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Storage and database collaboration

"If you don't have a seat at the table, you're probably on the menu"

Missouri State Senator Jolie L. Justus

IT organizations have been divided into different groups with distinct realms of control (aka silos) for many years. This paradigm has been changing over the past few years as a result of increased business focus on applications as the driver of revenue, and the increased levels of complexity associated with modern applications (virtualization, cloud, SOA, etc.).

The change is most evident with the rapidly growing DevOps movement, which promotes greater levels of collaboration between application developers and IT operations personnel. In this white paper we will explore the changes that are happening throughout IT organizations and explain why it is important for database and storage administrators to understand, embrace, and participate in this changing paradigm. Keep reading so you can take your seat at the table.

IT operations is changing

DevOps may be a buzzword but the philosophy is becoming reality within many IT organizations. The high degree of virtualization combined with the capability of deploying new infrastructure from code has created a situation where silo'd teams need to collaborate for multiple reasons:

– Collaboration helps teams deploy faster and fix problems faster

– Companies following collaborative philosophies like DevOps can innovate and respond to change faster

– Employees that are not able to collaborate will fall out of favor as the rest of the company changes

This new paradigm will encompass all groups involved with the delivery of application services. Development, system administration, application operations, database administration, storage administration, network operations, and any other group that plays a part in the creation, deployment, and operation of any application will eventually be required to participate.

DevOps statistics

ZeroTurnaround surveyed 620 engineers to understand how much time they spend carrying out their tasks each week. The results of the study were published on devops.com and are very interesting. (http://devops.com/tag/devops-statistics/) The image below is a list of tasks and associated hours. The black bars represent the traditional silo'd environment while the yellow bars represent work done in a DevOps oriented environment.
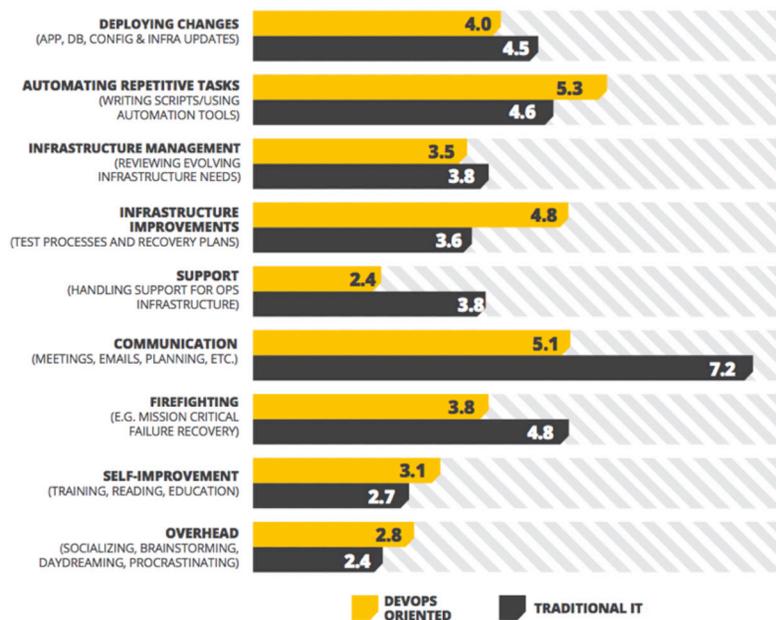

Task	DEVOPS ORIENTED	TRADITIONAL IT
DEPLOYING CHANGES (APP, DB, CONFIG & INFRA UPDATES)	4.0	4.5
AUTOMATING REPETITIVE TASKS (WRITING SCRIPTS/USING AUTOMATION TOOLS)	5.3	4.6
INFRASTRUCTURE MANAGEMENT (REVIEWING EVOLVING INFRASTRUCTURE NEEDS)	3.5	3.8
INFRASTRUCTURE IMPROVEMENTS (TEST PROCESSES AND RECOVERY PLANS)	4.8	3.6
SUPPORT (HANDLING SUPPORT FOR OPS INFRASTRUCTURE)	2.4	3.8
COMMUNICATION (MEETINGS, EMAILS, PLANNING, ETC.)	5.1	7.2
FIREFIGHTING (E.G. MISSION CRITICAL FAILURE RECOVERY)	3.8	4.8
SELF-IMPROVEMENT (TRAINING, READING, EDUCATION)	3.1	2.7
OVERHEAD (SOCIALIZING, BRAINSTORMING, DAYDREAMING, PROCRASTINATING)	2.8	2.4

Figure 1: DevOps survey results from ZeroTurnaround.

