APM: BEST PRACTICES
10 TIPS FROM REAL USERS

PeerPaper Report
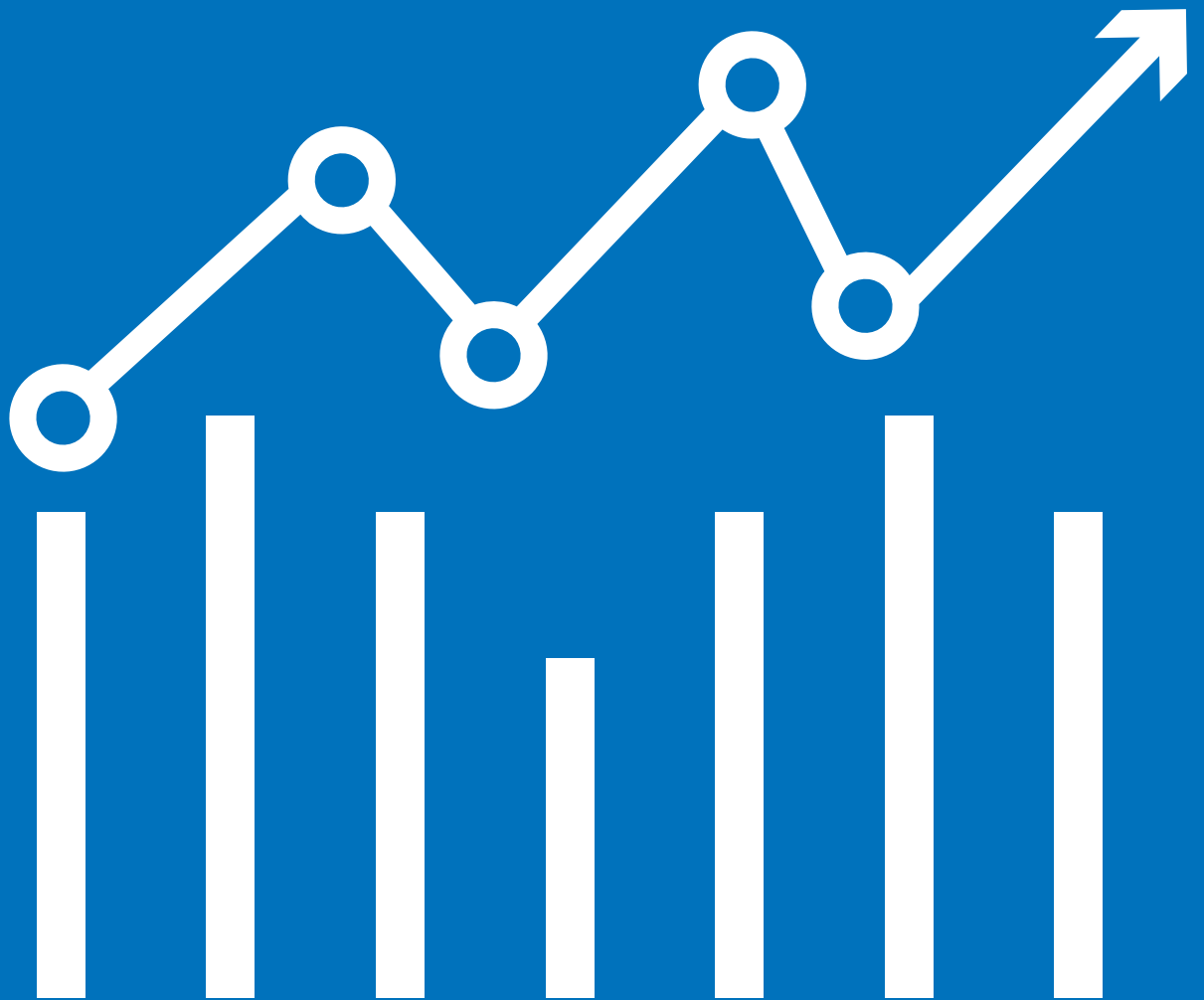
BASED ON REAL USER EXPERIENCES

IT Central Station
Unbiased reviews from the tech community

ABSTRACT

Application Performance Management (APM), the technology that enables IT departments to monitor and manage the performance of critical applications, continues to evolve and mature. Focusing on APM benefits both the IT department and the organization it serves. This is especially true as new architectures make applications more complex and interdependent. This paper presents APM best practices taken from real APM user reviews on IT Central Station. Their recommendations can help APM adopters get the best results from their investment in the technology.

