A Technical Overview:
Citrix XenApp & XenDesktop Deployments

By The Goliath Technologies Technical Team

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Goliath Technologies: Product Overview

This product overview document highlights some of the differentiating features Goliath Technologies offers that are currently unavailable with any other solutions in the marketplace today. These capabilities enable organizations to proactively monitor and troubleshoot not only their Citrix environments but associated end-user experience.

Transforming IT from Reactive to Proactive

Goliath Technologies offers IT professionals monitoring and troubleshooting software with embedded intelligence and automation that is purpose-built to help IT proactively anticipate, troubleshoot and prevent end-user experience issues – regardless of where IT workloads or users are located. By doing so, Goliath helps IT break out of reactive mode, into proactive mode.

Goliath provides IT teams an end-to-end view across the end-user experience, the IT delivery infrastructure (includes Citrix and/or VMware Horizon) and, if in healthcare, associated EHR applications (Epic, Cerner, MEDITECH, Allscripts). This view includes granular metrics that help IT quickly troubleshoot and resolve issues in hours, not days. In addition, early warning alerts and reports can be automated to anticipate issues before they occur, preventing them from ever impacting an end user. Finally, by leveraging objective evidence, in the form of reports and analytics, IT teams can effectively diagnose root cause and collaborate with management, cross-departmental counterparts and vendors to deliver permanent resolutions.

- **Anticipate**
  - Holistic view and correlation of insights combining end-user experience, Citrix or VMware Horizon delivery infrastructure and application (i.e. EHR) metrics all within a single view.
  - Proactive proof of Citrix or VMware Horizon availability with automated end-user logons from key locations to confirm all aspects of the delivery infrastructure and applications are available and performing as expected.
  - Preemptive, threshold-based alerting to monitor common failure points and alert if any of those points exceed a performance threshold.
- **Troubleshoot**
  - Broad and deep metrics around the end-user experience to identify the “where” and the “what” of an issue.
  - Automatic dependency map of end-to-end Citrix infrastructure providing visibility into overall workspace health.
  - Historical session data is stored to easily identify when something changed and how it impacted the overall digital workspace experience.
  - Deep metrics around logon initiation and duration to identify majority of slowness issues quickly.
  - Analysis of Citrix ICA/HDX or VMware Horizon’s PCoIP/Blast protocols to quickly identify user behavior impacts to performance.
- **Prevent**
  - Routinely schedule and automate real user logons to proactively launch applications and capturing snapshot evidence of the entire logon process to identify performance issues.
  - Options for on-demand remediation when common issues are discovered.
  - Historical reports and analytics enable identification of permanent resolutions to prevent similar problems occurring in the future.

Early Warning System

Goliath is the industry's only proactive, production-ready end-user experience software that validates availability of the entire Citrix delivery infrastructure (including the NetScaler). It intelligently ensures availability by executing real Citrix sessions that exercise the exact same steps a user takes during the Citrix logon process. Regardless of whether a user is remote or local, Goliath gives administrators an "early warning system" that allows them to know exactly what the Citrix end-user experience will be like for their users – in advance.

Illustrated Below: (1) The Application Availability Monitor Dashboard displaying a real-time assessment of Citrix Availability and then (2) breaking down launch times by stage.

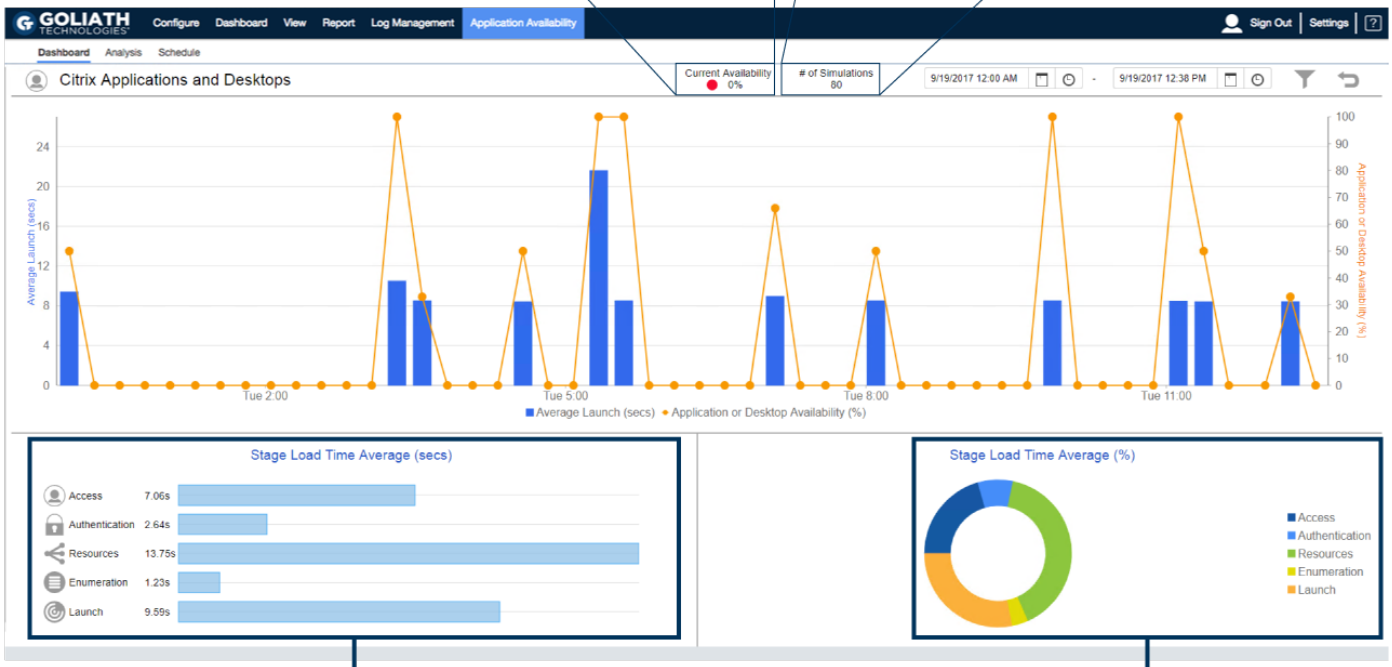
1

Immediate Citrix availability assessment, taking into consideration NetScaler, Storefront, Delivery Controller, SQL and Session Host availability, including XA configuration.

Current Availability 0%

# of Simulations 80

Automatically schedule launches to continuously test availability.



