



TIER 3

Transformation of IT Operations —

Realizing IT as a Service
through Comprehensive
Cloud Services

WHITE PAPER

Cloud computing technologies such as Infrastructure-as-a-Service (IaaS) and Platform-as-a-Service (PaaS) offer major advances that benefit IT operations and developers, respectively.

INTRODUCTION

IT managers face the challenge of meeting a wide range of needs from developers, IT operations and internal business clients. Cloud computing technologies such as Infrastructure-as-a-Service (IaaS) and Platform-as-a-Service (PaaS) offer major advances that benefit IT operations and developers, respectively. IT operations teams are rapidly embracing IaaS because it streamlines the cumbersome process of managing infrastructure while reducing ongoing operational demands. Developers prefer PaaS because it enables rapid application development without the distraction of infrastructure setup.

While IaaS and PaaS have evolved separately, innovative cloud providers are now working to unite the two into a unified experience, leveraging the best in each to achieve even greater business agility and operational efficiency. With the ability to provision and manage both services on a single enterprise-class cloud – businesses can begin to take a major step toward the long sought-after “IT as a Service” model, where the cloud becomes a unified delivery enabler for virtually any IT service.

THE IT MANAGER’S CHALLENGE

If you’re responsible for managing an IT department, you might relate to the characters on *Thirtysomething*, the classic 1980s TV show featuring an endless parade of needy souls. On that show, everyone seems to be complaining about how their needs are not being met. So it goes in enterprise IT. Different stakeholder groups, each with its own pressures and stresses, find themselves trying to address a seemingly unique set of needs. IT operations teams require infrastructure that is simple and cost-effective to manage, but which also provides extensive custom configuration and granular controls. Developers need solutions that will allow them to create new applications quickly and efficiently. Internal business clients want IT services that are highly available, flexible, easy to modify and – above all – cost effective. IT is responsible for trying to make everyone happy, which is no simple matter. The advent of the cloud, however, now offers IT some new and exciting ways to address their respective needs.