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INTRODUCTION

Application Performance Management (APM) enables IT departments to monitor and manage the performance of critical applications. With the rising popularity of new development methodologies and architectures, APM is needed now more than ever. While the cloud and loosely-coupled web services aid in digital transformation, they also speed up development and add complexity to applications. As a result, slowdowns and outages become more frequent and harder to interpret and remediate.

APM offers a solution. It gives IT departments a powerful tool to stay on top of applications that drive essential business process. As APM continues to evolve and mature, best practices are emerging to guide IT professionals in monitoring and managing applications. This paper presents relevant insights, sharing real-life experience from APM users on IT Central Station to help get the best results from APM.

Understanding APM's role in Today's IT Environments

APM monitors an application's availability as well as its ability to function under a given load level. APM solutions measure application response times and alert administrators when the application deviates from a Service Level Agreement (SLA). Solutions track the behavior of physical hardware, the virtual machines where applications reside, JVMs that execute the application environment, web containers and more. They stay on top of associated databases, caches, external web services and of course the code running the application itself. APM often features sophisticated analysis and the ability to interpret performance difficulties in real time.

While APM nominally focuses on applications, in reality APM stays on top of business processes that may be vital to profitability and brand image. It provides insight into the end user experience. For instance, if applications supporting financial
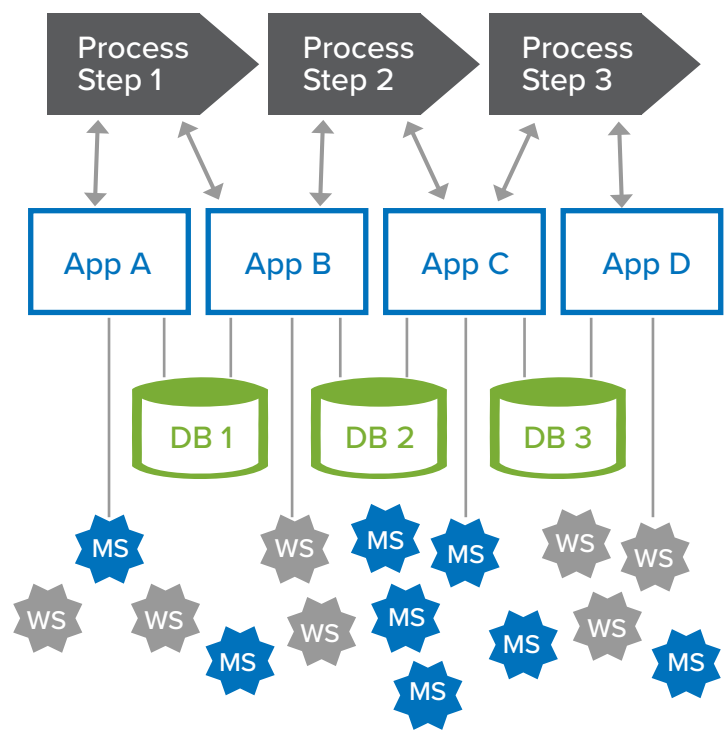

Figure 1 - Illustration of how a multi-step business process can be dependent on multiple applications which are in turn dependent on separate data sources and many web services and microservices—making it a challenge to monitor and manage application performance.

transactions slow down, that could result in lost revenue. The IT department must have visibility into such a slowdown and remediate the problem before it has a negative financial impact. Figure 1 approximates these kinds of dependencies.

The resulting challenge is twofold: It's necessary to see the problem quickly enough to react in a meaningful way. The nature of the problem must also be clear. For example, one piece of an application might be slowing down other dependent operations taking place in other applications. The APM toolset has to recognize the slowdown as well as specify the dependencies that contribute to the performance problem.

At the same time, trends in application architecture make application management and monitoring more difficult. Previously, with n-tier architecture, performance problems could originate with deficiencies in the database, the logic layer, the presentation layer or from integrations between the layers. Diagnosing issues was, comparatively speaking, simple. With today's cloud, applications can be assembled out of remotely-hosted, hard-to-track code. Alternatively, web services and microservices take the loosely connected quality of cloud software even further with independently deployable, small, modular services.

