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Standardize & Manage Test Environments

Ensure Higher Test Coverage and De-Risk Testing from Test Environmental Bottlenecks

Testing Services | Wipro Technologies

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Need for Standardizing & Efficiently Managing Test Environments

Many organizations establish and maintain test environments to enable smooth and on time completion of projects. However, managing these test environments efficiently and consistently across the software test life cycle is complex, costly and time consuming. Recent surveys have shown that up to 40% of a tester's time can be consumed by test environment issues; thereby affecting quality and productivity.

This paper describes the key challenges faced in today's test environments and why a standardized test environment management service is required to optimize activities at an enterprise level.

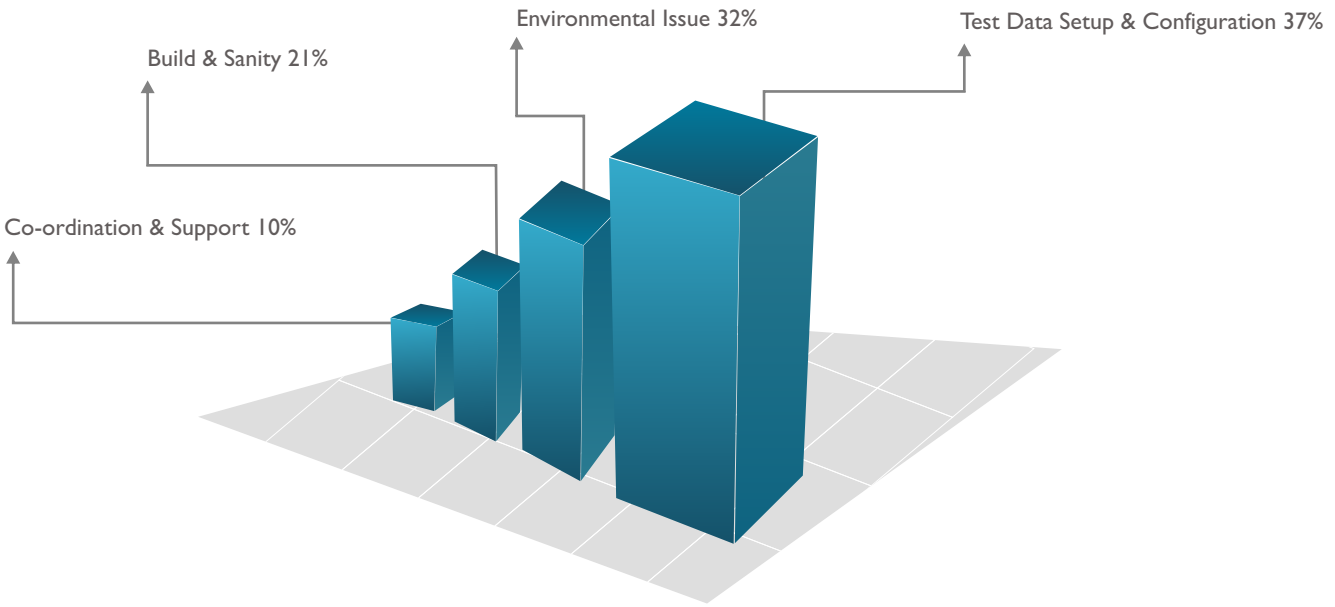
Why Standardize Test Environments?

Though virtualization is used for creating test environment assets, most organizations, for various reasons, still rely on multiple physical test environments and assets for their testing. If an existing test environment's capacity is not exploited, it will result both in cost overruns and operational issues. If different project teams contend for the same set of resources at the same time, this could lead to internal conflicts and logistical challenges as well.

Test environment services should therefore be systematic in approach to enable enterprise class delivery.

Key challenges to manage test environments efficiently are:

- On time test environment provisioning - setting up the test environment as per specifications and then re-using or decommissioning the same for other projects (challenging and error prone due to heterogeneous technologies and diversified skill sets)



Average Effort Distribution of a Test Environment Team

- Consolidation and effective utilization of test environment assets (physical, virtualized, public cloud or mix of asset types)
- Environment bookings, resource sharing and managing multiple configurations
- Demand forecasting and capacity planning
- Test environment support and managing incidents
- Standardization and test environment availability
- Governing and accountability of the test environments at an enterprise level
- Test data management, cleaning and refreshing test environments

To increase accountability and reduce the burden on cost and operations, organizations are advised to standardize their test environments. This is often offered as a managed service called - Test Environment Management Service (TEMS).

How to Standardize & Manage Test Environments?

Establish a dedicated Test Environment Management Service (TEMS) Team

Most test environment activities are hidden or distributed under testing, infrastructure and development teams. To bring more clarity on cost, utilization and ownership there is need for a dedicated Test Environment Management Service (TEMS). The key activities of the TEMS are:

1. Robust Program Governance

As part of the TEMS, a centralized program governance team will implement a 'Planning-Steering-Review' mechanism and maintain standards for all test environments at enterprise level.

