

Virtual and Online Queue Management

The second of our **#TTF16** Discussion Papers looks into the functionality and effectiveness of online (or virtual) queue systems to manage web site overloads during on-sales or peak demand. It also includes a case study from London's Barbican Theatre when star Benedict Cumberbatch performed in Hamlet.

WHAT IS A VIRTUAL QUEUE?

Web performance is becoming increasingly important with transactional websites, as web traffic directly translates to sales, and ultimately success or failure. Optimising your web performance to operate at peak efficiency is the key to standing out from your competitors, generating the most profit, and adding the most value to your end-users.

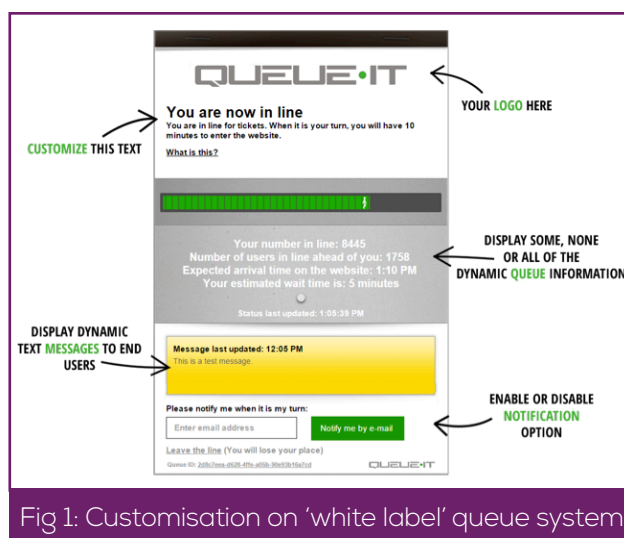
Using a virtual or online queue system to queue your high volume of end-users not only means that your web system or platform will be stabilised by being able to stay online, it also means that you will be operating at peak efficiency, and able to convert your substantial traffic into sales.

A virtual or online queue system is designed to manage website overload during extreme end-user peaks.

An online queue system can help ticket companies and venues with on-sales, including in-house solutions and white-label platforms. They can be applied for individual planned on-sales, or full time on your ticketing system to protect it against unplanned inflow 24/7.

"The reasons for the slowdowns and failures often consist of a number of factors outside of your own control... such as payment gateways"

Imagine that you have an upcoming on-sale that is anticipating drawing thousands of fans to your high load ticketing system. You can use an online queue system to prevent your ticketing website from failing and save the day for your team.



The reasons for the slowdowns and failures that occur when thousands of fans gather to secure tickets are complex and often consist of a number of factors, some of which are beyond your control, such as payment gateways.

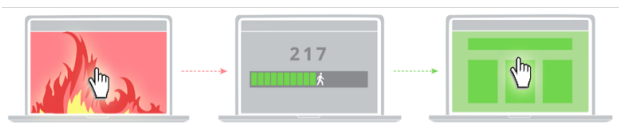
The online queue system acts as your on-sale protector so your ticketing system will not fail when thousands of fans gather on your platform, both before and during an on-sale, and you'll be able to successfully manage the sale.

THE ALTERNATIVES

A virtual or online queue system is often likened to a virtual waiting room, as end-users have the user experience of being placed in a queue to wait for access back to the website to complete their transactions.

Virtual queues and waiting rooms prevent website failures by redirecting users away from busy websites to an online queue/virtual waiting room. While waiting, both solutions can also display static content to end-users.

However, a virtual waiting room is a method for redirecting end-users back to a busy website in a **random** order.



An online queue system offloads end-users exceeding website capacity limits to the queue system. As capacity opens up, the online queue system redirects the end-users who waited in line back to your website in the correct, **sequential** order that the end-users entered the queue. This sequential order uses a first-in, first-out process that makes sure no one unfairly bypasses the queue. Thus, the online queue system's user experience design ensures fairness for end-users completing transactions on overloaded websites.

"An online queue system offloads end-users exceeding website capacity limits to the queue system"

In an online queue system, the design can allow for the additional user experience of:

- Dynamic communication directly to waiting end-users;
- Displayed social media feed to waiting end-users;
- Offers of compensation exclusively to validated waiting end-users;
- Displayed information about expected access time and progress to waiting end-users;
- Implementation of a pre-sale queue page prior to sale launch that randomizes queue numbers to waiting end-users at exact launch time.

