



A Technical Overview

By The Goliath Technologies Technical Team

"Goliath Performance Monitor is a great alternative to vRealize Operations. It's easy to set up and deploy, has the ability to create simple overviews of the metrics required for troubleshooting. Also the Goliath Application Availability Monitor is a great feature to troubleshoot one part of the user experience that is quite often neglected."

– Johan Van Amersfoort

VMware EUC Champion, VCDX-DTM, and author of the VDI Design Guide

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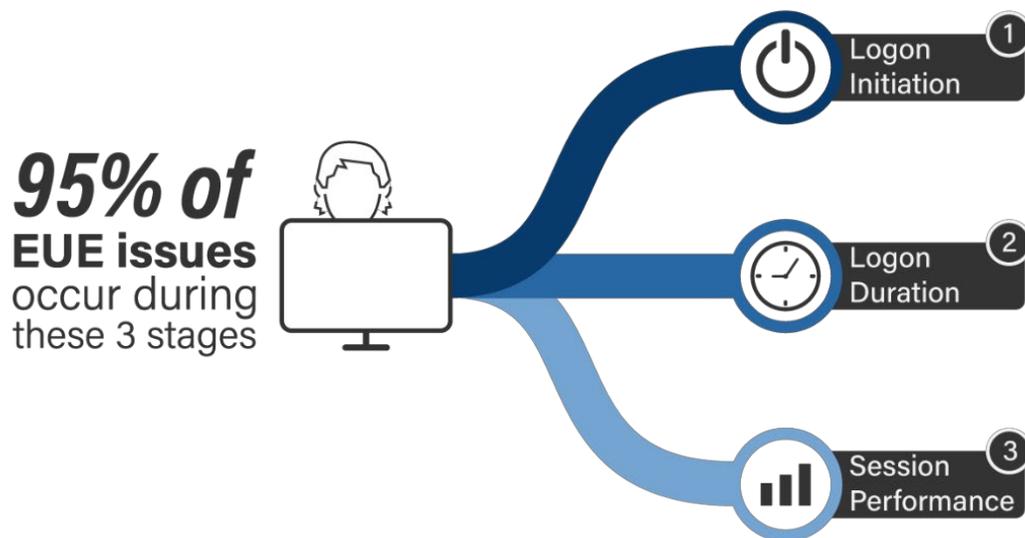
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Summary

This document highlights a few of the differentiating features Goliath offers that have allowed organizations to more proactively manage their VMware Horizon environments and the associated end user experience. Application & desktop virtualization brings a unique set of challenges to organizations that leverage a complex combination of infrastructure technologies. Goliath's software addresses the challenges of managing VMware Horizon environments, allowing IT professionals to anticipate, troubleshoot, resolve and prevent performance issues for VMware Horizon elements as well as the virtual and cloud infrastructures upon which they rely. Goliath Performance Monitor for VMware Horizon is being released with primary support for VMware Horizon 6 & 7.

Purpose-Built for VMware Horizon

Goliath's solutions fill the gap left in the marketplace between simplistic native utilities/point products, and expensive, services-intensive enterprise solutions. As a VMware Ready Partner, Goliath works alongside VMware product managers to bring to market solutions which allow VMware customers to improve the experience for their end users. Goliath focuses on providing granular visibility & advanced operational functionality into three key areas that impact VMware Horizon end user experience ("EUE"):



If an administrator receives a call from an end user, often it's because they are having issues logging on or using the application. With Goliath you get deep visibility into the virtualized desktop delivery infrastructure and detailed metrics that allow IT staff to troubleshoot and resolve performance issues. Goliath brings a cost-effective, feature rich solution to organizations looking to shift their operational posture to a more proactive stance towards end user experience.

Goliath's Software for VMware Horizon

GOLIATH APPLICATION AVAILABILITY MONITOR

Verify VMware and applications are available for local or remote end users

This is a complete early warning system that lets you know in advance if an end user is going to have a problem when they try to access an application, so you can fix it before they are negatively impacted.

The technology is designed to:

- ▶ Confirm that applications and the IT delivery infrastructure are available and working
- ▶ Send alerts if they fail or are slow for troubleshooting
- ▶ Provide reports as objective evidence of success, slowness or failure so permanent fix actions can be put in place to prevent issues in the future.

GOLIATH PERFORMANCE MONITOR

Proactive IT Performance Monitoring for Virtual Server, Virtual Desktop, Hybrid Cloud, and Mobile Environments

Goliath Performance Monitor provides complete support for monitoring virtual servers, virtual desktops, hybrid cloud environments and provides specialized modules for EHR and EMR applications. The technology has been designed from the ground up to help IT administrators anticipate issues before they become problems. If problems do appear, it gives you the data and functionality to troubleshoot and resolve them quickly and with minimal end user impact. The software also enables IT to put permanent fix actions in place to prevent issues from occurring in the future.