Key activities of the program governance will be:

- Plan, Steer and Review the SLA
- Standardization of the service across all test environments at organization level
- Demand forecasting and capacity planning
- Implementation of best practices
- Delivery by automated tools

An efficient TEMS should have a robust compliance mechanism to closely monitor and act as single point of contact for all stakeholders and test assets.

2. Seamless Test Environment Support

Test environments encapsulate heterogeneous platforms and huge application stacks, which are capital intensive and require constant monitoring.

The test environment support team, in an efficiently managed environmental setup will ensure hassle free operations and support for smooth execution and on time project delivery. This is an effective way to de-risk projects with issues and ensures an optimum and dynamic test environment.

The key responsibility areas (KRA) of the test environment support team will be to:

- Orchestrate end to end test environment service and improve resolution time
- Provide quicker resolution through a centralized knowledge base management
- Increase coordination between all stakeholders through a single window system
- Improve management and control of the environment
- Streamline internal and external operations and process consistency
- Decrease time to environment creation, coordinating with multiple stakeholders
- Improve assets utilization by effective tracking and monitoring
- Increase environment uptime through an 'intelligent support' mechanism
- Historic data maintenance for analysis purpose
- Increases internal productivity and quality of communication

The key sub-activities of the test environment support team are described below in brief:

Environment Booking - This service checks the availability of the test environment based on requirements, release cycle and reservation.

The key activities of the service are:

- Environment booking
- Conflict resolution
- Environment sharing
- Resource reservation dashboard

Conflicts occur when more than one project contend for the same asset or environment at the same time. The usual approach is to figure out ways of sharing the environment so that multiple projects can co-exist. In addition to sharing the environment- there are a range of methods of eliminating sources of conflict during the initial stage:

- **Pro-active dashboard distribution:** will provide information on when environments are booked, ready to be booked and free. Such proactive measures help in minimizing conflict and determining a resolution.
- **Analysis:** The test environment support team should identify resources where the demand is more but application instances are less. Proactively co-relating this data with similar projects will help manage the requests in a fashion that will reduce conflicts and delays.

- **Environment Refresh:** identify un-utilized environments; initiate refresh activity and move resources to the ready state, so that a new request can be accommodated

Centralized Inventory Database - It is the process of documenting and classifying test environment assets by providing unique identifier to track changes and identify asset locations. The centralized test assets inventory is the key input for test environment team to resolve most of test environment related issues.

Test Environment Maps - Test environment maps contain application stacks, device pools, tool processes and methodologies. The test environment support team can use this as a key reference to manage the test environments effectively.

Provision Tracking - Setting-up of the test environment as per specifications and then re-using or decommissioning the same environment for other projects is a challenging activity. Parameters like a thorough understanding of the environment landscape; interactions with other teams and coordination skills are key enablers to ensure on time provision fulfillment. This service performs daily sanity testing, smoke tests and checks the availability of the system after the provisioning

Deployments Monitoring & Version Validations - This service monitors the code deployment window and broadcast application/environment outage information to all stakeholders. The test environment team follows-up on approvals and provides proactive information on environment outages. It also monitors version validations to ensure that all relevant information is up to date and detailed in the release notes document.

Support to the Test Execution Team - Scalability and flexibility are two important aspects that a test environment should possess. Scalability refers to the ability to handle additional workloads, without affecting the test environment's availability by adding more support resources. This is useful during peak test execution time. Flexibility refers to the ability of the test environment team to support testing team at different timings during test execution. The program governance team assesses the demand and controls the teams' ramp up / ramp down.

Incident Tracking - The incident management team assigns issues to the right team and provides status updates.

Test Environment Availability - Non-availability of the environment will have a direct impact on test execution, coverage and time lines. To minimize this impact the test environment support team coordinates and supports all issues that disrupt the availability of the test environment through daily checks and monitoring. The test environment team coordinates with various teams - infrastructure, development, business & QA, and takes ownership of test environment availability.

Test Data Management - This service is responsible for generating test data as per steps defined by the component team and provides requirement collection and test data for execution.

Key activities of this service are:

- Cleaning and refresh of test data
- Collect test data requirements
- Plan, design and generate test data
- Distribute test data as per test requirements
- Reports and Dashboards

Reports and Dashboards - Provides detailed test environment reports to all stakeholders based on the roles allocated. This helps in getting a comprehensive view of the test environments and enables further analysis.

Conclusion

A dedicated Test Environment Management Service (TEMS) will be a huge benefit in today's dynamic world where businesses demand faster test execution of large scale and multiple releases of along with seamless support and management.

Direct benefits of TEMS include:

- Single point of contact and complete accountability for all test environment operations
- Reduced cycle time, operations cost and manual dependency by implementing test environment management tools
- Standardization of the test environment by implementing best practices
- Effective utilization of test environment assets and reduced infrastructure cost
- Faster go-to-market by assuring on time test environment availability

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About the Author

Peri Narasimha works at Wipro Technologies as a Solution Architect for the Test Environment Service. A postgraduate in Computer Science with 12 years of IT experience, Peri has led and executed many integrated and testing projects for different customers in the Telecom and Insurance sector. He has also defined best practices and standardized test environment activities at the enterprise level.

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