2

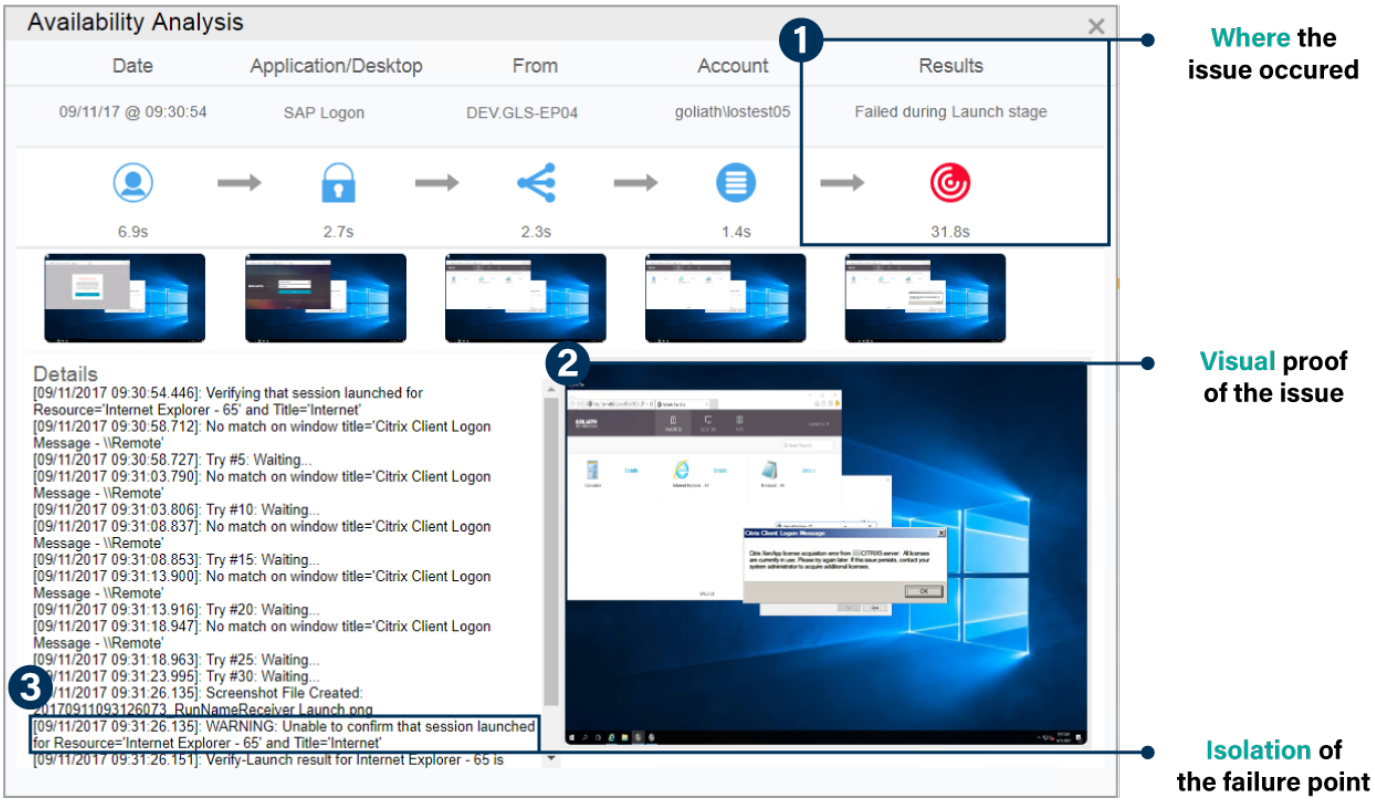
Breakdown failures by stage to determine if problems are related to overall environment health or one part of the delivery workflow.

Breakdown launch times by stage to identify which stage should be optimized to yield the best results, and how they are performing.

End User Screenshot Analytics

When there is a logon failure, an administrator will be alerted immediately. Using the simulation details, an administrator can quickly pinpoint where the failure occurred and the root cause.

Illustrated Below: Quickly drill down to investigate failures right from the application availability dashboard by clicking on the magnifying glass. In just three steps, you can then see *where* the logon issues occurred during the logon process and *what* the issue was:



1. In this case, failure occurred at the launch stage (marked by the '**1**')
2. The screenshot **(2)** proves that the application failed to launch and shows the root cause of the Citrix workflow and application launch failure as being the result of a licensing problem
3. By navigating to the "Details" or "Analytics" section **(3)**, we can see that the launch failed at the point of verifying that Internet Explorer launched

Proactive Monitoring and Troubleshooting

Automatic Citrix Discovery and Dependency Map

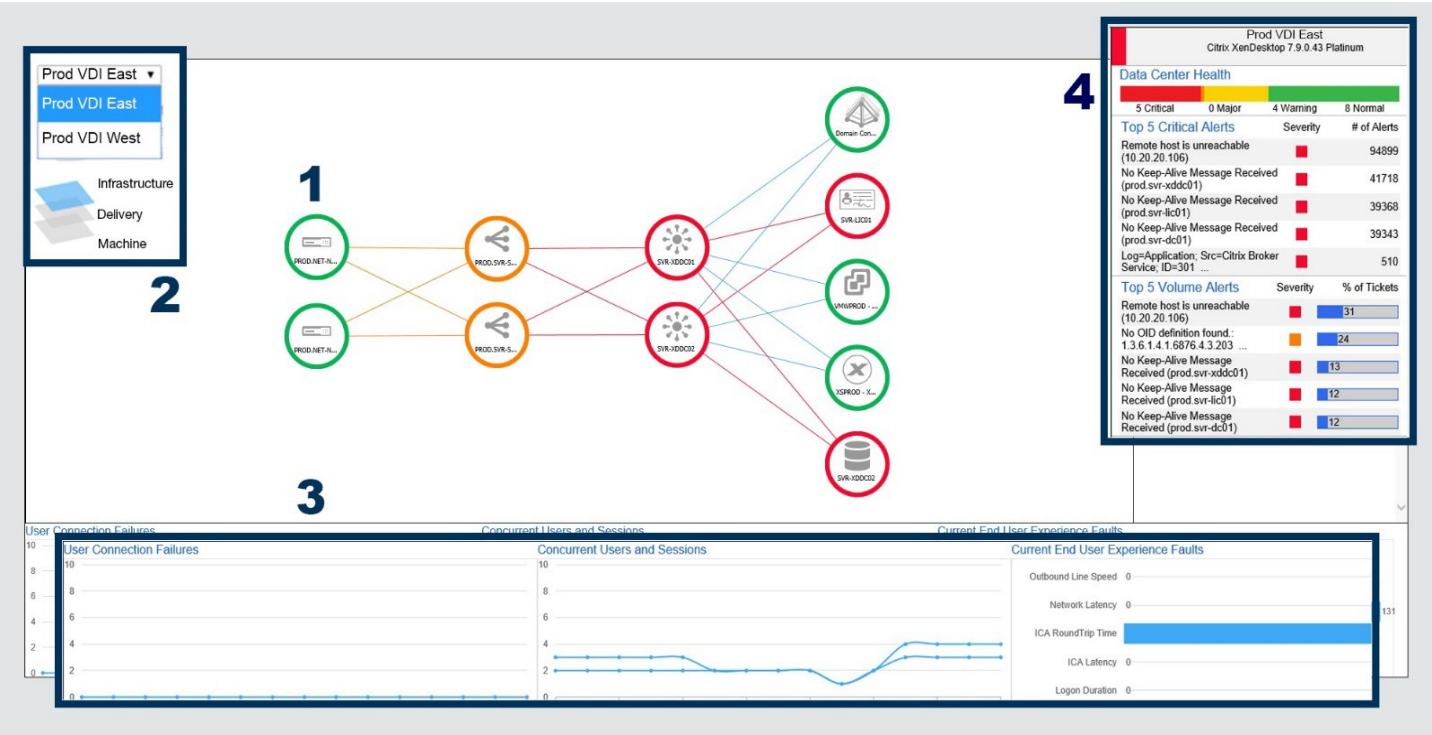
Goliath's Automatic Citrix Discovery and Dependency Map intelligently creates a dependency map of your entire Citrix infrastructure with true end-to-end visibility of the health of your Citrix infrastructure. This single, macro view used as a real-time NOC display of your Citrix environment gives administrators the ability to monitor, manage and troubleshoot issues with Citrix whether the root cause is the Citrix infrastructure or the supporting IT elements. It shows the overall health of your environment at a glance and provides context-sensitive supporting metrics and details as you select each element. You can drill down and dynamically examine your environment and troubleshoot issues more easily since everything is logically broken down.