Agile development and Continuous Integration of code (CI), further compound the challenges for APM. New code is deployed quickly and frequently. APM must be up to the challenge of monitoring and managing application performance in this fast-paced, complex environment. The tools must keep up with nearly constant changes in application topology and functionality and be able to quickly identify root causes of performance issues. APM tools need to enable automation, keeping IT staff away from repetitive, inefficient work and lengthy war room meetings. With the right APM toolset, it is possible to do all of this, and more.

Tips for APM Success

Among IT Central Station members are many IT professionals who rely on APM to manage apps in today's increasingly complex environment. For example, a Software Engineer at a company with over 1,000 employees said, "Without APM, you'd be spending a lot more time to try and investigate into all the individual event logs. Our services are massive. It's not a simple application with a front end and a back end. We have a lot of other microservices that talk to each other. When you have such a topology, it's very difficult to manually go through every single layer and figure out where the bottleneck is." In contrast to this confusing environment, he pointed out how with APM there is an end-to-end workflow that tells him exactly which layer is having the problem. He added, "Then it lets you drill down and further down. The zooming capability is brilliant."

An Engineer at a transportation company with over 10,000 employees uses his APM tool to monitor and manage thousands of .NET and Java applications as well as numerous applications built in Node.js. He said, "We have cut our MTTR [mean time to resolution] by half just by deploying agents. It significantly reduced the amount of time that we spend building synthetic monitors." He credits this success to his tool's easy to use API, customizable extensions and its ability to "facilitate business, dev and ops communication." From this type of experience, IT Central Station members offer the following tips on using APM to meet SLAs and manage IT operations efficiently:

1. UNDERSTAND THE BUSINESS FACTORS BEHIND APM REQUIREMENTS

Applications serve the business. What looks like a straightforward business process, like booking a customer order, is in fact typically an orchestrated collection of application workflows. From the other end, what looks like an application running in

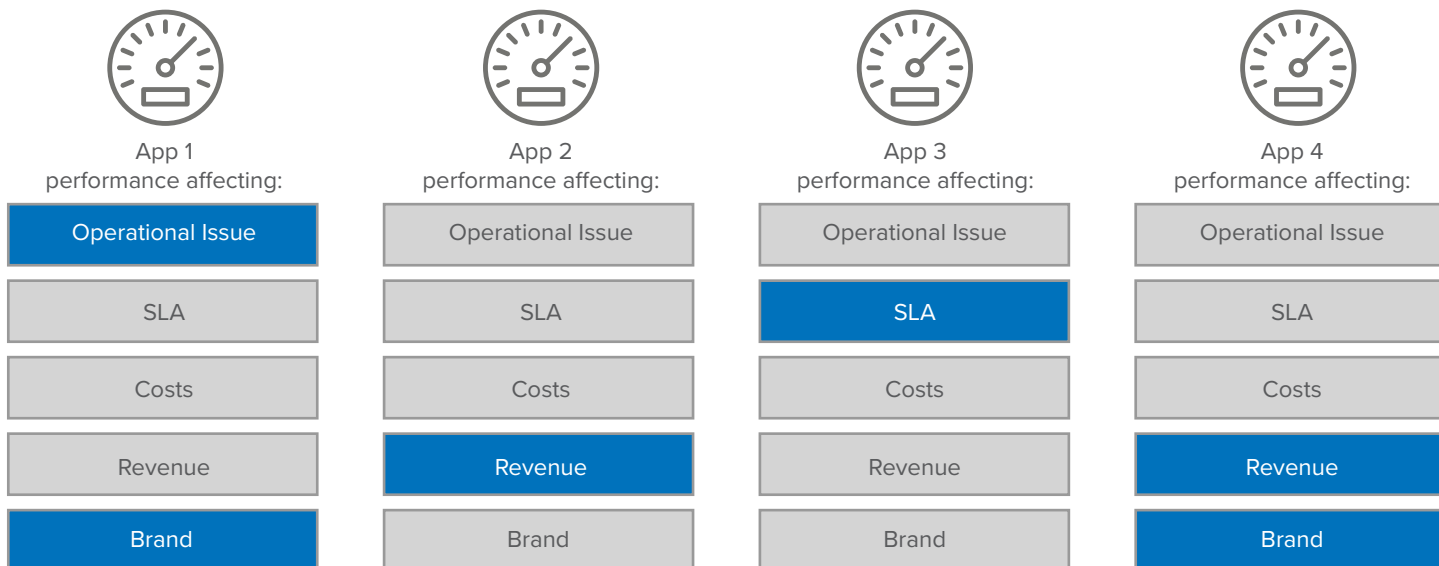| App 1 performance affecting:	App 2 performance affecting:	App 3 performance affecting:	App 4 performance affecting:
Operational Issue	Operational Issue	Operational Issue	Operational Issue
SLA	SLA	**SLA**	SLA
Costs	Costs	Costs	Costs
Revenue	**Revenue**	Revenue	**Revenue**
Brand	Brand	Brand	**Brand**