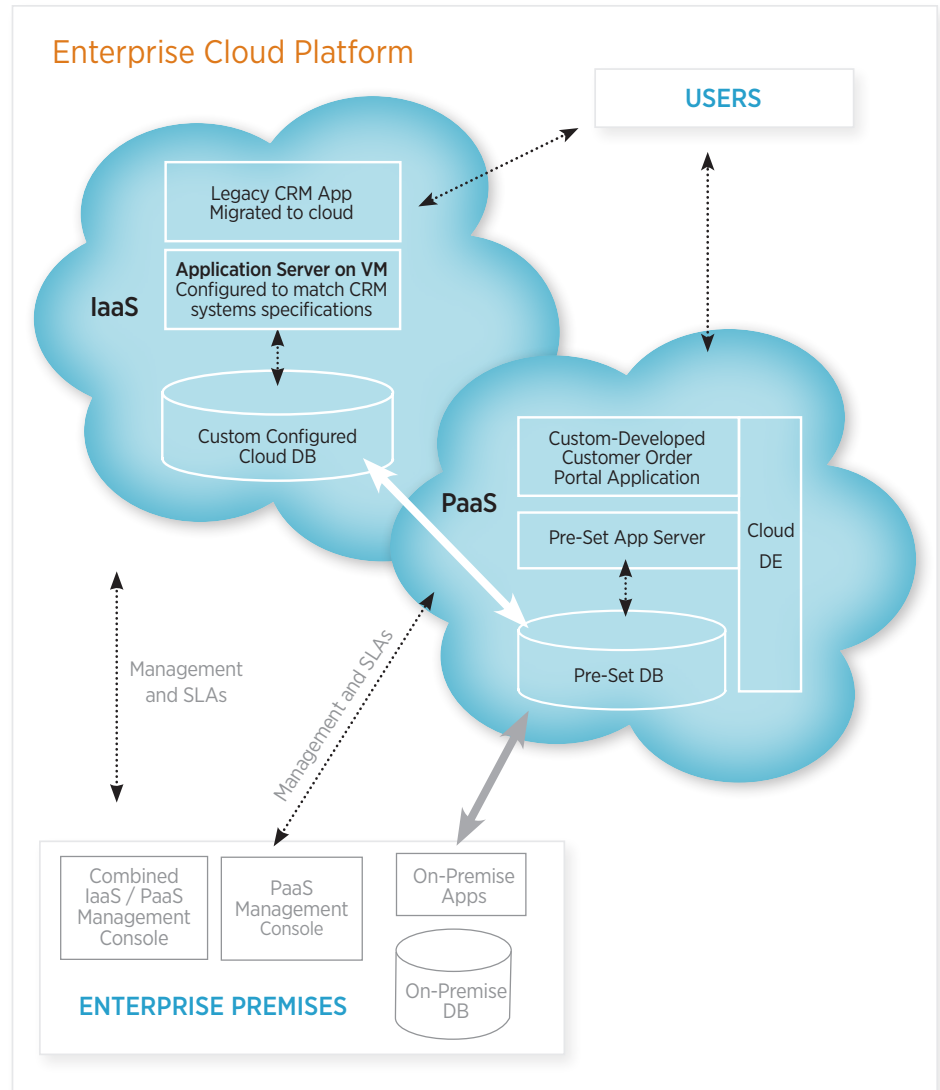
THE CLOUD IS A LEAP FORWARD IN MANAGING IT OPS AND DEVOPS

Imagine that your IT department is given two simultaneous assignments: Within a short time frame, you must manage A) migrating a legacy customer relationship management (CRM) system from an on-premise deployment to the cloud; and B) fast-track the creation of a customer order portal application in the cloud. To execute the assignments quickly and cost-effectively, the IT ops team elects to use a commercial IaaS provider while the developers choose a PaaS solution. These choices reflect the relative strengths of IaaS and PaaS.

From an IT operations point of view, IaaS is a great way to migrate a legacy application to the cloud. With IaaS, IT operations have a high degree of control over how the cloud-based virtual machines (VMs) are provisioned and configured. The flexible configuration and scalability inherent in IaaS provides the ability to move existing applications to the cloud while continuing to run them in much the same way as when they were on premise. You can architect the migrated CRM system for the cloud with your choice of operating systems and required OS settings, as well as select the database you need to support the CRM system. If the CRM requires Windows Server 2008, the .NET framework and Microsoft SQL 2005, all with application specific settings, this is not a

Figure 1- A simple IaaS and PaaS use case: the migration of CRM to the cloud, coupled with the development of a customer portal application.

problem. You can also build for anticipated load management and monitor the system for performance and service level (SLA) compliance. Figure 1 captures the essence of the CRM cloud migration to an IaaS provider.



The developers assigned the customer portal project love their PaaS solution. The integrated developer environment (IDE), application server, database and essential infrastructure are available on-demand in a “turn-key” environment. The PaaS removes many tedious steps from the traditional development deployment cycle, allowing for easy recreation of environments for development, testing, quality assurance (QA), user acceptance testing (UAT), and production as needed. Traditionally, each of those environments would have to be set up – often manually – for each discrete need. PaaS is an all-in-one environment for development and production, offering a huge advantage for rapid development with its complete technology stack and near instant application deployments. The pre-set APIs built into most PaaS solutions make it relatively simple to integrate applications and databases across cloud and on-premise systems, as Figure 1 depicts. In business terms, PaaS translates into faster time-to-market and lower development costs.

Tier 3 is pioneering a unique approach that delivers a comprehensive set of cloud services together in a core enterprise-grade platform. IT Ops and DevOps can each do their best work on a single platform that brings IaaS, PaaS, and other fabric services together in a secure, isolate environment running in a secure multi-tenant cloud.

THE IT MANAGER'S PERSPECTIVE

As the respective teams hasten to fulfill their assignments, you may find yourself confronting some new issues. Though IaaS and PaaS are each great for solving specific IT problems, they are not always optimal when planned and managed in isolation. In the use case shown in Figure 1, you will find yourself managing two sets of systems, two sets of network connections, two databases, and two management interfaces, as well as two distinct ways of setting and monitoring performance and SLAs. You will have to manage and secure the calls that occur between the systems. In addition, you will have two different disaster recovery plans. Billing and administration will also be separate – a seemingly minor issue that can loom large if you're managing your IT operations with an eye to administrative efficiency.

