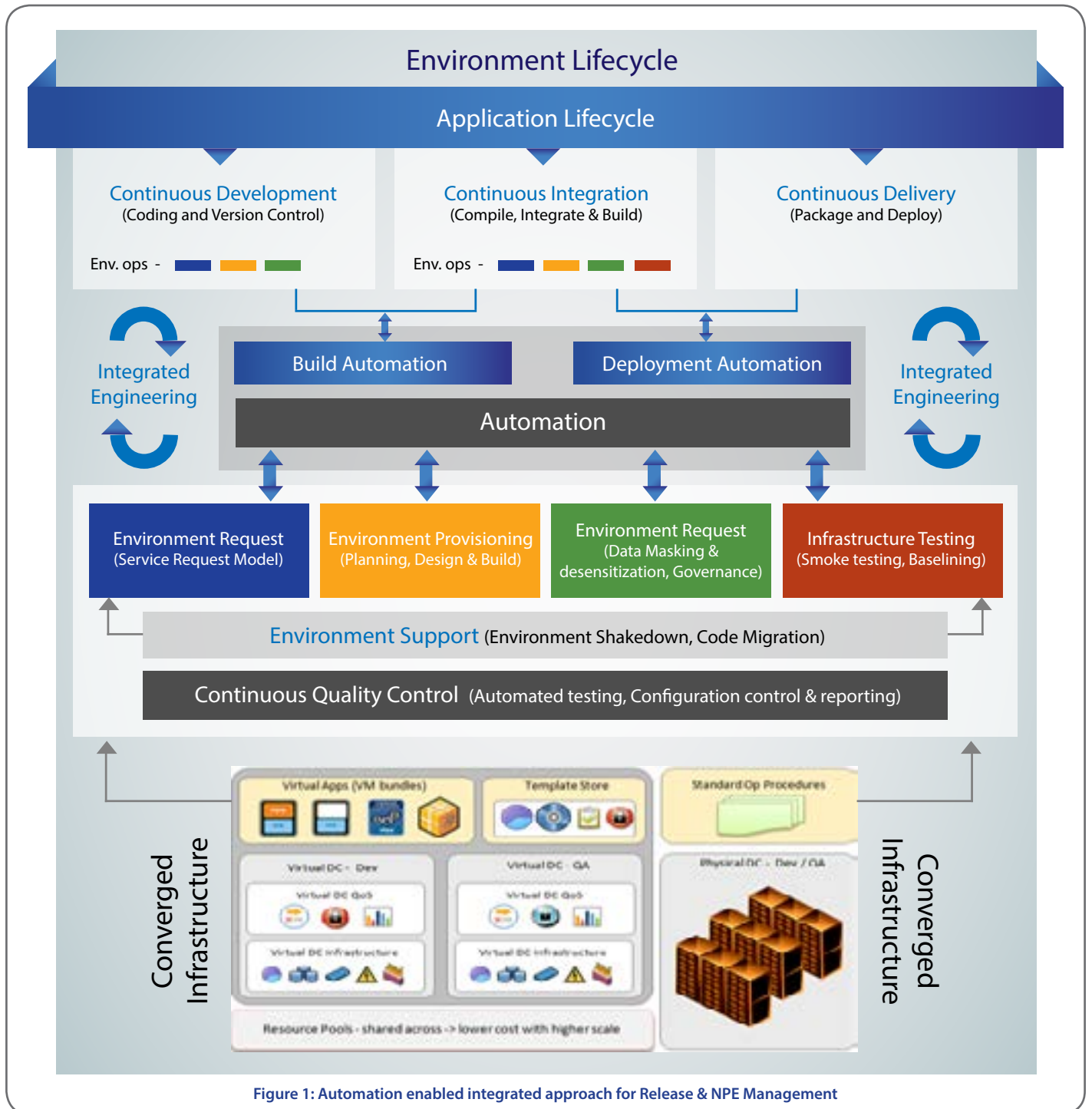


Figure 1: Automation enabled integrated approach for Release & NPE Management

A focused approach toward automation can reduce the dependencies involved in manual infrastructure provisioning. The result is a consistent and non-contentious environment that can be rapidly provisioned to the exact design and configuration specifications.

But how does one go about automation? And where does one start?

The following activities can help answer these questions and are critical success factors:

- Environment provisioning, configuration, testing, deployment and operational management
- Test data management and related compliance requirements
- Proactive monitoring of environment and self-healing for repeat incidents

- Configuration management with auto-discovery for environment asset management and licensing
- Patching and upgrade of infrastructure components compliant with enterprise policies

Though the approach to automation will likely vary across organizations, it basically involves a combination of pre-configured tools and scripts supporting the entire environment management lifecycle.

