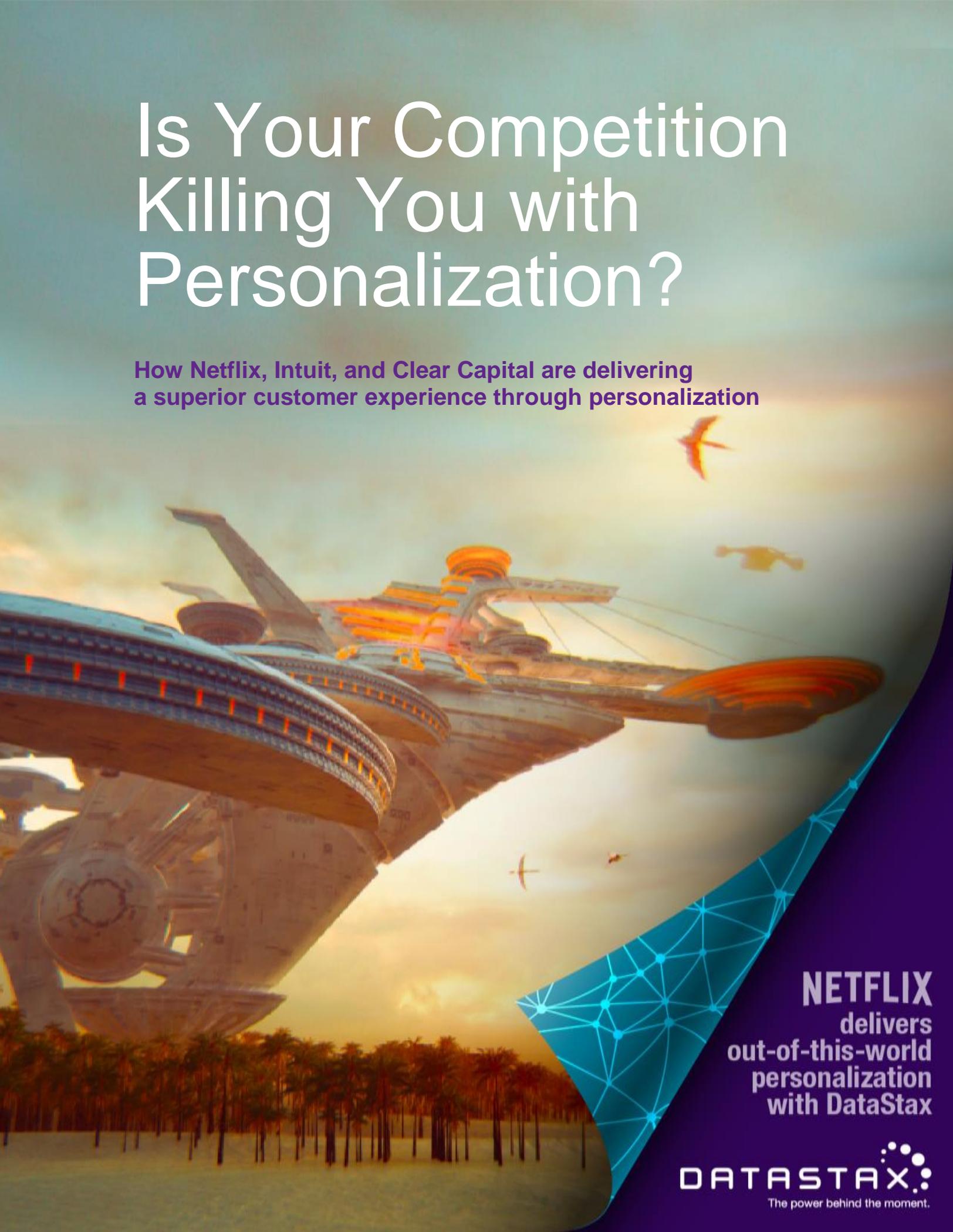


# Is Your Competition Killing You with Personalization?

How Netflix, Intuit, and Clear Capital are delivering a superior customer experience through personalization



**NETFLIX**  
delivers  
out-of-this-world  
personalization  
with DataStax

**DATASTAX**  
The power behind the moment.

PERSONALIZATION

# Is Your Competition Killing You with Personalization?

How Netflix, Intuit, and Clear Capital are delivering a superior customer experience through personalization.

Today's customers demand speed, convenience, and valuable in-context experiences. Netflix, Intuit, and Clear Capital — all leaders in their industry — are rising to fulfill the customer experience (CX) mandate in part by providing a tailored digital experience across multiple channels. These leaders know their customers won't give them a second chance if they fail to meet customer demands for an outstanding CX. They join enterprises around the globe that are prioritizing CX as a corporate initiative essential to their long-term success.