The numbers are impressively in favor of the organizations that have adopted a DevOps philosophy. The statistics look really good, but the big challenge is making the cultural shift.

So what does this all mean to DBA's and storage administrators and why am I lumping them together?

The database and storage relationship
Database performance is directly impacted by storage performance, and storage performance can be significantly impacted by database workloads. The natural side effect of this relationship is finger pointing when performance problems appear. Finger pointing is a consequence of working in a silo'd manner. Each team is accustomed to using the free or included tools that provide them with information only related to their silo'd system (DB, storage, etc.). This further compounds the natural response of finger pointing when there are problems that are difficult to isolate.

If the storage and database teams can begin to work in a collaborative manner on a daily basis they will start to reap the rewards shown in the ZeroTurnaround survey — less time fixing problems and more time making improvements.

Turning the idea into reality
Now that we have an understanding of the desired state (a high level of collaboration across organizational silos), the question becomes, how do you start down a path that leads to the final goal?

Start small and communicate - If you're a storage admin, reach out to some folks on the DBA team and ask if you can be included in their meetings. The same goes for the DBA's; start talking to your storage admins regularly. Don't get management involved and start a big project, that's too much overhead and too much scrutiny to start out with. The key is to quickly increase the quantity and quality of communication between teams. There is no need to merge teams, just to create a new level of engagement between teams.

Document a small success - Now that you are communicating better, you should see an area where this new level of collaboration is making an improvement. Remember "show and tell" time when you were in school? The corporate equivalent is the "dog and pony show". Regardless of how you feel about presenting, in order to expand this new collaborative paradigm you will need to show off your success to peers and management. Document your success (a small presentation of less than 10 slides will do fine) and be prepared to present it.

DevOps: "DevOps is the blending of tasks performed by a company's application development and systems operations teams."

Show your management - At this point you will probably need to get approval from your management to increase the reach of your collaborative program. Your documentation of success should be used to show management that what you are working on is worthwhile. This is the point where you can arrange with your manager to spend more time collaborating with other teams to make sure you are all working in a coordinated manner.

Engage the community - Hopefully you have permission to engage the larger community at this point. Ideally, you can describe your work to the rest of the storage and DBA teams and see who takes interest in your new style of working. The great part about this stage is that you can reuse the presentation material you used with your manager. Be sure to collect the contact information of the people who are interested in working in a more collaborative manner and create a group where everyone can communicate with each other easily.

Grow your reach - At this point you have influenced the way you and your peers work together. Now it's time to grow your reach beyond just database and storage. Reach out to the application and network teams and repeat the same process you just used. Invite them to your meetings and ask to be invited to theirs. If you can work in a collaborative manner with all of the people involved in delivering an application to the end users, you will improve the overall end user experience and your documentation will prove the value of your work.

The role of software tools

Software tools should help you achieve a defined goal. Tools should help solve a specific problem or set of problems. When you have a goal of a highly collaborative environment, you need to have tools that are designed to foster that collaboration.

Responding to production problems is an area where collaboration can produce dramatic results. When problems occur, application teams often blame the problem on the database. The database team is then tasked with either finding and fixing the problem or with proving their innocence. Database performance issues will reside within the database server itself or will be a result of slow storage response (which might also be a network problem).

The database and storage teams need to quickly understand if there are any problems that they need to fix. In order to do that, they need more intelligent monitoring tools that collect the proper data before and during the problem so that they can compare good performance to poor performance. They also need to see the storage and database metrics on the same screen to identify the impact of one on the other. See the example screenshots on the following pages.
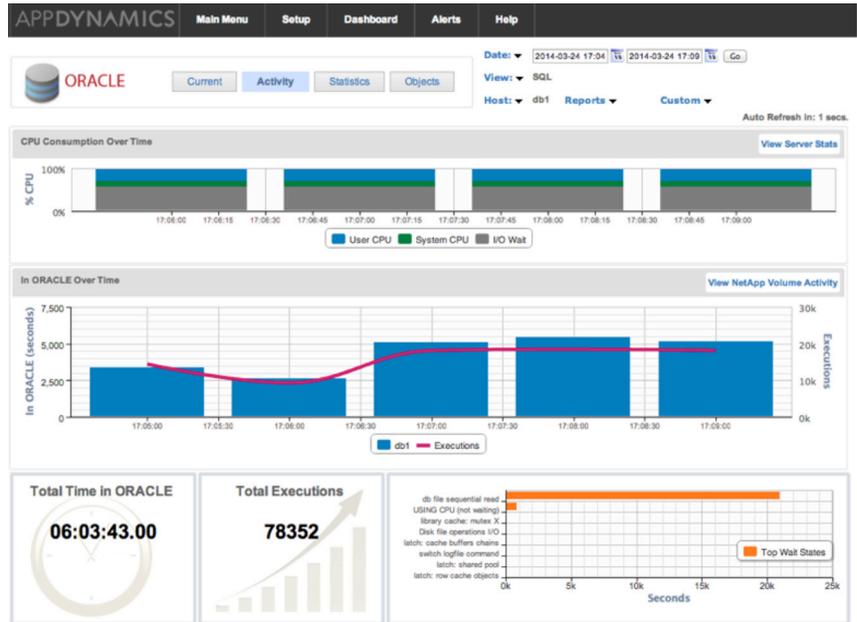
Figure 2: Oracle to NetApp Drill Down - Notice the "View NetApp Volume Activity" button that allows for in context drill down from DB to Storage.

