

VIRTUALIZATION

CLOUD

APPLICATION DEVELOPMENT

NETWORKING

STORAGE ARCHITECTURE

DATA CENTER MANAGEMENT

BUSINESS INTELLIGENCE/APPLICATIONS

DISASTER RECOVERY/COMPLIANCE

SECURITY

Up, Up and Away: Java App Development Heads to the Cloud

Cloud computing has changed the way software is being developed. Learn how smart organizations are using the cloud to save money and make production and security more efficient.

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A Game Changer for Development

TODAY, ENTERPRISE ARCHITECTS and software engineers are approaching application development and enterprise design in an entirely new way, and they have cloud computing to thank. The cloud has changed the way software is being developed, making the application lifecycle more streamlined, developers more efficient and the whole process more collaborative. This three-part guide will examine how smart organizations have made this happen—and how organizations can get started with this revolutionary technology.

In the first article, we look at how new technologies are making it possible to go all-in and do [full-scale cloud-based development](#), with everything from source

code to integrated development environments hosted externally.

Our second article looks at [emerging trends in the industry](#), reporting how businesses are moving toward the cloud and changing the way services are being used.

And since security has long been a major objection to cloud engagement among big businesses, the third article drills into issues surrounding [data security in the public cloud](#). Its findings: Many of the common fears and misconceptions swirling around the cloud may now be unfounded.

—CAMERON MCKENZIE
Editor in Chief, TheServerSide.com



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App Development in the Cloud Takes an Upward Turn

WHILE MANY SOFTWARE engineers are using Software as a Service (SaaS), [Platform as a Service](#) (PaaS) and Infrastructure as a Service (IaaS) technologies to accelerate and simplify their day-to-day activities, cloud-based technologies typically play only a peripheral role in developing software.

It is not unusual to see source code repositories hosted through SaaS, or test servers with multiple configurations hosted cheaply using an IaaS. But to date, there are very few successful tools that make it possible to do true application development in the cloud. But many of the roadblocks to cloud-based application development are falling by the wayside. With so many new innovations, cloud-based application development may just revolutionize how modern software is engineered.

So what exactly is meant by the term [cloud-based application development](#)? It isn't simply the process of leveraging peripheral cloud-based services to help the development process. True cloud-based application development means having the entire development environment hosted in the cloud. This entails having everything from the source code being edited to the development tools that are doing the editing, such as

Eclipse or NetBeans, all hosted in the cloud, as opposed to having all of these artifacts and tools installed on a user's desktop.

ENHANCING DEVELOPER PRODUCTIVITY

Hosting such a configuration in the cloud provides compelling benefits. The collective computing power of a cloud-based provider can significantly enhance developer productivity. Despite the attempt to always be creating modular, highly decoupled code, applications in development can be largely dependent on integrated frameworks and external libraries. The process of saving, compiling and rebuilding a single piece of code can involve linking to hundreds, if not thousands, of class files. On a standard desktop, it often takes five minutes to do compilation, which means a developer working at a snail's pace of six compilations an hour would be spending half of that hour sitting idle, waiting for the build to finish. But the collective computing power of a cloud-based environment can reduce the time spent compiling code by up to 90%, freeing the software engineer to spend more time developing.



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CENTRALIZED MANAGEMENT

Another benefit to cloud-based application development is its centralized environment. With each developer's workspace hosted externally, software engineers can quickly and easily switch between environments, which allows them to easily work on another project or module without having to access GitHub, connect to the development environment and then pull everything down locally, all while hoping the correct version and branch are being brought in locally. Cloud-based development environments also make it easier for other developers to connect to one another's environments, be it to work on a project while someone is on vacation or have a more experienced software engineer troubleshoot a junior developer's code. Centralized, cloud-based development environments can help teams collaborate effectively, share knowledge and solve problems faster, all of which speeds up the [software development lifecycle](#).

MULTI-DEVICE ENABLEMENT

Cloud-based development environments often provide facilities for performing a variety of functions using smartphones, tablets and other embedded devices. "We are amazed by the type of mobility people want to have with their development environment," said Tyler Jewell, CEO of Codenvy, a cloud development environment provider in San Francisco. "We are seeing people want to modify their applications through an iPhone or an

iPad. While it may not seem intuitive, there does seem to be a population of people on the go who are interested in accessing the system through mobile devices."

So with all of the benefits, why has the adoption of cloud-based development tools not been more widespread? When speaking at TheServerSide Java Symposium in 2011, James Gosling, known as "the father of Java," lamented his experiences with the enterprise Java development tools provided through Amazon's Beanstalk. "It's not fast," Gosling said. "I was actually using the Amazon tools for a while and eventually gave up. In the NetBeans and GlassFish world, the redeploy time is 100 to 200 milliseconds, while in the Amazon world it could be a couple of minutes."