To accomplish the level of personalization customers expect, businesses must be able to merge real-time customer interaction with historical data to paint a 360-degree picture of a customer's unique habits and preferences. Let's take a look at how these leaders use DataStax Enterprise to provide a CX their customers can't get anywhere else.

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## Key Requirements of Personalization in Cloud Applications

Creating and maintaining highly personalized applications involves the ingestion and analysis of massive volumes of dynamic user activity both historically and in real-time. It requires an always-on data platform capable of handling vast amounts of data in different formats, without impacting performance and availability. These modern applications that we call Cloud Applications, have some key characteristics that are needed for real-time personalization:



## DataStax Enterprise: Data Management for Cloud Applications

If you're ready to embark on a personalization project, you must ensure your database infrastructure can handle large amounts of dynamic data without skipping a beat. DataStax Enterprise (DSE) is the always-on data platform for cloud applications powered by the industry's best version of Apache Cassandra™. By ensuring that your applications always work, you can focus on what matters most to you. Applications built on DSE easily deliver a personalized, seamless customer experience.

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## Customer Success Stories

DataStax customers, Netflix, Mint Bills and Clear Capital are leading the way by innovating and redefining customer experiences.

# NETFLIX

Netflix, the leader in digital streaming media with over 83 million subscribers, migrated from Oracle to DataStax Enterprise for its ability to deliver continuous availability and scale across multiple data centers in the cloud. With DataStax Enterprise, Netflix is now able to easily handle a throughput of more than 10 million transactions per second without worrying about downtime or performance issues.



Mint Bills, (now part of Intuit) is a top-rated, award-winning mobile app that takes the work and worrying out of paying bills for more than 11 million U.S. consumers. Mint Bills selected DataStax Enterprise to store user account data. Even with a fast-growing number of users and accounts across various types of data models, Mint Bills continues to perform and scale with ease to support this massive growth.



Clear Capital is the premium provider of data and solutions for residential and commercial real estate asset valuation and collateral risk assessment for large financial services companies. They chose DataStax Enterprise to meet their requirements around linear scalability, high performance at scale, and continuous availability. Since moving to DataStax Enterprise, Clear Capital has delivered over 1 billion valuations on 122 million properties while remaining always-on.



## PERSONALIZATION

# NETFLIX GIVES USERS EXACTLY WHAT THEY WANT – EVERYTIME

Netflix is the world's leading Internet television network with more than 83 million streaming members in more than 190 countries. Based in Los Gatos, California, Netflix has successfully shifted its business model from DVDs by mail to online media and today leads the streaming media industry with more than \$6.7 billion digital revenue. Netflix dominates the all peak-time Internet usage and its shares continue to skyrocket with soaring numbers of subscribers.

### The Challenge

Netflix revolutionized the customer streaming experience with its "Watch Now" service launched in 2007. From the moment a customer signs up to be a member, Netflix collects and stores every detail about the subscriber including the titles they play, what titles are played before and after, why they abandon after five minutes of viewing, and where they pause. Netflix collects all these data points to tailor the overall experience to each customer.

In 2010, Netflix began moving its data to Amazon Web Services (AWS) to offer subscribers more flexibility across devices. At the time, Netflix was using Oracle as the back-end database and was approaching limits on traffic and capacity with the ballooning workloads managed in the cloud. The company knew that a single data center meant a single point of failure, and outages or poor-quality streaming could drive away customers. "For us, the problem with a central SQL database was that everything was in one place, which is only convenient until it fails," explained Adrian Cockcroft, Cloud Architect at Netflix. "And because these databases are expensive, you tend to put everything in there. Then everything fails at once."

Another problem was that schema changes required system downtime. "Every two weeks, we'd have at least 10 minutes of downtime to put in the new schema," Cockcroft explains. The limitations of a SQL database impacted their availability and scalability, not to mention the reliability and flexibility they needed to create and manage data clusters quickly as the company expanded internationally.

### The Solution

Netflix learned that traditional relational database technologies were not built to accommodate large volumes of data, neither from a cost-effective perspective nor regarding the needs for continuous availability and flexibility. The Netflix team performed an extensive evaluation of their database options and Apache Cassandra™ was the clear winner. Besides affordable scalability, Cassandra's schemaless architecture ensures no single point of failure and eliminates any downtime incurred by schema changes. Eventually, Netflix decided to migrate from Cassandra to DataStax Enterprise for its enterprise-level security and production. The entire migration of more than 80 clusters and 2500+ nodes was completed with only two engineers.

