

Acquia[®] THINK AHEAD.

Building Success on Acquia: The 10 Layers of Platform as a Service

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Introduction

Great web applications are essential for success in today's marketplace. The goal is to optimize the allocation of resources: not only to build, deploy, manage, and scale web applications but also to ensure the necessary focus on continuous innovation -- crucial for ongoing success.

Infrastructure-as-a-Service providers like AWS have helped bridge the gap. However, IT professionals and developers are starting to realize that an end-to-end Platform-as-a-Service (PaaS) is the solution needed to truly speed time-to-market and stay one step ahead of the ever-evolving technology landscape.

PaaS has delivered true value in this challenging environment. In addition to infrastructure, PaaS provides the technology to build, test, deploy, and optimize web applications in a secure way that guarantees performance and high availability. PaaS delivers an end-to-end solution which is ready to build on, starting day one.

This e-book is an update to our previous version of the 10 layers of PaaS. The update reflects the speed at which technology is evolving and features and functionality that you must account for when building Drupal websites.

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The Layers

Acquia has identified 10 critical layers of PaaS that provide the technology and business support required for a great web applications.

10	CUSTOM CODE & SERVICES
9	INTEGRATION WITH OTHER TOOLS
8	MONITORING & OPS
7	SECURITY
6	TEAMS & PERMISSIONS
5	MULTISITE
4	TROUBLESHOOTING TOOLS
3	AUTOMATED DEV TOOLS
2	PLATFORM & ORCHESTRATION
1	INFRASTRUCTURE

1 — INFRASTRUCTURE

Infrastructure is the foundation of a world class Platform-as-a-Service. There are many infrastructure providers to choose from. Identifying the right provider and then integrating the infrastructure with Drupal for features like high availability, scalability, security is time consuming and expensive. The Acquia platform eliminates this problem, Acquia has chosen to work with Amazon Web Services (AWS) to build a robust platform, optimized with the goal of running highly available, scalable, and resilient Drupal applications. The result: you don't have to worry about the underlying physical infrastructure. This strategic partnership allows Acquia access to all of AWS's innovations and expertise.

By leveraging AWS, Acquia takes advantage of best-in-class foundational infrastructure services and innovations in the spaces of compute, analytics, and databases. Additionally, by standardizing on AWS, Acquia builds better products and delivers value faster by:

- Standardizing Acquia's configurations for security & compliance
- Taking advantage of AWS's homogeneous yet globally distributed regions
- Building upon interconnections and proven combinations on AWS services (e.g. CloudFormation and VPC)
- Leveraging AWS's consistent reuse of best practices (IAM, KMS, etc.) across its services

In addition to the benefits seen by focusing on a single IaaS vendor, we're confident we've picked the right principal technology partner, as demonstrated by AWS's:

- Operations in over **10 global regions** — allowing Acquia to meet your global availability requirements
- Focus on innovation. AWS's velocity in releasing new features continues to accelerate: in **2015 AWS released 800+ features**, compared to **516 in 2014** and **280 in 2013**.
- AWS has **10x the compute capacity** than all the other public cloud providers combined (Gartner).

“Releasing software is too often an art; it should be an engineering discipline”

— David Farley

Acquia provides a variety of infrastructure configurations to meet your price, performance, security, and compliance needs. All Acquia enterprise workloads run on highly available and redundant infrastructure configurations in which data and services are distributed across availability zones (data centers); multi-region offerings are also available.

2 — PLATFORM AND ORCHESTRATION

Platforms allow for repeatability and predictability — both important to launch new projects and reliably ship software. A platform brings together building blocks necessary for application delivery, packaged with best-of-breed solutions and proven processes to improve velocity and time to market. Additionally, platforms provide benefit from the network effect: as new capabilities are added for one project, every user on the platform can utilize and benefit from the investment.