Highlights:

- Automatically deploys to your environment, with no manual set-up.
- Eliminates the time it takes to correlate root-cause to elements in your environment by graphically representing all the connection between component in your Citrix infrastructure. Easily switch between data centers and farms to eliminate siloed architectures.
- Drill down to the host level and view specific metrics for each element in your environment. View end user experience metrics for different layers in your environment at a glance.

Physical Layer

1. Automatically map your entire Citrix infrastructure to visualize connections, relationships, and health of components.
2. Easily switch views to different data centers or locations.
3. Correlate end user experience issues to delivery infrastructure components and health.
4. See context-sensitive metrics and alerts for selected components.



Delivery Layer

1. Shows the logical connections and dependencies of your Citrix environment by delivery group, machine catalog, and down to the specific image.
2. Correlates end user experience metrics for the selected delivery groups.
3. Delivers context sensitive metrics for any selected component.

Machine Layer

1. In addition to the delivery group elements, the machine layer displays Citrix PVS and/or MCS as well as the hypervisor resources and hosts.
2. The details on the right pane will update according to the selected node.

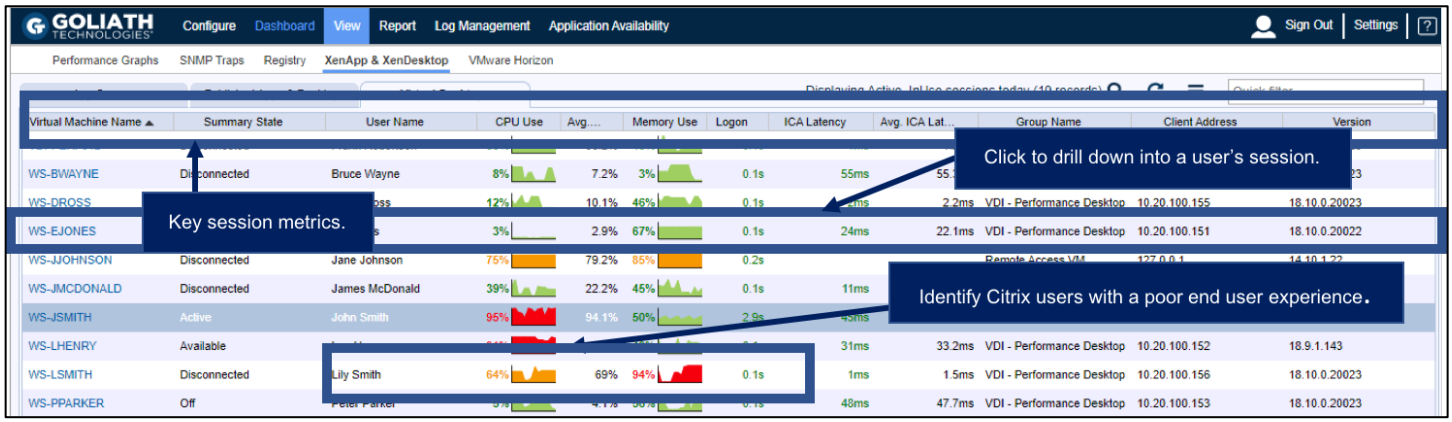
Real-Time Citrix Performance Graphs

Goliath provides five layers of visibility in one console: hardware, host, VM, OS, and application. The performance graphs allow administrators to trend Citrix ICA/HDX Latency and Logon Duration as well as resource utilization of each server.

View Citrix XenApp & XenDesktop along with the entire supporting infrastructure in one console

Real-Time XenApp & XenDesktop Session Display

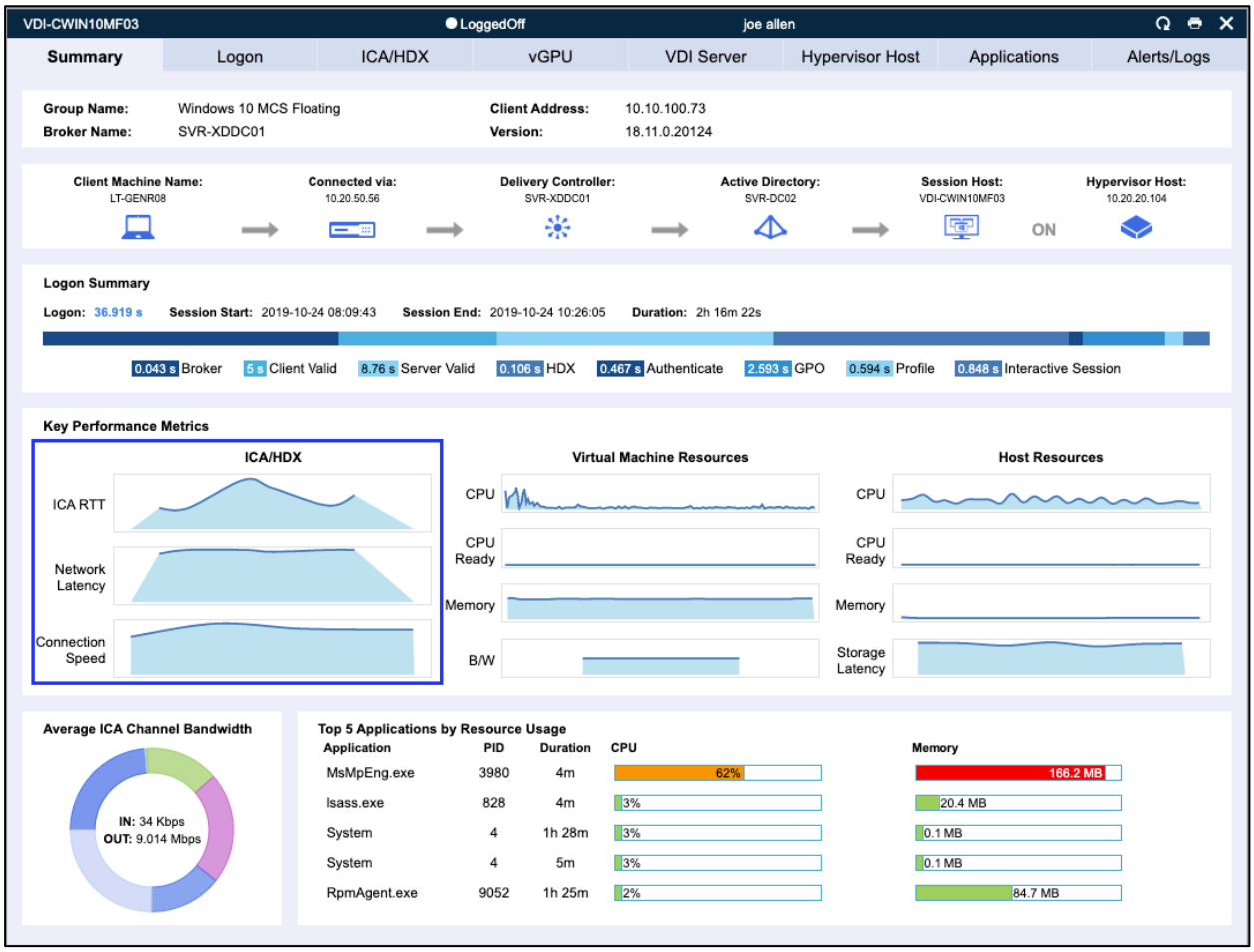
Goliath provides granular real-time and historic data for all Citrix Sessions. When there are end user experience issues, administrators can drill into an individual user session to gain deeper visibility and identify the root cause.



