Node.js and NodeSource Empower Digital Innovation At HomeAway

NodeSource and Node.js Foundation Case Study

NODESOURCE ®

Contents

HomeAway acquired several smaller vacation rental companies and was itself acquired by Expedia. Throughout the process, the company faced common, but perplexing problems associated with multiple acquisitions in large enterprise environments. HomeAway solved several of those issues at scale, initially using Java and then with Node.js and NodeSource, to accelerate their global vacation rental platform. Here's how.

HomeAway is now the world leader in vacation rentals, currently offering 2 million unique places to stay in over 190 countries. The company's business objective from its outset in 2005 was to unify the highly fragmented vacation rental industry. Its business plan called for numerous acquisitions of smaller vacation rental companies.

Combined, the upstream and downstream acquisitions made HomeAway the giant in the industry it is today. However, the resulting mix of systems and growing collection of disparate data inherited from the acquired companies posed several technical challenges for HomeAway – a situation that any company with more than one acquisition or merger can relate. The technical issues became further complicated when Expedia acquired HomeAway in 2015.

Unfortunately, technical limits soon impeded the customer experience, potentially throttling the company's success. HomeAway overcame many of the challenges in unifying the applications of several acquired companies by re-platforming their old Java-centric technology stack. The new stack leverages Node.js on the front end with Java on the back end and data science sides.

How The HomeAway Node.js Journey Began

It took about ten years for HomeAway to create its own vacation rental platform and merge the brands of the acquired companies onto it. Most of that work was completed by December 2015, around the time Expedia acquired HomeAway.

Like many companies working to incorporate and integrate acquired applications and infrastructures, HomeAway made conservative technology choices early on in an effort

to mitigate risks and reduce technological complexities. However, that strategy led to its own set of risks and complexities.

> *"It was a very Java-based platform, which a lot of big enterprise companies do for the web. As we started to get get through that consolidation phase, we started looking at modernizing the tech stack. "*
> *Patrick Ritchie, Director of Engineering, HomeAway.com*

Ritchie leads the web application platform team at HomeAway, which is the area of prime concern for any Internet-based company. His predecessor was hired as a UI architect and had already introduced Node.js in the company's development workflow, back in 2013. When Ritchie took over the team, he turned towards using Node.js exclusively and completely removed the Java component for application developers.

However, after Expedia bought HomeAway in 2015, scaling rapidly became a renewed priority and a new Principal Architect was hired to rev up the company's platform technologies. That new hire was Trevor Livingston, formerly a member of the Kracken.js framework team at PayPal.

"We were the team that brought Node.js to PayPal and scaled it in production. We were also responsible for the Kraken open source framework," said Livingston.

PayPal was home to one of the first, if not the first, huge Node.js success story at the enterprise level for all of its web applications.

Livingston is responsible for the high-level platform architecture, whereas Ritchie's team is the Web Application Platform team. Between Ritchie's and Livingston's teams, HomeAway is set to pivot to a global platform and scale rapidly as needed to "revolutionize the user experience" for both travelers and property owners.

> *"As we build out these new experiences, we need technologies which allow us to rapidly execute them, to be able to prototype, to be able to experiment with different experiences, learn form how a user uses the platform and tune to those needs."*
> *Trevor Livingston, Principal Architect, HomeAway.com*

"Node.js is a critical piece in this vision because Node.js is obviously a JavaScript runtime and is really the language of the web." says Livingston.

Where NodeSource Fits In With The Teams

It was around the time that Ritchie's team expanded their use of Node.js as the optimal tool on the front end, while maintaining their Java-based back end. This is when HomeAway brought in NodeSource. The team was doing some proof of concepts internally to demonstrate that they could use Node.js for the full front-end stack successfully. They used NodeSource to provide support and expertise throughout the process.

"Part of what we did with NodeSource was an Architectural Evaluation, relatively early on in the process, around February of last year," Ritchie said. "Then we built out several iterations internally to figure out how we wanted to use Node.js. Our first production launch was last summer, and we've been rolling stuff out pretty consistently since then."

NodeSource originally provided support, but its role at HomeAway has expanded since then. Like many enterprises with teams made of varying Node.js skillsets, finding time for lessons is a challenge. Highly-experienced members of the team can easily find themselves working at full capacity and unavailable to support those who are still learning. It was a no-brainer, Livingston says, to use NodeSource as a support parachute.

Ritchie says his team didn't need much support on the development side. However, on the server side more care is needed to make sure the website doesn't crash.

> *"When we've run into issues that we didn't necessarily understand because we were new to Node.js on the server, NodeSource could help us with that. "*
> *Patrick Ritchie, Director of Engineering, HomeAway.com*

Sometimes Ritchie's team used NodeSource as a sounding board "to make sure what we were doing was sane." Other times they leaned on NodeSource because they were having trouble debugging a certain issue or needed confirmation that what they were doing wasn't going to set up a problem for the business.