Figure 2 - Application performance can affect different areas of a business. A best practice is to understand how a particular performance issue might affect SLAs, revenue, branding and so forth.

production could be more accurately viewed as a critical element of running a business.

It's possible to get so caught up in the moment-to-moment demands of the technology that people lose sight of an application's true role. When applications slow down, so does the business. Revenue can lag. Thus, understanding the business factors behind APM can help.

The Software Engineer explained, "Where do the customers feel the pain the most? Start with that and then start instrumenting those [applications]. Before you turn on APM, think about what's important to you. Start with a subset that is critical to your business. Understand it from a customer perspective. Don't look at it from an operational perspective." A Senior Performance Consultant at a tech services company with over 1,000 employees also weighed in on this topic. He described his approach to making APM a driver of strong business operations, advising, "Connect the dots between application performance and business outcomes with custom dashboards. Get visibility into the business impact of customer experience quality."

2. LEVERAGE APM INSIGHTS FOR THE BUSINESS

Superficial problems in business operations tend to have root causes. In an organization undergoing a digital transformation, root causes often appear deep in the IT stack that support business processes. APM can help the IT department discover the application roots of an operational problem and provide a path to remediation. The Software Engineer explained how this can work, saying, "Features that are valuable to us are the business transaction transparency from one tier to the next and the ability to be able to drill down into the called stack. The ability to identify the stalled and error transactions in real time, and be able to investigate it, pick up the trends—that's one of the useful things. Because we use that as part of our root cause analysis and as a proactive, as well as a reactive way, to look at the incident and see what we can do to fix it." On a related note, the Senior Performance Consultant at the tech services company remarked that his APM solution "breaks the silos and creates the common language for IT and the business."

3. FOCUS ON CONFIGURATION AND DEPLOYMENT

APM tools work best when the IT department focuses carefully on configuration and deployment. IT Central Station members caution against accidentally over-provisioning. For example, a Vice President - Operations & Client Support at a tech services company with over 50 employees noted, "You can't over-speak to the importance of deployment, configuration and infrastructure footprint because what happens is that people get excited when they see the output of various products. They say, 'wow, it's very powerful, we've never had visibility, we're going to implement at all costs.' Then they buy the solution and they realize they need 5X the amount of servers, a lot of storage, experts to manage it, etc."

Each department has to figure out its ideal approach to configuration. In some cases, it helps to bring in outside expertise. For example, a Software Development Consultant at a financial services firm with over 1,000 employees commented on how he brought multiple internal and external stakeholders together for a successful deployment. He said, "Configuration in the IT environment is very important. It has to be done with the vendor, our development teams, our infra support teams and the business." Alternatively, a Technical Architect-Product Development at a tech vendor with over 1,000 employees did his implementation "In house." He noted, though, that "The tool is configuration intensive. A good development and operations team need to know the application dynamics to configure this application."

4. SELECT THE RIGHT PERSON/PEOPLE FOR APM

Well-trained people with the right skills make APM succeed. If APM is handed off to unqualified staff, the effort may struggle to find its way to full realization. For example, a CTO at a financial services firm with over 1,000 employees explains that you need to,

"Ensure the person who is deploying [APM] in your environment is among the top-most performers of your team, someone who knows your application in and out. Combine that with good, strong consultation by the [vendor] team. Get these two in place and you've got a winner on your hands." The Engineer at the transportation company expanded on this by sharing his approach. "We had an in-house team of two people, and a vendor team assisting," he said. "The team was a mix of beginner to expert, and it worked out great."