From a system performance perspective, the integrated systems shown in Figure 1 will likely have a latency issue as data and service calls hop across multiple networks across geographic regions. Then, at some point, the customer portal launched on the dedicated PaaS solution may grow and need to be migrated to a platform that gives more control options. In addition, migrating from a standalone PaaS to IaaS can be difficult as you have to unwind and recreate many of the settings that were established with the preset options on the PaaS solution.

Ideally, you should be able to choose a single platform that married the e strong infrastructure customization and management of IaaS with the ease of development of PaaS. You should be able to develop on PaaS but then port your applications to IaaS when you need the higher level of control and custom configuration. You should be able to architect cloud/on-premise hybrids that connect to both IaaS and PaaS-based systems. All of your applications should be managed through a single interface with uniform SLA criteria and administrative functions, with a single bill at the end of the month for all of your cloud services.

BRINGING IAAS AND PAAS TOGETHER: THE TIER 3 ENTERPRISE CLOUD PLATFORM

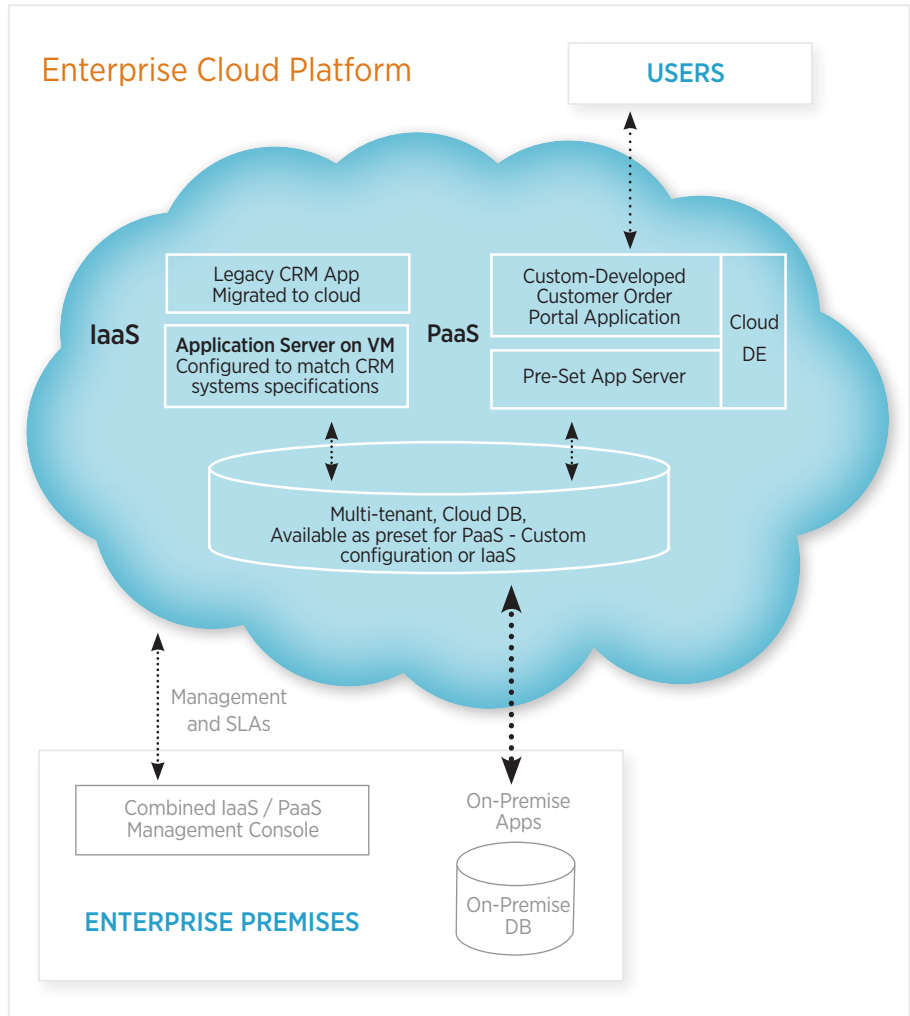
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Figure 2 shows how the earlier example of a cloud-based CRM application and customer portal would work on the Tier 3 Enterprise Cloud Platform. In this scenario, both systems run on the same platform, making it possible to develop in a PaaS environment but migrate to IaaS as needed. The platform also enables IaaS and PaaS to run side-by-side in a single network with private VLANs, better supporting direct integration with business applications and systems running on the IaaS. These “better together” benefits should make both IT operations managers and developers happy.