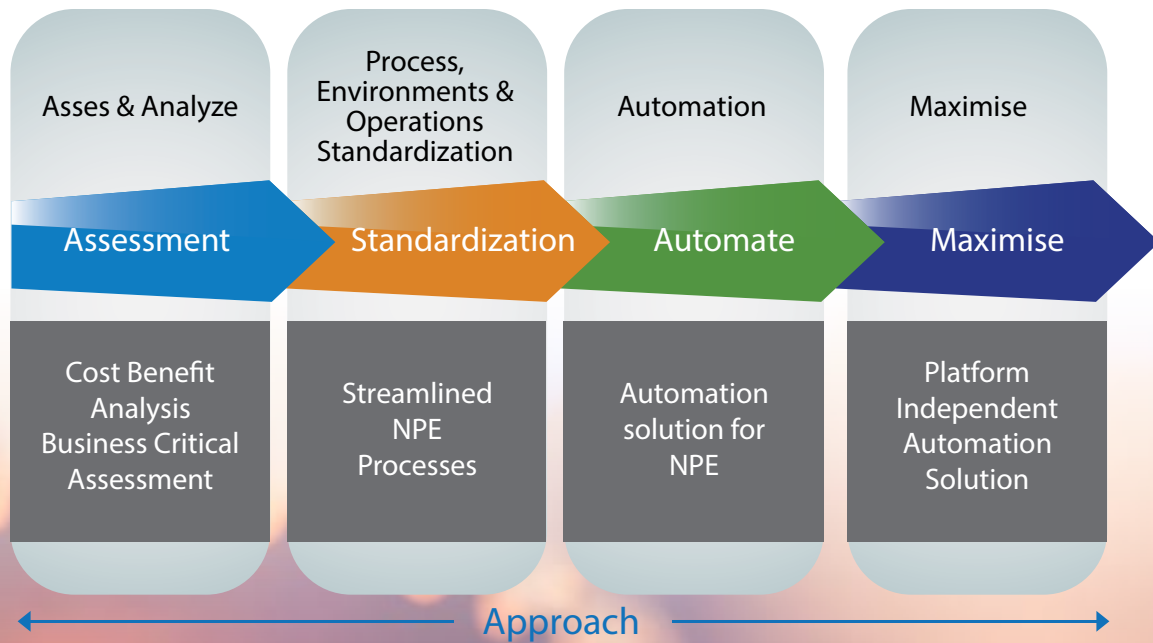


Figure 2: Best Practices of Automation Delivering Substantial Benefits at Each Milestone

The following steps must be taken while automating critical activities:

Step 1: Detailed assessment

This involves a thorough assessment of current non-production environment capabilities and benchmarking against industry standards. Activities repetitive in nature and time-consuming are identified and prioritized based on the criticality and expected benefits.

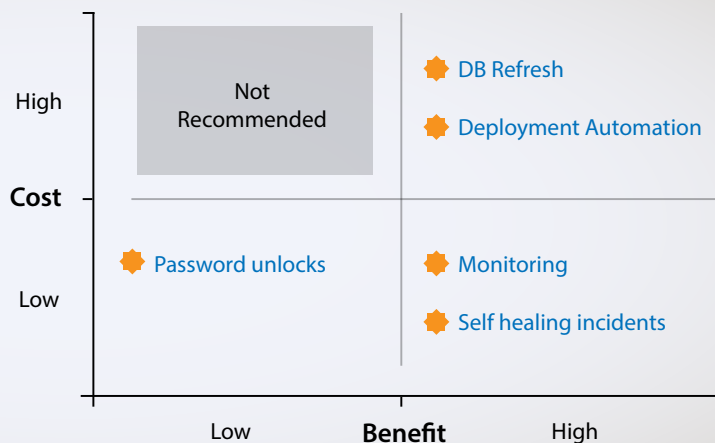


Figure 3: Cost Benefit Analysis Index

Step 2: Standardization of process, environments and operations

A key success factor for automation is the standardization of environment lifecycle processes. Based on the details gathered through assessment activities, processes and infrastructure can be streamlined and standardized.