Infrastructure is just the first step in building websites. Providing scalable and resilient application delivery is non-trivial for complex solutions such as Drupal, but Acquia provides the necessary platform orchestration and automation to handle even the most demanding workloads. This includes configuration management, optimization and ongoing enhancements for load balancing, caching, databases, application tier services, and more. Acquia takes care of the underlying platform components including proprietary software, open source components and foundational AWS services.

Platforms are more than just a combination of discrete components. Each piece must be carefully selected and integrated to achieve the desired results. Acquia has chosen and configured the best platform components, and evolved the platform over many years, to provide the optimal experience and efficiencies. We continue to reinvest in improving platform capabilities for the benefit of all our users.

Ultimately, Acquia frees you from worrying about the underlying physical infrastructure. Security hardening, performance optimization, and service disruption resiliency are all handled by the platform and Acquia support services.



3 — AUTOMATED DEVELOPER TOOLS

Developers want to build websites and features fast, while ensuring the code they write is reliable. To do so efficiently, you need tools that support software development best practice workflows. That is exactly what the Acquia platform provides: developer tools designed to simplify day-to-day activities by automating tasks. Acquia Cloud tools are designed to help developers:

- 1 — **Build** new websites and features faster (by writing code)
- 2 — **Test** code to make sure it works
- 3 — **Deploy** code between environments quickly

Acquia provides **pre-established dev-stage-prod environments** (with more environments available as needed). These separate environments encourage continuous integration and delivery, by seamlessly embedding clear stages for testing into the workflow. Automated tests flag issues as content and code is migrated between environments; the **activity log** tool ensures that issues can be quickly isolated by identifying recent changes. To speed deployment and time-to-market, Acquia offers easy and instant **drag-and-drop** deployment of code, files, and databases between environments automatically from a Git or Subversion source code repository. The workflow also offers **live development**, which means that developers can make changes to code on development and staging environments directly, without needing to first make the changes locally. Additionally, users can easily manage their local development environments and keep them in sync using Acquia Dev Desktop (for offline development) or through command-line and Drush integration. Acquia's engineering team is dedicated to continuously innovating its developer tools to deliver automation, predictability, and reliability for all developers.

*“Developers want to code,
not manage infrastructure”*

— Forrester

4 — TROUBLESHOOTING TOOLS

Building websites is just one part of the equation; developers also need tools that help them meet industry-accepted uptime service levels and performance. Acquia delivers a set of tools designed to:

- 1 — **Monitor** websites to ensure they stay up and running
- 2 — **Troubleshoot** websites and identify fixes when something goes wrong

Acquia Cloud Insight uses over 200 rules to analyze your site's configuration, performance, and security for risks and best practices. It produces reports, quality scores, proactive alerts and actionable recommendations for issues it discovers with your Drupal code and configuration. **Acquia Cloud Uptime** polls websites to ensure they are online and actively serving content. Log Streaming displays granularly filterable logs from all servers in real time as end users browse websites. **Activity Stream** enables users to audit developer activity, identify when and why code changes were made and which team is responsible for the changes. **Module Analysis** tracks changes made to your modules, identifies improper changes, and indicates if a particular module is out of date. **Stack View** provides a view of how websites are performing, the corresponding infrastructure usage, and identifies and fixes application errors easily. Acquia's monitoring and troubleshooting tools are designed to significantly simplify the task of keeping websites up and running, allowing developers to focus more time on building new websites and features.

5 — MULTISITE

As a developer, soon as you build a handful of successful sites, you're bombarded with requests to build more. Website sprawl often starts with just a few sites — as teams, products, marketing campaigns, and geographies multiply, so do sites and supporting technologies. Soon, it becomes unmanageable. That's when multisite management becomes critical. The Acquia platform enables you to overcome this problem through an interface that allows you to centrally manage your websites by running multiple sites on a



common codebase. This helps you simplify maintenance and security, while reducing associated costs. In addition, you can enforce roles and permissions to make sure the right people are working on the right tasks. The platform also provides developers with tools, flexibility and fine-grained access control for their sites. All of this allows developers to build websites quickly and securely, while giving marketers the creative freedom to manage their own sites and brands

6 — TEAMS & PERMISSIONS

One of the many advantages of leveraging the cloud is to foster teamwork. You've got your projects in the cloud, and then you've got all the teams who perform specific operations on those projects: adding and removing users, deploying code, modifying the databases, configuring servers, creating support tickets, monitoring performance, troubleshooting... The number of roles and permissions can very quickly become unmanageable, hindering productivity and increasing security risks.

