

INSTACART SUPPORTS GROWTH DEMANDS WITH FULL-STACK MONITORING

About Instacart

Instacart is an Internet-based grocery delivery service currently operating in 17 U.S. cities and metropolitan areas. Forbes named Instacart the Most Promising Company of 2015, citing its incredible growth since its 2012 inception.

Instacart's Director of Engineering Nick Elser discusses how his team supports the critical infrastructure that runs its business applications. Nick's team has developed Instacart's environment to support the constant demands for speedy service, expansion into new markets, and increasing numbers of customers and shoppers associated with the business' growth.

The challenge: Supporting intense growth and the demand for speed

Since Instacart originated in San Francisco in 2012, Nick's team has been responsible for taking the company into new cities with new customers, shoppers, stores and regulations; they now support over 7,000 workers. Nick says having the right infrastructure monitoring solutions saves his team time and allows them to focus on continuing to grow the business and support its users.

"We're always planning for the future, so we're building out our systems and processes so they'll be able to scale. Obviously one of the ways we do that is rely on external services like SolarWinds Cloud to handle scaling parts of our infrastructure in which we are not experts, like building massive log aggregation buckets or statistics reporting collection buckets, so we use Papertrail and Librato," Nick said. "This way, we spend time focusing on how to build a better grocery delivery service: how we can scale all our operations, our fleet of amazing shoppers, the number of cities we're in, the different tax laws and jurisdictions, and our engineering team, and how we can build the tools and processes necessary for us to move faster as a team."

Solution: Implement full-stack monitoring - then get back to growing the business

The Instacart engineering team uses SolarWinds Cloud products to ensure their stack is running as it should.

"We find all these services indispensable for the uptime and reliability of our services and we use them extensively to diagnose different kinds of issues," Nick said. "Every one of them provides a different facet from the top to the bottom in terms of how we're examining the health of our stack, and they all really just help us move a lot faster and not have to worry about our infrastructure."



THE INSTACART STACK

- Rails, Postgres, Ubuntu
- Amazon EC2
- Primary app written in Ruby on Rails connected to multiple Postgres databases with multiple replicas hosted in RDS
- ElastiCache and both Memcached and Redis for caching and queuing
- RabbitMQ as an RPC and queuing mechanism
- React and a custom CSS framework
- Some ancillary apps that do machine learning and job assignments and a logistics platform, all written in Python

PINGDOM - WEB PERFORMANCE MONITORING:

“We use Pingdom as a report for our uptime. It tells us when things are up or down from a macro scale.”

At the top of its stack, Instacart uses Pingdom, a powerful web performance management solution that monitors and alerts on a website's uptime, real user experience, synthetic transactions and more.

Nick said Pingdom is the most flexible uptime monitoring tool the Instacart team could find. They run checks on approximately 20 services and use it to alert on various breaches of concern, such as “no jobs processed in the last X minutes” or “no orders assigned to shoppers within the last interval.” According to Nick, this service “boils down a pipeline of extremely complicated machine learning algorithms and assignment systems into a very simple boolean health check that always needs to be healthy.”

pingdom

LIBRATO - REAL-TIME CLOUD MONITORING:

“We use Librato to aggregate all our metrics in one place and provide more detail about how everything's performing, how often we're running jobs, whether or not certain external services are responding in time, etc.”

Librato provides the next level of monitoring, collecting time-series metrics from various sources (including Pingdom, for example, or Amazon Web Services, Heroku, and countless other data sources), and providing customizable graphs which can be used to correlate data, identify issues, alert on threshold breaches, and more.

The Instacart team originally considered using Graphite or Nagios, but opted for Librato because of its simple integration with Heroku. They soon moved their infrastructure to AWS directly and began using the accompanying AWS CloudWatch monitoring component, but required additional visibility and custom metrics for their vast amounts of data.

“One of the reasons we use Librato is the really, really simple integration with AWS CloudWatch. While CloudWatch is amazing and we use a lot of EC2's resources, its interface and aggregation can't display all the things we need when we need them, and it doesn't have baked-in integration of RubyGems or Python libraries, for example,” Nick said. “Librato provides this amazing overlay on top of CloudWatch with a really easy interface to ingest data from CloudWatch and to basically provide custom metrics.”

librato™

Instacart uses CloudWatch with Librato to keep an eye on its database load and instance health, monitoring its fleet size, backlog queues and other things impacting overall infrastructure health. But their main goal, Nick said, is aggregating their thousands of CloudWatch metrics and parsing them out as needed for critical analysis. Librato correlates and compares these CloudWatch metrics for them.

"Any infrastructure that we don't have to maintain is good infrastructure," Nick said. "We've been really happy to have Librato as an external service that we can just trust and not have to worry about, especially since it's handling increases in load as we suddenly double our server count and then spin it back down or whatever we happen to be doing. It's really nice."

PAPERTRAIL - LOG MANAGEMENT:

"Papertrail is our log of record for everything happening that's textual: errors, exceptions, etc. Papertrail captures all of these different things, which allows us to really dive deep into debugging different things."

papertrail

The Instacart team also opted for Papertrail because of its simplicity. Papertrail provides frustration-free log management across all infrastructure systems, featuring search, troubleshooting, analysis and more. Nick said he compared various log collector options, but others weren't as easy to set up and required substantial overhead and manual configuration. He also considered the agent running on Instacart's servers to submit logs to a remote server and noted the remote syslog daemon that Papertrail offers as being very well written, fast and easy to set up.

"Papertrail just worked," Nick said. "I could have it on all my boxes, give it an endpoint, and it would all just magically work and be aggregated into different buckets based on host names. It's very expressive and powerful, and at the same time extremely simple."

Nick said SolarWinds Cloud is in the unique position of having three views into the health of Instacart's stack and can provide a lot of value that way. He said he recommends all SolarWinds Cloud products, especially now that they are together, and offered suggestions for their continued development, such as adding anomaly detection.

"I absolutely do recommend them to people and sell them on the strength of, 'it just works,' which I think is underrated in a lot of infrastructure pieces. We love you guys and we're excited to keep working!"

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