In Session Real-Time Analytics Overview

Goliath provides the ability to drill down into a single end user's session and, at a glance, review key analytics around that session performance: logon duration summary, key performance metrics from ICA/HDX, VM resources, host resources along with application resource usage data.

This quick summary enables an administrator to quickly view correlated performance metrics and rule out what isn't causing the performance bottleneck and focus on the metrics that appear to indicate root cause.

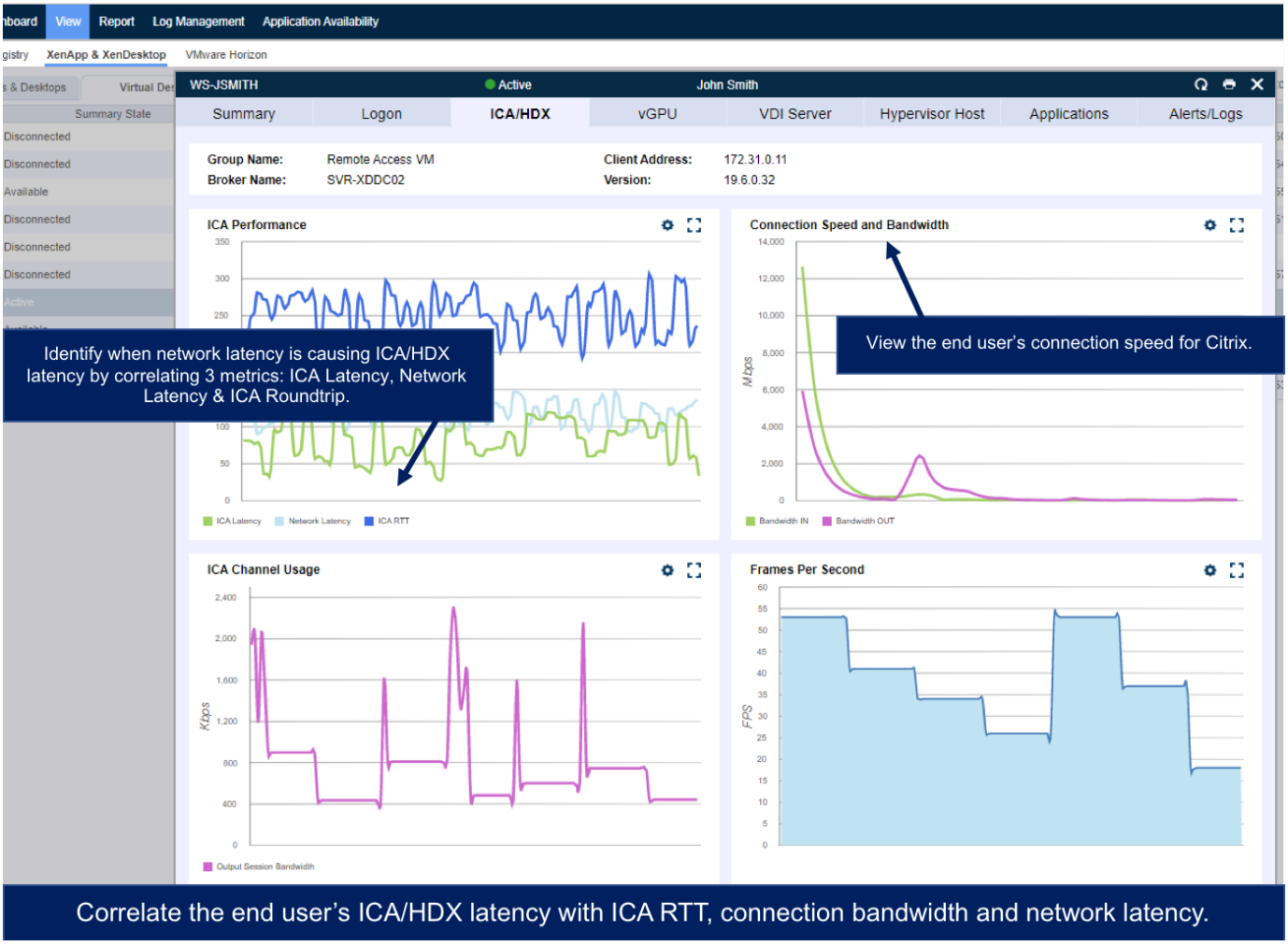


Real-Time ICA Channel Drill Down from Session Display

Goliath provides industry-leading visibility into Citrix session performance by breaking down the ICA/HDX protocol and returning precise metrics around individual ICA/HDX channel performance.

Detailed ICA/HDX Channel Metrics Include:

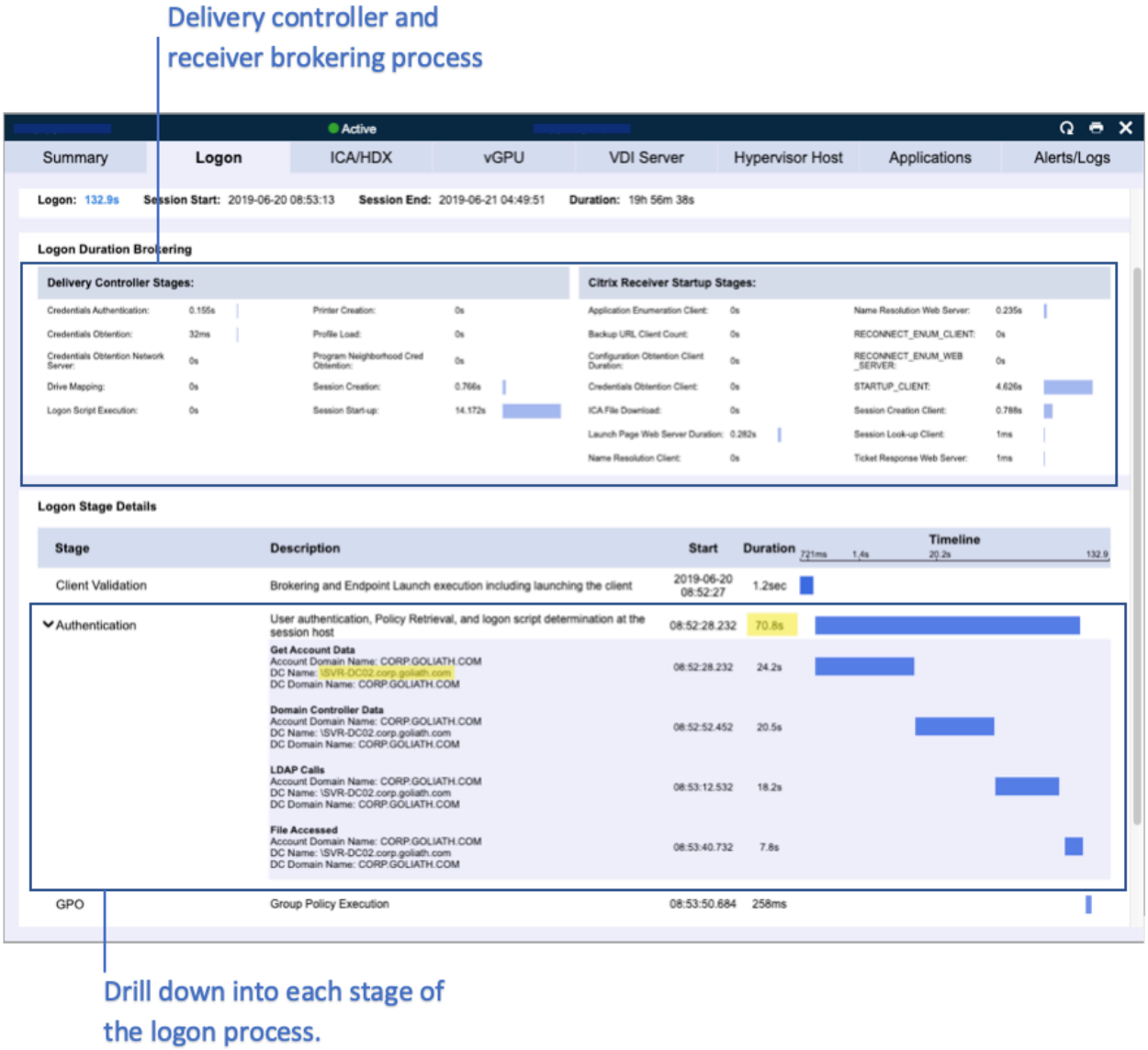
- User Connection Performance
- Printing Bandwidth
- Audio Bandwidth
- Clipboard Bandwidth
- Keyboard and Mouse Bandwidth
- Thinwire Bandwidth
- DCR Bandwidth
- Multimedia Bandwidth
- And more!