AN ENTERPRISE GRADE PLATFORM FOR VMS AND FABRIC SERVICES

Both cloud services run on Tier 3's respected enterprise-class cloud platform. Architected for security, performance and high availability with an enterprise-grade SLA at

Figure 2 – The cloud-based CRM and customer portal deployed as a unified IaaS/PaaS pair on the Tier 3 Enterprise Cloud Platform.



all layers and disaster recovery built in—the platform meets the stringent risk mitigation needs of IT Operations. IT teams also benefit from innovative technologies that orchestrate the deployment of complex environments and automate routine operations such as patching, managing and security – all of which greatly improve operational efficiency and reduce time spent on routine tasks. Developers and IT Ops alike benefit from innovative cloud performance optimization technologies to handle the workloads of the enterprise.

Developers using Tier 3’s PaaS offering—Web Fabric—can take advantage of Tier 3’s robust enterprise-grade cloud platform while working in a streamlined PaaS environment using tools they already know. Web Fabric offers extensive choices for language and platform, as well as the customization and configuration needed by IT Operations. When you develop on Tier 3 you can choose from a variety of languages and frameworks—including Java, PHP, Python, Node.js, and Ruby, as well as .NET with the incorporation of the Iron Foundry open source project. Ultimately, you can be confident that your apps will work from a highly available, high-performance platform that autoscales without having to code for additional performance tuning, high availability or load-balancing. At runtime, you can make your PaaS instance public, private, or both.

Tier 3 is driving the adoption of “IT as a Service”. In IT as a Service, all IT resources are available on demand from the cloud.

A CORE PLATFORM FOR CALLING A SERVICES FABRIC

The Tier 3 cloud provides a core platform that enables you to consume the services you need depending on your IT scenario. Your cloud projects can access the services you need from a Services Fabric with no technology lock-in. For example, your IaaS-based application can call on Tier 3’s Database-as-a-Service (DbaaS), known as Data Fabric, to deploy any databases such as MongoDB, Redis, MySQL, vPostgres, or Microsoft SQL Server. Tier 3 DbaaS offers high availability (HA) and auto-tuning with SQL server, MySQL, and PostgreSQL.

IAAS, PAAS, AND A SERVICES FABRIC IN THE SAME NETWORK

Services on the Tier 3 cloud are connected through secure, isolated networks. In our earlier CRM application example, the IT Ops team is responsible for the application itself, which requires a highly flexible, enterprise-grade cloud platform for managing and scaling the application as the business requires. The customer portal system runs separately on the Enterprise Cloud Platform, but both the primary application and the PaaS-based web portal enjoy many advantages from being deployed in a single, unified environment. IT operations managers gain insight into how both systems function through a single web control portal, while the internal environment can be accessed and controlled through a single API. Migration from PaaS to IaaS is secure and efficient when contrasted with the challenge of migrating from a freestanding PaaS environment to a separate IaaS environment on a different provider.

On Tier 3’s Enterprise Cloud Platform, both systems from the example CRM application interact on the same backplane with high bandwidth connections for lower latency calls between services (e.g. when the primary CRM application calls to the database server running on PaaS). Tier 3’s multi-tenant architecture enables applications running on the platform to make calls to each of the environments securely without extra work.

TIER 3’S IT AS A SERVICE VISION

Tier 3 is driving the adoption of “IT as a Service”. In IT as a Service, all IT resources are available on demand from the cloud. It no longer matters whether you’re talking about, PaaS, IaaS, DbaaS, messaging as a service (MaaS), or any other “as a service” cloud offering. Everything is available as a service from Tier 3’s unified, high-performance, secure cloud platform.

Tier 3’s platform design offers advantages on numerous levels of enterprise computing. All Tier 3 cloud services include advanced orchestration and automation to ease IT operational complexity and reduce burdens on administrators. The platform provides the transparency and control, with the ability to manage both servers and fabric services in one portal or API to integrate with existing enterprise systems management tools. You get high availability (HA), autoscaling, high performance, backups, and more without excessive operational task management. Looking forward, we will be continually introducing new fabric services such as messaging, queuing, and caching.

Platform choices made today will affect tomorrow's IT management burden, as well as cloud strategy, system management costs and return on investment.