# NETFLIX

### Use Case: Personalization

Systems that understand each person's unique habits and preferences and bring to light products and items that a user may be unaware of and not looking for.

### Industry

Streaming Media

### Challenges

- Affordable capacity to store and process immense amounts of data (more than 2.1 billion reads and 4.3 billion writes per day)
- Single point of failure with Oracle's legacy relational architecture
- Achieving business agility for international expansion

### Solution

- DataStax Enterprise delivers 100% uptime and scale across multiple data centers

### Results

- DataStax delivers a throughput of more than 10 million transactions per second
- Effortless creation/management of new data clusters across various regions
- Capture of every detail of customer viewing and log data

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“To do what we need to do today without DataStax Enterprise would cost a couple million dollars more and would be significantly harder to manage operationally.”

- Adrian Cockcroft  
Cloud Architect  
Netflix

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Netflix tailors content delivery based on viewing data captured and analyzed in DataStax Enterprise.

### The Results

Today, DataStax Enterprise is the preferred database at Netflix. About 95% of Netflix's non-program data is stored in DataStax Enterprise, which includes customer account information, movie ratings, bookmarks and logs, and viewing history services. Thanks to DataStax Enterprise, Netflix is able to store and handle immense amounts of customer viewing and log data to improve subscribers' searching and streaming experiences. DataStax Enterprise drives throughput to more than 10 million transactions per second. On average, Netflix processes more than 2.1 billion reads and 4.3 billion writes per day.

Cassandra's multi-data center replication enables Netflix to get more flexibility than ever to create and manage data clusters. "I can create a Cassandra cluster in any region of the world in 10 minutes," says Cockcroft. "When the marketing guys decide we want to move into a certain part of the world, we're ready."

Netflix's database engine can deliver more than 76,000 different genre types such as "alien films from the 1970s" — and feeds subscribers' viewing habits back into the data-driven Netflix programmed commissioning machine. When the company decides to sink \$100 million into House of Cards without even seeing a pilot, it isn't a blind bet. Netflix knew it would be successful based on the customer data stored in DataStax Enterprise.

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### Use Case: Personalization

Systems that understand each person's unique habits and preferences and bring to light products and items that a user may be unaware of and not looking for.

### Industry

Payments and Financial Services

### Challenges

- Managing extremely large volumes of data from more than 11 million customers
- Poor scalability and performance issues with MySQL relational database
- Relational technologies limited historical views and aggregation of information

### Solution

- Linear predictable scale accommodates high data growth
- Integration between operational information in DSE and Hadoop delivers a holistic customer view
- 24x7x365 expert support

### Results

- Real-time analysis of information for improved customer experience
- Expanded partner network with flexible data model accommodation
- More accurate customer account analysis with Hadoop integration

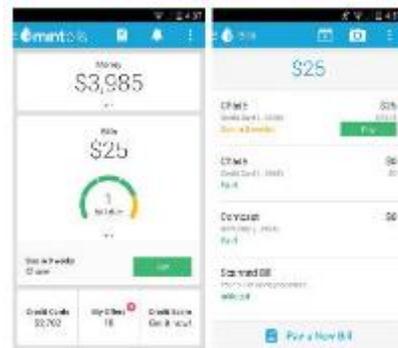
## PERSONALIZATION

# MINT BILLS (PART OF INTUIT) SIMPLIFIES PERSONAL FINANCES WITH DATASTAX

Mint Bills is a top-rated, award-winning mobile app that takes the work and worrying out of paying bills for more than 11 million U.S. consumers. The Mint Bills application stays on top of people's bills and money, eliminating missed payments, overdrafts, and late fees. Launched in 2008, Mint Bills was one of the initial 500 apps released on the first generation iPhone. The company was acquired by Intuit Inc. for \$360 million in June 2014.

### The Challenge

In the financial services sector, it is extremely challenging to get traction against established mega leaders, and stand out as a disruptor. Mint Bills is a top mobile app focused on bill payments and personal financial management, helping users manage and track bills quickly and efficiently. With a few taps, users get an easy-to-understand overview of their bills, credit cards, bank balances, and investment accounts, all in one place. The application also sends timely bill reminders coupled with mobile payment functionality, making Mint Bills a one-stop destination for everyday personal finance.



Mint Bills delivers all-in-one personal finance management services via a mobile app

With more than 11 million users, Mint Bills faced the challenge of aggregating exponentially growing amounts of user data while delivering application performance in real-time. Previously, Mint Bills relied on MySQL as a primary data store but soon hit a ceiling with scale and performance. Relational database architectures do not scale easily or predictably with massive data volumes and dynamic data models inherent in user data from different bank accounts, investment accounts and billers. Furthermore, Mint Bills' relational model could not keep up with performance needs of the online application supporting concurrent users viewing account information and retrieving payment results in real-time.

