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EXPECTATIONS - DELIVERED LIKE CLOCKWORK

Wipro's Application Performance Management derives optimal performance from application ensuring performance that meets user expectations.

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Abstract

Applications are the foundation of successful enterprises today. They enable day-to-day operations. The arrival of Mobility, Cloud, Social, Big Data and Analytics have made IT environments complex. Parallel to this, they have pushed up user expectations. Things have not been made easier by the fact that today's IT environments straddle a vast variety of applications, infrastructure, devices and networks governed by complex business rules and dependencies. When application performance degrades, it becomes difficult to identify the issue and rectify the problem promptly. This results in operational disruptions, bottom line impact, and poor user experience that can damage customer confidence.This paper discusses Application Performance Management (APM). It examines areas that organizations must focus on to detect problem areas and rectify them in a timely manner to ensure availability and quality so that user expectations are met.

Technology and evolving customer demands

With cheap and pervasive connectivity, consumers have all the information they need – literally – at the tips of their fingers. A touch of a device can produce facts, figures, opinions and complete entire transactions.

Armed with information and choice, the customer is truly 'King'. Businesses are being forced to compete with each other and satisfy the customer's heightened expectations and demands. These offerings include:

- Better value
- Consistent performance
- Competitive pricing
- Faster delivery

In order to ensure great customer experience, CIOs must ensure they stay connected to the customer. But technologies such as Mobility, Cloud, Social, Big Data, Analytics and architectural innovations are adding to the complexity of the IT environment. The CIO must deal with rapidly proliferating integration points. Each point also becomes a potential source of failure, posing a threat to service efficiency and customer relationships. The question, then, before CIOs is straightforward: "With increasingly complex IT and the demand for improved functionality, how do I satisfy spiraling business and customer needs?" The answer lies in going back to first principles: the CIO must ensure that applications that brought business success continue to do so.

Customer demands driving need for IT improvements in service enhancement

Delivery of IT services now spans cloud, mobile and legacy systems. Spliced between each of these layers are business rules, policies, regulatory needs, dependencies, local / geo-specific processes, ad hoc innovation, partner environments, security limitations and incongruous technology stacks that create unpredictable bottlenecks. But the business and end user doesn't really care about the complexity. They expect their applications to perform in a consistent and predictable manner whenever they access the application. Even more severe on the CIO is the fact that users expect applications, now liberally scattered across the modern IT estate, to perform in the same way as the applications they use for personal tasks.

The IT delivery function has failed to address these demands of the end user. This cannot continue if businesses, so dependent on applications, are to succeed. That is one reason why APM is slated to become the #1 Priority of IT in 2015. If your organization does not have some form of APM it could be in serious trouble. Monitoring and managing application performance in a strategic and structured manner should be the clear mandate for every organization focused on improving customer experience.

However, IT views APM as a technological challenge to ensure application availability. However, the end-goal is to service customers. What this actually implies is an understanding and interpretation of customer needs and ensuring that APM helps meet these needs and keep customers happy.

What is APM? What can it do for businesses?

APM is a method to uncover the real value of an application and measure if the application is delivering that value. APM captures data on application usage (frequency, time of access, access device, type of user, functionality used etc.), availability, cost of maintenance, interdependency on other applications and ability to complete user requests in a satisfactory manner. Analyzing this data helps improve the way an application is delivered and functions. The outcome of good APM is improved business impact and higher user satisfaction.

Fundamentally, APM shifts the focus of IT from ensuring that an application is available to ensuring it provides predictable business benefit in a changing environment and continues to deliver great user experience. In other words, APM establishes a link between IT and business – something that has been missing thus far. APM provides:

- A holistic view of application health across the delivery chain
- Helps understand as-is end user experience and helps capture and define should-be experience
- Improved application availability
- A root cause analysis of events and trends to take preventive action against future failures
- A dashboard for management that shows application availability and performance

APM uses a variety of tools to enhance end user experience. These tools:

- Measure end user response time
- Identify performance bottlenecks beyond the data center and outside the organization
- Identify issues during the User Acceptance Testing (UAT) phase through real end users (rather than in a simulated environment that is ideal)
- Correlate business performance as a derivative of systems and end users across regions
- Track issues across complex integration points inside and outside the organization
- Establish business SLAs for IT
- Enable better decision making through dashboards for management
- Determine type of end user (BYOD, desktop, wearable)

APM and its reach

APM focuses on the first mile to the last mile as a user interacts with an application, right across the application delivery chain, and measures application performance at each stage (see Figure 1).

