

# Monitoring Salesforce Performance

White Paper



salesforce



## Ensuring a Great Digital Experience for Salesforce Sales and Service Clouds

Salesforce is a critical SaaS-based application for many large enterprises, with over 150,000 paying customers as of 2017. Originally marketed as a customer relationship management (CRM) service, it has evolved to become a massive platform for many revenue-impacting functions, including marketing, billing, customer support, and others—with a large ecosystem of supported applications and API integrations. It's effectively become the single source of truth for enterprise customer data.

While Salesforce is a mature SaaS application, many organizations are still plagued with network and application performance issues due to the unpredictability of the Internet and the complexity of the Salesforce platform. Organizations that initially deployed Salesforce as a CRM are now rolling out additional capabilities and integrating more third-party applications, with 58% of Salesforce customers planning to deploy additional Salesforce Clouds, such as Service Cloud (including Live Agent). Service Cloud now accounts for 31% of Salesforce's business. Many of these newer capabilities are performance-sensitive, more mission-critical to the business, and expand the overall user base within the enterprise.

In general, SaaS applications can be challenging to monitor, given that you don't own the application infrastructure. Nor do you own all of the external network and service dependencies (Internet Service Providers, DNS, Secure Web Gateway, etc.) your users rely on for a good digital experience. Traditional network and application monitoring tools, such as packet capture and flow analyzers, don't work outside of your own environment, leaving you blind to the performance of your critical SaaS applications.

Not having visibility outside of your “four walls” leaves you blind for the majority of the delivery path, which is problematic because in the cloud you move from a “find and fix” to a “evidence and escalation” process in operations. When you own the infrastructure, you can directly fix it once you discover the problem. When you don't own the infrastructure, the problem domain expands as big as the Internet, and you need enough evidence to narrow that domain down to you or a particular provider, whether that be an ISP or Salesforce. If the issue is with a third-party, you need enough evidence to escalate effectively to convince them to take action. If you don't have that evidence, your help desk costs and mean time to troubleshoot (MTTT) could dramatically increase, and your users could be left with a terrible application experience.

## Challenges in Monitoring Salesforce

Salesforce, in particular, can be challenging to manage in terms of performance due to several factors:

### 1 User location can dramatically impact application performance

Every enterprise's production environment is serviced from a single Salesforce instance hosted out of a particular physical data center, so depending on where your users are located, they may have good or poor performance.

### 2 Service delivery architecture is more Internet-dependent

Salesforce doesn't have a large global network footprint so the user experience is heavily dependent on Internet performance.

### 3 Salesforce is an enterprise-customized platform, with custom code and third-party integrations

Salesforce is not an "out-of-the-box" application. It's typically customized by developers to suit the needs of the enterprise, and often leverages third-party applications and APIs for functions such as Marketing, Sales and Customer Support.

Despite these challenges, it's still possible to gain visibility into networks and services that you don't manage. By leveraging active monitoring techniques that focus on monitoring all of your Salesforce dependencies—internal and external—and adopting a lifecycle approach that emphasizes readiness, you can get ahead of performance issues that impact user experience.

The first step in developing a monitoring framework for any SaaS application, such as Salesforce, is to understand its service delivery architecture, as this architecture will reveal the components of user experience that are critical to application performance.

## Salesforce Service Delivery Architecture and Key Monitoring Considerations

Salesforce doesn't have a homogeneous architecture. It has a broad product portfolio composed of several different clouds that are delivered in different ways. However, their core platform offering, including Sales Cloud, Service Cloud and communities, have a common architecture. They are served out of Salesforce instances hosted in one of dozens of data centers in North America, Europe and AsiaPac. Each enterprise can choose only one instance to be served from, which effectively ties them to a specific physical

data center. For example, historically, the Salesforce NA38 instance has been hosted in either Dallas, Texas or Phoenix, Arizona, with one of these serving as the active host and the other as backup. When accessing Salesforce's front door ([salesforce.com](https://salesforce.com) or [login.salesforce.com](https://login.salesforce.com)), users will connect to a data center that is local to their region via global load balancing (GLB); however, once authenticated, they will connect to the data center that hosts their organization's instance.