Figure 3: NetApp to Database Drill Down - Notice the "Launch in context" link for correlating storage and database performance
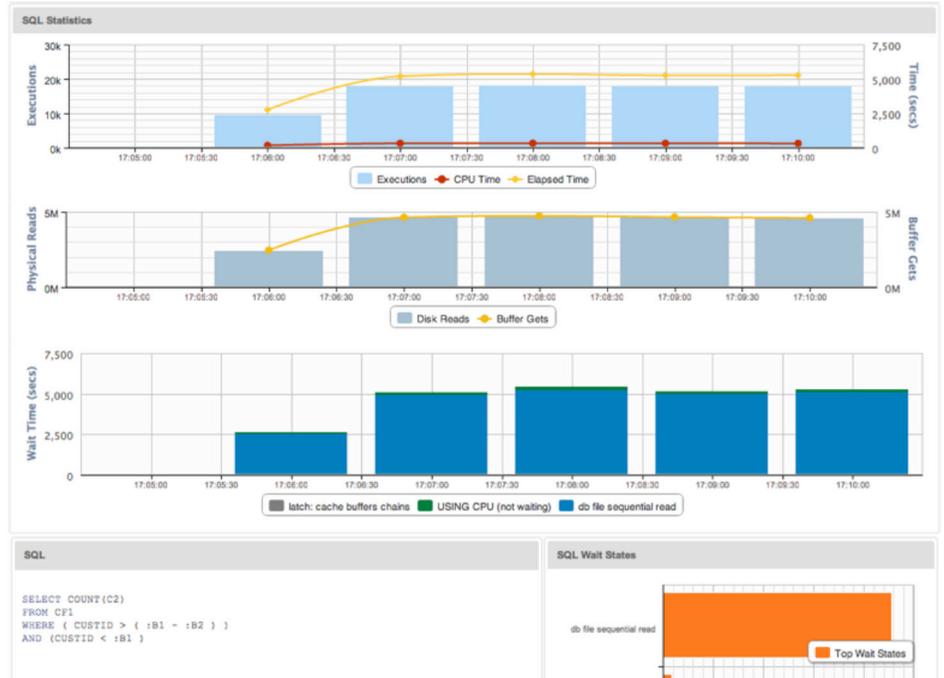
Figure 4: Database and Storage Metrics - Storage latency directly impacts database performance so it should be shown together with database statistics.
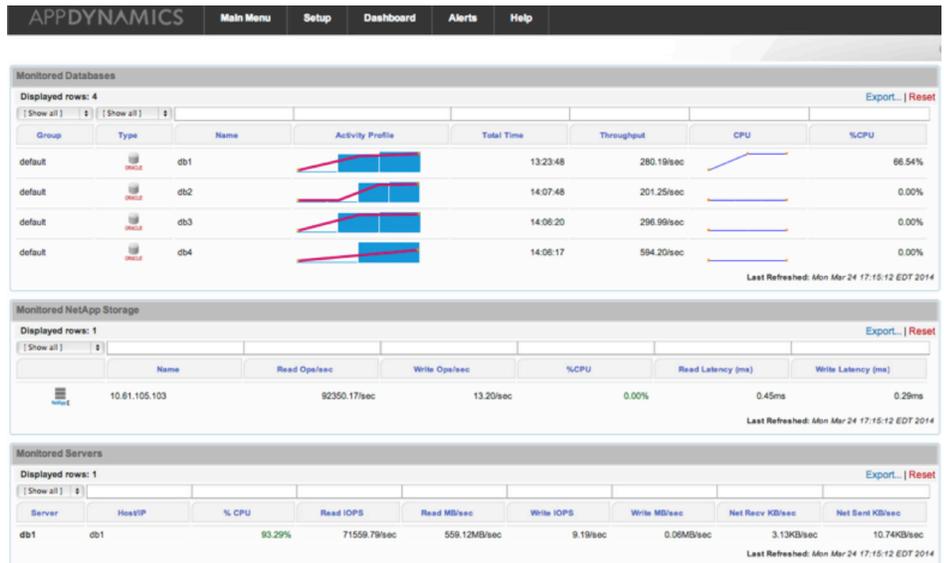