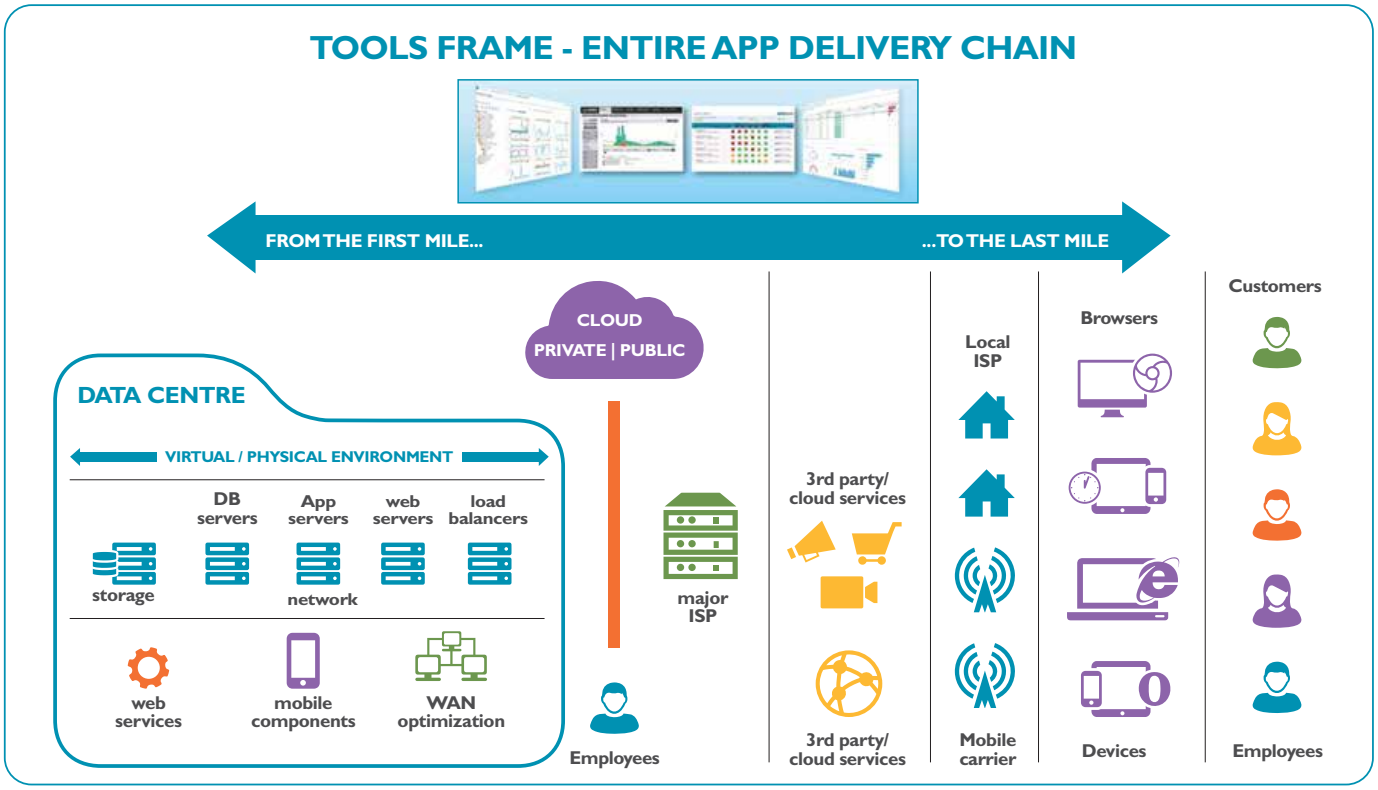

Figure 1: APM cuts across the entire IT system landscape to deliver optimal performance

APM needs to take into consideration a variety of technology layers as it cuts across the IT landscape. This could include devices in use to access the application (desktop, laptop, PDA, smartphone, tablet, handheld, wearable), a variety of networks over which the application is accessed and over which the application accesses data (routers, gateways, wiring, Internet backbone, mobile networks, WiFi, LAN, WAN, Bluetooth, NFC, etc.), firewalls, protocols (TCP/IP, DHCP, SMTP, HTTP, DDNS, UPNP, PPPoP, FTP, DNS, ARP, RARP, and ICMP), cloud environments (such as SaaS, HaaS and PaaS), servers (web, application, database) and platforms (.Net, Java, PHP).

Businesses and their need for APM

APM is important for any business that addresses customers, regardless of the fact that they are internal or external. This means it is critical to B2C and B2B organizations. Both types of organizations must bear in mind that APM must meet the demands of scalability and availability which are essential to maintain competitiveness.

It is therefore necessary to understand that APM can reveal areas for improvement in the performance of applications. Some examples are:

- Identifying which applications and application transactions have maximum users.
- Measuring end user response time accurately & helps identify the presence of a genuine problem.
- Isolating issues related to a single region/desktop/across region.
- Establishing time taken for each transaction process and potential scope for improvement.
- Demarcating the extent of issues faced due to technology layer restrictions, by the end user, network, and DC; and within DC the application server, database, and middleware.
- Highlighting technology areas that act as bottlenecks in the process, by isolating the particular domain or underlying technology that is causing the issue. The tool can accurately pinpoint a problem area from a multiple technology stack.

- Isolating the application code, module or line to identify the segment that is consuming excessive resources and affecting the process.