Real-Time Citrix Logon Duration Drilldown

If you can't drill down into all 33+ stages of the Citrix logon process, then you can't isolate and fix root cause of logon slowness. With the Citrix Logon Duration monitoring and troubleshooting functionality you can capture real-time Logon Duration times and get alerted to end user logon slowness on any of the 33+ Logon Duration Stages.

The real-time Citrix Logon Duration Drilldown breaks down a user's logon process into each of the stages to help understand what needs to be optimized to improve logon times. This report can also be used to identify and troubleshoot session load problems by identifying what may be getting stuck or taking too long to process. Threshold-based alerting on user logon times is also possible.



The logon duration drilldown allows an administrator to parse logon times into each of the stages and sub-stages. This includes the details of the brokering process that the Citrix Delivery Controller and Receiver is responsible for and the breakdown of the session launch from mouse click to being delivered onto the XenApp/XenDesktop Server or VDI, including but not limited to:

- End User Mouse Click to Launch Application or Desktop to Session Host ICA/HDX File Download
- XML Service Name Resolution of an App or Desktop to a Session Host
- User Authentication
- Time to Request Session Creation
- Determine the Session Host STA Ticket Retrieval
- Logon Script Execution
- Desktop Load

When the Session is established on the **XenApp/XenDesktop Server** or **VDI, GPM** further breaks down the policy and profile load stages to determine the root cause of which script or stage caused the logon delay. This is accomplished by providing the details of how long each process took and iterating each execution stage and how that occurs including:

- Identifying and establishing connection to the Domain Controller for authentication
- LDAP calls to copy over policies
- Copying over each script file

Execution of each group policy and script to determine the execution time of:

- Registry Extensions
- Citrix Group Policy
- Folder Redirection
- Citrix Profile Management
- Drive Mapping
- Printer Mapping
- OU Policy Execution

Out-of-the-Box Monitoring Intelligence

Goliath comes with embedded intelligence and automation consisting of hundreds of pre-configured monitoring rules and alerts based upon best practices from Citrix, VMware, Microsoft, and our own Goliath consulting experience. So immediately upon deployment, the product begins using this embedded intelligence to automatically search out these known failure points and conditions. This out-of-the-box functionality simplifies deployment and allows for administrators to immediately begin focusing on improving environmental bottlenecks or failure points

These rules cover the following conditions and more:

- Virtual Host & VM: CPU, CPU ready, memory provisioning, storage performance, and B/W usage
- XenApp & XenDesktop End User Experience: ICA/HDX latency, logon duration, server load

Unregistered machines, active users/sessions per server, and available desktops

- Application crashes, hangs, and high CPU/memory utilization
- Citrix delivery controller, StoreFront, PVS, Licensing Server, and Windows dependencies group policy and registry faults
- Printing and profile faults
- Windows errors and faults