Goliath Application Availability Monitor

An Early Warning System

GAAM is a production-ready end user experience software that validates availability of the entire VMware delivery infrastructure. It ensures availability by executing VMware sessions that exercise the exact same steps a user takes during the VMware logon process. Regardless of whether a user is remote or local, Goliath Application Availability Monitor gives administrators an “early warning system” that allows them to know exactly what the end user experience will be like for their users in advance. This guarantess the availability of the entire VMware delivery infrastructure and any applications that are dependent on it.

- ▶ Automatically tests the logon and application launch process across your entire infrastructure 24/7/365 and alerts you anytime anywhere of issues.
- ▶ Detailed reporting with screenshot evidence tells you exactly what stage your process failed and isolates the specific failure point.
- ▶ Deploy anywhere, on premises or in the cloud, to identify individual, site or geographical application availability issues.
- ▶ Automatic remediation actions built-in.

Pictured Below: (1) The Application Availability Monitor Dashboard displaying a real-time assessment of Citrix Availability. (2) The breakdown of launch times by stage.



End User Screenshot Analytics

When there is a logon failure an administrator will be alerted immediately. Using the provided details, IT professionals can pin-point where the failure occurred and the root cause.

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

1 Where the issue occurred

Date	Application/Desktop	From	Account	Results
10/05/17 @ 11:45:56	VDI001	DEV.GLS-EP04	goliath\lostest05	Failed during Launch stage

Progress bar: 16ms (User icon) → 15ms (Lock icon) → 47ms (Share icon) → 15ms (List icon) → 31.8s (Target icon)

2 Visual proof of the issue

3 Isolation of the failure point

Details

```
[10/05/2017 11:45:41.391] Launching the VMware Horizon View Client
[10/05/2017 11:45:41.532] Screenshot File Created:
20171005114541485_RunNameReceiver Launch.png
[10/05/2017 11:45:56.560] Verifying that session launched for
Resource='VDI001' and Title='VDI'
[10/05/2017 11:46:00.613] No match on window title='VMware Horizon Client'
[10/05/2017 11:46:00.628] Try #5: Waiting...
[10/05/2017 11:46:05.681] No match on window title='VMware Horizon Client'
[10/05/2017 11:46:05.681] Try #10: Waiting...
[10/05/2017 11:46:10.740] No match on window title='VMware Horizon Client'
[10/05/2017 11:46:10.748] Try #15: Waiting...
[10/05/2017 11:46:15.806] No match on window title='VMware Horizon Client'
[10/05/2017 11:46:15.814] Try #20: Waiting...
[10/05/2017 11:46:20.845] No match on window title='VMware Horizon Client'
[10/05/2017 11:46:20.845] Try #25: Waiting...
[10/05/2017 11:46:25.883] Try #30: Waiting...
[10/05/2017 11:46:30.945] Try #35: Waiting...
[10/05/2017 11:46:36.007] Try #40: Waiting...
[10/05/2017 11:46:41.063] Try #45: Waiting...
[10/05/2017 11:46:42.078] WARNING: Unable to confirm that session launched
[09/11/2017 09:31:26.135] WARNING: Unable to confirm that session launched
for Resource='Internet Explorer - 65' and Title='Internet'
20171005114642110_RunNameReceiver Launch.png
```

VMware Horizon Client Error Message: "VMware Horizon Client cannot verify the details of the session you are attempting to launch. Contact your administrator for assistance and the Horizon administrator console."

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

Goliath Performance Monitor for VMware

Single Console Platform Management

Goliath Performance Monitor for VMware Horizon consolidates all the pertinent data about your infrastructure into a single console for broad and deep visibility into VMware vSphere and end user experience. You get metrics for 5 layers (Hardware, Host, VMs, OS, Apps) of the VMware Horizon infrastructure in the form of detailed screens and customizable performance graphs.

- ▶ **RDSH Host Display:** Number of users, sessions, and resource utilization
- ▶ **Real-time Session Display:** user, farm/site, machine, SID, session start, duration, logon time, CPU usage, memory, RTT and more
- ▶ **PCoIP Blast Protocol Metrics:** RTT, bandwidth, channels, FPS
- ▶ **Server info:** CPU, memory, disk drives, host latency, datastore usage, queue length, IOPs, storage latency
- ▶ **Logon Duration:** 33+ stages of the logon process for precise troubleshooting
- ▶ **End User Experience:** Pertinent metrics to quickly determine a user's experience

Understand Infrastructure Performance

Goliath provides visibility into the underlying infrastructure supporting VMware Horizon including:

- ▶ vSphere hosts
- ▶ Connection servers
- ▶ Secure gateway
- ▶ Supporting infrastructure such as:
 - Active Directory,
 - SQL
 - back-end applications

This allows administrators to quickly identify whether the issues are user-specific, elsewhere in the infrastructure, or the root cause affecting large user groups.