Of course, that was two years ago.

"The latency issue is not nearly as big an issue as you think it might be," Jewell said. "The technology has gone far. You've got to give it a try, because all of the use cases that come along with it really change the entire approach and it opens you up to new opportunities."

So with concerns about latency and responsiveness fading, the industry is removing the most persistent objection developers have had about moving to a fully cloud-enabled application development environment. And with the various benefits organizations can gain from using cloud-based resources, be it increased collaboration, centralized resources, elastic computing power or efficiencies of scale, there's no doubt that moving application development to the cloud will be the next big thing. —Cameron McKenzie



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Cloud Moves In on Java Application Development

DOESN'T IT SEEM like just yesterday when cloud computing was born? In today's accelerated environment, the cloud is already entering its adolescence. Over the next year, Java application developers can expect growing pains as companies learn even more about the importance and limitations of scalability. There are plenty of hormonal mood swings on the horizon as enterprises continue their love-hate relationship with the cloud. Java cloud computing pros can expect lots of safety issues to navigate as well. Here are five of the trends I suspect will make 2013 a year to remember.

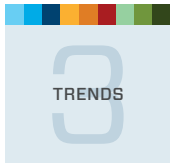
■ **Enterprises will experiment more.** Businesses that want to remain competitive this year know they must continue to innovate with their [enterprise software development](#)—especially with mobile changing the rules. This means development needs to get faster and less expensive. Testing is one area of development where cloud scalability has obvious implications for managing costs. But everything from collaboration to source code and issue tracking is ripe for migration.

Mark Driver, an analyst at Gartner Inc. in Stamford, Conn., said the risky business of experimentation will seem more attractive as businesses move development

activities to the cloud. “Projects can begin on a lighter budget. The people who are funding development teams tend to be more willing to try something because they don't have to commit six figures of resources or budget up front,” he said. “If it doesn't work out in a couple of months, then they didn't spend that much money. If it does work, they can ramp up the project and move forward.”

■ **Personal cloud will add to BYOD challenges.** In this brave new world, Java developers don't just have to worry about [the security sieve of “bring your own device” \(BYOD\)](#)—what's on the device itself or how to manage security across a range of different devices. Protecting enterprise data and enterprise apps from other apps that have been downloaded to an employee's personal device is also part of the battle. Ubiquitous personal clouds, which employees want to use for both personal and work purposes, are an additional threat.

File sharing and the use of personal email accounts to send business documents is just the tip of the iceberg. If your apps themselves are exposed to side channels via a personal cloud—which is always a public cloud—that poses an entirely different problem. Unless it is



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designed to resist de-compilation efforts, a business app in the wrong hands could provide backdoor access to your servers. While policies dictating what can and can't be shared via the cloud are a good idea, IT will have to put network, software and data safeguards in place.

■ **Hybrid will become the new normal.** Perhaps the hybrid cloud model should be renamed the “[enterprise cloud](#).” Public cloud was dismissed early on as incompatible with the needs of large organizations because it doesn't offer enough control. But the rush to implement private clouds as an alternative has proven that a solely internal system isn't going to cut it either. In fact, the private cloud has been compared to little more than souped-up virtualization. It makes more efficient use of resources, but it still means a substantial up-front investment and requires the organization to make guesses about future capacity requirements.

Sadly, enterprises are going to have to do the hard work of creating the hybrid software that will capture the flexibility and cost savings of public cloud while keeping some processes inside the more protected private cloud. This will likely include deploying less-sensitive applications in the public cloud and bursting certain activities as needed. We can expect to see more big businesses finally growing up and realizing that though the cloud will never be a simple solution, it is a rewarding one. On that note, cloud aggregators that can do the heavy lifting of putting together hybrid cloud

packages and delivering them via a single interface for IT to manage will probably have a boom year.

■ **A burgeoning user population will test the cloud to its limits.** Mobile and cloud seem made for each other. After all, they both offer the promise of being able to access applications, data and computing power anywhere at any time. But problems arise when every single mobile device user in the world wants to play the latest downloadable game at the same time. Jim Farrell, a product marketing professional at Joyent, a cloud services vendor in San Francisco, believes that businesses have to take a hard look at the platform they are using if they want to [scale cost-effectively in the cloud](#).

“Free or very cheap mobile devices are now available in India and other places in Asia. The number of mobile users, Internet connections and concurrent connections are all changing dramatically right now,” Farrell said. “Enterprises are used to being able to predict stuff. Now they're going to have a hard time. They need to embrace not only cloud, but open source technologies that allow them to scale differently.”