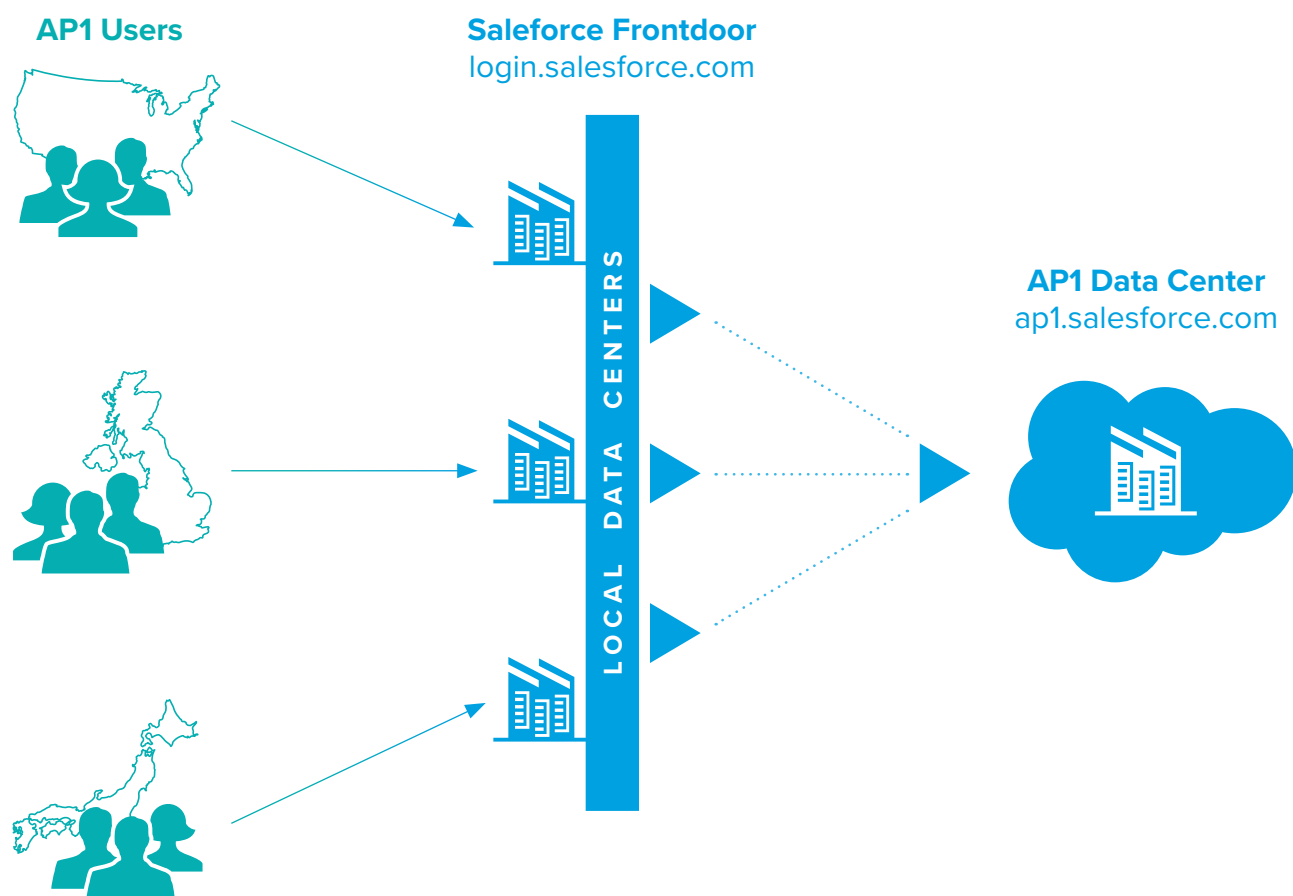


Figure 1: Salesforce Delivery Architecture

## High Internet Dependence

Different SaaS applications have different delivery architectures. For example, some SaaS applications are primarily served from a CDN edge; some providers, such as Microsoft, have a massive global edge. From locations all over the world, users typically only go through a few Internet hops to reach Microsoft's extensive edge. Salesforce's edge is much less extensive, so as a user you're going to spend more time transiting through the Internet than if you were connecting to a Microsoft application. Connecting to Salesforce's AP1 instance from New Zealand could mean you're located 15+ hops and 4 or more ISPs away from the Salesforce edge in Tokyo. But from that same location, connecting to Microsoft Dynamics, you may only have to traverse 3 or 4 hops before you reach a Microsoft peering point.

Salesforce does have more direct routes to its sites available through Salesforce Express Connect, however, this option is mostly designed to reduce, not eliminate Internet dependence. Even with Salesforce Express Connect, you need to understand connectivity performance and application availability for users. Salesforce overall is highly dependent on Internet performance, and users that are further away from your production data center may have greater latency and may experience degraded performance.

This service model can prove to be problematic for enterprises that have a global presence, because whatever their choice of instance, they may be putting some users at a disadvantage. The further away a user is from the Salesforce data center, the more network hops and service providers they may transit through. This can lead to significant variability in performance for users, depending on their proximity to the host data center and how they're routed to Salesforce.

Internet transit relies on many external dependencies outside of your control. These dependencies include

ISPs, DNS, cloud-based services such as Secure Web Gateway (SWG). Given Salesforce's footprint, the majority of external transit hops to your instance host data center will take place over the Internet. This means that there will be a higher number of dependencies other than Salesforce to manage. And because every one of your user locations will be taking a different path to get to Salesforce, there may be greater variation in performance.

Instance location choice is key to ensure high performance for all users across use cases (Sales, Service) you care about. A common mistake enterprises make in choosing where their data will be hosted is defaulting to an instance located close to their headquarters, without really understanding how that decision could impact users—particularly if those users are global or use more latency-sensitive components of Salesforce, such as Service Cloud. It's key to get data early on so you can decide on your location based on performance, and other considerations such as compliance, so you know what to expect once you roll out to production.

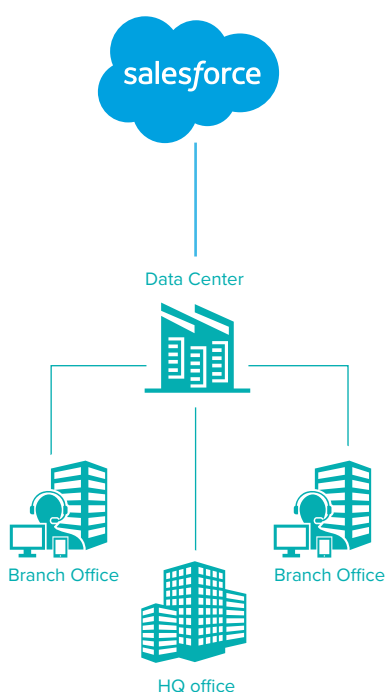
Your network architecture can dramatically impact the availability and performance of Salesforce. Whether or not you choose to backhaul traffic via MPLS WAN to a central egress point for security purposes, or connect your branch offices directly to the Internet (perhaps using a cloud-based security solution, such as Zscaler), consider how your user locations will be impacted.