Using an online queue system can save resources, as the traditional means of scaling capacity are expensive, complex and increase risk. There's a guarantee of having no failures or downtime, as your website will be running smoothly and retaining revenue. Your website will maintain performance and remain fast, secure and accessible.

Your brand and reliability will be protected as your customers will never see an 'error' message, which will increase trust, loyalty and satisfaction.

CASE STUDY: BARBICAN THEATRE – 2015 HAMLET TICKET RELEASE

The Barbican, Europe's largest multi-arts and conference venue located in London, UK, implemented an online queue system during the ticket release for the 2015 production of Hamlet, starring actor Benedict Cumberbatch playing in the Barbican Theatre in 2015.

The show was heralded as "the theatre event of 2015." According to publications such as *The Mirror*, *The Telegraph* and *The Wall Street Journal*, the Barbican's Hamlet was said to be the fastest selling and most in-demand, searched for, popular, and high-interest theatre show of all time after the successful ticket release. The Barbican's Hamlet sold out one year before opening, with press coverage speculating that there had never been this much demand ever before for a theatre production.



Due to the anticipation of the production, the Barbican originally sought a solution to help manage the expected end-user overload on their website once tickets would be released for sale.

The Barbican also aimed to maintain high customer satisfaction in the midst of phenomenal interest, and added-on the queueing solution to ensure the best possible customer experience (and publicity) during the ticket release.

According to Nicholas Triantafyllou, the Barbican's IT Business Systems Manager: "We knew the interest in the ticket release would be huge and we were satisfied that the ticket sales were smooth and provided a fair queueing process. In fact, the only complaint received was that the show had sold out!"

"The online queue system allowed for us to communicate clearly and efficiently with all the customers in queue, and kept our website up and running, even with more than 60,000 customers in the queue on the day of the release and over

/CASE STUDY CONTINUED...

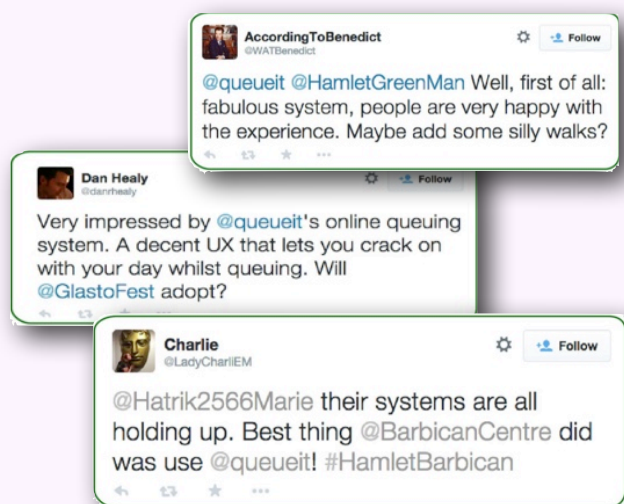
100,000 customers visiting our site throughout the ticket announcement."

"...the fastest selling and most in-demand, searched for, popular, and high-interest theatre show of 2015"

Hamlet tickets sold out seven hours after their release at 10:00am on August 11, 2014.

The application of the online queue throughout the ticket release also helped garner even more positive press and social media activity than anticipated. Customers even took to Twitter to declare their positive queueing experience on the Barbican site.

One clever end-user created a [@HamletGreenMan](#) Twitter handle dedicated specifically to the 'Barbican Hamlet Man' featured on the branded queue page that alerts customers of their position in the queue. Needless to say, Barbican customer satisfaction was maintained while the online customer journey assured ticket purchases were completed.



Overall, the Barbican noted that the Queue-it system is easy to implement and use, and comes with exceptional support from a helpful support team that provides advice in pre-event planning and testing.

On behalf of the Barbican, Nicholas Triantafyllou stated that they were "really happy with the support received", and that the use of the specific system "paid off; the service is ideal and highly recommended to all other companies looking to manage end-user overload situations". ■

WHEN NOT TO USE?

You can benefit from implementing an online queue system if you have a transactional website that experiences end-user peaks, especially if you have third-party add-ons, such as payment gateways, that are out of the control of your website.

If you have a non-transactional website, another alternative would be to scale your site in the cloud.

HOW DO THEY WORK?

When you implement an online queue system, your end-users will see the queue page whenever your capacity threshold is exceeded. End-users are offloaded from your website to Queue-it, to be held on the queue page, and then redirected back to your website.