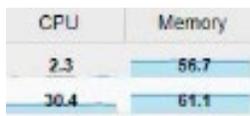
Integrated RDSH Hosts Display

Goliath Performance Monitor for VMware Horizon provides a single place to view all the RDSH servers, the number of users, sessions, and resource utilization of each. With a single glance, administrators can immediately determine if:

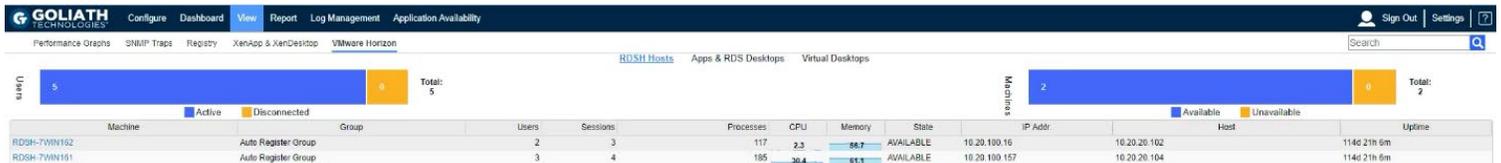
- ▶ An RDSH server is overloaded with users which may indicate a load balancing issue



- ▶ The environment is properly balanced or if certain servers have more users than others
- ▶ If user activity may be generating high CPU or Memory conditions

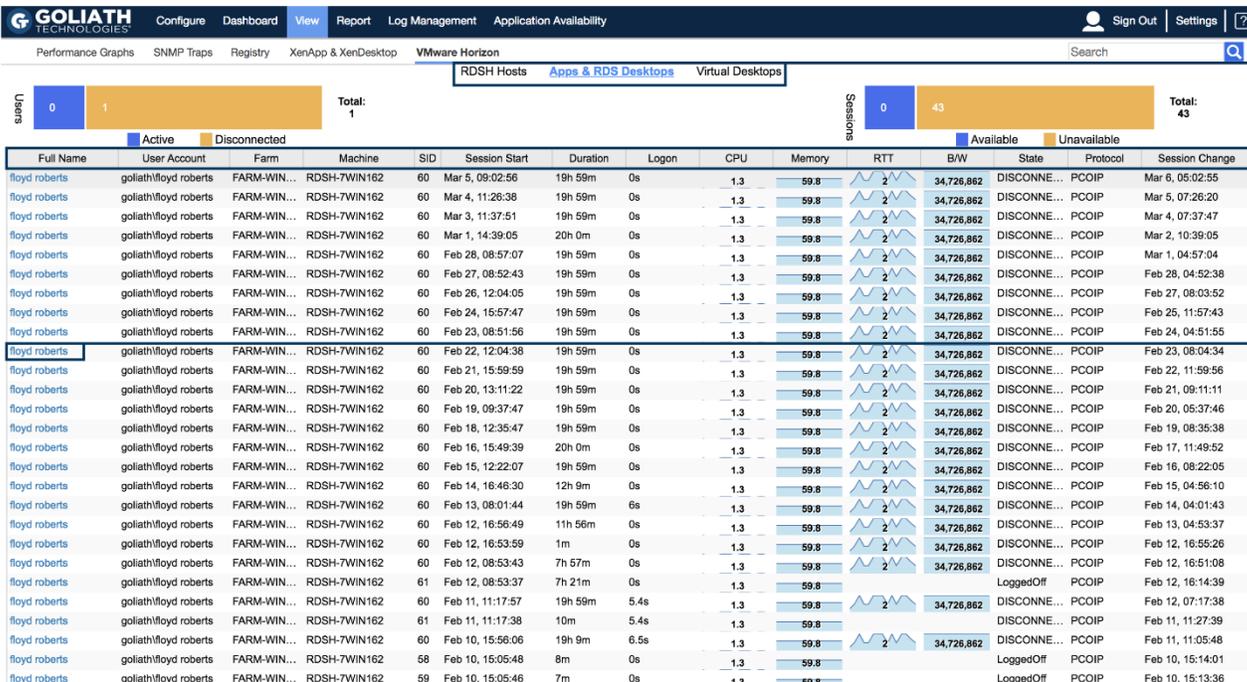


(in the above scenario the server may need to be put into maintenance or drain mode so the problem can be resolved)



Real-Time Session Display

Goliath provides granular real-time and historic data for all VMware Horizon sessions. When there are end user experience issues, drill into a user session to gain deeper visibility and identify the root cause.



Toggle between environments

Key session metrics:
Name, User, Farm/Site, Machine, SID, Session Start Date/Time, Duration, Logon Time, CPU Usage, Memory, RTT, B/W, State, Protocol, Session Change Date/Time.