Farrell pointed to Node.js as a platform that can accelerate mobile by ensuring cloud memory and CPU usage is as efficient as possible. With big players like Wal-Mart and LinkedIn already aboard the Node train, it's likely other enterprises will take an interest in clouds that can perform well when traffic spikes to previously unimagined levels.



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■ **Businesses will tighten cloud spending.** Like a college student with that first credit card, IT has gone hog-wild with spending in the cloud in some organizations. Then Dad (the CFO) gets a look at the bill and freaks out. Consumption-based spending doesn't save money if you consume to excess. After a brief honeymoon of apparent cost savings, enterprises are taking a closer look at month-to-month spending.

2013 is likely to be the year when businesses throttle back and stop gorging on cloud services. Instead, they will demand more accountability internally for how services are consumed. IT will be leveraging all the tools at its disposal, including detailed monitoring and automated provisioning and de-provisioning to spend its budget more strategically in the cloud. —*Jason Tee*



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CLOUD COMPUTING IS gaining ground, and many enterprises are finding ways to cut costs and improve efficiency with cloud services on the periphery. But security concerns seem to be holding enterprise application developers back from deploying enterprise software in the cloud. Cloud service providers are working hard to gain the trust of enterprise application developers, but earning trust is a slow process.

According to TechTarget Inc.'s [December 2012 IT Priorities Survey](#) of IT managers worldwide, enterprises are still mostly deploying applications on-premises. When asked which deployment models their company would use in 2013, just over 60% responded with on-premises software or hardware. In comparison, 20% indicated they would use Platform as a Service (PaaS), and only 12% indicated they would deploy their software on a public cloud infrastructure.

For organizations holding out on deploying applications in the public cloud, the primary reasons boil down to cloud data security. The top two concerns IT managers pointed to when asked about external cloud service providers were security and protecting company data.

But are the fear, uncertainty and doubt that surround public cloud models warranted? Some security and

cloud experts are suggesting that cloud platforms can be more secure than traditional, on-premises server architecture. However, it's not necessarily a matter of one model being fundamentally better than the other when it comes to security. [Web application security](#) in the cloud requires a slightly different approach than securing on-premises server applications.

Public cloud environments may actually be more secure than their on-premises counterparts, explains Forrester Research Inc. analyst John Rymer in a report titled *Achieve Cloud Economics for Operations and Services*. The report states, "In general, cloud vendors implement per-tenant, per-application, and/or per-resource security controls, while most enterprises rely on perimeter security."

CLOUD SECURITY IS DIFFERENT

Rymer's associate and frequent collaborator James Staten expounded on this difference. An analyst specializing in infrastructure and operations, Staten has seen the evolution of public cloud from the early, Wild West days to today's more sophisticated cloud environment.



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“Cloud providers have built their security around multi-tenancy,” Staten said, “which means they’re used to providing security that keeps tenants safe from other tenants.” On the other hand, corporate data center security efforts tend to center on a strong firewall. “It’s tough to bypass that firewall,” he said. “But once you’re inside you can do pretty much whatever you want.”

Chris Brenton, cloud security architect for CloudPassage Inc., a San Francisco-based security service provider, and a teaching fellow at the SANS Institute, sees the same differences between cloud security and on-premises security. He said that the students who come in green are quick to see the challenges of [securing cloud services](#) and adjust to them, while the ones who have a good deal of experience with traditional security measures have difficulty accepting that the public cloud can be secured.

“Cloud is different,” Brenton said “It’s not more or less secure, but it’s different.” Brenton said many developers working in the public cloud are encrypting everything. Everything that comes from the client gets encrypted before it hits the wire. These measures might be considered overkill in traditional application security models, where the predominate thinking is those communications should be kept on the secured network, where only the good guys have access and there’s no need for encryption. In Brenton’s view, “Public cloud is

driving application security to get better than applications sitting in the private space.”

SAFETY IN NUMBERS

Staten also mentioned a separate security concept that cloud services present but traditional IT infrastructure would be hard-pressed to implement. The concept is that malleable and tangled cloud IP addresses let cloud data hide in a mass of other data. Without a single static IP address or a known port to go to, targeted attacks become much more difficult. Staten compared it to security through obscurity. If a hacker were targeting a particular department store’s corporate data center, he could potentially wage brute strength attacks against the firewall until he broke through and then wreak whatever havoc came to mind.

On the other hand, if that same department store kept its data in a secure public cloud, it could hide among thousands of other organizations, none of which are actively broadcasting their existence to the Web. Plus, if a hacker did find and begin attacking the store’s cloud IP address, the store would simply change the IP address and go back into hiding. Of course, there are still security faux pas to avoid in the cloud. “You can make yourself a shining target by opening up all of your available ports,” Staten said. “If you handle it stupidly, you’re on your own.” —James A. Denman



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