5. TRAIN DEVELOPERS FOR APM

Developers will be some of the most critical users of APM. After all, their work will be managed and monitored by APM. They need to understand the importance of application performance in the context of the business. When developers are trained regarding how APM works, they will be able to anticipate application performance problems and code around them. The same goes for application integration and dependencies between applications, which are so common today. Additionally, as APM reveals troubled segments of applications, developers will be best able to remediate the problem if they understand the analysis from the APM solution.

The CTO at the financial services firm supports developer training on APM. He explained, "Get your developers trained as soon as possible. They're going to be the ones who need to utilize it." An Application Performance Engineer at a software R&D company with over 1,000 employees agreed, advising APM users, "Take some time to train technicians and development personal who will use the tool."

6. MAKE SURE IT DEPARTMENT ADOPTION OF APM IS STRONG

APM enables improved business outcomes when it is broadly adopted in an IT organization. The opposite is also true. Low adoption diminishes the potential

for APM to help IT support the business. This is partly a people issue, but the APM tool itself can affect adoption. For example, a [Sr. Enterprise Network Planner](#) at a healthcare company with over 1,000 employees praised his APM tool, saying, "One of the most valuable features has been the ease of use that really fuels adoption in our organization. Other solutions that we have used for APM were not as user friendly, and frankly it was just really difficult to get people to use the tools."

A [Capability Development Manager - Monitoring](#) at a retailer with over 10,000 employees contrasted his old, hard-to-adapt APM tooling with his new solution. He described how he went from a situation where "the 2 or 3 teams who were using it got some of that value, but the rest of the organization just didn't" to "Now, we've got teams who had never picked up an APM product already getting value out of it, literally in a matter of days after installation."

7. GET BROAD-BASED BUY-IN BEFORE COMMITTING TO APM

The business-facing nature of APM necessitates getting buy-in from relevant stakeholders beyond the IT department. Business managers will support APM as a project if they understand how application performance drives business results like revenue and customer satisfaction. A [Systems Engineer III](#) at a financial services firm with over 1,000 employees commented on this issue, saying, "You want that [business management] buy-in early on in the process, especially with a high number of applications. We have over 2,000 applications on our radar that we're going to instrument into it."

Realizing that applications impact a variety of teams in his organization, each with their own managers, he stressed the need for, "getting buy-in for cooperation, not only to schedule and prioritize, but which ones [applications] are getting in, on whose orders." He emphasized how important it is to know who will

be affected by an application. The results surprised him. He explained, "The competition among senior management for who was going to get it first became quite intense later on."

He then demonstrated the value of this approach, adding, "Some of the best success stories we have from the product have actually come from VPs over those different product areas, when they find out how [APM] scored a critical win. My advice to the other teams would be to involve all the other product teams, everybody who's going to be involved with it. Get them involved early on into the adoption, on what it can do. You don't want to have management overseeing it and not know what the product is."
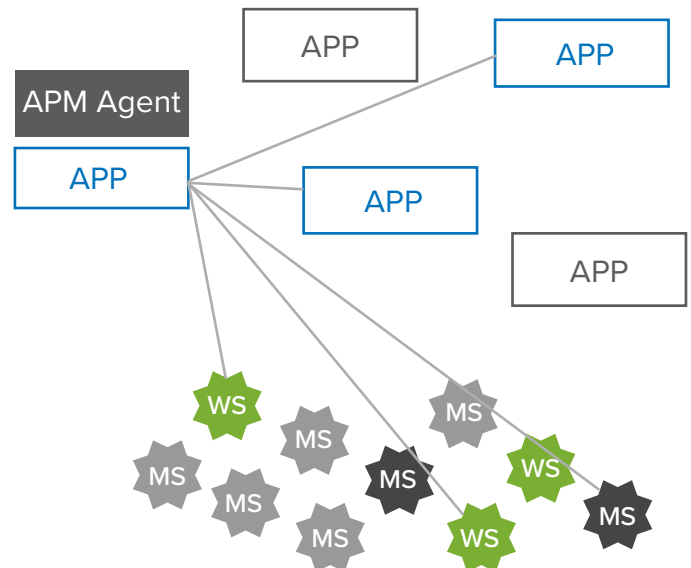

Figure 3 - Auto discovery can quickly reveal connections between independent applications and web services.