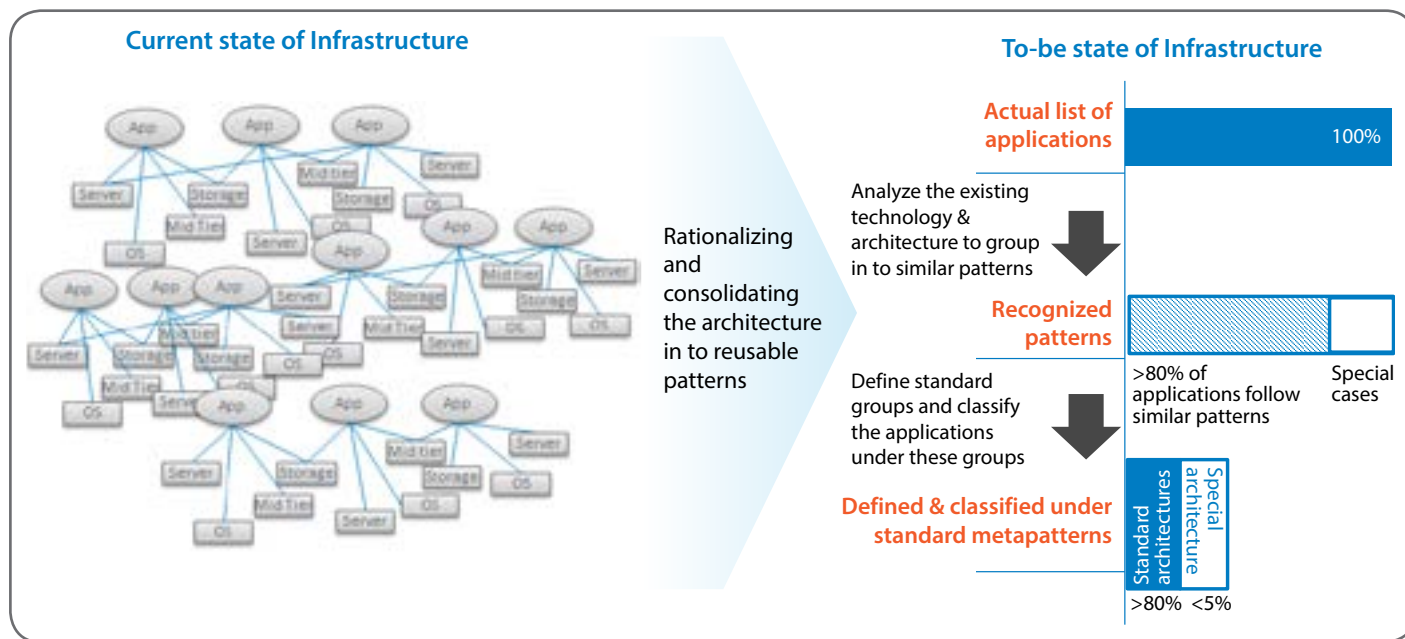


Figure 4: Standardization & Simplification Approach

Step 3: Automate

Once the initial standardization is done, all the inputs, outputs, check points, and failure points in the tasks identified are captured. These are then categorized as candidates for localized or centralized automation.

- Localized automation involves automation limited to specific components.

For example, automated task for database refresh, automated patching for Windows/Linux servers, etc.

- Centralized automation includes orchestration and integration of various systems in the environment. For example, orchestration of ticketing tool with deployment tool for standard operating procedures

There are a number of tools available to support and enable automation. However, it is important to complete the configuration and conduct adequate testing before deployment.

Step 4: Enhance

A robust automation script /workflow management source would lead to reusability of these scripts. Acting as a differentiator to develop a 'fit for purpose' automation solution.

Increase efficiency, reduce effort

Automation is the key that enables organizations to streamline repetitive activities and drastically reduce operational efforts. In a non-production environment, automation can bring about watershed changes and free up resources for deployment in other critical activities. In a nutshell, automation ensures:

30-40%

Reduction in time-to-market by improved provisioning cycle time

30-40%

Reduced cost of operations

Reduction in manual health check effort by up to

50%

20-30%

Enhanced Environment Efficiency through 30% reduction in IT Service Request Fulfillment

IMPACT

- Zero-tolerance with respect to contentious environments
- Risk minimization through better compliance with regulatory requirements
- Consistent and accurate environments through automated configuration updates across environments
- Self-healing and proactive resolution of quality-related issues
- Optimum utilization of infrastructure assets through better license management
- Availability of environments in "as-a-service" model
- Elimination of errors due to manual interventions and delays stemming from dependencies
- Effective masking of test data that caters to the requirements while maintaining security

Conclusion

Organizations, in their endeavor to manage complex environments, often struggle with intricate dependencies and manual intervention. Automation of environments, especially non-production ones, can yield significant gains in the form of standardization, less time taken to provision resources, optimal utilization of assets, and elimination of errors.

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