During a high interest event, such as a ticketing on-sale or e-commerce campaign, the typical end-user queuing experience will be:

- End-users will understand the situation and feel that everything is under control;
- End-users will understand the queue / line concept and feel that they are treated fairly;
- End-users will see their progress and estimated waiting time, and they can then make an informed decision to continue waiting or not – hence not wasting their time.

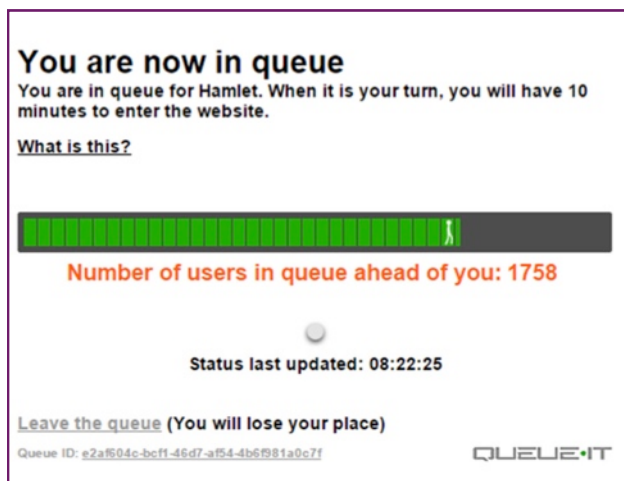
TECHNOLOGY CHOICES

The online queue systems currently on the market are provided as either SaaS cloud computing based software solutions that you can apply to your website, or as DNS solutions.

The only SaaS online queue system on the market now is Queue-it, which is hosted on Amazon AWS in a number of regions around the globe and uses a range of AWS components, like CloudFront, EC2, ELB load-balancers, S3, Dynamo DB, Redshift, Route53, CloudFormation, CloudWatch, SES and SQS. The system is developed using Microsoft .NET / C#. This technology stack has a scalability that enables the online queue system to hold an infinite number of simultaneous users. The system also offers a variety of integration options, from JavaScript, to a simple link with no user data placed outside the existing systems, to a sophisticated integration with e.g. your ticketing or e-commerce platform.

This system, for example, can be used by itself, as an integration on web-server level, or as a

supplement to other web performance initiatives such as CDN's (Akamai etc.) or load balancers (like F5, Cisco, Citrix NetScaler, Riverbed, Barracuda, etc.), or integrated with all major platforms. This online queue system can be implemented in as little as 30 minutes.



There is also the DNS approach, which proxies traffic by routing all traffic through the host's website and also gives them the payload between the end-user and the protected system. This approach also sees interdependency between the queue and the protected system. While this solution is relatively simple to configure with a DNS address change and can be difficult for end-users to bypass, there are some drawbacks:

- DNS entries are caches on thousands of DNS servers around the world, and not all adhere to your specified cache times. So to ensure that the majority of the DNS servers are updated, you need to do the change a long time before the sale starts (48 hours is not uncommon). This puts a limitation on how fast you can implement the queue, so the fastest implementation would be done in 48 hours or more.
- As your website is probably using SSL for the secure transfer of sensitive information, the DNS queue servers need a copy of your SSL certificate so it can decrypt the traffic before passing it on. Furthermore, you also need to give them your private SSL key so they can encrypt the traffic back to the client. In reality, you are giving the DNS queue provider the right to identify themselves as you. The DNS queue provider will have all of your / your users' payload on their servers. This includes personal data and payment details, etc. The payload can also risk being in regions outside

the legal boundaries of your business. Therefore, you need to trust the DNS provider, as they will listen in on your traffic with your customers, and you also need to consider what would happen if the queue server is compromised.

- Service availability is a function of the number of layers the traffic flows through. Sending all your traffic through a DNS queue server adds to the risk of downtime and, as it takes up to 48 hours to enable the queue, it also takes up to 48 hours to disable the queue in case of issues at the DNS queue provider.

FUTURE ADVANCES

Some would say that having every transactional website hosted in the cloud would solve capacity issues and remove the need for online queues. However, many companies that are hosted in the cloud still use online queue systems due to the lack of control over certain aspects of their transactional website, such as their third party components (i.e. payment gateways). ■

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ABOUT THE AUTHOR

Niels Henrik Sodemann is CEO and Co-Founder of Queue-it, the Denmark-based global supplier of online queuing solutions for retail and ticketing. He says: "We're still focused on what matters most



– delivering our world class online queueing service to our customers around the globe. At the same time, we continue to make the service even more scalable, with better redundancy and geographical reach. We can proudly look back on 2015 with 100% uptime on our service!"

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