While APM upside is significant, it has its limitations:

- APM can help identify problems -- however, to arrive at solutions operating teams must use their knowledge and experience of technology and business.
- Output quality will depend on input quality. If data entered is incorrect, the output too will not be reliable. Hence teams that understand both business and IT should handle APM.
- APM cannot read through the code of certain applications that do not expose their code or internal protocols

But the more critical aspect about applications is user expectations. Today, an increasing number of services are going online and are always available – these include email services, digital storage, online shopping, bank accounts and utilities. Users expect these services to be highly responsive. They don't want to wait for anything. Emails must open instantly, financial transactions must be completed in seconds, files must be uploaded to cloud storage services without a hitch, and medical records must be accessible at all times and so on.

Availability and speed have become so critical that an Amazon study shows that a 100 millisecond improvement in web site page load times can lead to a 1% increase in revenue. Google/Double Click have found that click through rates increased by 12% on advertisements that were 1.5% faster. Users have the same expectations from their enterprise applications.

Choosing the APM solution appropriate for the process

How can enterprise applications demonstrate the same traits that users have come to expect from their personal applications? This is where the selection of an appropriate APM solution requires a thorough study of the business and its processes. The decision making process involves six phases (see Figure 2: Giving Your APM Decision-Making the Right Direction).

Giving Your APM Decision-Making the Right Direction

1. **Define business objectives** - improving revenue, resources consumed, cost of downtime, reducing failed transactions, etc.
2. **Define technical objectives to meet business needs** - increase throughput, automation, application availability, improved SLA, etc.
3. **Mapping APM to business objectives**
4. **Understanding APM in the organization's technology fitment:** Implementation and support capabilities
5. **Understanding APM capability and scalability**
6. **Understanding pricing options**

Once the first two critical phases are defined, we suggest adopting this framework to arrive at a score for each of the phases from 3 to 6 as follows -

- Mapping ATM to business objectives: 20%
- Understanding APM in the organization's technological fitment: 30%
- Understanding APM capability and scalability: 25%
- Understanding pricing options: 25%

Figure 2

Four of the six phases have assigned scores (see Figure 2 for details of scoring). The final tally can help decide on the appropriate APM to adopt. For example, if the focus of an organization is on deep diagnostics and end user response monitoring for intranet users, the process will most likely go through the following steps:

- Technology Mapping to Objective: Define the users that need performance tracking and detailed diagnostics. Does the user require deep dive diagnostics and end user response monitoring or both? This is crucial as some tools have restrictions of the number of diagnostics applicable.
- Tool Capability and Scalability: Run checks across applications to establish the purpose of the deep dive and the level of granularity required for the target users. Follow up with tests of compatibility and explore the potential for scalability in the future and limitations, if any.
- Implementation and Support Capability: Accurate evaluation of these capabilities is essential before customizing the product to suit the user.
- Pricing: Run a cost-benefit analysis before starting the exercise, keeping in mind the long-term benefits of the exercise. Such an approach can provide an analysis at each appropriate level and will address the requirements of multiple stakeholders (see Table 1: Stakeholders benefitting from the APM process at different levels).

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Key Outputs	COO **	CIO	Regional Business Heads	Senior IT Mgmt	IT Support & Operations
Business Dashboards	Y	Y	Y	Y	
End User Response Management		Y	Y	Y	Y
Deep Dive Diagnostics				Y	Y
Change Management Assessment		Y		Y	Y
Measure Business SLA	Y	Y	Y	Y	Y
Ability To Check Trends And Capacity		Y		Y	Y
IT Scalability As Per Business	Y	Y		Y	

Table 1: Stakeholders benefitting from the APM process at different levels
** in some cases, 1st might be a CEO or CFO depending upon the multiple responsibilities undertaken

Business benefits of APM

APM benefits businesses with traditional IT systems in several other ways. It enhances quality, speed, and effectiveness of the systems, optimizing the technology-sunk costs of the organization. It also overcomes limitations of traditional IT through improved scalability and configuration management, expanding reach through IT level performance cutting across technology layers, change management, and systems availability. Some of the additional benefits of APM are:

- Ability to simulate live business scenarios
- Ability to relate business performance as a derivative of systems and end users across regions
- Ability to track complex issues across the organization
- Ability to manage increased IT complexity as integration points proliferate
- Ability to create and meet business SLAs through IT systems

Conclusion

APM can be used as a tool in web applications to enhance the quality of services through close monitoring and management of processes. Service quality is a crucial factor in meeting the needs of end users. Choosing the right APM can increase the efficiency, reliability, and responsiveness of services, providing businesses with the edge needed to stay ahead of competition. However, we also need to exercise care during the process.The use of a structured approach to weigh the various options and arrive at an informed decision can help ensure success.

Author Profile

Lini B. Karanath – Head Application and DB Practice in Wipro Ltd. Lini is responsible for Application and DB Practice in India, ME and KSA business. She has around 15 years of experience across multiple technologies in Application and Databases. Lini has worked with teams to develop cost-effective APM solutions through opensource model. She has experience working in multiple verticals, largely BFSI. She also has delivery understanding of Retail, Media, Mfg., etc. By qualification, she comes from a statistics background and has a Post Graduate degree from SP Jain Institute of Management & Research.

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IND/B&T/FEB - DEC 2015