The Acquia platform provides you the tools to efficiently manage teams and permissions, enabling granular visibility and control over who in your organization has access which tools, environments and features. Using Acquia's **"Teams and Permissions"** features, you can create teams of developers, assign roles to those team members, give teams access to your Acquia sites, and modify roles: specifying over 40 different permissions available in each role. When individuals move off projects, for whatever reason, Acquia makes it very easy to quickly remove privileges, ensuring those individuals do not have the access or privileges they should not have.

These features are designed to reduce friction and increase productivity. Acquia's tools are also pre-tuned to promote security best practices, such as enabling an IP whitelist for logins and multi-factor authentication. This system, refined over thousands of cloud projects, helps you significantly decrease the time spent on keeping track of employees and contractors.

*"With PaaS developers
can spend '100% of the
time on coding'"*

— TechTarget

7 — SECURITY

Security is more than just a checkbox. It's a frame of mind, a culture, a commitment.

The security threat landscape is constantly evolving. Meeting the challenges of these threats requires expertise, technology, financial resources, and collaboration. Security is at the heart of the Acquia platform. We have made the investments required to provide you a robust and secure platform through **Security by Design**, **Security through Compliance**, and **Security through Innovation**.

Security by Design includes the features you get out of the box: multiple layers of firewall, multi-factor authentication, vulnerability management, security incident response, and backups and disaster recovery capabilities. These features protect our customer workloads and also help us meet industry accepted certifications such as SOC 1 and SOC 2, PCI-DSS, HIPAA, FERPA, EU Data Protection, ISO 27001 and FedRAMP Moderate. Together these certifications comprise **Security through Compliance**. A key benefit of Acquia's compliance portfolio is to provide you confidence with cloud security — knowing there is independent, third party validation of Acquia's security.

Finally, to stay on the cutting edge of threat detection, our engineering teams have developed a number of security products that we categorize as **Security through Innovation**: Acquia Cloud Edge Protect, which helps mitigate DDoS attacks; Acquia Cloud Shield, a dedicated, logically isolated environment within Acquia Cloud that has customizable network configurations; and the Acquia Cloud VPC family which is a suite of virtual private cloud (VPC) products designed to provide elevated and compliant protection for sensitive data.

Acquia's security team is constantly working for you, to ensure your websites are built on a platform that will not fail your business or your customers.



8 — MONITORING & OPERATIONS

Successful monitoring and operations require more than just infrastructure and software. It takes an experienced team working together, around the clock. At Acquia we have a “follow-the-sun” approach, with teams on three continents constantly watching and responding to alerts 24x7.

Acquia employs two teams to monitor your web applications -- Operations and Support. The Operations team is comprised of infrastructure experts and the Support team is dedicated to support your Drupal code and applications. Working together, these teams are able to catch and resolve issues before they turn into problems.

Acquia uses redundant **monitoring systems** to provide instant visibility into vital, real-time, and historical metrics. We closely monitor both the platform’s underlying infrastructure and the services that power it. These systems trigger alerts and escalations to ensure that our teams are notified when events occur. The experience of monitoring and managing resources for thousands of sites has led us to invest in building **instrumentations systems** for monitoring over 50 metrics -- like disk usage, CPU usage, memory usage, running processes and many more.

To see these Acquia teams respond to an incident -- wielding expertise from Operations and Support -- is to see how well monitoring and operations can work in a true PaaS environment, and how much it adds to a plain vanilla infrastructure arrangement.