Click to drill into the user's session and see expanded EUE metrics

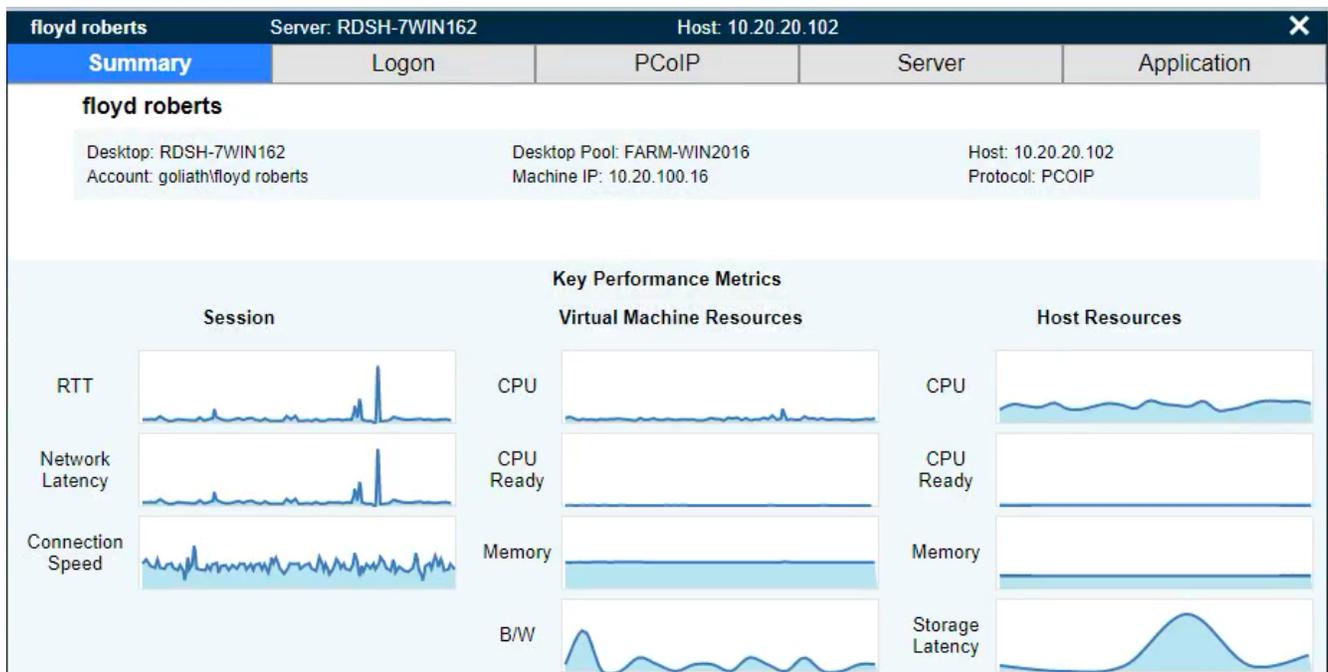
Troubleshooting End User Experience

Goliath Performance Monitor for VMware Horizon enables administrators to examine current and historical user sessions for troubleshooting problems with Virtual Desktops. Unlike the RDSH applications and desktops, with VDI there is a 1-to-1 relationship of users to servers which means it is unnecessary to have a separate view to present the performance and health of the VDI machines. User information is available right away to provide context and performance metrics:

With a single click an administrator or help desk technician can click into a user's session to identify what exactly is causing the problem in real-time or in a past session. Drilling down instantly provides a glimpse into how the user's application is performing, what problems are taking place, and full context for the user's session to start troubleshooting. Administrators get details such as logon times, protocol performance, RDSH/VDI machine performance, and application performance.

Details provided include:

- ▶ **Session Metrics:** RTT, network latency, and connection speed
- ▶ **Machine:** CPU, CPU ready, memory, and bandwidth
- ▶ **Host:** CPU, CPU ready, memory, and storage latency



Monitor User Experience from PCoIP and BLAST Protocols

Goliath provides industry-leading visibility into VMware Horizon session performance by breaking down the PCoIP/BLAST protocol into its key parts. Viewing these metrics in a single window gives administrators the ability to quickly identify relationships between user behavior and connection performance.