Meanwhile, Livingston previously knew and had worked with the team at NodeSource for a long time. He also liked working with them to grow the enterprise Node.js and JavaScript community. Reaching out to NodeSource was thus a natural step for him and his team at HomeAway.

> *"NodeSource's products include the N|Solid runtime for Node.js, which is something that we regard as being an important next step for us in operationalizing Node.js"*
> *Trevor Livingston, Principal Architect, HomeAway.com*

"N|Solid provides some of the capabilities that we expect from our enterprise software, such as insight into application performance, the CPU profiling, and memory usage, through dashboards, and the potential for other things like locking down security requirements."

HomeAway's Outstanding Results

HomeAway deployed Node.js in two phases: in development and on the server.

"The first step, in the 2013-2015 time frame, was to introduce Node.js to help with development," says Ritchie. "Node.js and the tooling around Node.js really helped build better client-side code." The team started building single-page applications, which allowed the front-end developers, who needed to know JavaScript anyway, to work in JavaScript almost exclusively. "Because it was a single-page application, the Java part was mostly out of the way, so that was a big step forward," explained Ritchie.

A major benefit to this move was that Node.js allows much richer applications. "The developer flow was much better, because it was mostly one language, and the tooling for building on the web is just so much better in Node.js than it is with, say, Java or really any other language," he said. "That was the impetus for the first phase."

The second phase entailed operational improvements to improve developer productivity. One choke point was that front-end developers needed either to have a Java developer on the team or they needed to learn Java themselves. Either option added friction and slowed the whole process down.

Adding Node.js for the final step allowed the teams to go full JavaScript for the front-end development and avoid any need to learn Java at all. It also allowed the JavaScript to be executed on the server, "which allowed us to server-side render, something that is very helpful both from a customer experience standpoint, but also from an SEO perspective, both of which are pretty important to HomeAway."

> *"NodeSource is our support parachute."*
> *Trevor Livingston, Principal Architect, HomeAway.com*

Some Lessons Learned

Despite obvious advantages and a relatively straightforward rollout, there are always a few sticking points -- a place or a time during adoption or deployment that snags the team and slows the effort. Both HomeAway teams encountered the same snag -- leadership buy-in, but surprisingly not on the business side.

"It (Node.js) is a very straightforward pitch that business leadership gets very quickly," says Ritchie. "The snag came with the pitch to technical leadership."

Node.js at HomeAway was largely a grassroots movement that neither had nor needed senior technology leadership buy-in, at least not in the early days. However, when it came time to begin the move to Node.js exclusively, that lack of technical leadership buy-in suddenly became a very big problem.

"The senior leadership, and this is just how it played out, has been more focused on the back-end services side of the world than the customer-facing, user experience part," said Ritchie and shifting that focus proved more difficult than the team had imagined it would be.

While Livingston's appearance on the scene helped win over technical leaders, it's still a bit of a struggle. Ritchie says they aren't pitching Node.js for the back-end as much as they are for the front-end, for now. The due diligence needed is underway, including spinning up more internal proofs of concepts, to steadily gain more leadership support.

Ritchie says if he had to do it all over again, he would have sought leadership buy-in much earlier. In the first six months, adoption was very light, and Ritchie attributes that directly to light executive support.

"There are a few stakeholders whom, even though they back us now, I would have engaged with earlier, probably about six months earlier, to really get them onboard and to get their help with the rollout sooner," he said.

What's Next for the HomeAway Node.js Team

HomeAway's growth is continuing unabated and Ritchie's and Livingston's teams are pushing Node.js out further to ensure that everything scales accordingly. Expedia is content with both the progress and the roadmap forward; its focus now is only on accelerating both. Ritchie and Livingston and their teams are happy to oblige.

HomeAway has relied on NodeSource from the outset of its transition to Node.js, and with positive results, particularly when the team is taking on tough projects, and while some team members are still coming up to speed on using Node.js.

"Obviously, we have varying skillsets onboard when it comes to Node.js experience," said Livingston. "A lot of people have questions. We bought an N|Support package to ensure the teams have access to answers on complex questions, or to technical difficulties."

> *"If you were to draw a graph of the adoption, we're right at the point, in terms of production traffic, where the hockey stick is about to kick up. "*
> *Trevor Livingston, Principal Architect, HomeAway.com*

"Over the next six to nine months, we expect most of our big teams to complete the transition to Node.js," says Ritchie. It's about to go from a few percent all the way up to 80% in the coming months. That's exciting."

ABOUT THE NODE.JS FOUNDATION

The Node.js Foundation's mission is to enable widespread adoption and help accelerate development of Node.js and other related modules through an open governance model that encourages participation, technical contribution, and a framework for long term stewardship by an ecosystem invested in Node.js' success.

Learn more at nodejs.org

ABOUT NODESOURCE

NodeSource helps organizations run mission-critical Node.js applications with products and services that support success in the modern digital era. The NodeSource platform empowers teams to deliver peak performance by offering greater visibility into resource usage and enhanced awareness around application behavior and security.

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