8. LEVERAGE AUTO-DISCOVERY

Many APM tools feature auto-discovery, which is a favorite of APM users on IT Central Station. A [Chief Architect](#) at an aerospace/defense firm with over 1,000 employees explained why: "With the auto-discovery feature, you can install an agent in one place and this product shows you what it's talking to." Through auto discovery, he could quickly and effortlessly get an overview of his application topology and easily determine where to focus his APM priorities.

The Engineer at the transportation company concurred, liking the fact that his APM tool enabled "auto discovery of application topology, based on real user traffic." This capability is useful to monitor loosely coupled application elements like web services and microservices. Figure 3 shows a simple visual reference to explain how auto-discovery reveals application topology.

9. MAP APPLICATIONS TO THE APM TOOLSET

The loosely coupled nature of modern applications makes it necessary to map applications carefully before monitoring them. Given how a single application element, like a cloud-hosted web service, can potentially throw an entire business process into disarray, it's useful to understand where all components of an application reside.

In this context, an Enterprise Platform Manager at a healthcare company with over 1,000 employees commented on the value of his APM tool's mapping abilities: "The flow map is very valuable to us. Before we installed APM, we had no idea how our application looked. If the developer who designed it decided to leave the company, we would be dead in the water. We had no idea what the application looked like. To understand the architecture, we would have to literally go back to the developers and ask them if they can at least put some blocks on paper. That was like, 'okay, help me out, please. Let's go for dinner, let's go for lunch. You have to do something.'"

10. UNDERSTAND YOUR ROI

APM is an investment, just like any other serious IT endeavor. It needs to show return on investment (ROI) in order to be considered a success. The best practice is to anticipate a request from the financial department to prove ROI before the technology is even acquired. IT Central Station users have had positive ROI experiences with APM. For example, a Lead Systems Engineer at a retailer with over 1,000

employees chose his APM tool based on project ROI. He explained that this chosen APM solution "was by far the quickest and easiest to get good results out of. The other two products required a lot more investment both as far as capital for purchasing systems to handle the load, as well as time to get the systems to really have useful data in them." He added, "The best advice would probably be to make sure that you know what your requirements are and that you're analyzing the tools to your requirements. Look at things such as capital and time to roll out. That makes a big difference in the ROI for a product."

ROI is financial, but it can also be measured with non-monetary metrics. For instance, an Application Architect at a financial services firm with over 1,000 employees said, "I'm not the business person, but we've seen an immediate ROI…" A Senior Consultant at an aerospace/defense firm with over 1,000 employees similarly commented, "I cannot discuss ROI in terms of money, but, yes, RCA became easy, which ultimately saves time/cost/efforts and which becomes large with time-critical applications." Financial stakeholders usually understand that non-financial metrics like time spent on a project translate into financial results.

It's best if ROI metrics can be quantified, though. The Production Operations Systems Administrator III at the software R&D company spoke to this, saying, "We are still in the process of completing our ROI calculations, but we already have examples of a 89% reduction in MTTR for one application… and a multitude of examples of money saved in others, including savings of around $150,000 for one particular issue that we were almost set to throw more hardware / software at."

CONCLUSION

New architectural styles, with their loose coupling and rapid development cycles, create an urgent need for application performance monitoring. These new types of applications are good for business in terms of cost-effective development and IT agility. However, their increased complexity makes them challenging to monitor. After all, business results depend on reliable application performance.

APM tools continue to evolve and mature, giving IT managers a way to stay on top of performance, no matter how many integrated components and dependencies an application may have. Users of APM solutions on IT Central Station recommend a number of practices to get the best results. These include understanding the business factors driving the need for APM and focusing on configuration. APM is a people- and organizationally-oriented technology. It requires finding the best staffers, getting buy-in from IT and business stakeholders and training developers in APM. On deployment, it's essential to leverage the tool's mapping and auto discovery functions. Using these techniques, IT managers can make APM part of their organization's business success.

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