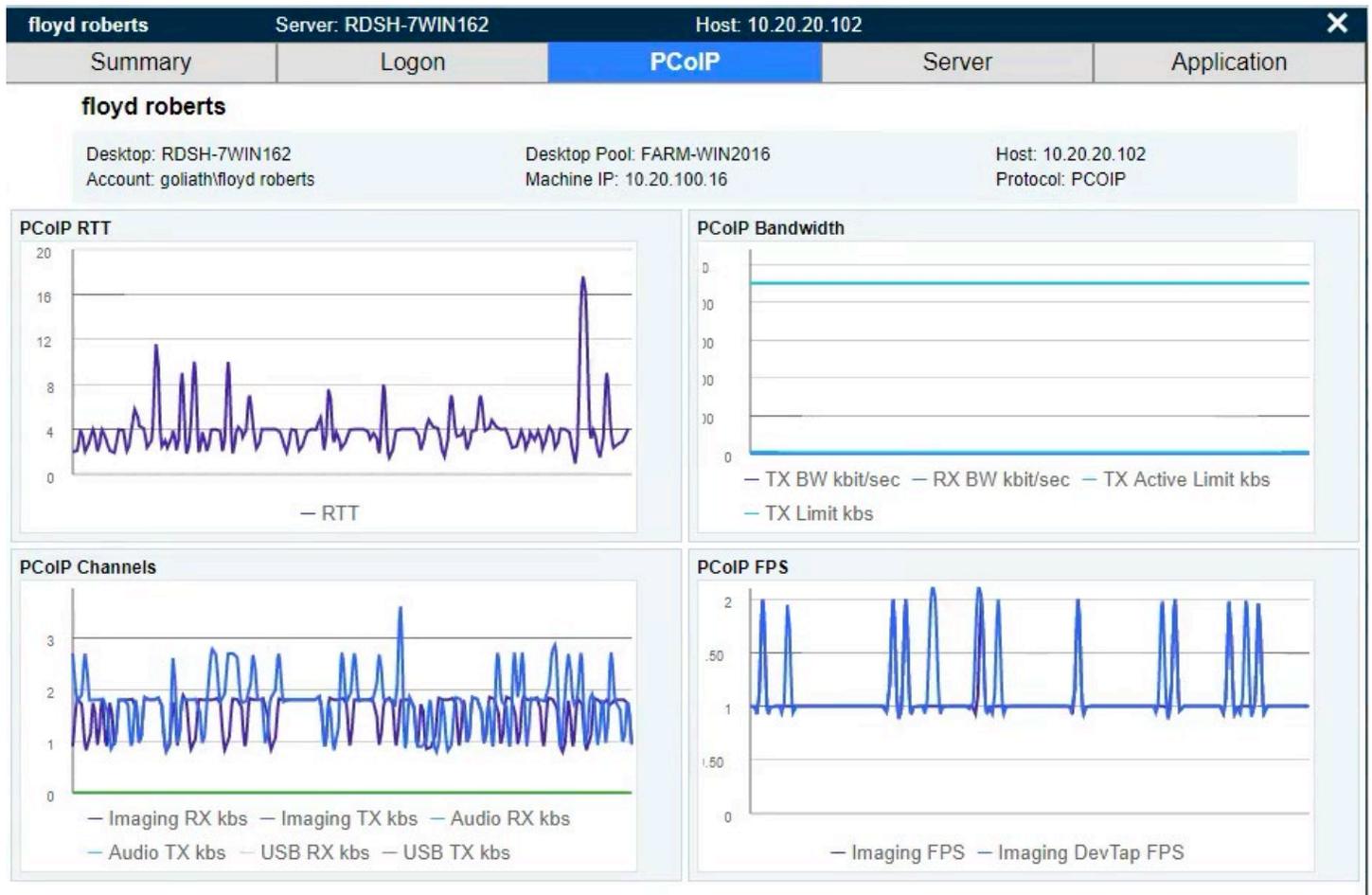
Details provided on this screen include:

RTT: Round Trip Time is the primary indicator of user experience. Values over 400ms are indicative of poor performance. RTT includes network latency, server TCP load, and presentation layer response time in the calculation.

Bandwidth: This chart includes the bandwidth usage along with the maximum available user connection speed overlaid on the same chart so administrators can determine if there is enough bandwidth to support the user activity.

Channels: There are three primary channels, Imaging (Video), Audio, and USB which are presented on this display so you can understand what type of activity from the user is putting the most pressure or load on the bandwidth consumption.

FPS: The user's frames per second are tracked to provide some perspective on how presentation performance is taking place for the user session.



Real-Time Logon Duration Drill Down from Session Display

The logon duration drill down breaks down a user's logon process into 33+ detailed stages to give admins a granular view of the process. This makes it easier to understand what needs to be optimized in order to improve logon times. You can use this window to identify session load problems by viewing what is stuck or taking too long to process. Utilizing threshold based alerting (*pg 13*) on logon times puts admins ahead of end user experience, allowing you to prevent issues before they occur.

floyd roberts		Server: RDSH-7WIN162		Host: 10.20.20.102		X			
Summary		Logon		PCoIP		Server		Application	
floyd roberts									
Desktop: RDSH-7WIN162			Desktop Pool: FARM-WIN2016			Host: 10.20.20.102			
Account: goliath\floyd roberts			Machine IP: 10.20.100.16			Protocol: PCOIP			
Stage	Description	Start Time	Duration	Timeline					
> Client Validation	Brokering and Endpoint Launch execution including launching the client	Feb 10, 15:56:00	5000ms						
> Authentication	User authentication, Policy Retrieval, and logon script determination at the session host	15:56:05.000	326ms						
> GPO	Group Policy Execution	15:56:05.326	342ms						
> Logon Scripts	Logon Script execution	15:56:05.668	0ms						
> Profile	User Profile loading	15:56:05.668	447ms						
> Desktop	Background processing for completing the load of the user's environment	15:56:06.115	372ms						

The logon duration drill down allows an administrator to parse logon times into each stage, policy, application and machine. This includes the details from the time that the connection server determines where the user is connecting to (RDSH Server or VDI) to the point where the session is fully established. The same capability is present for both VDI and RDSH published applications and desktops.