### Key Monitoring Implication

- Use monitoring early to choose your instance location
- Know what external dependencies are impacting your user experience

## Placement of Internet Exit Points

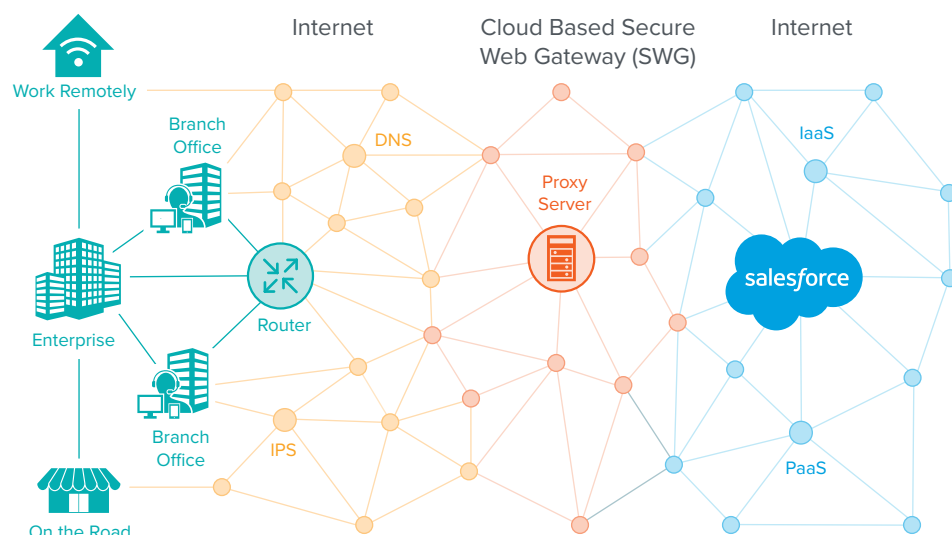
Most enterprises have a traditional WAN with centralized Internet exit points. This worked well when most of your traffic was internal, but increasingly the overwhelming balance of enterprise traffic is shifting external—driven by SaaS adoption and cloud migration.



**Figure 2:** Traditional WAN architecture connecting to Salesforce

Many organizations are evaluating or moving to direct Internet access from branch offices, often split-tunneling, and possibly using SD-WAN for policy control. Moving to a modern WAN architecture has a follow on effect of disrupting traditional enterprise security stacks. Managing traditional security appliances at scale—particularly when they're geographically distributed is extremely challenging and

may not be feasible. Traditional appliances like firewalls can also get overwhelmed by SaaS applications because they have so many components and third-party elements to load. Cloud-based security proxies, like Zscaler's Secure Web Gateway, are typically adopted alongside DIA migrations—which effectively increases the number of cloud-based dependencies you rely on for performance.



**Figure 3:** Modern WAN architecture connecting to Salesforce

The decision to maintain an MPLS-based WAN or adopt a hybrid WAN or move entirely to DIA, should be based in part on performance data. An enterprise may find backhauling some traffic will work better from some locations, while a split-tunneling or DIA approach may be better for others. The really key point here is that you need data to make an informed choice.

### Key Monitoring Implication

Measure your network architecture to understand its impact on performance.



## Customization and Third-Party Integrations

Salesforce as an application is not the same for every enterprise. You can develop and run your own code and create custom packages that may include external dependencies, such as APIs and third-party applications.

The high number of third-party integrations that most enterprise's use as part of their Salesforce implementation can increase its monitoring complexity. Many business applications are natively supported in Salesforce as part of their ecosystem—but additional applications may be integrated through an enterprise's custom code. These applications may cover critical functions such as marketing, billing, quoting, and voice/chat APIs (Marketo, DocuSign, Twilio). Now user experience is tied not just to Salesforce, but to your custom code, as well as applications that may be hosted elsewhere.

### Key Monitoring Implication

Monitor application-layer components, such as connect, DNS resolution and SSL negotiation times, as they can affect overall user experience.

Given that most enterprise Salesforce implementations are customized to suit the needs of the business, it's important to understand that your own developers' code could affect overall performance.

Because Salesforce is not “out of the box,” you need to think about monitoring the health of your specific implementation of Salesforce, not just the Salesforce platform and underlying application infrastructure.

Just as application providers must test their code and service both before and after pushing to production, it's important to treat your environment as an application that demands a rigorous monitoring. Monitoring throughout your environment lifecycle gives your developers the opportunity to measure customization impacts on performance and identify possible opportunities to optimize.

For validating Salesforce availability and performance, you're going to want to see a breakdown of application-layer components, such as DNS resolution and SSL negotiation because all of those can impact overall application experience, particularly when you factor in other performance indicators, like network latency. For verifying that your workflows are performing within your specific Salesforce environment, you can simulate user interactions using transactions tests.