To deliver the best possible customer experience, Mint Bills realized that it needed a more powerful technology approach for its database infrastructure. It also needed a fast and reliable way to aggregate user information daily and analyze and keep track of information like the number of credit cards and bills, even from previous weeks. These requirements led to Mint Bills' search for a platform that offered seamless Hadoop integration, with the power to merge and analyze transactional with historical information for accurate business insights.

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“With DataStax Enterprise as our database infrastructure, we can not only scale but give our users a real-time, engaging customer experience.”

- Micky Cszasznik-Shaked  
Technology Lead  
Mint Bills

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### The Solution

When Mint Bills began its search, relational databases were immediately ruled out because of their inability to cost effectively scale for immense volumes of data along with performance, complexity, and latency issues. “Our first decision was not to store user account data in a relational way,” said Micky Cszasznik-Shaked, Technology Lead at Mint Bills. “Because of the large number of data models we had, to get a full view of all information across user accounts meant that we would have to join numerous tables and make many calls to the database, thus bringing down application performance.” The other issue Mint Bills had was that with relational databases alone, it couldn’t save more than current results, which limited the ability to truly understand customer profiles.

To meet the needs for scalability and real-time performance, Mint Bills selected Apache Cassandra™ to store user account data. “When you are selecting between accounts on your Mint Bills app, you are actually retrieving information from Cassandra directly,” Cszasznik-Shaked added.

Mint Bills migrated to DataStax Enterprise for enterprise production support and professional services. The fact that Mint Bills is a financial services company sets a really high bar for database security, and DataStax Enterprise was able to deliver that with Mint Bills’ private data infrastructure. As a mission critical application, Mint Bills relies greatly on the Cassandra experts and 24x7 support provided by the DataStax team.

### The Results

Currently, Mint Bills has 21 nodes in one cluster and stores 15+ TB of transactional data in DataStax Enterprise. Even with a fast-growing number of user and accounts across various types of data models, Mint Bills continues to perform and scale with ease to support this massive growth. DataStax Enterprise has helped Mint Bills unlock valuable insights found in their Hadoop data lake, allowing them to integrate historical offline data with transactional online data.

“DataStax Enterprise gives us the power to change information in our supporting systems into actionable insights with historical views into account statuses. This was previously impossible with relational technologies. With Apache Cassandra™ and DataStax Enterprise as our database infrastructure, we can not only scale but give our users a real-time, engaging customer experience,” Cszasznik-Shaked said.

Mint Bills has extended its solution from mobile to a web application. Mint Bills’ award-winning app is recommended by media as an outstanding personal finance tool and is the leading mobile bill payment solution. The company continues to grow its partner network including financial institutions, regional utility providers, and communications carriers to provide superior user experiences to customers. Its huge success caught the eye of Intuit, who subsequently acquired the company for \$360 million in June 2014.

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### Use Case: Personalization

Systems that understand each person's unique habits and preferences and bring to light products and items that a user may be unaware of and not looking for.

### Industry

Real Estate and Financial Services

### Challenges

- Large volumes of high velocity data
- Maintaining continuous availability across data centers
- Delivering accurate property valuations and assessments in real-time

### Solution

- Linear scale, high performance and 100% uptime with DataStax
- Integrated geospatial, faceted search and analysis capabilities
- Proactive management, alerts and notifications with OpsCenter

### Results

- No planned outages
- Delivered over 1 billion valuations on 122 million properties while remaining always-on
- Improved compute resource allocation
- Gain data driven insights that ensure accuracy of property valuations

## PERSONALIZATION

# CLEAR CAPITAL DELIVERS AROUND-THE-CLOCK APPRAISALS WITH DATASTAX

Clear Capital is the premium provider of data and solutions for residential and commercial real estate asset valuation and collateral risk assessment for large financial services companies. Since 2001, the company has leveraged data and technology to deliver better results more efficiently. They pair best-in-class technology with the highest degree of customer service to set new standards for accurate and well documented real estate valuation data and assessments. Clear Capital's customers, including the largest U.S. banks, investment firms, and other financial organizations, rely on the company to make market-level decisions with the most recent and accurate data.

### The Challenge

Clear Capital is an appraisal management company (AMC) that provides independent valuation services to the mortgage finance community. They maintain a 40,000+ person vendor network of appraisers and real estate brokers and agents who perform independent real estate assessments. Clear Capital facilitates the ordering, tracking and delivery of valuation reports by leveraging massive data sets, human-based review and automated review tools. Clear Capital currently stores valuation data for over 90% of all properties in the U.S – roughly 122 million total properties and counting. Quality control also includes compliance of federal and state guidelines as well as meeting specific requirements set forth by their customers.