These stages include:

- ▶ Client Validation
- ▶ Authentication
- ▶ Group Policy Processing
- ▶ Logon Script Execution
- ▶ Profile loading
- ▶ Desktop load

Stage	Description	Start Time	Duration	Timeline					
✓ GPO	Group Policy Execution	07:03:11	258ms						
	Citrix Group Policy Extensions Starting Citrix Group Policy Extension Processing Local Group Policy	07:03:11	62ms						
	Group Policy Environment Extension Starting Group Policy Environment Extension Processing W7_XD Loopback User	07:03:11	26ms						
	Group Policy Local Users and Groups Extension Starting Group Policy Local Users and Groups Extension Processing W7_XD Loopback User	07:03:11	16ms						
	Group Policy Drive Maps Extension Starting Group Policy Drive Maps Extension Processing W7_XD Loopback User	07:03:11	76ms						
	Group Policy Files Extension Starting Group Policy File Extension Processing W7_XD Loopback User	07:03:11	56ms						
	Group Policy Ini Files Extension Starting Group Policy Ini File Extension Processing W7_XD Loopback User	07:03:11	11ms						
	Windows Search Group Policy Extension Extension Starting Windows Search Group Policy Extension Extension Processing W7_XD Loopback User	07:03:11	7ms						
	Group Policy Shortcuts Extension Starting Group Policy Shortcuts Extension Processing W7_XD Loopback User	07:03:11	4ms						

Advanced Remediation Capabilities

Goliath goes beyond providing differentiating VMware Horizon 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

Goliath enables you to specify custom thresholds and receive proactive notifications based on faults, errors, and conditions so administrators can resolve issues before end users report them. 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.

Specify Monitoring Rule Parameters and Properties

* Rule Name:

* Description:

* Severity: Critical ■

VMware CPU, Disk and Memory Parameters

CPU Performance Thresholds:
CPU Ready (Percent): Define custom thresholds

Disk Performance Thresholds:
Throughput (KBytes/sec), Read: Write:
IOPS (Operations/sec), Read: Write:
Latency (Milliseconds), Read: Write: Total:

Memory Performance Thresholds: Percent GB

Active: <input type="text" value="60"/>	Consumed: <input type="text" value="90"/>
Shared: <input type="text"/>	Granted: <input type="text"/>
Swap-in: <input type="text"/>	Swap-out: <input type="text"/>
Ballooned: <input type="text"/>	Overhead: <input type="text"/>

Proactive notifications on CPU, storage and memory performance

Alert Resolution Feature

For workflows that cannot be automated, Goliath allows administrators to save troubleshooting instructions. Those instructions can then be sent automatically to the appropriate support personnel when alerts are triggered. This enables consistent response quality regardless of the help desk responder.

Specify Monitoring Rule Parameters and Properties

Alert Resolution Notes

A program, the Csid displayed in the message, tried to start the DCOM server by using the DCOM infrastructure. Based on the security ID (SID), this user does not have the necessary permissions to start the DCOM server

RESOLUTION

Verify that the user has the appropriate permissions to start the DCOM server.

To assign permissions:

1. Using Regedit, navigate to the following registry value
HKCR\Clsid\clsid value\localserver32
The clsid value is the information displayed in the message.
2. In the right pane, double-click Default. The Edit String dialog box is displayed. Leave this dialog box open.
3. Click Start, and then click Control Panel.
4. Double-click Administrative Tools, and then double-click