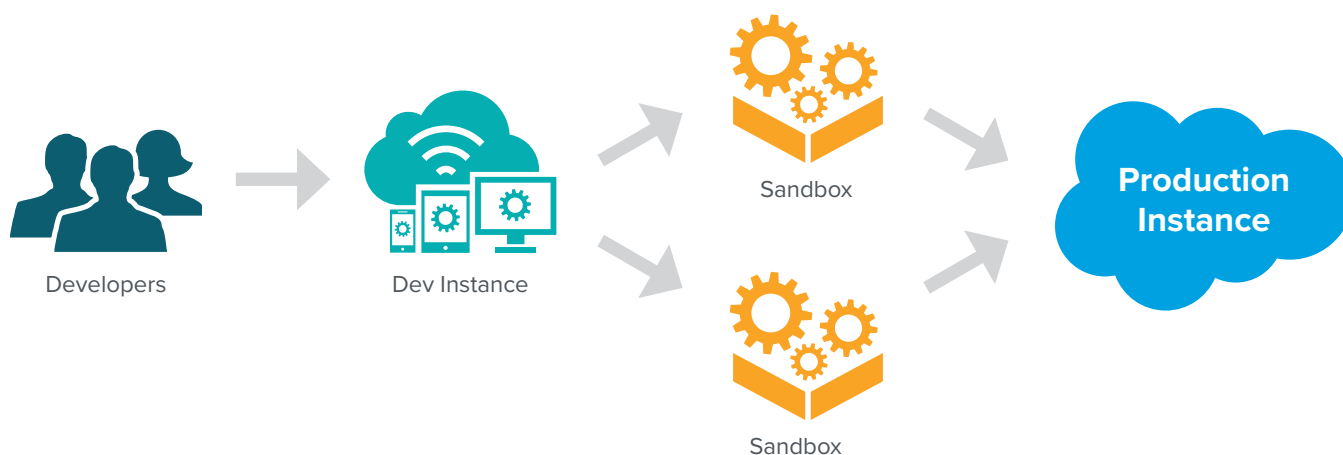


Figure 4: Salesforce development architecture

## How ThousandEyes Increases Salesforce Visibility

In order to gain insight into end-to-end performance for each of your Salesforce users, you need external visibility at both the network and application layers. ThousandEyes enables you to model and measure end-user experience to Salesforce before, during and after rollout, using a combination of active and passive application, network, Internet routing and end user experience data. All of this data is collected by ThousandEyes and algorithmically correlated with our collective dataset and visuals to make the data easy to understand.

In order to gain a holistic view of Salesforce performance for your users, you need visibility at multiple layers — network, application, Internet routing and user experience. At a minimum, you need to understand both application and hop-by-hop connectivity to Salesforce, Internet routing, as well as the performance of user workflows. All of this data is sourced using a combination of lightweight software agents that gather data from different vantage points:

- Enterprise Agents will be the principal data collection mechanism for monitoring from data centers and branch offices to Salesforce. These deploy at your sites and actively probe cloud-based applications and services.

- Cloud Agents are ThousandEyes-managed agents that are deployed in data centers in 160+ cities all over the globe. These agents should be included in your testing plan during your readiness phase. They are used to compare and benchmark the performance of your own sites against independent sites in the same city or region.
- Endpoint Agents deploy on user devices to provide user-specific performance data for SaaS applications of your choosing.

The dataset collected by these agents is then correlated and visualized for easy surfacing of deep insight into Salesforce performance from all of your locations. ThousandEyes also provides the ability to share a link to a fully interactive dataset that you can send to your providers when you're doing an escalation.

By placing a ThousandEyes Enterprise Agent into each of your locations, such as branch offices and data center, you can run active tests to understand availability and performance of not only Salesforce but every intermediary provider. The results are presented in a visually-rich intuitive interface that surfaces insight into the health and performance of Salesforce service delivery.

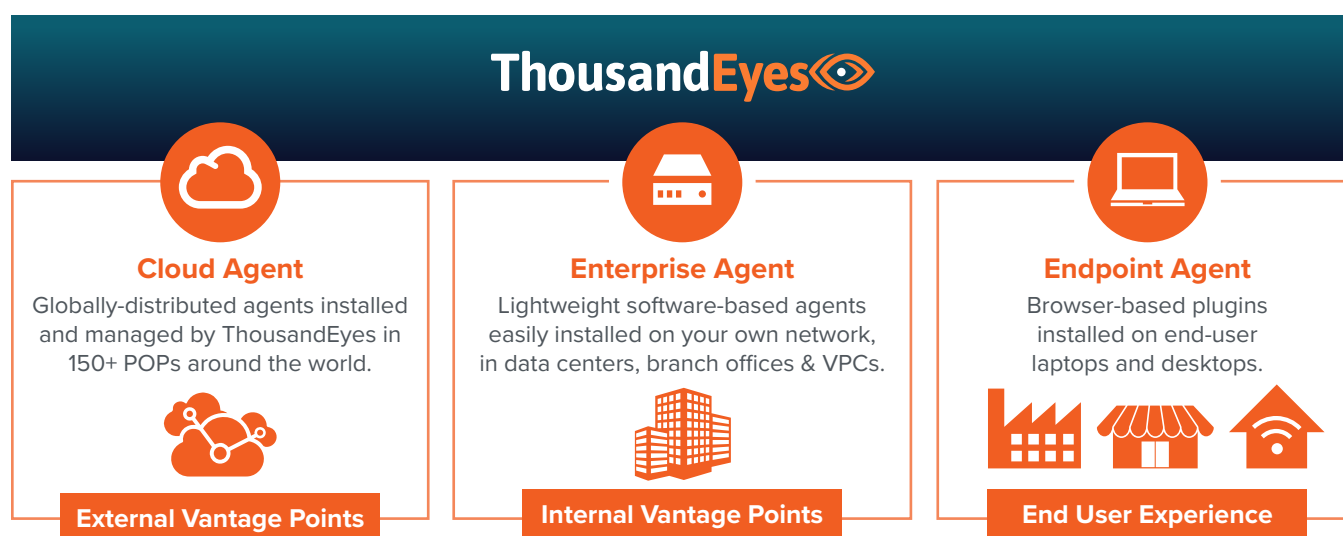


Figure 5: ThousandEyes monitoring agents



## The Cloud Readiness Lifecycle

The key to achieving a good user experience for your Salesforce users and getting ahead of change is to get visibility early, so you can define realistic success metrics, get to know your providers, and have the data you need to quickly get to root cause. ThousandEyes empowers a continuous lifecycle approach to monitoring, including a readiness phase that will ensure issues are uncovered early, before impacting users (see Figure 6).

Ensuring an excellent user experience for any SaaS application is a challenging—particularly because you’re dealing with a highly unpredictable Internet and there’s no steady state in the cloud.