Figure 5: Database, Storage, and Server Dashboard - Having a high level overview that can be shared between multiple inter-related roles helps accelerate identification and resolution of problems.

Documentation using software tools

Software tools are also a great way to create impressive and useful documentation. When you have tools that continually collect information about your infrastructure and applications you can use that information to make better decisions (is it time for new hardware?), to justify past decisions (is our new hardware performing the way we expected it to?), or to use as a planning tool for decisions that need to be made in the future (capacity planning).

Use screenshots from your tools to describe problems and results in a visual manner while calling out what the visuals mean. See Figure 6 and Figure 7.

Steps to create meaningful documentation:
1. Describe the problem
2. Describe the business impact of the problem
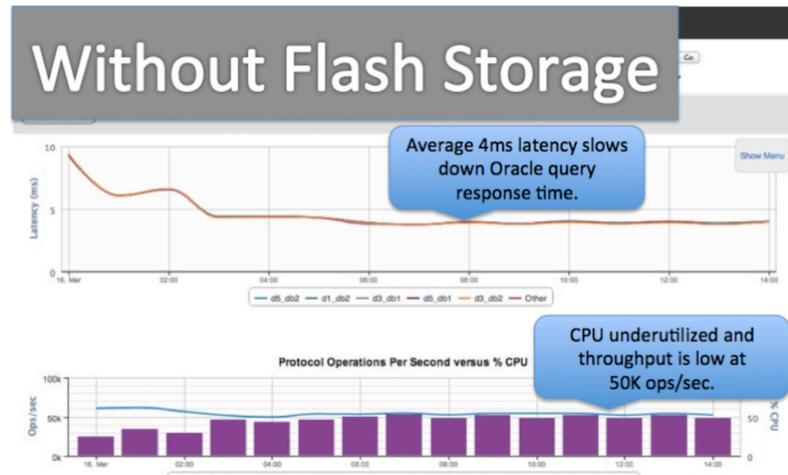3. Describe the solution and results

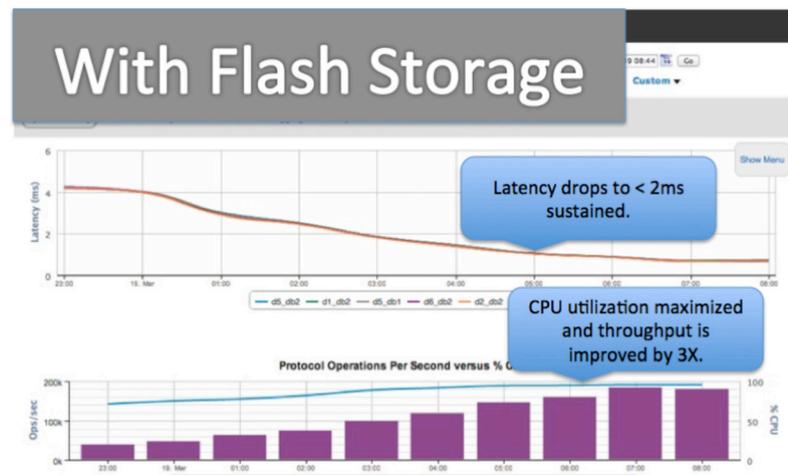
Figure 6: Oracle impact on storage without Flash

Figure 7: Oracle impact on storage with flash

Conclusion

IT applications, architecture, and operations are in the midst of a fundamental shift. With the adoption of virtualization, service oriented architectures, and cloud computing environments, collaboration is a requirement for solving problems in a fast and effective manner. Organizations that do not collaborate well will spend much more time troubleshooting issues instead of improving the quality of their service. Ultimately, the organizations that achieve high levels of collaboration will innovate faster while providing higher levels of service. These companies will take customer share and revenue from their less nimble and more problematic competition. Start your collaborative journey now and don't fall behind your competition. Don't be left without your seat at the table.

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