Log Type: Log

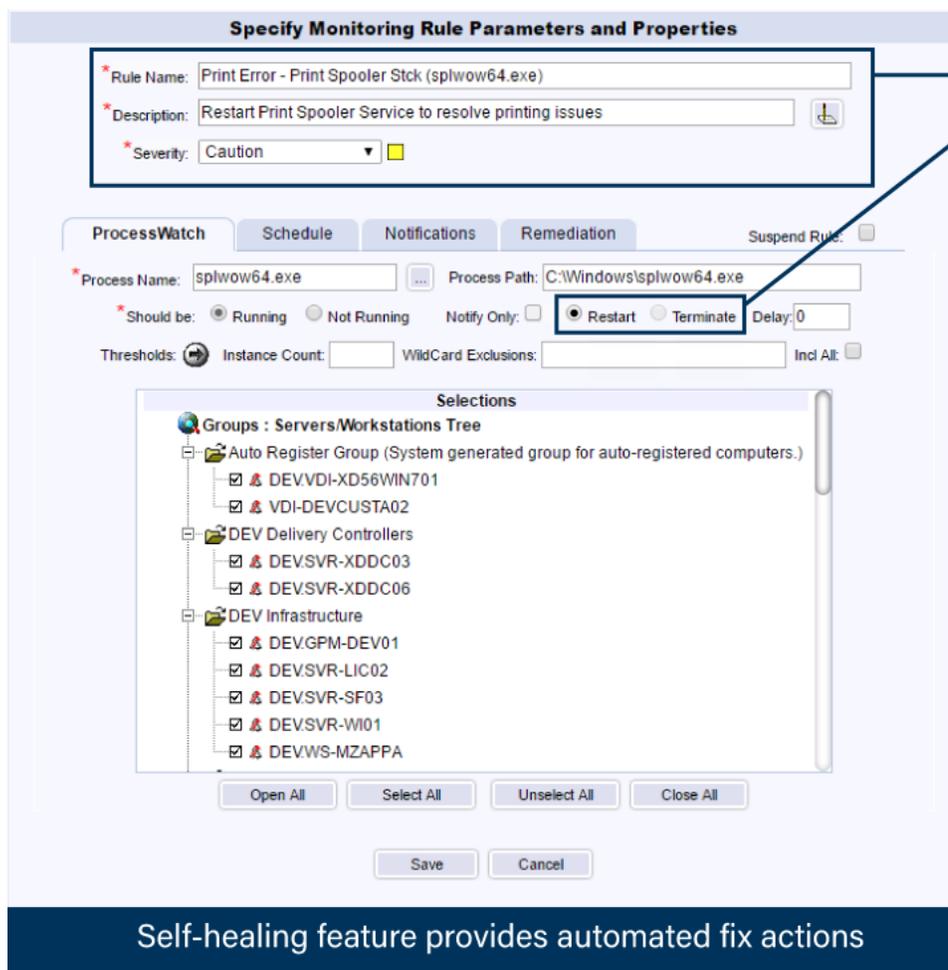
VDI-PERF12
 VDI-PERF13
 VDI-PERF14
 Auto Register Group (XenApp Farm. ServerName: ; Version: ; AdminType:)
 DEV.SVR-LIC02
 DEV.SVR-XDDC03
 GOLD.VDI-PERF000

Save remediation instructions in Alert Resolution feature.

Include remediation instructions with alerts to ensure consistency of fix actions and reduce resolution time.

Automated Remediation Actions

Additionally, Goliath gives you the ability to configure automatic remediation fixes to take place when certain alerts are triggered based on faults, events or conditions. Whether it is 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.



Execute simultaneous alerts and fix actions

Self-healing feature provides automated fix actions

Automated Infrastructure fix actions:

- ▶ 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

Built-in and Customized Alerting

Goliath Performance Monitor for VMware Horizon includes a series of built-in alerts for identifying problems with applications, profile, printing, and registry issues. These alerts scan for common problems end users may encounter:

- ▶ **Applications:** Crashes, hangs, leaking CPU and memory
- ▶ **Profile:** Profile corruption, temporary profiles, profile load failures, insufficient rights,
- ▶ **Printing:** Printing service failures, printer driver issues, printer mapping, and driver compatibility issues.
- ▶ **Registry:** Registry corruption, profile load failures, registry loading failures.

Out-of-the-Box Monitoring Intelligence for Common Failure Points

Goliath Performance Monitor comes with “embedded intelligence” consisting of hundreds of pre-configured monitoring rules and alerts based upon best practices from VMware and our own Goliath consulting experience. This means 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 alerts scan for common problems end users may encounter:

- ▶ Applications: Crashes, hangs, leaking CPU and Memory
- ▶ Profile: Profile corruption, temporary profiles, profile load failures, insufficient rights,
- ▶ Printing: Printing Service Failures, Printer Driver Issues, Printer Mapping, and driver compatibility issues.
- ▶ Registry: Registry Corruption, profile load failures, registry loading failures.

Additional alerts can be created and customized to the specific needs of the user.

Reporting

Out-Of-The-Box Reports For Full Visibility Into Your Infrastructure, Performance Issues & End User Experience

Built-In Reporting

Built-in reports allow administrators to report on session activity, trending faults and errors, and trend performance. Whether for troubleshooting or capacity planning, reports in Goliath Performance Monitor allow administrators to have a historical reference to environment performance and event

VMware Performance Reports

VMware ESX/ESXi – Host Performance

VMware ESX/ESXi – Virtual Machine Performance

VMware ESX/ESXi – Storage Usage

IT Infrastructure Reporting

In order to assist you in proactively managing your entire virtual and physical IT infrastructure and elements like **OS, Network**, Goliath has a series of IT Infrastructure Performance Reports that can help you get ahead of infrastructure performance issues that may cause end users to experience problems such as printing and profile failures