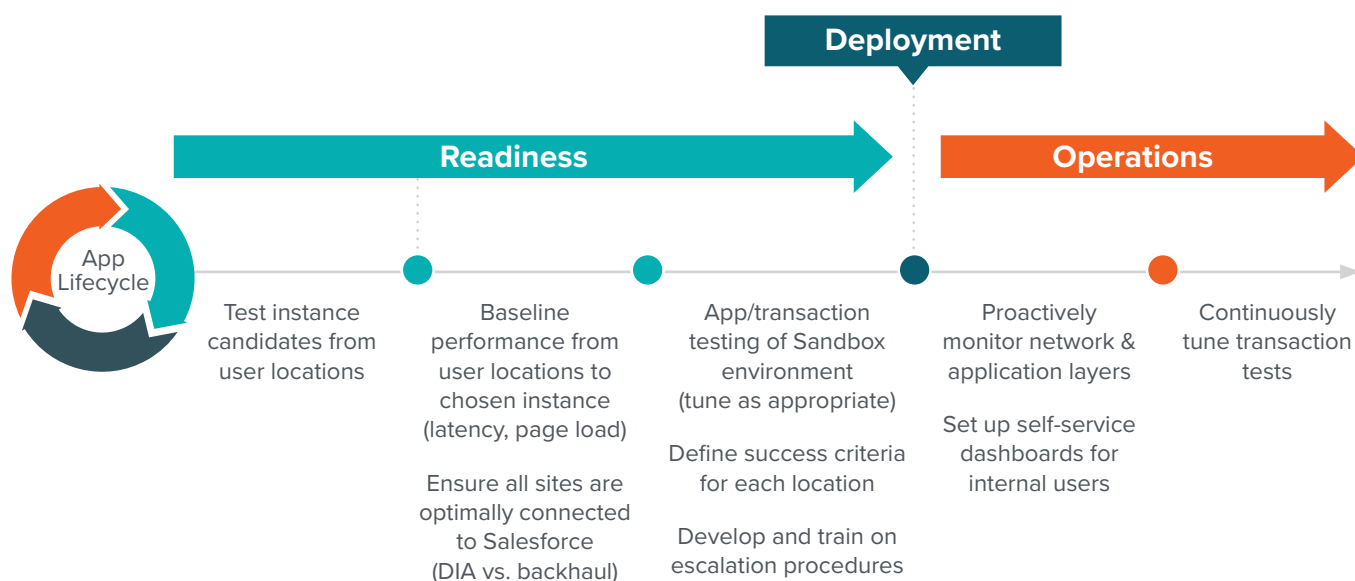


Figure 6: Salesforce readiness lifecycle by phase

## Blueprint for Monitoring Salesforce Performance

Understanding network and application performance for both the Salesforce front door, as well as your production instance, will give you visibility into the experience of your users and provide visibility your IT team needs to quickly pinpoint and troubleshoot issues. Adding a transaction test that simulates a real user interaction, including authentication, can also be valuable in ensuring key business workflows are functional.

The following is a recommended monitoring framework based on the experience of hundreds of enterprises who have successfully tackled SaaS performance management.

### Recommended Tests

ThousandEyes offers a wide variety of monitoring tests for various use cases. For Salesforce monitoring, the following tests have been shown to yield the most useful insight.



#### HTTP Server

An HTTP server test will give you awareness on Salesforce availability, including application-layer components such as DNS resolve time, connect time, wait time and time to negotiate SSL. The test will also provide details such as the number of redirects and server response code. This data is key to understanding if an issue is related to Salesforce's application infrastructure (versus a network problem).



#### Network

Network data is included in HTTP server tests. The Network layer view provides hop-by-hop metrics on packet loss, latency, and jitter (the standard deviation of the latency) in tabular, map, and line chart views, which can be further sliced by time interval and location. Path Visualization displays a router-by-router view of the nodes in the path from an Enterprise Agent to Salesforce, along with IP, MPLS and routing information about each node and link between nodes.



#### User Experience

Endpoint Agents provide real user monitoring data, covering application and network performance, including WiFi. Performance metrics and Path Visualization can be viewed by individual users for troubleshooting or across groups of users to uncover trends and gain cross-user insight. User experience data is available continuously while a user is connecting (or attempting to connect to Salesforce through a web browser).



#### BGP Route Visualization

BGP is the routing protocol of the Internet. If something goes wrong at a routing level, whether intentionally or due to a malicious act, you need to know what's happened and be able to correlate the change with traffic data. BGP Path Visualization displays an autonomous system-by-autonomous system view of the nodes in the path from the monitors to the Salesforce, along with routing and geographical information about each node and link between nodes. BGP routing data also comes standard with the HTTP Server test.



#### Transactions

Transaction tests simulate users interacting with a website or web-based application. They can be used to verify the availability and performance of user workflows on one or multiple pages of a site, and can also be used to perform authentication steps. Transaction tests provide data on successful execution and execution time, along with very detailed waterfall view that shows page components, component load time, and the domains and providers that are the source of the components. These tests can be particularly useful for an application like Salesforce that includes significant numbers of third-party components and integrations.

Other tests, such as Page Load and DNS Server and DNS Trace tests may also be useful for doing deeper root cause analysis:

### Page Load

Page Load tests will provide a detailed waterfall view of page component load sequencing and load times. This level of detail is important to understand whether or not users can successfully interact with a page. There could be individual elements called by the page that do not successfully load due to a number of factors, including third-party hosts, CDNs, network latency, and DNS resolution issues. Transaction tests (see above) will also present waterfalls detailing the load times of individual page elements across every navigated page—particularly key for applications like Salesforce, where the most important user interactions will take place behind an authentication form. Page load tests can be used to monitor the health of Salesforce's front door and can be paired with HTTP Server and Network Layer data to get a very complete performance profile. However, for a fuller picture beyond Salesforce's front door, ThousandEyes recommends performing Transaction tests.

### DNS Server and Trace

DNS Server tests can be used to run queries against Salesforce's DNS servers to measure availability and resolution time. DNS Trace tests can also be used to run queries against Salesforce DNS resource records.

