

Samsung — How the Leader in Innovation Leverages Cloud



For over 70 years, [Samsung](#) has been dedicated to making a better world through diverse businesses that today span advanced technology, semiconductors, skyscrapers, shipbuilding, petrochemicals, fashion, medicine, finance, hotels, and more. Their flagship company, Samsung Electronics, leads the global market in high-tech electronics R&D, manufacturing, and digital media.

Through innovative, reliable products and services, talented people, a responsible approach to business and global citizenship, and collaboration with our partners and customers, Samsung is leading the world in innovation, driving in bold and imaginative new directions.

Business Challenge

The company has built a reputation of quality and innovation that keeps them at the forefront of technology. This momentum of an increasingly innovative marketplace translates to huge demands on infrastructure delivery capabilities and high talent software development.

Samsung leads the world in mobility, enabling productivity for customers and partners. To fuel the increasing velocity of innovation, the Samsung team launched their initiative for building a Cloud Solutions Platform to deliver robust infrastructure and applications at cloud-scale. Samsung envisioned the Cloud Solution Platform to deliver infrastructure with best-in-class innovation and fastest time to market, enabling further convergence of the mobile and traditional enterprise management and document workflows.

Samsung's vision for the cloud platform can be seen with products like Samsung Cloud Print, Smart Printer Diagnostics System, integration with Amazon DRS, as well as its acquisition of PrinterOn. The success of Samsung's vision is enabled through key foundational technology decisions early in the design process. These included:

- Vendor-neutral cloud infrastructure
- Horizontal scalability
- Open source implementation (where applicable)
- Vendor-neutral integration with a cloud management platform

These principles are coupled with world class technology and practices:

- Rapid provision of new deployments (DEV, INT, QA, PROD, DR)
- Simplify solution application development effort
- Infrastructure-as-code practices
- Configuration management of core platform components
- Subsystem clustering
- Security configuration between subsystems
- Monitoring, alerting, and auto scaling
- Separate code and configuration

Each new iteration brought new complex challenges that required steady innovation by the software team. Numerous technologies were deployed and evaluated for each layer of the solution. Performance was measured for each component and subsystem as well as detailed cost profiling to ensure the system was viable and provided a strong ROI.

Business factors also influenced technical requirements. Samsung acquired PrinterOn®, a pioneer in mobile cloud printing solutions. Samsung began development of the cloud-based printing solution for any device, anywhere. Samsung needed to deliver infrastructure to the Dev teams with agility consistent with their rapid pace of development.

“ClearScale provides hard-to-find breadth in cloud and enterprise development, coupled with practical implementation capability. They have delivered a wide variety of tasks ranging from database integration, service development, performance, and the control dashboard. I am impressed with the timeliness on delivery and capability to expand staffing as needed. ClearScale is a great asset to any team.”

Brent Richtsmeier, Vice President,
Samsung Research of America - Advanced Printing Solutions Lab

ClearScale Solution

Samsung partnered with ClearScale to deliver the Cloud Solutions Platform. ClearScale provided expertise in the identification and selection of different cloud platform components and providers – this led to a cost effective way for Samsung to scale the development effort. Samsung leveraged ClearScale’s DevOps experience to automate deployments as well. Their knowledge of Amazon Web Services and enterprise cloud components helped Samsung build a best-in-class high performance design with an efficient cost footprint. The Cloud Solutions Platform would be cloud agnostic with the ability to manage AWS, GCE, and private cloud technologies. The cloud management component (e.g., RightScale) had to be modular and replaceable without redevelopment efforts. The system would provide services that have infinite horizontal scalability.

Keeping up with technological advances and Samsung's drive for excellence is no simple task for any Systems Integrator, in which ClearScale's hallmark of innovation is evident. It demands speed, agility, rapid adaptation to changing business requirements, deployment of the latest technology changes, and most importantly identification of new business opportunities with each field test and development iterations.

The Cloud Solutions Platform started with [RightScale as the cloud management engine](#), providing portability between [cloud infrastructure](#) while capitalizing on the unique capability and cost benefits of each of the infrastructures. ClearScale provided best-in-class expertise in cloud agnostic systems and developed RightScale Server Templates for Samsung application components. These templates had to be cloud independent, as Samsung was planning to reuse them for a variety of projects that would be deployed on Amazon, Google, and private/hybrid cloud deployments. As Samsung iterated through development, it became evident that businesses required a solution that could be deployed in the enterprise [private cloud](#) without any connection outside of the firewall. Additional requirements for analytics, monitoring, and stability were added to the platform. ClearScale then deployed ELK (Elasticache, Logstash, Kibana) in the stack to demonstrate in the pilot and provided the final production design for ELK in Samsung Cloud Print and Device Monitoring Solutions. Further optimization and cost management requirements drove the evolution of the platform, and the design refinement focused on [AWS CloudFormation/ OpsWorks](#) and pure Chef to minimize cost and deliver efficient automation.

ClearScale ran primary Chef development efforts in AWS and deployed services to Google Compute Engine (GCE) to validate code compatibility and analyze the performance of both service providers relative to [deployment automation](#).

Numerous iterations of Chef Cookbooks were developed over time as a direct response to business requirements. As development teams experimented with new technologies, ClearScale responded with new Cookbooks to add to the growing automation library. The result has been a comprehensive service catalog available to all Samsung teams.

Application Cookbooks were deployed in the following areas:

- JBoss (with and without Fuse ESB)
- Ejabberd
- OpenAM, OpenDJ
- Cassandra
- MongoDB (create single MongoDB instance, replica Sets, or clusters)
- MySQL
- And many more

Task-based Cookbooks:

- Volume management
- DNS management
- Resources for remote actions and tagging

The initial automated deployments for full stack dev/test instances were taking three to four hours to complete. To keep pace with innovation, Samsung needed to reduce deployment times to minutes. ClearScale developed a two-stage automated deployment process. The first stage of the process created new Amazon Machine Images (AMI) with updated software/components. This step ensured that AMIs were up-to-date with current patches and software distributions. The second stage of the process created the instance and managed the final configuration tasks. This two-stage method allowed Samsung to deploy fully functional dev and test instances rapidly (10-15 min for small and 5-6 min for large instances).

Samsung's acquisition of PrinterOn® brought on new product development efforts. The Cloud Solutions Platform was put through the test, delivering infrastructure to support the iterative cycles of development and testing. The development team was able to quickly change paths from Tomcat to JBoss, MySQL to Cassandra to MongoDB without missing a beat. They focused on innovation, not infrastructure.

Business Value

Samsung has enabled the delivery of cloud infrastructure at the pace of agile development. This shortens overall time-to-market for products and services and keeps this leader of innovation on the forefront.

Automated infrastructure deployment at cloud-scale reduces Samsung's IT management overhead and provides faster, more cost effective, and reliable services. This allows the business to focus on the products and services used by their customers and maintain a competitive edge in the marketplace.