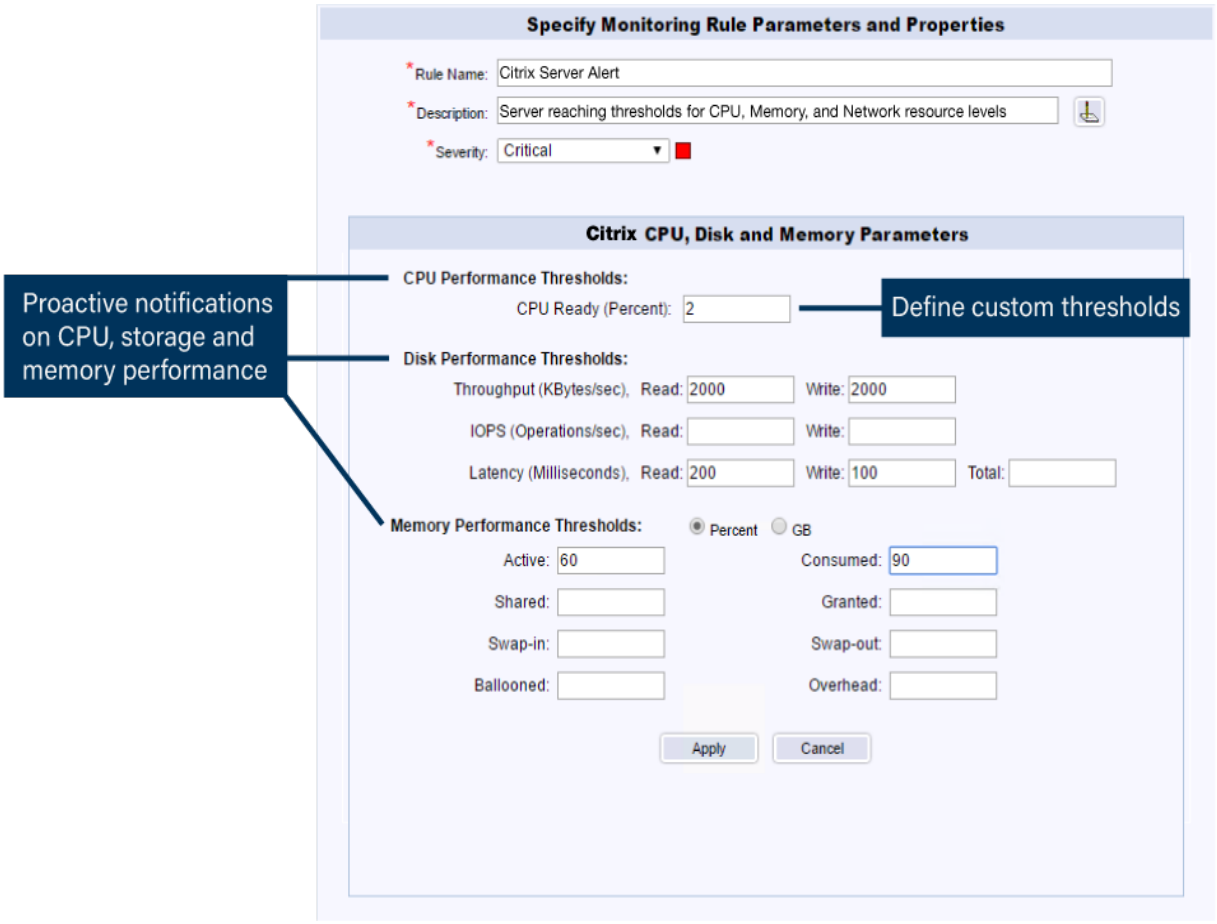
Rule Name	Type	Severity	Description
Printing Error - Printer Auto Creation Failure	EventLogWatch	Normal	Print failure and printer auto creation failure
Printing Error - Printer, Driver, Print Security Errors	EventLogWatch	Normal	This rule performs system level printer errors and failures for repc
Printing Error - Windows Print Spooler Crash	EventLogWatch	Critical	splwow64.exe, Citrix Print Manager service process, crashed
Profile Error - Cannot load the local profile	EventLogWatch	Caution	Profile failed to load due to insufficient security rights or a corrupt
Profile Error - Citrix Profile Management Errors	EventLogWatch	Caution	CPM errors and failures
Profile Error - Folder Redirection Errors	EventLogWatch	Caution	Folder Redirection failures (catch-all)
Profile Error - Group Policy Processing Failed	EventLogWatch	High	Group Policy failed to process for user
Profile Error - Insufficient Rights or Corrupt Profile	EventLogWatch	High	cannot load the local profile - insufficient security rights or a corru
Profile Error - Local Profile Backed Up	EventLogWatch	Caution	Local User Profile failed to load and was backed up
Profile Error - Local Profile Failed to Load and was Backed Up	EventLogWatch	Normal	cannot load the local profile - profile backed up
Profile Error - Logging User on with a Temporary Profile	EventLogWatch	Caution	Local User Profile failed to load and user logged on with tempror
Profile Error - Registry Classes File Cannot Load	EventLogWatch	Caution	Cannot load classes registry file
Profile Error - Registry Load Failure	EventLogWatch	Caution	Registry failed to load due to insufficient memory or security right
Profile Error - Temporary Profile Loaded	EventLogWatch	Caution	Logging user on with a temporary profile
Profile Error - User Home Directory Path Not Accessible/Does Not Exist	EventLogWatch	High	Terminal Services User Home Directory was not set because the
Profile Error - User Store Cannot Be Reached	EventLogWatch	High	The User Profile Store cannot be reached
Profile Error - Windows Folder Redirection Failed	EventLogWatch	Caution	Failed to apply the policy and redirect folder because file cannot
Profile Error - Windows Folder Redirection Failed; Access Denied	EventLogWatch	Critical	Failed to perform redirection of folder; Access is denied
Profile Error - Windows Profile Used Instead of CPM Profile	EventLogWatch	High	CPM could not monitor the profile of a user configured for extend
Profile Error - Windows User Profiles Service Errors	EventLogWatch	Normal	Windows User Profiles Service Errors
Program Needs More Memory	EventLogWatch	Caution	Monitor Program Needs More Memory System Event
Registry Failure - Cannot Load Classes Registry File	EventLogWatch	High	Cannot load classes registry file; profile load failure
Registry Failure - Could Not Apply Registry-based Policy Settings	EventLogWatch	High	Could not apply the registry-based policy settings for the Group P
Registry Failure - Incorrect Registry File Format	EventLogWatch	High	Insufficient security rights or memory; file not in registry file format
Registry Failure - Registry Hive corrupted and recovered	EventLogWatch	Caution	Registry hive failure
Registry Failure - User Profile Unable to Load	EventLogWatch	Normal	Registry load failures, cannot load classes registry file, and other

Advanced Remediation Capabilities to Improve Troubleshooting & Help Desk Operational Workflows

Goliath goes beyond providing differentiating Citrix visibility and granular metrics by also delivering unique operational features that allow organizations to take the next step in improving operational IT troubleshooting and Help Desk workflows.