## Applying ThousandEyes Tests to Lifecycle Monitoring

### Phase 1: Pre-deployment and Readiness

If you haven't yet deployed Salesforce or are still in a planning stage for all or some sites, you can use ThousandEyes to baseline end-user experience and network performance so you can make better decisions about how you're going to connect your users to Salesforce—via backhaul or DIA.

Use Enterprise Agents to measure application availability and transaction times from within your office locations. Optionally, you can run the same monitoring tests from ThousandEyes Cloud Agents to help you know whether your performance is normal for a particular city or region. During this phase, you also should start to test your customized application by running transaction tests your Salesforce sandbox.

The goal of the readiness phase is to get a view into what normal versus broken looks like for each location so you can establish baselines and set alerting thresholds. The other key goal of this phase is to define escalation procedures and train your staff and providers, like ISP and Salesforce, on processes.

Test	Target(s)	Frequency	Outcome
HTTP Server (includes Network/ BGP data)	Salesforce instance candidates	10 min	Compare instance performance for users, with emphasis on users with more latency-sensitive use cases, such as those that will use Live Agent
Transaction	Sandbox(es)	Ad hoc (pre-push to production)	<ul style="list-style-type: none"><li>• Verify user workflow performance from your user sites (or approximate location using Cloud Agents)</li><li>• Tune your application code based on performance</li></ul>
HTTP Server	Production instance (e.g. NA32)	5 min	<ul style="list-style-type: none"><li>• Get baseline performance from your user sites to your production instance. Benchmark this performance against performance from Cloud Agents in the same region.</li><li>• Establish connectivity approach for each site based on performance (DIA vs. backhaul)</li></ul>
Transaction	Front door/ production instance	10 min	Prior to opening Salesforce to users, some performance validation of customized implementation should be done, taking into account user location

## Phase 2: Deployment

As you start to roll Salesforce to production and open it up to your users, you will want to add some additional points of visibility from actual users—particularly those that are remote or mobile—using Endpoint Agents, in order to manage performance for these workers. Endpoint Agents should also be deployed on some worker devices in your offices to supplement Enterprise Agents, as these agents will provide additional performance context, including local WiFi connectivity.

At this point, you should also have a continuous test established for your Live Agent API endpoint, running at high-frequency intervals, since Live Agent supports a more business critical use case and needs to be available continuously.

Test	Target(s)	Frequency	Outcome
HTTP Server (includes Network/ BGP data)	Production instance	5 min	Get continuous visibility to ensure good user experience, monitor SLAs, and reduce MTTT during rollout and ongoing operations
Transaction	Live Agent endpoint	1 min	Ensure Live Agent is continuously available and performing
HTTP Server	Front door/ production instance	10 min	Validate key Salesforce workflows are available and performing within acceptable parameters for all of the user locations
Transaction	Front door/ production instance	All Salesforce sessions	See individual user SaaS performance, so you can ensure user productivity and reduce helpdesk costs, particularly for remote or mobile users

### Phase 3: Post-deployment/Operations

Once you're in your operations phase, start to broaden monitoring coverage to critical third-party applications, as needed. Also, ensure that Transaction tests are a standard part of your developer's validation process prior to implementing changes to your production environment.

Ongoing, you'll want to focus on the efficiency of your troubleshooting processes, ensuring you're getting good resolution times from providers. You should also continue to adjust baselines, as the Internet and even Salesforce's delivery network will evolve continuously because there's simply no such thing as a steady state in the cloud.

Test	Target(s)	Frequency	Outcome
HTTP Server	Production instance	5 min	Same as deployment stage
HTTP Server	Live Agent endpoint	1 min	Same as deployment stage
Transaction	Front door/production instance	10 min	Same as deployment stage
HTTP Server	Critical third-party apps/API endpoints	Variable	Get continuous visibility into the performance of third-party applications to ensure good user experience and reduce MTTT
User experience monitoring	Front door/production instance	All Salesforce sessions	Same as deployment stage
Transaction	Sandbox(es)	Ad hoc (pre-push to production)	Validate changes to Salesforce environment prior to roll out to production



## Benefits of ThousandEyes Visibility

ThousandEyes is an ideal solution for monitoring Salesforce availability and performance because it provides multi-dimensional data, covering network performance, application performance, as well as transaction simulation. By ensuring that each layer affecting user experience is monitored, you can maintain employee productivity and business continuity and reduce IT cycles troubleshooting issues. Getting to root cause is a significant challenge for SaaS

application users. Often times, help desks costs can escalate when enterprises migrate to cloud-based applications and services, as it can be challenging to troubleshoot availability and performance issues when there may be multiple networks and services between each of your users and Salesforce. IT groups often waste considerable cycles determining where an issue occurs, particularly when you've eliminated your own network, as well as Salesforce, as the root cause.