9 — INTEGRATION WITH OTHER TOOLS

Building and delivering impactful websites requires leveraging several third party-tools. Building integrations with these tools requires a massive engineering effort. Acquia’s platform accounts for this requirement and provides integrations with several third party tools in five flavors:



- 1 — Marketplaces - for vendors that integrate directly with the platform
- 2 — APIs - to allow developers to integrate the platform into other services
- 3 — SDKs - packaged wrappers around APIs to make them easier and faster to use
- 4 — CLIs - to speed up developers' day-to-day work by providing platform actions at their fingertips, in a terminal application
- 5 — Hooks - to react when an action occurs on the platform

Customers often discover that these integrations are crucial when they want to add features and functionality. For example:

- Internal business systems like project management systems or legal review typically require Hooks and APIs at a minimum, and can be sped up by SDKs.
- SaaS services like search, personalization, content syndication, and content translation are typically made available through a Marketplace.
- Developer tools like GitHub and Bitbucket, chat apps like Slack and Hipchat, and code automation tools like Jenkins and TravisCI typically rely mostly on Hooks.
- Application Performance Management tools like New Relic and AppNeta, as well as Load Testing tools like Blazemeter, are typically made available through a Marketplace and are integrated directly into the platform.

In addition to these platform integrations, you'll want a content management system that can support integrating with the business systems you already use. Drupal, with Acquia, delivers on enterprise level expectations and smoothly integrates with third party tools.

“Acquia’s uptime service level agreement makes us — and our customers — look good. We can build websites with confidence, knowing that the Acquia platform will never leave our customers hanging. Support is always there, for us, and our customers.”

— Brent Wilker, VP of Business Development at Acquia partner ImageX

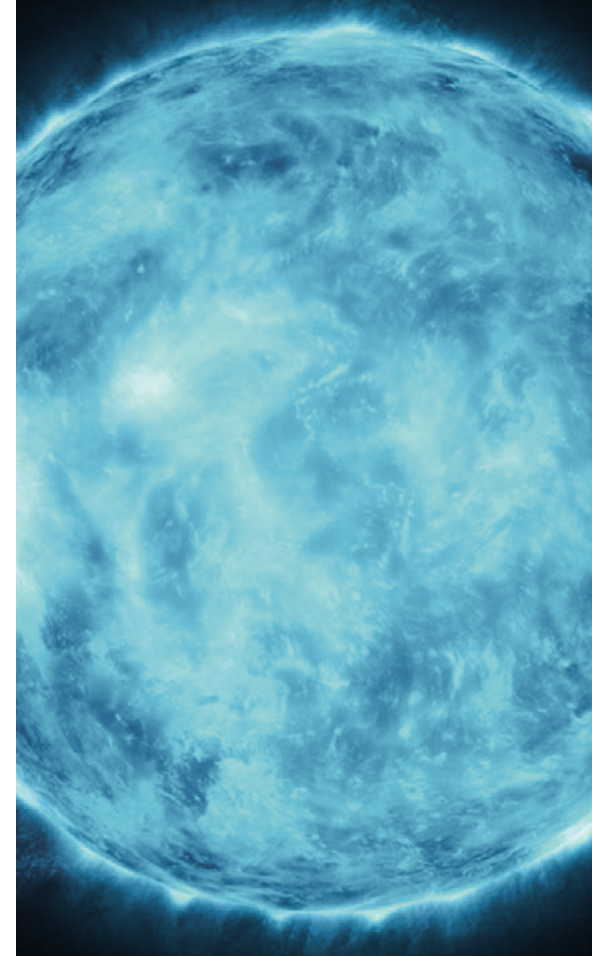
10 — CUSTOM CODE & SERVICES

Effectively running a 24x7x365 operation requires significant investment in building a knowledgeable, readily-available, and redundant support organization. There are several factors that need to be accounted for:

- Infrastructure support: SLA's only go so far. When your infrastructure fails, you need to have the right resources available to troubleshoot the problem and implement fixes
- Custom Code: Websites often take advantage of custom Drupal modules and integrations. Ensuring you have experts who are knowledgeable and experienced in working with custom code can get very expensive
- New website creation: Most organizations underestimate the effort required in moving a site from development to production

The Acquia platform delivers on all of the above and much more. Acquia's Global Support team is experienced in PaaS infrastructure and also in the integration of application and infrastructure. The team is built to support and sustain operations throughout the year and to address issues whenever they arise. Acquia's Global Support team will also work with you to troubleshoot and diagnose custom code issues within our scope. Over 60 Drupal experts, many of whom are key contributors to Drupal, are able to dive into your custom code, collaborate with other experts, and isolate difficult-to-find code issues. This helps you minimize the resources you need to allocate to these issues, and, more importantly, solve complex code issues faster.

Acquia's Ready team is available to help you put together an efficient and cost effective process to move a site from development to production - while remaining available to provide any assistance required during the actual process. Going live is more than simply moving code between environments. Acquia's Customer Service Managers and Engineers are experienced in preparing sites for launch via load tests, launch checklists, and many years of experience tuning Drupal to work with optimal performance.



Ongoing technical strategy and site optimization falls by the wayside in the face of managing the day-to-day infrastructure and application issues. Acquia's Technical Account Managers (TAM's) provide the expertise and technical strategy to ensure you are on the cutting edge. TAM's also work with you to ensure you are taking full advantage of the PaaS and any new features that are rolled out.

Conclusion

Although this paper focuses on the 10 layers of PaaS, it could just as easily have been titled, "Everything You Need for Web Development and Delivery Success." Acquia has successfully supported thousands of projects, and has identified the necessary components to build, deploy, manage, and scale Drupal applications. Acquia's engineering team is constantly engaged with the wider Drupal community in an effort to keep the platform up to date with the latest technical developments. With the Acquia platform, developers can focus on building web applications fast; and organizations can benefit by improving time-to-market. In addition you have the peace of mind of knowing your web applications are built and run on a secure platform, which is backed by 24x7 monitoring and support teams.

Building a solution comparable to Acquia would take months, a significant staff, and many thousands of dollars. Let Acquia reduce risk, take away a commoditized burden, and complement your team with expertise and better tools. Ensure your teams are focused on building products, features, and functionality that will keep you ahead of the competition. Give your application and operations team the tools they need to stop putting out fires, and start building and delivering great digital experiences. Acquia's Ready team is available to help you put together an efficient and cost effective process to move a site from development to production - while remaining available to provide any assistance required during the actual process. Going live is more than simply moving code between environments. Acquia's Customer Service Managers and Engineers are experienced in preparing sites for launch via load tests, launch checklists, and many years of experience tuning Drupal to work with optimal performance.

The below table gives you a high level view of the differences between Acquia's PaaS, managed hosting (IaaS) and on premise hosting

FEATURE	ACQUIA CLOUD	MANAGED HOSTING	ON-PREMISE HOSTING
PLATFORM: Fully managed and updated LAMP stack for Drupal-optimized websites	✓	✗	✗
SECURITY: Dedicated isolated network, two-factor authentication, WAF (DDoS mitigation), teams and permissions. More COMPLIANCE: SOC 1 and SOC 2, HIPAA, ISO 27001, EU Data Protection, FERPA, PCI-DSS, FedRAMP Moderator. More	✓	MAYBE	DIY
DEVELOPER TOOLS: Drag-and-drop workflow; separate build, stage and production environments; monitoring and troubleshooting tools, and much more	✓	✗	DIY
SUPPORT: 24x7 infrastructure and Drupal application support, 99.95% uptime SLA. More	✓	✗	✗
DISASTER RECOVERY: Multiple geographic regions for multi-region failover	✓	MAYBE	DIY