CONCLUSION

The cloud continues to evolve, but one thing is for sure. The cloud is a certainty. For IT managers, the arrival of the cloud presents both an opportunity and a challenge. The inherent needs of all IT stakeholders never change, but the cloud has the potential to either ease or exacerbate them. Platform choices made today will affect tomorrow's IT management burden, as well as cloud strategy, system management costs and return on investment. With the Enterprise Cloud Platform, Tier 3 sets you on the path to IT as a Service—delivering flexibility, scale and management efficiency. Developers get the on-demand developer and database tools they want, while IT operations teams get the robust, dynamic infrastructure they need. All related services are secure, enterprise grade, and centrally managed. Tier 3's Enterprise Cloud Platform is the foundation for a viable, sustainable long-term cloud strategy.

Use Cases

STAND ALONE PAAS: Some companies are available to migrate their systems directly to a PaaS Environment. Other companies may even launch and run their own PaaS Environment with the possibility of extending it into other PaaS Providers. In the case of Cloud Foundry enabled PaaS Providers this can take many different routes.

A great example is the enterprise that builds out an internal Cloud Foundry-based PaaS inside their company for an operational and thought leading design & innovation lab. Any type of "lab" that pushes the envelope has a drastically shorter time to test schedule. When a design lab is dealing with 1-3 week iterations this is a huge advantage. But what happens when a design lab needs more than just the internal capabilities or wants to migrate things directly from internal prototyping to a production public facing application? That's when a virtual private cloud offering like Tier 3 provides can enable and internal and external, or also known as an on-premise and off-premise cloud provider to talk with internal systems. Through a secure VPN the systems can act as a single PaaS enabling a seamless migration to production without interrupting the operational needs of a design & innovation lab.

PAAS + IAAS: One of the more common scenarios, that hinders progress toward utilizing cloud computing capabilities is the often separate availability of PaaS or IaaS. Having both available on the same network, from a single provider, simplifies the case to extend new PaaS Applications to interact with legacy applications that need IaaS Capabilities.

As an example, a company with a greenfield PaaS-enabled application is able to extend it when extra storage or compute resources are needed. A common use case of this is seasonal workloads. For example, an actuarial firm that needs 1-2 weeks of heavy compute calculations with simple threaded processing. This extra workload is ideal to break away onto simple IaaS-enabled compute instances. When the instances are finished computing these heavy calculations, the VMs can be idled and turned off while the primarily PaaS-enabled application stores the data that was processed. Then, whenever this data is needed, the PaaS application can easily access it and provide it without any excessive compute costs or extra systems.

Tier 3 Enterprise Cloud Features and Benefits

FEATURES	BENEFITS
Enterprise-grade platform with security, high availability, and backups built into every deployment.	Businesses get the security of a virtual private cloud with the performance, availability, and built in disaster recovery it needs to run business-critical applications in the cloud with confidence. Developers don't need to code in additional scaling, performance-tuning, HA, or DR into their applications.
Intelligent automation and orchestrations layers, plus Blueprint toolset and marketplace.	Automation features lower IT costs and ease the burden of managing everything from routine tasks to complex, enterprise-scale systems. Offload time-consuming IT chores while automatic monitoring and reports appraise of performance across the stack. Tier 3's orchestration toolset—Blueprints—enables fully automated deployments of best-practice optimized, complex environments and applications to the platform.
Innovative optimization technologies deliver best-in class cloud performance: Autoscaler, Dynamic Allocation, and Dynamic IO	Intelligent hypervisor tuning yields exceptional performance for even the most demanding, high-performance apps (server-side performance within a 5% differential of physical equipment). Predictive Autoscaler ensures systems stay up and running under increased load, while Dynamic IO determines the most efficient use of storage pools, optimizing storage for both performance and cost.
Growing global elastic fabric of cloud services with local point of presence (POP) locations.	Leverage a global elastic fabric of data centers for high availability and geo-specific services—all managed by Tier 3 to deliver the same exacting standards for scalability, performance, security and interoperability—and all easily accessible via a single management portal.
Expert onboarding services and 24/7 technical support.	Direct access to level 3 engineers who have experience architecting, implementing and operating complex technical environments for virtually any type of business. A team-based approach ensures support by an engineer who is familiar with your environment.