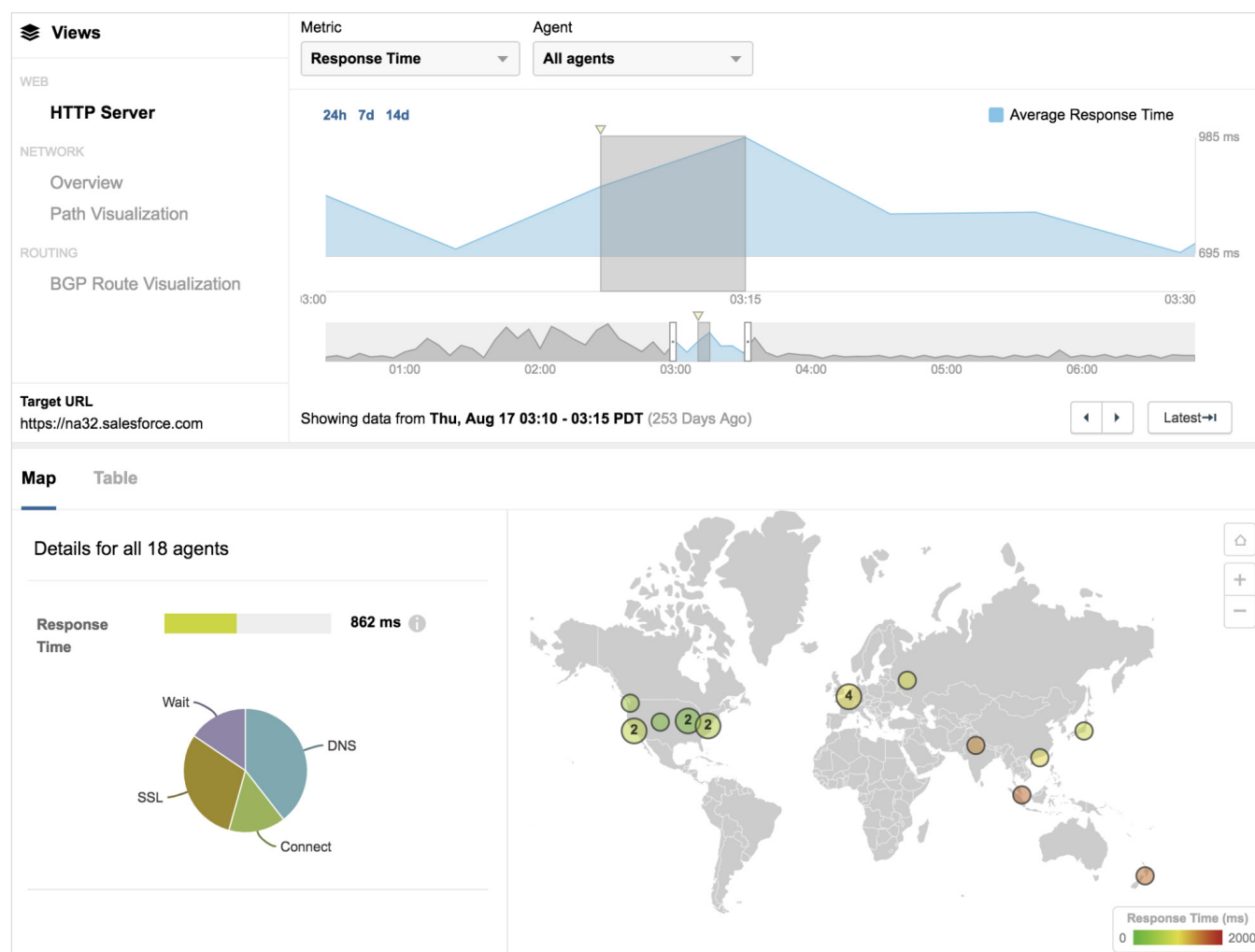


Figure 7: HTTP Server view

The deep visibility ThousandEyes provides not only allows for very rapid problem identification, it gives users the evidence they need to escalate to the right party. There's no need to guess who is at fault.

In the example in Figure 8, Salesforce was experiencing a significant outage event within their Dallas, Texas data center, which was affecting its availability for many users trying to connect to the NA32 instance. The hop-by-hop path visualization and network metrics in the ThousandEyes application provided clear evidence that Salesforce was the source of the issue.

Sharing meaningful data with providers such as Salesforce can enable escalation and remediation to progress smoothly, without the need for finger pointing.