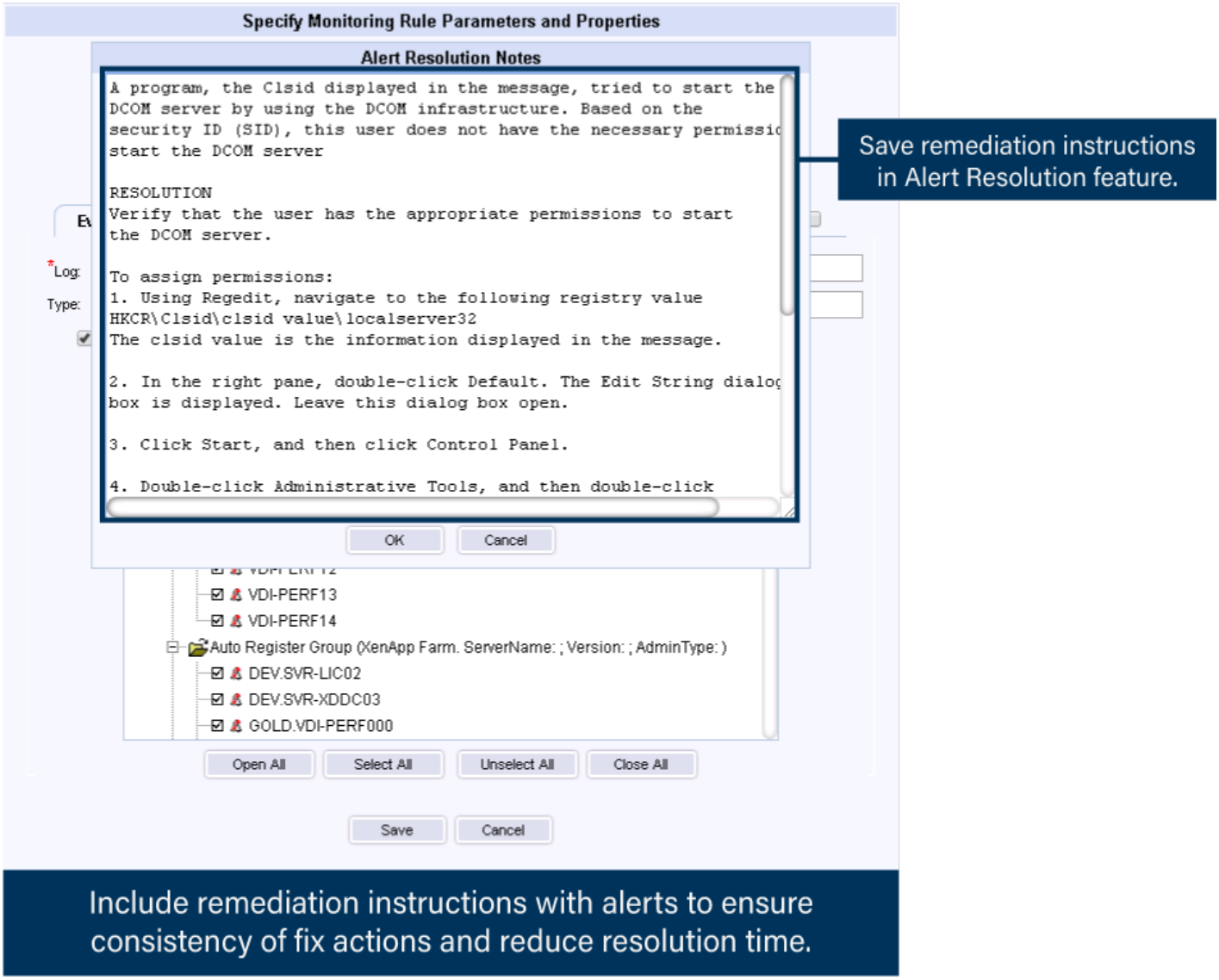
Threshold-Based Alerting

Define custom thresholds and receive proactive notifications based on faults, errors, and conditions so administrators can resolve issues before end users complain. Configuring alerts and tuning them to the specifications of each department requires no scripting or customizations because there are prebuilt templates for each type of alert.



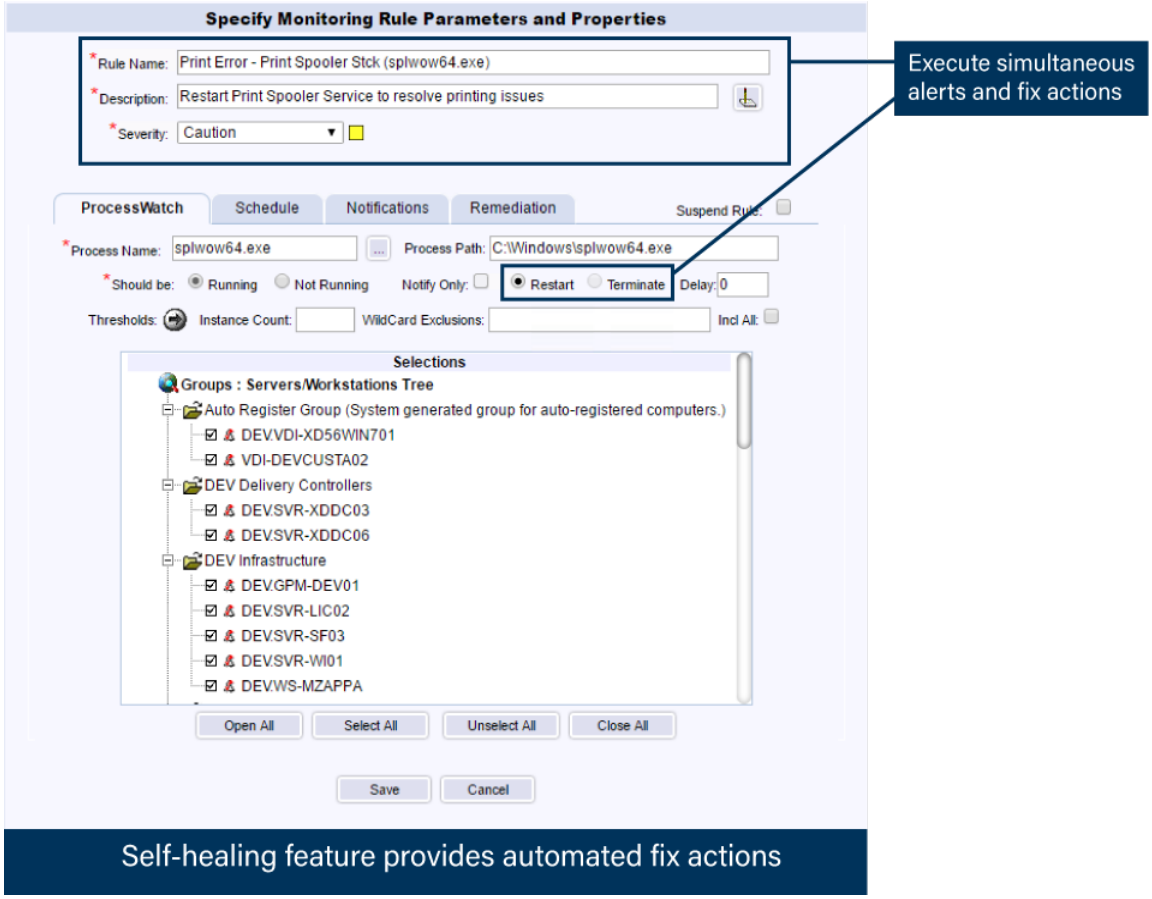
Alert Resolution Feature

For workflows that cannot be automated, Goliath allows administrators to automatically pass on troubleshooting instructions to the appropriate administrators when certain alerts are triggered. This enables consistent response quality regardless of the help desk responder and frees up senior resources for other projects rather than responding to recurring issues.



Automated Remediation Actions

You can configure automatic remediation fixes to take place when certain alerts are triggered based on faults, events or conditions. Whether it be restarting a service or running a PowerShell script, Goliath supports a number of “self- healing” workflows to allow IT organizations to dramatically increase Help Desk response times and implement truly proactive IT processes.



Citrix:

- Restart print, application, & Citrix Services
- Logoff disconnected user sessions
- Restart VDA Agent or VDI sessions
- Disable logons to XenApp Servers
- Kill print processes
- Clear print queues
- Kill Apps with Memory/CPU leaks
- Reset applications
- Detect old Citrix Receiver versions on client and automate update

Infrastructure:

- Restart SQL service
- Unlock user account
- Rebalance VDI Sessions across host
- Restart ANY application
- Terminate applications processes
- Restart backup job
- Execute Windows Job Scheduler tasks
- Reboot servers

Reporting

Citrix XenApp & XenDesktop Reports

With the XenApp & XenDesktop reports with Goliath (which includes modules for NVIDIA vGPU & EMR/EHR Apps), you get complete end-to-end visibility into the underlying delivery infrastructure so you can see how your environment is performing.

XenApp Reports

- Client Report
- End User Activity Report
- Environment Summary Report
- License Usage Report
- Peak Usage Server Health
- Session Activity

XenDesktop Reports

- Client Report
- End User Activity Report
- Environment Summary Report
- License Usage Report
- Peak Usage S
- Session Activity
- Gold Image Health

Citrix XenApp & XenDesktop End-User Experience Reports Along with Citrix XenServer and VMware Performance Reports

To proactively manage the Citrix XenApp/XenDesktop end user experience, using this set of reports will allow you to proactively detect and troubleshoot issues such as printing, profile and logon failures, and high ICA latency in order to remediate issues before end users complain.