With the largest source of valuation data for residential and commercial properties in the U.S., Clear Capital recognized a market opportunity to develop a software application that can digest their massive database of properties to deliver highly accurate and recent valuation data quickly to financial institutions and banks. They understood relational database systems were not built to support high volumes of small transactions, linear scalability, real-time performance, and continuous availability – all key requirements for their cutting-edge valuation review management software as a service platform.

Additionally, Clear Capital required their technology to support multiple data centers across the cloud. Currently, Clear Capital runs on Amazon Web Services (AWS), operating their non-production environment in a single data center with three availability zones, and their production environment across two data centers, also with three availability zones each. Relying on a proven solution that would support their requirement to deploy and manage their application in the cloud was critical.

“Sustaining continuous availability is imperative for us,” said David Prinzing, Solutions Architect at Clear Capital. “Managing multiple data centers across the Amazon cloud puts us in position to meet that goal, which means we need a database that can support such a complex deployment model.”

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“The ability to massively scale and deliver ongoing availability without sacrificing speed inspires us to aggregate vast amounts of local real estate and valuation data into actionable results that drive market-level decision-making.”

*David Prinzing  
Solutions Architect  
Clear Capital*

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## The Solution

Based on previous experiences with highly transactional applications that demand scalability, performance, and continuous availability, Clear Capital knew what type of underlying technology was required to ensure project success. “We needed a fast, real time transactional system that would not impact our ability to do business,” said Prinzing. “We evaluated a number of in-memory and NoSQL solutions to address these needs.”

The ability to handle massive volumes of small transactions, perform even with large workloads, and remain available even if nodes go down was key in their evaluation. During an extensive battery of tests, Clear Capital pushed various solutions through high throughput and outage scenarios to see how they would respond. DataStax Enterprise was the only solution that met all of their needs. In fact, they could take down an entire availability zone within their Amazon environment without experiencing any service interruptions whatsoever.

The deciding factor to go with DataStax Enterprise is its integrated search and powerful analytics. A major component of Clear Capital’s appraisal system is their geospatial search and analysis capability. This level of analysis allows Clear Capital to gain valuable market insights based on aggregate statistics, which feeds into the accuracy of the valuations delivered. “DataStax Enterprise powers our geospatial search and delivers real time insights to our customers who rely on the most recent data to support their market-level decisions,” said Prinzing. “This was a significant reason why we chose DataStax Enterprise to power our system.”

Ensuring their multiple data centers are running at optimal levels, Clear Capital employs OpsCenter, the visual management console for DataStax Enterprise, to manage their entire database system from a single dashboard. “OpsCenter empowers us to proactively manage our environment to ensure we are delivering the best possible service.”

## The Results

DataStax Enterprise gives Clear Capital the ability to deliver a powerful solution that can store massive volumes of data consistently and reliably. Without the concern of downtime and performance degradation, Clear Capital can continue to focus on providing best-in-class solutions to their customers.

When asked how DataStax has helped his team operate more efficiently, Prinzing stated, “I love the idea of one ring to rule them all. With transaction, analytics and search all in the same cluster, we can quickly find and analyze workloads of any size quickly without taxing compute resources.” DataStax Enterprise has made a material impact on Clear Capital’s business.

Since going into production, they have had no planned outages and have been able to deliver continuous availability of the valuation delivery service, even in the wake of nodes and entire clusters going down. From a strategic perspective, DataStax Enterprise is considered a foundational technology that Clear Capital will continue to rely on to grow their business into the future

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## About DataStax

It starts with a human desire, and when a universe of technology, devices and data aligns, it ends in a moment of fulfillment and insight. Billions of these moments occur each second around the globe. They are moments that can define an era, launch an innovation, and forever alter for the better how we relate to our environment. DataStax is the power behind the moment. Built on the unique architecture of Apache Cassandra™, DataStax Enterprise is the always-on data platform and has been battle-tested for the world’s most innovative, global applications.

With more than 500 customers in over 50 countries, DataStax provides data management to the world’s most innovative companies, such as Netflix, Safeway, ING, Adobe, Intuit, Target and eBay. Based in Santa Clara, Calif., DataStax is backed by industry-leading investors including Comcast Ventures, Crosslink Capital, Lightspeed Venture Partners, Kleiner Perkins Caufield & Byers, Meritech Capital, Premji Invest and Scale Venture Partners. For more information, visit [DataStax.com/customers](http://DataStax.com/customers) or follow us on @DataStax.  
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