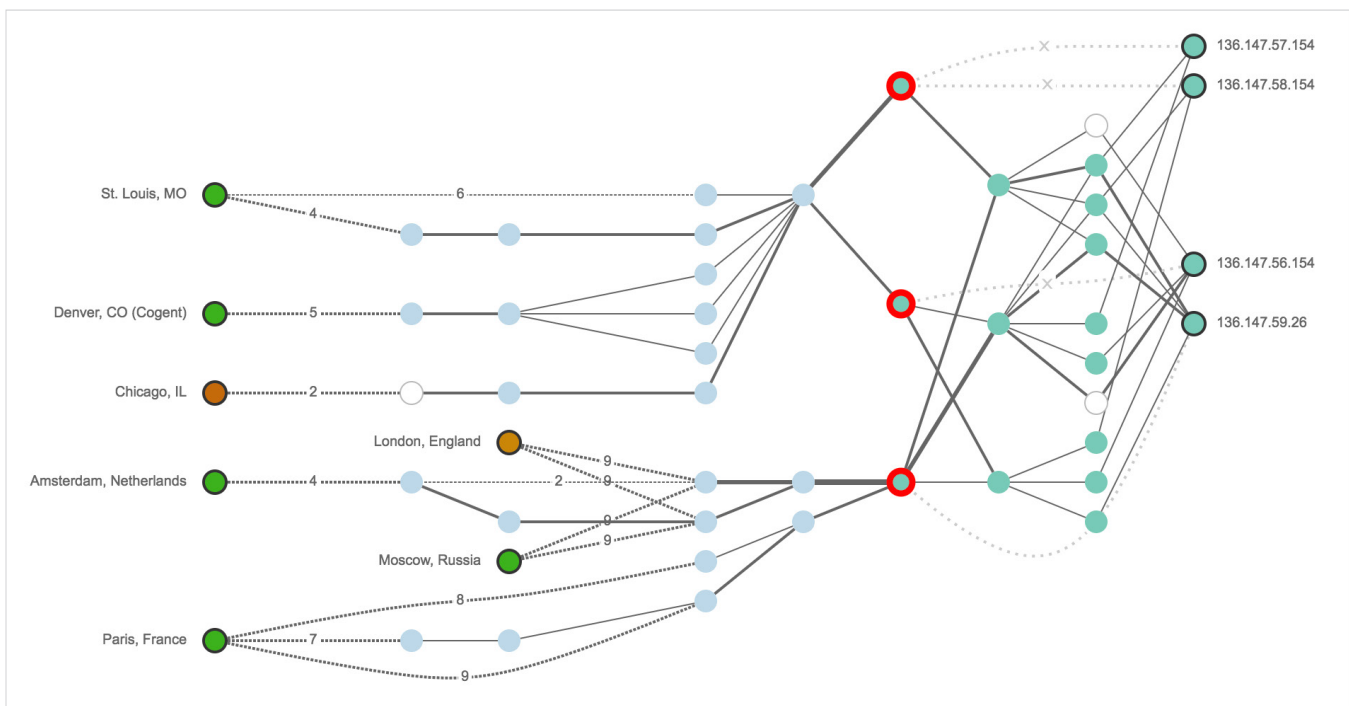


Figure 8: Salesforce NA32 Outage

## A Tale of Internet Woe... and Eventual Redemption: How an enterprise remediated Salesforce performance issues for their global users

A medium-sized enterprise with a global footprint, including offices in the US, APAC and EMEA, heavily relied on Salesforce to drive its Sales and Support operations. Multiple user sites were experiencing degraded performance connecting to Salesforce, but they were unable to pinpoint the source of the issue, even after escalations to Salesforce support and hunting within their own environment.

They decided to deploy ThousandEyes so they could gain visibility into the full-service delivery path to Salesforce from each site. Immediately, they were able to identify the source of the issues.

Figure 9 shows their users connecting to Salesforce.

The full-service delivery path—including the enterprise's WAN architecture—is visible here. The enterprise had a traditional MPLS WAN and was backhauling all sites to a common Internet gateway. Using this Path Visualization, the enterprise was able to quickly determine that multiple nodes

across two ISP networks were experiencing packet loss. They were able to establish root cause without hunting within their own environment or escalating to Salesforce—neither of which were the source of the issue. There was effectively breakage in the Internet, and they could see where. Once the IT team could see the real picture, with specific latency, loss and jitter metrics on a hop-by-hop basis from each location, they could escalate to the two providers at fault and get the issue fixed for all their users.

Very soon after this event, this enterprise began migrating a portion of their locations to DIA with the help of an SD-WAN solution, which means they now have multiple Internet gateways, and many more service providers they rely on. They were able to use ThousandEyes during this migration so they could understand what “normal” looked like for each location, perform benchmarking and set achievable success metrics.

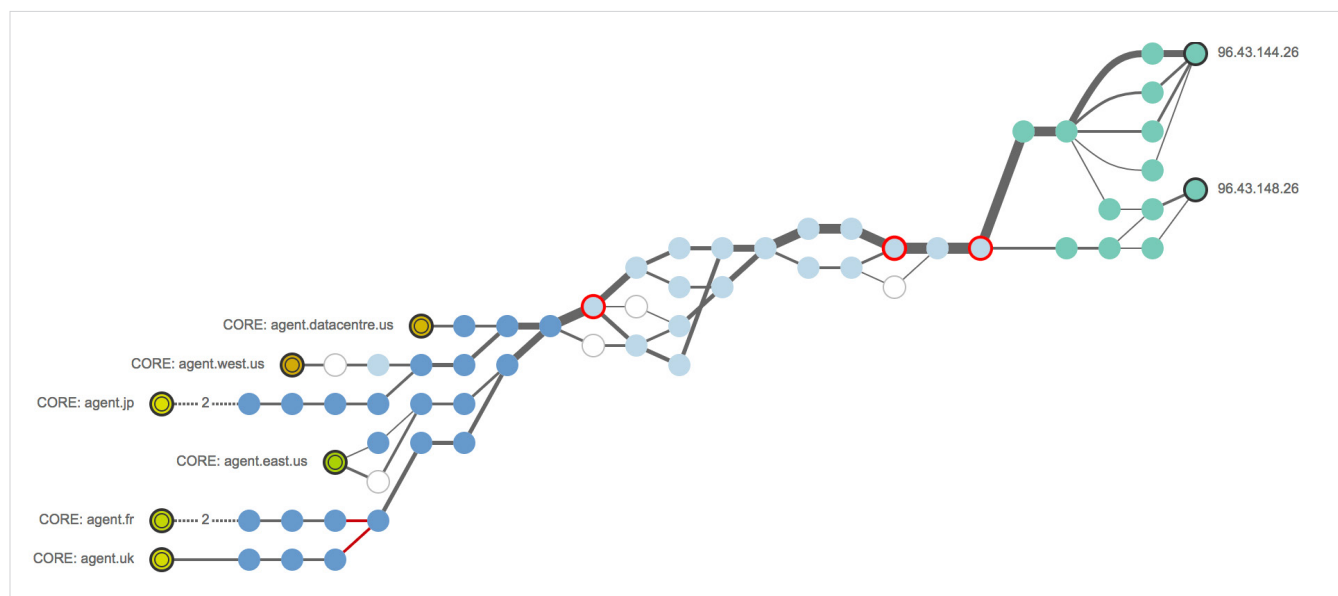


Figure 9: Multiple ISP nodes with packet loss causing intermittent performance issues for enterprise users.

## Conclusion

Relying on external providers, such as Salesforce, for critical business functionality requires new management processes to ensure you get the performance your users need for a good digital experience. ThousandEyes provides a multi-layered view of the availability and performance of every element involved in connecting your users to Salesforce, so you can quickly identify and troubleshoot issues and successfully plan changes and service and user expansions.

To try ThousandEyes for free, sign up for a 15-day trial at <https://www.thousandeyes.com/signup>

**ThousandEyes**

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### About ThousandEyes

ThousandEyes is a Network Intelligence platform that delivers visibility into every network your organization relies on, enabling you to resolve issues faster, improve application delivery and run your business smoothly.