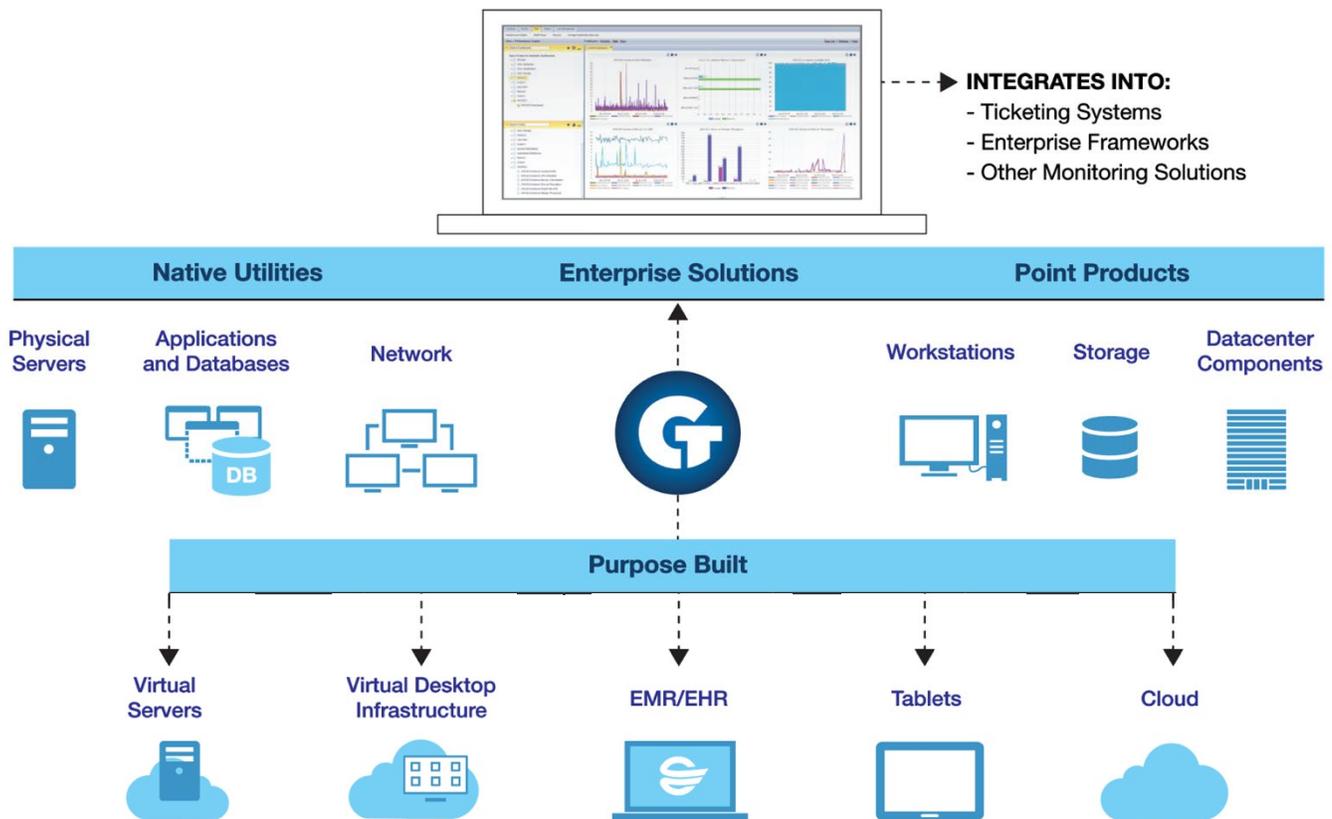
- ▶ Alert analysis
- ▶ Logical drive utilization status
- ▶ Printing health
- ▶ Registry monitor status
- ▶ Server monitoring rules assignments
- ▶ Syslog message analysis
- ▶ Windows event log analysis
- ▶ Operating system inventory
- ▶ User security
- ▶ Group policy & registry health
- ▶ Memory utilization status
- ▶ Profile errors
- ▶ Server configuration details
- ▶ SSL & communication errors
- ▶ Uptime & availability
- ▶ Windows server & configuration errors
- ▶ Group inventory

Advanced Reporting and Analytics Module

Goliath's Advanced Reporting and Analytics Module allows you to take advantage of your existing business intelligence platforms like Microsoft's Power BI and Tableau or use other tools like Excel to create advanced views into your data. With default Power BI templates available out of the box, you can quickly begin to analyze your data to gain even more insight into your environments.

Co-existence with Enterprise Monitoring

In order to better support the needs of large enterprises, Goliath has made it easy to leverage its purpose-built feature set by integrating it with enterprise monitoring tools (which are frequently different for each IT silo within an organization). This allows enterprises to acquire Goliath's differentiating functionality around VMware Horizon without requiring disruptive forklift upgrades or feature overlap.



To see how Goliath can help you improve VMware Horizon 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