Citrix End-User Experience Reports

- XenApp Logon Duration
- XenDesktop Logon Duration
- XenApp ICA Latency
- XenDesktop ICA Latency
- XenApp End-User Experience
- XenApp End-to-End Connection
- RDS & Terminal Services Errors
- User Logon Problems

Application Availability Monitor Reports

- Simulation Success or Failure Analysis

VMware & XenServer Performance Reports

- Citrix XenServer – Host Performance
- Citrix XenServer – Virtual Machine Performance
- Citrix XenServer – Storage Usage
- VMware ESX/ESXi – Host Performance
- VMware ESX/ESXi – Virtual Machine Performance
- VMware ESX/ESXi – Storage Usage

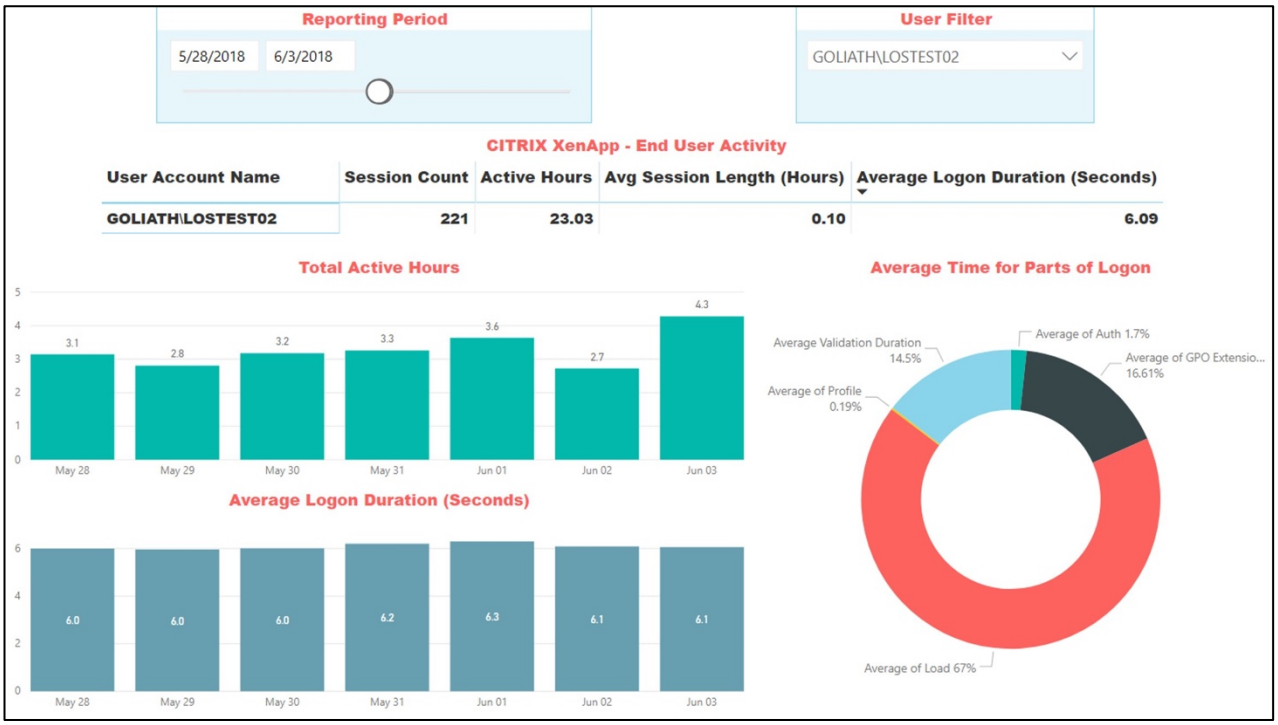
Sample Reports

This section highlights a few of the reports available with Goliath.

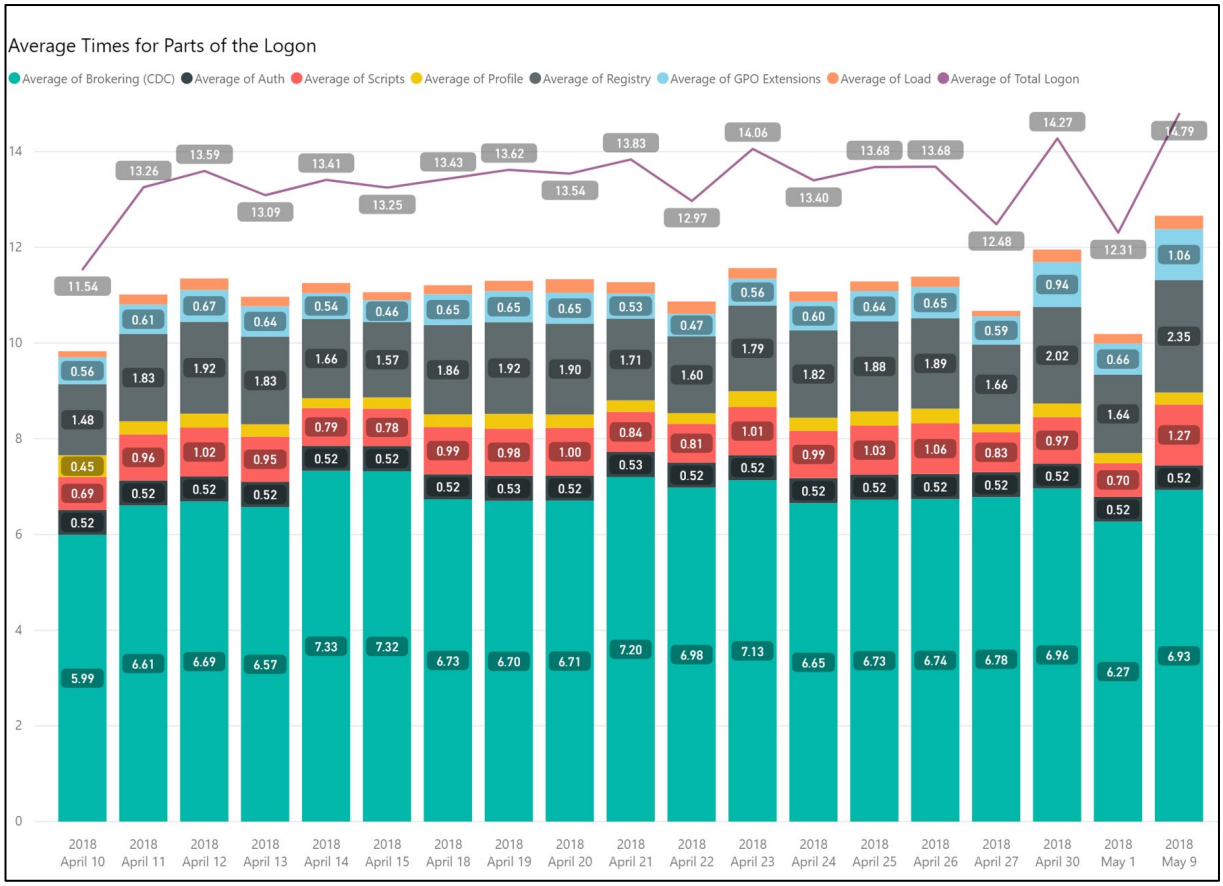
License Usage Report: This interactive template shows license usage by group or time period, with adjustable filters for date ranges and specific groups.

Session Logon Duration Pivots: This template shows another way to visualize and interact with Logon Duration data in pivot tables and charts.

End User Activity: This template shows end-user activity by time period and account name. It displays number of sessions, active hours, and session length.



Average Logon Duration by Stage



To see how Goliath can help you improve XenApp & XenDesktop end user experience:

Register for a demo: https://goliathtechnologies.com/schedule-demo/

Send us an email: techinfo@goliathtechnologies.com

Give us a call: 855-465-4284